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Verification Report

Quimobásicos HFC Recovery and Decomposition Project

Periodic Verification # 9
of the registered CDM project

No. 0151

Report No. 1175058
June 24, 2008

TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstr. 199 - 80686 Munich - GERMANY

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Report No.	Date of first issue	Version	Date of this revision	Certificate No.
1175058	April 21, 2008	2	June 19, 2008	

Subject:	Periodic Verification of a CDM Project
Executing Operational Unit:	TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 - 80686 Munich, GERMANY
Client:	Quimobásicos S.A. de C.V. Ave. Ruíz Cortínez N° 2333 Pte. Monterrey, Nuevo León, Mexico
Contract approved by:	Werner Betzenbichler
Report Title:	Periodic Verification of the Quimobásicos HFC Recovery and Decomposition Project in Mexico
Number of pages	18 (excluding cover page and annexes)

Summary:

The certification body "Climate and Energy" of TÜV SÜD Industrie Service GmbH has been ordered by Quimobásicos S.A. de C.V. (Quimobásico) to carry out the periodic verification of the registered CDM project number 0151 "Quimobásicos HFC Recovery and Decomposition Project" in Mexico for period December 31, 2007 to March 30, 2008.

The verifier confirms that all the elements of the project necessary for the HFC decomposition are implemented as planned and described in registered PDD and the monitoring system has been implemented according to the revised monitoring plan approved on Sept 05, 2007. The installed equipment runs reliably and is calibrated appropriately. The monitoring system is in place and the project does generate GHG emission reductions as a CDM Project

The verifier can confirm that the GHG emission reduction for the whole monitoring period is calculated without material misstatements and also confirms that the used monitoring plan is in compliance with the methodology AM0001 version 3. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

Reporting period: from December 31, 2007 to March 30, 2008

Verified emission in the above reporting period:

Baseline Emissions:	620007 t CO2e
Project Emissions :	47 t CO2e
Leakage	82 t CO2e
Emission Reductions:	619878 t CO2e

Work carried out by:	Javier Castro (Assesment Team Leader) Arturo Lemus (Auditor) Alberto Perez (Technical Expert) Sergio Degener (Auditor)	**Internal Quality Control by:** Werner Betzenbichler

Abbreviations

Abbreviations that have been used in the report here:

CAR	Corrective Action Request
CDM	Clean Development Mechanism
DAS	Data Acquisition System
DNA	Designated National Authority
FAR	Forward Action Request
GHG	Greenhouse Gas
HCFC22	Chemical component ($CHClF_2$)
HFC23	Chemical component (CHF_3)
IETA	International Emission Trading Association
IVC	Initial Verification Checklist
JI	Joint Implementation
KP	Kyoto Protocol
MP	Monitoring Plan
PDD	Project Design Document
PVC	Periodical Verification Checklist
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	UN Framework Convention on Climate Change
VVM	Validation and Verification Manual

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Table of Contents

1 INTRODUCTION

Quimobásicos S.A. de C.V. has commissioned an independent verification by TÜV SÜD Industrie Service GmbH (TÜV SÜD) of its registered CDM project "Quimobásicos HFC Recovery and Decomposition Project" in Mexico. The order includes the periodic verification of the project.

Verification is the periodic independent review and ex post determination by the Designated Operational Entity / Independent Entity of the monitored reductions in GHG emissions during the defined verification period.

This report summarizes the findings of the periodic verification. It is based on the Periodic Verification Report Template of the Validation and Verification Manual (VVM) published by International Emission Trading Association (IETA).

The periodic verification has been performed in a single mission on-site. This consisted of a desk review of the project documents including monitoring report, PDD, monitoring plan, last verification report; excel calculation sheet and further documentations.

The verification team consists of the following personnel:

Javier Castro	TÜV SÜD, Munich	Assesment Team Leader
Arturo Lemus	TÜV SÜD Mexico, México	Local expert, GHG auditor
Albert Perez	TÜV SÜD Mexico, Monterrey	Technical Expert
Sergio Degener	TÜV SÜD Munich	GHG Auditor

1.1 Objective

The objective of verification can be divided in Initial Verification and Periodic Verification:

- Initial Verification:

The objective of an initial verification is to verify that the project is implemented as planned, to confirm that monitoring plan of the registered PDD complies with the monitoring plan of the applied methodology and to assure that the project will generate verifiable emission reductions. A separate initial verification prior to the project entering into regular operations is not a mandatory requirement. The initial verification had been done by TÜV SÜD Industrie Service in July 19 and 20 of 2007; this report as well as the results of the previous periodic verification can be found on the UNFCCC website under:

http://cdm.unfccc.int/Projects/DB/DNV-CUK1138260062.21/view.html

- Periodic Verification:

The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems, also the revision of the last verification report is carry out. Further more the periodic verification evaluates the GHG emission reduction data and expresses a conclusion with a high level of assurance, verifies that the reported GHG

emission data is sufficiently supported by evidence, i.e. monitoring records and also confirm that the monitoring report complies with the applied methodology monitoring plan. The verification shall consider both quantitative and qualitative information on emission reductions.

Quantitative data comprises the monitoring reports submitted. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification is based on criteria set by UNFCCC, the Kyoto Protocol and the CDM modalities and procedures.

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions. The verification is based on the submitted monitoring report and the registered project design documents including its monitoring plan. The monitoring report and associated documents are reviewed against Kyoto Protocol requirements, UNFCCC rules and EB decisions. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the verification, focusing on the identification of significant risks of the project implementation and the generation of CERs.

The verification is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

The on-site visit was carried out during April 17 and 18 of 2008, the audit team has been provided with various documents showing the implementation of the project, such as updated procedures, manuals, records of measurements, calibration records, plasma efficiency calculation sheets, flow meters verification records, etc. In April 17, 2008 a Monitoring Report dated June 16, 2008 and calculation sheets that cover the period December 31, 2007 to March 30, 2008 have been submitted. This monitoring report has been made publicly available at UNFCCC:

http://cdm.unfccc.int/Projects/DB/DNV-CUK1138260062.21/iProcess/TUEV-SUED1192525528.86/view

These documents serve as the basis for the assessment presented herewith.

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

- Knowledge of Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Quality assurance
- Technical aspects of HFC decomposition
- Monitoring technologies and concepts
- Political, economical and technical conditions in host country

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

Javier Castro is deputy head of the certification body "Climate and Energy" at TÜV SÜD Industrie Service GmbH. He has an academic background in chemical engineering and energy systems. In his position he participates as project manager the validation, verification and certifications processes for GHG mitigation projects. He has received extensive training in the CDM and JI validation processes, and participated in some validation and verification of CDM projects.

Arturo Lemus is a GHG auditor and project manager for CDM activities in Mexico City. In his position he is responsible of coordination of all activities of Validation and Verification of the projects developed in Mexico. has received extensive training in the CDM validation and verification processes and participated already in several CDM project assessments as auditor.

Alberto Perez is a Ph.D. in Mechanical Engineering at the University of Leicester, UK. He has extensive experience in Mechanical Design, Failure Analysis, Risk analysis, processes and mechanisms. Dr. Perez has experience in leading research groups and engineering teams in the industry.

Sergio Degener is a GHG auditor at the "Carbon Management Service" in the head office of TÜV SÜD Industrie Service GmbH, Germany. Mr. Degener studied environmental engineer at the University of Applied Science in Bingen, Germany. Beside his main focus in studies of environmental economics and law, he dealt with environmental management and environmental controlling issues.

The audit team covers the above mentioned requirements as follows:

- Knowledge of Kyoto Protocol and the Marrakech Accords (ALL)
- Environmental and Social Impact Assessment (ALL)
- Quality assurance (ALL)
- Technical aspects of HFC decomposition (ALL)
- Monitoring technologies and concepts (ALL)
- Political, economical and technical conditions in host country (ALL)

Responsibility for the internal quality control of the project was with Werner Betzenbichler, head of the certification body "climate and energy".

1.3 GHG Project Description

The project activity involves the installation of an in-flight argon plasma arc facility to decompose the HFC23 generated as by-product of HCFC 22 production of Quimobásicos S.A. de C.V. at their plant in Monterrey, Mexico. As a brief description of the process, the waste gas stream enters into the plasma torch, which is of segmented design, using argon as plasma gas. The argon plasma is generated by a direct current discharge between a cathode and an anode. At typical operating conditions the mean exit enthalpy of the plasma is about 11 MJ/Kg at a mean exit temperature in excess of 10,000°C, under these conditions the decomposition of HFC 23 is almost complete. The installation was finish and operational on 31st March 2006. Batch process of HFC 23 destruction has been implemented by Quimobasicos in order to improve the plasma consumptions.

2 METHODOLOGY

The project assessment aims at being a risk based approach and is based on the methodology developed in the Validation and Verification Manual, an initiative of all Applicant Entities and Designated Operational Entities, which aims to harmonize the approach and quality of all such assessments.

These combined checklists serve the following purposes:

- It organizes details of the audit procedure and clarifies the requirements the project is expected to meet; and
- Ensures a transparent verification process and provides evidence of the how particular requirements have been proved and the result of the verification.

The findings are the essential part of this verification report, which is based on the verification protocols of the VVM. The completed protocol is enclosed in Annex 1 and Annex 2 to this report.

The structure of the tables is shown in the following:

Periodic Verification Checklist Table 1: Data Management System/Controls		
Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	A score is assigned as follows: **Full** all best-practice expectations are implemented. **Partial** a proportion of the best practice expectations is implemented **Limited** this should be given if little or none of the system component is in place.	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (**OK**)**,** or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications

Periodic Verification Checklist Table 2: GHG calculation procedures and management control testing		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Identification of potential reporting risks based on an assessment of the emission estimation procedures. Identification of key source data. Focus on those risks that impact the accuracy, completeness and consistency of the reported data.	Identification of the key controls for each area with potential reporting risks. Assessment of adequacy of the key controls and eventually test that the key controls are actually in operation. Internal controls include, Understanding of responsibilities and roles, Reporting, reviewing and formal management approval of data; Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc.	Identification of areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks Areas where data accuracy, completeness and consistency could be improved are highlighted.

Periodic Verification Checklist Table 3: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *FARs*)**
List of residual areas of risks of Periodic Verification Checklist Table 2 where detailed audit testing is necessary. *In addition, other material areas may be selected for detailed audit testing.*	*The additional verification testing performed is described. Testing may include:* ▪ *Sample cross checking of manual transfers of data* ▪ *Recalculation* ▪ *Spreadsheet 'walk throughs' to check links and equations* ▪ *Inspection of calibration and maintenance records for key equipment* ▪ *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions are noted here. Errors and uncertainties are highlighted.*

2.1 Review of Documentation and Site Visits

The verification was performed as a desk review of the project documents including PDD, monitoring plan, Monitoring report (December 31, 2007 – March 30, 2008), last verification report and further documentations.

An on-site visit was realized. It enabled the verification of the project installation and of the monitoring plan, as part of the visit, the emission reductions presented in the Monitoring report and all the raw data necessary to confirm such calculation was verified. During the onsite visit interviews with different plant employees have been realized.

Participants on the verification on the part of Quimobásicos were:

Armando Ortega	Superintendent of Quality Assurance
Mauricio Puente	Superintendent of Process
Rodolfo Vidaurri	Manager of the Plant
Encarnacion Ramirez	Process Engineer
Alejandro Treviño	Instrumentation and configuration Engineer

2.2 Resolution of Corrective and Forward Action Requests

The objective of this phase of the verification was to resolve the requests for corrective actions and any other outstanding issues which needed to be clarified for TÜV SÜD's positive conclusion on the GHG emission reduction calculation. Quality and accuracy of the data and documents presented during the on site visit was high nevertheless one CAR has been reported and the same has been solved completely. Forward Action Requests are defined for issues which do not effect the generation of emission reduction in the verified period, but shall be improved within a reasonably time frame in order to ensure the reliability of future data. To guarantee the transparency of the verification process, the reported CAR and FAR and responses that have been given, are summarized in chapter 3 below and documented in more detail in the verification protocol in annex 1.

3 PERIODIC VERIFICATION FINDINGS

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

The findings from the desk review of the monitoring report and further documentation and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Verification Protocol in annex 1.

1) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Corrective or Forward Action Request, respectively, have been issued. The Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in annex 1. The verification of the project resulted in one Corrective and one Forward Action Requests.
2) Forward Action Request are identified as an opportunity of improvement that will ensure the delivery of high quality CERs in the future. Forward Action Request is understood as recommendation for future project monitoring; they are stated, where applicable, in the following sections and are further documented in the Verification Protocol in annex 1.
3) The final conclusions for verification subject are presented.

3.1 Remaining issues, CARs, FARs from last verification

One task of the periodic verification is to check the remaining issues from the previous verification or issues which are clearly defined for assessment in the PDD.

The FAR 1 reported during the last (eighth) verification, regarding to carry out the periodic internal verifications before the periodic verification, in order to avoid minimum mistakes in the documentation has been solved and has checked by the audit team during this verification. The client provided documents assuring the continuation of this procedure.

3.2 Project Implementation

3.2.1 Discussion

The scrutiny of a proper implementation of the project and correct monitoring data are key issues of a periodic Verification, in order to have a successful emission reduction. The Quimobásicos HFC Recovery and Decomposition Project started operating on 31st March 2006, decomposing the HFC 23, generated as by-product of the HCFC 22 production, in the plasma unit.

As has been describe in the reports of last periods verified, the water treatment system is not completely implemented yet, they are expecting to finish the complete installation during February month of 2008 according to the water treatment system schedule. The residual water from the plasma unit is conducted to the plan, here the pH of the residual water is controlled and then is discharged into the general container, a device to measure the quantity of water treated was in-

stalled. Insofar the actual status does not correspond in detail to the planned project activity as described in the PDD. But as the alternative water treatment process does not impact the emission calculation integrity, the audit team considers this fact as not relevant.

All major components of the project were checked. This includes amongst others the plasma unit, two mass flow meters, steam meter and electrical meter. Additional support equipment has been also checked. This includes amongst others the gas-chromatograph, sampling equipment and pattern mass flow meter for weekly functionality test.

According to the methodology and the validated PDD the HCFC22 production of the plant is monitored and it is capped by the historical average as maximum. This cap has been fixed at 7,570 tonnes/year. The way the production data is obtained is consistent with the way the historical data had been determined.

Measurement equipments are in place and calibrated. All required metering systems have been identified and checked.

Responsibility for installation and operation of the equipment is within Quimobásicos employees. The equipment is calibrated periodically as proven during the on-site visit.

The project boundaries have not been changed.

The Monitoring Manual and procedures from the project activity have been added to the actual quality management system hold by Quimobasicos, an organization chart defines the responsibilities to consolidate the data required for emission reduction calculations. The Monitoring Manual documents the various processes established to monitor emission reductions. The documentation is accessible in electronic form and known to the relevant people.

3.2.2 Findings

None

3.2.3 Conclusion

The project complies with the requirements.

3.3 Internal and External data

3.3.1 Discussion

The external data has been verified and all are in line with the requirements.

The monitoring plan provided by the PDD is correctly implemented and hence all internal data to be monitored is available.

Most of the internal data is continuously acquired and stored in the computerized System and from these transferred manually to excel sheets or software. This transfer has a risk of human

failure. The computerized System (Data acquisition System DAS) is storing raw data without any possibilities of intended or unintended overwriting.

All the data have been verified completely, besides the purity of HFC23 analysis for which the verification was made by spot checks.

The emission factor of the electricity is provided by Iberdrola, which is the company that provides electricity to Quimobasicos.

The flow of HFC23 before the plasma unit is measure by two flow meters. According to the clarification given by the EB to the request AM_CLA_0019, the method to determine the amount of waste HFC23 flow is determined. The documentation provided by the DAS allows the correct used of this method.

The audit team can confirm that the used management and operational system is appropriate and is being implemented as defined in the Monitoring Plan. All of above data are stored in different documents all available during the on-site audits.

Project documentation has been included in the Quimobasico's ISO 9001:2000 Quality Management System and ISO 14001:2004 Quality Environmental Systems which are certified by an accredited certification body, this implementation ensure the quality of the CDM monitoring procedures.

3.3.2 Findings

None

3.3.3 Conclusion

The project complies with the requirements.

3.4 Environmental and Social Indicators

3.4.1 Discussion

There are no requirements from the authorities to measure the emissions (CO, CO_2, O_2, NO_2, NaF, NaCl, etc.) Nevertheless they measured them by an external laboratory voluntarily.

Since measurement of air pollutants as product of gas (HFC23) combustion has been required only initially and not continuously for the environmental license issued by the authority, no procedure for environmental indicators are considered to be necessary.

3.4.2 Findings

None

3.4.3. Conclusion

The project complies with the requirements.

3.5 Management and Operational System

3.5.1 Discussion

The Monitoring Reports document the various processes established to monitor emission reductions. All procedures have been observed and are available. All calibration documents are correctly recorded. They are accessible and known by the relevant personnel.

Qualification and training procedures are well established by the project participants. Documents were shown that demonstrate qualification and competence. Additionally, training for specific duties and responsibilities could be demonstrated with records of training of the personnel. The responsibilities are clearly defined and communicated.

The plant implemented an emergency plan (in case of fire, explosion, etc.). The procedures are adequately communicated.

Quimobasicos holds a quality management system based on ISO 9001:2000 and ISO 14001:2004 and certified by an accredited certification body, certificates are available.

3.5.2 Findings

None

3.5.3 Conclusion

The project complies with the requirements.

3.6 Completeness of Monitoring

3.6.1 Discussion

The reporting procedures reflect the monitoring plan completely. All parameters were determined as prescribed. The Monitoring report presents the monitoring concept in the same way as it is presented in the revised monitoring plan that has been aproved on September 05, 2007 and applied methodology AM0001 version 3. There were not deviations from the monitoring plan.

The revised monitoring plan approved on September 05, 2007 is available on UNFCCC website:

http://cdm.unfccc.int/Projects/DB/DNV-CUK1138260062.21/MonitoringPlanRevisions/01/RevisedMonitoringPlan

The measurement frequency of the emission gases in the stack (concentration of HFC23 and flow) correctly reflect the monitoring plan presented in the PDD. These have been increased to three measurements per month in order to demonstrate the representatively of these values.

Procedure for the functionality test of the flow meters, zero check and semester calibration have been implemented according to the monitoring plan.

Any outtake of waste gas after the flow meters has to be reflected by adjustment of the emission reductions. Additionally the installed system includes an evaporating tank, which is positioned directly before the plasma, in the case the tank would be repaired or open for any reason like maintenance, the amount of HFC23 content in the same should be included as project emission.

3.6.2 Findings

Corrective Action Request No.1.
Please include a table in the MR with the assessment of ("W") factor during the verification period.

Response:
W factor for period 31 December to 30 March is annexed in monitoring report.

3.6.3 Conclusion

The period of 31st of December to 30th March 2008 the W factor was verified by the audit team, according to the monitoring report updated, and electronic copy of this document has been provided as evidence.

Corrective Action Request No.2.
In section 7 of Emission reduced by the project activity, please include in the table of comments, a brief description about the calculations of the steam consumption mentioned in point 12.

As the same way the electricity consumption showed in point 15, please mention which the values include the operation tests of the water treatment plant.

Response:
A description of the consumptions of steam and electricity, will be included in monitoring report.

3.6.4 Conclusion

The monitoring report updated was verified by the audit team, and electronic copy of this document has been provided as evidence.

3.7 Accuracy of Emission Reduction Calculations

3.7.1 Discussion

According to the approved methodology there is no need to make corrections for data uncertainty. The audit team confirms that emission reduction calculations have been performed according to the Monitoring Plan and to the calculation methodology reported in the Monitoring Report.

The calibration records show the correct functionality of all the necessary equipment available in the plant.

The method to determine GHG emissions is fully documented base on the validated monitoring plan in the registered PDD. The amount of HFC23 waste gas has been calculated as recommended in the clarification AM_CLA_0019 given by the EB.

The procedure to determined the purity of the HFC23 flowing to the plasma is established. In case of maintenance in the evaporation tank, these will be documented and the project emissions are going to be included in the monitoring report and records will be available for further verification.

3.7.2 Findings

None.

3.7.3 Conclusion

The project complies with the requirements.

3.8. Quality of Evidence to Determine Emission Reductions

3.8.1 Discussion

Concerning verification, the calculation of emission reductions is based on internal and external data. The source and raw data of internal and external data were explicitly checked and all were in line with the requirements.

All key parameters are properly identified. All the calculation of the values for standard deviations and averages are done by software commercially proved. Inspection of calibration and maintenance records for key equipment was performed for all relevant equipment.

The emission factor for steam presented in the monitoring report is the same value of the validated in the PDD.

3.8.2 Findings

None

3.8.3 Conclusion

The project complies with the requirements.

3.9 Management System and Quality Assurance

3.9.1 Discussion

Quimobasicos holds a quality management system based on ISO 9001:2000 and ISO 14001:2004 and it is certified by an accredited certification body, this ensure that all documents, procedures, records, maintenance programs and management communication is implemented and controlled. All records involved in the CDM activity will be kept during the life time of the project and two more years in order to comply with CDM requirements. Procedures are available in electronic form, access in controlled with passwords.

The IT system used is very powerful. Additionally to avoid any human failure during data transfer, quality control carries out cross checks.

3.9.2 Findings

Foward Action Request No.1.

According to the maintenance orders and the production, binnacle should be improved, in order that both reports are congruent with the activities performed, when the plasma is out of service

Response:

Maintenance and plasma reports will be reviewed to accredit the information.

3.9.3 Conclusion

The implementation of this improvement will be evaluated during the next verification.

During the issuance process a request for review has been presented incuding following issue:

Issue (REQUEST 1, 2 AND 3):
Further clarification is required how the DOE verified that the w value cannot
Exceed the capped value for the past one year period (i.e. April 2007 - March 2008), in accordance with paragraph 90 of EB35.

Response by TÜV SÜD:
Based on EB 35 paragraph 90, the HFC23/HCFC22 mass ratio (w) value is monitored monthly and verified during each onsite visits by the DOE, the calculation excel sheet in section HFC 23 part HFC23/HCFC22 mass ratio (w), includes a lock based on the mass ratio limit of 2.44% of the validated PDD, this lock excludes the possibility of manipulating the production process to increase the quantity of waste. This limited quantity of HFC23 is used in calculation of baseline emissions. The DOE confirms that the annual HFC23/HCFC22 mass ratio (w) value is 2.301%.

Data of the period from 1 April 2007 to 31 March 2008, where annual w is demonstrated to the fulfillment of the factor.

The G22 production of the period was of: 7550.523 t
The G23 production according to w 2.44% (HCFC22 x w) is: 184.232 t
The G23 production (HFC23 x P_HFC23) was: 182.209 t
The G23 production Limited Quantity: 173.800
The w factor according to HFC23/HCFC22 was: 2.301 %

This data is available in the excel calculation sheet and has been verified by the audit team.

4. PROJECT SCORECARD

The conclusions on this scorecard are based on the revised CDM monitoring report.

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	State-of-the-art technology is applied in an appropriate manner. Quimobasicos is expecting to use a new chromatography at the end of 2007 in order to improve the gas analysis.
	Data calculations	✓	✓	✓	Emission reductions are calculated correctly.
	Data management & reporting	✓	✓	✓	No risk identified during this visit. Potential for improvement is indicated by FAR 1
Consistency	Changes in the project	✓	✓	✓	Results are consistent to underlying raw data.

5 VERIFICATION STATEMENT

TÜV SÜD Industrie Service GmbH has performed a periodic verification of the registered CDM project: "Quimobásicos HFC Recovery and Decomposition Project" in Mexico. The verification is based on requirements of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords".

The management of Quimobásicos S.A. de C.V. is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions.

The verifier confirms that all the elements of the project necessary for the HFC decomposition are implemented as planned and described in registered PDD, revised monitoring plan approved on September 05, 2007 and applied methodology. The installed equipment runs reliably and is calibrated appropriately. The monitoring system is in place and the project does generate GHG emission reductions as a CDM project.

Installed equipment being essential for generating emission reduction and for metering the data defined in the monitoring plan runs reliably and is calibrated appropriately. The monitoring system is in place and the project generates GHG emission reductions according to the approved methodology.

The verifier can confirm that the GHG emission reduction is calculated without material misstatements for the whole monitoring period. Issues indicated as Forward Action Request will be verified by the audit team during the next periodic verifications.

Our opinion relates to the project's GHG emissions reductions reported and related to the valid project baseline and monitoring, and its associated documents.

Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: from December 31, 2007 to March 30, 2008.

Verified emission in the above reporting period:

Baseline Emissions:	620007 t CO2e
Project Emissions:	47 t CO2e
Leakage:	82 t CO2e
Emission Reductions:	619878 t CO2e

Munich, 24.06.2008

Werner Betzenbichler
Head of certification body „Climate and Energy"

Javier Castro
Assesment Team Leader

Annex 1

Table 1: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

- Full - all best-practice expectations are implemented.
- Partial - a proportion of the best practice expectations is implemented
- Limited - this should be given if little or none of the system component is in place.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including Forward Action Requests)
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.*	Full	The responsibilities are clearly defined in the diagram "Organigrama G23" where the responsibilities of all personnel involve in the project are identified. For this period there are not new positions or functions involved in the project, so there are not changes in the document "Organigrama G23".
1.2 Responsibilities *Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees*.	Full	See above.
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.*	Full	The evidences about the internal qualification of the personnel were reviewed. Documents like training of plasma operation, gas measuring, monitoring procedures and list of participants have been provided.
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 on the data is estimated and the*	Partial	The Monitoring report presents the monitoring concept in the same way as the revised monitoring plan requested by the EB on July 27, 2007. No additional deviations are required.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including Forward Action Requests)
reasons justified.		According to the EB35/Report, Paragraph 90 regarding to the HFC23 waste generation rate/HCFC22 production ("w") values calculated during the verification period shall not exceed the maximum value as registered in the PDD, the audit team confirms that "w" value of Quimobasicos project does not exceeds the maximum validated value of 2,44%, the excel spread sheet has been locked in order to exclude the possibility of manipulating the production process to increase the quantity of waste, the quantity of HFC 23 waste is limited to a fraction (w) of the actual HCFC 22 production during the year at the originating plant. This limited quantity is used in calculation of baseline emissions. (see excel spread sheet section HFC23 part HFC23/HCFC22 mass ratio (w)). Concerning to the exhaust gas analysis reported from Gamatek laboratory, the period information has been verified by the auditor. The customer provided a copy of the reports dated 15-02-08 report Nr. 925/08, 12-03-08 report Nr. 1208/08 and 04-04-08 report Nr. 1316/08 **<u>Corrective Action Request No.1.</u>** Please include a table in the MR with the assessment of ("W") factor during the verification period.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including Forward Action Requests)
		Corrective Action Request No.2. In section 7 of Emission reduced by the project activity, please include in the table of comments, a brief description about the calculations of the steam consumption mentioned in point 12. As the same way the electricity consumption showed in point 15, please mention which the values include the operation tests of the water treatment plant.
2.2 Necessary Changes *Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary*.	Full	No changes or deviations to the monitoring plan are required.
3 Application of GHG determination methods		
3.1 Methods used *There are 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.*	Full	The method to determine GHG emissions is fully documented base on the validated monitoring plan in the last version of the PDD. The amount of HFC23 waste gas has been calculated as recommended in the clarification AM_CLA_0019 given by the EB. The procedures to determined the purity of the HFC23 flowing to the plasma is done taking 6 samples per day using an annual calibrated chromatograph which is verified every month using a certified standard, the samples HFC23 are taking in to account as project emission.
3.2 Information/process flow *An information/process flow diagram, describing the entire process from raw data to reported totals is developed.*	Full	Details of the information flow exist, and a flow diagram is available.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including Forward Action Requests)
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.*	Full	The data is saved in the System in magnetic tapes and/or in hard disks and also in physical form by the operators. This data is transferred to the calculation sheets automatically. The same is twice controlled. All data sources are clearly referenced. The electricity emission factor is calculated by an external company Iberdrola which is the Energy supplier and the data is submitted to Quimobasicos. For 2007, Iberdrola has provided monthly electricity emission factor of 2006, which is the recent data, the calculation of the new emission factor is less conservative than the emission factor of 2006, Quimobasicos has decided to continue using electricity emission factor 2006, this information has been provided to the DOE.
3.4 Data trails *Requirements for documented data trails are defined and implemented and all documentation are physically available.*	Full	The documents with primary data are available and primary data which were retrieved on a random basis could be confirmed. To ensure the reliability of the data, a spot-check was realized between the data from the main computer and the data from the spreadsheets, all data revised coincided in both sources.
4 Identification and maintenance of key process parameters		

Expectations for GHG data management system/controls	Score	Verifiers Comments (including Forward Action Requests)
4.1 Identification of key parameters *The key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) are identified.*	Full	Yes, all key parameters are identified. For further references please see sections D and E of Initial verification checklist from first verification report.
4.2 Calibration/maintenance *Appropriate calibration/maintenance requirements are determined.*	Partial	Yes, calibration / maintenance requirements are met. Whenever required calibration procedures are correctly applied by Quimobasicos by ordering Third Parties to deliver this service. Records are kept in the files and electronic and can be provided completely on request. All necessary maintenance and quality assurance measures are performed by the quality management system. There is a quality management system implemented and certified under ISO 9001 2000 and ISO 14001:2004 standards, the calibration and quality assurance procedures are documented, all the procedures are part of the quality management system. **Foward Action Request No.1.** According to the maintenance orders and the production, binnacle should be improved, in order that both reports are congruent with the activities performed, when the plasma is out of service.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including Forward Action Requests)
5 GHG Calculations		
5.1 Use of estimates and default data *Where estimates or default data are used, these 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.*	Full	The estimate and the default data were verified considering changes and accuracy levels. All values used are correctly applied in the calculations. The electricity consumed for the equipment installed in water treatment plant is considered in the project activity emission. The electric connection was realized after the electricity meter of the plasma. The stage of the installation was reviewed, and water treatment system is not completely implemented yet. At the moment the facility began with the tests on April of the present year. Currently, waste water is conducted to two tanks where parameter like PH are measured and controlled then the water goes to the general tank of the plant.
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.*	Full	The procedures are established and are included in a flow-chart diagram. Manual data transfer such as flow meter weekly verification is checked by the quality Manager.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including Forward Action Requests)
5.3 Internal verification *Internal verifications include the GHG data management systems, to ensure consistent application of calculation methods.*	Full	Quimobasicos has a certified quality management system based on ISO 9001:2000 and ISO 14001:2004 and the internal audits include CDM procedures, complementary see 4.2. The FAR 1 reported during the last (eight) verification regarding to carry out internal verifications, has been implemented with revisions and meetings once a month. Meeting reports were showed as evidence to the auditor.
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, problems should also be included in the data trail.*	Full	The final report is sign by the general manager as final step of the internal validation. This guarantees a high level of competence.
5.5 Data protection measures *Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).*	Full	Procedures to ensure the data protection and ensure the archiving data were implemented and documented.
5.6 IT systems *IT systems used for GHG monitoring and reporting should be tested and documented.*	Full	The IT system in use is very powerful. All the management of the information is correctly describe. The IT system is constantly updated, proof of that is the recent upgrade in the process information capacity of the equipments.

Table 2: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Based on an assessment of the emission calculation procedures and taking in account the last verifications periods, the potential reporting risk is: • Transfer of data • Gas concentration analysis method	A specialized software was developed to transfer the flow meters data from the main database to the excel files, only when the system is not working (due a change in the programming) the transfer is done manually, even with this manual transfer the risk is low because the data are not captured or typed, the data is only copied. The new software used to extract the data form the main data base consider a time synchronization of all equipments involved in the process, it reduce the risks of error or differences in the time of each reading of flow meter measurements. Additionally the excel file used to calculate the amount of HCF23 going to the plasma includes some formulas with references to other cells. These references are double checked manually; therefore the risk here is low. The method to analyze the gas composition is stable, this procedure does not represent a risk for the determination of emission reductions of this period. The stability of the method has been verified during the on-site visit.	No areas of residual risk have been found.

Table 3: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
Additional random testing	➢ Sample cross checking of manual transfers of data: All data which was used in the calculation sheets was explicitly checked. On a random basis data was checked at their primary source. A spot check was done in the cases were an average was used for the calculation, only when the amount of data was too big. ➢ Recalculation The calculations were also manually performed. ➢ Spreadsheet 'walkthroughs' to check links and equations All equations and algorithms used in the different workbook sheets were checked. ➢ Inspection of calibration and maintenance records for key equipment The seals and the documents for the key equipment were inspected.	All the findings are included as CARs and improvements as FARs in table 4.

Table 4: Compilation of open issues

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
Corrective Action Request No.1. Please include a table in the MR with the assessment of ("W") factor during the verification period.	W factor for period 31 December to 30 March is annexed in monitoring report.	The period of 31st of December to 30th March 2008 the W factor was verified by the audit team, according to the monitoring report updated, and electronic copy of this document has been provided as evidence. ☑
Corrective Action Request No.2. In section 7 of Emission reduced by the project activity, please include in the table of comments, a brief description about the calculations of the steam consumption mentioned in point 12. As the same way the electricity consumption showed in point 15, please mention which the values include the operation tests of the water treatment plant.	A description of the consumptions of steam and electricity, will be included in monitoring report	The monitoring report updated was verified by the audit team, and electronic copy of this document has been provided as evidence. ☑
Foward Action Request No.1. According to the maintenance orders and the production, binnacle should be improved, in order that both reports are congruent with the activities performed, when	Maintenance and plasma reports will be reviewed to accredit the information.	The implementation of this improvement will be evaluated

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
the plasma is out of service		during the next verification. ☑

Annex 2

Reference No.	Document or Type of Information
0	On-site interview at the offices of Quimobasicos in Monterrey, Mexico on April, 17 and 18 of 2008 by auditing team of TÜV SÜD **Validation team on-site:** Arturo Lemus — TÜV SÜD Mexico / CDM Auditor Alberto López — TÜV STechnical Expert **Interviewed persons:** Armando Ortega — Superintendent of Quality Assurance Sergio Lozano — General Director Mauricio Puente — Superintendent of Process Rodolfo Vidaurri — Manager of the Plant Encarnacion Ramirez — Process Engineer Juan Alejandro Treviño — Instrumentation and configuration Engineer
Category 1:	**Documents provided by the Client that relate directly to the GHG components of the project.**
1-1	Project Design Document of Quimobásicos HFC Recovery and Decomposition Project, Version 4, dated, May 23, 2006; registered under the number 0151 on June 14, 2006. UNFCCC homepage http://www.unfccc.int
1-2	Validation Report Quimobasicos HFC Recovery and Decomposition Project, Report Number 2005-1191, Rev. 02
1-3	Initial verification report Quimobasicos HFC Recovery and Decomposition Project
1-4	Last verification report Quimobasicos HFC Recovery and Decomposition Project for the period from Sep 29, 2007 to Dec 30, 2007
1-5	Monitoring Report Quimobásicos HFC Recovery and Decomposition Project period December 31 2007 to March 30, 2008 – dated June 16, 2008
1-6	Final Caculation workbook Planilla para soporte de reporte de monitoreo- excel file, dated April 11 2008
1-7	Procedure Plasma operation “Instructivo Operacion de Unidad Plasma” word file
1-8	Procedure flow meters verification P-7.6-09-A “Verificación de medidores de flujo en linea G23”.
1-9	Operational procedure “Determinación de %G23 En corriente de gases hacia Unidad de Plasma”
1-10	Operational procedure “Instructivo de la determinación del % de error y la incertidumbre”
1-11	Operational procedure “Control, calibración y verificación del cromatrografos”

Reference No.	Document or Type of Information
1-12	Org chart “Organigrama G23” power point file
1-13	Historic results of gas analyze through chromatography of G23 (December to March 2008)
1-14	Updated for the configuration of gas Analyze Method “Ventila .M”, dated April 2, 2006.
1-15	Results G23 analysis from December 31 to March 30, 2008 developed in Quimobásicos Laboratory
1-16	Project schedule of the wastewater treatment plant “ Planta de Tratamiento de la descarga del Plasma”
1-17	Reports from maintenance department “Sistema de Administración de Mantenimiento,
1-18	Validation of the revised Monitoring Plan of the Registered CDM Project 0151 Quimobasicos HFC Recovery and Descomposition Project – dated Aug 02, 2007 by TUV SUD.
1-19	Revised monitoring plan of the Registered CDM Project 0151 Quimobasicos HFC Recovery and Descomposition Project – Approved September 05, 2007.
1-20	G22 Production from December 31 to March 30 from Quimobasicos Plant.
Category 2	**Background documents related to the design and/or methodologies employed in the design or other reference documents. These documents have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.**
2-1	Results from Gamatek SA de CV of “Reporte de Evaluación de Emisión a la Atmósfera” Reports from January month to March Numbers. **925/08** issued Feb 15, 08 – sampling date Jan 15, 08. **1208/08** issued March 12, 08 – sampling date Feb 12 08, and **1316/08** issued April 04, 08 – sampling date March 03 08.
2-2	Calibration certificate of the standard gas used for chromatography verification. CRM, Inc. Preparation date: 03/12/07, expiration date: 03/12/09. Standard No. STDP031207B
2-3	Calibration certificates of the following equipments: Temperature transmission (RTD), electronic balance, electricity meter.