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# VALIDATION REPORT

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## “CENTRAL DE RESÍDUOS DO RECREIO LANDFILL GAS PROJECT (CRRLGP)”

REPORT No. 2006-0520

REVISION No. 02

DET NORSKE VERITAS



## VALIDATION REPORT

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### Summary:

Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” in Brazil on the basis of UNFCCC criteria for the CDM, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 12 of the Kyoto Protocol, the CDM modalities and procedures and the subsequent decisions by the CDM Executive Board.

The validation consisted of the following three phases: i) a desk review of the project design, baseline and monitoring plan, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion.

In summary, it is DNV's opinion that the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” as described in the revised PDD of 29 June 2006, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology ACM0001. Hence, DNV will request the registration of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” as a CDM project activity.

Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the project assists it in achieving sustainable development.

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Report title: “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”, in Brazil			
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Work verified by: Cintia Dias			
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## [Appendix A Validation Protocol](#)

***Abbreviations***

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH <sub>4</sub>	Methane
CL	Clarification request
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
CRRLGP	Central de Resíduos do Recreio Landfill Gas Project
DNV	Det Norske Veritas
FEPAM	Environment State Agency (Fundação Estadual de Proteção Ambiental)
DNA	Designated National Authority
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
LFG	Landfill gas
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
N <sub>2</sub> O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change



## 1 INTRODUCTION

SIL – Soluções Ambientais Ltda. and Econergy have commissioned Det Norske Veritas Certification Ltd. (DNV) to perform a validation of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” at Minas do Leão Municipality, Rio Grande do Sul State, Brazil.

This report summarises the findings of the validation of the project, performed on the basis of UNFCCC and host Party criteria for CDM projects, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The validation team consists of the following personnel:

Mr. Luis Filipe Tavares	DNV Rio de Janeiro	Team leader, Waste sector expert
Ms. Cintia Dias	DNV Rio de Janeiro	CDM auditor
Mr. Vicente San Valero	DNV Rio de Janeiro	CDM auditor
Mr. Michael Lehmann	DNV Oslo	Technical reviewer

### 1.1 Validation Objective

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, and the project's compliance with relevant UNFCCC and host Party criteria are validated in order to confirm that the project design as documented is sound and reasonable and meets the identified criteria. Validation is a requirement for all CDM projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of certified emission reductions (CERs).

### 1.2 Scope

The validation scope is defined as an independent and objective review of the project design document (PDD). The PDD is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board. The validation team has, based on the recommendations in the Validation and Verification Manual /6/, and employed a risk-based approach, 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 project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the project design

### 1.3 Description of Proposed CDM Project

The objective of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” is to capture and flare the landfill gas produced at the Central de Resíduos do Recreio landfill located in Minas do Leão, Rio Grande do Sul State, Brazil, to avoid emissions of methane to the atmosphere.

The Central de Resíduos do Recreio landfill started operations in October 2001, covers an area of 253 500 m<sup>2</sup> and has the capacity to receive 4.18 million tons of waste. The project is forecasted to start on 01 July 2007.



The current practise at the landfill is to collect and burn the gas only through a passive system, with no systematic and monitored flare. Methane is emitted naturally to the atmosphere through the existing wells, and part of the gas is burned due to safety and odour reasons.

The project involves the development of a collection pipeline network and a flaring system. The collection system will be built using the existing wells. The wells will be covered and connected to a main pipeline to transport the landfill gas to the flare. A blower will be installed in order to increase the amount of landfill gas collected.

The forecasted amount of GHG emission reductions from the project is estimated to be 755 166 tonnes CO<sub>2</sub> equivalents (tCO<sub>2</sub>e) during the first renewable 7-year crediting period (with the potential of being renewed twice), resulting in forecasted average annual emission reductions of 107 881 tCO<sub>2</sub>e.

## 2 METHODOLOGY

The validation consisted of the following three phases:

- I a desk review of the project design, baseline and monitoring plan;
- II follow-up interviews with project stakeholders;
- III the resolution of outstanding issues and the issuance of the final validation report and opinion.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual /6/. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

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

The validation protocol consists of three tables. The different columns in these tables are described in Figure 1.

The completed validation protocol for the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfilment of validation protocol criteria or where a risk to the fulfilment of project objectives is identified. *Corrective Action Requests* (CAR) are issued, where:

- i) mistakes have been made with a direct influence on project results;
- ii) validation protocol requirements have not been met; or
- iii) there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be certified.

The term request for *Clarification* (CL) may be used where additional information is needed to fully clarify an issue



<b>Validation Protocol Table 1: Mandatory Requirements for CDM Project Activities</b>			
<b>Requirement</b>	<b>Reference</b>	<b>Conclusion</b>	<b>Cross reference</b>
<i>The requirements the project must meet.</i>	<i>Gives reference to the legislation or agreement where the requirement is found.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements or a request for <b>Clarification (CL)</b> where further clarifications are needed.</i>	<i>Used to refer to the relevant checklist questions in Table 2 to show how the specific requirement is validated. This is to ensure a transparent Validation process.</i>

  

<b>Validation Protocol Table 2: Requirement Checklist</b>				
<b>Checklist Question</b>	<b>Reference</b>	<b>Means of verification (MoV)</b>	<b>Comment</b>	<b>Draft and/or Final Conclusion</b>
<i>The various requirements in Table 1 are linked to checklist questions the project should meet. The checklist is organised in seven different sections. Each section is then further sub-divided. The lowest level constitutes a checklist question.</i>	<i>Gives reference to documents where the answer to the checklist question or item is found.</i>	<i>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.</i>	<i>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.</i>	<i>This is either acceptable based on evidence provided (<b>OK</b>), or a <b>Corrective Action Request (CAR)</b> due to non-compliance with the checklist question (See below). A request for <b>Clarification (CL)</b> is used when the validation team has identified a need for further clarification.</i>

  

<b>Validation Protocol Table 3: Resolution of Corrective Action Requests and Requests for Clarification</b>			
<b>Draft report corrective action requests and requests for clarifications</b>	<b>Ref. to Table 2</b>	<b>Summary of project participants' response</b>	<b>Final conclusion</b>
<i>If the conclusions from the draft Validation are either a Corrective Action Request or a Clarification Request, these should be listed in this section.</i>	<i>Reference to the checklist question number in Table 2 where the Corrective Action Request or Clarification Request is explained.</i>	<i>The responses given by the project participants during the communications with the validation team should be summarised in this section.</i>	<i>This section should summarise the validation team's responses and final conclusions. The conclusions should also be included in Table 2, under "Final Conclusion".</i>

**Figure 1 Validation protocol tables**



## 2.1 Review of Documents

The PDD (version 1 of 24 February 2006) /1/ submitted by SIL – Soluções Ambientais Ltda. and Econergy on 2 March 2006 was assessed by DNV. A revised version of the PDD /2/ (version 02 dated 05 April 2006) was submitted to address DNV's initial validation findings, was assessed by DNV. Moreover, a final version /3/ (version 3 29 June 2006) was submitted, including the last version of ACM0001 /7/ and ACM 0002/8/.

In addition, a spreadsheet containing calculations of the combined margin grid electricity emission factor applied by the project /4/ and other documents, such as the environmental licences and licence requirements as well as the letters sent to local stakeholders, were assessed.

## 2.2 Follow-up Interviews

On 04 April 2006, DNV performed interviews with a representative of Econergy, in order to confirm and to resolve issues identified in the document review. This included, but was not limited to:

- Management System
  - authority and responsibilities
  - training
  - emergency preparedness
  - records maintenance
  - internal audits
  - corrective actions
- Consultation of local stakeholders
- Current practise of passive venting and unsystematic burning of LFG

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve any outstanding issues which needed to be clarified for DNV's positive conclusion on the project design.

The initial validation of the project identified 1 (one) *Corrective Action Request* and 6 (six) requests for *Clarification*. The project participant's response to DNV's draft validation report findings, including the submission of a revised PDD on 29 June 2006, addressed the *Corrective Action Requests* and requests for *Clarification* to DNV's satisfaction.

To guarantee the transparency of the validation process, the concerns raised are summarised in chapter 3 below and documented in more detail in the validation protocol in Appendix A.





### 3 VALIDATION FINDINGS

The findings of the validation of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” are stated in the following sections. The validation criteria (requirements), the means of verification and the results from validating the identified criteria are documented in more detail in the validation protocol in Appendix A.

The final validation findings relate to the project design as documented and described in the revised PDD of 29 June 2006.

#### 3.1 Participation Requirements

The project participant is SIL – Soluções Ambientais Ltda. of Brazil. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.

Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the project assists it in achieving sustainable development.

#### 3.2 Project Design

The project objective is to capture and flare the landfill gas produced at Central de Resíduos do Recreio landfill to avoid emissions of methane to the atmosphere. The technology to be employed will be the improvement of the landfill gas collection and flaring system, through the installation of an active recovery system composed by a collection and transportation pipeline network and a flaring system. The project will make use of the existing wells that have been installed for venting LFG. The wellheads will be connected to a collecting pipeline and to the manifolds which are connected to a blower that sent the gas to the flare.

A renewable 7-year crediting period is selected (with the potential of being renewed twice), starting on 01 January 2007. The starting date of the project activity is forecasted to be on 01 January 2007, and the expected operational lifetime of the project is 21 years.

The project is expected to bring improvement on sustainable development through reducing methane emissions and minimizing the risk of explosions at the site. The transfer of technology and specialized operators will be needed for project’s implementation and operation, which means a positive impact on employment and construction capacity skills.

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

#### 3.3 Baseline Determination

The project applies the approved baseline methodology ACM0001 – “*Consolidated baseline methodology for landfill gas project activities*” /7/. This methodology is applicable to project activities that reduce greenhouse gas emissions through landfill gas capture and destruction of the methane by flaring and/or generation of electricity. In the case of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”, the destruction of methane will be done through flaring.



The selected baseline scenario is the partial atmospheric release of the landfill gas. As “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” does not have any contractual obligations to burn methane, the baseline emissions are calculated using an “Adjustment Factor”. The “Adjustment Factor” is estimated to be 20% of total methane produced. The “Adjustment Factor” of 20% allows for the destruction of LFG in the baseline scenario which would have occurred as a result of the continuation of the current practise of passive venting and unsystematic burning of LFG.

### 3.4 Additionality

In accordance with ACM0001, the additionality of the project is demonstrated through the *Tool for the demonstration and assessment of additionality* [9], which includes the following steps:

*Step 0 - Preliminary screening based on the starting date of the project activity:* As the starting date of the crediting period is after the expected date of registration of the project, this step is not applicable.

*Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations:* The possible baseline scenarios are: a) LFG would continue to be released to the atmosphere and only small amounts of LFG would be burned due to safety and odour reasons and b) implement the project of capture and flaring of LFG without CDM incentives. There is no legislation in Brazil obliging landfills to flare the collected gas. Both scenarios are thus in compliance with all applicable legal and regulatory requirements.

*Step 2 - Investment analysis:* As the CDM project activity does not generate any financial or economic benefits other than CDM related income, the simple cost analysis scenario is applied. Considering the additional costs necessary for increasing the LFG capture capacity, without having any revenues, the project is not a likely baseline scenario. Even if LFG was utilised to generate electricity, this would not significantly alleviate the economic and financial hurdles of the project.

*Step 3 - Barrier analysis:* Not selected (Step 2 is selected only)

*Step 4 - Common practice analysis:* DNV was able to confirm that legislation that requires landfills to quantify and flare a certain amount of the gas produced is not likely to be implemented in the near future. Today 56% of waste produced in Southeast of Brazil is disposed as dump and only about 37% is destined to sanitary landfill. A major environmental problem related to domestic waste in Brazil is the lack of waste disposal to sanitary landfills. DNV was able to confirm that the investment to install systems to capture and flare methane is not common practice in Brazil.

*Step 5 - Impact of CDM registration:* As there is no income from the project, the sale of CERs will present the only revenue for the project and will significantly alleviate the economic and financial hurdles of the project.

### 3.5 Monitoring Plan

The project correctly applies the approved monitoring methodology ACM0001 - “*Consolidated monitoring methodology for landfill gas projects activities*” [7].

Details of the data to be collected, the frequency of data recording, its certainty, and format and storage location are described; however some adjustments needed to be implemented:



1) The monitoring plan indicated continuous monitoring of flare efficiency. However, in the comment it is indicated to be measured periodically. ACM0001 requires that the flare efficiency is monitored by continuously monitoring the operating hours and by quarterly (monthly if unstable) monitoring of the CH<sub>4</sub> content in the exhaust gas. The monitoring plan was corrected accordingly.

2) The CH<sub>4</sub> fraction in the landfill gas was stated to be monitored “continuously (quarterly, monthly if unstable)”. The revised PDD specified that the CH<sub>4</sub> fraction is continuously monitored.

3) The grid electricity CO<sub>2</sub> emission factor is fixed *ex-ante*, but the monitoring plan indicates that it is monitored “At the validation and yearly after registration”. The monitoring plan was modified to read that the grid electricity CO<sub>2</sub> emission factor is determined prior to validation and at renewal of the crediting period.

The Quality Control and Quality Assurance datasheet for the project identifies several monitoring routines. As the project is not yet implemented, the responsibilities for project operation and monitoring and reporting have not yet been developed. However, by the time of the project’s implementation, a team and its responsibilities will be assigned. The management system should be assessed during the first verification.

### 3.6 Calculation of GHG Emissions

Emission reductions are directly monitored and calculated *ex-post*, using the approach indicated in ACM0001.

For the *ex-ante* estimation of emission reductions, the expected LFG generation of the landfill is determined using the IPCC first order decay model. GHG emission reductions were estimated using IPCC’s guidelines and the first order decay model approach considering values of  $L_0 = 70 \text{ m}^3\text{CH}_4/\text{ton waste}$ ,  $k = 0.1$  and a collection efficiency of 50%. The assumptions used to estimate LFG generation seem appropriate and are based on the IPCC Good Practice Guidance and Brazilian conditions.

For the calculation of project emissions due to the import of electricity used to pump the LFG, the national grid CO<sub>2</sub> coefficient is fixed *ex-ante* for the first 7-year crediting period and is calculated to be 0.2647 tCO<sub>2</sub>e/MWh (weighted average of the build margin (BM) and operating margin (OM) emission coefficients). The calculation of the BM emission coefficient was updated with regard to the requirements contained in ACM0002 version 6 and the calculations were based on electricity generation data provided by the Brazilian Electricity Agency (ANEEL) and the National Electricity System Operator (ONS) for the electricity generated in the South-Southeast-Midwest (S-SE-CO) grid in the years 2002-2004, considering the IPCC Carbon emission factors for Residual Fuel Oil, Sub bituminous coal and dry natural gas as fossil combustible. Data for the years 2002-2004 are the most recent statistics available.

### 3.7 Environmental Impacts

The Central de Resíduos do Recreio landfill has been granted the last Operation Environmental Licence # 2495 issued on 30 March 2004 which is valid until 14 June 2008. This license was issued after the project’s Environmental Impact Assessment was evaluated by the State Environmental Agency (FEPAM).



The project has not yet obtained a licence for flaring landfill gas and such a licence must be applied for when the project is implemented. Given that the flaring of landfill gas has little adverse environmental impacts, it is likely that the licence will be obtained when the project is implemented. At the first period verification of the project it must be confirmed that this licence was eventually obtained.

### **3.8 Comments by Local Stakeholders**

Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Copies of the letters sent to the local stakeholders were verified during the follow up interviews. Four comments were received, all supporting the project. All comments were sufficiently taken into account by SIL – Soluções Ambientais Ltda.

## **4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS**

The PDD of 24 February 2006 was made publicly available on DNV's climate change website ([www.dnv.com/certification/climatechange](http://www.dnv.com/certification/climatechange)) and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 09 March 2006 to 07 April 2006. No comments were received.



## 5 VALIDATION OPINION

*Det Norske Veritas Certification Ltd. (DNV) has performed a validation of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”, at Minas do Leão Municipality, Rio Grande do Sul State, Brazil. The validation was performed on the basis of UNFCCC criteria for CDM project activities and relevant Brazilian criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.*

*The project participant is SIL – Soluções Ambientais Ltda of Brazil. The host Party Brazil meets all relevant participation requirements. No participating Annex I Party is yet identified.*

*The project objective is to capture and flare the landfill gas produced at Central de Resíduos do Recreio landfill, to avoid emissions of methane to the atmosphere. The technology to be employed will be the improvement of landfill gas collection and flaring, through the installation of an active recovery system composed by a collection and transportation pipeline network and a flaring system.*

*The project applies the approved baseline and monitoring methodology ACM0001, i.e. “Consolidated baseline and monitoring methodology for landfill gas project activities”. The baseline methodology has been correctly applied and the assumptions made for the selected baseline scenario are sound. It is sufficiently demonstrated that the project is not a likely baseline scenario and that emission reductions attributable to the project are additional to any that would occur in the absence of the project activity.*

*The monitoring methodology has been correctly applied. The monitoring plan sufficiently specifies the monitoring requirements.*

*By burning of methane of landfill gas the project results in reductions of CH<sub>4</sub> emissions that are real, measurable and give long-term benefits to the mitigation of climate change. Given that the project is operated as designed, the project is likely to achieve the estimated amount of emission reductions.*

*Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Four positive comments were received. Copies of the letters sent to the local stakeholders were verified during the follow up interview.*

*In summary, it is DNV’s opinion that the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”, as described in the revised and resubmitted project design document of 29 June 2006, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology. Hence, DNV will request the registration of the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” as CDM project activity.*

*Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the project assists it in achieving sustainable development.*



## REFERENCES

*Documents provided by the project proponent that relate directly to the project:*

- /1/ Econergy: *Project Design Document for the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”*, Version 1 (24 February 2006);
- /2/ Econergy: *Project Design Document for the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”*, Version 2 (05 April 2006);
- /3/ Econergy: *Project Design Document for the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”*, Version 3 (29 June 2006);
- /4/ *Spreadsheets for the calculation of the combined margin emission Coefficient (ONS-Emission factors S-SE-CO 2002-2004-2006.05.23.xls)*.
- /5/ Econergy: *Spreadsheets for the calculation of the emission reductions from the “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)”*. V3 2006-06-30

*Background documents related to the design and/or methodologies employed in the design or other reference documents:*

- /6/ International Emission Trading Association (IETA) & the World Bank’s Prototype Carbon Fund (PCF): *Validation and Verification Manual*. <http://www.vvmanual.info>
- /7/ Approved Baseline and Monitoring Methodology ACM0001: *“Consolidated baseline and monitoring methodology for landfill gas project activities”*. Version 03 of 19 May 2006.
- /8/ Approved Baseline and Monitoring Methodology ACM0002: *“Consolidated methodology for grid-connected electricity generation from renewable sources”* version 6 of 19 May 2006.
- /9/ CDM Executive Board: *Tool for the demonstration and assessment of additionality*. Version 02 of 28 November 2005

*Persons interviewed during the validation, or persons who contributed with other information that are not included in the documents listed above:*

- /10/ Eduardo Cardoso Filho - Econergy

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## **APPENDIX A**

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### **CDM VALIDATION PROTOCOL**

**Table 1 Mandatory Requirements for Clean Development Mechanism (CDM) Project Activities**

Requirement	Reference	Conclusion	Cross Reference / Comment
1. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3	Kyoto Protocol Art.12.2	OK	Table 2, Section E.4.1 No participating Annex I Party is yet identified.
2. The project shall assist non-Annex I Parties in achieving sustainable development and shall have obtained confirmation by the host country thereof	Kyoto Protocol Art. 12.2, CDM Modalities and Procedures §40a	--	Table 2, Section A.3 Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil, including the confirmation that the project assists it in achieving sustainable development.
3. The project shall assist non-Annex I Parties in contributing to the ultimate objective of the UNFCCC	Kyoto Protocol Art.12.2.	OK	Table 2, Section E.4.1
4. The project shall have the written approval of voluntary participation from the designated national authority of each party involved	Kyoto Protocol Art. 12.5a, CDM Modalities and Procedures §40a	--	Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approval of voluntary participation from the DNA of Brazil.
5. The emission reductions shall be real, measurable and give long-term benefits related to the mitigation of climate change	Kyoto Protocol Art. 12.5b	OK	Table 2, Section E
6. Reduction in GHG emissions shall be additional to any that would occur in absence of the project activity, i.e. a CDM project activity is additional if anthropogenic emissions of greenhouse gases by sources are reduced below those that would have occurred in the absence of the registered CDM project activity	Kyoto Protocol Art. 12.5c, CDM Modalities and Procedures §43	OK	Table 2, Section B.2
7. In case public funding from Parties included in Annex I is	Decision 17/CP.7,	OK	The validation did not reveal any



Requirement	Reference	Conclusion	Cross Reference / Comment
used for the project activity, these Parties shall provide an affirmation that such funding does not result in a diversion of official development assistance and is separate from and is not counted towards the financial obligations of these Parties.	CDM Modalities and Procedures Appendix B, § 2		information that indicates that the project can be seen as a diversion of ODA funding towards Brazil.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures §29	OK	The Brazilian designated national authority for the CDM is the Comissão Interministerial de Mudança Global do Clima.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities §30/31a	OK	Brazil has ratified the Kyoto Protocol on 23 August 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	N/A	No participating Annex I Party is yet identified.
11. The participating Annex I Party shall have in place a national system for estimating GHG emissions and a national registry in accordance with Kyoto Protocol Article 5 and 7	CDM Modalities and Procedures §31b	N/A	No participating Annex I Party is yet identified.
12. Comments by local stakeholders shall be invited, a summary of these provided and how due account was taken of any comments received	CDM Modalities and Procedures §37b	OK	Table 2, Section G
13. Documentation on the analysis of the environmental impacts of the project activity, including transboundary impacts, shall be submitted, and, if those impacts are considered significant by the project participants or the Host Party, an environmental impact assessment in accordance with procedures as required by the Host Party shall be carried out.	CDM Modalities and Procedures §37c	OK	Table 2, Section F
14. Baseline and monitoring methodology shall be previously approved by the CDM Executive Board	CDM Modalities and Procedures §37e	OK	Table 2, Section B.1.1 and D.1.1
15. Provisions for monitoring, verification and reporting shall be in accordance with the modalities described in the Marrakech Accords and relevant decisions of the COP/MOP	CDM Modalities and Procedures §37f	OK	Table 2, Section D
16. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation requirements	CDM Modalities and Procedures §40	OK	The PDD of 24 February 2006 was made publicly available on DNV's

Requirement	Reference	Conclusion	Cross Reference / Comment
for minimum 30 days, and the project design document and comments have been made publicly available			climate change website and Parties, stakeholders and NGOs were through the CDM website invited to provide comments during a 30 days period from 09 March 2006 to 07 April 2006. No comments were received.
17. A baseline shall be established on a project-specific basis, in a transparent manner and taking into account relevant national and/or sectoral policies and circumstances	CDM Modalities and Procedures §45c,d	OK	Table 2, Section B.2
18. The baseline methodology shall exclude to earn CERs for decreases in activity levels outside the project activity or due to force majeure	CDM Modalities and Procedures §47	OK	Table 2, Section B.2
19. The project design document shall be in conformance with the UNFCCC CDM-PDD format	CDM Modalities and Procedures Appendix B, EB Decision	OK	PDD is in accordance with CDM-PDD (version 02 of 1 July 2004).

**Table 2 Requirements Checklist**

Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
<b>A. General Description of Project Activity</b> <i>The project design is assessed.</i>					
<b>A.1. Project Boundaries</b> <i>Project Boundaries are the limits and borders defining the GHG emission reduction project.</i>					
A.1.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” is located at the municipality of Minas do Leão, Rio Grande do Sul State. However, the precise location of the project is not clearly identified in the PDD.	CL-1	OK
A.1.2. Are the project's system (components and facilities used to mitigate GHGs) boundaries clearly defined?	/1/	DR	The project's system boundary comprises the Central de Resíduos do Recreio landfill and complementary facilities to collect, pump and flare the LFG. Project emissions consider the S-SE-CO Brazilian grid emission factor.		OK
<b>A.2. Technology to be employed</b> <i>Validation of project technology focuses on the project engineering, choice of technology and competence/ maintenance needs. The validator should ensure that environmentally safe and sound technology and know-how is used.</i>					
A.2.1. Does the project design engineering reflect current good practices?	/1/	DR	The project design engineering reflects good practice through the use of top and bottom cover landfill, land fill gas recovery		OK

\* MoV = Means of Verification, DR= Document Review, I= Interview

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			and flaring.		
A.2.2. Does the project use state of the art technology or would the technology result in a significantly better performance than any commonly used technologies in the host country?	/1/	DR	The common practice in Brazil is sanitary landfill without landfill gas treatment or only flaring for safety reasons. The Central de Resíduos do Recreio landfill was established on a closed coal mine. The LFG collection, pumping and flaring systems were selected from American and European technologies.		OK
A.2.3. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	/1/	DR	The project is unlikely to be substituted by other more efficient technologies.		OK
- Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	/1/	DR	The project will require minimal additional training for project operation and maintenance.		OK
A.2.4. Does the project make provisions for meeting training and maintenance needs?	/1/	DR	The project activity will implement training needs for specialized operators.		OK
<b>A.3. Contribution to Sustainable Development</b> <i>The project's contribution to sustainable development is assessed.</i>					
A.3.1. Is the project in line with relevant legislation and plans in the host country?	/1/	DR	The Central de Resíduos do Recreio landfill has been granted an Operation Environmental Licence # 2495 issued on 30 March 2004, which is valid until 14 June 2008. The license was issued after the project's Environmental Impact Assessment was evaluated by the State Environmental Agency (FEPAM).		OK
A.3.2. Is the project in line with host-country specific CDM requirements?	/1/	DR	Local stakeholders, such as the Municipal Government, the state and municipal agencies, the Brazilian forum of NGOs,		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Four comments were received. Copies of the letters sent to the local stakeholders were sent to DNV and evidence the statement.		
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	The project is in line with current sustainable development priorities in Brazil. Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written confirmation by the DNA of Brazil that the project assists in achieving sustainable development.	--	
A.3.4. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project is expected to bring improvement on sustainable development through reducing methane emissions and minimizing the risk of explosions at the site. The transfer of technology and specialized operators will be needed for project's implementation and operation, which means a positive impact on employment and construction capacity skills.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
<b>B. Project Baseline</b> <i>The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.</i>					
<b>B.1. Baseline Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
B.1.1. Is the baseline methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies the approved baseline methodology ACM0001 - “Consolidated baseline and monitoring methodology for landfill gas project activities”		OK
B.1.2. Is the baseline methodology the one deemed most applicable for this project and is the appropriateness justified?	/1/	DR	The project fulfils the conditions under which ACM0001 / Version 02 is applicable considering only the capture and flaring of LFG.		OK
<b>B.2. Baseline Determination</b> <i>The choice of baseline will be validated with focus on whether the baseline is a likely scenario, whether the project itself is not a likely baseline scenario, and whether the baseline is complete and transparent.</i>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	/1/	DR	The application of the methodology is correct and the baseline determination is transparent		OK
B.2.2. Has the baseline been determined using conservative assumptions where possible?	/1/	DR	As the landfill operator does not have any contractual obligations to burn methane, baseline emissions are calculated using an		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			“Adjustment Factor”. The “Adjustment Factor” is estimated to be 20% of total methane produced. The “Adjustment Factor” of 20% allows for the destruction of LFG in the baseline scenario which would have occurred as a result of the continuation of the current practise of passive venting and unsystematic burning of LFG.		
B.2.3. Has the baseline been established on a project-specific basis?	/1/	DR	The baseline has been specifically designed for this project.		OK
B.2.4. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	/1/	DR	The National Waste Management Policy is under discussions and there is enough evidence to conclude that it will result only in requirements for LFG collection but no requirements for LFG destruction of more than 20% of the LFG produced.		OK
B.2.5. Is the baseline determination compatible with the available data?	/1/	DR	Yes		OK
B.2.6. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	/1/	DR	The common practice to dispose waste of large cities on Brazil is sanitary landfill. On small cities the practice is open dumping. All of these scenarios don't have any structure to collect and flare, only flare the natural emission due to safety reasons.		OK
B.2.7. Is it demonstrated/justified that the project activity itself is not a likely baseline scenario?	/1/	DR	In accordance with ACM0001, the additionality of the project is demonstrated through the Tool for the demonstration and assessment of additionality /9/, which includes the following steps: Step 0 -Preliminary screening based on the starting date of the project activity: As the		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			<p>starting date of the crediting period is after the expected date of registration of the project, this step is not applicable.</p> <p>Step 1 - Identification of alternatives to the project activity consistent with current laws and regulations: The possible baseline scenarios are: a) LFG would continue to be released to the atmosphere and only small amounts of LFG would be burned due to safety and odour reasons and b) implement the project of capture and flaring of LFG without CDM incentives. There is no legislation in Brazil obliging landfills to flare the collected gas. Both scenarios are in compliance with all applicable legal and regulatory requirements.</p> <p>Step 2 - - Investment analysis: As the CDM project activity does not generate any financial or economic benefits other than CDM related income, the simple cost analysis scenario is applied. Considering the additional costs necessary for increasing the LFG capture capacity, without having any revenues, the project is not a likely baseline scenario. Even if LFG was utilised to generate electricity, this would not significantly alleviate the economic and financial hurdles of the project.</p> <p>Step 3 - Barrier analysis: Not selected (Step 2 is selected only)</p> <p>Step 4 - Common practice analysis: DNV was able to confirm that legislation that</p>		

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			requires landfills to quantify and flare a certain amount of the gas produced is not likely to be implemented in a near future. Today 56% of waste produced in Southeast of Brazil is disposed as dump and only about 37% is destined to sanitary landfill. A major environmental problem related to domestic waste in Brazil is the lack of waste disposal to sanitary landfills. DNV was able to confirm that the investment to install systems to capture and flare methane is not common practice in Brazil. Step 5 - Impact of CDM registration: As there is no income from the project, the sale of CERs will present the only revenue for the project and will significantly alleviate the economic and financial hurdles of the project.		
B.2.8. Have the major risks to the baseline been identified?	/1/	DR	The project considers an Adjustment Factor of 20% and a collecting efficiency of 50%.		OK
B.2.9. Is all literature and sources clearly referenced?	/1/	DR	Spreadsheets for the calculation of the emission reductions of the Central de Resíduos do Recreio Landfill Gas Project evidence the calculations considering the First Order Decay Model with $L_0 = 70 \text{ m}^3 \text{ CH}_4 / \text{ton waste}$ and $k = 0.1$ from IPCC.		OK
<b>C. Duration of the Project/ Crediting Period</b> <i>It is assessed whether the temporary boundaries of the project are clearly defined.</i>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	/1/	DR	The starting date of the project activity is forecasted to be 01 January 2007. The		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			expected operational lifetime is 21 years.		
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?	/1/	DR	A renewable 7-year crediting period is selected (with the potential of being renewed twice), starting on 01 January 2007.		OK
<b>D. Monitoring Plan</b> <i>The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed ((Blue text contains requirements to be assessed for optional review of monitoring methodology prior to submission and approval by CDM EB).</i>					
<b>D.1. Monitoring Methodology</b> <i>It is assessed whether the project applies an appropriate baseline methodology.</i>					
D.1.1. Is the monitoring methodology previously approved by the CDM Executive Board?	/1/	DR	The project applies the approved baseline methodology ACM0001 - “Consolidated baseline and monitoring methodology for landfill gas project activities”.		OK
D.1.2. Is the monitoring methodology applicable for this project and is the appropriateness justified?	/1/	DR	Yes		OK
D.1.3. Does the monitoring methodology reflect good monitoring and reporting practices?	/1/	DR	The monitoring plan for emissions reductions occurring within the project boundary is based on measuring the LFG collected and flared, adjusted to STP conditions. The recording frequency of the data seems appropriate for the project.		OK
D.1.4. Is the discussion and selection of the monitoring	/1/	DR	Yes		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
methodology transparent?					
<b>D.2. Monitoring of Project Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?	/1/	DR	<p>The monitoring plan provides a detailed description on how to measure and adjust the volume of LFG collected and flared. Algorithms and formulas used have also been clearly established.</p> <p>For the calculation of project emissions due to the import of electricity used to pump the LFG, the national grid CO<sub>2</sub> coefficient is fixed ex-ante for the first 7-year crediting period and is calculated to be 0.2677 tCO<sub>2</sub>e/MWh (weighted average of the build and operating margins). The calculation of BM emission coefficient must be updated with regard to the requirements contained in the latest version of ACM0002, i.e. if 20% falls on part capacity of a plant, that plant is fully included in the calculation.</p>	CAR-1	OK
D.2.2. Are the choices of project GHG indicators reasonable?	/1/	DR	The monitoring plan indicates continuous monitoring of flare efficiency. However, in the comment it is indicated to be measured periodically. Please note that ACM0001 requires that the flare efficiency is monitored by continuously monitoring the operating hours and by quarterly (monthly if unstable) monitoring of the CH <sub>4</sub> content in the exhaust gas. The monitoring plan needs to be	CL-3	

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			corrected accordingly		
D.2.3. Will it be possible to monitor / measure the specified project GHG indicators?	/1/	DR	The CH <sub>4</sub> fraction in the landfill gas is stated to be monitored “continuously (quarterly, monthly if unstable)”. The PDD should specify whether it is monitored continuously or only periodically.	CL-4	
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	The grid electricity CO <sub>2</sub> emission factor seems to be fixed ex-ante, but the monitoring plan indicates that it is monitored “At the validation and yearly after registration”.	CL-5	
D.2.5. Will the indicators enable comparison of project data and performance over time?	/1/	DR	See D.2.1.	CAR-1	OK
<b>D.3. Monitoring of Leakage</b> <i>It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.</i>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	No potential emission sources of leakage are established by ACM0001. However, the project considers the emissions resulting from the use of energy for pumping the LFG.		OK
<b>D.4. Monitoring of Baseline Emissions</b> <i>It is established whether the monitoring plan provides for reliable and complete project emission data over time.</i>					
D.4.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining baseline emissions during the crediting period?	/1/	DR	See D.2.1.	CAR-1	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions, reasonable?	/1/	DR	See D.4.1.	<del>CL-1</del>	OK
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	See D.4.1.	<del>CL-1</del>	OK
<b>D.5. Monitoring of Sustainable Development Indicators/ Environmental Impacts</b> <i>It is checked that choices of indicators are reasonable and complete to monitor sustainable performance over time.</i>					
D.5.1. Does the monitoring plan provide the collection and archiving of relevant data concerning environmental, social and economic impacts?	/1/	DR	Neither ACM0001 nor Resolution 1 of the Brazilian DNA requires the monitoring of social or environmental indicators.		OK
<b>D.6. Project Management Planning</b> <i>It is checked that project implementation is properly prepared for and that critical arrangements are addressed.</i>					
D.6.1. Is the authority and responsibility of project management clearly described?	/1/	DR	Although the PDD mentions a team assigned to monitor emission reductions, no management structure was evidenced.	<del>CL-2</del>	OK
D.6.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	/1/	DR	See D.6.1	<del>CL-2</del>	OK
D.6.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Specialized engineers will be training the operators.		OK
D.6.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	No emergency procedures in case of unintended emissions of LFG were evidenced.	<del>CL-6</del>	OK
D.6.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	The project establishes periodical maintenance and testing of all		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			measurement equipments.		
D.6.6. Are procedures identified for maintenance of monitoring equipment and installations?	/1/	DR	See D.6.5.		OK
D.6.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Computer-based equipment generates continuous data to feed the spreadsheets used for determining emission reduction. See D.6.1	GL-2	OK
D.6.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	/1/	DR	See D.6.1.	GL-2	OK
D.6.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	See D.6.1	GL-2	OK
D.6.10. Are procedures identified for review of reported results/data?	/1/	DR	See D.6.1	GL-2	OK
D.6.11. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	/1/	DR	See D.6.1	GL-2	OK
D.6.12. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	/1/	DR	See D.6.1	GL-2	OK
D.6.13. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	/1/	DR	See D.6.1	GL-2	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
<b>E. Calculation of GHG Emissions by Source</b> <i>It is assessed whether all material GHG emission sources are addressed and how sensitivities and data uncertainties have been addressed to arrive at conservative estimates of projected emission reductions.</i>					
<b>E.1. Project GHG Emissions</b> <i>The validation of ex-ante estimated project GHG emissions focuses on transparency and completeness of calculations.</i>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	/1/	DR	The project considers the GHG emissions due to the electricity consumed to pump the LFG, as established by ACM0001.		OK
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	Yes		OK
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	/1/	DR	For the calculation of project emissions due to the import of electricity used to pump the LFG, the national grid CO <sub>2</sub> coefficient is fixed ex-ante for the first 7-year crediting period and is calculated to be 0.2677 tCO <sub>2</sub> e/MWh (weighted average of the build and operating margins). The calculation of BM emission coefficient must be updated with regard to the requirements contained in the latest version of ACM0002, i.e. if 20% falls on part capacity of a plant, that plant is fully included in the calculation.	<del>GAR-1</del>	OK
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the	/1/	DR	See E.1.3.	<del>GAR-1</del>	OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
documentation?					
E.1.5. Have all relevant greenhouse gases and source categories listed in Kyoto Protocol Annex A been evaluated?	/1/	DR	Yes.		OK
<b>E.2. Leakage</b> <i>It is assessed whether there leakage effects, i.e. change of emissions which occurs outside the project boundary and which are measurable and attributable to the project, have been properly assessed and estimated ex-ante.</i>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	/1/	DR	No potential emission sources of leakage are established by ACM0001.		OK
<b>E.3. Baseline Emissions</b> <i>The validation of ex-ante estimated baseline GHG emissions focuses on transparency and completeness of calculations.</i>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	/1/	DR	For the ex-ante estimation of emission reductions, the expected LFG generation of the landfill is determined using the IPCC first order decay model. The calculation ensures conservativeness by using an Adjustment Factor of 20% and a 50 % landfill gas collection efficiency. The assumptions used to estimate LFG generation seem appropriate and are based on the IPCC Good Practice Guidance and Brazilian conditions.		OK
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	/1/	DR	See E.3.1.		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	/1/	DR	See E.3.1.		OK
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	/1/	DR	See E.3.1.		OK
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	/1/	DR	See E.3.1.		OK
E.3.6. Have the project baseline(s) and the project emissions been determined using the same appropriate methodology and conservative assumptions?	/1/	DR	Yes.		OK
<b>E.4.Emission Reductions</b> <i>Validation of ex-ante estimated emission reductions.</i>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	/1/	DR	The forecasted amount of GHG emission reductions from the project is estimated to be 755 166 tonnes CO <sub>2</sub> equivalents (tCO <sub>2</sub> e) during the first renewable 7-year crediting period (with the potential of being renewed twice), resulting in forecasted average annual emission reductions of 107 881 tCO <sub>2</sub> e.		OK
<b>F. Environmental Impacts</b> <i>Documentation on the analysis of the environmental impacts will be assessed, and if deemed significant, an EIA should be provided to the validator.</i>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	/1/		The Central de Resíduos do Recreio landfill has been granted an Operation Environmental Licence # 2495 issued on 30 March 2004 that is valid until 14 June 2008. The license was issued after the project's		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			Environmental Impact Assessment was evaluated by the State Environmental Agency (FEPAM). The project has not yet obtained a licence for flaring landfill gas and such licence must be applied for when the project is implemented. Given that the flaring of landfill gas has little adverse environmental impacts, it is likely that the licence will be obtained when the project is implemented. At the first period verification of the project it must be confirmed that this licence was eventually obtained.		
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	/1/	DR	See F.1.1		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	See F.1.1		OK
F.1.4. Are transboundary environmental impacts considered in the analysis?	/1/	DR	See F.1.1		OK
F.1.5. Have identified environmental impacts been addressed in the project design?	/1/	DR	See F.1.1		OK
F.1.6. Does the project comply with environmental legislation in the host country?	/1/	DR	See F.1.1		OK
<b>G. Stakeholder Comments</b> <i>The validator should ensure that a stakeholder comments have been invited and that due account has been taken of any comments received.</i>					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	Local stakeholders, such as the Municipal Government, the state and municipal		OK

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Checklist Question	Ref.	MoV*	Comments	Draft Concl	Final Concl
			agencies, the Brazilian forum of NGOs, neighbouring communities and the office of the attorney general, were invited to comment on the project, in accordance with the requirements of Resolution 1 of the Brazilian DNA. Four comments were received. Copies of the letters sent to the local stakeholders were sent to DNV.		
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	See G.1.1		OK
G.1.3. If a stakeholder consultation process is required by regulations/laws in the host country, has the stakeholder consultation process been carried out in accordance with such regulations/laws?	/1/	DR	See G.1.1		OK
G.1.4. Is a summary of the stakeholder comments received provided?	/1/	DR	See G.1.1		OK
G.1.5. Has due account been taken of any stakeholder comments received?	/1/	DR	The comments received were adequately addressed by the project participant.		OK

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**Table 3 Resolution of Corrective Action and Clarification Requests**

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
<b>CAR 1</b> The calculation of BM emission coefficient must be updated with regard to the requirements contained in the latest version of ACM0002, i.e. if 20% falls on part capacity of a plant, that plant is fully included in the calculation.	D.2.1 to D.2.5 D.4.1 to D.4.3 E.1.3 E.1.4	The PDD was updated, with the new emission factor ( $EF = 0.2636 \text{ tCO}_2/\text{MWh}$ ).	The revised PDD, dated 29 June 2006, applies the combined emission factor determined in accordance with the most recent version of ACM0001. This CAR is therefore closed.
<b>CL 1</b> The “Central de Resíduos do Recreio Landfill Gas Project (CRRLGP)” is located at the municipality of Minas do Leão, Rio Grande do Sul State. However, the precise location of the project is not clearly identified in the PDD.	A.1.1	The PDD was updated on page 4.	Complementary information included in the revised PDD, dated 29 June 2006, clearly identifies the location of the project. This CL is therefore closed.
<b>CL 2</b> Although the PDD mentions a team assigned to monitor emission reductions, no management structure was evidenced.	D.6.1 D.6.2 D.6.7 to D.6.13	As the project is not implemented, no responsibility was evidenced. By the time of the project's implementation, a team and its responsibilities will be assigned.	The provided response is satisfactory. The management system should be assessed during the initial verification. This CL is therefore closed
<b>CL 3</b> The monitoring plan indicates continuous monitoring of flare efficiency. However, in the comment it is indicated to be measured periodically. Please note that ACM0001 requires that the flare efficiency is monitored by continuously monitoring the operating hours and by quarterly (monthly if unstable) monitoring of the CH <sub>4</sub> content in the exhaust gas. The monitoring plan needs to be	D.2.2	The Monitoring Plan and the Table D.2.2.1 (page 15) were updated.	The revised PDD, dated 29 June 2006, define the monitoring plan in accordance with the most recent version of ACM0001. This CL is therefore closed

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants' response	Final conclusion
corrected accordingly			
CL 4 The CH <sub>4</sub> fraction in the landfill gas is stated to be monitored “continuously (quarterly, monthly if unstable)”. The PDD should specify whether it is monitored continuously or only periodically.	D.2.3	The methane content on LFG is measured continuously, in the flare's entrance. The Table D.2.2.1, on page 15 was updated.	The revised PDD, dated 29 June 2006, defined the monitoring plan in accordance with the most recent version of ACM0001.  This CL is therefore closed
CL 5 The grid electricity CO <sub>2</sub> emission factor seems to be fixed ex-ante, but the monitoring plan indicates that it is monitored “At the validation and yearly after registration”.	D.2.4	The Table D.2.2.1, on page 15 was updated.	The revised PDD, dated 29 June 2006, established an CO <sub>2</sub> emission factor at the validation and baseline renewal  This CL is therefore closed
CL 6 No emergency procedures in case of unintended emissions of LFG were evidenced.	D.6.4	As the project is not implemented, no emergency procedures were evidenced. By the time of the project's implementation, all emergency procedures will be developed.	The provided response is satisfactory. The management system should be assessed during the initial verification.  This CL is therefore closed

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