

CDM VALIDATION REPORT

PETRAMAS S.A.C.

**VALIDATION OF THE PROJECT ACTIVITY:
Modelo del Callao Landfill Gas Capture and
Flaring System**

AENOR REFERENCE: 2009/025/CDM/04

VERSION: 04

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Validation Report:	AENOR Reference n°:	Version of this report:	Date:	
	2009/025/CDM/04	04	20/08/2012	
PDD:	Title:	GSC publication date:	Comments received:	
	Modelo del Callao Landfill Gas Capture and Flaring System	2009/09/18	<input type="checkbox"/> Yes* <input checked="" type="checkbox"/> No	
Parties involved:	Host Party:	Other involved Parties:		
	Peru			
Project Participant(s):	In host Party:	In other involved Parties:		
	PETRAMAS S.A.C.			
Size of the project activity:	<input type="checkbox"/> Small-scale <input checked="" type="checkbox"/> Large-scale			
Applied methodologies:	Title:	Code:	N°version	Scope:
	Consolidated baseline and monitoring methodology for landfill gas project activities	ACM0001	11	13
Applied tools:	Title:	Version:		
	Tool for the demonstration and assessment of additionality	5.2.1		
	Title:	Version:		
	Tool to determine project emissions from flaring gases containing methane	1		
	Title:	Version:		
	Tool to calculate baseline, project and/or leakage emissions from electricity consumption	1		
	Title:	Version:		
	Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion	2		
	Title:	Version:		

* The comments are detailed in section 4 of this validation report

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	Combined tool to identify the baseline scenario and demonstrate additionality	4.0.0	
	Title:	Version:	
	Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site	5.1.0	
	Title:	Version	
	Tool to calculate the emission factor for an electricity system	2.2.1	
Emission reductions (ER):		GSC PDD:	Final PDD:
<input checked="" type="checkbox"/> Annual average of the ER (tCO₂e)		52,182	61,024
<input type="checkbox"/> Total ER (tCO₂e)			
Previous versions of this document:		Version:	Date:
		1	26/10/2011
		2	26/12/2011
		3	11/05/2012
		4	
Report prepared by:		Climate Change Unit. AENOR	

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Abbreviations

ACM0001	Consolidated baseline and monitoring methodology for landfill gas project activities
CAR	Corrective action request
CL	Clarification
CDM	Clean Development Mechanism
CER	Certified emission reductions
DECISION 3/CMP.1	Modalities and procedures for a clean development mechanism as defined in Article 12 of the Kyoto Protocol
DNA	Designated national authority
EB	Executive board of the CDM of the Kyoto Protocol
EIA	Environmental impact assessment
ERCP	Emission reduction calculation procedure
GHG	Greenhouse gasses
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
LFG	Landfill gas
LoA	Letter of approval
MINEM	Ministry of Energy and Mines
MP	Monitoring plan
MWh	Megawatt hour
MSW	Municipal solid waste
PDD	Project design document
SWDS	Solid waste disposal site
tC	Carbon tonnes
ODA	Official development aid
UNFCCC	United Nations Framework Convention on Climate Change

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ANNEX 1: CDM VALIDATION PROTOCOL

1 INTRODUCTION

This validation concerns a project implemented by PETRAMAS S.A.C. in Peru to reduce emissions of CO₂ by flaring the CH₄ captured from the landfill. The objectives of the validation exercise are to confirm that the project meets the necessary CDM criteria, that the project follows the approved methodology, ACM0001, version 11, and that the proposals presented by PETRAMAS S.A.C in the PDD will lead to a realistic determination of the emission reductions.

The scope of the validation covers the additionality assessment (investment barrier), environmental approval and the stakeholder consultation. In addition it covers the baseline methodology, the calculation of the emission factor and the monitoring methodology to quantify the emission reductions during the operational life of the project.

The project implies the installation of a landfill gas collection and flaring project in district of Ventanilla, province of Callao, in the Republic of Peru.

1.1 Objective

PETRAMAS S.A.C has commissioned AENOR to validate **"Modelo del Callao Landfill Gas Capture and Flaring System"**. The purpose of a validation is to have an independent third-party assessment of the project design. In particular, the project's baseline, the monitoring plan (MP), and the project's compliance with relevant UNFCCC and host country criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the stated requirements and identified criteria.

Validation is a requirement for all CDM projects and is considered necessary in order to provide assurance of the quality of the project and its intended generation of certified emission reductions (CERs).

UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities as agreed in the Bonn Agreement and the Marrakech Accords.

1.2 Scope

The scope of the validation is to assess all aspects of GHG reduction involved in the project, including the project design, the baseline, the determination of the grid's emission factor and the procedures proposed for monitoring emission reductions in the future.

The following documents were reviewed as part of the scope of the activity:

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- PDD /1/ /2/, including baseline study and monitoring plan
- “Consolidated baseline and monitoring methodology for landfill gas project activities”, ACM0001, version 11 /3/
- Decision 3/CMP.1 and relevant decisions and guidelines from the EB
- Validation and Verification Manual, version 1.2
- Associated documentation (EF calculations, environmental requirements, investment analysis, etc.)

The validation scope is defined as an independent and objective review of the project design document, the project’s baseline study, monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. AENOR, based on the Instruction for Validation, Verification and Certification of CDM Project Activities (IE-DTC-039) and the Validation and Verification Manual, has used a risk-based approach in the validation, focusing on the identification of significant risks for project implementation and the generation of CERs.

The validation is not meant to provide any consultancy services to the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the PDD.

2 METHODOLOGY

The validation of the project started in September 2009. The validation was performed in the manner of an audit, where, first, a desk review of the PDD, version 1, was undertaken against the approved methodology and CDM and other relevant criteria. The desk review was followed by site visits to PETRAMAS S.A.C., MINEM (environmental authority), the Peruvian DNA and key stakeholders in Peru.

In order to ensure transparency, a validation protocol was customized for the project according to Instruction IE-DCT-039. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- It organizes, provides details and clarifies the requirements a CDM project is expected to meet.
- It ensures a transparent validation process during which the validator will document how a particular requirement has been validated and the result of the validation.

The validation protocol consists of two tables. The completed validation protocol is enclosed in appendix A to this report.

The sequence of the validation is given in the table below:

Topic	Date
Submission of PDD for global stakeholder consultation process	18/09/2009
On-site visit	12-13/05/2010
Validation Protocol - Version 01	15/10/2010
Final validation report	20/08/2012

Table 1: Sequence of the main validation activities

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2.1 Appointment of team members and technical reviewers

The list of involved personnel and the qualification status are summarised in the table below:

Name	Qualification	
	Position in the team	Technical areas
Jose Antonio Gesto	Chief Validator and Technical Expert	TA 13.1
Elena Llorente Pérez	Validator	
Freddy Garro Flores	Validator	
M ^a Carmen Gonzalez	Technical Reviewer	TA 13.1

Technical areas (TA) mentioned above correspond to the following:

TA code	Technical area
TA 1.1	Thermal energy generation from fossil fuels and biomass including thermal electricity from solar (COMPLEX)
TA 1.2	Energy generation from renewable energy sources
TA 2.1	Electricity distribution
TA 2.2	Heat distribution
TA 3.1	Energy demand
TA 4. 1	Cement sector (COMPLEX)
TA 4.2	Aluminium (COMPLEX)
TA 4.3	Iron and steel (COMPLEX)
TA 4.4	Refinery (COMPLEX)
TA 5.1	Chemical process industries (COMPLEX)
TA 6.1	Construction
TA 7.1	Transport
TA 8.1	Mining and mineral processes, excluding those included in TA 8.2 below
TA 8.2	Oil and gas industry, coalmine methane recovery and use (COMPLEX)
TA 9.1	Metal production

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TA 10.1	Mining and mineral processes, excluding those included in TA 10.2 below
TA 10.2	Oil and gas industry, coalmine methane recovery and use (COMPLEX)
TA 11.1	Chemical process industries (COMPLEX)
TA 11.2	GHG capture and destruction
TA 12.1	Chemical process industries (COMPLEX)
TA 13.1	Waste handling and disposal
TA 13.2	Animal waste management
TA 14.1	Forestry
TA 15.1	Agriculture
TA 15.2	Animal waste management

2.2 Document review

The project design document submitted by PETRAMAS S.A.C. was reviewed against the approved methodology and against CDM and other relevant criteria. Additional background documents related to the project design and baseline were also made available before and during the on-site visit in Peru. These additional background documents were also reviewed.

To address the corrective actions and clarification requests that arose from the desk review and on-site visit, PETRAMAS S.A.C. revised the project design document several times and developed a final version (version 5) dated on 25 April 2012.

The final validation findings are presented in this report on the project, as described in version 5 of the project design document.

The reviewed documents used throughout the validation process are detailed in chapter 6 of this report.

2.3 Follow-up actions

AENOR conducted interviews with project developers in Peru to confirm selected information and to resolve issues identified in the document review.

From 12 May 2010 to 13 May 2010, representatives from PETRAMAS S.A.C, the Peruvian DNA, the SEIN and main stakeholders were interviewed. The Municipality of Callao and representatives from the Environmental Authority were also interviewed.

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The main topics of the interviews are summarized in table 1.

Table 2: Organisations and people interviewed:

Organization/person/position interviewed	Interview topics
PETRAMAS S.A.C -Diego Soria Dall Orso, Manager of Purchases	✓ Project design ✓ Additionality assessment (investment and barrier analysis) ✓ EIA approval and related conditions Monitoring of environmental impacts
COES (Committee of Economic Operation of the System) - Freddy Augusto Rengifo Vela, Analysis Manager	✓ Compliance with law applicable to electrical generation ✓ Operation of the electricity dispatch model ✓ Baseline determination: OM & BM (power plants, electricity production, start of operation, fuels, efficiencies, most recent data...)
DNA - Laura María Reyes Polvarini, CDM Specialist	✓ Project's sustainable development contribution. LoA. ✓ Monitoring of environmental impacts ✓ Consultation with municipality's authorities, landowners and other stakeholders ✓ DNA's opinion
Municipality of Callao - Susana Maldonado Villanueva, Environmental Control Manager	✓ Compliance with applicable law ✓ Opinion about the project ✓ Knowledge of the environmental impacts ✓ Benefits for the community ✓ Consultation with municipal authorities, landowners and other stakeholders

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Organization/person/position interviewed	Interview topics
Área de Gestión de Residuos Sólidos de DIGESA Urban Solid Waste Mangement- Public Health General Direction Sonia Alvarez	<ul style="list-style-type: none">✓ Solid waste management in Perú✓ Common Practice✓ Situation of the landfills and Dumpsites in Perú.

2.4 Findings

As an outcome of the validation process, the team can raise different types of findings according to the CDM Validation and Verification Manual.

A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

Where a non-conformance arises the validation team shall raise a corrective action request (CAR). A CAR is issued, where:

- a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions;
- b) The CDM requirements have not been met; or
- c) There is a risk that emission reductions cannot be monitored or calculated.

Failure to address a CL may result in a CAR. Information or clarifications provided as a result of a CL may also lead to a CAR.

A forward action request (FAR) is raised during validation to highlight issues related to project implementation that require review during the first verification of the project activity. FARs shall not relate to the CDM requirements for registration.

The project participant was requested to address all validation findings and finally provided the validation team with sufficient evidence to determine that the applicable CDM requirements have been met. The project participant modified the initial PDD to resolve the validation team's concerns and resubmitted a final version of the PDD. AENOR has prepared this report based on the final PDD.

All the validation findings are summarised in section 3 below and documented in more detail in the validation protocol included in annex 1.

2.5 Internal quality control

Following the completion of the assessment process by the validation team, all documentation undergoes an internal quality control through a technical review before submission to the CDM-EB. The technical reviewer is a qualified member of AENOR, independent from the team that carried out the validation of the project activity. The technical reviewer or the team appointed for the technical review are qualified in the technical area(s) and sectoral scope(s) of the project activity.

3 VALIDATION FINDINGS

3.1 Approval

CAR 1 was raised in relation to the letter of approval. This CAR was resolved. For further information see appendix A of this report.

The project participant for **"Modelo del Callao Landfill Gas Capture and Flaring System"** is PETRAMAS S.A.C. from Peru, the host country.

PETRAMAS S.A.C., from the host country, Peru, meets all relevant participation requirements detailed as follows:

- Peru has confirmed that it is Party to the Kyoto Protocol (12 September 2002).
- Peru has confirmed its voluntary participation and the project's contribution to sustainable development through national approval of the project (12 August 2009) /5/. The authenticity of the letter of approval was checked through interviews with the people in charge of the approval.

The project's contribution to the sustainable development of Peru was confirmed by the DNA of the host country.

The validation did not identify any information that indicates that the project can be seen as a diversion of ODA funding towards Peru.

The PP provided the validation team with the letter of approval from Peru.

The LoA does not refer to a specific version of the PDD or validation report. The corresponding references included in the LoA, PDD and validation report are consistent.

AENOR ensures that the LoA has been issued by the host Party's designated national authority and does not doubt the authenticity of the letter of approval received from the PP. The validation team carried out a meeting with the Peruvian DNA and confirmed the authenticity of the LoA. Hence, AENOR confirms that the LoA is in compliance with paragraphs 45-48 of the VVM v.1.2.

3.2 Participation

As stated above, the project participant for the **"Modelo del Callao Landfill Gas Capture and Flaring System"** is PETRAMAS S.A.C. from Peru, the host country.

The participation of PETRAMAS S.A.C. has been approved in a separate, specific letter of approval of participation /6/ issued on 8 July 2011.

The project participant has been listed in a consistent manner in the project documentation, and the participation in the project activity has been approved by a Party to the Kyoto Protocol. The project participant information listed in tabular form in section A.3 of the PDD is consistent with the contact details provided in annex 1 of the PDD.

No entities other than those approved as project participants are included in these sections of the PDD.

In addition, the approval of participation has been issued by the relevant DNA.

AENOR's validation team states that the participation of the project participant has been approved by a Party to the Kyoto Protocol. This situation has been checked against a separate letter from the Peruvian DNA specifically approving participation.

3.3 Project design document

The PDD of the **"Modelo del Callao Landfill Gas Capture and Flaring System"** has been prepared in accordance with the latest template and guidance from the CDM Executive Board.

3.4 Project description

CL 1, CL 2, CL 3 and CL 4 were raised in relation to the description of the project activity. These CLs have been resolved. For further information, see appendix A of this report.

"Modelo del Callao Landfill Gas Capture and Flaring System" is a landfill gas collection and flaring project, located in Peru, province of Callao. The landfill of El Callao has an area of 54 hectares and on November 2003 was conceded to the project participant. This concession will last for 30 years.

The project scope is to reduce methane emissions by flaring landfill gas (LFG). A collection system will be installed over the landfill area.

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The main technical characteristics are detailed below:

- 50 vertical extraction wells of high density polyethylene pipes. The well depth is 20 meters and the diameter of the pipes will be 16 cm.
- The suction system will have a maximum transportation capacity of 1500 standard cubic feet per minute (SCFM).
- The flare station is composed of blowers and LFG measuring and recording equipment.

As is established in the PDD, the project's contribution to sustainable development consists not only of the destruction of CH₄ captured from the project activity, but also of social benefits that will be introduced in the area. The project activity will reduce landfill odours by the combustion of the landfill gas, reduce possible health risks by destroying the non-CH₄ organic compounds and create jobs. As it was checked during the on-site interviews, its operation will provide jobs to the municipalities that are directly affected, which will allow them to assume the development of their own projects, thus contributing directly to the improvement of the standard of living of the communities affected.

The validation team has mainly checked the project design against the concession contract /7/, the El Callao project profile /8/, and the project map design /9/.

A visual inspection was carried out in order to check the pre-project situation in the landfill.

All the characteristics included in the PDD were checked during the on-site visit and against the maps and the documentation submitted by PETRAMAS S.A.C.

The latest version of the PDD details the project's design in a precise manner, in accordance with the accuracy and completeness principles required for the CDM process.

The PDD clearly states the difference resulting from the project activity compared with the pre-project situation.

AENOR's validation team states that the description of the proposed CDM project activity as contained in the PDD sufficiently covers all relevant elements, is accurate and that it provides the reader with a clear understanding of the nature of the proposed CDM project activity.

In conclusion, AENOR confirms that the project description, as included in the PDD, is sufficiently accurate and complete in order to comply with the requirements of the CDM.

3.5 Baseline methodology

CAR 2 was raised in relation to the baseline methodology. This CAR was resolved. For further information see annex 1 of this report.

The final version of the PDD describes the application of the baseline methodology, which is in conformance with the approved methodology ACM0001 “Consolidated baseline methodology for grid-connected electricity generation from renewable sources”, version 11 [3]. The key conclusions about the correct application are summarised below.

Version 1 of the PDD submitted to AENOR for public comments does not include the versions of the applied tools. Therefore, CAR 2 was raised and subsequently solved after the project participant updated the PDD to include the versions of the applied tools. In addition, the project participant updated the versions of the tools to the latest approved ones.

Therefore, the project applies the following tools, which are referred to in ACM0001:

- Tool for the demonstration and assessment of additionality, version 5.2.1/[11/
- Tool to determine project emissions from flaring gases containing methane, version 1, EB 28 annex 13. [12/
- Tool to calculate baseline, project and/or leakage emissions from electricity consumption, version 1, EB 39 annex 7. [13/
- Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion, version 2, EB 41 annex 11. [14/
- Combined tool to identify the baseline scenario and demonstrate additionality, version 4.0.0, EB 66 annex 48. [15/
- Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site, version 5.1 EB 61 annex 10. [16/
- Tool to calculate the emission factor for an electricity system, version 2.2.1, EB 63 annex 19. [17/

The ACM0001 methodology is applicable because the project activity involves a landfill gas (LFG) collection and flaring or combustion project, thus converting its CH₄ content into CO₂, reducing its greenhouse gas effect. The plausible baseline scenario is the continuation of the present gas management at the landfill, which is the total passive venting of LFG. Based on the on-site visit assessment and relevant documents provided by the project participant during the validation process such as concession contract and the project profile [8], AENOR checked the applicability of the methodology to the project activity.

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The **“Modelo del Callao Landfill Gas Capture and Flaring System”** will collect and flare the landfill gas produced by municipal solid waste received daily from Callao and the district of San Martín de Porres. The project’s system boundary comprises the landfill gas (LFG) collection system and the enclosed flaring system.

The project activity requires electricity from the Peruvian grid for the operation of the facility; therefore, the electricity source is included in the project boundary. This requirement is in accordance with the ACM0001 methodology, version 11.

The baseline emissions included in the final version of the PDD has been determined ex ante by projecting the future GHG emission of the landfill. Baseline emission will be determined ex post by metering the actual quantity of methane captured and destroyed once the project activity is operational according to the steps stated in ACM0001 “Consolidated baseline and monitoring methodology for landfill gas projects activities”, version 11 and the “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”, version 5.1.

The tool selected to calculate the project emission from flaring in the final version of the PDD is “Tool to determine project emissions from flaring gases containing methane” (version 1). Project emissions from flaring are calculated as the sum of emissions from each hour h , based on the methane flow rate in the residual gas ($TM_{RG,h}$) and the flare efficiency during each hour h ($\eta_{flare,h}$).

Since the proposed project activity is a simple landfill gas flaring project and does not include heat consumption, the project emissions in the final version of the PDD are calculated as $PE_{EC,y}$ (emissions from consumption of electricity) in line with the applied methodology ACM0001, version 11. The project emissions from electricity consumption will be calculated according to the “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”, version 1.

Calculation spreadsheets /4/ along with the chapter 6 of the “Study for the safe and efficient environmental protection Landfill Model of El Callao” elaborated by Dr. Kuroiwa /10/, Comprehensive Plan for the Environmental Management of Solid Waste - PIGARS /26/ and Report N°216-08 LAB N°20 /27/ have been provided to the AENOR validation team. Thus AENOR has validated that data and assumptions considered in the PPD and spreadsheet calculations are consistent with data provided by the project participant. Furthermore, AENOR has reproduced the calculations in a clear and transparent manner to obtain the same results.

The formulae included in the spreadsheets were checked and they were in accordance with the methodology, using the same values and variables.

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The following sources of data were taken into account:

- “Calculation of the useful life of the landfill” (Cálculo de la vida útil del relleno sanitario), chapter 6 of the “Study for the safe and efficient environmental protection Landfill Model of El Callao” elaborated by Dr. Kuroiwa. /10/
- “Comprehensive Plan for the Environmental Management of Solid Waste – PIGARS” elaborated by the Municipality of El Callao. /26/
- Report N°216-08 LAB N°20. Municipal waste density of El Callao. /27/
- Regulatory requirements relating to landfill gas, “General Solid Waste Law” /18/ and “Decree 057-04-PCM” /19/
- Letters from the Municipality of El Callao (Letter N° 509-2012-MPC/GGPMA) and Ministry of Environment (Letter N° 604-2012-MINAM-VMGA-DGCA) /29/
- Municipal approval (Resolution N° 196-2006-MPC-GGMPA), environmental report and environmental approval of the landfill (Resolution 1326/2005/DIGESA) /30/
- Data from article written by Dr. C. P. Eden¹
- 2006 IPCC Guidelines for National Greenhouse Gas Inventories, vol. 5, chapter 2

AENOR confirms that the baseline and monitoring methodologies selected by the project participant comply with the methodologies previously approved by the CDM Executive Board, that the selected methodology is applicable to the project activity and that the PP has correctly applied the selected methodology.

3.5.1 Applicability of the selected methodology to the project activity

CAR 4 was raised in relation to the baseline methodology. This CAR was resolved. For further information see annex 1 of this report.

The methodology ACM0001, version 11, is applicable to LFG capture project activities, where the baseline scenario is the partial or total atmospheric release of the gas. During the on-site visit AENOR’s validation team confirmed that the current situation is the simple venting of the landfill gas into the atmosphere in

¹ Dr. C.P. Eden. CLP Organogas “LANDFILL GAS ISSUES AND OPPORTUNITIES”

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order to comply with regulations, contractual requirements¹ or other requirements (safety or odour concerns). The proposed project activity is in line with criteria (a) as the captured gas will be collected and flared.

The applicability of the selected relevant tools is discussed below:

Tool to determine project emissions from flaring gases containing methane

The project activity includes the flaring of the residual gas, obtained from decomposition of municipal organic waste. AENOR's validation team verified on-site that the residual gas stream to be flared is obtained from decomposition of municipal organic material from the **"Modelo del Callao Gas Capture and Flaring System"**. In addition, this applicability condition was confirmed against information provided by the project activity.

Tool to calculate baseline, project and/or leakage emissions from electricity consumption

The project equipment will consume electricity. Electricity-consuming equipment attributable to the project activity will be connected to the national grid from where the power required will be imported. Hence, AENOR confirms that the project falls under scenario A "Electricity consumption from the grid". This was confirmed with the information provided by the PP.

Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site

As identified on site, the landfill is a solid waste disposal site (SWDS). It was also confirmed on site that the project activity is an anaerobic managed solid waste disposal site and the municipal waste will be deposited in a site that is clearly identified. This was confirmed with information provided by the project participant.

Tool to calculate project or leakage CO₂ emissions from fossil fuel combustion

This tool is not used since the project activity will not consume fossil fuels. This was confirmed with the information provided by the project participant.

Tool to calculate the emission factor for an electricity system

This tool is not used since the project activity does not generate electricity and uses the conservative default value of 1.3 tCO₂/MWh in accordance with the applied "Tool to calculate baseline, project and/or leakage

¹ "Law N° 27314: General Solid Waste Law" and "Decree 057-04-PCM"

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emissions from electricity consumption”. This was confirmed with information provided by the project participant.

Therefore, AENOR confirms the applicability of the selected methodology ACM0001 and tools to the **“Modelo del Callao Landfill Gas Capture and Flaring System”**.

The project activity is not expected to result in emissions other than those allowed by the methodology, and there are no greenhouse gas emissions occurring within the proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity that are expected to contribute more than 1% of the overall expected average annual emissions reductions that are not addressed by the applied methodology.

3.5.2 Project boundary

The project boundary of the project activity is as per methodology ACM0001 definition: “the site of the project activity where the gas is captured and destroyed”. Precisely, the project’s system boundaries comprise the landfill gas (LFG) collection system and the enclosed flaring system.

The project activity requires electricity from the grid for the operation of the facility; therefore, the electricity grid is included in the project boundary.

In addition, all emission sources and gases related to the baseline scenario, project scenario, and leakage are clearly identified and described in a complete manner. CO₂ is the main emission source and is included in the baseline, but not CH₄ or N₂O, in compliance with the methodology. CO₂ emission from electricity consumption is included in the project emissions but N₂O and CH₄ are not included in the project activity as an emission source.

AENOR has validated the project boundary of the project during the on-site visit and with Modelo del Callao’s project profile, the concession contract and the electric map project design /20/.

The validation team states that the identified boundary and selected sources and gases are justified for the project activity.

3.5.3 Baseline identification

CL 7 and CL 8 were raised in relation to the baseline identification. These CLs were resolved. For further information see appendix A of this report.

As mandated by the methodology ACM0001, version 11, the project participant identified the baseline scenario and demonstrated additionality by using version 5.2.1 of the “Tool for demonstration and assessment of additionality”.

The PDD defines the following baseline scenario:

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- The atmospheric release of landfill gas or landfill gas passive venting (maintenance of status quo.)

The procedure for the selection of the most plausible validated baseline scenario is summarised below.

Step 1: Identification of alternative scenarios

There is relevant national/sectoral legislation on landfill and MSW management in Peru that defines the requirements for final disposal of MSW in landfills, but does not provide a specific requirement for the collection and combustion of LFG. The project participant was asked to include a description of relevant Peruvian waste legislation (CL 8), which was described in the final version of the PDD. Therefore, CL 8 was closed. The concession contract, “Law 27314: General Solid Waste Law” and its “Decree N° 057-2004-PCM”, letter from the Municipality of El Callao (N° 509-2012-MPC/GGMPA) and Ministry of Environment (N° 604-2012-MINAM-VMGA-DGCA) /29/, municipal approval (Resolution N° 196-2006-MPC-GGMPA), analysis of environmental impacts and mitigations actions (PAMA report of the landfill) and its approval (Resolution 1326/2005/DIGESA) /30/ provided to the validation team confirmed that gas destruction within the legislation or contract is not and will not be required neither because of safety reasons and environmental regulations. Articles 87 and 88 of Law 27314 set minimum conditions for installing and operating landfills respectively, including LFG control and LFG evacuation chimneys, but they do not regulate the amount of the LFG to be controlled. Therefore, the project participant used an adjustment factor (AF) equal to zero based on the facts that the regulatory requirements, including the concession contract or requirements to address safety and odour concerns do not indicate any specific amount of gas collection and destruction, or utilization, and that in practice, no LFG is collected and flared in the Modelo del Callao landfill.

Alternative scenarios discussed in the final version of the PDD are derived correctly according ACM0001, version 11, and the “Tool for demonstration and assessment of additionality”. AENOR has validated the argumentation line against the reference documents to which the PDD refers.

In the first version of the PDD submitted for validation, the steps followed for baseline identification were not clearly described. Therefore, AENOR requested that the project proponent clarify the steps related with the baseline scenario and CL 7 was raised. After the project participant improved the baseline identification in the final version of the PDD in accordance with the applied methodology ACM0001, version 11, this CL was closed.

For the scenario’s LFG recovery, options LFG1 (i.e. landfill gas capture and flaring or electricity generation without considering as CDM project activity) and LFG2 (i.e. atmospheric release of LFG and electricity generation in the existing grid) have been reasonably considered as plausible alternatives for the project. In addition, it was checked on site that due to the location of the project, there are no potential end-users for potential electrical or thermal applications.

Step 2: Investment analysis

Option I, simple cost analysis, has been appropriately selected as the project generates no financial or economic benefits other than CDM related income.

Input values for the simple cost analysis were based on quotations and the project proponent's experience of another LFG CDM project, "Huaycoloro". The investment analysis clearly demonstrated that the most likely alternative to the project is simply not installing flaring equipment at the site, which would constitute the business-as-usual scenario, i.e. that the baseline scenario is less costly than the project activity.

Step 3: Common practice analysis

The common practice analysis adequately listed and analysed the Peruvian landfill situation, based both on publicly available government reports and own market knowledge. Moreover, a review of ongoing CDM activities in the MSW field has been included, providing a full picture regarding prevailing practices and the way in which CDM could be used to execute landfill gas collection and flaring.

The validation team has cross-checked the information and sources contained in the updated PDD on these matters.

The assumptions and data used in the identification of the baseline scenario are appropriately justified, supported by evidence and can be deemed reasonable. In addition, relevant national and/or sectoral policies and circumstances are in the final version of the PDD.

The final version of the PDD identifies the baseline for the proposed CDM project activity, defined as the scenario that reasonably represents the anthropogenic emissions by sources of GHGs that would occur in the absence of the proposed CDM project activity.

3.5.4 Algorithms and/or formulae used to determine emission reductions

CL 6 was raised in relation to the emission reduction calculation. This CL was resolved after the project participant provided the validation team with all information regarding emission reduction calculation (spreadsheets, evidence, assumptions, etc.) and the evidence/assumptions were found consistent with data in the final PDD and the calculation spreadsheet. For further information see appendix A of this report.

AENOR has conducted an assessment of the applicability of version 11 of ACM0001 and each tool required by the methodology as well as of the associated parameters and data used to calculate the baseline emissions and emission reductions.

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AENOR has validated the calculations, data and parameters used in the final PDD and the ER calculation spreadsheet /4/.

- Regulatory requirements relating to landfill gas: Publicly available information of the Peruvian's regulatory requirements relating to landfill gas has been taken into account for the adjustment factor (AF) and MD_{BL} . AF was set as zero as current regulatory requirements and the concession contract do not indicate any specific amount of gas collection and destruction, or utilization and that in practice, no amount of LFG is collected and flared in the Modelo del Callao landfill. Therefore, $MD_{BL,y}$ is equal to zero for the ex ante ER calculation.
- Adjustment factor (AF): as stated above AF was set as zero as current regulatory requirements, concession contract or other requirements (safety or odour concerns) do not indicate any specific amount of gas collection and destruction, or utilization; and that in practice, no amount of LFG is collected and flared in the Modelo del Callao landfill in line with the on-site visit; where it was verified that there was no infrastructure in the landfill capable of destroying methane. This information was crosschecked by clarifications letter from Municipality of El Callao and Ministry of Environment, municipal approval, environment approval by DIGESA and interviews with relevant stakeholders in the host country.
- Global warming potential of CH₄ (GWP_{CH_4}): Value of 21 as per the applied methodology.
- Methane density (D_{CH_4}): Value of 0.0007168 tCH₄/m³CH₄ as per the applied methodology
- Methane generation from the landfill in the absence of the project activity at year ($BE_{CH_4SWDS,y}$): Calculated as per the Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site.
- Amount of methane destroyed historically for the previous year before the start of project activity (MD_{Hist}): AENOR confirms that during the on-site visit there was no infrastructure in the landfill capable of destroying methane.

According to ACM0001, version 11, the measurement of w_{CH_4} has to be carried out using certified equipment. At the validation stage, the choice of technology supplier has been finalised. The gas analyser is provided by the flare supplier as part of the gas flaring system. The gas analyser is certified by Nova Analytical System Inc., and the flare supplier is John Zink /24/, one of the most common flare suppliers that is certified ISO 9001.

Therefore, the results of the calculations show that the parameters and data used for the calculation to determine emission reductions are appropriate.

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Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site

AENOR has validated the calculations, data and parameters used in the final PDD and the ER calculation spreadsheet /4/. The evidence for waste volume and composition calculations, measurements and forecasts were provided to the DOE and the PDD values were consistent.

The key input factors beyond the volume and waste composition (MCF, oxidation factor, recovery rate, climatic conditions relating to the decay rate) influencing the LFG generation were also investigated and their accuracy and conservativeness were checked with the following results:

- Model correction factor to account for model uncertainties (ϕ): AENOR confirms the value of 0.9 as per the applied tool.
- Oxidation factor (OX): AENOR confirms the value of 0.1 as per the applied tool. On-site verification showed that the project activity includes cover material (clayed soil) in specific areas.
- Volume fraction of methane in the SWDS gas (F): AENOR confirms the value of 0.5 as per the applied tool.
- Fraction of degradable organic carbon (DOC_f) that can decompose: AENOR confirms the value of 0.5 as per the applied tool.
- Methane correction factor (MCF): As per on-site verification, AENOR confirms that the landfill site belongs to the anaerobic managed solid waste disposal site category; therefore, the value of 1.0 is appropriately used.
- Waste composition: AENOR confirms that the waste composition of the landfill is correct in accordance with the study “Comprehensive Plan for the Environmental Management of Solid Waste – PIGARS” made by Municipality of El Callao.
- Fraction of degradable organic carbon (by weight) in the waste type (DOC_j): AENOR confirms that the result of the chosen value of DOC_j for each waste type is correctly shown and explained in the PDD as per the applied tool.
- Decay rate for the waste type j (K_j): AENOR confirms that value of K_j for the climate and waste composition are considered for the project. The result of the chosen value of K_j for each waste type is correctly shown and explained in the PDD as per the applied tool.
- The amount of waste disposed in the landfill sites (W_x): AENOR confirms the value of the amount of waste disposed is correctly stated in the PDD in accordance with a study regarding the landfill “Modelo del Callao” made by Eng. Julio Kuroiwa /10/. In this study the amount of waste disposed in the landfill has been estimated based in statistics of population increase, waste generation per capita, municipal waste density and capacity design of the landfill. These values were validated by the validation team.

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- LFG collection efficiency (CE): The collection efficiency of 50% is deemed reasonable and conservative on the basis of article made by Dr. C. P. Eden. The information provided by the project proponent has been crosschecked with the UNFCCC website and other official sources such as United States Environmental Protection Agency (US-EPA). Moreover, taking into consideration the information gathered during site visit and the project profile, mainly based on the characteristic of the cover, it is considered that 50% for the LFG collection system is realistic. Therefore, 50% of LFG collection system is considered suitable.
- Climatic conditions influencing the decay rate (Kj): chosen decay rate (Kj) for each waste type is correctly identified in the PDD; the climatic conditions – boreal & dry – have been verified. Climate conditions are in accordance with information of Food and Agriculture Organization of the United Nations - FAO (<http://www.fao.org/nr/water/aquastat/countries/peru/indexesp.stm>) at the project area, which is based in national statistics. In addition, the validation team confirms these values against the “Study of the hydroelectric potential of Peru” [28] and confirms that are reasonable.

The results of the calculations show that the parameters and data used for the calculation to determine methane emissions avoided from disposal of waste at landfill sites are appropriate. AENOR confirms that the assumptions for the ex ante baseline methane emissions avoided from disposal of waste at a solid waste disposal site are plausible.

Tool to determine project emissions from flaring gases containing methane

The DOE has validated the calculations, data and parameters used in the final PDD and the ER calculation spreadsheet [4].

Regarding the ex ante calculations, AENOR concludes that the tool has been applied correctly and the parameters and data used are reasonable. All assumptions and data, including their references and sources, used by the project participant are listed in the final PDD.

Tool to calculate baseline, project and/or leakage emissions from electricity consumption

The DOE has validated the calculations, data and parameters used in the final PDD and the ER calculation spreadsheet [4]. AENOR confirms that the tool has been applied correctly and the data used are reasonable. The data, including their references and sources, used by the project participant are listed in the final PDD.

- Quantity of electricity consumed by the project electricity consumption (EC_{pl,y}): AENOR confirms that for ex-ante estimation this parameter is based in the maximum electricity consumption of the equipments to be installed and operating hours per year in accordance with the electric map project design.

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- Emission factor of the grid (EF_{ELiy}): The conservative default value of 1.3 tCO₂/MWh is correctly applied in accordance with the tool.
- Average technical transmission and distribution losses for providing electricity from the grid (TDLy): For ex-ante estimation the default value (scenario A) of 20% is correctly applied in accordance with the tool.

Therefore, AENOR confirms that all assumptions and data, including their references and sources, used by the PP to calculate project emissions, baseline emissions, leakage and emission reductions are listed in the final PDD. Furthermore, all documentation used by the project participant as the basis for assumptions and source of data is correctly quoted and interpreted in the PDD and all values used in the PDD are considered reasonable in the context of the proposed CDM project activity. Finally, the baseline methodology has been applied correctly to calculate project emissions, baseline emissions, leakage and emission reductions; also, all estimates of the baseline emissions can be replicated using the data and parameter values stated in the PDD.

3.6 Additionality

3.6.1 Starting date of the project activity and prior consideration of the CDM

The project's starting date is 03 December 2010, thus after 02 August 2008. The validation team confirmed this date by review of the project schedule. At the time of the on-site assessment, no activities related to the project were being carried out and no contracts for construction or equipment provision were available.

The validation team proved that the starting date is in line with the definition of the current version of the glossary, since the starting date considered is the date on which the project participant has committed to expenditures (flaring system purchase invoice) related to the implementation or the construction of the project activity. Minor pre-project expenses, e.g. the contracting of services/payment of fees for feasibility studies or preliminary surveys, has not been considered in the determination of the starting date.

Notification on the commencement of the project activity and of the intention to seek CDM status by the host Party, DNA and/or the UNFCCC is not necessary because the PDD was published for global stakeholder consultation on 18 September 2009, thus before the project starting date.

Furthermore, other evidence on the serious CDM consideration is available, such as previous studies performed by consultants, the validation contract with this DOE, and written communications in the framework of the local stakeholder consultation process.

3.6.2 Analysis of the additionality

The additionality of the project has been assessed using the "Tool for the demonstration and assessment of additionality", version 5.2.1

The validation team considered all the arguments presented in the final version of the PDD.

Consideration of these arguments is presented in the following paragraphs:

Step 1: Four alternatives were identified and two of them, which are consistent with the current laws and regulations, were finally selected:

- **Alternative 1: The project activity, including the capture of landfill gas and its flaring, undertaken without being registered as a CDM project activity (LFG1):** The project would not generate any revenues, and would thus clearly be economically unattractive (see step 2 below).
- **Alternative 2: Atmospheric release of the landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odour concerns (LFG2).**
- **Alternative 3: Power generation in the absence of the project activity (alternatives P1 to P6)**
- **Alternative 4: Heat generation in the absence of the project activity (includes alternatives H1 to H7)**

Alternatives 1 and 2 were finally selected. The validation team confirmed that alternatives 2 and 3 were not realistic or credible.

The validation team considers the list of the alternatives to be complete, since it states the project activity is undertaken without being registered as a CDM project activity. The identified alternatives are realistic and viable to destruct the generated LFG and are in compliance with all applicable and enforced legislation.

Laws and regulations enforcement, national/sectoral policies and circumstances:

In the PDD the project participant presented an analysis of the Peruvian legal framework related to landfills. The validation team cross-checked this analysis by performing independent searches and by reading the regulations mentioned in the PDD:

- Law 27314, the General Solid Waste Law, defines the requirements for final disposal of MSW in landfills, but does not provide a specific requirement for the collection and combustion of LFG. Articles 87 and 88 of this law set minimum conditions for installing and operating landfills respectively, including LFG control and LFG evacuation chimneys, but they do not regulate the amount of the LFG to be controlled. This was confirmed through verbal information received in

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interviews provided by members of official organisms such as the Municipality of Callao, and the DNA.

Therefore, alternatives 1 and 2 identified above satisfy the national requirements and are plausible scenarios.

Since alternatives to the project have been identified that are consistent with current laws and regulations, the project is considered to be additional under step 1.

Based on the information above, the validation team confirms that the list of relevant legal requirements is complete.

Contractual and other requirements

The concession was regarded as a solution for converting the open dump into a landfill, and encompasses the management and final disposal of the MSW. The 30-year concession clearly establishes that the rights to the LFG belong to PETRAMAS. Furthermore, it was confirmed that the regulatory requirements, including the concession contract and other requirements of the landfill (safety or odour concerns), do not indicate any specific amount of gas collection and destruction, or utilization and that, in practice, no LFG is collected and flared in the Modelo del Callao landfill.

Taking the abovementioned confirmation process into consideration, it has been concluded that the identification of alternative 2 as the as the most plausible baseline scenario is valid.

Step 2: Since the CDM project does not generate any financial or economic benefit, the project proponent chose to apply the simple cost analysis.

The project proponent provided a breakdown of the costs associated with the CDM project activity. This breakdown of costs demonstrates that alternative 2 (LFG – BaU) is less costly than the project activity.

This breakdown of costs was supported by quotations of several items. The validation team reviewed the available quotations and found them to be authentic. Copies of the quotations of major components were also provided to the validation team.

The validation team investigated similar registered LFG flaring projects located in Peru and confirmed that their capital expenditures range from around US\$1 to 5 million.

The total investment cost for **"Modelo del Callao Landfill Gas Capture and Flaring System"** is US\$929,130. This value lies in the lower limit of the observed investment costs range observed in similar registered LFG flaring projects.

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Thus the validation team considers that the presented values are plausible and concludes that alternative 1 (that is, the proposed project activity without the CDM) is clearly economically unattractive, as it provides no revenues.

Step 3: Project proponent chose not to apply this step (barrier analysis). This approach is considered to be correct, since it is allowed by the "Tool for the demonstration and assessment of additionality", version 5.2.1.

Step 4: Common practice analysis

The region for the common practice analysis has been defined as the country itself, Peru.

The assessment team has revised official sources such as legal requirements in Peru and has found that there is no requirement to collect and/or burn landfill gases. It has also been confirmed with a CONAM presentation that, even though there are some landfill gas collection activities in Peru, they are not formally established. Additionally, the team made a further cross-check of the information with the interviews held.

The Guidelines on Common Practice (EB 63 Report. Annex 12) propose four steps to determine if the proposed project activity is a common practice. The guidelines have been applied by the PP, and the validation team considers that the assumptions made are correct and conservative. Approach for Common Practice was followed by the PP:

Step 1: Calculate applicable output range as $\pm 50\%$ of the design output or capacity of the proposed project activity: According to the PDD the landfill daily capacity of Modelo del Callao used in the PDD is 1,250 tones of Municipal Solid Waste (MSW). Therefore the $\pm 50\%$ range of daily capacity goes from 625 tones to 1,875 tones of MSW. As a conservative approach the PP considered all landfills of Peru. This approach is deemed correct by the validation team.

Step 2: In the applicable geographical area, Perú, all plants that deliver the same output or capacity, within the applicable output range calculated, have been correctly identified. All the identified plants have started commercial operation before the start date of the project and the registered CDM have been identified and excluded in this step. Thus the validation team confirmed that the landfills that implemented a LFG collection and flaring system have been developed under the CDM. The final number N_{all} is 7. The selected landfills have been crosschecked with official sources and deemed correct. Validation team crosschecked the available published information with the Unit of Urban Solid Waste Management (DIGESA- Public Health General Direction, Government of Perú), and they confirm that the common practice in Perú is the passive venting, and the only Landfills with systems for the collection, recovery and flaring of Landfill gas are Huaycoloro and Ancon. Due to this information validation team deems correct the assumptions made by the PP.

Step 3: Within plants identified in Step 2, the PP has correctly identified those that apply technologies different that the technology applied in the proposed project activity.

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To define plants with different technologies the PP has selected plants with technologies that deliver the same output and differ by at least one of the following:

- (i) Energy source/fuel;
- (ii) Feed stock;
- (iii) Size of installation (power capacity):
 - Micro (as defined in paragraph 24 of Decision 2/CMP.5 and paragraph 39 of Decision 3/CMP.6);
 - Small (as defined in paragraph 28 of Decision 1/CMP.2);
 - Large

(iv) Investment climate in the date of the investment decision, inter alia:

The final number of landfills using different technologies (N_{diff}) is 7. Sources and references have been assessed and found the conclusions correct.

Step 4: The PP has calculated factor $F=1-N_{diff}/N_{all}$ representing the share of plants using technology similar to the technology used in the proposed project activity in all plants that deliver the same output or capacity as the proposed project activity. As a result of the calculation the Factor F is 0.

According to the Guidelines the calculation $N_{all}-N_{diff}$ has been made and the result is 0.

The validation team confirms that the proposed project activity is not a “common practice” within a sector in the applicable geographical area since the factor F is lower than 0.2 and $N_{all}-N_{diff}$ is lower than 3.

Therefore the proposed project clearly differentiates from these projects, and it cannot be taken as a common practice in Peru.

Taking the abovementioned into consideration it can be concluded that the implementation of LFG collection and flaring systems in landfills is not a common practice in the host country.

3.7 Monitoring plan

The project uses the approved consolidated monitoring methodology for CDM projects, ACM0001, version 11, and tools that are applicable to landfill gas capture project activities where the baseline scenario is the partial or total atmospheric release of the gas.

Applicability of these methodology and tools are justified in the final version of the PDD. The validation team has verified all parameters in the monitoring plan against the requirements of the methodology and no deviations have been found.

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The procedures have been reviewed by the validation team through document review and interviews with the relevant personnel. The information provided and an on-site inspection has allowed the validation team to confirm that the proposed monitoring plan is feasible within the project design. The relevant points of the monitoring plan have been discussed with the PPs. Specifically, these points include the location of meters, data management, and the quality assurance and quality control procedures to be implemented in the context of the project.

Leakage emissions are not produced, so the monitoring plan is not applicable to this issue.

Also, trainings, archiving, measuring and calculation procedures, equipment details, calibration frequency and maintenance needs are clearly mentioned.

Therefore, in the opinion of AENOR's validation team, the PP's will be able to implement the monitoring plan.

3.7.1 Compliance of the monitoring plan with the approved methodology

CL 12 was raised in relation to the monitoring plan of the project activity. This CL was resolved. For further information, see appendix A of this report.

As stated above, the **“Modelo del Callao Landfill Gas Capture and Flaring System”** will continuously measure mainly the fraction of CH_4 , temperature, pressure, flow of LFG and project emissions from the flaring of the residual gas stream per year via meters calibrated in accordance with national standards and manufacturer specifications.

CL 12 was raised since the description of the monitoring parameters was not in accordance with the applied methodology. Therefore, CL 12 was closed when the description of parameters in section B.7.1 of the final PDD had been updated. As stated in the methodology ACM0001, version 11, the applied tools and in the final PDD, version 5, the main monitoring parameters are as follows:

- Total amount of landfill gas captured at normal temperature and pressure ($\text{LFG}_{\text{total},y}$): All landfill gas captured will be flared. The project activity does not include use of LFG for power or thermal energy production. Thus, $\text{LFG}_{\text{total},y}$ equals $\text{LFG}_{\text{flared},y}$ and no separate flow meter will be installed. $\text{LFG}_{\text{total},y}$ will be measured by the flow meter placed directly on the installation. The flow meter will be subject to a regular maintenance and testing regime to ensure accuracy. The flow meter will be calibrated according to the manufacturer's specifications. There will be a continuous monitoring frequency.
- Amount of LFG flared at normal temperature and pressure ($\text{LFG}_{\text{flared},y}$): The amount of landfill gas flared equals to the amount of landfill gas sent to the flare. Thus, $\text{LFG}_{\text{total},y}$ equals $\text{LFG}_{\text{flared},y}$ and no

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separate flow meter will be installed. $LFG_{\text{flared},y}$ will be measured by the flow meter placed directly on the installation. The flow meter will be subject to a regular maintenance and testing regime to ensure accuracy. The flow meter will be calibrated according to the manufacturer's specifications. There will be a continuous monitoring frequency.

- Temperature and pressure of the landfill gas (T, P): Temperature and pressure will be measured continuously. No separate monitoring of temperature is necessary when using flow meters that automatically measure temperature and pressure. Measuring instruments should be subject to a regular maintenance and testing regime in accordance with appropriate national/international standards.
- Temperature in the exhaust gas of the flare (T_{flare}): The temperature of the exhaust gas stream in the flare will be measured continuously by a Type N thermocouple. Thermocouples will be replaced or calibrated every year. According to the manufacturer (project profile annex (8)), John Zink, the expected destruction efficiency is above 90%. The combustion temperature is in a range between 760 °C to 982 °C (1,400 °F to 1,800 °F). In order to be conservative for the ex ante calculation, the default flare efficiency of 90% was applied.
- Methane destroyed due to regulatory or other requirements: Changes in regulatory requirements relating to the baseline landfill(s) need to be monitored in order to update the adjustment factor (AF) or MD_{reg} directly. This is done at the beginning of each crediting period.
- Project emissions from flaring of the residual gas stream ($PE_{\text{flare},y}$): The parameters used to determine $PE_{\text{flare},y}$ will be monitored as per the “Tool to determine project emissions from flaring gases containing methane”. The parameters used for the determination of PE_{flare} are $FV_{\text{RG},h}$, w_{CH_4} , $fv_{i,h}$, $fv_{\text{CH}_4,\text{FG},h}$, t_{O_2} and T_{flare} .
- Methane fraction in the landfill gas (w_{CH_4}): This parameter will be measured and monitored continuously by the gas quality analyser. The gas analyser will be subject to a regular maintenance and testing regime to ensure accuracy. The gas analyser will be calibrated according to the manufacturer's specifications.
- Volumetric fraction of component i in the residual gas in the hour ($fv_{i,h}$): This parameter will be measured continuously using a gas analyser. Analysers will be periodically calibrated according to the manufacturer's recommendation.
- Concentration of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour ($fv_{\text{CH}_4,\text{FG},h}$): This parameter will be measured continuously using a gas analyser. This device will be calibrated according to the manufacturer's specifications.
- Volumetric flow rate of the residual gas in dry basis at normal conditions in the hour ($FV_{\text{RG},h}$): This parameter will be measured using a flow meter. There will be a continuous monitoring frequency. The flow meter will be subject to a regular maintenance and testing regime to ensure accuracy. The flow meter will be calibrated according to the manufacturer's specifications.

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- Volumetric fraction of O₂ in the exhaust gas of the flare in the hour (t_{O₂h}): This parameter will be measured continuously using a gas analyser. Analysers must be periodically calibrated according to the manufacturer's recommendation.
- Project emissions from electricity consumption by the project activity during the year (PE_{EC,y}): This parameter will be calculated as per the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption".
- Quantity of electricity consumed by the project electricity consumption (EC_{Pl,y}): Electricity consumption of the equipment to be installed will be measured continuously at the project site with an electricity meter.
- Average technical transmission and distribution losses for providing electricity from the grid (TDLy): This parameter will be monitored annually in accordance with the "Tool to calculate baseline, project and/or leakage emissions from electricity consumption".

In addition, all necessary parameters required by the selected approved methodology and tools are contained in the monitoring plan of the final PDD, and they are clearly described in accordance with the methodology ACM0001, version 11, and applied tools.

Therefore, AENOR confirms that the parameters required for the selected approved methodology have been stated in the monitoring plan of the PDD, that the monitoring plan contains all necessary parameters, which are clearly described, and that the means of monitoring described in the plan complies with the methodology's requirements.

3.7.2 Implementation of the monitoring plan

CL 13 and CL 14 were raised in relation to the implementation of the monitoring plan of the project activity. These CLs were resolved after the project participant updated the project profile /8/ with technical descriptions of the measurement equipment. For further information, see appendix A of this report.

The project participant has developed the emission reduction calculation procedure (ERCP) in order to compile the guidelines for the emission reduction calculation detailed in the PDD. In accordance with this procedure, the responsibilities are defined and the people in charge of the emission reduction calculations will gather all the parameters and indicators used to calculate the emission reduction. A monitoring plan steering committee will be created in order to supervise the ERCP manager's monitoring work (monthly). ERCP Management will be in charge of the emission reduction calculation and will report to the steering committee. This is included in the ERCP.

AENOR has checked that the provisions included in the monitoring plan satisfy the purpose of guaranteeing that the project activity is correctly organized since the beginning. The validation team

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interviewed the person in charge of the supervision of the monitoring activities and checked the provided information, and everything is in conformance with the provisions detailed in the monitoring plan of the final PDD. Procedures for calibration and maintenance of monitoring equipment, reporting, procedures for review, etc. are also addressed in the procedure.

The monitoring plan includes quality and inspection procedures to ensure monitoring accuracy (ERCP quality control). Moreover, troubleshooting procedures have been established in the ERCP to ensure monitoring accuracy.

Therefore, AENOR confirms that the monitoring arrangements described in the monitoring plan are feasible within the project design, and that the data management, quality assurance, and quality control procedures are sufficient to ensure that the emission reductions achieved by/resulting from the proposed CDM project activity can be reported ex post and verified.

3.8 Comments by local stakeholders

CL 17 was raised in relation to the social activities of the project activity. This CL was resolved. For further information, see appendix A of this report.

A stakeholder consultation process was carried out by the PP following the requirement of the Peruvian DNA in order to obtain the letter of approval. Local stakeholders have been invited by the PP through letters to comment on the proposed CDM project activity prior to the publication of the PDD on the UNFCCC website. CL 12 was raised as evidence regarding local stakeholders' consultation had to be provided; thus this CL was closed when invitations letters and minutes /21/ of the public consultation were provided to the validation team.

As mentioned above, the PP provided the validation team with the minutes of the public consultation as evidence from the meeting conducted during the process. AENOR checked all the related documents and may confirm that the consultation was appropriate. A summary of the comments from the local stakeholders and the agreements achieved between the local communities and the PP have been addressed in the final PDD.

In total, one meeting was carried out on the landfill site (23 August 2008). The list of participants and minutes of the meeting are available in the final PDD. The validation team could assess the meeting through the desk-review of the documents and during the on-site visit.

The social benefits were checked through the meeting with the Peruvian DNA and the Municipality of El Callao.

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In accordance with the minutes the following social actions will be carried out in the communities near the project:

- Perform a quality analysis of the drinking water that is delivered by tankers to the communities of Virgen de Las Mercedes, Virgen del Carmen, and 18 de Octubre;
- Deliver three tankers of drinking water weekly for these three communities; and
- Collect the solid waste of these three communities.

Representatives of the local communities were Nazario Quispe (Virgen del Carmen), Orlando Farias (Virgen de Las Mercedes), Carlos Alvarado (18 de Octubre) and Sebastian Cano (Virgen de Las Mercedes). In addition, 26 local inhabitants attended the meeting. No negative feedback was received and feedback was checked during the on-site interview with the Municipality of El Callao.

AENOR states that the local stakeholder consultation is adequate and accurate.

3.9 Environmental impacts

CL 16 was raised in relation to the environmental issues of the project activity. This CL was resolved. For further information, see appendix A of this report.

According to the Law on the National System for Environmental Impact Assessment [22], Articles 2 and 3, the project activity cannot be considered subject to an environmental certification in Peru.

The **“Modelo del Callao Landfill Gas Capture and Flaring System”** permit was granted by the Municipality of El Callao via concession contract on 10 November 2003. According to the General Solid Waste Law [18], the municipalities are responsible for municipal solid waste (MSW) within their boundaries and have the authority to approve and authorize the commissioning of solid waste manage (SWM) projects, including disposal. Therefore, the Municipality of El Callao, through Resolution No. 196-2006-MPC-GGPMA [23], has determined that Modelo del Callao landfill fulfils all the requirements established in the General Solid Waste Law guidelines in order to be qualified as a landfill and has also authorized its operation.

CL 16 was raised since the validation team requested the PDD describe the main environmental effects derived from the construction and operation of the project. Therefore, the PDD was updated with a voluntary analysis of potential environmental impacts and mitigation actions carried out by the project participant based on its previous experience in another LFG CDM project, “Huaycoloro” and CL 16 was resolved.

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“Modelo del Callao Landfill Gas Capture and Flaring System”

According to the environmental impact analysis, environmental impacts are not considered significant by the project participant.

The final version of the PDD is in line with the environmental impact analysis. These requirements are described in the PDD (section D.2.) and they were checked by the audit team during the on-site visit and the interview with the Ministry of Environment and the Municipality of El Callao.

AENOR concludes that the PPs have followed a correct analysis of environmental impacts in accordance with procedures as required by the host Party.

In addition, AENOR confirms that the host Party's DNA confirmed the project's contribution to the sustainable development of Peru during the on-site visit and through the approval letter.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

According to Decision 3/CMP.1, the validator shall make the PDD publicly available and receive, within 30 days, comments on the validation requirements from parties, stakeholders and UNFCCC-accredited NGOs, and must also make those comments publicly available.

AENOR published the first PDD, version 1, on the CDM website on 18 September 2009 and invited comments by parties, stakeholders and non-governmental organizations. No comments were received during this period.

5 VALIDATION OPINION

AENOR has performed the validation of the **"Modelo del Callao Landfill Gas Capture and Flaring System"** in Peru. The validation process was performed on the basis of all UNFCCC issues and criteria for CDM projects, the host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting. The conclusions of this report show that the project, as was described in the project documentation, is in line with all criteria applicable for the validation.

The validation consisted of the following three phases: i) a desk review of the project design, the baseline and the monitoring plans; ii) follow-up interviews with project stakeholders; iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. In the course of the validation process, four corrective actions and 17 clarifications were raised; all have been successfully closed.

The project participant used the "Tool for demonstration and assessment of additionality", version 5.2.1, and the "Guidance on the demonstration and assessment of prior consideration of the CDM", version 4, to demonstrate the additionality of the project. In line with this tool, the PDD provides an investment analysis to determine that the project activity itself is not the baseline scenario. The latest "Tool to Determine Project Emissions from Flaring Gases Containing Methane", version 1, "Tool to Determine Methane Emissions Avoided from Disposal of Waste at a Solid Waste Disposal Site", version 5.1.0, and "Tool to Calculate Baseline, Project and/or Leakage Emissions from Electricity Consumption", version 1, were also applied to determine the emission reductions of the project.

The investment analysis demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are, hence, additional to any that would occur in the absence of the project activity.

The review of the project design documentation and additional documents related to the baseline and monitoring methodology, the subsequent background investigation, follow-up interviews and review of comments by parties and stakeholders have provided AENOR with sufficient evidence to validate the fulfilment of the stated criteria.

The conclusions can be summarised in detail as follows:

VALIDATION REPORT

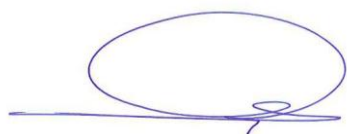
"Modelo del Callao Landfill Gas Capture and Flaring System"

- The project is in line with all relevant host country criteria of Peruvian DNA, with Peruvian letter of approval and with all relevant UNFCCC requirements for CDM. The LoA from Peru is dated 12 August 2009.
- The project additionality is sufficiently justified in the PDD.
- The monitoring plan is transparent and adequate.
- The calculation of project emission reductions has been carried out in a transparent and conservative manner, so that the total calculated emission reductions of 61,024 tCO₂e are most likely to be achieved within the renewable crediting period.

In our opinion, the project correctly applies and meets the relevant UNFCCC requirements for the CDM and the relevant host country criteria. The validation is based on the information made available to us and the engagement conditions detailed in this report.

The validation has been performed using a risk-based approach, as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, AENOR cannot be held liable by any party for decisions made or not made based on the validation opinion, which would go beyond the purpose.

20/08/2012



Luis Robles Olmos

Authorized person

20/08/2012



Jose Antonio Gesto

Validation Team Leader

VALIDATION REPORT

“Modelo del Callao Landfill Gas Capture and Flaring System”

6 REFERENCES

Category 1 documents: Documents provided by the project proponents that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the determination conclusions.

Category 2 documents: Background documents related to the design and/or methodologies employed in the design or other reference documents. Where applicable, Category 2 documents have been used to check project assumptions and confirm the validity of information given in the category 1 documents.

Category	Ref	Document Name	Date	Author/Competent Authority
1	1	PDD El Callao, version 1	17 August 2009	PETRAMAS S.A.C.
1	2	PDD El Callao, version 5	25 April 2012	PETRAMAS S.A.C.
1	3	ACM0001 “Consolidated baseline and monitoring methodology for landfill gas project activities”, version 11	28 May 2009	CDM – EXECUTIVE BOARD
1	4	ER calculation spreadsheet for the project	April 2012	PROJECT PROPONENT
2	5	Letter of approval from Peru	12 August 2009	PERUVIAN DNA
2	6	Letter of PP authorization from Peru	08 July 2011	PERUVIAN DNA
2	7	Concession contract El Callao landfill	10 November 2003	MUNICIPALITY OF EL CALLAO
2	8	El Callao project profile	April 2011	PETRAMAS S.A.C.
2	9	Project map design	April 2011	PETRAMAS S.A.C.
2	10	Chapter 6 of the Kuroiwa Study “Study for the safe and efficient environmental protection Landfill Model of El Callao”	2009	PROJECT PROPONENT
2	11	Tool for the demonstration and assessment of additionality, version 5.2.1	August 2011	CDM – EXECUTIVE BOARD
2	12	Tool to determine project emissions from flaring gases containing methane, version 1	2006	CDM – EXECUTIVE BOARD
2	13	Tool to calculate baseline, project and/or leakage emissions from electricity consumption, version 1	2008	CDM – EXECUTIVE BOARD
2	14	Tool to calculate project or leakage CO ₂ emissions from fossil fuel combustion, version 2	August 2008	CDM – EXECUTIVE BOARD

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Category	Ref	Document Name	Date	Author/Competent Authority
1	15	Combined tool to identify the baseline scenario and demonstrate additionality, version 4.0.0	March 2012	CDM – EXECUTIVE BOARD
2	16	Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site, version 5.1.0	June 2011	CDM – EXECUTIVE BOARD
2	17	Tool to calculate the emission factor for an electricity system, version 2.2.1	September 2011	CDM – EXECUTIVE BOARD
2	18	Law N° 27314 "General Law for Solid Waste"	July 2000	MINISTRY OF HEALTH
2	19	Supreme Decree N° 057-2004-PCM	July 2004	MINISTRY OF HEALTH
2	20	Electric project map design	2009	PROJECT PROPONENT
2	21	Invitation letters and minute of the public consultation	2008	PROJECT PROPONENT
2	22	Law N° 27446 "Law on the National System for Environmental Impact Assessment"	2001	CONGRESS OF THE REPUBLIC OF PERU
2	23	Resolution No. 196-2006-MPC-GGPMA	2006	MUNICIPALITY OF EL CALLAO
2	24	Gas analyser certificate	2009	PROJECT PROPONENT
2	25	Flaring system purchase invoice	3 December 2010	
1	26	"Comprehensive Plan for the Environmental Management of Solid Waste – PIGARS" elaborated by the Municipality of El Callao.	2002	MUNICIPALITY OF EL CALLAO
1	27	Report N°216-08 LAB N°20	2008	NATIONAL UNIVERSITY OF ENGINEERING
1	28	Study of the hydroelectric potential of Peru	2011	MINISTRY OF ENERGY AND MINES
1	29	Letter from the Municipality of El Callao (N° 509-2012-MPC/GGPMA) and Letter from Ministry of Environment (N° 604-2012-MINAM-VMGA-DGCA)	2012	MUNICIPALITY DEL CALLAO AND MINISTRY OF ENVIRONMENT
1	30	PAMA report of the landfill and its approval	2005	DIGESA

APPENDIX A

VALIDATION PROTOCOL

PROJECT:

“Modelo del Callao Landfill Gas Capture and Flaring System “

Validation Type	
<input checked="" type="checkbox"/> Validation of a Project Activity	
Validation Team: Jose Antonio Gesto Elena Llorente Freddy Garro	
Version of this Validation Protocol: 04	Date: 11/05/2012

CHECKLIST TOPIC / QUESTION	MoV/Ref.*	COMMENTS	Draft Conclusion	Final Conclusion
A. GENERAL DESCRIPTION OF PROJECT ACTIVITY				
A.1. Approval				
A.1.1. Have all the Parties involved in the project activity provided a written letter of approval of the project activity?		CAR 1 - LoA has to be provided to the validation team. The LoA has been provided to the validation team. Therefore, CAR 1 has been resolved.	CAR 1	OK
A.1.2 Do the letters of approval confirm that: <ul style="list-style-type: none"> • The Party is a Party to the Kyoto Protocol; • The participation is voluntary; • The CDM project activity contributes to the sustainable development (host Party); and that • The title of the project activity is precise and coincides with the title included in the PDD? 		To be assessed according to CAR 1 Once the LoA was provided, this section was re-evaluated. The LoA contains all the sections.	CAR 1	OK

A.1.3. Has the letter of approval been obtained from the project participants or directly from the DNA? In case that it has been obtained from the project participant, how has its authenticity been assessed?		To be assessed according to CAR 1 After closing CAR 1, This section was assessed. The LoA was obtained from the project participant.	CAR 1	OK
A.2. Project participants				
A.2.1. Has the form required for the indication of project participants been correctly applied in the PDD?		Yes the form is correctly applied.	OK	OK
A.2.2. Has the participation of all project participants been approved by a Party to the Kyoto Protocol?		To be assessed according to CAR 1 After closing CAR 1, This section was assessed. The participation of the project participant has been approved.	CAR 1	OK
A.2.3. Is all information on participants/Parties provided consistent with details provided by further chapters of the PDD (in particular annex 1)?		Yes. Annex 1 is consistent with the PDD.	OK	OK
A.3. Project design document				
A.3.1. Does the project title used clearly enable identification of the unique CDM project activity? Is it consistent in all section of the PDD and in all documents?		Yes. The project title enables identification of the project activity and is consistent in the entire PDD.	OK	OK

A.3.2. Is there any indication concerning the version number and the date of the version? <i>(Note: PDDs older than 6 months are not acceptable)</i>		Yes. The PDD has a version number and a date.	OK	OK
A.3.3. Is this consistent with the time line of the project's history?		CL 1 - An updated chronograph with date shall be provided. The updated chronograph was provided and it is in line with the project history. CL 1 has been resolved.	CL 1	OK
A.3.4. Has the PDD been prepared in accordance with the latest template and requirements from the CDM Executive Board?		Yes, PDD form version 3 has been used.	OK	OK
A.3.5. Has the PDD been published for global stakeholder consultation (GSC) on the UNFCCC website?		Yes. The PDD was published for global stakeholder consultation (GSC) on September 2009.	OK	OK
A.3.6. Have there been any comments during the GSC process?		There were no comments during the GSC process.	OK	OK
A.3.7. Have they been correctly addressed by the validation team?		N/A	N/A	N/A

A.4. Description of the project activity

The PDD (section A.2) shall contain a clear description of the project activity that provides the reader with a clear understanding of the precise nature of the project activity.

A.4.1. Does the description deliver a transparent overview of the project activities?		The description of the project activity gives a good overview of the project activity.	OK	OK
A.4.2. What evidence is available to demonstrate that the project description is in compliance with the actual situation or planning?		CL 2 - Information regarding the planning should be provided to the validation team. The information regarding the planning has been provided. CL 2 has been resolved.	CL 2	OK
A.4.3. Is the information provided by this evidence consistent with the information provided by the PDD?		To be assessed according CL 2 This section was assessed and the planning and the concession contract for the landfill was provided. CL 2 has been closed.	CL 2	OK
A.4.4. Has the validation team conducted a physical site inspection to confirm the description of the PDD? If not, justify.		Yes, an on-site visit was carried out.	OK	OK

A.5. Technical description of the project activity

The PDD (section A.4) shall contain a clear description of the project activity that provides the reader with a clear understanding of the technical aspects of its implementation.

A.5.1. Location of the project activity

A.5.1.1. Does the information provided on the location of the project activity allow for clear identification of the site(s)? Are the latitude and longitude of the site indicated (decimal points)?

The validation team carried out the on-site visit on 12/13 May 2010. The description of the PDD was confirmed.

OK

OK

A.5.1.2. How is it ensured and/or demonstrated that the project proponents can implement the project at this site (ownership, licenses, contracts etc.)?

CL 3 - Evidence of the implementation of the project have to be provided.

The invoice of the flaring system, the project profile and schedule for the implementation of the project was provided.

CL 3 has been resolved.

CL 3

OK

A.5.2. Category of the project activity

A.5.2.1. To which category(ies) does the project activity belong? Is this category correctly identified and indicated?

"Modelo del Callao Landfill Gas Capture and Flaring System" falls under CDM Sectoral Scope #13: Waste Handling and Disposal.

OK

OK

A.5.2.2. Does the project qualify as a small-scale CDM project activity as defined in paragraph 6 (c) of decision 3/CMP.1 on the modalities and procedures for the CDM?		No	N/A	N/A
A.5.2.3. Does the proposed project activity conform to one of the project categories defined for small-scale CDM project activities?		N/A	N/A	N/A
A.5.2.4. In the case of a small-scale project activity, has it been justified that it is not a debundled component of a larger project activity?		N/A	N/A	N/A
<i>A.5.3. Technology to be employed by the project activity</i>				
A.5.3.1. Does the description of the technology to be applied provide sufficient and transparent input/information to evaluate its impact on the greenhouse gas balance? And is the explanation of how the project will reduce greenhouse gas emission transparent and suitable?		CL4 - Technology description should be improved with more detailed information. Section A.4.3 has been reinforced, and the evidence for the technology description has been provided. CL 4 has been resolved.	CL 4	OK

A.5.3.2. Does the project require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period? If so, does the project make provisions for meeting training and maintenance needs?		CL 5 - Further information regarding training needs has to be provided to the validation team and incorporated in the PDD. Training regarding the monitoring of emission reductions has been incorporated into the PDD. CL 5 has been resolved.	CL 5	OK
A.5.3.3. Is a schedule available for the implementation of the project and are there any risks for delays? Is the schedule consistent with the starting date of the crediting period?		To be assessed according CL 1 The schedule provided is consistent with the starting date of the crediting period. CL 1 has been closed.	CL 1	OK
<i>A.5.4. Estimated amount of emission reductions over the chosen crediting period</i>				
A.5.4.1. Has the form required for the indication of projected emission reductions been correctly applied?	DR	The correct form has been used for the emission reduction but it has not been applied (e.g. years of the period).	OK	OK
A.5.4.2. Are the figures provided consistent with other data presented in the PDD?	DR	CL 6 - Further information regarding emission reduction calculation has to be provided to the validation team. (e.g. spreadsheets, evidence, assumptions, etc.) The validation team verified that all information regarding emission reduction calculation is consistent with data in the final PDD and the calculation spreadsheet. Therefore, CL 6 has been resolved.	CL 6	OK

<i>A.5.5. Public funding of the project activity</i>				
A.5.5.1. In case of public funding from Annex I Parties, has it been confirmed that such funding does not result in a diversion of official development assistance?		The project will not receive any public funding from Annex I Parties included in the UNFCCC.	OK	OK
A.5.5.2. Is all information provided consistent with the details given in remaining chapters of the PDD (in particular annex 2)?		Yes, there is no public funding.	OK	OK
B. BASELINE AND MONITORING METHODOLOGY				
B.1. Title and reference of the approved baseline and monitoring methodology				
B.1.1. Are reference number, version number, and title of the approved baseline and monitoring methodology clearly indicated?	DR	Approved Consolidated Baseline Methodology for Landfill Gas Project Activities, ACM0001, Version 11 (EB 47), as a consolidated baseline methodology for landfill gas project activities, has been used.	OK	OK
B.1.2. Is the applied version the most recent one and/or is this version still applicable?	DR	Yes, it is the most recent version.	OK	OK

B.1.3. Does the PDD refer to the corresponding tools with their latest approved versions?	DR	<p>CAR 2 - The versions of the tools have to be included in the PDD.</p> <p>The validation team verified that versions of the applied tools have been included in the final version of the PDD.</p> <p>During the validation process the project participant updated the versions of the applied tools to the latest approved versions.</p> <p>Therefore, CAR 2 has been resolved.</p>	CAR 2	OK
B.2. Applicability of the selected methodology to the project activity				
B.2.1. Are the chosen tools considered applicable in accordance with the design of the project and the provisions of the applied methodology?	DR	<p>To be assessed according to CAR 2</p> <p>The validation team confirms that the project activity is a landfill gas capture and flaring system.</p> <p>In addition, a project profile of the project activity has been provided to the validation team. CAR 2 has been closed.</p> <p>CAR 4 - The PDD does not include the justification for the applicability conditions of the applied tools.</p> <p>The validation team confirms that the applicability conditions of the used tools have been included in the PDD in accordance with the evidence provided by the project participant.</p> <p>Therefore, CAR 4 has been resolved.</p>	CAR 2, CAR 4	OK

B.2.2. Has the choice of the methodology been correctly justified by the PDD and is the project in conformance with all applicability criteria of the applied methodology?	DR	Yes, the applicability of the methodology has been correctly described.	OK	OK								
Fill in the required amount of sub checklists for applicability criteria as given by the methodology applied and comment at least every line answered with “No”.												
B.2.4. Criterion 1: The captured gas is flared.	DR I	<p>The project, therefore, fulfils the conditions of Option (a), and thus ACM0001 was considered the most appropriate methodology.</p> <table><tr><th>Applicability checklist</th><th>Yes/No</th></tr><tr><td>Criterion discussed in the PDD?</td><td>Yes</td></tr><tr><td>Evidence provided?</td><td>Yes</td></tr><tr><td>Compliance verified?</td><td>Yes</td></tr></table> <p>A project profile has been provided to the validation team. Also, during the on-site visit the validation team confirmed the applicability of the methodology ACM0001, version 11.</p>	Applicability checklist	Yes/No	Criterion discussed in the PDD?	Yes	Evidence provided?	Yes	Compliance verified?	Yes	OK	OK
Applicability checklist	Yes/No											
Criterion discussed in the PDD?	Yes											
Evidence provided?	Yes											
Compliance verified?	Yes											
B.3. Description of the project boundary												

B.3.1. Are all the sources and gases included in the project boundary of the project activity (baseline scenario, project scenario and leakage) in accordance with the applied methodology?	DR	<p>According to ACM0001, the project boundary is the site of the project activity where the gas will be captured and destroyed since the project includes waste deposition, decomposition, LFG generation and collection, fugitive emissions and flaring.</p> <p>During the validation process the project participant has improved the description of the project boundary in the final version of the PDD.</p> <p>The project boundary is the site of the project activity where the gas is captured and destroyed/used. Precisely, the project's system boundaries comprise the landfill gas (LFG) collection system and the enclosed flaring system. The project activity requires electricity from the grid for the operation of the facility; therefore, the electricity source is included in the project boundary.</p> <p>The improved description of the project boundary is in line with the applied methodology ACM0001.</p>	OK	OK
B.3.2. Are the inclusion or exclusion of the sources of gases correctly justified?	DR	Yes, the inclusion and exclusion of sources are in accordance with methodology and they are properly justified.	OK	OK
B.3.3. Do the spatial and technological boundaries as verified on site comply with the discussion provided by the PDD?	DR	Yes. The spatial and technological boundaries were verified on site.	OK	OK

B.3.4. In case of grid-connected electricity projects, has the relevant grid been correctly identified in accordance with EB guidance and the underlying methodology?	DR	Yes, the project activity requires electricity from the national grid for the operation of the facility.	OK	OK
B.4. Description of the baseline scenario identification				
B.4.1. Has the baseline scenario been clearly described?	DR	<p>CL 7 - Please clarify the steps followed according to the methodology in relation to the baseline scenario.</p> <p>The baseline scenario has been clearly described in the final version of the PDD in accordance with applied methodology ACM0002, version 11.</p> <p>Therefore, CL 7 has been resolved.</p>	CL 7	OK
B.4.2. Have other alternative scenarios been considered? Is the selected scenario justified as the most likely one?	DR	<p>To be assessed according to CL 7</p> <p>The validation team verified that other scenarios have been considered in the selection of the baseline in accordance with the applied methodology.</p> <p>In the final version of the PDD it is justified that the baseline scenario is the continuation of the present gas management at the landfill, which is the passive venting of LFG. CL 7 has been closed.</p>	CL 7	OK

B.4.3. Does the PDD follow the steps to determine the baseline scenario required by the methodology?	DR	<p>To be assessed according to CL 7</p> <p>The PDD has been updated with the procedure for the selection of the most plausible baseline scenario in accordance with the applied methodology ACM0001 and the tool for the demonstration and assessment of additionality. CL 7 has been closed.</p>	CL 7	OK
B.4.4. Has the baseline scenario been determined using conservative assumptions where possible?	DR	<p>To be assessed according to CL7</p> <p>The validation team confirms that baseline scenario in the final version of the PDD has been determined using conservative assumptions. CL 7 has been closed.</p>	CL 7	OK
B.4.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies? <i>(Note: refer Annex 3 EB 22).</i>	DR	<p>CL 8 - Relevant national/sectoral policies have to be described.</p> <p>Relevant national/sectoral policies such as “General Solid Waste Law” and its corresponding “Decree 057-04-PCM” have been described in the baseline scenario identification in the final version of the PDD.</p> <p>“Law No 27314 General Law for SW.pdf” and “Decree DS_057_2004_PCM_2 Reglamento de Ley 27314.pdf” have been provided to the validation team.</p> <p>Therefore, CL 8 has been resolved.</p>	CL 8	OK

B.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered CDM project activity (assessment and demonstration of additionality):

B.5.1. Has the project additionality been assessed according to the applicable methodology? Detail the Tool used to demonstrate the additionality of the project activity.		The project's additionality has been demonstrated and assessed using the "Tool for the Demonstration and Assessment of Additionality", version 5.2.1, according to ACM0001, version 11.	OK	OK
B.5.2. In the case of a small-scale project activity, has the additionality been justified according to the applicable CDM requirements specific for small-scale project activities?		N/A	N/A	N/A
B.5.3. Has evidence been provided that CDM has been seriously considered in the decision to proceed with the project activity (CDM decision before project start) in accordance with CDM requirements?		PDD was published for global stakeholder consultation or a new methodology was proposed to the executive board for the specific project before the project activity starting date stated in the PDD.	OK	OK
B.5.4. Have realistic and credible alternatives been identified providing comparable outputs or services?		Yes, realistic and credible alternatives providing comparable outputs or services have been identified.	OK	OK
B.5.5. Has the project activity without CDM been included in these alternatives?		Yes.	OK	OK

B.5.6. Has a discussion been provided for all identified alternatives concerning the compliance with applicable laws and regulations?		Yes, sectoral laws have been taking into account to discuss the alternatives.	OK	OK
B.5.7. In case of using a FSR as a basis of the decision, has this analysis been made in accordance with the EB Guidance? (<i>NOTE: Paragraph 54 EB 28</i>)		N/A	N/A	N/A
B.5.8. In case the PDD argues that specific laws are not enforced in the country or region: Is evidence available concerning that statement?		<p>CL 9 - The statement “Neither Law 27314, the General Solid Waste Law, nor its corresponding Decree 057-04-PCM, have been enforced since their adoption five years ago; they are used more generally as policy guidance” should be backed up by evidence.</p> <p>The statement “Neither Law 27314, the General Solid Waste Law, nor its corresponding Decree 057-04-PCM, have been enforced since their adoption five years ago; The evidence has been provided.</p> <p>CL 9 has been resolved.</p>	CL 9	OK

B.5.9. In case of applying step 2/investment analysis of the additionality tool: Has the analysis method been identified appropriately?		As the proposed project activity does not generate revenues other than CER income, the "Tool for the demonstration and assessment of additionality specifies that Option 1 (simple cost analysis) is appropriate.	OK	OK
B.5.10. In case of Option I (simple cost analysis): Has it been demonstrated that the activity produces no economic benefits other than CDM income?		Yes, since the project activity aims to reduce methane (CH ₄) emissions by flaring LFG, without energy generation.	OK	OK
B.5.11. In case of Option II (investment comparison analysis): Has the most suitable financial indicator been clearly identified (IRR, NPV, cost benefit ratio, or [levelised] unit cost)?		N/A	N/A	N/A
B.5.12. In case of Option III (benchmark analysis): Has the most suitable financial indicator been clearly identified (IRR, NPV, cost benefit ratio, or [levelised] unit cost)?		N/A	N/A	N/A
B.5.13. In case of Option II or Option III: Has the calculation of financial figures for this indicator been correctly made for all alternatives and the project activity?		N/A	N/A	N/A

B.5.14. In case of Option II or Option III: Has the analysis been presented in a transparent manner including publicly available evidence for the utilized data?		N/A	N/A	N/A
B.5.15. In case of Option II or Option III: Has the sensitive analysis been made taking into account the relevant parameters in accordance with EB guidance?		N/A	N/A	N/A
B.5.16. In case of applying step 3 (barrier analysis) of the additionality tool: Has a complete list of barriers been developed that prevent the different alternatives from occurring?		N/A	N/A	N/A
B.5.17. In case of applying step 3 (barrier analysis): Has transparent and documented evidence been provided on the existence and significance of these barriers?		N/A	N/A	N/A
B.5.18. In case of applying step 3 (barrier analysis): Has it been transparently shown that the execution of at least one of the alternatives is not prevented by the identified barriers?		N/A	N/A	N/A

B.5.19. Have other activities in the host country/region similar to the project activity been identified and are these activities appropriately analysed by the PDD (step 4a)?		<p>CL 10 - Further information regarding common practice has to be provided to the validation team (e.g. dumps and landfills at national scale).</p> <p>Common practice analysis has been improved and is in accordance with UNFCCC requirements.</p> <p>CL 10 has been resolved.</p>	CL 10	OK
B.5.20. If similar activities are occurring: Has it been demonstrated that in spite of these similarities the project activity would not be implemented without the CDM component (step 4b)?		<p>To be assessed according to CL 10</p> <p>After this section was assessed, CL 10 was closed.</p>	CL 10	OK
B.5.21. Has it appropriately explained how the approval of the project activity will help to overcome the economic and financial hurdles or other identified barriers?		<p>By investing in a LFG collection and flaring system, the project would not generate any revenues in the absence of the CDM. Therefore, the project activity can be considered as a non-economically attractive scenario; hence, the approval of the project activity will help overcome the economic and financial hurdles.</p>	OK	OK

B.5.22. If a barrier analysis has been used, has it been shown that the proposed project activity faces barriers that prevent the implementation of this type of proposed project activity but would not have prevented the implementation of at least one of the alternatives?		N/A	N/A	N/A
B.5.23. Has sufficient evidence been provided to support the relevance of the arguments made?		<p>CL 11 - Further Information regarding investment analysis (spreadsheet, evidence, etc.) has to be provided to the validation team.</p> <p>The time of investment decision has been proven.</p> <p>Incorrect references regarding investment and crediting period have been corrected.</p> <p>Original quotations have been provided and found correct and credible.</p> <p>CL 11 has been resolved.</p>	CL 11	OK
B.5.24. Has it been demonstrated/justified that the project activity is not a likely baseline scenario?		<p>To be assessed according to CL 11</p> <p>Once this section was assessed, CL 11 was closed. It has been justified that the project activity is not the baseline scenario.</p>	CL 11	OK
B.6. Emissions reductions				

<i>B.6.1. Explanation of methodological choices</i>				
B.6.1.1. Has it been explained how the procedures provided in the methodology are applied by the proposed project activity?	DR	Yes the procedures have been followed.	OK	OK
B.6.1.2. Has every selection of options offered by the methodology been correctly justified and is this justification in line with the situation verified on site?	DR	See Section A.5.4.2 - CL 6 Every selection of options has been correctly justified in the final version of the PDD and the calculation spreadsheet, in accordance with the applied methodology and the situation verified during the on site assessment. CL 6 has been closed.	CL 6	OK
B.6.1.3. Have the formulae required for the determination of emissions reductions been correctly presented and used? (Open Excel, traceability of data, etc.)	DR	To be assessed according to CL 6 The validation team confirms that all formulae required for the determination of emission reductions have been correctly presented and used in the final version of the PDD and the calculation spreadsheet "ER Calculation Modelo del Callao" provided to the validation team. CL 6 has been closed.	CL 6	OK

B.6.1.4. Are all the data and assumptions listed in the PDD appropriate and do calculations result in a conservative estimate of emission reductions?	DR	<p>To be assessed according to CL 6</p> <p>The validation team verified that data for the emission reductions calculation are appropriate and calculations result in conservative estimation.</p> <p>The validation team has reproduced the calculation and found that is correct.</p> <p>CL 6 has been closed.</p>	CL 6	OK
B.6.1.5. Have the formulae required for the determination of emission reductions been correctly presented?	DR	<p>To be assessed according to CL 6</p> <p>Formulae used for the calculation of emission reductions have been updated and corrected in the final version of the PDD in accordance with the applicable methodology ACM0001, version 11.</p> <p>The validation team has reviewed the parameters used in the calculation and found that is correct. CL6 has been closed.</p>	CL 6	OK
<i>B.6.2. Data and parameters that are available at validation</i>				

B.6.2.1. Is the list of parameters presented in chapter B.6.2 considered to be complete with regard to the requirements of the applied methodology? Has all the information required for each parameter been included?	DR	To be assessed according to CL 6 The validation team checked that the lists of parameters in chapter B.6.2 have been updated in accordance with the applied methodology and tools. The information required for each parameter has been included in the final version of the PDD. CL 6 has been closed.	CL 6	OK
B.6.2.2. Are all the data derived from official data sources or replicable records and have they been correctly quoted?	DR	To be assessed according to CL 6 Data used for the emission reductions calculations have been updated with the latest official data available. The data has been checked against official data from IPCC, project profile data, technical study and official permits. Also, all data sources have been correctly quoted in the final version of the PDD and calculation spreadsheet. CL 6 has been closed.	CL 6	OK
<i>B.6.3. Calculation of GHG emission reductions – baseline emissions</i> <i>Assess whether the baseline emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>				
B.6.3.1 Have the calculations been documented according to the approved methodology and in a complete and transparent manner?	DR	To be assessed according to CL 6 Calculations have been documented according to the approved methodology ACM0001, version 11. CL 6 has been closed.	CL 6	OK

B.6.3.2. Have conservative assumptions been used when calculating the baseline emissions?	DR	To be assessed according to CL 6 The validation team checked that conservative assumptions have been used in calculations. CL 6 has been closed.	CL 6	OK
B.6.3.3. Have uncertainties in the baseline emission estimates been properly addressed?	DR	To be assessed according to CL 6 The validation team checked that uncertainties have been properly addressed. CL 6 has been closed.	CL 6	OK
B.6.3.4. Has additional background information on baseline data been provided in annex 3 of the PDD? Is this information consistent with data presented in other sections of the PDD?	DR	To be assessed according to CL 6 The validation team checked that all information about baseline is consistent throughout the entire PDD. CL 6 has been closed.	CL 6	OK
<i>B.6.4. Calculation of GHG emission reductions – project emissions</i> <i>Assess whether the project emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>				
B.6.4.1. Have the calculations been documented according to the approved methodology and in a complete and transparent manner?	DR	To be assessed according to CL 6 The validation team confirms that calculations have been documented in the final version of the PDD according to the approved methodology ACM0001, version 11, and tools. CL 6 has been closed.	CL 6	OK

B.6.4.2. Have conservative assumptions been used when calculating the project emissions?	DR	To be assessed according to CL 6 The validation team confirms that the project emissions have been calculated in a transparent and conservative manner in accordance with the applied methodology ACM0001, version 11, and tools. CL 6 has been closed.	CL 6	OK
B.6.4.3 Have uncertainties in the project emission estimates been properly addressed?	DR	To be assessed according to CL 6 The validation team confirms that uncertainties have been properly addressed. CL 6 has been closed.	CL 6	OK
<i>B.6.5. Calculation of GHG emission reductions – leakage</i> <i>Assess whether leakage emissions are stated according to the methodology and whether the argumentation for the choice of default factors and values – where applicable – is justified.</i>				
B.6.5.1. Have the leakage calculations been documented according to the approved methodology and in a complete and transparent manner?	DR	To be assessed according to CL 6 The validation team checked that no leakage emissions need to be considered. CL 6 has been closed.	CL 6	OK
B.6.5.2. Have conservative assumptions been used when calculating the leakage emissions?	DR	To be assessed according to CL 6 The validation team checked that no leakage emissions need to be considered. CL 6 has been closed.	CL 6	OK

B.6.5.3. Are uncertainties in the leakage emission estimates properly addressed?	DR	To be assessed according to CL 6 The validation team checked that no leakage emissions need to be considered. CL 6 has been closed.	CL 6	OK
<i>B.6.6. Ex ante calculation of emission reductions</i>				
B.6.6.1. Have the GHG calculations been documented in a complete and transparent manner? Are all the calculations correct?	DR	To be assessed according to CL 6 Yes, inconsistencies in the emission reductions calculation have been corrected. Also, calculations have been reproduced by the validation team and the results obtained are the same ones as those estimated by the PP. CL 6 has been closed.	CL 6	OK
B.6.6.2. Is the data provided in this section consistent with data as presented in other chapters of the PDD?	DR	To be assessed according to CL 6 Yes, the validation team checked that data included in section B.6 is consistent throughout the entire PDD. CL 6 has been closed.	CL 6	OK
<i>B.6.7. Summary of the ex ante estimation of emission reductions</i>				
B.6.7.1. Will the project result in fewer GHG emissions than the baseline scenario?	DR	To be assessed according to CL 6 Yes, the validation team confirms that the project activity is expected to reduce GHG emissions. CL 6 has been closed.	CL 6	OK

B.6.7.2. Are the emissions reductions projected in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	DR	To be assessed according to CL 6 Yes, the validation team confirms that the emission reductions are correctly projected in line with the starting date of the crediting period. CL 6 has been closed.	CL 6	OK
B.7. Application of the monitoring methodology and description of the monitoring plan				
<i>B.7.1. Description of the monitoring plan</i>				
B.7.1.1 Has the monitoring plan been documented according to the approved methodology and relevant tools and in a complete and transparent manner?	DR	The monitoring methodology for the project is in accordance with the approved consolidated baseline methodology, ACM0001, version 11, which is applicable to landfill gas capture project activities where the baseline scenario is the partial or total atmospheric release of the gas.	OK	OK
B.7.1.2. Does the monitoring methodology provide a consistent approach in the context of all parameters to be monitored and further information provided in the PDD?	DR	Yes, the monitoring methodology provides a consistent approach in the context of all parameters to be monitored.	OK	OK
B.7.1.3. Does the monitoring plan provide a clear description of the organization structure involved in monitoring activities and their responsibilities?	DR	Yes, an organizational system has been described to perform the monitoring plan.	OK	OK

B.7.1.4. If applicable: Does annex 4 provide useful information enabling a better understanding of the envisioned monitoring provisions?	DR	Yes, information provided in annex 4 can be considered complete and consistent.	OK	OK
B.7.1.5. Are the registration, monitoring, measurement and reporting procedures defined?	DR	Yes, a monitoring procedure has been described.	OK	OK
<i>B.7.2. Compliance of the monitoring plan with the approved methodology</i>				
B.7.2.1. Is the list of parameters considered to be complete with regard to the requirements of the applied methodology? Are all of them clearly described in the monitoring plan and in accordance with the methodology and tools?	DR	<p>CL 12 - Description of the parameters to be monitored should be adapted to those defined in the methodology ACM00001, version 11. Evidence to back up some assumptions have to be provided to the validation team.</p> <p>The list of parameters in section B.7.1 of the final version of the PDD is considered complete in accordance with the requirements of the applied methodology ACM00001, version 11, and tools. In addition, all parameters are clearly described in the monitoring plan.</p> <p>Therefore, CL 12 has been resolved.</p>	CL 12	OK

B.7.2.2. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for the estimation or measurement of the emission reductions within the project boundary during the crediting period?	DR	<p>To be assessed according to CL 12</p> <p>The validation team checked that the monitoring plan provides an ERCP and spreadsheets for the collection and archiving of all relevant data necessary for the emission reductions calculation.</p> <p>All data gathered in the monitoring plan of the PDD provide sufficient information for the estimation or measurement of the emission reductions. CL 12 has been closed.</p>	CL 12	OK
<i>B.7.3. Implementation of the monitoring plan</i>				
B.7.3.1. Do the means of monitoring of each of the parameters included in the plan comply with the requirements of the methodology?	DR	<p>To be assessed according to CL 12</p> <p>The validation team checked that means of monitoring of each parameter described in the final version of the PDD comply with the monitoring requirements of the applied methodology ACM0001, version 11. CL 12 has been closed.</p>	CL 12	OK

B.7.3.2. Is the measurement equipment described and deemed appropriate?	DR	<p>CL 13 - Further information about the characteristics of the measurement equipment has to be provided to the validation team.</p> <p>The description of the measurement equipment (calibration, maintenance and installation) has been included in the final version of the PDD and is correctly described.</p> <p>Project profile with technical description of the measurement equipment has been provided to the validation team.</p> <p>Therefore, CL 13 has been resolved.</p>	CL 13	OK
B.7.3.3. Are procedures identified for maintenance of monitoring equipment and installations? Are provisions regarding the calibration intervals included in the monitoring plan?	DR	<p>CL 14 - Further information regarding calibration and maintenance of monitoring equipment has to be provided to the validation team.</p> <p>Procedures for maintenance and installation of equipment, as well as calibration, will be performed according to manufacturer specifications of equipment. The periodic calibration would be performed every year.</p> <p>Project profile with technical description of the measurement equipment has been provided to the validation team.</p> <p>Therefore, CL 14 has been resolved.</p>	CL 14	OK

B.7.3.4. Is the measurement accuracy addressed and deemed appropriate? Are procedures in place on how to deal with erroneous measurements or lack of data?	DR	<p>To be assessed according to CL 14</p> <p>Measurement equipment will be implemented according to the manufacturer specifications. Measurement accuracy has been addressed in the final version of the PDD in accordance with the project profile provided to the validation team. Moreover, troubleshooting procedures have been established in the ERCP to ensure monitoring accuracy. Therefore, CL 14 has been resolved.</p>	CL 14	OK
B.7.3.5. Is the monitoring plan sufficient to ensure the verification of proper implementation of the monitoring plan?	DR	<p>To be assessed according to CLs 12, 13 and 14</p> <p>The validation team verified that the monitoring plan is sufficient to ensure the monitoring plan.</p> <p>All data gathered in the monitoring plan of the PDD provides sufficient information for the estimation or measurement of emission reductions.</p> <p>The uncertainties and possible data adjustments are considered in the monitoring plan in order to avoid them. Therefore, CLs 12, 13 and 14 has been resolved.</p>	CL 12 CL 13 CL 14	OK
B.8. Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)				

B.8.1. Is there any indication of a date when the baseline and monitoring was determined?	DR	The baseline study and monitoring methodology was completed on 26 August 2009 by Francisco Fernandez-Asin of Endesa Carbono.	OK	OK
B.8.2. Is this consistent with the timeline of the PDD history?	DR	Yes, the date is consistent with the PDD timeline.	OK	OK
B.8.3. Is the information on the person(s)/entity(ies) responsible for the application of the baseline and monitoring methodology provided consistent with the actual situation?	DR	Yes, the information on the person and entity is consistent with the actual situation.	OK	OK
B.8.4. Is information provided whether this person/entity is also considered a project participant? (Guidelines for Completing the Project Design Document (CDM-PDD) and the Proposed New Baseline and Monitoring Methodologies (CDM-NM)	DR	Endesa Carbono is not a project participant.	OK	OK

C. DURATION OF THE PROJECT ACTIVITY / CREDITING PERIOD

C.1. Duration of the project activity

C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?		<p>The starting date of the project is 01 October 2009 and the landfill is expected to have an operating lifetime of approximately 25 years.</p> <p>CL 15 - Further information regarding starting date of the project and operational lifetime of the project activity shall be provided to the validation team.</p> <p>The flaring system purchase has been stated as the starting date.</p> <p>CL 15 has been resolved.</p>	CL 15	OK
C.2. Choice of the crediting period and related information				
C.2.1. Is the assumed crediting period clearly defined and reasonable (renewable crediting period of a maximum of seven years with a possibility of two renewals or fixed crediting period of a maximum of 10 years)? And has the starting date of the crediting period been correctly considered?		<p>Length of the first crediting period: Seven (7) years with the option of two renewal periods.</p> <p>CAR 3 – The starting date of the crediting period must be in line with the CDM glossary.</p> <p>The starting date of the crediting period has been correctly established.</p>	CAR 3	OK
D. ENVIRONMENTAL IMPACTS				
D.1. Documentation on the analysis of the environmental impacts, including transboundary impacts				

D.1.1. Has the analysis of the environmental impacts of the project activity been sufficiently described in the PDD?	DR	<p>CL 16 - Main environmental effects derived of the construction and operation of the project activity have to be described in the PDD.</p> <p>Potential environmental impacts of the construction and operation phases of the project activity have been described in section D.2 of the final version of the PDD.</p> <p>Therefore, CL 16 has been solved.</p>	CL 16	OK
D.1.2. Are there any host Party requirements for an environmental impact assessment (EIA), and if so, has an EIA been approved?	DR	The project activity cannot be considered subject to an environmental certification in Peru according to the Law on the National System for Environmental Impact Assessment , Articles 2 and 3.	OK	OK
D.1.3. Will the project create any adverse environmental effects? Has any environmental impact been identified as significant?	DR	<p>To be assessed according to CL 16</p> <p>The validation team confirms that the project has adverse environmental effects, but none have been considered significant. CL 16 has been closed.</p>	CL 16	OK
D.1.4. Are transboundary environmental impacts identified in the analysis?	DR	<p>To be assessed according to CL 16</p> <p>The validation team confirms that transboundary impacts are not mentioned in the PDD due to the geographical location of the project activity. CL 16 has been closed.</p>	CL 16	OK

D.2. If environmental impacts are considered significant by the project participants or the host Party, please provide conclusions and all references to support documentation of an environmental impact assessment undertaken in accordance with the procedures as required by the host Party.

D.2.1. Have the identified environmental impacts been sufficiently addressed in the PDD?	DR	To be assessed according to CL 16 The main environmental impacts have been correctly addressed in the final version of the PDD based on the previous experience of the Peruvian CDM LFG project of Huaycoloro, which belongs to the project sponsor. CL 16 has been closed.	CL 16	OK
D.2.2. Does the project comply with any other environmental legislation in the host country?	DR	The validation team could check the compliance of the project activity with local laws during the on-site visit.	OK	OK

E. STAKEHOLDERS' COMMENTS
E.1. Brief description how comments by local stakeholders have been invited and compiled

E.1.1. Have relevant stakeholders been consulted? Is the exact date of the consultation process included in the PDD?	DR	CL 17 - Evidence regarding local stakeholders' consultation has to be submitted to the validation team. The invitations and the minutes of the local consultation meeting is in the document "Invitation letters and minutes of the public consultation" and have been provided to the validation team. Therefore, CL 17 has been resolved.	CL 17	OK
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E.1.2. Have appropriate media been used to invite comments by local stakeholders?	DR	To be assessed according to CL 17 The validation team verified that the stakeholders were invited by letters. CL 17 has been closed.	CL 17	OK
E.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	DR	To be assessed according to CL 17 The validation team verified that the stakeholder consultation process is required to obtain the DNA approval; therefore this process has been carried out. CL 17 has been closed.	CL 17	OK
E.1.4. Has the stakeholder process that was carried out been described in a complete and transparent manner?	DR	To be assessed according to CL 17 The validation team verified that a meeting with local authorities was carried out on 23 August 2008. CL 17 has been closed.	CL 17	OK
E.2. Summary of the comments received				
E.2.1. Has a summary of the stakeholder comments received been provided?	DR	To be assessed according to CL 17 Minutes of the public consultation has been provided to the validation team. These minutes contains a summary of the stakeholder comments. CL 17 has been closed.	CL 17	OK
E.3. Report on how due account was taken of any comments received				

E.3.1. Has due account been taken of any stakeholder comments received?	DR	To be assessed according to CL 17 The validation team confirms that the project participant has made commitments with the community. CL 17 has been closed.	CL 17	OK
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Table 2 Resolution of corrective action and clarification requests

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CAR 1 – LoA has to be provided to the validation team.	A.1.1	The LoA and the approval of the project participant have been provided.	<p>The LoA has been provided to the validation team.</p> <p>The participation of the project participant has been approved in a separate letter specially to approve participation.</p> <p>CAR 1 has been resolved.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CAR 2 – The versions of the tools have to be included in the PDD.	B.1.3	<p>The versions of the tools are included in section B.1. of the PDD.</p> <p>Also, the “Tool to Calculate the Emission Factor for an Electricity System” has been updated to version 2.2.1.</p> <p>Versions of the applied tools have been updated in the PDD.</p>	<p>Versions of the tools have been included in section B.1 of the PDD.</p> <p>It is recommended to update the versions of the tools in the PDD.</p> <p>CAR 2 has been resolved since versions of the tools have been included in the final version of the PDD.</p> <p>Also, versions of the applied tools in accordance with ACM0001 have been updated.</p>
CAR 3 – The starting date of the crediting period must be in line with the CDM glossary.	C.2.1	<p>The project implementation will start once it is registered since it depends on CDM revenues to be feasible.</p>	<p>The starting date of the crediting period is in accordance with the current dates.</p> <p>CAR 3 has been resolved.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CAR 4 - The PDD does not include the justification for the applicability conditions of the applied tools.	B.2.1	<p>In section B.2 of the PDD it has been added the justification for the applicability conditions of the applied tools.</p> <p>The project applies to this tools as it is a recognized landfill for municipal solid waste disposal as it documented in Municipal management resolution No 196-2006-MPC-GGPMA and the municipal waste will be deposited in a site that is clearly identified, as it is documented in the concession contract.</p>	<p>The project participant has included a justification for the applicability conditions of the used tools in accordance with the evidence provided to the validation team.</p> <p>CAR 4 has been resolved.</p>
CL 1 – An updated chronograph with date shall be provided.	A.3.3	The implementation schedule of the project has been provided.	<p>A concrete chronograph has been provided and it is in accordance with the timelines of the project activity.</p> <p>CL 1 has been resolved.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 2 – Information regarding the planning should be provided to the validation team.	A.4.2	The implementation schedule of the project has been provided.	<p>The information regarding the planning has been provided.</p> <p>The date of the concession contract has been corrected in the PDD in accordance with the evidence provided to the validation team.</p> <p>CL 2 has been resolved.</p>
CL 3 – Evidence of the implementation of the project has to be provided.	A.5.1.2	The evidence of the implementation has been provided.	<p>The correct evidence has been provided.</p> <p>CL 3 has been resolved.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 4 – Technology description should be improved with more detailed information.	A.5.3.1	The PDD has been updated.	Section A.4.3 has been reinforced, and the evidence for the technology description has been provided. The final number of extraction wells to be installed has been clarified. CL 4 has been resolved.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 5 – Further information regarding the training needs has to be provided to the validation team and incorporated in the PDD.	A.5.3.2	Training is described in general terms since a detailed description will only be possible once the monitoring equipment is acquired, as it has to adapt to calibration, operation and maintenance manufacturers specifications. However, the process of the information towards emission reduction calculation will be according to the ERs calculation procedure (ERCP), which is described in the section “Emissions Reductions Calculation Procedure and Required Spreadsheets” of annex 4. The project has not required extensive initial training and maintenance efforts because the project sponsor staff is familiar with this type of project since they have been operating a similar technology in the CDM LFG “Huaycoloro” project . Moreover, the project sponsor has already issued CERs for that project.	<p>Training regarding the monitoring of emission reductions has been incorporated into the PDD.</p> <p>It has been clarified that the project does not require extensive initial training and maintenance efforts in order to be carried out as scheduled during the project period.</p> <p>CL 5 has been resolved.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
<p>CL 6 – Further information regarding emission reduction calculation (e.g. spreadsheets, evidence, assumptions, etc.) has to be provided to the validation team.</p> <p>R-DTC-108.02</p>	A.5.4.2	<p>The following information has been provided to the validation team:</p> <p><u>Collection efficiency:</u> The efficiency of the gas collection has been reduced to 50% in the PDD and in the calculation spreadsheet in order to be more realistic and conservative.</p> <p>Source: Article written by Dr. C. P. Eden.</p> <p><u>Waste composition:</u> The waste content by type has been obtained from the study about the efficient use of the Modelo del Callao Landfill made by Dr. Julio Kuroiwa.</p> <p>Source: Chapter 6 of the Kuroiwa Study.pdf</p> <p>The waste composition and source have been included in the calculation spreadsheet and the PDD.</p> <p><u>Life time of the project activity:</u> The project activity has municipal concession for 30 years starting from 10 November 2003. Source: Concession Contract Landfill Callao.pdf</p> <p><u>Amount of MSW received by the landfill:</u> In the study made by Dr. Kuroiwa, it is calculated that the landfill could receive waste for 22 years, from 2008 until 2030. This amount of waste is considered for ex ante emission reduction calculation.</p>	<p>Values of all parameters have been correctly justified in the PDD and in the spreadsheet provided to the validation team.</p> <p>Parameters in the calculation spreadsheet and in the PDD have been clarified.</p> <p>However, determination of the hourly flare efficiency shall be clarified.</p> <p>CL 6 has been resolved since all information regarding emission reduction calculation has been provided to the validation team.</p> <p>All inconsistencies have been corrected and evidence is referenced in the final version of the PDD and calculation spreadsheet.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
		<p>The calculation spreadsheet has been corrected and titled "ER Calculation Modelo del Callao Version 3.xls"</p> <p>The flare efficiency has been clarified in the PDD.</p> <p>The "ER Calculation Modelo del Callao" spreadsheet has been reviewed and now only contains the English language.</p>	
CL 7 - Please clarify the steps followed according to the methodology in relation to the baseline scenario.	B.4.1	<p>The steps followed for the selection of the baseline scenario have been clarified.</p>	<p>CL 7 has been resolved since the steps followed for the selection of the most plausible scenario have been clarified in the PDD and are in accordance with the applied methodology ACM0001, version 11.</p> <p>The project participant identified the baseline scenario by using version 5.2.1 of the "Tool for demonstration and assessment of additionality".</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 8 - Relevant national/sectoral policies have to be described.	B.4.5	<p>Relevant national/sectoral policies are regulated by Law 27314, the “General Solid Waste Law”, and its corresponding “Decree 057-04-PCM”. This regulation could be found on the webpage of the General Direction for Environmental Health of the Peruvian Ministry of Health.</p> <p>See documents: “Law No 27314 General Law for SW.pdf” and “Decree DS_057_2004_PCM_2 Reglamento de Ley 27314.pdf”</p> <p>Relevant national/sectoral policies and regulations have been mentioned in the PDD.</p>	CL 8 has been solved since relevant national/sectoral policies such as the “General Solid Waste Law” and its corresponding “Decree 057-04-PCM” have been described in the baseline scenario identification in the final version of the PDD.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 9 - The statement “Neither Law 27314, the General Solid Waste Law, nor its corresponding Decree 057-04-PCM, have been enforced since their adoption five years ago; they are used more generally as policy guidance” should be backed up by evidence.	B.5.8	“Step 4 – Common Practice Analysis” - in Peru the operation of an adequate landfill is an exception since none of them have an LFG collection and flaring system unless they are CDM projects.	Expression “Neither Law 27314, the General Solid Waste Law, nor its corresponding Decree 057-04-PCM, have been enforced since their adoption five years ago; they are used more generally as policy guidance” can be found on page 10. CL 9 has been resolved.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 10 - Further information regarding common practice (e.g. dumps and landfills on a national scale)has to be provided to the validation team.	B.5.19	<p>“Step 4 – Common Practice Analysis” has been changed and more information about national scale has been added using the report of the current situation of solid waste management in Peru issued by the Peruvian Ministry of Environment. The report was issued in October 2008 and is available on the redress website</p> <p>See document: Report LFG Peru October 2008 and a report elaborated by the Peruvian Ombudsman’s Office regarding the situation of MSW in Peru.</p>	<p>Common practice analysis has been improved and it is in accordance with UNFCCC requirements.</p> <p>CL 10 has been resolved.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 11 - Further information regarding investment analysis (spreadsheet, evidence, etc.) has to be provided to the validation team.	B.5.23	<p>The project sponsor has aimed to implement the project since receiving the concession for the operation of the Modelo del Callao landfill in 2004. In 2009, efforts towards the implementation of the project became more aggressive. In 2009 the project received the host country letter of approval, started the CDM validation, and asked for quotations for LFG capture equipment. By mid-2010, with quotations in place and with a better idea of the LFG potential of the project, the project sponsor took the decision to invest in the project. The first clear consequence of the decision is that in December 2010, the flaring system was purchased.</p> <p>See documents: "ACISA Quotation.pdf", "John Zink Quotation.pdf" and "Global Plast Quotation.pdf"</p>	<p>Investment costs have been modified from the PDD for GSP. The new budget is supported by evidence shown in the spreadsheet. The evidence provided is deemed correct by the validation team.</p> <p>Time of investment decision has been proven.</p> <p>Incorrect references regarding investment and crediting period have been corrected.</p> <p>Original quotations have been provided and found correct and credible.</p> <p>CL 11 has been resolved.</p>

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 12 - Description of the parameters to be monitored should be adapted to those defined in the methodology ACM 00001, version 11. Evidence to back up some assumptions has to be provided to the validation team.	B.7.2.1	The PDD has been corrected accordingly.	CL 12 has been resolved since all parameters to be monitored have been described in accordance with the applied methodology. Furthermore, evidence has been referenced in the final version of the PDD and provided to the validation team.
CL 13 - Further information about the characteristics of the measurement equipment has to be provided to the validation team.	B.7.3.2	The types of measurement equipment are mentioned according to the methodology in background information in annex 4 of the PDD.	CL 13 has been resolved since information about the characteristics of the measurements equipment has been included in the PDD and the “Modelo del Callao Project Profile” has been provided to the validation team.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 14 - Further information regarding calibration and maintenance of monitoring equipment has to be provided to the validation team.	B.7.3.3	It has been explained in annex 4 of the PDD that adequate equipment, which will be used for monitoring gas flows, concentration and flare temperature, will be defined and procured during project construction. Procedures for maintenance and installation of equipment, as well as calibration, will be performed according to the manufacturer's specifications.	CL 14 has been resolved since further information regarding calibration and maintenance of the monitoring equipment has been included in the final version of the PDD and "Modelo del Callao Project Profile" has been provided to the validation team. According to project profile the calibration of measurement equipment will be yearly.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 15 - Further information regarding starting date of the project and operational lifetime of the project activity shall be provided to the validation team.	C.1.1	The project implementation will start once it is registered since it depends on CDM revenues to be feasible. The starting date of the project activity is 03 December 2010 which is the date of the flaring system purchase.	The operational lifetime of the project activity has been justified. Evidence of the starting date stated in the PDD has been provided. The flaring system purchase has been stated as the starting date. CL 15 has been resolved.
CL 16 - Main environmental effects derived from the construction and operation of the project activity have to be described in the PDD.	D.1.1	Environmental impacts are considered not significant. However, as per your request we have added a list of the potential environmental impacts and how the sponsor will mitigate those impacts in section D.2. This analysis has made according to what has been implemented in the Peruvian CDM LFG project of Huaycoloro, which belongs to the project sponsor.	CL 16 has been resolved since potential environmental impacts of the construction and operation phases of the project activity have been described in section D.2 of the final version of the PDD.

Clarifications and corrective action requests by validation team	Ref. to table 1	Summary of project owner response	Validation team conclusion
CL 17 - Evidence regarding local stakeholders' consultation have to be submitted to the validation team.	E.1.1	The invitations and the minutes of the local consultation meeting are in the document "Invitation letters and minute of the public consultation".	CL 17 has been resolved since evidence has been provided to the validation team.