JI MONITORING REPORT
(for reporting period 01/01/2008–31/07/2012)

Title of manager of the developer of documentation

Director of Evo Carbon Trading Services Ltd		**N.L. Egorova**
(position)	(signature)	(surname, name and patronymic of the person)

S.P.

Title of manager of the economic activity subject- JI Project Host Party

Director on commercial activity SE "DZERZHINSKUGOL"		**O.V.Bondarenko**
(position)	(signature)	(surname, name and patronymic of the person)

S.P.

INITIAL AND FIRST PERIODIC JI MONITORING REPORT

Version 2.0

28/09/2012

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SECTION A. General project activity information

A.1 Title of the project activity:

"Implementation of the energy efficiency measures and reduction of greenhouse gas emissions into the atmosphere at SS "Coal mine named after F.E. Dzerzhynskyi", SE "DZERZHINSKUGOL".

Sectoral scope: 8. Mining/mineral production

A.2. JI registration number:

JI registration number will be specified later.

A.3. Short description of the project activity:

The project is initiated by State Enterprise «DZERZHINSKUGOL» in order to reduce greenhouse gases emissions into the atmosphere and to improve the environmental situation in the region. Project is aimed at quenching and stabilization of the waste heaps that are under the control of mine "named after F.E. Dzerzhynskyi" that is managed by SE "DZERZHINSKUGOL" located in the town Dzerzhynsk in Donetsk region. Project activity will reduce the emission of greenhouse gases into the atmosphere. Project activity lies in stabilization of waste heap applying vermiculite material.

In the baseline scenario it is assumed that the existing common practice will continue and waste heaps will be burning and emitting GHG into the atmosphere until the coal is consumed.

A.4. Monitoring period:

- Monitoring period starting date: 01/01/2008.
- Monitoring period closing date: 31/07/2012[1]

A.5. Methodology applied to the project activity (incl. version number):

The JI specific approach is used for the monitoring of emission reductions a in accordance with the JI Guidance on Criteria for Baseline Setting and Monitoring, Version 03.

A.5.1. Baseline methodology:

The project is initiated by State Enterprise «DZERZHINSKUGOL» in order to reduce greenhouse gases emissions into the atmosphere and to improve the environmental situation in the region.

The Ukrainian coal mining industry is a complex business system that integrates around 167 active coal mines and 3 coal strip mines, mines at the decommissioning stage, coal washing, transportation and other enterprises. Ukraine is the largest coal mining region in Europe and is among top eight in the world. The main coal mining area is Donbas that is located in Donetsk and Luhansk regions for the most part.

Coal is found in the area of Donbas at the average depth of 400-800 m. The average thickness of coal-bed is 0.6-1.2 m. Therefore coal in Donbas is produced mostly by mining. Most mines operate on the depth of 400-800 m but there are 35 mines in Donbas that extract coal from the 1000-1300 m level. Coal-beds in Donetsk basin are interleaved with rock and are usually found every 20-40 m. Mining activities in such conditions result in vast amounts of matter being extracted and brought to the surface. Coal is separated from rock and this non-coal matter forms huge waste heaps of tailings found almost everywhere in Donbas. Separation process on the mines was not and sometimes is not entirely efficient. For a long period of time it was not economically feasible to extract 100% of coal from the rock that had been mined. That is why waste heaps of Donbas contain considerable masses of coal. In the course of time those waste heaps are vulnerable to spontaneous ignition and slow combustion. According to different estimates the rock that is mined contains only up to 65-70% of coal only, the rest is barren rock. Up to 60% of this rock is put into waste heaps[2]. Waste heaps that are burning or are close to spontaneous ignition are sources of uncontrolled greenhouse gas and hazardous substances emissions. The latter include

[1] Both days included.

[2] Geology of Coal Fires: Case Studies from Around the World, Glenn B. Stracher, Geological Society of America, 2007, p. 47

sulphurous anhydride that transforms into sulphur acid and is the reason for acid rains, hydrogen sulphide and carbon oxide. Erosion can lead overtime to the total destruction of a waste heap in a massive landslide that is dangerous both in terms of direct hazard to population and property and massive emissions of particles and hazardous substances into the atmosphere. Erosion also helps to intensify the process of spontaneous combustion. Combustion of coal in the waste heap is rather long-term and lasts up to 15 years.[3].

Despite the dangers caused by the burning waste heaps, it is common in the area of Donbas to not extinguish the fires. The owners that are responsible for the waste heaps receive relatively small fines for the air pollution, therefore there is little incentive for them to deal with the problem, and extinguishing those heaps that are currently alight may not be postponed.

In baseline scenario it is assumed that this common practice will be going on, waste heaps will be burning and will lead to continuous uncontrolled greenhouse gases (GHG) emissions into the athmosphere.

Waste heaps that appear in during the process of coal extraction from the mines of Donbas region in accordance with the scientific researches contain 10-15% of coal, burning of which leads to GHG emission and other hazardous substances emission into the atmosphere. Actions aimed at heap quenching before implementation of JI project were unable to fully quench heaps, so recurrent inflammations sometimes occurred. As a result of project implementation GHG emissions from burning of natural mine heaps will be dropped; that will reduce GHG emissions compared with the current practice.

Project is aimed at quenching and stabilization of the waste heaps that are under the control of mine "named after F.E. Dzerzhynskyi" that is managed by SE "DZERZHINSKUGOL" located in the town Dzerzhynsk in Donetsk region. Project activity will reduce the emission of greenhouse gases into the atmosphere. Project activity lies in stabilization of waste heap applying vermiculite material.

Baseline emissions come from the following major sources:

1) Carbon dioxide emissions from burning waste heaps. These are calculated as stationery combustion emissions from coal . As the baseline suggests that the current situation is preserved regarding the waste heaps burning, and the waste heaps in question are at risk of burning it is assumed that actual burning will occur for a long period of time.

A.5.2. Monitoring methodology:

A JI-specific monitoring approach was developed for this project in line with the JI Guidance on Criteria for Baseline Setting and Monitoring, Version 03. The resulting Monitoring Plan was determined as part of the determination process.

Emission reductions due to the implementation of this project will come from the following major sources:

- Removing the source of green-house gas emissions from the burning / slow burning waste heap by quenching and stabilization of waste heap.

For any monitoring period the following parameters have to be collected and registered:

- The temperature of the waste at waste heap. Project emissions are expected to be equal zero. Mothballing of the burning waste heap foresees total elimination of possibility of waste heap burning. However, the condition of waste heap will still be controlled accurately. If, in emergency case, the indicators of temperature will show that there are evidences of waste heap burning, emissions caused by this process will be taken into account in emission reduction calculation. This parameter used for indication of whether the waste heap is burning or not. Temperature of waste heap is strictly controlled. The monitoring is performed once per month. The data of monitoring is submitted into the production logbooks and is the subject of reporting to company's management. On the basis of this data factor k used for emission

[3]. http://www.nbuv.gov.ua/portal/natural/Pb/2010_17/Statti/10.pdf

reduction calculation is estimated (is there are any evidences of waste heap burning factor k is equal 1, is there are no such evidences, then factor k is equal 0).

A.6. Status of implementation including time table for major project parts:

04/04/2006 in accordance with the results of temperature survey the waste heap of the mine was considered as the one which is burning. After that the development of the project aimed at the stabilization of waste heap has started. Until the end of July 2006 all the actions directed on stabilization and quenching of waste heap were undertaken. Emission reduction generation in the framework of the project has started in August 2006.

The project obtained Letter of Endorsement (#2261/23/7 dated 17/08/2012) from State Environmental Investment Agency of Ukraine. Due to Switzerland legislation, no LoE from Switzerland is needed. The project obtained Letter of Approval from Switzerland on 21/09/2012. The project obtained Letter of Approval #2556/23/7 dated 12/09/2012 from State Environmental Investment Agency of Ukraine.

A.7. Intended deviations or revisions to the registered PDD:

There are no deviations from the PDD.

The actual emission reductions in the monitoring report are not different from the forecast in the registered PDD:

Values in tCO_2e	Data in the PDD	Data in monitoring period
Total Emission reductions in monitoring period	3 491 809	3 491 809

Table 1: Emission reduction comparison.

There is no differences between the amount of greenhouse gases emission reduction. That is because the actual data for 2012 was applied in the registered PDD.

A.8. Intended deviations or revisions to the monitoring plan:

There are no deviations from the determined monitoring plan.

A.9. Changes since last verification:

Not applicable.

A.10. Person(s) responsible for the preparation and submission of the monitoring report:

State Enterprise "DZERZHINSKUGOL":

- Dmytro Zhytlenok , General Director

EVO CARBON TRADING SERVICES LTD:

- Nataliya Egorova, Director.

SECTION B. Key monitoring activities according to the monitoring plan for the monitoring period stated in A.4.

For any monitoring period the following parameters have to be collected and registered:

- The temperature of the waste at waste heap. Project emissions are expected to be equal zero. Mothballing of the burning waste heap foresees total elimination of possibility of waste heap burning. However, the condition of waste heap will still be controlled accurately. If, in emergency case, the indicators of temperature will show that there are evidences of waste heap burning, emissions caused by this process will be taken into account in emission reduction calculation. This parameter used for indication of whether the waste heap is burning or not. Temperature of waste heap is strictly controlled. The monitoring is

performed once per month. The data of monitoring is submitted into the production logbooks and is the subject of reporting to company's management. On the basis of this data factor k used for emission reduction calculation is estimated (is there are any evidences of waste heap burning factor k is equal 1, is there are no such evidences, then factor k is equal 0).

B.1. Monitoring equipment types

1. **General purpose thermometer.** Temperature range – from 0^{o}C to 3000 ^{o}C. Accuracy class – 0,5. Description: Glass thermometer, technical, equipped with safety case.

Verification of equipment will be done in accordance with the Host Party legislation - State Standard of Ukraine DSTU 2708:2006 "Metrology. Verification of measuring instruments. The organization and procedure".

B.1.2. Involvement of Third Parties:

Third parties are not involved

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B.2. Data collection (accumulated data for the whole monitoring period):

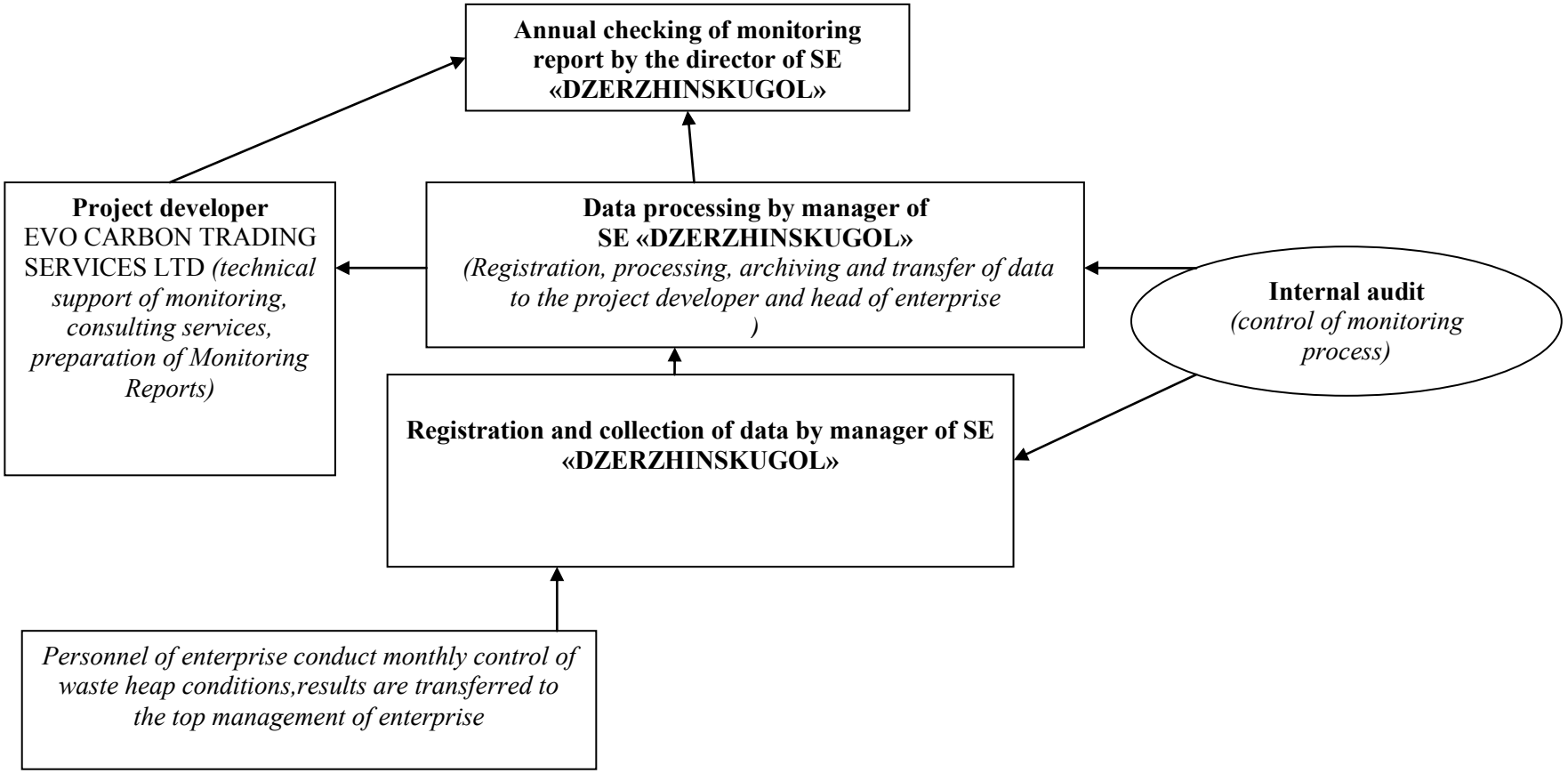

Figure 1: Data collection

B.2.1. List of the values applied for the calculation of GHG project emissions:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
1. $FC_{p,PO,coal}$	*Total quantity of coal in waste heap at the beginning of performance of quenching works*	*Calculated in accordance with the proposed monitoring plan*	*ths. t*	*c*	*Once*	*100 %*	*Electronic/Paper*	
2. $NCV^{y}_{p,coal}$	*Net calorific value of coal combustion in monitoring period «y», in the project scenario*	*Information value. National Inventory report of Ukraine 1990-2010*[4]	*TJ/ths t*	*e*	*Annually*	*100 %*	*Electronic/Paper*	
3. $EF^{y}_{p,CO_2,coal}$	*Carbon emission factor in the process of coal combustion in monitoring period «y», in the project*	*Information value. National Inventory report of Ukraine 1990-2010*[5]	*tC/TJ*	*e*	*Annually*	*100 %*	*Electronic/Paper*	

[4] http:// unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

[5] http:// unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

	scenario							
4. V_{PO}	*Waste heap volume at the moment of waste heap quenching and stabilization*	*Waste heap passport data*	*m^3*	*e*	*Once*	*100 %*	*Electronic/Paper*	*24022900 m^3*
5. C_{coal}	*Carbon content in waste heap*	*Publications based on the scientific researches*[6]*.*	*%*	*e*	*Once*	*100 %*	*Electronic/Paper*	10%
6. ρ_n	*Waste heap density at the moment of waste heap quenching and stabilization*	*Waste heap passport data*	*kg/m^3*	*e*	*Once*	*100 %*	*Electronic/Paper*	*2400 kg/m^3*
7. k_i^y	*Waste heap burning factor in month and year "*y"	*Results of monitoring of waste heaps conditions.*	-	*m*	*Monthly*	*100 %*	*Electronic/Paper*	In case if the waste heap burning was detected in the reporting month the value is equal k=1, if the waste heap burning was not detected, as it is prescribed by the project, the value is equal k=0
8. $OXID_{b,coal}^y$	*Carbon oxidation factor in the process of*	*Information value. National Inventory report of*	*ratio*	*e*	*Annually*	*100 %*	*Electronic/Paper*	

[6] http://www.envsec.org/publications/Risk%20Assessment%20Considerations%20in%20the%20Donetsk%20Basin%20Report_RUS.pdf

	coal combustion in monitoring period «y», in the project scenario, (relative unit)	*Ukraine 1990-2010*[7]						

B.2.2. List of the values applied for the calculation of GHG baseline emissions:

ID number *(Please use numbers to ease cross-referencing to D.2.)*	Data variable	Source of data	Data unit	Measured (m), calculated (c), estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	Comment
9. $FC_{b,PO,coal}$	*Total quantity of coal in waste heap at the beginning of performance of quenching works*	*Calculated in accordance with the proposed monitoring plan*	*ths. t*	*c*	*Once*	*100 %*	*Electronic/Paper*	
10. $NCV^{y}_{b,coal}$	*Net calorific value of coal combustion in monitoring period «y», in the baseline scenario*	*Information value. National Inventory report of Ukraine 1990-2010*[8]	*TJ/ths t*	*e*	*Annually*	*100 %*	*Electronic/Paper*	

[7] http:// unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

[8] http:// unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

11. $EF^{y}_{b,CO_2,coal}$	*Carbon emission factor in the process of coal combustion in monitoring period «y», in the baseline scenario*	*Information value. National Inventory report of Ukraine 1990-2010*[9]	*tC/TJ*	*e*	*Annually*	*100 %*	*Electronic/Paper*	
12. V_{PO}	*Waste heap volume at the moment of waste heap quenching and stabilization*	*Waste heap passport data*	m^3	*e*	*Once*	*100 %*	*Electronic/Paper*	*24022900* m^3
13. C_{coal}	*Carbon content in waste heap*	*Publications based on the scientific researches*[10].	*%*	*e*	*Once*	*100 %*	*Electronic/Paper*	10%
14. ρ_n	*Waste heap density at the moment of waste heap quenching and stabilization*	*Waste heap passport data*	kg/m^3	*e*	*Once*	*100 %*	*Electronic/Paper*	*2400* kg/m^3
15. $OXID^{y}_{b,coal}$	*Carbon oxidation factor in the*	*Information value. National Inventory report*	*ratio*	*e*	*Annually*	*100 %*	*Electronic/Paper*	

[9] http:// unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

[10] http://www.envsec.org/publications/Risk%20Assessment%20Considerations%20in%20the%20Donetsk%20Basin%20Report_RUS.pdf

	process of coal combustion in monitoring period «y», in the baseline scenario, (relative unit)	*of Ukraine 1990-2010*[11]						

B.2.3. Data concerning leakage:

No leakages are expected.

[11] http:// unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/ukr-2012-nir-13apr.zip

B.3.Data processing and archiving (incl. software used):

All data will be archived electronic and paper. Data acquisition and processing procedure for each parameter monitored:

1. **The temperature of the waste at waste heap**. Project emissions are expected to be equal zero. Mothballing of the burning waste heap foresees total elimination of possibility of waste heap burning. However, the condition of waste heap will still be controlled accurately. If, in emergency case, the indicators of temperature will show that there are evidences of waste heap burning, emissions caused by this process will be taken into account in emission reduction calculation. This parameter used for indication of whether the waste heap is burning or not. Temperature of waste heap is strictly controlled. The monitoring is performed once per month. The data of monitoring is submitted into the production logbooks and is the subject of reporting to company's management. On the basis of this data factor k used for emission reduction calculation is estimated (is there are any evidences of waste heap burning factor k is equal 1, is there are no such evidences, then factor k is equal 0).

B.4. Special event log:

All special and exceptional events are documented by the special notes to the management of the company. The nature of the project and underlying operations does not foresee any factors that can cause unintended emissions due to emergencies.

SECTION C. Quality assurance and quality control measures

C.1. Trainings:

The project does not require extensive initial training. The required workforce can get basic industrial profession training locally. Most of the required personnel such as heavy machinery operators, trucks and excavator drivers, electric and mechanical maintenance workers are locally available. Maintenance needs are covered by the local capacities: in-house maintenance workers and outsourced maintenance and repair subcontractors. The project makes provisions for training needs. All workers are required to have a valid professional education certificate and pass periodical safety trainings and exams. Professional education can be obtained locally in the Donetsk region in all of the professional areas covered by the project.

Training on safety issues is mandatory and must be provided to all personnel of the project as required by local regulations. Procedure for safety trainings includes the scope of the trainings, training intervals, forms of training, knowledge checks etc. The project host management will maintain records for such trainings and periodic knowledge check-ups.

C.2. Involvement of Third Parties:

Third parties are not involved.

C.3. Internal audits and control measures:

Internal cross-checks and audits are performed for all of the data that is directly monitored, i.e. the temperature of waste heap. Director of the company reviews monthly and yearly reports and conducts selective cross-checks with the raw documents.

For the fixed data and ex-ante parameters and factors the quality assurance requires to check that the data were acquired from the reliable (i.e. recognised and/or based on research), verifiable (data are open for access, or are available for the project participants) sources.

C.4. Troubleshooting procedures:

All exceptional and troubleshooting events are documented by internal notes.

In cases if any errors, fraud or inconsistencies will be identified during the monitoring process special commission will be appointed by project host management that will conduct a review of such case and issue an order that must also include provisions for necessary corrective actions to be implemented that will ensure such situations are avoided in future.

The project host management will also establish a communication channel that will make it possible to submit suggestions, improvement proposals and project ideas for more accurate future monitoring for every person involved in the monitoring activities. Such communications will be delivered to the project host management who is required to review these communications and in case it is found appropriate implement necessary corrective actions and improvements. Project participant –EVO CARBON TRADING SERVICES LTD will conduct periodic review of the monitoring plan and procedures and if necessary propose improvements to the project participants.

SECTION D. Calculation of GHG emission reductions

D.1. Description of formulae used to calculate GHG emission reduction:

D.1.1. Description of formulae used to calculate project emissions:

For the project scenario setting under the proposed project was selected specific approach based on the requirements of JI projects in accordance with paragraph 9 (a) JI Guidance on criteria for baseline setting and monitoring.

Greenhouse gases emissions which included in the project scenario:

1. GHG emissions from coal burning in waste heaps.

Greenhouse gases emissions which included in the project scenario:

$$PE_y = \sum PE^j_{PO} \quad (1)$$

Studies have shown that the period of waste heaps burning is 15 years [12], which means that the entire amount of coal of waste heap completely burned during this period. Project monitoring of waste heap condition allows for the control the condition of the heap and prevention of its burning, and if the latter occurs, to take measures for its rapid quenching, provides for the monthly monitoring of waste heap. Based on the conditions of the monitoring program of waste heap condition, the formula for calculation of GHG emissions from waste heap burning of the baseline was adapted to the activities of the monthly monitoring of heap condition.

$$PE^y_{PO} = \sum_{i=1}^{12} \frac{FC_{p,PO,coal} \cdot NCV^y_{p,coal} \cdot k^y_i \cdot EF^y_{p,CO2,coal}}{180} + PE^y_{p,PO,disel}, \quad (2)$$

PE^y_{PO} - GHG emissions generated in the process of repeated flickering of waste heap after quenching measures, during period «y» in the project scenario (tCO_2eq);

$PE^y_{p,PO,disel}$ - GHG emissions from diesel fuel combustion, which is used in technological process of waste heaps quenching in monitoring period «*y*», in the project scenario, (t CO_2-eq);

$FC_{p,PO,coal}$ - total quantity of coal in waste heap at the beginning of performance of quenching works (ths t);

$NCV^y_{p,coal}$ - net calorific value of coal combustion in monitoring period «y», in the project scenario, (TJ/ths. t);

[12] http://www.nbuv.gov.ua/portal/natural/Pb/2010_17/Statti/10.pdf

$EF^{y}_{p,CO_2,coal}$ - default CO_2 emission factor for stationary coal combustion in monitoring period «y», in the project scenario, (t C/TJ);

k^{y}_{i} – waste heap burning factor in month and year "*y"* (in case of waste heap burning were found in the reporting month is assumed to be k = 1, if the burning were not found, as it provided under the project, then is taken k = 0.).

180 - number of months in fifteen years (15 years is the period of complete burning of waste heap).

$[disel]$ - index relating to diesel fuel;

$[y]$ - index corresponding to montoring period;

$[i]$ - index corresponding to sequence number of month, year «*y*» ;

$[p]$ - index corresponding to the project scenario;

$[n]$ - index corresponding to density;

$[coal]$ - index relating to coal.

Emissions from diesel fuel consumed by technological equipment during waste heap quenching arise only in case of repeated burning of waste heap, and are less than 1% of the emissions generated in the process of waste heap burning because of it these emissions can be neglected. Thus:

$$PE^{y}_{PO} = \sum_{i=1}^{12} \frac{FC_{p,PO,coal} \cdot NCV^{y}_{p,coal} \cdot k^{y}_{i} \cdot EF^{y}_{p,CO2,coal}}{180}, \quad (3)$$

$$FC_{b,PO,coal} = \frac{V_{PO} \cdot \rho_{n} \cdot C_{coal}}{1000000}, \quad (4)$$

$FC_{b,PO,coal}$ - total quantity of coal in waste heap at the beginning of performance of quenching works (t);

$V_{PO.}$ – waste heap volume, m^3;

C_{coal} – coal consist in waste heap, %;

ρ_{n} - waste heap density, kg/m^3;

$[PO]$ - index relating to waste heap;

$[n]$ - index corresponding to density;

$\left[\frac{1}{1000000}\right]$ - index relating to kg to thousand tonnes conversion.

$[coal]$ - index relating to coal.

$$EF^{y}_{p,CO2,coal} = EF^{y}_{p,C,coal} \cdot OXID^{y}_{p,coal} \cdot 44/12, \quad (5)$$

$EF^{y}_{b,C,coal}$ - carbon emission factor in the process of coal combustion in monitoring period «y», in the project scenario, (t C/TJ);

$OXID^{y}_{b,coal}$ - carbon oxidation factor in the process of coal combustion in monitoring period «y», in the project scenario, (relative unit);

$44/12$ - stoichiometric ratio of CO_2 and C molecular masses, (t CO_2 /t C);

$[y]$ - index corresponding to the monitoring period;

$[p]$ - index corresponding to the project scenario;

$[coal]$ - index relating to coal.

D.1.2 Description of formulae used to calculate baseline emissions:

A specific approach based on the requirements to JI projects in accordance with paragraph 9 (a) of the JI Guidance on criteria for baseline setting and monitoring, Version 03, was chosen for the proposed project.

Under the baseline scenario continuation the process of waste heaps burning at SE «DZERZHINSKUGOL», emergence of new burning centers at waste heaps is the most plausible scenario.

GHG emissions included in the baseline scenario:

- GHG emissions caused by coal burning in waste heaps.

$$BE_y = \sum BE^{j}_{PO} \quad (6)$$

Studies have shown that the period of waste heaps burning is 15 years [13], which means that the entire amount of coal of waste heap completely burned during this period. Project monitoring of waste heap condition allows for the control the condition of the heap and prevention of its burning, and if the latter occurs, to take measures for its rapid quenching, provides for the monthly monitoring of waste heap. Based on the conditions of the monitoring program of waste heap condition, the formula for calculation of GHG emissions from waste heap burning of the baseline was adapted to the activities of the monthly monitoring of heap condition.

$$BE^{y}_{PO} = \sum_{i=1}^{12} \frac{FC_{b,PO,coal} \cdot NCV^{y}_{b,coal} \cdot k^{y}_{i} \cdot EF^{y}_{b,CO2,coal}}{180}, \quad (7)$$

$FC_{b,PO,coal}$ - total coal production in the waste heap at the beginning of performance of quenching works (ths t);

[13] http://www.nbuv.gov.ua/portal/natural/Pb/2010_17/Statti/10.pdf

$NCV^{y}_{b,coal}$ - net calorific value of coal combustion in monitoring period «y», in the baseline scenario, (TJ/ths. t);

$EF^{y}_{b,CO_2,coal}$ - default CO_2 emission factor for stationary coal combustion in monitoring period «y», in the baseline scenario, (t CO_2 /TJ);

k^{y}_{i} – waste heaps burning factor for month «*i*» year «*y*» (in case of waste heap burning were found in the reporting month is assumed to be k = 1, if the burning were found, as it provided under the project, then is taken k = 0. Because under the baseline scenario the waste heap continues to burn, k = 1 for all months of the monitoring period).

$[PO]$ - index relating to the waste heap;

$[b]$ - index corresponding to the baseline scenario;

$[coal]$ - index relating to coal.

$[i]$ - index corresponding to the sequence number of the month, year «*y*».

$$FC_{b,PO,coal} = \frac{V_{PO} \cdot \rho_n \cdot C_{coal}}{1000000}, \quad (8)$$

$FC_{b,PO,coal}$ - total quantity of coal in waste heap at the beginning of performance of quenching works (ths t);

V_{PO} – waste heap volume, m^3;

C_{coal} – consist of coal in the waste heap, %;

ρ_n - waste heap density, kg/m^3;

$[PO]$ - index relating to the waste heap;

$[b]$ - index corresponding to the baseline scenario;

$[coal]$ - index relating to coal.

$\left[\frac{1}{1000000}\right]$ - index relating to kg to thousand tonnes conversion.

$$EF^{y}_{b,CO2,coal} = EF^{y}_{b,C,coal} \cdot OXID^{y}_{b,coal} \cdot 44/12, \quad (9)$$

$EF^{y}_{b,C,coal}$ - CO_2 emission factor in the process of coal combustion in monitoring period «y», in the baseline scenario, (t C/TJ);

$OXID^{y}_{b,coal}$ - carbon oxidation factor in the process of coal combustion in monitoring period «y», in the baseline scenario, (relative unit);

$44/12$ - stoichiometric ratio of CO_2 and C molecular masses, (t CO_2 /t C);

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$[y]$ - index corresponding to the monitoring period;

$[b]$ - index corresponding to the baseline scenario;

$[coal]$ - index relating to coal.

D.1.3 Description of formulae used to estimate emission reductions for the project

$$ER_y = BE_y - PE_y \quad (10)$$

BE_b^y - baseline emission in period y (tCO_2e);

PE_b^y - project emission in period y (tCO_2e);

$[y]$ - index corresponding to monitoring period;

$[b]$ - index corresponding to baseline scenario;

$[p]$ - index corresponding to project scenario.

D.2. Description and consideration of measurement uncertainties and error propagation:

All measurement uncertainties and error propagation of the measured parameters are according to the manuals of equipment manufacturers. Uncertainty level of the fixed values and external data is low as they are taken from reliable and publicly available, verifiable sources.

D.3. Amount of GHG emission reductions:

D.3.1. Project emissions:

		2008	2009	2010	2011	2012	Total
Project emissions	[tonnes of CO_2 equivalent]	0	0	0	0	0	**0**

Table 2: Project emissions.

D.3.2. Baseline emissions:

		2008	2009	2010	2011	2012	Total
Baseline emissions	[tonnes of CO_2 equivalent]	757215	768372	761118	761118	443986	**3491809**

Table 3: Baseline emissions.

D.3.3. Leakage:

		2008	2009	2010	2011	2012	Total
Leakages	[tonnes of CO_2 equivalent]	0	0	0	0	0	**0**

Table 4: Leakages.

D.3.4. Summary of the emissions reductions during the monitoring period:

		2008	2009	2010	2011	2012	Total
Emission reductions	[tonnes of CO_2 equivalent]	757215	768372	761118	761118	443986	**3491809**

Table 5: Emission reductions.

Annex 1

Definitions and acronyms

Acronyms and Abbreviations

CH_4	METHANE
CO_2	CARBON DIOXIDE
GHG	GREENHOUSE GASES
GWP	GLOBAL WARMING POTENTIAL
IPCC	INTERGOVERMENTAL PANEL ON CLIMATE CHANGE
PDD	PROJECT DESIGN DOCUMENT

Definitions

Baseline	The scenario that reasonably represents what would have happened to greenhouse gases in the absence of the proposed project, and covers emissions from all gases, sectors and source categories listed in Annex A of the Protocol and anthropogenic Removals by sinks, within the project boundary.
Emissions reductions	Emissions reductions generated by a JI project that have not undergone a verification or determination process as specified under the JI guidelines, but are contracted for purchase.
Global Warming Potential (GWP)	An index that compares the ability of greenhouse gases to absorb heat in the atmosphere in comparison to carbon dioxide. The index was established by the Intergovernmental Panel of Climate Change.
Greenhouse gas (GHG)	A gas that contributes to climate change. The greenhouse gases included in the Kyoto Protocol are: carbon dioxide (CO_2), Methane (CH_4), Nitrous Oxide (N_2O), Hydrofluorcarbons (HFCs), Perfluorcarbons (PFCs) and Sulphurhexafluoride (SF6).
Joint Implementation (JI)	Mechanism established under Article 6 of the Kyoto Protocol. JI provides Annex I countries or their companies the ability to jointly implement greenhouse gas emissions reduction or sequestration projects that generate Emissions Reduction Units.
Monitoring plan	Plan describing how monitoring of emission reductions will be undertaken. The monitoring plan forms a part of the Project Design Document (PDD).