



VERIFICATION REPORT

Of Nitrous Oxide Reduction at Agropolychim Fertilizers Plant

First Periodic Verification
of the JI Project “Nitrous Oxide Reduction at
Agropolychim Fertilizers Plant”

MONITORING PERIOD:
1 JANUARY 2008 TO 31 DECEMBER 2009

REPORT No. BULGARIA- VER #/0003/2010
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BUREAU VERITAS CERTIFICATION



VERIFICATION REPORT

Date of first issue: 15/06/2010	Organizational unit: Bureau Veritas Certification Holding SAS
Client: AGROPOLYCHIM JSCo	Client ref.: Mr. Krassimir Berbenkov Mrs. Miroslava Vasileva

Summary:

Bureau Veritas Certification has carried out first periodic verification of the JI Track I project "Nitrous Oxide Reduction at Agropolychim Fertilizers Plant", Devnya, Bulgaria based on UNFCCC criteria for the JI, as well as criteria given to ensure consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

The verification scope is defined as a periodic independent review and ex post determination by the Accredited Independent Entities of the monitored reductions in GHG emissions during defined verification period, and consisted of the following three phases: i) desk review of the monitoring report, project design document including its monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

The first output of the verification process is a list of Clarification Requests, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the GHG emission reduction is calculated without material misstatements. 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.

Reporting period: From 01/01/2008 to 31/12/2009.

Emission Reductions for 2008 : 263 589 t CO₂ equivalents
Emission Reductions for 2009 : 189 297 t CO₂ equivalents

Total Emission Reductions : 452 886 t CO₂ equivalents

Report No.: BULGARIA- VER #/0003/202010	Subject Group: JI
Project title: "Nitrous Oxide Reduction at Agropolychim Fertilizers Plant"	
Work carried out by: Team Leader : Konstantin Rachev Team Member : Christo Shvabski	
Work verified by: Flavio Gomes – Internal technical reviewer Rayna Zlatarova - Technical Specialist	
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Indexing terms

Climate Change, Kyoto Protocol, JI, Emission Reductions, Verification

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Abbreviations

AIE	Accredited Independent Entities
CAR	Corrective Action Request
CL	Clarification Request
CO2	Carbon Dioxide
ERU	Emission Reduction Units
FAR	Forward Action Request
GHG	Green House Gas(es)
IETA	International Emissions Trading Association
JI	Joint Implementation
MP	Monitoring Plan
MR	Monitoring report
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change



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1 INTRODUCTION

AGROPOLYCHIM JSCo, has commissioned Bureau Veritas Certification to verify the emission reductions of its JI project “Nitrous Oxide Reduction at Agropolychim Fertilizers Plant”, Devnya, Bulgaria” (hereafter called “the project”) located in town Devnya, Bulgaria. The order comprises First periodic verification and is related to emission reductions achieved during 1 January 2008 to 31 December 2009.

This report summarizes the findings of the verification of the project, performed based on UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

The purpose of this verification is a First periodic verification covering the period from 01/01/2008 to 31/12/2009

The objective of the periodic verification is the review and ex post determination by an AIE of the GHG emission reductions. It includes the verification of the data given in the monitoring report by checking the monitoring records and the emissions reduction calculation.

1.2 Scope

The verification of this project is based on the Project Design Document 2004-04-23, the latest version of Monitoring Report (covers January 1, 2008 to Dec 31, 2009), ver. 3 from 2010-10-18, the monitoring plan as set in the PDD, Determination Report for this JI Project and supporting documents made available to Bureau Veritas Certification, and information obtained through the on-site interviews and on-site assessment. The documents and information are reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

Bureau Veritas Certification, based on the recommendations in the Validation and Verification Manual (IETA/PCF), has employed a risk-based approach in the verification, focusing on the identification and reporting of significant risks and on reliability of project monitoring and generation of Emission Reductions Units (ERU).

The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the Client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.



1.3 GHG Project Description

Agropolychim JSC is located in Devnia, near the city Varna, in Northeast Bulgaria.

The objective for the project is to reduce the N_2O emission by utilizing new developed technology (i.e. a catalyst) that converts the Nitrous Oxide into Oxygen and Nitrogen, which have zero Global Warming Potentials.

The new technology is applied by introducing a new catalyst bed, which is installed directly under the Platinum Gauze in the reactors. This new catalyst does not have any effects on the present production (no yield loss).

The technology is owned and patented by Heraeus. The technology has been installed in a few plants and operated without problems. The supplier guarantees the performance of the catalyst technology. The pressure drop over the catalyst is not significant and is normally about 15 mbar. The lifetime of the catalyst is expected to be maximum 3 years. In case the performance throughout this period is not satisfactory, it will be replaced at the next possible shutdown. The last replacement of the catalyst was on 08-09 December 2009.

The formation of N_2O is unavoidable, since the NO yield is limited. From an environmental point of view, emissions of N_2O need to be prevented. N_2O has a global Warming Potential (GWP) of 310 times greater than CO_2 .

Only N_2O emissions from the nitric acid plant are determined, as only these emissions of Agropolychim are affected by the project. The project does not have any impact related to the energy consumption or generation, waste, raw material consumption and emissions other than N_2O .

A baseline N_2O emission factor (5.54 kg N_2O per tonne of nitric acid) was determined based on N_2O concentration measurements, tail gas flow rate, temperature, pressure, and nitric acid production. The N_2O concentration of 860 ppmv measured in 2004 is comparable to the N_2O concentration measurements carried out at other plants. The presented information was validated during 2004, which is documented in the Determination Report from 2004.

The catalyst for converting N_2O was supplied by Heraeus. This product was installed and operated without problems and great success in the Nitric Acid Plant.

The design and the installation of the catalyst were ready on September 15th 2005. The reductions of N_2O emissions started immediately following the installation of the new technology.

2 METHODOLOGY

The verification is as a desk review and field visit including discussions and interviews with selected experts and stakeholders.

In order to ensure transparency, a verification protocol was customized for the project, according to the Validation and Verification Manual (IETA/PCF) a verification protocol is used as part of the verification. 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 the project is expected to meet; and
- It ensures a transparent verification process where the verifier will documents how a particular requirement has been verified and the result of the verification;

The verification protocol consists of one table under Initial Verification checklist (applicable only for initial verification) and four tables under Periodic verification checklist. The different columns in these tables are described in Figure 1.

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification procedures.

The completed verification protocol is enclosed in Appendix A to this report.

Initial Verification Protocol Table 1			
Objective	Reference	Comments	Conclusion (CARs/FARs)
The requirements the project must meet	Gives reference to where the requirement is found.	Description of circumstances and further comments on the conclusion	This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non-compliance of the stated requirements. Forward Action Request (FAR) indicates essential risks for further periodic verifications.

Periodic Verification Checklist Protocol Table 2: Data Management System/Controls		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
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.	<p>A score is assigned as follows:</p> <ul style="list-style-type: none"> • 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 Protocol Table 3: GHG calculation procedures and management control testing		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
<p>Identify and list potential reporting risks based on an assessment of the emission estimation procedures, i.e.</p> <ul style="list-style-type: none"> ➤ the calculation methods, ➤ raw data collection and sources of supporting documentation, ➤ reports/databases/information systems from which data is obtained. <p>Identify key source data. Examples of source data include metering</p>	<p>Identify the key controls for each area with potential reporting risks. Assess the adequacy of the key controls and eventually test that the key controls are actually in operation.</p> <p>Internal controls include (not exhaustive):</p> <ul style="list-style-type: none"> ➤ Understanding of responsibilities and roles ➤ Reporting, reviewing and formal management approval of data; ➤ Procedures for ensuring 	<p>Identify areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks</p> <p>Areas where data accuracy, completeness and consistency could be improved are highlighted.</p>



<p>records, process monitors, operational logs, laboratory/analytical data, accounting records, utility data and vendor data. Check appropriate calibration and maintenance of equipment, and assess the likely accuracy of data supplied.</p> <p>Focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include:</p> <ul style="list-style-type: none"> ➤ manual transfer of data/manual calculations, ➤ unclear origins of data, ➤ accuracy due to technological limitations, ➤ lack of appropriate data protection measures. For example, protected calculation cells in spreadsheets and/or password restrictions. 	<p>data completeness, conformance with reporting guidelines, maintenance of data trails etc.</p> <ul style="list-style-type: none"> ➤ Controls to ensure the arithmetical accuracy of the GHG data generated and accounting records e.g. internal audits, and checking/ review procedures; ➤ Controls over the computer information systems; ➤ Review processes for identification and understanding of key process parameters and implementation of calibration maintenance regimes ➤ Comparing and analysing the GHG data with previous periods, targets and benchmarks. <p>When testing the specific internal controls, the following questions are considered:</p> <ol style="list-style-type: none"> 1. Is the control designed properly to ensure that it would either prevent or detect and correct any significant misstatements? 2. To what extent have the internal controls been implemented according to their design; 3. To what extent have the internal controls (if existing) functioned properly (policies and procedures have been followed) throughout the period? 4. How does management assess the internal control as reliable? 	
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Periodic Verification Protocol Table 4: 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)
List the residual areas of risks. Table 2 where detailed audit testing is necessary. In addition, other material areas may be selected for detailed audit testing.	<p>The additional verification testing performed is described. Testing may include:</p> <ol style="list-style-type: none"> 1. Sample cross checking of manual transfers of data 2. Recalculation 3. Spreadsheet 'walk throughs' to check links and equations 4. Inspection of calibration and maintenance records for key equipment <ul style="list-style-type: none"> ➤ Check sampling analysis results ➤ Discussions with process engineers who have detailed knowledge of process uncertainty/error bands. 	<p>Having investigated the residual risks, the conclusions should be noted here. Errors and uncertainties should be highlighted.</p> <p>Errors and uncertainty can be due to a number of reasons:</p> <ul style="list-style-type: none"> ➤ Calculation errors. These may be due to inaccurate manual transposition, use of inappropriate emission factors or assumptions etc. ➤ Lack of clarity in the monitoring plan. This could lead to inconsistent approaches to calculations or scope of reported data. ➤ Technological limitations. There may be inherent uncertainties (error bands) associated with the methods used to measure emissions e.g. use of particular equipment such as meters. ➤ Lack of source data. Data for some sources may not be cost effective or practical to collect. This may result in the use of default data which has been derived based on certain assumptions/conditions and which will therefore have varying applicability in different situations. <p>The second two categories are explored with the site personnel, based on their knowledge and experience of the processes. High risk process parameters or source data (i.e. those with a significant influence on the reported data, such as meters) are reviewed for these uncertainties.</p>

Verification Protocol Table 5: Resolution of Corrective Action and Clarification Requests			
Report clarifications and corrective action requests	Ref. to checklist question	Summary of project owner response	Verification conclusion
If the conclusions from the Verification are either a Corrective Action Request or a Clarification Request, these should be listed in this section.	Reference to the checklist question number in Tables 2, 3 and 4 where the Corrective Action Request or Clarification Request is explained.	The responses given by the Client or other project participants during the communications with the verification team should be summarized in this section.	This section should summarize the verification team's responses and final conclusions. The conclusions should also be included in Tables 2, 3 and 4, under "Final Conclusion".



Figure 1 Verification protocol tables

2.1 Review of Documents

The Monitoring Report (MR) ver. 1 and furthermore amended in ver.2 and ver. 3 submitted by AGROPOLYCHIM JSCo and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Determination Report, Kyoto Protocol, Clarifications on Verification Requirements were reviewed by AIE.

The verification findings presented in this report relate to the project as described in the PDD from 2004 and latest version of Project Monitoring Report (MR), ver. 3 from 2010-10-18.

2.2 Follow-up Interviews

On 08/06/2010, Bureau Veritas Certification performed field visit (on site) interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of AGROPOLYCHIM JSCo were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
AGROPOLYCHIM JSCo	<ul style="list-style-type: none"> ❖ Project Implementation stages; ❖ Continuing monitoring equipment and measurement; ❖ Calibration and maintenance of the used monitoring equipment; ❖ Roles, responsibilities and legal environmental requirements; ❖ Project specific documentations and monitoring of the main data; ❖ Organization scheme and responsibilities; ❖ Data collecting and archiving; ❖ GHG Emission reduction estimation and calculations. Baseline and Project emission estimations; ❖ Nitric acid Installation ❖ Social and Environmental Responsibilities

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

Findings established during the initial verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

Corrective Action Requests (CAR) are issued, where:



- i) there is a clear deviation concerning the implementation of the project as defined by the PDD;
- ii) requirements set by the MP or qualifications in a verification opinion have not been met; or
- iii) there is a risk that the project would not be able to deliver (high quality) ERUs.

Forward Action Requests (FAR) are issued, where:

- iv) the actual status requires a special focus on this item for the next consecutive verification, or
- v) an adjustment of the MP is recommended.

The verification team may also use the term Clarification Request (CL), which would be where:

- vi) additional information is needed to fully clarify an issue.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in the verification protocol in Appendix A.



3 FIRST PERIODIC VERIFICATION FINDINGS

Verification is the periodic independent review and ex post determination by the AIE of the monitored reductions in GHG emissions during defined verification period.

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 the monitoring system is in place and fully functional, 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.

Periodic Verification: The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; furthermore the periodic verification evaluates the GHG emission reduction data and express a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission reduction data is free of material misstatements; and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records. If no prior initial verification has been carried out, the objective of the first periodic verification also includes the objectives of the initial verification.

The verification follows UNFCCC criteria referring to the Kyoto Protocol criteria, the JI rules and modalities, and the subsequent decisions by the JISC, as well as the host country criteria.

3.1 Remaining issues, CAR's, FAR's from previous verification

FAR 1; FAR 2 and FAR 3 covering the monitoring period from 01.01.2006 to 31.12.2006 were assessed. During this verification all FARs were check and found that the remaining issued is resolved and the FARs were closed.

FAR 4; FAR 5 and FAR 6 from the previous verification of the project covering the monitoring period from 01.01.2007 to 31.12.2007 were assessed. During this verification all FARs were check and found that the remaining issued is resolved and the FARs were closed as follows:

Answer of FAR 4:

The calibration routines are described in the MR. The calibration period of measuring devices to be once per year, which was checked during the on site visit of the company. All calibration protocols are available and checked.

Answer of FAR 5:



A procedure for the recalculation of data for the periods when the N₂O analyser is out of operation is described and documented. The Procedure name is "Procedure for the correcting of false – recorded data from the continuous monitoring equipment system for NO_x emissions from the Nitric acid plant" from 2007-10-05.

Answer of FAR 6:

Please refer to CAR 1 and CL 2 from Table 5 from this Report.

3.2 Project implementation

3.2.1 Discussion

The project implementation date is described in the PDD and in the Monitoring Report, point 4.1. In this point is documented a list of major JI Project stages.

The catalyst is periodically replaced (every three years). The last replacement was done during 08-09 December 2009. The catalyst performance is checking through N₂O reduction and used technical regime. This was verified during on site visit of the company.

3.2.2 Findings

There is no deviation found between starting date of the project activity documented in the PDD and the real one. After that, there were conducted three verifications (out site Kyoto) up to this one. The deviation was found in the estimated ERUs in the PDD and real ERUs during this verification. The real amount of ERUs is smaller in compare to the given in the PDD (due to technical maintenances during the years and shut downs of the installation).

3.2.3 Conclusion

The project complies with the requirements.

3.3 Internal and External data

3.3.1 Discussion

The monitoring approach in the Monitoring Plan of the PDD requires monitoring and measurement of variables and parameters necessary to quantify the baseline emissions and project emissions in a conservative and transparent way. The monitoring parameters are not changed.

According to the determined monitoring plan, project and baseline emissions and emission reductions are calculating on the monthly and annual basis.

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

The MP and the corresponding Baseline Study is based on the assumption that the project will reduce emission of GHG, which is emitted from the nitric acid plant. The reduced environmental impacts shall be recorded in order to monitor that the expected environmental benefits are achieved. Local stakeholders can at any time submit comments to the project's environmental impact. Important comments and its solution will be included in the annual monitoring report.

The environmental sustainability in terms of benefits comprises reduction of GHG in form of N₂O. Since, project implementation will not affect production and near surroundings, no particular social or environmental impacts are expected from the project.

The Nitric Acid plan possessed Environmental Complex Permission (IPPC) dated from 2005.

3.4.2 Findings

None

3.4.3. Conclusion

The project complies with the JI requirements as well as with the local requirements.

3.5 Completeness of Monitoring

3.5.1 Discussion

Monitoring routines have been checked. It can be stated that monitoring routines are implemented in accordance with the monitoring plan.

The Monitoring Plan has been carried out in accordance with the monitoring plan contained in the registered PDD. No deviations found.

Internal and external data are clearly demonstrated in the monitoring report.

3.5.2 Findings

Identified areas of concern are described in Appendix A Table 5 (refer to CL 1; CL 2; CL 3; CL 4).

3.5.3 Conclusions

Bureau Veritas confirms that:

Documented CLs were implemented efficiently in the latest version of the Monitoring Report. All of them were closed during the verification.

The Monitoring Report is transparent and complete.



3.6 Accuracy of Emission Reduction Calculations

3.6.1 Discussion

N₂O emissions are continuously measured after the installation of the catalyst. The monitoring of N₂O is based on an on-line measurement of the tail gas and the production flow. Hence, the monitoring methodology was built upon the on-line measurements of:

- i) On-line measurement of N₂O concentration (IR measuring technology - Infrared Analyzer Module, manufactured by Hartmann & Braun, Frankfurt, Germany);
- ii) On-line measurement of tail gas flow with an ultra-sonic flow meter. The tail gas flow is measured with system for measuring of tail gas flow – Durag system D-FL 100, with transmitters for temperature and pressure;
- iii) On-line measurement of temperature of tail gas with Durag measuring system;
- iv) On-line measurement of absolute pressure of tail gas with Durag measuring system;
- v) On-line measurement of HNO₃ production by an ultra-sonic flow meter. Nitric acid production is measured with 100 % HNO₃ mass-flow meter, manufactured by Yokogawa, Japan).

The data from the on-line measurements are linked to a computer with a database to store actual measurements. The calculations were performed on the computer in spreadsheets and the flow rate of the tail gas had been taken into account to compensate the temperature and pressure of the tail gas. The formula for estimation of actual N₂O emission reductions is shown on pages 16 and 17 of the Monitoring Plan. The same monitoring procedure is described on pages 18 and 19 of the Monitoring Report for 2008 and 2009. The MP has been developed in accordance with the French standard BP X 30-331 "Protocol for quantification for nitrous oxide emissions in the manufacture of nitric acid".

The emission reduction is calculated as the difference between the emission factors of the baseline (5,54 kg N₂O per ton 100 % nitric acid) and the actual emission factor multiplied by the actual Nitric Acid production.

The data for emission reduction of N₂O were corrected in accordance with the procedure for the correcting, using data from the previous work of the plant.

The monitoring results are presented according to the requirements (Annex IV from PDD) shown in Annex I and Annex II (Monitoring Data for the period 01.01.2008 - 31.12.2009 and N₂O Emission Reduction for the period 01.01.2008 - 31.12.2009)

The procedure for correcting of false-recorded data from the continues monitoring system of N₂O emissions from Nitric Acid Plant is explain on page 48 of Monitoring Report for 2008 and 2009.

In order to ensure the necessary accuracy of the monitoring data and elimination of the abnormal emission levels detected at a start-up and a shut-down of the Nitric Acid Plant in the monitoring system was integrated a filter, based on the indicative for the operation of the plant index "flow rate of the effluent gasses". At a limit value of the flow rate 90 000 Nm³/h, these abnormal emissions are excluded/ filtered, thus made equal to zero and the same participate when making the calculations.



When the data were not recorded, because of the maintenance of the continuous monitoring system for NO_x and CO₂eq emissions, the data were replaced according to the procedure for the correcting of false-recorded data from the continuous monitoring system for NO_x emissions from the nitric acid plant. Please see <Annex III> on page 48 of MR.

The corrected N₂O and CO₂eq emission reductions are shown in table <Annex II> of MR for the period 01.01.2008 till 31.12.2008. The table with last column <Corrections of CO₂eq reduction> is shown on page 40-42 of MR. The correction emission reductions for 2008 is only +306.46 tCO₂eq.

The total emission reductions for 2008 of CO₂eq is estimated to be 264 272.2 tCO₂eq. The percentage of corrections is only 0.115% from the total amount emission reductions and is negligible.

The correction of emission reductions for 2009 is estimated to be +541.67 tCO₂eq. The actual measured emission reductions for 2009 is estimated to be 189 881.2 tCO₂eq. Please see N₂O and CO₂eq emission reductions for 2009 on pages 44 – 46 of MR. The correction of emission reductions is only 0.285% of the total amount and is negligible small.

The proposed monitoring methodology, data collection, data management and guidelines can only be changed after mutual agreement of the Bulgarian MOEW, the Danish DEPA and the Verifier BV, as it is state in the project PDD.

There is no official approval and nothing mention in the Monitoring Plan for using the corrections reduction estimation in emission reduction calculations. Please see the correspondence made in the Verification Report pointed in CL 7 and FAR 1.

Calculations of the emission reductions presented in the Monitoring report have been checked. The audit team confirms that emission reduction calculations have been performed according to the Monitoring Plan.

3.6.2 Findings

Identified areas of concern are described in Appendix A Table 5 (refer to CL 5; CL 6; CL 7 and FAR1).

3.6.3 Conclusions

Bureau Veritas confirms that:

Emission reduction calculations are carried out according to the monitoring plan of the approved PDD without mistakes and misstatements.

3.7 Quality Evidence to Determine Emission Reductions

3.7.1 Discussion

Concerning verification the calculation of emission reductions is based on internal data and external data. The origin of those data was explicitly checked. Further, on, entering and processing of those data in the



monitoring workbook Excel sheets were checked where predefined algorithms compute the annual value of the emission reductions. All equations and algorithms used in the different workbook sheets were checked. Inspection of calibration and maintenance records for key equipment was performed for all relevant meters.

Necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the various parameters following continuous monitoring system and used software.

3.7.2. Findings

Identified areas of concern are described in Appendix A Table 5 (refer to CL 5; CL 6; CL 7 and FAR 1).

3.7.3 Conclusions

Bureau Veritas confirms that:

Documented CLs and FAR1 were implemented efficiently in the latest version of the Monitoring Report. All of them were closed during the verification. The monitoring report is transparent and complete.

The monitoring report is in conformity with requirements to the quality of evidence.

3.8 Management System and Quality Assurance

3.8.1 Discussion

The management system procedures are documented and implemented effectively as a result of the CAR1. The monitoring staff responsibility is well described in the MR, point 4.9.

The Quality assurance system is described in the MR, point 4.7

3.8.2 Findings

Identified area of concern are described in Appendix A Table 5 (refer to CAR 1).

3.8.3 Conclusions

Bureau Veritas confirms that:

The monitoring is in accordance with the PDD requirements for the management system and operational control.

Documented CAR 1 was implemented efficiently in the latest version of the Monitoring Report. It is closed during the verification.

The monitoring report is transparent and complete.



4 PROJECT SCORECARD

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	Relevant sources are covered by the monitoring plan. Boundaries of the project are defined transparently and correctly.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	Physical measurements and analysis are reliable.
	Data calculations	✓	✓	✓	Data are calculated correctly.
	Data management & reporting	✓	✓	✓	Data management and reporting are reliable.
Consistency	Changes in the project	✓	✓	✓	There are no changes in the project; results are consistent to underlying raw data.



5 FIRST PERIODIC VERIFICATION STATEMENT

Bureau Veritas Certification has performed the First periodic verification of the project “Nitrous Oxide Reduction at Agropolychim Fertilizers Plant”. The verification is based on the currently valid documentation of the United Nations Framework Convention on the Climate Change (UNFCCC).

The management of AGROPOLYCHIM JSCo is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD from 2004. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report for the reporting period as indicated below.

Bureau Veritas Certification can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project’s GHG emissions and resulting GHG emissions reductions reported and related to the valid and approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated that we confirm the following statement:

Reporting period: From 01/01/2008 to 31/12/2009

Emission Reductions for 2008	: 263 589 t CO2 equivalents
Emission Reductions for 2009	: 189 297 t CO2 equivalents

Total Emission Reductions	: 452 886 t CO2 equivalents
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6 REFERENCES

Category 1 Documents:

Documents provided by AGROPOLYCHIM JSCo that relate directly to the GHG components of the project.

- /1/ PDD "Nitrous Oxide Reduction at Agropolychim Fertilizers Plant", Devnya, Bulgaria" from 2004-04-23
- /2/ Determination Report No. 2004-0726, Revision 01 from 2004-06-16, issued by DNV
- /3/ Monitoring Report of JI Project - "Nitrous Oxide Reduction at Agropolychim Fertilizers Plant" for 2008 and 2009
- /4/ Emission reduction estimations – excel file
- /5/ Verification Report № PRJC -03593-2007-CCS-CSZ/2008-10-30 for 2007 emission reduction estimation, made from DNV.

Category 2 Documents:

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

- /6/ Company schemes, diagrams, protocols and data flows and Company Monitoring Instructions
- /7/ Measurements devices calibrations files
- /8/ Technical descriptions on used measurement devices
- /9/ Letter of approval from Ministry of Environment and water, Bulgaria issued during July 2004
- /10/ Letter of Approval from the Kingdom of Denmark during August 2007.
- /11/ "Procedure for the correcting of false – recordered data from the continuous monitoring equipment system for NO_x emissions from the Nitric acid plant" from 2007-10-05.
- /12/ Protocols for N₂O analyser technical maintenance from 15.05.2009 and December 2009
- /13/ Protocol for calibration of Coriolis Mass Flow Meter from 2009-05-13
- /14/ Protocol for internal check of Yokogawa Type EJA 130 A from 2009-06-23
- /15/ Protocol for calibration of Gas analyser №165 from 2009-11-28
- /16/ Complex Environmental Permission (IPPC) from 2005
- /17/ Mrs. Vasileva Certificate of conducted training for used measurements devices, equipment and used monitoring software held from 25.05.2010 to 31.05.2010
- /18/ Table for Roles and responsibilities and Internal control procedure for JI project
Monitoring plan documented in the Monitoring Report

Persons interviewed:

List persons interviewed during the verification or persons that contributed with other information that are not included in the documents listed above.

- /1/ Mr. Krassimir Berbenkov, Vice CEO
- /2/ Mrs. Miroslava Vasileva, production department technologist



/3/ Eng. Georgi Boshov, nitric acid plant manager

/4/ Eng. Emil Stefanov, instrumentation engineer

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APPENDIX A: PROJECT VERIFICATION PROTOCOL

Initial Verification Protocol Table 1			
Objective	Reference	Comments	Conclusion (CARs/FARs)
DNV has been prepared three verification protocols covered 2005; 2006 and 2007 years. Protocol from 2007 was check during the first verification (in site Kyoto).	5	There are three open FARs from the last verification. All of them are explained in section 3.1 from this Report. All CARs, CRs and FARs were closed during the Verification process.	OK

Table 2: 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.



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Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
1. Defined organizational 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.	Partial	<p>Mrs. Miroslava Vasileva as well as other staff connected with Nitric acid Installation clearly demonstrated their accountability and awareness during the on-site visit. Nevertheless, the responsibilities, roles and the staff position for monitoring and reporting are not clearly stated in the Monitoring Report.</p> <p>Mr. Berberov, Vice CEO, was clearly demonstrated his accountability and responsibility for the JI project during the on-site visit of the company.</p> <p><u>Corrective action request № 1: (please refer to Table №5)</u></p>
1.2. Responsibilities Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees.	Partial	<p>The responsibilities of the staff is appointed in 4.6 and 4.9 of the MR. During the on site visit the appointed staff clearly demonstrated his accountability and awareness for collecting and reporting the required data. Please also refer to CAR №1.</p>
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	<p>The competences needed is appointed in p. 4.8 of the MR. The appointed staffs that have the necessary competence and skills carry out the monitoring of Nitric acid production. Furthermore, during the on site visit, there were checked the conducted training of the used measurements devices, equipment and used monitoring software. It was checked the conducted internal training of Mrs. Vasileva during 25.05.2010 to 31.05.2010, documented in Certificate.</p>
2. Conformance with monitoring plan		



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Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
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 reasons justified.	Partial	<p>The monitoring plan is based on an on-line measurement of the tail gas and the production flow. Emission factors are calculated in the baseline and measured on-line continuously.</p> <p>The reporting procedures are described in the monitoring plan in the PDD and in the Monitoring Report. There are no deviations or revisions to the Monitoring Plan. However there was documented a CR.</p> <p><u>Clarification request № 4: (please refer to Table №5)</u></p>
2.2. Necessary Changes Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary.	Partial	<p>During the verification there were documented next deviations:</p> <p><u>Clarification request № 1: (please refer to Table №5)</u></p> <p><u>Clarification request № 3: (please refer to Table №5)</u></p> <p><u>Clarification request № 5: (please refer to Table №5)</u></p> <p><u>Clarification request № 6: (please refer to Table №5)</u></p> <p><u>Clarification request № 7: (please refer to Table №5)</u></p>
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	<p>The method to determine GHG emissions is clearly documented in the Monitoring Report, following the requirements documented in the PDD.</p> <p>The baseline N₂O emission factor (5.54 kg N₂O per tone of Nitric acid) was determined ex-ante and used to determine the project's baseline emission.</p> <p>N₂O emission in the project and the baseline scenario during the reporting period was correctly calculated using the validated calculation formulae and baseline emission factor given in the PDD.</p>
3.2. Information/process flow An information/process flow diagram, describing the entire process from raw data to reported totals is developed.	Partial	Please refer point 1.1 and CAR 1 (Table 5)



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Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
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 monitoring plan is based on an on-line measurement of the tail gas and the production flow. Emission factors are calculated in the baseline and measured on-line continuously. There is no data transfer between or within systems/spreadsheets. All the information is collecting in the used software.
3.4. Data trails Requirements for documented data trails are defined and implemented and all documentation are physically available.	Full	Company used continuous monitoring system for NOx emissions from the Nitric acid plant. The used monitoring software and all documents with required data are physically available (On-line monitoring records). During the on site visit was proved that there is good data trails. All data is registered and processed electronically and monitoring reports can easily be retrieved from the electronic data management system.
4. Identification and maintenance of key process parameters		
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	Key monitoring activities according to the monitoring plan for the stated monitoring period is explain in Monitoring report, point 4. Baseline emission, emission factor, tables with values and variables, equipments is also documented in the Monitoring report.
4.2. Calibration/maintenance Appropriate calibration/maintenance requirements are determined.	Full	During the on site visit were checked all measuring devices calibration. All devices were calibrated from authorized laboratory and regarding Bulgarian laws. All necessary protocols were physically available and checked. There is no deviation found. In the MR is documented a table providing information for used measuring equipment. The calibration of the N ₂ O analyzer was done in November 2009 and the Nitric acid flow meter in May 2009. The supplier of the monitoring equipment (ABB) is responsible for the installation, test and periodically check the used devices. During May and December 2009 was held two maintenances of gas-analyzer, documented in Protocol. There is also a Protocol for internal check of Yokogawa Type EJA 130 A from 2009-06-23.
5. GHG Calculations		



VERIFICATION REPORT

Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
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 default value of the emission factor as well as the baseline emissions has been already described in the PDD and has been confirmed in the Determination report. Tables with fixed default values and variables are also documented in the Monitoring report. The used measuring monitoring hardware and software was found adequate. Sampling and analyzing is performed by the online device every 10 seconds. The used data management system gives evidence and allows for verification of the emission reduction data calculations. <u>Forwarded Action Request FAR №1</u>
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	Mrs. Miroslava Vasileva as well as other staff connected with Nitric acid Installation is responsible for monitoring management. There is also documented a Procedure for the correcting of false – recorded data from the continuous monitoring system for NOx emissions from the Nitric acid plant.
5.3. Internal verification Internal verifications include the GHG data management systems, to ensure consistent application of calculation methods.	Partial	A procedure for periodic internal verification of data and estimation of GHG reductions as well as cross check procedures is not included in the MR. <u>Clarification request № 2: (please refer to Table №5)</u>
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	Mrs. Miroslava Vasileva, JI Project coordinator, Mr. Stefanov, Engineer “Automation & Control” Nitric acid plant and Mr. Berbenkov, vice executive director are responsible for internal validation procedure.
5.5. Data protection measures Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).	Full	The on-line data are filed on a PC and two hard disk and monthly recording on a CD for a back up. No specific protections are used.



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Expectations for GHG data management system/controls	Score	Verifiers Comments (including <i>Forward Action Requests</i>)
5.6. IT systems IT systems used for GHG monitoring and reporting should be tested and documented.	Full	The on-line data are filed on a PC and two hard disk and monthly recording on a CD for a back up. No specific IT systems are used for GHG monitoring and reporting.

**Table 3: GHG calculation procedures and management control testing**

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Failure of the monitoring meters (measuring devices)	Errors because of technical failure or insufficient calibration are possible.	All monitoring meters (measuring devices) are controlled permanently from the competent laboratory, supplier and company responsible staff. There is also an Internal procedure for calibration of used equipment. The meters are calibrated according to the requirements of the manufacturer and regarding Bulgarian legislation, by external authorized laboratory. There is also a Procedure for the correcting of false – recorded data from the continuous monitoring system for NOx emissions from the Nitric acid plant. Hence, a severe failure of the monitoring meters is rather unlikely.
Failure in data collection and management	Failures because of incorrect computer handling or incorrect data input are possible.	Company used continuous monitoring system for NOx emissions from the Nitric acid plant. Monitoring data are recorded in the used monitoring software for online data management. The on-line data are filed on a PC and two hard disk and monthly recording on a CD for a back up. Specialists handle the computers. Hence, errors in data collection and management are unlikely.
Errors in calculation	Errors because of wrong data input or false formulae are possible.	Company used continuous monitoring system and monitoring software for online data management. In order to ensure the necessary authenticity of the monitoring data and elimination of the abnormal emission levels detected at a start-up and a shut-down of the Nitric Acid Plant in the monitoring system was integrated a procedure, which is documented in the MR, hence the risk of calculation errors is considered low.

**Table 4: Detailed audit testing of residual risk areas and random testing**

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including <i>Forward Action Requests</i>)
Human mistakes in measurements and data processing.	During the on-site visit the persons involved in the data acquisition process have been interviewed and asked concerning their role and competencies, furthermore they had to describe the procedures for which they are responsible.	All interviewed staff showed competence and has been trained well. Hence, human mistakes in measurements and data processing are very unlikely.
Random testing of the data and calculations	<ul style="list-style-type: none">- All data that were used in the management system gives evidence and allows for verification of the emission reduction data calculations. On a random basis, data were checked at their primary source.- Spreadsheet “walk through” to check equations were used- All numbers, equations and algorithms used in the different workbook sheets and software were checked.- Calibration and maintenance records for key equipment were also checked.	The data files have been checked based on primary data. No errors have been found. Hence, data errors are very unlikely. The done calculation has been checked random wise. No significant errors have been found. The calibration of all monitoring meters has been checked. For all meters, valid calibration protocols have been delivered. Hence, severe calibration errors are unlikely.

**Table 5: Resolution of Corrective Action and Clarification Requests**

Report clarifications and corrective action requests	Reference to checklist question	Summary of project owner response	Verification conclusion
<u>Corrective Action Request CAR №1</u> Please provide (flow chart or table) with roles, responsibilities and position of the persons in charge for each item of the project monitoring (data collecting, storing, archiving, etc). Please add the procedures for monitoring reporting and data flow. The (flow chart or table) has to include also Persons responsible for the preparation and submission of the monitoring report has to provide contact information for themselves together with their identity.	Table 2, p. 1.1	TABLE WITH FULL DESCRIPTION OF ALL ROLES AND RESPONSIBILITIES, NAMES AND POSITIONS IS GIVEN IN POINT 4.9, PAGE 22 IN MR 2008_2009. IT IS CLEARLY POINTED AS A PROCEDURE FOR "ROLES AND RESPONSIBILITIES FOR JI PROJECT MONITORING PLAN FULFILLING - NITRIC ACID PLANT, "AGROPOLYCHIM" JSCo"	The Verification team checks the additional data. The presented information is correct and closed this CAR.
<u>Clarification Request CL №1</u> Please provide information in the Monitoring Report (MR) about the respective implementation procedure for approval of this JI project (Track 1 or Track 2) and is the project PDD submitted to JISC for registration.	Table 2, p. 2.2	STATED ON PAGE 16 IN MR 2008_2009 – LAST ROW (UNDERLINED)	The Verification team checks the additional data. The presented information is correct and closed this CL.
<u>Clarification Request CL №2</u> A procedure for periodic internal verification of data and estimation of GHG reductions as well as cross check procedures should be included in the MR. Please indicates who is responsible for conducting the internal verification.	Table 2, p. 5.3	THE STATEMENTS ARE INCLUDED IN CAR 1 – IN "PROCEDURE FOR INTERNAL CONTROL". THREE STATEMENTS ARE MARKED IN BLUE COLOR AND UNDERLINED.	The Verification team checks the additional data. The presented information is correct and closed this CL.
<u>Clarification Request CL №3</u> Please provide a table in the MR with major dates for implementation of the different stages for this JI Project.	Table 2, p. 2.2	DESCRIBED ON PAGE 16 IN MR 2008_2009	The Verification team checks the additional data. The presented information is correct and closed this CL.
<u>Clarification Request CL №4</u> Please provide information in the MR is there any deviations or revisions to the registered PDD.	Table 2, p. 2.1	Page 15, point 4.1 in MR 2008_2009	The Verification team checks the additional data. The presented information is correct and closed this CL.
<u>Clarification Request CL №5</u>	Table 2, p. 2.2	Page 49 – "Summary results from emission reduction 2008_2009"	The Verification team checks the additional data. The presented



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Report clarifications and corrective action requests	Reference to checklist question	Summary of project owner response	Verification conclusion
Please provide information in tabular format in the MR about the final results from Baseline emissions, Project emissions, Leakages and Emission Reduction.			information is correct and closed this CL.
<u>Clarification Request CL №6</u> Please provide emissions reduction estimations from the project in Excel format.	Table 2, p. 2.2	GIVEN AS SEPARATE EXCEL FILE "EMISSION REDUCTION"	The Verification team checks the additional data. The presented information is correct and closed this CL.
<u>Clarification Request CL №7</u> Please clarify is there any official approval for using the corrections reduction estimation in emission reduction calculations.	Table 2, p. 2.2	STATEMENT IS GIVEN ON PAGE 48, AT THE BOTTOM OF THE PAGE – UNDERLINED PARAGRAPH.	A FAR 5 was documented in the Verification Report № PRJC - 03593-2007-CCS-CSZ/2008-10-30 for 2007 emission reduction estimation, made from DNV. After that, no revision or amendments are done in the Monitoring Plan for the project. The verification team does not accept the corrected ERs for this periodic verification. This CL is closed and there is documented a FAR.
<u>Forwarded Action Request FAR №1</u> For purpose of using the corrections reduction estimation in emission reduction calculations, please revise the Monitoring Plan for next periodic verification. Please explain the procedure of doing this corrections reduction estimation, in purpose to be more conservative.	Table 2, p. 5.1	THE MONITORING PLAN WILL BE REVISED.	To be verified during the next periodic verification.



APPENDIX B: VERIFICATION TEAM

The verification team consists of the following personnel:

Bureau Veritas Certification - Internal Technical Reviewer

Mr. Flavio Gomes is a Chemical and Safety Engineer graduated from «UNICAMP – Universidade Estadual de Campinas», with a MSc title in Civil Engineer (Sanitation). He spent four years at RIPASA Pulp and Paper as Environmental Process Engineer. He is, since 2006 the Global Manager for Climate Change. Previously and since 1997, he was senior consultant for Bureau Veritas Consulting in fields of Environment, Health, Safety, Social Accountability and Sustainability audit and management systems. He also acted as Clean Development Mechanism verifier, and Social/Environmental Report auditor, in the name of Bureau Veritas Certification. Flavio is pursuing this PhD on Energy Management at the Imperial College – London.

Mr. Konstantin Rachev (KDR):

“Bureau Veritas Certification – Lead Auditor and Lead Verifier (M.Sc. Ecology)

He has 10 years of experience in environmental field, Mr. Rachev is a lead auditor for environment, safety and quality management systems and lead verifier for GHG projects (CDM Verifier / Lead Verifier Training Course held on February 25-29, 2008). He has been involved in the validation and verification processes of 10 CDM/VCS/JI projects since 2008.

Mr. Christo Schwabski

“Bureau Veritas Certification – Auditor (M.Sc. Thermal Power)

He has 30 years of experience in energy and environment field. Mr. Schwabski has been involved in GHG reduction projects since 2002. Since that time he has extensive experience in establishing PDD, baselines setting, monitoring plans, GHG estimations and investment and financial analysis's of GHG projects. He participates as a consultant in 7 JI projects and develops estimation of Bulgarian CO2 emission factor for the Electricity Power System.

Mr. Schwabski participates as auditor and verifier trainee in 10 CDM/VCS/JI projects since 2008.



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Mrs. Rayna Zlatarova (ZRV):

"Bureau Veritas Certification" – Lead Auditor and Deputy Technical Manager for Bulgaria

She is MSc in Chemical Engineering. She has more than 10 years of experience in the field of quality and environment. Mrs. Zlatarova is a lead auditor for environment, safety and quality management systems. She works for 8 years in State Administration in the field of Chemical Standardisation. She successfully completed Training course for EU Emissions Trading Scheme in 2008. She was involved in Project for preparation of Regulatory Register of GE ENERGY for Bulgaria.