



**BUREAU  
VERITAS**

# VERIFICATION REPORT GREEN GAS KRASNODON LLC

## VERIFICATION OF THE “POWER GENERATION FROM THE COAL MINE METHANE AT THE SUKHODOLSKAYA-VOSTOCHNAYA MINE”

SECOND PERIODIC  
(01/01/2012 – 30/09/2012)

REPORT No. UKRAINE-VER/0630/2012

REVISION No. 01

BUREAU VERITAS CERTIFICATION



## VERIFICATION REPORT

Date of first issue: 07/12/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: Green Gas Krasnodon LLC	Client ref.: Elena Ostrovskaya

## Summary:

Bureau Veritas Certification has made the second periodic verification of the JI project "Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine", JI Registration Reference Number UA1000423, project of the Green Gas Krasnodon LLC located in Luhansk region, Ukraine, and applying JI specific approach with aspects of approved consolidated baseline and monitoring methodology ACM0008 (version 07), on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for 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 Entity 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 against project design and the baseline and 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, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in approved project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reductions are calculated accurately and without material errors, omissions, and misstatements, and the ERUs issued totalize 49, 439 tonnes of CO<sub>2</sub> equivalent for the monitoring period from 01/01/2012 to 30/09/2012.

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

Report No.: UKRAINE-ver/0630/2012	Subject Group: JI
Project title: "Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine"	
Work carried out by: Kateryna Zinevych – Lead Verifier Olena Manziuk – Verifier Vasiliy Kobzar – Technical Specialist	
Work reviewed by: Ivan Sokolov – Internal Technical Reviewer Vladimir Kulish – Technical Specialist	
Work approved by: Ivan Sokolov – Operational Manager	
Date of this revision: 07/12/2012	Rev. No.: 01
Number of pages: 34	

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<b>Table of Contents</b>		<b>Page</b>
1	INTRODUCTION .....	3
1.1	Objective	3
1.2	Scope	3
1.3	Verification Team	3
2	METHODOLOGY.....	4
2.1	Review of Documents	4
2.2	Follow-up Interviews	5
2.3	Resolution of Clarification, Corrective and Forward Action Requests	5
3	VERIFICATION CONCLUSIONS.....	6
3.1	Remaining issues and FARs from previous verifications	6
3.2	Project approval by Parties involved (90-91)	6
3.3	Project implementation (92-93)	7
3.4	Compliance of the monitoring plan with the monitoring methodology (94-98)	8
3.5	Revision of monitoring plan (99-100)	9
3.6	Data management (101)	9
3.7	Verification regarding programmes of activities (102-110)	11
4	VERIFICATION OPINION.....	12
5	REFERENCES .....	14
	APPENDIX A: VERIFICATION PROTOCOL.....	18



## 1 INTRODUCTION

Green Gas Krasnodon LLC has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” (hereafter called “the project”) at Luhansk region, Ukraine.

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

### 1.1 Objective

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

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

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.

### 1.2 Scope

The verification scope is defined as an independent and objective review of submitted monitoring report and the determined project design document including the project’s baseline study and monitoring plan and other relevant documents. 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 clarifications, corrective and/or forward actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

### 1.3 Verification Team

The verification team consists of the following personnel:

Kateryna Zinevych

Team Leader, Bureau Veritas Certification Climate Change Lead Verifier

Olena Manziuk

Team member, Bureau Veritas Certification Climate Change Verifier



Vasiliy Kobzar  
Team member, Bureau Veritas Certification Technical specialist

This verification report was reviewed by:

Ivan Sokolov  
Bureau Veritas Certification Internal Technical Reviewer

Vladimir Kulish  
Bureau Veritas Certification Technical Specialist

## 2 METHODOLOGY

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

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

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

### 2.1 Review of Documents

The monitoring report (MR) submitted by Green Gas Krasnodon LLC and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), approved CDM methodology ACM0008 (version 07) and Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol, Clarifications on Verification Requirements to be Checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the Monitoring Report version 01 dated 15/10/2012, the Monitoring Report version 02 dated 13/11/2012, and project as described in the determined PDD.



## 2.2 Follow-up Interviews

On 30/10/2012 Bureau Veritas Certification during site visit performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Green Gas Krasnodon LLC and Sukhodolskaya-Vostochnaya Mine were interviewed (see References). The main topics of the interviews are summarized in Table 1.

**Table 1 Interview topics**

Interviewed organization	Interview topics
Sukhodolskaya-Vostochnaya Mine	<ul style="list-style-type: none"> <li>➤ Organizational structure</li> <li>➤ Responsibilities and authorities</li> <li>➤ Training of personnel</li> <li>➤ Quality management procedures and technology</li> <li>➤ Implementation of equipment (records)</li> <li>➤ Metering equipment control</li> <li>➤ Metering record keeping system, database</li> <li>➤ Monitoring procedure</li> </ul>
Green Gas Krasnodon LLC	<ul style="list-style-type: none"> <li>➤ Baseline methodology</li> <li>➤ Monitoring plan</li> <li>➤ Monitoring report</li> <li>➤ Deviations from PDD</li> <li>➤ Emission reduction calculation</li> </ul>

## 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.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

(a) Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;





(b) Clarification request (CL), requesting the project participants to provide additional information for the Verification Team to assess compliance with the monitoring plan;

(c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

The Verification Team will make an objective assessment as to whether the actions taken by the project participants, if any, satisfactorily resolve the issues raised, if any, and should conclude its findings of the verification.

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

### **3 VERIFICATION CONCLUSIONS**

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Corrective Action Requests and Clarification Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in three Corrective Action Requests and two Clarification Requests.

The number between brackets at the end of each section corresponds to the DVM paragraph.

#### **3.1 Remaining issues and FARs from previous verifications**

No FARs and remaining issues from previous verification were raised by verification team. Thus, the following section is not applicable.

#### **3.2 Project approval by Parties involved (90-91)**

Written project approval (LoA # 3534/23/7 dated 30/11/2011) by the host Party (Ukraine) has been issued by the State Environmental Investment Agency of Ukraine.

Also, the Ministry of Economic Affairs, Agriculture and Innovation (the Netherlands) has issued the Letter of Approval # 2010JI33 dated



29/11/2010 for this project acting as the Designated National Authority of that Party (refer to the section 5 References of this report).

The abovementioned written approval is unconditional.

### 3.3 Project implementation (92-93)

JI project "Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine" main goal is to efficiently capture the coal mine gas (CMG) emitted on the Sukhodolskaya-Vostochnaya coal mine (Ukraine) and to destroy methane gas.

In most of the active mines in the Ukraine, CMM is partially or in total released to the atmosphere, despite the fact that it is well-known as harmful greenhouse gas with a global warming potential (GWP) of 21 t CO<sub>2</sub>eq / t CH<sub>4</sub>.

According to the PDD, the JI project activity is divided into two phases. The first phase of the project is the installation of flaring facility to begin reducing emission as quickly as possible. The second phase is the installation of methane-fuelled power generators to satisfy the mine's electrical base load consumption.

The first phase of the JI project activity has been fully implemented during the monitoring period 01/01/2012 – 30/09/2012. A high temperature flare facility has been installed as a methane destruction scheme for surplus Coal Mine Methane (CMM) due to inherent fluctuations in CMM production. Commissioning of the flare facility took place in December 2010. Installation of the second phase is delayed because of the lack of finance as the drainage system of the Mine does not allow continuous gas supply which meets the quality required for CMM-fired gensets. An additional investment in new drainage system will be required to ensure continuous electricity production by both CMM-fired gensets through a stable gas supply by the Mine. As per the second phase, methane-fuelled power generators will be installed to satisfy the electrical consumption of the Mine, which will reduce electricity off take from the national grid.

Thus, during reported monitoring period 01/11/2012 – 30/09/2012 the JI project reduces methane emissions by utilizing the CMM which would have been otherwise vented into the atmosphere in the absence of this project.

There is difference between the achieved emission reductions during this period, 49, 439 tonnes CO<sub>2</sub> equivalent, and the value estimated in the PDD for the same period (247, 963 tonnes CO<sub>2</sub>equivalent), since the amount of actual extracted Coal Mine Methan is less than the prediction in





the PDD. Also, such difference is due to some problems during the function of the plant in winter. Furthermore, frozen Pipelines have made impossible to arrange the quantity and quality calculated in the PDD.

The identified areas of concern as to project implementation, project participants response and BV Certification's conclusion are described in Appendix A (refer to CAR01, CAR02, CAR03, and CL01).

### **3.4 Compliance of the monitoring plan with the monitoring methodology (94-98)**

The monitoring occurred in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final. According to the PDD, selection of monitoring approach was made on the basis of approved consolidated baseline and monitoring methodology ACM0008 (version 07) and in compliance with "Guidance on criteria for baseline setting and monitoring". The project developer used JI specific approach with aspects of approved monitoring methodology ACM0008 for establishing the monitoring. Collection of all key parameters required to calculate greenhouse gas emissions is undertaken according to Operational and technical maintenance manual that provides a procedure of quality management for plant operational and technical maintenance.

For calculating the emission reductions key factors, such as amount of additional electricity consumption for capture and use or destruction of methane and further electricity consumption within project activity, amount of methane sent to flare, quality parameters of methane, concentration of methane in the exhaust gas of the flare in dry basis at normal conditions in the hour, temperature in the exhaust gas of the flare as well as risks associated with the JI project were taken into account, as appropriate.

Data sources used for calculating emission reductions, such as calibrated measurement equipment, the orders that establishes standardized emission factors for the Ukrainian electricity grid, IPCC, etc. are clearly identified, reliable and transparent. Automatic system registers the data related to methane. Recorded data are stored in the electronic database. In detail, registration of monitoring parameters at the plant is conducted in accordance with identified procedure of data collection. Plant management is performed by plant operators and engineers of Green Gas Krasnodon LLC; it includes operation and maintenance of project equipment, data monitoring, and gas management. JI project management is realized by consultants of Green Gas Germany GmbH. Consultants carry out internal training for plant managers and engineers, internal audits, troubleshooting measures if any is needed, and prepare reported documentation. Finally, plant operators and JI project consultants report to project participants such as PJSC "Krasnodon Coal Company" and



Green Gas Ukraine Holdings B.V. In general, all roles and responsibilities connected with JI project at Green Gas Krasnodon LLC are established in accordance with procedure described in section D “Monitoring plan” of the registered PDD version 06 dated 25/04/2011.

Within the monitoring period 01/01/2012 – 30/09/2012 additional training was performed for the plant manager. Specifically, the manufacturer of the gas warning system trained the plant manager to ensure practical knowledge in function about gas warning systems. As a result Certificate on training was issued as documented evidence. The document was provided to the verification team (see the Category 2 Documents, section 5 of that report).

Emission factors are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice. According to the JI project documents, several emission factors are used for calculation of emission reductions, such as carbon emission factor for combusted methane, carbon emission factor for combusted non methane hydrocarbons, carbon emission factor of electricity replaced by the project, and CO<sub>2</sub> emission factor of electricity used from the national grid.

The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

### **3.5 Revision of monitoring plan (99-100)**

No revisions of the monitoring plan of JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” occur during reported monitoring period 01/01/2012 – 30/09/2012. Thus, that section is not applicable.

### **3.6 Data management (101)**

As a result of site visit, documents revision, and verification process at all verification team can conclude that the data and their sources, provided in monitoring report for the period 01/01/2012 – 30/09/2012, are clearly identified, reliable and transparent.

The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures. For instance, internal audits and control measures are conducted by JI project consultants from Green Gas Germany GmbH. These procedures are described in detail in the registered project design document.

As per plant schedule the exhaust thermocouple was replaced. The replacement was justified with the documented evidences such as Spare

VERIFICATION REPORT

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part replacement report. That document was reviewed by the verification team and found satisfactory (see the Category 2 Documents, section 5 of that report).

According to the documents on measurement equipment and its calibration certificates, the function of the monitoring equipment, including its calibration status, is in order.

During site visit initial monitoring documents were revised, and electronic database was checked and discovered as reliable and functional. Thus, the evidence and records used for the monitoring are maintained in a traceable manner.

As a result of the site visit interview the verification team was informed that some special events occurred within the monitoring period 01/01/2012 – 30/09/2012. Those are related to the Micro Box PC and the air flap actuator. Firstly, the data logging system had problems of function. The system did not store operation data after the maintenance operations carried out to electric equipments in the Main Control Cabinet. This event took place on 15/08/2012. The problem was detected next day, namely, on 16/08/2012, due to the crosschecking procedure. The event was documented according to the approved procedure. The situation and taken action was registered in the special Report of malfunction. Project participants provided the report to the AIE (see the Category 2 Documents, section 5 of that report). Finally, the Micro Box PC was restarted by the project participants and all cables reconnected. Secondly, the air flap actuators did not react on a signals control system. It happened on 16/05/2012. As project participants detected, the flare was shut down because the cables were damaged by the hot surface of the flare. According to the procedure, the event was fixed in the special document (i.e., the Report of malfunction). The event Report was provided to the verification team for justification of the taken actions. The air flap actuator and cables from both terminal boxes to the flare cabinet were replaced on 18/05/2012. As a result, the actuator was tested and adjusted.

The data collection and management system for the JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” is in accordance with the monitoring plan registered in the PDD.

The identified areas of concern as to data management, project participants response and BV Certification’s conclusion are described in Appendix A (refer to CL02).



### **3.7 Verification regarding programmes of activities (102-110)**

Not applicable.



#### 4 VERIFICATION OPINION

Bureau Veritas Certification has performed the second periodic verification of the JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” in Ukraine, which applies JI specific approach on the basis of approved consolidated baseline and monitoring methodology ACM0008 (version 07). The verification was performed in compliance with UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

The verification consisted of the following three phases: i) desk review of the monitoring report against the project design and the baseline and 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 management of Green Gas Krasnodon LLC 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 Plan that is indicated in the final PDD version 06 dated 25/04/2011. 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 version 02 dated 13/11/2012 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as planned and described in approved project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is accurately calculated and is free of material errors, omissions, and misstatements. Our opinion relates to the project’s GHG emissions and resulting GHG emissions reductions reported and related to the approved project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated, we confirm, with a reasonable level of assurance, the following statement:



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VERIFICATION REPORT

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Reporting period: From 01/01/2012 – 30/09/2012

Baseline emissions	: 56, 742	tonnes of CO <sub>2</sub> equivalent
Project emissions	: 7, 303	tonnes of CO <sub>2</sub> equivalent
Emission Reductions (1 quarter 2012 – 3 quarter 2012)	: 49, 439	tonnes of CO <sub>2</sub> equivalent

Emission reductions, project emissions and baseline emissions which are stated above are rounded by developers of the monitoring report to the whole figure (i.e., 1t) and are based on detailed calculations which are demonstrated in excel spreadsheets attached to the monitoring report.





## 5 REFERENCES

### Category 1 Documents:

Documents provided by Green Gas Krasnodon LLC that relate directly to the GHG components of the project.

- /1/ Monitoring report of JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” for the reported period 01/01/2012 – 30/09/2012, version 01 dated 15/10/2012;
- /2/ Monitoring report of JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” for the reported period 01/01/2012 – 30/09/2012, version 02 dated 13/11/2012;
- /3/ PDD of JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” version 06 dated 25/04/2011;
- /4/ Letter of Approval # 2010JI33 dated 29/11/2010 of the JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” issued by the state of the Netherlands acting through the Ministry of Economic Affairs, Agriculture and Innovation;
- /5/ Letter of Approval # 3534/23/7 dated 30/11/2011 of the JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” issue by the State Environmental Investment Agency of Ukraine;
- /6/ Determination report # UKRAINE-det/0139/2010 of the JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” issued by BVC and dated 26/04/2011.
- /7/ Verification report No. UKRAINE-ver/0419/2012 of the JI project “Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine” issued by BVC and dated 25/10/2012

### Category 2 Documents:

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

- /1/ Report of malfunction at Sukhodolskaya-Vostochnaya Mine (form #549, version 1.0) dated 17/08/2012 (the micro box)
- /2/ Spare part replacement report of Sukhodolskaya-Vostochnaya Mine (form #550, version 1.0) dated 25/07/2012 (replacement of the exhaust thermocouple)



## VERIFICATION REPORT

- /3/ Spare part replacement report of Sukhodolskaya-Vostochnaya Mine (form #550, version 1.1) dated 15/03/2012 (the measuring pump ser. # 2.03221690 was replaced by the measuring pump ser. # 2.04186094 in the residual gas analyzer A 141)
- /4/ Report of malfunction at Sukhodolskaya-Vostochnaya Mine (form #549, version 1.0) dated 18/05/2012 (air flap actuator KM 81.20 ser. # 091203C)
- /5/ Spare part replacement report of Sukhodolskaya-Vostochnaya Mine (form #550, version 1.0) dated 21/03/2012 (the sensor ser. # 84315100 B.1011-3528 was replaced by the sensor ser. # 84315200 A.1120026528; the sensor ser. # 84315100 B.1011-3563 was replaced by the sensor ser. # 84315200 A.1123028359)
- /6/ Spare part replacement report of Sukhodolskaya-Vostochnaya Mine (form #550, version 1.0) dated 21/03/2012 (condensate pump in the residual gas analyzer ser. # 94016717 was replaced by the same one ser. # 14104419, and measuring pump in the exhaust gas analyzer ser. # 2.03221697 was replaced by the same one ser. # 2.04992807)
- /7/ Weekly raw monitoring data for the monitoring period January 2012 – September 2012
- /8/ Data of energy consumption for the monitoring period January 2012 – September 2012
- /9/ Calibration report on exhaust gas analyzer dated 04/01/2012 (NGA1-CH4-O2, order 4009.22)
- /10/ Calibration report on residual gas analyzer dated 04/01/2012 (NGA1-CH4-CO2-O2, order 4009.22)
- /11/ Calibration report on residual gas analyzer dated 18/01/2012 (NGA1-CH4-CO2-O2, order 4009.22)
- /12/ Calibration report on exhaust gas analyzer dated 18/01/2012 (NGA1-CH4-O2, order 4009.22)
- /13/ Calibration report on residual gas analyzer dated 01/02/2012 (NGA1-CH4-CO2-O2, order 4009.22)
- /14/ Calibration report on exhaust gas analyzer dated 01/02/2012 (NGA1-CH4-O2, order 4009.22)
- /15/ Calibration report on residual gas analyzer dated 15/02/2012 (NGA1-CH4-CO2-O2, order 4009.22)
- /16/ Calibration report on exhaust gas analyzer dated 15/02/2012 (NGA1-CH4-O2, order 4009.22)
- /17/ Calibration report on exhaust gas analyzer dated 01/03/2012 (NGA1-CH4-O2, order 4009.22)
- /18/ Calibration report on residual gas analyzer dated 01/03/2012 (NGA1-CH4-CO2-O2, order 4009.22)
- /19/ Calibration report on residual gas analyzer dated 09/03/2012 (NGA1-CH4-CO2-O2, order 4009.22)
- /20/ Calibration report on exhaust gas analyzer dated 09/03/2012 (NGA1-CH4-O2, order 4009.22)
- /21/ Calibration report on residual gas analyzer dated 22/03/2012



## VERIFICATION REPORT

- (NGA1-CH4-CO2-O2, order 4009.22)
- /22/ Calibration report on exhaust gas analyzer dated 22/03/2012 (NGA1-CH4-O2, order 4009.22)
  - /23/ Calibration report on residual gas analyzer dated 11/07/2012 (NGA1-CH4-CO2-O2, order 4009.22)
  - /24/ Calibration report on exhaust gas analyzer dated 11/07/2012 (NGA1-CH4-O2, order 4009.22)
  - /25/ Calibration report on exhaust gas analyzer dated 25/07/2012 (NGA1-CH4-O2, order 4009.22)
  - /26/ Calibration report on residual gas analyzer dated 25/07/2012 (NGA1-CH4-CO2-O2, order 4009.22)
  - /27/ Calibration report on exhaust gas analyzer dated 08/08/2012 (NGA1-CH4-O2, order 4009.22)
  - /28/ Calibration report on residual gas analyzer dated 08/08/2012 (NGA1-CH4-CO2-O2, order 4009.22)
  - /29/ Calibration report on exhaust gas analyzer dated 22/08/2012 (NGA1-CH4-O2, order 4009.22)
  - /30/ Calibration report on residual gas analyzer dated 22/08/2012 (NGA1-CH4-CO2-O2, order 4009.22)
  - /31/ Calibration report on residual gas analyzer dated 05/09/2012 (NGA1-CH4-CO2-O2, order 4009.22)
  - /32/ Calibration report on exhaust gas analyzer dated 05/09/2012 (NGA1-CH4-O2, order 4009.22)
  - /33/ Calibration report on residual gas analyzer dated 19/09/2012 (NGA1-CH4-CO2-O2, order 4009.22)
  - /34/ Calibration report on exhaust gas analyzer dated 19/09/2012 (NGA1-CH4-O2, order 4009.22)
  - /35/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 03/01/2012
  - /36/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 02/02/2012
  - /37/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 02/03/2012
  - /38/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 05/04/2012
  - /39/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 30/04/2012
  - /40/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 21/05/2012
  - /41/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 01/06/2012
  - /42/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 12/07/2012
  - /43/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 22/08/2012
  - /44/ Plant status and operation report of Sukhodolskaya-Vostochnaya Mine dated 13/09/2012



- /45/ Certificate on a training about gas warning systems dated 26/09/2012 and issued to Yaroslav Okhremenko
- /46/ Gas content sampled 20/09/2012 PJSC “Krasnodon Coal Company” Sukhodolskaya-Vostochnaya Mine
- /47/ Agreement # 1931210791/436-I/05-12 dated 23/05/2012 between Respirator Scientific and Research Institute of Mine Rescue and Fire Safety and PJSC “Krasnodon Coal Company” on study ignition gas samples from degassing pipeline
- /48/ Letter # 8/2-46 dated 15/05/2012 from PJSC “Krasnodon Coal Company” to Green Gas Krasnodon LLC director, O. Ostrovskaya concerning electricity consumption class of Sukhodolskaya-Vostochnaya Mine
- /49/ Information on electricity registration accounting means of OJSC “Krasnodon Coal Company” Sukhodolskaya-Vostochnaya Mine
- /50/ Data logging and transfer procedure. Standard Operating procedure 181 of the Sukhodolskaya-Vostochnaya Coal Mine (Krasnodon, Ukraine), version 2.7

**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/ Serhii Halushkin – chief engineer of the Sukhodolskaya-Vostochnaya Mine
- /2/ Yana Pushkar – lead engineer of KYOTO at PJSC “Krasnodon Coal Company”
- /3/ Iryna Diumina – lead engineer of Joint Implementation projects
- /4/ Yaroslav Okhremenko - Plant manager, site engineer
- /5/ Viacheslav Sopov - Site manager’s assistant
- /6/ Airat Khakimzianov – JI consultant
- /7/ Raj Kumar - Carbon Revenue Manager of Green Gas International B.V.



## VERIFICATION REPORT

## APPENDIX A: VERIFICATION PROTOCOL

**Table 1 Check list for verification, according to the JOINT IMPLEMENTATION DETERMINATION AND VERIFICATION MANUAL (Version 01)**

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
<b>Project approvals by Parties involved</b>				
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	Letter of Approval (LoA) of the JI project "Power generation from the coal mine methane at the Sukhodolskaya-Vostochnaya Mine" was issued by the NFP of Ukraine (Host Party) as well as the Netherlands (Party B). They were provided to AIE which does not question its authenticity. Host Party (i.e., Ukraine) provided Letter of Approval # 3534/23/7 dated 30/11/2011 which was issued by the State Environmental Investment Agency of Ukraine. Also, Party B (i.e., the Netherlands) provided Letter of Approval # 2010JI33 dated 29/11/2010 that was issued by the Ministry of Economic Affairs, Agriculture and Innovation.	OK	OK
91	Are all the written project approvals by Parties involved	Yes, all the written project approvals by Parties involved are unconditional.	OK	OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	unconditional?			
<b>Project implementation</b>				
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	Project activity has been implemented according to the project design document version 06 dated 25/04/2011 that is deemed final during determination.	OK	OK
93	What is the status of operation of the project during the monitoring period?	<p>As per registered PDD, regarded JI project activity divided into two phases. Phase 1 has been fully implemented. Flare facility was commissioned in December 2010. No additional measures as per the project activity were implemented during the current monitoring period (i.e., January 2012 – September 2012).</p> <p>Installation of Phase 2 is delayed due to the lack of finance. Drainage system of the Mine does not allow continuous gas supply which meets the quality required for CMM-fired gensets.</p> <p>Additional investment is required for new drainage system to ensure continuous electricity production by both CMM-fired gensets through a stable gas supply by the Mine.</p>		OK





BUREAU  
VERITAS

## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>The value of emission reductions achieved for the monitoring period 01/01/2012 - 30/09/2012 makes 49,439 t CO<sub>2</sub> equivalent and that one estimated in PDD – 248,415 t CO<sub>2</sub> equivalent.</p> <p><u>Corrective Action Request 01 (CAR01).</u> During interview with PPs through site visit special events within the monitoring period were revealed. It is concerned to Micro box PC and Air flap actuator. Reports of malfunction were provided by PPs. Please describe the relevant information in the MR for the 01/01/2012 - 30/09/2012 monitoring period.</p> <p><u>Corrective Action Request 02 (CAR02).</u> According to the Contract and the major part of documented evidences of the JI project, there is known that current monitoring period is from 01/01/2012 to 30/09/2012. Please make the information of the monitoring period interval in compliance throughout the monitoring report (MR). Please pay your attention on the page 20 of the MR.</p> <p><u>Corrective Action Request 03 (CAR03).</u> During site visit there was discovered that</p>	<p>CAR01</p> <p>CAR02</p> <p>CAR03</p>	<p>OK</p> <p>OK</p> <p>OK</p>



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>training about gaswarning systems was performed for plant manager in September. Certificate on training was provided for verification team. Please state the information about training in the monitoring report.</p> <p><u>Clarification Request 01 (CL01)</u>. Please clarify why the value of emission reductions provided in the MR for 01/01/2012 – 30/09/2012 monitoring period differs from the value stated in registered PDD for the same period.</p>	CL01	OK
<b>Compliance with monitoring plan</b>				
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	<p>The Monitoring System is in place and operational. Monitoring of GHG emission reductions occurred basically in accordance with the determined Monitoring Plan included in registered PDD.</p> <p>Data used for calculation of emissions reduction based on information that confirmed by PJSC “Krasnodon Coal Company” documents.</p>	OK	OK
95 (a)	For calculating the emission reductions or enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii)	For calculating the emission reductions, the key factors listed in 23 (b) (i)-(vi) DVM, influencing the baseline emissions and the activity level of the project and the	OK	OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	emissions as well as risks associated with the project were taken into account as follows (refer to PDD B): <ul style="list-style-type: none"> <li>✓ Flaring of CMM is not required by existing national regulations;</li> <li>✓ There was no skilled and properly trained personnel for the operation and maintenance of the specific modern kind of technology before the project;</li> <li>✓ The concentration of methane within VAM is too low;</li> <li>✓ Present technology is only available for the gases with high calorific value, and CMM has low calorific value, etc.</li> </ul>		
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	All the data sources used for calculating emission reductions are clearly identified, reliable and transparent. They are listed and classified in the MR Sections B.2. According to the monitoring procedure, monitoring data are recorded automatically and stored in the electronic database of the plant. Relevant monitoring points, measurement equipment, and responsible persons are	OK	OK



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		<p>explicitly indicated in the MR Section B and on Figure B.2.1.1 and Figure B.2.1.2. Calculation of emission reduction was performed on the excel spreadsheet. The results are summarised in the MR Section D.</p> <p>Verification result shows that the initial monitoring data from the plant reported documents are consistent with the same data provided in the monitoring report and the excel spreadsheet.</p>		
95 (c)	<p>Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice?</p>	<p>CO<sub>2</sub> emission factor from the grid and Carbon emission factor for combusted methane are used for calculation of emissions and emission reductions. Carbon emission factor for combusted methane was taken from the approved consolidated methodology ACM0008 (version 07).</p>	OK	OK
95 (d)	<p>Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?</p>	<p>The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner. As a result of documents revision, all data connected with estimation of emission reduction are</p>	OK	OK



BUREAU  
VERITAS

## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		consistent through the Monitoring report and excel spreadsheets with calculation.		
<b>Applicable to JI SSC projects only</b>				
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?	Not applicable	N/A	N/A
<b>Applicable to bundled JI SSC projects only</b>				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	Not applicable	N/A	N/A
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	Not applicable	N/A	N/A
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods,	Not applicable	N/A	N/A



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?			
<b>Revision of monitoring plan</b>				
<b>Applicable only if monitoring plan is revised by project participant</b>				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	No revisions are considered in the Monitoring report for 01/01/2012 – 30/09/2012 monitoring period.	N/A	N/A
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	Not applicable	N/A	N/A
<b>Data management</b>				
101 (a)	Is the implementation of data collection procedures in	The implementation of data collection procedures is in accordance with the	OK	OK





BUREAU  
VERITAS

## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	accordance with the monitoring plan, including the quality control and quality assurance procedures?	determined monitoring plan and is an integral part of the operational routine at the PJSC "Krasnodon Coal Company" including quality control and quality assurance procedures. Measurement equipment, such as power meter, gas flow meter, pressure meter, continuous gas quality analyzer for CH <sub>4</sub> , thermocouple, etc. Monitoring data of the JI project is monitored in compliance with scheduled frequency approved in the developed monitoring plan and monitoring procedure.		
101 (b)	Is the function of the monitoring equipment, including its calibration status, in order?	All monitoring equipment has calibration. It is calibrated with periodic frequency (certificate of each device states the calibration frequency) according to the national regulations. During site visit verifiers received and reviewed certificates and passports on calibration of all measurement equipment. Based on the documents revision, they were found satisfactory.	OK	OK
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable	The evidence and records performed during the monitoring are maintained by responsible departments in a traceable		



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	manner?	manner. <u>Clarification Request 02 (CL02)</u> . Please clarify whether internal control and crosschecking of the monitoring data are registered in any documented evidence. If yes please provide.	CL02	OK
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	The data collection and management system for the project is in accordance with the approved monitoring plan. Implementation of monitoring procedure was checked through the site visit, and concluded that the procedure is completely in accordance with the revised monitoring plan. This fact is also confirmed by documented evidences. Responsibilities of the persons are explicitly indicated in the Monitoring report.	OK	OK
<b>Verification regarding programmes of activities (additional elements for assessment)</b>				
102	Is any JPA that has not been added to the JI PoA not verified?	Not applicable	N/A	N/A
103	Is the verification based on the monitoring reports of all JPAs to be verified?	Not applicable	N/A	N/A
103	Does the verification ensure the accuracy and conservativeness	Not applicable	N/A	N/A



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	of the emission reductions or enhancements of removals generated by each JPA?			
104	Does the monitoring period not overlap with previous monitoring periods?	Not applicable	N/A	N/A
105	If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?	Not applicable	N/A	N/A
<b>Applicable to sample-based approach only</b>				
106	Does the sampling plan prepared by the AIE: (a) Describe its sample selection, taking into account that: (i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such	Not applicable	N/A	N/A



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	as: <ul style="list-style-type: none"> <li>- The types of JPAs;</li> <li>- The complexity of the applicable technologies and/or measures used;</li> <li>- The geographical location of each JPA;</li> <li>- The amounts of expected emission reductions of the JPAs being verified;</li> <li>- The number of JPAs for which emission reductions are being verified;</li> <li>- The length of monitoring periods of the JPAs being verified; and</li> <li>- The samples selected for prior verifications, if any?</li> </ul>			
107	Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?	Not applicable	N/A	N/A
108	Has the AIE made site inspections of at least the square root of the number of total JPAs,	Not applicable	N/A	N/A



## VERIFICATION REPORT

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation and justification?			
109	Is the sampling plan available for submission to the secretariat for the JISC ex ante assessment? (Optional)	Not applicable	N/A	N/A
110	If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?	Not applicable	N/A	N/A

**Table 2 Resolution of Corrective Action and Clarification Requests**

Draft report clarification and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
<p><u>Corrective Action Request 01 (CAR01)</u>. During interview with PPs through site visit special events within the monitoring period were revealed. It is concerned to Micro box PC and Air flap actuator. Reports of malfunction were provided by PPs. Please describe the relevant information in the MR for the 01/01/2012 - 30/09/2012 monitoring period.</p>	Table 1, 93	The missing information, regarding the special events raised during the monitoring period, have been explained under section B.4. of the MR.	The details related to the special events within the regarded monitoring period were described in the monitoring report version 02. Provided information is in compliance with the documented evidences. Thus, issue is closed.
<p><u>Corrective Action Request 02 (CAR02)</u>. According to the Contract and the major part of documented evidences of the JI project, there is known that current monitoring period is from 01/01/2012 to 30/09/2012. Please make the information of the monitoring period interval in</p>	Table 1, 93	The monitoring report has been corrected in compliance with the documented evidences and the monitoring period has been corrected throughout the complete document.	The required amendments were done, and the information in the monitoring report version 02 is sufficient. Issue is closed.



## VERIFICATION REPORT

Draft report clarification and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
compliance throughout the monitoring report (MR). Please pay your attention on the page 20 of the MR.			
<u>Corrective Action Request 03 (CAR03)</u> . During site visit there was discovered that training about gaswarning systems was performed for plant manager in September. Certificate on training was provided for verification team. Please state the information about training in the monitoring report.	Table 1, 93	The missing information, regarding the training about gas warning systems during the monitoring period, has been explained under section C.1.2 of the MR.	Information of training in the frame of regarded monitoring period was provided in the last version of the monitoring report. So, issue is closed.
<u>Clarification Request 01 (CL01)</u> . Please clarify why the value of emission reductions provided in the MR for 01/01/2012 – 30/09/2012 monitoring period differs from the value stated in registered PDD for the same period.	Table 1, 93	There is difference between the achieved emission reductions during this period, 49,439 tCO <sub>2</sub> e, and the value estimated in the PDD for the same period (247,963 t CO <sub>2</sub> e), since the amount of actual extracted CMM is less than the prediction in the PDD. Also such difference is due to some problems during the function of	Issue is closed based on the provided explanation that is justified with documents.





## VERIFICATION REPORT

Draft report clarification and corrective action requests by verification team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
		the plant in winter. Frozen Pipelines have made impossible to arrange the quantity/quality calculated in the PDD.	
<p><u>Clarification Request 02 (CL02).</u> Please clarify whether internal control and crosschecking of the monitoring data are registered in any documented evidence. If yes please provide.</p>	Table 1, 101 (c)	<p>Standard Operating Procedures (SOP) are available for the correct functioning of the plant. Within SOP 181 is explained how data publisher is a telecontrol system designed to proceed with the remote control of the flare booster station to establish a fluent process without permanent presence of local staff. The collected data are stored on the Data Server, based in Germany, and are downloaded in a daily routine by the Carbon Project Controller in order to use the collected data for cross-checks, analysis, for calculating the ERUs and for reporting the</p>	<p>According to the clarification and documented evidenced that were provided by PPs, issue is closed.</p>



VERIFICATION REPORT

<b>Draft report clarification and corrective action requests by verification team</b>	<b>Ref. to checklist question in table 1</b>	<b>Summary of project participant response</b>	<b>Verification team conclusion</b>
		figures for internal purposes.	