

VALIDATION REPORT

Promotora Ambiental S.A.B. de C.V.

**Landfill Gas Recovery and Flaring
Project in the El Verde Landfill, León**

SGS Climate Change Programme

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Organisation:	Client:
SGS United Kingdom Limited	Promotora Ambiental S.A.B. de C.V. (PASA)
Publication of PDD for Stakeholders Consultation	
Commenting Period:	13 th February 2009 – 14 th March 2009
First PDD Version and Date:	Version 4, 11 th February 2009 ¹
Final PDD Version and Date:	Version 11, 5 th October 2010
Summary:	
<p>Promotora Ambiental S.A.B. de C.V. has commissioned SGS² to perform the validation of the project: Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León.</p> <p>Methodology Used: ACM0001</p> <p>Version and Date: Version 10 valid from 27 Feb 09 to 10 Jun 09 (Requests for registration can be submitted until 10 Feb 10 23:59 GMT)</p> <p>The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and applicable CDM requirements.</p> <p>The report is based on the assessment of the project design document undertaken through stakeholder consultations, application of standard auditing techniques including but not limited to document reviews, follow up actions (e.g. site visit, telephone or e-mail interviews) and also the review of the applicable approved methodology and underlying formulae and calculations.</p> <p>The report and the annexed validation describes a total of 46 findings which include:</p> <ul style="list-style-type: none"> • 30 Corrective Action Requests (CARs); • 16 Clarification Requests (CLs); • 0 Forward Action Requests (FARs); and <p>All findings have been closed satisfactorily and the project will be recommended to the CDM Executive Board with a request for registration.</p>	
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¹ PDD has been previously published for ISHC, under version 3, dated 19th December 2007. PDD was then republished for ISHC, under version 4, dated as 11th February 2009, after inclusion of a new technology

² MGM International Group LLC initially commissioned SGS to perform the validation however the contract was transferred to Promotora Ambiental S.A.B. de C.V. (PASA). Refer to CAR46

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Abbreviations

ACM	Approved Consolidated Methodology
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction
CL	Clarification Request
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
EB	CDM Executive Board
EF	Emission factor
EIA	Environmental Impact Assessment
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas
IPCC	Intergovernmental Panel on Climate Change
IRR	Internal Rate of Return
MP	Monitoring Plan
PASA	Promotora Ambiental S.A.B. de C.V.
PDD	Project Design Document
PP	Project Participant
REF	Reference
SCS	SCS Engineers
SEMARNAT	Secretary of Environment and Natural Resources
SENER	Secretary of Energy
SWDS	Solid Waste Disposal Site
UNFCCC	United Nations Framework Convention on Climate Change
WACC	Weighted Average Cost of Capital

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1. Validation Opinion

SGS United Kingdom Ltd has been contracted Promotora Ambiental S.A.B. de C.V. (PASA) to perform a validation of the project: "Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León" in Mexico.

The Validation was performed in accordance with the UNFCCC criteria for the Clean Development Mechanism (CDM), Validation and Verification Manual version 1 and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

By capturing landfill gas for leachate evaporation and flaring, as well as possibly using the LFG for electricity generation, the project activity will result in reductions of greenhouse gas (GHG) emissions that are real, measurable and give long-term benefits to the mitigation of climate change.

In our opinion, the project meets all relevant UNFCCC, CDM criteria and all relevant host country criteria. The project correctly applies methodology ACM0001 version 10. It is demonstrated that the project 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 total emission reductions from the project are estimated to be 1,252,310 tCO₂e over a 7-year crediting period (renewable) during 01/01/10 to 31/12/16, averaging 178,901 tCO₂e annually. The emission reduction forecast has been checked and it is deemed likely that the stated amount is achieved given the underlying assumptions do not change.

The project will hence be recommended by SGS for registration with the UNFCCC.

Signed on Behalf of the Validation Body by Authorized Signatory

A handwritten signature in blue ink, appearing to read 'Siddharth', with a long horizontal line extending to the right.

Signature:

Name: Siddharth Yadav

Date: 27th October 2010

2. Introduction

2.1 Objective

Promotora Ambiental S.A.B. de C.V. (PASA) has commissioned SGS to perform the validation of the project: “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León” with regard to the relevant requirements for Clean Development Mechanism (CDM) project activities. The purpose of a validation is to have an independent third party assess 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 seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reduction (CER). UNFCCC criteria refer to the Kyoto Protocol criteria and the CDM rules and modalities and related decisions by the COP/MOP and the CDM Executive Board.

2.2 Scope

The scope of the validation is defined as an independent and objective review of the project design document, the project's baseline study and monitoring plan and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. SGS has employed 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 consulting towards the Client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project design.

2.3 GHG Project Description

The project activity consists of landfill gas capture and its combustion through 3 different technologies: flaring, leachate evaporation and electricity generation. At a first stage, the project would consist in the installation of the flaring and the landfill leachate evaporator systems, when the captured gas would be first used for leachate evaporation, with excess LFG flared. In a second stage, when the project is operational, project proponent proposes to install electricity generation equipments, when the captured gas would be first used to meet leachate evaporator needs, and then used to generate electricity, with excess LFG flared.

ERs are claimed for the landfill gas combustion and energy displacement from the Grid. For leachate evaporation there is no emission reductions claimed for exchange in fuel since in the baseline scenario the leachate would not be evaporated using any fuel. Hence the baseline scenario of the project activity is limited to the landfill gas and the National Grid.

The baseline scenario for this project activity would be the same as the scenario existing prior to the start of implementation of the project activity, which involves passive venting with no landfill gas combustion, and the electricity generated by plants connected to the Grid. Therefore, the project activity will result in reductions of greenhouse gas emissions.

2.4 The Names and Roles of the Validation Team Members

Assessment Team	Role
Mayra Caradec	Lead Assessor, Local Assessor, Sectoral Expert Scope 13
Carolina Campos	Lead Assessor (Request for Review/ Corrections)
Alessandra Treuherz	Assessor
Michelle Nuñez	Assessor (Request for Review/ Corrections)
Abhishek Mahawar	Financial expert

Technical Review Team	Role
Kaviraj Singh	Technical Reviewer/ Sectoral Expert Scope 13

3. Methodology

3.1 Review of CDM-PDD and Additional Documentation

The validation is performed primarily as a document review of the publicly available project document version 03 dated 19/12/2007 (first PDD published for ISHC) and the subsequent versions dated 11/02/2009 (second PDD published for ISHC), 08/05/2009, 04/09/2009, 08/10/2009, 05/11/2009 and 14/01/2010 (final version). The assessment is performed by trained assessors using a validation protocol attached as Annex 2, table 2.

The site visit was performed on 9th and 10th of March 2009. Results are summarized in checklists included in Annex 1 and Annex 2 of this report. The Lead Assessor was also involved to confirm other statements in the PDD through review of documents and direct contacts with key stakeholders (including the project developers and local government). On 9th March 2009 the Lead Assessor interviewed the environmental representatives of the municipality regarding the concession given to PASA for operation and maintenance of the landfill and the local stakeholder's consultation process.

3.2 Use of the Validation Protocol

The validation protocol used for the assessment is designed in accordance with the Validation and Verification Manual, Version 1 dated 28 November 2008. It serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation (reporting).

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	Ref ID	Means of Verification (MoV)	Comment	Draft and/or Final Conclusion
The various requirements are linked to checklist questions the project should meet.	Lists any references and sources used in the validation process. Full details are provided in the table at the bottom of the checklist.	Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.	The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.	This is either acceptable based on evidence provided (Y), or a Corrective Action Request (CAR) due to non-compliance with the checklist question (See below). Clarification Request (CL) is used when the validation team has identified a need for further clarification.

The completed validation protocol for this project is attached as Annex A.1 to this report

3.3 Findings

As an outcome of the validation process, the team can raise different types of findings

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 Assessor shall raise a **Corrective Action Request (CAR)**. A CAR is issued, where:

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

The validation process may be halted until this information has been made available to the assessors' satisfaction. 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.

Corrective Action Requests and Clarification Requests are raised in the draft validation protocol and detailed in a separate form (Annex A.3). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to CLs and FARs.

3.4 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team. Findings can be raised at this stage and client must address them within agreed timeline.

4. Validation Findings

4.1 Approval

The Host party for this project is Mexico and it has ratified the Kyoto Protocol on 7th September 2000. The web link is <http://maindb.unfccc.int/public/country.pl?country=MX>.

An English version of Mexican Letter of Approval (LoA) identified as #180 / 2007 and dated December 14th of 2007 (Ref. 13) was received from the project proponent. Initially, the LoA referred to “Promotora Ambiental S.A.B de C.V.” and “MGM Carbon Portfolio, S.a.r.l.” as project participants, but on the other hand the republished PDD did not include MGM Carbon Portfolio, S.a.r.l. as a project participant. CAR 1 was raised. To this extent, a request to modify the LoA (dated 18-03-2009) was submitted by the PP to the Mexican DNA (Ref. 51), in order to reflect the change of project participants in the PDD. An English and Spanish version (Ref. 14a – 14b) of the updated Mexican LoA was issued by the DNA and provided by the project participant. The new Letter of Approval is dated 18th March 2009 and identified as #216/2009, in replacement of #180/2007 (ID of previous LoA). As verified, the letter refers to “Promotora Ambiental S.A.B de C.V.” as the project participant and no longer includes “MGM Carbon Portfolio, S.a.r.l.”, which is in accordance with section A.3 and Annex 1 of PDD (Ref.1). It was also verified that the letter was issued and signed by the host country DNA (SEMARNAT) – Fernando Tudela Abad. The letter confirms that the participation of the host country is voluntary, that the project contributes to the sustainable development of the country and complies with national legislation. Name of project “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León” complies with the name established in the PDD. Hence, CAR 1 was closed out. No doubts of authenticity have been raised regarding the provided LoA received by the PP since the audit team has experience with the Host Country and LoA format, and also approval by the Host Party was confirmed during the interview with representatives of the municipality of Leon, where project is being implemented.

4.2 Participation Requirements

The Project Participant for the CDM proposed project activity as stated in the PDD is “Promotora Ambiental S.A.B. de C.V.” (Private entity) of Mexico (host country), and as verified in the Mexican Letter of Approval (LoA). As noted in the above section, the project participant “MGM Carbon Portfolio, S.a.r.l.” of United Kingdom of Great Britain and Northern Ireland was initially listed in the first PDD published for ISHC (Ref.1a), nevertheless the entity was excluded from the second published PDD (Ref.1b).

1) According to EB30 Report (Para. 41), “where a project participant listed in the PDD published at validation is not included in the PDD submitted for registration, the DOE shall provide a letter from the withdrawn project participant confirming its voluntary withdrawal from the proposed project activity, and address this issue in its validation report.” The project participants listed in the 1st PDD published at ISHC were: “Promotora Ambiental S.A.B. de C.V.” and “MGM Carbon Portfolio, S.a.r.l.” However, the 2nd published PDD only includes “Promotora Ambiental S.A.B. de C.V.” as a project participant. The PDD which will be submitted for request for registration (Ref.1f) also indicates “Promotora Ambiental S.A.B. de C.V.” as the only project participant. In this regard, a letter of withdrawal was requested from MGM Carbon Portfolio, S.a.r.l. The PP provided the corresponding letter of withdrawal (Ref.91) dated 24-11-2009, confirming the voluntary withdrawal of MGM Carbon Portfolio as Project Participant from the project activity.

2) Also, according to EB 50 Annex 48 (Para. 7-9) as well as the CDM Modalities and Procedures (Para. 37), the DOE is required to have a contractual relationship with the project participants. To this extent, following the withdrawal of one PP, the DOE no longer had contractual relationship with the indicated project participant “Promotora Ambiental S.A.B. de C.V.” as per 2nd PDD published and most recent version of the PDD. CAR46 was therefore raised. The PP signed a contract with SGS (Ref.96) for the conduction of validation services, thereby demonstrating a contractual relationship between the DOE and the PP. Hence, CAR 46 was closed out.

A Modalities of Communication (Ref.12a) for the project participant “Promotora Ambiental S.A.B. de C.V.” dated February 11th 2008 was provided by the PP. The project name in the MoC (“Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León”) complies with the name stated in the PDD. The information in the MoC was found in line with Section A.3 (Project Participants) of the PDD, however the contact personal e-mail was found different from the PDD Annex 1 and also the PP was requested to adapt the MoC to the latest template available (EB 45, annex 60). CAR 2 was raised. Contact e-mail in Annex 1 of PDD version 5

(Ref.1c) was checked and verified by the assessment team and is now in accordance with information in the revised MoC (Ref.12b). The revised MoC was verified to be in accordance with the new template as per EB45 Annex 60. The project name and contact details were also verified in line with the information in the PDD (Ref.1d). CAR 2 was closed out.

4.3 Project Design Document including Project Description

Project Design Document (PDD) published for ISHC

The PDD first submitted for validation and published for ISHC is indicated as Version 03, dated 19/11/2007 and made available for public comments from 9 January 2008 to 7 February 2008 on the following UNFCCC link: <http://cdm.unfccc.int/Projects/Validation/DB/Q2FCX6TF43RFDJ77RTQ64YUTP1EX18/view.html> with no comments received.

The PDD was revised in order to address another use for the landfill gas (leachate evaporation) and since changes were considered relevant for stakeholders, a new Local Stakeholder consultation and a new ISHC were done. The resubmitted PDD for ISHC is indicated as version 4 and dated 11/02/2009 (Ref.1b). The PDD was republished for public comments from 13 February 2009 to 14 March 2009 on the following UNFCCC link: <http://cdm.unfccc.int/Projects/Validation/DB/GBX12JR23264NA0L9ZO1HYZV774RSX/view.html> with no comments received.

PDD format: compliance with Guidelines for Completing the Project Design Document (CDM-PDD)

The PDD format applied by the project participant was crosschecked with the template available on the UNFCCC website and Guidelines for Completing the Project Design Document (CDM-PDD). CAR 3 was raised to request the PP to make the necessary corrections of format in a revised PDD. In response, the PP provided a revised PDD which was revised as requested. The PDD format applied by project participant was verified to comply with the template available in the UNFCCC website and the Guidelines for Completing the PDD, version 7. The PDD was also completed using the same font without modifying its format, font, headings or logo, in accordance with the PDD template and guidelines. CAR 3 was closed out.

Project purpose, description and technology

The title “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León” clearly enables to identify the CDM activity. It was also confirmed through the UNFCCC web site that no other project activity has been registered on the UNFCCC under such title.

The project activity consists of landfill gas capture and its combustion through 3 different technologies: flaring, leachate evaporation and electricity generation. The purpose of the project activity regarding these different types of technology used was initially not clearly described in the PDD, and was not consistent with the assumptions provided in ERs calculations. Since the landfill gas is to be used among different technologies, and in different stages, the basis for the landfill gas distribution among these technologies and assumptions had to be clarified and consistently reported. CAR 4 was raised. In response, the information on the purpose of the project activity and the type of technology used was edited in a revised PDD on sections A.2 and A.4.3. The information was compared to the revised ER Spreadsheet for consistency and the following was verified:

1. Initial stage: Leachate Evaporation + Flaring (implementation estimated by 2010)

In this initial stage of the project activity, from the total landfill gas generated estimated as per the *Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site*, part of the landfill gas is to be sent to the leachate evaporator and the remaining to the flare.

- Leachate Evaporator

The landfill gas volume to be sent to the evaporator is based on the Landfill Gas consumption as per information of the budgetary proposal for Leachate Evaporator Model ED500 provided by manufacturer Ecologix Environmental System, LLC (Ref.60). The document states that the Landfill Gas Consumption needed for the technology is 183 SCFM (Standard Cubic Feet per Minute), resulting in 2,723,650 m³/year of landfill gas when considering 100% operation time during the year. This quantity was fixed for the whole crediting period. Further information on evaporator can be found at http://www.ecologixsystems.com/evapo_dry.php.

The quantity to be sent to the leachate evaporator is considered a key information since the remaining landfill gas is distributed to the other technologies based on this data. Initially no technical details were

provided in PDD section A.4.3 such as capacity; hence it was not possible to confirm if 2,723,650 m³/year of landfill gas would meet the project activity needs and if it represented reliable information. This is because it was not clear if the Landfill Gas Consumption needed for the Leachate Evaporator technology indicated in Ref.60 represented the evaporator fuel requirements as informed in the PDD, and if it referred to a minimum, average or maximum consumption. Also, it was not clear how the quantity of leachate available in the Landfill site was taken into account considering that the capacity of technology Model ED500 to evaporate waste water is 1.89 cubic meters per hour (Budgetary proposal, Ref.60), and also taking into account the landfill gas requirement by manufacturer.

In response, technical details of the leachate evaporator were included in the PDD section A.4.3, regarding the equipment capacity. Equipment to be installed is EvapoDry Model ED 500 and equipment capacity is 500 gallons per hour or 1.89 m³/h, which has been confirmed in the budgetary proposal (Ref. 60). Also, it was noted that the estimated amount of LFG to be sent to evaporator was changed from 2,723,650m³/year to 2,263,490 m³/year in the revised ER spreadsheet (Ref.10d). This change was attributed to the amount of working hours per year, which were previously assumed to be 8,760 h/year, equivalent to the extension of one year round. However, technical information provided by the manufacturer (Ref.60) shows that the actual operating time on waste water reported is 7,280 h/year. Hence, the correct value of estimated LFG to be sent to evaporator is 2,263,490 m³/year as reported in the revised spreadsheet. It is important to note that it is reasonable to consider that the equipment will not work in one year round, due to possible stops for maintenance and operation problems.

With regard to the evaporator LFG consumption requirement, the project participant clarified that the LFG consumption needed for the leachate evaporator indicated in Ref.60 (183 ft³/minute) represents the amount of LFG needed to evaporate 1.89 m³/hour of leachate. Regarding the relation between the quantity of leachate available in the landfill and the capacity of leachate evaporation of the equipment, the project participant provided the file "Leachate generation 2006-2009 mod MGM 19Aug09.xls" (Ref.76), where historical data of leachate generation was verified. It was confirmed that a maximum leachate generation rate of 1.11m³/h was reached in September of 2008, and that the average generation rate between January and July of 2009 was 0.63m³/h. Moreover, PP explained that the total accumulated waste at the end of 2009 is estimated to be about 4 million tonnes, and that in year 2017 the landfill will reach about 8 million tonnes of waste. This information was confirmed in the ER spreadsheet calculations (Ref. 10d), sheet "Waste", where increase in waste reception is calculated based on the expected population increase in the municipality of Leon (Ref.62 & 63). Thus, given that the capacity of the evaporator is 3 times the leachate generation average rate for 2009 (1.89m³/h vs 0.63 m³/h), the evaporator capacity is applicable in the project context and adequate to meet the future needs of the project activity.

- Enclosed flare

Annual quantity of landfill gas to be sent to flare varies according to the variation of total landfill gas generated estimated per year. The maximum volume of landfill gas to be sent to the flare had been estimated in 19,019,007 m³ per year. This was in line with maximum equipment capacity quoted. According to John Zink Quote of February 2008 (Ref.59), the equipment has a maximum capacity of 1700 SCFM (Standard Cubic Feet per Minute), resulting in 25,106,547 m³/year considering 8000 hours/year of operation. Due to changes in project estimations related to the findings raised during the validation process, the maximum volume of landfill gas to be sent to the flare has been finally estimated in 18,198,965 m³/year, which is also within equipment capacity range.

2. Later Stage: Leachate Evaporator + Flaring + Electricity Generation (implementation of EG estimated to 2012)

In a later stage, it is planned to use the landfill gas to generate electricity. Once this is implemented, the landfill gas would first be used in the leachate evaporator, then in the electricity generator, and remaining gas would be flared.

- Electricity Generator

The power capacity estimated during the project operation depends on the estimated LFG available in each year (based on the Tool to determine methane emissions avoided from disposal of waste) and the generators specification (LFG needed to generate a certain amount of electricity). Three Caterpillar Generators Model CAT3516s (0.8 MW each) would be used during a first stage (2012-2013), representing the 2.4MW capacity. Four additional Caterpillar generators model CAT3516s would be used from 2014-2031, adding 3.2 MW of installed capacity (resulting in a total capacity of 5.6MW). For the final

period (2032-2033) it is estimated to only use 4 Caterpillar Generators Model CAT3516s (0.8 MW each), representing 3.2 MW of total capacity. Hence, the capacity of the project activity varies from 2.4MW-5.6MW, according to the LFG available annually.

It was noticed that the amount of landfill gas used for the electricity generator was initially estimated based on technical information of Waukesha engines, while the financial analysis referred to the economical estimates from SCS Engineers (Ref.56) (hereinafter referred to as 'SCS')³ which were based on CAT3516 engine generators. The PP was requested through CAR 04 to include in the PDD information on equipments capacity and to revise this inconsistency, since differences in equipment specification can affect project costs.

It was clarified that technical information of Waukesha engines was initially used as a data source to estimate the efficiency of electricity generation using LFG. On the other hand, the economic estimates from SCS engineers were based on CAT3516 engine generators. It was explained that the choice of the exactly equipment to be used had not been determined and will not be done until LFG is actually available and monitored. The breakdown of investments associated with the project was provided by SCS in the Cost Estimates Report (Ref.56), which was developed based on data available from site visits, installation of test wells, development of conceptual system design, and additional studies performed by others. SCS report is based on preliminary information assuming the installation of 3 Caterpillar Generators (0.8MW), Model CAT 3516s, representing 2.4 MW of total capacity. It was possible to confirm that the capacity used in the report was intend to be used only as a reference to the PP, since the data obtained for LFG generation by SCS (Ref.95) was verified to be even higher than the estimation of LFG achieved by the PP using the Tool to determine methane emissions avoided from disposal of waste.

In this context, it is important to note that it was verified that equipment cost variances are being considered in the project sensitivity analysis conducted with a variance of 20%. Nonetheless, the PP now uses specifications for CAT3516 engines to estimate the efficiency of electricity generation for consistency between documents. Hence all reference to Waukesha engines was deleted in the revised PDD. Data of gas flow (300 SCFM at 50% of methane needed to generate 0.8MW) was verified in manufacturer website <http://www.lfgtech.com/catech.htm>. Conversion of units from ft³/m to m³/h was also verified correct, resulting in an efficiency value of 509 m³/h. PDD and ER spreadsheet have been revised accordingly. As a result, more LFG was verified to be sent to electricity generation when applying CAT3516 engines needs in ERs calculation. The landfill gas distribution among the different technologies to be used and assumptions were clarified and consistently reported in the revised PDD. Please refer further to section 4.6.4 for a discussion on financial aspects regarding the power generation capacity used. CAR 4 was closed out.

Regarding the contribution of the project activity to sustainable development, it is confirmed that the project would have important local environmental benefits with the combustion of landfill gas collected, such as destruction of air pollutants, (i.e. hydrogen sulfide that is present in trace quantities in LFG), reduction of fire and explosion risk through improved management of landfill gas, and reduction of odor which affects nearby population.

Actual status in relation to baseline scenario and landfill lifetime

The PDD (Section A.2) did not clearly state if the baseline scenario identified corresponded to the actual situation of the landfill, as per Guidelines for Completing the PDD. Also, this section should clearly describe how the project activity reduces greenhouse gas emissions making reference to the scenarios, emission sources and gases. CAR 5 was raised. Section A.2 of the revised PDD (Ref. 1c) was modified to include a description of the relation between the current situation and the baseline scenarios identified, stating that both are the same (landfill gas realeased into the atmosphere, with no landfill gas capture and destruction; the electricity generated by plants connected to the Grid). PP also excluded terms such as "LFG2", P6" which were only explained in further sections, what made the description unclear. Also, a description of how the project activity reduces greenhouse gas emissions was summarized in this section as required. It is now clear that emissions reductions would be obtained with project activity through the landfill gas collection followed by combustion (flaring, leachate evaporation, electricity generation), which would otherwise be released into the atmosphere. It is important to mention that ERs are only claimed for the landfill gas combustion and energy

³ SCS Engineers is a consulting company specialized on environmental engineering and construction, including waste engineering services (available at <http://www.scsengineers.com>). The company was contracted by PASA (PP) and is responsible for the installation and construction of the project activity (LFG capture and use) under contracts verified (Ref.19 & Ref.90).

displacement from the Grid, since in the baseline scenario the leachate would not have been evaporated using any fuel (as actual scenario). Hence the baseline scenario of the project activity is only limited to the landfill gas and the National Grid. Please refer to Section 4.6 below for discussion on this issue. CAR 5 was closed out.

The PDD had initially stated that the landfill was expected to close in May 2016. However, according to the landfill EIA ("Manifiesto de Impacto Ambiental") Annex 25 (Ref. 28), the landfill has a lifetime of 16.28 years (calculated based on Norm NOM-ECOL-084-94). Based on this information, and considering that the landfill started receiving waste on year 2001, the landfill would be expected to close in 2017. Therefore, CAR 10 was raised. The landfill lifetime used for the project was modified in the revised PDD (Ref.1c) and ER spreadsheet (Ref.10b) as ending in 2017, in accordance with the landfill EIA (Ref. 28). Therefore, CAR 10 was closed out.

Moreover, it was stated in the PDD that since LFG continues to be produced for many years afterwards, the proposed project is expected to have a useful life until December 2032. Please also refer to section 4.7 for discussion on CL 11 raised in relation to calculation of the project operational lifetime.

PDD section A.2 stated that currently there are 50 landfill gas vents (or passive gas wells) distributed in the 4 cells, covering the current 30 ha area. During the site visit it was verified in the landfill "Macro Cells Plan" identified as LN-03 and dated 08-05-2000 (Ref. 24a – 24d) that there are 2 macro cells: macro cell 1 and macro cell 2, both of which comprise a total of 51.4 hectares. Macro cell 1 is currently being used for the waste received, and corresponds to approximately 25 hectares, with 5 remaining hectares designated as buffer zone. It was initially understood that Macro cell 2 was not included in the project boundaries as verified in the PDD and during the site visit. It was also verified in the cartographic plan that macro cell 1 contains 5 cells (with 10 vents per cell), and not 4 as stated in the PDD. Hence, a CAR was raised in order to request the PP to revise the information accordingly. CAR 6 was raised.

The revised PDD (Ref.1d) was verified and section A.2 now states clearly that the proposed project includes macro cells 1 and 2, comprising an area of approximately 60 ha altogether (including buffer zones), which is in line with the "Macro Cells Plan" dated 08-05-2000 (Ref.24a – 24d). This 60 ha area includes the present scenario (approximately 30 ha area – macro cell 1) and future expansion (approximately 26 ha area – macro cell 2). The wells in macro cell 1 are venting the gas from inside the waste mass to the top of each vent and the same would be expected for macro cell 2 in the absence of the project activity. According to the Environmental Impact Report (Ref.28), the entire landfill site comprises a volume of 11,094,224.13 m³, which was calculated as per Mexican norm NOM-ECOL-084-94. As shown in the file "Waste quantities 2001-08 - 20Aug08.xls" (Ref.61), the amount of waste projected to be disposed until 2017 would be 8,225,969 tonnes, which, based on the average historical density of the landfill (0.77 tonnes/m³), would occupy a total volume of 10,683,077 m³. When considering the historical average density of the landfill, this estimated projection is lower but very close to the projected value in the Environmental Impact Report (Ref.28), which takes the entire landfill site into account (macro cell 1 and 2). This shows that the estimated gas production in the ER calculations includes both macro cells 1 and 2, which make up the entire site. Hence, it evidences that the area available is sufficient to cover the quantity of waste projected until 2017, confirming consistency between information provided by the PP. Landfill volume of 11 million m³ was correctly referenced in Annex 3, table 3.1, parameter Wj,x. CAR 6 was closed out.

The PDD states that the operational lifetime of the landfill may be extended beyond 2017 in case there is still space available for waste disposal, what can depend on real waste disposal type and quantity, density and compacting during crediting period, among others factors. Please refer to Section 4.6.4 "Investment Analysis", for this discussion.

The DOE has investigated and confirms that there was no landfill gas flaring mechanism available in the baseline scenario. PDD states that the current landfill gas wells are venting the gas from inside the waste mass to the top of each vent, with no presence of flames. During site visit no sign of gas combustion was observed at the landfill. Interviews conducted with project personnel confirmed that indeed no flaring has been carried out at the landfill. Moreover, an SCS Engineers statement (Ref.78) was provided (see CL 24) which states that "since early 2007, SCS has not witnessed any combustion of LFG in the existing LFG venting well system." It further states that the current construction of the LFG venting wells is not appropriate to perform passive combustion of the LFG since the main conduit is constituted of polyvinyl chloride (PVC) plastic pipe. This was confirmed in the landfill EIA document, Annex 15 (Ref.25), which provides a diagram of the gas wells, specifying that these are tubes made of PVC material.

Regarding the landfill operations and history, the PDD states that the landfill began accepting waste in May 2002. However, the waste history records (Ref. 50), show values for 2001. Therefore, CAR 7 was raised. Information on landfill operation start date was corrected in the revised PDD (Ref. 1c), in accordance with the

landfill waste records verified (Ref. 50 & Ref. 61). The revised PDD and ER spreadsheet (Ref. 10b) were also verified and baseline values are now based on the waste data available from June 2001. CAR 7 was closed out.

Furthermore, the PDD stated that the landfill was filling at an average rate of 1,700 tonnes per day, or greater than 530,000 tonnes per year. However, the values reported in the ER spreadsheet showed lower values per year from 2001 to 2008. In addition, annual values in the ER spreadsheet did not coincide with the waste history records (Ref. 50). CAR 8 was raised. The updated spreadsheet with waste records until March 2009 and original historical records of waste disposed in the landfill (2001-March 2009) provided by PP were verified. Annual values in the ER spreadsheet have been corrected and now coincide with the waste history records provided (Ref.50). Due to this correction the reductions estimated for the project activity originally have changed. However, the assumption that from January to March 2009 the landfill had an average rate of about 1,400 tonnes per day could not be confirmed, as the re-calculated value was 1,211 tonnes per day. Also in the ER spreadsheet, it was not possible to understand the annual filling average rate and daily filling average rate calculated in "Waste" (Cells C72 and C76). CAR 8 remained open. In response, information on the average rate of waste has been corrected in the revised PDD, which now mentions 1,211 tonnes per day or more than 442,000 tonnes per year, which is consistent with the historical data presented in the file "Waste quantities 2001-08.xls" (Ref.61). Also, the emission reduction spreadsheet was revised to exclude the data of cells C72 and C76. CAR 8 was closed out.

According to 2nd published PDD (Ref.1b), PASA expected the disposal rate to increase by 7% per year in the coming years. CL 9 was raised to request the project proponent to support this statement with verifiable evidence. Disposal growth rate was changed from 7% to 2.7%, based on the recent population increase rate of Leon (Ref. 62 & 63); that is, the PP assumed that waste generation increases at the same rate as the general population. This assumption is appropriate and in accordance with the 2006 IPCC Guidelines for National Greenhouse Gas Inventories (Volume 5, Chapter 3, numeral 3.7.2.1. pg 25), which states that "waste generation may be estimated from population (or urban population) and per-capita waste generation rates." Even though waste generation increases both with population and per-capita waste generation, the PP has conservatively based the estimation on population growth rate only. For instance, a study by the Pan-American Health Organization (PAHO) indicates that per capita waste generation in Latin America may be expected to increase at a rate between 0.5% and 1% annually (pg. 84 - /Ref.92/). By considering a value of zero (i.e., no increase in per capita waste generation), which is lower than PAHO rate, it is conservative since this represents less LFG estimated, and hence less emissions reductions. The values for expected disposal waste from 2009 to 2017 given in the ER spreadsheet (Ref.10b) and Annex 3 of PDD (Ref. 1c) were adjusted by the PP based on the revised percentage, and were verified correct. Therefore, CL 9 was closed out.

All information provided was verified in consistency with details provided in Annex 1. Furthermore, section A.3 has been correctly applied in the PDD. As explained in sections 4.1 and 4.2 above, one project participant (MGM Carbon Portfolio, S.a.r.l.), representing the Party of UK, was excluded in the second PDD published for ISHC. Thus, a UK LoA was no longer required for the validation assessment. The revised PDD versions indicate Promotora Ambiental S.A.B. de C.V. (Mexico as Party) as the only project participant. Also, information in Annex 1 was found in compliance with information in Section A.3 of PDD.

Project Location

The project activity is to be located in the city of León, which is 45 kilometers northwest of the Del Bajío International Airport, in the state of Guanajuato, about 350 kilometers northwest of Mexico City. The PDD initially stated that the project coordinates were N 21°10'28"; W 101°46'32, and the project EIA ("Manifiesto de Impacto Ambiental" – Ref. 33) page 2, section 1 showed the following coordinates: N 21°10'14"; W 101°46'30. CAR 12 was raised. Project location coordinates in PDD section A.4.1.4 were modified to N 21°10'14"; W 101°46'30 in accordance with the EIA (Ref. 33). CAR 12 was closed out. The description of the project location in PDD was confirmed on page 10 of Section II of the EIA ("Manifiesto de Impacto Ambiental" /Ref. 33/). Project location was also verified during the site visit by the assessment team.

Ownership and licenses

The El Verde landfill is owned by Promotora Ambiental S.A.B. de C.V (hereinafter called PASA) through a concession contract signed with the municipality of León. PASA is identified in the PDD as the project participant of the project activity. The legal registry of PASA ("Acta Constitutiva" – Ref.32) dated 23-07-1994 was obtained from project proponent during the site visit. The concession contract for the landfill was signed on 2001 between the Municipality of Leon and PASA (Ref. 31), which endows the municipality the right to

supervise the landfill operations at its will, and requires PASA to communicate the municipality of any changes of activities in the landfill (page 7 of Concession Contract – Ref.31). As verified, this contract concedes PASA the management and operation of El Verde landfill for a period of 15 years. Thus, concession would be expected to end in 2015. Nevertheless, a contract between PASA and the municipality concerning the sharing of CER benefits (Ref.27) establishes that the contract is valid until 31 December 2012 or, if the Kyoto Protocol extends, until the conclusion of the Kyoto Protocol. This indicates that PASA is allowed to implement the project activity at the site, and is the owner of the project throughout its entire crediting period, as long as it is valid within the framework of the Kyoto Protocol.

It was also verified in the Concession contract between the municipality and PASA (Ref.31) that the public bid of the El Verde landfill celebrated on 19/07/2000 was conceded to PASA by the municipality. Considering that in 2006 a contract between the municipality and PASA was signed concerning the share of CER benefits among the municipality and PASA, a search for evidence showing that the landfill was not created to become a CDM project was done. It was verified in the project EIA dated 10-12-2000 (Ref. 33), page 1 of section II that in that moment the solid waste disposal site for the city of León (“Relleno Sanitario Controlado”) was in the closure of its useful lifetime, and therefore the need to obtain a new site for municipal waste management. Hence, it was confirmed that the El Verde landfill was not created to become a CDM project activity and that it would have been implemented anyway without the collection and utilization of the LFG.

The landfill has conducted an Environmental Impact Assessment (“Manifiesto de Impacto Ambiental” or “MIA”– Ref.33) as part of the requirements to obtain the EIA authorization (“Autorización de Manifiesto de Impacto Ambiental” /Ref.52/), equivalent to an operation license. The Environmental Impact Assessment Authorization dated 23-11-2000 (Ref.52) was granted to PASA by the state of Guanajuato allowing the construction, operation and maintenance of the El Verde landfill. The state also issued on 21/05/2001 a separate permit referring to the EIA Authorization (Ref.30). Similarly, the Municipality of Leon issued on 23/05/2001 an additional permit for the landfill construction (Ref.30). In October 2006, the Municipality provided authorization for the proposed CDM project activity (Ref.53). However, it was not clear whether the state of Guanajuato would be the entity responsible of conferring authorization to PASA for the implementation and operation of the project activity under the CDM. Therefore, CL 13 was raised. In response, the project participant made reference to two laws which were verified by the assessor. The Law for Ecological Balance and Environmental Protection (Ref.64) states that “it corresponds to the municipality the application of legal jurisdiction related to the prevention and control of the effects over the environment caused by the generation, transport, storage, management, treatment and final disposition of the solid and industrial residues that are not considered as dangerous, in conformity with the Article 137 of the present Law.” Article 137 states that “it corresponds to the Municipalities or the Federal District to authorize the functioning of the systems of recollection, storage, transport, reuse, treatment and final disposition of municipal solid residues.” The Law for the Residual Management of Guanajuato (Ref.65) states in article 10 that “it is responsibility of the city hall to formulate by themselves the municipal programs for the prevention and integral management of urban solid waste.” It also states in number IV of the same article that it is the responsibility of the town hall (“Ayuntamiento”, in Spanish) to prevent the generation and control the integral management of urban solid waste. Also, number VI of article 10 states that it is responsibility of the city hall to give totally or partially as a concession the public service of cleaning, recollection, transport, treatment and final disposition of the wastes. It is concluded that it corresponds to the Municipality of Leon to confer authorization for the operations in the landfill, and hence, to the proposed CDM project activity in the El Verde landfill. Hence, the municipal authorization of the project is in accordance to the landfill concession processes in the host country. CL 13 was closed out.

Selection of crediting period and projected emission reductions

The crediting period start date was not clear since in Section C.2.1.1 there were 2 dates considered, and not a conditional statement in relation to the registration date, e.g. “whichever is later.” In addition, the PP was requested to revise the date mentioned in this section (01/01/2009) to a more realistic timeframe, as the date established was earlier than the validation start date. CAR 36 was raised. Section C.2.1.1 of the revised PDD (Ref. 1c) was verified to include a conditional statement on the project registration date: “01/01/2010 or the registration date, if this is after 01/01/2010.” Therefore, CAR 36 was closed out.

The crediting period is defined as 7 years renewable, which was found to be reasonable considering the operational lifetime of the project. The operational lifetime of the project (23 years) exceeds three 7-year periods altogether (21 years). Hence, the operational lifetime assures that the system will be operating until after the end of the (3 x 7 year) crediting period.

It was verified in the ER spreadsheet (Ref.10a) that the project estimated electricity generation initially started from 2009. Considering that currently the project does not count with a license for generating electricity, the PP was requested to revise the projected start date for electricity generation since generally the public licenses concession processes are known as an extensive process in Latin America. Thus, CAR 14 was raised. The start date for generating electricity in the project activity was changed to January 2012, based on a more realistic timeframe. The projections in revised ER spreadsheet (Ref.10b) for electricity generation were verified to start in January 2012. Therefore, CAR 14 was closed out.

The table required for the indication of projected emission reductions has been correctly applied, and shows the annual estimated ERs in tonnes of CO₂ for 7 years (renewable). However, as the ER spreadsheet contained values in decimals, the sum of yearly values in the PDD version 4 (Ref.1b) did not result in 1,025,360 tCO₂ but 1,025,357 tCO₂. As the yearly values reported in the PDD do not (and should not) contain decimals, the sum should reflect the values reported for compliance. CAR 37 was raised. The revised PDD (Ref.1c) and ER spreadsheet (Ref.10b) were verified to be consistent, and values in ER spreadsheet are now given in whole numbers. CAR 37 was closed out.

Public Funding

Finally, in regard to public funding, section A.4.5 of PDD states “No public funding is used for this project activity.” Indeed, financial data verified (Ref.11) do not indicate any possible public funding. This information was verified to be consistent with details provided in Annex 2.

4.4 Applicability of selected methodology to the project activity

Initially section A.4.2 of PDD stated that the project categories were 13 – Waste handling and disposal; and 1 – Energy industries (renewable / non-renewable sources. However, according to the list of CDM scopes available on the UNFCCC website, the methodology ACM0001 is only applicable to scope 13. CAR 15 was raised. Section A.4.2 of the revised PDD (Ref. 1c) has been modified and correctly states the project category as 13 – Waste handling and disposal. CAR 15 was closed out.

The approved methodology applied by the project is ACM0001. Initially the most recent version by the time of PDD publication was applied (v.9.1). However the PDD was updated to apply a newer version of the methodology, ACM0001(v.10). It was verified that section B.1 of PDD version 4 (Ref.1b) indicated that the “Tool for the demonstration and assessment of additionality” used for the project was version 5. However version 5.2 of the tool was available at UNFCCC website. CAR 16 was raised. The PDD was updated to version 5.2 of the Additionality tool. Hence, CAR 16 was closed out.

According to ACM0001, the methodology is “applicable to landfill gas capture project activities, where the baseline scenario is the partial or total atmospheric release of the gas and the project activities include situations such as:

(a) The captured gas is flared; and/or

- The project activity involves a partial amount of LFG being flared. Hence, this alternative applies.

(b) The captured gas is used to produce energy (e.g. electricity/thermal energy). Emission reductions can be claimed for thermal energy generation, only if the LFG displaces use of fossil fuel either in a boiler or in an air heater. For claiming emission reductions for other thermal energy equipment (e.g. kiln), project proponents may submit a revision to this methodology;

- In the project case, the captured gas will be used to produce both electricity and thermal energy (through a leachate evaporator – air heater); hence this option applies to project. Nevertheless, as is stated in section B.5 of the PDD, no combustion of CO₂ emissions for any fuel displaced by the thermal energy use of the LFG will be claimed for this project.

(c) The captured gas is used to supply consumers through natural gas distribution network. If emissions reductions are claimed for displacing natural gas, project activities may use approved methodology AM0053.

- No captured gas will be used to supply natural gas to a distribution network. Hence this option does not correspond to the project activity.

In conclusion, methodology ACM0001 is deemed the most applicable as the project involves capturing LFG for flaring, with some leachate evaporation as well as possibly electricity generation from LFG. It was also verified that the discussion in the PDD is in accordance with all applicability criteria of ACM0001.

4.5 Project Boundary

The description of the project boundaries given in the PDD is in compliance with the methodology. According to ACM0001, “the project boundary is the site of the project activity where the gas is captured and destroyed/used.” Also, “if the electricity for project activity is sourced from grid or electricity generated by the LFG captured would have been generated by power generation sources connected to the grid, the project boundary shall include all the power generation sources connected to the grid to which the project activity is connected.” In addition, “if the electricity for project activity is from a captive generation source or electricity generated by the captured LFG would have been generated by a captive power plant, the captive power plant shall be included in the project boundary”.

As per the PDD, “the project boundary comprises the landfill site and all power plants in the interconnected power grid,” as required by the methodology. The solid waste included in the project boundary is restricted to the solid waste that is received from the municipality of Leon, as evidenced in the Concession Contract from the municipality, page 2 (Ref. 31).

According to the Tool to calculate the emission factor for an electricity system, the relevant electric power system should be identified in Step 1 of the tool for determining the electricity emission factor. It is stated in the PDD that “the geographic and system boundaries include all the geographic area and infrastructures within the whole territory of Mexico, taking into account the energy exports and imports outside the Mexican energy system.” However, CAR 17 was raised to request that the relevant grid is identified and included in a revised PDD. Consequently, the relevant grid was clearly identified in the revised PDD (Ref.1c), Step 1 of the Tool; which is in accordance with the information of the Mexican grid found in the document “Prospective of the Electrical Sector 2008-2017” (Ref.54). CAR 17 was closed out.

A diagram of the project boundary is shown in the PDD as figure 4, which includes the emission sources and the different technologies implemented in the project: leachate evaporation system, flare station and a LFG fuelled generator. Emission sources and gases related to the baseline and project scenarios are clearly identified in the corresponding table in section B.3. There is no information on GHG emissions which are expected to contribute more than 1% of the overall expected annual emission reductions, which are not addressed by the applied methodology ACM0001.

4.6 Baseline Selection and Additionality

The PDD correctly follows the steps established by the methodology to determine the most likely baseline scenario. In step 1 for identifying alternatives to the project activity consistent with current laws and regulations, the project participant has correctly applied version 5.2 of the Tool for the demonstration and assessment of additionality” as required by the methodology.

In sub-step 1a, the methodology requires that alternatives for the disposal/treatment of the waste in the absence of the project activity, i.e. the scenario relevant for estimating baseline methane emissions, to be analyzed should include, *inter alia*:

LFG1: The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity;

LFG2: 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.

Also, ACM0001, Ver. 10 states that if LFG is used for generation of electric or heat energy for export to a grid and/or to a nearby industry or used on-site, realistic and credible alternatives should also be separately determined for

- Power generation in the absence of the project activity;
- Heat generation in the absence of the project activity.

The project participant proposes to use some of the captured LFG to evaporate leachate. According to ACM0001, Ver. 10, for heat generation, the realistic and credible alternative(s) may include scenarios H1-H7. Initially the PP stated in the PDD (Section B.4) that among the realistic alternatives to be considered as possible alternative baselines were H1 through H7 (for heat generation). However, no emissions from heat generation were taken into account in calculating baseline emissions in Section B.6. Also, PP was requested to clarify how the leachate evaporation would not occur otherwise in the baseline scenario, taking local regulation and laws, where applicable, into account. It was also requested to include relevant information with this regard in the PDD since there was no mention of leachate available in actual / baseline scenario, and

related information, when considering what is done at this moment with leachate generated. CL 38 was raised. In response, PP explained that prior to project implementation, leachate was collected in pools, and some of it evaporates, while the remainder is re-circulated by spraying on top of the landfill. These mentioned pools were verified during the site visit (photos available) while PP had previously informed part of the leachate was re-circulated. Furthermore, section A.2 of PDD stated: *"Note that in the baseline scenario, leachate would not be evaporated using any fuel"*. To support this statement, PP provided local legislations related to this matter. It was verified that Leachate Management in Mexico is regulated by the Mexican Official Norm 083-SEMARNAT-2003 named *Specifications for environmental protection for site selection, design, construction, operation, monitoring, closure and additional works of a final disposal site for municipal solid waste*.⁴

On page 8, specifically article 7.3, the regulation states the following:

7.3 A system must be built that ensures the collection and extraction of leachate generated at the landfill site. The leachate must be recirculated on the waste depending on humidity needs for waste decomposition, treatment, or a combination of both.

On the other hand, the *General Law for Prevention and Integral Management of Waste*⁵ states in its Article 97 that leachate should not migrate outside the landfill, but does not refer to any special action or treatment at the landfill site.

It is important to note that neither the *Regulation of the General Law for Prevention and Integral Management of Waste*⁶ nor the *Guanajuato State Law for the Integral Management of Residues from the State and Guanajuato Municipalities*⁷ provides any information about leachate or actions in this regard. . It is therefore confirmed that the current practice meets all laws and regulations, and therefore leachate evaporation would not occur in a baseline scenario. CL 38 was closed out.

Recirculation of leachate into the landfill is a common practice in Mexico's landfills, in which the objective is to use the solar heat to evaporate some of the leachate poured on the landfill. As mentioned above, this practice is in alignment with the provisions of the Norm 083-SEMARNAT-2003. Evidence to support that leachate recirculation is a common practice in Mexico was verified in a statement prepared by a Research Professor of the Autonomous University of Nuevo Leon, Mr. Horacio Villalón Mendoza, who visited 22 landfills in different regions of Mexico explaining that the practice that he observed was leachate collection in pools where evaporation can happen and recirculation spraying it in the landfill.

The equipment used for this purpose in this landfill is a tank truck with a capacity of 10,000 liters, which pumps the leachate from leachate wells and pools. The truck transports the leachate and empties the leachate on the landfill. Nonetheless, it was deemed necessary to change the leachate management system for the project activity, because when the test wells for LFG extraction were established, a large amount of leachate accumulation was determined in the landfill. With this amount of leachate accumulated, the landfill gas extraction was not possible. Different studies were carried out. With the support of SCS Engineers (the landfill management company, consultant to the project engineering design), the use of a leachate evaporator was selected as the option to solve the problem. The evaporator is a stainless steel vessel with a gas-fired burner positioned in the upper portion of the vessel that is designed to fire downward into the vessel. The burner is fired with landfill gas. Leachate collected from the landfill is pumped directly into the unit near the top. The burner heats the liquid through a tube immersed in the leachate promoting low temperature evaporation of the liquid.

There is a solids/slurry that is accumulated in the vessel and must be drained periodically, typically once a week (at least). This material shall be returned to the landfill.

The baseline scenario should reasonably represent the scenario in the absence of the project activity. Since there has never been leachate evaporation in the past, and it would only be implemented with the project activity (with CDM) it was not found reasonable to consider it as a realistic baseline scenario. Therefore, a

⁴ <http://www.semarnat.gob.mx/leyesy normas/Normas%20Oficiales%20Mexicanas%20vigentes/NOM-083-SEMAR-03-20-OCT-04.pdf> (Ref.17).

⁵ <http://www.diputados.gob.mx/LeyesBiblio/pdf/263.pdf> (Ref.87)

⁶ http://www.cddhcu.gob.mx/LeyesBiblio/regley/Reg_LGPGIR.pdf (Ref.88)

⁷ http://ecologia.guanajuato.gob.mx/normatividad/leyes/ley_residuos.pdf (Ref.65)

CAR 19 was raised to request the PP to make the necessary adjustments for consistency in the PDD. In response, PP explained that no baseline CO₂ emissions were identified corresponding to heat generation (leachate evaporator). Hence, section B.4 of the PDD was modified. Alternatives H1 through H7 were excluded for further analysis after applying step 1 (Identification of alternatives to the project activity consistent with current laws and regulations). Heat generation as a baseline scenario was thus correctly eliminated from further analysis after section B.4. CAR 19 was closed out.

The project proponent may also generate a certain amount of electricity, using LFG left over after leachate evaporation. ACM0001 Ver. 10 states “For power generation, the realistic and credible alternative(s) may include, inter alia:

- P1. Power generated from landfill gas undertaken without being registered as a CDM project activity;
- P2. Existing or Construction of a new on-site or off-site fossil fuel fired cogeneration plant;
- P3. Existing or Construction of a new on-site or off-site renewable based cogeneration plant;
- P4. Existing or Construction of a new on-site or off-site fossil fuel fired captive power plant;
- P5. Existing or Construction of a new on-site or off-site renewable based captive power plant;
- P6. Existing and/or new grid-connected power plants”

With regard to scenarios P3 and P5, the PDD explains in section B.4 that although there are numerous renewable energy options, many resources such as hydro, wave, marine currents, etc. are not available at a landfill site. Furthermore, it is stated that a landfill that receives solid waste on a daily basis is not a suitable location for windmills or solar power stations, as LFG will continue to leak out, and the ground will subsidize even after landfill closure. Hence it was deemed reasonable to conclude that renewable power generation options at the site do not comprise a realistic baseline scenario. Also, regarding P2 and P4, it is explained that the PP provides solid waste management services and are not involved in power generation, so that off-site power generation is not an alternative to be considered. Hence, the only two remaining options are P1 and P6.

In sub-step 1b for determining consistency with mandatory laws and regulations, PDD states that the federal norm NOM-083-SEMARNAT-2003 /Ref.17/ (which requires combustion of LFG despite no specific amount of LFG for combustion is stipulated) is not enforced in Mexico because landfills are the responsibility of the municipalities, who have control of solid waste disposal, and because the norm has never been enforced. During an interview with representatives of the municipality of Leon, it was confirmed that indeed the federal norm NOM-083-SEMARNAT-2003 is systematically not enforced in Mexico. This is also known from auditor’s experience in other registered CDM landfill projects in the host country. Therefore both LFG1 and LFG2 would comply with local regulations.

Hence, alternatives LFG1, LFG2, P1 and P6 are the only realistic alternatives to be considered as possible alternative baselines at this point. Please refer to section 4.6.3 below where these alternatives are further analyzed.

4.6.1 Additionality

The PDD has been verified to correctly apply the “Tool for the demonstration and assessment of additionality” in its latest version 5.2, as required by the methodology. The additionality of the project activity has been demonstrated through the following steps from the Additionality Tool:

- Step 1 – Selection of alternatives to the project activity consistent with mandatory laws and regulations;
- Step 2 – Investment analysis; and
- Step 4 – Common practice analysis

Please refer to section 4.6 above for a discussion on the assessment of the selection of the baseline scenario. Also, refer to section 4.6.4 below for a discussion on the assessment of the investment analysis. Finally, refer to section 4.6.6 below for a discussion on the assessment of the common practice analysis.

Note that step 3 of the Additionality Tool for the application of a barrier analysis was initially applied in the PDD. However, as discussed in section 4.6.5 below, the PP decided to exclude this step from the PDD (Ref. 1c). This was verified in compliance with the Additionality Tool which establishes that if additionality is demonstrated in step 2, application of a barrier analysis is not necessary.

4.6.2 Prior Consideration of the Clean Development Mechanism

The project starting date mentioned in PDD section C.1.1 is 26/10/2007, which refers to the contract with SCS Engineers for engineering services related to landfill gas capture and use. According to the CDM Glossary of Terms (http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM_v04.pdf), “the start date [of a project activity] shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/operation services required for the project activity.”

Yet, since leachate evaporation involves new equipment other than for flaring and electricity generation, the project participant was requested to clarify how this starting date was still applicable for the project activity. CL 21 was raised. In response, the PP provided an invoice for the evaporator (Ref.67) identified as 3413-1491A and dated 18/06/2008. The revised PDD section C.1.1 was modified, indicating 18/06/2008 as the start date of the project activity. However, this date was not found conservative in terms of CDM consideration as the chosen date comes later than the previous. Also, the contract between SCS and PASA (dated 26/10/2007) represents a real action, regardless of the activity to be implemented in the project (flare, leachate, electricity), thus PP was requested to amend the project starting date. The starting date was correctly revised to the originally chosen date (26/10/2007) in section C.1.1 of the PDD. CL 21 was closed out.

The project timeline from the conceptualization of the project until the time it was submitted to validation is summarized in a separate document provided by the PP (Ref.16). In addition, a timeline of key milestones was elaborated (refer to Appendix A of this report) based on the verifiable evidence collected during the validation process and all events show a logic sequence, which is in line with the CDM requirements and rules.

As per the Guidance on the demonstration and assessment of prior consideration of the CDM (Annex 46 of EB 41), “project activities with a starting date on or after 02 August 2008, the project participant must inform a Host Party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status.” The project activity starting date as per section C.1.1 of PDD is 26 October 2007, which is before 02 August 2008. Therefore, in this case no notification from project participant to a host party DNA and/or the UNFCCC secretariat is necessary.

Moreover, according to the Guidelines on the Demonstration and Assessment of Prior Consideration of the CDM version 3 (EB 49 Annex 22), requirement 6:

- *“Proposed project activities with a start date before 2 August 2008, [...]”*

In this project case, the starting date indicated in section C.1.1 of PDD is 26/10/2007; hence start date is prior to 2 August 2008.

- *“...for which the start date is prior to the date of publication of the PDD for global stakeholder consultation,”*

The 1st publication of the PDD for ISHC took place on 9 Jan 2008 and the 2nd publication of PDD was on 13 Feb 2009; hence the start date is prior to the date of both publications of the PDD. Therefore, requirements 6a) and b) of the Guidelines must be applied:

- *“...are required to demonstrate that the CDM was seriously considered in the decision to implement the project activity. Such demonstration requires the following elements to be satisfied:*
(a) The project participant must indicate awareness of the CDM prior to the project activity start date, and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. Evidence to support this would include, inter alia, minutes and/or notes related to the consideration of the decision by the Board of Directors, or equivalent, of the project participant, to undertake the project as a CDM project activity”.

To this extent, a Technical Memorandum from Conestoga Rovers & Associates (Ref.18) was issued to PASA on 13 April 2006, which delivered the results of a landfill gas production assessment regarding a potential project “to generate greenhouse gas (GHG) emission reduction credits that may be sold to generate revenue.” The primary purpose of the technical memorandum was to provide an estimate of the quantities of landfill gas that may be available at the site for such a project. This evidence indicates the awareness of the CDM prior to the project activity start date and that the benefits of the CDM were a decisive factor in the decision to proceed with the project.

- *(b) The project participant must indicate, by means of reliable evidence, that continuing and real actions were taken to secure CDM status for the project in parallel with its implementation. Evidence*

to support this should include, inter alia, contracts with consultants for CDM/PDD/methodology services, Emission Reduction Purchase Agreements or other documentation related to the sale of the potential CERs (including correspondence with multilateral financial institutions or carbon funds), evidence of agreements or negotiations with a DOE for validation services, submission of a new methodology to the CDM Executive Board, publication in newspaper, interviews with DNA, earlier correspondence on the project with the DNA or the UNFCCC secretariat”.

With less than 2 years of a gap between the following documented evidences, the DOE has determined that continuing and real actions were taken to secure CDM status for the project activity:

1. An Emission Reduction Purchase Agreement between León Municipality and PASA (landfill operator and CDM project sponsor) with respect to the CER rights within the CDM was signed on 20 March 2007 (Ref.27).
2. A contract was signed on 24 October 2007 between PASA and MGM International for PDD preparation (Ref.89)
3. Also, a contract was signed on 26 October 2007 between PASA and SCS Engineers for engineering services related to landfill gas capture and use (Ref.19) (represents the start date of the project activity).
4. A Letter of Approval (LoA) from the Mexican DNA (SEMARNAT) identified as #180 / 2007 was issued on 14 December 2007 (Ref.13) for the project “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León.”
5. A contract between SGS and MGM (consultant) for CDM validation was signed on 21 December 2007.
6. In addition, a price quote for the flare was issued by John Zink to PASA on 6 February 2008 (Ref.59).
7. A request to modify the LoA was submitted to the Mexican DNA on 18 March 2009 (Ref. 51), in order to reflect the change of project participants in the PDD. An English and Spanish version (Ref. 13a – 13b) of the updated Mexican LoA was provided. The new Letter of Approval is dated March 18, 2009 and identified as #216/2009, in replacement of #180/2007 (ID of previous LoA).
8. A price quote for the leachate evaporator was issued by Ecologix Environmental Systems LLC to PASA on 29 May 2008 (Ref.60).

Hence, based on all the evidences provided and verified, it has been demonstrated that the proposed CDM project activity complies with the requirements of EB41, Annex 46 and that the CDM benefits were considered necessary in the decision to undertake the project as CDM project activity.

4.6.3 Identification of alternatives

The choice of the alternatives was verified consistent with the scenarios selected in the discussion on the most likely baseline. Please refer to section 4.6 above. As explained in the mentioned section, alternatives LFG1, LFG2, P1 and P6 were identified in step 1 of the methodology as the possible baseline scenarios.

The Step 2, regarding identification of the fuel for the baseline is not applicable for scenarios LFG1 and LFG2. For power generation, there is no fuel to be selected to scenarios P1 and P6 since the baseline corresponds to the electricity generated by plants connected to the Grid.

In step 3 for assessing which of these alternatives should be excluded from further consideration, ACM0001, Ver. 10 requires that the additionality test “be applied for each component of the baseline, i.e. baseline for waste treatment, electricity generation and heat generation”. For this purpose, the possible baseline scenarios are:

- Combination of LFG1+P1. The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity.
- Combination of LFG2+P6. Current situation at the El Verde landfill.

Sub-step 2a of the Tool involves a determination of the appropriate analysis method. The following options are given:

- I. Simple cost analysis
- II. Investment comparison analysis, or
- III. Benchmark analysis

For the combination LFG1+P1, as noted in the PDD, there are substantial investments as well as revenues from the electricity sales. Then, through a benchmark analysis (see section 4.6.4 below), it is demonstrated that scenarios LFG1 (capture of LFG and flaring and/or its use) and P1 (electricity generation from LFG)

would not be economically feasible, and hence are eliminated as possible baseline scenarios. The remaining and identified baseline scenarios are then LFG2 (for LFG treatment) and P6 (for power generation), which coincide with the actual situation before project implementation as stated in PDD section A.2. It was also confirmed that both scenarios LFG2 and P6 would abide by the same applicable norm NOM-083-SEMARNAT (Ref.17), as discussed in Section 4.6.

4.6.4 Investment analysis

The validation of the financial analysis was based on the Guidance for investment analysis published by CDM EB and on the “Tool for the demonstration and assessment of additionality” version 5.2. To assess the benchmark and sensitivity analysis of the project activity SGS verified the Financial Spreadsheet provided (Ref.11), which is linked to the Emission Reductions Calculation Spreadsheet (Ref.10). All inputs used in the project financial analysis have been analysed as indicated in the Guidance for investment analysis and Tool of additionality requirements.

1. Period of assessment (23 years) and lifetime of equipments

According to the Additionality Tool, a financial analysis of the proposed project activity without the revenues of CDM must be done in Step 2. However, initially an investment analysis was carried out for each of the identified alternatives to the project activity. In addition, a simple cost analysis was chosen in PDD while the project counts with revenues (electricity generation). CAR 20 was raised. The PDD was revised, and was found to be in accordance with the Tool. CAR 20 was closed out.

According to the Guidance on the Assessment of Investment Analysis (Annex 45 of EB 41), “the period of assessment should not be limited to the proposed crediting period of the CDM project activity.” The guidance further states that “both project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime) (...)”. It was verified in the economic analysis spreadsheet of the project that the economic assessment covered the period from 2007 to 2019 (13 years), which did not correspond to the technical lifetime of the project as mentioned in section C.1.2 of PDD. Thus, CL 22 was raised to request clarification regarding this period of assessment.

As verified in the revised economic analysis (Ref.11b) the period of assessment was changed to 2009-2032 (23 years). This period reflects the operation lifetime expected for the project activity, in line with EB 39 – Annex 35. Section C.1.2 of PDD also indicates 23 years as the period expected for the project lifetime. The operation lifetime of 23 years also assures that the system will be operating until after the end of the (3 x 7 year) crediting period. So information provided was found consistent.

Yet in order to assess reliability of information, the following was verified:

- I. Landfill Lifetime: as per EIA provided by PP, the useful lifetime of the landfill is expected to be 17 years, based on the area available (11,094,224.13 m³) and projection of waste to be disposed in the landfill (Ref.28), calculated as per Norm ECOL-084-94. It was noted that the waste disposal projected by the EIA is higher than the projection made by PP on ER Calculations (Ref.10). Based on this information and considering landfill gas collection starting on 2010 (Ref.10), there would be still landfill gas available to be used for the project activity by 2032, when project activity is assumed to end. The PDD states that the operational lifetime of the landfill may be extended beyond 2017 in case there is still space available for waste disposal, what can depend on real waste disposal type and quantity, density and compacting during crediting period, among others factors. Since it was verified that the Environmental Impact Report (Ref.28) is an external and official data source specific for the landfill, the assumption of end of landfill life to be 2017 was considered appropriate. Nevertheless, in order to evaluate the additionality of the project in the scenario where the operational lifetime of the landfill extends beyond 2017, a simulation was elaborated by the PP in a separate economic spreadsheet (Ref.93) and ER spreadsheet (Ref.94). The hypothetical scenario considers the same waste reception rate (2.7%) for all years until 2032 (date when project lifetime ends), and additional investments of 0.8 MW electricity generation units according to the LFG available yearly. This scenario shows that even if the lifetime of the landfill is extended until 2032, the NPV would remain negative (\$ -5,465,642). This result is even less encouraging than the NPV calculated for the project activity (\$ -4,779,661). In addition to this analysis, the additional investments in electricity units were removed from the calculations by the assessor in order to evaluate what impact would these have on the NPV, and the result remains negative (\$ -2,218,419). Therefore, the extension of the landfill lifetime to 2032 was not found to affect the additionality of the project.
- II. Main equipment lifetime (Evaporator, Flare, Electricity generators): No references, data sources or documentation was initially provided to support that equipments would be functioning until end of crediting

period. For electricity generation and flare station, it was stated in the revised PDD (Ref.1) that equipment would be replaced at the end of each 10-year period; data sources were requested. This was deemed necessary since if costs were being considered for equipment exchange in financial analysis and this would not be necessary, it would not be conservative either. Also, regarding the LFG evaporator, even though (conservatively) leachate evaporator costs are not included in the financial analysis of the project, PP was requested to provide evidence on estimated lifetime of evaporator for the purpose of assessing operational lifetime of the project activity.

In response the PP provided the document "Letters Venting Wells and Special Equipment Service Life-smh edit.pdf" (Ref.78), which states that SCS Engineers, an engineering company with experience in landfill and landfill gas (LFG) engineering and consulting since 1970, estimates the lifetime of the enclosed flare to be from 15 to 20 years and of the electricity generator as 20 years. However, the lifetime chosen by the PP for these equipments was 10 years, which was not found conservative in terms of financial additionality. The PP was requested to adjust the lifetime of equipment applied in the financial analysis in order to be consistent with the information provided by SCS Engineers. Consequently the useful lifetime of electricity generators and enclosed flare was adjusted to 20 years in the revised PDD, which represents a more conservative value considering the estimates provided by SCS Engineers (Ref.78).

Regarding the leachate evaporator, the PP provided e-mail evidence from Ecologix Environmental Systems, LLC (Ref.84) which states that the lifetime of the equipment varies from 10 to 20 years. Contact info from Ecologix was also made available. As explained in CL11 below, operational lifetime of 23 years for the project has been considered appropriate considering the longest life estimates for equipments (20 years). CL 22 was closed out.

Initially the operational lifetime of the project activity could not be clearly identified in the PDD because it was stated in pg. 2 of PDD: "*Since landfill gas continues to be produced for many years afterwards, the proposed project is expected to have a useful life to December 2029*". The ER spreadsheet showed in section "PDD-FS" values for LFG to be captured within the project activity (Column U): 2009 was shown as the first year to have LFG captured and 2029 as the last year to have LFG captured (also illustrated in a graphic), totaling 21 years (same as $7 \times 3 = \text{crediting period renewable}$). On the other hand, the PDD section C.1.2 stated that the *operational lifetime* of the project was 23 years. Hence the PP was requested to clarify what the term "useful lifetime" referred to in the PDD text; and how the operation lifetime was calculated for the proposed project activity taking into account the methane collection and equipments lifetime. The PP was requested to take into account that the CDM Glossary of terms defines the operational lifetime as "*the period during which the project activity or CPA is in operation. No crediting period shall end after the end of the operational lifetime (calculated as from starting date)*". CL11 was raised. In response, the operation start date was changed in the revised PDD to start on 01/10/09 reflecting a more realistic timeframe. The revised PDD section C.1.2 (expected operational lifetime of the project activity) was verified to include the following text: "23 years from start of operation, expected in January 2010. 25 years from the start date as defined above." Explanation on the rationale used to determine the operational lifetime of project was also included in section B.5 of PDD.

It has been clearly explained that the project now considers as a conservative approach the longest life estimates provided by SCS Engineers for the equipments (20 years), applied for the flare and electricity generators. For the leachate evaporator, it was verified in the equipment supplier email provided by the PP that lifetime of the evaporator may vary between 10 and 20 years. The equipment will be replaced at the end of their useful lifetime, as needed as long as there is sufficient LFG available. The PP has considered 23 years as the project life, which would involve one or two replacements of evaporator, depending on the actual life of the evaporator. It is important to mention that the leachate evaporator has never been part of financial analysis as its scenario would only happen considering CER revenues, what is conservative when comparing the cost of leachate recirculation (common practice) against leachate evaporation. Refer to the comparison below:

Operating costs of leachate recirculation are based on:

- Fuel consumption for leachate pumping and transportation.
- Lubricant consumption.
- Preventive maintenance.
- Spare parts.
- Operator salary.
- Fixed charges (e.g. insurance).

The monthly costs of leachate recirculation (including operation and maintenance cost) is USD 905.74.

As verified in an analysis of operative costs for leachate recirculation, a monthly average of 489 m³ of leachate was recirculated in the year 2008; therefore, the cost of leachate recirculation works out to be 1.85 USD per m³ of leachate recirculated.

As shown in the attached document "*Evaporator Technical Sheet.pdf*" (Ref.97) the initial investment for leachate evaporator equipment purchase is 240,533 USD. This quantity includes the evaporator and the set-up transformer, but does not include the shipment and the engineering.

SCS Engineers was the project manager for the evaporator installation, and their fee for all of the tasks was 98,524 USD, as shown in the attached document "*Leon proposal review MBD 060308.pdf*" (Ref.98).

Thus, including equipment and engineering, the total initial investment for the evaporator is 339,057 USD.

The operation costs of the evaporator are based on:

- Expected power consumption: 24.7 kW (Ref.97).
- Weekly maintenance recommended by the engineering consultant (SCS Engineers), which is estimated based on the truck tank operative cost, hydro washer, labor work, preventive maintenance and final disposal of solids/slurry. It is estimated as 2,000 USD per month (Ref.99).
- Labor work for operating the evaporator

Since a monthly average of 1,179.36 m³ of leachate is expected to be evaporated⁸, the cost of the leachate evaporation works out to be 4.55 USD per m³ of leachate evaporated.

As explained above, the cost of leachate recirculation is 1.85 USD/m³, while the cost of leachate evaporation is 4.55 USD/m³. Additionally, the initial investment related to the leachate evaporator is 339,057 USD.

As a consequence, the installation of a leachate evaporator as part of the CDM project activity results in additional investment and higher operating costs. There are no cost savings associated with the change in the leachate management system (LMS). It is thus conservative not to consider in the investment analysis of the Landfill Gas Project the costs incurred in the leachate evaporator.

Moreover, it was verified that for:

- Electricity generators:

The economic analysis assumes two stages for electricity equipment purchase:

1) Initial purchase of three 0.8 MW Caterpillar generators with a total installed capacity of 2.4 MW in 2011 for use from Jan. 2012, which would last until Dec. 2031 (20 years).

2) Second acquisition of four 0.8 MW Caterpillar generators with a total installed capacity of 3.2 MW in 2013 for use from Jan 2014 and would last until 2033 (20 years).

Considering that the set of generators is used proportionally to landfill gas available estimated in the crediting period, it was confirmed that no equipment exchange would be necessary as explained by PP. As stated in Section C.1.2 of PDD, the project operational lifetime is 23 years and is expected to start in January 2010 and end on Dec. 2032. As the second generation of electricity equipment is expected to operate until year 2033, it is now clear that the lifetime determined avoids extra investments (equipment exchange).

- Flare:

The economic analysis considers the flare operation start date as 2010; hence a new investment would take place on 2028 taking into account lifetime of 20 years. It has additionally been confirmed that, according to landfill gas generation projection, there will be sufficient landfill gas captured to meet project activity needs by the end of the project lifetime.

Hence, CL 11 was closed out.

⁸ Assuming a treatment of 1.89 m³/h, 24 hours per day and 26 days per month (the capacity design of the evaporator is 1,89 m³/h). See evaporator technical details in Ref.96, page 5.

Since the cash flows were changing signs frequently, the use of simple IRR formula would not yield correct result. Hence the PP was requested to use NPV as the financial indicator. Also, NPV calculated did not include cash flows for all the years. The PP was requested to correct it to include cash flows for 23 years (Cell D to AB). CAR 45 was raised. The economic analysis spreadsheet was revised to use the NPV as the financial indicator (Ref.11c). NPV calculation now considers the cash flows for all 23 years (cell D to AB). The financial Indicator has been corrected. The cash flows have been taken for the technical lifetime of the project. Hence, CAR 45 was closed out.

2. Revenues from electricity generation

The revenues are calculated based on the power capacity to be used (MW), equipment working hours, the electricity produced (MWh), and the energy price (USD/KWh). The calculation was found to be correctly applied and inputs have been validated as follows:

2.1. Power Capacity to be used (MW)

The capacity to be installed by the project activity varies in a factor 0.8MW, from 2.4MW to 5.6MW, as discussed in Section 4.3.

As verified in the ER Spreadsheet, sheet "FOD Total", the electricity generation potential (Row 41) was obtained based on the landfill gas projections and equipment specification (LFG needed to generate a certain amount of electricity), which is higher than the capacity to be installed by the project activity (Row 44). The capacity used for ERs calculation (Row 43) is then equal to the lower value (potential vs installed capacity). The calculation was found appropriate since it takes into account the equipment needs of LFG, and the LFG estimated available for each year. The PP has stated that the real investment in the electricity generation equipments will only be made when confirming the real availability of landfill gas captured. This is reasonable since, as observed in several CDM landfill verifications, it is well known in this sector that the amount of landfill gas generated after landfill project implementation depends on several factors that are not all under control during validation stage, and can only be estimated as close as possible of future scenario. Since the exactly equipment to be installed in the project activity has not been yet defined (estimated using CAT specifications of LFG needs: 509m³/h), and considering that the capacity used for the project (installed vs potential) can affect project costs and revenues, in order to validate the use of the maximum electricity potential, the following analysis below has been conducted: values of power generator potential based on the estimated landfill gas projection (ER Spreadsheet, in "FOD Total", Row 41) were applied into the financial analysis spreadsheet (Row 24 of "Elec gen no CER"), where previously it was assuming values of the possible capacity to be used (ER Spreadsheet, in "FOD Total", Row 43). Doing this test analysis, it was verified that NPV remains negative and, even with very higher capacities applied yearly in the financial analysis, the revenues generated from these equipments with such capacity are not sufficient to turn the project financially attractive. Considering that lower costs are conservative in terms of additionality, the implementation of a higher capacity (equivalent to the electricity potential) would not result in a higher NPV.

2.2 Equipment working hours (8000h/year)

Value applied in the financial analysis complies with the working hours of generators used in ER Spreadsheet (Ref. 10; Cell H9) to estimate the electricity generation potential (Ref. 10; Row 47). Data source provided was verified, which refers to an electricity generator using LFG (File "Waukesha enginator WPS 2"; Ref.77; section features and benefits, page 1). According to the document, Landfill gas engines are typically designed to operate 24/7 (8760 hours/year), however PP assumed a conservative value of 8,000 hours of operation per year in order to consider maintenance and eventual operational problems.

2.3. Electricity produced (MWh)

Presented in Row 25 of financial analysis spreadsheet (Ref.11), it is calculated based on validated data above (capacity and working hours).

2.4. Energy Price (0.0538 USD/kWh)

In a normal scenario, it would be unrealistic to assume that there would be no increase in the electricity tariff rate in coming years. The PP was requested to explain why no annual price escalation was considered in the tariff rate of electricity. CAR 43 was raised.

In response, the PP informed that based on an expert reviewing Mexican laws on the sale of independently generated power, a correction was needed in the electricity tariff value. Input values for calculation of

electricity tariff 0.0538 USD/kWh in file CFE price summary 2006-2008.xls (Ref.70) were confirmed in <http://www.cfe.gob.mx/aplicaciones/otros/costostotales/consultaarchivoprojectado.aspx>, official website of the National Electricity Commission (CFE).

Assumption that independent generators can use the power for their own use (Own Supply Scheme) or sell it to the National Electricity Commission (CFE) was confirmed in "Ref.73 - Law of Renewable Energy & Financing of energetic transition.pdf" and "Ref.71 - El Verde Regulatory Framework Analysis.pdf" which was prepared by Eng. Jorge Plauchú. Also, assumption of 10% discount on tariff used in calculations was verified in file "Ref.72 - Methodology for calculating short term total cost of electricity.pdf."

An overview of the calculations was made available in the spreadsheet "Ref.70 - CFE price summary 2006-2008.xls," which were found correct by the financial expert. In addition, it was verified that tariff was increased annually based on inflation (validated in item "Inflation" below), comparing to the initial version of the PDD. The Inflation rate has been verified and factored in the electricity price.

However, after comparing the electricity prices for year 2007 and 2008, it was observed that there is large variation in annual average electricity prices. Hence, it was requested that more transparency should be brought into the appropriateness of the escalation rate for electricity price. It should be demonstrated by means of evidences for historical prices that the long term escalation rate applicable on electricity prices will not be higher than the long term inflation rate in the region. If it was otherwise then the escalation rate should be corrected to reflect the actual scenario.

As a response, the PP explained that past trends are not an indication of future prices, since (a) private power generation was introduced in recent years prior to which there was no possibility of generating and selling to the grid; (b) according to recently introduced rules which determine prices paid to private power generators, the price depends on the marginal cost of the public power utility CFE. The marginal cost depends on petroleum prices. As is common knowledge, petroleum prices surged during 2008 before collapsing. Year end prices in 2007 and 2008 were virtually identical; (c) for the node to which the proposed project would be connected, electricity prices are available from 2006 to 2009, so a longer time series is not available. More recent data was found to extend the time series into 2009 and also one more data point for September 2005. It is clear that the September 2005 price was in fact higher than the averages for 2006 and 2007 and only slightly lower than the average for 2008 (with its petroleum price spike). Moreover, 2009 prices are *considerably* lower (i.e. 48% lower than the average price in 2008).

The PP has conducted the sensitivity analysis to +/-20% with respect to the base case. Moreover, recognizing that electricity sales price is a sensitive parameter, the PP has extended the analysis to consider what increase in electricity price would be needed for the project to have zero NPV. The answer, shown in *El_Verde_Economic_Analysis_4Nov09.xls*, sheet "elec gen no CERs", cell J67, is 43.3%, meaning that even if electricity selling prices were 43.3% higher over the entire crediting period, the NPV would only increase to zero. As explained by PP, there is no basis for predicting that future prices would exceed inflation rate (which is the base case assumption) by such a margin that it would be equivalent to an electricity price increase of 43.3% over the entire period. Early years weigh more in NPV estimation, and these prices are likely to be better determined, so that an average increase of 43.3% over the entire period means astronomical increases, beyond inflation, in the distant future. Hence the sensitivity analysis indicates that the proposed project activity is not financially attractive under any reasonable assumptions on the future price of electricity.

Recent inclusion of private companies in energy sector in the country was verified at http://www.cec.org/files/pdf/Breceda-e_EN.PDF & http://www.cec.org/files/pdf/ECONOMY/mbinvest_es.pdf. It was observed that the late participation of private companies was mostly due to negative experiences in other prior privatization actions. It was also verified in media publications that the variances to petroleum prices observed in 2008 had a direct effect into energy prices, having reached in this same year the highest price in the country history what has directly affected energy prices in Mexico (<http://www.jornada.unam.mx/2008/03/11/index.php?section=economia&article=023n1eco>). Information on energy prices (of the node to which the proposed project would be connected, "Nodo Occidental" Nodo#33) was verified from 2006-2009 and variances pointed by the PP were confirmed. Based on the information provided and verified it can be concluded that the past trends are not a reasonable indicator of future prices.

Due to the fact that the electricity tariff is a sensitive parameter (linked to petroleum price, increase in other types of energy, investments in private sector, etc), it has been correctly included in sensitivity analysis as per EB41 Annex 45 (17). In the financial analysis spreadsheet it also verified that even if electricity selling prices were 43.3% higher over the entire crediting period, the NPV would only increase to zero. The variance in the electricity price analysed in the sensitivity analysis is found appropriate for the project case to cover eventual changes in host country as previously discussed.

CAR 43 was closed out.

3. Inflation (4.54%)

The inflation rate considered in the financial analysis (Ref.11; Cell B59) has been determined from consumer price index data published by the Mexican central bank (official source) in: <http://www.banxico.org.mx/polmoneinflacion/estadisticas/indicesPrecios/indicesPreciosConsumidor.html>. The calculations are shown in file "Inflation.xls" (Ref.75) sheet "CPI_gen_ann", SP1 January 2002 =98.2 (cell D6); SP1 January 2009 =134.0 (cell D13); Inflation = $(134.0/98.2)^{(1/7)}$, which were crosschecked and confirmed with the published data. The resulting value 4.54% has been applied correctly in project investments, costs and electricity tariff, in financial analysis spreadsheet (Ref.11).

4. Contingency (15%),_levelized top ends (175,000 USD) and levelized major overhauls (108,000 USD)

PP was requested to provide evidence for the contingency (15%) taken for mechanical equipment and electrical equipment installation, as well as for levelized top ends and levelized major overhauls. CAR 42 was raised. Contingency value of 15% for mechanical equipment (USD 74,250) and electrical equipment installation (USD 95,100) was confirmed in the cost estimation file provided by SCS Engineers "SCS PASA Cost Estimate report 29feb08.pdf" (Ref.56). The values for levelized top ends (USD 175,000) and levelized major overhauls (USD 108,000) were also confirmed in the mentioned file. CAR 42 was closed out.

5. Corporate Tax Rate (28%) and employee profit sharing (10%)

The PP was requested to provide evidence for the depreciation rate and type (WDV/SLM) applicable for corporate tax calculation. In addition, as it is a general accounting practice to deduct the carried forward losses of previous years from the present profit to calculate tax, the PP was requested to explain why losses were not carried forward in the tax calculation. CAR 44 was raised. In response, the PP explained that the straight line method has been applied. Also, losses have now been carried forward; additional rows were added in the spreadsheet. The PP explained that the depreciation calculation had errors since it did not consider all the investments. It has now been corrected with additional rows added in the spreadsheet. It was noted that the corporate tax rate is in fact 28%, according to the tax law "Ley de Impuesto sobre la renta" (Ref.74), most recent update 4/06/09 (article 10). An additional 10% is employee profit sharing, and this is based on 1) the Mexican Constitution, section A, Article 123, "fraction" IX, referring to general principles for workers' rights; and 2) Resolution of the Fourth National Commission on Employee Profit Sharing, published in the Official Bulletin (Diario Oficial de la Federación) on 26/12/1996; this latter document specifies the percentage to be shared. The spreadsheet has been modified, adding rows. Also, inflation has been included in all expenses and revenues (see validation of "Inflation" above). Carry forward losses have been included in the tax calculation (Row 46, elec gen no CERs). However, only the previous year's losses were carried forward to next year. PP was requested to correct it to carry forward cumulative losses of all the previous years to next year. The carried forward losses were corrected to include losses for all the years and found to be appropriate. CAR 44 was closed out.

6. Benchmark or Discount Rate (10.6%) and risk premium

According to the Additionality Tool, discount rates and benchmarks can be derived from "government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data." It was verified that the benchmark determined for the project activity is based on Mexican government bonds. The benchmark/discount rate used was 10.6%, which according to the PDD, was the commercial interest rate for fixed rate loan for November 2007 as per data published by Central Bank of Mexico. The PP was requested to provide documentary evidence for the applicable interest rate for small amount of loans for medium or small size companies. The PP was also requested to provide documentary evidence for the applicable risk premium on the technology. CAR 40 was raised.

In response, the PP provided the file "Mexican interest rates 2007.xls" (Ref.82) which shows that the commercial interest for fixed rate loans was 10.6% for November 2007. For the purpose of double-checking, the website

<http://www.banxico.org.mx/sistema financiero/estadisticas/MercadoDineroValores/tasasInteres.html> was assessed and data was generated into an Excel file (Ref.83) confirming the interest rate of 10.6% for the month of November 2007. The PP also explained that there was no documentary evidence available for the applicable risk premium, and thus the value has been deleted and removed from the analysis. The discount

factor is now verified with the supporting evidence and was found appropriate by the financial expert. Hence CAR 40 was closed out.

7. Project Investments & costs

The PP was requested to provide the rationale and break-up of the annual landfill investment cost and the rationale and break-up of the landfill investment cost added after the 10th year. CAR 41 was raised.

Input values used for estimation of annual landfill investment cost were confirmed in SCS Cost Estimate Report (Ref.56). In fact, the Landfill Gas Field, Flare and Electricity Investments are separately shown in the financial analysis, rows 11, 12 and 13 respectively, and was verified in the Economic analysis, in “Flare Station Investments” and “Power plant investment SCS”, that all investments and cost values have been used as per SCS PASA Cost Estimate report (Ref.56). Since SCS report uses as reference a capacity of 2.4MW and filed costs are linked to waste deposited, the PP has used costs values of SCS report to calculate proportionally the costs for the project case, which was verified and found correct. Low range and high range totals were confirmed in the file. The arithmetic mean was used and is acceptable because a rationale business decision can only be taken after accounting both the best case and worst case scenario. There are business uncertainties which cannot be ruled out while making an investment decision. Moreover, these uncertainties are also covered in the sensitivity analysis. It should be taken care that sensitivity analysis includes the variation of parameters up to the worst case and best case scenario. The variation of total investment may vary up to 19.45% as per the data given. The sensitivity analysis for the input variables has been performed up to 20% variation. Hence it was found appropriate. In addition, the PP now applies the highest lifetime values possible; 20 years for both enclosed flare and electricity generator, which was deemed conservative, and the replacement cost were added after completion of the lifetime of the equipments consistently (See also CL 22 above). The same has been corrected in the calculation sheet as well. The replacement cost has been added at the end of the 20th year by factoring in the inflation to the present cost. This was found to be acceptable as the inflation is also factored in the price of electricity. Hence, CAR 41 was closed out.

7.1. Operation costs of the landfill gas capture and flaring (10%)

This represents the estimated operation costs of the landfill gas capture and flaring components. It has been confirmed in the SCS Cost estimate report (Ref.56), and refers to 10% of the landfill gas investment (average of low and high ranges).

7.2. Operation and Maintenance Costs Electricity generation

Is linked to the generation of electricity, expressed in Row 92, 93 in “Power plant investment SCS”. The value of 19,200 MWh (Row 92 = ER Spreadsheet, in “FOD Total”, Row =O47) represents the generation from 3 units of electricity generator. As SCS costs are also estimated costs for 3 units (Ref.56), the value of 19,200 is correctly used to estimate costs per MWh (Total cost / MWh/year) = 33.78 US\$/MWh. Yearly O&M is then calculated (Row 17 of “Elec gen no CER”) based on energy produced (Row 25), and is found consistent with SCS Report (Ref.56).

Investments and O&M costs were found appropriate to be considered as part of the sensitivity analysis. It was verified that project under this scenario (variance of 20% higher & lower) without CDM still an unattractive option (NPV negative). Refer to 2.4 Energy Price” above for sensitivity analysis applied for these parameters. To observe the results for the sensitivity analysis, the parameters variances are applied in Cells B15, B21 and B26. For example, If the variance in NPV to be evaluated is a increase of 20% in total investment, the value in Cell B15 is changed to 1.20 manually and results are observed in Cell E62 (NPV). The results observed for each variance are copied in the sensitivity analysis shown in rows 67, 71 and 75, and were confirmed to be correct.

All information and assumptions in the investment analysis have been supported by references and documentation, which were included transparently in the financial analysis spreadsheet and verified. Financial calculations were verified correct. As shown in the above discussion, the DOE has determined that the proposed CDM project activity is unlikely to be the most financially attractive.

4.6.5 Barrier analysis

Initially it was not possible to confirm the investment barriers mentioned in section B.5 of PDD (Ref.1b), as no reference was provided (i.e. on the low tipping fees mentioned). Therefore, CL 23 was raised to request evidence of these assumptions. As a result, the barrier analysis (step 3) was excluded from the PDD (Ref. 1c). This complies with the Additionality Tool, which establishes that if additionality is demonstrated in step 2, application of a barrier analysis is not necessary. Hence, Step 3 (Barrier Analysis) of the Additionality Tool is no longer applied in the PDD, which is appropriate. CL 23 was closed out.

4.6.6 Common practice analysis

Through an interview conducted with the Leon municipality, it was confirmed that no landfills that are not CDM project activities are currently flaring biogas in Mexico, except for a landfill gas to energy project in Monterrey, Nuevo Leon funded with subsidies from the Global Environment Facility, as stated in the PDD section B.5. Furthermore, it was confirmed during the interview with the municipality that the norm NOM-083-SEMARNAT /Ref.17/ (which requires LFG burning despite not specifying an amount) is systematically not enforced in Mexico, as is also generally known for other CDM landfill projects in Mexico. Hence, it is confirmed that the project activity is not common practice in the host country.

4.7 Application of Baseline Methodology and Calculation of Emission Factors

4.7.1 Baseline emissions

According to the methodology ACM0001 v.9.1 the formula for calculating baseline emissions is the following;

$$BE_y = (MDProject,y - MDBL,y) \cdot GWPC_{CH_4} + ELLFG,y \cdot CE_{Felec,BL,y} + ETLFG,y \cdot CE_{Fther,BL,y}$$

As stated in the PDD, thermal energy would not be delivered from combustion of fossil fuels in the absence of the project activity, since leachate would not be evaporated in the baseline scenario. Hence, $ETLFG,y$ and $CE_{Fther,BL,y}$ equal zero. Therefore, the equation can be reduced to:

$$BE_y = (MDProject,y - MDBL,y) \cdot GWPC_{CH_4} + ELLFG,y \cdot CE_{Felec,BL,y}$$

The components of the equation were verified in the PDD as follows:

MDproject,y

$$MDProject,y = BE_{CH_4,SWDS,y} / GWPC_{CH_4}$$

$$BE_{CH_4,SWDS,y} = \Phi \cdot (1-f) \cdot GWP_{CH_4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^y \sum_j W_{j,x} \cdot DOC_j \cdot e^{-k_j(y-x)} \cdot (1-e^{-k_j})$$

Φ = Model correction factor to account for model uncertainties. Value of 0.9 is applied, as required by the Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site.

f = Fraction of methane captured at the SWDS and flared, combusted or used in another manner. The tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site estimates methane generation adjusted for, using adjustment factor (f) any landfill gas in the baseline that would have been captured and destroyed to comply with relevant regulations or contractual requirements, or to address safety and odor concerns. As this is already accounted for in equation 2, " f " in the tool shall be assigned a value 0.

GWPC_{CH₄} = Global Warming Potential value for methane for the first commitment period is 21 tCO₂e/tCH₄ (please see also section B.6 for ex-ante data).

OX = Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste). According to the tool to determine methane emissions, a value of 0.1 should be used for managed SWDS that are covered with oxidizing material such as oil or compost; for other types of SWDS, 0 should be used. OX used is 0.0; soil is not covered with oxidizing material as verified in EIA (Ref. 33).

F = Fraction of methane in the SWDS gas (volume fraction). A default value of 0.5 is applied by the project (verified), as recommended by IPCC.

DOC_f = Fraction of degradable organic carbon (DOC) that can decompose. Value applied is 0.5 as per IPCC 2006 Guidelines (verified).

MCF = Methane correction factor. This accounts for the fact that unmanaged SWDS produce less methane from a given amount of waste than managed SWDS, this is because a larger fraction of waste decomposes

aerobically in the top layers of unmanaged SWDS. As per IPCC Guidelines, 1.0 should be applied for anaerobic managed SWDS; 0.5 for semi-aerobic managed SWDS; 0.8 for unmanaged SWDS, deep and/or with high water table; and 0.4 for unmanaged-shallow SWDS. MCF used for the project is 1.0, this has been verified as being correct according to the EIA (Ref. 33).

W_{j,x} = Amount of organic waste type j prevented from disposal in the SWDS in the years x (tons).

1. Historical data of waste disposed in the landfill (2001-2008) as reported in ER spreadsheet (Sheet "Waste", cells C8 to C15) has been validated against the summary of waste records (Ref.61) available from 2001-2008, which were also cross-checked against the original records available onsite (Ref.50). Please refer to CAR07 and CAR08 in section 4.3 above for further details.
2. Estimated data of waste to be disposed (2009-2017) as reported in ER spreadsheet (Sheet "Waste", C16 to C24) was calculated based on recent population growth rate of the city of Leon (Ref.62 & Ref.63). Please refer to CL09 in section 4.3 above.

DOC_j = Fraction of degradable organic carbon (by weight) in the waste type j, categorized as per the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site". Values were verified to be used on a wet basis. Waste composition was measured and reported in a study prepared for PASA by "RH Auditoria y Gestion Ambiental" (Ref.45). The categories are shown in original (Spanish), their English translation, and values in section DOC_j of table 3.1 of PDD. Input values were verified as being correct in accordance with the original data (Ref.45). Given that there are many more categories in the study than in the tool, waste composition is converted to the categories of the tool through an intermediate result, as outlined in table 3.1 of PDD. Categorization of waste types has been verified by the assessment team as being correct and inline with the tool. The calculations and values were also verified by the assessment team and were found to be correct.

K_j = Decay rate for the waste type j. IPCC values used from the wet, boreal and temperate range. Correct as verified in the landfill EIA (Ref. 33) that the climate is temperate with a mean annual temperature of 19.2°C and a mean annual precipitation of 697 mm.

BECH₄,SWDS,y calculation and MDProject,y calculation based on BECH₄,SWDS,y values was verified correct in the PDD and ER spreadsheet.

MDBL,y = As MD_{BL,y} was verified to not be given/defined in local regulation and/or contract and no historic data exists for LFG captured and destroyed, as per methodology applied, MDBL,y is defined as MDproject,y * AF.

MDproject,y = See calculation above (MDproject,y = BECH₄,SWDS,y/GWPCH₄)

Adjustment Factor (AF): $AF = (C_{BL} / C_{PR})$

Step 1 Baseline destruction efficiency (C_{BL})

C_{BL} = MD_{Hist} / MG_{Hist}

Step 1(a) was verified to be not applicable to project activity since there is no "*system for collection and destruction of methane prior to implementation of the project activity...*". Also, Step 1(c) was verified not applicable to project activity since no "*specific percentage of the 'generated' amount of methane to be collected and destroyed is specified in the contract or mandated by regulations...*". Therefore, the PP applies Step 1 (b) of the methodology. A procedure for estimating the amount of landfill gas that would be captured in absence of the project activity used to estimate the MD_{Hist} has been described in the PDD.

MD_{Hist} = In order to estimate the amount of landfill gas that would be captured in absence of the project activity (to estimate MD_{Hist}), the following information was considered and verified:

Passive gas wells present in the landfill but no flaring / combustion historically conducted.

Interviews were conducted with landfill personnel not related to the project activity and it was confirmed that no flaring / combustion has been carried out in the landfill. In this case MD_{Hist} would be zero, and Baseline Destruction Efficiency would result zero. However, in order to be conservative the PP opted to calculate an Adjustment Factor (6%) based on assumptions which could not be validated. CL24 was raised (see F.O. in Annex 3 for details). In the absence of further evidences, the PP decided to adjust the AF to zero in PDD (Ref.1d) and ER spreadsheet (Ref.10c), which is correct considering the project case (no flaring / combustion has been carried out in the landfill) The followig was used to support the Adjustment Factor as 0%:

- Municipality statement (Ref.80) dated 20/08/2009 confirms that one person working for the municipality who is responsible to observe the activities in the landfill since 2001 has not witnessed any combustion of LFG in the existing LFG venting well system;

- SCS states that has been performing projects for PASA since 2007, and since early 2007 to the present has not witnessed any combustion of LFG in the existing LFG venting well system (Ref.78);
- SCS statement (Ref.78) confirms that the current construction of the LFG venting wells is not appropriate to perform passive combustion of the LFG since the main conduit is constituted of polyvinyl chloride (PVC) plastic pipe, which is widely known as a combustible material. This was confirmed in the landfill EIA document, Annex 15 (Ref.25), which provides a diagram of the gas wells, specifying that these are tubes made of PVC material. Photos available from site visit also indicate the same. The low heat distortion temperature (softening temperature) compared with other plastics of the similar molecular structure was confirmed in the official website of PVC products (<http://www.pvc.org/What-is-PVC/PVC-s-physical-properties/Heat-Distortion-Temperature-softening-temperature>).
- During the site visit there was no sign of combustion in the wells observed in the landfill.

With the evidence provided it was possible to confirm that no LFG burning could have taken place in the venting wells installed historically, hence AF=0 is found applicable to the project activity. As a result it was verified that the estimated emission reductions increased, which was expected. CL24 was closed out.

Project destruction efficiency (ϵ_{PR})

According to the methodology, the calculation of the destruction efficiency of the system in the project activity (step 2 for estimating the AF) can be calculated using two options; one if applying an ex-ante estimation of the AF, and another if calculating the AF ex-post. As verified in the PDD, neither of these options was chosen. CAR 25 was raised. A revised PDD was provided, however option 1 was not correctly applied. The PDD stated: "We do not have measurements of the methane destroyed by the project activity, since it is not yet operational. Therefore we cannot apply Eq. (4)." The PP explained that the methodology indicates the formula to *estimate* the destruction efficiency of the system used in the project activity and that it was not expected from the PP to have such values measured. However, as confirmed in CL 24, the Adjustment Factor of the project is 0% as no LFG burning could have taken place in the baseline scenario. Hence, equation (4) for estimating the destruction efficiency is not applicable and has no longer been used. CAR 25 was closed out.

Also a CL18 had been raised regarding chimneys available per hectares. Since Adjustment Factor of the project is now 0%, this is no longer applicable. CL18 was closed out. See Annex 3 (Findings Overview) for details.

GWpch4: Global Warming Potential value for methane for the first commitment period is 21 tCO₂e/tCH₄ (please see also section B.6 for ex-ante data).

ELLFG,y: Net amount of electricity generated using LFG. Ex-ante estimation for the first 7-year crediting period as per ER spreadsheet (Ref. 10b): 108,000 MWh.

CEFelec,BL,y = EFgrid,CM,y:

$$EF_{grid,CM,y} = EF_{grid,OM,y} \times W_{OM} + EF_{grid,BM,y} \times W_{BM}$$

As stated in section B.1 of PDD, the "Tool to calculate the emission factor for an electricity system" used for the project activity is version 1. However version 1.1 was available at UNFCCC website. CAR 26 was raised. Version 1.1 of the Tool to calculate the emission factor for an electricity system has been applied for the project activity in the revised PDD (Ref. 1c). CAR 26 was closed out.

Operating margin CO₂ emission factor (EF_{grid,OM,y}):

The PDD states in Annex 3 that "according to the tool, the Dispatch Data Analysis method should be the choice considered, but this method cannot be used for this project activity (...)". It was not clear which tool the PDD referred to. CL 27 was raised. The "Tool to calculate the emission factor for an electricity system" was named in the revised PDD. However the PP was requested to clarify why PDD stated that "the Dispatch Data Analysis method should be the choice considered." The PDD was revised and sentence referring to Dispatch Data Analysis was deleted. CL 27 was closed out.

According to the Tool to calculate the emission factor for an electricity system, the simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term normal's for hydroelectricity production. As verified in the PDD, the simple OM method was chosen (option A), based on choice 1. However, the calculation was based on years from 2002 to 2006. CAR 28 was raised as it was verified that there was more recent data available in the Mexican Secretary of Energy website (www.sener.gob.mx), by the time when the PDD was made public for ISHC (Feb 2009). PDD was updated and demonstration that low-cost/must-run

resources constitute less than 50% of total grid generation is now based on the average of years 2003-2007. CAR 28 was closed out.

For the calculation of the OM Emission Factor, the Tool provides two options: the ex-ante option (based on a 3-year generation-weighted average of the most recent data available) and the ex-post option. PDD stated that the ex-ante option was selected. As verified, Calculation of Mexican grid Emission Factor (Ref.20) took into account years 2004, 2005 and 2006. CAR 29 was raised as it was verified that there was more recent data available in the Mexican Secretary of Energy website (www.sener.gob.mx), by the time when the PDD was made public for ISHC (Feb 2009). The calculation of the Operating Margin EF was verified in the revised PDD (Ref. 1c), Annex 3, which was updated with data from years 2003 to 2007, the most recent official data available. CAR 29 was closed out.

According to the tool, option A for the Simple OM calculation should be preferred and must be used if fuel consumption data is available for each power plant / unit. It was verified in the PDD that Option C was chosen with no further justification provided. Therefore, CL 30 was raised. The PDD was revised to apply option A for calculating the OM emission factor, in accordance with the tool guidance. CL 30 was closed out.

The calculation of the Operating Margin EF was verified correct in /Ref.68c/ (sheet Operating Margin, row 21) in accordance to the Tool for calculating the emission factor for an electricity system.

Verified value: 0.6398 tCO₂/MWh.

Build margin CO₂ emission factor (EF_{grid,BM,y}):

As indicated by the Tool for calculating the emission factor for an electricity system, step 4 for identifying the sample of power units to calculate the build margin states that the sample should be made from the most recently built power units in the system. Table 3.10 of PDD made reference to table 19 of document "Electricity Sector Prospective 2007-2016", which did not show the values reported in PDD (such as power generation), and also did not show data from years 2003, 2004 and 2005 which were reported in PDD. Nevertheless, the same study equivalent to the cited document was identified in the Ministry of Energy website (www.sener.gob.mx) as a more recent source of data. PP was requested to update this data in the PDD with consideration of the observations in paragraph above. CAR 31 was raised. Calculation of the Build Margin Emission Factor in PDD (Ref.1c) and EF spreadsheet (Ref.68) was updated with the most recent data available and now uses data from years 2004, 2005, 2006 and 2007. CAR 31 was closed out.

The calculation of the Build Margin EF was verified correct in /Ref.68c/ (sheet Build Margin, cell 67) in accordance to the Tool for calculating the emission factor for an electricity system.

Verified value: 0.3853 tCO₂/MWh.

Combined margin CO₂ emission factor (EF_{grid,CM,y}):

According to the Tool for calculating the emission factor for an electricity system, the combined margin emissions factor is calculated as follows:

$$EF_{grid,CM,y} = EF_{grid,OM,y} * W_{OM} + EF_{grid,BM,y} * W_{BM}$$

For the project case, the tool indicates that the default values used for w_{OM} and w_{BM} should be 0.5 and 0.5 for the first crediting period, and $w_{OM} = 0.25$ and $w_{BM} = 0.75$ for the second and third crediting period, "unless otherwise specified in the approved methodology." The formula for calculating the combined margin EF was verified to apply correctly the default value of 0.5 for w_{OM} and w_{BM} (see /Ref.68c/, Emission Factor sheet, cell C4), which is expressed in the following way: $(EF_{grid,OM,y} + EF_{grid,BM,y}) / 2$.

Verified value: 0.516 tCO₂/MWh.

Hence, the calculation of the grid Emission Factor was verified in accordance with the Tool for calculating the emission factor for an electricity system and confirmed correct. Finally, formula used in calculation of baseline emissions was verified correct and in line with the methodology. The estimated baseline emissions are indicated as 1,254,418 tCO₂e.

4.7.2 Project emissions

The approved methodology has been correctly applied for determining project emissions. According to ACM0001, project emissions are calculated based on the emissions from consumption of electricity and emissions from consumption of heat using the following formula:

$$PE_y = PE_{EC,y} + PE_{FC,j,y}$$

As per methodology, the project emissions from electricity consumption ($PE_{EC,y}$) shall be calculated following the latest version of “Tool to calculate baseline, project and/or leakage emissions from electricity consumption”. If in the baseline a part of LFG was captured then the electricity quantity used in calculation is electricity used in project activity net of that consumed in the baseline. In this regard there are no baseline emissions for this case, since project electricity consumption is associated with landfill gas capture and flaring, and there is no active capture of LFG prior to project implementation.

As the project case involves no consumption of heat, project emissions from heat consumption are zero, and therefore $PE_y = PE_{EC,y}$.

The tool presents three different scenarios for the sources of electricity consumption, and the El Verde Landfill Project corresponds to Scenario A: Electricity consumption from the grid. According to the tool, project emissions from electricity generation are calculated as follows:

$$PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$$

$EC_{PJ,j,y}$ is the quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr). It was verified that project emissions are based on power consumption of the blower and evaporator for the first 2 years of the project starting in 2010, as electricity generation from LFG will only start in 2012. Power consumption for these equipments is calculated on the basis of:

Captured LFG for the project in m³/yr * calculated amount of 0.009975 kWh consumed by blower per m³ of LFG {which is calculated from a 25 HP per 1869 m³/h of LFG, 1100 SCFM} / 1000 {for conversion to MWh/yr} + (24.7kW needed per hour by evaporator * 8,760 working hours per yr) / 1000 {for conversion to MWh/yr}. Values used as electricity consumption capacities for the blower and evaporator have been verified in manufacturer quotes /Ref.59/ and /Ref.60/ respectively and were confirmed correct. Nevertheless, PP has recently revised PDD to consider working hour for the leachate evaporator as 7,280 h/year (no longer 8,760 h/year). PP was requested to revise cell V7 accordingly (page 40 of PDD) and to make sure all documents had addressed recent changes made to PDD and associated documents.

Also with regard to project emissions, PP was requested to clarify why energy consumed for equipment start up was not being considered in ER calculation, since it is expected that this energy will be used even in the presence of the electricity generated on site. It was also requested to clarify if any project emissions are expected with the use of leachate evaporator technology (documented evidence was requested). CL 39 was raised.

- Project Emissions

Flare start up (LPG): It was verified that according to flare manufacturer information (Ref.87, Ref.88), one LPG cylinder of 5 gallons (20 lb; Ref.87) can be used up to 196 times, and pilot is expected to turn on 12 times per year. PP has considered the most conservative approach of 196 times per year for the pilot use. Hence, project emissions for flare start up has been calculated and verified as follows in ER Spreadsheet (in “ACM0001” row 34):

$PE = \text{LPG Consumption (9.1 kg/year)} \times \text{NCV}_{\text{LPG}} (47.3 \text{ TJ/Gg}) \times EF_{\text{CO}_2 - \text{LPG}} (63.1 \text{ tCO}_2/\text{TJ}) = 27 \text{ tCO}_2$ (for all 7 crediting period years). Value was verified to be correctly applied in Section B.7.1 of revised PDD (in “ $PE_{FC,j,y}$ Project emissions from fossil fuel combustion in process j during the year y ”).

Additional sources used were verified as follows:

20 lb = 9.071847 kg	Conversion 1lb = 0.453 kg
$\text{NCV}_{\text{LPG}} = 47.3 \text{ TJ/Gg}$	47.31 TJ/10 ³ tonnes (10 ³ 10 ³ = 1 Gg) Verified in http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1wb1.pdf
$EF_{\text{CO}_2 - \text{LPG}} = 63.1 \text{ tCO}_2/\text{TJ}$	IPCC 2006, verified in http://www.ipcc-nggip.iges.or.jp/EFDB/find_ef.php

Blower (Grid electricity): As per John Zink Flare Quote (Ref. 59), blower capacity is 1100 SCFM (= 1869 m³/h), considering 0.0283 m³ per cubic foot (<http://www.ipcc.ch/ipccreports/tar/wg3/index.php?idp=477>), and 60 min/h, 1100*0.0283*60 = 1868. A 25 HP Variable Frequency Drive is used for 1 blower of 1869 m³/h capacity; Ref.59). Hence project emissions for blower use has been calculated and verified as shown in ER Spreadsheet (FOD_Total, Q8:Q11):

Electricity Consumption = $25 \text{ HP} \times 0.7457 \text{ (kW/HP)} / 1869 \text{ (m}^3\text{)} = 0.009975 \text{ kWh/m}^3$ of LFG. This is applied to quantity of landfill gas captured (Row 30 "FOD_Total"), converted to MWh and expressed in Row 49 (FOD_Total").

Evaporator (Grid electricity): As verified in evaporator quote (Ref.60), 24.70 kWh is needed per hour of use of evaporator. Hence project emissions for evaporator use has been calculated and verified as follows in ER Spreadsheet (FOD_Total): $24.70 \text{ kWh} \times 8760 \text{ h/year} / 1,000 = 216.4 \text{ MWh/year}$.

It was noticed that PP referred to "evaporator working hours" in cell V7 for project emission calculation but 7,280 in cell H10 for gas used in evaporator for ER calculation. Nevertheless it was understood that value in cell V7 reflects 100% working hours of evaporator in the year only for conservativeness purpose in project emissions calculation, even though it is expected evaporator to work around 7280 hours as per manufacture information in Evaporator quote (Ref.60), as reflected in cell H10.

It was verified that, as noted in the PDD section B.6.1, estimated electricity consumption is accounted for all years considering no use of electricity generated by project in any year. This assumes, conservatively, that all project electricity consumption is supplied from the Grid. Considering that now energy consumed = energy imported from the grid as a conservative approach according to the PP, it was verified that Row 49 now = Row 50 (FOD_Total), which is consistent with changes made by the PP.

- Any additional sources of GHG Emissions with use of leachate evaporator

As verified in Evaporator quote (Ref.60), only water vapour is released by evaporator. Document was verified to state "All models are pre-piped, wired and tested before shipment. *All models have a 10 micron pad mist eliminator to ensure only vapor is released to the atmosphere.* Multiple devices are furnished to ensure a safe efficient continuous operation". Hence it was confirmed that no additional GHG apart from CO₂ emissions associated with electricity used by evaporator is expected.

Hence CL 39 is closed out.

EF_{grid,y} is 0.5126 tCO₂e/MWh (Combined Margin) calculated using the "Tool to calculate the emission factor for an electricity system". Please refer to subsection 4.71 above. TDL is 20% given as default value in the Tool to calculate baseline, project and/or leakage emissions from electricity consumption, version 1.

The value applied for estimating project emissions is 2,108 tCO₂e. The formula used to determine project emissions is clearly indicated in the PDD and ER spreadsheet and was found in compliance with the monitoring methodology.

4.7.3 Leakage emissions

No leakage effects need to be accounted under this methodology.

4.7.4 Calculation of emission reductions

Direct calculation of emission reductions has been correctly applied in the PDD (Ref.1f) and ER spreadsheet (Ref. 10e), following the methodology formula: $ER_y = BE_y - PE_y$. The value applied for estimating emission reductions during the 1st crediting period is 1,252,310 tCO₂e.

The methodology has been applied exactly as defined. The PDD clearly states which equations are being used in calculating baseline emissions and all the required steps/calculations have been followed. Formulas for calculation of emissions and emission reductions have been correctly applied.

4.8 Application of Monitoring Methodology and Monitoring Plan

The monitoring plan provides clear and appropriate procedures for training, data collection and recording, quality control and quality assurance. The GHG indicators (parameters to be monitored) are in full compliance with the prescriptions of the methodology. The information and procedures given for each monitored parameters listed in Section B.7.1 are sufficient to ensure the verification of a proper implementation of the monitoring plan.

The following ex-ante parameters included in the PDD have been verified:

#	Parameter	Source
1	Regulatory requirements relating to landfill gas projects	Publicly available information of the host country's regulatory requirements relating to landfill gas.
2	GWP_{CH4} – Global Warming Potential of CH ₄	IPCC; 21 for the first commitment period.

3	D_{CH4} – Methane density	Standard value: 0.0007168 tCH ₄ /m ³ CH ₄
4	BECH₄, SWDS.y - Methane generation from the landfill in the absence of the project activity at year y	Calculated as per “Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site”, version 4.
5	CEFelec,BL,y = EFgrid,CM,y - CO ₂ emissions intensity of the grid connected to the project site.	Official data for power plants in the Mexican grid connected to the project site. Calculation details are provided in Annex 3.

- 1) **Regulatory requirements relating to landfill gas projects:** Used to determine the adjustment factor ex-ante. Based on the federal norm NOM-083-SEMARNAT-2003 (Ref.17), which defines the specifications for environmental protection from the selection, design, construction and operation, monitoring and closure of final disposal sites for urban and special solid waste. It provides guidance regarding LFG, including recommendations for the collection, utilisation and/or flaring of the LFG. However, the regulation does not specify minimum requirements regarding the amount of gas to be collected and utilised or flared. Moreover, as shown in the PDD and verified through interviews with the municipality, this norm is systematically not enforced in Mexico. In the absence of the proposed project, all the landfill gas will be released to the atmosphere. Therefore AF is 0% (please refer to subsection 4.7.1 above)
- 2) **GWPCH₄:** Value applied is 21 tCO₂e/tCH₄ (as specified in the methodology).
- 3) **DCH₄:** At standard temperature and pressure (0 degree Celsius and 1,013 bar) the density of methane is 0.0007168 tCH₄/m³CH₄ (as specified in the methodology).
- 4) **BECH₄, SWDS.y:** Calculated correctly, as per formula in the Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site, version 4, as verified in ER Spreadsheet (Ref.10)..
- 5) **CEFelec,BL,y = EFgrid,CM,y:** 0.5126 tCO₂e/MWh (Combined Margin) calculated using the “Tool to calculate the emission factor for an electricity system”

Initially it was noticed that the ex-ante parameters MDHist and MGHist listed in methodology were excluded in the PDD. Also, parameter CEFelec,BL,y (= EFgrid,CM,y) that was available in PDD was not enlisted as ex-ante parameter in the methodology. Hence, CL 32 was raised to request clarification to project proponent.

Regarding MDHist and MGHist: Since there are several options to estimate AF, ACM0001 states “This parameter could be used for the estimation of AF”. PP makes use of Step 1 (b), in which methodology requires calculation through MDHist/MGHist. Nevertheless, as explained in CL 24, an adjustment factor of 0% has been used for the project as no LFG burning occurred in the baseline scenario. Hence, step 1 (b) of the methodology for calculating AF through MDHist/MGHist was no longer applied. Therefore it was deemed reasonable to exclude parameters MDHist and MGHist from the Monitoring Plan. Also, in regard to parameter CEFelec,BL,y = EFgrid,CM,y, PP explained that since the value does not change for the first crediting period, it is included as an ex-ante parameter in section B.6.2. This was found acceptable and hence CL 32 was closed out.

The list of parameters to be monitored required by the selected approved methodology and applicable to the project activity was confirmed in the monitoring plan:

#	Parameter	Description
1	LFGtotal,y	Total amount of landfill gas captured at normal temperature and pressure
2	LFGflare,y	Amount of landfill gas flared at normal temperature and pressure
3	LFGthermal,y	Amount of landfill gas combusted in leachate evaporator at normal temperature and pressure
4	LFGelectricity,y	Amount of landfill gas combusted in power plant at normal temperature and pressure
5	PEflare,y	Project emissions from flaring of the residual gas stream in year y
6	wCH₄,y	Methane fraction in the landfill gas
7	T	Temperature of the landfill gas

8	P	Pressure of the landfill gas
9	ELLFG –	Net amount of electricity generated using LFG
10	Operation of the power plant	-
11	Operation of the flare station	-
12	PEEC,y	Project emissions from electricity consumption by the project activity during the year y
13	PEFC,j,y	Project emissions from fossil fuel combustion in process j during the year y

The PDD stated in section B.5 that no combustion CO₂ emissions for any fuel displaced by the thermal energy use of the LFG are being claimed for in the project activity. However, as the monitoring plan includes parameter LFGthermal,y (amount of methane combusted in boiler at Normal Temperature and Pressure) while excluding parameter ETLFG (total amount of thermal energy generated using LFG) and “operation of the boiler,” it remained unclear whether the project would claim emission reductions from the use of LFG for thermal energy.

Also, parameter name “operation of the power plant” did not comply with the methodology, and parameter “operation of the flare station” was not part of the monitoring parameters available in the methodology. Finally, parameter MGPR,y (amount of methane generated during year y of the project activity) as per methodology is not included in the monitoring plan. CL 33 was raised to request clarification from project proponent.

- 1) Regarding LFGthermal,y, the PP clarified that although the thermal energy would not be derived from the combustion of fossil fuels in the absence of the project activity (since leachate would not be evaporated in the absence of the project activity), emission reductions will be generated from the *methane destruction* in leachate evaporation process, and therefore the project will only claim emission reductions for methane destruction and hence parameter LFGthermal,y is required to account for this.
- 2) As verified in the PDD, parameters ETLFG,y and CEFther,BL are not relevant to the project activity and hence not included in the Monitoring Plan. This is because no emission reductions will be claimed from the displacement of energy but rather from the destruction of methane in the process of leachate evaporation. Therefore, the parameter LFGthermal,y remains in the Monitoring Plan in order to calculate emission reductions from methane destruction.
- 3) Regarding “operation of the power plant”, terminology was corrected in the Monitoring Plan according to methodology.
- 4) Parameter operation of the flare station was deleted from PDD, in consistency with methodology.
- 5) Parameter MGPR,y has been deleted from monitoring plan in accordance with the option chosen from the methodology.

CL 33 was closed out.

Initially it was not clear how the quantity of LFG to each component (flare, evaporator, power generator) would be monitored and controlled (i.e. if a threshold for each equipment will be established), and if it would be controlled manually or automatically. CL 35 was raised. In response it was explained that the landfill gas flow to the flare and evaporator will be controlled automatically by the vacuum blower. The PP further stated that LFG to be sent to power generators will also be controlled automatically; and that technical details would be available once the option of electricity generation is approved by the PP. This information has been included in section A.4.3 of the PDD enhancing the discussion of the technological details of the project activity. CL 35 was closed out.

The revised PDD (Ref. 1d) was verified and all monitoring parameters are now consistent with the project design. The GHG indicators are reasonable and in conformance with the requirements set by the approved methodology applied. The specified project GHG indicators have been properly listed in section B.7.1 and will allow a proper implementation of the monitoring plan.

Quality Control and Quality Assurance

The authority and responsibility of project management have been clearly described in the PDD. According to the PDD, the project proponent and CDM project investor, PASA, will be responsible for oversight on all aspects involving monitoring and quality control.

A concession contract was signed on year 2001 between the Municipality of Leon and PASA (Ref. 31). As verified, this contract concedes PASA the management and operation of El Verde landfill for a period of 15 years. Thus, concession would be expected to end in 2015. Nevertheless, a contract between PASA and the municipality concerning the sharing of CER benefits (Ref. 27) establishes that the contract is valid until 31 December 2012 or, if the Kyoto Protocol extends, until the conclusion of the Kyoto Protocol. This indicates that PASA is owner of the project throughout its entire crediting period, as long as it is valid within the framework of the Kyoto Protocol.

PASA experience in several other landfills was confirmed in the firm's website (http://www.gen.tv/pre_rsanitarios.html).

According to PDD, the management structure responsible for project monitoring is as follows: The technical Team of PASA will be responsible for the day-to-day operation of the landfill gas collection, flaring and use system. This technical team would also be responsible for monitoring key variables required for meeting CDM monitoring requirements. All data recorded would be transferred to and stored as electronic spreadsheets and other electronic files. The Landfill Gas Operators will conduct monitoring of key variables, with supervision of the Landfill Gas Project Engineer. Other staff persons will be assigned by the Landfill Gas Project Engineer to assist in the monitoring tasks, as needed.

Calibration certificates would be stored as paper copies, although scanned copies may also be stored electronically. PASA will maintain hard copies of all data collected, including calibration certificates for all instruments." The original data, the calculation procedures and the resulting emission reductions will be made available to an independent Designated Operational Entity (DOE). Thus, both electronic and hard copies of all monitoring variables will be archived onsite.

Regarding calibration and data uncertainties, section B.7.1 of PDD states that the flow meters will be subject to a regular maintenance and testing regime to ensure accuracy. Calibration of flow meters and electric meters will be conducted by independent laboratories, with the data archived by the landfill and PASA Technical Team. Calibration of flow meters will be carried out every 2 years or according to manufacturer's specifications. The gas analyzers will be calibrated every year or according to manufacture specifications. The electricity meter, the operation hour meters and additional parameters for PEflare,y will be calibrated in a frequency according to manufacture's specifications. Calibration certificates will be issued by the Calibration Laboratory, and will be filed by the PASA Technical Team.

Monitoring data will be clearly reproducible and comparable; Section B.7.2 of PDD states that all data recorded would be transferred to and stored as electronic spreadsheets and other electronic files. The electronic data would be used in a spreadsheet procedure in order to calculate emissions reductions. Also, PASA will maintain hard copies of all data collected. The original data, the calculation procedures and the resulting emission reductions will be made available to an independent Designated Operational Entity (DOE). Thus, both electronic and hard copies of all monitoring variables will be archived onsite. It was verified that the monitoring plan in section B.7 safeguards the proper operations of all data capture, data analysis and data compilation systems to be employed by the project participants. The Operational Management Structure laid out in figure 6 ensures the quality control of the data and that data provisions will be free of potential conflicts of interests.

It is stated in the PDD that PASA will count on supervision from the flare supplier for training, commissioning and start-up. Similarly, the supplier of the leachate evaporation plant would provide support for training, commissioning and start-up. It further states that if PASA decides to generate electricity using landfill gas, they will acquire either from equipment supplier and/or specialist consultant all the services needed for training related to the operation of the LFG generation system. CL 34 was raised to request verifiable evidences on the training provisions mentioned.

A quote from the flare supplier (John Zink) was provided (Ref.59), in which it is stated that "one (1) week of start-up and field training for this system" will be provided as well as "one (1) full year of the EnviroComp Report Service including MMBtu and Carbon Credit Reports". Also, the quote from the supplier of the leachate evaporator (Ecologix Environmental Systems, LLC) states: "start-up/training for four (4) days, including airfare and lodging" (Ref.60). Regarding electricity generation, PP explained that no quotation is available for power generators and will be done once the permits for generating electricity are obtained. Therefore, CL 34 was closed out.

According to the PDD, internal audits will be conducted twice a year by the PASA Technical Team. The internal auditor will prepare a report to the Manager of the landfill and the Head of PASA Technical Team on the state of items 1 to 11 (table 8 of PDD). In case of non-conformities, it is stated that PASA will aim to resolve them prior to the annual verification carried out by the DOE. A copy of this report will be filed in the Offices of PASA.

Based on the monitoring procedures and management structure established in the monitoring plan as well as the qualified personnel as observed during site visit, it is determined that the project participant is sufficiently qualified to implement the monitoring plan.

4.9 Environmental Impacts

The project activity complies with the applicable federal norm NOM-083-SEMARNAT-2003 (Ref. 17), which defines the specifications for environmental protection from the selection, design, construction and operation, monitoring and closure of the final disposal sites for urban and special solid waste.

The landfill has conducted an Environmental Impact Assessment (Manifiesto de Impacto Ambiental – Ref. 33) as part of the requirement to obtain the operation license dated 23-11-2000 (Autorización de Manifiesto de Impacto Ambiental – Ref. 52). This Authorization states that the Environmental Impact Assessment presented during the landfill conception and construction complies with the laws in force for LFG capture and use. An Environmental Impact Assessment has been approved and was provided by project proponent (Ref. 33) – Authorization MIA-026-3357/2000 of December 10th, 2000. Guanajuato State Environment Authority - Institute of Ecology (Instituto de Ecología del Gobierno del Estado de Guanajuato). This Authorization states that the Environmental Impact Assessment presented during the landfill conception and construction complies with the laws in force for LFG capture and use.

According to the PDD, LFG combustion would produce small amounts of nitrogen oxides (NO_x), particulate matter and carbon monoxide (CO). Although emissions of such gases are not regulated in Mexico, the project would use enclosed flares specially designed to reduce these emissions to minimal levels. Also during site visit, it was confirmed with the municipality of Leon that no adverse environmental effects are expected from the project activity.

As confirmed with the municipality of Leon, there are no trans-boundary environmental impacts identified for the project activity. Environmental impacts have been addressed in the project design. The project activity will use enclosed flares in order to reduce emissions of nitrogen oxides (NO_x), particulate matter and carbon monoxide (CO) that may generate from LFG combustion.

4.10 Local Stakeholder Comments

There were two local stakeholder consultations conducted for the project, as the initial project activity did not consider the use of LFG for thermal energy, and a second consultation was needed for the validation of the updated project design (version 4). This 2nd PDD considers the use of leachate evaporation to generate thermal energy. Thus, the second stakeholder meeting can be considered as the relevant stakeholder consultation for the purpose of this validation.

This second consultation was held on January 30th at the events room of the greenhouse of the Park “Los Cárcamos” León, Guanajuato State, Mexico. According to the PDD, section E.1, a total of 39 people from different parties were invited to attend this meeting; 14 from non-governmental organizations and/or consultancies, 25 from the local and federal government, 3 from the private sector and 15 members of the surrounding communities. A list of people that attended the meeting is provided in section E.1 of PDD.

The means of invitation used for the second local consultation were letters sent on January 23, 2009 by Eleazar López Araiza Alday, General Director of Environmental Protection of the municipality of Leon. Copies of these letters have been provided by project proponent (Ref.47) and the information above was confirmed correct.

The undertaken stakeholder process is described in a complete and transparent manner in the PDD as confirmed with invitation letters, photos, assistance list and surveys provided (Ref.46-49). A summary of the stakeholder comments and questions was provided in section E.3 and were confirmed with copies of the opinion surveys provided (Ref.46). Section E.3 shows that all questions and comments received during the meeting were properly addressed by the project participant.

5. Comments by Parties, Stakeholders and NGOs

In accordance with sub-paragraphs 40 (b) and (c) of the CDM modalities and procedures, the project design document of a proposed CDM project activity shall be made publicly available and the DOE shall invite comments on the validation requirements from Parties, stakeholders and UNFCCC accredited non-governmental organizations and make them publicly available. This chapter describes this process for this project.

5.1 Description of how and when the PDD was made publicly available

The Project Design Document for this project was made available on the UNFCCC website <http://cdm.unfccc.int/Projects/Validation/DB/Q2FCX6TF43RFDJ77RTQ64YUTP1EX18/view.html> and was open for comments from 09 Jan 08 until 07 Feb 08.

The Project Design was modified by the project participant and was republished on the UNFCCC website <http://cdm.unfccc.int/Projects/Validation/DB/GBX12JR23264NA0L9ZO1HYZV774RSX/view.html>, and which was open for comments from 13 Feb 09 until 14 Mar 09. Comments were invited through the UNFCCC CDM homepage.

5.2 Compilation of all comments received

Comment Number	Date Received	Submitter	Comment
0	N/A	N/A	N/A

5.3 Explanation of how comments have been taken into account

No comments were received.

6. List of Persons Interviewed

Date	Name	Position	Short Description of Subject Discussed
09/03/2009 – 10/03/2009	Julio C. Rodriguez	PASA – General Manager	Landfill physical delineation, corroboration of data
09/03/2009 – 10/03/2009	Miguel Gastelum	Landfill of Leon – General Manager	Landfill physical delineation, corroboration of data
– 10/03/2009	Elizabeth Mosqueda	MGM International – Technical Analyst	PDD information, data, calculations and assumptions
09/03/2009	José Eleazar López	Municipality of Leon – General Director of Sustainable Development	Environmental legislation, stakeholder consultation, EIA requirements, common practice in landfills, project additionality.
10/03/2009	Alfonso Martinez	PASA – Research & Development	PDD information, data, project design and technology

7. Document References

Category 1 Documents (documents provided by the Client that relate directly to the GHG components of the project, (i.e. the CDM Project Design Document, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the designated national authority):

- /1a/ El Verde PDD version 3 – 19-12-2007 – Published from 09 Jan 08 - 07 Feb 08 at: <http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/project.php?id=420>
- /1b/ El Verde PDD version 4 – 11/02/2009 – Published from 13 Feb 09 - 14 Mar 09 at: <http://cdm.unfccc.int/Projects/Validation/DB/GBX12JR23264NA0L9ZO1HYZV774RSX/view.html>
- /1c/ El Verde PDD version 5 – 08/05/2009
- /1d/ El Verde PDD version 6 – 04/09/2009
- /1e/ El Verde PDD version 7 – 08/10/2009
- /1f/ El Verde PDD version 8 – 05/11/2009
- /1g/ El Verde PDD version 9 – 14/01/2010
- /1h/ El Verde PDD version 10 20/09/2010
- /1i/ El Verde PDD version 11 05/10/2010
- /2a/ Methodology ACM0001 version 9.1 (Valid from 16 Aug 08 to 26 Feb 09)
- /2b/ Methodology ACM0001 version 10 (Valid from 27 Feb 09 to 10 Jun 09). Requests for registration can be submitted until 10 Feb 10 23:59 GMT as per the UNFCCC website: <http://cdm.unfccc.int/methodologies/DB/203B03KT6N8QCC0R1C56DFOF9OYO2T/view.html>.
- /3/ Tool for the demonstration and assessment of additionality – EB39 v5.2
- /4/ Tool to determine methane emissions avoided from disposal of waste at... EB41 v4
- /5/ Tool to determine project emissions from flaring gases containing methane - EB28
- /6/ Combined tool to identify the baseline scenario and demonstrate additionality - EB28 v2.2
- /7/ Tool to calculate project or leakage CO2 emissions from fossil fuel combustion EB41 v.2
- /8/ Tool to calculate baseline, project and or leakage emissions from electricity consumption - EB39 v.1
- /9/ Tool to calculate the emission factor for an electricity system - EB-5 - v.1.1
- /10a/ El Verde ER spreadsheet version 1 – 12/11/2008
- /10b/ El Verde ER spreadsheet version 2 – 08/05/2009
- /10c/ El Verde ER spreadsheet version 3 – 04/09/2009
- /10d/ El Verde ER spreadsheet version 4 – 08/10/2009
- /10e/ El Verde ER spreadsheet version 5 – 03/11/2009
- /10f/ El Verde ER spreadsheet version 6 – 18/12/2009
- /11a/ El Verde Economic Analysis version 1 – 10/09/2008
- /11b/ El Verde Economic Analysis version 2 – 08/05/2009
- /11c/ El Verde Economic Analysis version 3 – 04/09/2009
- /11d/ El Verde Economic Analysis version 4 – 08/10/2009
- /11e/ El Verde Economic Analysis version 5 – 04/11/2009
- /12a/ El Verde Modalities of Communication – 11/02/2008
- /12b/ El Verde Modalities of Communication – 18/08/2009
- /13/ Mexico Letter of Approval – 14/12/2007
- /14a/ Mexico Letter of Approval – 18/03/2009 (English version)
- /14b/ Mexico Letter of Approval – 18/03/2009 (Spanish version)

Category 2 Documents (background documents used to check project assumptions and confirm the validity of information given in the Category 1 documents and in validation interviews):

- /15/ Training plan
- /16/ Project Schedule Revised 01-2008
- /17/ Official Norm NOM-083-SEMAR-2003 dated 20-10-04
- /18/ Estimation Landfill gas generated – CRA technical Memorandum 13-04-2006
- /19/ SCS and Promotora Ambiental Contract – Dated 26-10-2007
- /20/ Mexico Emission Factor Electricity 2007
- /21/ Mexico Electric Generation Capacity

- /22/ No Objection Letter issued by SEMARNAT (Mexican DNA) – dated 01-11-2007
- /23/ Leon Municipality letter 14-11-2007
- /24/ Macro Cells Plan dated 08-05-2000
- /25/ Diagram of vents (EIA Annex 15) 10-12-2000
- /26/ Project design map (SCS) Feb 2008
- /27/ CER contract between PASA and municipality 20-03-2007
- /28/ Useful lifetime calculation (EIA Annex 25)
- /29/ Environmental License 29-08-2008
- /30/ Municipality permit 23-05-01 & State permit 21-05-2001
- /31/ Municipality Concession Contract 09-01-2001
- /32/ PASA Commercial Registry (Acta Constitutiva) 23-07-1994
- /33/ Environmental Impact Assessment Section II 10-12-2000
- /34/ Description of residues generated EIA Section II 10-12-2000
- /35/ Design & construction biogas plant invoice 23-07-2008
- /36/ Evaporator Invoices – Ecologix Environmental Systems
- /37/ Flare Invoice (John Zink) dated 24-06-2008
- /38/ Generator renting – TRACSA S.A. de C.V. 03-12-2008
- /39/ Meters quoting (Landtec) 06-05-2008
- /40/ Construction invoices – Ralosa, Comanhi, Ferremas, Industrial Air 04-11-2008
- /41/ Pipeline invoices – Polytuberias
- /42/ Engineering invoices (SCS)
- /43/ Leachate monitoring and control
- /44/ PASA biogas project estimation 31-05-2008
- /45/ PASA Solid Waste, Soil & Climate Environmental Study RH
- /46/ Local SHC surveys 30-01-2009
- /47/ Local SHC letters 23-01-2009
- /48/ Local SHC Assistance List 30-01-2009
- /49/ SHC Photos 30-01-2009
- /50/ Waste history (tons) 2001-2009
- /51/ Request to modify LoA 18-03-2009
- /52/ State environmental authorization 23-11-2000
- /53/ Municipality CDM environmental authorization 10-10-2006
- /54a/ Electricity Sector Prospective 2006-2015 – Secretary of Energy (SENER). Available at :
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/prospsectelec2006.pdf
- /54b/ Electricity Sector Prospective 2007-2016 – Secretary of Energy (SENER). Available at:
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20Sector%20Electrico%20FINAS.pdf
- /54c/ Electricity Sector Prospective 2008-2017 – Secretary of Energy (SENER). Available at :
http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf
- /55/ Landfill gas process flow description
- /56/ SCS PASA Cost Estimate report – dated 29-02-2008
- /57/ Mexican Government Bonds 2007 – Bank of Mexico
- /58/ Exchange rates 2007 – Bank of Mexico
- /59/ John Zink Flare Quote – dated 06-02-2008
- /60/ Ecologix Evaporator Quote – dated 29-05-2008
- /61/ Waste quantities 2001-08 – dated 20-08-2008
- /62/ Statistical data of population of Leon
- /63/ Leon demographics spreadsheet
- /64/ Law for Ecological Balance and Environmental Protection – Available at the National Commission of Protected Natural Areas website:
http://www.conanp.gob.mx/pdf/leygra_equilibrio.pdf
- /65/ Law of Integral Waste Management of Guanajuato – Available at the Guanajuato State Institute of Ecology link: http://ecologia.guanajuato.gob.mx/normatividad/leyes/ley_residuos.pdf
- /66/ Towards sustainable household consumption; trends and policies in OECD – published by OECD. Available at: http://www.ine.gob.mx/descargas/dgipea/towards_sust.pdf
- /67/ Ecologix Evaporator Invoice – dated 18-06-2008
- /68a/ Mexico electricity emissions factor 2009 calculation spreadsheet
- /68b/ Mexico electricity emissions factor 2009 calculation spreadsheet (corrected)

- /69/ Interest Rates 2007 – Bank of Mexico
- /70/ CFE price summary 2006-2008
- /71/ El Verde Regulatory Framework Analysis
- /72/ Methodology for calculating short term total cost of electricity – Available at:
<http://www.cre.gob.mx/documento/52.pdf>
- /73/ Law of Renewable Energy & Financing of energetic transition – Dated 28-11-2008. Available at:
<http://www.diputados.gob.mx/LeyesBiblio/pdf/LAERFTE.pdf>
- /74/ General Tax Law – Dated 04-06-2009. Available at:
<http://www.diputados.gob.mx/LeyesBiblio/pdf/82.pdf>
- /75/ Inflation index spreadsheet
- /76/ Leachate generation 2006-2009 mod MGM 19-08-2009
- /77/ Technical details of Waukesha Enginotor WPS 2
- /78/ Letters on Venting Wells and Special Equipment Service Life – dated 03-09-2009
- /79/ Landfill macrocell delineation map
- /80/ Letter from Municipality Leon regarding absence of LFG burning in the Leon Landfill
- /81/ Print screen Bank of Mexico
- /82/ Mexican interest rates 2007 – Bank of Mexico
- /83/ Interest rates data consulting – Bank of Mexico
- /84/ Mail Ecologix timelife evaporator 31-08-2009
- /85/ E-mail received from Brandy Johnson John Zink – LPG usage by flare – dated 03-11-2009
- /86/ Flare design criteria rev.2
- /87/ General Law for Waste Prevention and Integral Management – dated 08-10-2003
- /88/ Regulation to the General Law for Waste Prevention and Integral Management
- /89/ Contract between MGM & PASA for PDD elaboration – dated 24-10-2007
- /90/ Contract between PASA & SCS (revised for leachate component) – dated 18-06-2008
- /91/ Letter of Withdrawal of MGM as PP – dated 24-11-2009
- /92/ PAHO Guide for the design, construction and operation of landfills – dated 2002
- /93/ CAR06 El Verde Economic Analysis 4Nov09 mod 18Jan10
- /94/ CAR06 CER Calculation El Verde 18Dec09 mod 18Jan10
- /95/ SCS LFG Projections – dated 09/12/2007
- /96/ Signed contract SGS & PASA 05-02-2010
- /97/ Annex 2 Evaporator Technical Sheet.pdf
- /98/ Annex 3 Leon Proposal review MBD 060308.pdf
- /99/ Annex 1 Email Evaporator Follow-up from Jose Luis Davila.pdf

A.1 Annex 1: Local Assessment

This checklist is designed to provide confirmation of in-country data and information provided in the Project Design Document for “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León.”

It serves as a “**reality check**” on the project that is completed by a local assessor from SGS Panama.

Issue	Findings	Source/Mean of Verification	Further Action / Clarification / Information Required?
Verify status of the LoA Table 1 – Requirement 3	LoA refers to Promotora Ambiental S.A.B de C.V. and MGM Carbon ,S.a.r.l. as projects participants. However, the republished PDD does not include MGM Carbon Portfolio, S.a.r.l. as a project participant. <u>CAR 1 was raised.</u>	DR	CAR-1 OK
Verify that there are 50 landfill gas vents (or passive gas wells) distributed in the 4 cells, covering the current 30 ha area. Verify that no LFG is captured and destroyed in the baseline (MD _{BL,y}). Section A.2.2 & B.5.1	PDD section A.2 states that currently there are 50 landfill gas vents (or passive gas wells) distributed in the 4 cells, covering the current 30 ha area. During the site visit it was verified in the landfill “Macro Cells Plan” identified as LN-03 and dated 08-05-2000 (Ref. 24a – 24d) that there are 2 macro cells: macro cell 1 and macro cell 2, both of which comprise a total of 51.4 hectares. Macro cell 1 is currently being used for the waste received, and corresponds to approximately 25 hectares, with 5 remaining hectares designated as buffer zone. Macro cell 2 is not included in the project boundaries as verified in the PDD and during the site visit. It was also verified in the cartographic plan that macro cell 1 contains 5 cells (with 10 vents per cell), and not 4 as stated in the PDD. <u>CAR 6 was raised.</u>		CAR-6 OK
Check evidences on the following statements: -Landfill began accepting waste in May 2002.	Regarding the landfill operations and history, the PDD states that the landfill began accepting waste in May 2002. However, the waste history records (Ref. 50), show values for 2001. <u>CAR 7 was raised</u> PDD states that the landfill is filling at an average rate of		CAR-7 CAR-8 CL-9

Issue	Findings	Source/Mean of Verification	Further Action Clarification Information Required? /
<p>-Currently, the landfill is filling at an average rate of 1,700 tonnes per day, or greater than 530,000 tonnes per year.</p> <p>-Disposal rate is expected to increase by 7% per year.</p> <p>-The landfill is expected to close in May 2016.</p> <p>-The proposed project is expected to have a useful life to December 2029.</p> <p>Check information on the status of the project activity, vents, planning, design capacity, historic production.</p> <p>Section A.2.2 & Section A.4.2</p>	<p>1,700 tonnes per day, or greater than 530,000 tonnes per year. However, the values reported in the ER spreadsheet show lower values per year from 2001 to 2008. In addition, annual values in the ER spreadsheet do not coincide with the waste history records (Ref. 50).</p> <p><u>CAR 8 was raised.</u></p> <p>According to PDD, PASA expects the disposal rate to increase by 7% per year in the coming years.</p> <p><u>CL 9 was raised</u> to request project proponent to support this statement with verifiable evidence.</p> <p>PDD states that the landfill is expected to close in May 2016. However, according to the Environmental Impact Assessment of the project ("Manifiesto de Impacto Ambiental") Annex 25 (Ref. 28), the landfill has a lifetime of 16.28 years (calculated based on Norm NOM-ECOL-084-94). Based on this information, and considering that the landfill started receiving waste on year 2001, the landfill would be expected to close in 2017.</p> <p><u>CAR 10 was raised.</u></p> <p>PDD states that since LFG continues to be produced for many years afterwards, the proposed project is expected to have a useful life until December 2029. This is consistent with data in ER spreadsheet (Ref. 10), which shows that landfill gas capture is expected until end of 2029.</p> <p>According to the PDD and ER spreadsheet, the project is expected to have a useful lifetime until December 2029. On the other hand, the PDD section C.1.2 also states that the operational lifetime of the project is 23 years. Considering that the ER spreadsheet presents the useful lifetime starting from 2008, <u>CL 11 was raised</u> to request clarification on how the operational lifetime was calculated (considering the fact that useful lifetime should be based on equipment lifetime and methane capture estimation).</p>		<p>CAR 10</p> <p>CL 11</p> <p>OK</p>

Issue	Findings	Source/Mean of Verification	Further Action Clarification Information Required?
Check project location & coordinates (N 21°10'28"; W 101°46'32) Section A.4.1	Description of the project location in PDD was confirmed on page 10 of Section II of the EIA ("Manifiesto de Impacto Ambiental" – Ref. 33). Project location was also verified during the site visit. PDD states that the project coordinates are N 21°10'28"; W 101°46'32, and the project EIA ("Manifiesto de Impacto Ambiental" – Ref. 33) page 2, section 1 shows the following coordinates: N 21°10'14"; W 101°46'30. <u>CAR 12 was raised.</u>		CAR-12 OK
Check ownership or licenses which allow implementation of the project at that site Section A.4.2	The registry of Promotora Ambiental, S.A. de C.V. ("Acta Constitutiva" – Ref. 32) dated 23-07-1994 was obtained from project proponent during the site visit. A concession contract was signed on year 2001 between the Municipality of Leon and PASA (Ref. 31), which endows the municipality the right to supervise the landfill operations at its will, and requires PASA to communicate the municipality of any changes of activities in the landfill (page 7 of Concession Contract – Ref. 31). As verified, this contract concedes PASA the management and operation of El Verde landfill for a period of 15 years. Thus, concession would be expected to end in 2015. Nevertheless, a contract between PASA and the municipality concerning the sharing of CER benefits (Ref. 27) establishes that the contract is valid until 31 December 2012 or, if the Kyoto Protocol extends, until the conclusion of the Kyoto Protocol. This indicates that PASA is owner of the project throughout its entire crediting period, as long as it is valid within the framework of the Kyoto Protocol. The landfill has conducted an Environmental Impact Assessment ("Manifiesto de Impacto Ambiental" – Ref. 33) as part of the requirements to obtain the authorization of this EIA, equivalent to an operation license ("Autorización de Manifiesto de Impacto Ambiental" – Ref. 52).	DR, I	CL-13 CAR-14 OK

Issue	Findings	Source/Mean of Verification	Further Action Clarification Information Required?
	<p>The Environmental Impact Assessment Authorization dated 23-11-2000 (Ref. 52) was granted to PASA by the state of Guanajuato which allowed the construction, operation and maintenance of the El Verde landfill. The state also issued on 21-05-2001 a separate permit making reference to the EIA Authorization (Ref. 30). Similarly, the Municipality of Leon issued on 23-05-2001 an additional permit for the landfill construction (Ref. 30). In October 2006, the Municipality provided authorization for the proposed CDM project activity (Ref. 53). However, it is not clear whether the state of Guanajuato should be responsible of conferring authorization to PASA for the project activity under the CDM. <u>CL 13 was raised.</u></p> <p>It was verified in the ER spreadsheet (Ref. 10) that the project estimates electricity generation starting from 2009. Considering that currently the project does not count with a license for generating electricity, project proponent is requested to revise the projected start date for electricity generation.</p> <p><u>CAR 14 was raised.</u></p>		
<p>Verify information on the technology details to be applied by the project activity; if it reflects current good practice and if it is state of the art. Has equipment already been chosen?</p> <p>Sections A.4.4 & A.4.7</p>	<p>Evaporator to be installed is from Ecologix Environmental Systems, LLC, an EvapoDry model ED500 as per quote dated May 29 2008 (Ref.60). Evaporator has already been purchased as per invoice provided (Ref.67); nonetheless, no investment or maintenance costs from the evaporator are considered in the financial analysis which is deemed conservative.</p> <p>Enclosed flare is to be purchased from John Zink as per quote provided (Ref.59). According to the SCS Cost Estimate Report (Ref.56), 3 Caterpillar Generators, model CAT 3516 would be purchased for the electricity generation component. Further units would be added as LFG is available and at the end of operational lifetime of the</p>	DR	No, Ok

Issue	Findings	Source/Mean of Verification	Further Action Clarification Information Required?
	generators previously installed.		
Check project history and compliance with actual situation and planning. Section A.4.6 And check if info and plans are in accordance with the calendar provided. Section A.4.11	A timeline was provided by PP (Ref.16) with a description of the most important events in the project history such as project design stage to equipment acquisition and installation.	DR	No, Ok
Check evidences for agreements on training, commissioning & start-up between PASA and the flare supplier; the leachate evaporation plant; and generator equipment supplier or specialist consultant. Section A.4.9	It is stated in the PDD that PASA will count on supervision from the flare supplier for training, commissioning and start-up. Similarly, the supplier of the leachate evaporation plant would provide support for training, commissioning and start-up. It further states that if PASA decides to generate electricity using landfill gas, they will acquire either from equipment supplier and/or specialist consultant all the services needed for training related to the operation of the LFG generation system. <u>CL 34 was raised</u> to request verifiable evidences on the training provisions mentioned.	DR	CL-34 OK
Check financial data for any possible indication of public funding. Section A.5.1	No indication of public funding for this project activity was found in the financial spreadsheet provided (Ref.11)		No, Ok
Verify with the municipality that: -NOM-083-SEMARNAT-2003 which requires LFG flaring is systematically not enforced in municipality and that landfills are responsibility of the municipalities.	During an interview with representatives of the municipality of Leon, it was confirmed that the federal norm NOM-083-SEMARNAT-2003 is systematically not enforced in Mexico. A contract between the municipality and PASA was signed on 20-03-2007 (Ref. 27) for the sharing of the CER benefits of the El Verde project. This contract is valid until 31 December 2012 or, if the Kyoto Protocol extends, until the conclusion of the Kyoto Protocol. This indicates that PASA	DR, I	No, Ok

Issue	Findings	Source/Mean of Verification	Further Action Clarification Information Required?
Section B.3.2 -After the concession period, who would receive the CDM benefits in the rest of the crediting period?	(along with the municipality) is owner of the project throughout its entire crediting period, as long as it is valid within the framework of the Kyoto Protocol.		
Check if data for leachate evaporation is included in economic analysis of project. Section B.4.6	As outlined in CL 22, the economics of power generation does not include the initial investment in the evaporator, operating expenses, or the cost of equipment replacement at the end of its life. Hence the evaporator investments and operating costs do not form part of the economic analysis. This was deemed conservative as including these costs would reduce the cost effectiveness of power generation even further.	DR	No, Ok
Verify that thermal energy is not being generated in the landfill. Section B.5.1	Currently no generation of thermal energy is carried out in the landfill as verified during the site visit.	I, SV	No, Ok
Check for Quality control and Quality Assurance procedures on the selection of data, free of conflict of interests. Section B.11.1 & B.11.5	The PDD provides in section B.7.2 QC&QA adequate procedures for the monitoring and management of data.	DR	No, Ok
Verify Promotora S.A.B. de C.V (PASA), is owner of landfill and responsible for operation and maintenance. Verify landfill was conceded to PASA by municipality of León, Guanajuato. PASA experience in other landfills in Mexico. Section B.12.1	A concession contract was signed on year 2001 between the Municipality of León and PASA (Ref. 31). As verified, this contract concedes PASA the management and operation of El Verde landfill for a period of 15 years. Thus, concession would be expected to end in 2015. Nevertheless, a contract between PASA and the municipality concerning the sharing of CER benefits (Ref. 27) establishes that the contract is valid until 31 December 2012 or, if the Kyoto Protocol extends, until the conclusion of the Kyoto Protocol. This indicates that PASA is owner of the project throughout its	DR, SV	No, Ok

Issue	Findings	Source/Mean of Verification	Further Action Clarification Information Required?																
	entire crediting period, as long as it is valid within the framework of the Kyoto Protocol. PASA experience in several other landfills was confirmed in the firm's website (http://www.gen.tv/pre_rsanitarios.html).																		
Verify stakeholder consultation evidence (invitation letters, surveys, "PowerPoint presentation of the Project", "Brochure with the Executive Summary of the Project", assistance list, photos, etc.) Sections E.1.1, E.1.2, E.1.4.	The following evidences of the stakeholder consultation were provided: Invitation letters (Ref. 47); Attendance List (Ref. 48), Opinion surveys (Ref. 46), Photos (Ref. 49), which confirm the information in the PDD regarding the local stakeholder consultation process.		No, Ok																
Verify input values with internal system (real data, not estimated). Verify data processing system, control, recording procedure. <table><tr><td>2001</td><td>279,091</td></tr><tr><td>2002</td><td>464,012</td></tr><tr><td>2003</td><td>448,379</td></tr><tr><td>2004</td><td>481,084</td></tr><tr><td>2005</td><td>474,761</td></tr><tr><td>2006</td><td>443,274</td></tr><tr><td>2007</td><td>474,303</td></tr><tr><td>2008</td><td>507,504</td></tr></table>	2001	279,091	2002	464,012	2003	448,379	2004	481,084	2005	474,761	2006	443,274	2007	474,303	2008	507,504	Regarding the landfill operations and history, the PDD states that the landfill began accepting waste in May 2002. However, the waste history records (Ref. 50), show values for 2001. Therefore, <u>CAR 7 was raised</u> to request project proponent to make the necessary adjustments.		CAR 7 OK
2001	279,091																		
2002	464,012																		
2003	448,379																		
2004	481,084																		
2005	474,761																		
2006	443,274																		
2007	474,303																		
2008	507,504																		
Verify percentage LFG sent to each equipment to verify priority as stated during site visit	The purpose of the project activity and the type of technology used are not clearly described in the PDD. The PDD states that "the initial project activity would involve landfill gas capture, with some of the recovered gas used for leachate evaporation with the remainder flared. Another possible use for the LFG is electricity generation for use at the landfill site		CAR 4 CL 35 OK																

Issue	Findings	Source/Mean of Verification	Further Action Clarification Information Required?
	<p>the landfill site and/or supply to the local grid.” Also, PDD states that the “recovered LFG would first be used for leachate evaporation. Any surplus LFG would be sent to the power plant, if one is installed, with the leftover LFG sent to the flare station.” Furthermore, PDD states that “once the requirement for leachate evaporation has been met, some of the remaining LFG may be burnt to produce electricity instead of being sent to the flare station.” Finally, section A.4.3 states: “The objective of El Verde Landfill Gas Project is to capture and flare the landfill gas (LFG) generated (...)”</p> <p>On the other hand, the ER spreadsheet (Ref. 10) shows a greater percentage of LFG sent to electricity generator than to flare or to the leachate evaporator. Also, the proportion between LFG to flare and LFG to leachate evaporator is not constant along the crediting period years. A CAR was raised to request project participant to make the necessary changes in the PDD and/or ER spreadsheet in order to reflect clearly the purpose of the landfill gas use. <u>CAR 4 was raised.</u></p> <p>It was not clear how the quantity of LFG to each component (flare, evaporator, power generator) will be monitored and controlled (i.e. if a threshold for each equipment will be established), and if it will be controlled manually or automatically.</p> <p><u>CL 35 was raised.</u></p>		



A.2 Annex 2: Validation Checklist

Table 1 Participation Requirements for Clean Development Mechanism (CDM) Project Activities (Ref PDD, Letters of Approval and UNFCCC website)

Requirement	Reference	Comments	Conclusion/C ARs/ CLs
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Requirement	Reference	Comments	Conclusion/C ARs/ CLs
<p>1. All Parties involved have approved the project activity</p> <ul style="list-style-type: none"> o Has the DNA of each Party involved in the proposed CDM project activity in section A.3 of the PDD provided a written letter of approval which confirms <ul style="list-style-type: none"> <input type="checkbox"/> The country is a Party to the Kyoto Protocol <input type="checkbox"/> Participation is Voluntary <input type="checkbox"/> The Host Party confirming that the proposed CDM project activity contributes to sustainable development of the country Non-Annex 1 Party shall submit a letter of approval <input type="checkbox"/> It refers to the precise proposed CDM project activity title in the PDD being submitted for registration 	<p>Annex 3, Clean Development Mechanism, Validation and Verification Manual, Version 01 (from this point forwarded referenced as VVM) – 49a-d /54a-b/125</p> <p>Paragraph 37 CDM Modalities and procedures</p>	<p>According to UNFCCC web site, (http://maindb.unfccc.int/public/country.pl?country=MX), Mexico has the following status on the Kyoto Protocol: Date of signature: June 9, 1998; Date of ratification: September 7, 2000; Date of entry into force: February 16, 2005.</p> <p>An English version of Mexican Letter of Approval (LoA) identified as #180 / 2007 dated as December 14th of 2007 (Ref. 13) was received from project proponent. It was verified that the letter was issued by the host country DNA (SEMARNAT), signed by the Ministry of Environment and Natural Resources – Fernando Tudela Abad. The letter confirms that project contributes to the sustainable development of the country and complies with national legislation. Name of project “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León” complies with the name established in the PDD.</p> <p>LoA refers to Promotora Ambiental S.A.B de C.V. and MGM Carbon Portfolio, S.a.r.l. as the project participants. However, the republished PDD does not include MGM Carbon Portfolio, S.a.r.l. as a project participant.</p> <p><u>CAR 1 was raised</u>MoC (Ref. 12) dated February 11th 2008 was provided by project proponent. Project name in MoC (“Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León”) complies with the name stated in the PDD. The information in the MoC was found in line with Section A.3 (Project Participants) of the PDD, however the contact personal e-mail was found different from the PDD Annex 1.</p> <p><u>CAR 2 was raised.</u></p>	<p>CAR-1 CAR-2 OK</p>

Requirement	Reference	Comments	Conclusion/CARs/CLs
<p>1.1. If the project participant(s) listed in the PDD published at international stakeholder consultation are not included in the PDD submitted with request for registration, a letter should be obtained from the withdrawn project participant(s) confirming its voluntary withdrawal from the proposed project activity.</p>	<p>EB 30 Para. 41. EB 50 Annex 48 Para. 7-9</p>	<p>1) According to EB30 Report (Para. 41), “where a project participant listed in the PDD published at validation is not included in the PDD submitted for registration, the DOE shall provide a letter from the withdrawn project participant confirming its voluntary withdrawal from the proposed project activity, and address this issue in its validation report.”</p> <p>The project participants listed in the 1st PDD published at ISHC were: “Promotora Ambiental S.A.B. de C.V.” and “MGM Carbon Portfolio, S.a.r.l.” However, the 2nd published PDD only includes “Promotora Ambiental S.A.B. de C.V.” as a project participant. The PDD which will be submitted for request for registration (Ref.1f) also indicates “Promotora Ambiental S.A.B. de C.V.” as the only project participant. In this regard, no letter of withdrawal has been submitted at this point by MGM Carbon Portfolio, S.a.r.l. Please provide the mentioned confirming voluntary withdrawal from the proposed project activity.</p> <p>2) Also, according to EB 50 Annex 48 (Para. 7-9) as well as the CDM Modalities and Procedures (Para. 37), the DOE is required to have a contractual relationship with the project participants. To this extent, the DOE has no contractual relationship with the indicated project participant “Promotora Ambiental S.A.B. de C.V.” as per 2nd PDD published and most recent version of the PDD.</p> <p>Hence, a <u>CAR has been raised</u>.</p>	<p>CAR 46</p>

Requirement	Reference	Comments	Conclusion/C ARs/ CLs
(a) The letter/s of approval are unconditional with respect to □o□ to □o□ above	VVM Para. 49/54	No doubts of authenticity have been raised regarding the provided LoA received by PP since audit team has experience with the Host Country and LoA format, and also approval by the Host Party was confirmed during an interview with representatives of the municipality of Leon.	OK
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof, and be entered into voluntarily	VVM Para. 54 Marrakech Accords, CDM Modalities §29 and §30 Kyoto Protocol Art. 12.2, Marrakech Accords, CDM Modalities §40a	An English and Spanish version (Ref. 13a – 13b) of the Mexican LoA was provided. The new Letter of Approval is identified as #216/2009, in replacement of #180/2007 (refer to CAR 1) and is dated March 18, 2009. As verified, the letter refers to Promotora Ambiental S.A.B de C.V. as the project participant, which is in accordance with section A.3 and Annex 1 of PDD (Ref. 1c). It was also verified that the letter was issued by the host country DNA (SEMARNAT), signed by the Ministry of Environment and Natural Resources – Fernando Tudela Abad. The letter confirms that the project contributes to the sustainable development of the country and that the parties involved due so voluntarily. Name of project “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León” complies with the name established in the PDD.	OK

Requirement	Reference	Comments	Conclusion/C ARs/ CLs
3. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements for a minimum of 30 days, and the project design document and comments have been made publicly available	VVM Para. 128 Marrakech Accords, CDM Modalities, §40	<p>PDD version 4 dated 11 February 2009 was published for ISHC at: http://cdm.unfccc.int/Projects/Validation/DB/GBX12JR23264NA0L9ZO1HYZV774RSX/view.html</p> <p>Starting date and closing date: 13/02/2009 to 14/03/2009.</p> <p>Number of comments received: 0</p> <p>This ISHC refers to a republication of the PDD since project participant wanted to add another use for the landfill gas, for leachate evaporation. As this change would impact the project boundary, and the baseline and additionality discussion, a new ISHC was conducted. As stated previously, no comments have been received.</p> <p>The previous PDD published for ISHC is identified as version 3 dated 19 December 2007 and found in: http://cdm.unfccc.int/Projects/Validation/DB/Q2FCX6TF43RFDJ77RTQ64YUTP1EX18/view.html</p> <p>Starting date and closing date: 09/01/2008 to 07/02/2008.</p> <p>Number of comments received: 0</p>	OK

Requirement	Reference	Comments	Conclusion/CARs/CLs
4. The project design document is in accordance with the applicable CDM requirements for completing PDDs.	VVM Para. 57 Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	<p>The PDD format applied by project participant was crosschecked with the template available in the UNFCCC website and Guidelines for Completing the Project Design Document (CDM-PDD). A CAR was raised to request project proponent to make the necessary corrections in a revised PDD. The following issues were identified:</p> <ol style="list-style-type: none"> 1) PDD template version used was 3.1, however a new version (3.2) was available at the UNFCCC website: http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html. 2) It was noticed throughout the PDD that large sections of the Guidelines for Completing the Project Design Document (CDM-PDD) as well as of the methodology and the tools were inserted in a copy-paste manner. However, this adds up length to the PDD and is not necessary for PDD assessment. 3) Section B.6.4 has been colored in orange and differs from the PDD template available in the UNFCCC webpage. 4) Emission Reduction Table should not have legend as it was used from the Guidelines for Completing the Project Design Document (CDM-PDD). 5) Section B.7.1, page 57: Table was left blank. 6) Please make sure to include legends and references for all the tables that are not used from the Guidelines for Completing the Project Design Document (CDM-PDD). On the other hand, tables that are used from the Guidelines, methodology and/or tools should not have references. 7) First paragraph of page 81 of PDD shows scratched out text. Please revise. <p>CAR 3 was raised</p>	CAR 3 OK

Table 2PDD

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
A. General Description of Project Activity				
A.1. Project Title				
A.1.1. Does the used project title clearly enable the reader to identify the unique CDM activity?	VVM Para.56 Guidelines for completing a CDM-PDD (PDD) section A.1	DR	The title "Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León" clearly enables to identify the CDM activity. It was also confirmed that no other project activity has been registered in UNFCCC website under such title.	OK
A.1.2. Is there an indication of a revision number and the date of the revision?	VVM Para.56 PDD section A.1	DR	The PDD submitted for ISHC is indicated as Version 4, dated as 11 th February 2009. The PDD that had been previously submitted for validation and published for ISHC is indicated as Version 03, dated as 19 th November 2007. The PDD has been revised in order to address another use for the landfill gas (leachate evaporation) and another publication for ISHC was requested to project participant.	OK
A.2. Description of the Project Activity				
A.2.1. Does the description of the proposed CDM project activity as contained in the PDD sufficiently cover all relevant elements accurately?	VVM Para.59 PDD section A.2 see also A.4, A.4.3 and B.3	DR	Initially the purpose of the project activity and the type of technology used were not clearly described in the PDD. The PDD stated that "the initial project activity would involve landfill gas capture, with some of the recovered gas used for leachate evaporation with the remainder flared. Another possible use for the LFG is electricity generation for use at the landfill site and/or supply to the local grid." Also, PDD stated that the "recovered LFG would first be used for leachate evaporation. Any surplus LFG would be sent to the power plant, if one is installed, with the leftover LFG sent to the flare station." Furthermore, PDD stated that "once the requirement for leachate evaporation has been met, some of the remaining LFG may be burnt to produce electricity instead of being sent to the flare station." Finally, section A.4.3 stated: "The objective of El Verde Landfill Gas Project is to capture and flare the landfill gas (LFG) generated (...)" On the other hand, the ER spreadsheet (Ref. 10) showed a greater percentage of LFG sent to electricity generator than to flare or to the leachate evaporator. Also, the	CAR 4 CAR 5 CL 35 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>proportion between LFG to flare and LFG to leachate evaporator was not constant along the crediting period years. A CAR was raised to request project participant to make the necessary changes in the PDD and/or ER spreadsheet in order to reflect clearly the purpose of the landfill gas use.</p> <p><u>CAR 4 was raised.</u></p> <p>Regarding the contribution to sustainable development, the project would have important local environmental benefits: Destruction of air pollutants, such as hydrogen sulfide, that is present in trace quantities in LFG; reduced fire and explosion risk through improved management of landfill gas; reduced odor as landfill gas is captured and burnt for energy or flared.</p> <p>According to the Guidelines for Completing the Project Design Document (CDM-PDD), the description of the project activity (Section A.2 of the PDD) must contain information of the baseline scenario. In case when the baseline scenario coincides with the existing situation, it should only be informed in this section that both (baseline and actual scenario) are the same. The PDD does not clearly state if the baseline scenario identified corresponds to the actual situation of the landfill.</p> <p>Also, according to the Guidelines for Completing the Project Design Document (CDM-PDD), this section should clearly describe how the project activity reduces greenhouse gas emissions making reference to the scenarios, emission sources and gases. This information is not clearly summarized in this section.</p> <p><u>CAR 5 was raised.</u></p> <p>It was not clear how the quantity of LFG to each component (flare, evaporator, power generator) will be monitored and controlled (i.e. if a threshold for each equipment will be established), and if it will be controlled manually or automatically.</p> <p><u>CL 35 was raised.</u></p>	
A.2.2. Does the information provide the reader with a clear understanding of the proposed CDM activity?	VVM Para.60 PDD section A.2 see also A.4, A.4.3 and B.3	DR	Please refer to Section A.2.1.	OK
A.2.3. Is all information provided consistent and in compliance with the actual	VVM Para.64 PDD section A.2 see also A.4, A.4.3	DR	Regarding the actual status of the landfill, PDD section A.2 states that currently there are 50 landfill gas vents (or passive gas wells) distributed in the 4 cells, covering the current 30 ha area. During the site visit it was verified in the landfill "Macro Cells Plan"	CAR 6 CAR 7

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
situation or planning?	A.4.3 and B.3		<p>identified as LN-03 and dated 08-05-2000 (Ref. 24a – 24d) that there are 2 macro cells: macro cell 1 and macro cell 2, both of which comprise a total of 51.4 hectares. Macro cell 1 is currently being used for the waste received, and corresponds to approximately 25 hectares, with 5 remaining hectares designated as buffer zone. Macro cell 2 is not included in the project boundaries as verified in the PDD and during the site visit. It was also verified in the cartographic plan that macro cell 1 contains 5 cells (with 10 vents per cell), and not 4 as stated in the PDD. Hence, a CAR was raised in order to request PP to revise this information in the PDD accordingly. <u>CAR 6 was raised.</u></p> <p>–PDD also states that such wells are venting the gas from inside the waste mass to the top of each vent, with no presence of flames. During site visit there was no sign of combustion in the wells observed in the landfill. Interviews conducted with project personnel confirmed that indeed no flaring has been carried out in the landfill. Moreover, a SCS statement (Ref.78) was provided (see CL 24) which states that “since early 2007, SCS has not witnessed any combustion of LFG in the existing LFG venting well system.” It further states that the current construction of the LFG venting wells is not appropriate to perform passive combustion of the LFG since the main conduit is constituted of polyvinyl chloride (PVC) plastic pipe. This was confirmed in the landfill EIA document, Annex 15 (Ref.25), which provides a diagram of the gas wells, specifying that these are tubes made of PVC material.</p> <p>Regarding the landfill operations and history, the PDD states that the landfill began accepting waste in May 2002. However, the waste history records (Ref. 50), show values for 2001. Therefore, <u>CAR 7 was raised</u> to request project proponent to make the necessary adjustments. PDD states that the landfill is filling at an average rate of 1,700 tonnes per day, or greater than 530,000 tonnes per year. However, the values reported in the ER spreadsheet show lower values per year from 2001 to 2008. In addition, annual values in the ER spreadsheet do not coincide with the waste history records (Ref. 50). Therefore, <u>CAR 8 was raised.</u></p> <p>According to PDD, PASA expects the disposal rate to increase by 7% per year in the coming years. <u>CL 9 was raised</u> to request project proponent to support this statement with verifiable evidence. PDD states that the landfill is expected to close in May 2016. However, according to the Environmental Impact Assessment of the project (“Manifiesto de Impacto Ambiental”) Annex 25 (Ref. 28), the landfill has a lifetime of 16.28 years (calculated based on Norm NOM-ECOL-084-94). Based on this information, and considering that the landfill started receiving waste on year 2001, the landfill would be expected to close in 2017. <u>CAR 10 was raised.</u> PDD states that since LFG continues to</p>	<p>CAR 8</p> <p>CL 9</p> <p>CAR 10</p> <p>OK</p>

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			LFG continues to be produced for many years afterwards, the proposed project is expected to have a useful life until December 2029. This is consistent with data in ER spreadsheet (Ref. 10), which shows that landfill gas capture is expected until end of 2029. Please also refer to section B.8.2 for discussion on CL 11 raised in relation to calculation of the project operational lifetime.	
A.2.4. Is all information provided consistent with details provided in further chapters of the PDD?	VVM Para.64 PDD section A.2	DR	All information provided is in consistency with details provided in Annex 1. The project description clearly states the differences resulting from the project activity compared to the pre-project situation (no landfill gas destruction).	OK
A.3. Project Participants				
A.3.1. Is the table required for the indication of project participants correctly applied?	VVM Para. 51 PDD section A.3	DR	Section A.3 has been correctly applied in the PDD. One project participant (MGM Carbon Portfolio, S.a.r.l.), representing the Party of UK, was excluded from the first PDD published for ISHC. Thus, a UK LoA is no longer required for the validation assessment. The revised PDD version 4 indicates Promotora Ambiental S.A.B. de C.V. (Mexico as Party) as the only project participant.	OK
A.3.2. Is all information provided in consistency with details provided by further chapters of the PDD (in particular Annex 1)?	VVM Para. 51 PDD section A.3	DR	Information of project participants in Annex 1 was found in compliance with information in Section A.3 of PDD.	OK
A.4. Technical Description of the Project Activity				
A.4.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)? Are the latitude and longitude of the site indicated (decimal points)	VVM Para.64 PDD section A.4	DR	Project activity is to be located in the city of León, which is 45 kilometers northwest of the Del Bajío International Airport, in the state of Guanajuato, about 350 kilometers northwest of Mexico City. The geographical coordinates are N 21°10'28"; W 101°46'32". Description of the project location in PDD was confirmed on page 10 of Section II of the EIA ("Manifiesto de Impacto Ambiental" – Ref. 33). Project location was also verified during the site visit. PDD states that the project coordinates are N 21°10'28"; W 101°46'32, and the project EIA ("Manifiesto de Impacto Ambiental" – Ref. 33) page 2, section 1 shows the following coordinates: N 21°10'14"; W 101°46'30.	CAR-12 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<u>CAR 12 was raised.</u>	
A.4.2. Does the proposed CDM project activity involve the alteration of existing installations or process?	VVM Para.64 PDD section A.4	DR	The PDD clearly states the differences between the pre-project operation and the project activity. The current scenario is the uncontrolled release of landfill gas, with only passive venting and no flaring. The proposed project activity involves the installation of a LFG collection system, flare, leachate evaporator and electricity generator for LFG destruction, thus reducing methane emissions compared to the pre-project scenario.	OK
A.4.3. Do the project participants possess ownership or licenses which will allow the implementation of the project at that site / those sites?	VVM Para.64 PDD section A.4	DR	<p>El Verde landfill is owned by Promotora Ambiental S.A.B. de C.V (hereinafter called PASA) through a concession contract signed with the municipality of León. PASA is identified in the PDD as the project participant of the project activity. The legal registry of PASA ("Acta Constitutiva" – Ref. 32) dated 23-07-1994 was obtained from project proponent during the site visit.</p> <p>The concession contract was signed on year 2001 between the Municipality of Leon and PASA (Ref. 31), which endows the municipality the right to supervise the landfill operations at its will, and requires PASA to communicate the municipality of any changes of activities in the landfill (page 7 of Concession Contract – Ref. 31).</p> <p>As verified, this contract concedes PASA the management and operation of El Verde landfill for a period of 15 years. Thus, concession would be expected to end in 2015. Nevertheless, a contract between PASA and the municipality concerning the sharing of CER benefits (Ref. 27) establishes that the contract is valid until 31 December 2012 or, if the Kyoto Protocol extends, until the conclusion of the Kyoto Protocol. This indicates that PASA is allowed to implement the project activity at the site, and is the owner of the project throughout its entire crediting period, as long as it is valid within the framework of the Kyoto Protocol.</p> <p>The landfill has conducted an Environmental Impact Assessment ("Manifiesto de Impacto Ambiental" – Ref. 33) as part of the requirements to obtain the authorization of this EIA, equivalent to an operation license ("Autorización de Manifiesto de Impacto Ambiental" – Ref. 52).</p> <p>The Environmental Impact Assessment Authorization dated 23-11-2000 (Ref. 52) was granted to PASA by the state of Guanajuato which allowed the construction, operation and maintenance of the El Verde landfill. The state also issued on 21-05-2001 a separate permit making reference to the EIA Authorization (Ref. 30). Similarly, the Municipality of Leon issued on 23-05-2001 an additional permit for the landfill construction (Ref. 30). In October 2006, the Municipality provided authorization for the</p>	<p>CL-13</p> <p>CAR-14</p> <p>OK</p>

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>proposed CDM project activity (Ref. 53). However, it is not clear whether the state of Guanajuato should be responsible of conferring authorization to PASA for the implementation and operation of the project activity under the CDM.</p> <p><u>CL 13 was raised.</u> <input type="checkbox"/> panish</p> <p>It was verified in the Concession contract between the municipality and PASA (Ref. 31) that the public bid of the El Verde landfill celebrated on 19-07-2000 was conceded to PASA by the municipality. Considering that in 2006 a contract between the municipality and PASA was signed concerning the share of CER benefits among the municipality and PASA, a search for evidence showing that the landfill was not created to become a CDM project was done. It was verified in the project EIA dated 10-12-2000 (Ref. 33), page 1 of section II that in that moment the solid waste disposal site for the city of León ("Relleno Sanitario Controlado") was in the closure of its useful lifetime, and therefore the need to obtain a new site for municipal waste management. Hence, it was confirmed that the El Verde landfill was not created to become a CDM project activity.</p> <p>It was verified in the ER spreadsheet (Ref. 10) that the project estimates electricity generation starting from 2009. Considering that currently the project does not count with a license for generating electricity, project proponent is requested to revise the projected start date for electricity generation since generally the public licenses concession processes are known as an extensive process in Latin America.</p> <p><u>CAR 14 was raised.</u></p>	
A.4.4. Is the category(ies) of the project activity correctly identified?	VVM Para.64 PDD section A.4	DR	<p>Section A.4.2 of PDD states that the project categories are 13 – Waste handling and disposal; and 1 – Energy industries (renewable / non-renewable sources. However, according to the list of CDM scopes available on the UNFCCC website, the methodology ACM0001 is only applicable to scope 13.</p> <p><u>CAR 15 was raised.</u></p>	CAR 15 OK
A.4.5. Is all information provided in compliance with actual situation or planning as available by the project participants?	VVM Para.64 PDD section A.4	DR	Please refer to sections A.2.3 and A.4.3	OK
A.4.6. Is the table required for the indication of projected emission reductions	VVM Para.64 PDD section A.4	DR	The table required for the indication of projected emission reductions has been correctly applied, and shows the annual estimated Ers in tones of CO2 for 7 years (renewable). However, as the ER spreadsheet contained values in decimals, the sum of yearly	CAR 37

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
correctly applied?			values in the PDD version 4 (Ref.1b) did not result in 1,025,360 tCO ₂ but 1,025,357 tCO ₂ . As the yearly values reported in the PDD do not (and should not) contain decimals, the sum should reflect the values reported for compliance. <u>CAR 37 was raised.</u>	
A.5. Public Funding				
A.5.1. Does the information on public funding provided conform to the actual situation or planning as presented by the project participants?	PDD section A.4.5	DR	In PDD section, A.4.5 it is stated, “No public funding is used for this project activity.” Financial data verified do not indicate any possible public funding.	OK
A.5.2. Is all information provided consistent with details provided by further chapters of the PDD (in particular annex 2)?	PDD section A.4.5	DR	Yes, all information is consistent with details provided in Annex 2.	OK
A.5.3. In case of public funding from Annex I Parties is it confirmed that such funding does not result in a diversion of official development assistance	PDD section A.4.5	N/A	N/A	N/A
B. Baseline and Monitoring Methodology				
B.1. Choice and Applicability				
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	VVM Para.68 PDD section B.1	DR	The approved methodology applied by the project is ACM0001, in the most recent version (v.9.1) by the time of PDD publication. Considering the time taken to complete the validation process, PP has updated PDD to use a newer version of ACM0001 (version 10).	OK
B.1.2. Has the methodology (incl. the tools) been altered	VVM Para.69 PDD section B	DR	Section B.1 of PDD: “Tool for the demonstration and assessment of additionality” used for the project is version 5. However version 5.2 of the tool is available at UNFCCC	CAR 16 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
from the original version as referenced in the PDD?	(B.1-B.2)		website. <u>CAR 16 was raised.</u>	
B.1.3. Is the selected approved methodology applicable to the project activity in the PDD?	VVM Para.75/66a/68/73 PDD section B (B.1-B.2)	DR	According to methodology ACM0001, it is "applicable to landfill gas capture project activities, where the baseline scenario is the partial or total atmospheric release of the gas and the project activities include situations such as: (a) The captured gas is flared; and/or (b) The captured gas is used to produce energy (e.g. electricity/thermal energy); I The captured gas is used to supply consumers through natural gas distribution network." This methodology is deemed the most applicable as the project involves capturing LFG for flaring, with some leachate evaporation as well as possibly electricity generation from LFG.	OK
B.1.4. Is the discussion in the PDD in conformance with all applicability criteria of the applied methodology?	VVM Para.75/66b/68 PDD section B (B.1-B.2)	DR	The discussion in the PDD is in accordance with all applicability criteria of ACM0001.	OK
B.2. Project Boundary				
B.2.1. Are all emission sources and gases related to the baseline scenario, project scenario and leakage clearly identified and described in a complete and transparent manner? Is there information on GHG emissions in proposed CDM project activity boundary as a result of the implementation of the proposed CDM project activity which are expected	VVM Para.79/76 67a PDD section B.3	DR	Emission sources and gases related to the baseline and project scenarios are clearly identified in table 2 of section B.3 and in flow diagram page 12. There is no information on GHG emissions which are expected to contribute more than 1% of the overall expected annual emission reductions, which are not addressed by the applied methodology ACM0001.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
to contribute more than 1% of the overall expected average annual emissions reductions, which are not addressed by the applied methodology.				
B.2.2. In case of grid connected electricity projects: Is the relevant grid correctly identified in accordance with the tool to calculate emission factor of electricity system (wherever applicable) and the underlying methodology?	VVM Para.79 PDD section B.3	DR	According to the Tool to calculate the emission factor for an electricity system, the relevant electric power system should be identified in Step 1 of the tool for determining the electricity emission factors. It is stated in the PDD that “the geographic and system boundaries include all the geographic area and infrastructures within the whole territory of Mexico, taking into account the energy exports and imports outside the Mexican energy system.” However, <u>CAR 17 was raised</u> to request that the relevant grid is identified and included in a revised PDD.	CAR 17 OK
B.2.3. Does the project boundary include the physical delineation of the proposed CDM project activity?	VVM Para.78/79 PDD section B.3 also see section A.4.3	DR	A diagram of the project boundary is shown in page 12 of the PDD, which includes the emission sources and the different technologies implemented in the project: leachate evaporation system, flare station and a LFG fuelled generator.	OK
B.2.4. Are the project's geographical boundaries and the project's system boundaries (components and facilities used to mitigate GHGs) clearly defined?	VVM Para.76/79 PDD section B.3 also see section A.4.3	DR	As per the PDD, “the project boundary comprises the landfill site and all power plants in the interconnected power grid,” as required by the methodology. The solid waste included in the project boundary is restricted to the solid waste that is received from the municipality of Leon, as evidenced in the Concession Contract from the municipality, page 2 (Ref. 31).	OK
B.3. Identification of the Baseline Scenario				
B.3.1. Does the PDD discuss the identification of the most likely baseline scenario? Does the PDD follow the steps to determine the	VVM Para.67b.80/82/86 PDD Section B.4/B.5	DR	The PDD correctly follows the steps established by the methodology to determine the most likely baseline scenario. In step 1 for identifying alternatives to the project activity consistent with current laws and regulations, the project participant has correctly applied version 5.2 of the Tool for the demonstration and assessment of additionality” as	CAR 19 CL 38 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
baseline scenario required by the methodology and is the application of the methodology and the discussion and determination of the chosen baseline transparent?			<p>required by the methodology.</p> <p>In sub-step 1a, the methodology requires that alternatives for the disposal/treatment of the waste in the absence of the project activity, i.e. the scenario relevant for estimating baseline methane emissions, to be analyzed should include, <i>inter alia</i>:</p> <p>LFG1: The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity;</p> <p>LFG2: 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.</p> <p>Also, ACM0001, Ver. 10 states that if LFG is used for generation of electric or heat energy for export to a grid and/or to a nearby industry or used on-site, realistic and credible alternatives should also be separately determined for</p> <ul style="list-style-type: none"> • Power generation in the absence of the project activity; • Heat generation in the absence of the project activity. <p>The project proponent proposes to use some of the captured LFG to evaporate leachate. According to ACM0001, Ver. 10, for heat generation, the realistic and credible alternative(s) may include, <i>inter alia</i>:</p> <p>H1. Heat generated from landfill gas undertaken without being registered as CDM project activity;</p> <p>H2. Existing or Construction of a new on-site or off-site fossil fuel fired cogeneration plant;</p> <p>H3. Existing or Construction of a new on-site or off-site renewable based cogeneration plant;</p> <p>H4. Existing or new construction of on-site or off-site fossil fuel based boilers. Air heaters or other heat generating equipment (e.g. kilns);</p> <p>H5. Existing or new construction of on-site or off-site renewable energy based boilers, air heaters or other heat generating equipment (e.g. kilns);</p> <p>H6. Any other source such as district heat, and</p> <p>H7. Other heat generation technologies (e.g. heat pumps or solar energy).</p> <p>Section B.4 of PDD stated that among the realistic alternatives to be considered as</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>possible alternative baselines were H1 through H7 (for heat generation). However, no emissions from heat generation were taken into account in calculating baseline emissions in Section B.6. The baseline scenario should reasonably represent the scenario in the absence of the project activity. Since there has never been leachate evaporation in the past, and it would only be implemented with the project activity (with CDM) it was not found reasonable to consider it would be implemented. Therefore, a <u>CAR 19 was raised</u> to request project proponent to make the necessary adjustments for consistency in the PDD.</p> <p>However, considering the use of leachate evaporator in the project activity scenario, the PP was requested to clarify how it can be verified that the leachate evaporation would not occur otherwise in the baseline scenario, taking local regulation and laws, where applicable, into account. It was also requested to include relevant information with this regard in the PDD since there was no mention of leachate available in actual / baseline scenario, and related information, when considering what is done at this moment with leachate generated. <u>CL 38 was raised</u>.</p> <p>The project proponent may also generate a certain amount of electricity, using LFG left over after leachate evaporation. ACM0001 Ver. 10 states:</p> <p>“For power generation, the realistic and credible alternative(s) may include, inter alia:</p> <p>P1. Power generated from landfill gas undertaken without being registered as a CDM project activity;</p> <p>P2. Existing or Construction of a new on-site or off-site fossil fuel fired cogeneration plant;</p> <p>P3. Existing or Construction of a new on-site or off-site renewable based cogeneration plant;</p> <p>P4. Existing or Construction of a new on-site or off-site fossil fuel fired captive power plant;</p> <p>P5. Existing or Construction of a new on-site or off-site renewable based captive power plant;</p> <p>P6. Existing and/or new grid-connected power plants.”</p> <p>With regard to scenarios P3 and P5, the PDD explains in section B.4 that although there are numerous renewable energy options, many resources such as hydro, wave, marine currents, etc. are not available at a landfill site. Furthermore, it is stated that a landfill that receives solid waste on a daily basis is not a suitable location for windmills or solar</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>or solar power stations, as LFG will continue to leak out, and the ground will subsidize even after landfill closure. Hence it was deemed reasonable to conclude that renewable power generation options at the site do not comprise a realistic baseline scenario. Also, regarding P2 and P4, it is explained that the PP provides solid waste management services and are not involved in power generation, so that off-site power generation is not an alternative to be considered. Hence, the only two remaining options are P1 and P6.</p> <p>In sub-step 1b for determining consistency with mandatory laws and regulations, PDD states that the federal norm NOM-083-SEMARNAT-2003 (which requires combustion of LFG despite no specific amount of LFG for combustion is stipulated) is not enforced in Mexico because landfills are the responsibility of the municipalities, who have control of solid waste disposal, and because the norm has never been enforced. During an interview with representatives of the municipality of Leon, it was confirmed that indeed the federal norm NOM-083-SEMARNAT-2003 is systematically not enforced in Mexico. This has also been widely known from other registered CDM landfill projects. Therefore both LFG1 and LFG2 would comply with local regulations. As discussed in section B.4.3 below, the current situation at the El Verde landfill corresponds to LFG2.</p> <p>In step 2 for identifying the fuel for the baseline of energy source taking into account the national and/or sectoral policies, the PDD has correctly applied methodology ACM0001 version 10. For power generation, P1 and P6 are considered. ACM0001, Ver. 10 requires that the additionality test “shall be applied for each component of the baseline, i.e. baseline for waste treatment, electricity generation and heat generation”. These remaining scenarios are further discussed in section B.5 of the PDD through an investment analysis. For this purpose, the possible baseline scenarios are:</p> <ul style="list-style-type: none"> • Combination of LFG1+P1. The project activity (i.e. capture of landfill gas and its flaring and/or its use) undertaken without being registered as a CDM project activity. • Combination of LFG2+P6. Current situation at the El Verde landfill. <p>Sub-step 2a of the tool involves a determination of the appropriate analysis method. The following options are given:</p> <ol style="list-style-type: none"> I. Simple cost analysis II. Investment comparison analysis, III. Benchmark analysis 	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>For the combination LFG1+P1, as stated in PDD, there are substantial investments as well as revenues from the electricity sales. Then, through a benchmark analysis (see section 4.6.4 below), it is demonstrated that scenarios LFG1 (capture of LFG and flaring and/or its use) and P1 (electricity generation from LFG) would not be economically feasible, and hence are eliminated as a possible baseline scenarios. The remaining baseline alternatives are then LFG2 (for LFG treatment) and P6 (for power generation).</p> <p>Hence, the identified baseline scenarios are LFG2 (the atmospheric release of landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odor concerns) and P6 (obtaining electricity from existing and/or new grid-connected power plants), which coincide with the actual situation before project implementation as stated in PDD section A.2. It was also confirmed that both scenarios LFG2 and P6 would abide by the same applicable norm NOM-083-SEMARNAT (Ref.17)</p>	
B.3.2. Are all tools/procedures in the methodology correctly applied to identify the most reasonable baseline scenario? This includes all potential realistic and credible baseline scenarios in the discussion taking into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	VVM Para.81/82*86a-d/83/84 PDD Section B.4/B.5	DR	The PDD addresses all the potential scenarios that would have a comparable output with the project activity and includes a description of the technology that would be employed. The PDD follows the scenarios proposed by the methodology: LFG1, LFG2, H1 through H7, and P1 through P6.	OK
B.3.3. Is the choice of the baseline compatible with the available data?	VVM Para.86b-c/95 PDD Section B.4/B.5	DR, SV	According to the PDD, the baseline scenario is the atmospheric release of LFG. In sub-step 1b for selecting the baseline scenario, PDD states that the federal norm NOM-083-SEMARNAT-2003 (which requires combustion of LFG however no specific amount of LFG for combustion is stipulated) is not enforced in Mexico because landfills are the responsibility of the municipalities, who have control of solid waste disposal, and because the norm has never been enforced. During an interview with representatives of the municipality of Leon, it was confirmed that indeed the federal norm NOM-083-SEMARNAT-2003 is systematically not enforced in Mexico. This has also been widely known from other registered CDM landfill projects.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.3.4. Is conservativeness addressed in the way of identifying the baseline?	VVM Para.90 PDD Section B.4/B.5	DR	<p>Previously the PDD assumptions for determining the baseline were found very conservative as an adjustment factor of 6% had been chosen, even though no methane destruction was carried out in the baseline scenario. However, as there was no supporting evidence available for the previously used AF of 6%, the project participant has properly justified the change in AF value to 0% (please refer to CL 24), considering that:</p> <ul style="list-style-type: none"> - During site visit there was no sign of combustion in the wells observed in the landfill; - SCS states that has been performing projects for PASA since 2007, and since early 2007 to the present has not witnessed any combustion of LFG in the existing LFG venting well system (Ref.78); - SCS statement (Ref.78) confirms that the current construction of the LFG venting wells is not appropriate to perform passive combustion of the LFG since the main conduit is constituted of polyvinyl chloride (PVC) plastic pipe. The low heat distortion temperature (softening temperature) compared with other plastics of the similar molecular structure was confirmed in the official website of PVC products (http://www.pvc.org/What-is-PVC/PVC-s-physical-properties/Heat-Distortion-Temperature-softening-temperature). - Municipality states that one person working for the municipality who is responsible to observe the activities in the landfill since 2001 has not witnessed any combustion of LFG in the existing LFG venting well system; <p>Hence, it is confirmed that no LFG burning could have taken place in the venting wells installed historically, hence AF = 0% is found applicable to the project activity.</p>	OK
B.3.5. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	VVM Para.90/91 PDD Section B.4/B.5	DR	The baseline represents the most likely scenario among the other possible scenarios discussed in the PDD; please refer to section B.3.1 above.	OK
B.3.6. Is there a verifiable description of the baseline scenario? Does this include a description of the technology that would be	VVM Para.86e/85 PDD Section B.4/B.5	DR, SV	The description of the baseline scenario is verifiable; the baseline scenario LFG2 was verified during site visit and through an interview with the municipality (please refer to section B.3.4 above); and scenario P6 (power plants connected to the grid) is valid as the project proponent currently uses electricity from the grid and would continue to do so even after initial project implementation, unless it decides to generate power on site	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
employed and/or the activities that would take place in the absence of the proposed CDM project activity?			using LFG.	
B.4. Additionality				
B.4.1. Does the PDD clearly demonstrate the additionality using the approach as specified in the methodology and by following all the required steps?	VVM Para.67d/95 PDD Section B.1/B.4/B.5	DR	Yes, additionality is demonstrated using the Additionality tool, as indicated by the methodology.	OK
B.4.2. In case of using the additionality tool: Is the 'Additionality Tool' used in the PDD latest version? If an earlier version has been used, do the changes impact the discussion in the PDD? Are all steps followed in a transparent manner?	PDD Section B.1/B.4/B.5	DR	According to the Additionality Tool, a financial analysis of the proposed project activity without the revenues of CDM must be done in Step 2. However, an investment analysis is carried out for each of the identified alternatives to the project activity. In addition, a simple cost analysis was chosen in PDD when applying step 2 of the Additionality Tool. However, it has been stated in the PDD that generation of electricity is also contemplated for the project activity, which would be for use at the landfill site and/or supply to the local grid, creating economic benefits other than the CDM revenues. It is requested that another option is selected in this step in a revised PDD. <u>CAR 20 was raised.</u>	CAR 20 OK
B.4.3. Has all information been backed up with references, sources and certification? Is the data presented credible and reliable with complete transparency to all available data and documentation?	VVM Para.93/91 PDD Section B		All information and assumptions in the investment analysis have been supported by references and documentation.	OK
B.4.4. Is the discussion on	VVM Para.102b	DR	Project starting date mentioned in PDD version 4 section C.1.1 is 26/10/2007. Since	CL 21

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
<p>additionality and the evidence provided consistent with the starting date of the project?</p> <p>If the project activity start date is prior to the validation is it discussed how the CDM was taken into account in the decision to go ahead with the project activity</p>	PDD Section B.5		<p>leachate evaporation involves new equipment other than for flaring and electricity generation, the project participant was requested to clarify how the starting date was still applicable for the project activity.</p> <p>CL 21 was raised.</p> <p>Please refer to section B.4.5 below for discussion on additionality and evidence of prior consideration of the CDM.</p>	OK
<p>B.4.5. For an existing project activity with a start date before 2 August 2008, for which the start date is prior to the date of publication of the PDD for global stakeholder consultation, is the real documented evidence for an assessment of real and continuing actions available for validation and is this evidence authentic?</p>	EB 49, annex.22	DR	<p>Starting date indicated in section C.1.1 of PDD is 18/06/2008; hence start date is prior to 2 August 2008. The 2nd publication of the PDD for ISHC took place on 13 Feb 2009; hence the start date is prior to the date of 2nd publication of the PDD. Therefore, requirements 6a) and b) of the Guidelines must applied. To this extent, a Technical Memorandum from Conestoga Rovers & Associates (Ref.18) was issued to PASA on 13 April 2006, which delivered the results of a landfill gas production assessment regarding a potential project “to generate greenhouse gas (GHG) emission reduction credits that may be sold to generate revenue.” This evidence indicates the awareness of the CDM prior to the project activity start date and that the benefits of the CDM were a decisive factor in the decision to proceed with the project. With less than 2 years of a gap between the following documented evidences, the DOE has determined that continuing and real actions were taken to secure CDM status for the project activity:</p> <ul style="list-style-type: none"> • An Emission Reduction Purchase Agreement between León Municipality and PASA (landfill operator and CDM project sponsor) with respect to the CER rights within the CDM was signed on 20 March 2007 (Ref.27). • Also, a contract was signed on 26 October 2007 between PASA and SCS Engineers for engineering services related to landfill gas capture and use (Ref.19) 	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<ul style="list-style-type: none"> A Letter of Approval (LoA) from the Mexican DNA (SEMARNAT) identified as #180 / 2007 was issued on 14 December 2007 (Ref. 13) for the project "Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León." A contract between SGS and MGM (consultant) for CDM validation was signed on 21 December 2007. In addition, a price quote for the flare was issued by John Zink to PASA on 6 February 2008 (Ref.59). A request to modify the LoA was submitted to the Mexican DNA on 18 March 2009 (Ref. 51), in order to reflect the change of project participants in the PDD. An English and Spanish version (Ref. 13a – 13b) of the updated Mexican LoA was provided. The new Letter of Approval is dated March 18, 2009 and identified as #216/2009, in replacement of #180/2007 (ID of previous LoA). A price quote for the leachate evaporator was issued by Ecologix Environmental Systems LLC to PASA on 29 May 2008 (Ref.60). 	
B.4.6. If an investment analysis has been used, has it been shown that the proposed project activity is economically or financially less attractive than at least one other alternative without the revenue from the sale of CERs?	VVM Para. 106, 107, 109 ^a 12a-c PDD Section B.5	DR	<p>According to the Guidance on the Assessment of Investment Analysis (Annex 45 of EB 41), "the period of assessment should not be limited to the proposed crediting period of the CDM project activity." The guidance further states that "both project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime) (...)". It was verified in the economic analysis spreadsheet of the project that the economic assessment covers the period from 2007 to 2019 (13 years), which does not correspond to the technical lifetime of the project as mentioned in section C.1.2 of PDD. Thus, <u>CL 22 was raised</u> to request clarification regarding this period of assessment.</p> <p>a) The PP was requested to provide the rationale and break-up of the annual landfill investment cost of US\$ 120,000.</p> <p>b) PP was also requested to provide the rationale and break-up of the landfill investment cost of US\$ 445,000 added every 10th year.</p> <p><u>CAR 41 was raised.</u></p> <p>a) Furthermore, the PP was requested to provide evidence for the contingency (15%) taken for mechanical equipment and electrical equipment installation;</p> <p>b) As well as for levelized top ends and levelized major overhauls.</p> <p><u>CAR 42 was raised.</u></p>	<p>CL 22</p> <p>CAR 41</p> <p>CAR 42</p> <p>CAR 43</p> <p>CAR 44</p> <p>CAR 45</p> <p>OK</p>

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>In a normal scenario, it would be unrealistic to assume that there would be no increase in the electricity tariff rate in coming years. The PP was requested to explain why no annual price escalation was considered in the tariff rate of electricity.</p> <p><u>CAR 43 was raised.</u></p> <p>a) "It was also requested to provide evidence for the depreciation rate and type (WDV/SLM) applicable for corporate tax calculation.</p> <p>b) It is a general accounting practice to deduct the carried forward losses of previous years from the present profit to calculate tax. PP was requested to explain why losses were not carried forward in the tax calculation.</p> <p><u>CAR 44 was raised.</u></p> <p>a) "Since the cash flows were changing signs frequently, the use of simple IRR formula would not yield correct result. Hence NPV should be used as the financial indicator.</p> <p>b) NPV calculated did not include cash flows for all the years. PP was requested to correct it to include cash flows for 23 years (Cell D to AB).</p> <p><u>CAR 45 was raised.</u></p>	
B.4.7. If a benchmark is used, is it ensured that it is selected in accordance with the requirements of the tool /methodology and it represents standard returns in the market (not linked to the subjective profitability expectation or risk profile of a particular project developer).	VVM Para. 110 PDD Section B.5	DR	<p>According to the Additionality Tool, discount rates and benchmarks can be derived from "government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert or documented by official publicly available financial data." It was verified that the benchmark determined for the project activity is based on Mexican government bonds. The discount rate used was 10.6%, which according to the PDD, was the commercial interest rate for fixed rate loan for November 2007 as per data published by Central Bank of Mexico.</p> <p>a) The PP was requested to provide documentary evidence for the applicable interest rate for small amount of loans for medium or small size companies.</p> <p>b) PP was also requested to provide documentary evidence for the applicable risk premium on the technology.</p> <p><u>CAR 40 was raised.</u></p>	CAR 40 OK
B.4.8. If a barrier analysis has been used, has it been shown that the proposed	VVM Para. 114	DR	<p>Initially it was not possible to confirm the investment barriers mentioned in section B.5 of PDD (Ref. 1b), as no reference was provided (i.e. on the low tipping fees mentioned). Therefore, <u>CL 23 was raised</u> to request evidence of these assumptions.</p>	CL 23 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
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?	^a 15a-b/116 PDD Section B.5			
B.4.9. Is the discussion on additionality consistent with the identification of all plausible and credible baseline scenarios?	VVM Para. 105 PDD Section B.5	DR	Yes, the choice of the alternatives is consistent with the scenarios selected in the discussion on the most likely baseline. Please see section B.3.1.	OK
B.4.10. Do the identified baseline scenarios include technologies and practices that include outputs or services comparable with the proposed CDM project activity? Do they also abide by the same applicable laws and legislations?	VVM Para. 105 PDD Section A.4.3/B.5	DR	As explained in section B.3.1, the identified baseline scenarios are LFG2 (the atmospheric release of landfill gas or partial capture of landfill gas and destruction to comply with regulations or contractual requirements, or to address safety and odor concerns) and P6 (obtaining electricity from existing and/or new grid-connected power plants). It was confirmed that both scenarios LFG2 and P6 would abide by the same applicable norm NOM-083-SEMARNAT (Ref.17).	OK
B.4.11. Has it been shown that the project is not common practice?	VVM Para. ^a 19a/b PDD Section B.5	DR, SV	Through an interview conducted with the Leon municipality, it was confirmed that no landfills that are not CDM project activities are currently flaring biogas in Mexico, except for a landfill gas to energy project in Monterrey, Nuevo Leon funded with subsidies from the Global Environment Facility, as stated in the PDD section B.5. Furthermore, it was confirmed that the norm NOM-083-SEMARNAT (which requires LFG burning despite not specifying an amount) is systematically not enforced in Mexico, as is also generally known for other CDM landfill projects in Mexico.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
B.4.12. What are the key distinctions between the project activity and any similar projects that are widely used as common practice?	VVM Para. 118, 119c/d PDD Section B.5	SV	Please see section B.4.11 above.	OK
B.5. Application of the Baseline Methodology				
B.5.1. Has the approved methodology been applied correctly for determining baseline emissions ?	VVM Para. 91d PDD Section B (B.6–1 –B.71)	DR	<p>According to the methodology ACM0001 v.9.1 the formula for calculating baseline emissions is the following;</p> <p>Bey = (MDProject,y – MDBL,y) * GWPCH4 + ELLFG,y · CEFelec,BL,y + ETLFG,y * CEFther,BL,y</p> <p>As stated in the PDD, thermal energy would not be delivered from combustion of fossil fuels in the absence of the project activity, since leachate would not be evaporated in the baseline scenario. Hence, ETLFG,y and CEFther,BL,y equal zero. Therefore, the equation can be reduced to:</p> <p>Bey = (MDProject,y – MDBL,y) * GWPCH4 + ELLFG,y · CEFelec,BL,y</p> <p>The components of the equation were verified in the PDD as follows:</p> <p><u>Mdproject,y</u></p> <p>MDProject,y = BECH4,SWDS,y/GWPCH4</p> <p><u>BECH4,SWDS,y</u></p> $BE_{CH4,SWDS,y} = \phi \cdot (1-f) \cdot GWP_{CH4} \cdot (1-OX) \cdot \frac{16}{12} \cdot F \cdot DOC_f \cdot MCF \cdot \sum_{x=1}^y \sum_j W_{j,x} \cdot DOC_j \cdot e^{-k_j \cdot (y-x)} \cdot (1 - e^{-k_j})$ <p>Φ = Model correction factor to account for model uncertainties. Value of 0.9 is applied, as required by the Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site.</p> <p>F = Fraction of methane captured at the SWDS and flared, combusted or used in another manner. The tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site estimates methane generation adjusted for, using adjustment factor (f) any landfill gas in the baseline that would have been captured and</p>	<p>CL 24</p> <p>CL 18</p> <p>CAR 25</p> <p>CAR 26</p> <p>CL 27</p> <p>CAR 28</p> <p>CAR 29</p> <p>CL 30</p> <p>CAR 31</p> <p>Also see CAR 6</p> <p>OK</p>

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>destroyed to comply with relevant regulations or contractual requirements, or to address safety and odor concerns. As this is already accounted for in equation 2, “f” in the tool shall be assigned a value 0.</p> <p>GWpch4 = Global Warming Potential value for methane for the first commitment period is 21 tCO₂e/tCH₄ (please see also section B.6 for ex-ante data).</p> <p>OX = Oxidation factor (reflecting the amount of methane from SWDS that is oxidized in the soil or other material covering the waste). According to the tool to determine methane emissions, a value of 0.1 should be used for managed SWDS that are covered with oxidizing material such as oil or compost; for other types of SWDS, 0 should be used. OX used is 0.0; soil is not covered with oxidizing material as verified in EIA (Ref. 33).</p> <p>F = Fraction of methane in the SWDS gas (volume fraction). A default value of 0.5 is applied by the project (verified), as recommended by IPCC.</p> <p>DOCf = Fraction of degradable organic carbon (DOC) that can decompose. Value applied is 0.5 as per IPCC 2006 Guidelines (verified).</p> <p>MCF = Methane correction factor. Accounts for the fact that unmanaged SWDS produce less methane from a given amount of waste than managed SWDS, because a larger fraction of waste decomposes aerobically in the top layers of unmanaged SWDS. As per IPCC Guidelines, 1.0 should be applied for anaerobic managed SWDS; 0.5 for semi-aerobic managed SWDS; 0.8 for unmanaged SWDS, deep and/or with high water table; and 0.4 for unmanaged-shallow SWDS. MCF used for the project is 1.0, verified correct according to the EIA (Ref. 33).</p> <p>W_{j,x} = Amount of organic waste type j prevented from disposal in the SWDS in the years x (tons).</p> <p>DOC_j = Fraction of degradable organic carbon (by weight) in the waste type j. Values were used on a wet basis.</p> <p>K_j = Decay rate for the waste type j. IPCC values used from the wet, boreal and temperate range. Correct as verified in the landfill EIA (Ref. 33) that the climate is temperate with a mean annual temperature of 19.2°C and a mean annual precipitation of 697.6mm.</p> <p>BECH₄,SWDS,y calculation and MDProject,y calculation based on BECH₄,SWDS,y values was verified correct in the PDD and ER spreadsheet.</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p><u>MDBL,y</u> As MD_{BL,y} was verified to not be given/defined in local regulation and/or contract and no historic data exists for LFG captured and destroyed, as per methodology applied, MDBL,y is defined as Mdproject,y * AF.</p> <p>Mdproject,y: See calculation above (MDProject,y = BECH4,SWDS,y/GWPCH4)</p> <p>Adjustment Factor (AF) AF= (C_{BL} / C_{PR})</p> <p>Step 1 Baseline destruction efficiency (C_{BL}) C_{BL} = MD_{Hist}/MG_{Hist}</p> <p>Step 1(a) was verified to be not applicable to project activity since there is no “<i>system for collection and destruction of methane prior to implementation of the project activity...</i>”. Also, Step 1(c) was verified not applicable to project activity since no “<i>specific percentage of the ‘generated’ amount of methane to be collected and destroyed is specified in the contract or mandated by regulations...</i>”. Therefore, PP applies Step 1 (b) of the methodology. A procedure for estimating the amount of landfill gas that would be captured in absence of the project activity used to estimate the MDHist has been described in the PDD.</p> <p>MD_{Hist} In order to estimate the amount of landfill gas that would be captured in absence of the project activity (to estimate MD_{Hist}), the following assumptions were considered and verified:</p> <p><u>Passive gas wells present in the landfill but no flaring / combustion historically conducted. However in baseline scenario PASA would install flares at its passive vents (conservative approach)</u></p> <p>Interviews were conducted with landfill personnel not related to the project activity and it was confirmed that no flaring / combustion has been carried out in the landfill. In this case MDHist would be zero, and Baseline Destruction Efficiency would result zero. Nevertheless, to be conservative PP assumed by the time of PDD version 5 /Ref.1c/ (see further discussion below on AF) that in the absence of the project activity, PASA would install flares at its passive vents.</p> <p><u>Percentage of LFG vented through the Passive System if all were captured</u> PDD states in page 26 that “when there is an adequate number of passive vents</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>distributed throughout the landfill area, the capture efficiency may be 15% to 20%. We assume a value of 20% in order to be conservative." <u>CL 24 was raised</u> to request evidence of this assumption.</p> <p>It was verified that 37% is the average collection efficiency for active gas collection, as per IPCC Guidelines.</p> <p>The basis for the assumptions is clarified in this new section, based on cited evidence. Note that there has been a slight modification in the assumptions. However, the final result on methane destruction in the baseline remains the same.</p> <p>Percentage of chimneys available for flaring</p> <ul style="list-style-type: none"> - <u>1.67 wells per hectarea</u> <p>As verified in the "Macro Cells Plan" identified as LN-03 part of the EIA and dated 08-05-2000 (Ref. 24a – 24d), the area available for disposal in the landfill covers 2 Macro Cells (1 and 2) with approximately 25 hectares each, with 5 remaining hectares designated as buffer zone, comprising a total of approximately 60 hectares for the landfill. Each Macro Cell is divided into 5 cells. Each cell contains 10 vents (passive gas wells), totalizing 100 vents in the whole landfill. It is understood that PP refers to 50 vents in a area of 30 hectares in different sections of the PDD because at this moment Macro Cell 2 is not completed, however it is also understood that in the baseline scenario (future scenario), Macro Cell 2 is assumed to be completed as planned (with 5 cells with 10 passive gas wells each) and to be included in the project boundary. Therefore the baseline scenario would count with a 100 vents in 60 hectares. Even though value of 1.67 wells per hectare stated in the PDD would remain the same for both cases, since $30/50 = 60/100 = 1.67$ wells per hectare, <u>CL18 was raised</u> to ask PP for clarification and revise the PDD where applicable in order to have this information clear throughout the document.</p> <p>Project destruction efficiency (ϵ_{PR})</p> <p>According to the methodology, the calculation of the destruction efficiency of the system in the project activity (step 2 for estimating the AF) can be calculated using two options; one if applying an ex-ante estimation of the AF, and another if calculating the AF ex-post. As verified in the PDD, neither of these options was chosen.</p> <p><u>CAR 25 was raised.</u></p> <p>GWpch4: Global Warming Potential value for methane for the first commitment period</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>is 21 tCO₂e/tCH₄ (please see also section B.6 for ex-ante data).</p> <p>ELLFG,y: Net amount of electricity generated using LFG. Ex-ante estimation for the first 7-year crediting period as per ER spreadsheet (Ref. 10b): 108,000 MWh.</p> <p>CEFelec,BL,y = Efgrid,CM,y:</p> $EF_{\text{grid,CM,y}} = EF_{\text{grid,OM,y}} \times W_{\text{OM}} + EF_{\text{grid,BM,y}} \times W_{\text{BM}}$ <p>As stated in section B.1 of PDD, the “Tool to calculate the emission factor for an electricity system” used for the project activity is version 1. However version 1.1 is available at UNFCCC website.</p> <p><u>CAR 26 was raised.</u></p> <p>Efgrid,OM,y:</p> <p>The PDD states in Annex 3 that “according to the tool, the Dispatch Data Analysis method should be the choice considered, but this method cannot be used for this project activity (...)”. It was not clear which tool the PDD referred to.</p> <p><u>CL 27 was raised.</u></p> <p>According to the Tool to calculate the emission factor for an electricity system, the simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term normals for hydroelectricity production. As verified in the PDD, the simple OM method is chosen (option A), based on choice 1. However, the calculation is based on years from 2002 to 2006.</p> <p><u>CAR 28 was raised</u> because it was verified that there is more recent data available in the Mexican Secretary of Energy website (www.sener.gob.mx).</p> <p>For the calculation of the OM Emission Factor, the Tool provides two options: the ex-ante option (based on a 3-year generation-weighted average of the most recent data available) and the ex-post option. PDD page 88 states that the ex-ante option is selected. As verified, Calculation of Mexican grid Emission Factor (Ref. 20) takes into account years 2004, 2005 and 2006.</p> <p><u>CAR 29 was raised</u> because it was verified that there is more recent data available in the Mexican Secretary of Energy website (www.sener.gob.mx).</p> <p>According to the tool, option A for the Simple OM calculation should be preferred and must be used if fuel consumption data is available for each power plant / unit. It was</p>	

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>verified in the PDD that Option C was chosen, and no further justification has been provided.</p> <p><u>CL 30 was raised.</u></p> <p>Efgrid,BM,y:</p> <p>As indicated by the Tool for calculating the emission factor for an electricity system, step 4 for identifying the sample of power units to calculate the build margin states that the sample should be made from the most recently built power units in the system. Table 3.10 of PDD makes reference to table 19 of document "Electricity Sector Prospective 2007-2016", which does not show the values reported in PDD (such as power generation), and also does not show data from years 2003, 2004 and 2005 which are reported in PDD. Nevertheless, the same study equivalent to the cited document was identified in the Ministry of Energy website (www.sener.gob.mx) as a more recent source of data. PP was requested to update this data in the PDD with consideration of the observations in paragraph above.</p> <p><u>CAR 31 was raised.</u></p>	
B.5.2. Has the approved methodology been applied correctly for determining project emissions ?	VVM Para. 90/91d PDD Section B (B.6.2-B.71)	DR	<p>The approved methodology has been correctly applied for determining project emissions. According to ACM0001, project emissions are calculated based on the emissions from consumption of electricity and emissions from consumption of heat using the following formula:</p> $PE_y = PE_{EC,y} + PE_{FC,j,y}$ <p>As per methodology, the project emissions from electricity consumption ($PE_{EC,y}$) shall be calculated following the latest version of "Tool to calculate baseline, project and/or leakage emissions from electricity consumption". If in the baseline a part of LFG was captured then the electricity quantity used in calculation is electricity used in project activity net of that consumed in the baseline. In this regard there are no baseline emissions for this case, since project electricity consumption is associated with landfill gas capture and flaring, and there is no active capture of LFG prior to project implementation.</p> <p>As the project case involves no consumption of heat, project emissions from heat consumption are zero, and therefore $PE_y = PE_{EC,y}$.</p> <p>The tool presents three different scenarios for the sources of electricity consumption, and the El Verde Landfill Project corresponds to Scenario A: Electricity consumption from the grid. According to the tool, project emissions from electricity generation are</p>	CL 39 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>calculated as follows:</p> $PE_{EC,y} = \sum_j EC_{PJ,j,y} \times EF_{EL,j,y} \times (1 + TDL_{j,y})$ <p>$EC_{PJ,j,y}$ is the quantity of electricity consumed by the project electricity consumption source j in year y (MWh/yr). It was verified that project emissions are based on power consumption of the blower and evaporator for the first 2 years of the project starting in 2010, as electricity generation from LFG will only start in 2012. Power consumption for these equipments is calculated on the basis of:</p> <p>Captured LFG for the project in m3/yr * calculated amount of 0.009975 kWh consumed by <u>blower</u> per m3 of LFG {which is calculated from a 25 HP per 1869 m³/h of LFG, 1100 SCFM} / 1000 {for conversion to MWh/yr} + (24.7kW needed per hour by <u>evaporator</u> * 8,760 working hours per yr) / 1000 {for conversion to MWh/yr}. Values used as electricity consumption capacities for the blower and evaporator have been verified in manufacturer quotes /Ref.59/ and /Ref.60/ respectively and were confirmed correct. Nevertheless, PP has recently revised PDD to consider working hour for the leachate evaporator as 7,280 h/year (no longer 8,760 h/year). PP was requested to revise cell V7 accordingly (page 40 of PDD) and to make sure all documents had addressed recent changes made to PDD and associated documents.</p> <p>Also in regards to project emissions, PP was requested to clarify:</p> <ol style="list-style-type: none"> 1) Why energy consumed for equipment start up was not being considered in ER calculation, since it is expected that this energy will be used even in the presence of the electricity generated on site. 2) If any project emissions are expected with the use of leachate evaporator technology (documented evidence was requested) <p>Also PP was requested to include text of project emissions in appropriate section as it was in page 32, and should be above in "Project Emissions". <u>CL 39 was raised.</u></p> <p>$\square_{apourE}f_{grid,y}$ is 0.5126 tCO₂e/MWh (Combined Margin) calculated using the "Tool to calculate the emission factor for an electricity system". Please refer to section B.5.1 above.</p> <p>TDL is 20%. Default value given in the Tool to calculate baseline, project and/or leakage emissions from electricity consumption, version 1.</p>	
B.5.3. Has the approved	VVM Para.	DR	No leakage effects need to be accounted under this methodology.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
methodology been applied correctly for determining leakage ?	91d PDD Section B (B.6–2 –B.71)			
B.5.4. Where applicable, has the approved methodology been applied correctly for the direct calculation of emission reductions ?	VVM Para 88/91d PDD Section B (B.6–2 –B.71)	DR	Direct calculation of emission reductions has been correctly applied in the PDD (Ref.1) and ER spreadsheet (Ref. 10), following the methodology formula: $ER_y = B_y - PE_y$	OK
B.5.5. Where there is an option between different equations or parameters, has the methodological choices for the project been explained, have they been properly justified and are they correct?	VVM Para.89/90/91 PDD Section B (B.6–2 –B.71)	DR	According to the methodology, the calculation of the destruction efficiency of the system in the project activity (step 2 for estimating the AF) can be calculated using two options; one if applying an ex-ante estimation of the AF, and another if calculating the AF ex-post. As verified in the PDD, neither of these options was chosen. <u>CAR 25 was raised.</u> The methodological choices for the project have been properly justified and are correct. Please also see section B.5.1.	CAR-25 OK
B.5.6. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	PDD Sections B.5-C	DR	See section B.5.1	OK
B.6. Ex-ante Data and Parameters Used				
B.6.1. Are the data provided in compliance with the methodology?	VVM Para. 91/67c	DR	The following ex-ante parameters are shown in the monitoring plan: Regulatory requirements relating to landfill gas projects GWPC4	CL-32 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
	PDD Section B.6.3B.6.4		DCH4 BECH4, SWDS.y CEFelec,BL,y = Efgrid,CM,y However, ex-ante parameters MDHist and MGHist listed in methodology are excluded in the PDD. Also, parameters CEFelec,BL,y (= Efgrid,CM,y) that are available in PDD are not enlisted as ex-ante parameters in methodology. <u>CL32 was raised</u> to request clarification to project proponent.	
B.6.2. Is all the data derived from official data sources or replicable records and have these been correctly quoted?	VVM Para. 91a/b PDD Section B.6.3/B.6.4	DR	Yes, all data has been derived from official sources and were correctly quoted. Please refer to section B.9.1 below.	OK
B.6.3. Is the vintage of the baseline data correct?	PDD Section B.6.3/B.6.4	DR	Refer to CAR 28, 29 and 31. Most recent data has been applied and vintage can be deemed conservative.	OK
B.6.4. Is all the data appropriate and correctly applied to the CDM project activity?	VVM Para. 91c PDD Section B.6.3/B.6.4	DR	All the data is appropriate and has been correctly applied to the CDM project activity as per methodology ACM0001.	OK
B.6.5. Are data and parameters that are not being monitored and remained fixed throughout the crediting period appropriately assessed, correct, and will they result in conservative estimates?	VVM Para. 90 PDD Section B.6.3/B.6.4	DR	Yes, the data and parameters that remain fixed throughout the crediting period have been properly assessed and are correct. Please refer to section B.6.1 above.	OK
B.7. Calculation of Emissions Reductions				
B.7.1. Has the approved methodology been applied correctly for determining emission reductions ?	VVM Para. 91d PDD Section	DR	The methodology has been applied exactly as defined. The PDD clearly states which equations are being used in calculating baseline emissions and all the required steps/calculations have been followed.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
	A.4.4/B.6			
B.7.2. Are the emission reduction calculations documented in a complete and transparent manner?	VVM Para. 91e PDD Section B.6	DR	All equations and steps were followed in the PDD as per methodology ACM0001 version 9.1 and are documented in a complete and transparent manner.	OK
B.7.3. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	PDD Section B.6	DR	Projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period (7 years, renewable).	OK
B.7.4. Is the calculation of the emission reduction correct?	VVM Para. 91e PDD Section B.6	DR	Formulas for calculation of emissions and emission reductions have been correctly applied.	OK
B.8. Emission Reductions				
B.8.1. Is the form/table required for the indication of projected emission reductions correctly applied?	PDD Section A.4.4/ Section B.6	DR	Emission Reduction Table should not have legend as it was used from the Guidelines for Completing the Project Design Document (CDM-PDD). Please make the necessary adjustments. <u>CAR 3 was raised.</u>	CAR 3 OK
B.8.2. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	PDD Section A.4.4/ Section B.6	DR	Projection is in line with the envisioned time schedule for the project's implementation (operation lifetime of 23 years) and the indicated crediting period (7 years, renewable). Initially the operation lifetime of the project activity could not be clearly identified in the PDD because: 1. According to the PDD, page 2, "Since landfill gas continues to be produced for many years afterwards, the proposed project is expected to have a useful life to December 2029". The ER spreadsheet shows in section "PDD-FS" values for LFG to be captured within the project activity (Column U): 2009 is shown as the first year to have LFG captured and 2029 as the last year to have LFG captured (also illustrate in a graphic), totalizing 21 years (same as 7x3 = crediting period renewable) 2. The PDD section C.1.2 states that the <i>operational lifetime</i> of the project is 23 years;	CL 11 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>A <u>CL11 was raised</u> to ask PP to clarify:</p> <ol style="list-style-type: none"> 1. What PP means with the term “useful lifetime” in the PDD text (point 1 above); 2. How the operation lifetime has been calculated for the proposed project activity taking into account the methane collection and equipments lifetime (point 2 above). PP was asked to take into consideration that the CDM Glossary of terms defines the operational lifetime as “<i>the period during which the project activity or CPA is in operation. No crediting period shall end after the end of the operational lifetime (calculated as from starting date)</i>”. 	
B.9. Monitoring Methodology				
<p>B.9.1. Does the monitoring methodology provide a consistent approach in the context of all parameters to be monitored and further information provided by the PDD?</p> <p>Are all parameters and data that are available at validation consistent with the approved methodology. Has this data been interpreted and applied correctly?</p>	<p>VVM Para. 67e PDD Section B.7-B.8 see also Annex 4</p>	DR	<p>Data available at validation (also refer to section B.6.1 above):</p> <p>Regulatory requirements relating to landfill gas projects: Used to determine the adjustment factor ex-ante. Based on the federal norm NOM-083-SEMARNAT-2003 (Ref.17), which defines the specifications for environmental protection from the selection, design, construction and operation, monitoring and closure of final disposal sites for urban and special solid waste. It provides guidance regarding LFG, including recommendations for the collection, utilisation and/or flaring of the LFG. However, the regulation does not specify minimum requirements regarding the amount of gas to be collected and utilised or flared. Moreover, as shown in the PDD and verified through interviews with the municipality, this norm is systematically not enforced in Mexico. In the absence of the proposed project, all the landfill gas will be released to the atmosphere. Therefore AF is 0% (please refer to section B.3.4)</p> <p>GWPC_{H4}: Value applied is 21 tCO₂e/tCH₄ (as specified in the methodology).</p> <p>DCH₄: At standard temperature and pressure (0 degree Celsius and 1,013 bar) the density of methane is 0.0007168 tCH₄/m³CH₄ (as specified in the methodology).</p> <p>BECH₄, SWDS.y: Calculated correctly, as per formula in the Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site, version 4. Estimated value applied: 1,861,795 t CO₂e.</p> <p>CEFelec,BL,y = Efgrid,CM,y: 0.5126 tCO₂e/MWh (Combined Margin) calculated using the “Tool to calculate the emission factor for an electricity system”</p>	OK
<p>B.9.2. Does the monitoring methodology apply consistently the choice of</p>	<p>PDD Sections B and C</p>	DR	<p>Yes, the monitoring methodology and parameters to be monitored comply with the choice of the project activity (captured LFG is flared and used to produce energy, e.g. electricity/thermal energy).</p>	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
the option selected for monitoring both of project and baseline emissions?				
B.10. Data and Parameters Monitored				
B.10.1. Does the monitoring plan in the PDD comply with the approved methodology provided for the collection and archiving of all relevant data necessary for estimation or measuring the emission reductions within the project boundary during the crediting period?	VVM Para. ^a 91a/91d/121/79 PDD Section B.7-B.7.2	DR	<p>The following monitoring parameters from the methodology are mentioned in the PDD :</p> <p>LFGtotal-y – Total amount of landfill gas captured at normal temperature and pressure</p> <p>LFGflare-y – Amount of landfill gas flared at normal temperature and pressure</p> <p>LFGthermal-y – Amount of landfill gas combusted in leachate evaporator at normal temperature and pressure</p> <p>LFGelectricity-y – Amount of landfill gas combusted in power plant at normal temperature and pressure</p> <p>Peflare-y – Project emissions from flaring of the residual gas stream in year y</p> <p>wCH4-y – Methane fraction in the landfill gas–T – Temperature of the landfill gas–P – Pressure of the landfill gas</p> <p>ELL-G – Net amount of electricity generated using LFG.</p> <p>Operation of the power plant</p> <p>Operation of the flare station</p> <p>PEEC-y – Project emissions from electricity consumption by the project activity during the year y</p> <p>PEFC,j-y – Project emissions from fossil fuel combustion in process j during the year y</p> <p>PDD states in section B.5 that no combustion CO2 emissions for any fuel displaced by the thermal energy use of the LFG are being claimed for in the project activity. However, the monitoring plan includes parameter LFGthermal,y (amount of methane combusted in boiler at Normal Temperature and Pressure) while excluding parameter ETLFG (total amount of thermal energy generated using LFG) and “operation of the boiler.” It remains unclear whether the project will claim emission reductions from the use of LFG for thermal energy.</p> <p>Also, parameter name “operation of the power plant” does not comply with the methodology, and parameter “operation of the flare station” is not part of the monitoring parameters available in the methodology. Finally, parameter MGPR,y (amount of</p>	CL-33 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			methane generated during year y of the project activity) as per methodology is not included in the monitoring plan. <u>CL 33 was raised</u> to request clarification from project proponent.	
B.10.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	PDD Section B.7-B.7.2/B.6.2	DR	The GHG indicators are reasonable and in conformance with the requirements set by the approved methodology applied.	OK
B.10.3. Will it be possible to determine the specified project GHG indicators?	PDD Section B.6.2-B.8	DR	The specified project GHG indicators have been properly listed in section B.7.1 and will allow a proper implementation of the monitoring plan.	OK
B.10.4. Is the information given for each monitoring variable by the presented table sufficient to ensure the verification of a proper implementation of the monitoring plan?	PDD Section B.6.2-B.7.1	DR	<p>The information and procedures given for each monitored parameter listed in Section B.7.1 are sufficient to ensure the verification of a proper implementation of the monitoring plan:</p> <p>LFGtotal – Measured in Nm³ by a flow meter Data will be measured at least once per hour, recorded electronically, and will also be aggregated monthly/yearly.</p> <p>LFGflare – Measured in Nm³ by a flow meter. Data will be measured for each flare at least once per hour, recorded electronically, and will also be aggregated monthly/yearly.</p> <p>LFGthermal – Measured in Nm³ by a flow meter. Data will be measured for each power plant at least once per hour, recorded electronically, will also be aggregated monthly/yearly.</p> <p>LFGelectricity – Measured in Nm³ by a flow meter Data will be measured for each power plant at least once per hour, recorded electronically, will also be aggregated monthly/yearly.</p> <p>Pe flare – calculated as tCO₂e The parameters used for the determination of PE_{flare,y} are LFG_{flare,y}, w_{CH₄,y}, fv_{i,h}, fv_{CH₄,FG,h} and t_{O₂,h}, T_{flare} Regular maintenance will ensure optimal operation of the flare. Analysers will be calibrated according to manufacturer's recommendations.</p> <p>W_{CH₄,y} – Measured in m³ CH₄ / m³ LFG by a gas analyzer</p>	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			<p>Data will be measured at least once per hour, recorded electronically, and will also be aggregated monthly/yearly. Gas analyzers should be subject to a regular maintenance and testing regime to ensure accuracy.</p> <p>T – Measured in °C. No separate monitoring of temperature is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters (Nm³).</p> <p>P – Measured in Pa. Data will be measured with pressure analyser at least once per hour, recorded electronically. Data will also be aggregated monthly/yearly. Records will be kept during the crediting period and two years after. No separate monitoring of pressure is necessary when using flow meters that automatically measure temperature and pressure, expressing LFG volumes in normalized cubic meters (Nm³).</p> <p>EL_{LFG} – Measured by an electric meter in MWh The readings will be made at least once per hour and electronically stored in a spreadsheet. Moreover, the meter will be calibrated periodically according to manufacturer's specification.</p> <p>Operation of the energy plant – Measured in hours with run meter connected to the power plant. Run meter will be calibrated according to manufacturer specifications.</p> <p>Operation of the heat generating equipment plant – Measured in hours with run meter connected to the evaporator. The meter will be calibrated according to manufacturer specifications.</p> <p>Tflare – measured in °C by a thermocouple Continuous measurement of the temperature of the exhaust gas stream in the flare by a thermocouple. A temperature above 500 °C indicates that a significant amount of gases are still being burnt and that the flare is operating. Thermocouples will be replaced or calibrated every year.</p>	
B.10.5. Is the information given for each monitoring variable by the presented table sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	PDD Section B.6.2-B.7.1	DR	Yes, the information given for each monitoring variable by the presented table is sufficient to ensure delivery of high quality data. Please see section B.10.4 above.	OK
B.10.6. Is the monitoring approach	PDD Section B.5-	DR	Yes, the monitoring plan will ensure the delivery of high quality data.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	B.7.2			
B.10.7. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	PDD Section B.6.2-B.7.1	DR	The formulae used to determine project emissions is clearly indicated in the PDD and ER spreadsheet and was found in compliance with the monitoring methodology.	OK
B.11. Quality Control (QC) and Quality Assurance (QA) Procedures				
B.11.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	VVM Para. 121 Refer to all data within the PDD Inc. B.6.2-B.7.1	DR	PDD states that the PASA Technical Team will be responsible for data monitoring. The Landfill Gas Operators will conduct monitoring of key variables, with supervision of the Landfill Gas Project Engineer. Other staff persons will be assigned by the Landfill Gas Project Engineer to assist in the monitoring tasks, as needed. According to the PDD, certain activities (calibration of flow meters and electric meters) would be conducted by independent, outside laboratories, with the data archived by the landfill and PASA Project and Development and Investigation Departments.	OK
B.11.2. Is the belonging determination of uncertainty levels done correctly for each ID in a correct and reliable manner?	Refer to all data within the PDD Inc. B.4/B.7.2/Annex 4	DR	Regarding calibration and data uncertainties, section B.7.1 states that the flow meters will be subject to a regular maintenance and testing regime to ensure accuracy. Also, an independent company, accredited by local authorities, will conduct contrasting and data checking in accordance with manufacturer specifications.	OK
B.11.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	VVM Para 121	DR	Yes, it was verified that the monitoring plan in section B.7 safeguards the proper operations of all data capture, data analysis and data compilation systems to be employed by the project participants. The Operational Management Structure laid out in figure 6 ensures the quality control of the data.	OK
B.11.4. Is it ensured that data will be bound to national or internal reference	VVM Para. 86d	DR	Monitoring data will be clearly reproducible and comparable; Section B.7.2 of PDD states that all data recorded would be transferred to and stored as electronic spreadsheets and other electronic files. The electronic data would be used in a	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
standards?			spreadsheet procedure in order to calculate emissions reductions. Also, PASA will maintain hard copies of all data collected. The original data, the calculation procedures and the resulting emission reductions will be made available to an independent Designated Operational Entity (DOE). Thus, both electronic and hard copies of all monitoring variables will be archived onsite.	
B.11.5. Is it ensured that data provisions will be free of potential conflicts of interests resulting in a tendency of overestimating emission reductions?	VVM Para. 19	DR	The Operational Management Structure laid out in figure 6 ensures the quality control of the data and that data provisions will be free of potential conflicts of interests.	OK
B.12. Operational and Management Structure				
B.12.1. Is the authority and responsibility of project management clearly described?	PDD Section B.8/Annex 1	DR	<p>According to the PDD, El Verde landfill is owned by Promotora S.A.B. de C.V (PASA), who is responsible for operation and maintenance as well as all landfill gas related projects and services conceded to PASA by the León de los Aldama in Guanajuato State, Mexico. PASA has experience in different landfills in Mexico (Host country).</p> <p>A concession contract was signed on year 2001 between the Municipality of Leon and PASA (Ref. 31). As verified, this contract concedes PASA the management and operation of El Verde landfill for a period of 15 years. Thus, concession would be expected to end in 2015. Nevertheless, a contract between PASA and the municipality concerning the sharing of CER benefits (Ref. 27) establishes that the contract is valid until 31 December 2012 or, if the Kyoto Protocol extends, until the conclusion of the Kyoto Protocol. This indicates that PASA is owner of the project throughout its entire crediting period, as long as it is valid within the framework of the Kyoto Protocol.</p> <p>PASA experience in several other landfills was confirmed in the firm's website (http://www.gen.tv/pre_rsanitarios.html).</p>	OK
B.12.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	PDD Section B.8/Annex 1	DR	<p>According to the PDD, the project proponent and CDM project investor, PASA, will be responsible for oversight on all aspects involving monitoring and quality control.</p> <p>PDD states that the technical Team of PASA will be responsible for the day-to-day operation of the landfill gas collection, flaring and use system. This technical team would also be responsible for monitoring key variables required for meeting CDM monitoring requirements. Data monitoring will be conducted by Landfill gas Operators</p>	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
			supervised by the Landfill Gas Project Engineer, all of them belonging to the Project and Development and Investigation Departments of PASA. Other staff persons will be assigned by the Landfill Gas Project Engineer to assist in the monitoring tasks, as needed. According to the PDD, certain activities (calibration of flow meters and electric meters) would be conducted by independent, outside laboratories, with the data archived by the landfill and PASA Project and Development and Investigation Departments.	
B.12.3. Are procedures identified for training of monitoring personnel?	PDD Section B.8/Annex 1	DR	It is stated in the PDD that PASA will count on supervision from the flare supplier for training, commissioning and start-up. Similarly, the supplier of the leachate evaporation plant would provide support for training, commissioning and start-up. It further states that if PASA decides to generate electricity using landfill gas, they will acquire either from equipment supplier and/or specialist consultant all the services needed for training related to the operation of the LFG generation system. <u>CL 34 was raised</u> to request verifiable evidences on the training provisions mentioned.	CL 34 OK
B.13. Monitoring Plan (Annex 4)				
B.13.1. Is the monitoring plan developed in a project specific manner clearly addressing the unique features of the CDM activity?	VVM Para. 122a	DR	It was not clear how the quantity of LFG to each component (flare, evaporator, power generator) will be monitored and controlled (i.e. if a threshold for each equipment will be established), and if it will be controlled manually or automatically. <u>CL 35 was raised.</u>	CL 35 OK
B.13.2. Does the monitoring plan completely describe all measures to be implemented for monitoring all parameter required, including measures to be implemented for ensuring data quality?	VVM Para. 122b	DR	According to PDD, the management structure responsible for project monitoring is as follows: All data recorded would be transferred to and stored as electronic spreadsheets and other electronic files. The Landfill Gas Operators will conduct monitoring of key variables, with supervision of the Landfill Gas Project Engineer. Other staff persons will be assigned by the Landfill Gas Project Engineer to assist in the monitoring tasks, as needed. Calibration certificates would be stored as paper copies, although scanned copies may also be stored electronically. PASA will maintain hard copies of all data collected, including calibration certificates for all instruments."	OK
B.13.3. Does the monitoring plan provide information on monitoring equipment and respective positioning in	VVM Para. 122b	DR	Information on the respective positioning of monitoring equipment is not given in the monitoring plan. However, section B.3 presents a flow diagram that shows the respective positioning of monitoring variables and equipment.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
order to safeguard a proper installation?				
B.13.4. Are procedures identified for calibration of monitoring equipment?	VVM Para. 122a-c	DR	PDD states that calibration of flow meters and electric meters will be conducted by independent laboratories, with the data archived by the landfill and PASA Technical Team. Calibration of flow meters will be carried out every 2 years, and the electric meter will be calibrated twice a year. Calibration certificates will be issued by the Calibration Laboratory, and will be filed by the PASA Technical Team.	OK
B.13.5. Are procedures identified for maintenance of monitoring equipment and installations?	VVM Para. 122a-c	DR	The monitoring plan states that flow meters will be subject to a regular maintenance and testing regime. Also, an independent company, accredited by local authorities, will conduct contrasting and data checking in accordance with manufacturer specifications.	OK
B.13.6. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)?	VVM Para. 122a-c	DR	According to PDD, the management structure responsible for project monitoring is as follows: "All data recorded would be transferred to and stored as electronic spreadsheets and other electronic files. Calibration certificates would be stored as paper copies, although scanned copies may also be stored electronically. PASA will maintain hard copies of all data collected, including calibration certificates for all instruments."	OK
B.13.7. Are procedures identified for dealing with possible monitoring data adjustments and missing data allowing redundant reconstruction of data in case of monitoring problems?	VVM Para. 122a-c		Yes, procedures are in place allowing redundant reconstruction of data. Section B.7.2 of PDD states that all data recorded would be transferred to and stored as electronic spreadsheets and other electronic files. The electronic data would be used in a spreadsheet procedure in order to calculate emissions reductions. Also, PASA will maintain hard copies of all data collected. The original data, the calculation procedures and the resulting emission reductions will be made available to an independent Designated Operational Entity (DOE). Thus, both electronic and hard copies of all monitoring variables will be archived onsite.	OK
B.13.8. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	VVM Para.122a-c	DR	According to the PDD, internal audits will be conducted twice a year by the PASA Technical Team. The internal auditor will prepare a report to the Manager of the landfill and the Head of PASA Technical Team on the state of items 1 to 11 (table 8 of PDD). In case of non-conformities, it is stated that PASA will aim to resolve them prior to the annual verification carried out by the DOE. A copy of this report will be filed in the Offices of PASA.	OK
B.13.9. Are procedures identified for project performance	VVM Para.	DR	As stated in section B.13.8 above, the project will be subjected to internal audits for	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
reviews before data is submitted for verification, internally or externally?	122a-c		performance reviews before data is submitted for verification.	
B.13.10. Describe the ability of the project participants to implement the monitoring plan.	VVM Para. 122c	DR, SV	Based on the monitoring procedures and management structure established in the monitoring plan as well as the qualified personnel as observed during site visit, it is determined that the project participant is sufficiently qualified to implement the monitoring plan.	OK
B.14. Baseline Details				
B.14.1. Is there any indication of a date when determining the baseline?	PDD Section B.8/Annex 3	DR	The date of completion of the initial baseline study is stated as 15/12/2007, and the revised baseline study following draft validation report and updated versions of methodologies and tools is stated as 14/11/2008.	OK
B.14.2. Is this consistent with the time line of the PDD history?	Also see revision history of the PDD	DR	Yes, date of completion of initial baseline study is of 15/12/2007; date of revised baseline study is of 14/11/2008, and PDD date of completion is of 5/02//2009.	OK
B.14.3. Is all data required provided in a complete manner by annex 3 of the PDD?	PDD Annex 3	DR	Data on Annex 3 was verified correct according to ER spreadsheet and applied methodology and tools.	OK
C. Duration of the Project / Crediting Period				
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	VVM Para. ^a 02a-c PDD Section C.1.1/C.1.2	DR	The operational lifetime of the project is 23 years as stated in Section C.1.2. Reasonable considering the crediting period of 7 years renewable. Project starting date mentioned in PDD version 4 section C.1.1 is 26/10/2007. However, since leachate evaporation involves new equipment other than for flaring and electricity generation, the project participant was requested to clarify how the starting date was still applicable for the project activity. <u>CL 21 was raised.</u>	CL 21 OK
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7	VVM Para. ^a 02a PDD Section		Defined as 7 years renewable, reasonable considering the operational lifetime of the project. Section C.2.1.1: there are 2 dates considered, and not a conditional statement, e.g. "whichever is later." In addition, the date mentioned in this section (01/01/2009) should be updated to a more realistic timeframe, as the date is earlier than the	CAR 36 OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
years with potential for 2 renewals or fixed crediting period of max. 10 years)?	C.2/C.2.1/C.2.2		validation start date. <u>CAR 36 was raised.</u>	
C.1.3. Does the project's operational lifetime exceed the crediting period	VVM Para. a02a PDD Section C.1.2/C.2.1.1/C.2.1.2	DR	Operational lifetime of the project (23 years) exceeds the first crediting period (7 years) and the three crediting periods altogether (21 years).	OK
C.1.4. Does the start date indicate whether this is a new project activity or a pre-existing project activity?	VVM Para. a02a/ 98 PDD Section C.1.1/C.2.1.1	DR	As per the Guidance on the demonstration and assessment of prior consideration of the CDM (Annex 46 of EB 41), "project activities with a starting date on or after 02 August 2008, the project participant must inform a Host Party DNA and/or the UNFCCC secretariat in writing of the commencement of the project activity and of their intention to seek CDM status." The project activity starting date as per section C.1.1 of PDD is 18 June 2008, which is before 02 August 2008. Therefore, in this case no notification from project participant to a host party DNA and/or the UNFCCC secretariat is necessary.	OK
D. Environmental Impacts				
D.1.1. Does the project comply with environmental legislation in the host country?	VVM Para. 131 PDD section D	DR	The project complies with the applicable federal norm NOM-083-SEMARNAT-2003 (Ref. 17), which defines the specifications for environmental protection from the selection, design, construction and operation, monitoring and closure of the final disposal sites for urban and special solid waste.	OK
D.1.2. Has an analysis of the environmental impacts of the project activity been sufficiently described?	VVM Para. 131 PDD section D	DR	The landfill has conducted an Environmental Impact Assessment (Manifiesto de Impacto Ambiental – Ref. 33) as part of the requirement to obtain the operation license dated 23-11-2000 (Autorización de Manifiesto de Impacto Ambiental – Ref. 52). This Authorization states that the Environmental Impact Assessment presented during the landfill conception and construction complies with the laws in force for LFG capture and use.	OK
D.1.3. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	VVM Para. 131 PDD section D	DR	An Environmental Impact Assessment has been approved and was provided by project proponent (Ref. 33) – Authorization MIA-026-3357/2000 of December 10 th , 2000. Guanajuato State Environment Authority – Institute of Ecology (Instituto de Ecología del Gobierno del Estado de Guanajuato). This Authorization states that the Environmental Impact Assessment presented during the landfill conception and construction complies with the laws in force for LFG capture and use.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
D.1.4. Will the project create any adverse environmental effects?	VVM Para. 131 PDD section D	DR, SV	According to the PDD, LFG combustion would produce small amounts of nitrogen oxides (Nox), particulate matter and carbon monoxide (CO). Although emissions of such gases are not regulated in Mexico, the project would use enclosed flares specially designed to reduce these emissions to minimal levels. Also during site visit, it was confirmed with the municipality of Leon that no adverse environmental effects are expected from the project activity.	OK
D.1.5. Are trans-boundary environmental impacts considered in the analysis?	VVM Para. 131 PDD section D	SV	As confirmed with the municipality of Leon, there are no trans-boundary environmental impacts identified for the project activity.	OK
D.1.6. Have identified environmental impacts been addressed in the project design?	VVM Para. 131 PDD section D	DR, SV	Yes, as explained in section D.1.4 above, and as stated in the PDD, the project will use enclosed flares in order to reduce emissions of nitrogen oxides (Nox), particulate matter and carbon monoxide (CO) that may generate from LFG combustion.	OK
E. Stakeholder Comments				
E.1.1. Have relevant stakeholders been consulted?	VVM Para. 28a PDD Section E.1	DR	There were two consultations conducted for the project, as the initial project activity did not consider the use of LFG for thermal energy, and a second consultation was needed for the validation of the updated project design (version 4), which considers the use of leachate evaporation to generate thermal energy. Thus, the second meeting can be considered as the relevant stakeholder consultation for the purpose of validation. This second consultation was held on January 30 th at the events room of the greenhouse of the Park "Los Cárcamos" León, Guanajuato State, Mexico. According to the PDD, section E.1, a total of 39 people from different parties were invited to attend this meeting; 14 from non-governmental organizations and/or consultancies, 25 from the local and federal government, 3 from the private sector and 15 members of the surrounding communities. A list of people that attended the meeting is provided in PDD, page 75.	OK
E.1.2. Have appropriate media been used to invite comments by local stakeholders?	VVM Para. 28a PDD Section E.1	DR	The means of invitation used for the second local consultation were letters sent on January 23, 2009 by Eleazar López Araiza Alday, General Director of Environmental Protection of the municipality of Leon. Copies of these letters have been provided by project proponent (Ref. 47) and the information above was confirmed correct.	OK

Checklist Question	Ref. ID	MoV*	Comments	Conclusion/ CARs/CLs
E.1.3. Is the undertaken stakeholder process described in a complete and transparent manner?	VVM Para. 128b PDD Section E.1	DR	The undertaken stakeholder process is described in a complete and transparent manner in the PDD as confirmed with invitation letters, photos, assistance list and surveys provided (Ref. 46-49).	OK
E.1.4. Is a summary of the stakeholder comments received provided?	VVM Para. 128b PDD Section E.2	DR	Yes, a summary of the stakeholder comments and questions was provided in section E.3 and were confirmed with copies of the opinion surveys provided (Ref. 46).	OK
E.1.5. Has due account been taken of any stakeholder comments received?	VVM Para. 128b PDD Section E.3	DR	Section E.3 shows that all inquiries that took place during meeting were answered by the project proponent.	OK

References

Reference ID	Title / Description	Comments
/1a/	El Verde PDD version 3 – 19-12-2007 – Published from 09 Jan –8 – 07 Feb 08 at: http://www.sgsqualitynetwork.com/tradeassurance/ccp/projects/project.php?id=420	First PDD published at UNFCCC
/1b/	El Verde PDD version 4 – 11/02/2009 – Published from 13 Feb –9 – 14 Mar 09 at: http://cdm.unfccc.int/Projects/Validation/DB/GBX12JR23264NA0L9ZO1HYZV774RSX/view.html	Second PDD published at UNFCCC
/1c/	El Verde PDD version 5 – 08/05/2009	
/1d/	El Verde PDD version 6 – 04/09/2009	
/1e/	El Verde PDD version 7 – 08/10/2009	
/1f/	El Verde PDD version 8 – 05/11/2009	
/1g/	El Verde PDD version 9 – 14/01/2010	
/2a/	Methodology ACM0001 version 9.1 (Valid from 16 Aug 08 to 26 Feb 09).	
/2b/	Methodology ACM0001 version 10 (Valid from 27 Feb 09 to 10 Jun 09). Requests for registration can be submitted until 10 Feb 10 23:59 GMT as per the UNFCCC website:	

Reference ID	Title / Description	Comments
	http://cdm.unfccc.int/methodologies/DB/203B03KT6N8QCC0R1C56DFOF9OYO2T/view.html .	
/3/	Tool for the demonstration and assessment of additionality – EB39 v5.2	
/4/	Tool to determine methane emissions avoided from disposal of waste at... EB41 v4	
/5/	Tool to determine project emissions from flaring gases containing methane - EB28	
/6/	Combined tool to identify the baseline scenario and demonstrate additionality - EB28 v2.2	
/7/	Tool to calculate project or leakage CO2 emissions from fossil fuel combustion EB41 v.2	
/8/	Tool to calculate baseline, project and or leakage emissions from electricity consumption - EB39 v.1	
/9/	Tool to calculate the emission factor for an electricity system - EB-5 - v.1.1	
/10a/	El Verde ER spreadsheet version 1	Dated 12/11/2008
/10b/	El Verde ER spreadsheet version 2	Dated 08/05/2009
/10c/	El Verde ER spreadsheet version 3	Dated 04/09/2009
/10d/	El Verde ER spreadsheet version 4	Dated 08/10/2009
/10e/	El Verde ER spreadsheet version 5	Dated 03/11/2009
/10f/	El Verde ER spreadsheet version 6	Dated 18/12/2009
/11a/	El Verde Economic Analysis version 1	Dated 10/09/2008
/11b/	El Verde Economic Analysis version 2	Dated 08/05/2009
/11c/	El Verde Economic Analysis version 3	Dated 04/09/2009
/11d/	El Verde Economic Analysis version 4	Dated 08/10/2009
/11e/	El Verde Economic Analysis version 5	Dated 04/11/2009
/12a/	El Verde Modalities of Communication	Dated 11/02/2008
/12b/	El Verde Modalities of Communication	Dated 18/08/2009
/13/	Mexico Letter of Approval	Dated 14/12/2007
/14a/	Mexico Letter of Approval (English version)	Dated 18/03/2009
/14b/	Mexico Letter of Approval (Spanish version)	Dated 18/03/2009

Reference ID	Title / Description	Comments
/15/	Training plan	
/16/	Project Schedule Revised	Dated Jan 2008
/17/	Official Norm NOM-083-SEMAR-2003	Dated 20-10-2004
/18/	Estimation Landfill gas generat–d - CRA technical Memorandum	Dated 13-04-2006
/19/	SCS and Promotora Ambiental Contract	Dated 26-10-2007
/20/	Mexico Emission Factor Electricity 2007	
/21/	Mexico Electric Generation Capacity	
/22/	No Objection Letter issued by SEMARNAT (Mexican DNA)	Dated 01-11-2007
/23/	Leon Municipality letter	Dated 14-11-2007
/24/	Macro Cells Plan	Dated 08-05-2000
/25/	Diagram of vents (EIA Annex 15)	Dated 10-12-2000
/26/	Project design map (SCS)	Dated Feb 2008
/27/	CER contract between PASA and municipality	Dated 20-03-2007
/28/	Useful lifetime calculation (EIA Annex 25)	
/29/	Environmental License	Dated 29-08-2008
/30/	Municipality permit & State permit	Dated 23-05-01 & 21-05-2001
/31/	Municipality Concession Contract	Dated 09-01-2001
/32/	PASA Commercial Registry (Acta Constitutiva)	Dated 23-07-1994
/33/	Environmental Impact Assessment Section II	Dated 10-12-2000
/34/	Description of residues generated EIA Section II	Dated 10-12-2000
/35/	Design & construction biogas plant invoice	Dated 23-07-2008
/36/	Evaporator Invoic–s - Ecologix Environmental Systems	
/37/	Flare Invoice (John Zink)	Dated 24-06-2008
/38/	Generator renti–g - TRACSA S.A. de C.V.	Dated 03-12-2008

Reference ID	Title / Description	Comments
/39/	Meters quoting (Landtec)	Dated 06-05-2008
/40/	Construction invoice-s - Ralosa, Comanhi, Ferremas, Industrial Air	Dated 04-11-2008
/41/	Pipeline invoice-s - Polytuberias	
/42/	Engineering invoices (SCS)	
/43/	Leachate monitoring and control	
/44/	PASA biogas project estimation	Dated 31-05-2008
/45/	PASA Solid Waste, Soil & Climate Environmental Study RH	
/46/	Local SHC surveys	Dated 30-01-2009
/47/	Local SHC letters	Dated 23-01-2009
/48/	Local SHC Assistance List	Dated 30-01-2009
/49/	SHC Photos	Dated 30-01-2009
/50/	Waste history (tons) 2001-2009	
/51/	Request to modify LoA	Dated 18-03-2009
/52/	State environmental authorization	Dated 23-11-2000
/52/	Municipality CDM environmental authorization	Dated 10-10-2006
/53/	Municipality CDM environmental authorization	Dated 10-10-2006
/54a/	Electricity Sector Prospective 2006-2015 – Secretary of Energy (SENER). Available at: h http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/prospsectelec2006.pdf	
/54b/	Electricity Sector Prospective 2007-2016 – Secretary of Energy (SENER). Available at: http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20Sector%20Electrico%20FINAS.pdf	
/54c/	Electricity Sector Prospective 2008-2017 – Secretary of Energy (SENER). Available at: h http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf	
/55/	Landfill gas process flow description	
/56/	SCS PASA Cost Estimate report	Dated 29-02-2008
/57/	Mexican Government Bonds 2007 – Bank of Mexico	
/58/	Exchange rates 2007 – Bank of Mexico	

Reference ID	Title / Description	Comments
/59/	John Zink Flare Quote	Dated 06-02-2008
/60/	Ecologix Evaporator Quote	Dated 29-05-2008
/61/	Waste quantities 2001-08	Dated 20-08-2008
/62/	Statistical data of population of Leon	
/63/	Leon demographics spreadsheet	
/64/	Law for Ecological Balance and Environmental Protection – Available at the National Commission of Protected Natural Areas website: http://www.conanp.gob.mx/pdf/leygra_egilibrio.pdf	Dated 28-01-1988
/65/	Law of Integral Waste Management of Guanajuato – Available at the Guanajuato State Institute of Ecology link: http://ecologia.guanajuato.gob.mx/normatividad/leyes/ley_residuos.pdf	Dated 10-05-2005
/66/	Towards sustainable household consumption; trends and policies in OECD – published by OECD. Available at: http://www.ine.gob.mx/descargas/dgipea/towards_sust.pdf	
/67/	Ecologix Evaporator Invoice	Dated 18-06-2008
/68a/	Mexico electricity emissions factor 2009 calculation spreadsheet	
/68b/	Mexico electricity emissions factor 2009 calculation spreadsheet (corrected)	
/69/	Interest Rates 2007 – Bank of Mexico	
/70/	CFE price summary 2006-2008	
/71/	El Verde Regulatory Framework Analysis	
/72/	Methodology for calculating short term total cost of electricity – Available at: http://www.cre.gob.mx/documento/52.pdf	
/73/	Law of Renewable Energy & Financing of energetic transition – Dated 28-11-2008. Available at: http://www.diputados.gob.mx/LeyesBiblio/pdf/LAERFTE.pdf	
/74/	General Tax Law – Dated 04-06-2009. Available at: http://www.diputados.gob.mx/LeyesBiblio/pdf/82.pdf	
/75/	Inflation index spreadsheet	
/76/	Leachate generation calculation 2006-2009 mod MGM	Dated 19-08-2009
/77/	Technical details of Waukesha Enginotor WPS 2	
/78/	Letters on Venting Wells and Special Equipment Service Life	Dated 03-09-2009
/79/	Landfill macrocell delineation map	

Reference ID	Title / Description	Comments
/80/	Letter from Municipality Leon regarding absence of LFG burning in the Leon Landfill	Dated 20-08-2009
/81/	Print screen Bank of Mexico	
/82/	Mexican interest rates 2007 – Bank of Mexico	
/83/	Interest rates data consulting – Bank of Mexico	
/84/	Mail on Ecologix timelife evaporator	Dated 31-08-2009
/85/	E-mail received from Brandy Johnson John Zink – LPG usage by flare	Dated 03-11-2009
/86/	Flare design criteria rev.2	
/87/	General Law for Waste Prevention and Integral Management	Dated 08-10-2003
/88/	Regulation to the General Law for Waste Prevention and Integral Management	
/89/	Contract between MGM & PASA for PDD elaboration	Dated 24-10-2007
/90/	Contract between PASA & SCS (revised for leachate component)	Dated 18-06-2008
/91/	Letter of Withdrawal of MGM as PP	Dated 24-11-2009
/92/	PAHO Guide for the design, construction and operation of landfills	Dated 2002
/93/	CAR06 El Verde Economic_Analysis 4Nov09 mod 18Jan10	
/94/	CAR06 CER Calculation El Verde 18Dec09 mod 18Jan10	
/95/	SCS LFG Projections – dated 09/12/2007	
/96/	Signed contract SGS & PASA	Dated 05-02-2010

Appendix A

Chronology of key events: Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León

#	Date	Milestone
1	13/04/2006	Technical Memorandum from Conestoga Rovers & Associates for PASA (Ref.18) which delivered the results of a landfill gas production assessment regarding a potential project to generate greenhouse gas (GHG) emission reduction credits.
2	20/03/2007	Emission Reduction Purchase Agreement between León Municipality and PASA (landfill operator and CDM project sponsor) with respect to the CER rights (Ref.27)
3	16/10/2007	1 st local stakeholder consultation for the CDM
4	24/10/2007	Contract with MGM International for PDD preparation (Ref.89)
5	26/10/2007	Contract with SCS Engineers for engineering services related to landfill gas capture and use (Ref.19) – Start Date of project activity
6	01/11/2007	Letter of no objection from Mexican government climate change office (SEMARNAT) (Ref.22)
7	14/12/2007	1 st Letter of Approval issued by Mexican DNA (Ref.13)
8	15/12/2007	Baseline study completed (1 st published PDD, v.3 – Ref.1a)
9	21/12/2007	Signed Agreement between MGM International and SGS Panama for CDM validation
10	09/01/2008	1 st publication of PDD (Ref.1a) for ISHC
11	06/02/2008	Price quote for flare (Ref.59)
12	11/02/2008	Modalities of Communications with CDM EB (Ref.12a)
13	29/05/2008	Price quote for leachate evaporator (Ref.60)
14	18/06/2008	Start date of the project activity. Invoice for the purchase of a leachate evaporator (Ref.67).
15	18/06/2008	Revised contract between PASA & SCS taking into account leachate component (Ref.90)
16	24/06/2008	Invoice for flare (Ref.37)
17	14/11/2008	Revised baseline study following draft validation report and updating versions of methodologies and tools (2 nd published PDD, v.4 – Ref.1b)
18	30/01/2009	2 nd Local stakeholder consultation for the CDM (Ref.46 – Ref.49)
19	13/02/2009	2 nd publication of PDD (Ref.1b) for ISHC
20	09/03/2009– 10/03/2009	Validation site visit
21	18/03/2009	2 nd Letter of Approval issued by Mexican DNA (Ref.14)
22	18/08/2009	Revised Modalities of Communications with CDM EB (Ref.12b)

A.3 Annex 3: Overview of Findings

Findings Overview

Findings from validation of “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León.”

Each Table below represents a finding from the validation assessment. The findings are numbered consecutively, approximately in the order that they have been identified and irrespective of the nature of the findings, for eg.: CAR #1, CAR #2, CL #3, FAR #4 etc.

Description of Table:

Type	Findings are either Corrective Action Requests (CARs), Clarification Requests (CLs), and Forward Action Request (FARs). A corrective action request (CAR) is raised if one of the following occurs: I. The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable additional emission reductions; II. The CDM requirements have not been met; III. There is a risk that emission reductions cannot be monitored or calculated. A clarification request (CL) is raised if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met 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.
Lead Assessor	Details the content of the finding
Comments	
Ref	Refers to the item number in the Validation Protocol
Response	Please insert response to finding, starting with the date of entry.

Please Note: This is an open list and more findings may be added as validation progresses.

Responses to each Finding and relevant associated documentation should be recorded in this form by the Client and send back to the Lead Assessor in one submission to SGS (exception of finding linked to Letter of Approval, which can be submitted separately).

SGS reserves the right to review the associated fees and timeline if:

- more than one response submission is received from the Client
- a finding (CL/CAR), raised by the Lead Assessor prior to Technical Review stage, is not closed within 30 days of notification to the Client by SGS.

Rows for comments and further response will be appended to the table until the Findings has been addressed to the satisfaction of the Lead Assessor.

Findings Overview Summary

	CARs	CLs	FARs
Total Number raised	30	16	0

Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CAR	Number:	01	Reference:	Annex 2; Table 1, Requirement 1
Lead Assessor Comment:					
Letter of Approval provided (Ref. 13) refers to Promotora Ambiental S.A.B de C.V. and MGM Carbon Portfolio, S.a.r.l. as project participants. However, the republished PDD does not include MGM Carbon Portfolio, S.a.r.l. as a project participant. Therefore, a CAR was raised to request project proponent to make the necessary adjustments for consistency on this regard.					
Project Participant Response:				Date: 8/05/2009	

<i>The Letter of Approval was changed accordingly</i>	
Documentation Provided by Project Participant:	
CAR 1a-LOA Spanish.PDF CAR 1b-LOA Trans English.PDF	
Information Verified by Lead Assessor:	
An English and Spanish version (Ref. 13b - 13c) of the updated Mexican LoA was provided. The new Letter of Approval is identified as #216/2009, in replacement of #180/2007 (ID of previous LoA) and dated March 18, 2009. As verified, the letter refers to Promotora Ambiental S.A.B de C.V. as a project participant and no longer includes MGM Carbon Portfolio, S.a.r.l. as a project participant, which is in accordance with the PDD (Ref. 1c). It was also verified that the letter was issued by the host country DNA (SEMARNAT), signed by the Ministry of Environment and Natural Resources – Fernando Tudela Abad. The letter confirms that the project contributes to the sustainable development of the country and complies with national legislation. Name of project “Landfill Gas Recovery and Flaring Project in the El Verde Landfill, León” complies with the name established in the PDD.	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/05/2009
As explained above, information on project participants in PDD is now in accordance with the LoA. Therefore, this CAR is closed out.	
Acceptance and Close out by Lead Assessor:	Date: 14/05/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	02	Reference:	Section A.3.2
Lead Assessor Comment:					
The information in the MoC (Ref. 12) was found in line with Section A.3 (Project Participants) of the PDD (Ref. 1), however the contact personal e-mail was found different from the PDD Annex 1. Please make the necessary corrections.					
Project Participant Response:				Date: 08/05/2009	
<i>The e-mail of the contact person was corrected accordingly on Annex 1 table.</i>					
Documentation Provided by Project Participant:					
<i>Revised PDD</i>					
Information Verified by Lead Assessor:					
Contact e-mail in Annex 1 of PDD version 5 (Ref. 1c) was verified in accordance with information in MoC (Ref. 12). Nevertheless PP is now requested to use the MoC template available in EB45 annex 60, available since 13 th February 2009.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/05/2009	
Contact e-mail in Annex 1 of PDD version 5 (Ref. 1c) was verified in accordance with information in MoC (Ref. 12). Nevertheless PP is now requested to use the MoC template available in EB45 annex 60, available since 13 th February 2009					
Project Participant Response:				Date: 31/08/09	
MoC template according to EB45, annex 60 has been used by the project participant. Please see attached file “MoC Gas Recovery and Flaring Project in the El Verde Landfill, León.pdf”					
Documentation Provided by Project Participant:					
<i>“MoC Gas Recovery and Flaring Project in the El Verde Landfill, León.pdf”</i>					
Information Verified by Lead Assessor:					
Project participant provided the MoC (Ref.12b) which was verified to be in accordance with the new template as per EB45 Annex 60. Project name and contact details were verified in line with the information in the PDD (Ref.1d).					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 01/10/2009	
Based on the above, CAR 02 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 01/10/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)
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Type:	CAR	Number:	03	Reference:	Annex 2; Table 1, Requirement 4
Lead Assessor Comment:					
<p>The PDD format applied by project participant was crosschecked with the template available in the UNFCCC website and Guidelines for Completing the Project Design Document (CDM-PDD). A CAR was raised to request project proponent to make the necessary corrections in a revised PDD. The following issues were identified:</p> <p>1) PDD template version used was 3.1 however a new version (3.2) is available at the UNFCCC website: http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/index.html.</p> <p>2) It was noticed throughout the PDD that large sections of the Guidelines for Completing the Project Design Document (CDM-PDD) as well as of the methodology and the tools were inserted in a copy-paste manner. However, this adds up length to the PDD and is not necessary for PDD assessment.</p> <p>3) Section B.6.4 has been colored in orange and differs from the PDD template available in the UNFCCC webpage.</p> <p>4) Emission Reduction Table should not have legend as it was used from the Guidelines for Completing the Project Design Document (CDM-PDD).</p> <p>5) Section B.7.1, page 57: Table is left blank.</p> <p>6) Please make sure to include legends and references for all the tables that are not used from the Guidelines for Completing the Project Design Document (CDM-PDD). On the other hand, tables that are used from the Guidelines, methodology and/or tools should not have references.</p> <p>7) First paragraph of page 81 of PDD shows scratched out text. Please revise.</p>					
Project Participant Response:				Date: 08/05/2009	
<p>1) <i>The PDD format now used corresponds to version 3.2. Note, however, that the form appearing in the CDM website "http://cdm.unfccc.int/Reference/PDDs_Forms/PDDs/PDD_form04_v03_2.doc" shows it simply as "Version 3". We have therefore used this version (3.2) and this designation (3).</i></p> <p>2) <i>Given frequent changes in versions of methodologies and tools, we prefer to copy the detailed content of versions used within the PDD. This is intended to keep a permanent record of the versions used, with the contents, throughout the duration of the crediting period. While it may be easy for the validator to know the versions, since they are recent, it will not be easy for a verifier to know the details. Please indicate where there are redundant details, which can be deleted without affecting monitoring and verification.</i></p> <p>3) <i>The colour from section B.6.4 was changed according to the template available.</i></p> <p>4) <i>Do you mean the table in section A.4.4? We have removed the title of the table, but not sure if this is what you wanted.</i></p> <p>5) <i>The table on this section was erased as requested.</i></p> <p>6) <i>It is not clear to us what SGS means by this comment. We have deleted the titles for tables in sections A.4.4, B.3 (Table 4) and B.6.4. Table numbers were updated as a result.</i></p> <p>7) <i>The text was corrected.</i></p>					
Documentation Provided by Project Participant:					
Revised PDD					
Information Verified by Lead Assessor:					
<p>1) The template of PDD version 5 (Ref. 1c) now corresponds to version 3.2. As pointed out by PP, it was noted that version 3.2 of the document is designated as "version 3", nevertheless the correct version was applied (3.2).</p> <p>2) Project participant explained that references in PDD to the methodology and tools are intended to keep a permanent record of the version used to facilitate the future verifiers to know the details of the versions applied.</p> <p>3) Section B.6.4 of the revised PDD (Ref. 1c) was verified and is now in accordance with the PDD template.</p> <p>4) Emission Reduction Table in section A.4.4 of revised PDD (Ref. 1c) is now in accordance with the PDD template.</p> <p>5) Section B.7.1, page 57 of revised PDD (Ref. 1c) was verified; blank table was removed.</p> <p>6) Tables that are used from the Guidelines, methodology and/or tools were verified. No references are now included in these tables, which is correct. However, it was noted that numeration of tables is not consistent as one table number is missing (Table 6).</p> <p>7) The first paragraph in Annex 3 of PDD was corrected.</p>					
Reasoning for not Acceptance or Acceptance and				Date: 14/05/2009	

Close Out:	
As explained in item 6) above, numeration of tables in the revised PDD (Ref. 1c) is not consistent as one table number is missing (table 6). Please revise PDD accordingly.	
Project Participant Response:	Date: 31/08/09
Numeration of tables has been corrected accordingly. In addition, numeration for figures was added and updated (figures 2, 3, 4, 5 and 6).	
Documentation Provided by Project Participant:	
Ref.1d - El Verde PDD ver 6 04-09-09 clean.doc	
Information Verified by Lead Assessor:	
The revised PDD was verified, however table numbers remain inconsistent (table 4 is missing).	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 01/10/2009
Please kindly arrange the table numbers in a consistent manner. CAR 03 remains open.	
Project Participant Response:	Date: 05/10/09
Numeration of tables in the PDD has been corrected and is now consistent throughout the document.	
Documentation Provided by Project Participant:	
El Verde PDD ver 6 08Oct09 clean.doc	
Information Verified by Lead Assessor:	
Tables were verified to be numbered in a consistent manner in the revised PDD.	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 15/10/2009
Based on the above, CAR 03 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 15/10/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	04	Reference:	Section A.2.1
Lead Assessor Comment:					
<p>The purpose of the project activity and the type of technology used are not clearly described in the PDD. The PDD states that “the initial project activity would involve landfill gas capture, with some of the recovered gas used for leachate evaporation with the remainder flared. Another possible use for the LFG is electricity generation for use at the landfill site and/or supply to the local grid.” Also, PDD states that the “recovered LFG would first be used for leachate evaporation. Any surplus LFG would be sent to the power plant, if one is installed, with the leftover LFG sent to the flare station.” Furthermore, PDD states that “once the requirement for leachate evaporation has been met, some of the remaining LFG may be burnt to produce electricity instead of being sent to the flare station.” Finally, section A.4.3 states: “The objective of El Verde Landfill Gas Project is to capture and flare the landfill gas (LFG) generated (...)”.</p> <p>On the other hand, the ER spreadsheet (Ref. 10) shows a greater percentage of LFG sent to electricity generator than to flare or to the leachate evaporator. Also, the proportion between LFG to flare and LFG to leachate evaporator is not constant along the crediting period years. A CAR was raised to request project participant to make the necessary changes in the PDD and/or ER spreadsheet in order to reflect clearly the purpose of the landfill gas use.</p>					
Project Participant Response:				Date: 08/05/2009	
<p><i>In section A.2 of the PDD, the description was changed as follows:</i></p> <p>“The initial project activity would consist of landfill gas capture, with some of the recovered gas used for leachate evaporation and the remainder flared. The LFG extraction system would consist of a series of vertical extraction wells interconnected by header piping. The LFG would be extracted from the landfill by a blower and conducted to a single point. Recovered LFG would first be used for leachate evaporation, if the amount of landfill gas captured is adequate to meet the evaporator fuel requirements. Otherwise it would all be flared. It is expected that the LFG generation would exceed the requirements of the evaporator. Any LFG captured beyond evaporator needs would initially be flared. Once the project is operational and capturing LFG for use in the evaporator (with additional LFG flared), project proponent proposes to install electricity generation equipment sized to the amount of LFG actually captured. At that time, the flaring stage will be replaced by the use of LFG in the power plant. Any LFG remaining after meeting evaporator and electricity generator needs would still be flared. Electricity generated would meet landfill needs with possible sale to local Municipalities.”</p>					

In section A.4.3 of the PDD. Technology to be employed by the project activity, the text has been modified as follows:

“The objective of El Verde Landfill Gas Project is to capture landfill gas (LFG), use part of it to evaporate leachate, and initially flare the remaining LFG. Once LFG capture has been established, and the volume of LFG captured is known, project proponent would install LFG-fired power generation equipment. From then on, LFG would be used to evaporate leachate, generate electricity, and only send the excess LFG to the flare. Thus all LFG will be combusted in one of these three ways, and methane contained in LFG would be destroyed.”

It further states:

“In order to maximize LFG recovery rates, and thus GHG emission reductions, an active LFG collection system will need to be installed. The system will consist of a series of vertical extraction wells interconnected by header piping. The LFG will be extracted from the landfill by a blower and a certain amount will be conducted for leachate evaporation while the rest of the total landfill gas will initially be flared. Once LFG gas recovery is operational, project proponent would install LFG-fired power generation equipment. Subsequently, LFG would be used both for leachate evaporation and for power generation, with any excess LFG flared. Electricity generated would be used to meet requirements at the landfill, with excess generation sold to local municipalities.”

Documentation Provided by Project Participant:

See CAR 04- Landfill Gas Process Flow.pdf
Revised ER spreadsheet
Revised PDD

Information Verified by Lead Assessor:

Ref.1 - Revised PDD containing the purposed of the project activity
Ref. 10 - Revised ER Spreadsheet containing the different volume of landfill gas to be sent to each of the technologies applied
Ref.5 - Landfill Gas Process Flow (email exchanged between PPs regarding how the distribution of landfill gas would take place)
Ref.60 - Ecologix Evaporator Quote May08.pdf (Budgetary proposal for Leachate Evaporator Model ED500 from Ecologix Environmental System, LLC)
Ref.56 - SCS PASA Cost Estimate report 29feb08.pdf

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 14/08/2009

The information on the purpose of the project activity and the type of technology used has been edited in a revised PDD on sections A.2 and A.4.3. The information was compared to the revised ER Spreadsheet for consistency and the following was verified:

1) Initial stage: Leachate Evaporator + Flaring (implementation estimated to 2010)

In this initial stage of the project activity, from the total landfill gas generated estimated as per *Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site*, part of the landfill gas is to be sent to the leachate evaporator and the remaining to the flare. The landfill gas volume to be sent to the leachate is based on the Evaporator Landfill Gas consumption as per information of the Budgetary proposal for Leachate Evaporator Model ED500 provided by manufacture Ecologix Environmental System, LLC (Ref.60). The document states that the Landfill Gas Consumption needed for the technology is 183 SCFM (Standard Cubic Feet per Minute), resulting in 2,723,650 m³/year of landfill gas when considering 100% operation time during the year. This quantity is fixed for the whole crediting period.

Annual quantity of landfill gas to be sent to flare varies according to the variation of total landfill gas generated estimated per year. The maximum volume of landfill gas to be sent to the flare has been estimated in 19,019,007 m³/year. This is in line with maximum equipment capacity quoted. According to John Zink Quote of February 2008 (Ref.59), the equipment has a maximum capacity of 1700 (Standard Cubic Feet per Minute), resulting in 25,106,547 m³/year considering 8000 hours/year of operation.

2) Later Stage: Leachate Evaporator + Flaring + Electricity Generation (implementation of EG estimated to 2012)

In a later stage, it is planned to use the landfill gas to generate electricity. Once this is implemented, the

landfill gas would be used in the leachate evaporator, in the electricity generator, and the remaining gas would be flared. Power capacity is estimated from 1.0 MW to 5.0 MW for electricity generation during the project operation using 3 Caterpillar Generators Model CAT 3516s to be installed in different stages, depending on the quantity available of landfill gas. The amount of landfill gas used for the electricity generator has been estimated based on:

- LFG needed to generate 1 MWe of electricity (688 m³/h as per Waukesha Engine, @50% CH₄, resulting in 0.001453 MWh/m³)
- Operation hours (8000/year). As per Waukesha Enginotor WPS 2, landfill gas engines are typically designed to work 8760 hours year. 8000/years is a conservative approach applied by PP considering maintenance and eventual operational problems.
- Available landfill gas per year estimated as per *Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site*
- Equipment capacity varying in a factor 0.5 MW

Regarding Initial Stage (1):

The quantity to be sent to the leachate evaporator is considered a key information since the remaining landfill gas is distributed to the others technology based initially on this data. No technical details has been provided in PDD section A.4.3 such as capacity It was not possible to confirm if 2,723,650 m³/year of landfill gas would meet the project activity needs and if represents a reliable information, since is not clear:

- If the Landfill Gas Consumption needed for the Leachate Evaporator technology indicated in Ref.60 represents the evaporator fuel requirements as informed in the PDD. Does it refer to a minimum, average or maximum consumption?
- How the quantity of leachate available in the Landfill site has been taken into account considering that the capacity of waste water to be evaporated by technology Model ED500 is 1.89 cubic meters per hour (Budgetary proposal, Ref.60).
- How has the total capacity of waste water in the technology been evaluated vs leachate available in the Landfill site vs landfill gas requirement by manufacture?

Regarding Later Stage (2):

- Waukesha Enginotor WPS 2 document has not been provided to SGS and it is not possible to confirm the stated information.
- It is not clear what the capacity of the electricity engines is to be implemented with the project activity. ER Spreadsheet shows power generation capacities increasing and decreasing in a factor 0.5MW, while the SCS cost estimate report (Ref.56) refers to the project activity as 2.4 MW. Also it was verified on manufacture website that different capacities are available for the same engine model 3516.

PP is also requested to include in the PDD information on equipments capacity, since differences in equipment specification can affect project costs.

Project Participant Response:

Date: 31/08/09

Regarding Initial Stage (1):

The consumption of 183 ft³/minute of LFG mentioned by ECOLOGIX in its budgetary proposal refers to the LFG needed to evaporate 1.89 m³/hour of leachate. According to information provided by PASA's Technical Advisor (SCS Engineers), the landfill gas is supplied to the burner of the evaporator by a blower that discharges a relatively constant volume of gas. Unless there is a major problem with the landfill gas collection wellfield, the flow rate of gas sent to the burner remains relatively constant. If the amount of gas that can be drawn from the landfill is restricted and less than required for combustion, the burner will not start, or if it is running, it will automatically shut down.

The evaporator works on a batch mode basis. There is a button on the control panel that activates the liquid level controller on the evaporator that is wired to the remote leachate fill pump in the storage pond. When this button is activated it should allow the pump to start pumping leachate into the evaporator. Once the leachate reaches a pre-set level in the evaporator the controller signals the leachate pump to shut-off.

The burner of the evaporator is designed to operate once the leachate level reaches a certain level in the holding tank and to shut off when the level drops to the lower level. If there is not enough leachate in the storage pond to fill the evaporator, the burner will not start and no leachate will be evaporated.

When designing the evaporator, leachate generation trends were considered. According to historical data available from 2006 up to July 2009, a maximum leachate generation of 1.11 m³/h was reached in September, 2008. The leachate generation average between January-July 2009 was 0.63 m³/h. Thus, in order to guarantee a proper treatment capacity, PASA decided to install a leachate evaporator with adequate capacity, substantially exceeding recent leachate generate rates. Note that prior to the installation and operation of the leachate evaporator, some of the leachate was recirculated into the landfill. This tends to increase measured leachate generation rates. With the leachate evaporator in operation, there will be no recirculation and we would expect the measured generation rate to decrease. As the landfill expands, more leachate will be generated. However, it should be noted that leachate is generated both by rainfall penetration as well as by waste decomposition. Rainfall penetration is most important at the working surfaces of the landfill, since the closed sections are covered with material that is relatively impermeable. The working surface remains about the same size while the landfill expands, so there is no increase in rainwater penetration there. The total accumulated waste at year end 2009 is estimated to be about 4 million tonnes while the estimate for year 2017 is a little over 8 million (see "Waste" sheet of CER estimation spreadsheet. Thus, even if there was no leachate removal, the total amount of leachate would only double in the remaining lifetime of the landfill. Since the capacity of the evaporator is three times the capacity of recent leachate generation rate (with recirculation and without any evaporation), we expect that the evaporator capacity is more than adequate to meet all future needs.

Leachate generation trends can be found in the file "Leachate generation 2006-2009 mod MGM 19Aug09.xls" Regarding later Stage (2):

The file "Waukesha Enginator WPS 2.pdf" is attached to this response.

PDD and ER Spreadsheet and Economic analysis have been updated according with SCS Engineers study (SCS PASA Cost Estimate report 29feb08.pdf), where a 2.4 MW LFG power generators would be installed in order to start operations in January 2012. They assume 3 Caterpillar generators model CAT3516s. Further 0.8MW units would be added as LFG is available and at the end of operational lifetime of the generator previously installed.

Finally, information regarding equipment capacity has been added in section A.4.3.

Documentation Provided by Project Participant:

Leachate generation 2006-2009 mod MGM 19Aug09.xls

Waukesha Enginator WPS 2.pdf

EI Verde PDD ver 6 04Sep09.doc

EI Verde Economic Analysis 26Aug09.xls

CER Calculation EI Verde 24Aug09.xls

Information Verified by Lead Assessor:

Regarding initial stage (1):

Technical details of the leachate evaporator has been included in the PDD section A.4.3, including the equipment capacity. Model to be installed is EvapoDry Model ED 500 and equipment capacity of 500 gallons per hour or 1.89 m³/h were confirmed in the budgetary proposal (Ref. 60).

Also, it was noticed that the estimated amount of LFG to be sent to evaporator has been changed from 2,723,650m³/year to 2,263,490 m³/year in the revised ER spreadsheet (Ref.10d). This change is attributed to the amount of working hours per year, which were previously assumed to be 8,760 h/year, equivalent to the extension of one year round. However, technical information provided by the manufacturer as per the budgetary proposal (Ref.60) shows that the actual operating time on waste water reported is 7,280 h/year. Hence, the correct value of estimated LFG to be sent to evaporator is 2,263,490 m³/year as reported in the revised spreadsheet. Is important to note that it is reasonable to consider that the equipment is not going to work in one year round, due to posible stops for manitanance and operation problems.

- The project participant clarified that the LFG consumption needed for the leachate evaporator indicated in Ref. 60 (183ft³/minute) represents the amount of LFG needed to evaporate 1.89m³/hour of leachate.

- With regard to the relation between the quantity of leachate available in the landfill and the capacity of leachate evaporation of the equipment, project participant provided the file "Leachate generation 2006-2009 mod MGM 19Aug09.xls" (Ref.76), where historical data of leachate generation was verified. It was confirmed that a maximum leachate generation of 1.11m³/h was reached in September of 2008, and that the average generation between January and July of 2009 was of 0.63m³/h. Moreover, PP explained that the total accumulated waste at the end of 2009 is estimated to be about 4 million tonnes, and that in year 2017 landfill will reach about 8 million tonnes of waste. This information was confirmed in the ER spreadsheet calculations (Ref. 10d), sheet "Waste", where increase in waste reception is calculated based on the expected population

increase in the municipality of Leon (see Ref.62 & 63). Thus, given the capacity of the evaporator is 3 times the leachate generation rate (1.89m³/h vs 0.63 m³/h), the evaporator capacity is applicable in project context and adequate to meet the future needs of the project activity.

Regarding later stage (2)

- The file "Waukesha Enginator WPS 2.pdf" was provided and verified. The document contains technical information on power generators of manufacturer Waukesha model VHP7100GLD/5904LTD with a capacity of 1.0 MW. However, it was not possible to confirm this information given that the PDD in section A.4.3, states: "According to an SCS Engineers study, 2.4 MW LFG power generators would be purchased in order to start operations in January 2012. They assume 3 Caterpillar generators model CAT3516s each of capacity 0.8 MW. Further 0.8 MW units would be added as LFG is available and at the end of operational lifetime of the generators previously installed. Electricity generated by these power plants would offset emissions at power plants elsewhere in the grid." Please clarify.

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 01/10/2009

Based on last point detailed above, CAR 04 remains open.

Project Participant Response:

Date: 05/10/09

We had previously used data from a technical sheet of Waukesha engines as a reference to estimate the efficiency of electricity generation using LFG, i.e. the amount of LFG needed to generate 1MW of electricity. We were assuming that this efficiency value was roughly the same for different equipment from different manufacturers. Note that the choice of equipment has not been determined, and will not be done until LFG is actually available and monitored. However, for the economic analysis, we had used estimates from a detailed engineering study conducted by SCS Engineers. They assumed CAT3516 engine generators, rather than Waukesha equipment. The efficiency values are in fact very similar. However, we have now used specifications for CAT3516 engines. According to the information provided in the website <http://www.lfgtech.com/catech.htm>, a landfill gas flow of 300 SCFM at 50% of methane is needed to generate 0.8MW. Since 1 cubic foot = 0.0283168466 cubic meters, 300 SCFM = 8.495 m³/min = 509 m³/h. See cell H17 of sheet "FODtotal" of revised ERs estimation spreadsheet. The PDD has also been updated accordingly.

Documentation Provided by Project Participant:

<http://www.lfgtech.com/catech.htm>

El Verde PDD ver 6 08Oct09 clean.doc

CER Calculation El Verde 08Oct09.xls

Information Verified by Lead Assessor:

It was clarified that technical information of Waukesha engines was initially used with intention of estimating the efficiency of electricity generation using LFG and that on the other hand, economic estimates from SCS Engineers were based on CAT3516 engine generators. It was explained that the choice of equipment has not been determined and will not be done until LFG is actually available and monitored. It is important to mention in this context that it was verified that equipment cost variances are being considered in project investment analysis in sensitivity analysis conducted with a variance of 20%.

As a response to the findings raised, PP now uses specifications for CAT3516 engines to estimate the efficiency of electricity generation for compliance. Hence all reference to Waukesha engines has been deleted in the revised PDD. Data of gas flow (300 SCFM at 50% of methane needed to generate 0.8MW) was verified in manufacturer website <http://www.lfgtech.com/catech.htm>. Conversion of units from ft³/m to m³/h was also verified correct, resulting in a efficiency value of 509 m³/h. PDD and ER spreadsheet have been revised accordingly. As a result, more LFG was verified to be sent to electricity generation when applying CAT3516 engines needs in ERs calculation.

In order to verify how changes in distribution of landfill gas within different technologies during project activity operation (evaporator, flare, electricity generator) was affecting additionality in investment analysis, the inputs used in ERs spreadsheet were crosschecked with the Economic Analysis inputs. It was noted in Economic Analysis, in "Elec gen no CERs", that total revenues for sale of energy (line 27) is based on line 24, which states "Power in Kw" (and understood to be in fact "Power in MW"). Line 24 are the same results of ER spreadsheet for "Possible power generation, PROJECT (MW)", line 43 in "FOD_Total". PP is requested to clarify what this possible power generation represents, and how it differs from total possible capacity (case where all landfill gas would be sent to the electricity generator). This is intend to show that even if all landfill gas collected yearly was sent to the electricity generators, the revenues obtained from energy selling using this total capacity would still not make the project financially attractive (NPV would be still negative).

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 28/10/2009

CAR 04 remains open due to clarification requested above.	
Project Participant Response:	Date:
<p>The spreadsheet has been correctly labelled MW instead of kW. The electricity generation capacity of 2.4 MW was determined by SCS Engineers in their engineering study of this landfill, as noted in the tab "Power plant investment SCS" with the report cited in this tab and submitted to SGS earlier. The electricity generation capacity to be installed would be determined by the LFG actually captured. We have assumed that initially a power generation capacity of 2.4 MW would be installed in 2012, as indicated by SCS Engineers. However, once LFG is available, and assuming that the amount of LFG captured is as high as indicated by our model, we have assumed that the capacity would be increased it to 5.6 MW in 2014. The latter value is considerably higher than the value indicated by SCS Engineers, and makes the project financially more attractive, and therefore more conservative than maintaining the recommendation of SCS Engineers.</p>	
Documentation Provided by Project Participant:	
<i>Revised Economic Analysis Spreadsheet (Ref.11e)</i>	
Information Verified by Lead Assessor:	
<i>Revised Economic Analysis Spreadsheet (Ref.11e)</i> <i>Ref.19 - SCS and Promotora Ambiental Contract-Signatory Page.pdf</i> <i>Ref.56 - SCS PASA Cost Estimate report 29feb08.pdf</i>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 06/11/2009
<p>Economic Analysis, in "Elec gen no CERs", line 24, which stated "Power in Kw" now is correctly informed as MW.</p> <p>It was confirmed that the power generator capacity assumed was not based on the landfill gas projection estimated based on the "Tool to determine methane emissions avoided from disposal of waste at a solid waste disposal site" but in the capacity determined by SCS Engineers in their engineering study of the landfill, as previously verified in SCS PASA Cost Estimate report (Ref.56) which indicates the estimated capacity of 2.4MW to be installed. It was also verified in PP calculation that the capacity is assumed to be increased to 5.6 MW in 2014, what is conservative in relation to SCS report (2.4MW constant).</p> <p>As verified in the ER Spreadsheet, in "FOD Total", the values obtained with the landfill gas projections result in a higher capacity of use for electricity generation (Row 41) than the values established for the ER calculation based on SCS report (Row 43). Since the capacity used for the project affects project costs and revenues, in order to validate if the use of SCS values (lower capacity) are appropriate, the following analysis below has been conducted.</p> <p><u>Revenues</u></p> <p>Values of power generator capacity based on the estimated landfill gas projection (ER Spreadsheet, in "FOD Total", Row 41) were applied into the financial analysis spreadsheet (Row 24 of "Elec gen no CER"), where previously it was assuming values of SCS report and the increased assumption in 2014 (ER Spreadsheet, in "FOD Total", Row 43). Doing this test analysis, it was verified that NPV remains negative and, even with very higher capacities applied every year in the financial analysis, the revenues generated from these equipments with such capacity are not sufficient to turn project financially attractive.</p> <p><u>Costs</u></p> <p>As verified in the Economic analysis, in "Power plant investment SCS", all costs values are established in SCS report which have been already verified to be used exactly as expressed in the report (Ref.56). Besides all these costs, there are two calculated costs linked to power generator capacity / energy generation:</p> <ol style="list-style-type: none"> 1. Replacement of equipment: These are considered as per lifetime of equipments already validated (refer to specific section to this issue), and considering additional units costs calculated proportionally to the costs available by SCS (3 units) (Column C of "Power plant investment SCS"). These costs could be affected by changes in the equipment capacity since SCS costs are based on a specific technology (Caterpillar Model CAT 3516s, capacity 0.8MW). Nevertheless, it is likely to have increase in costs with higher capacities equipments, therefore considering the lower capacity as it is in PP calculation (lower costs), actual assumption and calculation is found conservative for additionality purpose. 2. O&M: is linked to the generation of electricity, expressed in Row 92, 93 in "Power plant investment SCS". The value of 19,200 MWh (Row 92 = ER Spreadsheet, in "FOD Total", Row =O47) represents the generation from 3 units of electricity generator. As SCS costs are estimates costs for 3 units, the value of 19,200 is correctly used to estimate costs per MWh (Total cost / MWh/year) = 33.78 US\$/MWh. Yearly O&M is then calculated (Row 17 of "Elec gen no CER") based on energy produced 	

(Row 25). Since higher capacity equipments can produce same or higher quantity of energy, it is conservative to consider lower production, hence resulting in lower O&M costs.

It is also verified that costs have been considered as part of the sensitivity analysis and project under this scenario (variance of 20% higher & lower) without CDM still an unattractive option (NPV negative).

It is important to highlight that as stated in PP response and explained to SGS previously, the real investment in the electricity generation equipments will only be made by PP when confirming the real availability of landfill gas captured. As observed in several CDM landfill verifications, it is well known in this sector that the amount of landfill gas generated after landfill project implementation depends on several factors that are not all under control during validation stage (temperature, rain, waste type, etc), and can only be estimated as close as possible of future scenario. Nevertheless, in case PP decides to implement another technology / capacity for electricity generation (only source of revenues) any different than what has been validated and reported during this validation process in the documents to be made publicly available (PDD, ER Spreadsheet, Financial Analysis, Validation Report), the impacts in additionality must be evaluated after project implementation. CAR04 is closed out.

Acceptance and Close out by Lead Assessor:	Date: 06/11/2009
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Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	05	Reference:	Section A.2.1
Lead Assessor Comment:					
<p>According to the Guidelines for Completing the Project Design Document (CDM-PDD), the description of the project activity (Section A.2 of the PDD) must contain information of the baseline scenario. In case when the baseline scenario coincides with the existing situation, it should only be informed in this section that both (baseline and actual scenario) are the same. The PDD does not clearly state if the baseline scenario identified corresponds to the actual situation of the landfill.</p> <p>Also, according to the Guidelines for Completing the Project Design Document (CDM-PDD), this section should clearly describe how the project activity reduces greenhouse gas emissions making reference to the scenarios, emission sources and gases. This information is not clearly summarized in this section.</p>					
Project Participant Response:				Date: 08/05/2009	
<p><i>Section A.2 of PDD has been revised to explain the relation between the actual situation and the baseline scenario.</i></p> <p><i>A new sub-section “How proposed activity reduces greenhouse gas emissions” of sectionA.2 includes two paragraphs to explain how GHG emissions are reduced in the project scenario compared to in the baseline scenario..</i></p>					
Documentation Provided by Project Participant:					
<i>Revised PDD</i>					
Information Verified by Lead Assessor:					
<i>Revised PDD, section A.2</i>					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/05/2009	
<p>Section A.2 of the revised PDD (Ref. 1c) was modified and now includes a description of the relation between the current situation and the baseline scenarios identified, stating that both are the same. However PP make use of therms such as “LFG2”, P6” which are only explained in further sections, what makes the description confusing.</p> <p>Also, a description of how the project activity reduces greenhouse gas emissions is now summarized in this section, making reference to the scenarios, emission sources and gases.</p> <p>However, the last paragraph in page 3 of PDD states: “<i>Note that in the baseline scenario, leachate would not be evaporated using any fuel. Hence, the use of some LFG to evaporate leachate in the project scenario brings about a local environmental benefit (through reduced leachate contamination) <u>but does not reduce GHG emissions.</u></i>” Nevertheless, this information is not clearly reported as the ER spreadsheet (Ref. 10b) takes into account emission reductions through landfill gas combustion in the leachate evaporator.</p> <p>Also PP states in the PDD that “<i>Current situation before the project implementation is the atmospheric release of landfill gas to comply with regulations and to address safety and odour concern</i>”. Please clarify this statement or make necessary correction to avoid misunderstandings.</p> <p>CAR remains open.</p>					

Project Participant Response:	Date: 31/08/09
MGM Response: In line with recommendations made by SGS on another landfill PDD recently, we have simplified sections A. 2 and A.4.3 to reduce duplication of information that is described in full in sections B. This makes the description of the baseline easier to follow. We have also made some other changes to clarify doubts noted above. We hope that all confusion is now resolved, and that the PDD and Excel are now entirely consistent. We have also eliminated the contradictions regarding LFG capture and combustion in the baseline, by simplifying the text of the PDD, and setting AF to zero.	
Documentation Provided by Project Participant:	
Ref.1d - El Verde PDD ver 6 04-09-09 track.doc	
Information Verified by Lead Assessor:	
In response, the PDD was revised, which presents the description of the project activity in a clear manner. Section A.2 was simplified to avoid confusion, and the paragraph in section A.2 was corrected as follows: <i>"Note that in the baseline scenario, leachate would not be evaporated using any fuel. Hence, the use of some LFG to evaporate leachate in the project scenario brings about a local environmental benefit (through reduced leachate contamination) and reduces methane emissions (since LFG is burnt in the leachate evaporator) <u>but does not reduce CO2 emissions, since no fossil fuel is displaced.</u>"</i> Finally, the paragraph referring to the current situation was corrected and now states: <i>"Current situation before the project implementation is the atmospheric release of landfill gas generated at the landfill site. The situation before project implementation coincides with the baseline scenario, with no landfill gas capture and destruction."</i>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 28/09/2009
Based on the above explanation, CAR 05 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 28/09/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	06	Reference:	Section A.2.3
Lead Assessor Comment:					
Regarding the actual status of the landfill, PDD section A.2 states that currently there are 50 landfill gas vents (or passive gas wells) distributed in the 4 cells, covering the current 30 ha area. During the site visit it was verified in the landfill “Macro Cells Plan” identified as LN-03 and dated 08-05-2000 (Ref. 24a – 24d) that there are 2 macro cells: macro cell 1 and macro cell 2, both of which comprise a total of 51.4 hectares. Macro cell 1 is currently being used for the waste received, and corresponds to approximately 25 hectares, with 5 remaining hectares designated as buffer zone. Macro cell 2 is not included in the project boundaries as verified in the PDD and during the site visit. It was also verified in the cartographic plan that macro cell 1 contains 5 cells (with 10 vents per cell), and not 4 as stated in the PDD. Hence, a CAR was raised in order to request PP to revise this information in the PDD accordingly.					
Project Participant Response:				Date: 08/05/2009	
<i>In section A.2, one paragraph has been rewritten as follows:</i> “Currently, waste is disposed at one macro cell, covering a 30 ha area, of which 25 hectares are for waste disposal and 5 hectares comprise a buffer zone. The macro cell is subdivided into 5 cells. There are 10 landfill gas vents (or passive gas wells) per cell, i.e. a total of 50 vents for the macro cell. The wells are venting the gas from inside the waste mass to the top of each vent. Current practice in the country is the uncontrolled release of landfill gas. This is also the case for El Verde landfill. with no presence of flames at any of the vents.”					
Documentation Provided by Project Participant:					
<i>Revised PDD</i>					
Information Verified by Lead Assessor:					
Information on the technical status of the landfill has been edited in section A.2 of the revised PDD (Ref. 1c), reflecting the area and number of cells in accordance with the “Macro Cells Plan” verified during site visit.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/05/2009	

<p>The description of the actual status of the landfill has been edited, however the project boundary is still unclear since section A.2, 3rd paragraph states that 60 ha is planned for waste disposal. Please clarify if Macro cell 2 is to be or not to be included in project boundary.</p> <p>Also please provide evidence to show if the landfill gas production estimated in the ER Calculations is taking into account area available in Macro Cell 1 and 2, or only one cell. Please base your response with information of total area available and waste and gas estimated, in order to show that the area available is sufficient to cover the quantity of waste projected until 2017, when the landfill is estimated to close.</p>	
Project Participant Response:	Date: 01/09/09
<p>The PDD has been revised (A.2, paragraphs 3 and 5; A.4.3, para 3) to make it clear that the proposed project includes future expansion of the landfill, and therefore comprises the entire 60 ha (i.e. macro cells 1 and 2). Please note that the amount of waste used in the estimation of landfill gas generation is considering both macro cells as disposing area. Considering a compaction density average value of 0.77 tonnes/m³ during the years 2001-2009 as shown in file "Waste quantities 2001-08 mod MGM 20Aug08.xls" the estimated 8.2 million tonnes to be disposed until 2017 would use a total volume of 10.6 million m³, which is less than the 11 million m³ considered as landfill volume in the Manifiesto de Impacto Ambiental (MIA). Therefore, it can be stated that the area and volume available at the landfill is sufficient to cover the quantity of waste projected until 2017.</p>	
Documentation Provided by Project Participant:	
Waste quantities 2001-08 mod MGM 20Aug08.xls	
Information Verified by Lead Assessor:	
<p>The revised PDD (Ref.1d) was verified and section A.2 now states clearly that the proposed project includes macro cells 1 and 2, comprising an area of approximately 60 ha altogether (including buffer zones), what is in line with the "Macro Cells Plan" identified as LN-03, dated 08-05-2000 (Ref. 24a – 24d). This 60 ha area includes the present scenario (approximately 30 ha area – macro cell 1) and future expansion (approximately 26 ha area – macro cell 2). The wells in macro cell 1 are venting the gas from inside the waste mass to the top of each vent and the same would be expected for macro cell 2 in the absence of the project activity.</p> <p>According to the landfill EIA (Ref.28), the entire landfill site comprises a volume of 11,094,224.13 m³, which was calculated as per Mexican norm NOM-ECOL-084-94. As shown in the file "Waste quantities 2001-08 - 20Aug08.xls" (Ref.61), the amount of waste projected to be disposed until 2017 would be 8,225,969 tonnes, which, based on the average historical density of the landfill (0.77 tonnes/m³), would occupy a total volume of 10,683,077 m³. When considering the historical average density of the landfill, this estimated projection is less but very close to the projected value in the Manifesto de Impacto Ambiental (MIA / EIA), which takes the entire landfill site into account (macro cell 1 and 2). This shows that the estimated gas production in the ER calculations take into account both macro cells 1 and 2, which make up the entire site, and that the area available is sufficient to cover the quantity of waste projected until 2017, confirming consistency between information provided by PP.</p> <p>As informed in the PDD, the operational lifetime of the project may be extended beyond 2017 in case there is still space available for waste disposal, what can depend on real waste disposal type and quantity, density and compacting during crediting period, among others factors.</p> <p>- However it was verified that PDD pg.78 does not provide the reference of the total volume of 11 million m³, as it states: "According to the cited file, the landfill volume is 11 million m³", with no actual mentioning of the file. Please kindly revise for consistency.</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 01/10/2009
Based on the above explanation, CAR 06 remains open.	
Project Participant Response:	Date: 05/10/09
The reference of the landfill volume capacity of 11 million m ³ has been now included in the row of the parameter Wj,x in table 3.1 – Annex 3	
Documentation Provided by Project Participant:	
El Verde PDD ver 6 08Oct09 clean.doc	
Information Verified by Lead Assessor:	
<p>Landfill volume of 11 million m³ has been correctly referenced in Annex 3, table 3.1, parameter Wj,x. Further information regarding consideration of cells, compacting density, and disposal of waste discussed in this finding raised has been also clearly explained in the same section. It is clearly evidenced that the landfill site is sufficient to dispose the waste estimated in the PDD, until 2017.</p> <p>Nevertheless it was noted that PP states in the same section that "However, in order to be conservative, we have maintained the end of landfill life to be 2017". PP is requested to clarify this statement regarding approach conservativeness, since is understood that the landfill site could support waste disposal for a longer</p>	

<p>period (as previously discussed in CAR 10, closure now pending this clarification). Please respond to this request:</p> <ol style="list-style-type: none"> 1) In terms of impact to ERs estimated, taking into account possible increase in landfill gas previously estimated in the crediting period. 2) In terms of impact on additionality in electricity generation scenario (financial analysis). Please take in consideration also your response for CAR 04, since it is now pending clarification on how revenues are being affected by landfill gas available / equipment capacity. 	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 28/10/2009
Project Participant Response:	Date:
<p>We have removed the phrase "in order to be conservative". There are different ways of estimating the life of the landfill. For instance, the current concession period ends in March 2016, but this could be renewed. The Environmental Impact Report (Manifiesto de Impacto Ambiental, MIA) noted that the landfill has sufficient volume to take waste until 2017 (no month was specified, but it is understood that the entire year is included). If waste were compacted, it is possible that the landfill could hold waste for longer, though there is no way of quantifying with precision. We believe the calculations included in the Manifiesto de Impacto Ambiental forms the basis for the most appropriate determination of landfill life.</p>	
Documentation Provided by Project Participant:	
<p>Ref.1f - El Verde PDD ver 8 - 05-11-09 clean.doc Ref.1f - El Verde PDD ver 8 - 05-11-09 track changes.doc</p>	
Information Verified by Lead Assessor:	
<p>Ref.1f - El Verde PDD ver 8 - 05-11-09 clean.doc Ref.1f - El Verde PDD ver 8 - 05-11-09 track changes.doc Ref.28 - Environmental Impact Report (Manifiesto de Impacto Ambiental, MIA)</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 06/11/2009
<p>It was verified in the revise PDD submitted that PP limited the explanation about the use of end of landfill life to be 2017 as it has been determined in the Environmental Impact Report (Manifiesto de Impacto Ambiental, MIA) (Ref.28) previously verified. The information about conservativeness has been excluded, and justified that due to different ways of estimating the life of the landfill, this could vary. In fact the lifetime of the landfill can be shorter or longer depending on real waste disposal type and quantity, density and compacting, among others factors. Since it was verified that the Environmental Impact Report is an external and official data source specific for the landfill, the assumption of end of landfill life to be 2017 is considered appropriate. In order to evaluate the additionality of the project in the scenario where the operational lifetime of the landfill extends beyond 2017, a simulation was elaborated by the PP in a separate economic spreadsheet (Ref.93) and ER spreadsheet (Ref.94). The hypothetical scenario considers the same waste reception rate (2.7%) for all years until 2033 (date when project lifetime ends), and a additional investments of 0.8 MW electricity generation units according to the LFG available. This scenario shows that even if the lifetime of the landfill is extended until 2033, the NPV would remain negative (\$ 5,465,642). This result is even more negative than the NPV calculated for the project activity (\$4,779,661). In addition to this analysis, the additional investments in electricity units were removed from the calculations by the assessor in order to see what impact would these have in the NPV, and the result remains negative. Therefore, the extension of the landfill useful lifetime up until 2033 was not found to affect the additionality of the project.</p> <p>CAR06 is closed out.</p>	
Acceptance and Close out by Lead Assessor:	Date: 06/11/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	07	Reference:	Section A.2.3
Lead Assessor Comment:					
<p>Regarding the landfill operations and history, the PDD states that the landfill began accepting waste in May 2002. However, the waste history records (Ref. 50), show values for 2001. Therefore, a CAR was raised to request project proponent to make the necessary adjustments.</p>					
Project Participant Response:				Date: 08/05/2009	

A file received from the client (Waste quantities 2001-08.xls) stated the quantity and dates of acceptance of wastes in the landfill. Section A.2 has been modified to show that "landfill began accepting waste in June 2001". The new data available from the client has been used to revise the emission reduction calculations (CER Calculation El Verde 8may09.xls), and the corrected values have been inserted in other sections of the PDD. See also responses to CAR 08, CL 09, and CAR 10.	
Documentation Provided by Project Participant:	
Waste quantities 2001-08.xls	
CER Calculation El Verde 8may09.xls	
Information Verified by Lead Assessor:	
Information on landfill operation start date was corrected in the PDD, in accordance with the landfill waste records (Ref. 50 & Ref. 61). The ER spreadsheet (Ref. 10b) was also verified and baseline values are now based on the waste data available from June 2001. Revised PDD (Ref. 1c) was verified to include the updated values of waste data.	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/05/2009
Based on the above information verified, CAR 7 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 14/05/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	08	Reference:	Section A.2.3
Lead Assessor Comment:					
PDD states that the landfill is filling at an average rate of 1,700 tonnes per day, or greater than 530,000 tonnes per year. However, the values reported in the ER spreadsheet show lower values per year from 2001 to 2008. In addition, annual values in the ER spreadsheet do not coincide with the waste history records (Ref. 50). Therefore, a CAR was raised.					
Project Participant Response:				Date: 08/05/2009	
<i>The new data mentioned in response to CAR7 have been used to revise section A.2 as follows: "Recently (Jan. to March 2009), the landfill was filling at an average rate of about 1,400 tonnes per day or greater than 510,000 tonnes per year." The revised values have also been used to update the waste data for calculation of emissions reduction (CER Calculation El Verde 8may09.xls), as mentioned in the response to CAR7. See also responses to CAR 09 and 10.</i>					
Documentation Provided by Project Participant:					
<i>CER Calculation El Verde 8may09.xls</i>					
Information Verified by Lead Assessor:					
The updated spreadsheet with waste records until March 2009 and original historical records of waste disposed in the landfill (2001-March 2009) provided by PP were verified. Annual values in the ER spreadsheet have been corrected and now coincide with the waste history records provided (Ref.50). Due to this correction the reductions estimated for the project activity originally have changed. The assumption that from January to March 2009 the landfill had an average rate of about 1,400 tonnes per day could not be confirmed. The average rate of tonnes per day was re-calculated, and a value of 1,211 tonnes per day was reached. Also in the ER spreadsheet, it was not possible to understand the annual filling average rate and daily filling average rate calculated in "Waste" (Cells C72 and C76). Also please notice that there is a non finished sentence in 4 th paragraph of Section A.2 which states "In the coming years." CAR 8 remains open.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/07/2009	
As per information verified above, CAR 8 remains open.					
Project Participant Response:				Date: 31/08/09	

The file "Waste quantities 2001-08.xls" (submitted to SGS in May 2009) shows monthly data on waste disposal from June 2001 to March 2009. The data for the first three months of 2009 add up to 109,019 tonnes (See cell AH25 of only sheet of cited Excel file) over a period of 31+28+31= 90 days. This implies a filling rate of $109,019/90 = 1,211$ tonnes per day. Hence Validator is correct in noting the error. The numbers in section A.2 have been corrected accordingly.

Similarly, cells C72 and C76 are errors, and these cells and associated text have been deleted.

Note that these corrections do not affect the extrapolation of waste quantities, which are shown in Annex 3 of PDD.

We have changed the period at the end of "In the coming years" by a comma, so that the sentence now reads: *"In the coming years, projecting the population increase rate, we expect the disposal rate to increase by 2.7% per year from 2009 to 2017"*

We thank the validator for noting these errors.

Documentation Provided by Project Participant:

Information Verified by Lead Assessor:

Information on the average rate of waste has been corrected in the revised PDD, which now mentions 1,211 tonnes per day or more than 442,000 tonnes per year, which is consistent with the historical data presented in the file "Waste quantities 2001-08.xls" (Ref.61). Also, the emission reduction spreadsheet was revised to exclude the data of cells C72 and C76. Finally, the sentence in the 4th paragraph of section A.2 was re-written in a complete manner.

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 28/09/2009

Based on the above, CAR 08 was closed out.

Acceptance and Close out by Lead Assessor:

Date: 28/09/2009

Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	09		Reference:	Section A.2.3

Lead Assessor Comment:

According to PDD, PASA expects the disposal rate to increase by 7% per year in the coming years. A CL was raised to request project proponent to support this statement with verifiable evidence.

Project Participant Response:

Date: 08/05/2009

We have reduced the growth rate to 2.7% per year, based on the following considerations. The population of Leon increased at a rate of 2.7% per year from 1990-2000 (Demographics Leon.xls). While waste generation per capita often increases with increasing income, we have assumed, conservatively, that the waste generation increases at the same rate as the general population. The revised % has been used to modify the waste expected to be deposited from 2009 to 2017 in Annex 3 of PDD, in estimating emissions reductions (CER Calculation El Verde 8may09.xls), which are also reported at various points in the PDD.

Documentation Provided by Project Participant:

Demographics Leon.xls citing **Population of Leon.pdf** (Source: <http://www.cinterfor.org.uy/public/spanish/region/ampro/cinterfor/publ/ibarro2/pdf/anexo.pdf>)

CER Calculation El Verde 8may09.xls

Information Verified by Lead Assessor:

Disposal growth rate was changed from 7% to 2.7%, based on the recent population increase rate of Leon (Ref. 62 & 63); project participant assumed that waste generation increases at the same rate as the general population, which can be deemed conservative, as waste generation usually increases with income (this assumption was confirmed by the assessor in document "Towards Sustainable Household Consumption?" pg. 84, published by OECD – Ref. 66). The values for expected disposal waste from 2009 to 2017 given in the ER spreadsheet (Ref. 10b) and Annex 3 of PDD (Ref. 1c) were adjusted by PP based on the revised percentage, and were verified correct. Therefore, this CL is closed out.

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 14/05/2009

Based on the above, CL 09 is closed out.

Acceptance and Close out by Lead Assessor:

Date: 14/05/2009

Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CAR	Number:	10	Reference:	Section A.2.3

Lead Assessor Comment:	
PDD states that the landfill is expected to close in May 2016. However, according to the Environmental Impact Assessment of the project ("Manifiesto de Impacto Ambiental") Annex 25 (Ref. 28), the landfill has a lifetime of 16.28 years (calculated based on Norm NOM-ECOL-084-94). Based on this information, and considering that the landfill started receiving waste on year 2001, the landfill would be expected to close in 2017. Therefore, a CAR has been raised.	
Project Participant Response:	Date: 08/05/2009
According to the file "CAR 10- Impact Assessment Landfill Lifetime.jpg", the life of the landfill is expected to be 16.28 years. Considering the landfill started receiving waste in June 2001, this implies that the landfill will be full by September 2017. However the waste projections shown in the cited file in the first few years are higher than the actual data as shown in our response to CAR 07. Using our projections for future waste disposal (see responses to CL09), and the column "D" of the sheet "Waste" of the file "CER Calculation El Verde 8may09.xls" the landfill would have accumulated only 8.2 million m ³ by the end of 2017. According to the first cited file, the landfill volume is 11 million m ³ . Hence, if we apply the same procedure as used in the cited file, based on total landfill volume, it would last several years, beyond 2017. However, in order to be conservative, we have maintained the end of landfill life to be 2017. This end date has been reported at various points in the modified PDD, and included in the revised estimation of expected emissions reductions (CER Calculation El Verde 8may09.xls).	
Documentation Provided by Project Participant:	
CAR 10- Impact Assessment Landfill Lifetime.jpg CER Calculation El Verde 8may09.xls	
Information Verified by Lead Assessor:	
The landfill lifetime was modified in the revised PDD (Ref. 1c) and ER spreadsheet (Ref. 10b). The end of the landfill lifetime has been set at 2017, based on the information given in the landfill Environmental Impact Assessment (Ref. 28).	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/05/2009
The landfill lifetime used for the project has been adjusted in accordance with the landfill EIA (Ref. 28). Therefore, CAR 10 is closed out.	
Acceptance and Close out by Lead Assessor:	Date: 14/05/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	11	Reference:	Section A.2.3
Lead Assessor Comment:					
The operation lifetime of the project activity could not be clearly identified in the PDD because:					
1. According to the PDD, page 2," <i>Since landfill gas continues to be produced for many years afterwards, the proposed project is expected to have a useful life to December 2029</i> ". The ER spreadsheet shows in section "PDD-FS" values for LFG to be captured within the project activity (Column U): 2009 is shown as the first year to have LFG captured and 2029 as the last year to have LFG captured (also illustrate in a graphic), totaling 21 years (same as 7x3 = <i>crediting period</i> renewable)					
2. The PDD section C.1.2 states that the <i>operational lifetime</i> of the project is 23 years;					
A CL11 was raised to ask PP to clarify:					
1) What PP means with the term "useful lifetime" in the PDD text (point 1 above);					
2) How the operation lifetime has been calculated for the proposed project activity taking into account the methane collection and equipments lifetime (point 2 above). Please note that, as defined in the CDM Glossary of terms, the <i>Operation Lifetime</i> is " <i>the period during which the project activity or CPA is in operation. No crediting period shall end after the end of the operational lifetime (calculated as from starting date)</i> ".					
Project Participant Response:				Date: 08/05/2009	
1. <i>The sentence on useful life has been deleted from Section A.2 of PDD. The period from January 2010 to December 2030 is the 21-year CDM crediting period.</i>					
2. <i>Different components have different lifetime. Lifetime further depends on maintenance. For the project proponent (PP) to obtain CERs, all equipment needs to be operational. Therefore PP will repair or purchase replacement equipment as needed until beyond the crediting period. Hence an operational</i>					

lifetime of 23 years is indicated in section C.1.2. For further clarification, we have added the following text "25 years from the start date as defined above", meaning the date given in C.1.1 (starting date of project activity), since Starting date is defined by the decision to start the project, and not when equipment is installed.

Documentation Provided by Project Participant:

None

Information Verified by Lead Assessor:

PDD section C.1.2 (expected operational lifetime of the project activity) was verified to include the following text: "23 years from start of operation, expected near the end of 2008, 25 years from the start date as defined above [18/06/2008]." However, from the cited sentence, it seems that project participant refers to an year different than 2008 for the start of operation, as it was verified the project was not operating yet during site visit (2009). PP is requested to revise this statement in the PDD for consistency.

Moreover, from the PP response, it was not possible to verify how the operational lifetime of the project activity (23 years) was calculated. Project participant is requested to clarify how this number was arrived at taking into account equipments to be used in the project activity, and how it can be verified.

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 14/07/2009

From the above information verified, CL 11 remains open.

Project Participant Response:

Date:

Text in section C.1.2 has been changed to reflect a realistic start operation date (01/10/09)
PDD and Excel files have also been modified to indicate clearly that the life of power generation equipment and to include additional purchases at the end of equipment lifetime. The analysis has been extended to 23 years, with residual value of equipment taken into consideration for correction evaluation of project economics. See detailed response and documentation on equipment life in the response to CL22.

Documentation Provided by Project Participant:

See response to CL22.

Information Verified by Lead Assessor:

1) The operation start date was changed in the revised PDD to 01/10/09 reflecting a more realistic timeframe.
2) With regard to the operational lifetime, it still remains unclear how the duration of 23 years was calculated. It was explained in CL 22 that SCS Engineers estimates the lifetime of the enclosed flare to be from 15 to 20 years and of the electricity generator as 20 years (Ref. 78). Nevertheless, PP further explained that a period of 10 years was considered as a reasonable working life of flare and power generators. Hence, it is not clear what rationale was used for determining the operational lifetime of the project as 23 years. Please clarify.

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 01/10/2009

Based on point 2) above, CL 11 remains open.

Project Participant Response:

Date: 05/10/09

Please note that SGS had previously stated in a response to CL22 the following:
"..It was verified in the revised economic analysis (Ref.11) that PP changed the period of assessment to 2009-2032 (23 years). This period reflects the operation lifetime expected to the project activity, in line with EB 39 – Annex 35. Section C.1.2 of PDD (Ref.1) also indicates 23 years as the period expected to the project lifetime. The operation lifetime of 23 years also assures that the system will be operating until after the end of the (3 x 7 year) crediting period. So information provided was found consistent..."

We reiterate that the operational lifetime of landfill gas recovery and use of LFG depends on the amount of LFG available, and whether it is worthwhile capturing it or not. To this end, maintenance of the wellfield is continued and associated equipment is maintained or replaced as needed. In our earlier analysis, we had taken "reasonable" estimates of equipment lifetime, with replacement at the end of life. In our earlier economic analysis, the life of flare station, evaporator, and electricity generator were each assumed to be 10 years, with replacement at the end of useful life, since considerable LFG continued to be available beyond 10 years. The SCS Engineers study assumed lifetimes to be larger, for an enclosed flare to be 15 to 20 years, and for electricity generators to be 20 years. While we believe that these are extremely long lifetimes, we also recognize that the cost effectiveness of electricity generation is favoured by long life. Hence a more conservative approach to economic additionality should consider the longer lifetime estimates. Therefore we have revised our economic additionality analysis using the longest life estimates, as given by SCS Engineers: 20 years for flare and 20 years for electricity generation. See response to CL22.

As noted above, wellfield and associated equipment can be maintained or replaced indefinitely as long as it is

believed to be worthwhile. The most expensive equipment is for electricity generation. Our economic analysis assumes an initial purchase of 2.4 MW in 2011 for use from Jan. 2012. This would last until Dec. 2031 (20 years). The second acquisition of generation equipment of 3.2 MW would take place in 2013, for use in the same year, and would last until 2032. After the first set of generators are retired in 2031, the total capacity would fall from 5.6 MW to 3.2 MW. However, by 2031, the available LFG could only generate 1.7 MW (see cell Z24 in sheet "Elec gen no CERs" of Economic workbook). Thus the second set of generators would be more than adequate capacity, and the first set of generators will not need to be replaced at the end of their 20-year life. The second set of generators would last until sometime in 2033 when they would need to be replaced. However, since this involves a very substantial investment, our economic analysis assumes that this investment will not be made, and hence, for practical purposes, the project life would end in 2032. This is the basis for the assumption that project life would be at the end of 2032, i.e. 23 years after the start date, in January 2010. Note that the economic analysis includes residual values of any surviving equipment in 2033. Hence, we consider that a project life time of 23 years is appropriate.

Documentation Provided by Project Participant:

EI Verde PDD ver 6 08Oct09 clean.doc

Information Verified by Lead Assessor:

The PDD Section B.5 has been revised to include explanation on the rationale used for determining the operational lifetime of the project as 23 years. It has been clearly explained that the project now considers as a conservative approach the longest life estimates provided by SCS Engineers for the equipments (20 years), applied for the flare and electricity generators. For the leachate evaporator, it was verified in the equipment supplier email provided by PP that lifetime of the evaporator may vary between 10 and 20 years. The equipment will be replaced at the end of their useful lifetime, as needed as long as there is sufficient LFG available. PP has considered 23 years as the project life, which would involve one or two replacements of evaporator, depending on the actual life of the evaporator. It is important to mention that the leachate evaporator has never been part of financial analysis as its scenario would only happen considering CER revenues, what is conservative.

Therefore it was verified that for:

Electricity generator equipments:

The economic analysis assumes two stages for electricity equipment purchase:

- 1) Initial purchase of three 0.8 MW Caterpillar generators with a total installed capacity of 2.4 MW in 2011 for use from Jan. 2012, which would last until Dec. 2031 (20 years).
- 2) Second acquisition of four 0.8 MW Caterpillar generators with a total installed capacity of 3.2 MW in 2013 and would last until 2032 (20 years).

Considering that set of generators are used proportionally to landfill gas available estimated in the crediting period, it was confirmed that no equipment exchange would be necessary as explained by PP. As stated in Section C.1.2 of PDD, the project operational lifetime is 23 years and is expected to start in January 2010 and end on Dec. 2032. As the second generation of electricity equipment is expected to operate until year 2032, it is now clear that the lifetime determined avoids extra investments (equipment exchange).

Flare:

The economic analysis considers the flare operation start as 2010, hence a new investment would take place on 2028 taking into account lifetime of 20 years.

It has additionally been confirmed that, according to landfill gas generation projection, there will be sufficient landfill gas captured to meet project activity needs by the end of the project lifetime.

Nevertheless, after revising updated documents, PP is requested to revise the Economical Analysis, "inputs & data source" where it states lifetime of flare is 15 years. Please review updated documentation to assure that all new information used has been addressed in different sections of PDD, Financial Analysis and ER calculation sheets.

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 20/10/2009

Based on the above, CL remains open.

Project Participant Response:

Date:

The tab "Inputs & data source" of the Economics spreadsheet has been modified to indicate a life of 20 years.

Documentation Provided by Project Participant:

EI Verde Economic Analysis_04Nov09.xls

Information Verified by Lead Assessor:

Ref.78 - Letters Venting Wells and Special Equipment Service Life.pdf

EI Verde Economic Analysis_04Nov09.xls

Reasoning for not Acceptance or Acceptance and Close Out:	Date: 06/11/2009
It was verified that Economical Analysis, "inputs & data source" was corrected to reflect lifetime as informed by SCS Engineers. CL11 closed out	
Acceptance and Close out by Lead Assessor:	Date: 06/11/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	12	Reference:	Section A.4.1
Lead Assessor Comment:					
PDD states that the project coordinates are N 21 °10'28"; W 101 °46'32", and the project EIA ("Manifiesto de Impacto Ambiental" – Ref. 33) page 2, section 1 shows the following coordinates: N 21 °10'14"; W 101 °46'30". Therefore, a CAR was raised.					
Project Participant Response:			Date: 08/05/2009		
<i>The text was corrected accordingly to the EIA ("Manifiesto de Impacto Ambiental"). The corrected coordinates (N 21 °10'14"; W 101 °46'30) were added in section A.4.1.</i>					
Documentation Provided by Project Participant:					
None					
Information Verified by Lead Assessor:					
Project location coordinates in PDD section A.4.1.4 were modified to N 21 °10'14"; W 101 °46'30 in accordance with the EIA (Ref. 33).					
Reasoning for not Acceptance or Acceptance and Close Out:			Date: 14/05/2009		
Location coordinates are now in consistency with the landfill EIA, therefore CAR 12 is closed out.					
Acceptance and Close out by Lead Assessor:			Date: 14/05/2009		

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	13	Reference:	Section A.4.3
Lead Assessor Comment:					
An Environmental Impact Assessment Authorization dated 23-11-2000 (Ref. 52) was granted to PASA by the state of Guanajuato which allowed the construction, operation and maintenance of the El Verde landfill. In 2006, the Municipality of Leon provided authorization for the proposed CDM project activity, dated 10-10-2006 (Ref. 53). It is not clear whether the state of Guanajuato should be responsible of conferring authorization to PASA for the project activity under the CDM. Therefore, a CL was raised to request clarification from PP based on verifiable evidence.					
Project Participant Response:				Date: 08/05/2009	
<i>According to the LGEPPA (Ley General para el Equilibrio Ecológico y la Protección al Ambiente), in its Chapter II (Distribución de Competencias y Coordinación), in its article 8 number IV, states that (in translation): "It corresponds to the Municipality the application of legal jurisdiction related to the prevention and control of the effects of the environment caused by the generation, transport, storage, management and treatment and final disposition of the solid and industrial wastes that are not considered as dangerous, according to the article 137."</i>					
<i>Article 137 states that it is concerned to the authorization of the Municipality, according to their local laws on the matter of collection, storage, transportation, storage, reuse, and treatment and final disposition of the solid municipal wastes.</i>					
<i>Also, the Law for the Management of the Wastes of Guanajuato State in its article 10 states that (in translation): "it is responsibility of the city hall or town hall (ayuntamiento) to formulate by themselves the municipal programs for the prevention and integral management of urban solid waste". It also states in number IV of this same article that it is the responsibility of the town hall (ayuntamiento) to prevent the generation and control the integral management of urban solid waste. Number VI of article 10 states that it is responsibility of town hall (ayuntamiento) to give a concession totally or partially of the cleaning public service, recollection, transport, treatment and final disposition of the wastes.</i>					
<i>According to these two Laws it is enough for the Municipality of Leon to authorize the CDM project to be executed.</i>					

Documentation Provided by Project Participant:	
<i>CL 13a- Ley para la Gestión de los Residuos en el Estado de Guanajuato.pdf</i>	
<i>CL 13b-Ley General del Equilibrio Ecológico y la Protección al Ambiente.pdf</i>	
Information Verified by Lead Assessor:	
<p>The information provided by project participant was verified correct. The Law for Ecological Balance and Environmental Protection (Ref. 64) states that “it corresponds to the municipality the application of legal jurisdiction related to the prevention and control of the effects over the environment caused by the generation, transport, storage, management, treatment and final disposition of the solid and industrial residues that are not considered as dangerous, in conformity with the Article 137 of the present Law.” Article 137 states that “it corresponds to the Municipalities or the Federal District to authorize the functioning of the systems of recollection, storage, transport, reuse, treatment and final disposition of municipal solid residues.”</p> <p>The Law for the Residual Management of Guanajuato (Ref. 65) states in article 10 that “it is responsibility of the city hall to formulate by themselves the municipal programs for the prevention and integral management of urban solid waste.” It also states in number IV of this same article that it is the responsibility of the town hall (ayuntamiento) to prevent the generation and control the integral management of urban solid waste. Also, number VI of article 10 states that it is responsibility of the city hall to give totally or partially as a concession the public service of cleaning, recollection, transport, treatment and final disposition of the wastes.</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/05/2009
From the two laws referred to above, it can be concluded that it corresponds to the Municipality of Leon to confer authorization for the proposed CDM project activity in the El Verde landfill. Therefore, CL 13 is closed out.	
Acceptance and Close out by Lead Assessor:	Date: 14/05/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	14	Reference:	Section A.4.3
Lead Assessor Comment:					
It was verified in the ER spreadsheet (Ref. 10) that the project estimates electricity generation starting from 2009. Considering that currently the project does not count with a license for generating electricity, project proponent is requested to revise the projected start date for electricity generation based on a more realistic scenario. Thus, a CAR has been raised.					
Project Participant Response:				Date: 08/05/2009	
<i>Considering that it would take about two years to obtain the permits for generating electricity, the start date for electricity generation has been changed to January 2012, and the ER calculation has been updated accordingly.</i>					
Documentation Provided by Project Participant:					
<i>CER Calculation El Verde 8may09.xls</i>					
Information Verified by Lead Assessor:					
Projections in ER spreadsheet for electricity generation were verified to start in January 2012.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/05/2009	
The start date for generating electricity in the project activity has been changed to January 2012, based on a more realistic timeframe. Therefore, CAR 14 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 14/05/2009	

Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	15		Reference:	Section A.4.4
Lead Assessor Comment:						
Section A.4.2 of PDD states that the project categories are 13 – Waste handling and disposal; and 1 – Energy industries (renewable / non-renewable sources). However, according to the list of CDM scopes available on the UNFCCC website, the methodology ACM0001 is only applicable to scope 13. A CAR was thus raised.						
Project Participant Response:				Date: 08/05/2009		
<i>The sectoral scope was changed in section A.4.2 to “13. Waste handling and disposal”.</i>						
Documentation Provided by Project Participant:						
<i>Revised PDD</i>						

Information Verified by Lead Assessor:	
Section A.4.2 of revised PDD was verified. It states: According to the "Sectoral Scope" classification, the project category is: "13. Waste handling and disposal".	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/05/2009
Section A.4.2 of the revised PDD (Ref. 1c) has been modified and correctly states the project category as 13 – Waste handling and disposal. CAR 15 is closed out.	
Acceptance and Close out by Lead Assessor:	Date: 14/05/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	16	Reference:	Section B.1.1
Lead Assessor Comment:					
Section B.1 of PDD: "Tool for the demonstration and assessment of additionality" used for the project is version 5. However version 5.2 of the tool is available at UNFCCC website. CAR 16 was raised to request project participant either to apply the most updated version of the Tool or justify in a revised PDD why changes from version 5.0 to subversion 5.2 do not affect the project activity.					
Project Participant Response:				Date: 08/05/2009	
<i>The main changes since version 5 were the following:</i> <i>Version 5.1:</i> Addition of the "Guidance on the assessment of investment analysis" as an annex to the Additionality Tool. <i>Version 5.2.</i> Updated with version 2 of the annex "Guidance on the assessment of investment analysis". <i>The Economic analysis was already consistent with the Guidance. Note that Ver. 5.2 also appears to give a preference to IRR as a financial indicator. The previous version of the PDD provided values for both IRR and NPV. The latter have now been deleted. Hence the PDD has been updated to version 5.2 of the Additionality Tool.</i>					
Documentation Provided by Project Participant:					
<i>Revised PDD</i>					
Information Verified by Lead Assessor:					
Versions of the Tool for the demonstration and assessment of additionality were verified and changes from version 5.0 to 5.2 do not affect the application of the tool in the PDD. Eventhough PDD was updated to version 5.2 of the Additionality Tool to incorporate and revise minor information.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/05/2009	
PDD was updated version 5.3 of the Additionality Tool. Therefore, CAR 16 is closed out.					
Acceptance and Close out by Lead Assessor:				Date: 14/05/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	17	Reference:	Section A.1.4
Lead Assessor Comment:					
According to the Tool to calculate the emission factor for an electricity system, the relevant electric power system should be identified in Step 1 of the tool for determining the electricity emission factors. It is stated in the PDD that “the geographic and system boundaries include all the geographic area and infrastructures within the whole territory of Mexico, taking into account the energy exports and imports outside the Mexican energy system.” However, a CAR was raised to request that the relevant grid is identified and included in a revised PDD.					
Project Participant Response:				Date: 08/05/2009	
<i>In Annex 3 of the revised PDD, the sentence cited above has been replaced by the following:</i> “The relevant power system is the one where the landfill is located, and comprises all of Mexico, except Baja California North and Baja California South, each of which has an isolated system, not connected to the rest of Mexico, or to each other.”					
Documentation Provided by Project Participant:					
See figure in p. 116 of “ Prospectiva SE 2008-2017.pdf ” (Source: http://www.sener.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf)					
Information Verified by Lead Assessor:					

The relevant grid has been clearly identified in the revised PDD (Ref. 1c), Step 1 of the tool to calculate the emission factor for an electricity system, which is in accordance with the information of the Mexican grid found in the document "Prospective of the Electrical Sector 2008-2017" (Ref. 54).	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/05/2009
As the relevant grid has been identified in the revised PDD, CAR 17 is closed out.	
Acceptance and Close out by Lead Assessor:	Date: 14/05/2009

Date:	19/08/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	18	Reference:	B.5
Lead Assessor Comment:					
As verified in the "Macro Cells Plan" identified as LN-03 part of the EIA and dated 08-05-2000 (Ref. 24a – 24d), the area available for disposal in the landfill covers 2 Macro Cells (1 and 2) with approximately 25 hectares each, with 5 remaining hectares designated as buffer zone, comprising a total of approximately 60 hectares for the landfill. Each Macro Cell is divided into 5 cells. Each cell contains 10 vents (passive gas wells), totaling 100 vents in the whole landfill. It is understood that PP refers to 50 vents in a area of 30 hectares in different sections of the PDD because at this moment Macro Cell 2 is not completed, however it is also understood that in the baseline scenario (future scenario), Macro Cell 2 is assumed to be completed as planned (with 5 cells with 10 passive gas wells each) and to be included in the project boundary. Therefore the baseline scenario would count with a 100 vents in 60 hectares. Even though value of 1.67 wells per hectare stated in the PDD would remain the same for both cases, since $30/50 = 60/100 = 1.67$ wells per hectare, a CL38 is raised to ask PP to revise the PDD in order to have this information clear throughout the document.					
Project Participant Response:				Date: 31/08/09	
PDD was modified in order to make clear that wells density is 1.6 wells per hectare in macro cell 1. Please note that according with the attached file "Niveles de desplante de Macroceldas El Verde, León, Gto.052009.pdf" the total amount of wells in macro cell 1 is 48. Therefore, wells density is 1.6 wells per hectare (48/30). In addition, the landfill gas vents distribution plan for macro cell 2 was described in section A.2 para 5.					
Documentation Provided by Project Participant:					
Niveles de desplante de Macroceldas El Verde, León, Gto.052009.pdf El Verde PDD ver 6 04Sep09.doc					
Information Verified by Lead Assessor:					
The revised PDD (Ref.1d) was verified to mention the correct number of wells and wells density. PP also provided the file "Niveles de desplante de Macroceldas El Verde, León, Gto.052009.pdf" (Ref.79) which shows a map of the landfill site dated May 2009, and that shows a total of 48 wells in macro cell 1, confirming the information stated in the PDD.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 01/10/2009	
Based on the above explanation, CL 18 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 01/10/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	19	Reference:	Section A.1.6
Lead Assessor Comment:					
Section B.4 of PDD states that among the realistic alternatives to be considered as possible alternative baselines are H1 through H7 (for heat generation). However, no emissions from heat generation are taken into account in calculating baseline emissions in Section B.6, which shows an inconsistency in the PDD. Therefore, a CAR was raised to request project proponent to make the necessary adjustments for consistency in the PDD.					
Project Participant Response:				Date: 08/05/2009	

<p><i>There are no baseline CO₂ emissions corresponding to heat generation (leachate evaporator) in the project scenario. This is because the evaporator would not exist without the CDM project. It is very unlikely that PP would use a fuel such as propane to evaporate leachate, because of the high operating (fuel) costs. By not including baseline emissions from heat generation, not only are we being realistic, we are also being conservative, since total baseline emissions are lower.</i></p> <p><i>Section B.4 has been modified. Alternatives H1 through H7 have been excluded for further analysis after applying step 1 (Identification of alternatives to the project activity consistent with current laws and regulations).</i></p>					
Documentation Provided by Project Participant:					
None					
Information Verified by Lead Assessor:					
Heat generation as a baseline scenario was correctly eliminated from section B.4, which is consistent with the actual situation and baseline scenario.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/05/2009	
Based on the information above, CAR 19 is closed out.					
Acceptance and Close out by Lead Assessor:				Date: 14/05/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	20	Reference:	Section A.1.8
Lead Assessor Comment:					
<p>According to the Additionality Tool, a financial analysis of the proposed project activity without the revenues of CDM must be done in Step 2. However, an investment analysis is carried out for each of the identified alternatives to the project activity. Please revise PDD accordingly.</p> <p>In addition, a simple cost analysis was chosen in PDD when applying step 2 of the Additionality Tool. However, it has been stated in the PDD that generation of electricity is also contemplated for the project activity, which would be for use at the landfill site and/or supply to the local grid, creating economic benefits other than the CDM revenues. It is requested that another option is selected in this step in a revised PDD.</p>					
Project Participant Response:				Date: 08/05/2009	
<p><i>In applying Step 2 of the Additionality Tool, Simple Cost Analysis was used only to discard baseline scenarios LFG1.1 (Flaring only) and LFG1.3 (LFG use for leachate evaporation) since in each case there are investment requirements and no revenues in the absence of the CDM. Leachate evaporation provides a local environmental benefit but no revenues to PP.</i></p> <p><i>In the case of electricity generation, there are investments as well as revenues (through electricity cost savings and electricity sales to users outside the landfill). Hence, a financial analysis was conducted for all baseline scenarios involving electricity generation.</i></p> <p><i>Hence it is not clear what is meant by this CAR.</i></p>					
Documentation Provided by Project Participant:					
None					
Information Verified by Lead Assessor:					
<p>Project participant responded that a Simple Cost Analysis was used only to discard baseline scenarios LFG1.1 (Flaring only) and LFG1.3 (LFG use for leachate evaporation) as in each case there are investment requirements and no revenues in the absence of the CDM. As verified, the selection of the most plausible scenario follows primarily the procedures in ACM0001, which makes reference to the Additionality Tool. It was not clear whether in Step 2 the PDD should conduct an investment analysis of the project activity without CDM benefits or of all alternative scenarios that had been identified in step 1. However, as stated in the PDD, ACM0001, Ver. 10 actually requires that the additionality test in step 2 of the tool "be applied for each component of the baseline, i.e. baseline for waste treatment, electricity generation and heat generation". Therefore, the application of step 2 in the PDD was verified correct, following the methodology guidelines. CAR 20 was closed out.</p>					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/05/2009	
As explained above, step 2 of the Additionality Tool was verified correctly applied in the PDD. Therefore, CAR 20 was closed out.					

Acceptance and Close out by Lead Assessor:	Date: 14/05/2009
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Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CL	Number:	21	Reference:	Section B.4.2

Lead Assessor Comment:

Project starting date mentioned in PDD version 4 section C.1.1 is 26/10/2007. However, it is not clear whether this date is applicable due to the re-consideration of the technology to be applied as leachate evaporation has been included as one main activity in the project.

According to the CDM Glossary of Terms (http://cdm.unfccc.int/Reference/Guidclarif/glos_CDM_v04.pdf), “the start date [of a project activity] shall be considered to be the date on which the project participant has committed to expenditures related to the implementation or related to the construction of the project activity. This, for example, can be the date on which contracts have been signed for equipment or construction/operation services required for the project activity.”

Project Participant Response:	Date: 08/05/2009
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The starting date of the project activity was changed to 18/06/2008, corresponding to the invoice for leachate evaporator equipment purchase from Ecologix Environmental Systems. This is the most conservative (i.e. earliest) date of real action, since project participant has committed to make this expenditure for CDM project activity.

Documentation Provided by Project Participant:

Invoice_34131491A_from_Ecologix_Environmental_Systems_LLC.pdf

Information Verified by Lead Assessor:

Evaporator invoice (Ref. 67) identified as 3413-1491A was verified with date as 18-06-2008. Revised PDD section C.1.1 was modified and now states 18/06/2008 as the start date of the project activity. However, this date is not conservative in terms of CDM consideration as the chosen date comes later than the previous. Also, the contract between SCS and PASA (dated 26/10/2007) does represent a real action, regardless of the activity to be implemented in the project (flare, leachate, electricity), thus PP is requested to amend the project starting date.

Reasoning for not Acceptance or Acceptance and Close Out:	Date: 14/12/2009
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CL21 remained open, based on explanation above.

Project Participant Response:	Date: 15/01/10
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Starting date of the project activity has been changed as suggested. Please see section B.5 and C.1.1.

Documentation Provided by Project Participant:

Ref.1g - El Verde PDD ver 9 14-01-10

Information Verified by Lead Assessor:

Starting date has been revised in section C.1.1 of the PDD.

Reasoning for not Acceptance or Acceptance and Close Out:	Date: 18/01/2010
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Based on the above explanation, CL21 was closed out.

Acceptance and Close out by Lead Assessor:	Date: 18/01/2010
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Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CL	Number:	22	Reference:	Section A.1.9

Lead Assessor Comment:

According to the Guidance on the Assessment of Investment Analysis (EB 39 – Annex 35), “the period of assessment should not be limited to the proposed crediting period of the CDM project activity.” The guidance further states that “both project IRR and equity IRR calculations shall as a preference reflect the period of expected operation of the underlying project activity (technical lifetime) (...)”. It was verified in the economic analysis spreadsheet of the project that the economic assessment covers the period from 2007 to 2019 (13 years), which is even shorter than the operational lifetime of the project as mentioned in section C.1.2 of PDD. Thus, a CL was raised to request clarification regarding this period of assessment. Please also provide information of approximately lifetime expected from equipments to be used in the project activity, provided by manufactures.

Project Participant Response:	Date: 08/05/2007
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<p><i>Manufacturers do not provide information on equipment lifetime. Hence lifetime values are based on expert estimates. Key equipment (flare and electricity generators) is replaced after 10 years. This, together with equipment maintenance ensures that the system is operating until after the end of the (3 x 7 year) crediting period. Additional investments and operating costs, as well as revenues from electricity sales have now been extended to 2032 to extend the economic analysis to that time. Residual value of the flare and electricity generator has been assigned to year 2033. The revised economic analysis is shown in El Verde Economic Analysis 8may09 final.xls. The additional assumptions and updated results are included in the revised PDD.</i></p>	
<p>Documentation Provided by Project Participant:</p>	
<p>El Verde Economic Analysis 8may09 final.xls</p>	
<p>Information Verified by Lead Assessor:</p>	
<p>Ref.11- Revised Economic Analysis Ref. 28 – Useful lifetime calculation (Annex of EIA) Ref.10 – Revised ER Calculations Ref.1 – Revised PDD</p>	
<p>Reasoning for not Acceptance or Acceptance and Close Out:</p>	<p>Date: 19/08/2009</p>
<p>It was verified in the revised economic analysis (Ref.11) that PP changed the period of assessment to 2009-2032 (23 years). This period reflects the operation lifetime expected to the project activity, in line with EB 39 – Annex 35. Section C.1.2 of PDD (Ref.1) also indicates 23 years as the period expected to the project lifetime. The operation lifetime of 23 years also assures that the system will be operating until after the end of the (3 x 7 year) crediting period. So information provided was found consistent. In order to assess reliability of information, the following were verified:</p> <ul style="list-style-type: none"> - Landfill Lifetime: as per EIA provided by PP, the useful lifetime of the landfill is expected to be of 17 years, based on the area available (11,094,224.13 m3) and projection of waste to be disposed in the landfill (Ref.28), calculated as per Norm ECOL-084-94. It was noted that the waste disposal projected by the EIA is higher than the projection made by PP on ER Calculations (Ref.10), what is conservative since landfill could then be used to dispose waste for a longer time. Based on this information and considering landfill gas collection starting on 2010 (Ref.10), there would be still landfill gas available to be used for the project activity by 2032, when project activity is assumed to end. - Main equipment lifetime (Evaporator, Flare, Electricity generators): No references, data sources or documentation was provided to support that equipments would be functioning until end of crediting period. For electricity generation and flare station, it was stated in the revised PDD (Ref.1) that equipment is replaced at the end of each 10-year period. Please indicate source of data. This is necessary since if costs are being considered for equipment exchange in financial analysis and this is not necessary, hence is not conservative either. If manufacture of such equipment cannot provide such information, PP should provide references from experts as support to the response, so it can be verified. 	
<p>Project Participant Response:</p>	<p>Date:02/09/09</p>
<p>SCS Engineers, leading US engineering company on landfill management including LFG capture, flaring and energy use of LFG have provided estimates for the maximum expected lifetime of enclosed flares and LFG power generation equipment. See file: "Letters Venting Wells and Special Equipment Service Life-smh edit.pdf". These estimates indicate that equipment can be very long lasting with best possible maintenance. In order to be conservative, we have assumed 10 years as a reasonable working life of flare and power generators. Equipment would be replaced at the end of the useful life, and the cost of replacement equipment has been included in the economic analysis. We have assumed the same 10-year lifetime for the evaporator. It is a combustion device similar to the flare, and simpler than the generator (which has moving parts, etc.). Hence a 10-year lifetime is conservative. Since the evaporator is not needed for power generation, the economics of power generation does not include the initial investment in the evaporator, operating expenses, or the cost of equipment replacement at the end of its life. Hence the evaporator investments and operating costs do not form part of the economic analysis. Note that this is conservative, since including these costs would reduce the cost effectiveness of power generation even further.</p>	
<p>Documentation Provided by Project Participant:</p>	
<p>Letters Venting Wells and Special Equipment Service Life-smh edit.pdf</p>	
<p>Information Verified by Lead Assessor:</p>	
<p>1) It was verified in the document "Letters Venting Wells and Special Equipment Service Life-smh edit.pdf"</p>	

<p>(Ref.78) that SCS Engineers, an engineering company with experience in landfill and landfill gas (LFG) engineering and consulting since 1970, estimates the lifetime of the enclosed flare to be from 15 to 20 years and of the electricity generator as 20 years. However, the lifetime chosen by the project participant for these equipments was of 10 years. This may be conservative for the purpose of cost estimations by the project developer; yet this is not conservative in terms of additionality in the financial analysis. Hence, it is not possible to validate the lifetime of 10 years chosen given that the lifetime estimates provided by SCS Engineers are higher. Please adjust the lifetime of equipment applied in the financial analysis in order to be consistent with the information provided by SCS Engineers.</p>					
<p>2) No information was given for the leachate evaporator. A 10-year lifetime was used for the leachate evaporator based on the other two equipments. However, as indicated by project proponent, the leachate evaporator costs are not included in the financial analysis of the project which is conservative. Nevertheless, for the purpose of assessing the operational lifetime of the project activity, project participant is requested to provide evidence from either manufacturer or experts addressing an estimated lifetime for evaporator.</p>					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 01/10/2009	
Based on the above explanation, CL 22 remains open.					
Project Participant Response:				Date: 05/10/09	
<p>Regarding point 1) above: while we believe that 10-year operational life to be reasonable, we have now redone economic analysis considering the upper limit of life estimates given by SCS Engineers, i.e. electricity generators and enclosed flare have lifetime of 20 years. PDD and economic analysis spreadsheet have been changed properly.</p> <p>Regarding point 2): the equipment supplier sent the attached email indicating that lifetime of the evaporator may vary between 10 and 20 years. As explained in our response to CAR4 and CL11, and in the PDD, equipment will be replaced at the end of their useful lifetime, as needed as long as there is sufficient LFG available. We have considered 23 years as the project life, which would involve one or two replacements of evaporator, depending on the actual life of the evaporator.</p> <p>Eli Gruber from Ecologix may be contacted to confirm the information provided.</p> <p>Contact info: Email: egruber@ecologixsystem.com Tel: 1-678-514-2100 Fax: 1-678-514-2106</p>					
Documentation Provided by Project Participant:					
Mail Ecologix timelife evaporator 31Aug09.pdf El Verde PDD ver 6 08Oct09 clean.doc El_Verde_Economic_Analysis_08Oct09.xls					
Information Verified by Lead Assessor:					
<p>1) Useful lifetime of electricity generators and enclosed flare have been adjusted to 20 years, which represents a more conservative value considering the estimates provided by SCS Engineers (Ref.78).</p> <p>2) With regard to the LFG evaporator, PP has provided e-mail evidence from Ecologix Environmental Systems, LLC (Ref.84) which states that the lifetime of the equipment varies from 10 to 20 years. Contact info from Ecologix was also made available. As explained in CL11, operational lifetime of 23 years for the project has been considered appropriate considering the longest life estimates for equipments (20 years).</p>					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 15/10/2009	
Based on the above explanation, CL22 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 15/10/2009	
Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CL	Number:	23	Reference:	Section A.1.10
Lead Assessor Comment:					
<p>It was not possible to confirm the investment barriers mentioned in section B.5 of PDD, as no reference has been provided (i.e. on the low tipping fees mentioned) and no evidences were presented regarding the difficulty of the project activity to obtain funds. Therefore, a CL was raised to request evidence of these assumptions.</p>					
Project Participant Response:				Date: 08/05/2009	

Barrier analysis has been deleted from PDD. Additionality is shown only through financial analysis.	
Documentation Provided by Project Participant:	
None	
Information Verified by Lead Assessor:	
Barrier Analysis is optional as per Tool for the demonstration and assessment of additionality.	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 10/08/2008
As Barrier Analysis is optional as per Tool for the demonstration and assessment of additionality, CL 23 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 10/08/2008

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	24	Reference:	Section A.1.12
Lead Assessor Comment:					
In the estimation of the methane destruction efficiency of the baseline system for calculating the Adjustment Factor, PDD states in page 26 that “when there is an adequate number of passive vents distributed throughout the landfill area, the capture efficiency may be 15% to 20%.” It further adds: “A medium drainage of gas consists of about 5 wells per hectare.” A CL was raised to request evidence of these assumptions.					
Project Participant Response:				Date: 08/05/2009	
A new section has been added within Annex: “Determination of methane destruction efficiency in baseline, ϵ_{BL}” . The basis for the assumptions are clarified in this new section, based on cited evidence. Note that there has been a slight modification in the assumptions. However, the final result on methane destruction in the baseline remains the same.					
Documentation Provided by Project Participant:					
Revised PDD					
Information Verified by Lead Assessor:					
Revised PDD					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 27/08/2009	
<p>The information provided in the Annex has been revised. Nevertheless it was noted that PP does not applies the methodology step as required.</p> <p>It has been confirmed that Step 1 (b) of the methodology is applicable for project activity since there is no “system for collection and destruction of methane prior to implementation of the project activity...”. and the “specific percentage of the ‘generated’ amount of methane to be collected and destroyed is specified in the contract or mandated by regulations...”.. Then, as per methodology requirement, “In other cases, a procedure for estimating the amount of landfill gas that would be captured in absence of the project activity shall be provided in the CDM PDD validated by the DOE. This procedure shall be used to estimate the MD_{Hist} in equation 3 above to estimate the baseline destruction efficiency”.</p> <p>The option given by the methodology to “other cases” already takes into account that the project activity is supposed to estimate a “historical” data.</p> <p>The procedure proposed by project activity is estimating the destruction efficiency directly. PDD states that “Note that Eq. (3) refers to <i>historical</i> measurements and estimates, since the equation was introduced in relation to Step 1(a) in ACM0001, Ver. 10. Prior to project implementation, there was no methane capture, so that MD_{Hist} is zero, since there was no methane capture and destruction by flaring or other means.</p> <p>This argument is not valid in PDD context. Based on PP conservative approach established, an AF is estimated to consider that the passive vents in the project site would be used to combust the landfill gas. PP has data available to estimate MD_{Hist} and MG_{Hist} to be used in calculation as per methodology: $C_{BL} = MD_{Hist}/MG_{Hist}$ hence AF calculation should be revised.</p> <p>Also, it is not clear why PP uses a value of 25% of chimneys available calculated based on an ideally number of chimneys. The calculation is understood; it is not clear why PP does not apply 100% since all of the vents installed would be used for flaring in a hypothetical scenario?</p>					
Project Participant Response:				Date: 03/09/09	
There was no combustion of LFG historically. This has been confirmed by documents provided by the Municipality (Letter from Municipality Leon.jpg) as well by SCS Engineers (Letters Venting Wells and Special Equipment Service Life-smh edit.pdf). Indeed SCS Engineers have further stated that the venting wells are made of PVC. i.e. a combustible polymer, these vents could not be used for combusting LFG. Therefore, it					

would not be possible to combust any LFG with passive vents such as those installed in the landfill. All this should have been clearly visible during the two validation visits realized by SGS to this landfill. Hence, AF has been set to zero, and the contradictory text deleted from the PDD.	
Documentation Provided by Project Participant:	
Letter from Municipality Leon.jpg Letters Venting Wells and Special Equipment Service Life-smh edit.pdf)	
Information Verified by Lead Assessor:	
<p>Project participant provided a letter from the Municipality of Leon (Ref.80) which was verified and confirms that a supervisor from the Municipality has been at the El Verde landfill since the start of its operations, and that no LFG combustion has taken place in any of the existing gas vents. Furthermore, the PP provided a letter from SCS Engineers (Ref. 78) which was confirm to state that “since early 2007, SCS has not witnessed any combustion of LFG in the existing LFG venting well system.” It further states that the current LFG venting wells are not appropriate to perform passive combustion of LFG as the main conduits of the gas vents are made of polyvinyl chloride (PVC) which is widely known as a combustible material. This was confirmed in the landfill EIA document, Annex 15 (Ref.25), which provides a diagram of the gas wells, specifying that these are tubes made of PVC material. Photos available from site visit also indicate the same. In fact polyvinyl chloride (PVC) is widely known as a combustible material however in the other hand the chlorine content of PVC makes it difficult to ignite the material. The flammability depends on the type of PVC used in wells and the temperature of exposure; hence, more information is required from project participant to confirm this statement.</p> <p>- Based on the statement that no methane destruction was possible in baseline scenario, the project participant decided to change the Adjustment Factor from 6%, which was originally established in the published PDD (Ref. 1b), to 0% as established in the revised PDD (Ref.1d), and as a result the estimated emission reductions increased from to 1,215,217 (Ref.10b) to 1,309,637 (Ref.10c). However, it is necessary to justify why PP has changed the adjustment factor (AF) since the previous value was more conservative.</p> <p>- Also, it was noted that pg. 35 of PDD is contradictory with the new value of AF chosen: “<u>While we show an adjustment factor AF different from zero</u>, i.e. equivalent to some landfill gas (methane) destruction in the baseline scenario [...]” Please revise accordingly.</p> <p>- Finally, it was noticed that the methodology requires that “in cases where regulatory or contractual requirements do not specify <i>MDBL</i>,y or no historic data exists for LFG captured and destroyed an “Adjustment Factor” (AF) shall be used and justified, taking into account the project context.” With reference to this requirement, the PDD states in section B.6.1 that “neither current regulations nor any contractual obligations require the capture and combustion of LFG [...]”. Nevertheless, it was verified that the federal norm “NOM-083-SEMARNAT-2003 (Ref.17) prescribes in point 7.2 the combustion of LFG through the means of individual wells or a network of central incinerators. Although it is known that this norm is not extensively enforced in Mexico, and that it requires no specific amount of LFG for combustion, project participant is requested to revise this statement in the PDD for the purpose of transparency and consistency.</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 01/10/2009
Based on the above, CL 24 remains open.	
Project Participant Response:	Date:
<p>Since we cannot defend a value of AF other than zero, we have used a value of AF = 0 in recent versions of the PDD (which reflect what is really happen at the landfill site). Note that in several instances the draft validation report asked for supporting documentation to back specific assumptions. In some of these cases, we had to change the assumptions to a value which we could support through additional documentation. In some of these cases, the changes make the calculation more conservative (e.g. lower discount rate and, now, longer equipment lifetime) while other changes become less conservative, e.g. reduced AF. It is true that some of our assumptions in earlier versions were more conservative, but without supporting documentation. In fact, on the basis of the passive vent design and manufacture with a combustible plastic (PVC), whose combustion releases toxic gases, in revised versions we have shown that it would in fact be impossible to burn LFG. The main purpose of a flare is to burn methane (to reduce fire and explosion risks) and to destroy volatile organic compounds, which are toxic. A PVC vent pipe, which goes soft at temperatures below 100 C, and releases toxic gases upon burning, is far from adequate for burning LFG.</p> <p>The fact that a certain assumption becomes less conservative when we provide documentation is not grounds for rejecting the modification.</p>	

We have deleted the incorrect and contradictory sentence from what was p. 35 of PDD. We have also corrected B.6.1 as noted in the last paragraph above.	
Documentation Provided by Project Participant:	
El Verde PDD ver 6 08Oct09 clean.doc	
Information Verified by Lead Assessor:	
Project participant has properly justified the change in Adjustment Factor value, as there was no supporting evidence available for the previously used AF of 6%. The low heat distortion temperature (softening temperature) compared with other plastics of the similar molecular structure was confirmed in the official website of PVC products (http://www.pvc.org/What-is-PVC/PVC-s-physical-properties/Heat-Distortion-Temperature-softening-temperature).	
Considering that:	
<ul style="list-style-type: none"> - During site visit there it was no sign of combustion in the wells observed in the landfill; - SCS states that has been performing projects for PASA since 2007, and since early 2007 to the present has not witnessed any combustion of LFG in the existing LFG venting well system; - SCS statement confirms that the current construction of the LFG venting wells is not appropriate to perform passive combustion of the LFG since the main conduit is constituted of polyvinyl chloride (PVC) plastic pipe. This was verified as expressed above; - Municipality states that one person working for the municipality who is responsible to observe the activities in the landfill since 2001 has not witnessed any combustion of LFG in the existing LFG venting well system; 	
It is confirmed that no LFG burning could have taken place in the venting wells installed historically, hence AF=0 is found applicable to the project activity.	
Moreover, the incorrect and contradictory sentence was removed from pg. 35 of PDD. Also, incorrect reference to NOM-083-SEMARNAT-2003 was amended in section B.6.1 of PDD.	
Please note the Figure 4 still referring to "CH ₄ Emissions in BASELINE scenario (Passive LFG venting, AF = 6%)". Please make the necessary correction for compliance. Please make sure all documentation provided addresses updated information in all different sections.	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 28/10/2009
Based on the above information verified, CL 24 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 28/10/2009
Project Participant Response:	Date:
The text has been corrected to eliminate any mention of AF = 6%.	
Documentation Provided by Project Participant:	
Revised PDD	
Information Verified by Lead Assessor:	
Revised PDD	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 06/11/2009
It was verified that Figure 4 of revised PP has been corrected to eliminate any mention of AF = 6%. CL24 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 06/11/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	25	Reference:	Section A.1.12
Lead Assessor Comment:					
According to the methodology, the calculation of the destruction efficiency of the system in the project activity (step 2 for estimating the AF) can be calculated using two options; one if applying an ex-ante estimation of the AF, and another if calculating the AF ex-post. As verified in the PDD, neither of these options was chosen. Therefore, a CAR was raised.					
Project Participant Response:				Date: dd/mm/yyyy	

We selected option 1. This was stated in the PDD. We have now emphasized the sentence in the PDD. Hence we are not clear what this CAR means.					
Documentation Provided by Project Participant:					
Revised PDD					
Information Verified by Lead Assessor:					
Revised PDD					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 26/08/2009	
Option 1 is not correctly applied. PDD states: "We do not have measurements of the methane destroyed by the project activity, since it is not yet operational. Therefore we cannot apply Eq. (4)." The methodology indicates the formula to <i>estimate</i> the destruction efficiency of the system used in the project activity. It is not expected from PP to have such values measured; it clearly refers to estimation. PP has available the estimated data on methane to be destroyed in the project activity to provide calculation in accordance with methodology requirement. Please revise it accordingly.					
Project Participant Response:				Date: 02/09/09	
As explained in response to CL24, there is no methane destruction historically, nor would there be any in the baseline, hence AF is zero. Eq (4) is therefore not needed.					
Documentation Provided by Project Participant:					
See response to CL24.					
Information Verified by Lead Assessor:					
See CL24					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 01/10/2009	
Based on the above, CAR 25 remains open.					
Project Participant Response:				Date:	
See response to CL24.					
Documentation Provided by Project Participant:					
Information Verified by Lead Assessor:					
As confirmed in CL 24, Adjustment Factor of the project is 0% as no LFG burning could have taken place in the baseline scenario. Hence, equation (4) for estimating the destruction efficiency is not applicable.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 28/10/2009	
Based on the above information verified, CAR 25 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 28/10/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	26	Reference:	Section A.1.12
Lead Assessor Comment:					
As stated in section B.1 of PDD, the "Tool to calculate the emission factor for an electricity system" used for the project activity is version 1. However version 1.1 is available at UNFCCC website. CAR 26 was raised to request project participant to whether to apply the most updated version of the Tool or justify in a revised PDD why changes subversions do not affect the project activity.					
Project Participant Response:				Date: 08/05/2009	
PDD has been updated to version 1.1 of this tool.					
Documentation Provided by Project Participant:					
None					
Information Verified by Lead Assessor:					
Version 1.1 of this tool was applied by PP in a revised PDD.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 15/07/2009	

Version 1.1 of this tool was applied by PP in a revised PDD. CAR 26 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 15/07/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	27	Reference:	Section A.1.12
Lead Assessor Comment:					
The PDD states in Annex 3 that “according to the tool, the Dispatch Data Analysis method should be the choice considered, but this method cannot be used for this project activity (...)”. It is not clear which tool the PDD is referring to. Therefore, a CL was raised.					
Project Participant Response:				Date: 08/05/2009	
The Tool has now been named in the revised PDD.					
Documentation Provided by Project Participant:					
None					
Information Verified by Lead Assessor:					
Revised PDD / Tool to calculate the emission factor for an electricity system					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 15/07/2009	
Please clarify why PDD states that Dispatch Data Analysis method should be the choice considered.					
Project Participant Response:				Date: 31/08/09	
Statement has been deleted from Annex 3 of revised PDD.					
Documentation Provided by Project Participant:					
El Verde PDD ver 6 04Sep09.doc					
Information Verified by Lead Assessor:					
The PDD was revised and sentence referring to Dispatch Data Analysis was deleted.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 29/09/2009	
CL 27 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 29/09/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	28	Reference:	Section A.1.12
Lead Assessor Comment:					
According to the Tool to calculate the emission factor for an electricity system, the simple OM method (option a) can only be used if low-cost/must-run resources constitute less than 50% of total grid generation in: 1) average of the five most recent years, or 2) based on long-term normals for hydroelectricity production. As verified in the PDD, the simple OM method is chosen (option A), based on choice 1. However, the calculation is based on years from 2002 to 2006. A CAR was raised because it was verified that there is more recent data available in the Mexican Secretary of Energy website (www.sener.gob.mx).					
Project Participant Response:				Date: 08/05/2009	
<i>The calculation was updated with data from years 2003 to 2007. See Annex 3 of revised PDD.</i>					
Documentation Provided by Project Participant:					
<i>Mexico electricity emissions factor 2009.xls</i>					
Information Verified by Lead Assessor:					
Ref.68 - Mexico electricity emissions factor 2009.xls Revised PDD Electricity Sector Prospective 2008-2017 (http://www.energia.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf), available on www.sener.gob.mx .					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 26/08/2009	
More recent data available in the Mexican Secretary of Energy website has been used by PP. Data from years 2003-2007 were used in calculation presented in Table “Mexico electricity emissions factor 2009.xls” (Ref.68). Calculations were correctly applied, and results are correctly reported in the revise PDD. It demonstrates that low-cost/must-run resources constitute less than 50% of total grid generation Hence, simple OM method is					

applicable for the project activity. CAR 28 closed out.	
Acceptance and Close out by Lead Assessor:	Date: 26/08/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	29	Reference:	Section A.1.12
Lead Assessor Comment:					
For the calculation of the OM Emission Factor, the Tool provides two options: the ex-ante option (based on a 3-year generation-weighted average of the most recent data available) and the ex-post option. PDD page 88 states that the ex-ante option is selected. As verified, Calculation of Mexican grid Emission Factor (Ref. 20) takes into account years 2004, 2005 and 2006. A CAR was raised because it was verified that there is more recent data available in the Mexican Secretary of Energy website (www.sener.gob.mx).					
Project Participant Response:				Date: 08/05/2009	
As stated in response to CAR 28, calculation was updated with more recent data.					
Documentation Provided by Project Participant:					
Mexico electricity emissions factor 2009.xls					
Information Verified by Lead Assessor:					
Ref.68 - Mexico electricity emissions factor 2009.xls Revised PDD Electricity Sector Prospective 2008-2017 (http://www.energia.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf), available on www.sener.gob.mx .					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 26/08/2009	
More recent data available in the Mexican Secretary of Energy website has been used by PP. Data from years 2005-2007 were used in calculation presented in Table "Mexico electricity emissions factor 2009.xls" (Ref.68). The ex-ante option (based on a 3-year generation-weighted average of the most recent data available) is applied. CAR 29 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 26/08/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	30	Reference:	Section A.1.12
Lead Assessor Comment:					
According to the tool, option A for the Simple OM calculation should be preferred and must be used if fuel consumption data is available for each power plant / unit. It was verified in the PDD that Option C was chosen, and no further justification has been provided. Therefore a CL was raised.					
Project Participant Response:				Date: 08/05/2009	
Since fuel consumption data are available in Mexico, Option A was chosen for Simple OM calculation. The text of Annex 3 has been changed accordingly.					
Documentation Provided by Project Participant:					
Mexico electricity emissions factor 2009.xls					
Information Verified by Lead Assessor:					
Ref.68 - Mexico electricity emissions factor 2009.xls Revised PDD Electricity Sector Prospective 2008-2017 (http://www.energia.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf), available on www.sener.gob.mx .					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 27/08/2009	
Since fuel consumption data are available in Mexico, Option A was chosen for Simple OM calculation, as verified in revised PDD provided. Data from three most recent years have been used (2005-2007). FC _{i,m,y} values confirmed in data source (Electricity Sector Prospective 2008-2017 (www.sener.gob.mx)). NCV _{i,y} values confirmed in data source (IPCC 2006).					

<p>EF_{CO₂,I,y} values confirmed in data source (IPCC 2006). However please revise Table 3.7 Title of second column.</p> <p>Electricity generation (EG_{m,y}) for OM is calculated in Mexico electricity emissions factor 2009 sheet (Ref.68) as:</p> <p>Total generation (GWh) - Low cost/must run generation (GWh) + Imports (GWh).</p> <p>The Tool states that “For imports from connected electricity systems located in another host country(ies), the emission factor is 0 tons CO₂ per MWh”. Through information available on Electricity Sector Prospective 2008-2017 (www.sener.gob.mx), it was confirmed that there are no imports inside Mexico from other systems, being these imports limited to USA, hence for these emission factor is 0 tCO₂/MWh. However it is understood from PP calculations that these are included to obtain OM.</p> <p>Please clarify calculations which include energy imported from USA, and if Graphic 39 (www.sener.gob.mx) includes fossil fuels used in energy exported. Please also note Table 3.5 has values allocated to wrong titles. Also regarding power plants / units serving the grid, Tool states: “Electricity exports should <u>not</u> be subtracted from electricity generation data used for calculating and monitoring the electricity emission factors”.</p> <p>As per Electricity Sector Prospective 2008-2017 (www.sener.gob.mx), it was verified that Total Energy which is considered by PP for calculation does not include electricity exported. Hence this is not being included in calculation. Further clarification is requested to PP.</p>	
Project Participant Response:	Date: 31/08/09
<p>Table 3.7 has been corrected, eliminating mention of oxidation factor, and citing values from IPCC. Incorrect text immediately before table has been deleted.</p> <p>Table 3.5 has been corrected with the correct title and content of the rows.</p> <p>Graphic 39 of Electricity Sector Prospective 2008-2017 includes all generation in Mexico, including small amounts of exports, as shown in Table 18 of same report. As per tool, these exports have not been subtracted from electricity generation data for the calculation of electricity emission factor.</p>	
Documentation Provided by Project Participant:	
Information Verified by Lead Assessor:	
<p>Table 3.7 has been revised, with columns “oxidation factor” and “CO₂ emission coefficient” deleted from table. Also, table 3.5 was revised with the correct content of the rows, in accordance with the data available in report “Electricity Sector Prospective 2008-2017” (Ref. 54c).</p> <p>However, it was noticed that pg. 84 of the PDD states: “For determining the operating margin emission factor, it is necessary to determine the electricity imports.” Also, it was verified that table 3.5 for the calculation of total electricity generation still includes import values. However, according to the tool to calculate the emission factor for an electricity system, “for imports from connected electricity systems located in another host country(ies), the emission factor is 0 tons CO₂ per MWh”. In other words, <u>no data on imports</u> shall be included in the calculation of the Operating Margin.</p> <p>On the other hand, the tool requires that electricity exports should <u>not</u> be subtracted from electricity generation data used for calculating the emission factor. In this regard, it was not possible to confirm whether exports are included in the calculation. Please include in the calculation of OM emission factor the values for exports.</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 01/10/2009
CL 30 remains open.	
Project Participant Response:	Date: 06/10/09
<p>Note that the Operating Margin EF was determined using “(a) Simple OM (Option C)” as described in p. 5 of The tool to calculate the emission factor for an electricity system, version 1.1. Page. 8 of the Tool states: “For this approach (simple OM) to calculate the operation margin the subscript m refers to the power plants / units delivering electricity to the grid, not including low-cost / must-run power plants / units, and including electricity imports to the grid. Electricity imports should be treated as one power plant.” As stated in the PDD, Annex 3, the emission factor for this import is 0 tCO₂ per MWh, according to the tool.</p> <p>As also stated in the PDD, Annex 3, below Table 3.4, “Electricity exports are not subtracted from the electricity generation data used for calculating the grid emission factor”. Table 3.4 is just informative.</p>	
Documentation Provided by Project Participant:	
am-tool-07-v1.1.pdf	
Information Verified by Lead Assessor:	
Project participant has clarified that electricity exports are not subtracted from the electricity generation data	

and that table 3.4 is only informative.	
1) However please revise table 3.5 of PDD, the value for Electricity generation for OM in 2005 should be 173,338 (as further shown in table 3.9) and not 173,388 GWh as presented.	
2) In addition it is not clear why total generation values in table 3.5 do not correspond to the Total Generation values in pg. 112 of the cited document "Electricity Sector Prospective 2008-2017" (Ref.54c), and rather corresponds to the "Servicio Público Nacional" values in the same page. Please clarify.	
3) Please also refer to excel sheet "Emission factor calculation.xls" for an overview of the calculations done by the assessor, which give slightly different values from those reported. Please clarify.	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 28/10/2009
Due to the above, CAR remains open.	
Project Participant Response:	Date:
1) Corrected Table 3.9. This was a transcription error in the PDD, and therefore does not affect the calculations.	
2) The values shown in Table 3.5 as "Total generation" correspond to power plants located within Mexico that are connected to the grid. <i>It excludes "imports"</i> (see below) and excludes self-generation (and cogeneration) by users since this is not available to the interconnected public grid. Note that the total shown in Table 3.5, corresponding to "Servicio Público Nacional" includes not only government power plants but also private concession power plants (listed in p. 110 (Gráfica 31) of the "Prospective" report. Moreover, the fuel consumption of the same set of interconnected power plants has been the basis for the determination of emissions. Hence the procedure is correct and consistent.	
3) Detailed response to comments have been inserted in the spreadsheet "Emission Factor calculation com MGM.xls". One transcription error (from Excel to Word) has been corrected. Another minor error in the Excel has been corrected, but did not affect the EF calculation. As noted in the PDD, Annex 3 immediately before Table 3.5, and following the methodology "There are no imports from other systems inside Mexico. For imports from connected electricity system located in another country, the emission factor is 0 tCO ₂ /MWh." This is why imports are <i>added</i> to total generation in the interconnected system in Table 3.5. There is no basis for subtracting imports from total generation, since imports were never included in the total, and also since the methodology requires imported electricity to be included but with zero emissions. Other differences noted by DOE are from rounding: DOE checked the values with the round numbers, whereas spreadsheet used the complete number. In any case these differences are extremely small.	
Documentation Provided by Project Participant:	
Emission Factor calculation com MGM.xls	
Electric Emission Factor Mexican grid 2009 corr 31oct09.xls	
Information Verified by Lead Assessor:	
Emission Factor calculation com MGM.xls	
Electric Emission Factor Mexican grid 2009 corr 31oct09.xls	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 06/11/2009
1) Transcription error corrected by PP, verified.	
2) It was clarified and verified that values shown in Table 3.5 as "Total generation" correspond to power plants located within Mexico that are connected to national grid, and that this total already excludes "imports" (imports were never included in the total as verified) and excludes self-generation (and cogeneration) by users since this is not available to the interconnected public grid.	
3) It was confirmed that differences were caused by rounding and complete values used by PP was confirmed to be the correct use for calculation. Regarding imports, PP is correct in methodology interpretation that energy generated should be included in the accounting but with emission factor of 0 tons CO ₂ per MWh. Calculations are verified to be correct.	
Minor corrections regarding fuel % were confirmed to not affect final value of combined margin emissions factor.	
CL30 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 06/11/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)
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Type:	CAR	Number:	31	Reference:	Section A.1.12
Lead Assessor Comment:					
As indicated by the Tool for calculating the emission factor for an electricity system, step 4 for identifying the sample of power units to calculate the build margin states that the sample should be made from the most recently built power units in the system. Table 3.10 of PDD makes reference to table 19 of document "Electricity Sector Prospective 2007-2016", which does not show the values reported in PDD (such as power generation), and also does not show data from years 2003, 2004 and 2005 which are reported in PDD.					
Nevertheless, the same study equivalent to the cited document was identified in the Ministry of Energy website (www.sener.gob.mx) as a more recent source of data. Please update this data in the PDD with consideration of the observations in paragraph above.					
Project Participant Response:				Date: 08/05/2009	
As stated in response to CAR 28, calculation updated with more recent data.					
Documentation Provided by Project Participant:					
Ref.68 - Mexico electricity emissions factor 2009.xls Revised PDD					
Information Verified by Lead Assessor:					
Ref.68 - Mexico electricity emissions factor 2009.xls Revised PDD Electricity Sector Prospective 2008-2017 (http://www.energia.gob.mx/webSener/res/PE_y_DT/pub/Prospectiva%20SE%202008-2017.pdf), available on www.sener.gob.mx					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 27/08/2009	
<u>Build Margin</u> More recent data available in the Mexican Secretary of Energy website has been used by PP. Data from years 2005-2007 were used in calculation presented in Table "Mexico electricity emissions factor 2009.xls" (Ref.68). Option 1 is chosen (ex-ante) As per Tool, the sample group that comprises the larger annual generation should be used, and this is the option followed by PP. It was confirmed that the 20% of the system generation during 2007 results to be 0.20 × 232,552,000 MWh = 46,510,400 MWh. New power plants have been confirmed in data source provided <i>Electricity Sector Prospective 2008-2017</i> . For some power plants the power generation data was not available, however it is confirmed to be a conservative approach to not include such plants since these have the least clean technologies. Also, it was confirmed that the most efficient factor of each technology provided in "Electricity Sector Prospective 2007-2016" was used, what is conservative. Calculation were verified to be applied correctly in Mexico electricity emissions factor 2009 (Ref.68). Please clarify Emission Factor value 73.36 tCO2/TJ as it is not available in sheet OM "CO2 emission coefficient. See Build Margin, cell L33.					
Project Participant Response:				Date: 31/08/09	
The incorrect value in L33 has been replaced by the correct value 74.10. It is also corrected in the PDD, Annex 3, Table 3.11, Row 2005, Holbox. Note that this correction did not affect the value of the Build Margin emission factor. This is because the power plant did not consume fuel or generate electricity.					
Documentation Provided by Project Participant:					
El Verde PDD ver 6 04Sep09.doc Electric Emission Factor Mexican grid 2009 corr 31aug09.xls					
Information Verified by Lead Assessor:					
Project participant provided the revised PDD (Ref.1d) and emission factor calculation spreadsheet (Ref.68b), where the value of 73.36tCO2/TJ was corrected and replaced by 74.10 tCO2/ TJ, which corresponds to the emission factor of diesel as shown in sheet OM "Emission factor of each fuel". It was confirmed in the emission factor spreadsheet (Ref.68b) that no fuel consumption or electricity generation was registered for this power plant. Hence, this does not affect the calculation of the Build Margin emission factor.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 01/10/2009	
Based on the above, CAR 31 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 01/10/2009	
Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		

Type:	CL	Number:	32	Reference:	Section B.6.1
Lead Assessor Comment:					
The following ex-ante parameters are shown in the monitoring plan:					
1. Regulatory requirements relating to landfill gas projects					
2. GWPCH4					
3. DCH4					
4. BECH4, SWDS.y					
5. CEFelec,BL,y = EFgrid,CM,y					
6. TDL					
However, ex-ante parameters MDHist and MGHist listed in methodology are excluded in the PDD. Also, parameters CEFelec,BL,y (= EFgrid,CM,y) that are available in PDD are not enlisted as ex-ante parameters in methodology. A CL was raised to request clarification to project proponent.					
Project Participant Response:				Date: 08/05/2009	
<i>The ex-ante parameters MD_{Hist} and MG_{Hist} listed in the methodology are for the determination of methane destruction in the baseline, based on measurements of historical methane destruction. At this landfill, there was no historical methane destruction. Hence MD_{Hist} is zero. However, to be conservative, methane destruction efficiency has been estimated, as shown in Annex 3.</i>					
<i>(Note that ACM0001, ver. 10 states about these two parameters: "This parameter could be used for the estimation of AF" It does not require its use.</i>					
<i>CEF_{elec,BL,y} (=EF_{grid,CM,y}) was already in the table (in B.6.2), since the value does not change for the first crediting period.</i>					
Documentation Provided by Project Participant:					
None					
Information Verified by Lead Assessor:					
Meth ACM0001					
PDD					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 27/08/2009	
Only regarding MDHist and MGHist:					
Since there are several options to estimate AF, ACM0001 states "This parameter could be used for the estimation of AF".					
PP makes use of Step 1 (b), in which methodology requires calculation through MDHist/MGHist. Please refer to CL24.					
Project Participant Response:				Date: 03/09/09	
See response to CL24. MDHist is zero. The PDD has been simplified and contradictions have been eliminated.					
Documentation Provided by Project Participant:					
See response to CL24					
Information Verified by Lead Assessor:					
As explained in CL 24, an adjustment factor of 0% has been used for the project as no LFG burning occurred in the baseline scenario. Hence, step 1 (b) of the methodology for calculating AF through MDHist/MGHist is no longer applied. Therefore it was deemed logical to exclude parameters MDHist and MGHist from the Monitoring Plan.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 28/10/2009	
CL 32 was closed out.					
Acceptance and Close out by Lead Assessor:				Date: 28/10/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	33	Reference:	Section B.10.1
Lead Assessor Comment:					

<p>PDD states in section B.5 that no combustion CO₂ emissions for any fuel displaced by the thermal energy use of the LFG are being claimed for in the project activity. However, the monitoring plan includes parameter LFG_{thermal,y} (amount of methane combusted in boiler at Normal Temperature and Pressure) while excluding parameter ETLFG (total amount of thermal energy generated using LFG) and “operation of the boiler.” It remains unclear whether the project will claim emission reductions from the use of LFG for thermal energy. Also, parameter name “operation of the power plant” does not comply with the methodology, and parameter “operation of the flare station” is not part of the monitoring parameters available in the methodology. Finally, parameter MGPR_y (amount of methane generated during year y of the project activity) as per methodology is not included in the monitoring plan. A CL was raised to request clarification from project proponent.</p>	
Project Participant Response:	Date: 08/05/2009
<p><i>The project will only claim emissions reductions for methane destruction in leachate evaporation (thermal energy production) but not for CO₂ emissions reduction.</i></p> <p><i>I am sorry that ACM0001 says “Operation of an energy plant”. This is wrong, since an energy plant can produce heat or electricity. It is clear from the comment in the methodology table that they mean electricity: “This is monitored to ensure methane destruction is claimed for methane used in electricity plant when it is operational.” We have therefore retained the correct terminology “Operation of the power plant”. We will be happy to discuss this with the CDM EB, except that we are not allowed to communicate with them.</i></p> <p><i>The “operation of the flare station” data table has been deleted.</i></p> <p><i>A data table for MG_{PR} has been included in the revised PDD.</i></p>	
Documentation Provided by Project Participant:	
Revised PDD	
Information Verified by Lead Assessor:	
Revised PDD	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 26/08/2009
<p>1) Regarding LFG_{thermal,y} (amount of methane combusted in boiler at Normal Temperature and Pressure) Information has been clarified by PP along with responses to other findings raised, and is considered correctly applied in PDD. OK</p> <p>2) Regarding ETLFG (total amount of thermal energy generated using LFG) The parameter has been included in the revised PDD, however PDD, page 23, states “Hence the parameters <u>ETLFG_y</u> and <u>CEF_{ther,BL, y}</u> are not relevant to the proposed project”. Please revise where applicable in the PDD.</p> <p>3) Regarding “operation of the power plant” Please correct terminology as per methodology. This will not be misunderstood with other types of energy since it is clear stated in the same and PDD “This is monitored to ensure methane destruction is claimed for methane used in electricity plant when it is operational”. A formal clarification or a revision to the methodology can be requested to EB in case PP considers it necessary.</p> <p>4) Regarding “operation of the flare station” Information has been deleted from PDD. If PP wishes to include any parameter that is not presented in the methodology in order to improve monitoring of emission reductions, this is allowed, but requires a justification.</p> <p>5) Regarding MGPR_y (amount of methane generated during year y of the project activity) Since Option 1 has been chosen (ex-ante), and this is not subject to monitoring, please do not consider the initial request and revise PDD accordingly to eliminate parameter.</p>	
Project Participant Response:	Date: 31/08/09
<p>Regarding point 2 above: this paragraph remains as it is: “<i>While thermal energy will be produced using landfill gas in the project scenario, it is assumed that this thermal energy would not be derived from the combustion of fossil fuels in the absence of the project activity (since leachate would not be evaporated in the absence of the project activity). Hence the parameters <u>ETLFG_y</u> and <u>y</u> are not relevant to the proposed project</i>”. Table with parameter <u>ETLFG_y</u> has been deleted from section B.7.1. In addition, <u>CEF_{ther,BL, y}</u> has not been mentioned in the PDD to reflect that these two parameters are not relevant. For leachate evaporation (thermal energy production), the project will only claim emissions reductions for methane destruction, not for CO₂ emissions offset from thermal energy use. <i>Therefore, the parameter LFG_{thermal,y} remains in the PDD since its monitoring is necessary in order to claim emissions reductions from methane destruction.</i></p>	

Regarding point 3 above: terminology has been corrected as per methodology in the respective table in section B.7.1.	
Regarding point 4, no changes in methodology are needed.	
Regarding point 5 above: the parameter MGPR,y has been deleted from PDD.	
Documentation Provided by Project Participant:	
Revised PDD	
Information Verified by Lead Assessor:	
<p>2) Revised PDD (Ref. 1d) was verified and monitoring parameters are now consistent with the project design. As verified in the PDD, parameters ETLFG,y and CEFther,BL are not relevant to the project activity and hence not included in the Monitoring Plan. This is because no emission reductions will be claimed from the displacement of energy but rather from the destruction of methane in the process of leachate evaporation. Therefore, the parameter LFGthermal,y remains in the Monitoring Plan in order to calculate emission reductions from methane destruction.</p> <p>3) Regarding "operation of the power plant", terminology was corrected in the Monitoring Plan according to methodology.</p> <p>4) Parameter operation of the flare station was deleted from PDD, in consistency with methodology.</p> <p>5) Parameter MGPR,y has been deleted from monitoring plan in accordance with the option chosen from the methodology.</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 29/09/2009
CL 33 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 29/09/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CL	Number:	34	Reference:	Section A.1.21
Lead Assessor Comment:					
<p>It is stated in the PDD that PASA will count on supervision from the flare supplier for training, commissioning and start-up. Similarly, the supplier of the leachate evaporation plant would provide support for training, commissioning and start-up. It further states that if PASA decides to generate electricity using landfill gas, they will acquire either from equipment supplier and/or specialist consultant all the services needed for training related to the operation of the LFG generation system. A CL was raised to request verifiable evidences on the training provisions mentioned.</p>					
Project Participant Response:				Date: 08/05/2009	
<p><i>The statements where training, commissioning and start-up are attached.</i></p> <p>For the Flare: CL 34a- John Zink Flare Quote Feb08.pdf, page 8 states that 1 week of training and start up, and one full year of service.</p> <p>For leachate evaporation: CL 34b-Ecologix Evaporator Quote May08.pdf, page 5 states a period of four days of start-up/training and from fourteen to sixteen weeks delivery. (See file:)</p> <p><i>Regarding the electricity generation, no quotation is available, since no decision on what power plant to acquire has been made. Such decision would not be made until permits for power generation are available.</i></p>					
Documentation Provided by Project Participant:					
CL 34a- John Zink Flare Quote Feb08.pdf					
CL 34b-Ecologix Evaporator Quote May08.pdf					
Information Verified by Lead Assessor:					

A quote from the flare supplier (John Zink) was provided (Ref. 59), in which it is stated that “one (1) week of start-up and field training for this system” will be provided as well as “one (1) full year of the EnviroComp Report Service including MMBtu and Carbon Credit Reports”. Also, the quote from the supplier of the leachate evaporator (Ecologix Environmental Systems, LLC) states: “start-up/training for four (4) days, including airfare and lodging” (Ref. 60). Regarding electricity generation, PP explained that no quotation is available for power generators and will be done once the permits for generating electricity are obtained.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/08/2009	
Training provisions were confirmed in the above information verified. Therefore, CL 34 is closed out.					
Acceptance and Close out by Lead Assessor:				Date: 14/08/2009	
Date:	19/03/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CL	Number:	35	Reference:	Section A.1.21
Lead Assessor Comment:					
It was not clear how the quantity of LFG to each component (flare, evaporator, power generator) will be monitored and controlled (i.e. if a threshold for each equipment will be established), and if it will be controlled manually or automatically. Thus, a CL was raised.					
Project Participant Response:				Date: 08/05/2009	
<i>Landfill gas analyzer: The extraction monitoring system includes a landfill gas analyzer with field proven infrared technology for continuous gas monitoring, the sampling and analysis of gas composition is automatic. Flare analyzer: The exit gas flare analyzer monitoring system has a fixed position analyzer that automatically samples methane in ppm, and oxygen by volume.</i>					
Documentation Provided by Project Participant:					
CAR 35- invoice monit eq 5may08.pdf					
Information Verified by Lead Assessor:					
The question has not been understood. This was raised was regarding how PP will control the LFG to be sent to the different technologies, as discussed during the site visit. Since the landfill gas is to be directed to the electricity generator when meeting the evaporator requirements, is not clear how this is going to be monitored / control by PP (manually, automatically).					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 14/08/2009	
Please see above					
Project Participant Response:				Date: 31/08/09	
The landfill gas flow to the flare and evaporator is controlled automatically. There is a permanent junction connection on the main wellfield suction pipe to the flare that feeds the evaporator. The individual landfill gas vacuum blower for the flare and evaporator when operating together will balance the gas flows proportionately, following initial tuning operations. LFG to be sent to power generator units will also be controlled automatically. Technical details would be provided once electricity generation option has been assessed and approved by the project participant.					
Documentation Provided by Project Participant:					
Information Verified by Lead Assessor:					
It was explained that the landfill gas flow to the flare and evaporator will be controlled automatically by the vacuum blower. PP further stated that LFG to be sent to power generators will also be controlled automatically; and that technical details would be available once the option of electricity generation is approved by PP. Please provide information in a revised PDD accordantly.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 01/10/2009	
Based on the above explanation, CL 35 remains open.					
Project Participant Response:				Date: 05/10/09	
Information provided above has been included in section A.4.3 of the PDD (technology to be employed by the project activity).					
Documentation Provided by Project Participant:					
El Verde PDD ver 6 08Oct09 clean.doc					
Information Verified by Lead Assessor:					

Information on how LFG will be regulated with regard to the different equipments has been included in section A.4.3 of the PDD improving discussion of the technological details of the project activity.	
Reasoning for not Acceptance or Acceptance and Close Out:	Date: 20/10/2009
CL 35 was closed out.	
Acceptance and Close out by Lead Assessor:	Date: 20/10/2009

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	36	Reference:	Section A.1.26
Lead Assessor Comment:					
Section C.2.1.1: there are 2 dates considered, and not a conditional statement, e.g. "whichever is later." In addition, the date mentioned in this section (01/01/2009) should be updated to a more realistic timeframe, as the date is earlier than the validation start date. Therefore, a CAR was raised.					
Project Participant Response:				Date: 08/05/2009	
Section C.2.1.1 was modified to: "01/01/2010 or the registration date, if this is after 01/01/2010".					
Documentation Provided by Project Participant:					
None					
Information Verified by Lead Assessor:					
Section C.2.1.1 was verified to include a conditional statement on the project registration date: "01/01/2010 or the registration date, if this is after 01/01/2010."					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 15/05/2009	
Based on the information verified, CAR 36 is closed out.					
Acceptance and Close out by Lead Assessor:				Date: 15/05/2009	

Date:	19/03/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	37	Reference:	Section A.4.6
Lead Assessor Comment:					
The table required for the indication of projected emission reductions has been correctly applied, and shows the annual estimated ERs in tones of CO2 for 7 years (renewable). However, as the ER spreadsheet contains values in decimals, the sum of yearly values in the PDD does not result in 1,025,360 tCO2 but 1,025,357 tCO2. As the yearly values reported in the PDD do not (and should not) contain decimals, the sum should reflect the values reported for compliance. CAR 37 was raised.					
Project Participant Response:				Date: 08/05/2009	
<i>Emissions reduction calculations have been updated, with decimals removed. Numbers that appear in the PDD now add up correctly.</i>					
Documentation Provided by Project Participant:					
<i>CER Calculation El Verde 8may09.xls</i>					
Information Verified by Lead Assessor:					
Revised PDD (Ref. 1c) and ER spreadsheet (Ref. 10b) were verified, and values in ER spreadsheet are now given in whole numbers. However, emission reduction values in the PDD do not match those in the ER spreadsheet.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 10/08/2009	
Based on the above, CAR 37 remains open.					
Project Participant Response:				Date: 03/09/09	
Spreadsheet and PDD values match in revised versions of Excel and PDD.					
Documentation Provided by Project Participant:					
Information Verified by Lead Assessor:					
Project participant provided a revised ER spreadsheet (Ref.10d) which now shows the same values presented in the PDD.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 29/09/2009	

CAR 37 was closed out.

Date:	28/10/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CL	Number:	38	Reference:	Project Description / Baseline
Lead Assessor Comment:					
<p>Considering the use of leachate evaporator in the project activity scenario, please clarify how it can be verified that the leachate evaporation would not occur otherwise in the baseline scenario, taking local regulation and laws, where applicable, into account. Please include relevant information in this regard in the PDD since there is no mention to leachate available in actual / baseline scenario, and related information, when considering what is done at this moment with leachate generated.</p>					
Project Participant Response:				Date:	
<p>Prior to project implementation, leachate was collected in pools. Some of it evaporates, while the remainder is recirculated by spraying on top of the landfill. The legislation does not require any specific treatment for leachate.</p> <p>LEY GENERAL PARA LA PREVENCIÓN Y GESTIÓN INTEGRAL DE LOS RESIDUOS, updated 19 June 2007, Article 97 (see attachment) merely states that leachate should not migrate outside the landfill. This condition is being met with the current practice.</p> <p>“REGLAMENTO DE LA LEY GENERAL PARA LA PREVENCIÓN Y GESTIÓN INTEGRAL DE LOS RESIDUOS” makes no specific mention of leachate treatment. Similarly Guanajuato state laws (see reference below) make no mention of leachate treatment. Therefore current practice meets all laws and regulations, and therefore leachate evaporation would not happen in a baseline scenario.</p>					
Documentation Provided by Project Participant:					
<p>National legislation can be found in: http://www.semarnat.gob.mx/leyesynormas/Pages/normasoficialesmexicanasvigentes.aspx LEY GENERAL PARA LA PREVENCIÓN Y GESTIÓN INTEGRAL DE LOS RESIDUOS.pdf</p> <p>Guanajuato State legislation can be found in: http://www.congresogto.gob.mx/legislacion/Leyes/acrobat/residuos.pdf LEY PARA LA GESTIÓN INTEGRAL DE RESIDUOS DEL ESTADO Y LOS MUNICIPIOS DE GUANAJUATO.pdf</p>					
Information Verified by Lead Assessor:					
<p>Ref.65 - Ley para la Gestión Integral de Residuos del Estado y los Municipios de Guanajuato Ref. 87 - Ley General Para La Prevención Y Gestión Integral De Los Residuos Ref.88 - Reglamento De La Ley General Para La Prevención Y Gestión Integral De Los Residuos</p>					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 06/11/2009	

PP explained that prior to project implementation, leachate was collected in pools, and some of it evaporates, while the remainder is recirculated by spraying on top of the landfill. These mentioned pools were verified during the site visit (photos available) while PP had previously informed part of the leachate was recirculated.

Section A.2 of PDD states “*Note that in the baseline scenario, leachate would not be evaporated using any fuel*”. To support this statement, PP provided local legislations related with this matter. The “Ley General Para La Prevención Y Gestión Integral De Los Residuos” (Ref.87) states that leachate should not migrate outside the landfill but does not refer to any special action or treatment in the landfill boundary. It was also confirmed that neither the “Reglamento De La Ley General Para La Prevención Y Gestión Integral De Los Residuos” (Ref.88) nor the Guanajuato state law “Ley para la Gestión Integral de Residuos del Estado y los Municipios de Guanajuato” (Ref.65) provide any information about leachate or actions in this regard. Other National and local legislations were searched and the references provided were found the only applicable to this subject.

It is hence confirmed that current practice meets all laws and regulations, and therefore leachate evaporation would not happen in a baseline scenario.

CL 38 was closed out.

Date:	28/10/2009		Raised by:	Mayra Caradec (Lead Assessor)	
Type:	CL	Number:	39	Reference:	Project Emissions

Lead Assessor Comment:

It was verified that project emissions are based on power consumption of the blower and evaporator for the first 2 years of the project starting in 2010, as electricity generation from LFG will only start in 2012. Power consumption for these equipments is calculated on the basis of:

Captured LFG for the project in m³/yr * calculated amount of 0.009975 kWh consumed by blower per m³ of LFG {which is calculated from a 25 HP per 1869 m³/h of LFG, 1100 SCFM} / 1000 {for conversion to MWh/yr} + (24.7kW needed per hour by evaporator * **8,760** working hours per yr) / 1000 {for conversion to MWh/yr}.

Values used as electricity consumption capacities for the blower and evaporator have been verified in manufacturer quotes /Ref.59/ and /Ref.60/ respectively and were confirmed correct. Nevertheless, PP has recently revised PDD to consider working hour for the leachate evaporator as 7,280 h/year (no longer 8,760 h/year). Please revise cell V7 accordingly (page 40 of PDD) and please make sure all documents have addressed recent changes made to PDD and associated documents.

Also in regards to project emissions, PP is requested to clarify:

- 3) Why energy consumed for equipment start up is not being considered in ER calculation, since it is expected that this energy will be used even in the presence of the electricity generated on site.
- 4) If any project emissions are expected with the use of leachate evaporator technology (please provide documented evidence)

Please also revise PP to include text of project emission in appropriate section. It is now in page 32, and should be above in “Project Emissions”.

Project Participant Response:	Date:
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We have made leachate operating hours to be 8760 hours everywhere. We have considered this higher value in order to be conservative with respect to project electricity consumption, and hence project emissions.

Project emissions:

1) In the previous version, emissions from equipment startup were neglected from ex ante emissions, since they are very small. These emissions were, however, included among monitored parameters. We have now also included the emissions in the ex ante calculations (LPG use for flare station startup). Assumption: According to John Zink, one cylinder of 5 gallons can be used up to 196 times (John Zink - Flare design criteriarev2.pdf). According to John Zink, under normal operating conditions and maintenance, the pilot may be turned on only 12 times a year (Email received on November 3rd from Brandy Johnson, John Zink). In order to be extremely conservative, we have assumed the use of one cylinder per year (i.e., a turn on 196 times per year). 1 Cylinder (5 gallons) per year = 20 lb = 9.071847 kg. This consumption appears in cell Q4 of sheet “FODtotal” of revised file “CER Calculation El Verde 03Nov09.xls”. Cells Q5 and Q6 include the associated coefficients (based on IPCC). This correction adds project emissions of 27 t CO₂/year, shown in row 34 of sheet “ACM0001” of the same file. Note that even this extremely high estimate (considering 192 turn ons instead of 12) amounts to only 27 t CO₂/year, which is 0.019% of baseline emissions in year 2010 and an even smaller % in subsequent years.

In the previous version, we had considered that project electricity consumption was supplied by on-site generation using LFG after such generation was available. In the revised version, in order to be more conservative, i.e. higher project emissions, we have assumed that all project electricity consumption (for blowers and evaporator) come from the power grid in all years. This change can be seen in row 50 of sheet "FODtotal" of revised file "CER Calculation El Verde 03Nov09.xls".

2) The leachate evaporator merely heats the leachate and evaporates it. Only water vapor is emitted, as noted. The document submitted earlier "**CL 34b-Ecologix Evaporator Quote May08.pdf**", p. 3, par. 5 states: "All models have a 10 micron pad mist eliminator to ensure only vapor is released to the atmosphere". Thus only water vapor is released. In the absence of the leachate evaporator, some leachate would evaporate from the collection pool and from the landfill. Thus the leachate evaporator would not produce any greenhouse gas emissions, except during startup from the combustion of a fossil fuel (see item 1 above). Note that electricity consumption by the evaporator was already included in the calculations, see cell V13 and row 49 of sheet "FODtotal" of revised file "CER Calculation El Verde 03Nov09.xls". As noted above, we now assume this electricity consumption as well as that for the blower are supplied by the power grid, and that project emissions associated with this consumption are calculated on this basis, see row 25 of sheet "ACM0001" of the same file.

The section on Project emissions in p. 32 of PDD has now been correctly labeled.

Documentation Provided by Project Participant:

CER Calculation El Verde 03Nov09.xls
John Zink - Flare design criteriarev2.pdf
Email received on November 3rd from Brandy Johnson, John Zink.pdf

Information Verified by Lead Assessor:

CER Calculation El Verde 03Nov09.xls
Ref.87 - John Zink - Flare design criteriarev2.pdf
Ref.88 - Email received on November 3rd from Brandy Johnson, John Zink.pdf

Reasoning for not Acceptance or Acceptance and Close Out:

Date: 08/11/2009

1) Project Emissions

Flare start up (LPG)

It was verified that according to flare manufacture information (Ref.87, Ref.88), one LPG cylinder of 5 gallons (20 lb; Ref.87)) can be used up to 196 times, and pilot is expected to turn on 12 times per year. PP has considered the most conservative approach of 196 times per year for the pilot use. Hence, project emissions for flare start up has been calculated and verified as follows in ER Spreadsheet (in "ACM0001" row 34):

$$PE = \text{LPG Consumption (9.1 kg/year)} * \text{NCV}_{\text{LPG}} (47.3 \text{ TJ/Gg}) * \text{EF}_{\text{CO}_2 - \text{LPG}} (63.1 \text{ tCO}_2/\text{TJ}) = 27 \text{ tCO}_2 \text{ (for all 7 crediting period years).}$$
Value was verified to be correctly applied in Section B.7.1 of revised PDD (in "**PE_{FC,i,y}** Project emissions from fossil fuel combustion in process j during the year y")

Additional sources used verified:

20 lb = 9.071847 kg	Conversion 1lb = 0.453 kg
NCV _{LPG} = 47.3 TJ/Gg	47.31 TJ/10 ³ tonnes (10 ³ = 1 Gg) Verified in http://www.ipcc-nggip.iges.or.jp/public/gl/guidelin/ch1wb1.pdf
EF _{CO2 - LPG} = 63.1 tCO ₂ /TJ	IPCC 2006, verified in http://www.ipcc-nggip.iges.or.jp/EFDB/find_ef.php

Blower (Grid electricity)

As per John Zink Flare Quote (Ref. 59), blower capacity is 1100 SCFM (= 1869 m³/h), considering 0.0283 m³ per cubic foot (<http://www.ipcc.ch/ipccreports/tar/wg3/index.php?idp=477>), and 60 min/h, 1100*0.0283*60 = 1868. A 25 HP Variable Frequency Drive is used for 1 blower of 1869 m³/h capacity; Ref.59). Hence project emissions for blower use has been calculated and verified as shown in ER Spreadsheet (FOD_Total, Q8:Q11):

Electricity Consumption = 25 HP * 0.7457 (kW/HP)/1869 (m³) = 0.009975 kWh/m³ of LFG. This is applied to quantity of landfill gas captured (Row 30 "FOD_Total"), converted to MWh and expressed in Row 49 (FOD_Total").

Evaporator (Grid electricity)

As verified in evaporator quote (Ref.60), 24.70 kWh is needed per hour of use of evaporator. Hence project emissions for evaporator use has been calculated and verified as follows in ER Spreadsheet (FOD_Total):

24.70 kWh * 8760 h/year / 1,000 = 216.4 MWh/year.

It was noticed that PP refers to “evaporator working hours” in cell V7 for project emission calculation but 7,280 in cell H10 for gas used in evaporator for ER calculation. However it was understood that value in cell V7 reflects 100% working hours of evaporator in the year only for conservativeness purpose in project emissions calculation, even though it is expected evaporator to work around 7280 hours as per manufacture information in Evaporator quote (Ref.60), as reflected in cell H10.

Blower and Evaporator: It was verified that, as informed by PP, electricity consumption is accounted for all years considering no use of electricity generated by project in any year. This assumes, conservatively, that all project electricity consumption is supplied from the Grid. Considering that now energy consumed = energy imported from the grid as a conservative approach according to PP, it was verified that Row 49 now =Row 50 (FOD_Total), which is consistent with changes made by PP.

2) Any additional sources of GHG Emissions with use of leachate evaporator

As verified in Evaporator quote (Ref.60), only water vapor is release by evaporator. Document was verified to state “All models are pre-piped, wired and tested before shipment. *All models have a 10 micron pad mist eliminator to ensure only vapor is released to the atmosphere.* Multiple devices are furnished to ensure a safe efficient continuous operation”. Hence it was confirmed that no additional GHG apart from CO₂ emissions associated with electricity used by evaporator is expected.

Hence CL39 is closed out.

Date:	04/09/2009	Raised by:	Financial Expert		
Type:	CAR	Number:	40	Reference:	Discount Rate
Lead Assessor Comment:			Date: 04/09/2009		
c) In case if the project has not achieved financial closure, PP should provide documentary evidence for the applicable interest rate for small amount of loans for medium or small size companies. Otherwise PP should use the actual interest rate in the calculation.					
d) PP should provide documentary evidence for the applicable risk premium on the technology.					
Project Participant Response:			Date: 22/09/2009		
a) As noted in the PDD (v.6, 26 Aug 09), “Note that in November 2007, the Interbank Rates TIIE (28 days) and one-year Mexibor rates were all around 7.5% (http://www.banxico.org.mx/). Five-year Mexican government bonds had an interest rate of 7.55% on November 4, 2007 (http://www.banxico.org.mx/polmoneinflacion/estadisticas/tasasInteres/tasasInteres.html).” From the same source (http://www.banxico.org.mx/sistemafinanciero/estadisticas/MercadoDineroValores/tasasInteres.html), we note that the commercial interest rate for fixed rate loan are as shown in “Mexican interest rates 2007.xls”. According to this, the interest rate for November 2007 was 10.6%. This value is now used as the discount rate.					
b) We do not have any documentary evidence for the applicable risk premium. So this value is deleted and will not be taken into account in the analysis.					
Note that the PDD will need some changes as a result of the responses to these CARs, and resulting changes in the calculations. PDD changes will be made after these responses have been accepted by the validator.					
Documentation Provided by Project Participant:					
Source: http://www.banxico.org.mx/sistemafinanciero/estadisticas/MercadoDineroValores/tasasInteres.html . File downloaded as: “Mexican interest rates 2007.xls”					
Information Verified by Lead Assessor:					
a) Interbank Rates TIIE (28 days) and one-year Mexibor rates were confirmed in the website http://www.banxico.org.mx/ to be around 7.5% for November 2007 (Ref.69). File “Mexican interest rates 2007.xls” (Ref.82) provided by the project participant shows that the commercial interest for fixed rate loans was 10.6% for November 2007. For the purpose of double-checking, the website http://www.banxico.org.mx/sistemafinanciero/estadisticas/MercadoDineroValores/tasasInteres.html was assessed and data was generated into an Excel file (Ref.83) confirming the interest rate of 10.6% for the month of November 2007.					
Reasoning for not Acceptance or Acceptance and Close Out:					

- a) The interest rate has been verified from the supporting evidence and found appropriate.
- b) The discount factor is now verified with the supporting evidence and found appropriate.

Hence CAR is closed.

Acceptance and Close out by Lead Assessor:

Date: 22/10/2009

Date:	04/09/2009		Raised by:	Financial Expert	
Type:	CAR	Number:	41	Reference:	Investment Cost
Lead Assessor Comment:				Date: 21/09/2009	
(Detail the issue raised)					
c) Please provide the rationale and break-up of the annual landfill investment cost of US\$ 120,000.					
d) Please also provide the rationale and break-up of the landfill investment cost of US\$ 445,000 added every 10 th year.					

Project Participant Response:

Date: 22/09/2009

- a) Annual landfill investment cost was corrected. In order to provide values with a reliable data source, MGM prepared an estimation of the annual investment due to well field expansion, based on the initial investment prepared by SCS Engineers. Annual well field expansion investment depends on the rate at which the landfill is being filled annually. Estimation details can be found in columns H through O, in the sheet "Flare station investment" of the corrected economic analysis. Two additional rows have been added in the sheet "Elec gen no CERs" where both landfill gas field and flare equipment values are shown separately.
- b) LFG flare equipment life is 10 years. Therefore, equipment is replaced at the end of each 10-year period, at the same cost as initially. As per SCS report and estimation by MGM, the flare replacement cost is taken to be USD 398,250 and includes flare station (363,250), start up (12,500) and source test (22,500). In order to be consistent throughout the assessment, the arithmetic mean between the low and high range unit cost estimated by SCS was used, instead of the high range values used previously. These values can be found now in the sheet "Flare station investment" of the corrected economic analysis.

Documentation Provided by Project Participant:

El Verde Economic Analysis_19sep09 ver1.xls

Information Verified by Lead Assessor:

- a) Input values used for estimation of annual landfill investment cost were confirmed in SCS Cost Estimate Report (Ref.56). Low range and high range totals were confirmed in the file.
- b) PLEASE NOTE: Statement of PP is no longer valid; project participant was requested to change the lifetime of equipments to a more conservative value in the separate Findings Overview. According to a statement from SCS Engineers (Ref.78), the enclosed flare has a lifetime of 15 to 20 years and lifetime of generators is 20 years. Hence, assumption of 10 years lifetime was not deemed conservative, as the lower the lifetime the higher the replacement costs over the period.
PP now applies the highest lifetime values possible, 20 years for both enclosed flare and electricity generator, which was deemed conservative.
Nevertheless, the inputs values were confirmed in the budgetary proposal (Ref.56).

Reasoning for not Acceptance or Acceptance and Close Out:

- a) The arithmetic mean is acceptable because a rationale business decision can only be taken after accounting both the best case and worst case scenario. There are business uncertainties which cannot be ruled out while making an investment decision. Moreover, these uncertainties are also covered in the sensitivity analysis. It should be taken care that sensitivity analysis includes the variation of parameters upto the worst case and best case scenario. The variation of total investment may vary upto 19.45% as per the data given. The sensitivity analysis for the input variables has been performed upto 20% variation. Hence it is found appropriate.
- b) It was correctly observed that the replacement cost should be added after completion of the lifetime of the equipments. The same has been corrected in the calculation sheet as well. The replacement cost has been added at the end of the 20th year by factoring in the inflation to the present cost. This is found to be acceptable as the inflation is also factored in the price of electricity.

Hence CAR is closed.

Acceptance and Close out by Lead Assessor:	Date: 22/10/2009
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Date:	04/09/2009		Raised by:	Financial Expert		
Type:	CAR	Number:	42		Reference:	Contingency and O&M

Lead Assessor Comment:	Date: 04/09/2009
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(Detail the issue raised)

- Please provide evidence for the contingency (15%) taken for mechanical equipment and electrical equipment installation.
- Please provide evidence for levelized top ends and levelized major overhauls.

Project Participant Response:	Date: 22/09/2009
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All the assumptions shown in sheets "Flare station investment" and "Power plant investment SCS" of "El Verde Economic Analysis 8Sep09.xls", including those mentioned above, were part of the engineering study prepared by SCS Engineers for PASA. SCS Engineers is a company with experience in hundreds of landfills over many years and are the responsible of the engineering of the project. Therefore, they are the most qualified experts to make these assumptions. Please visit their website: <http://www.scsengineers.com/>. Note also that our sensitivity analysis considers a wide range of +/-20% around the reference value. In all cases, the NPV remains negative.

Documentation Provided by Project Participant:

"SCS PASA Cost Estimate report 29feb08.pdf" is the source of the sheets mentioned above

Information Verified by Lead Assessor:

- Contingency value of 15% for mechanical equipment (USD 74,250) and electrical equipment installation (USD 95,100) was confirmed in the cost estimation file provided by SCS Engineers "SCS PASA Cost Estimate report 29feb08.pdf" (Ref.56) and was found correct.
- Also, values for levelized top ends (USD 175,000) and levelized major overhauls (USD 108,000) were confirmed in the mentioned file.

Reasoning for not Acceptance or Acceptance and Close Out: 05/10/2009

- The issue may be closed as it is verified and found appropriate.
- The overhauling costs are verified and found acceptable.

Hence CAR is closed.

Acceptance and Close out by Lead Assessor:	Date: 05/10/2009
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Date:	04/09/2009		Raised by:	Financial Expert	
Type:	CAR	Number:	43	Reference:	Electricity Tariff Rate

Lead Assessor Comment:	Date: 04/09/2009
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In a normal scenario, it would be unrealistic to assume that there would be no increase in the electricity tariff rate in coming years. Please explain why no annual price escalation is considered in the tariff rate of electricity.

Project Participant Response:	Date: 22/09/2009
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Based on an expert reviewing Mexican laws on the sale of independently generated power, a correction has been needed in the electricity tariff value. According to Mexican law, as noted in the expert report, independent generators can use the power for their own use (Own Supply Scheme) or sell it to the National Electricity Commission (CFE) at a price that is 10% below CFE's short-term marginal cost. A full explanation is provided in the Expert Report (Spanish) Prepared by ENG. Jorge Plauchú "Análisis Marco Regulatorio El Verde.pdf", and supporting documents, listed below. The short term marginal costs (called CTCP) are published by CFE for all electricity interconnection points, called nodes, in <http://www.cfe.gob.mx/aplicaciones/otros/costostotales/consultaarchivoprojectado.aspx> See file "CFE price summary 2006-2008.xls" for further details. Leon belongs to the "Nodo Occidental" Nodo#33. See map at <http://www.cfe.gob.mx/aplicaciones/otros/costostotales/Imagenes/mapactcp.jpg>. Calculation shown in "Summary" tab of Excel file. Value used = 0.0538 USD/kWh. This is the base value used. The sensitivity analysis reveals that for the entire range, the NPV is negative. In fact, electricity price would have to be 54.08% higher for all years in the future for NPV to become positive.

Documentation Provided by Project Participant:	
<ul style="list-style-type: none"> • El_Verde_Economic_Analysis_19sep09 ver1.xls • CFE price summary 2006-2008.xls • Análisis Marco Regulatorio El Verde.pdf (Spanish) • Metodología de Cálculo de Costo Total de Corto Plazo de EE.pdf • Ley para el aprovechamiento de energías renovables y el financiamiento de la transición energética.pdf 	
Information Verified by Lead Assessor:	
<p>Please note that the electricity tariff applied has changed. Input values for calculation of electricity tariff 0.0538 USD/kWh in file CFE price summary 2006-2008.xls were confirmed in the website http://www.cfe.gob.mx/aplicaciones/otros/costostotales/consultaarchivoprojectado.aspx. Assumption that independent generators can use the power for their own use (Own Supply Scheme) or sell it to the National Electricity Commission (CFE) was confirmed in "Ref.73 - Law of Renewable Energy & Financing of energetic transition.pdf" and "Ref.71 - El Verde Regulatory Framework Analysis.pdf" which was prepared by Eng. Jorge Plauchú. Also, assumption of 10% discount on tariff used in calculations was verified in file "Ref.72 - Methodology for calculating short term total cost of electricity.pdf."</p> <p>Please find attached file "Ref.70 - CFE price summary 2006-2008.xls" for an overview of the calculations. In addition, it was verified that tariff is now increased annually based on inflation.</p>	
Reasoning for not Acceptance or Acceptance and Close Out:	
<p>The Inflation rate has been verified and factored in the electricity price.</p> <p>After comparing the electricity prices for year 2007 and 2008, it was observed that there is large variation in annual average electricity prices. Hence, it is requested that more transparency should be brought into the appropriateness of the escalation rate for electricity price. It should be demonstrated by means of evidences for historical prices that the long term escalation rate applicable on electricity prices will not be higher than the long term inflation rate in the region. If it is otherwise then the escalation rate should be corrected to reflect the actual scenario.</p> <p>CAR04 remains opened</p>	
Acceptance and Close out by Lead Assessor:	Date: 10/11/2009
Project Participant Response:	Date:
<p>As explained earlier, past trends are not an indication of future prices, since (a) private power generation was introduced in recent years prior to which there was no possibility of generating and selling to the grid; (b) according to recently introduced rules which determine prices paid to private power generators, the price depends on the marginal cost of the public power utility CFE. The marginal cost depends on petroleum prices. As is common knowledge, petroleum prices surged during 2008 before collapsing. Year end prices in 2007 and 2008 were virtually identical; (c) For the node to which the proposed project would be connected, electricity prices are available from 2006 to 2009, so a longer time series is not available. Nevertheless we have found more recent data to extend the time series into 2009, and also one more data point for September 2005. It is clear that the September 2005 price was in fact higher than the averages for 2006 and 2007 and only slightly lower than the average for 2008 (with its petroleum price spike). Moreover, 2009 prices are <i>considerably</i> lower (i.e. 48% lower than the average price in 2008). Thus, we have further evidence to support our contention that the past trends are not a reasonable indicator of future prices.</p> <p>CDM rules (EB41 Annex 45: Guidance on the Assessment of Investment Analysis) states the following with respect to Sensitivity Analysis:</p> <p>17. Guidance: The DOE should assess in detail whether the range of variations is reasonable in the project context. Past trends may be a guide to determine the reasonable range. As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances. In cases where a scenario will result in the project activity passing the benchmark or becoming the most financially attractive alternative the DOE shall provide an assessment of the probability of the occurrence of this scenario in comparison to the likelihood of the assumptions in the presented investment analysis, taking into consideration correlations between the variables as well as the specific socio-economic and policy context of the project activity.</p> <p>We have conducted our sensitivity analysis to +/-20% with respect to the base case. Moreover, recognizing</p>	

that electricity sales price is a sensitive parameter, we have extended the analysis to consider what increase in electricity price would be needed for the project to have zero NPV. The answer, shown in El_Verde_Economic_Analysis_4Nov09.xls, sheet "elec gen no CERs", cell J67, is 43.3%, meaning that even if electricity selling prices were 43.3% higher over the entire crediting period, the NPV would only increase to zero. There is no basis for predicting that future prices would exceed inflation rate (which is the base case assumption) by such a margin that it would be equivalent to an electricity price increase of 43.3% over the entire period. Recall that the early years weigh more in NPV estimation, and these prices are likely to be better determined, so that an average increase of 43.3% over the entire period means astronomical increases, beyond inflation, in the distant future. It is therefore our conclusion that the sensitivity analysis indicates that the proposed project activity is not financially attractive under any reasonable assumptions on the future price of electricity.

Documentation Provided by Project Participant:

- CFE price summary 2006-2008 mod 10Nov09.xls
- Exch_rate mod 10Nov09.xls
- Short term marginal costs (CTCP) - Nodo Occidental can be found at:
<http://www.cfe.gob.mx/aplicaciones/otros/costostotales/consultaarchivoprojectado.aspx>

Information Verified by Lead Assessor:

- CFE price summary 2006-2008 mod 10Nov09.xls
- Exch_rate mod 10Nov09.xls
- Short term marginal costs (CTCP) - Nodo Occidental can be found at:
<http://www.cfe.gob.mx/aplicaciones/otros/costostotales/consultaarchivoprojectado.aspx>

Reasoning for not Acceptance or Acceptance and Close Out:

Recent inclusion of private companies in energy sector in the country was verified at http://www.cec.org/files/pdf/Breceda-e_EN.PDF & http://www.cec.org/files/pdf/ECONOMY/mbinvest_es.pdf. It was observed that the late participation of private companies was mostly due to negative experiences in other prior privatization actions. It was also verified in media publications that the variances to petroleum prices observed in 2008 had a direct effect into energy prices, having reached in this same year the highest price in the country history what has directly affected energy prices in Mexico (<http://www.jornada.unam.mx/2008/03/11/index.php?section=economia&article=023n1eco>). Information on energy prices (of the node to which the proposed project would be connected, "Nodo Occidental" Nodo#33) was verified from 2006-2009 and variances pointed by PP were confirmed. Based on the information provided and verified it can be concluded that the past trends are not a reasonable indicator of future prices. Due to the fact that the electricity tariff is a sensitive parameter (linked to petroleum price, increase in other types of energy, investments in private sector, etc), it has been correctly included in sensitivity analysis as per EB41 Annex 45 (17). In the financial analysis spreadsheet it also verified that even if electricity selling prices were 43.3% higher over the entire crediting period, the NPV would only increase to zero. The variance in the electricity price analysed in the sensitivity analysis is found appropriate for the project case to cover eventual changes in host country as previously discussed. CAR4 is closed out.

Acceptance and Close out by Lead Assessor:

Date: 18-11-2009

Date:	04/09/2009		Raised by:	Financial Expert		
Type:	CAR	Number:	44	Reference:	Cashflow Calculation	
Lead Assessor Comment:				Date: 04/09/2009		
c) Please provide evidence for the depreciation rate and type (WDV/SLM) applicable for corporate tax calculation.						
d) It is a general accounting practice to deduct the carried forward losses of previous years from the present profit to calculate tax. Please explain why losses are not carried forward in the tax calculation.						
Project Participant Response:				Date: 22/09/2009		

a) Straight line method has been applied.

b) Losses have now been carried forward, additional rows are added in the spreadsheet.

The depreciation calculation had errors since it did not consider all the investments. It has now been corrected with additional rows added in the spreadsheet.

Note also that the corporate tax rate is in fact 28%, according to the tax law "Ley de Impuesto sobre la renta", most recent update 4/06/09 (article 10). An additional 10% is employee profit sharing, and this is based on 1) the Mexican Constitution, section A, Article 123, "fraction" IX, referring to general principles for workers' rights; and 2) Resolution of the Fourth National Commission on Employee Profit Sharing, published in the Official Bulletin (Diario Oficial de la Federación) on 26/12/1996; this latter document specifies the percentage to be shared. The spreadsheet has been modified, adding rows.

Supplementary response Sept 22, 2009:

Responding to SGS further request, inflation has now been included in all expenses and revenues. The inflation rate has been determined from consumer price index data published by the Mexican central bank in: <http://www.banxico.org.mx/polmoneinflacion/estadisticas/indicesPrecios/indicesPreciosConsumidor.html>. The calculations are shown in file "Inflation.xls" Sheet "CPI_gen_ann", SP1 January 2002 =98.2 (see cell D6); SP1 January 2009 =134.0 (see cell D13); Inflation = $(134.0/98.2)^{(1/7)}$. The resulting value 4.54% has been used.

Documentation Provided by Project Participant:

- El_Verde_Economic_Analysis_19sep09 ver1.xls
- Tax law _Ley de Impuesto sobre la renta 04Jun09.pdf (Source: http://www.diputados.gob.mx/LeyesBiblio/ref/lisr/LISR_ref15_04jun09.pdf)
- Inflation.xls

Information Verified by Lead Assessor:

Corporate tax rate was confirmed in the General Tax Law (Ref.74). Please find attached the file "Inflation.xls" for assessing the calculation of the inflation rate applied in all expenses and revenues.

Reasoning for not Acceptance or Acceptance and Close Out:

Corporate tax rate has been verified and accepted.

Carry forward losses have been included in the tax calculation (Row 46, elec gen no CERs). However, only last year's losses are carried forward to next year. Please correct it to carry forward cumulative losses of all the previous years to next year.

Acceptance and Close out by Lead Assessor:

Date: 22/10/2009

Remains open due to the above

Project Participant Response:

Date:

Cumulative losses from previous years have been carried forward in the corrected spreadsheet. The affected cells are highlighted in yellow. There is no significant change in the results. For instance, electricity price would have to be 43.3232% higher than base value for NPV to become zero. Previously the increase needed was 43.609%.

Documentation Provided by Project Participant:

El_Verde_Economic_Analysis_4nov09.xls

Information Verified by Lead Assessor:

The revised sheet includes carried forward losses for all the years in the calculation of tax.

Reasoning for not Acceptance or Acceptance and Close Out:

The carried forward losses are corrected to include losses for all the years and found to be appropriate. Hence CAR 05 is closed.

Acceptance and Close out by Lead Assessor:

Date: 09/11/2009

Date:	04/09/2009		Raised by:	Financial Expert		
Type:	CAR	Number:	45	Reference:	NPV	
Lead Assessor Comment:				Date: 04/09/2009		
c) Since the Cashflows are changing signs frequently, the use of simple IRR formula will not yield correct result. Hence NPV should be used as the financial indicator.						
d) NPV calculated does not include cashflows for all the years. Please correct it to include cashflows for 23 years (Cell D to AB).						
Project Participant Response:				Date: 22/09/2009		

a) NPV is now the indicator used for financial indicator and for the sensitivity analysis.	
b) Cash flow now continues to column AB.	
Documentation Provided by Project Participant:	
EI_Verde_Economic_Analysis_19sep09 ver1.xls	
Information Verified by Lead Assessor:	
a) Economic analysis spreadsheet was revised to use the NPV as the financial indicator (Ref.11c).	
b) NPV calculation now considers the cashflows for all 23 years (cell D to AB).	
Reasoning for not Acceptance or Acceptance and Close Out:	
The financial Indicator has been corrected. The cashflows have been taken for the technical lifetime of the project. Hence CAR is closed.	
Acceptance and Close out by Lead Assessor:	Date: 22/10/2009

Date:	11/11/2009	Raised by:	Mayra Caradec (Lead Assessor)		
Type:	CAR	Number:	46	Reference:	Participation requirements
Lead Assessor Comment:					
1) According to EB30 Report (Para. 41), “where a project participant listed in the PDD published at validation is not included in the PDD submitted for registration, the DOE shall provide a letter from the withdrawn project participant confirming its voluntary withdrawal from the proposed project activity, and address this issue in its validation report.” The project participants listed in the 1 st PDD published at ISHC were: “Promotora Ambiental S.A.B. de C.V.” and “MGM Carbon Portfolio, S.a.r.l.” However, the 2 nd published PDD only includes “Promotora Ambiental S.A.B. de C.V.” as a project participant. The PDD which will be submitted for request for registration (Ref.1f) also indicates “Promotora Ambiental S.A.B. de C.V.” as the only project participant. In this regard, no letter of withdrawal has been submitted at this point by MGM Carbon Portfolio, S.a.r.l. Please provide the mentioned confirming voluntary withdrawal from the proposed project activity. 2) Also, according to EB 50 Annex 48 (Para. 7-9) as well as the CDM Modalities and Procedures (Para. 37), the DOE is required to have a contractual relationship with the project participants. To this extent, the DOE has no contractual relationship with the indicated project participant “Promotora Ambiental S.A.B. de C.V.” as per 2 nd PDD published and most recent version of the PDD.					
Project Participant Response:				Date: 05/02/2010	
Documentation Provided by Project Participant:					
Ref.91 - Letter of Withdrawal of MGM as PP.pdf Ref.96 – Signed contract SGS & PASA 05-02-2010					
Information Verified by Lead Assessor:					
1) The PP provided the corresponding letter of withdrawal (Ref.91) dated 24-11-2009, confirming the voluntary withdrawal of MGM Carbon Portfolio as Project Participant from the project activity. 2) The PP signed a contract with SGS (Ref.96) on February 05 th 2010 for the conduction of validation services, thereby demonstrating a contractual relationship between the DOE and PP.					
Reasoning for not Acceptance or Acceptance and Close Out:				Date: 07/02/2010	
Based on the above explanation, CAR 46 is closed.					

A.4 Annex 4: Team Members Statements of Competency

Statement of Competence

Name: Caradec, Mayra SGS Affiliate: SGS Panama

Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input checked="" type="checkbox"/> (Mexico)	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
2. Energy Distribution	<input type="checkbox"/>
<i>Sub scope(s):</i>	
3. Energy Demand	<input type="checkbox"/>
<i>Sub scope(s):</i>	
4. Manufacturing	<input type="checkbox"/>
<i>Sub scope(s):</i>	
5. Chemical Industry	<input type="checkbox"/>
<i>Sub scope(s):</i>	
6. Construction	<input type="checkbox"/>
<i>Sub scope(s):</i>	
7. Transport	<input type="checkbox"/>
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
9. Metal Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
<i>Sub scope(s):</i>	
12. Solvent Use	<input type="checkbox"/>
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	<input checked="" type="checkbox"/>
<i>Sub scope(s): Landfill gas</i>	
14. Afforestation and Reforestation	<input type="checkbox"/>
<i>Sub scope(s):</i>	
15. Agriculture	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 27/01/2010 and 01/02/2010

Statement of Competence

Name: Treuherz, Alessandra SGS Affiliate: SGS Panama

Status

-	Lead Assessor	<input type="checkbox"/>	-	Expert	<input type="checkbox"/>
-	Assessor	<input checked="" type="checkbox"/>	-	Financial Expert	<input type="checkbox"/>
-	Local Assessor	<input type="checkbox"/>	-	Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
2. Energy Distribution	<input type="checkbox"/>
<i>Sub scope(s):</i>	
3. Energy Demand	<input type="checkbox"/>
<i>Sub scope(s):</i>	
4. Manufacturing	<input type="checkbox"/>
<i>Sub scope(s):</i>	
5. Chemical Industry	<input type="checkbox"/>
<i>Sub scope(s):</i>	
6. Construction	<input type="checkbox"/>
<i>Sub scope(s):</i>	
7. Transport	<input type="checkbox"/>
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
9. Metal Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
<i>Sub scope(s):</i>	
12. Solvent Use	<input type="checkbox"/>
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	<input type="checkbox"/>
<i>Sub scope(s):</i>	
14. Afforestation and Reforestation	<input type="checkbox"/>
<i>Sub scope(s):</i>	
15. Agriculture	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 26/01/2010

Statement of Competence

Name: Mahawar, Abhishek SGS Affiliate: SGS India

Status

- Lead Assessor	<input type="checkbox"/>	- Expert	<input type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input checked="" type="checkbox"/>
- Local Assessor	<input checked="" type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
2. Energy Distribution	<input type="checkbox"/>
<i>Sub scope(s):</i>	
3. Energy Demand	<input type="checkbox"/>
<i>Sub scope(s):</i>	
4. Manufacturing	<input type="checkbox"/>
<i>Sub scope(s):</i>	
5. Chemical Industry	<input type="checkbox"/>
<i>Sub scope(s):</i>	
6. Construction	<input type="checkbox"/>
<i>Sub scope(s):</i>	
7. Transport	<input type="checkbox"/>
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
9. Metal Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
<i>Sub scope(s):</i>	
12. Solvent Use	<input type="checkbox"/>
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	<input type="checkbox"/>
<i>Sub scope(s):</i>	
14. Afforestation and Reforestation	<input type="checkbox"/>
<i>Sub scope(s):</i>	
15. Agriculture	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by: Siddharth Yadav Date: 12/11/2009

Statement of Competence

Name: Singh, Kaviraj

Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input checked="" type="checkbox"/>
- Assessor	<input type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input type="checkbox"/>	- Technical Reviewer	<input checked="" type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input type="checkbox"/>	<input type="checkbox"/>
<i>Sub scope(s):</i>		
2. Energy Distribution		<input type="checkbox"/>
<i>Sub scope(s):</i>		
3. Energy Demand		<input type="checkbox"/>
<i>Sub scope(s):</i>		
4. Manufacturing		<input type="checkbox"/>
<i>Sub scope(s):</i>		
5. Chemical Industry		<input type="checkbox"/>
<i>Sub scope(s):</i>		
6. Construction		<input type="checkbox"/>
<i>Sub scope(s):</i>		
7. Transport		<input type="checkbox"/>
<i>Sub scope(s):</i>		
8. Mining/Mineral Production		<input type="checkbox"/>
<i>Sub scope(s):</i>		
9. Metal Production		<input type="checkbox"/>
<i>Sub scope(s):</i>		
10. Fugitive Emissions from Fuels (solid, oil and gas)		<input type="checkbox"/>
<i>Sub scope(s):</i>		
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride		<input type="checkbox"/>
<i>Sub scope(s):</i>		
12. Solvent Use		<input type="checkbox"/>
<i>Sub scope(s):</i>		
13. Waste Handling and Disposal		<input checked="" type="checkbox"/>
<i>Sub scope(s): Landfill gas, Wastewater and sludge treatment, Composting</i>		
14. Afforestation and Reforestation		<input type="checkbox"/>
<i>Sub scope(s):</i>		
15. Agriculture		<input type="checkbox"/>
<i>Sub scope(s):</i>		

Approved Member of Staff by:

Siddharth Yadav

Date:

16/12/2009

Statement of Competence

Name: Campos, Carolina.

Status

- Lead Assessor	<input checked="" type="checkbox"/>	- Expert	<input type="checkbox"/>
- Assessor	<input checked="" type="checkbox"/>	- Financial Expert	<input type="checkbox"/>
- Local Assessor	<input checked="" type="checkbox"/>	- Technical Reviewer	<input type="checkbox"/>

Scopes of Expertise

1. Energy Industries (renewable / non-renewable)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
2. Energy Distribution	<input type="checkbox"/>
<i>Sub scope(s):</i>	
3. Energy Demand	<input type="checkbox"/>
<i>Sub scope(s):</i>	
4. Manufacturing	<input type="checkbox"/>
<i>Sub scope(s):</i>	
5. Chemical Industry	<input type="checkbox"/>
<i>Sub scope(s):</i>	
6. Construction	<input type="checkbox"/>
<i>Sub scope(s):</i>	
7. Transport	<input type="checkbox"/>
<i>Sub scope(s):</i>	
8. Mining/Mineral Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
9. Metal Production	<input type="checkbox"/>
<i>Sub scope(s):</i>	
10. Fugitive Emissions from Fuels (solid, oil and gas)	<input type="checkbox"/>
<i>Sub scope(s):</i>	
11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride	<input type="checkbox"/>
<i>Sub scope(s):</i>	
12. Solvent Use	<input type="checkbox"/>
<i>Sub scope(s):</i>	
13. Waste Handling and Disposal	<input type="checkbox"/>
<i>Sub scope(s):</i>	
14. Afforestation and Reforestation	<input type="checkbox"/>
<i>Sub scope(s):</i>	
15. Agriculture	<input type="checkbox"/>
<i>Sub scope(s):</i>	

Approved Member of Staff by:

Siddharth Yadav

Date:

12 November 2009

Statement of Competence

Name: Michelle
Nuñez

Status

- Lead Assessor		- Expert	
- Assessor	x	- Financial Expert	
- Local Assessor	Panama	- Technical Reviewer	

Scopes of Expertise

- | | |
|--|--------------------------|
| 1. Energy Industries (renewable / non-renewable) | <input type="checkbox"/> |
| Sub scope(s): | |
| 2. Energy Distribution | <input type="checkbox"/> |
| Sub scope(s): | |
| 3. Energy Demand | <input type="checkbox"/> |
| Sub scope(s): | |
| 4. Manufacturing | <input type="checkbox"/> |
| Sub scope(s): | |
| 5. Chemical Industry | <input type="checkbox"/> |
| Sub scope(s): | |
| 6. Construction | <input type="checkbox"/> |
| Sub scope(s): | |
| 7. Transport | <input type="checkbox"/> |
| Sub scope(s): | |
| 8. Mining/Mineral Production | <input type="checkbox"/> |
| Sub scope(s): | |
| 9. Metal Production | <input type="checkbox"/> |
| Sub scope(s): | |
| 10. Fugitive Emissions from Fuels (solid, oil and gas) | <input type="checkbox"/> |
| Sub scope(s): | |
| 11. Fugitive Emissions from Production and Consumption of Halocarbons and Sulphur Hexafluoride | <input type="checkbox"/> |
| Sub scope(s): | |
| 12. Solvent Use | <input type="checkbox"/> |
| Sub scope(s): | |
| 13. Waste Handling and Disposal | <input type="checkbox"/> |
| Sub scope(s): | |
| 14. Afforestation and Reforestation | <input type="checkbox"/> |
| Sub scope(s): | |
| 15. Agriculture | <input type="checkbox"/> |
| Sub scope(s): | |

Approved Member of Staff by:

Siddharth
Yadav

Date:

15/07/2010