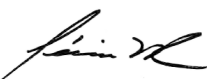




Verification and certification report form for CDM project activities

(Version 01.0)

VERIFICATION AND CERTIFICATION REPORT

Title of the project activity	Suba and Usaquen hydroelectric CDM umbrella project
Reference number of the project activity	9798
Version number of the verification and certification report	02.0
Completion date of the verification and certification report	12/05/2017
Monitoring period number and duration of this monitoring period	First Monitoring Period 04/06/2014 - 31/12/2015
Version number of monitoring report to which this report applies	03
Crediting period of the project activity corresponding to this monitoring period	Renewable, 04/06/2014 – 03/06/2021, seven years
Project participant(s)	Empresa de Acueducto y Alcantarillado de Bogotá E.S.P.-EAAB
Host Party	Colombia
Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)	Sectoral Scope: 1- Energy industries (renewable - / non-renewable sources) Methodology AMS-I.D Grid connected renewable electricity generation, version 17.0
Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD	16,450 tCO ₂ e
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	12,094 tCO ₂ e
Name of DOE	Colombian Institute for Technical Standards and Certification (ICONTEC)
Name, position and signature of the approver of the verification and certification report	 Monica Vivas Head of Conformity Assessment

SECTION A. Executive summary

ICONTEC performed the 1st periodic verification of the registered CDM project Suba and Usaquen hydroelectric CDM umbrella project in Colombia on the basis of UNFCCC criteria contained in Article 12 of the Kyoto Protocol and CDM modalities and procedures according to the Marrakech Agreement, the criteria of the CDM Executive Board and the host country, as well as the operational and technical monitoring criteria specific to this type of project.

The proposed project activity under this verification process is based on methodology AMS-I.D: Grid connected renewable electricity generation, version 17.0. The project involves the installation of two small run-of-river hydroelectric plants (Suba and Usaquen), which take advantage of the water flow supply system of Bogotá. The project activity has a total effective capacity of 3.77 MW (rated capacity of turbine-generator system). The energy produced by this project activity will be delivered to the Colombian electrical grid.

The verification process consisted of the following three phases:

- I. Desk review of the monitoring documentation, registered PDD, validation report and if apply, previous verification reports and relevant information (e.g. IPCC reports).
- II. On-site visit and follow up interviews with project stakeholders
- III. Resolution of outstanding issues and the issuance of the final verification and certification report.

The review of the monitoring documentation, registered PDD, validation report, relevant information and interviews during the on-site visit allowed ICONTEC to collect enough evidence to completely assess the verification criteria and determinate that the project has been implemented as planned and as it has been described in the registered PDD version 04.0. Emission reductions were correctly calculated based on the PDD and the monitoring equipment with an impact on the claimed emission reductions work reliably. The monitoring system is in place and has been calibrated appropriately. ICONTEC can confirm that the GHG emission reductions are calculated without material misstatements.

SECTION B. Verification team, technical reviewer and approver**B.1. Verification 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 review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader and Technical Expert in Sectoral Scope 1.2	IR	Ramirez	Francy	Employee	✓	✓	✓	✓

B.2. Technical reviewer and approver of the verification and certification report

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 Expert Reviewer in Sectoral Scope 1.2	EI	Grisales	Cristian	Freelance
2.	Approver	IR	Vivas	Monica	Employee

SECTION C. Application of materiality**C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions	Low	The monitoring data is exported directly from XM Web page, so there is low potential risk of errors/errors, omissions or misstatements.	To cross check 100% of electricity generation stated in Excel ER spreadsheet with the information available in XM Web page.
2.	Undue reliance on a designed information system, which may lead to Omissions and misstatements in data transfer from raw data into digital Excel ER spreadsheet	Low	Ineffective quality control of data transfer due to unclear QA/QC procedure.	Check Quality Management procedures and instructives. PP may demonstrate how to transfer data and how this is crosschecked. Conduct interview with related personnel whether procedure is actually conducted but not adequately described.
3.	Calibration delays on monitoring equipment	Medium	Since the power plants began their operation on April 2013 and is was written in the MR version 1 the existence of one calibration activity, it is missing other calibration activity for one set of measurement equipment (CL 5).	In the audit plan was included the review of all the calibration certificates (100%).
4.	Missing data due to failure of measurement equipment	Low	The monitoring plan defines emergency procedures in case a meter fails. Besides back-up meters are either installed or available onsite for fast exchange.	Check if related meters are installed as per monitoring plan. Check if emergency procedure is known across related personnel via interviews. Check back-up meters on correct calibration.
5.	Possibility of post-registration changes	Medium	Inasmuch as this is the first verification process after the registration of the project activity, maybe the implementation of the project activity could vary from the original project design described in the registered PDD	In the audit plan was included a tour by the facilities of both hydroelectric power plants

C.2. Consideration of materiality in conducting the verification

A risk assessment was undertaken by the verification team by means of onsite physical inspection, and document review. The audit team checked the 100% of the possible material misstatements, hence, no sampling plan was required in the monitoring plan. The verification team is able to confirm that all material misstatements were properly conducted and the required corrections were performed by the PP on the version 02 of the MR.

SECTION D. Means of verification**D.1. Desk review**

The verification of the project documentation provided by the project proponent is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emission reports, and review and internal audit of calculations.

Main documents reviewed during the desk review stage, provided by the project proponent, are:

- Registered PDD version 04.0, dated on April 25th/2014
- Previous validation report issued by ICONTEC, dated on May 19th/2014
- Monitoring report as submitted to UNFCCC, version 1, dated on October 12th/2016
- Emission reduction calculation file dated on October 12th/2016

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

- Methodology AMS-I.D: Grid connected renewable electricity generation, version 17.0
- CDM validation & verification standard, version 09.0
- CDM project standard, version 09.0
- CDM project cycle procedure, version 09.0
- Guideline on the application of materiality in verifications, version 02.0
- Monitoring report form, version 05.1

A compilation of the documents related to the verification activities have been compiled under Appendix 3.

D.2. On-site inspection

Duration of on-site inspection: 24/11/2016 and 28/11/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	Description of operation of the project activity	Project activity site	24/11/2016	Francy Ramírez
2.	Status of the Project			
3.	Compliance of the project implementation with the registered project design document			
4.	Compliance of monitoring activities with the registered monitoring plan			
6.	Compliance of the monitoring report with the monitoring report form	EAAB's office	28/11/2016	
7.	Maintenance: Cross check between shutdowns, maintenance activity and MR Raw Data			
8.	Compliance with the calibration frequency requirements for measuring instruments			
9.	Assessment of data and calculation of emission reductions			
10.	Procedures for data recording and emission reductions calculation. Materiality Considerations			

D.3. Interviews

No.	Interviewee	Date	Subject	Team
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	Last name	First name	Affiliation			member
1.	Jimenez	Jose	Quality and Process Management EAAB	24/11/2016 and 28/11/2016	Description of operation of the project activity, Status of the Project, Compliance of the project implementation with the registered project design document, Compliance of monitoring activities with the registered monitoring plan, Compliance of the monitoring report with the monitoring report form, Maintenance: Cross check between shutdowns, maintenance activity and MR Raw Data, Compliance with the calibration frequency requirements for measuring instruments, Assessment of data and calculation of emission reductions, Procedures for data recording and emission reductions calculation. Materiality Considerations	Francy Ramirez
2.	Santa	Fabián	Control Centre Director EAAB			
3.	Carreño	Luis Eusebio	Hydraulic system Technician EAAB			
4.	Parra	Luis Francisco	Hydraulic system Technician EAAB			
5.	Apache	Roosvelt	Electromechanical Services Director EAAB			
6.	Sanchez	Juan Carlos	Specialized Professional - Electromechanical Services EAAB			
7.	Robles	Gloria	Contractor – Environmental sanitation EAAB			
8.	Molano	Fernando	Environmental sanitation Director EAAB			
9.	Bernal	Alberto	Specialized Professional - Maintenance Logistics EAAB			
10.	Rendon	John Fredy	Quality Management Director EAAB			
11.	Peñaloza	José	Tactical Maintenance Division Chief EAAB			
12.	Cruz	Martha	Specialized Professional EAAB			
13.	Charry	Francisco	CDM Consultant EAAB – EBT			

D.4. Sampling approach

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

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	CL 1 CL 2 CL 3 CL 4	-	-
Compliance of the project implementation with the registered PDD	-	-	-
Post-registration changes	-	-	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	-	-	-
Compliance of monitoring activities with the registered monitoring plan	CL 5	-	FAR 1
Compliance with the calibration frequency requirements for measuring instruments	-	CAR 1	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
Others (please specify)	-	-	-
Total	5	1	1

SECTION E. Verification findings**E.1. Compliance of the monitoring report with the monitoring report form**

Means of verification	Monitoring report version 1 was submitted to the verification team by the project participants on 20/10/2016. ICONTEC has made this report publicly available prior to the start of the verification activities. No comments were received. During the verification, mistakes and clarifications were identified. The PP conducted the requested corrections on the latest version 03 of the MR. It can be confirmed that the monitoring report is complete, transparent and in accordance with the registered PDD, relevant CDM requirements and applicable monitoring report form. ICONTEC confirms that the MR version 03 is free of material misstatements.
Findings	CL 1, CL 2, CL 3 and CL 4. More details about these findings in Appendix 4.
Conclusion	ICONTEC verified through documental review that the latest version of the MR for the 03 monitoring period was applied.

E.2. Remaining forward action requests from validation and/or previous verification

There are no remaining forward action requests from validation process

E.3. Compliance of the project implementation with the registered project design document

Means of verification	At the time of the desk review, the audit team assessed the implementation of the project reported on MR version 01, against the one established on the registered PDD. No inconsistencies were found.				
	During the onsite visit, the implementation status and monitoring plan reported on MR version 01 were compared with the onsite evidence, physical inspection and interviews. No inconsistencies were found.				
	The status of implementation, progress and operation's starting date for each phase are shown on the next table:				
	Implementation Status				
	Phase/Site	Status of Implementation	Progress	Operation	Comments
	Star of operation: two hydroelectric run-of river power generation projects with a total effective capacity of 3.77 MW (rated capacity of turbine-generator system)	Operation Started	There was no delay or interruptions in the implementation	The power plant began delivery of electrical energy to the Colombian electrical grid on June /2013 (Suba hydropower plant) and on April /2013 (Usaquen hydropower plant)	The project activity is already implemented and it is currently operating as it was described in the registered PDD.
Findings	No finding was raised regarding to this issue				
Conclusion	The audit team can confirm that: <ul style="list-style-type: none">• The implementation of the project is consistent with the information provided in the registered PDD (Physical features such as technology project equipment, monitoring and metering equipment• The project is operated as per the registered PDD.• Information provided in the MR is in accordance with that stated in the registered PDD.				

E.4. Post-registration changes

E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

No temporary deviations have been approved by the Board for this monitoring period or will be submitted with the request for issuance.

E.4.2. Corrections

There are no corrections to project information or parameters fixed at validation, as was described in the registered PDD made by the project participant during the current monitoring period.

E.4.3. Changes to the start date of the crediting period

The project participant did not change the start date of the crediting period during the current monitoring period.

E.4.4. Inclusion of a monitoring plan to a registered project activity

There is no inclusion of a monitoring plan to the registered project activity during this monitoring period.

E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

There are no permanent changes from the registered monitoring plan and/or methodology identified during the current monitoring period.

E.4.6. Changes to the project design of a registered project activity

There are no proposed or actual changes to the project design of the registered CDM project activity reported or identified during the current monitoring period.

E.4.7. Types of changes specific to afforestation and reforestation project activities

This kind of changes does not apply to this project.

E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	During the desk review phase, it was checked the monitoring plan against the monitoring methodology AMS-I.D. ver. 17 - Grid connected renewable electricity generation./UN1/ ICONTEC declares that the registered monitoring plan is in accordance with the approved methodology AMS-I.D, version 17 and the registered PDD version 04.0 /2/
Findings	There is no finding regarding to this issue
Conclusion	According to the registered PDD /2/, the CDM project activity Suba and Usaquen hydroelectric CDM umbrella project was monitored following the guidelines of the approved monitoring methodology AMS-I.D: Grid connected renewable electricity generation, version 17.0

E.6. Compliance of monitoring activities with the registered monitoring plan**E.6.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	The monitoring parameters related to the GHG emission reductions in the project activity have been implemented in accordance with the monitoring plan contained in the registered PDD /2/.			
	The following table describes the parameters that were determined ex-ante and not monitored during the monitoring period:			
	Parameters Determined Ex-Ante in the Registered PDD			
	Parameter	Description	Value	Source
	EF _{grid,y}	Combined margin CO ₂ emission factor in year y.	0.38115 tCO ₂ e/kWh	This value was calculated once at the request of registration of the project activity as it was established in the

				registered PDD /2/
Findings	There is no finding regarding to this issue			
Conclusion	ICONTEC can determine that the data sources and assumptions are appropriate and calculations are correctly used on the PDD version 04.0 and result in a conservative estimate of the emission reductions on the spreadsheet 100517 Emissions Reductions calculation_Suba and Usaquen hydroelectric CDM umbrella project-V3.xlsx /4/.			

E.6.2. Data and parameters monitored

Means of verification	The monitoring parameter related to the GHG emission reductions in the project activity has been implemented in accordance with the monitoring plan contained in the registered PDD /2/.													
	The following table includes the parameter monitored and describes how ICONTEC verified the fulfillment of this parameter with the registered monitoring plan, including the information flow and the values as reported in the MR.													
	<table><tr><th colspan="4">Monitored Parameters</th></tr><tr><th>Monitored Parameter</th><th>Description</th><th>Value</th><th>Means of Verification</th></tr><tr><td>$EG_{\text{facility},y}$ ($EG_{\text{BL},y}$)</td><td>Net electricity generated and supplied to the grid by the project activity in the year y.</td><td>Suba: 17,150,864 kWh Usaquen: 14,579,455 kWh</td><td><p>Source of Data and Frequency:</p><p>Hourly transmission of the information to XM is done by EMGESA via Internet using the digital and coded mechanisms defined for all the agents of the Wholesale Power Market. The databases for recording the operations of the Colombian market are managed by XM. It is worth to mention that EMGESA does the transmission of information based on the data transmitted by the measurement systems located in Morato (Suba) and Usaquen Electrical Substations, respectively.</p><p>These substations are owned by CODENSA, the local distributor and grid operator. ICONTEC verified that the connection point of the transmission line from both hydroelectric power plants to its respective substation, which, in fact, are the commercial frontiers registered by the project responsible in the National Dispatch Center – CND.</p><p>For this parameter the PP used the information recorded by CND. This data is publicly available, and ICONTEC verified by documental review that the information used for this parameter and hence utilized in the emissions reduction calculation are credible and reliable.</p><p>Used Equipment:</p><p>Two power meters installed in the commercial frontier (Suba and Usaquen Electrical Substations, respectively) by power plant (Four</p></td></tr></table>			Monitored Parameters				Monitored Parameter	Description	Value	Means of Verification	$EG_{\text{facility},y}$ ($EG_{\text{BL},y}$)	Net electricity generated and supplied to the grid by the project activity in the year y.	Suba: 17,150,864 kWh Usaquen: 14,579,455 kWh
Monitored Parameters														
Monitored Parameter	Description	Value	Means of Verification											
$EG_{\text{facility},y}$ ($EG_{\text{BL},y}$)	Net electricity generated and supplied to the grid by the project activity in the year y.	Suba: 17,150,864 kWh Usaquen: 14,579,455 kWh	<p>Source of Data and Frequency:</p> <p>Hourly transmission of the information to XM is done by EMGESA via Internet using the digital and coded mechanisms defined for all the agents of the Wholesale Power Market. The databases for recording the operations of the Colombian market are managed by XM. It is worth to mention that EMGESA does the transmission of information based on the data transmitted by the measurement systems located in Morato (Suba) and Usaquen Electrical Substations, respectively.</p> <p>These substations are owned by CODENSA, the local distributor and grid operator. ICONTEC verified that the connection point of the transmission line from both hydroelectric power plants to its respective substation, which, in fact, are the commercial frontiers registered by the project responsible in the National Dispatch Center – CND.</p> <p>For this parameter the PP used the information recorded by CND. This data is publicly available, and ICONTEC verified by documental review that the information used for this parameter and hence utilized in the emissions reduction calculation are credible and reliable.</p> <p>Used Equipment:</p> <p>Two power meters installed in the commercial frontier (Suba and Usaquen Electrical Substations, respectively) by power plant (Four</p>											

				<p>power meters in total). These have identical Schneider Electric features¹, with an accuracy of 0.2 IEC.</p> <p>Data Cross Checking:</p> <p>In order to verify the data provided by the PP in the spreadsheet used for emissions reduction calculations, ICONTEC reviewed the electricity generation reported by the PP in the information service about the Colombian Wholesale Power Market operated by XM. After this review the audit team concluded that the information provided by the PP is reliable, coherent, consistent and traceable with secondary sources of information.</p> <p>Consistency Between the QA/QC Defined in the Methodology:</p> <p>In table 1 of the applied methodology /UN1/, it was stated as the performance of calibration activities for the measurement equipment. As it will be explained in the Section E.7 of this verification report.</p> <p>Consistency Between the QA/QC Established by the Project Participants in the PDD:</p> <p>In section B.7.1 of the registered PDD, the PP listed procedures for power plant operation and for power plant maintenance. During the onsite visit, it was verified the execution of all those procedures guaranteeing proper functioning of both hydroelectric power plants.</p> <p>ICONTEC could verify that according to the monitoring plan approved in the PDD and the methodology AMS.I-D, version 17.0, the data from electricity generation from the project activity can be checked and it is available in the XM information platform, on the other hand, this monitoring plan is in accordance with the rules established by Colombian Electrical Authorities /5/.</p> <p>Application of Default Values:</p> <p>Not applicable</p>
Findings	CL 5 and FAR1. More details about these findings in Appendix 4			
Conclusion	<p>ICONTEC could verify the completeness and integrity of the data used by the project proponents for the emission reductions calculations. During the verification, ICONTEC was able to verify that the parameter is properly measured according to the monitoring plan and the registered PDD, and that the information is consistent with the secondary information sources used to verify the information.</p>			

¹ Schneider Electric Meters:
Model: POWERLOGIC ION8650

Voltage: 57-277 V

Current: 2.5A

Class: 0.2S

	<p>ICONTEC can conclude that the data aggregation is appropriate to comply with the methodology and it is in accordance with the registered PDD.</p> <p>In conclusion the process of data management, transfer, storage and reporting was carried out in compliance with the monitoring plan, the registered PDD /2/ and the methodology AMS.I-D version 17/UN1/ .</p> <p>ICONTEC can thus conclude that:</p> <p>The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.</p> <p>All parameters stated in the monitoring plan of the registered PDD have been correctly and sufficiently monitored and listed. The monitored data for required parameters have been verified by ICONTEC and have been found complete, reliable and consistent.</p>
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E.6.3. Implementation of sampling plan

Means of verification	The PP did not apply a sampling approach for the determination of data and parameters monitored.
Findings	There is no finding regarding to this issue
Conclusion	No sampling approach was applied by the PP in order to determine the monitored parameters.

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means of verification	The following table includes the current monitoring equipment for the parameters above mentioned and the information about equipment identification and calibration records. ICONTEC verified that there was a delay in the calibration activities during this monitoring period under assessment.					
	Monitoring Equipment					
	Parameter	Equipment		Calibration Frequency	Calibration Records	Date of Calibration
	EG _{facility,y} (EG _{BL,y}) Net electricity generated and supplied to the grid by the project activity in the year y	Suba hydroelectric project	Schneider Electric power meter with an accuracy of 0.2 IEC.	In accordance with the monitoring plan in the registered PDD (Section B.7.1): At least once every two years.	Calibration Certificate N° CAM-IM-1205-019533. Dated on May 22 nd /2012	22/05/2012
			Serial number of Main measurement equipment: MW-1203A089-01		Calibration Certificate N° ME-1701-20379. Dated on January 30 th /2017	29/01/2017
Schneider Electric power meter with an accuracy of 0.2 IEC.			Calibration Certificate N° CAM-IM-1205-019470. Dated on May 19 th /2012		19/05/2012	

		Usaquen hydroelectric project	Serial number of Back up measurement equipment: MW-1203A090-01	Calibration Certificate N° ME-1701-20378. Dated on January 30 th /2017	29/01/2017
			Schneider Electric power meter with an accuracy of 0.2 IEC.	Calibration Certificate N° CAM-IM-1205-019469. Dated on May 18 th /2012	18/05/2012
			Serial number of Main measurement equipment: MW-1203A086-01	Calibration Certificate N° CAM-IM-1501-016399. Dated on January 30 th /2015	26/01/2015
			Schneider Electric power meter with an accuracy of 0.2 IEC	Calibration Certificate N° CAM-IM-1205-019047. Dated on May 17 th /2012	17/05/2012
			Serial number of Back up measurement equipment: MW-1203A087-01	Calibration Certificate N° CAM-IM-1501-016399. Dated on January 30 th /2015	26/01/2015
			In accordance with the calibration activities executed for monitoring equipment there was a delay which covers the entire monitoring period for the power meters measuring the electricity delivered by Suba Hydroelectric power plant. Likewise for Usaquen hydroelectric power plant, there was a delay in the calibration activities executed which involves the electricity delivered since June 4 th /2014 to January 26 th /2015.		
Once the PP get the outcomes of the delayed calibration activities, the ERs calculation /4/ was adjusted in accordance with paragraph 395 (a) of the VVS /UN2/. Since the error detected is smaller ($\approx 0.046\%$) than the maximum permissible error (2%), the maximum permissible error was applied to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration.					
For values measured for Usaquen hydroelectric power plant, the PP decided to apply the maximum permissible error for the entire month of January 2015, as a conservative approach.					
Findings	CAR 1. More details about this finding in Appendix 4				
Conclusion	ICONTEC concluded that the detected calibration delays were penalized in				

	accordance with the established guidelines in the latest version of VVS /UN2/ and PS /UN3/.
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E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	<p>In accordance with AMS I.D, version 17 /UN1/, the baseline is the kWh produced by project activity (Suba & Usaquen Hydroelectric Plant) multiplied by the emission factor of the national interconnected grid of Colombia.</p> <p>It is worth to draw attention, that a discount was carried out by PP in the electricity delivered by the project activity to Colombian interconnected electrical grid, since there was a delay in the calibration activities, (See section E.7 on this report)</p> $BE_y = EG_{BL,y} \times EF_{CO_2,grid,y}$ <p>For Suba hydroelectric power plant :</p> $BE_y = 17,150 \text{ kWh} \times 0.38115 \text{ kgCO}_2\text{e/kWh}$ $BE_y = 6,537 \text{ tCO}_2\text{e}$ <p>For Suba hydroelectric power plant :</p> $BE_y = 14,579 \text{ kWh} \times 0.38115 \text{ kgCO}_2\text{e/kWh}$ $BE_y = 5,557 \text{ tCO}_2\text{e}$
Findings	No finding was raised on this issued.
Conclusion	ICONTEC concludes that baseline emission reductions have been correctly calculated without material misstatements.

E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	In accordance to the applied methodology AMS.1-D, version 17/UN1/ paragraph 20, emissions by sources of GHG due to the project activity are zero.
Findings	N/A
Conclusion	N/A

E.8.3. Calculation of leakage GHG emissions

Means of verification	Given that, Leakages are to be considered only when transferring existing renewable energy technology from another activity and this project activity is not transferring existing renewable energy technology from another activity, leakages are considered as zero.
Findings	N/A
Conclusion	N/A

E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	<p>In accordance with the applied methodology /UN1/ and the description provided in section E.8.1, E.8.2 and E.8.3:</p> $ER_y = BE_y$ $ER_y = 12,094 \text{ tCO}_2\text{e}$
Findings	No finding was raised on this issued.
Conclusion	<p>The data used for determination of the emission reductions are available and have been monitored in accordance with the registered monitoring plan and methodology AMS.1-D version 17.</p> <p>The data used for the calculation of ERs in this monitoring period were verified and they were found consistent with those reported in the registered PDD.</p> <p>The appropriate methods and formulae for calculating baseline emissions, project emissions and leakage were followed in accordance with the approved PDD and applied methodology.</p> <p>The assumptions, emission factors and default values applied in the MR version 02</p>

	and the calculations were correctly justified.
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E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	ICONTEC verified that the emission reductions achieved during the 1 st monitoring period (12,094 tCO ₂ e) are lower than the ex-ante value (16,450 tCO ₂ e) of emission reductions in the approved PDD.
Findings	No findings were raised for this section.
Conclusion	During on site visit, ICONTEC validated the explanations for the difference provided by the PP in the monitoring report (Section E.6) and considered them as appropriate and consistent.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	During the verification ICONTEC confirm that there was not increase of emission reductions compared with the emissions reductions approved on the PDD, as it was explained in Section E.8.5. above
Findings	No finding was raised regarding to this issue
Conclusion	During the verification ICONTEC confirm that there was not increase of emission reductions compared with the emissions reductions registered on the PDD.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	<p>Following the statements in the applied methodology and previously explained in section E.8.4 on this report the emissions reductions belongs to period from January 1st/2013 onwards:</p> $BE_y = EG_{BL,y} \times EF_{CO_2,grid,y}$ <p>For Suba hydroelectric power plant :</p> $BE_y = 17,150 \text{ MWh} \times 0.38115 \text{ kgCO}_2\text{e/kWh}$ $BE_y = 6,537 \text{ tCO}_2\text{e}$ <p>For Suba hydroelectric power plant :</p> $BE_y = 14,579 \text{ MWh} \times 0.38115 \text{ kgCO}_2\text{e/kWh}$ $BE_y = 5,557 \text{ tCO}_2\text{e}$
Findings	No finding was raised regarding to this issue
Conclusion	ICONTEC deems that the current ERs have been correctly reported on the period from 1 January 2013 onwards

SECTION F. Internal quality control

This report includes the verification findings that underwent a technical review before being submitted to UNFCCC.

The technical review and the quality control process was performed by an internal technical reviewer team in accordance with the ICONTEC's internal procedures for carrying out validation, verification and certification audits of CDM project activities. After this step the submission for requesting for issuance has been conducted.

The technical reviewers are qualified in accordance with the ICONTEC's professional qualification scheme for CDM validation and verification.

SECTION G. Verification opinion

ICONTEC was engaged by Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) to verify the greenhouse gas (GHG) emission reductions reported by the CDM project Suba and Usaquen hydroelectric CDM umbrella project, registration number 9798, owned by PP for the period 04/06/2014 to 31/12/2015, equating to 12,094 tCO₂e.

The verification was performed based on the requirements set by the CDM and relevant guidance provided by CMP and the CDM Executive Board. ICONTEC considers that the project's GHG emissions and resulting GHG emissions reductions reported in the monitoring report version 03 dated on 10/05/2017, are fairly stated.

ICONTEC confirms that the project is implemented as described in the validated and registered PDD. Installed equipment essential for generating emission reductions are running reliably and calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions as a CDM project.

Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's monitoring and verification plan.

Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) is responsible for developing and keeping records and reporting procedures in accordance with the monitoring plan.

ICONTEC received the information and asked for explanations deemed necessary to provide enough evidence about the amount of GHG emissions and the calculation of the GHG emission reductions.

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

It is ICONTEC's responsibility to set an independent GHG verification opinion on the GHG emissions from the project and approved a baseline for the monitoring period.

ICONTEC utilizes a risk-based approach that draws on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. ICONTEC's examination process includes test-based assessments of all evidence relevant to the amounts and disclosures of a project's GHG emissions and the calculations of such reductions for the reporting period.

ICONTEC can confirm that the GHG emissions reductions are calculated without material misstatements.

ICONTEC's opinion applies to the project's GHG emissions and the resulting GHG emission reductions reported and related to the validated and registered baseline, as well as the monitoring plan and its associated documents. ICONTEC confirms the following statements:

CDM project:	Suba and Usaquen CDM umbrella project
Reporting period:	04/06/2014 to 31/12/2015
Baseline emissions:	12,094 tCO ₂ e
Project emissions:	0 tCO ₂ e
Leakage:	0 tCO ₂ e
Emission Reductions:	12,094 tCO ₂ e

SECTION H. Certification statement

ICONTEC has been engaged by Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) to examine the greenhouse gas (GHG) emission reductions reported from Suba and Usaquen CDM umbrella project for the corresponding period, equating to 12,094 tonnes of CO₂ equivalent.

We consider that the project's GHG emissions and resulting GHG emissions reductions reported in the Monitoring Report version 3 (10/05/2017) are fairly stated. Monitoring Report first version was publicly available on October 21st/2016.

The owner of Suba and Usaquen CDM umbrella project is responsible for the preparation of the GHG emission data and the reported GHG emission reductions on the basis set out within the project's Monitoring and Verification Plan.

The owner of Suba and Usaquen CDM umbrella project is responsible for developing and keeping records and reporting procedures in accordance with the Monitoring Plan.

ICONTEC is responsible to set an independent GHG verification opinion on the GHG emissions from the Project activity and approved baseline for the same period.

For this verification audit ICONTEC was provided the information and asked for explanations we deemed necessary to provide enough evidence that the amount of GHG emission and the calculation of the GHG emission reductions, based on the Monitoring Report, are fairly stated for the reporting period.

Our verification approach was based on the Kyoto Protocol requirements, Marrakech Agreement, as well as those defined by the CDM Executive Board.

ICONTEC's approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. Our examination includes review and assessment, of the evidence related to the project's GHG emission and calculations for this reporting period.

ICONTEC is able to certify that the emission reductions from the Suba and Usaquen CDM umbrella project during the 1st verification period from June 4th/2014 to December 31st/2015 equals to 12,094 tonnes of CO₂ equivalent.

Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified emission reductions
CL	Clarification Request
CND	Colombian National Dispatch Center (Centro Nacional de Despacho)
CO ₂ e	Carbon dioxide equivalent
CREG	Colombian Regulatory Commission for energy and gas (Comision de Regulación de Energia y Gas)
DNA	Designated National Authority
DOE	Designated Operational Entity
EBT	Environmental Business Technology
EAAB	Bogota aqueduct and sewerage company (Empresa de Acueducto y Alcantarillado de Bogota)
ERs	Emission Reductions
GHG	Greenhouse Gases
ICONTEC	Colombian Institute of Technical Standards and Certification (Instituto Colombiano de Normas Técnicas y Certificación)
IPCC	Intergovernmental Panel on Climate Change
ISA	Electrical Interconnection (Interconexión Eléctrica S.A. E.S.P.)
MoC	Modalities of Communication
MR	Monitoring Report
PCP	CDM Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PRC	Post Registration Change
PS	CDM Project Standard
UNFCCC	United Nations Framework Convention for Climate Change
VVS	CDM Validation and Verification Standard
XM	Abbreviation for "Market Experts". XM is a company of the ISA Group that provides integral services. www.xm.com.co

Appendix 2. Competence of team members and technical reviewers

Francy Ramírez

Lead auditor and Technical Expert in Sectoral Scope 1.2

Education:

Electrical Engineer. Universidad Los Andes, 2001

Post grade:

Assessment of Social Projects. Universidad Los Andes, 2005

Environmental Management. Universidad Los Andes, 2016

University of Oxford. Course: Applying Knowledge Management, Principle and Practices (December 1st/ 2009).

University of Oxford. Course: Successful Change Management for Engineers, Scientists and Staff in Hi-tech Companies (December 2nd 2009).

University of Oxford. Course: Essentials of Project Management for Engineers, Scientists and Staff in Hi-tech Companies (December 3rd 2009).

University of Oxford. Course: Advanced Project Management for Engineers, Scientists and Staff in Hi-tech Companies (December 4th 2009).

Climate Change, Trade and Standardization - in a development perspective". Stockholm, Sweden(23 and 25 November 2009)

ISO global workshop on Greenhouse Gas Schemes Addressing Climate Change – How ISO Standards Help, Stockholm, Sweden. (20 and 21st November 2009)

Conference on Climate Change – Deforestation and Standardization. Bali, Indonesia (31st May and 1st June 2010)

Professional Background:

ICONTEC (2005 - 2010)

Professional of Standardization

Planning, coordinate, implement and ensure compliance with the program of national standardization in technical committees among which are electrical installations, electrical power quality, electrical transformers, substations and equipment for medium and high voltage, lighting, appliances and electrical accessories, protection against lightning strikes and electrical equipment. Develop technical standards. Develop and manage special projects assigned. Participate in programs of regional and international standardization.

CODENSA (2002 - 2005)

Inspections and electrical works coordinator

Supervise field work and download the results in the central information system, evaluate the inspections performed, reconciled with contractors, addressing the results of inspections to different areas of the company, charging inspections and electrical work to clients of the firm , coordination and support group field sales engineers, technical training for technical staff, administrative support to department business processes and lost control, maintenance of the database for internal management inspections. Project Leader for the Optimization of Technical Processes and Regional Trade in Cundinamarca.

CDM Experience

Lead Auditor

- Validation of Guanaquitas 9.74 MW hydroelectric project, Colombia
- Validation of Fuel Switching through change of furnaces at Imusa S.A., Colombia
- Validation of Installation of a high-pressure/high-efficiency bagasse boiler to cogenerate heat and power, Argentina
- Validation of Cueva Maria Hydroelectric Expansion Project, Guatemala
- Validation of Paysandú Clean Energy, Uruguay
- Validation of La Vegona Hydroelectric project, Honduras
- Validation of Chamelecón 280 Hydroelectric project, Honduras
- Validation of Pardos SHPs and LOGICarbon CDM Project, Brazil
- Validation of Pequi and Sucupira SHPs and LOGICarbon CDM Project, Brazil
- Validation of Cambará and Embaúba SHPs and LOGICarbon CDM Project, Brazil
- Validation of Bonyic hydroelectric project, Panamá
- Validation of METALDOM Fossil fuel switch from reheat furnace, República Dominicana
- Validation of Toachi – Pilaton Hydroelectric Project, Ecuador
- Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle, Colombia
- Validation of Energy efficiency at Malvinas Gas Plant, Perú
- Validation of Marañon Hydroelectric Project, Perú
- Validation of Santa Rita Hydroelectric Plant, Guatemala
- Validation of Ventana, Suba and Usaquén Hydroelectric CDM Bundled, Colombia

- Verification of Los Algarrobos hydroelectric project, Panamá
- Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
- Validation of Taurichuco Hydropower Project, Perú
- Validation of Aguafresca Multipurpose and Environmental Service Project, Colombia
- Verification of Agua Fresca Multipurpose and Environmental Service Project, Colombia
- Verification of La Joya Hidroelectric project, Costa Rica
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia

Specialist:

- Validation of Rio Bonito and Baitaca SHPs and LOGICarbon CDM Project, Brazil
- Validation VCS of Pequi and Sucupira SHPs and LOGICarbon CDM Project, Brazil
- Verification of three crediting periods of La Vuelta and la Herradura hydroelectric project, Colombia

CDM Technical Reviewer:

- Validation of improving energy efficiency in a new Gas Plant in Gibraltar - Colombia
- Validation of Tres Valles Cogeneration Project, Honduras
- Validation of Tunjita Diversion Hydroelectric Project, Colombia
- Validation of Ferreira Gomes Hydro Power Plant CDM Project, Brazil
- Verification of two crediting periods of La Venta II, México
- Verification of two crediting periods of La Joya Hidroelectric Project, Costa Rica
- Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
- Verification of Tres Valles Cogeneration Project, Honduras
- Verification of Agua Fresca Multipurpose and Environmental Services, Colombia
- Verification of La Venta II, México
- Verification of two crediting periods of Fertinal Nitrous Oxide Abatement Project, México
- Verification of Co-composting of EFB and POME project, Guatemala
- Verification of Biogas Project, Olmeca III, Tecun Uman, Guatemala
- Verification of Jepirachi Wind Power Project, Colombia
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala
- Verification of Santa Ana Hydroelectric Project, Colombia
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Biogas Project, Olmeca III, Tecun Uman, Guatemala

Specialist Technical Reviewer

- Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil

Cristian Grisales

Lead technical reviewer and Technical Expert in Sectoral Scope 1.2

Education:

Clean Technologies – Environmental technology, innovation and management systems as means for regional and local economic development

Weitz Center for Development Studies – Israel

June 16th - July 10th 2015

Master Executive in Renewable Energies

EOI-Madrid, Spain
February 2015

Certified ISO 14001
ICONTEC
May 2012

Certified ISO 9001
ICONTEC
August 2012

Electrical Engineer
National University of Colombia
Bogotá - Colombia
July 2009

Professional Background

Professional of Climate Change
ICONTEC

May 2012 – Today

Professional on developing validation and verification on CDM projects as lead auditor and as technical expert in the energy sector.

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.

Engineering Intern
INGENIERIA ESPECIALIZADA

Commercial visits to different industries, sales, design and assembly of shielding systems, grounding grids, power quality studies, calculation of electrical installations, RETIE inspections, diagnostic grounding systems, implementation, supervision and maintenance of the developed projects.

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
- Validation of Doña Teresa Hydroelectric Power Plant, Colombia
- Validation of SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil
- Validation of SHPs Tambaú, das Pedras and Rio do Sapó CDM Project (JUN1132), Brazil
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia

- Verification of Ciudad Juarez Landfill Gas to Energy Project, Mexico
- Verification of Santa Ana Hydroelectric Plant, Colombia
- Verification of Biogas Project, Olmeca III, Tecún Uman, Guatemala
- Verification of Berlin Geothermal Project, Phase Two, San Salvador

Technical Reviewer:

- Validation of Thuan Nhon Wind Farm, Viet Nam
- 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

Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/1/	EEAB	Monitoring Report for first monitoring period (04/06/2014 – 31/12/2015) of Suba and Usaquen CDM umbrella project	Version 01 , dated on October 12 th /2016 Version 02, dated on February 20 th /2017 Version 03, dated on May 10 th /2017	PP
/2/	EAAB	Approved project design document (PDD)	Version 04.0, dated on April 25 th /2014	Other
/3/	ICONT EC	Previous validation report for registration purposes	Report No: CDMVAL-057-04, dated on May 19 th /2014	Other
/4/	EAAB	Spreadsheet used for emissions reductions calculations	Files: -091216 Emissions Reductions calculation_Suba and Usaquen hydroelectric CDM umbrella project-V2.xlsx -100517 Emissions Reductions calculation_Suba and Usaquen hydroelectric CDM umbrella project-V3	PP
/5/	CREG	Resolution 038	Issued on 2014 http://www.creg.gov.co/index.php?option=com_phocadownload&view=category&id=178	Other
/UN 1/	UNFC CC	Methodology AMS-I.D: Renewable electricity generation for a grid, version 17.0		Other
/UN 2/	UNFC CC	CDM validation & verification standard, version 09.0		Other
/UN 3/	UNFC CC	CDM project standard, version 09.0		Other

/UN 4/	UNFC CC	CDM project cycle procedure, version 09.0		Other
/UN 5/	UNFC CC	Guideline on the application of materiality in verifications, version 02.0		Other
/UN 6/	UNFC CC	Monitoring report form, version 05.1		Other

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

Table 1. Remaining FAR from validation and/or previous verification

FAR ID	NA	Section no.	E.2	Date: DD/MM/YYYY
Description of FAR				
NA				
Project participant response				Date: DD/MM/YYYY
NA				
Documentation provided by project participant				
NA				
DOE assessment				Date: DD/MM/YYYY
NA				

Table 2. CL from this verification

CL ID	1	Section no.	E.1	Date: 26/10/2016
Description of CL				
<i>The estimated GHG emission reductions for this monitoring report described in the first page of the monitoring report version are not in accordance with the registered PDD</i>				
<i>Attachment of the Monitoring report form, version 05.1, section 2, paragraph 1(k)</i>				
Project participant response				Date: 20/02/2017
<i>On table "Monitoring Report Form" (page 1 of the monitoring report, version 02) the value for the estimated amount of GHG emission reductions has been corrected to make it consistent with the emission reductions value established in the registered PDD (for this monitoring period).</i>				
Documentation provided by project participant				
<i>The Monitoring Report version 02 and the emission reduction calculation spreadsheet in version 02 are attached to this document.</i>				
DOE assessment				Date: 25/04/2017
<i>In updated MR (version 02) dated on February 20th/2017, the estimated amount of emission reductions described in the first page is in accordance with the registered PDD</i>				
Audit team conclusion: Closed				

CL ID	2	Section no.	E.1	Date: 26/10/2016
Description of CL				
<i>In the monitoring report version 1 Section A.1, it is missing a brief description of the installed technology and equipment, as well as Relevant dates for the project activity</i>				
<i>Attachment of the Monitoring report form, version 05.1, section A.1, paragraphs 1(b) and 1 (c)</i>				
Project participant response				Date: 20/02/2017
<i>On section A.1 (page 2 of the monitoring report, version 02) a description of the installed technology and equipment has been included, considering the inclusion of a relevant dates.</i>				
Documentation provided by project participant				
<i>The Monitoring Report version 02 is attached to this document</i>				
DOE assessment				Date: 25/04/2017

In the updated version of the MR (version 02) it was included a brief description of the installed technology and equipment, as well as Relevant dates for the project activity
Audit team conclusion: Closed

CL ID	3	Section no.	E.1	Date: 26/10/2016
Description of CL				
<i>The tools to which the applied methodology (AMS-I.D version 17.0) refers are not mentioned in the monitoring report version 1 Section A.4</i>				
<i>Attachment of the Monitoring report form, version 05.1, section A.4, paragraph 1(b)</i>				
Project participant response				Date: 20/02/2017
<i>On section A.4 (page 3 of the monitoring report, version 02) has been included a reference for the tools referred in the applied methodology AMS-I.D version 17.</i>				
Documentation provided by project participant				
<i>The Monitoring Report version 02 is attached to this document.</i>				
DOE assessment				Date: 25/04/2017
<i>In the updated version of MR (version 2), Section A.4, it was clarified and it was described tools used at registration time referred in the applied methodology.</i>				
Audit team conclusion: Closed				

CL ID	4	Section no.	E.1	Date: 26/10/2016
Description of CL				
<i>A description of the installed technology and equipment is missing in the monitoring report version 1 Section B.1, as well as the information on the implementation status of the project activity during this monitoring period in accordance with the applicable provision for description of implemented registered CDM project activity in the Project standard.</i>				
<i>Attachment of the Monitoring report form, version 05.1, section B.1, paragraph 2</i> <i>CDM project standard, version 09.0, Section 13.3, paragraphs 244 (a) and 244 (b)</i>				
Project participant response				Date: 20/02/2017
<i>On section B.1 (pages 5 to 8 of the monitoring report, version 02) a description of the installed technology and the status of implementation have been included according to the provisions stated in the registered PDD.</i>				
Documentation provided by project participant				
<i>The Monitoring Report version 02 is attached to this document.</i>				
DOE assessment				Date: 25/04/2017
<i>In the updated version of MR (version 2) it was included in Section B.1. a description of the installed technology and equipment used in the project activity, likewise the PP wrote a description about the implementation status of the project activity during this monitoring period</i>				
Audit team conclusion: Closed				

CL ID	5	Section no.	E.6.2	Date: 26/10/2016
Description of CL				
<i>In Section D.2 of the Monitoring Report version 1, there is only a description for one set of measurement equipment (main and backup), likewise, it is missing a identification for the measurement equipment assigned for each electricity generation measurement for both power plants.</i>				
<i>CDM project standard, version 09.0, Section 13.5, paragraph 248 (b)</i>				
Project participant response				Date: 20/02/2017
<i>On section D.2 (page 19 of the monitoring report, version 02) a full reference for the measurement equipment of each power plant (main and back-up) has been included in accordance with the records available.</i>				
Documentation provided by project participant				
<i>The Monitoring Report version 02 is attached to this document.</i>				
DOE assessment				Date: 25/04/2017

In the updated version of MR (version 2) it was included in Section D.2. a complete description of measurement equipment (identification included) for both power plants.
Audit team conclusion: Closed

Table 3. CAR from this verification

CAR ID	1	Section no.	E.7	Date: 28/11/2016
Description of CAR				
<i>The gap between calibration activities executed for measurement equipment are not in accordance with the QA/QC procedures established in the registered PDD</i>				
<i>VVS version 09.0 paragraph 394</i> <i>Registered PDD version 04.0 Section B.7.1 (QA/QC Procedures)</i>				
Project participant response				Date: 20/02/2017
<i>In sections D.2, E.4 and E.5 (pages 18 and 21 of the monitoring report, version 02) the measurements value have been corrected considering the adjustment to the monitored data during periods that measurement equipment was not covered by the available calibration certificates, according to the provisions of the CDM-EB65-A04-STAN "CDM validation and verification standard" version 09.0, art 395, paragraph a. As the results of delayed calibration are available and demonstrate that error identified is smaller than the maximum permissible error, the PP has decided as a conservative approach to apply the maximum permissible error of the instrument to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</i>				
Documentation provided by project participant				
<i>The Monitoring Report version 02 and records of calibration performed on January 2017 (for Suba hydropower plant) are attached to this document. The documents are:</i> - Calibration certificate No.ME-1701-20378 - Calibration certificate No.ME-1701-20379				
DOE assessment				Date: 25/04/2017
<i>The audit team reviewed the calibration certificates provided by the PP and it was identified a delayed calibration implemented after the monitoring period under assessment. Hence, it was mandatory to apply the error identified in the delayed calibration activities ($\approx 0.046\%$).</i> <i>Nevertheless, the PP decided, as a conservative approach, to use the maximum permissible error of the measuring equipment (that is larger than the error identified in the delayed calibration activities) = 0.2% in the calculation of emissions reductions in accordance with the provisions of VVS, version paragraph 395 (a).</i>				
Audit team conclusion: Closed				

Table 4. FAR from this verification

FAR ID	1	Section No.	E.6.2	Date: 28/11/2016
Description of FAR				
<i>Although there is a backup measurement equipment installed by EAAB in order to crosscheck the electricity delivered to Colombian electrical grid registered by XM, it would be useful to access to the recorded data in these EAAB equipments for next monitoring periods.</i>				
<i>VVS version 09.0, paragraph 373 (b)(iv)</i>				
Project participant response				Date: 20/02/2017
<i>Considering the FAR issued, the EAAB is waiting the completion (on April 2017) of the warranty period with the builder of the power plants Suba and Usaquen, in order to define a plan to improve technical aspects of the plants including a dedicated communication system to access online the monitoring data of the EAAB backup energy measurement system (to crosscheck the electricity delivered to Colombian electrical grid registered by XM). Once the improvement plan is defined, it must be approved by EAAB management for its subsequent implementation and commissioning.</i>				
Documentation provided by project participant				
<i>The indicative action plan for Suba and Usaquen power plants improvement (including support document), indicating activities to be performed, responsible, and relevant dates, are attached to this document. The documents are:</i> - M4CE0401F02-03 Plan de mejoramiento. - M4CE0401F01-03 formato análisis de causas.				
DOE assessment				Date: 25/04/2017

The audit team reviewed the documentation provided by the PP.

The audit team strongly recommend to next assessment team to evaluate the accomplishment of the indicative action plan for Suba and Usaquen power plants improvement. Since its execution will provide a reliable cross check for electricity generation reported to XM.

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Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		