ENVIRONMENTAL AND SOCIAL ACTION PLAN FOR ISD

AUGUST 2007 REVISION

Considerable environmental issues still exist at both steel plants; this however is acknowledged by ISD, and will be addressed as their CAPEX plan continues to be implemented. Air emissions in particular are excessively high – current abatement systems, where installed, have poor performance, and secondary aspiration at blast furnaces and converters is generally absent, with high fugitive and workplace concentrations of dust and fume evident. The first reconstruction and newly built units to mitigate these issues are now being commissioned. The following Environmental and Social Action Plan (ESAP), as revised in August 2007, defines further actions necessary to bring the plants in compliance with practices employed at modern steel operations.

Wastewater issues at both sites have had less immediate impact on the nearby surroundings than air emissions and are thus considered to be of comparatively lower priority. Over the last year the exceedances of oils and suspended solids in the discharges to receiving rivers have been eliminated, and the recycling rate of water use within the plants has continued to improve. Further improvements are expected as new units will include enhanced internal recycling and treatment systems. Overall water use and recycling at the DMK site is still in need of improvement as indicated in the ESAP.

Some overall attention at both sites to the permitting and monitoring of waste (slag and sludge dumps) is required. A large (300,000 – 1 million tonnes) quantity of slag had been deposited outside of the authorised slag disposal area at the DMK site. Use of this disposal site has now stopped and DMK has successfully worked with the authorities to control and legalize this deposit.

Minimal hard data exists on ground and groundwater contamination and further investigation is scheduled in the ESAP to allow ISD to fully understand potential ground related liabilities. Groundwater at both locations does not however appear to be a sensitive receptor and is not used locally for potable water supply.

Health and safety issues present no particular cause for concern. Accident rates are generally as expected for this sector. Improvements must be made to housekeeping, internal lighting and floor conditions to prevent the most common type of accidents. An increased focus on providing and ensuring the use of respiratory protection must also be given, although this will be less of an issue as the workplace environment improves with the introduction of secondary aspiration systems. Potential liabilities associated with long term occupational dust exposure appear to be relatively low, given the small number of cases reported to date.

Protection Zones at both locations contain a significant number of households that should in theory be relocated. The Authorities at Alchevsk and Dniprodzerzhynsk both acknowledge that this is impractical, as the zones extend well into established parts of the respective towns. New protection zones will in time be negotiated following improvements in ambient air quality, but there remains the likelihood that an unknown number of households will need to be relocated in the future.

Recommendations

Significant improvements to environmental performance will occur as the CAPEX plan rolls out. Where design data for new units are available, performance meets World Bank guidelines, and often approaches or meets EU BAT standards (as per the European Commission document "Best Available Techniques Reference Document on the Production of Iron and Steel", December 2001). In general, reliable European suppliers (e.g. VAI, Danielli) are being used, and this provides reassurance that the future operations will meet modern standards. Under IFC lending guidelines, the plant will need to fully comply with World Bank guidelines and local legislative standards at the end of the investment project. This means that all new units will need to comply fully after commissioning, while older plants will need to comply with their respective requirements within a reasonable timeframe as stipulated in the ESAP. While compliance with EU BAT standards is not a strict requirement, these standards are clearly a valuable reference point and target towards which to aim. In the longer term EU BAT standards will increasingly be implemented in Ukraine due to the approximation of Ukrainian legislation with EU legislation, and eventual expected EU membership.

The following ESAP tables are a revision (as of August 2007) of the original plan developed for the first IFC loan. It is envisaged that if this ESAP is fully implemented together with any additional actions from ESAP improvement point No. C3, then the core plant operations will achieve broad compliance with IFC/World Bank guidelines.

	CORPORATE ISD (C1 – C4)		
	Environmental Issue / Plant Feature	**Corrective Actions Required**	**Timetable Milestones/ Events**
C1	Develop and implement an Environmental, Health and Safety Management System (EHS MS). Appoint dedicated corporate (ISD) environmental Director and provide necessary resources.	Resources must be provided for training and monitoring of environmental, health and safety (EHS) performance, as well as developing a formalised procedure for future investments.	Develop an EHS MS by 2008/9. Attain ISO or equivalent certification by 2010.
C2	Health & Safety Issues. High workplace dust levels in many workshops, and little use of PPE. Some cases of silicosis and other respiratory illnesses in workforce. Many internal areas poorly lit, and floors in poor condition, thus resulting in a potential accident hazard. General internal and external housekeeping needs to be improved.	A review of worker exposure to dust must be undertaken, and respiratory protective equipment supplied to staff identified as being at risk. The use of respiratory equipment must be enforced. Improved lighting and repairs to floor must be undertaken. Significant effort must be put into clearing old equipment and materials, with a view to vastly improving housekeeping across all sites.	Continuous efforts and fully implemented by December 2008. Continuous efforts and fully implemented by December 2007. Continuous efforts and fully implemented by December 2010.
C3	The overall CAPEX program deals with the most immediate environmental issues requiring resolution. The corporate EHS MS system will however also have to assure that all plants are analysed for secondary issues resulting in non-compliance with local requirements or IFC/World Bank guidelines. Such issues will need to be listed, prioritized, and tracked to assure corrective measures are taken.	Preparation of a corporate non-compliance tracking system, including a system for tracking and ensuring that corrective actions are taken. The corporate EHS MS has to include this as a core function.	Included in the EHS MS by 2008/9 and the first tracking list with prioritization and expected correction dates to be supplied to IFC by July 2009.
C4	IFC lending agreement requires that other (as yet unplanned) developments at the sites during the loan period must meet IFC/World Bank environmental guidelines.	Any additional developments at the sites within the loan period must meet the appropriate IFC/World Bank environmental guidelines.	As required.

	DMK (D1 – D20)		
	Environmental Issue/Plant Feature	**Corrective Actions Required**	**Timetable Milestones/Events**
D1	Current sinter plant produces high (>300mg/m^3) point source and large fugitive dust emissions, as well as high workplace dust levels.	DMK to submit full design details to IFC allowing a comparison against World Bank and EU standards to be made. DMK are considering a combination of building a new sinter plant, together with renovation of sections of the existing sinter plant. Any new plant must meet, at minimum, the World Bank Standards of: particulate 50 mg/Nm^3; SOx 500 mg/Nm^3; NOx 500 mg/Nm^3; VOC 20 mg/Nm3. New plant should also preferably either meet or approach the EU BAT guidelines of: particulate <50 mg/NM^3; SO_2 <500 mg/NM^3 (achieved by feedstock control); PCDD/F 0.1 – 0.5 ng/NM^3.	Phase 1 (covering current production Capacity) by 2010. Phase 2 to be installed after blast furnace works completed, and only if a 3rd converter is installed / necessary. Submit basic design – June 2008 Submit design specifications – Dec 2008
D2	DMK has prepared a complete overhaul plan for its Blast Furnace (BF) operations. While the original plan relied on rehabilitation of existing BF units, the new plan (as of August 2007) includes significant installation of new BFs to replace old furnaces. At the end of the investment period only two of the existing BFs will be in operation after Capital repair and installation of full emission abatement technologies. As per the complete rehabilitation, all BFs will be renumbered, according to their actual location in the plant layout. The new numbering system is used in the following D2-6 action points: **BF #1**: (Previously known as BF #10) with secondary emission abatement for casting/tapping/ore handling etc installed in addition to the primary controls.	The new plant will include secondary fume collection for casting/tapping and ore yard operations, enclosed and extracted conveyors and loading bunkers. Current plans for dust abatement include ESPs and/or bag filters for dust control. The new plant must meet, at minimum, the World Bank Standard of: particulate 50 mg/Nm^3,and should also preferably either meet or approach EU BAT guidelines of: • Blast furnace gas recovery; • Direct injection of reducing agents (PCI) • Hot stoves – dust <10 mg/Nm^3, NOx<350 mg/Nm^3 • Blast furnace gas treatment with efficient de-dusting; to give a residual particulate matter concentration of < 10 mg/Nm^3. • Secondary dust abatement to meet dust 1 – 15 mg/m^3, and fugitive dust rates of 5 – 15 g dust /tonne iron.	BF 1 Operational September 2007, with secondary emission abatement for casting/tapping/ore handling etc installed in addition to the primary controls.
D3	**BF # 2**: (Currently known as BF #8). Currently no secondary abatement applied, and high	DMK must confirm the main aspirated release points and predicated emissions, and provide design specifications to IFC to allow a full	BF #2 reconstruction scheduled for 2008 – 2009, with primary

	dust/fume releases and workplace levels.	assessment against BAT to be made. Plant must comply with World Bank standards (as in D2) and preferably meet or approach EU BAT standards (as in D2).	emission control. Secondary emission abatement for casting/tapping/ore handling for BF#2 will be connected to BF#1 system, if technically possible, otherwise installation of secondary controls on BF#2 by 2011.
D4	**BF #3:** (Currently known as BF #9). Initially no secondary abatement installed, and high dust/fume releases and workplace levels.	BF #3 is currently under reconstruction and relining, in addition to improvements of emission controls. Due to the short reconstruction time, no secondary emission abatement for casting/tapping has been included, and this will have to be added when the remaining reconstruction has been completed in 2011.	BF #3 reconstruction scheduled for completion October 2007, except for secondary emission abatement for casting/tapping, which is to be installed in 2011.
D5	**BF #4**, will be a new BF, with secondary emission abatement for casting/tapping/ore handling etc installed in addition to the primary controls.	Once BF # 1, 2, 3 are completed at the end of 2009 in accordance with the above schedule, the current BF #11 will be closed down and dismantled, while the new BF #4 will be build in parallel. BF#4 will include secondary fume collection for casting/tapping and ore yard operations, enclosed and extracted conveyors and loading bunkers, and pulverized coal injection (PCI). Current plans for dust abatement include ESPs and/or bag filters for dust control. The new plant must meet, at minimum, the World Bank Standard of: particulate 50 mg/Nm^3,and should also preferably either meet or approach EU BAT guidelines of: • Blast furnace gas recovery; • Direct injection of reducing agents (PCI) • Hot stoves – dust <10 mg/Nm^3, NOx<350 mg/Nm^3 • Blast furnace gas treatment with efficient de-dusting; to give a residual particulate matter concentration of < 10 mg/Nm^3. • Secondary dust abatement to meet dust 1 – 15 mg/m^3, and fugitive dust rates of 5 – 15 g dust /tonne iron.	Current BF #11 to be closed by the end of 2009. New BF #4 construction scheduled for 2010-2011, with secondary emission abatement for casting/tapping/ore handling etc installed in addition to the primary controls.
D6	**BF #5**, will be a new BF, with secondary emission abatement for casting/tapping/ore handling etc installed in addition to the primary	Once BF # 1, 2, 3, 4 are completed at the end of 2011 in accordance with the above schedule, the current BF #12 will be closed down and dismantled. At this time a new BF #5 can be constructed to increase hot iron capacity, and allow for further down time for e.g. BF #3 to have	Current BF #12 to be closed by the end of 2011. New BF #5 construction

	controls.	casting emission controls installed. BF#5 will include secondary fume collection for casting/tapping and ore yard operations, enclosed and extracted conveyors and loading bunkers, and pulverized coal injection (PCI). Current plans for dust abatement include ESPs and/or bag filters for dust control. BF#5 must meet, at minimum, the World Bank Standard of: particulate 50 mg/Nm^3,and should also preferably either meet or approach EU BAT guidelines of: • Blast furnace gas recovery; • Direct injection of reducing agents (PCI) • Hot stoves – dust <10 mg/Nm^3, NOx<350 mg/Nm^3 • Blast furnace gas treatment with efficient de-dusting; to give a residual particulate matter concentration of < 10 mg/Nm^3. • Secondary dust abatement to meet dust 1 – 15 mg/m^3, and fugitive dust rates of 5 – 15 g dust /tonne iron.	scheduled for 2012-2013, with secondary emission abatement for casting/tapping/ore handling etc installed in addition to the primary controls.
D7	Converters No. 1 and 2 have both been repaired, but without secondary aspiration systems. Reportedly the roof configuration makes this difficult. Resultant high fugitive and workplace dust/ fume emissions, with dust (point source) around 100mg/m^3.	DMK must undertake a review of secondary collection options and feasibility, and submit this to IFC. Adequate secondary aspiration should be provided in the longer term, and this s hould meet the World Bank standards for converters: particulate 50 mg/NM^3; SOx 500 mg/Nm^3; NOx 500 mg/NM^3. Secondary abatement systems should also preferably either meet or approach EU BAT for converters: dust of 5 – 15 mg/m^3 (if bag filters used) or 20 – 30 mg/m^3 if ESPs used. These standards apply to both hot metal pre-treatment and secondary charging and tapping operations.	Deliver study - September 2007 Deliver time schedule and budget – June 2008
D8	New continuous casting machine CCM1 (currently under construction) using VAI equipment. Rehabilitation of CCM3, to convert it from bloom to billet casting.	Continuous casting is regarded as BAT and will result in reduced materials losses and energy savings. EU BAT standards for dust are either 5 mg/m^3 (new plant) or 15 mg/m^3 (existing plant). EU BAT also suggests the use of a closed loop water cooling system.	CCM 1: Construction completion – June 2008 CCM3: Construction completion – March 2009
D9	New ladle furnaces 1 and 2 – both under current installation.	EU BAT for ladling operations requires aspiration and bag filters to achieve a dust release of 5 g/tonne LS. All emissions must comply with the IFC/World Bank guidelines of 50 mg	Ladle 1: Construction completion – June 2008 Ladle 2: Construction completion

		dust/Ncm.	– March 2009
D10	Revamp of 350 mill	DMK to submit details when known on water systems to IFC to allow a judgement of whether BAT is being applied. The revamped mill should contain an efficient water recirculation system (scale removal) with a view to reducing overall plant water use, and that reduces the amount of oil sent onwards to the settlement ponds.	Submit design specifications – December 2009 Mill work upgrade scheduled for 2010
D11	Ore handling yard – in particular fugitive dust releases from the tippler.	Dust suppression systems should be installed in the ore handling yard. DMK will need to design and implement a dust suppression system for the ore handling yard, with focus on tippler caused fugitive emissions.	Concept design to be presented by December 2007, detailed design by Dec 2008, and completed by Dec 2009
D12	Lime kilns – dust emissions from main kiln stacks is approximately 200 mg/m^3.	DMK must investigate the options of improvements to dust abatement systems for the main kiln stacks. Improved abatement should be provided in the longer term, and that this should meet the World Bank particulate limit of 50 mg/m^3. A level of particulate of 100 mg/Nm^3 may be acceptable if the old equipment can be upgraded/optimized to achieve this.	Study completed by Dec 2007. If old system can be upgraded this has to be carried out by December 2007. If a new kiln option is pursued then to be completed by Dec 2010
D13	Water use and recycling/internal treatment systems in circuits – current overall site recycling rate is at c.81% (this is up from 62% at the start of the ESAP program). Low recycling results in elevated oils and suspended solids levels entering final treatment ponds. Further improvement of water recycling is needed.	DMK must improve treatment on a number of internal circuits to move towards a 95% recycle target. Some improvements will be incorporated as part of other improvements – e.g. the new sinter plant, 350 mill, the rail mill. As a result, they should achieve recycling rate of >90%.	Achieve >90% recycle rate by Dec 2010.
D14	Settlement pond is silted up causing poor performance, and elevated levels of suspended solids and oils discharged to the Dnieper.	The settlement pond is under continuous dredging to achieve the original design capacity of the pond. The direct discharge of effluent from this pond to the Dnieper River has ceased.	Compliance with local requirements and IFC/World Bank guidelines has been achieved by June 2007. Dredging and recycling of dredging sludge as sinter feed to continue.
D15	Boreholes used for monitoring of settlement pond impact are no longer functioning.	DMK must reinstall or clear boreholes used for monitoring groundwater quality in the vicinity of settlement pond.	Complete by March 2008

D16	Housekeeping with respect to oil storage and use is poor, resulting in localised ground contamination, and high levels of oils entering drainage systems.	DMK must improve all oil storage facilities to meet best practice. The rail works hop, waste oil storage and garages are priorities for improvement. A surface water run-off collection system must also be installed at vehicle workshop to prevent oily water run-off.	Complete by Dec 2009
D17	Waste management – a number of practices require improvement or permitting	DMK must ensure the following: Full permits and associated documentation must be obtained/undertaken for the quarries used for blast furnace sludge storage; and for other temporary or permanent storage or disposal sites as listed in the annual environmental report. Improved site practices to prevent the mixing of industrial and domestic wastes, proper storage of all waste materials, and to improve the analysis of any wastes that are sent off site for reclamation.	Full compliance by Dec 2009
D18	Protection Zone. The current zone contains 6000 households, who should in theory be resettled (but in practice accepted by Authorities that this is not feasible).	DMK must agree a reduced PZ area with the Authorities, following implementation of the CAPEX plan, and appropriate modelling/monitoring to confirm ambient air concentrations.	CAPEX plan completed Dec 2009 New Protection Zone agreed by Dec 2010.
D19	Resettlement of remaining households within Protection Zone.	DMK may be required to relocate an unknown number of remaining households following adoption of a new (reduced) protection zone. No estimate of the number of households can be made at present.	If required, timescale to be agreed between DMK and the Authorities.
D20	There is potential for contaminated land (soil and/or groundwater) liabilities to exist at the current steel making site. The long industrial history of these sites makes a degree of contaminative impact likely, but there is currently insufficient data to assess the nature or extent of any impact.	DMK should undertake a series of phased ground investigations at the sits. These investigations should include assessment of soil and groundwater, and should focus initially on contaminants likely to have associated with the steel making activities (metals including Cr, Pb, Ni, V, Zn, As, cyanides; sulphates, sulphides, phenols, oils & hydrocarbons).	Based on findings a clean-up or containment plan is to be agreed with the local authorities. Study and implementation period: 2007 – 2012 with milestones to be set by December 2007.

	AMK (A1 – A12)		
	Environmental Issue/Plant Feature	**Corrective Actions Required**	**Timetable Milestones/Events**
A1	Lime kilns - despite abatement plant produce very high (600-700 mg/m^3) levels of dust release.	Two new shaft kilns are under construction. These kilns will have extraction systems designed to release less than 30 mg particulate/Nm^3.	Kilns operational by September 2008.
A2	Sinter Plant. Current sinter plant produces high (300 – 400 mg/m^3) point source and large fugitive dust emissions as well as high workplace dust levels.	AMK has decided to initially construct a new sinter plant in two phases. Phase 1 will have the same capacity as the currently existing sinter plant, and Phase 2 will add a similar capacity, thereby doubling the in-house sintering capacity. Detailed design is yet to be undertaken, and no data on expected performance currently exists, but the new plant must meet, at minimum, the World Bank Standards of: particulate 50 mg/Nm^3; SOx 500 mg/Nm3; NOx 500 mg/Nm^3, VOC 20 mg/Nm^3. New plant should also preferably either meet or approach the EU BAT guidelines of: particulate <50 mg/NM^3; SO_2 <500 mg/NM^3 (achieved by feedstock control); PCDD/F 0.1 – 0.5 ng/NM^3.	Submit design specifications – July 2008 Phase 1: 2009-2010. Start-up of new sinter plant (phase 1) followed by the total close down of the existing sinter plant before the end of 2010. Phase 2: 20011-2012. Start-up of new sinter plant (phase 2)
A3	**BF#1** – currently under reconstruction and commissioning.	The new BF #1 will have secondary extraction to ESP plant to achieve <25 mg/Nm^3 particulate; and will also feature dust suppression at the bells. The unit will not initially have PCI (regarded as EU BAT), but a PCI unit is under construction (30% complete) and will deliver PCI for BF#1, as well as the coming BF#2 and a renovated BF#5. The PCI unit will be commissioned by June 2008. The new plant will include secondary fume collection for casting/tapping, enclosed and extracted conveyors and loading bunkers, and will as a minimum meet the World Bank Standard of 50 mg particulate/Nm^3. New plant will preferably either meet or approach EU BAT guidelines of: • Hot stoves – dust <10 mg/Nm^3, NOx<350 mg/Nm^3 • Blast furnace gas treatment with efficient de-dusting; to give a residual particulate matter concentration of < 10 mg/Nm3. • Secondary dust abatement to meet dust 1 – 15 mg/m^3, and fugitive	BF 1 operational in 2007.

		dust rates of 5 – 15 g dust /tonne iron.	
A4	Construction of a **new large BF#2 to replace BF#3 and BF#4**. No secondary abatement for casting/tapping/ore handling etc is installed on these old BFs resulting in high fugitive emissions and workplace dust/fume concentrations.	AMK has contracted Danielli to design and construct the new BF #2. Danielli has confirmed that the BF will be designed to meet or exceed the following emissions standards: Casthouse: Particulate matter (stack discharge to atmosphere): 30 mg/Nm^3 Slag Granulation System: SO2 emissions per cast is equal to or lower than 1 g/s. H2S emissions per cast is equal to or lower than 5 g/s Hot blast stoves: For CO content: Max. 500ppm / 625 mg/m3 / 73 g/sec at 3% of remaining oxygen in waste gas; For NOx content: Max. 15 g/s at 3% Oxygen remaining in waste gas. Stockhouse: Particulate matter (stack discharge to atmosphere): 30 mg/Nm^3	Construction scheduled for July 2007 – June 2009. Upon successful commissioning and production testing of the new BF#2, BF#3 and BF#4 will be closed down (before the end of 2009).
A5	Revamping of **BF#5**. No secondary abatement for casting/tapping/ore handling etc is installed on this BF resulting in high fugitive emissions and workplace dust/fume concentrations.	Upon successful commissioning and production testing of the new BF#2 (scheduled for June 2009, and no later than the end of 2009), BF#5 will be taken down for rehabilitation and installation of secondary emission control systems. AMK must confirm the main aspirated release points and predicated emissions, and provide design specifications to IFC to allow a full assessment against BAT to be made. A similar standard and type of plant design to BF #1 will be applied to this BF in the revamping. Other designs can be applied as long as full compliance with the IFC/World Bank guidelines is achieved.	Submit design specs – June 2009. Revamping start July 2009 (upon successful commissioning of BF#2) and last till June 2010 before emission control systems can be fully operational due to inability to finalize and start these during the winter.
A6	Open hearth furnaces will be replaced by Converters 1 and 2.	The converter shop will have primary extraction to ESP banks, guaranteed to <35 mg/Nm^3. Secondary extraction to bag filters guaranteed to <20 mg/Nm^3 The new plant will be constructed in compliance with IFC/WB guidelines. EU BAT standards are 5 – 15 mg particulate/Nm^3 (if bag filters used) or 20 – 30 mg/Nm^3 if ESPs used. These standards apply to both hot metal pre-treatment and secondary charging and tapping operations.	Construction completion and commissioning: Converter 1 – end of 2007 Converter 2 – early 2008 As the converters are successfully commissioning and production tested the OHFs will be closed down (all OHFs, 4 units, closed by June 2008).
A7	Emissions from new tandem furnaces (an improved and more energy efficient form of	As part of the IFC/World Bank requirement for full phase out of open hearth furnaces the tandem furnace will be phased out by 2012. Details	Prepare revised hot metal balance and deliver detailed

	OHF operation). Gas cleaning systems (primary collection only) are installed.	will be prepared in connection with the establishment of future hot metal balances. A third converter will be installed in the long term.	plan/design for assuring on-time tandem furnace phase out – June 2010. All tandem furnaces closed by Dec 2012.
A8	New material blending yard	AMK must submit details on dust suppression systems to IFC to allow a judgement of whether BAT is being applied. No design specifications are yet available. Dust suppression measures have to be included in the design and implementation.	Submit design specifications – June 2008 Construction scheduled for 2008 – 2009.
A9	CCGT power station utilising steel and coke plant waste gas.	Subject to separate funding and study by EBRD.	Construction scheduled for 2007 – 2009.
A10	Protection Zone (PZ). Current zone contains an unknown number of households, who should in theory be resettled (but in practice may be accepted by Authorities that this is not feasible).	AMK is preparing a model and a monitoring program to simulate and control the effect of the ESAP upgrades. Based on this AMK will agree with the Authorities on how to define and assure a reduced PZ area in the future.	Model and monitoring program, preparation, submission and agreement: July 2007 - Dec 2008 New Protection Zone established Dec 2010 (after proof of effect of ESAP program).
A11	Resettlement of remaining households within Protection Zone.	AMK may be required to relocate an unknown number of remaining households following adoption of a new (reduced) protection zone. No estimate of the number of households can be made at present.	If required, timescale to be agreed between AMK and the Authorities.
A12	There is potential for contaminated land (soil and/or groundwater) liabilities to exist at the current steel making site. The long industrial history of these sites makes a degree of contaminative impact likely, but there is currently insufficient data to assess the nature or extent of any impact.	AMK must undertake a series of phased ground investigations at the sites. These investigations should include assessment of soil and groundwater, and should focus initially on contaminants likely to have associated with the steel making activities (metals including Cr, Pb, Ni, V, Zn, As, cyanides; sulphates, sulphides, phenols, oils & hydrocarbons).	A clean-up or containment plan is to be agreed with the local authorities as part of new 10 year permit to be issued 2008. Study and implementation period: 2007 and onwards with mileposts to be set by December 2008.

	Alchevsk Coke Plant (CK 1 – 2)		
	Environmental Issue/Plant Feature	**Corrective Actions Required**	**Timetable Milestones/Events**
CK1	New coke oven battery 10-bis – battery construction completed, but quenching/cooling system still pending.	The new battery includes: dry quenching, a double collector main for charging emissions (smokeless charging), coke-side dust collection system, and standpipe water injection during charging. The battery will meet the World Bank guidelines which recommend dry quenching, collection of charging and pushing emissions, with mass releases (in kg/tonne coke) of particulate 50 mg/Nm^3, SO_2 0.5 mg/Nm^3, VOCs 0.3 mg/Nm^3, NO_x 0.6 mg/Nm^3. EU BAT recommends smokeless charging, dry quenching with heat recovery, coke oven gas de-SOx, low NOx technologies (stage combustion), and generally good maintenance and sealing of doors, lids, tops, ascension pipes etc.	The dry quenching system consists of 3 chambers, each with a capacity of 50% of the total needed for the battery 10-bis line. Dry quench Commissioning: Chamber #1: October 2007 Chamber #2: December 2007 Chamber #3: June 2008
CK2	There is potential for contaminated land (soil and/or groundwater) liabilities to exist at the current steel making site. The long industrial history of these sites makes a degree of contaminative impact likely, but there is currently insufficient data to assess the nature or extent of any impact.	Alchevsk Coke must undertake a series of phased ground investigations at the sits. These investigations should include assessment of soil and groundwater, and should focus initially on contaminants likely to have associated with the coke making activities (metals including CD, CR, Cu, Pb, Hg, V, Zn, As, cyanides; sulphates, sulphides, phenols, oils and hydrocarbons).	A clean-up and containment plan has been agreed with the local authorities for the period 2007-2012.