VALIDATION REPORT

IRANI WASTEWATER METHANE AVOIDANCE PROJECT

REPORT NO. 2007-0709

REVISION NO. 02

DET NORSKE VERITAS

VALIDATION REPORT

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Approved by: Einar Telnes Director	Organisational unit: DNV Certification, International Climate Change Services
Client: Celulose Irani S.A and EcoSecurities Group Plc	Client ref.: David Denton

DET NORSKE VERITAS AS

DNV Certification

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

Summary:

Det Norske Veritas Certification AS (DNV) has performed a validation of the Irani Wastewater Methane Avoidance Project 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. This validation report summarizes the findings of the validation.

The validation consists of the following three phases: i) a desk review of the project design documents, ii) follow-up interviews with project stakeholders and iii) the resolution of outstanding issues and the issuance of the final validation report and opinion. This validation report summarizes the findings of the validation.

In summary, it is DNV's opinion that the Irani Wastewater Methane Avoidance Project, as described in the revised PDD of version 3 of 20 August 2007, meets all relevant UNFCCC requirements for the CDM, and all relevant host country criteria and correctly applies the simplified baseline and monitoring methodology AMS-III.I (Version 06 of 10 August 2007) for small-scale CDM project activities. Hence, DNV will request the registration of the Irani Wastewater Methane Avoidance Project as a CDM project activity.

Prior to the submission of this validation report for registration by the CDM Executive Board, DNV will have to receive the written approvals of voluntary participation from the DNA of Brazil and the DNA of United Kingdom, including the confirmation that the project assists in achieving sustainable development.

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Abbreviations

ANEEL	Brazilian Electricity Agency (Agência Nacional de Energia Elétrica)
BM	Build margin
BOD	Biological Oxygen Demand
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CH_4	Methane
CL	Clarification request
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
COD	Chemical Oxygen Demand
DNA	Designated National Authority
DOC	Degradable organic carbon
DOC_f	Fraction DOC dissimilated to landfill gas
FATMA	Fundação do Meio Ambiente (Santa Catarina State Environment Agency)
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
MCF	Methane correction factor
MP	Monitoring Plan
N_2O	Nitrous oxide
NGO	Non-governmental Organisation
ODA	Official Development Assistance
OM	Operating margin
ONS	National Electricity System Operator (Operador Nacional do Sistema)
PDD	Project Design Document
S-SE-CO	South-Southeast-Midwest
UNFCCC	United Nations Framework Convention on Climate Change

1 INTRODUCTION

Celulose Irani S.A and EcoSecurities Group Plc have commissioned Det Norske Veritas Certification AS (DNV) to perform a validation of the Irani Wastewater Methane Avoidance Project in Brazil (hereafter called "the project").

This report summarizes 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 Certification, Rio de Janeiro	Team leader, Sector Expert
Mr. Felipe Lacerda Antunes	DNV Certification, Porto Alegre	GHG auditor
Mr. Einar Telnes	DNV Certification, 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 Validation 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, including the approved baseline and monitoring methodology AMS-III.I (Version 06 of 10 August 2007) /7/. The validation team has, based on the recommendations in the Validation and Verification Manual /6/, 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

Celulose Irani is a Brazilian pulp and paper manufacturing company for both domestic and export markets. The current wastewater treatment at Celulose Irani consists of primary treatment only, characterised by a series of ponds with superficial aeration only in the first pond. Except for this minimal and inefficient superficial aeration in the first pond, the waste water is degraded on anaerobic conditions producing significant amounts of methane.

The purpose of the project is to avoid methane emissions from the current wastewater treatment and disposal practices. The project activity will involve implementation of a new wastewater treatment scheme, involving aerobic treatment, referred to as secondary or biologic treatment. The new wastewater treatment system will use highly aerated activated sludge, which will be

decanted and reused. With these measures, the project developer will stop the anaerobic digestion of the organic wastewater in the ponds.

Estimated GHG emission reductions from the project are 388 871 tonnes CO_2 equivalent (tCO_2e) during the 7 years crediting period, which results in estimated average annual emission reductions of 55 553 tCO2e.

2 METHODOLOGY

The validation consisted of the following three phases:

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

This validation report summarizes the findings of the validation.

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

- It organizes, 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 Irani Wastewater Methane Avoidance Project is enclosed in Appendix A to this report.

Findings established during the validation can either be seen as a non-fulfillment of validation protocol criteria or where a risk to the fulfillment 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 clarification may be used where additional information is needed to fully clarify an issue

Validation Protocol Table 1: Mandatory Requirements			
Requirement	***Reference***	***Conclusion***	***Cross reference***
The requirements the project must meet.	*Gives reference to the legislation or agreement where the requirement is found.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Validation report.*	*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.*

Validation Protocol Table 2: Requirement checklist				
Checklist Question	***Reference***	***Means of verification (MoV)***	***Comment***	***Draft and/or Final Conclusion***
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.	*Gives reference to documents where the answer to the checklist question or item is found.*	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **Clarification** is used when the validation team has identified a need for further clarification.*

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

Figure 1 Validation protocol tables

2.1 Review of Documents

The PDD (version 3 of 20 August 2007) /1/ submitted by Celulose Irani S.A and EcoSecurities Group Plc as well as other supporting documents submitted by the project developer /4/ were assessed by DNV as a part of the validation.

Others documents, such as Environmental Impact Assessment, the Environmental Installation Licence and the Invitation for Comments by Local Stakeholders were reviewed during the site visit.

2.2 Follow-up Interviews

On 03 May 2007, DNV performed interviews with personnel from Celulose Irani /9//10/ and Ecosecurities /11//12/ during a site visit at Celulose Irani at Vargem Bonita, Santa Catarina State, to confirm and to resolve issues identified in the document review. The main topics of the interviews are summarised in Table 1.

Table 1 Interview topics

Interviewed organisation	Interview topics
Celulose Irani and Ecosecurities	➢ Environment licenses conditioning compliance, ➢ Confirmation that current practise is anaerobic wastewater treatment by Celulose Irani, ➢ Verification of the implementation process of the aerobic wastewater treatment of the paper production's effluents. ➢ Verification of monitoring plan

2.3 Resolution of Clarification and Corrective Action Requests

The objective of this phase of the validation is 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.* The project participant's response to DNV's initial findings, which included the submission of the final PDD version 3 of 20 August 2007, addressed the corrective action request and requests for clarifications to DNV's satisfaction.

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

2.4 Internal Quality Control

The validation report including the initial validation findings underwent a technical review before being submitted to the project participants. The final validation report underwent another technical review before requesting registration of the project activity. The technical review was performed by a technical reviewer qualified in accordance with DNV's qualification scheme for CDM validation and verification.

3 VALIDATION FINDINGS

The findings of the validation 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 validation findings relate to the project design as documented and described in the PDD version 3 of 20 August 2007.

3.1 Participation Requirements

The project participants are Celulose Irani S.A (Brazil), EcoSecurities Group Plc (United Kingdom). All Parties involved, i.e., Brazil and the United Kingdom, meet the requirements to participate in the CDM.

Prior to the submission of this validation report for registration by the CDM Executive Board, DNV will have to receive the written approvals of voluntary participation from the DNA of Brazil and the DNA of United Kingdom, including the confirmation that the project assists in achieving sustainable development

The project will be funded by Celulose Irani and the validation did not reveal any information indicating that the project can be seen as a diversion of ODA funding towards Brazil.

3.2 Project Design

Celulose Irani has as main effluents: i) the discharge from the paper production lines, where the water suspended fibers are filtered to produce the paper and ii) the water containing small fibers discharged from the facilities. This effluent is carried to the current wastewater treatment, which consists of primary treatment only, characterised by a flotation unit for the high fibers content stream and a sedimentation unit for low fiber content stream. The overflow from these two streams is carried to a series of ponds with superficial in the first pond only. Except for this minimal and inefficient superficial aeration in the first pond, the wastewater is anaerobically degraded. The organic material degrades anaerobically in the facility's lagoon system, producing significant amounts of methane.

The project activity will convert the current anaerobic system (without methane recovery) to an aerobic system through the installation of a complementary activated sludge, which is a result of a process in which oxygen is forced into the wastewater to develop a biological floc (or solid) which reduces the organic content of the sewage. After undergoing this biological treatment, the organic material in the wastewater eventually decreases, resulting in clean water. The sludge produced by the biological treatment will be dried and incinerated in a boiler, without any sludge decay that possibly could produce methane.

The project activity reduces GHG emissions by avoiding the production of methane from wastewater which is currently being treated in anaerobic lagoons. Hence, the Irani Wastewater Methane Avoidance Project qualifies as a category III.I small-scale CDM project activity (Other Projects Activities/ "Avoidance *of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems"*) as outlined in Appendix B of the simplified modalities and procedures for a small-scale CDM project activities /7/.

The project meets the small-scale eligibility threshold for category III.I, i.e. the project emissions are estimated to be less than 60 000 tCO_2e per year. The selected definition of the project emissions being the CH_4 emissions due to aerobic treatment of Celulose Irani wastewater and by the CO_2 emissions due the electricity used by the project activity facilities. These are eatimated by calculating the emission factor according category I.D and ACM0002, which is deemed appropriate as this definition is in line with other approved CDM baseline and monitoring methodologies.

The project design represents good practise. The aerobic wastewater treatment plant will be fed by three new blowers and the oxygen contend will be controlled by four oxygen content meters and supported by a separate chemical and biological laboratory.

The project is not a de-bundled component of a larger project activity. Celulose Irani has another project activity in which the registered methodologies AMS-I.D and AMS-III.E are applied, and reduces greenhouse gases (GHG) emissions by switching from grid electricity to electricity generated from biomass residue burning, and also methane avoidance from biomass residues that would have otherwise been landfilled. The other project does not involve wastewater treatment, and thus, employs a technology completely different from the project activity described in this PDD.

3.3 Baseline

The project applies the approved simplified baseline methodology for selected small-scale CDM project activity categories, category III.I small-scale CDM project activities (Other Projects Activities / "Avoidance *of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems"* Version 06 of 10 August 2007. /7/. This category is applicable as the project is an aerobic wastewater treatment in substitution of anaerobic wastewater treatment, and avoids methane emissions with amount of emissions reductions lower than 60 kton CO_2e /year.

The baseline scenario is that the methane produced by degradation organic matter in wastewater through anaerobic wastewater treatment, and the baseline emissions are calculated according AMS III.H considering the default IPCC values for B_o= 0,21 kg CH_4/kg COD and for MCF=0,8 for lower value for anaerobic wastewater lagoons with more than 2 meters depth. The original lagoon, as verified by the project and during the site visit, had 3 meters depth.

3.4 Additionality

The additionality of the project is demonstrated through an analysis of barriers for three options: i) proposed project activity without CDM, ii) continuation of current practice of anaerobic wastewater treatment and iii) constructions of anaerobic wastewater treatment with methane recovery or composting. The option "iii" was excluded due high changes on lay-out facilities and consequent high investment.

(a) Investment barriers: The installation of aerobic wastewater treatment has no revenue and the calculation of NPV for 21 years result on –R$ 7.05 millions, according the investment of R$ 4.9 millions and operational cost of –R$ 392 000/year. As verified in the implementation budget during the site visit, this shows that the project is not economically attractive in the absence of

CDM benefits. A sensitivity analysis has been performed with regards to cost savings up to 50%, but the project still has a negative NPV.

(b) Technical/technological barriers: No technological restriction was identified, as in the paper industry the aerobic wastewater treatment is common practice and the technology is available in Brazil.

(c) Prevailing business practice barriers: As commented on item (b), the aerobic wastewater treatment, is already used on paper sector and no such barrier is hence deemed present. .

(d) Other barriers: As verified during the site visit and interviews, the constructing and assembling of the aerobic wastewater treatment needed changes in the actual anaerobic treatment, including a new chemical and biological laboratory and specific training for respective employees, which can be considered a barrier considering the core business of Celulose Irani being paper manufacturing only.

The barrier analysis demonstrates that the most plausible scenario is the continuation of current prevailing practice (continuation of use of anaerobic treatment for paper production effluent).

As verified through the 2005 and 2006 wastewater treatment reports, the efficiency of the anaerobic wastewater treatment reached around 66% of BOD removal. The Santa Catarina state environment law (Decree 14,250) establishes a minimum efficiency of 80% BOD removal for effluent to discharge on rivers. DNV is aware of the fact that the lower expensive scenario was extension of the anaerobic wastewater treatment. As verified during the site visit, Celulose Irani has enough area to implement complementary ponds. DNV thus considers the anaerobic treatment as a likely scenario and the additionality is thus still justified.

The starting date of the project activity is 1 January 2006. A renewable 7 years crediting period has been selected starting on 1 January 2008, with an option for renewal of the crediting period. The expected operational lifetime of the project is more than 21 years.

3.5 Monitoring Plan

The project applies the monitoring methodology established according to the simplified monitoring methodology for category III.I small-scale CDM project activities. The main parameters are the flow at the entrance of wastewater treatment (Parshall flumes 3 and 4) and the COD content in the aerobic tanks' entrance. As the electricity consumed by the pumps, blowers and motors is considered as project emissions, the project participant will install an electricity meter on the distribution panel or will consider the total capacity of 840 kW for these, as verified on the equipment description/name plates.

The calculation of CERs will be considered only for the months in which the atmospheric temperature average will be over 15ºC. This temperature will be measured by the meteorological station of Celulose Irani.

Detailed responsibilities and authorities for project management, procedures for monitoring and reporting, and QA/QC procedures are assured through ISO 9001 certification of Celulose Irani.

3.6 Calculation of GHG Emissions

The baseline calculations are according to the COD average contend of anaerobic wastewater treatment and the average flow of wastewater for the last 2 years, according to the simplified baseline methodology for category III.I small-scale CDM project activities, i.e.

$$BE_y = \sum (Q_{ww,y,m} * COD_{y,m}) * B_0 * MCF_{lagoon} * GWP\_CH4$$

Where:

BE_y	Baseline emissions in the year "y" (tCO_2e)
$Q_{ww,y,m}$	Volume of the wastewater treated during the months m, during year "y", for the months with average atmospheric temperature above 15°C (m3)
$COD_{y,m}$	Chemical oxygen demand of influent entering the lagoons in the year y (tonnes/m^3) for the months with average atmospheric temperature above 15ºC.
B_o	Methane producing capacity for the wastewater (IPCC default value for domestic wastewater of 0.21 kg CH_4/kg.COD)
MCF_{lagoon}	Methane correction factor for the wastewater treatment in anaerobic lagoons (MCF lower value of 0,8 as per table III.H.1 under AMS III.H)
GWP_CH_4	Global Warming Potential for CH_4 (value of 21)

The project emissions will consider the methane emission of aerobic wastewater treatment

$$PE_{y,ww,treatment} = Q_{ww,y} * COD_y * B_o * MCF_{aerobic} * GWP\_CH_4$$

Where:

PEy,ww,treatment	Project emissions from the aerobic wastewater treatment in the year "y"
Qww,y	Volume of the wastewater treated during the year "y" (m3)
CODy	Chemical oxygen demand of effluent entering the lagoons in the year y (tonnes).
Bo	Methane producing capacity for the wastewater (IPCC default value for domestic wastewater of 0.21 kg CH4/kg.COD)
MCFaerobic	Methane correction factor for the wastewater treatment in aerobic systems (MCF lower value of 0,1 for well managed systems as per table III.H.1 under AMS III.H)

The project emission also include the CO_2 emissions with respect the electricity consumed by the wastewater aerobic treatment according the combined margin emission coefficient for the S-SE-CO grid determined *ex-ante* in accordance to the simplified methodology for category I.D small-scale CDM project activities/ACM0002. On baseline calculations the electricity was calculated considering the total capacity of new aerobic wastewater treatment equipments of 840 kW.

The emission factor calculations are based on the 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 grid in the years 2003-2005, the most recent statistics available. For the determination of the operating margin (OM) emission coefficient, average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid and IPCC carbon emission factors for specific fuels were applied to calculate plant specific emission coefficients. For the calculation of the build margin emission coefficient, the conservative plant efficiencies recommended by the CDM Executive Board at its

22nd meeting were applied. The resulting simple-adjusted OM emission coefficient is 0.4349 tCO_2e/MWh and the BM emission coefficient 0.0872 tCO_2e/MWh, resulting in a combined margin emission coefficient of 0.2611 tCO_2e/MWh (weighted average of the build and operating margin). The emission coefficient calculations were transparently presented in spreadsheet /5/ submitted to and verified by DNV.

No leakage is foreseen once the aerobic wastewater equipments are new.

3.7 Environmental Impacts

According to Brazilian Environment Legislation it is necessary to acquire an Environmental License for a new facility which could have potential environment impact. The licence is obtained in three steps: Preliminary Environment License at design phase, Installation Environment License at construction phase and Operation Environment License at operation phase. The wastewater treatment of Celulose Irani has received the Installation Licence number 066/2006 from FATMA (State Environment Agency). All licenses and conditional clauses were verified during the site visit. According to the Brazilian procedures, an Operational Environmental Licence can only be obtained after construction of the project is completed. Although the environment impact of wastewater treatment will only be positive, once the BOD charge of the final effluent of Celulose Irani will be reduced, the Operational Environmental Licence will thus still need to be verified during the first verification of emission reductions.

3.8 Comments by Local Stakeholders

According to the Resolution 1 of the Brazilian Inter-ministerial Commission for Global Climate Change, the CDM project should invite selected local stakeholders to comment on the project. The relevant stakeholders were invited by letters, which were verified during the site visit.

One comment that was supportive of the project was received and there was thus no need to modify the project.

4 COMMENTS BY PARTIES, STAKEHOLDERS AND NGOS

DNV Certification published the PDD of 09 April 2007 on the DNV Climate Change web site (http://www.dnv.com/certification/ClimateChange) and stakeholders were through the UNFCCC CDM web site invited to provide comments within a 30 days period from 13 April 2007 to 12 May 2007. No comment was received.

5 VALIDATION OPINION

Det Norske Veritas Certification AS has performed a validation of the Irani Wastewater Methane Avoidance Project *in Brazil. The validation was performed on the basis of UNFCCC criteria for the Clean Development Mechanism and host country criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.*

The project participants are Celulose Irani S.A (Brazil), EcoSecurities Group Plc (United Kingdom). All Parties involved, i.e., Brazil and the United Kingdom, meet the requirements to participate in the CDM.

The project consists on replacement of anaerobic wastewater treatment by a new aerobic wastewater treatment of paper production effluent of Celulose Irani.

The project applies the approved simplified baseline methodology for selected small-scale CDM project activity categories, category III.I small-scale CDM project activities (Other Projects Activities / "Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems" Version 06 of 10 August 2007 with amount of emissions reductions lower than 60 kton CO_2e /year.

The additionality of the project is demonstrated by applying the barrier analysis contained in Attachment A to the simplified modalities and procedures for small-scale CDM project activities. The presented barriers demonstrate that the project is not a likely baseline scenario.

The methodology consider the COD average content of anaerobic wastewater treatment and the average flow of wastewater and IPCC default value for B_0 and MCF of anaerobic and aerobic wastewater treatment

By the replacement of anaerobic wastewater treatment by aerobic treatment the project results in reductions of CH_4 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.

The project correctly applies the monitoring methodology AMS-III.I. The monitoring plan sufficiently specifies the monitoring requirements.

In summary, it is DNV's opinion that the Irani Wastewater Methane Avoidance Project as described in the submitted project design document version 3 of 20 August 2007, meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the baseline and monitoring methodology for category AMS-III.I Version 06 of 10 August 2007 *Hence, DNV will request the registration of the Irani Wastewater Methane Avoidance Project as a CDM project activity.*

Prior to the submission of this validation report for registration by the CDM Executive Board, DNV will have to receive the written approvals of voluntary participation from the DNA of Brazil and the DNA of United Kingdom, including the confirmation that the project assists in achieving sustainable development.

6 REFERENCES

Documents provided by the Project Participants i.e. the CDM-PDD, confirmation by the host Party on contribution to sustainable development and written approval of voluntary participation from the DNAs of the participating Parties:

/1/ *EcoSecurities, Irani Wastewater Methane Avoidance Project PDD,* version 1 of 09 April 2007

/2/ *EcoSecurities, Irani Wastewater Methane Avoidance Project PDD,* version 2 of 08 May 2007

/3/ *EcoSecurities, Irani Wastewater Methane Avoidance Project PDD,* version 3 of 20 August 2007

/4/ *EcoSecurities, Irani Wastewater calculator*

/5/ *EcoSecurities, Spreadsheet of Calculation of Combined* Margin (*ONS database* SSECO 2003-2005).

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

/6/ International Emissions Trading Association (IETA) & the World Bank's Prototype Carbon Fund (PCF): Validation and Verification Manual. Available at http://www.vvmanual.info.

/7/ *"Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities"* - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities: AMS-III.I – "*Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems"* for Type III – *Other Project Activities*. Version 06 of 10 August 2007.

/8/ *"Appendix B of the "Simplified modalities and procedures for small-scale CDM project activities"* - Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activities AMS-I.D - "*Energy efficiency and fuel switching measures for industrial facilities*", version 12 of 10 August 2007.

Persons interviewed:

/9/ Leandro Lexis Farina – Celulose Irani – Quality Manager

/10/ Eder Oliveira – Celulose Irani – Wastewater treatment supervisor

/11/ Luis Filipe Kopp – Ecosecurities

/12/ Thiago Viana – Ecosecurities

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APPENDIX A

VALIDATION PROTOCOL
FOR SMALL-SCALE CDM PROJECT ACTIVITIES

Table 1 Mandatory Requirements for Small Scale 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 The PDD identifies the United Kindom, as participating Annex I Party.
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, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	--	Table 2, Section A.3 Prior to the submission of this validation report for registration by the CDM Executive Board, DNV will have to receive the written approvals of voluntary participation from the DNA of Brazil and the DNA of United Kingdom, including the confirmation that the project assists 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, Simplified Modalities and Procedures for Small Scale CDM Project Activities §23a	--	Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approvals of voluntary participation from the DNA of Brazil and the DNA of the United Kingdom.
5. The emission reductions should 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.1 to E.4
6. Reduction in GHG emissions must 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	Kyoto Protocol Art. 12.5.c, Simplified Modalities and Procedures for Small	OK	Table 2, Section B.2.1

REQUIREMENT	REFERENCE	Conclusion	Cross Reference/Comment
absence of the registered CDM project activity	Scale CDM Project Activities §26		
7. Potential public funding for the project from Parties in Annex I shall not be a diversion of official development assistance	Decision 17/CP.7	OK	No public funding is involved.
8. Parties participating in the CDM shall designate a national authority for the CDM	CDM Modalities and Procedures § 29	OK	The Brazilian DNA is the Comissão Interministerial de Mudança Global do Clima. The DNA of the United Kingdom is the Department for Environment, Food and Rural Affairs.
9. The host Party and the participating Annex I Party shall be a Party to the Kyoto Protocol	CDM Modalities and Procedures § 30, 31b	OK	Brazil ratified the Kyoto Protocol on 23 August 2002. The UK ratified the Kyoto Protocol on 31 May 2002.
10. The participating Annex I Party's assigned amount shall have been calculated and recorded	CDM Modalities and Procedures §31b	OK	The UK's assigned amount is 92% of its 1990 emissions.
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	OK	The UK has in place a national registry and reported on 15 April 2004 its national GHG inventory for the years 1990-2002.
12. The proposed project activity shall meet the eligibility criteria for small scale CDM project activities set out in § 6 (c) of the Marrakesh Accords and shall not be a debundled component of a larger project activity	Simplified Modalities and Procedures for Small Scale CDM Project Activities §12a,c	OK	Table 2, Section A.1
13. The project design document shall conform with the Small Scale CDM Project Design Document format	Simplified Modalities and Procedures for Small Scale CDM Project Activities, Appendix A	OK	PDD is in accordance with CDM-SSC-PDD (version 3 of 22 December 2006).

REQUIREMENT	REFERENCE	Conclusion	Cross Reference/Comment
14. The proposed project activity shall confirm to one of the project categories defined for small scale CDM project activities and uses the simplified baseline and monitoring methodology for that project category	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22e	OK	Table 2, Section A.1.3, B and D
15. Comments by local stakeholders are invited, and a summary of these provided	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22b	OK	Table 2, Section G
16. If required by the host country, an analysis of the environmental impacts of the project activity is carried out and documented	Simplified Modalities and Procedures for Small Scale CDM Project Activities §22c	OK	Table 2, Section F
17. Parties, stakeholders and UNFCCC accredited NGOs have been invited to comment on the validation requirements and comments have been made publicly available	Simplified Modalities and Procedures for Small Scale CDM Project Activities §23b,c,d	--	The PDD was published on www.dnv.com/certification/ClimateChange. Parties, stakeholders and NGOs were through the UNFCCC CDM website invited to provide comments on the validation requirement during a period of 30 days from 13 April to 12 May 2007. No comment was received.

Table 2 Requirements Checklist

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
***A.* Project Description** The project design is assessed.					
A.1. Small scale project activity It is assess whether the project qualifies as small scale CDM project activity.					
A.1.1. Does the project qualify as a small scale CDM project activity as defined in paragraph 6 (c) of decision 17/CP.7 on the modalities and procedures for the CDM?	/1/	DR	The project applies the approved simplified baseline methodology for selected small-scale CDM project activity categories, category III.I small-scale CDM project activities (Other Projects Activities / "Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems"). /7/. This category is applicable as the project is an aerobic wastewater treatment in substitution of an anaerobic wastewater treatment, and avoids methane emissions with amount of emissions reductions lower than 60 kton/year CO2e.		OK
A.1.2. The small scale project activity is not a debundled component of a larger project activity?	/1/	DR	The project is not a de-bundled component of a larger project activity. Celulose Irani has another project activity in which the registered methodologies AMS-I.D. and AMS-III.E. are applied, and reduces Greenhouse Gases (GHG) emissions by switching from grid electricity to electricity generated from biomass residue burning, and also methane avoidance from biomass residues that would have otherwise been landfilled. The other project does not involve wastewater		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			treatment, and thus, employs a technology completely different from the project activity described in this PDD.		
A.1.3. Does proposed project activity confirm to one of the project categories defined for small scale CDM project activities?	/1/	DR	The project is a "Avoidance *of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems"* (Type III.I) small-scale CDM project activity as defined in the simplified modalities and procedures for small-scale CDM project activities.		OK
A.2. Project Design Validation of project design focuses on the choice of technology and the design documentation of the project.					
A.2.1. Are the project's spatial (geographical) boundaries clearly defined?	/1/	DR	The project is located at Vargem Bonita City in Santa Catarina State and has as boundaries the limits of the aerobic wastewater treatment of paper production effluent of Celulose Irani according to paragraph 2 of the simplified baseline and monitoring methodologies for small scale projects category III.I.		OK
A.2.2. Are the project's system (components and facilities used to mitigate GHG's) boundaries clearly defined?	/1/	DR	The project comprises the conversion of the current the anaerobic system (without methane recovery), to an aerobic system through the installation of a complementary activated sludge which is a result of a process in which oxygen is forced into wastewater to develop a biological floc (or solid) which reduces the organic content of the sewage. After undergoing this biological treatment, the organic material in the wastewater eventually decreases, resulting in clean water.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
A.2.3. Does the project design engineering reflect current good practices?	/1/	DR	The aerobic wastewater treatment technology appears to represent best practice in the paper industry.		OK
A.2.4. Will the project result in technology transfer to the host country?	/1/	DR	Not necessarily. The aerobic wastewater treatment is a common practice on paper sector industry.		OK
A.2.5. Does the project require extensive initial training and maintenance efforts in order to work as presumed during the project period? Does the project make provisions for meeting training and maintenance needs?	/1/	DR	The Celulose Irani wastewater treatment station supervisor receives training from APLISYA (Environment company) with respect to operational, chemical and biological operation control. This training will be transmitted to the other wastewater treatment and chemical and biological operators		OK
A.3. Contribution to Sustainable Development The project's contribution to sustainable development is assessed					
A.3.1. Will the project create other environmental or social benefits than GHG emission reductions?	/1/	DR	The project is likely to mitigate the environmental impacts like the reduction of BOD charge of Celulose Irani effluent discharged on Anta River and avoid methane and odour produced by anaerobic wastewater treatment.		OK
A.3.2. Will the project create any adverse environmental or social effects?	/1/	DR	Not foreseen.		OK
A.3.3. Is the project in line with sustainable development policies of the host country?	/1/	DR	Prior to the submission of this validation report to the CDM Executive Board, DNV will have to receive the written approvals of voluntary participation including the confirmation that the project assists in achieving sustainable development from the DNA of Brazil	--	
A.3.4. Is the project in line with relevant	/1/	DR	The project complies with environmental legislation		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
legislation and plans in the host country?			according to the Installation Environmental Licence 066/2006 for wastewater treatment station and Operation Environment License 269/2006 for the paper manufacture, issued by the Environmental Agency (FATMA) . All restrictions were complied.		
B. **Project Baseline** The validation of the project baseline establishes whether the selected baseline methodology is appropriate and whether the selected baseline represents a likely baseline scenario.					
B.1. Baseline Methodology It is assessed whether the project applies an appropriate baseline methodology.					
B.1.1. Is the selected baseline methodology in line with the baseline methodologies provided for the relevant project category?	/1/	DR	The project applies the approved simplified baseline methodology for selected small-scale CDM project activity categories, category III.I small-scale CDM project activities (Other Projects Activities / "Avoidance of methane production in wastewater treatment through replacement of anaerobic lagoons by aerobic systems"). /7/. This category is applicable as the project is an aerobic wastewater treatment in substitution of anaerobic wastewater treatment, and avoids methane emissions with amount of emissions reductions lower than 60 kton/year CO2e.		OK
B.1.2. Is the baseline methodology applicable to the project being considered?	/1/	DR	The baseline scenario is that the methane produced by degradation organic matter in wastewater through anaerobic wastewater treatment, and the baseline emissions are		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			calculated according AMS III.H considering the default IPCC values for Bo= 0,21 kg CH4/kg COD and for MCF=0,8 for lower value for anaerobic wastewater lagoons with more than 2 meters depth. The original lagoon, as verified by the project and during the site visit, had 3 meters depth.		
B.2. Baseline Determination It is assessed whether the project activity itself is not a likely baseline scenario and whether the selected baseline represents a likely baseline scenario.					
B.2.1. Is it demonstrated that the project activity itself is not a likely baseline scenario due to the existence of one or more of the following barriers: investment barriers, technology barriers, barriers due to prevailing practice or other barriers?	/1/	DR/I	The additionality of the project is demonstrated through an analysis of barriers for three options: i) proposed project activity without CDM, ii) continuation of current practice of anaerobic wastewater treatment and iii) constructions of anaerobic wastewater treatment with methane recovery or composting. The last option was removed due high changes on lay-out facilities. The barrier analysis (Investment, technical /technological, prevailing business practice and other barriers) demonstrates that the most plausible scenario is the continuation of current prevailing practice (continuation of use of anaerobic treatment for paper production effluent). However, as verified on 2005 and 2006 wastewater treatment reports, the efficiency of anaerobic wastewater treatment reach around 66% of BOD removal. The Santa Catarina state environment law (Decree 14,250) establishes a minimum efficiency of 80%	CAR 1:	

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			BOD removal for effluent to discharge on rivers. DNV request more clarification about considering the implementation of the project without CDM.		
B.2.2. Is the application of the baseline methodology and the discussion and determination of the chosen baseline transparent and conservative?	/1/	DR/I	The selected baseline emissions are calculated according AMS III.H considering the default IPCC values for Bo= 0,21 kg CH4/kg COD and for MCF=0,8 for lower value for anaerobic wastewater lagoons with more than 2 meters depth..		OK
B.2.3. Are relevant national and/or sectoral policies and circumstances taken into account?	/1/	DR	As verified on 2005 and 2006 wastewater treatment reports, the efficiency of anaerobic wastewater treatment reach around 66% of BOD removal however the Santa Catarina state environment law (Decree 14,250) establishes a minimum efficiency of 80% BOD removal for effluent to discharge on rivers.	CAR 1:	
B.2.4. Is the baseline selection compatible with the available data?	/1/	DR	Yes		OK
B.2.5. Does the selected baseline represent the most likely scenario describing what would have occurred in absence of the project activity?	/1/	DR/I	See B.2.1	CAR 1	
C. **Duration of the Project / Crediting Period** It is assessed whether the temporary boundaries of the project are clearly defined.					
C.1.1. Are the project's starting date and operational lifetime clearly defined?	/1/	DR	The project's starting date is 1 January 2006 and the expected operation lifetime of the project is more than 21 years.		OK
C.1.2. Is the assumed crediting time clearly defined (renewable crediting period of	/1/	DR	Yes. The project asks for a renewable crediting period of 7 years, starting on 1 January 2008.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
seven years with two possible renewals or fixed crediting period of 10 years with no renewal)?					
***D.* Monitoring Plan** The monitoring plan review aims to establish whether all relevant project aspects deemed necessary to monitor and report reliable emission reductions are properly addressed.					
D.1. Monitoring Methodology It is assessed whether the project applies an appropriate monitoring methodology.					
D.1.1. Is the selected monitoring methodology in line with the monitoring methodologies provided for the relevant project category?	/1/	DR	Yes, selected monitoring methodology is according to the methodology established for small scale projects categories III.I.		OK
D.1.2. Is the monitoring methodology applicable to the project being considered?	/1/	DR	Yes, it complies with the monitoring requirements for small scale projects categories III.I.		OK
D.1.3. Is the application of the monitoring methodology transparent?	/1/	DR	Yes		OK
D.1.4. Will the monitoring methodology give opportunity for real measurements of achieved emission reductions?	/1/	DR	Yes.		OK
D.2. Monitoring of Project Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
D.2.1. Does the monitoring plan provide for the collection and archiving of all relevant data	/1/	DR	The project emissions results of CH4 from aerobic		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
necessary for estimation or measuring the greenhouse gas emissions within the project boundary during the crediting period?			wastewater treatment, calculated through the flow and COD concentration at the entrance of aerobic tanks and CO2 from incomplete combustion of biomass. CO2 emissions associated with the the electricity consumed by the pumps, blowers and motors are considered as project emissions, The project participant will install an electricity meter on the distribution panel or will consider the total capacity of 840 kW as verified on equipment description and calculated trough the emission factor of 0,2611 calculates for the S-SE-CO Brazilian grid according to ACM0002 and the data of last years available.		
D.2.2. Are the choices of project emission indicators reasonable?	/1/	DR	Yes.		OK
D.2.3. Will it be possible to monitor / measure the specified project emission indicators?	/1/	DR	Yes. The flow is measured through calibrated Parshall flume, the COD contend is measured through weekly chemical analyses and the electricity will be measured with a specific meter or the total capacity of the aerobic wastewater treatment will be considered.		OK
D.2.4. Will the indicators give opportunity for real measurements of project emissions?	/1/	DR	Yes.		OK
D.3. Monitoring of Leakage It is assessed whether the monitoring plan provides for reliable and complete leakage data over time.					
D.3.1. Does the monitoring plan provide for the collection and archiving of all relevant data necessary for determining leakage?	/1/	DR	No leakage effects are expected (see E.2.1).		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
D.3.2. Are the choices of leakage indicators reasonable?	/1/	DR	N/A		OK
D.3.3. Will it be possible to monitor / measure the specified leakage indicators?	/1/	DR	N/A		OK
D.3.4. Will the indicators give opportunity for real measurements of leakage effects?	/1/	DR	N/A		OK
D.4. Monitoring of Baseline Emissions It is established whether the monitoring plan provides for reliable and complete project emission data over time.					
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/I	The project applies the monitoring methodology established according to the simplified monitoring methodology for category III.I small-scale CDM project activities. The main parameters are the flow at the entrance of wastewater treatment (Parshall flumes 3 and 4) and the COD contend on the aerobic tanks' entrance. As the electricity consumed by the pumps, blowers and motors is considered as project emissions, the project participant will install an electricity meter on the distribution panel or will consider the total capacity of 840 kW as verified on the equipment description. The calculation of CERs will be considered only for the month which the atmospheric temperature average will be over 15ºC. This temperature will be measured by the meteorological station of Celulose Irani.		OK
D.4.2. Is the choice of baseline indicators, in particular for baseline emissions,	/1/	DR	See D.4.1		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
reasonable?					
D.4.3. Will it be possible to monitor / measure the specified baseline indicators?	/1/	DR	Yes, it appears to be adequate.		OK
D.4.4. Will the indicators give opportunity for real measurements of baseline emissions?	/1/	DR	Yes.		OK
D.5. Project Management Planning It is checked that project implementation is properly prepared for and that critical arrangements are addressed.					
D.5.1. Is the authority and responsibility of project management clearly described?	/1/	DR/I	Detailed responsibilities and authorities for project management, procedures for monitoring and reporting, and QA/QC procedures are assured through ISO 9001 certification of Celulose Irani.		OK
D.5.2. Is the authority and responsibility for registration monitoring measurement and reporting clearly described?	/1/	DR	Yes		OK
D.5.3. Are procedures identified for training of monitoring personnel?	/1/	DR	Yes, all procedures for wastewater treatment and chemical and biological laboratory analysis are established as ISO 9001 procedures.		OK
D.5.4. Are procedures identified for emergency preparedness for cases where emergencies can cause unintended emissions?	/1/	DR	All troubleshooting of wastewater treatment including biological malfunction is described on operational procedures.		OK
D.5.5. Are procedures identified for calibration of monitoring equipment?	/1/	DR	Yes, the Parshall flume sensors are calibrated and included on critical A instruments. The chemical and biological laboratory has a procedure for calibration yearly and adjusts daily.		OK
D.5.6. Are procedures identified for maintenance	/1/	DR	Yes		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
of monitoring equipment and installations?					
D.5.7. Are procedures identified for monitoring, measurements and reporting?	/1/	DR	Yes, the chemical analyses are carried out weekly and the flow meter data is on line. All information is stored on a central server computer with systematic back-up		OK
D.5.8. 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.5.7		OK
D.5.9. Are procedures identified for dealing with possible monitoring data adjustments and uncertainties?	/1/	DR	Yes		OK
D.5.10. Are procedures identified for internal audits of GHG project compliance with operational requirements as applicable?	/1/	DR	Yes, according to the Quality Management System		OK
D.5.11. Are procedures identified for project performance reviews?	/1/	DR	Yes		OK
D.5.12. Are procedures identified for corrective actions?	/1/	DR	Yes according to the Quality Management System		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E. **Calculation of GHG emission** 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.					
E.1. Project GHG Emissions The validation of predicted project GHG emissions focuses on transparency and completeness of calculations.					
E.1.1. Are all aspects related to direct and indirect project emissions captured in the project design?	/1/	DR	CH_4 emissions associated with the wastewater aerobic treatment and CO_2 emissions associated with the electricity consumed by the aerobic treatment, calculated according to the Combined Margin established on ACM0002.		OK
E.1.2. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	Yes, see E.1.1		OK
E.1.3. Do the methodologies for calculating project emissions comply with existing good practice?	/1/	DR	Yes, according to the formulae established by the simplified baseline and monitoring methodologies for small scale project type III.I/III.H with respect to methane avoidance and ACM0002 for electricity consumption.		OK
E.1.4. Are the calculations documented in a complete and transparent manner?	/1/	DR	Yes.		OK
E.1.5. Have conservative assumptions been used?	/1/	DR	Yes. For CH_4 emission, default IPCC factors for the wastewater aerobic treatment are used. For CO_2 emissions with respect to the electricity		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
			consumed by the wastewater aerobic treatment according the combined margin, emission coefficient for the S-SE-CO grid is determined ex-ante in accordance to the simplified methodology for category I.D small-scale CDM project activities/ACM0002. The calculations are based on the 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 grid in the years 2003-2005, the most recent statistics available. For the determination of the operating margin (OM) emission coefficient, average plant efficiencies for different power plant types established in the IEA study on the Brazilian grid and IPCC carbon emission factors for specific fuels were applied to calculate plant specific emission coefficients. For the calculation of the build margin emission coefficient, the conservative plant efficiencies recommended by the CDM Executive Board at its 22nd meeting were applied. The resulting simple-adjusted OM emission coefficient is 0.4349 tCO2e/MWh and the BM emission coefficient 0.0872 tCO2e/MWh, resulting in a combined margin emission coefficient of 0.2611 tCO2e/MWh (weighted average of the build and operating margin).		
E.1.6. Are uncertainties in the project emissions estimates properly addressed?	/1/	DR	Yes, according to the formulae established by the simplified baseline and monitoring methodologies for small scale project type III.I.		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.2. Leakage 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.					
E.2.1. Are leakage calculation required for the selected project category and if yes, are the relevant leakage effects assessed?	/1/	DR	No leakage is foreseen once the aerobic wastewater equipments are new.		OK
E.2.2. Are potential leakage effects properly accounted for in the calculations (if applicable)?	/1/	DR	N/A		OK
E.2.3. Do the methodologies for calculating leakage comply with existing good practice (if applicable)?	/1/	DR	N/A		OK
E.2.4. Are the calculations documented in a complete and transparent manner and (if applicable)?	/1/	DR	N/A		OK
E.2.5. Have conservative assumptions been used (if applicable)?	/1/	DR	N/A		OK
E.2.6. Are uncertainties in the leakage estimates properly addressed (if applicable)?	/1/	DR	N/A		OK
E.3. Baseline GHG Emissions The validation of predicted baseline GHG emissions focuses on transparency and completeness of calculations.					
E.3.1. Are the baseline emission boundaries	/1/	DR	Yes, the project considers the boundaries		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
clearly defined and do they sufficiently cover sources for baseline emissions?			established in the simplified baseline and monitoring methodologies for type III.I corresponding to the wastewater anaerobic treatment of paper production effluent of Celulose Irani.		
E.3.2. Are all aspects related to direct and indirect baseline emissions captured in the project design?	/1/	DR	Yes, the direct baseline emissions are established considering the COD average contend of anaerobic wastewater treatment and the average flow of wastewater for the last 2 years, according to the simplified baseline methodology for category III.I small-scale CDM project activities. Indirect baseline emissions are not foreseen.		OK
E.3.3. Have all relevant greenhouse gases and sources been evaluated?	/1/	DR	See E.1.2		OK
E.3.4. Do the methodologies for calculating baseline emissions comply with existing good practice?	/1/	DR	Yes, according to the simplified baseline and monitoring methodologies for small scale category III.I.		OK
E.3.5. Are the calculations documented in a complete and transparent manner?	/1/	DR	The methane avoidance by replacement of anaerobic wastewater treatment by aerobic (biologic) wastewater treatment was determined using the IPCC default B_0= 0.21 kg CH_4/kg.COD and MCF_{lagoon}= 0,8 as per table III.H.1 under AMS III.H. The selection of these factors is reasonable.	CAR 2	OK
E.3.6. Have conservative assumptions been used?	/1/	DR	See E.3.5		OK
E.3.7. Are uncertainties in the baseline emissions estimates properly addressed?	/1/	DR	Yes		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
E.4. Emission Reductions Validation of baseline GHG emissions will focus on methodology transparency and completeness in emission estimations.					
E.4.1. Will the project result in fewer GHG emissions than the baseline case?	/1/	DR	The project is forecasted to reduce CO2 emissions to the extent of 388 871 tCO2e (55 553 tCO2e / year average) over the defined first renewable 7 years crediting period.		OK
F. **Environmental Impacts** It is assessed whether environmental impacts of the project are sufficiently addressed.					
F.1.1. Does host country legislation require an analysis of the environmental impacts of the project activity?	/1/	DR	The wastewater treatment of Celulose Irani has received the Installation Licence number 066/2006 from FATMA (State Environment Agency). All licenses and conditional clauses were verified during the site visit.		OK
F.1.2. Does the project comply with environmental legislation in the host country?	/1/	DR	See F.1.1		OK
F.1.3. Will the project create any adverse environmental effects?	/1/	DR	Not foreseen. The project is likely to mitigate the environmental impacts like the reduction of BOD charge of Celulose Irani effluent discharged on the Anta River and avoid methane and odour produced by the anaerobic wastewater treatment.		OK
F.1.4. Have environmental impacts been identified and addressed in the PDD?	/1/	DR	Yes		OK

CHECKLIST QUESTION	Ref.	MoV*	COMMENTS	Draft Concl.	Final Concl.
***G.* Comments by Local Stakeholder** Validation of the local stakeholder consultation process.					
G.1.1. Have relevant stakeholders been consulted?	/1/	DR	According to the Brazilian DNA Resolution 1, letters to main local stakeholders were issued.		OK
G.1.2. Have appropriate media been used to invite comments by local stakeholders?	/1/	DR	These letters were verified during the site visit.		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	Yes, see G.1.1		OK
G.1.4. Is a summary of the comments received provided?	/1/	DR	One comment that was supportive of the project was received and there was thus no need to modify the project.		OK
G.1.5. Has due account been taken of any comments received?	/1/	DR	See G.1.4		OK

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	Validation team conclusion
CAR 1: The additionality of the project is demonstrated through an analysis of barriers for three options: i) proposed project activity without CDM, ii) continuation of current practice of anaerobic wastewater treatment and iii) constructions of anaerobic wastewater treatment with methane recovery or composting. The option "iii" was excluded due high changes on lay-out facilities and consequent high investment. The barrier analysis (Investment, technical/technological, prevailing business practice and other barriers) demonstrates that the most plausible scenario is the continuation of current prevailing practice (continuation of use of anaerobic treatment for paper production effluent). However, as verified on 2005 and 2006 wastewater treatment report, the efficiency of anaerobic wastewater treatment reach around 66% of BOD removal however the Santa Catarina state environment law (Decree 14,250) establishes a minimum efficiency of 80% BOD removal for effluent to discharge on rivers. DNV request more clarification about considering the implementation of	B.2.1 B.2.3 B.2.5	The applicable legislation (State Decree 14,250) at Santa Catarina State, Brazil, establishes that the wastewater treatment system must have 80% or more of efficiency or an amount of BOD of 60 mg/L at the discharge to the water body. Celulose Irani has suffered an important growth of their production volumes, what has direct impact on the volumes of wastewater treated. Due to it, the current wastewater treatment is not in compliance with the national and local environmental regulations. With the baseline configuration, the project's wastewater treatment system discharge is a little bit higher than stated in the applicable legislation. Therefore, an alternative must be implemented in order to fulfill national and local environmental regulations. The project is still applicable to the chosen methodology and the baseline of this project activity is the use of anaerobic lagoons as the wastewater treatment system because of the following reasons: • The applicable legislation aimed to treat industrial effluents in order to discharge them in compliance with quality parameters levels. However, nor national neither local regulations aimed for an specific wastewater treatment, consequently all kind of wastewater treatment are permissible by the	DNV is aware of the fact that the lower expensive scenario was extension of the anaerobic wastewater treatment. As verified during the site visit, Celulose Irani has enough area to implement complementary ponds. DNV thus considers the anaerobic treatment as a likely scenario and the additionality is thus still justified.

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants response	Validation team conclusion
the project without CDM.		national and local Government regulations as long as the treated wastewater meets the discharge quality standards; • According to CONAMA (Environmental National Council, from Portuguese *Conselho Nacional do Meio Ambiente*), in its resolution number 20, from 18 June 1986, provides parameters to classify the waterbodies from the Brazilian Territory. The referred river that is used by the company to discharge its effluents is classified as a "Class 2" water, which includes, among other characteristics: o BDO5 in 20°C: maximum of 5 mg/1 O2; o OD, in any sample, not less than 5 mg/1O2; According to measurements performed by the Project Developer (available to the validator at the time of the site visit, using samples taken a few meters ebb tide from the place of the discharge), the river is being able to depurate the amount of organic matter successfully, remaining in the same CONAMA classification (Class 2). The river that is being used to discharge the water from the treatment system is a relatively big river, with capacity to depurate the amount of organic matter discharged in its body in the present day with minor impact on its water quality; • The efficiency of the treatment system (almost 70%) is very close to the one stated in the applicable legislation. By this fact, we can assume that the most attractive course of action to the project developer in order to	

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants response	Validation team conclusion
		comprise with the legislation is to build more anaerobic lagoons. As the project developer only needs to increase its efficiency in around 15%, if there is a minor increase in the volume used today to anaerobically treat the wastewater we can achieve this efficiency; • The approved methodology AM0013, in its page 6, approaches the problematic of environmental compliance of the wastewater discharge. In the flowchart provided in the referred page of the methodology, is stated that if the current system do not fulfill current environmental regulations, but the discharge limits can be met by introducing more ponds and there is land available to accommodate more ponds, the project is still additional and the baseline is anaerobic open lagoon. Therefore, as the small scale approved methodology AMS-III.I. does not approaches this problematic, the guidance provided by a similar approved large scale methodology is followed. As the new treatment system project already focus this problematic, the forecasted organic matter content of the effluent discharged, as well as the efficiency of the system under construction, is completely under the legislation requirements. In conclusion, according to the reasons presented above and mainly according to the guidance provided by a similar large scale methodology, this project	

Draft report corrective action requests and requests for clarifications	Ref. to Table 2	Summary of project participants response	Validation team conclusion
		activity can be considered additional and its baseline continues to be anaerobic lagoon.	

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APPENDIX B

CERTIFICATES OF COMPETENCE

CERTIFICATE OF COMPETENCE

Michael Lehmann

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	Yes
CDM Verifier:	Yes	***JI Verifier:***	Yes
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1,2,3 & 9		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0021*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029	Yes	*AM0023*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0024*	Yes
ACM0004	Yes	*AM0027*	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	*AM0028, AM0034*	Yes
ACM0007	Yes	*AM0030*	Yes
ACM0008	Yes	*AM0031*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0032*	Yes
AM0006, AM0016, AMS-III.D	Yes	*AM0035*	Yes
AM0009, AM0037	Yes	*AM0038*	Yes
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	*AM0041*	Yes
AM0014	Yes	*AM0034*	Yes
AM0017	Yes	*AMS-II.A-F*	Yes
AM0018	Yes	*AMS-III.A*	Yes
AM0020	Yes	*AMS-III.E, AMS-III.F*	Yes

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Einar Telnes

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	--
CDM Verifier:	Yes	***JI Verifier:***	--
Industry Sector Expert for Sectoral Scope(s):	Sectoral scope 1, 2, 3 6 & 10		
Technical Reviewer for (group of) methodologies:			
ACM0001, AM0002, AM0003, AM0010, AM0011, AM0012, AMS-III.G	Yes	*AM0027*	Yes
ACM002, AMS-I.A-D, AM0019, AM0026, AM0029, AM0045	Yes	*AM0028, AM0034*	Yes
ACM003, ACM0005, AM0033, AM0040	Yes	*AM0030*	Yes
ACM0004	Yes	*AM0031*	Yes
ACM0006, AM0007, AM0015, AM0036, AM0042	Yes	*AM0032*	Yes
ACM0007	Yes	*AM0035*	Yes
ACM0008	Yes	*AM0038*	Yes
ACM0009, AM0008, AMS-III.B	Yes	*AM0041*	Yes
AM0006, AM0016, AMS-III.D, ACM0010	Yes	*AM0034*	Yes
AM0009, AM0037	Yes	*AM0043*	
AM0013, AM0022, AM0025, AM0039, AMS-III.H, AMS-III.I	Yes	*AM0046*	
AM0014	Yes	*AM0047*	
AM0017	Yes	*AMS-II.A-F, AM0044*	Yes
AM0018	Yes	*AMS-III.A*	Yes
AM0020	Yes	*AMS-III.E, AMS-III.F*	Yes
AM0021	Yes		
AM0023	Yes		
AM0024	Yes		

Høvik, 5 February 2007

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director

CERTIFICATE OF COMPETENCE

Felipe Antunes

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	--	***JI Validator:***	-
CDM Verifier:	--	***JI Verifier:***	-
Industry Sector Expert for Sectoral Scope(s):			

Høvik, 5 February 2007

Einar Telnes Michael Lehmann
Director, International Climate Change Services Technical Director

CERTIFICATE OF COMPETENCE

Luis Filipe Tavares

Qualification in accordance with DNV's Qualification scheme for CDM/JI (ICP-9-8-i1-CDMJI-i1

GHG Auditor:	Yes		
CDM Validator:	Yes	***JI Validator:***	-
CDM Verifier:	Yes	***JI Verifier:***	-
Industry Sector Expert for Sectoral Scope(s):	ɔe 9 & 13		

Høvik, 6 November 2006

Einar Telnes
Director, International Climate Change Services

Michael Lehmann
Technical Director