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CDM Verification Report

Enterprise

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Service

Audit/Assessment:	CDM First Verification
Audit/Assessment beginning/end:	18/10/2010 -16/06/2011
Project name:	Fuel Substitution by Hydro Generation in Pasto Bueno
GBZ/Report-No.:	321227/P30370.43
UNFCCC Scope(s)/Technical area(s):	1/TA 1.2
UNFCCC Methodology:	AMS-I.A. ver. 12
UNFCCC Scale:	Small Scale
UNFCCC Project number:	1986
Team of auditors/assessors:	Mr Martin Rügsegger Mr Oliver Gardi

Approved by

Lead auditor/assessor:
Martin Rügsegger

Reviewer:
Felix Martin

Executive board:
Silvio Leonardi

Date

16/06/2011

16/06/2011

22/06/2011

Signature

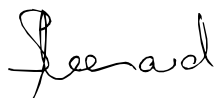


Table of Content

1	Introduction	3
1.1	Objective.....	3
1.2	Scope	3
1.3	Project description	3
1.4	Verification methodology	4
1.5	Level of assurance	5
2	Verification and Certification Statement	6
2.1	Assessment of data and calculation of greenhouse gas emission reductions	6
2.2	Conclusion on the verified amount of emission reductions achieved	6
2.3	Certification statement.....	7
3	Findings of the Desk Review and On-Site Visit	8
3.1	Remaining issues from the previous validation or verification period	8
3.2	Project implementation in accordance with the registered project design document.....	8
3.3	Compliance of the monitoring plan with the monitoring methodology.....	9
3.4	Compliance of monitoring with the monitoring plan	9
3.5	Assessment of data and calculation of greenhouse gas emission reductions	9
3.6	Request for deviation	10
3.7	Request for revision of the monitoring report.....	10
3.8	List of each parameter specified by the monitoring report.....	10
3.9	Verification protocol.....	10
4	List of Interviewees and Documents Reviewed	11
5	Verification Team and Reviewer.....	11
6	Quality Control.....	11
7	Appendix A: On-Site Visit Programme	12
8	Appendix B: Interviews	13
9	Appendix C: Documents Reviewed	14
10	Appendix D: Certificates of Competence.....	16
11	Appendix E: Abbreviations /Reverences	19
12	Appendix F: CDM Verification Protocol	20

1 Introduction

1.1 Objective

Emerging Power Developers Ltd has commissioned SQS to perform the first verification over the first monitoring period of the small scale CDM project "Fuel Substitution by Hydro Generation in Pasto Bueno" (hereafter called "the project"). The verification objective is an independent assessment by a Designated Operational Entity (DOE) of a proposed project activity against all defined criteria set for the registration under the Clean Development Mechanism (CDM).

1.2 Scope

Based on the applicable requirements of paragraph 62 of the CDM modalities and procedures, the assessment shall:

- Ensure that the project activity has been implemented and operated as per the registered PDD, and that all physical features (technology, project equipment, and monitoring and metering equipment) of the project are in place;
- Ensure that the monitoring report and other supporting documents provided are complete and verifiable and in accordance with applicable CDM requirements;
- Ensure that actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan and the approved methodology;
- Evaluate the data recorded and stored as per the monitoring methodology.

The verification team has used a risk-based approach focusing on the identification of significant risks for project implementation and the generation of CERs.

1.3 Project description

The project involves the installation of a hydropower station at Pasto Bueno including two generator units with a total power of 600kW, transformers, connection points with measuring equipment and the connecting power lines. The project included the refit of the intake water channel, pressure tubes and irrigation channel after the Station to extended agriculture area near Pampas. The project's main aim is the production of hydroelectric energy for the nearby "Huaaura" mining compound in order to replace the diesel fuel-generated energy used before.

UNFCCC registered the project officially on 25/11/2008 (Reg. No.: 1986). 25/11/2008 was the starting date of first GHG crediting period. The project has been operational since 01/01/2009.

The Host Party is Peru, where the project participant is Hidroelectrica Pelagatos SAC. Other project participants are Emerging Power Developers Ltd Switzerland, a private enterprise.

The applied Methodology refers to AMS-I.A. Version 12. "Renewable Energy Projects - Electricity generation by the user". The estimated emissions reduction according to PDD for this project is 5,326 tCO₂e/year.

Location of the project is in Peru at the Pasto Bueno Plant, Consuzo, in the district of Pampas, in the department of Ancash, part of the province of Pallasca. The geographical coordinates of Pasto Pueno are mentioned with latitude 8°10'28 S and longitude 77°51'8 W.

1.4 Verification methodology

The SQS auditors apply standard auditing techniques to assess the quality of the information, including but not limited to:

(a) Desk review, involving:

- Review of the data and information presented to verify their completeness;
- Review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment, including calibration requirements, and the quality assurance and quality control procedures;
- Evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

(b) On-site assessment involving:

- Assessment of the implementation and operation of the proposed CDM project activity as per the registered PDD;
- Review of information flow for generating, aggregating and reporting the monitoring parameters;
- Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan in the PDD;
- A cross-check between information provided in the monitoring report and data from other sources, such as plant log books, inventories, purchase records or similar data sources;
- A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the PDD and the selected methodology;
- Review of calculations and assumptions made in determining the GHG data and emission reductions;
- Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

If, during the verification of a project activity, the auditor identifies issues related to the monitoring, implementation or operations of the proposed CDM project activity that could impair the capacity of the proposed CDM project activity to achieve emission reductions, or influence the reporting of emission reductions, the auditor identifies, discusses and concludes these issues in the verification report.

The auditor shall raise a corrective action request (CAR) if one of the following occurs:

- (a) Non-conformities with the monitoring plan or methodology are found in monitoring and reporting, or if the evidence provided to prove conformity is insufficient.
- (b) Mistakes were made in applying assumptions, data or calculations of emission reductions which will impair the estimate of emission reductions.
- (c) Issues identified in a FAR during validation to be verified during verification that have not been resolved by the project participants.

The auditor shall raise a clarification request (CL) if information is insufficient or not clear enough to determine whether the applicable CDM requirements have been met.

The auditor shall raise a forward action request (FAR) during verification for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

All CARs and CLs raised by the auditor during verification shall be resolved prior to submitting a request for issuance.

In order to ensure transparency, a verification protocol (Checklist CDM Verification) was customized for the project. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes details and clarifies the requirements a CDM project is expected to meet.
- It ensures a transparent verification process where the verifier will document how a particular requirement was verified and the result of the verification.
- The completed verification protocol consists of two tables. The different columns in these tables are described in the figure below.

CDM Verification Protocol 1-3: Requirement Checklist	
<i>Requirement</i>	The requirements the project must meet.
<i>Ref.</i>	Reference to the PDD or documents
<i>MoV (Means of Verification)</i>	Explains how conformance with the requirements is investigated. DR = Document Review, I = Interview, N/A = Not Applicable
<i>Comment</i>	The section is used to elaborate and discuss the conformance to the requirement.
<i>Draft Concl. / Final Concl. (Draft and/or Final Conclusion)</i>	OK = conform, CAR = Corrective Action Request, CL = Clarification Request, FAR = Forward Action Request

CDM Verification Protocol 4: Summary of Requests	
<i>No.</i>	The requests (CAR, CL, FAR) are numbered and listed in this section.
<i>Ref.</i>	Reference to the requirement number in Protocol 1-2 where the request is explained.
<i>Verifier request</i>	The section is used to elaborate and discuss the request. May give reference to the PDD or documents.
<i>Project participant response</i>	The responses given by the client or other project participants during the communications with the verification team should be summarised in this section.
<i>Verifier conclusion</i>	This section should summarise the verification team's responses and final conclusions. The conclusions should also be included in Protocol 1-2, under "Final Conclusion".
<i>Date</i>	Date when request was closed.

1.5 Level of assurance

Based on the process and the procedures conducted, SQS provides a reasonable but not absolute level of assurance that the project's greenhouse gas assertion is materially correct, and a fair representation of the greenhouse gas data and information. The term *reasonable* is to be understood according to the inputs by the UNFCCC Secretariat to EB meeting 48 as well as to the definition in ISO14064-3, A.2.3.

2 Verification and Certification Statement

2.1 Assessment of data and calculation of greenhouse gas emission reductions

The Swiss Association for Quality and Management Systems (SQS) has performed the initial verification of the project: "Fuel Substitution by Hydro Generation in Pasto Bueno", in line with the relevant requirements for CDM project activities. The project reduces GHG emissions by substitution of fossil fuel of diesel generators by a hydropower plant.

This first verification covers the period from 25/11/2008 to 30/09/2010.

The director of the Pasto Bueno hydropower plant Hidroelectrica Pelagatos SAC is responsible for the collection of data in accordance with the validated monitoring plan and the reporting of GHG emissions reductions from the project.

As a result of this verification with positive closing of all clarification and corrective action requests, SQS confirms that the project has been implemented and operational on site described in the validated PDD.

The implicated monitoring procedure is reliable and the certified and calibrated measurement equipment appropriate. Furthermore, the installed system is fully capable of recording the necessary data to determine the emission reductions.

SQS conducted the verification on the basis of the monitoring methodology AMS-I.A. Version 12. "Renewable Energy Projects - Electricity generation by the user", the monitoring plan included in the PDD [3] and the Monitoring Report version 1, dated 06/11/2010 [1]. The verification included:

- i) checking whether the design of the project is implemented and installed as planned and as described in the registered project design document;
- ii) checking whether the provisions of the monitoring methodology and the monitoring plan in the PDD were consistently and appropriately applied
- iii) the collection of evidence supporting the reported data.
- iv) checking whether the installed equipment essential for measuring parameters required for calculating emission reductions are calibrated appropriately.

In SQS's opinion, the assumptions, emission factors and default values applied in the calculations are justified.

2.2 Conclusion on the verified amount of emission reductions achieved

In SQS's opinion, the GHG emission reductions for the small scale project "Fuel Substitution by Hydro Generation in Pasto Bueno" (UNFCCC Project no.: 1986) as reported in the revised first Monitoring Report version 2, issued 04/05/2011 [2], are calculated without material misstatements in a conservative and appropriate manner.

The GHG emission reductions were correctly calculated on the basis of the approved monitoring methodology AMS-I.A. Version 12, for Scope TA 1.2: "Energy generation from renewable energy sources" and the monitoring plan contained in the validated Project Design Document for the project.

SQS herewith confirms that the project has achieved emission reductions in the mentioned reporting period as follows:

Emission reductions for first verification period from 25/11/2008 to 30/09/2010 of **5,696 tCO₂e**.

The verification of the project and monitoring report in terms of the completeness, comparability, accuracy and correctness of the reported GHG emission reductions is fulfilled.

2.3 Certification statement

SQS has performed the first verification of the emission reductions

- for the project “Fuel Substitution by Hydro Generation in Pasto Bueno” (UNFCCC Registration Reference No. 1986)
- for the period of 25/11/2008 to 30/09/2010.

Based on the verification findings, SQS is able to certify that the project activity achieved the verified amount of reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity as follows:

Verified emission reductions:

Project emissions	0	t CO ₂ equivalents
Baseline emissions	5,696	t CO ₂ equivalents
Emission reductions	5,696	t CO ₂ equivalents

Therefore, SQS confirms that the emission reduction from the “Fuel Substitution by Hydro Generation in Pasto Bueno Project” during the period 25/11/2008 to 30/09/2010 amounts to **5,696 tonnes of CO₂** equivalent.

3 Findings of the Desk Review and On-Site Visit

3.1 Remaining issues from the previous validation or verification period

The verification performed was the first periodic verification. There are no remaining issues to be considered concerning previous verifications.

The previous validation finished without any remaining issues or open questions (CL/CAR), as can be seen from the Validation Report (VALR) [4]. In the mentioned report, a FAR as FAR1 was raised on page 106:

“Once the plant begins to operate special attention should be given to the methodology and monitoring plan implementation. Related person/position – task for collection, handling and processing of the CDM data and ERs determination is clear”.

Special attention to this FAR1 was given during the entire verification, especially during the on-site visit and during document review. Clarification Requests CL3, CL5, CL6 and CL7 were raised during the on-site visit which relate to FAR1. The project participant's answers cover the open points. All above mentioned CL's could be closed according to the documents reviewed. See also Appendix F: Summary of Requests. Methodology and monitoring plan were implemented correctly and persons and position for collection, handling and processing of CDM data and ER determination were clearly assigned. FAR1 was answered satisfactorily and has been closed.

3.2 Project implementation in accordance with the registered project design document

The Installation has been setup, the commissioning was successful and the reporting and data logging started. During the on-site visit, the power station was presented fully operational and in production. There are only minor changes between “as designed” according the validation [4] of the PDD and “as built” i.e. how the Installation is presented today. The minor changes were addressed by SQS and classified as conservative:

- The max power of the generators changed from “as designed” 500kW and 400kW to “as built” 450kW and 150kW.
- For simplifying control systems and fly wheel installations, a grid connection with an additional power line was installed for 50Hz synchronization. There is no feedback possibility of produced power back into the grid. See also CAR.1 (closed).
- An additional measuring device was installed at the power line supply, which does only count consumed electricity. With this additional measuring device, the overall control as well the accuracy of the measured and produced electricity by the power station increased.

The first monitoring period is from 25/11/2008 to 30/09/2010. The implementation status of the project is fulfilled, equipment installed, commissioned, in operation and properly maintained.

The actual operation of the CDM project activity is as planned realized and data management in functional condition.

Based on the on-site visit and the reviewed project documentation, SQS confirms that the realized Hydro power technology including the monitoring and metering equipment was implemented and has been operating as described in the registered PDD [3]. The operation starting date of the project was 01/01/2009.

3.3 Compliance of the monitoring plan with the monitoring methodology

During the document review, the verification team reviewed the monitoring report [1] and compared it with the monitoring methodology [5] and with the monitoring plan [3] to verify its compliance. During the on-site visit, SQS verified processes and the installation in Peru. Based on this review, SQS confirms that the project's monitoring is in compliance with the applicable monitoring methodology as defined by AMS-I.A. Version 12. "Renewable Energy Projects - Electricity generation by the user".

No deviation and no revision to the monitoring plan were necessary.

The verification of the parameters was complete, considering the requirements of the methodology and considering the entire monitoring period.

3.4 Compliance of monitoring with the monitoring plan

SQS confirms that all parameters stated in the monitoring plan contained in the registered PDD [3] are monitored and reported appropriately. All parameters required to be monitored by the monitoring plan as per the monitoring methodology AMS-I.A. Version 12. "Renewable Energy Projects - Electricity generation by the user" were assessed during the on-site visit.

The monitoring report lists each parameter required by the monitoring plan and the information flow (i.e. from data generation, aggregation, recording, calculation and reporting).

The monitoring plan indicated in the registered PDD [3] requires only the monitoring of electricity generated. The emission factor of the project is fixed *ex-ante* as 0.8 tCO₂e/MWh.

The measuring equipment installed at the output of the power plant monitors the electricity generated and as described in the monitoring plan of the PDD. SQS was able to verify the calculations and deemed that the conclusion is transparent and reasonable.

According to Peruvian law, calibration must be repeated every ten years [25]. Today's metering equipment with data logger is sealed and cannot be manipulated. It is a fact that after ten years, the entire electronic measurement equipment usually needs to be replaced. Handling with such electronic measurement devices is currently state of art. It is not necessary and not intended to recalibrate this type of measurement equipment within 10 years. It is designed to remain calibrated over its 10 year lifespan.

SQS verified the values in the monitoring report by means of reviews of the excel file with recorded raw data, control sample of billings and archive control samples.

3.5 Assessment of data and calculation of greenhouse gas emission reductions

The theoretical physical maximum emission reduction is currently by full load on both hydro generator units during 8800h yearly operating hours and equals 4 224 t CO₂ e/year (600 kW x 8800h x 0,8 kgCO₂ e/kWh/1000 = 4 224 t CO₂ e/year). Total emission reduction during the first monitoring period (25/11/2008 to 30/09/2010) is 5,696 tCO₂e (during 22 months and 5 days). Total calculated emission reduction achieved in average per year during the mentioned monitoring period is 3,107 tCO₂e average per year, which is lower than the theoretical maximum.

Lower values of emission reductions than estimated in the PDD are due to:

- During November and December 2008 no electricity was monitored or delivered due to delayed commissioning.
- Lower installed max power on the turbines than mentioned in PDD

- Less full load running hours than expected in the first months 2009

SQS confirms that the power generated during this monitoring period was reasonable.

Further, SQS confirms that the calculations of GHG emission reductions are identically in the PDD and MR and that appropriate methods and formulae were applied.

3.6 Request for deviation

The monitoring report Version 2 [2] reflects the application of the approved guidance from the CDM Executive Board regarding the request for deviation:

The monitoring is conducted as per the methodology AMS-I.A. Version 12. "Indicative simplified baseline and monitoring methodology for selected small-scale CDM project activity categories".

No request for deviation is needed nor submitted.

3.7 Request for revision of the monitoring report

The monitoring report Version 2 [2] reflects the application of the approved guidance from the CDM Executive Board regarding the request for revision:

The monitoring is conducted as per the methodology AMS-I.A. Version 12.

No request for revision of the monitoring plan is needed or submitted.

3.8 List of each parameter specified by the monitoring report

There is one parameter to be monitored:

Parameter electricity quantity generated (see MR Chapter D.2):

The monitored data (the electricity quantity generated) are recorded automatically every 15 minutes. The data are processed on a monthly basis for the purpose of invoicing, under the responsibility of the director of the Pasto Bueno hydropower power plant.

During the on-site visit, it was demonstrated that the parameters are accurately measured, collected, stored, activated and transferred to the MR. The measuring equipment was found in proper functional condition and with untouched official seals. Due to the fact that the visit was in the beginning of December, the proper manner of data collecting by Laptop PC's could be observed and documented by SQS. Several datasets were crosschecked in Peru by SQS from the Measuring Equipment down to the recording billing and emission reduction calculating.

One parameter was fixed and validated ex-ante:

Emission Coefficient: In line with AMS-I.A. Ver.12 the default value is applied and has been confirmed during validation by SGS. The emission coefficient of 0.8 kg CO₂/kWh was correctly applied in the MR.

3.9 Verification protocol

In order to ensure transparency and organize the corrective or additional information and measures, a verification protocol was established for the project. The protocol shows in transparent manner the criteria (requirements), the means of verification and the results from verifying the identified criteria including any resulting CAR, FAR and CL. The protocol and the summary of request are attached in Appendix F to this document.

4 List of Interviewees and Documents Reviewed

The on-site visit and interviews were done according to the on-site visit programme (see appendix A) which was communicated to the project owner in advance of the audit.

The following stakeholders were interviewed during the verification (see appendix B).

The following documents were assessed during the verification (see appendix C).

5 Verification Team and Reviewer

The following matrix shows the names and roles of the members of the verification team and the reviewer. The reviewer is not a member of the verification team. Certificates of competence for each verification team member are included in appendix D to this report.

Name	Role (1)	Country	Duties					
			Desk review	On-site audit	Resolution of CAR & CL	Report	Internal review	Technical review
Martin Rügsegger	LA	Switzerland	x	x	x	X		
Oliver Gardi	TM	Switzerland	x		x		x	
Felix Martin	TR	Switzerland	x					X

(1) LA = Lead auditor/assessor; TM = Team member; TE = Technical expert (if any); TR = Technical reviewer

6 Quality Control

Cross checks and/or other plausibility checks undertaken during verification are mentioned in the report or in the protocol. The draft verification report, including the initial verification findings, undergoes an internal review (by a member of the verification team) before being submitted to the project participants. The final validation report undergoes a review for final approval, carried out by a reviewer (not a member of the verification team), before requesting registration of the project activity. The reviewer is qualified in accordance with SQS' qualification scheme for CDM validation and verification.

7 Appendix A: On-Site Visit Programme

Time from to		Topic	Function/Department	People to be interviewed
29/11/2010		<u>Switzerland Lima</u>		
30/11/2010				
04h00	16h00	Transfer from Lima to site		
16h00	18h00	Arrival on site, General visit of Pasto Bueno power plant area	CP Director (ad interim) HIDROPESAC	Antoine Dubas Mylène Le Tellier
1/12/2010				
08h00	09h00	Visit of the Pasto Bueno hydropower plant	CP Director (ad interim) HIDROPESAC	Antoine Dubas Mylène Le Tellier
09h00	10h00	Interview with the Pasto Bueno HPP Chief Engineer and his deputy	Plant Manager HIDROPESAC Deputy Chief Engineer HIDROPESAC	Antonio Atanacio Edson Pizarro
10h00	11h00	Main office Pasto Bueno: Documents, recordings, document storing, communications tracking's	Plant Manager HIDROPESAC	Antonio Atanacio
11h00	13h00	Visit at the Metering sites, information recovery. MALAGA Office : procedures	Chief Computer engineer (MALAGA)	Alberto Barreto
13h00	15h00	Visit to the diesel generators sites	Chief Mecanical Engineer (MALAGA)	Carlos Lazo
16h00	18h00	Discussion additional information's	CP Director (ad interim) HIDROPESAC	Antoine Dubas Mylène Le Tellier
2/12/2010		Transfer to Lima		
09h00	23h00	Transfer from site to Lima		
3/12/2010				
09h00	13h00	Visit office of HIDROPESAC	Director (ad interim) HIDROPESAC	Mylène Le Tellier
13h00	15h00	Visit office of HIDROPESAC	Interview with Administration HIDROPESAC	William Romero
3/12/2010		<u>Lima- Switzerland</u>		

8 Appendix B: Interviews

Source of information for local issues		
Name		Issue
Mylène Le Tellier Hidropesac	Executive Assistant	Translation General Information
Antoine Dubas EPD Ltd	Director	

Date 30.11 Pasto Bueno (DSC04093a)		
Name	Position	Issue
Mylène Le Tellier Hidropesac	Executive Assistant	General on-site visit
Antoine Dubas EPD Ltd	Director EPD Ltd	

Date 1.12 Hydropower plant (DSC04028, DSC04040, DSC04044 and DSC04026) and Main office Pasto Bueno (DSC 04078)		
Name	Position	Issue
Edson Pizarro	Chief Electrical Engineer	Data recording, tracking, technical, failure recording, shut downs
Antonio Atanacio	Plant Manager	Organisation, shifts, maintenance, responsibility's, archive,
Mylène Le Tellier Hidropesac	Executive Assistant	Translation

Date 1.12 Pasto Bueno Mine (Huaura Mine) (DSC01722) and Office (DSC04112)		
Name	Position	Issue
Alberto Barreto	IT Engineer	Electrical meters, data collection
Carlos Lazo	Mechanical Engineer	Diesel Generators, data collection
Mylène Le Tellier Hidropesac	Executive Assistant	Translation

Date 2.12 Huachaper Pampas measuring point (DSC01754)		
Name	Position	Issue
Roberto Chinga	IT Technician	Electrical meters, data collection
Mylène Le Tellier Hidropesac	Executive Assistant	Translation

Date 3.12 Head office Hidropesac Lima (DSC04178)		
Name	Position	Issue
Mylène Le Tellier Hidropesac	Executive Assistant	Management, administration, billing, documentation
William Romero	Administration	administration, billing, documentation

9 Appendix C: Documents Reviewed

No.	Title	Version
	Public Document reviewed	
1	Monitoring Report (MR 1 Version 1 of 06/11/2010)	1
2	Monitoring Report (Version number 2, issued on 04/05/2011)	2
3	PDD Registered project design document (PDD Version 4 of 13/11/2008)	4
4	VALR Validation Report (VALR Version 2 of 17/11/2008)	2
5	AMS-I.A. Version 12. "Indicative simplified baseline and monitoring methodology for selected small-scale CDM project activity categories"	12
6	VVM Clean Development Mechanism Validation and Verification Manual (Version 01.2, EB 55)	01.2
	Internal customer document reviewed [ICD]	
	Powerdistribution and Generators in the area Huaura Mine	
10	Tracking list of 3 Energy Measuring points „Consumo de Energia Huaura“ (DSC04110)	
11	Tracking list of Generator operating hours „Consumo de Energia Huaura“	
12	Energy summary list „Reporte de suministro de energia“ (DSC04111)	
13	Monthly Energy measuring procedure with Laptop 1/12/10 (DSC01729)	
	Received during Interview at Hotel PB	
15	A_to_CL1 „Time Schedule – summary of main events Pasto Bueno“	01/12/2010
16	A_to_CL10 EPD SA HR Auszug (Official Registration)	
17	A_to_CL4part1 Bueno to customer Counter certificate	
	Lima Head office Hydropesac	
20	A_to_CL2 Line Diagram	
21	A_to_CL3 Hidropesac Organization Chart	
22	A_to_CL5 Information Flow Chart Diagram	
23	A_to_CL6 Hydroelectrica Employs	
24	A_to_CL7 Information Persons Involved	
25	A_to_CL8 Peru Law Osinergmin (ME Inspection interval 10 Y)	
26	A_to_CL9.1 Billing Data (of electricity)	
27	A_to_CL9.2 Billing Data (of electricity)	
	Received after OSV	
28	A_to_CL4part2 Bueno to customer Counter certificate in house powerstation	26/01/2011
29	A_to_CL1 „Time Schedule – summary of main events Pasto Bueno“	18/01/2011
30	A_to_CAR1 "Answers SQS second hand unit, Installed capacity"	06/04/2011
	Hydropower Station Pasto Bueno	
40	Manual de operacion y guia rapida del generador GR1(DSC04052)	
41	Manual de operacion y guia rapida del generador GR2 (DSC04052)	
42	Power station Shift book of the operators (DSC04055)	
43	Training Manual (DSC04058)	
44	Registro del Tablero General (Energy and power tracking list „every hour“)	

	(DSC04057)	
45	Parada de Turbina 1 + 2 (Out of operation List) (DSC04060)	
46	Shift list and Program for operators (DSC04079)	
47	Report archive (DSC04081 DSC04081)	
48	Esatec „electrical diagrams and layout“ Hydropower station Pasto bueno (DSC04081)	

10 Appendix D: Certificates of Competence

Name: Mr Martin Rügsegger

Scopes of expertise:		
1	Energy industries (renewable/non-renewable sources)	X
	TA 1.1: Thermal energy generation from fossil fuels as well as thermal energy from solar	X
	TA 1.2: Energy generation from renewable energy sources	X
	TA 1.3: Other energy industries	X
2	Energy distribution	X
	TA 2.1: Electricity distribution	X
	TA 2.2: Heat distribution	X
3	Energy demand	X
	TA 3.1 Energy demand	X
4	Manufacturing industries	X
	TA 4.1: Cement sector	<input type="checkbox"/>
	TA 4.2: Aluminium	X
	TA 4.3: Iron and steel	X
	TA 4.4: Refinery	X
	TA 4.5: Other manufacturing industries	X
5	Chemical industry	<input type="checkbox"/>
	TA 5.1: Chemical process industries	<input type="checkbox"/>
6	Construction	X
	TA 6.1: Construction	X
7	Transport	<input type="checkbox"/>
	TA 7.1: Transport	<input type="checkbox"/>
8	Mining/mineral production	<input type="checkbox"/>
	TA 8.1: Mining and mineral processes, excluding those included in TA 8.2 below	<input type="checkbox"/>
	TA 8.2: Oil and gas industry, coal mine methane recovery and use	<input type="checkbox"/>
9	Metal production	X
	TA 9.1: Metal production	X
10	Fugitive emissions from fuels	<input type="checkbox"/>
	TA 10.1: Mining and mineral processes, excluding those included in TA 10.2 below	<input type="checkbox"/>
	TA 10.2: Oil and gas industry, coal mine methane recovery and use	<input type="checkbox"/>
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	<input type="checkbox"/>
	TA 11.1: Chemical process industries	<input type="checkbox"/>
	TA 11.2: GHG capture and destruction	<input type="checkbox"/>
12	Solvents use	<input type="checkbox"/>
	TA 12.1: Chemical process industries	<input type="checkbox"/>
13	Waste handling and disposal	X
	TA 13.1: Waste handling and disposal	X
	TA 13.2: Animal waste management	<input type="checkbox"/>
14	Afforestation and reforestation	<input type="checkbox"/>
	TA 14.1: Forestry	<input type="checkbox"/>
15	Agriculture	<input type="checkbox"/>
	TA 15.1: Agriculture	<input type="checkbox"/>
	TA 15.2: Animal waste management	<input type="checkbox"/>

Name: Mr Oliver Gardi

Scopes of expertise:		
1	Energy industries (renewable/non-renewable sources)	X
	TA 1.1: Thermal energy generation from fossil fuels as well as thermal energy from solar	<input type="checkbox"/>
	TA 1.2: Energy generation from renewable energy sources	X
	TA 1.3: Other energy industries	<input type="checkbox"/>
2	Energy distribution	<input type="checkbox"/>
	TA 2.1: Electricity distribution	<input type="checkbox"/>
	TA 2.2: Heat distribution	<input type="checkbox"/>
3	Energy demand	<input type="checkbox"/>
	TA 3.1 Energy demand	<input type="checkbox"/>
4	Manufacturing industries	<input type="checkbox"/>
	TA 4.1: Cement sector	<input type="checkbox"/>
	TA 4.2: Aluminium	<input type="checkbox"/>
	TA 4.3: Iron and steel	<input type="checkbox"/>
	TA 4.4: Refinery	<input type="checkbox"/>
	TA 4.5: Other manufacturing industries	<input type="checkbox"/>
5	Chemical industry	<input type="checkbox"/>
	TA 5.1: Chemical process industries	<input type="checkbox"/>
6	Construction	<input type="checkbox"/>
	TA 6.1: Construction	<input type="checkbox"/>
7	Transport	<input type="checkbox"/>
	TA 7.1: Transport	<input type="checkbox"/>
8	Mining/mineral production	<input type="checkbox"/>
	TA 8.1: Mining and mineral processes, excluding those included in TA 8.2 below	<input type="checkbox"/>
	TA 8.2: Oil and gas industry, coal mine methane recovery and use	<input type="checkbox"/>
9	Metal production	<input type="checkbox"/>
	TA 9.1: Metal production	<input type="checkbox"/>
10	Fugitive emissions from fuels	<input type="checkbox"/>
	TA 10.1: Mining and mineral processes, excluding those included in TA 10.2 below	<input type="checkbox"/>
	TA 10.2: Oil and gas industry, coal mine methane recovery and use	<input type="checkbox"/>
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	<input type="checkbox"/>
	TA 11.1: Chemical process industries	<input type="checkbox"/>
	TA 11.2: GHG capture and destruction	<input type="checkbox"/>
12	Solvents use	<input type="checkbox"/>
	TA 12.1: Chemical process industries	<input type="checkbox"/>
13	Waste handling and disposal	X
	TA 13.1: Waste handling and disposal	X
	TA 13.2: Animal waste management	X
14	Afforestation and reforestation	X
	TA 14.1: Forestry	X
15	Agriculture	X
	TA 15.1: Agriculture	X
	TA 15.2: Animal waste management	X

Name: Mr Felix Martin

Scopes of expertise:

1	Energy industries (renewable/non-renewable sources)	X
	TA 1.1: Thermal energy generation from fossil fuels as well as thermal energy from solar	<input type="checkbox"/>
	TA 1.2: Energy generation from renewable energy sources	X
	TA 1.3: Other energy industries	X
2	Energy distribution	X
	TA 2.1: Electricity distribution	<input type="checkbox"/>
	TA 2.2: Heat distribution	X
3	Energy demand	<input type="checkbox"/>
	TA 3.1 Energy demand	<input type="checkbox"/>
4	Manufacturing industries	X
	TA 4.1: Cement sector	<input type="checkbox"/>
	TA 4.2: Aluminium	<input type="checkbox"/>
	TA 4.3: Iron and steel	X
	TA 4.4: Refinery	<input type="checkbox"/>
	TA 4.5: Other manufacturing industries	<input type="checkbox"/>
5	Chemical industry	<input type="checkbox"/>
	TA 5.1: Chemical process industries	<input type="checkbox"/>
6	Construction	<input type="checkbox"/>
	TA 6.1: Construction	<input type="checkbox"/>
7	Transport	<input type="checkbox"/>
	TA 7.1: Transport	<input type="checkbox"/>
8	Mining/mineral production	<input type="checkbox"/>
	TA 8.1: Mining and mineral processes, excluding those included in TA 8.2 below	<input type="checkbox"/>
	TA 8.2: Oil and gas industry, coal mine methane recovery and use	<input type="checkbox"/>
9	Metal production	<input type="checkbox"/>
	TA 9.1: Metal production	<input type="checkbox"/>
10	Fugitive emissions from fuels	<input type="checkbox"/>
	TA 10.1: Mining and mineral processes, excluding those included in TA 10.2 below	<input type="checkbox"/>
	TA 10.2: Oil and gas industry, coal mine methane recovery and use	<input type="checkbox"/>
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride	<input type="checkbox"/>
	TA 11.1: Chemical process industries	<input type="checkbox"/>
	TA 11.2: GHG capture and destruction	<input type="checkbox"/>
12	Solvents use	<input type="checkbox"/>
	TA 12.1: Chemical process industries	<input type="checkbox"/>
13	Waste handling and disposal	X
	TA 13.1: Waste handling and disposal	X
	TA 13.2: Animal waste management	<input type="checkbox"/>
14	Afforestation and reforestation	<input type="checkbox"/>
	TA 14.1: Forestry	<input type="checkbox"/>
15	Agriculture	X
	TA 15.1: Agriculture	X
	TA 15.2: Animal waste management	<input type="checkbox"/>

11 Appendix E: Abbreviations /Reverences

General Abbreviations

AE	Applicant entity
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction
CL	Clarification Request
CO ₂	Carbon dioxide
CO ₂ e	Carbon dioxide equivalent
CPA	CDM programme activity
DNA	Designated National Authority
DOE	Designated operational entity (SQS)
FAR	Forward Action Request
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MVP	Monitoring and Verification Plan
NGO	Non-governmental Organisation
ODA	Official Development Assistance
PDD	Project Design Document
PP	Project Participant
SQS	Swiss Association for Quality and Management Systems
UNFCCC	United Nations Framework Convention on Climate Change

Abbreviations Project related

[CP]	Contact Person	
[ME]	Measuring Equipment	
[OSV]	On Site Visit	
[EPD Ltd]	Emerging Power Developers Ltd	(English)
[EPD SA]	Emerging Power Developers SA	(French)
[PB]	Pasto Bueno	Site Old Mine, Plant, Village, Hydropower Station
[MALAGA]	Huaura Mine	Site New Mine (el. Power Customer)
[Hidropesac]	HIDROELECTRICA PELAGATOS S.A.C.	(Owner of hydro power plant Pasto Bueno)

References

[VVM]	UNFCCC: "Clean Development Mechanism Validation and Verification Manual" (Version 01.2)
[PDD]	Registered project design document (PDD Version 4 of 13. November 2008)
[VALR]	Validation Report (VALR Version 2 of 17. November 2008)
[MR]	Monitoring Report (MR 1 Version 1 of 06. November 2010)
[VER1]	Verification Report Pasto Bueno of first MR from SQS (this actual Document)
[VPRT]	CDM Verification Protocol Pasto Bueno of first MR from SQS
[XLS]	Emission Reduction Calculation
[ICD]	Internal Company Document's
[F]	Photo

**Swiss Association for Quality and
Management Systems (SQS)**

B e r n s t r a s s e 1 0 3
P . O . B o x 6 8 6
C H - 3 0 5 2 Z o l l i k o f e n
T e l . + 4 1 3 1 9 1 0 3 5 3 5
F a x . + 4 1 3 1 9 1 0 3 5 4 5
h e a d o f f i c e @ s q s . c h
w w w . s q s . c h

CDM Verification Protocol

Enterprise

Business account:	321800
Company:	Emerging Power Developers Ltd
Address:	Rue du Lac 33 CH-1020 Renens VD
Phone:	+41 21 637 15 13
Fax:	+41 21 637 15 08
E-Mail:	ads@stucky.ch
Contact person :	Mr Antoine Dubas

Service

Audit/Assessment:	CDM First Verification
Audit/Assessment beginning/end:	18/10/2010 -16/06/2011
UNFCCC Project name:	Fuel Substitution by Hydro Generation in Pasto Bueno
GBZ/Report-No.:	321227/P30370.43
UNFCCC Scope(s)/Technical area(s):	1/TA 1.2
UNFCCC Methodology:	AMS-I.A. ver. 12
UNFCCC Scale:	Small Scale
UNFCCC Project number:	1986
Team of auditors/assessors:	Mr Martin Rügsegger Mr Oliver Gardi

Content

Protocol 1: General CDM Requirements	3
Protocol 2: Methodology AMS-IA Version 12.....	10
Protocol 3: Project Specific Requirements	12
Protocol 4: Summery of Requests	13

Scope

[VVM] 177: In carrying out its verification work, the DOE shall ensure that the project activity complies with the requirements of paragraph 62 of the CDM modalities and procedures.

[VVM] 179: The DOE shall assess and verify that the implementation of the project activity and the steps taken to report emission reductions comply with the CDM criteria and relevant guidance provided by the CMP and the CDM Executive Board.

[VVM] 181: The DOE's verification of the project documentation provided by the project participant shall be based upon both, quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted to the DOE. Qualitative information comprises information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emissions reports and review, and internal audit of calculations.

References

[VVM]	UNFCCC: "Clean Development Mechanism Validation and Verification Manual" (Version 01.2)
[PDD]	Registered project design document (PDD Version 4 of 13. November 2008)
[VALR]	Validation Report (VALR Version 2 of 17. November 2008)
[MP]	Monitoring Plan see PDD and VALR
[MR]	Monitoring Report (MR 1 Version 1 of 06. November 2010)
[VER1]	Verification Report Pasto Bueno of first MR from SQS
[VPRT]	CDM Verification Protocol Pasto Bueno of first MR from SQS (this actual Document)
[XLS]	Emission Reduction Calculation
[ICD]	Internal Company Document's
[F]	Photo

Abbreviations

[CP]	Contact Person
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[PB]	Pasto Bueno
[MALAGA]	Huaura Mine
[Hidropesac]	HIDROELECTRICA PELAGATOS S.A.C.
	Site Old Mine, Plant, Village, Hydropower Station
	Site New Mine (el. Power Customer)
	(Owner of hydro power plant Pasto Bueno)

MoV = Means of Verification, DR = Document Review, I = Interview, N/A = Not Applicable,
CAR = Corrective Action Request, CL = Clarification Request, FAR = Forward Action Request

Protocol 1: General CD M Requirements

Requirement	Ref.	MoV	Draft Concl.	Final Concl.
1. Defined organisational structure, responsibilities and competencies				
1.1. Position and roles Position and role of each person in the GHG data management process is clearly defined and implemented, from raw data generation to submission of the final data. Accountability of senior management must also be demonstrated.	PDD MR	DR I	CL3 CL5 CL6 CL10	Ok
Comments: Position and roles were explained verbal only. The auditor opened CL3 for Hidropesac Organization Chart, CL5 Information Flow Chart Diagram, CL6 List of Hydroelectrica Employs and CL10 Official Company Registration Answers shown in documents listed in Appendix C of VER1 with No.: 21 (A_to_CL3 Hidropesac Organization Chart), 22 (A_to_CL5 Information Flow Chart Diagram), 23 (A_to_CL6 Hydroelectrica Employs) and 16 (A_to_CL10 EPD SA Official Registration). With above document position and roles are clearly shown. Hence CL3, 5, 6 and 10 are correctly closed.				
1.2. Responsibilities Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees.	PDD VALR MR	DR I	CL5 CL7	Ok
Comments: Responsibilities must be included in job descriptions or special instructions for employees in documents. The auditor opened CL7 Information Persons Involved and CL 5 Information Flow Chart Diagram (See also 1.1.) Answers shown in documents listed in Appendix C of VER1 ref No.: 22 (A_to_CL5 Information Flow Chart Diagram) and 24 (A_to_CL7 Information Persons Involved) Information available such as job description, responsibility and instructions in above ICD. Hence CL5 and 7 are correctly closed.				
1.3. Competencies needed Competencies needed for each aspect of the GHG determination process are analysed. Personnel competencies are assessed and training programme implemented as required.	PDD VALR MR OSV	DR I	Ok	Ok
Comments: Is fulfilled, referring to several interview with CP during OSV. Training books instruction manual are available. An adequate education level and professional skills could be noted by the auditor during the Interviews.				
1.4. Dates of operation Verify the history	PDD MR	DR I	CL4	Ok
Comments: Dates mentioned in Monitoring Report under A7 and B1.1 could be lead to misunderstanding. Time table of project activity must be shown. The auditor opened CL1 „Time Schedule – summary of main events Pasto Bueno CP will supply overview graph 2007-2015 (including first crediting period) See in Appendix C of VER1 ref No.: 15 (A_to_CL1 „Time Schedule – summary of main events Pasto Bueno). This documents shows the mentioned dates. Hence, CL1 is correctly closed.				

Requirement	Ref.	MoV	Draft Concl.	Final Concl.
1.5. Discrepancy changes Have there been any changes since the last audit? - Equipment, machinery - Project size, project ownership - Monitoring - etc.	PDD VALR MR	DR I	CL2	Ok
Comments: The installation was set up; the commissioning took place and the reporting and data logging started. There are only minor changes between "as designed" according the VALR of the PDD and "as build" how the Installation is presented today. CL2 was opened for request of modified Line Diagram Document listed in Appendix C of VER1 ref No.: 20 (A_to_CL 2 Line Diagram) The changes are shown correctly. Hence CL2 is correctly closed.				
2. Conformance with monitoring plan				
2.1. Reporting procedures Reporting procedures should reflect the monitoring plan content. Where deviations from the monitoring plan occur, the impact of this in the data is estimated and the reasons justified.	PDD VALR MR F, OSV	DR I	CAR 1	
Comments: The MR in section C reflects with the line diagram only 3 metering points. The Metering point "M00" and "MGT" must be shown, in the Monitoring report. CAR1 was opened: A modified diagram must be included in the MR Version 2.				
2.2. Necessary changes Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary.	MR VALR MP	DR	OK	OK
Comments: No change to the monitoring plan was necessary. The MP was implemented as described in the registered PDD				
2.3. Current monitoring plan Registered PDD or accepted revised monitoring plan	PDD VALR MP	DR	Ok	OK
Comments: VALR refers in Chapter 4.6 and FAR1 to special attention for the MR and verification No change to the monitoring plan was necessary. The MP was implemented as described in the registered PDD				
3. Application of GHG determination methods				
3.1. Methods used There is documented description of the methods used to determine GHG emissions and justification for the chosen methods. If applicable, procedures for capturing emissions from non-routine or exceptional events are in place and implemented.	PDD MP	DR I	Ok	OK
Comments: „Methods for determining emission reductions were checked. They fully comply with the MP and the AMS-I.A v.12. Non exceptional events, attributable to the project activity, that can cause additional emissions were identified."				

Requirement	Ref.	MoV	Draft Concl.	Final Concl.
3.2. Information/process flow An information/process flow diagram, describing the entire process from raw data to reported totals is developed.	ICD VER1	I DR	CL5	Ok
Comments: Information flow diagram was missing. CL5 was opened. (see also 1.1) The diagram was presented in the Head office Hydropesac in Lima. Document is listed in Appendix C of VER1 ref No.: 22 (A_to_CL5 Information Flow Chart Diagram) Hence CL5 is correctly closed.				
3.3. Data transfer Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted - automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented.	VER1 App C OSV F	DR I	CL5, CL7	Ok
Comments: During the on-site visit data transfer was proved and observed. The auditor was able to verify data recording, transmitting, archiving, on the mine site, power station and in Lima. The correct billing to customer with mentioned data was crosschecked. Also, the correct spreadsheet information for calculation of emission reduction was crosschecked. "Information flow chart" and "information persons involved" must be documented (see also 1.2). CL 5 and CL 7 were opened. Answers shown correctly in documents listed in Appendix C of VER1 ref No.:22 (A_to_CL5 Information Flow Chart Diagram) and 24 (A_to_CL7 Information Persons Involved) Hence, CL5 and 7 are correctly closed.				
3.4. Data trails Requirements for documented data trails are defined and implemented and all documentation is physically available.	ICD F	DR I	CL5, CL7	Ok
Comments: The on-site visit took place, by chance, on the first of December. On the first day of each month, the monthly data collection from the meters are collected with a "lap top PC". The entire data flow was observed this way in reality. The auditor assisted on-site from the physical data collecting by Laptop PCs from all Measuring points down to the onsite offices at the mine at Pasto Bueno, then the billing procedure and also the GHG calculation in the administration at Hidropesac in Lima. During the interviews, a suitable correct data management was verified. The same documentation has been requested in 1.2 and 3.3 with opening CL5 and CL7. Answers shown in ICDs listed in Appendix C of VER1 ref No.:22 (A_to_CL5 Information Flow Chart Diagram) and 24 (A_to_CL7 Information Persons Involved) Hence, CL5 and 7 are correctly closed.				

Requirement			Ref.	MoV	Draft Concl.	Final Concl.
4. Identification and maintenance of key process parameters						
4.1. Identification of key parameters			MR	I DR	CL4,8	OK
The key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) are identified.						
Comments:	See also 4.2 The only measuring equipments used are (state of the art) electrical energy meters (counter). Counters are, according to Peru standard, conformed and with certificates. The documents were not available as copies so CL4 “Counter Certificate” and CL8 “Peru Law Osinergmin” were opened. Copies of Documents received are listed in Appendix C of VER1 ref No.:17, 28 and 25. Hence CL4 and 8 are correctly closed. Generally the measuring methods are proven , are conservative and the measuring setup is redundant.					
4.2. Calibration/maintenance			ICD	I DR	CL4 CL8	Ok
Appropriate calibration/maintenance requirements are determined.						
	Device	Identification		Test date		
	M000	Fulfilled OSV, find in sealed condition VER1, App. C: No.17, A_CL4part1, No. 25, A_CL8		19/03/2007		
	M001	Fulfilled OSV, find in sealed condition VER1, App. C: No.17, A_CL4part1, No. 25, A_CL8		19/03/2007		
	M002	Fulfilled OSV, find in sealed condition VER1, App. C: No.17, A_CL4part1, No. 25, A_CL8		19/03/2007		
	MG1	Fulfilled OSV, find in sealed condition VER1 App. C: No. 28, A_CL4part2, No. 25, A_CL8		conformity declaration		
	MG2	Fulfilled OSV, find in sealed condition VER1 App. C: No. 28, A_CL4part1, No. 25, A_CL8		conformity declaration		
	MGT	Fulfilled OSV, find in sealed condition VER1 App. C: No. 28, A_CL4part1, No. 25, A_CL8		conformity declaration		
Comments:	All measuring equipment from each metering point mentioned in table above were visited on-site, checked, found in functional condition and correctly sealed. The documents were not available as copies so CL4 “Counter Certificate” and CL8 “Peru Law Osinergmin” were opened. Copies of Documents received and are listed in Appendix C of VER1 ref No.:17, 28 and 25. Hence CL4 and 8 are correctly closed.					

Requirement	Ref.	MoV	Draft Concl.	Final Concl.
5. GHG calculations				
5.1. Use of estimates and default data Where estimates or default data are used, they are validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.	PDD VALR MR	DR	Ok	OK
Comments: One parameter was fixed and validated ex-ante: Emission Coefficient: In line with AMS-I.A. Ver.12 the default value is applied and has been confirmed during validation by SGS. The emission coefficient is 0.8 kg CO ₂ /kWh. There are no further parameters.				
5.2. Guidance on checks and reviews Guidance is provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.	ICD OSV F	DR I	CL5 CL7	Ok
Comments: The existing monthly energy billing system to costumer leads a self controlling system by customer with feedback due to the financial interests of costumer. Persons involved and data flow must be documented. The auditor opened CL5 Information Flow Chart Diagram and CL7 Information Persons Involved (See also 1.2.) Answers shown in documents listed in Appendix C of VER1 ref No.: 22 (A_to_CL5 Information Flow Chart Diagram) and 24 (A_to_CL7 Information Persons Involved) Information available such as job description, responsibility and instructions in above ICD. Hence, CL5 and 7 are correctly closed.				
5.3. Internal verification Internal verifications include the GHG data management systems to ensure consistent application of calculation methods.	ICD OSV F	DR I	OK	OK
Comments: The monthly energy bills to costumer are referring to actual data of energy ME; the same data are used for GHG calculations. GHG calculation are correctly internal verified.				

Requirement	Ref.	MoV	Draft Concl.	Final Concl.
5.4. Internal validation Data reported from internal departments should be validated visibly (by signature or electronically) by an employee who is able to assess the accuracy and completeness of the data. Supporting information on the data limitations and problems should also be included in the data trail.	OSV ICD	DR I	CL5 CL7	Ok
Comments: Each step from internal data reporting, transmitting, controlling was adequate presented on site. Documents were signed or approved. Responsibilities and special instructions for employees must be visible in documents. The auditor opened CL7 Information Persons Involved and CL 5 Information Flow Chart Diagram (See also 1.2.) Answers shown in documents listed in Appendix C of VER1 ref No.: 22 (A_to_CL5 Information Flow Chart Diagram) and 24 (A_to_CL7 Information Persons Involved) The implication of internal validation is considered as adequate and correct with above ICD and observations during the on-site visit. Hence, CL5 and 7 are correctly closed.				
5.5. Reasons for missing data What are the reasons for missing data?			N/A	
Comments: On the on-site visit could not be discovered any missing data				
5.6. Calculation Are CERs correctly and conservative calculated	MR ICD	DR I	Ok	OK
Comments: The calculation is correct. Due to the fact that positive side effects of CO ₂ reduction do not appear in the calculations, the CERs are calculated in a conservative way. Positive side effects are not considered in GHG calculation in that project such as: - Reinstallation and reconnection of Irrigation channel approximately 10 km by Pasto Bueno Hydropower project with downstream water for extend agriculture area located above Pampa village (no water transport by trucks any more) - Surplus power and power peaks over maximum Hydropower production which is needed on the mining complex is not any more generated by Diesel generators due to connection to public grid. - because the processing plant (crusher and mechanical concentration) for the mining complex is transferred to the new closer site (less then 1km) of the actual mine, the internal truck transportation for raw mining material was drastically reduced by distance and level difference (before from approximate 3600m over a pass of 4 424m down to 3600 for a distance of 13 km).				
5.7. Cross-checks Between records and reports	MR ICD	DR I	Ok	Ok
Comments: During the on-site visit in Lima: Billing system, billing procedure to customer and GHG procedure were controlled. Two cross check of month March and September 2009 were made from the daily raw data to monthly summary, as well down to costumer bills and also the GHG calculation. This checks showed that data corresponds to the aggregated data presented in MR.				

Requirement		Ref.	MoV	Draft Concl.	Final Concl.
5.8. Data protection measures Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights)		OSV ICD	DR I	Ok	OK
	Example	Where			
	Archiv Paper/PC/Laptop/ without connection to Internet	Monthly data	Pasto Bueno		
	Archive paper/PC/Laptop/Server Restricted access rights	Monthly data/annual report	Lima		
	Server/backup secured/ Restricted access rights	Monthly data/annual report	CH-Renens		
Comments:	Pasto Bueno area is secured with 24 hours security guards and the head office of Hidropesac in Lima is secured office building. During the OSV these could be noticed.				
5.9. IT systems IT systems used for GHG monitoring and reporting should be tested and documented.		ICD	DR I	OK	OK
Comments:	During the on-site visit on the Huaura Mine, the data logging was demonstrated by the staff and observed by the auditor and contact person (by chance, due to normal end of the month, data logging procedure). Program used is Alpha-plus (official IT-program used in Peru for electric ME and counters).				
6. Remaining issues from the previous verification period					
6.1. FAR 1 from previous VALR FAR1 from VALR page 106: <i>“Once the plant begins to operate special attention should be given to the methodology and monitoring plan implementation. Related person/position – task for collection, handling and processing of the CDM data and ERs determination is clear”.</i>		VALR MR MP PDD	DR	OK	OK
Comments:	Special attention was given to this FAR1 during the entire verification, the on-site visit and as well during the document review. CL3, CL5, CL6 and CL7 were opened during the on-site visit. All CLs were closed successfully, based on additional information contained in requested documents (see also Appendix F: Summery of Requests).				

Protocol 2: Methodology AMS-I.A Version 12

Requirement		Ref.	MoV	Draft Concl.	Final Concl.
7. Technology/measure					
Does the implemented project activity comply with the applicability criteria of the methodology?		§1 - §5 VALR	DR	OK	OK
Comments:	Yes it does: §1 Renewable energy (Hydro power) replaces fossil fuel, § 2 the project is smaller than 15 MW, §4-5 is N/A				
8. Boundary					
Does the boundary of the implemented project activity correspond to the boundary described in the methodology?		§6	DR I	OK	OK
Comments:	The implementation of the project activity fully corresponds with the project boundary described in the PDD and the requirements of the AMS-I.A. v. 12. The only observed deviation from the MP is with regard to the documentation of the monitoring equipment.				
9. Baseline					
The energy baseline is the fuel consumption of the technology in use or that would have been used in the absence of the project activity.		PDD VALR MR §7, §10	DR	OK	OK
Comments:	In the VALR, the baseline calculation was approved according AMS-I.A Version 12. If the Pasto Bueno Hydropower project would not be implemented, the diesel generator would still be operating. The approved default value is correct in regard to the presented situation. Baseline emission factors are used consistently and applied correctly in PDD and MR.				
10. Leakage					
If the energy generating equipment is transferred from another activity: Is leakage (re-) considered?		MR §14	DR I	yes	OK
Comments:	The second hand 150 kW unit was purchased for Pasto Bueno from a refitted Hydro power plant. Due the replacement of a new generator and turbine set, the old set is not used any more. This set was sold and, after revision, installed in Pasto Bueno. see VER1 App. C: No. 30 The replaced diesel generators were found on site during the onsite visit “out of operation”. There is no other Leakage to consider.				

11. Monitoring

Parameter 1: Electricity generated		MR	DR	OK	Ok
Data Protocol	Yes / No				
Completeness	yes				
QA/QC procedures	yes				
Implementation & operation as in PDD	yes				
Information flows generating, aggregating, reporting	yes				
Interview with personnel, if procedures understood	yes				
Cross-check of data if available see	yes				
Comments:	No more parameters to be monitored				

Protocol 3: Project Specific Requirements

Requirement		Ref.	MoV	Draft Concl.	Final Concl.
12. License					
License available		VALR	DR	OK	OK
Comments:	Construction licence available (VALR page 107/110, available on-site). CDM project registration (Project Nr 1986)				
13. Monitoring Report					
The monitoring report corresponds to the findings of the audit an it is correct		MR	DR I	CAR	
Comments:	The Monitoring Report has to be adapted according to the completeness check from 26.1.2011 and CAR1 presented as Version 2.				

Protocol 4: Summary of Requests

No.:	CL 1	Reference:	VPRT 1.4
Verifier request:	Dates mentioned in Monitoring Report under A7 and B1.1 leads to misunderstanding. Time table of project activity is missing.		
Project participant response:	CP will supply overview graph 2007-2015 (including first crediting period) 01/12/2010 received A_to_CL1 Time Schedule Version1		
Verifier request:	Dates on tables are not structured well.		
Project participant response:	CP will supply modified overview graph 2007-2015 26/01/.2011 received: A_to_CL1 Time Schedule –Pasto Bueno Version2		
Verifier conclusion:	OK	CL1 is closed	Date: 01/02/2011

No.:	CL 2	Reference:	VPRT 1.5
Verifier request:	Declaration of changes between “as designed” according the Validation of the PDD and “as build” how the Installation is presented today are missing		
Project participant response:	The Installation has been setup, the commissioning was successful and the reporting and data logging started. There are only minor changes between “as designed” according the Validation of the PDD and “as build” how the Installation is presented today. The power of the generators changed from “as designed” 500kW and 400kW to as build 450kW and 150kW . There is one ME device more then designed. For simplifying control systems and fly wheel installations a grid connection with power line was installed for 50Hz synchronization. There is no Feedback possibility back into the grid. New Line diagram will be available 03/12/2010 received: A_to_CL2 Line diagram.		
Verifier conclusion:	OK	CL2 is closed	Date: 06/12/10

No.:	CL 3	Reference:	VPRT 1.1
Verifier request:	Organization Chart of Hidropesac is missing		
Project participant response:	Will be available in Lima 03/12/2010 received: A_to_CL3 Hidropesac Organization Chart		
Verifier conclusion:	OK	CL3 is closed	Date: 06/12/10

No.:	CL 4	Reference:	VPRT 4.1 and 4.2
Verifier request:	Measuring equipment's Certificate is missing		
Project participant response:	Available, 02/12/2010 received: A_to_CL4part 1 for Power Line ME M0, M1 and M2		
Verifier request:	for Hydropower station ME certificates must be presented as well		
Project participant response:	Conformity and ME documentation received on 26/01/2011 received document A_to_CL4part 2		

MoV = Means of Verification, DR = Document Review, I = Interview, N/A = Not Applicable,
CAR = Corrective Action Request, CL = Clarification Request, FAR = Forward Action Request

Verifier conclusion:	OK	CL4 is closed	Date:	02/02/2011
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No.:	CL 5	Reference:	VPRT 1.2 and 3.2 - 3.4
Verifier request:	Information flow diagram is missing		
Project participant response:	Available 03/12/2010 received: A_to_CL5 Information Flow Chart Diagram		
Verifier conclusion:	OK	CL5 is closed	Date: 06/12/2010

No.:	CL 6	Reference:	VPRT 1.1
Verifier request:	CL6 Hidropesac Employs List and position are missing		
Project participant response:	Available 03/12/2010 received: A_to_CL6 Hydroelectrica Employs		
Verifier conclusion:	OK	CL6 is closed	Date: 06/12/10

No.:	CL 7	Reference:	VPRT 1.2 and 3.2- 3.4
Verifier request:	List of Persons and company Involved with measuring equipment is missing		
Project participant response:	Available 03/12/2010 received: A_to_CL7 Information Persons Involved		
Verifier conclusion:	OK	CL 7 is closed	Date: 06/12/10

No.:	CL 8	Reference:	VPRT 4.1, 4.2
Verifier request:	In the PDD (B.7.2) is a three year calibration interval mentioned. OSV the CP explained that according the Lima Dep. Of Energy there is a ten year calibration period to be requested. Lima law Documents for inspection intervals are missing.		
Project participant response:	Available The reality shown OSV is that ME is a electronic device and cannot be calibrated. The ME is sealed and must be replaced after then years or when the seal will be broken off. 03/12/2010 received: A_to_CL8 Peru Law Osinergmin (ME Inspection interval 10 Y)		
Verifier conclusion:	Procedure in conformity with manufacturer's specifications Ok	CL8 is closed	Date: 06/12/10

No.:	CL 9	Reference:	
Verifier request:	Billing structure and example are not available		
Project participant response:	Available, 03/12/2010 received: A_to_CL9.1 and A_to_CL9.2		
Verifier conclusion:	Ok	CL9 is closed	Date: 06/12/10

MoV = Means of Verification, DR = Document Review, I = Interview, N/A = Not Applicable,
CAR = Corrective Action Request, CL = Clarification Request, FAR = Forward Action Request

No.:	CL 10	Reference:	VPRT 1.1
Verifier request:	Official registration of EPD Ltd is missing		
Project participant response:	Available 02/12/2010 received: A_to_CL10 EPD SA HR Auszug (Ofical Registration)		
Verifier conclusion:	Ok	CL10 is closed	Date: 06/12/10

No.:	CAR 1	Reference:	VPRT 2.1 and 2.2
Verifier request:	<p>Existing Monitoring Report is not in line with CDM requirements. The MR reflects with line diagram in "section C" only 3 metering points. Information Is missing. Changes between "as designed" according the Validation of the PDD and "as build" how the Installation is presented today are missing. Dates are not in short date format: dd/mm/yyyy Baseline in D2 also in Chapter E1 is incorrect. E4 and E5 The comparison of actual emission reduction and estimated emission reduction encompass not the same time frame. (vintage table).</p>		
Project participant response:	<p>In A_to_CL 2 the changes are presented. The power of the generators changed from "as designed" 500kW and 400kW to "as build" 450kW and 150kW. There is one ME device more then designed in the power line. For simplifying control systems and fly wheel installations a grid connection with power line was realized for 50Hz synchronization. There is no power feeding possibility back into the grid.</p> <p>New MR will be elaborated as Version 2.</p>		
Verifier conclusion:	open	Date:	07/02/2011
Project participant response:	<p>In A_to_CAR1 received 06/04/2011: Second hand turbine was replaced by a more powerful unit on the former site (due to that fact no leakage must be considered).</p> <p>New monitoring report elaborated by EPD Ltd: Monitoring report Version 2 (dated 04/05/2011) received on 08/05/2011</p>		
Verifier conclusion:	Ok	CAR1 is closed	Date: 09/05/2011

No.:	FAR	Reference:	
Verifier request:	no FAR raised.		