VERIFICATION REPORT

ING BANK N.V.

VERIFICATION OF THE "Coal Mine Methane Capture and Utilization at Samsonivska-Zakhidna MINE"

REPORT NO. UKRAINE-VER/0635/2012

REVISION NO. 04

BUREAU VERITAS CERTIFICATION

Date of first issue: 19/09/2012	Organizational unit: Bureau Veritas Certification Holding SAS
Client: ING BANK N.V.	Client ref.: Stephen Hibbert

Summary:

Bureau Veritas Certification has made the 2nd periodic verification of the "COAL MINE METHANE CAPTURE AND UTILIZATION AT SAMSONIVSKA-ZAKHIDNA MINE",JI Registration Reference Number UA1000221, project of PJSC "Krasnodon Coal" located in the town of Molodogvardiysk (Krasnodon district of Luhansk Oblast) in the eastern Ukraine, and applying the methodology ACM0008 (version 06) "Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation", 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 Action Requests, Forward Action Requests (CL, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as per determined changes . 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 reduction is calculated accurately and without material errors, omissions, or misstatements, and the ERUs issued totalize 125087 tonnes of CO_2 equivalent for the monitoring period from 01/08/2010 to 31/07/2012. Our opinion relates to the project 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/0635/2012	Subject Group: JI	
Project title: "COAL MINE METHANE CAPTURE AND UTILIZATION AT SAMSONIVSKA-ZAKHIDNA MINE "		
Work carried out by: Svitlana Gariyenchyk - Team Leader, Lead Verifier Sergii Verteletskyi – Team member, Verifier Dmytro Balyn – Technical Specialist		
Work reviewed by: Ivan Sokolov - Internal Technical Reviewer Vladimir Lukin – Technical Specialist		
Work approved by: Ivan Sokolov – Operational Manager		
Date of this revision: 14/11/2012	Rev. No.: 04	Number of pages: 32

Bureau Veritas Certification Holding SAS

☒ No distribution without permission from the Client or responsible organizational unit

☐ Limited distribution

☐ Unrestricted distribution

Table of Contents *Page*

1 INTRODUCTION

ING Bank N.V.has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Coal Mine Methane Capture and Utilization at Samsonivska- Zakhidna Mine” (hereafter called “the project”) located at the town of Molodogvardiysk, Krasnodon district, Luhansk Oblast, 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 the project design document, the project’s baseline study, monitoring plan and monitoring report, 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:

Svitlana Gariyenchyk Bureau Veritas Certification	Team Leader, Climate Change Verifier
Sergii Vertletskyi Bureau Veritas Certification	Climate Change Verifier
Dmytro Balyn	Technical Specialist

This verification report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification, Internal Technical Reviewer

Vladimir Lukin 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 GreenStream Network GmbH and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved CDM methodology ,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(s) 01, 02, 03, 04 and project as described in the determined PDD.

2.2 Follow-up Interviews

On 29/08/2012 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of PJSC

"Krasnodon Coal" and GreenStream Network GmbH were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Coal Mine Samsonivska-Zakhidna	– Project implementation status – · Organizational structure – · Responsibilities and authorities – · Personnel training – · Quality management procedures and technology – · Records of equipment installation – · Control of metering equipment – · Metering record keeping system, database – · Cross-check of the information provided in the MR with other sources
GreenStream Network GmbH	– · Baseline methodology – · Monitoring plan – · Monitoring report – · Deviations from PDD

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 Clarification, Corrective and Forward Action 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 07 Corrective Action Requests, 02 Clarification Requests, and 00 Forward Action 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

FAR 01 (from previous verification): In order to meet the JISC requirements on data saving and archiving, an Order on archiving of all project related documentation for two years after the last ERU transmission should be developed and included to the Emission Monitoring Manual. All persons responsible for data collection and monitoring should be aware of the provisions of this Order.

Conclusion for FAR01: During site visit the new version of Emission Monitoring Manual (hereafter called “EMM”) and “Order on archiving of all project related documentation” #381 dated 13.09.2011. have been presented to the AIE as supporting documents, thus FAR01 is closed.

FAR 02 (from previous verification): The training plans and procedures should be described in Monitoring Manual.

Conclusion for FAR02: During site visit the new version of Emission Monitoring Manual (hereafter called “EMM”) has been provided. The appropriate description was added to the Section 8 of the Monitoring Manual, thus FAR02 is closed.

FAR 03 (from previous verification): Please ensure registration of the operational time of the emission reduction related installations.

Conclusion for FAR03 (from previous verification): Sections 4.1.9 and 4.3 of the updated Emission Monitoring Manual have detailed explanation of operational time registration procedure, thus FAR03 is closed.

FAR 04 (from previous verification): In monitoring manual a specific frequency of cross-checking and the staff responsible for this must be provided.

Conclusion for FAR04: The appropriate description was added to the Section 5 of the Monitoring Manual, thus FAR 04.

3.2 Project approval by Parties involved (90-91)

Written project approvals by the Netherlands and Ukraine have been issued by the DFPs of those Parties when submitting the first verification report for registration. (They are listed among Category 1 Documents in the Reference section of this report)

The abovementioned written approval is unconditional.

3.3 Project implementation (92-93)

Samsonivska-Zakhidna is an underground coal mine; its operation has started in 1999. As of 2007, 2967 people were employed at the mine. The current production capacity of Samsonivska-Zakhidna mine is 1 250 000 tons of coal per year. The mine covers the territory of 105.1599 hectares. Balance reserves of Samsonivska-Zakhidna mine is 154 377 million tons of coal. Thickness of beds, which are being developed, is 1.25 meters. The type of the coal is “Zh” coking coal according to the Ukrainian coal quality scale. Ash content of coal is 37.4. Sulfur content is 1.7%. The average content of methane in coal is 27 m3/t of coal. The primary means of coal mining in the mine is long coalfaces development. The current number of producing faces is three. A typical width of one coalface is 270 m. The number of shafts is 5: the main shaft (length - 960 m), auxiliary shaft №1 (857 m), intake shaft (1020 m), air shaft №2 (888 m). Coal beds are mined with long-pillars with increase method. The length of the drifts is 250-270 m. One of the main sources of methane emissions to the atmosphere is coal mining. Methane, which is released into the atmosphere due to operation of Samsonivska-Zakhidna mine, has two main sources: ventilation methane and methane captured by degassing system. Due to extremely low concentrations of methane in the ventilation system, this component is not taken into account in the calculations. The proposed project at the Samsonivska-Zakhidna mine consists of the

following measures aimed at prevention of methane emissions and utilization of the CMM energy content:

1) Installation of three flaring systems for CMM combustion
A positive conclusion from the Donetsk Technical Expertise center regarding the use of UKG-5/8 was received on April 22nd, 2008. This date is considered the date of the project activity start. The first UKG-5/8 flare was installed onsite and started operation in the testing mode on April 1st, 2009. A temporary state permit has been issued for the testing operation of the UKG-5/8 unit on September 14th, 2009. After successful UKG-5/8 flare unit operation the work on commissioning of two other flare units has been continued: according to positive expert conclusion of SE UCAC "Prombezpeka" dated 16.02.2009 and temporary state permit for the testing operation of the KGUU-5/8 dated 24.02.2009, the flare unit KGUU-5/8 was leased and commissioned for the period from 19.04.2011 to 06.09.2011, and the flare unit KGUU-15 was commissioned on 02.11.2011 (according to positive conclusion of CB "Tecko" dated 01.07.2011 and state permit #3429.11.30-29.52.1 for the operation of the KGUU-15 flare unit dated 13.10.2011).

2) Switching of existing coal boilers KE-10/14 and KVTS-20-150 to methane.
The management of the Samsonivska-Zakhidna mine has commissioned CJSC 'Kotloenergoproekt' for developing the technical design for the KE-10/14 boiler switch to CMM in 2004. Construction work performed under this project since 11.01.2011. Since 01.12.2011, testing combustion of methane as a fuel in the boiler KE-10/14 was started. The positive conclusion of KhCDO "Energoprogress" for the project "Reconstruction of the KE-10/14 coal-boiler to combust CMM as a fuel" has been received on 05.01.2012, the positive expert conclusion of ICPB Ltd. for the project "Switching the boiler KE-10/14 for CMM combustion at the central site of mine division Samsonovske-Zakhidne of PJSC "Krasnodon Coal" has been received 29.02.2012.

3) Installation of three gas engines for the CMM utilization.
The technical design for power production by gas engines using CMM as fuel was prepared by CJSC 'Kotloenergoproekt' in 2008. Comissioning of gas engine units moved from 2011 to 2013 due to the lack of financing available from the project owner.

Introduction of gas engines for CMM utilization
It is planned for 2013 to install three GE Jenbacher J 420 units with 1.416 MW of installed power capacity for each unit. Power efficiency of GE Jenbacher J 420 is 42.48%. Generated electricity will be supplied to the mine and will partially cover the electricity demand of the mine.

CMM flares installation

During the monitoring period in the Samsonivska-Zakhidna mine the following flare units were operated: UKG-5/8, KGUU-5/8 and KGUU-15. The flare unit UKG-5/8 is an enclosed flare with a nominal capacity of 5 MW; maximum capacity is 8 MW. Flaring process is controlled automatically by the unit's computer. Minimum flaring temperature is 850°C; minimum flaring efficiency is 99.9%. The flare unit KGUU-5/8 is an enclosed flare with a nominal capacity of 5 MW; maximum capacity is 8 MW. Flaring process is controlled automatically by the unit's computer. Minimum flaring temperature is 850°C; minimum flaring efficiency is 99.9%. The flare unit KGUU-15 is an enclosed flare with a maximum capacity of 15 MW. Flaring process is controlled automatically by the unit's computer. Minimum flaring temperature is 850°C; minimum flaring efficiency is 99.9%.

Switching of existing coal boilers KVTS-20-150 and KE-10/14 to methane

Thermal energy for the needs of Samsonivska-Zakhidna mine is currently produced by installed coal boiler KVTS-20-150 (efficiency 89%) and reconstructed coal boiler KE-10/14 (efficiency 87%), the latter can use CMM and coal as a fuel. Another KVTS-20-150 boiler is mothballed and not operated. Existing coal boiler KE-10/14 was reconstructed with subsequent switching to the use of methane as primary fuel. Burners on the side walls of the combustion chamber were reconstructed; air and methane-air mixture supply to the burners were improved; air regulating valves have been installed on air lines group that supplies air under the grate; screens reconstruction in boiler's burners were made, explosive valves have been installed on the boiler and economizers. As a result of the reconstruction, boiler KE-10/14 can work both on CMM supplied from the mine's degassing system and coal. It was also planned to reconstruct the coal boiler KVTS-20-150 in the same way, but for now KE-10/14 boiler capacity is sufficient for the needs of the mine, so reconstruction of the boiler KVTS-20-150 in the near future is not planned.

The following changes in the implementation schedule have happened during the monitoring period compared to the registered PDD version 2.01:

Installation of the flare #2 is postponed, but the flare unit KGUU-5/8 was leased and commissioned. Installation of the flare #3 is postponed by 19 months. The flare unit KGUU-5/8 was leased and commissioned for the period from 19.04.2011 to 06.09.2011, and the flare unit KGUU-15 was commissioned on 02.11.2011. The main reason for the delays in the implementation schedule is the lack of financing available from the project owner. However, the delay with commissioning of the two UKG-5/8 flares has no significant impact on the project's additionality, since the flares

are only able to generate profit by selling emission reductions. Conducting work on commissioning of gas engine units was moved to 2013 due to lack of funds available from the project owner

The implementation schedule of the measures envisaged within the project is given in the table 2 below:

№	Activity	Designing start	Build start	Putting into operation
1	**CMM flaring system installation**			
1.1	Flare №1 installation	December 2008	June 2008	April 2009
1.2	Flare №2 installation	December 2008	June 2009	January 2010
1.3	Flare №3 installation	December 2008	June 2009	April 2010
2	**Gas engine installation**			
2.1	Unit №1 installation (GE Jenbacher J420, 1.416 MW)	December 2008	June 2010	January 2011
2.2	Unit №2 installation (GE Jenbacher J420, 1.416 MW)	December 2008	June 2010	January 2011
2.3	Unit №3 installation (GE Jenbacher J420, 1.416 MW)	December 2008	June 2010	January 2011
3	**Switching of existing coal boilers to methane**	December 2008	June 2010	January 2011

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 performed. For calculating the emission reductions key factors influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the project were taken into account, as appropriate. The exhaustive description and justification of the key factors is provided in Section B.1. of the PDD version 2.01 dated 06 April 2010. Data sources used for calculating emission reductions, such as:

- · Methane flow to flares (m3);
- · Methane pressure at flares (bar);

- · Methane temperature at flares (°C);
- · Methane concentration in the captured gas (%);
- · Carbon emission factor of NMHC (tCO2e/tNMHC);
- · Proportion of the non-methane hydrocarbon substances in the gas collected (%);

are clearly identified, reliable and transparent. Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice. List of fixed default values is presented in Section D.1 of the Monitoring report. 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)

Not applicable

3.6 Data management (101)

The data and their sources, provided in monitoring report, 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. These procedures are mentioned in the section “References” of this report.

The function of the monitoring equipment, including its calibration status, is in order. Measuring devices for pressure, concentration, volume and temperature of gas sent to UKG-5/8, KGUU-5/8, KGUU-15 units and KE-10/14 boiler are regularly checked by the SE ‘Sumy Regional Research and Production Standardization, Metrology and Certification Centre’. Check procedure is supervised by the equipment manufacturer – All-Ukrainian Research Institute ‘Kompresormash’. All checks are documented through certificate issuance.

The evidence and records used for the monitoring are maintained in a traceable manner.

As a general quality control measure, methane concentration and CMM flow data of the UKG-5/8, KGUU-5/8 and KGUU-15 flares and KE-10/14 boiler are compared with the indication of the meters from the vacuum pump station for plausibility. The QC/QA measures for UKG-5/8, KGUU-5/8 and KGUU-15 flares and KE-10/14 boiler are described below.

1) Quality Control and Quality Assurance procedures used for UKG-5/8, KGUU-5/8 and KGUU-15 flares

CMM flow and methane concentration electronic data is stored and regularly backed up at PJSC ”Krasnodon Coal”.

A monitoring engineer from the Bureau for Industrial Safety of PJSC Krasnodonvugillya checks the data from the server every day and makes internal weekly reports.

The Leading engineer of the Kyoto Protocol project support of PJSC Krasnodonvugillya prepares monthly reports which are checked by the Department of the Preventive Measures and Safety of PJSC ”Krasnodon Coal”.

The Department of the Preventive Measures and Safety prepares the monitoring report, which is checked by Acting Chief of Bureau for Industrial Safety and the General Director of PJSC Krasnodonvugillya. Additionally data is recorded manually in log journals by the pumping units operators. The journals are checked daily by the Leading engineer of the Kyoto Protocol project support and cross-checked monthly by the Department of the Preventive Measures and Safety.

Pumping unit operator provides daily inspection of degassing system pumping units, including UKG-5/8, KGUU-5/8 and KGUU-15. Site machine operator inspects the degassing system equipment once a week.

The paper data is stored at the coal mine.

2) Quality Control and Quality Assurance procedures used for KE-10/14 boiler

A monitoring engineer from the Bureau for Industrial Safety of PJSC Krasnodonvugillya checks the data from the boiler operator every day and makes internal weekly reports.

The Leading engineer of the Kyoto Protocol project support of PJSC Krasnodonvugillya prepares monthly reports which are checked by the Department of the Preventive Measures and Safety of PJSC Krasnodonvugillya.

The Department of the Preventive Measures and Safety prepares the monitoring report, which is checked by Acting Chief of Bureau for Industrial Safety and the General Director of PJSC ”Krasnodon Coal. Additionally data is recorded manually in log journals by the heat boiler operator. The journals are checked daily by the Leading engineer of the Kyoto Protocol project support and cross-checked monthly by the Department of the Preventive Measures and Safety.

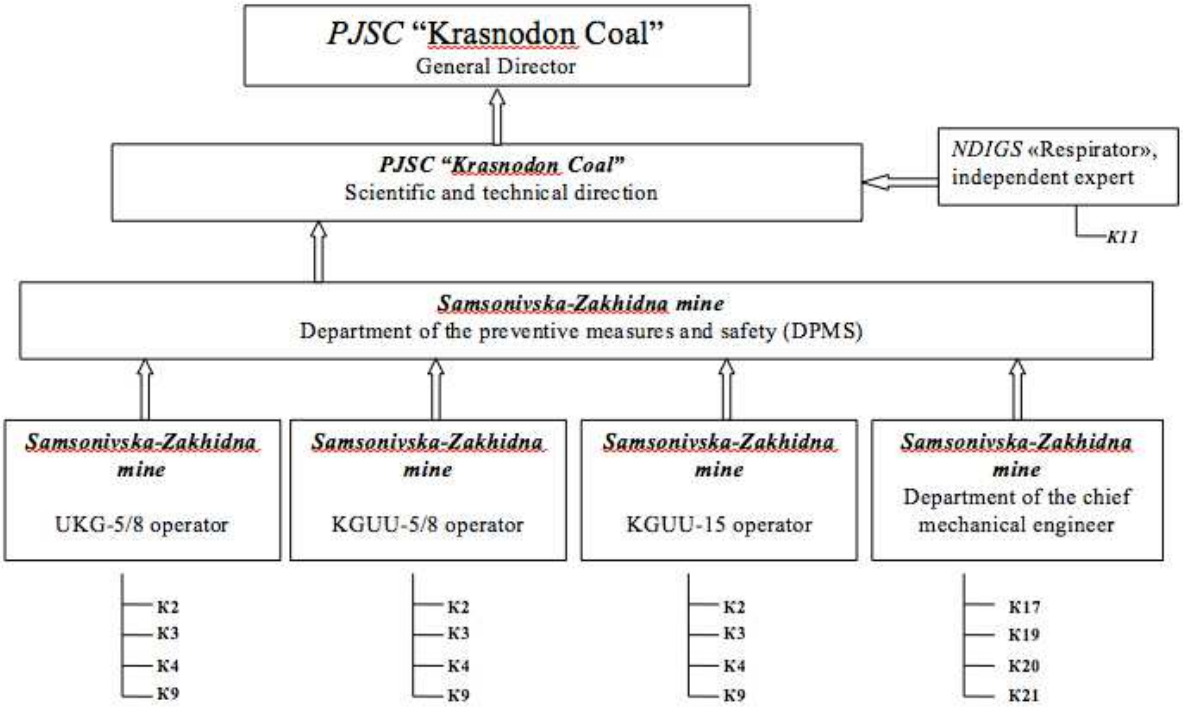
The cross-checking of the boiler's gas consumption for the heat generation is carried with the use of the "Methodology of heat and coal use":

1. The "Methodology of heat and coal use" is used to define the amount of fuel to be sent to the boiler, in order to achieve the expected heat output;

2. The amount of burned methane is calculated using boiler meters' of gas volume, methane concentration, pressure and temperature data;

3. Cross-checking of the amount of methane burned by the boiler and generated heat energy is making by the Department of chief mechanical engineer.

Boiler operator provides daily inspection of boilers and distribution pipeline. The paper data is stored at the coal mine. Project operational and management structure is provided in the table below:



3.7 Verification regarding programmes of activities

Not applicable

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the second 2nd periodic verification of the "Coal Mine Methane Capture and Utilization at Samsonivska- Zakhidna Mine" Project in Ukraine, which applies the methodology ACM008 version 06 "Consolidated methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction through flaring or flameless oxidation". The verification was performed on the basis of 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 Coal Mine "Samsonivska-Zakhidna" 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 indicated in the final PDD version. 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 04 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.
In the view of low measurements accuracy of mass and NCV of the coal burnt in the boiler KE 10/14 there were slight deviations from the registered monitoring plan in order to improve the ERUs calculation accuracy, specifically, changes were made to the calculation (formula(3) and description of the formula parameters (1)-(8). Besides, instead of the IPCC data the more actual data from the National Inventory of anthropogenic emissions and removals of greenhouse gases in Ukraine for 1990 –2010 was used.

The deviations of emission reductions in the Monitoring report version 04 and those in the registered PDD are explained by the following reasons:

1) Postponed commissioning of the 2nd and 3rd flares. More detailed information on changes in the project implementation schedule can be found in Section B.1 of this monitoring report;

2) Amount of methane utilized by flaring units has changed compared to the scenario described in PDD, version 2.01 of 06.04.2010;

3) Postponed commissioning of the gas engine units.

Bureau Veritas Certification can confirm that the GHG emission reduction is accurately calculated and is free of material errors, omissions, or 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:

Reporting period: From 01/08/2010 to 31/12/2010

Baseline emissions	: 14567	tonnes of CO_2 equivalent.
Project emissions	: 1981	tonnes of CO_2 equivalent.
Emission Reductions (Year 2010)	: 12586	tonnes of CO_2 equivalent.

Reporting period: From 01/01/2011 to 31/12/2011

Baseline emissions	: 86747	tonnes of CO_2 equivalent.
Project emissions	: 11814	tonnes of CO_2 equivalent.
Emission Reductions (Year 2011)	: 74933	tonnes of CO_2 equivalent.

Reporting period: From 01/01/2012 to 31/07/2012

Baseline emissions	: 45240	tonnes of CO_2 equivalent.
Project emissions	: 7672	tonnes of CO_2 equivalent.
Emission Reductions (Year 2012)	: 37568	tonnes of CO_2 equivalent.

Total reductions	: 125087	tonnes of CO_2 equivalent.

5 REFERENCES

Category 1 Documents:
Documents provided by GreenStream Network GmbH that relate directly to the GHG components of the project.

/1/ PDD "Coal mine methane capture and utilization at Samsonivska-Zakhidna mine" version 2.01, dated 06 April 2010
/2/ Determination Report "Coal mine methane capture and utilization at Samsonivska-Zakhidna mine", dated 12 April 2010 issued by Bureau Veritas Certification holding SAS
/3/ Verification Report "Coal mine methane capture and utilization at Samsonivska-Zakhidna mine", dated 31 December 2010 issued by Bureau Veritas Certification holding SAS for the monitoring period 01 April 2009 - 31 July 2010
/4/ Letter of Approval No 1535/23/7 dated 06 October 2010 issued by National Environmental Investment Agency of Ukraine
/5/ Declaration of Approval dated 13 August 2010 issued by Netherlands' Ministry of Economic Affairs
/6/ Second Periodic JI Monitoring Report "Coal mine methane capture and utilization at Samsonivska-Zakhidna mine", version 01 dated 03.08.2012
/7/ Second Periodic JI Monitoring Report "Coal mine methane capture and utilization at Samsonivska-Zakhidna mine", version 02 dated 21.09.2012
/8/ Second Periodic JI Monitoring Report "Coal mine methane capture and utilization at Samsonivska-Zakhidna mine", version 03 dated 08.11.2012
/9/ Second Periodic JI Monitoring Report "Coal mine methane capture and utilization at Samsonivska-Zakhidna mine", version 04 dated 13.11.2012
/10/ Excel calculation spreadsheet "S-Z_ERs_100812", version 1 dated 27.08.2012
/11/ Excel calculation spreadsheet "S-Z_ERs_100812", version 2 dated 21.09.2012
/12/ Excel calculation spreadsheet "S-Z_ERs_100812", version 3 dated 08.11.2012
/13/ Excel calculation spreadsheet "S-Z_ERs_131112", version 4 dated 13.11.2012

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

/1/ Logbook on boiler-house equipment stops
/2/ Methane quality certificate dated 28/10/2011
/3/ Methane quality certificate dated 19/10/2011
/4/ Expert opinion # 36189153-020155-12 about change of fuel for boiler КЕ 10-14С
/5/ Working committee acceptance certificate dated 28/10/11 on final completion
/6/ Data on methane consumed by boiler УКГ – 5/8 for November 2011
/7/ Data on methane consumed by boiler УКГ – 5/8 for December 2011
/8/ Data on methane consumed by boiler УКГ – 5/8 for November 2011

/9/ Data on methane consumed by boiler УКГ – 5/8 for January 2011
/10/ Data on methane consumed by boiler УКГ – 5/8 for February 2012
/11/ Data on methane consumed by boiler УКГ – 5/8 for June 2012
/12/ Data on methane consumed by boiler УКГ – 5/8 for September 2012
/13/ Data on methane consumed by boiler КГУУ – 15 for April 2012
/14/ Data on methane consumed by boiler КГУУ – 15 for May 2012
/15/ Replacement statement dated 27/12/2011on measuring equipment (meter # 56934 instead of meter # 6486)
/16/ Passport on boiler, registration number # 0980
/17/ Passport on boiler, registration number # 7238
/18/ Report on air protection for 2010
/19/ Report on air protection for 3rd quarter of 2010
/20/ Report on air protection for 2011
/21/ Report on air protection for 2nd quarter of 2012
/22/ Report on air protection for 1st quarter of 2012
/23/ Permit # 4421488801-10 dated 19/05/2011 on stationary sources air pollution
/24/ Permit # 4421488801-11 dated 19/05/2011 on stationary sources air pollution
/25/ Permit # 4421488801-10 dated 06/12/2010 on stationary sources air pollution
/26/ Permit # 4421488801-12 dated 19/05/2011 on stationary sources air pollution
/27/ Report on results of usage of fuel, heat energy and electric energy for December 2011
/28/ Report on results of usage of fuel, heat energy and electric energy for 2010
/29/ Operating manual on compressor gas-utilizing machine УКГ – 5/8
/30/ Passport on gas-utilizing machine type КГУУ, serial # 162501
/31/ Passport on gas analyzer type Binos 100, serial # 48987001, last calibration date is 20/04/2011
/32/ Passport on diaphragm, serial # 486343, last calibration date is 20/04/2011
/33/ Measuring equipment calibration certificate # 1041 dated 20/04/2011 on pressure transducer type ST 3000, serial # 0609C2801413001002
/34/ Measuring equipment calibration certificate # 1044 dated 20/04/2012 on pressure transducer type ST 3000, serial # Ex612124576
/35/ Passport on gas analyzer type Ultramat 23, serial # N1-W1-371, last calibration date is 27/12/2011
/36/ Measuring equipment calibration certificate # 2351 dated 09/12/2011 on pressure transducer type Siemens, serial # N1-W1-9688556
/37/ Measuring equipment calibration certificate # 2351 dated 09/12/2011 on pressure transducer type Siemens, serial # AZB/W 4117222
/38/ Passport on pressure meter type Метран -100, serial # 227341, last calibration date is 14/07/2005
/39/ Passport on gas analyzer type ГАММА – 100, serial # 416

/40/ Order # 385 dated 13/09/2011 on creation of special monitoring group

/41/ Order # 385 dated 13/09/2011 on centralized document storage

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/ Mikhail Mikhnovsky - developer “GreenStream Network GmbH” Ukraine

/2/ Yana Pushkar - leading engineer for JI projects of PJSC ”Krasnodon Coal

/3/ Vladislav Antipov – leader of carbon content projects, representative of Metinvest Holding

/4/ Galina Mironenko – machinist of pump station

/5/ Vikroriya Belokopitova - machinist of pump station

/6/ Lyubov Tyazhelnikova – master of boiler-house

APPENDIX A: VERIFICATION PROTOCOL

BUREAU VERITAS CERTIFICATION HOLDING SAS

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
Project approvals by Parties involved				
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?	Written project approvals by the Netherlands and Ukraine have been issued by the DFPs of those Parties when submitting the first verification report for publication in accordance with paragraph 38 of the JI guidelines. (They are listed among Category 1 Documents in the Reference section of this report) CAR01 Please add in section A.6 reference on LoA issued by host Party.	CAR01	OK
91	Are all the written project approvals by Parties involved unconditional?	The above mentioned written approvals are unconditional constituting the authorization by the DFPs of the legal entity to participate in the JI project under consideration	OK	OK
Project implementation				

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
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?	There are delays in the project implementation compared to the schedule determined in the PDD version 2.01. Flare Units # 2,3 were postoned. CL01 Please calrify what is current situation with operation of gas engines installation Unit #1,2,3?	CL01	OK
93	What is the status of operation of the project during the monitoring period?	On the whole project started as defined in the PDD version 2.01 dated 06 April 2010 and the implementation is evidenced by statements of work completion (see list of verified documents).	OK	OK
Compliance with monitoring plan				
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?	No changes in monitoring plan. CAR02 FAR05 (from previous verification) FAR is opened concerning registration of operation time.	CAR02	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) above, influencing the baseline emissions or net removals and the activity level of the project and the	The exhaustive description and justification of the key factors is provided in Section B.1. of the PDD version 2.01 dated 06 April 2010 which is deemed final.	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	emissions or removals as well as risks associated with the project taken into account, as appropriate?			
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	All operators are responsible for data administration. All relevant data summarized every two hours and archived in register records.	OK	OK
95 (c)	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?	Emission factors, including default emission factors are presented in Section F of PDD. CAR03 **FAR 01.(from previous verification)** In order to meet the JISC requirements on data saving and archiving, an Order on archiving of all project related documentation for two years after the last ERU transmission should be developed and included to the Emission Monitoring Manual. All persons responsible for data collection and monitoring should be aware of the provisions of this Order.	CAR03	OK
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner. CL02 Please clarify what actions were done in order to meet conservative assumptions.	CL02	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
Applicable to JI SSC projects only				
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?	N/A	N/A	N/A
Applicable to bundled JI SSC projects only				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	N/A	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?	N/A	N/A	N/A
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, 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	N/A	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	already deemed final in the past?			
Revision of monitoring plan				
Applicable only if monitoring plan is revised by project participant				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	N/A	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?	N/A	N/A	N/A
Data management				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	All data necessary for the CO2 emission reductions calculation are collected. CAR04 In order to meet the JISC requirements on QC and QA, frequent internal audits should be conducted within monitoring process. Please provide evidance on internal audits mentioned above. CAR05 **FAR 02 (from previous verification).** The training plans and procedures should be described in Monitoring Manual.	CAR04 CAR05 CAR06	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		CAR06 **FAR 03 (from previous verification).** Please ensure registration of the operational time of the emission reduction related installations.		
101 (b)	Is the function of the monitoring equipment, including its calibration status, in order?	Calibration is conducted by State Center of Metrology and Standardization. The documents that confirmed calibration were provided for the verification team **CAR07** **FAR 04 (from previous verification).** In monitoring manual a specific frequency of cross-checking and the staff responsible for this must be provided.	CAR07	OK
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	Data collection is clearly defined in the monitoring report, and is implemented on-site.	OK	OK
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	All data necessary for the CO2 emission reductions calculation is collected. The scheme of data flow and a description of the management system is introduced.	OK	OK
Verification regarding programmes of activities (additional elements for assessment)				

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
102	Is any JPA that has not been added to the JI PoA not verified?	N/A	N/A	N/A
103	Is the verification based on the monitoring reports of all JPAs to be verified?	N/A	N/A	N/A
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	N/A	N/A	N/A
104	Does the monitoring period not overlap with previous monitoring periods?	N/A	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?	N/A	N/A	N/A
Applicable to sample-based approach only				
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	N/A	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	reasonable, taking into account differences among the characteristics of JPAs, such as: − The types of JPAs; − The complexity of the applicable technologies and/or measures used; − The geographical location of each JPA; − The amounts of expected emission reductions of the JPAs being verified; − The number of JPAs for which emission reductions are being verified; − The length of monitoring periods of the JPAs being verified; and − The samples selected for prior verifications, if any?			
107	Is the sampling plan ready for publication through the secretariat along with the verification report and supporting documentation?	N/A	N/A	N/A
108	Has the AIE made site inspections of at least the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site	N/A	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	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)	N/A	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?	N/A	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
CAR01 Please add in section A.6 reference on LoA issued by host Party.	90	The appropriate reference is provided in the Section A.6 of the Monitoring report.	The issue is closed
CL01 Please clarify what is current situation with operation of gas engines installation Unit #1,2,3?	91	Commissioning of gas engine units was moved to 2013 due to lack of funds available from the project owner, please see Section B.1 for further reference.	The issue is closed

CAR02 FAR05 (from previous verification) FAR is opened concerning registration of operation time.	94	In the supporting documents please find the corresponding orders #56 dated 20.01.2012, #385 dated 13.09.2011, and #38 dated 06.01.2012. Please also see Sections 4.1.9 and 4.3 of the updated Monitoring Manual for the detailed explanation of operational time registration procedure.	The Monitoring Manual is checked. The issue is closed
CAR03 **FAR 01.(from previous verification)** In order to meet the JISC requirements on data saving and archiving, an Order on archiving of all project related documentation for two years after the last ERU transmission should be developed and included to the Emission Monitoring Manual. All persons responsible for data collection and monitoring should be aware of the provisions of this Order.	95(c)	In the supporting documents please find the “Order on archiving of all project related documentation” #381 dated 13.09.2011.	Documents related to the issue are checked. FAR is closed

CL02 Please clarify what actions were done in order to meet conservative assumptions.	95(d)	The following actions were done in order to meet the conservative assumptions in calculation of the project and baseline scenario emissions: 1) Only CO_2 emissions from fuel combustion are included into the calculations; emissions of other greenhouse gases (e.g. methane, N_2O) were excluded from the calculations; 2) emissions from transporting the coal used by the boilers are not taken into account; 3) emissions from transporting the methane within the degassing system to the flares and boiler are not taken into account;	The issue is closed

		4) the amount of the methane released into the atmosphere was calculated using the default efficiency of methane destruction by flares factor. The minimum flaring efficiency is 99.9%. For the purpose of calculations the default value of 99.5% is taken according to the National Inventory Report (1990-2010), Page 471, Table P2.42, Column 1.A.1.c. 5) in accordance with the methodology chosen, the manufacturer's data regarding the efficiency of boiler was used in the calculations. According to the boiler chart, the minimal value (relevant to 50% load) of efficiency was taken.	
CAR04 In order to meet the JISC requirements on QC and QA, frequent internal audits should be conducted within monitoring process. Please provide evidence on internal audits mentioned above.	101(a)	The corresponding explanation was added to the Monitoring Report, Section C.3.	The issue is closed

CAR05 **FAR 02 (from previous verification).** The training plans and procedures should be described in Monitoring Manual.	101(a)	The appropriate description was added to the Section 8 of the Monitoring Manual.	The Monitoring Manual is checked. The issue is closed
CAR06 **FAR 03 (from previous verification).** Please ensure registration of the operational time of the emission reduction related installations.	101(a)	In the supporting documents please find the corresponding orders #56 dated 20.01.2012, # 385 dated 13.09.2011, and # 38 dated 06.01.2012. Please also see Sections 4.1.9 and 4.3 of the updated Monitoring Manual for the detailed explanation of operational time registration procedure.	The Monitoring Manual and appropriate orders are checked. The issue is closed
CAR07 **FAR 04 (from previous verification).** In monitoring manual a specific frequency of cross-checking and the staff responsible for this must be provided.	101(b)	The appropriate description was added to the Section 5 of the Monitoring Manual.	The Monitoring Manual is checked. The issue is closed