



Industrie Service

# Validation Report

**Corporación Andina de Fomento**

VALIDATION OF THE CDM-PROJECT:  
VINASSE ANAEROBIC TREATMENT PROJECT  
- COMPAÑÍA LICORERA DE NICARAGUA, S. A.  
(CLNSA)  
IN CHICHIGALPA, NICARAGUA

REPORT NO. 477279

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TÜV SÜD Industrie Service GmbH  
Carbon Management Service  
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<b>Executing Operational Unit:</b>		TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 - 80686 Munich Federal Republic of Germany		
<b>Client:</b>		Corporación Andina de Fomento (CAF) Torre CAF, Avenida Luis Roche, Altamira, Caracas, Venezuela		
<b>Contract approved by:</b>		Michael Rumberg		
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<b>Summary:</b>  The Certification Body "Climate and Energy" of TÜV SÜD Industrie Service GmbH has been ordered by CAF to perform a validation of the above mentioned project.  Using a risk based approach; the validation of this project has been performed by document reviews and on-site inspections, audits at the locations of the project and interviews at the offices of the project developer and the project owner.  In summary, it is TÜV SÜD's opinion that the project "Vinasse Anaerobic Treatment Project - Compañía Licorera de Nicaragua, S. A. (CLNSA)", as described in the revised project design document dated September 14, 2006 meets all relevant UNFCCC requirements for the CDM, set by the Kyoto Protocol, the Marrakech Accords and relevant guidance by the CDM Executive Board and that the project furthermore meets all relevant host country criteria and correctly applies the baseline and monitoring methodology AM0013, vers. 3.  Hence, TÜV SÜD will recommend this project for registration as CDM project activity by the CDM Executive Board.  Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 1,198,466 tons CO <sub>2e</sub> over a crediting period of ten years, resulting in a calculated annual average of 119,847 tons CO <sub>2e</sub> , represents a realistic estimation using the assumptions given by the project documents.				
Work carried out by:	Werner Betzenbichler (project manager)  Mauro Fadda (ghg lead auditor)		Internal Quality Control by:  Javier Castro	

## Abbreviations

<b>CAF</b>	Corporación Andina de Fomento
<b>CAR</b>	Corrective Action Request
<b>CDM</b>	Clean Development Mechanism
<b>CER</b>	Certified Emission Reduction
<b>CLNSA</b>	COMPAÑÍA LICORERA DE NICARAGUA S. A.
<b>CR</b>	Clarification Request
<b>DNA</b>	Designated National Authority
<b>DOE</b>	Designated Operational Entity
<b>EB</b>	Executive Board
<b>EIA / EA</b>	Environmental Impact Assessment / Environmental Assessment
<b>ER</b>	Emission reduction
<b>GHG</b>	Greenhouse gas(es)
<b>KP</b>	Kyoto Protocol
<b>MP</b>	Monitoring Plan
<b>NGO</b>	Non Governmental Organisation
<b>PDD</b>	Project Design Document
<b>TÜV SÜD</b>	TÜV SÜD Industrie Service GmbH
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change
<b>VVM</b>	Validation and Verification Manual

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## 1 INTRODUCTION

### 1.1 Objective

Corporación Andina de Fomento (CAF) has commissioned the Certification Body “Climate and Energy” of TÜV SÜD Industrie Service GmbH (TÜV SÜD) to validate the prospective CDM Project: Vinasse Anaerobic Treatment Project - Compañía Licorera de Nicaragua, S. A. (CLNSA). The validation serves as design verification and is a requirement of all CDM projects. 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 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).

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

### 1.2 Scope

The validation scope 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. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual 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.

After approval of AM0013 which is based on a new methodology (NM0085) that has been submitted in the context of this specific project activity, TÜV SÜD has been provided with a first PDD version in September 2005. Based on this documentation a document review and a fact finding mission in form of an on-site audit has taken place. This PDD version was made publicly available by the DOE as required by the Marrakech Accords. In September 2006 a revised final PDD has been submitted in which all open issues and clarification requests as documented by this report have been resolved. It serves as the basis for the final evaluation presented herewith.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the validation team has to cover at least the following aspects:

- Ø Knowledge of Kyoto Protocol and the Marrakech Accords
- Ø Environmental and Social Impact Assessment
- Ø Skills in environmental auditing (ISO 14000, EMAS)
- Ø Quality assurance
- Ø Wastewater treatment in the sugar/alcohol industry
- Ø Business environment in the sugar/alcohol industry
- Ø Energy generation
- Ø Monitoring concepts

Ø Political, economical and technical conditions in host country

According to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body “climate and energy”:

The validation team was consisting of the following two experts:

Werner Betzenbichler (project manager, GHG lead auditor) TÜV SÜD

Mauro Fadda (GHG lead auditor) TÜV SÜD

**Werner Betzenbichler** is head of the department Carbon Management Service of TÜV SÜD and head of the “Certification Body for Climate and Energy” and expert for conventional energy generation, renewable energy, energy expansion planning and familiar with the recent version of CDM and JI criteria as necessary for the implementation of Art. 6 and Art. 12 of the KP. Since 2000 he has been working in the international climate change and emission trading business as a verifier.

**Mauro Fadda** is heading the department “Environmental Services” of ccaQualitas in Santiago de Chile, a local company being member of the TÜV SÜD Group. Having an academic education as bio-chemist is well familiar with the assessment of anaerobic and aerobic treatment of effluents. He has received extensive training in the CDM validation and verification process, is an appointed lead auditor for CDM projects and participated already in numerous CDM project assessments all over South and Central America.

The audit team covers the above mentioned requirements as follows:

- § Knowledge of Kyoto Protocol and the Marrakech Accords (Betzenbichler, Fadda)
- § Environmental and Social Impact Assessment (Betzenbichler, Fadda)
- § Skills in environmental auditing (Betzenbichler, Fadda)
- § Waste management (Betzenbichler, Fadda)
- § Energy generation (Betzenbichler, Fadda)
- § Quality assurance (Betzenbichler, Fadda)
- § Technical aspects (Betzenbichler, Fadda)
- § Monitoring concepts (Betzenbichler, Fadda)
- § Political, economical and technical conditions in the region (Fadda)

In order to have an internal quality control of the project, a team of the following persons has been composed by the certification body “climate and energy”:

- § Javier Castro (deputy head of certification body “climate and energy”)

### 1.3 GHG Project Description

The project consists of the installation of biodigesting technology in the effluent stream of the alcohol production plant of CLNSA in Chichigalpa, Nicaragua. Methane that would have been otherwise emitted by the use of an open lagoon will be created in biodigesters and will be used for heat and electricity generation. The remaining effluents are used for irrigation and fertilization.

The project started operation in June 2003. It is qualified for retroactive registration.

## 2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual (for further information see [www.vvmanual.info](http://www.vvmanual.info)), an initiative of all Applicant Entities, which aims to harmonize the approach and quality of all such assessments.

In order to ensure transparency, a validation protocol was customised for the project, according to the Validation and Verification Manual. 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 is enclosed in Annex 1 to this report.

**Figure 1 Validation Protocol Tables**

<b>Validation Protocol Table 1: Mandatory Requirements</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 (OK), or a <b>Corrective Action Request (CAR)</b> of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.</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 subdivided. 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). <b>Clarification</b> is used when the validation team has identified a need for further clarification.</i>

<b>Validation Protocol Table 3: Resolution of Corrective Action and Clarification Requests</b>			
<b>Draft report clarifications and corrective action requests</b>	<b>Ref. to checklist question in table 2</b>	<b>Summary of project owner response</b>	<b>Validation 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 Client or other 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>

## 2.1 Review of Documents

The project design document submitted by the Client and additional background documents related to the project design and baseline were reviewed. A complete list of all documents reviewed is attached as annex 2 to this report.

## 2.2 Follow-up Interviews

In the period of Oct 17 to 19, 2005 TÜV SÜD performed interviews on-site with project stakeholders to confirm selected information and to resolve issues identified in the first document review. The main topics of the interviews are summarised in Table 1.



**Table 1 Interview topics**

Interviewed organization	Interview topics
CLNSA	<ul style="list-style-type: none"> <li>§ Project implementation</li> <li>§ Baseline determination</li> <li>§ Additionality</li> <li>§ Monitoring plan</li> <li>§ Environmental licensing</li> <li>§ Stakeholder process</li> <li>§ Maintenance</li> <li>§ Environmental legislation</li> <li>§ Environmental impacts</li> <li>§ Stakeholder process</li> <li>§ Approval by the host country</li> </ul>
CAF	<ul style="list-style-type: none"> <li>§ Project design document</li> <li>§ Baseline determination</li> <li>§ Additionality</li> <li>§ Crediting period</li> <li>§ Annex-I-country approval</li> </ul>
Econergy	<ul style="list-style-type: none"> <li>§ Project design document</li> <li>§ Baseline determination</li> <li>§ Additionality</li> <li>§ Monitoring Plan</li> </ul>
Mayor of Chichigalpa	<ul style="list-style-type: none"> <li>§ Environmental impacts</li> <li>§ Stakeholder process</li> </ul>

## 2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation was to resolve the requests for corrective actions and clarification and any other outstanding issues which needed to be clarified for TÜV SÜD's positive conclusion on the project design. The Corrective Action Requests and Clarification Requests raised by TÜV SÜD were resolved during communication between the client and TÜV SÜD. To guarantee the transparency of the validation process, the concerns raised and responses that have been given are summarised in chapter 3 below and documented in more detail in the validation protocol in annex 1.

### 3 VALIDATION FINDINGS

In the following sections the findings of the validation are stated. The validation findings for each validation subject are presented as follows:

- 1) The findings from the desk review of the final project design document and the findings from interviews during the follow up visit are summarised. A more detailed record of these findings can be found in the Validation Protocol in annex 1.
- 2) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification or Corrective Action Request, respectively, have been issued. The Clarification and Corrective Action Requests are stated, where applicable, in the following sections and are further documented in the Validation Protocol in annex 1. The validation of the project resulted in eight Corrective Action Requests and eight Clarification Requests.
- 3) Where Clarification or Corrective Action Requests have been issued, the exchanges between the Client and TÜV SÜD to resolve these Clarification or Corrective Action Requests are summarised.
- 4) The final conclusions for validation subject are presented.

The validation findings relate to the project design as documented and described in the final project design documentation dated 2006-09-14.

### 3.1 Project Design

#### 3.1.1 Discussion

The submitted project design document applies the version 2 of the PDD template as provided by the EB, which is still valid. A revision number and the date of the revision have not been indicated by the first PDD version.

The form required for the indication of project participants is not correctly applied as it indicates CAF and CLNSA as Parties of the KP and the Government of Nicaragua as project participant.

The technical design is based on advanced biodigesting technology. The PDD delivers in principle a complete and transparent overview of the project activity. All information on technical details has been verified and is in principal in compliance with the actual situation. But information on technologies shows discrepancies. In contrary to the information in the first PDD version only one distillation tower exists on-site while the second one has been removed. The statement that the effluent will not be sent any longer to the lagoon is not correct as some share is stored there before used for ferti-irrigation. The description does not provide a transparent view of the treatment of effluents when leaving the biodigesters.

Regarding the employed technology, there is no technical requirement avoiding the continuation of the recent operation conditions. Furthermore, there are no significant indications that the technology used to implement the project could be substituted during the envisaged operational lifetime of the project activity (21 years) and in particular during the first crediting period.

The project is in line with relevant legislation of Nicaragua. The funding for the project does not lead to a diversion of official development assistance as according to the information obtained by the audit team ODA does not contribute to the financing of the project.

In Nicaragua and neighboring countries the use of biodigesters in the sugar and/or alcohol industry is neither common practice nor regulated. CLNSA complies with local environmental regulations in the baseline scenario and had no obligation that avoided the continuation of the status quo.

The applied methodology AM0013 is deemed being the most fitting one for this specific project.

The fixed crediting period covers the period 03 Jun 2003 – 02 Jun 2013. The operational lifetime of the project is indicated as 21 years, which can be confirmed as a reasonable estimation.

### **3.1.2 Findings**

#### Corrective Action Request 1:

The version number and a date of the issuance of this version should be indicated by a revised PDD.

#### Response:

A revised PDD has been submitted, responding to the request.

#### Corrective Action Request 2:

Correct information on the equipment on site and the flows of effluents should be given by a revised PDD version.

#### Response:

A revised PDD has been submitted, responding to the request

#### Corrective Action Request 3:

The form indicating project participants has to be correctly applied by a revised PDD version

#### Response:

A revised PDD has been submitted, responding to the request

#### Corrective Action Request 4:

The PDD refers scope 1 (ACM0002) and scope 4, while AM0013 is linked to scope 13 (waste handling and disposal). The correct category has to be given by a revised PDD.

#### Response:

The revised PDD has changed the information on the category accordingly.

#### Clarification Request 1:

Information on the emission reduction aspects of laminar irrigation, ferti-irrigation and intermediate storage of effluents should be provided.

#### Response:

A graph and an additional description have been inserted to the revised PDD providing details on this issue.

### 3.1.3 Conclusion

The requests indicated above are considered as being resolved. The project is in compliance with the requirements.

## 3.2 Baseline and Additionality

### 3.2.1 Discussion

Although AM0013 is based on the input from this specific project the applicability of the methodology could be proofed as AM0013, vers. 1 required a retention time of the sludge in the baseline scenario being more than 1 year. As no further specification has been given on the definition of sludge the dimensions of the baseline lagoon and the effluent flow did not proof the applicability of the project. Hence a request for clarification on an approved methodology has been submitted to the meth panel in December 2005.

The required response to the clarification request sent to the UNFCCC secretariat became obsolete with the publication of AM0013, vers.3. This version changed the problematic applicability criterion. The fulfillment of all applicability criteria is demonstrated by the revised PDD.

The applicability criteria as provided by AM0013, vers. 3 are fulfilled:

- the depth of the lagoon is more than 1 meter
- the temperature is always higher than 10°C
- the residence time of the sludge in the baseline is more than 30 days
- sludge produced during the project activity is used directly for irrigation/fertilization

The baseline is established in a project specific manner. A stepwise approach as given by the methodology is applied for identifying the baseline scenario. The "Pollotech-Study" also indicates further two scenarios named:

- - spray irrigation
- - aerobic biological treatment

as potential scenarios under comparable industrial conditions. These two scenarios have not been considered in the baseline discussion of the first PDD version.

It is demonstrated and evidenced by underlying information that the continuation of the current situation, i.e. the methanisation of untreated effluents in an open lagoon, represents the baseline. By using the tools for demonstrating the additionality it is shown that CDM delivered a decisive incentive for implementing the project.

The baseline determination is compatible with information available on site in particular concerning

- Existing installations
- Legal requirements
- Compliance to legal requirements
- Energy generation in Nicaragua

All baseline parameter that have to be determined ex-ante are presented by the document and have been verified in the course of this validation process. Annex 3 (of the first PDD version) provides sources and approaches how baseline data has been determined. It only focuses on data relevant due to AM0013, while information on data for electricity generation (ACM0002) is not referenced.

The project boundaries for the several paths of emission reductions are clearly defined. Formulae for the calculation of baseline and project emissions are delivered in chapter E. Although this is not the standard approach this is deemed to be acceptable as all information required is presented transparently.

### **3.2.2 Findings**

#### Clarification Request 2:

It has to be clarified by the meth panel whether the project meets the applicability criteria, which are deemed to be interpretable.

#### Response:

See discussion above.

#### Corrective Action Request 6:

Both (Pollutech) scenarios should be included as potential baseline options within the baseline discussion.

#### Response:

A revised PDD has been submitted, responding to the request.

#### Clarification Request 3:

It would be preferred due to the complexity of the project activity to receive flow chart covering all vinasse effluent treatment activities and activities by the use of bio-methane

#### Response:

Such a flow chart has been inserted into the revised PDD

#### Corrective Action Request 7:

It is necessary also to discuss the grid electric emission factor within annex 3.

#### Response:

A revised PDD has been submitted, responding to the request.

### **3.2.3 Conclusion**

All issues resulting in CARs or CRs are considered being resolved. The projects baseline and additionality are in line with the requirements.

### 3.3 Monitoring Plan

#### 3.3.1 Discussion

The project applies monitoring methodologies AM0013 in conjunction with ACM0002.

The choice of parameter is following the approved methodology. Monitoring technology for these parameters is available on the market. In principle the provided monitoring approach is consistent. As a cogeneration unit will be in use the aspects of heat and electricity generation can be covered by metering less parameter. The project participants operate a computerized system (SCADA) where all data to be monitored will be integrated. The responsibilities are clearly described and allocated in advance, as the project is already operational due to its retroactive character.

With regard to version 1 of the PDD the intended procedures on quality assurances and quality control are not considered to be complete and sufficient. As requested by the EB guidance more details on quality assurance and data uncertainty have to be specified. It has not been possible to assess the inherent overall uncertainty belonging to the foreseen approach because of a lack of information in the first PDD version. The monitoring approach as seen on-site is in line with current good practice.

For determining project and baseline emissions more details are required on type of equipment, data recording and data reduction processes (e.g. creation of averages). QA/QC procedures are not yet sufficiently described, only the need of the performance of such measures is indicated without providing more details (e.g. use of external calibration services etc.)

The provided monitoring procedures do not ensure the verifiability of metered data as it will not be possible to check whenever necessary routines (e.g. calibration, function tests) have to be performed.

#### 3.3.2 Findings

##### Clarification Request 4:

For determining project emissions it is necessary to provide more details on

- type of metering equipment
- calibration procedures

##### Response:

The required information has been inserted to the column "comment" in the relevant tables of chapter D.

##### Clarification Request 5:

For determining baseline emissions it is necessary to provide more details on

- type of metering equipment
- data recording and processing procedures
- calibration procedures

##### Response:

The required information has been inserted to the column "comment" in the relevant tables of chapter D.

Clarification Request 6:

More information on the envisioned quality control procedures is required. It is not sufficient simply to refer to the existing ISO14000 system of the plant operator

Response:

Details of the monitoring plan have been provided as revised annex 4 of the PDD.

Clarification Request 7:

It is not yet clarified which kind of standards will be used.

Response:

The revised PDD refers to ISO standards.

Corrective Action Request 8:

The Monitoring Plan as provided by annex 4 should be updated due to the guidance given by EB and the project-specific requirements as already discussed by this validation protocol.

Response:

Details of the monitoring plan have been provided as revised annex 4 of the PDD.

### **3.3.3 Conclusion**

The revised PDD provides all data requested. It delivers a comprehensive insight to the envisioned monitoring system. By resolving the underlying CARs and CRs also qualitative information on the accuracy of all key parameter has been provided. The revised monitoring plan also provides all procedures requested. The envisioned quality assurance system for all parameter is deemed to be sufficient.

The project is in line with the requirements.

## **3.4 Calculation of GHG Emissions**

### **3.4.1 Discussion**

The calculations have been provided by Excel-files in a transparent manner. The estimation is based on the same procedures as ongoing monitoring due to the retroactive character of this project. Uncertainties are addressed by the conservative factors provided by the methodology itself.

The project will result in emission reductions.

There will be a phased implementation of the project activity which is reflected by the estimation provided by the original PDD.

The form for indicating project emission reductions is not correctly applied. It does not provide figures for the year 2003 and does not correctly reflect the fact that 2013 will only include six months. Furthermore the estimations and predominately base on IPCC default values while real on-site data is already available.

### **3.4.2 Findings**

#### Corrective Action Request 5:

The table on estimated emission reduction has to be corrected reflecting correctly the estimations for the years 2003 and 2013.

#### Response:

A revised table is clearly indicating the projections for the years 2003 and 2013.

### **3.4.3 Conclusion**

The project will result in a reduction of GHGs. The calculated estimation of prospective emission reductions, the indicated amount of emission stated with 1,198,466 tons CO<sub>2e</sub> over a crediting period of ten years, i.e. 119,847 tons CO<sub>2e</sub> annually, is deemed to be a realistic estimation.

The project complies with the requirements.

## **3.5 Environmental Impacts**

### **3.5.1 Discussion**

An EIA has been performed as required by the national legislation. The PDD includes a correct summary. The original document has been submitted to the validation team. An environmental license has been provided.

The EIA does conclude in limited impacts relevant in a short distance (noise, temperature) that may result in measures concerning the work environment.

Transboundary impacts are not discussed but also not to be expected.

### **3.5.2 Findings**

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### **3.5.3 Conclusion**

The project is in line with national and regional laws. The project fulfils the requirements of the UNFCCC.



### **3.6 Comments by Local Stakeholders**

#### **3.6.1 Discussion**

A local stakeholder meeting is presented by the PDD, but during the on-site audit it has been mentioned that two further meetings took place required by the Nicaraguan DNA, which were not reflected by the first PDD version.

Appropriate media has been used for inviting potential stakeholders.

A summary of comments is included in the PDD. No further action has been required.

#### **3.6.2 Findings**

##### Clarification Request 8:

Please clarify why information on the two further meeting is not included in the PDD.

##### Response:

Information on the two further stakeholder meetings is provided by the revised PDD.

#### **3.6.3 Conclusion**

The project is in compliance with the CDM requirements.

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

TÜV SÜD published the project documents on UNFCCC website and on its own website by installing a link to

[http://www.netinform.net/KE/Wegweiser/Guide2.aspx?ID=1283&Ebene1\\_ID=26&Ebene2\\_ID=313&mode=1](http://www.netinform.net/KE/Wegweiser/Guide2.aspx?ID=1283&Ebene1_ID=26&Ebene2_ID=313&mode=1)

during the period September 30, 2005 to October 29, 2005.

No comments were received.

## 5 VALIDATION OPINION

TÜV SÜD has performed a validation of the project: Vinasse Anaerobic Treatment Project - Compañía Licorera de Nicaragua, S. A. (CLNSA), on the basis of UNFCCC criteria and host country criteria, 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 subsequent decisions by the CDM Executive Board.

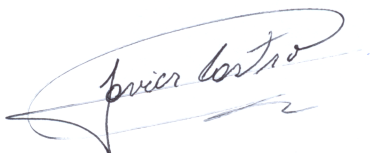
The review of the project design documentation and the subsequent follow-up interviews have provided TÜV SÜD with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant UNFCCC requirements for the CDM. Hence TÜV SÜD will recommend the project for registration by the CDM Executive Board.

The project will reduce methane emission from an open lagoon and CO<sub>2</sub> emission from fossil fuel consumption for generation heat at the project's site and electricity for the Nicaraguan grid by applying biodigesting technology in the effluent stream of an alcohol production plant. An analysis as provided by the applied methodology demonstrates that the proposed project activity is not a likely baseline scenario. Emission reductions attributable to the project are hence additional to any that would occur in the absence of the project activity. Given that the project is operated as designed, the project is likely to achieve the estimated amount of emission reductions.

Additionally the assessment team reviewed the estimation of the projected emission reductions. We can confirm that the indicated amount of emission reductions of 1,198,466 tons CO<sub>2e</sub> over a crediting period of ten years, resulting in a calculated annual average of 119,847 tons CO<sub>2e</sub>, represents a realistic estimation using the assumptions given by the project documents.

The validation is based on the information made available to us and the engagement conditions detailed in this report. The validation has been performed using a risk based approach as described above. The only purpose of this report is its use during the registration process as part of the CDM project cycle. Hence, TÜV SÜD can not be held liable by any party for decisions made or not made based on the validation opinion, which will go beyond that purpose.

Munich, 2006-09-27



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Javier Castro  
Certification Body "Climate and Energy"  
TÜV SÜD Industrie Service GmbH

Munich, 2006-09-26



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Werner Betzenbichler  
Project Manager

Validation of the CDM Project:  
Vinasse Anaerobic Treatment Project  
- Compañía Licorera de Nicaragua, S. A. (CLNSA)



Industrie Service

## **Appendix A: Validation Protocol**



**Table 1 Project's Environment**

REQUIREMENT	REFERENCE	Comment	CONCLUSION
1. The host country shall be a Party to the Kyoto Protocol	Marrakech Accords, CDM Modalities §30	Yes, Nicaragua has ratified the Kyoto Protocol on 18 Nov 1999	p
2. Parties participating in the CDM shall designate a national authority for the CDM	Marrakech Accords, CDM Modalities §29	Nicaragua and The Netherlands have designated each a DNA and published the related information on the CDM webpage of UNFCCC.	p
3. 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, Marrakech Accords, CDM Modalities §40a	A LoA provided by the DNA of the host country is available.	p
4. The project shall have the written approval of voluntary participation from the designated national authorities of each party involved.	Kyoto Protocol Art. 12.5a, Marrakech Accords, CDM Modalities §40a	Letters of approval by both DNAs are available.	p
5. The project shall assist Parties included in Annex I in achieving compliance with part of their emission reduction commitment under Art. 3. A letter of approval for participants originating from Annex-I-Countries should be available.	Kyoto Protocol Art.12.2	LoA from The Netherlands is available.	p
6. Parties, stakeholders and UNFCCC accredited NGOs shall have been invited to comment on the validation re-	Marrakech Accords, CDM Modalities, §40	Global stakeholders have been invited by installing a link to	p



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REQUIREMENT	REFERENCE	Comment	CONCLUSION
quirements for minimum 30 days, and the project design document and comments have been made publicly available		<a href="http://www.netinform.net/KE/Wegweiser/Guide2.aspx?ID=1283&amp;Ebene1_ID=26&amp;Ebene2_ID=313&amp;mode=1">http://www.netinform.net/KE/Wegweiser/Guide2.aspx?ID=1283&amp;Ebene1_ID=26&amp;Ebene2_ID=313&amp;mode=1</a> publicly available on the CDM webpage of UNFCCC during the period September 30, 2005 to October 29, 2005. No comments have been received	
7. The project design document shall be in conformance with the UNFCCC CDM-PDD format	Marrakech Accords, CDM Modalities, Appendix B, EB Decisions	The document is in line with version 2 of the CDM-PDD format, which is still valid.	p
8. The project participants shall submit a letter on the modalities of communication (MoC) before submitting a request for registration	EB-09 F_CDM_REG form	A letter on the modalities of communication signed by the project participants has been submitted.	p

Table 2 PDD

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>A. General Description of Project Activity</b>					
<b>A. 1. Project Title</b>					
A.1.1. Does the used project title clearly enable to identify the unique CDM activity?	4, 5	DR	The project's title enables a clear identification of the CDM activity	p	p
A.1.2. Are there an indication of a revision number and the date of the revision?	4, 5	DR	A revision number and the date of the revision have not been indicated by the first PDD version.  <u>Corrective Action Request 1:</u> The version number and a date of the issuance of this version should be indicated by a revised PDD.	CAR 1	p
A.1.3. Is this in consistency with the time line of the project's history?	4, 5	DR	There are no inconsistencies in the time line of the project's history. Project schedules have been presented and assessed. The project qualifies for retroactive registration, hence all phase of implementation are either already performed or in an advanced status.	p	p
<b>A.2. Description of the project activity</b>					
A.2.1. Is the description delivering a transparent overview of the project activities?	4, 5	DR	The description in section A.2 delivers a transparent overview on the project activity	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			and describes the different types of technologies and measures to be implemented in several phases.		
A.2.2. Is all information provided in compliance with actual situation or planning?	4, 5 1	DR I	<p>The provided information on the time line is mainly in compliance with the recent situation. But information on technologies shows discrepancies. In contrary to the information in the first PDD version only one distillation tower exists on-site while the second one has been removed. The statement that the effluent will not be sent any longer to the lagoon is not correct as some share is stored there before used for ferti-irrigation.</p> <p><u>Corrective Action Request 2:</u></p> <p>Correct information on the equipment on site and the flows of effluents should be given by a revised PDD version.</p>	<b>CAR 2</b>	p
A.2.3. Are proofs available evidencing all information with relevance for the validity, for the determination of baseline and project emissions and for emission projections?	4, 5 1	DR I	Proofs for data provided with the description of the project activity (chapter A.2) are available.	p	p
A.2.4. Is all information provided in consistency with details provided by further chapters of the PDD?	4, 5 1	DR I	The figures mentioned correspond to the indications given at other passages of the PDD and the data used for estimating the emission reductions.	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>A.3. Project Participants</b>					
A.3.1. Is the form required for the indication of project participants correctly applied?	4, 5	DR	The form required for the indication of project participants is not correctly applied as it indicates CAF and CLN as Parties of the KP and the Government of Nicaragua as project participant.  <u>Corrective Action Request 3:</u> The form indicating project participants has to be correctly applied by a revised PDD version.	<b>CAR 3</b>	p
A.3.2. Is the voluntary participation of all listed entities or Parties confirmed by each of them?	1	I	The voluntary participation can be confirmed.	p	p
A.3.3. Is all information provided in consistency with details provided by further chapters of the PDD (in particular annex 1)?	4, 5	DR	Annex 1 details the information of the listed project participants.	p	p
<b>A.4. Technical description of the project activity</b>					
A.4.1. Does the information provided on the location of the project activity allow for a clear identification of the site(s)?	4, 5	DR	The information provided enables a unique identification of the site.	p	p
A.4.2. Do the project participants possess ownership or licenses which will allow the implementation of the project at that site / those sites?	4, 5 1	DR I	The local project participant is owner of the industrial site.	p	p
A.4.3. Is the category(ies) of the project activity correctly identified?	4, 5	DR	The PDD refers scope 1 (ACM0002) and scope 4, while AM0013 is linked to scope 13 (waste management and disposal).  <u>Corrective Action Request 4:</u>	<b>CAR 4</b>	p





CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			The correct category has to be given by a revised PDD.		
A.4.4. Does the project design engineering reflect current good practices?	4, 5 1	DR I	The project design reflects current good practice implementing a greenhouse gas abatement technology which is already installed in several annex-I-countries, but not yet common practice in developing countries.	p	p
A.4.5. Does the description of the technology to be applied provide sufficient and transparent input to evaluate its impact on the greenhouse gas balance?	4, 5 1	DR I	<p>The description of the technology allows a rough overview on the abatement technology including information on the several emission reduction paths like methane avoidance and substitution of fossil fuel and energy generation by a renewable source. Nonetheless the description does not provide a transparent view of the treatment of effluents when leaving the biodigesters. (see also CAR 2)</p> <p><u>Clarification Request 1:</u></p> <p>Information on the emission reduction aspects of laminar irrigation, ferti-irrigation and intermediate storage of effluents should be provided.</p>	CR 1	p
A.4.6. Is the brief explanation how the project will reduce greenhouse gas emission transparent and suitable?	4, 5	DR	An appropriate explanation is provided by the PDD.	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
A.4.7. Is all information provided in compliance with actual situation or planning as available by the project participants?	4, 5 1	DR I	See CAR 2 and CR1	See CAR2 CR1	p
A.4.8. 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?	4, 5 1	DR I	The project uses a greenhouse gas abatement technology which is already installed in many annex-I-countries, but not yet common practice in developing countries.	p	p
A.4.9. Is the project technology likely to be substituted by other or more efficient technologies within the project period?	4, 5 1	DR I	No, a replacement during the project period is not reasonably.	p	p
A.4.10. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period?	4, 5 1	DR I	On the facility level responsible persons like engineers, technicians etc. received an initial training. Due to the retroactive aspect it is obviously that the project is meanwhile operational since several years.	p	p
A.4.11. Does the project make provisions for meeting training and maintenance needs?	4, 5 1	DR I	The needs of maintenance will be covered by the local project participant.	p	p
A.4.12. Is a schedule available on the implementation of the project and are there any risks for delays?	4, 5 1	DR I	Not relevant due to the retroactive registration.	p	p
A.4.13. Is the form required for the indication of projected emission reductions correctly applied?	4, 5 1 15, 16 17	DR	The form for indicating project emission reductions is not correctly applied. It does not provide figures for the year 2003 and does not correctly reflect the fact that 2013 will only include six months. Furthermore the estimations and predominately base on IPCC default values while real on-site data is already available.	<b>CAR 5</b>	p

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<u>Corrective Action Request 5:</u> The table on estimated emission reduction has to be corrected accordingly.		
<b>A.5. Public Funding</b>					
A.5.1. Is all information on public funding provided in compliance with actual situation or planning as available by the project participants?	4, 5 1	DR I	The PDD states that no public funding has been used in the context of this project. Negotiations with the Dutch government in the context of the CERUPT programme already at an early stage are mentioned	p	p
A.5.2. Is all information provided in consistency with details provided by further chapters of the PDD (in particular annex 2)?	4, 5 1	DR I	OK	p	p
<b>B. Baseline Methodology</b>					
<b>B.1. Choice and Applicability</b>					
B.1.1. Is the baseline methodology previously approved by the CDM Methodology Panel?	2, 3 6	DR	The project applies AM0013, which has been approved reflecting NM0085, a new methodology that has been submitted in conjunction with this specific project. Hence this project will qualify for retroactive registration in case it will be registered before December 31, 2006.	p	p
B.1.2. Is the choice of the methodology correctly justified by the PDD?	4, 5	DR	See above	p	p
B.1.3. Is the baseline methodology the one deemed most applicable for this project?	3, 4, 5, 6	DR	See above	p	p

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B.1.4. Is the project in conformance with all applicability criteria of the applied methodology?	3, 4, 5 1	DR I	<p>Although AM0013 is based on the input from this specific project the applicability of the methodology could be proofed as AM0013, vers. 1 required a retention time of the sludge in the baseline scenario being more than 1 year. As no further specification has been given on the definition of sludge the dimensions of the baseline lagoon and the effluent flow did not proof the applicability of the project. Hence a request for clarification on an approved methodology has been submitted to the meth panel.</p> <p><u>Clarification Request 2:</u></p> <p>It has to be clarified by the meth panel whether the project meets the applicability criteria, which are deemed to be interpretable.</p>	CR 2	p
<b>B.2. Application of the Baseline Methodology / Identification of the Baseline Scenario</b>					
B.2.1. Is the application of the methodology and the discussion and determination of the chosen baseline transparent?	4, 5 1	DR I	The discussion is done in a transparent manner.	p	p
B.2.2. Does the application consider all potential baseline scenarios in the discussion?	4, 5 1, 9	DR I	<p>The "Pollotech-Study" also indicates further two scenarios named:</p> <ul style="list-style-type: none"> <li>- spray irrigation</li> <li>- aerobic biological treatment</li> </ul> <p>as potential scenarios under comparable industrial conditions. These two scenarios are not yet considered in the baseline discus-</p>	CAR 6	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>sion.</p> <p><u>Corrective Action Request 6:</u></p> <p>Both scenarios should be included as potential baseline options within the baseline discussion.</p>		
B.2.3. Is conservativeness addressed in the way of identifying the baseline?	4, 5 1	DR I	Yes	p	p
B.2.4. Has the baseline been established on a project-specific basis?	4, 5 1	DR I	<p>The baseline is established in a project specific manner. It can be confirmed that there are no reasons which would contradict the continuation of the baseline situation continuing the use of the anaerobic lagoon.</p> <p>The baseline for energy generation is correctly developed due to ACM0002.</p>	p	p
B.2.5. Does the baseline scenario sufficiently take into account relevant national and/or sectoral policies, macro-economic trends and political aspirations?	4, 5 1	DR I	Yes, policies and trends have been taken into account.	p	p
B.2.6. Is the baseline determination compatible with the available data?	4, 5 1	DR I	<p>The baseline determination is compatible with information available on site in particular concerning</p> <ul style="list-style-type: none"> <li>- existing installations</li> <li>- legal requirements</li> <li>- compliance to legal requirements</li> <li>- production trends</li> <li>- own energy consumption and generation</li> </ul>	p	p

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B.2.7. Does the selected baseline represent the most likely scenario among other possible and/or discussed scenarios?	4, 5 1	DR I	The continuation of the current situation is the most likely course of action.	p	p
B.2.8. Does the PDD follow the approach for identifying the baseline scenario as given by the approved methodology?	4, 5 9	DR	See CAR 6	See CAR 6	p
B.2.9. Is all literature and sources clearly referenced?	4, 5	DR	The required literature is clearly referenced	p	p
<b>B.3. Additionality</b>					
B.3.1. Is the discussion of how emission reductions are archived by the project scenario in comparison to the identified project scenario provided in a transparent manner?	4, 5 1	DR I	The discussion is provided in a transparent manner.	p	p
B.3.2. Does the PDD clearly demonstrate the additionality using the approach as given by the methodology?	4, 5 1	DR I	The PDD uses the additionality tool.	p	p
B.3.3. In case of using the additionality tool: Are all steps followed in a transparent and provable manner?	4, 5 1, 7 8, 10	DR I	<p>All steps are followed in a transparent manner. As the project applies for retroactive registration a step 0 test is performed. The potential of CDM is already acknowledged by the company's annual reports 1999 – 2001. i.e far ahead before the decision to implement the project was made.</p> <p>Step 1 test finally shows that the project participants finally had the options either to decide for the continuation of the current situation or to implement the project as no other scenario would have provide a comparable</p>	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>output of products (i.e. power generated).</p> <p>The PDD applies for step 2 and step 3 tests as project participants feel that the project is able to pass both approaches.</p> <p>Step 2 demonstrates that the project is requiring the highest investment among all discussed baseline scenario. But it is also shown that it is delivering a reasonable return in long-term projections.</p> <p>Step 3 test is considered by the validation team to be more suitable when applying the additionality tool. The statements concerning the risks of having return pre-dominantly in local currency and risks associated by the fact of being the first project of this kind in Central America are substantiated by available information.</p> <p>The common practice test (step 4) is fulfilled due to the reason given above.</p> <p>Under step 5 it is indicated that the CDM has play a decisive role when making the investment decision for the implementation of the project activity. This statement has been substantiated during the on-site audits.</p>		
B.3.4. Does the discussion sufficiently take into account relevant national and/or sectoral policies,	4, 5 1	DR I	The discussion is complete in that context.	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
macro-economic trends and political aspirations?					
B.3.5. Does the CDM registration have any impact on the implementation of the project?	4, 5 1	DR I	There would have been no implementation without CDM as stated within step 5 of the additionality tool.	p	p
B.3.6. Is the approach for demonstrating additionality provided by the most recent (or still applicable) methodology correctly applied?	4, 5 1	DR I	The additionality tool is applied in a correct and complete manner.	p	p
B.3.7. Are other proofs than anecdotal evidence for all assumptions and statements used by the additionality discussion?	4, 5 1, 8	DR I	Insight to evidences on statements on investment and the decision making process has been provided during the on-site visit.	p	p
<b>B.4. Project Boundary</b>					
B.4.1. Are all emission related to the baseline scenario clearly identified and described in a complete manner?	4, 5 1	DR I	<p>The several paths of emission reductions are clearly identified and described in the text.</p> <p><u>Clarification Request 3:</u></p> <p>It would be preferred due to the complexity of the project activity to receive flow chart covering all vinasse effluent treatment activities and activities by the use of bio-methane.</p>	<b>CR 3</b>	p
B.4.2. In case of grid connected electricity projects: Is the relevant grid correctly identified due to the EB guidance and the underlying methodology?	4, 5 1	DR I	The project uses the Nicaraguan grid.	p	p





CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
B.4.3. Are all emission related to the project scenario clearly identified and described in a complete manner?	4, 5 1	DR I	All emissions related to the project scenario are completely identified.	p	p
B.4.4. Are all emission related to leakage clearly identified and described in a complete manner?	4, 5 1	DR I	Due to the methodology no leakage is associated to the project activity.	p	p
<b>B.5. Detailed Baseline Information</b>					
B.5.1. Is there any indication of a date when determine the baseline?	4, 5 1	DR	Correctly indicated in chapter B.5.	p	p
B.5.2. Is this in consistency with the time line of the PDD history?	4, 5 1	DR I	The date is in consistency with the known time line.	p	p
B.5.3. Is all data required provided in a complete manner by annex 3 of the PDD?	4, 5 1	DR I	Annex 3 provides sources and approaches how baseline data has been determined. It only focuses on data relevant due to AM0013, while information on data for electricity generation (ACM0002) is not referenced.  <u>Corrective Action Request 7:</u>  It is necessary also to discuss the grid electric emission factor within annex 3.	<b>CAR 7</b>	p
B.5.4. Is all data given in compliance with the methodology?	4, 5 1	DR I	All data I sin compliance with the methodology.	p	p
B.5.5. Is all data evidence by official data sources or replicable records?	4, 5 1	DR I	All data including such not documented in the first PDD has been verified on-site	p	p
B.5.6. Is the vintage of the baseline data correct?	4, 5	DR	Baseline data is built on the most recent	p	p

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
	1	I	<p>available figures (AM0013 and ACM0002). The grid electricity emission factor is calculated ex-ante use data for the years (2002 to 2004). It is presented in chapter E.1.</p> <p><u>Remark to revised PDD:</u></p> <p>AM0013, vers. 3 requests to adjust the COD of the baseline by a factor AD in case there is an effluent from the lagoons in the baseline. AD should be derived from a one year historical data. Caused by the fact that only few samples are available for the pre-project situation the PDD uses a conservative factor of 0.7 instead of 0.86 derived from such samples or 0.8 to 0.95 given from literature sources. This approach is very conservative and delivers reliable data that ensures the conservativeness of the emission reduction calculations.</p>		
<b>C. Duration of the Project / Crediting Period</b>					
C.1.1. Are the project's starting date and operational lifetime clearly defined and reasonable?	4, 5	DR	All dates are clearly defined and reasonable.	p	p
C.1.2. Is the assumed crediting time clearly defined and reasonable (renewable crediting period of max 7 years with potential for 2 renewals or fixed crediting period of max. 10 years)?	4, 5	DR	The project activity applies a 10 year fixed crediting period.	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>D. Monitoring Plan</b>					
<b>D.1. Monitoring Methodology</b>					
D.1.1. Is the monitoring methodology previously approved by the CDM Methodology Panel?	2, 3	DR	The project applies AM0013 in conjunction with ACM0002	p	p
D.1.2. Is the choice of the methodology correctly justified by the PDD?	4, 5	DR	The use of this methodology is justified.	p	p
D.1.3. Is the project in conformance with all applicability criteria of the applied methodology?	3, 4, 5	DR I	Yes, as above already stated for the baseline methodology (there are no further criteria)	p	p
D.1.4. Does the PDD provide a consistent approach in the context of all parameter to be monitored and further information provided by the monitoring methodology?	3, 4, 5 1	DR I	The PDD provides an approach in consistency with the applied methodologies (AM0013 and ACM0002). As a cogeneration unit will be in use the aspects of heat and electricity generation can be covered by metering less parameter.	p	p
D.1.5. Does the monitoring methodology apply consistently the choice of the option selected for monitoring both of project and baseline emissions?	4, 5 1	DR I	Yes it is consistently applied.	p	p
<b>D.2. Monitoring of Project Emissions (if applied)</b>					
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?	4, 5 1	DR I	Yes, but to determine project emissions more details are required on type of equipment, data recording and data reduction processes (e.g. creation of averages)  <u>Clarification Request 4:</u> It is necessary to provide more details on	<b>CR 4</b>	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			- type of metering equipment - calibration procedures		
D.2.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	4, 5 1	DR I	The choice of parameter is following the approved methodology	p	p
D.2.3. Will it be possible to determine the specified project GHG indicators?	4, 5 1	DR I	It should be no problem as all required technology is available on the market.	p	p
D.2.4. Will the indicators enable comparison of project data and performance over time?	4, 5 1	DR I	In case of a proper implementation and operation of the monitoring plan such a comparison will be possible.	p	p
D.2.5. 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?	4, 5 1	DR I	Not as long as CR4 is not resolved.	See CR4	p
D.2.6. 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?	4, 5 1	DR I	Not as long as CR4 is not resolved.	See CR4	p
D.2.7. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable and reasonably acceptable accuracy?	4, 5 1	DR I	The monitoring approach as seen on-site is in line with current good practice.	p	p
D.2.8. Are all formulae used to determine project emission clearly indicated and in compliance with the monitoring methodology.	4, 5	DR	All formulae are clearly indicated and in compliance with AM0013	p	p

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>D.3. Monitoring of Baseline Emissions (if applied)</b>					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for estimation or measuring the greenhouse gas emissions of the baseline emissions during the crediting period?	4, 5 1	DR I	Yes, but to determine baseline emissions more details are required on type of equipment, data recording and data reduction processes  <u>Clarification Request 5:</u> It is necessary to provide more details on - type of metering equipment - data recording and processing procedures - calibration procedures	CR 5	p
D.3.2. Are the choices of project GHG indicators reasonable and in conformance with the requirements set by the approved methodology applied?	4, 5 1	DR I	The choice of parameter is following the approved methodology	p	p
D.3.3. Will it be possible to determine the specified project GHG indicators?	4, 5 1	DR I	It should be no problem as all required technology is available on the market.	p	p
D.3.4. 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?	4, 5 1	DR I	Not as long as CR5 is not resolved.	See CR5	p
D.3.5. 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?	4, 5 1	DR I	Not as long as CR5 is not resolved.	See CR5	p
D.3.6. Is the monitoring approach in line with current good practice, i.e. will it deliver data in a reliable	4, 5 1	DR I	The monitoring approach as seen on-site is in line with current good practice.	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
and reasonably acceptable accuracy?					
D.3.7. Are all formulae used to determine baseline emission clearly indicated and in compliance with the monitoring methodology.	4, 5	DR	All formulae are clearly indicated and in compliance with AM0013 and ACM0002	p	p
<b>D.4. Direct Monitoring of Emission Reductions (if applied) à not applicable</b>					
<b>D.5. Monitoring of Leakage (if applicable) à not applicable</b>					
<b>D.6. Determination of Emission Reductions</b>					
D.6.1. Are all formulae used to determine the emission reductions clearly indicated and in compliance with the monitoring methodology.	4, 5	DR	The given formulae are in compliance.	p	p
D.6.2. Is the information given for each calculated variable sufficient to ensure the delivery of high quality data free of potential for biases or intended or unintended changes in data records?	4, 5 1	DR I	The project participants operate a computerized system (SCADA) where all data to be monitored will be integrated.	p	p
<b>D.7. Quality Control (QC) and Quality Assurance (QA) Procedures</b>					
D.7.1. Is the selection of data undergoing quality control and quality assurance procedures complete?	4, 5 1	DR I	The choice of parameter and the identification of needs for quality control are sufficiently done.	p	p
D.7.2. Is the belonging determination of uncertainty levels done correctly for each ID in a correct and reliable manner?	4, 5 1	DR I	Uncertainty levels are correctly determined in a qualitative manner.	p	p
D.7.3. Are quality control procedures and quality assurance procedures sufficiently described to ensure the delivery of high quality data?	4, 5 1	DR I	QA/QC procedures are not yet sufficiently described, only the need of the performance of such measures is indicated without providing more details (e.g. use of external calibration services etc.)	<b>CR6</b>	p

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
			<p>The provided monitoring procedure do not ensure the verifiability of metered data as it will not be possible to check whenever necessary routines (e.g. calibration, function tests) have to be performed..</p> <p><u>Clarification Request 6:</u></p> <p>More information on the envisioned quality control procedures is required. It is not sufficient simply to refer to the existing ISO14000 system of the plant operator.</p>		
D.7.4. Is it ensured that data will be bound to national or internal reference standards?	4, 5 1	DR I	<p><u>Clarification Request 7:</u></p> <p>It is not yet clarified which kind of standards will be used.</p>	<b>CR7</b>	p
D.7.5. Is it ensured that data provisions will be free of potential conflicts of interests resulting in a tendency of overestimating emission reductions?	4, 5	I	The project participants plan to integrate the project in the existing SCADA system.	p	p
<b>D.8. Operational and management structure</b>					
D.8.1. Is the authority and responsibility of project management clearly described?	4, 5 1	DR I	The responsibilities are clearly described and allocated in advance, as the project is already operational due to its retroactive character.	p	p
D.8.2. Is the authority and responsibility for registration, monitoring, measurement and reporting clearly described?	4, 5 1	DR I	As above	p	p
D.8.3. Are procedures identified for training of monitoring personnel?	4, 5 1	DR	Training procedures have already been conducted.	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.8.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions or will endanger the verifiability of data?	4, 5 1	DR I	The local project participant runs a certified management system (ISO14000) including such procedures.	p	p
<b>D.9. Monitoring Plan (Annex 4)</b>					
D.9.1. Is the monitoring plan developed in a project specific manner clearly addressing the unique features of the CDM activity?	4, 5 1	DR I	As indicated by several clarification requests above details are missing on several monitoring issues. The existing monitoring plan is considered to be incomplete. <u>Corrective Action Request 8:</u> The Monitoring Plan as provided by annex 4 should be updated due to the guidance given by EB and the project-specific requirements as already discussed by this validation protocol.	<b>CAR8</b>	p
D.9.2. Does the monitoring plan completely describes all measures to be implemented for monitoring all parameter required?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.3. Does the monitoring plan completely describes all measures to be implemented for ensuring data quality of all parameter to be monitored?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.4. Does the monitoring plan provide information on monitoring equipment and respective positioning in order to safeguard a proper installation?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.5. Are procedures identified for calibration of monitoring equipment?	4, 5 1	DR I	See CAR 8	See CAR8	p





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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
D.9.6. Are procedures identified for maintenance of monitoring equipment and installations?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.7. Are procedures identified for monitoring, measurements and reporting?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.8. Are procedures identified for day-to-day records handling (including what records to keep, storage area of records and how to process performance documentation)	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.10. Does the monitoring plan provide procedures identified for troubleshooting allowing redundant reconstruction of data in case of monitoring problems?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.11. Are procedures identified for review of reported results/data?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.12. Are procedures identified for internal audits of GHG project compliance with operational requirements where applicable?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.13. Are procedures identified for project performance reviews before data is submitted for verification, internally or externally?	4, 5 1	DR I	See CAR 8	See CAR8	p
D.9.14. Are procedures identified for corrective actions in order to provide for more accurate future monitoring and reporting?	4, 5 1	DR I	See CAR 8	See CAR8	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
<b>E. Calculation of GHG Emissions by Source</b>					
<b>E.1. Predicted Project GHG Emissions</b>					
E.1.1. Are all aspects related to direct and indirect GHG emissions captured in the project design?	4, 5 1 15, 16	DR I	All aspects are completely covered.	p	p
E.1.2. Are the GHG calculations documented in a complete and transparent manner?	4, 5 1 15, 16	DR I	The calculations are presented in a reproducible and complete manner.	p	p
E.1.3. Have conservative assumptions been used to calculate project GHG emissions?	4, 5 1 15, 16	DR I	The calculations have been provided by Excel-files in a transparent manner. Conservative assumptions have been used.	p	p
E.1.4. Are uncertainties in the GHG emissions estimates properly addressed in the documentation?	4, 5 1 15, 16	DR I	OK	p	p
E.1.5. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	4, 5 1 15, 16	DR I	The estimation is based on the same procedures due to the retroactive character of this project.	p	p
E.1.6. Is the projection based on provable input parameter?	4, 5 1 15, 16	DR I	See above	p	p
<b>E.2. Leakage</b>					
E.2.1. Are potential leakage effects beyond the chosen project boundaries properly identified?	4, 5	DR I	Not relevant	p	p
E.2.2. Have these leakage effects been properly accounted for in calculations?	4, 5	DR I	Not relevant	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E.2.3. Have conservative assumptions been used to calculate leakage emissions?	4, 5	DR I	Not relevant	p	p
E.2.4. Are uncertainties in the leakage estimates properly addressed in the documentation?	4, 5	DR I	Not relevant	p	p
E.2.5. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	4, 5	DR I	Not relevant	p	p
E.2.6. Is the projection based on provable input parameter?	4, 5	DR I	Not relevant	p	p
<b>E.3. Baseline Emissions</b>					
E.3.1. Have the most relevant and likely operational characteristics and baseline indicators been chosen as reference for baseline emissions?	4, 5 1 15, 16	DR I	The PDD reflects baseline emissions derived from most recent available data.	p	p
E.3.2. Are the baseline boundaries clearly defined and do they sufficiently cover sources and sinks for baseline emissions?	4, 5 1 15, 16	DR I	The baseline boundaries are clearly defined.	p	p
E.3.3. Are the GHG calculations documented in a complete and transparent manner?	4, 5 1 15, 16	DR I	The calculations have been provided by Excel-files in a transparent manner.	p	p
E.3.4. Have conservative assumptions been used when calculating baseline emissions?	4, 5 1 15, 16	DR I	Conservative assumptions have been made in case no data resulting from monitoring has been available.	p	p
E.3.5. Are uncertainties in the GHG emission estimates properly addressed in the documentation?	4, 5 1 15, 16	DR I	Uncertainties are addressed by the conservative factors provided by the methodology itself.	p	p

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
E.3.6. Is the projection based on same procedures as used for later monitoring or acceptable alternative models?	4, 5 1 15, 16	DR I	The projection is based on the same algorithms as provide by the methodology.	p	p
E.3.7. Is the projection based on provable input parameter?	4, 5 1 15, 16	DR I	The project is based on provable project design figures.	p	p
<b>E.4. Emission Reductions</b>					
E.4.1. Will the project result in fewer GHG emissions than the baseline scenario?	4, 5 1 15, 16	DR I	The project will result in emission reductions.	p	p
E.4.2. Is the form/table required for the indication of projected emission reductions correctly applied?	4, 5 1 15, 16	DR I	No, the same mistake has been made is given by CAR 5	See CAR 5	p
E.4.3. Is the projection in line with the envisioned time schedule for the project's implementation and the indicated crediting period?	4, 5 1 15, 16	DR I	There will be a phased implementation of the project activity which is correctly reflected by the estimation.	p	p
<b>F. Environmental Impacts</b>					
F.1.1. Has an analysis of the environmental impacts of the project activity been sufficiently described?	4, 5 1 14	DR I	An EIA has been performed as required by the national legislation. The PDD includes a correct summary. The original document has been submitted to the validation team.	p	p
F.1.2. Are there any Host Party requirements for an Environmental Impact Assessment (EIA), and if yes, is an EIA approved?	4, 5 1 14	DR I	See above	p	p
F.1.3. Will the project create any adverse environ-	4, 5	DR	The EIA does conclude in limited impacts	p	p



CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
mental effects?	1	I	relevant in a short distance (noise, temperature) that may result in measures concerning the work environment.		
F.1.4. Are transboundary environmental impacts considered in the analysis?	4, 5 1	DR I	Transboundary impacts are not discussed but also not to be expected.	p	p
F.1.5. Have identified environmental impacts been addressed in the project design?	4, 5 1	DR I	See above	p	p
F.1.6. Does the project comply with environmental legislation in the host country?	4, 5 1 14	DR I	See above	p	p
<b>Stakeholder Comments</b>					
G.1.1. Have relevant stakeholders been consulted?	4, 5 1 13	DR I	A local stakeholder meeting is presented by the PDD, but during the on-site audit it has been mentioned that two further meetings took place required by the Nicaraguan DNA. <u>Clarification Request 8:</u> Please clarify why information on the two further meeting is not included in the PDD.	CR8	p
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	4, 5 1 13	DR I	Appropriate media has been used.	p	p
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?	4, 5 1	DR I	See above	p	p



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CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl	Final Concl
G.1.4. Is the undertaken stakeholder process described in a complete and transparent manner?	4, 5 1	DR I	See CR 8	See CAR8	p
G.1.5. Is a summary of the stakeholder comments received provided?	4, 5 1 13	DR I	A summary is provided.	p	p
G.1.6. Has due account been taken of any stakeholder comments received?	4, 5 1 13	DR I	No further action has been required.	p	p

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

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
<p>A revision number and the date of the revision have not been indicated by the first PDD version.</p> <p><u>Corrective Action Request 1:</u></p> <p>The version number and a date of the issuance of this version should be indicated by a revised PDD.</p>	A 1.2	A revised PDD has been submitted, responding to the request.	<p>The issue is considered being resolved.</p> <p>þ</p>
<p>Information on technologies shows discrepancies. In contrary to the information in the first PDD version only one distillation tower exists on-site while the second one has been removed. The statement that the effluent will not be sent any longer to the lagoon is not correct as some share is stored there before used for ferti-irrigation.</p> <p><u>Corrective Action Request 2:</u></p> <p>Correct information on the equipment on site and the flows of effluents should be given by a revised PDD version.</p>	A 2.2	A revised PDD has been submitted, responding to the request.	<p>The provided information of the final PDD version is in the compliance with the situation verified. The issue is considered being resolved.</p> <p>þ</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
<p>The form required for the indication of project participants is not correctly applied as it indicates CAF and CLN as Parties of the KP and the Government of Nicaragua as project participant.</p> <p><u>Corrective Action Request 3:</u></p> <p>The form indicating project participants has to be correctly applied by a revised PDD version.</p>	A 3.1	A revised PDD has been submitted, responding to the request.	<p>The form has been applied correctly. The issue is considered being resolved.</p> <p>þ</p>
<p>The PDD refers scope 1 (ACM0002) and scope 4, while AM0013 is linked to scope 13 (waste handling and disposal).</p> <p><u>Corrective Action Request 4:</u></p> <p>The correct category has to be given by a revised PDD.</p>	A 4.3	The revised PDD has changed the information on the category accordingly.	<p>The issue is considered being resolved.</p> <p>þ</p>
<p>The description of the technology allows a rough overview on the abatement technology including information on the several emission reduction paths like methane avoidance and substitution of fossil fuel and energy generation by a renewable source. Nonetheless the description does not provide a transparent</p>	A 4.5	A graph and an additional description have been inserted to the revised PDD providing details on this issue.	<p>The issue is considered being resolved.</p> <p>þ</p>





Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
<p>view of the treatment of effluents when leaving the biodigesters. (see also CAR 2)</p> <p><u>Clarification Request 1:</u></p> <p>Information on the emission reduction aspects of laminar irrigation, ferti-irrigation and intermediate storage of effluents should be provided.</p>			
<p>The form for indicating project emission reductions is not correctly applied. It does not provide figures for the year 2003 and does not correctly reflect the fact that 2013 will only include six months. Furthermore the estimations and predominately base on IPCC default values while real on-site data is already available.</p> <p><u>Corrective Action Request 5:</u></p> <p>The table on estimated emission reduction has to be corrected accordingly.</p>	A 4.13	A revised table is clearly indicating the projections for the years 2003 and 2013.	<p>The issue is considered being resolved.</p> <p style="text-align: center;">p</p>
<p>Although AM0013 is based on the input from this specific project the applicability of the methodology could be proofed as AM0013, vers. 1 required a retention time of the sludge in the baseline scenario being more than 1</p>	B 1.4	<p>The required response to the clarification request sent to the UNFCCC secretariat became obsolete with the publication of AM0013, vers.3. This version changed the problematic applicability criterion. The fulfillment of all applicability criteria is demonstrated</p>	<p>The applicability criteria as provided by AM0013, vers. 3 are fulfilled:</p> <ul style="list-style-type: none"> <li>- the depth of the lagoon</li> </ul>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
<p>year. As no further specification has been given on the definition of sludge the dimensions of the baseline lagoon and the effluent flow did not proof the applicability of the project. Hence a request for clarification on an approved methodology has been submitted to the meth panel.</p> <p><u>Clarification Request 2:</u></p> <p>It has to be clarified by the meth panel whether the project meets the applicability criteria, which are deemed to be interpretable.</p>		<p>by the revised PDD.</p>	<p>is more than 1 meter</p> <ul style="list-style-type: none"> <li>- the temperature is always higher than 10°C</li> <li>- the residence time of the sludge in the baseline is more than 30 days</li> <li>- sludge produced during the project activity is used directly for irrigation/fertilization</li> </ul> <p>The issue is considered being resolved.</p> <p>þ</p>
<p>The “Pollotech-Study” also indicates further two scenarios named:</p> <ul style="list-style-type: none"> <li>- spray irrigation</li> <li>- aerobic biological treatment</li> </ul> <p>as potential scenarios under comparable industrial conditions. These two scenarios are not yet considered in the baseline discussion.</p> <p><u>Corrective Action Request 6:</u></p> <p>Both scenarios should be included as poten-</p>	<p>B 2.2</p>	<p>A revised PDD has been submitted, responding to the request.</p>	<p>The issue is considered being resolved.</p> <p>þ</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
tial baseline options within the baseline discussion.			
<p>The several paths of emission reductions are clearly identified and described in the text.</p> <p><u>Clarification Request 3:</u></p> <p>It would be preferred due to the complexity of the project activity to receive flow chart covering all vinasse effluent treatment activities and activities by the use of bio-methane.</p>	B 4.1	Such a flow chart has been inserted into the revised PDD.	<p>The issue is considered being resolved.</p> <p>þ</p>
<p>Annex 3 provides sources and approaches how baseline data has been determined. It only focuses on data relevant due to AM0013, while information on data for electricity generation (ACM0002) is not referenced.</p> <p><u>Corrective Action Request 7:</u></p> <p>It is necessary also to discuss the grid electric emission factor within annex 3.</p>	B 5.3	A revised PDD has been submitted, responding to the request.	<p>The issue is considered being resolved.</p> <p>þ</p>
For determining project emissions more details are required on type of equipment, data recording and data reduction processes (e.g. creation of averages)	D 2.1	The required information has been inserted to the column "comment" in the relevant tables of chapter D.	<p>The issue is considered being resolved.</p> <p>þ</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
<p><u>Clarification Request 4:</u></p> <p>It is necessary to provide more details on</p> <ul style="list-style-type: none"> <li>- type of metering equipment</li> <li>- calibration procedures</li> </ul>			
<p>For determining baseline emissions more details are required on type of equipment, data recording and data reduction processes</p> <p><u>Clarification Request 5:</u></p> <p>It is necessary to provide more details on</p> <ul style="list-style-type: none"> <li>- type of metering equipment</li> <li>- data recording and processing procedures</li> <li>- calibration procedures</li> </ul>	D 3.1	The required information has been inserted to the column "comment" in the relevant tables of chapter D.	<p>The issue is considered being resolved.</p> <p>þ</p>
<p>QA/QC procedures are not yet sufficiently described, only the need of the performance of such measures is indicated without providing more details (e.g. use of external calibration services etc.)</p> <p>The provided monitoring procedure do not ensure the verifiability of metered data as it will not be possible to check whenever necessary routines (e.g. calibration, function tests) have to be performed.</p>	D 7.3	Details of the monitoring plan have been provided as revised annex 4 of the PDD.	<p>The issue is considered being resolved.</p> <p>þ</p>



Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
<u>Clarification Request 6:</u> More information on the envisioned quality control procedures is required. It is not sufficient simply to refer to the existing ISO14000 system of the plant operator.			
<u>Clarification Request 7:</u> It is not yet clarified which kind of standards will be used.	D 7.4	The revised PDD refers to ISO standards.	The issue is considered being resolved.  p
As indicated by several clarification requests above details are missing on several monitoring issues. The existing monitoring plan is considered to be incomplete.  <u>Corrective Action Request 8:</u> The Monitoring Plan as provided by annex 4 should be updated due to the guidance given by EB and the project-specific requirements as already discussed by this validation protocol.	D 9.1	Details of the monitoring plan have been provided as revised annex 4 of the PDD.	The issue is considered being resolved.  p
A local stakeholder meeting is presented by the PDD, but during the on-site audit it has been mentioned that two further meetings	G 1.1	Information on the two further stakeholder meetings is provided by the revised PDD.	The issue is considered being resolved.



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Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in tables 1 and 2	Summary of project owner response	Validation team conclusion
took place required by the Nicaraguan DNA. <u>Clarification Request 8:</u> Please clarify why information on the two further meeting is not included in the PDD.			p


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Validation of the CDM Project:  
Vinasse Anaerobic Treatment Project  
- Compañía Licorera de Nicaragua, S. A. (CLNSA)




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## **Appendix B: Information Reference List**

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Reference No.	Document or Type of Information
1.	<p>On-site interviews at the premises of CLNSA by auditing team of TÜV SÜD performed on Oct 17 to 19, 2005 in Nicaragua</p> <p>Participants: Mauro Fadda, TÜV SÜD, Santiago office</p> <p>Carlos Peña, CLNSA, Lawyer Simón Peña, CLNSA, Lawyer Francisco Sucre, CAF, representative Elianne Peñalba, CLNSA, Business Analyst Fermin Ramirez, CLNSA, Project Operation Manager Evan Evans, Econergy, Consultant (by telephone conference) Net Hoytt, Econergy, Consultant (by telephone conference) Wilfredo Rostrán, Major of Chichigalpa Cristobal Herrera, CLNSA, Project Operation Assistant</p>
2.	<a href="http://www.unfccc.int">www.unfccc.int</a> - web-page of UNFCCC
3.	Approved Methodology AM0013, Versions 1, 2, and 3
4.	Project Design Document: "Vinasse Anaerobic Treatment Project - Compañía Licorera de Nicaragua, S. A. (CLNSA)" dated 28 September 2005
5.	Project Design Document: "Vinasse Anaerobic Treatment Project - Compañía Licorera de Nicaragua, S. A. (CLNSA)" version 4.1, 14 September 2006
6.	Approved Methodology ACM0002, Version 6
7.	CLNSA 1999-2000 Annual Report, issued 2001



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Reference No.	Document or Type of Information
8.	Annual Board of Directors Meeting Report, CLNSA, 2001
9.	"Preliminary investigation of wastewater management alternatives", Pollutech, April, 1998, pp. 7-17.
10.	Decreto No. 33-95, Gaceta No. 118 (1996) Disposiciones para el control de la Contaminación proveniente de las descargas de aguas residuales, domesticas, industriales y agropecuarias
11.	<a href="http://www.bolsanic.com">www.bolsanic.com</a> (webpage of the Nicaraguan Stock exchange)
12.	Build and operate Environmental License, Administrative Resolution No. 007-2001, MARENA
13.	Minutes of the stakeholder meetings held April 04, 2002 (in Chichigalpa), April 16, 2004 (in Managua) and June 16, 2004 (in Chichigalpa)
14.	Estudio de Impacto Ambiental (EIA), Sistema de Tratamiento anaerobio de vinaza, Compañía Licorera de Nicaragua, S. A., PIDMA-UNI, Managua, March 2002
15.	FINAL CLN PDD Analysis 12 Sept 2006.xls (Excel spreadsheet containing the emission reduction projections), Sept 2006
16.	Licorera Nicaragua Calculations Spreadsheet.xls (Excel spreadsheet containing the emission reduction projections), Sept 2005
17.	Laboratory analyses of COD, performed by the laboratory from the "Universidad Nacional de Ingenieria"