VERIFICATION REPORT
JSC "IVANO-FRANKIVSK CEMENT"

VERIFICATION OF THE IVANO-FRANKIVSK CEMENT SWITCH FROM WET-TO-DRY CEMENT AND FUEL SAVINGS FOR COAL DRYING

PERIODIC (2009)

REPORT NO. UKRAINE/0100/2010

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BUREAU VERITAS CERTIFICATION

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30 April 2010	Bureau Veritas Certification Holding SAS
Client:	**Client ref.:**
JSC «Ivano-Frankivsk Cement»	Mykola Makoviychuk

Summary:

Bureau Veritas Certification has made the verification of the "Ivano-Frankivsk Cement Switch from Wet-to-Dry Cement and fuel savings for coal drying" project of JSC "Ivano-Frankivsk Cement" located in vil. Yamnytsya, Tysmenytsya district, Ivano-Frankivsk Region, Ukraine on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting, as well as the host country criteria.

The verification scope is defined as a periodic independent review and 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, Project Design Document 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 Requests, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

The verification is based on the Monitoring Report (covers January 1st 2009 – December 31s 2009), the monitoring plan, the determined PDD, version 1.4, and supporting documents made available to Bureau Veritas Certification by the project participant.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered 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 reduction is calculated without material misstatements.

Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on information seen and evaluated we confirm that the implementation of the project has resulted in 136515 t CO2e reductions during period from 01/01/2009 up to 31/12/2009.

On the behalf of verification team, Flavio Gomes, the Bureau Veritas Certification Holding SAS Global Product Manager for Climate Change, approved final version of the Verification Report and it is signed by Ivan Sokolov authorized Bureau Veritas Certification Holding SAS Local product manager for Climate Change in Ukraine.

Report No.:	Subject Group:
UKRAINE/0100/2010	JI

Project title:
Ivano-Frankivsk Cement Switch from Wet-to-Dry Cement and fuel savings for coal drying

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Indexing terms

Climate Change, Kyoto Protocol, Joint Implementation, Emission Reductions, Verification

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Abbreviations

AIE	Accredited Independent Entity
BVCH	Bureau Veritas Certification Holding SAS
CAR	Corrective Action Request
CL	Clarification Request
CO_2	Carbon Dioxide
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Green House Gas(es)
IETA	International Emissions Trading Association
JI	Joint Implementation
JISC	JI Supervisory Committee
MoV	Means of Verification
MP	Monitoring Plan
PCF	Prototype Carbon Fund
PDD	Project Design Document
UNFCCC	United Nations Framework Convention on Climate Change

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1 INTRODUCTION

JSC Ivano-Frankivsk Cement has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project "Ivano-Frankivsk Cement Switch from Wet-to-Dry Cement and fuel savings for coal drying") at vil Yamnytsya, Tysmenytsya district, Ivano-Frankivsk Region, Ukraine (JI Reference Number UA1000100).
This report summarizes the findings of the verification of the project, performed on the basis of criteria given to provide for consistent project operations, monitoring and reporting, and contains a statement for the verified emission reductions.
This report includes the findings of the periodic verification covering period 01/01/2009 – 31/12/2009. It is based on the Initial Verification Report Template Version 3.0, December 2003 and on the Periodic Verification Report Template Version 3.0, December 2003, both part of the Validation and Verification Manual (VVM) published by International Emission Trading Association (IETA).
The results of the determination were documented by Bureau Veritas Certification Holding SAS in the report: "Ivano-Frankivsk Cement Switch from Wet-to-Dry Cement and fuel savings for coal drying", Report No. UKRAINE/0043/2009 dated August 26th, 2009 See Section 6).
The results of initial and first periodic verification were documented by Bureau Veritas Certification Holding SAS in the report: "Ivano-Frankivsk Cement Switch from Wet-to-Dry Cement and fuel savings for coal drying", Report No. UKRAINE/0057/2009 dated October 30th, 2009 (See Section 6).
Project is approved by the National Environmental Investment Agency of Ukraine and the Ministry of Economic Affairs of the Netherlands (Letters of approval are presented, see Section 6) and registered under Track 1.

1.1 Objective

Verification is the periodic independent review and ex post determination by the AIE of the monitored reductions in GHG emissions during defined verification period.
The objective of verification can be divided in Initial Verification and Periodic Verification.
Initial Verification: The objective of an initial verification is to verify that the project is implemented as planned, to confirm that the monitoring system is in place and fully functional, and to assure that the project will generate verifiable emission reductions. A separate initial verification prior to the project entering into regular operations is not a mandatory requirement.
Periodic Verification: The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; furthermore the periodic verification evaluates the GHG emission

reduction data and express a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission reduction data is free of material misstatements; and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records. If no prior initial verification has been carried out, the objective of the first periodic verification also includes the objectives of the initial verification.
The verification follows UNFCCC criteria referring to the Kyoto Protocol criteria, the JI rules and modalities, and the subsequent decisions by the JISC, as well as the host country criteria.

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions. The verification is based on the submitted monitoring report and the 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. Bureau Veritas Certification has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the verification, focusing on the identification of significant risks of the project implementation and the generation of ERUs.
The verification is not meant to provide any consulting towards the Client. However, stated requests for forward actions and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.
The audit team has been provided with a Monitoring Report version 1.1 dated 18th of February 2010 and underlying data records, covering the period 01 January 2009 to 31 December 2009 inclusive (see Section 6).

1.3 GHG Project Description

Situation existing prior to the start of the project: Cement manufacturing is a highly complex process which requires the consumption of substantial amounts of energy. As a result of having high energy consumption, cement manufacturing produces significant amounts of greenhouse gas (GHG), specifically CO_2 emissions. Cement production generally creates three main sources of emissions which are a result of the following main activities; (1) Combustion of fossil fuel (2) Electricity consumption, and (3) Chemical decomposition of limestone (referred to as the calcination process).
This project aims to substantially reduce the first two streams of emissions by implementing two primary project activities, as follows:

1) Switch from wet to dry clinker production (including capacity expansion) resulting in significant fuel savings
2) Utilization of waste heat for drying coal that is used as fuel source in the kiln

Description of baseline scenario: The baseline scenario identified for the project is a hybrid between a project-specific and sector-wide baseline. This is due to a clinker production capacity expansion in project which must be compared against a sector-wide energy intensity, using the assumption that if the additional capacity had not been produced at the IF Cement facility, it would have been produced by other production facilities in the Ukraine. Therefore, for all production capacity up to 456, 960 tonnes clinker/year (i.e. the previous production capacity) the baseline is derived from the energy intensity of the previous wet production process. For all increases in production beyond 456, 960 tonnes clinker/year, the baseline is derived from the energy intensity in a sector wide baseline that has been estimated in the Volyn Cement PDD.

2 METHODOLOGY

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

In order to ensure transparency, a verification protocol was customized for the project, according to the Validation and Verification Manual (IETA/PCF) a verification protocol is used as part of the verification (see Section 6). 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 organises, details and clarifies the requirements the project is expected to meet; and
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 verification protocol consists of one table under Initial Verification checklist and four tables under Periodic verification checklist. The different columns in these tables are described in Figure 1.

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

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

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

Periodic Verification Checklist Protocol Table 2: Data Management System/Controls		
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**
The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	A score is assigned as follows: • Full - all best-practice expectations are implemented. • Partial - a proportion of the best practice expectations is implemented • Limited - this should be given if little or none of the system component is in place.	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (OK), or a Corrective Action Request (CAR) of risk or non compliance with stated requirements. The corrective action requests are numbered and presented to the client in the verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications.

Periodic Verification Protocol Table 3: GHG calculation procedures and management control testing		
Identification of potential reporting risk	**Identification, assessment and testing of management controls**	**Areas of residual risks**
Identify and list potential reporting risks based on an assessment of the emission estimation procedures, i.e. ➢ the calculation methods, ➢ raw data collection and sources of supporting documentation, ➢ reports/databases/information systems from which	Identify the key controls for each area with potential reporting risks. Assess the adequacy of the key controls and eventually test that the key controls are actually in operation. Internal controls include (not exhaustive): ➢ Understanding of responsibilities and roles ➢ Reporting, reviewing and	Identify areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks Areas where data accuracy, completeness and consistency could be improved are highlighted.

data is obtained. Identify key source data. Examples of source data include metering records, process monitors, operational logs, laboratory/analytical data, accounting records, utility data and vendor data. Check appropriate calibration and maintenance of equipment, and assess the likely accuracy of data supplied. Focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include: ➢ manual transfer of data/manual calculations, ➢ unclear origins of data, ➢ accuracy due to technological limitations, ➢ lack of appropriate data protection measures? For example, protected calculation cells in spreadsheets and/or password restrictions.	formal management approval of data; ➢ Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc. ➢ Controls to ensure the arithmetical accuracy of the GHG data generated and accounting records e.g. internal audits, and checking/ review procedures; ➢ Controls over the computer information systems; ➢ Review processes for identification and understanding of key process parameters and implementation of calibration maintenance regimes ➢ Comparing and analysing the GHG data with previous periods, targets and benchmarks. When testing the specific internal controls, the following questions are considered: 1. Is the control designed properly to ensure that it would either prevent or detect and correct any significant misstatements? 2. To what extent have the internal controls been implemented according to their design; 3. To what extent have the internal controls (if existing) functioned properly (policies and procedures have been followed) throughout the period? 4. How does management assess the internal control as reliable?	

Periodic Verification Protocol Table 4: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including Forward Action Requests)**
List the residual areas	The additional verification	Having investigated the residual risks, the

of risks (Table 2 where detailed audit testing is necessary. In addition, other material areas may be selected for detailed audit testing.	testing performed is described. Testing may include: 1. Sample cross checking of manual transfers of data 2. Recalculation 3. Spreadsheet 'walk throughs' to check links and equations 4. Inspection of calibration and maintenance records for key equipment ➢ Check sampling analysis results ➢ Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.	conclusions should be noted here. Errors and uncertainties should be highlighted. Errors and uncertainty can be due to a number of reasons: ➢ Calculation errors. These may be due to inaccurate manual transposition, use of inappropriate emission factors or assumptions etc. ➢ Lack of clarity in the monitoring plan. This could lead to inconsistent approaches to calculations or scope of reported data. ➢ Technological limitations. There may be inherent uncertainties (error bands) associated with the methods used to measure emissions e.g. use of particular equipment such as meters. ➢ Lack of source data. Data for some sources may not be cost effective or practical to collect. This may result in the use of default data which has been derived based on certain assumptions/conditions and which will therefore have varying applicability in different situations. The second two categories are explored with the site personnel, based on their knowledge and experience of the processes. High risk process parameters or source data (i.e. those with a significant influence on the reported data, such as meters) are reviewed for these uncertainties.

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

Figure 1 Verification protocol tables

2.1 Review of Documents

The Monitoring Report (MR) dated 18 of February 2010 submitted by GreenStream Network and additional background documents related to

the project design and baseline, i.e. country Law, Project Design Document (PDD), applied methodology, Kyoto Protocol, Clarifications on Verification Requirements to be checked were reviewed.

To address Bureau Veritas Certification corrective action and clarification requests, GreenStream Network revised the MR and resubmitted it as version 1.2 on 14 of April 2010.

The verification findings presented in this report relate to the project as described in the PDD version 1.4 and Monitoring Report version 1.1 and version 1.2.

2.2 Follow-up Interviews

On 03/03/2010 Bureau Veritas Certification performed interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of JSC Ivano-Frankivsk Cement, developer and local stakeholders were interviewed (see 6 References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
JSC Ivano-Frankivsk Cement	Organizational structure. Responsibilities and authorities. Training of personnel. Quality management procedures and technology. Implementation of equipment (records). Metering equipment control. Metering record keeping system, database.
Local Stakeholder: District State Administration	Social impacts. Environmental impacts.
Consultant: GreenStream Network	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.

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

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

Forward Action Requests (FAR) are issued, where:
iv) the actual status requires a special focus on this item for the next consecutive verification, or
v) an adjustment of the MP is recommended.

The verification team may also use the term Clarification Request (CL), which would be where:
vi) additional information is needed to fully clarify an issue.

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

3 PERIODIC VERIFICATION FINDINGS (2009)

In the following sections, the findings of the verification are stated. The verification findings for each verification subject are presented as follows:
1) The findings from the desk review of the original project activity documents and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Verification Protocol in Appendix A.
2) The conclusions for verification subject are presented.

In the final verification report, the discussions and the conclusions that followed the preliminary verification report and possible corrective action requests are encapsulated in this section.

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

One task of the verification is to check the remaining issues from the previous determination and verification or issues which are clearly defined for assessment in the PDD. The previous verification report, prepared by Bureau Veritas Certification Holding SAS notes the following open issue.

Forward Action Request (FAR) 1

Please include the information considering qualification and training of the stuff in the next version of the Monitoring Report.

Conclusion of the verification team

Because of the fact that FAR 1 was not addressed in the initially submitted Monitoring Report version 1.1 of 18/02/2010, verification team issued Clarification Request # 4 (refer to Appendix A, Table 5).
The CL # 4 was closed based on due amendments made to the 1st version of Monitoring Report and presented in the Monitoring Report version 1.2 of 14.04.2010.

3.2 Project Implementation

The dry kiln was put in operation in July of 2008 and the process of utilization of waste heat for drying coal that is used as fuel source in the kiln started in December of 2008. Currently, the dry kiln is in exploitation. In 2009 the project continues to reduce the emissions resulting from the manufacturing at the IF Cement location. The project improved efficiency of use of natural gas and electricity at the enterprise and thus leaded to decrease of harmful emissions.

The project implementation has a positive impact on health and safety of the plant's personnel.

Though the physical components of project implementation are not mentioned in the monitoring report the evidence of the equipment put into operation were seen and validated on-site (see the List of the Documents checked).

The identified areas of concern as to Project Implementation, project participants response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CAR 1, CAR 2, CL1).

3.3 Internal and External Data

Data from Project Activity Emissions

Emissions from the project year are a combination of two distinct sets of calculations representing all aspects of the project location affected by the implementation of the project. The two components affected by the project are (1) the emissions from fuel combustion for coal processing and (2) fuel combustion for the production of clinker. These two project aspects each contribute to the overall emission reductions, and have been calculated separately for transparency.

In order to calculate project emissions from the coal drying and crushing such internal data were used:

- The electricity due to coal drying and handling (kWh/ tonne coal)
- The fuel consumption for drying of the coal mill in year y (m3 /tonne coal),
- Volume of Coal Processed within the project year (tonnes coal)In order to calculate project emissions from cement production the summary of project emissions due to calcination from both existing capacity and capacity expansion production (tCO_2e), project emissions from combustion of kiln fuels from both existing capacity and capacity expansion production (tCO_2e) and project emissions from the consumption of electricity for cement production from both existing capacity and capacity expansion production (tCO_2e) is used.

Project emissions from combustion of kiln fuels

The fuel used within the kilns is comprised of a number of different fuel types; the summation of all energy, in GJ, provided by the kiln fuels will be quantified as the combustion emissions of the three kilns; including the new dry kiln. Fuel mix providing the heat energy will be taken as the fuel mix from the project year, as fluctuations in fuel mix are not affected by the project activity. The fuel mix is primarily influenced by price and availability considerations. Overall fuel usage is seen to decrease over the crediting period, on a per tonne of clinker basis, as the increased dry kiln production phases out the production in the remaining wet kilns. Quantification of emissions for kiln fuel has been adapted from the approved CDM methodology ACM0003 version 07.2.

In order to calculate project emissions from kiln fuel consumption of fuel type was used as an internal datum. And external fixed parameters:

- Emission factor for fuel type *i* (tCO_2/ GJ)
- Net calorific value of fuel *i* (kcal/tonne or m^3)
- The emission factor of Ukraine electricity grid in year y (tCO_2/MWh)
- Conversion from kcal to kJ (constant) (kJ/kcal)

Project Emissions from Electricity Consumption

Indirect emissions caused by the consumption of electricity are accounted for within the production of cement. Electricity is utilized within the cement manufacturing process to power fans, conveyers and grinders and other such electric devices throughout the cement production process. Electricity consumption is affected by the project activity as the process of raw mill preparation and kiln consumption differs between the wet and dry cement process. Electricity consumption has been broken down into three main components for quantification:

- Electricity for the raw materials preparation and transport to the site (MWh)
- Electricity for the kiln (MWh)
- Electricity consumption for clinker milling (MWh)

Quantification of emissions for electricity consumption has been adapted from the approved CDM methodology ACM0005 version 04. And the external fixed parameter used is carbon emission factor of Ukraine electricity grid (tCO_2/MWh), whichis taken from JI PDD 0018 'Introduction of energy efficiency measures at ISTIL mini steel mill, Ukraine'.

Project Emissions from Calcination

Calcination emissions are only included in the capacity expansion calculations (and not project or baseline totals) since it is assumed that the mix of raw materials will not change between the project and the baseline and therefore, the calcination emissions will not change for the existing capacity calculation.

Data from Baseline Activity Emissions

Emissions from the baseline year are a combination of two distinct sets of calculations representing all aspects of emissions occurring in absence of the project activity. These two sources are (1) the emissions from coal drying and processing and (2) the production of clinker using wet production technology including electricity and calcination emissions; as in the project calculations. The methodological approach to account for incremental cement production has been taken from Annex 2 of the Volyn cement PDD1.

Baseline energy consumption values were calculated averaging data from the previous 3 years (2005-2007). Overall the emissions from coal drying (using natural gas) and wet cement production makeup the baseline emissions. These baseline aspects each contribute to the overall emissions of the everyday operations and have been calculated separately for transparency. As previously noted, calculations for capacity expansion did not result in ERUs for 2009, and have been omitted from this report.

Overall Baseline Emissions for 2009 consist of the baseline emissions from the coal mill in year y (tCO2e), the baseline emissions from wet cement production in year y (tCO2e).

Baseline Emissions from Coal Processing

In order to calculate baseline emissions from the coal drying and crushing such internal data were used:

- Electricity for coal preparation and handling
- The natural gas consumption of coal dryer
- Quantity of coal processed in project year

And external data:

- The carbon emission factor of Ukraine electricity grid (tCO2/MWh)
- The carbon emission factor (tCO2/GJ)
- Net calorific value of fuel (kcal/tonne or m3)

- Conversion from kcal to kJ

Baseline Emissions from Cement Production
(Kiln, Electricity and Calcination) consist of summary of baseline emissions from the production of cement using the wet process (tCO2), baseline emissions due to calcinations for existing capacity (tCO2), baseline emissions from combustion of kiln fuels for existing capacity (tCO2) and baseline emissions from the consumption of electricity for cement production for existing capacity (tCO2).
Baseline Emissions from Kiln Fuel
In order to calculate baseline emissions from kiln fuel such internal data were used:
- The average baseline kiln efficiency for 3 years prior to the project (2005-2007) for the existing kiln (GJ/tonne clinker)
- Clinker production in the baseline scenario on the existing kilns in year y (tonnes clinker),

And emission factor for fuel mix (tCO2 / GJ) (based on identified fuel mix from 2009 project year) as an external parameter.

Baseline Emissions from Electricity Consumption
Baseline Emissions from Electricity Consumption consist of summary indirect emissions from electricity consumption for the raw material processing (tCO2), indirect emissions from electricity consumption for wet kiln operation (tCO2) and indirect emissions from the consumption of electricity for grinding of cement (tCO2). Electricity consumption has been broken down into three main components for quantification:
- Electricity for the raw materials preparation and transport to the site (MWh)
- Electricity for the kiln (MWh)
- Electricity consumption for clinker milling (MWh)

Quantification of emissions for electricity consumption has been adapted from the approved CDM methodology ACM0005 version 04. And the external fixed parameter used is carbon emission factor of Ukraine electricity grid (tCO2/MWh), which is taken from JI PDD 0018 'Introduction of energy efficiency measures at ISTIL mini steel mill, Ukraine'.

Baseline Emissions from Calcination
Calcination emissions are only included in the capacity expansion calculations (and not project or baseline totals) since it is assumed that the mix of raw materials will not change between the project and the baseline and therefore, the calcination emissions will not change for the existing capacity calculation.
As noted in earlier the baseline emissions for calcination for the capacity expansion is derived from the energy intensity in a sector wide baseline that has been estimated in the Volyn Cement PDD.

The external parameters are obtained according to the monitoring plan.

The identified areas of concern as to Internal and External Data, project participants response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CL7).

3.4 Environmental and Social Indicators

3.4.1 Discussion

In 2009 the project continues to reduce the emissions resulting from the manufacturing at the IF Cement location. The project improved efficiency of use of natural gas and electricity at the enterprise and thus leaded to decrease of harmful emissions. This project by reducing GHG emissions contributes towards a better environment and hence works towards social well-being for all. Project implementation will lead to improvement of ecological climate of the region, increase of payments to the budgets of all levels for social needs, prevention of reduction of working places and better working conditions at JSC Ivano-Frankivsk Cement.

Switching to a dry process allowed the company to significantly reduce emissions of harmful substances. An aggregate maximum concentration of the substances at the border of the sanitary buffer zone (1000 m) is twice less than the maximum permissible level. The closest residential area is located at the distance of 1100 meters from the plant. Therefore the plant's emissions do not have negative impacts on the local population. The project implementation has a positive impact on health and safety of the plant's personnel. As a result of the training program, the plant's operating personnel obtained skills relevant to dry processing line which is newer technology in Ukraine.

3.5 Management and Operational System

Monitoring was carried out as according to the monitoring plan in the PDD for the monitoring period of the year 2009.

A detailed records management system has been established at Ivano-Frankivsk Cement to record and document all required data. The records management system includes paper records maintained by staff of the laboratory and production staff as well as electronic records maintained by the departments. These records are available as part of the verification process, as they outline all consumption values for the project site.

Main assumptions for the calculations:

- Calcination emissions do not change between the baseline and the project; as the baseline and project raw materials mix fed to the kiln remains constant;
- The cement to clinker ratio is determined by orders received from IF

Cement customers and does not change between the project and the baseline

- There is no legal requirement to implement any of the project activities;
- The fuel mix for the kiln firing is unaffected by the implementation of the project, only the quantity of fuel required;

Data collection and manipulation for the monitoring plan are the responsibility of 4 departments within IF Cement (Power and Electrical Department, Engineering and Metrologist Department, Laboratory, Shift man, shop economist and superintendant).

3.6 Completeness of Monitoring

The reporting procedures reflect the monitoring plan completely. It is confirmed that the monitoring report does comply with the monitoring methodology and PDD.

All parameters were determined as prescribed. The complete data is stored electronically and documented. The necessary procedures have been defined in internal procedures.

According to PDD version 1.4, emission reductions during 2009 monitoring period were expected to be 172956 t CO2e. According to Monitoring Report version 1.2 emission reductions achieved are 136515 t CO2e.

The identified areas of concern as to Completeness of Monitoring, project participants response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CL2).

3.7 Accuracy of Emission Reduction Calculations

The audit team confirms that emission reduction calculations have been performed according to the Monitoring Plan.

According to the Article 10 paragraph 1 of the Ukrainian Law "On Metrology and Metrological Activity" measurement results can be used in case if appropriate characteristics of errors and uncertainty are known. Characteristics of errors are presented in the passports of the equipment. The level of uncertainty is considered as low which is why it can be neglected in the calculations.

Project consists of the 29 project and 41 baseline parameters that are being monitored. Some of the parameters that are used in the calculation of the baseline and project emissions are measured directly with the use of special equipment while others are estimated with the use of appropriate coefficients.

The identified areas of concern as to Accuracy of Emission Reduction Calculations, project participants response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CL3).

3.8 Quality Evidence to Determine Emissions Reductions

Concerning verification the calculation of emission reductions is based on internal data. The origin of those data was explicitly checked. Further on, entering and processing of those data in the monitoring workbook Excel sheet was checked where predefined algorithms compute the annual value of the emission reductions. All equations and algorithms used in the different workbook sheets were checked. Inspection of calibration and maintenance records for key equipment was performed for all relevant meters.
Necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the various parameters on daily basis.

3.9 Management System and Quality Assurance

A detailed records management system has been established at Ivano-Frankivsk Cement to record and document all required data. The records management system includes paper records maintained by staff of the laboratory and production staff as well as electronic records maintained by the departments. These records are available as part of the verification process, as they outline all consumption values for the project site.

Data collection and manipulation for the monitoring plan are the responsibility of 4 departments within IF Cement (Power and Electrical Department, Engineering and Metrologist Department, Laboratory, Shift man, shop economist and superintendant).

The identified areas of concern as to Management System and Quality Assurance, project participants response and BV Certification's conclusion are described in Appendix A Table 5 (refer to CL4, CL5, CL6, CL8).

4 PROJECT SCORECARD

Risk Areas	Conclusions			Summary of findings and comments
	Baseline Emissions	Project Emissions	Calculated Emission Reductions	

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Calculated Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	State-of-the-art technology is applied in an appropriate manner. Appropriate backup solutions are provided.
	Data calculations	✓	✓	✓	Emission reductions are calculated correctly
	Data management & reporting	✓	✓	✓	Data management and reporting were found to be satisfying.
Consistency	Changes in the project	✓	✓	✓	Results are consistent to underlying raw data.

5 PERIODIC (2009) VERIFICATION STATEMENT

Bureau Veritas Certification has performed a verification of the JI project "Ivano-Frankivsk Cement Switch from Wet-to-Dry Cement and fuel savings for coal drying". The verification is based on the currently valid documentation of the United Nations Framework Convention on the Climate Change (UNFCCC) and Host country criteria.

The management of IF Cement is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring and Verification Plan indicated in the final PDD version 1.4. 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 1.1 and version 1.2 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as planned and described in validated and registered 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 calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid and registered project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

Reporting period: From 01/01/2009 to 31/12/2009
Baseline emissions : 349516 t CO2 equivalents.
Project emissions : 213001 t CO2 equivalents.
Emission Reductions : 136515 t CO2 equivalents.

6 REFERENCES

Category 1 Documents:
Documents provided by Project Participants that relates directly to the GHG components of the project.

/1/ Project Design Document, version 1.4 dated 26 of August 2009

/2/ Monitoring Report version 1.1 dated 18 of February 2010

/3/ Monitoring Report version 1.2 dated 14 of April 2010

/4/ Determination Report by the Bureau Veritas Certification Holding SAS, dated 31 of August 2009

/5/ Verification Report by Bureau Veritas Certification Holding SAS for initial and first periodic (2008) verification No UKRAINE/0057/2009 of 30/10/2009

/6/ Letter of Approval № 1220/23/7 from National Agency of Ecological Investment of Ukraine dated 14th of October 2009

/7/ Letter of Approval from Ministry of Economic Affairs of the Netherlands and its agency SenterNovem dated 10th December 2009

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

/8/ Documents checked during the verification onsite are presented in Annex C

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

/1/ Stanislav Korchynskiy – Labor safety and environment

/2/ Petro Kardash – Chief Power Engineer

/3/ Oleg Yarema – Head of the technological department

/4/ Lesya Ivantsiv – engineer-technologist

/5/ Andriy Demkiv – Head of the cement production

/6/ Mykola Makoviychuk – Head of the cementitious materials department

/7/ Vasyl Kalyn – Head metrologist

/8/ Iryna Gevyuk – Head of the Laboratory

/9/ Vasyl Todos – Head of the Alternative Fuel Department

APPENDIX A: COMPANY JI PROJECT VERIFICATION PROTOCOL

Initial Verification Protocol Table 1			
Objective	**Reference**	**Comments**	**Conclusion (CARs/FARs)**
1. Opening Session			
1.1. Introduction to audits	/8/	The intention and the target of the audit were illustrated to the participants of the audit. Participants at the audit were the following persons: Verification team: Ms. Nadiia Kaiiun, Lead Verifier, Bureau Veritas Ukraine, Ms. Kateryna Zinevych, Verifier, Bureau Veritas Ukraine, Ms. Victoria Legka, Verifier, Bureau Veritas Ukraine Interviewed persons JSC Ivano-Frankivsk Cement: Stanislav Korchynskiy – Labor safety and environment Petro Kardash – Head energetic Oleg Yarema – Head of the technological department Lesya Ivantsiv – engineer-technologist Andriy Demkiv – Head of the cement production Mykola Makoviychuk – Head of the cementitious materials department	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		Vasyl Kalen – Head metrologist Iryna Gevyuk – Head of the Laboratory Vasyl Todos – Head of the Alternative Fuel Department	
1.2. Clarification of access to data archives, records, plans, drawings etc.	/3/	The verification team got open access to all required plans, data, records, drawings and to all relevant facilities.	OK
1.3. Contractors for equipment and installation works	/3,8/	Project has been implemented as defined in the PDD version 1.4 and the implementation is evidenced by statements of work completion (see list of verified documents).	OK
1.4. Actual status of installation works	/3/	The dry kiln was put in operation in July of 2008 and the process of utilization of waste heat for drying coal that is used as fuel source in the kiln started in December of 2008. Currently, the dry kiln is in exploitation.	OK
2. Open issues indicated in validation report			
2.1. Missing steps to final approval	/6,7/	Letter of Approval № 1220/23/7 was issued by the National Agency of Ecological Investments from 14th of October 2009. The Letter of Approval from the Dutch side was issued on the 10th of December 2009.	OK
3. Implementation of the project			

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.1. Physical components	/3/	Though the physical components of project implementation are not mentioned in the monitoring report the evidence of the equipment put into operation were seen and validated on-site (see the List of the Documents checked). <u>Clarification Request (CL) 1</u> The PDD version 1.4 (Section A.2) it is stated that for all production capacity up to 450 000 tonnes clinker/year the baseline is derived from the energy intensity of the previous wet production process while the Monitoring Report says that for all production capacity up to 456,960 tonnes clinker/year the baseline is derived from the energy intensity of the previous wet production process. Please clarify the difference of data on production capacity in Monitoring Report and PDD version 1.4 (Section A.2).	CL1 The issue is closed
3.2. Project boundaries	/1/, /2/, /3/, /4/, /5/	Yes, the project boundaries are as defined in the PDD version 1.4.	OK
3.3. Emission reductions achieved	/3/	In the PDD version 1.4 it is stated that emission reduction units in 2009 are supposed to be 172956 t CO_2 while the Monitoring Report says the amount of ERU's achieved in 2009 is 136515 t CO_2. <u>Clarification Request (CL) 2</u> Please clarify the difference between the values of the	CL2 The issue is closed

Objective	Reference	Comments	Conclusion (CARs/FARs)
		emissions reductions in the Monitoring Report and the PDD version 1.4.	
3.4. Monitoring and metering systems	/3/	There is no approved CDM methodology that can be directly applied to the proposed project. However approved CDM Methodologies, such as ACM0003 v07.2 and ACM0005 v04, have been consulted in detail for general principles and guidance with regards to cement projects. Further guidance has been taken from two similar JI projects that have already been determined by an Independent Entity: the Podilsky Cement project and the Volyn Cement project. The Podilsky Cement PDD outlines a change in cement process from a wet clinker production technology to a dry process. Volyn Cement has also switched cement production from a wet process to semi-dry, as well as implementing changes in the raw material composition for kiln fuel. The Podilsky Project Design Document (PDD) has passed the JISC review process, while the Volyn Cement PDD has passed stakeholder review, therefore using this guidance while developing the project design document for IF Cement is feasible. This monitoring plan used these methods as guidance, rather than full adoption, due to slight differences in the project activity. Monitoring as according to the monitoring plan for the	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
		monitoring period stated in section 1.4. A detailed records management system has been established at Ivano-Frankivsk Cement to record and document all required data. The records management system includes paper records maintained by staff of the laboratory and production staff as well as electronic records maintained by the departments. These records are available as part of the verification process, as they outline all consumption values for the project site. Data collection and manipulation for the monitoring plan are the responsibility of 4 departments within IF Cement (Power and Electrical Department, Engineering and Metrologist Department, Laboratory, Shift man, shop economist and superintendant).	
3.5. Data uncertainty	/3/	<u>Clarification Request (CL) 3</u> Please provide information on how the level of uncertainty is taken into account, and define if the level of uncertainty is taken into account in the final emission reductions calculations. Please include this information in the Monitoring Report.	CL3 The issue is closed

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.6. Calibration and quality assurance	/3/	Corrective Action Request (CAR) 1 There are no proper records on calibration of the X-Ray spectrometer. Please provide information on calibration of the X-Ray spectrometer. Corrective Action Request (CAR) 2 Available accreditation certificate of the testing laboratory expired on 07.07.2009. Please provide the evidence of accreditation of the testing laboratory.	CAR1 CAR2 The issues are closed
3.7. Data acquisition and data processing systems	/3/	A detailed records management system has been established at Ivano-Frankivsk Cement to record and document all required data. The records management system includes paper records maintained by staff of the laboratory and production staff as well as electronic records maintained by the departments. These records are available as part of the verification process, as they outline all consumption values for the project site.	OK
3.8. Reporting procedures	/3/	The Monitoring Plan defines the responsibilities to consolidate the data required for emission reduction calculations. According to PDD version 1.4. General coordination and reporting of the monitoring is responsibility of Chief Engineer.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
3.9. Documented instructions	/3/	Section 2 of the Monitoring Report 1.2. Key Monitoring Activities and Data provides with the necessary information relating the procedures for the monitoring, measurements and reporting. These were verified onsite and found satisfactory.	OK
3.10. Qualification and training	/3/	During interviews onsite training was checked and found adequate. Sufficient information considering qualification and training is not provided in the Monitoring Report 1.1. Clarification Request (CL) 4 Please include information considering qualification and more detailed information on training of the stuff to the Monitoring Report.	CL4 The issue is closed
3.11. Responsibilities	/3/	Head of the laboratory and engineer-chemist are responsible for data gathering. Shop power engineering specialist, technician and economist are responsible for data collection. Engineer-metrologist is responsible for calibration of devices for which the following data are collected. Shop superintendent, economist and shift man are responsible for data collection.	OK
3.12. Troubleshooting procedures	/3/	Clarification Request (CL) 5 Please provide information on troubleshooting procedures and include it in the Monitoring Report.	CL5 The issue is closed

Objective	Reference	Comments	Conclusion (CARs/FARs)
4. Internal Data			
4.1. Type and sources of internal data	/3/	The internal parameters are obtained according to the monitoring plan. Monitoring report contains the internal parameters that are monitored as well tables with the relevant data of these parameters.	OK
4.2. Data collection	/3/	A detailed records management system has been established at Ivano-Frankivsk Cement to record and document all required data. The records management system includes paper records maintained by staff of the laboratory and production staff as well as electronic records maintained by the departments. These records are available as part of the verification process, as they outline all consumption values for the project site.	OK
4.3. Quality assurance	/3/	All monitoring equipment is part of detailed calibration plan. On the date of verification, Calibration records of the measuring and monitoring equipment has been verified on-site.	OK
4.4. Significance and reporting risks	/3/	Clarification Request (CL) 6 Please provide information considering reporting risks. Please include this information in the Monitoring Report.	CL6 The issue is closed

Objective	Reference	Comments	Conclusion (CARs/FARs)
5. External Data			
5.1. Type and sources of external data	/3/	The external parameters are obtained according to the monitoring plan.	OK
5.2. Access to external data	/3/	Clarification Request (CL) 7 Please provide the information considering access to external data. Please include this information in the Monitoring Report.	CL7 The issue is closed
5.3. Quality assurance	/3/	See chapter 10 of the Monitoring report 1.2	OK
5.4. Data uncertainty	/3/	See chapter 10 of the Monitoring report 1.2.	OK
5.5. Emergency procedures	/3/	See chapter 10 of the Monitoring report 1.2.	OK
6. Environmental and Social Indicators			
6.1. Implementation of measures	/3/	See chapter 8 of the Monitoring report 1.2.	OK
6.2. Monitoring equipment	/3/	See chapter 6.1.	OK
6.3. Quality assurance procedures	/3/	See chapter 6.1.	OK

Objective	Reference	Comments	Conclusion (CARs/FARs)
6.4. External data	/3/	See chapter 6.1.	OK
7. Management and Operational System			
7.1. Documentation	/3/	The company complies with all legal and statutory requirements of Ukraine and the same were made available to the verification team. JSC Ivano-Frankivsk Cement has all the necessary permissions and licenses, issued by the State Inspection on Labor Safety.	OK
7.2. Qualification and training	/3/	See chapter 3.10 of this protocol.	OK
7.3. Allocation of responsibilities	/3/	The responsibilities and authorities are described for each individual in job descriptions as required statutorily. Persons working at sites are aware of their responsibilities, and relative records are maintained.	OK
7.4. Emergency procedures	/3/	The emergency procedures with respect to operation controls are available in data control.	OK
7.5. Data archiving	/3/	Data are archived in the physical and electronic forms and then stored in Planning Department.	OK
7.6. Monitoring report	/3/	Data information is laid down in the monitoring report.	OK
7.7. Internal audits and management review	/3/	Clarification Request (CL) 8 Please provide more information concerning internal audits and management reviews. Please include this information in the Monitoring Report.	CL8 The issue is closed

Periodic Verification Checklist Protocol Table 2: Data Management System/Controls

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
1. Defined organizational structure, responsibilities and competencies		
1.1. Position and roles	Full	Data collection and manipulation for the monitoring plan are the responsibility of 4 departments within IF Cement (Power and Electrical Department, Engineering and Metrologist Department, Laboratory, Shift man, shop economist and superintendant).
1.2. Responsibilities	Full	Data collection and manipulation for the monitoring plan are the responsibility of 4 departments within IF Cement (Power and Electrical Department, Engineering and Metrologist Department, Laboratory, Shift man, shop economist and superintendant).
1.3. Competencies needed	Full	The responsibilities and authorities are described for each individual in job descriptions as required statutorily. Training needs were identified in advance and training was delivered that was checked onsite.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
2. Conformance with monitoring plan		
2.1. Reporting procedures	Full	The monitoring plan is as per the registered PDD version 1.4. The applauded version of PDD version 1.4. is publicly available at the site http://www.bureauveritas.com.ua where it was placed during determination process. The monitoring CDM Methodologies, such as ACM0003 v07.2 and ACM0005 v04 were used in monitoring process.
2.2. Necessary Changes	Full	No essential changes were necessary.
3. Application of GHG determination methods		
3.1. Methods used	Full	The reporting procedures reflect the monitoring plan content. The calculation of the emission reduction is correct.
3.2. Information/process flow	Full	A detailed records management system has been established at Ivano-Frankivsk Cement to record and document all required data. The records management system includes paper records maintained by staff of the laboratory and production staff as well as electronic records maintained by the departments. These records are available as part of the verification process, as they outline all consumption values for the project site.
3.3. Data transfer	Full	The complete data is stored electronically and also the part of Management information system which is controlled by accounts

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
3.4. Data trails	Full	The necessary procedures have been defined in internal procedures and additional internal documents relevant for the determination of the all the parameters listed in the monitoring plan
4. Identification and maintenance of key process parameters		
4.1. Identification of key parameters	Full	The critical parameters for the determination of GHG emissions are the parameters listed in section D of the approved PDD version 1.4.
4.2. Calibration/maintenance	Full	The company maintains the elaborate calibration plan for each of the equipment. The audit team verified the status for all the equipment at the sites sampled for the audit and found them to be complying with the plan.
5. GHG Calculations		
5.1. Use of estimates and default data	Full	Emission factor for the fuel, Conversion from kcal to kJ, emission factor of Ukraine electricity grid in year, Emission factor for fuel mix, Baseline emission factor for incremental cement production in year, Clinker factor; average quantity of clinker in finished cement.
5.2. Guidance on checks and reviews	Full	See section 7.7 of this protocol, table 1.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
5.3. Internal validation and verification	Full	Monitoring procedure for JI Project includes the responsibility and frequency for carrying out internal audits. Internal audits did not reveal any non-conformances. The audit team did verify all the parameters listed in monitoring report.
5.4. Data protection measures	Full	The necessary procedures relating to Information technology are in place to provide necessary data security, and also prevent the unauthorized use of the same.
5.5. IT systems	Full	Data is collected in electronic database.

Periodic Verification Protocol Table 3: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Potential reporting risks based on an assessment of the emission estimation procedures can be expected in the following fields of action: ➢ the calculation methods, ➢ raw data collection and sources of supporting documentation, ➢ reports/databases/information systems from which data is obtained. Key source data applicable to the project assessed are hereby: ➢ metering records , ➢ process monitors, ➢ operational logs (metering records), ➢ laboratory/analytical data (for energy content of fuels), ➢ accounting records, Appropriate calibration and maintenance	Regarding the potential reporting risks identified in the left column the following mitigation measures have been observed during the document review and the on site mission: Key source data for this parameter are: • meter reading. • Invoices and record for Fuels (and coal) for consumption and purchase. The metering equipments are installed appropriately in the enclosure panels and same are of reputed make. Calculation methods: The reporting procedures reflect the monitoring plan content and the calculation of the emission reduction is correct and also additionally deducting the project emissions caused by fossil fuel.	The issue remaining is the way the data obtained is used to calculate the emission reduction in a conservative manner according to the approach prescribed in the PDD version 1.4 as well as the way data obtained is used to calculate the emissions reductions.

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
of equipment resulting in high accuracy of data supplied should be in place. It is hereby needed to focus on those risks that impact the accuracy, completeness and consistency of the reported data. Risks are weakness in the GHG calculation systems and may include: ➢ manual transfer of data/manual calculations, ➢ position of the metering equipment, ➢ unclear origins of data, ➢ accuracy due to technological limitations, ➢ lack of appropriate data protection measures (for example, protected calculation cells in spreadsheets and/or password restrictions).		

Periodic Verification Protocol Table 4: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including Forward Action Requests)
The issue remaining is the way the data obtained is used to calculate the emission reduction in a conservative manner according to the approach prescribed in the PDD.	There has been a complete check of data transferred from daily consumption and generation readings to the calculation tool. There was no error in such transfer. The correct installation of the metering equipment can be confirmed.	Having investigated the residual risks, the audit team comes to the following conclusion: Immediate action is not needed with respect to the current emission reduction calculation. Those corrections have been considered during the verification process, so no residual risk is open.

Verification Protocol Table 5: Resolution of Corrective Action and Clarification Requests

Report clarifications and corrective action requests	Ref. to checklist question in tables 2/3	Summary of project owner response	Verification conclusion
Corrective Action Request (CAR) 1 There are no proper records on calibration of the X-Ray spectrometer. Please provide information on calibration of the X-Ray spectrometer.	3.6.	Calibration of the X-ray spectrometer ARL9800 used for the slurry and clinker analysis is done by the experts of 'Thermo Techno Ukraine'; ARL9900 X-ray spectrometer used for raw meal and clinker tests is calibrated by the experts of «FLSmidt». The analytic engineer makes a cross check of the spectrometers every two weeks (or more often if necessary) using the wet chemistry method in accordance with the standards GOST 5382-91 "Cements and cementatious materials. Methods of chemical analysis" and EN 196-2 for the following oxides: SiO_2, Al_2O_3, Fe_2O_3, CaO, MgO, SO_3, K_2O, Na_2O. The last calibration was done in 2009: ARL9800 for slurry – 25.12.2009, for clinker – 25.12.2009	The issue is closed based on the received information and supporting evidences on the last calibration of X-Ray spectrometer.

		ARL9900 for raw meal – 28.12.2009, for clinker – 18.12.2009	
<u>Corrective Action Request (CAR) 2</u> Accreditation Certificate of the testing laboratory expired on 07.07.2009. Please provide the evidence of accreditation of the testing laboratory.	3.6	The application for laboratory reaccreditation was submitted to the National Accreditation Agency of Ukraine in May 2009. The audit of the testing laboratory at at JSC "Ivano-Frankivsk Cement" was conducted by NAAU in August 2009. Accreditation materials in accordance with the standards DSTU/ISO/IEC 17025:2006 'General requirements for the competency of test and calibration laboratories' for the IF cement laboratory were sent to the National Agency on the Laboratory Accreditation, chief auditor Ms. Olga Valeriivna Khromenko, on 02.12.2009.	The application letter for testing laboratory reaccreditation #18/697 dated 15/05/2009 was seen. The letter with accreditation materials after NAAU audit was sent to the Accreditation Agency on 02/12/2009 (the supporting evidences were reviewed). The accreditation certificated is being prepared at the moment by NAAU and will be received by the enterprise in the nearest future. The issue is closed based on information provided and records seen.
<u>Clarification Request (CL) 1</u> In the PDD version 1.4 (Section A.2) it is stated that for all production capacity up to 450 000 tonnes clinker/year the baseline is derived	3.1.	Production capacity for the previous wet kilns has been revised by IF Cement given actual figures which were available for the 2005 - 2007 production years. The estimate in the PDD was arrived at based on approximate production figures from the wet kilns.	The issue is closed based on clarifications provided.

from the energy intensity of the previous wet production process while the Monitoring Report says that for all production capacity up to 456,960 tonnes clinker/year the baseline is derived from the energy intensity of the previous wet production process Please clarify the difference the data on production capacity in Monitoring Report version 1.1 and PDD version 1.4 (Section A.2).			
Clarification Request (CL) 2 Please clarify the difference between the values of the emissions reductions	3.3.	Emission reduction estimates in the PDD version 1.4 were based on forecasted clinker and cement production for 2009 along with estimates of the energy and fuel requirements. The monitoring report	The issue is closed based on clarifications and due amendments made to 1st version of Monitoring made to MR.

in the Monitoring Report and the PDD version 1.4.		contains actual figures of clinker and cement production along with actual fuel use figures for the cement kilns and the dryer/crusher.	
Clarification Request (CL) 3 Please provide information on how the level of uncertainty is taken into account, and define if the level of uncertainty is taken into account in the final emission reductions calculations. Please include this information in the Monitoring Report.	3.5.	Uncertainties are defined as low because all clinker production data, fuel use and electricity data are monitored. Since these are commercially purchased or produced products, accurate monitoring is practiced in line with the financial importance of the task and therefore it can be assumed that these figures are very accurate. Emission factors for the GHG estimates in both the project and baseline are obtained from authoritative sources (IPCC, CDM methodologies) and are as accurate as can be expected from this type of project. Finally, IF Cement has proper accreditations for its analysis laboratories and follows good laboratory practice for these analyses, so chemical composition of produced products is expected to be monitored very accurately.	Response is perused and accepted. CL is closed based on due amendment made to MR.

Clarification Request (CL) 4 Please include information considering qualification and more detailed information on training of the stuff to the Monitoring Report.	3.10	Staff are trained according to their respective responsibility levels. Knowledge and skills are controlled periodically by an internal commission. According to the internal procedures of IF cement, operational staff have to pass internal examination once a year, engineers are to pass examinations once in every three years. For the installation and operation of the new dry kiln training was provided to the staff by the kiln manufacturer and the management of IF cement.	Response is accepted. CL is closed based on due amendment made to MR.
Clarification Request (CL) 5 Please provide information on troubleshooting procedures in the Monitoring Report.	3.12.	Troubleshooting procedures are based on the 'Technological instruction for rotary kiln operation', reference №516692-3.0 approved as of 29.06.2006 and 'Staff instructions for the operating engineers', approved as of 14.07.2005. If the emergency situation happens the employee shall notify the shift man, the shift man shall notify the shop superintendent, mechanic, engineering specialist and then chief engineer; the situation is further considered and the decision on	Response is accepted. CL is closed based on due amendment made to MR.

		service responsible for elimination of the situation is accepted and reported to this service.	
Clarification Request (CL) 6 Please provide information considering reporting risks. Please include this information in the Monitoring Report.	4.4	The following stops can be considered as risks: - cyclone blocking; - ingress of metal in dryer crusher. If this happens the employee shall notify the shift man, the shift man will notify the shop superintendent, the shop superintendent will notify the chief engineer. Corrective works are carried out by qualified shift men. The shop has roundsmen who inspect the equipment and record its state in the journal of remarks on mechanical equipment. Shop mechanic, superintendent and chief engineer are informed. Check-up on effectiveness of kilns is made on a quarterly basis via weighing through motor-car transportation on a motor-car balance. Stocktaking of equipment and its calibration (scales, coal scales) is carried out by a service of metrology. PGNAA calibration is carried out by a service of metrology and laboratory on a quarterly basis.	Response is accepted. CL is closed based on due amendment made to MR.

Clarification Request (CL) 7 Please provide the information considering access to external data. Please include this information in the Monitoring Report.	5.2.	External parameters, such as emission factors and conversion factors are obtained from external sources within the scope of the JI project. Such parameters are being constantly monitored for relevance to ensure that IF Cement calculations are based on the most current and best sources available (i.e: IPCC). Since, in specific cases, the production capacity of the new dry kiln exceeds pre-project conditions, efficiency ratings must be compared to the external sector wide performance currently occurring in Ukraine. Comparing to external sources allows the production efficiency of the IF Cement plant to be compared to typical Cement efficiencies in Ukraine Sector. To complete this comparison the method developed, and approved, under the VolynCement PDD will be utilized as most current and directly relevant to the IF Cement situation. External sector wide baseline performance will be monitored over the coming years.	The provided information is considered sufficient. Based on due corrections were made in the MR the verification team decided to close the issue. The issue is closed.

Clarification Request (CL) 8 Please provide more information concerning internal audits and management reviews. Please include this information in the next version of the Monitoring Report.	7.7	Check-up on effectiveness of kilns is made on a quarterly basis via weighing through motor-car transportation on a motor-car balance. Stocktaking of equipment and its calibration (scales, coal scales) is carried out by a service of metrology. Neutron analyzer of raw materials PGNAA is installed at the entry to the raw materials silo. Its calibration is carried out by a service of metrology and laboratory on a quarterly basis.	The information provided is sufficient. Response is perused and accepted. CL is closed based on due amendment made to MR.

APPENDIX B: VERIFICATION TEAM

The verification team consists of the following personnel:

Nadiya Kaiiun, M.Sci. (environmental science)

Team Leader, Climate Change Lead Verifier
Bureau Veritas Ukraine Health, Safety and Environment Department Project Manager.

Nadiya Kaiiun has graduated from National University of Kyiv-Mohyla Academy with the Master Degree in Environmental Science. She is a Lead auditor of Bureau Veritas Certification for Environment Management Systems. She has performed over 15 audits since 2008. She has undergone intensive training on Clean Development Mechanism /Joint Implementation and is involved in the determination/verification of 10 JI projects.

Kateryna Zinevych, M.Sci. (environmental science)

Team Member, Climate Change Verifier

Bureau Veritas Ukraine Health, Safety and Environment Project Manager

Kateryna Zinevych has graduated from National University of Kyiv-Mohyla Academy with the Master Degree in Environmental Science. She has successfully completed IRCA registered Lead Auditor Training Course for Environment Management Systems and Quality Management Systems. She has undergone a training course on Clean Development Mechanism /Joint Implementation and she is involved in the determination/verification of 26 JI projects.

Victoria Legka, B.Sci. (biology)

Team Member, Climate Change Verifier

Bureau Veritas Ukraine Health, Safety and Environment Project Manager

She has graduated from National University of Kyiv-Mohyla Academy with the Bachelor Degree in Bilolgy. She is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered). She performed 6 audits since the beginning of 2009. She is involved in the validation of 3 JI projects.

The verification report was reviewed by:

Ivan G. Sokolov, Dr.Sci (biology, microbiology)

Internal Technical Reviewer,
Climate Change Lead Verifier, Bureau Veritas Certification Holding SAS Local Climate Change Product Manager for Ukraine

Bureau Veritas Black Sea District Health, Safety and Environment Department Manager

He has over 25 years of experience in Research Institute in the field of biochemistry, biotechnology, and microbiology. He is a Lead auditor of Bureau Veritas Certification for Environment Management System (IRCA registered), Quality Management System (IRCA registered), Occupational Health and Safety Management System, and Food Safety Management System. He performed over 140 audits since 1999. Also he is Lead Tutor of the IRCA registered ISO 14000 EMS Lead Auditor Training Course, and Lead Tutor of the IRCA registered ISO 9000 QMS Lead Auditor Training Course. He is Lead Tutor of the Clean Development Mechanism /Joint Implementation Lead Verifier Training Course and he was involved in the determination/verification over 50 JI/CDM projects.

APPENDIX C: DOCUMENTS CHECKED DURING VERIFICATION

1 Daily report. Company Vuglefikaci. Meter “Універсал-02” #1356. Starting of verification 01.07.2009. End of verification 01.08.2009.

2 Archive of emergency conditions: 0 registration. Archive of access: 21 registrations.

3 Daily report (Line 1). Company Object 89. Meter “Універсал-02” #5222. Starting of verification 01.07.2009. End of verification 01.08.2009.

4 Archive of emergency conditions: 8 registration. Archive of access: 3 registrations.

5 State verification dated 15.10.2009.

6 Technical passport Scales ВПП ПС-100 №0203. Site of installation: Cement shop.

7 Technical passport Scales ВЦ ПС-150 №0204. Site of installation: Cement shop.

8 Operating manual ТВТВ 404437 НЕ. Automobile tensometric scales. State periodic verification dated 12.06.2009

9 Operating manual ТВТВ 404437 НЕ. Automobile tensometric scales. State periodic verification dated 12.10.2009

10 Operating manual ТВТВ 404437 НЕ. Automobile tensometric scales. State periodic verification dated 14.12.2009

11 Operating manual ТВТВ 404437 НЕ. Coach tensometric scales ТВВ-150-50-13.5(8), ser. #265 dated 26.03.2009.

12 Certificate of working measurement device verification #671 dated 06.04.2007. Valid to 06.04.2009.

13 Passport ГРЭМ 020000.001-01 ПС, ГРЭМ 020000.001-02 ПС. Gas volume meter «Універсал». Verification date 26.08.2008.

14 Passport. Rotary gas meter Delta 2050/100 A, Delta 2050/160 A. Verification date 24.07.2008.

15 Certificate of working measurement device verification #82 dated 23.01.2008. Valid to 23.01.2010.

16 Passport ТНКИ.406233.033 ПС. Pressure sensor МИДА-13П. Periodic

verification date 23.01.2008.

17 Passport ТНКИ.406233.033 ПС. Pressure sensor МИДА-13П. Periodic verification date 10.12.2009.

18 Passport Ф-62.734.408-91 ПС. Gas meter ЛГ-К-Ex-200-1600-1.6. Passport Ф-62.734.408-91 ПС. Gas meter ЛГ-К-Ex-200-1600-0.63-01. Verification date 02.12.2009.

19 Certificate of working measurement device verification #752 dated 18.04.2008. Valid to 18.04.2009.

20 Certificate of working measurement device verification #691/9 dated 22.04.2009. Valid to 22.04.2011.

21 Certificate of working measurement device verification #2463 dated 12.11.2007. Valid to 12.11.2009.

22 Passport МДВГ.406233.033 ПС. Pressure sensor-ДА МИДА-13П-01 Ex, ser. #07207241. Verification date 25.01.2010.

23 Passport. Gas volume meter ”Універсал”. Verification date 11.06.2008.

24 Passport. Gas volume meter ”Універсал”. Verification date 12.09.2008.

25 Statute of metrological service OJSC “Ivano-Frankivskcement” dated 2006.

26 Job description of chief metrologist.

27 Photo. Triphase electric meter.

28 Photo. Electrical substation #24. REF542plus

29 Photo. Electrical substation #21. REF542plus

30 Photo. Meter DELTA G65

31 Photo. Gas volume calculator. Universal. Inv. #4668.

32 Register. Determination of fuel calories.

33 Register #25 of incoming inspection of coal.

34 Register #29 of incoming inspection of alternative fuel.

35 Journal of grinding coal.

36 Register. Average data on heap.

37 Average data. Raw meal – silage entrance.

38 Average data. Power oven – silage exit.

39 Average data. Clinker. Meal after the fourth cycle.

40	Permission #262713 for emissions of pollutants into the atmosphere by stationary sources.
41	Results of burning coal for the year 2010.
42	Reference on coal input control which comes to the OJSC “Ivano-Frankivskcement”. 31.01.10.
43	Reference on coal input control which comes to the OJSC “Ivano-Frankivskcement”. 29.01.10.
44	Reference on coal input control which comes to the OJSC “Ivano-Frankivskcement”. 30.01.10.
45	Reference on coal input control which comes to the OJSC “Ivano-Frankivskcement”. 03.02.10.
46	Reference on coal input control which comes to the OJSC “Ivano-Frankivskcement”. 17.02.10.
47	Charts of recertification of test equipment of OJSC “Ivano-Frankivskcement” for 2009.
48	Schedule of periodic calibration of measuring instruments of OJSC “Ivano-Frankivskcement” for 2009.
49	Certificate on calibration of work measuring device. Electronic laboratory weigh-scales. №3172. Valid to 22.12.2009.
50	Certificate on calibration of work measuring device. Automated combustion calorimeter. #1684/т. Valid to 20.08.2010.
51	List of measures to monitor compliance with established maximum permissible emissions of pollutants and with conditions of permit for emissions.
52	Register #16 of chemical analysis of incoming raw materials. 2009.
53	Attestation certificate № IФ100. Issued from 14.12.2006., valid to 14.12.2009.
54	Certificate on accreditation of testing laboratories №UA 6.002.T.554. Valid to 07.07.2006.
55	Certificate of validity renovation of accreditation certificate of testing laboratory №UA6.002.T.554. Updated to 07.07.2007.
56	Certificate of validity renovation of accreditation certificate of testing

laboratory №UA6.002.T.554. Updated to 07.07.2008.

57 Certificate of validity renovation of accreditation certificate of testing laboratory №UA6.002.T.554. Updated to 07.07.2009.

58 Order of the National Accreditation Agency of Ukraine #405 dated 19.08.2008.

59 Certificate #200 natural gas quality dated 06.06.09.

60 Certificate of natural gas quality dated 07.07.2009.

61 Certificate #226 of natural gas quality dated 21.07.2009.

62 Certificate #221 of natural gas quality dated 22.07.2009.

63 Certificate #216 of natural gas quality dated 17.07.2009.

64 Certificate #210 of natural gas quality dated 15.07.07.

65 Gas consumption at OJSC «Ivano-Frankivskcement» for 2009.

66 Gas consumption at OJSC “Ivano-Frankivskcement” for July 2009.

67 Daily meter/collector figures РГ-К-4С-Ех/ОКВГ-01.

68 Registration of meter figures “Універсал-02” #4511.

69 Archive of emergency conditions dated 03.08.2009. 0 registration.

70 Archive of emergency conditions dated 03.08.2009. 4 registrations.

71 Registration of meter figures “Універсал-02” #1352.

72 Registration of meter figures “Універсал-02” #1356.

73 Archive of emergency conditions dated 29.07.09.

74 Multifunctional electrical meter Landis&Gyr type ZxD400/300CR ser. #94977009. Passport. Verification date: April 2008.

75 Certificate #180 On state metrological attestation dated 07.11.2007.

76 Multifunctional electrical meter Landis&Gyr of type ZxD400/300CR ser. #94977013. Passport. Verification date: April 2008.

77 Multifunctional electrical meter Landis&Gyr of type ZxD400/300CR ser. #94977010. Passport. Verification date: April 2008.

78 Multifunctional electrical meter Landis&Gyr of type ZxD400/300CR ser. #94916174. Passport. Verification date: April 2008.

79 Passport. Multifunctional meter of electricity energy Landis&Gyr type ZxD. Meter ZMD405CR4400070S2-3x58/100, ser. # 94344587. Verification date is December 2007.

80 Consumption of electricity for 2009.

81 Report of volume of coal that should be drying for 2009.

82 Report of clinker production ОП #1, cement, fuel consumption for clinker production for 2009.

83 Report of clinker production ОП #2, cement, fuel consumption for clinker production for 2009.

84 Report of clinker production ОП #3, cement, fuel consumption for clinker production for 2009.

85 Consumption of fuel for clinker production by kiln #1 for 2009.

86 Consumption of fuel for clinker production by kiln #2 for 2009.

87 Consumption of fuel for clinker production by kiln #3 for 2009.

88 Yearly summary of consumption of fuel for clinker production for 2009.

89 Letter to the head of National Accreditation Agency of Ukraine dated 02.12.2009.

90 Letter #18/697 of JSC «Ivano-Frankivsk Cement» to the head of National Accreditation Agency of Ukraine dated 15.05.2009 about testing laboratory reaccreditation.

91 Application #20062 for accreditation of the plant for cementing materials production of JSC «Ivano-Frankivsk Cement» against the ДСТУ ISO/IEC 17025 (ВЛ) requirements.