




**Validation report form for post-registration changes for  
CDM project activities  
(Version 02.0)**

*Complete this form in accordance with the instructions attached at the end of this form.*

**BASIC INFORMATION**

<b>Title and UNFCCC reference number of the project activity</b>	Ciudad Juarez Landfill Gas to Energy Project No.1123
<b>Process track</b>	<input type="checkbox"/> Prior approval <input checked="" type="checkbox"/> Issuance <input type="checkbox"/> Renewal of crediting period
<b>Version number of the validation report on PRCs</b>	3.0
<b>Completion date of the validation report on PRCs</b>	09/05/2019
<b>Type(s) of PRCs</b>	<input type="checkbox"/> Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines <input checked="" type="checkbox"/> Corrections <input type="checkbox"/> Changes to the start date of the crediting period <input type="checkbox"/> Inclusion of a monitoring plan <input checked="" type="checkbox"/> Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools <input type="checkbox"/> Changes to the project design <input type="checkbox"/> Changes specific to afforestation and reforestation project activities
<b>Version number of PDD to which this report applies</b>	7.0
<b>Project participants</b>	Biogas de Juarez S.A. de C.V. BELEKTRON d.o.o
<b>Host Party</b>	Mexico
<b>Applied methodologies and standardized baselines</b>	ACM0001: "Large-scale Consolidated Methodology: Flaring or use of landfill gas." Version 15.0.
<b>Mandatory sectoral scopes linked to the applied methodology</b>	13.0 (Sectoral scope: Waste handling and disposal)
<b>Conditional sectoral scopes linked to the applied methodologies</b>	Scope number conditioned to the power plant component: 1.0  Sectoral scope: Energy industries (renewable - / non-renewable)
<b>Name and UNFCCC reference number of</b>	Instituto Colombiano de Normas Técnicas y Certificación

the DOE	– ICONTEC Internacional, E-0024
Name, position and signature of the approver of the validation report on PRCs	 German Nava Technical Director

**SECTION A. Executive summary**

&gt;&gt;

*Biogas de Juarez S.A. de C.V.* commissioned ICONTEC to carry out the validation assessment for a post-registration changes for the CDM project activity: “*Ciudad Juarez Landfill Gas to Energy Project (registration number 1123)*”. The request of post registration changes has been submitted in accordance with the CDM requirements /5/ /7/ /16/. The validation report of Post Registration Changes (PRC) analyzed the changes related to a correction on the use of parameters in operational conditions and not in standard conditions in attention to ruling note CDM-PA1123-RULE01 published on January 7<sup>th</sup>, 2019 /15/.

The proposed project examined under this validation process activity is located in Mexico, more specifically at the local landfill of Ciudad Juarez, in the state of Chihuahua. The project activity’s purpose is to maximize the capture of landfill gas (LFG) in actual operating zones within the perimeter of the Ciudad Juarez landfill site; and to combust it in order to generate electrical energy, and thus reduce fugitive emissions of methane generated by anaerobic waste degradation, and also displaces energy generated by fossil fuel combustion. In the absence of the proposed project activity, the waste would decay anaerobically and methane would be emitted freely to the atmosphere. The project applied the methodology “ACM0001: Large-scale Consolidated Methodology: Flaring or use of landfill gas.” (version 15.0)” /4/.

The purpose of the validation was to have an independent third-party assessment of the proposed post-registration changes for the revised PDD in order to request approval of these changes to the CDM EB. A complete description of the PRC is presented on the revised version of the PDD /2/ /3/ and it is described further in this validation report.

The present validation report includes the complete assessment and the validation opinion of ICONTEC for the proposed PRC valid for the registered CDM project activity as per latest version of its the revised PDD version 7.0 /3/, in accordance with applicable guidance of the latest version of the CDM project standard for project activities (version 02.0) /7/ and project cycle procedure (version 02.0) /16/. On the matters, the PRC was addressed by the project participant (PP) through the completion of a revised version of the PDD /2/ for the project activity that is valid for the crediting period from 30/11/2014 to 29/11/2021. In accordance with the applicable CDM requirements, the revised PDD version 7.0 /3/ correctly applies the latest version of the CDM-PDD form (version 10.1) /12/. Moreover, the completeness of the form of such revised version of the PDD /2/ /3/ was assessed by the audit team taking into account all applicable guidance/requirements for completing the CDM-PDD form /12/, and equally important, followed the instructions for completing this form.

At finished the validation, ICONTEC confirms that PRC complies with the relevant applicable requirements in CDM Project Standard /7/ related to corrections. Hence, ICONTEC recommends the approval of the changes of PDD provided by the PP. This Validation Opinion Report thus includes the complete assessment and the validation opinion of ICONTEC regarding the post-registration change valid for the registered CDM project activity as per latest version of its revised PDD version 7.0 /3/.

**SECTION B. Validation team, technical reviewer and approver**

&gt;&gt;

The validation assessment involves an independent and objective revision to determine whether the corrections from the registered PDD comply with the procedures of the UNFCCC. The validation opinion on the changes by ICONTEC has been prepared in accordance with the “CDM validation and verification standard” /5/.

**B.1. Validation team member**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk/document review	On-site inspection	Interviews	Validation findings
1.	Team Leader and Technical Expert sector 13	IR	Urrego Ortiz	Erika Lucia	ICONTEC	X	n/a	X	X

**B.2. Technical reviewer and approver of the validation report on PRCs**

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	EI	Grisales	Cristian	Freelance -ICONTEC
2.	Approver	IR	Nava	German	ICONTEC

Please refer to Appendix 2 below for demonstration of how the team meets the competence required for the validation opinion assessment.

**SECTION C. Means of validation****C.1. Desk/document review**

>>

The present validation assessment was performed to the PDD version 5 dated on 26/10/2017 /1/, Appendix 1 - 2017\_10\_16\_Baseline Calculations Ciudad Juarez\_PRC.xls. /8/ and the revised PDD /2,3/. Furthermore, the previous validation report and opinion /6/ were crosschecked by ICONTEC for this PRC process.

In addition to the documentation provided by the project proponent, ICONTEC reviewed:

- CDM validation & verification standard, version 02.0 /5/
- CDM project standard, version 02.0 /7/
- CDM project cycle procedure, version 02.0 /16/
- Approved Consolidated Methodology ACM0001, version 15: "Flaring or use of landfill gas" /4/ and clarification AM CLA 0252 /4/.
- Methodological Tool: "Project emissions from flaring" Version 2.0 /10/
- Methodological Tool: "Tool to determine the mass flow of a greenhouse gas in a gaseous stream", version 2.0 /11/
- Methodological Tool: "Tool to calculate the emission factor for an electricity system", version 4.0 /13/
- Methodological Tool: "Tool Emissions from solid waste disposal sites" Version 6.0.1 /14/
- Methodological Tool: Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 1.0 /9/
- Project design document form CDM-PDD-FORM, version 10.1 /12/

## C.2. On-site inspection

According to the CDM Validation and Verification Standard /5/, it is optional to conduct an on-site visit (VVS, v2, paragraph 340). Since the VVS does not explicitly require the validation team to conduct an on-site inspection during this kind of PRC (request of a correction), the validation assessment did not include an on-site visit. Therefore, the audit team focused on the information provided in the PDD versions 5 and 6.1 /1,2,3/, interview by virtual meeting, previous validation report and opinion /6/, baseline calculations dated on October 16<sup>th</sup>, 2017 /8/ and the previous ICONTEC's knowledge of the project (ICONTEC has made 2 previous verification processes including on-site visits).

## C.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Avendaño	Guadalupe	Carbon Consultant	08/02/2019 Virtual meeting	Changes of PDD.	Erika Urrego
2.	Herrada	Nancy	ERCP Management & Support		Explanation of corrections and whether it is complied with the requirements applicable. Clarify findings.	

## C.4. Sampling approach

>>

ICONTEC checked the 100% of project's information related to the PRC, hence no sampling approach was required.

## C.5. Clarification requests (CLs), corrective action requests (CARs) and forward action requests (FARs) raised

Areas of validation findings	No. of CL	No. of CAR	No. of FAR
Compliance with PDD form	--	--	--
Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines	--	--	--
Corrections	CL 1	CAR 1 CAR 2	--
Changes to the start date of the crediting period	--	--	--
Inclusion of a monitoring plan	--	--	--
Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools	--	CAR 2	--
Changes to the project design	--	--	--
Changes specific to afforestation and reforestation project activities	--	--	--
Others (please specify)	--	--	--
<b>Total</b>	1	2	--

## SECTION D. Validation findings

### D.1. Compliance with PDD form

<b>Means of validation</b>	<p>During the document review, the audit team verified the compliance of the revised PDD (both, in tracked-changes and clean versions) with the most up to date version of the PDD form and its instructions, provided in the UNFCCC website /12/.</p> <p>In accordance with applicable requirements of the CDM-VVS /5/, the audit team assessed the completion of the revised version of the PDD /2,3/ addressing the PRC. Among others, the audit team verified the correctness of the application of</p>
----------------------------	---

	the guidance for the completion of the PDD. In this sense, the validation focused on the assessing of how the information and documentation to demonstrate compliance with the CDM project activity requirements was fulfilled. The audit team verified the track changes and clean versions of the PDD /2,3/ against the applicable rules and requirements such as PS /7/. ICONTEC evaluated the description of the project activity (under its corrections) and confirmed that the revised PDD provides an understanding of its nature and implementation considering the PRC.
<b>Findings</b>	No findings were identified.
<b>Conclusion</b>	Registered /1/ and revised /3/ PDD were assessed in order to identify the consistency of the original information and assumptions of the registered PDD version 5 /1/ and the information and assumptions transferred to the revised version of the PDD version 7.0 /3/ applying to the approval of PRC. Information and assumptions are materially the same as those in the registered PDD /1/.  The revised PDD version 7.0 /3/ has been completed using the latest available template of CDM-PDD-FORM /12/.

## D.2. Temporary deviations from the registered monitoring plan, applied methodologies or applied standardized baselines

<b>Means of validation</b>	No were identified temporary deviations.
<b>Findings</b>	NA
<b>Conclusion</b>	NA

## D.3. Corrections

<b>Means of validation</b>	<p>ICONTEC carried out a documental review of PDD version 7.0 in both, track changes and clean and compared them with the version 5 of the registered PDD. As result of this assessment CL 1 and CAR 1 were raised.</p> <p>After the documentary review, a telephonic interview with the PP was conducted in order to clarify the reasons that generated the request for post-registration change. It was confirmed that the main reason was to comply with the ruling note CDM-PA1123-RULE01 published on January 7th, 2019 /15/, where it is indicated that in the monitoring plan of version 5 of the PDD were established standard conditions for the parameters: <math>LFG_{total}</math>, <math>LFG_{flared}</math>, <math>LFG_{electricity}</math> and density of methane <math>\rho_{CH_4} = D_{CH_4}</math> which had to be corrected to operational conditions in compliance with the applied methodology ACM0001 version 15 and related tools.</p> <p>On the version 5 of the PDD the density of methane <math>\rho_{CH_4} = D_{CH_4}</math> was a default value, on the version 7.0 this parameter is calculated, for this reason change of the section B.6.2 Data and parameters fixed ex ante, to the section B.7.1 Data and parameters to be monitored of PDD.</p> <p>To sum up, the corrections presented by the PP are:</p> <p>It was clarified on section B.7.1 of the revised PDD that the application of parameters <math>LFG_{total}</math>, <math>LFG_{flared}</math>, <math>LFG_{electricity}</math> and density of methane <math>\rho_{CH_4} = D_{CH_4}</math> in emission reductions calculation is done at operational conditions. The audit team reviewed the formulae stated in Section B.6.1 of the approved PDD /1/ where these parameters are applied at operational conditions, as it was required by the applied methodology/4/ and the tool to determine the mass flow of a greenhouse gas in gaseous stream, version 2.0.0 /11/.</p> <p>The formulae stated in Section B.6.1 of the approved PDD /1/ remains the same in the revised PDD /2/ /3/.</p> <p>On the other hand the audit team reviewed the spreadsheet used by the PP to calculate the ERs claimed for the monitoring period from May 13<sup>th</sup>/2016 to May 31<sup>st</sup>/2017 (file: 2019_02_20_Total ERY 3rd verification.xlsx) and the applied formulae used for parameters <math>LFG_{total}</math>, <math>LFG_{flared}</math>, <math>LFG_{electricity}</math> and density of methane <math>\rho_{CH_4} = D_{CH_4}</math> are at operational conditions.</p>
----------------------------	---

	<p>With these considerations, the audit team deemed the changes proposed by the PP as corrections since it provides clarification and correct an editorial mistake on how the parameters <math>LFG_{total}</math>, <math>LFG_{flared}</math>, <math>LFG_{electricity}</math> and density of methane <math>\rho_{CH_4} = D_{CH_4}</math> are taken into account for ERs calculation (at operational conditions) in accordance with Section 8.3.1 of VVS PA/5/, the 228 (a) and paragraph 232 and Appendix of PS PA /7/</p> <p>ICONTEC confirmed through a documentary review that corrections made in the revised PDD 7.0 are in accordance with the applied methodology ACM0001 version 15, related tools and the registered monitoring plan.</p> <p>During the telephonic interview, PP indicated that he is going to submit this post registration change together with the request for issuance of CER's for the 3<sup>rd</sup> monitoring period of the 2<sup>nd</sup> crediting period.</p>
<b>Findings</b>	CL 1, CAR 1 and CAR 2. More detail about these findings on Appendix 4
<b>Conclusion</b>	<p>PP resolved and corrected the findings identified during the documentary review on the version 6.1 of the revised PDD.</p> <p>ICONTEC confirms that in version 7.0 of PDD, the parameters have been corrected to operational conditions and the density of methane has been included on the section B.7.1. These corrections do not increase or reduce the baseline calculations, hence, the spreadsheet calculation presented for the previous post registration change approved by the board on February 12<sup>th</sup> 2018 does not have changes and it remains available on the UNFCCC webpage, file: Appendix 1 - 2017_10_16_Baseline Calculations Ciudad Juarez_PRC.xls /8/.</p> <p>According to PS paragraph 246 and its appendix (paragraph 1, (a)), this correction does not require prior approval by the board and may be suitable for approval under the issuance track for the 3<sup>rd</sup> monitoring period of the project.</p>

**D.4. Changes to the start date of the crediting period**

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

**D.5. Inclusion of a monitoring plan**

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

### D.6. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other applied standards or tools

<b>Means of validation</b>	<p>The PP has included the parameter density of methane: <math>\rho_{CH_4} = D_{CH_4}</math> as a monitored parameter in section B.7.1 of the revised PDD version 7.0 /2//3/, because the same is required to be calculated for the emission reduction calculation.</p> <p>The audit team reviewed the provisions of the applied methodology /4/ and the provisions of the Tool to determine the mass flow of a greenhouse gas in gaseous stream/11/ and confirmed that the parameter density of methane: <math>\rho_{CH_4} = D_{CH_4}</math> has to be monitored in order to calculate the emissions reductions of the project activity, as it was already stated in PDD version 5.0 (page 27), and now in version 7.0 of PDD, is clarified how the parameter density of methane: <math>\rho_{CH_4} = D_{CH_4}</math> is monitored.</p> <p>On the other hand, the audit team reviewed the spreadsheet used by the PP to calculate the ERs claimed for the monitoring period from May 13<sup>th</sup>/2016 to May 31<sup>st</sup>/2017 (file: 2019_02_20_Total ERY 3rd verification.xlsx, sheet: "Simplified MDelec XXXXX" column "J") and the applied formulae used for parameter density of methane <math>\rho_{CH_4} = D_{CH_4}</math> at operational conditions is correctly calculated.</p> <p>This change applied since May 13<sup>th</sup>/2016 to the end of the second crediting period.</p> <p>This change will not lead to a reduction in the accuracy of the calculation of GHG emission reductions nor it will reduce the level of accuracy of the monitoring compared with the requirements contained in the approved monitoring plan /1/; since the monitoring of density of methane is required by the regulatory documents issued by the CDM EB /4//11/</p> <p>As a result of this change, it was eliminated the parameter density of methane: <math>\rho_{CH_4} = D_{CH_4}</math> from B.6.2 of PDD version 7.0 /2//3/</p>
<b>Findings</b>	CAR 2. More details about this finding on Appendix 4
<b>Conclusion</b>	<p>After the assessment of this permanent change to the registered monitored plan, the audit team determined:</p> <ul style="list-style-type: none"> <li>• The proposed permanent change to the registered monitoring plan complies with the relevant requirements in Section 8.3.4 of the CDM project standard for project activities /7/</li> <li>• The proposed permanent change to the registered monitoring plan does not reduce the level of accuracy of the monitoring compared with the requirements contained in the approved monitoring plan.</li> <li>• The proposed permanent change to the registered monitoring plan does not lead to a reduction in the accuracy of the calculation of GHG emission reductions.</li> </ul>

### D.7. Changes to the project design

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

### D.8. Changes specific to afforestation and reforestation project activities

<b>Means of validation</b>	NA
<b>Findings</b>	NA
<b>Conclusion</b>	NA

## SECTION E. Internal quality control

>>

The technical review, understood as the internal quality control process to ensure the fulfilment of the validation criteria, was performed by a qualified internal technical reviewer as described in appendix 2 and in accordance with the internal procedures for carrying out validation of PRC established by ICONTEC. The technical review performed was independent from any periodic



validation assessment and it was carried out under the “prior approval process track” for addressing PRCs.

Following the PRC’s assessment results, the reviewer verified whether the PRC validation report and its procedures were in line with the specific requirements /5/ /7/ and methodological framework /4,9,10,11,13,14/. The technical review provides results and corrections to be attended by the audit team, including comments associated to the means of validation and reporting requirements. The audit team generated the final version of the report in response to the comments of the reviewer. Lastly, the audit team sent the final version of the present report to the final approval and subsequent submission.

## SECTION F. Validation opinion

>>

The audit team performed the validation assessment of the proposed PRC relative to corrections of the project activity: “Ciudad Juarez Landfill Gas to Energy” (UNFCCC Registration Reference No.1123). The corrections to the project activity are related to: change from standard to operational conditions on the monitoring plan and the inclusion of the parameter *Methane Density* on section B.7.1 of the PDD (currently this parameter has to be calculated). These changes also are performed attending the ruling note CDM-PA1123-RULE01 and requirements of methodology ACM0001 version 15 and related tools.

The validation assessment was carried out based on the rules and requirements defined by UNFCCC for the CDM project activities /5/ /7/ /16/. The revised PDD version 7.0 /3/ and telephonic based interview, provided the audit team with enough evidence to determine the fulfilment of stated criteria.

The information provided in version 7.0 of the revised PDD /3/ meets all relevant criteria stated in the UNFCCC rules and requirements for the CDM project activities. The updated PDD version 7.0 /3/ correctly applies the selected baseline and monitoring methodology described in the methodology ACM0001 version 15 /4/ as well as the relevant methodological tools /10,11,13,14/. In addition, the information contained in the revised version of the PDD /3/ correctly transferred the information from the registered PDD /1/ and is free of material misstatements. The calculations, assumptions and implications of the PRC on the matters of corrections do not imply affectations neither to the additionally of the project activity, nor to implementation or operation of the project. Moreover, the audit team is able to confirm that the revised version of the PDD /3/ was completed by correctly applying the latest version of the CDM-PDD form /12/ as well as following the guidelines provided in the previously mentioned form. For this reason, the estimated calculation of annual average GHG emission reductions is equal to the previously reported and approved post-registration change and it is maintained on 143,095 tCO<sub>2e</sub>.

In summary, ICONTEC through a revision of the documents provided by the PP, is able to confirm that:

- The post-registration changes comply with the applied methodology (ACM0001, version 15: “Flaring or use of landfill gas).
- The abovementioned post-registration changes are an accurate reflection of actual project implementation (monitoring plan).
- The above-mentioned post-registration changes do not affect the additionality of the proposed project activity or the validity of the baseline.
- The correction of the monitoring proposed by the applied methodology is not likely to lead to a reduction in the accuracy of the calculation of GHG emission reductions or net anthropogenic GHG removals.

Bogotá D.C., 09/05/2019

## Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified emission reductions
CL	Clarification Request
CO <sub>2</sub> E	Carbon dioxide equivalent
DOE	Designated Operational Entity
ERs	Emission Reductions
GHG	Greenhouse Gases
ICONTEC	Colombian Institute of Technical Standards and Certification (ICONTEC as per its acronym in Spanish)
MP	Methodologies Panel of the Executive Board of the CDM
MR	Monitoring Report
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
VVS	CDM Validation and Verification Standard
PP	Project Participant
IPCC	Intergovernmental Panel on Climate Change
PS	CDM Project Standard
PRC	Post-Registration Change

## Appendix 2. Competence of team members and technical reviewers

### Erika Lucia Urrego Ortiz

Lead auditor and Technical Expert (Sector 13)

#### MAIN PROFESSIONAL EDUCATION

Master degree on Quality and Integral Management. Santo Tomas University - ICONTEC. Bogotá, Colombia. April 2013.

Specialist in Environmental Management Systems. Externado de Colombia University. Bogotá D.C. September 2002

Zootechnician, Universidad Agraria de Colombia, Bogotá D.C. Colombia. August 1997.

Lead Auditor on Energy Management Systems under ISO 50001:2011. Bogotá, Colombia. July 2015.

Lead auditor on Quality Management Systems under ISO 9001, ICONTEC, Bogotá, Colombia. 2006.

Lead auditor on OHSAS 18001 and ISO 45001, ICONTEC, Bogotá D.C. July 2005 and 2018.

Lead auditor on Environmental Management Systems under ISO 14001, ICONTEC, Bogotá, Colombia. 2002.

Updating on CDM (Course), Ministry of Environment, Housing and Territorial Development, Bogotá D.C, Colombia. 2006

## PROFESSIONAL EXPERIENCE

- ICONTEC (2006 – Actual)

To prepare and perform the certification services assigned as per her Career Plan qualification, according to the stated on the procedures. To provide guidance to the certification costumers about the technical aspects of the assigned services provision. To participate in changing or designing Certification services, by changing or creating the respective procedures. Perform audits on schemes of ISO 9001, ISO 14001, OHSAS 18001, ISO 50001. Validation and verification of CDM projects like technical expert and lead auditor to scope 13.

- ASOCIACION COLOMBIANA DE PORCICULTORES-FNP (2003 – 2006) (Colombian Association of Pig Farmers)

To coordinate the activities to be performed by the Environmental Window Program in the various country areas. To allocate and execute resources engaged under the Cleaner Production agreements signed together with several environmental authorities. To lead the CDM project, focused to reduce methane (CH<sub>4</sub>) emissions issued by animal waste.

To be aware of the Ecuadorian and Chilean methodologies already approved by the CDM's Executive Board for Hog Breeding Sector to elaborate a proposal for the hog breeding sector together with the Ministry of Environment, Housing and Territorial Development in order to join farms to CDM projects.

- FICHTNER GmbH & Co. KG (2001 – 2002)

To prepare, design and apply surveys focused to identify power consumption in the sector of slaughter, processed meat and food concentrate for animals

- Regional Environmental Authority (CAR Sumapaz) 1998 – 2001

To support the environmental management unities on technical concepts of processes, permissions, sanctions, control, monitoring and assessment in the proper and timely management of the Sumapaz area's natural resources.

## EXPERIENCE IN CDM ACTIVITIES

Lead auditor on validation MDL:

1. Validation of Macano Small Hydro Power Plant, Panamá
2. Validation of Montenegro Landfill Gas Recovery and Flaring, Colombia
3. Validation of Monteria Landfill Gas Recovery and Flaring, Colombia
4. Validation of Pirgua Landfill Gas Recovery and Flaring, Colombia
5. Validation of Tunjita Diversion Hydroelectric Project, Colombia

6. Validation of El Toqui wind power project, Chile
7. Validation of Los Angeles Landfill Gas Flaring Project, Colombia
8. Validation of Ferreira Gomes Hydro Power Plant CDM Project, Brazil
9. Validation of BRASILM 1 - Avoidance of Methane Emissions through Composting of Manure Waste, Brazil
10. Validation of CGR Catanduva Landfill Gas Project, Brazil
11. Validation of Macaubas Landfill Gas Project, Brazil
12. Validation of Palmaceite Wastewater Treatment and Biogas Utilization Project, Colombia
13. Validation of Teresina Landfill Gas Project, Brazil
14. Validation of Maceio Landfill Gas Project, Brazil
15. Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
16. Validation Doña Teresa Small hydro power plant, Colombia
17. Validation Biogas recovery and heat generation from Palm Oil Mill Effluent (POME), Coopeagropal. Costa Rica.
18. Validation Panuco Bagasse Cogeneration Project. México.

Lead auditor on verification MDL:

1. Verification of Biogas energy plant from palm oil mill effluent, Guatemala 2
2. Verification of Doña Juana Landfill gas-to-energy project, Colombia
3. Verification of Tres Valles Cogeneration Project, Honduras
4. Verification of Landfill Gas to Energy Facility at the Nejapa Landfill Site, El Salvador, El Salvador
5. Verification of La Venta II, México
6. Verification of Jepirachi Wind Power Project, Colombia
7. Verification of Santa Ana Hydroelectric Project, Colombia
8. Verification of BRASCARBON Methane Recovery Project BCA-BRA-01, Brazil
9. Verification of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
10. Verification of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
11. Verification of Ciudad Juarez Landfill gas-to-energy Project, México.

Lead auditor renewal crediting period:

1. Monte Rosa Bagasse Cogeneration Project (MRBCP)

Lead auditor on other schemes:

1. Validation VCS de Reforestación de áreas de pastura en la Sociedad Agrícola de Interés Social "José Carlos Mariátegui" – Proyecto Joven Forestal, Perú.
2. Validation Gold Standard Energy Efficiency at Ladrillera Alcarraza, Colombia.
3. Validation Gold Standard de Paramonga Bagasse Boiler Project, Perú.
4. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-02, Brazil
5. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-03, Brazil
6. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-05, Brazil
7. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-07, Brazil
8. Validation and Verification VCS of BRASCARBON Methane Recovery Project BCA-BRA-08, Brazil

Technical Expert:

1. Validation of ECC methane capture and combustion from AWMS at dairy farms in Mexico – I, México

## 2. La Calera Biodigesters Project, Perú

## Technical Review

1. Validation of Fuel Switching through change of furnaces at Imusa S.A., Colombia
2. Validation of Cervecería Hondureña Methane Capture Project, Honduras
3. Validation of Paysandú Clean Energy, Uruguay
4. Validation of Securitization and Carbon Sinks Project, Chile
5. Validation of METALDOM Fossil fuel switch from reheat furnace, República Dominicana
6. Validation of Reforestation of degraded/degrading land in the Caribbean Savannah of Colombia, Colombia
7. Validation of Co-composting of organic residues in ORO ROJO's Palm Oil Mill at Sabana de Torres, Colombia
8. Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle, Colombia
9. Validation of Energy efficiency at Malvinas Gas Plant, Perú
10. Validation of Marañón Hydroelectric Project, Perú
11. Validation of Santa Rita Hydroelectric Plant, Guatemala
12. Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
13. Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
14. Validation of CTR Rosario Landfill Gas Project, Brazil
15. Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil
16. Validation of Taurichuco Hydropower Project, Perú
17. Validation of Feira de Santana Landfill Gas Project, Brazil
18. Validation of Doña Juana Landfill gas-to-energy Project, Colombia
19. Renovación Inversiones Hondurenas Cogeneration Project
20. Validación SHPs Tambaú, das Pedras and Rio do Sapo CDM Project (JUN1132), Brazil
21. Validación SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil
22. Validación Santa Rita Hydroelectric Plant, Colombia
23. Validation Conservation and reforestation of degraded areas in Barbosa, Colombia
24. Verification Doña Juana Landfill gas-to-energy Project, Bogotá, Colombia.
25. Verificación Monomeros nitrous oxide abatement project. Barranquilla, Colombia.
26. Verification BRT Bogotá, Colombia: TransMilenio Phase II to IV
27. Verification BRT Macrobus Guadalajara, Mexico
28. Verification Inversiones Hondurenas Cogeneration Project, Honduras.
29. Verification Incauca S. A. Fuel Switch from Coal to Green Harvest Residues CDM Project. Colombia.

**Cristian Grisales**

Technical review (Sector 01 and 13)

**Education:**

Master Executive in Renewable Energies

EOI-Madrid, Spain

February 2015

Certified ISO 14001

ICONTEC

May 2013

Certified ISO 9001

ICONTEC

August 2012

Electrical Engineer

National University of Colombia  
Bogotá – Colombia  
July 2009

### **Professional Background:**

Professional of Climate Change and Sustainability (freelance)

ICONTEC

May 2012 - Today

Professional on developing validation and verification on CDM projects as lead auditor and as technical expert in the energy and waste handling and disposal sectors.

Electrical Maintenance Engineer

EMGESA S.A ESP. Colombia

November 2009 - May 2012

Electrical maintenance engineer in the Bogotá River Hydroelectric plants. Executing preventive, predictive and corrective maintenance of the generators, auxiliary services, power transformers and electrical substation. Developed the investment projects' inventory in accordance with the annual operating budget. Implementation of RCM maintenance programs. Monthly service availability in the plant, and full-time availability in failure care. Electrical testing of generators, transformers, motors and substation equipment.

### **CDM Experience**

#### **Auditor and Specialist:**

- Validation of Biogas Project, Olmeca I, Santa Rosa, Guatemala
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil
- Validation of Taurichuco Hydropower Project, Perú
- Validation of Teresina Landfill Gas Project, Brazil
- Validation of Maceio Landfill Gas Project, Brazil
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia
- Validation of Doña Teresa Small Hydro Power Plant, Colombia
- Verification of the Ciudad Juarez Landfill Gas Project, Mexico
- Verification and Renewal of the Crediting Period of LaGeo Geothermal Project, Salvador
- Verification of Santa Ana Hydro Power Project, Colombia.
- Validation of SHPS Tambaú, Das Pedras and Rio Do Sapo Cdm Project (JUN1132), Brazil
- Validation of SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil
- Verification of Conversion of Open Cycle Gas Turbines to Combined Cycle at Kallpa Thermoelectric Power Plant
- Verification of Biogas project, Olmeca III, Tecún Uman
- Verification of DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT
- Verification of Combined Cycle at Loma de la Lata Thermo Unit Project, Argentina.
- Validation Cururos Wind Farm Project
- Validation Rio Amoya Run River Hydro Project

#### **Technical Reviewer:**

- Validation of Thuan Nhen Phong Wind Farm, Vietnam
- Validation of Phuong Mai 3 Wind Power Project, Viet Nam
- Validation of Chamelecón 280 Hydroelectric project, Honduras
- Validation of Providencia I: 1.8MW Small Hydro Power Generation Plant, Colombia
- Validation of Providencia III: 9.11MW Small Hydro Power Generation Plant, Colombia
- Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil, Brazil

- Renewal of Aguafresca Multipurpose and Environmental Service Project, Colombia
- Validation of Feira de Santana Landfill Gas Project, Brazil
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Santa Ana Hydroelectric Plant, Colombia
- Verification of Methane recovery and effective use of power generation project Norte III-B Landfill, Argentina
- Verification of DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT, Colombia
- Validation of Suba and Usaquen hydroelectric CDM umbrella project, Colombia
- VCS Validation of Hydroelectric Project Ituango, Colombia
- Verification of La Venta II Wind Power Project, México
- Validation of Panuco Bagasse Cogeneration Project, Brazil
- GS Validation of BK ENERGIA ITACOATIARA PROJECT, Brazil
- Verification of MIO Cali, Colombia
- VCS Validation of HYDROELECTRIC PROJECT EL EDÉN, Colombia
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala
- Verification of Agua Fresca Multipurpose and environmental services project, Colombia
- GS Validation of PARAMONGA BAGASSE BOILER PROJECT, Brazil
- Renewal of Crediting Period Poechos II hydroelectric plant project
- Renewal of Crediting Period Xacbal Hydroelectric Project
- Renewal of Crediting Period Queluz Renewable Energy Project
- Verification La Vuelta and La Herradura Hydroelectric Project
- Verification Orosí
- Validation VCS PUBLIC LIGHTING SERVICE IN THE MUNICIPALITY OF SAN SALVADOR delta
- Validation VCS ESCUELA DE MINAS
- Validation VCS Larimar Wind Farm Project
- Verification La Vuelta and La Herradura Hydroelectric Project
- Verification DOÑA JUANA LANDFILL GAS-TO-ENERGY PROJECT
- Verification Sogamoso Hydroelectric Project
- Validation Poechos I Project
- Verification Agua fresca multipurpose and environmental services project

### Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
1	PP	Approved PDD Version 5.0, date: 26/10/2017	<a href="https://cdm.unfccc.int/Projects/DB/TUE V-SUED1179241731.11/view">https://cdm.unfccc.int/Projects/DB/TUE V-SUED1179241731.11/view</a>	UNFCCC Website
2	PP	Revised PDD version 6.0, track changes, date: 11/01/2019 Revised PDD version 6.1, track changes, date: 12/02/2019  Revised PDD version 7.0, track changes, dated 08/05/2019	2019_01_11_v.6.0_Ciudad Juarez_PDD_track-changes  2019_02_12_v.6.1_Ciudad Juarez_PDD_track-changes  2019_05_08_v.7.0_Ciudad Juarez_PDD_track-changes	PP
3	PP	Revised PDD version 6.0, clean version, date:	2019_01_11_v.6.0_Ciudad Juarez_PDD_clean	PP



		11/01/2019 Revised PDD version 6.1, clean version, date: 12/02/2019	2019_02_12_v.6.1_Ciudad Juarez_PDD_clean	
		Revised PDD version 7.0, clean version, dated 08/05/2019	2019_05_08_v.7.0_Ciudad Juarez_PDD_clean	
4	UNFCCC	Methodology: ACM0001, version 15: "Flaring or use of landfill gas". Clarification AM CLA 0252.	<a href="https://cdm.unfccc.int/methodologies/PAmethodologies/approved">https://cdm.unfccc.int/methodologies/P Amethodologies/approved</a>	UNFCCC website
5	UNFCCC	CDM validation & verification standard Version 02.0	<a href="https://cdm.unfccc.int/Reference/Standards/index.html">https://cdm.unfccc.int/Reference/Stand ards/index.html</a>	UNFCCC website
6	ICONTEC	Previous validation report and opinion Version 3.0. 04/12/2017.	<a href="https://cdm.unfccc.int/Projects/DB/TUEV-SUED1179241731.11/view">https://cdm.unfccc.int/Projects/DB/TUE V-SUED1179241731.11/view</a>	UNFCCC website
7	UNFCCC	CDM project standard Version 02.0	<a href="https://cdm.unfccc.int/Reference/Standards/index.html">https://cdm.unfccc.int/Reference/Stand ards/index.html</a>	UNFCCC website
8	PP	Appendix 1 - 2017_10_16_Baseline Calculations Ciudad Juarez_PRC.xls.	<a href="https://cdm.unfccc.int/PRCContainer/DB/prcp608476019/view">https://cdm.unfccc.int/PRCContainer/D B/prcp608476019/view</a>	UNFCCC website
9	UNFCCC	Methodological Tool to calculate baseline, project and/or leakage emissions from electricity consumption", version 1.0	<a href="https://cdm.unfccc.int/Reference/tools/index.html">https://cdm.unfccc.int/Reference/tools/i ndex.html</a>	UNFCCC website
10	UNFCCC	Methodological Tool: "Project emissions from flaring" Version 2.0	<a href="https://cdm.unfccc.int/Reference/tools/index.html">https://cdm.unfccc.int/Reference/tools/i ndex.html</a>	UNFCCC website
11	UNFCCC	Methodological Tool: Tool to determine the mass flow of a greenhouse gas in a gaseous stream", version 2.0	<a href="https://cdm.unfccc.int/Reference/tools/index.html">https://cdm.unfccc.int/Reference/tools/i ndex.html</a>	UNFCCC website
12	UNFCCC	CDM-PDD-FORM Project Design Document Form version 10.1.	<a href="https://cdm.unfccc.int/Reference/PDDs_Forms/index.html">https://cdm.unfccc.int/Reference/PDDs _Forms/index.html</a>	UNFCCC website
13	UNFCCC	Methodological Tool: "Tool to calculate the emission factor for an electricity system", version 4.0	<a href="https://cdm.unfccc.int/Reference/tools/index.html">https://cdm.unfccc.int/Reference/tools/i ndex.html</a>	UNFCCC website
14	UNFCCC	Methodological Tool: "Tool Emissions from solid waste disposal sites" Version 6.0.1	<a href="https://cdm.unfccc.int/Reference/tools/index.html">https://cdm.unfccc.int/Reference/tools/i ndex.html</a>	UNFCCC website
15	UNFCCC	CDM-PA1123-RULE01 published on January 7th, 2019.	<a href="http://cdm.unfccc.int/Reference/Rulings/index.html">http://cdm.unfccc.int/Reference/Rulings /index.html</a>	UNFCCC website
16	UNFCCC	CDM project cycle procedure Version 02.0	<a href="http://cdm.unfccc.int/Reference/Procedures/index.html">http://cdm.unfccc.int/Reference/Proced ures/index.html</a>	UNFCCC website

## Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. CLs from this validation

CL ID	01	Section no.	D.3.	Date:	08/02/2019
<b>Description of CL</b>					
<p>The change requested by the PP does not correspond to a permanent deviation from the monitoring proposed by the applied methodology as it is indicated on appendix 7 Summary of post-registration changes on the PDD version 6.</p> <p>Paragraph 8.3 of Project Standard version 02.0</p>					
<b>Project participant response</b>					<b>Date:</b> 13/02/2019
<p>The PRC proposed is a Permanent change, type: correction, as indicated in section 8.3.1 of the Project Standard, version 02.0.</p> <p>The same is now specified in appendix 7 of the PDD, version 6.1</p>					
<b>Documentation provided by project participant</b>					
PDD version 6.1					
<b>DOE assessment</b>					<b>Date:</b> 14/02/2019
<p>ICONTEC confirms that the proposed post-registration change corresponds to a correction because the PP is able of complying with the monitoring plan and it does not require a deviation of the methodology ACM0001 version 15.</p> <p>Closed.</p>					

Table 2. CARs from this validation

CAR ID	01	Section no.	D.3.	Date:	08/02/2019
<b>Description of CAR</b>					
<p>On PDD, Section B.7.1. Data and parameters monitored, it was not included the parameter <math>\rho_{CH_4} = D_{CH_4}</math> Density of Methane.</p> <p>Paragraph 361 of VVS version 02.0.</p>					
<b>Project participant response</b>					<b>Date:</b> 13/02/2019
<p>Parameter is now included in section B.7.1 and erased from section B.6.2.</p> <p>Fulfilling the instructions for completing the PDD form, section B.6.2, specifically: "...Do not include data that are calculated with equations provided in the applied methodologies (tools)..."</p>					
<b>Documentation provided by project participant</b>					
PDD version 6.1					
<b>DOE assessment</b>					<b>Date:</b> 14/02/2019
<p>ICONTEC confirmed that the parameter: density of methane has been included in the section B.7.1 of the revised PDD, version 6.1.</p> <p>Closed.</p>					

CAR ID	02	Section no.	D.3.	Date:	08/05/2019
<b>Description of CAR</b>					
<p>In the revised PDD, in particular four parameters <math>LFG_{total}</math>, <math>LFG_{flared}</math>, <math>LFG_{electricity}</math> and <math>\rho_{CH_4} = D_{CH_4}</math>, the changes are regarded as correction. Provide information on how it has concluded that the proposed changes are corrections.</p>					
<b>Project participant response</b>					<b>Date:</b> 08/05/2019

The proposed changes are now correctly indicated, as per PDD and MR:

SUMMARY of proposed Post-Registration changes in version 7.0, of the PDD:

Permanent changes:

1. Corrections (under section 8.3.1 of the CDM project standard for project activities, version 02.0)

Parameters: LFG<sub>total</sub>, LFG<sub>flared</sub>, LFG<sub>electricity</sub> and  $pCH_4 = DCH_4$ , have changed in order to comply with the following paragraph of Ruling Note: CDM-PA1123-RULE01:

“(a) The monitoring plan under valid version of the PDD applies standard conditions (STP expressed in Nm<sup>3</sup>, Normal Cubic Meter unit) for the parameters: LFG<sub>total</sub>, LFG<sub>flared</sub>, LFG<sub>electricity</sub> and  $DCH_4 = pCH_4$ . However, application of these parameters at standard conditions is not in accordance with the applied version of the methodology and the tool, which require the parameters to be determined at the operating conditions”.

Due to an editorial mistake the mentioned parameters are seemed to be applied at standard conditions, however the monitoring is done at operating conditions and further calculations using these parameters are done at operating conditions too, as required by applicable methodology and tool. Therefore, the units and conditions are now correctly and accurately indicated in the PDD.

2. Permanent changes to the registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines, or other methodological regulatory documents (under section 8.3.4 of the CDM project standard for project activities, version 02.0)

Also, parameter  $pCH_4 = DCH_4$  was moved from section B.6.2 Data and parameters fixed ex ante to section B.7.1 Data and parameter to be monitored, in order to fulfil the instructions for completing the PDD form, section B.6.2, specifically: “...Do not include data that are calculated with equations provided in the applied methodologies (tools)...”. The parameter was accidentally not included in this section before.

Although the PP is able to implement the registered monitoring plan, and the monitoring plan would not be permanently deviate from applied methodology or tools, the non-conforming is related to the “Instructions for completing the CDM-PDD form” and the alternative is to change the mentioned parameter from section B.6.2 to section B.7.1. Any assumption or discount factor is needed since Emission Reductions will not change due to this permanent change to the registered monitoring plan.

#### Documentation provided by project participant

PDD, version 7.0

MR, version 7.0

#### DOE assessment

Date: 08/05/2019

In the updated versions of revised PDD (version 7.0) and MR (version 7.0), it was clarified how the post-registration changes have been addressed by the PP as correction (for parameters LFG<sub>total</sub>, LFG<sub>flared</sub>, LFG<sub>electricity</sub> and  $DCH_4 = pCH_4$ ), as well as permanent change in the monitoring plan (for parameter  $DCH_4 = pCH_4$ ).

The audit team assessed these post-registration changes in accordance with the provisions stated in sections 8.3.1 and 8.3.4 of PS PA and sections 8.3.1 and 8.3.4 of VVS PA. The audit team deemed that post-registration changes presented are in compliance with the CDM EB regulatory provisions.

Audit team conclusion:

Closed

**Table 3. FARs from this validation**

FAR ID	xx	Section no.	Date: DD/MM/YYYY
Description of FAR			
Project participant response			
Date: DD/MM/YYYY			
Documentation provided by project participant			
DOE assessment			
Date: DD/MM/YYYY			

--

- - - - -

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
02.0	31 October 2017	Revision to align with the requirements in the “CDM validation and verification standard for project activities” (version 01.0).
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory		
Document Type: Form		
Business Function: Registration		
Keywords: post-registration change, project activities, validation report		