Put 5; Iaz 2; 3; 3A (Balan Central), Harghita County, Design: Spectral Deva

DESCRIPTION OF MINE AND PREVIOUS ACTIVITY

- Main activity of Put 5; Iaz 2; 3; 3A (Balan Central) is: Extraction of copper ore by underground methods. It extends on a surface of 43.2 Hectares including mine curtilages, waste tips, tailing storage facilities and other ancillary activities. The activity ceased in 2003

- Associated with former mining operations there are 1 waste tips, containing 60 000 cubic meters of mine waste. 3 Tailing storage facilities with on surface 37 ha and a volume of 7 500 000 cubic meters.

- The nearest community is Sandominic Town situated at 1000 m from mine, having 7 000 inhabitants and local watercourse is River Olt situated at 999 m from mine boundary.

- The mine water does not reach the surface.

CULTURAL PROPERTY

It is not anticipated to be applicable. However, if there is an accidental find of something valuable, the Engineer of the Contract will stop any physical operations until competent authority (County Commission for Historical Monuments or Ministry of Culture and Religious Affairs) provides permission to continue.

PROPOSED WORKS

The mine closure and environmental remediation proposals:

- General site clearance, removal of scrap metal and demolition of 11 buildings and structures, having a total volume of 830 cubic meters of demolition materials (concrete and bricks) which will be decontaminated, processed and used for filling of underground workings

- Collection of contaminants and contaminated materials and disposal to a special constructed landfill. The location and size of landfill should be decided by the Engineer of the Contract based on quantity of unaccepted material identified on site. Three isolation layers shall be placed onto the compacted surface: a bentonite mattress 2.5 cm depth, a geomembrane layer of 2.5 mm and a geotextile layer of 5 mm. On completion of the final layer of unacceptable material the surface shall be domed to assist water run off. A gas ventilation pipe shall be placed at the highest point.
- Filling and capping of 1 shafts. Filling and sealing of 3 adits. Closing of raises, boreholes or other minor mine workings connected to the surface.

- Excavation and removal of 150 000 mc. of material from waste tips, curtilages, benches and slopes.
- Reshape of all mine waste dumps and TSF to appropriate slope angles below 1/3. Construction of erosion fences and gabion walling to ensure long term stability and erosion control.

- Top soiling, cultivation and grassing of 6 ha, and planting of 3 ha with local species of trees or shrubs.
- Protection of rehabilitated surfaces and Affluent river by guard ditches and drainage systems in total length of 1200 m.

- Rehabilitation of tailing storage facilities by:

- reshaping and regarding of tailing material to slope angle below 1/3;
-construction of deep perimeter drains, side and toe drains
- topsoiling and re-vegetation (grassing on platforms and planting on slopes) of the tailing dam
- if local materials are used, make sure they are chemically and biologically inert and sufficiently resistant to weathering. No low-grade ores must be used.

KEY ENVIRONMENTAL ISSUES DURING THE CONSTRUCTION WORKS

Depending on works, equipment and methods used for execution of works the following environmental issues might occur:

- Noise, dust and mud generated by earthmoving equipment;
- Noise, dust, smoke and vibrations generated by blasting operations;
- Potential land pollution by fuel, oil or lubricants because spillage from earthmoving equipment or lorries;
- Potential water pollution by fuel and oil because spillage from equipment while working above, adjacent or in watercourses;

- Potential soil or water pollution by used waters generated by site activities in offices, workshops and -messes;
- Potential underground water pollution by contaminated material used for filling of underground workings;
- Damage of existing vegetation from or adjacent of site because of negligent driving of equipment or site operations;
- Damage of public roads because of traffic, equipment or site operations;
- Potential soil or water pollution by spillage of tailing material from lorries or while working on tailing storage facilities.

COMMUNITY CONSULTATION (See annex "Consultarea comunitatilor – Obiective scanate")

ANNEX 1 – MITIGATION PLAN
PUT5;IAZ 2, 3, 3A MINE

Phase/Operation	**Issue** Mitigation Measure	Cost	**Institutional Responsibility /** Approval and inspection
1 CONSTRUCTION			
A Demolition Works			**Contractor**
(a) Blasting of buildings and structures	**i. Noise:** - Restriction of blasting program to 8:00 – 18:00 o'clock, Monday to Saturday; - Informing of the affected community SANDOMINIC town about blasting program; **ii. Vibration:** - Restriction of the explosive quantity for each charge – 0.5Kg/blasting hole, minimum 1 second delay each other; **iii. Dust and smoke:** - Dust suppression measures (wet blasting) - Restriction of blasting when wind drive dust and smoke over the SANDOMINIC town area;	Contract	Engineer of Contract
(b) Processing of demolition materials	**i. Dust:** - Dust suppressors (wet processing) **ii. Noise:** - Location of the processing facilities not less than 1Km far from SANDOMINIC town; - Noise screens around of processing equipment if necessary; **iii. Pollutants on or in demolition materials:** - Selection of the contaminants from demolition materials before being processed. Contaminated materials will be disposed off separately at landfill;		Engineer of Contract
(c) Haulage/deposition of demolition materials	**i. Mud** - Keeping the lorries clean while working on or outside of the site area; - Establish cleaning pad and tyre washing area at construction zone boundaries;	Contract	Engineer of Contract

Phase/Operation	Issue Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
	ii. Dust - Sprinkling of demolition materials on lories and at dumping location; - Cover of lories if the haulage is through inhabited area SANDOMINIC;		
B Earth Works			**Contractor**
(a) Excavation and loading of materials	**i. Lubricant and/or fuel spillage:** - The equipment should be inspected[1] for technical compliance with safety end environmental regulations, by the Engineer monthly. Equipment which will not pass the inspection will be removed from the site according with contractual clauses; **ii. Spillage of tailing materials during of works on tailing dams:** - Access roads will be refurbished in accordance with kind of equipment, duration of works, before to commence any works; - Using of sealed lories for haulage of tailing material outside of TSF; **iii. Failure of benches or slopes during of works:** **-** Each work bench for excavators and access roads on excavation place will be constructed to comply with Technical Prescriptions appended (TP-C**), 1997 edition; **-** Fencing and barriers around of unstable areas; **-** TSF slope construction: use appropriate excavation and support sequence during construction of retaining walls to avoid construction-induced failures		Engineer of Contract
(b) Haulage/deposition spread/level/place	**i. Noise during the transport on site or public roads;** **-** Restriction on haulage program to 8 o'clock 18 o'clock, Monday to Saturday; **-** Restriction of lorries speed to 30Km/h, or less as agreed with community; **ii. Mud and dust on public roads:** **-** Cleaning of lorries wheel before emerging from loading/unloading location; **-** Suppress of any spillage from lories during the transport by **sealing** off; **iii. Noise:** **-** Noise suppressors at the exhaust pipes;		Engineer of Contract
C Concrete works			**Contractor**
(a) preparing and placing of	**i. Concrete outside of construction areas:**		Engineer of

Phase/Operation	Issue Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
concrete in situ **(b) haulage of concrete**	- Using only mechanical batching equipment for preparing of concrete; - Location of batching facilities for concrete to be approved by the site Engineer i. **Pollution of public roads because of concrete spillage during the transport** - Using only specialised concrete transport trucks for haulage of concrete; - Cleaning of site at the end of each day;		Contract
D General Works			**Contractor**
(a) Working adjacent over or in water courses or accumulation (OLT RIVER)	**i. Surface waters pollution** - Working with equipment free of any pollutant in vicinity of river; - Fencing or erecting of barriers river; **ii. Rainfall control** - Construction of guard ditches to control runoff and to protect lakes or rivers **iii. Underground water pollution** - Filling material used for underground workings will be inspected by the Engineer before to be used. Inspection will guarantee that it is free of deleterious materials;	Contract	Engineer of Contract
(b) Cultivating re-vegetation and curing of existing vegetation	**i. Pollution with unacceptable pesticides** - Using only fertilizers approved by the engineer of contract; - topsoil, subsoil or natural fertilizer will be tested by laboratory analyses to be free of pesticides heavy metals or any other unaccepted materials; **ii. Damage of existing vegetation** - The Engineer will keep the necessary records of number of trees and existing natural grassed areas. The contractor will restore on his own cost any damage on vegetation.	Contract	Engineer of Contract
(c) Operation of site offices, workshops	**i. Pollution of the area adjacent of offices, workshops and storage facilities** - construction of site facilities on approved by the engineer of contract areas, having all necessary facilities to deal with domestic and industrial waste; - industrial and domestic waste should be disposed of daily at site landfill;	Contract	Engineer of Contract
E Hazardous materials			**Contractor**
(a) Decontamination of buildings and	**i. Accidents involving contaminated materials.** - storage of hazardous chemicals in areas approved by the Engineer of the contract;		

Phase/Operation	Issue Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
equipments by flotation reactants	collection of contaminated materials still contamined in the flotation building and equipment and disposal at open pit as it was approved by the Environmental Permit; - washing of flotation equipment and location before to be demolished or decommissioned. The resulted materials will be disposed of at open pit; - neutralizing of the equipment and their location with lime solution 10% before to be removed or demolished;		
(b) Storage, handling/ using of explosives	**ii. Accidents involving explosives** - Using of proper storage facilities (existing explosive storage facilities); - Using containers and lorries approved by the Engineer of the Contract; - Security of storage, authorized access only		Engineer of Contract
(c) Storage using distributing of fuel and lubricants	**i Spill of lubricants and/or fuel** - Using of spillage collection vessels in storage facilities. Cleaning of the storage area every day disposing off any contaminated material. iii. **Fuel/oil spillage during refilling operations** - construction and operate of fuel/oil repository - using only filling pump installed on refilling tank to refill equipment on site; **iii. Fire on storage facilities** **-** construction of fuel storage facilities on location and according an approved by the engineer method of construction; **-** fire extinguishing equipment as regulation for fire fighting and control asks[2]		Engineer of Contract

ANNEX 2 – MONITORING PLAN
PUT5; IAZ 2, 3, 3A MINE

Issue	Where is parameter to be monitored	How is parameter to be monitored	Frequency of measurement	Responsible for the measurement
A. CONSTRUCTION				
i. **Noise** generated by: • Blasting; • heavy machinery • lorries	On site and inhabited area	Noise measurement equipment (dB-meter[1])	Daily	The Engineer of the Contract
ii. **Vibration** generated by: • Blasting; • heavy machinery • lorries	near sensitive buildings	Vibrometer	A measurement should be performed to establish level of blasting and transport along the inhabited area	The Engineer of the Contract
iii. **Dust** generated by: • blasting • traffic and equipment and lorry's	On site and inhabited area	Visual	Daily	The Engineer of the Contract
iv. **Smoke** generated by: • blasting • equipment and lorry's engines	On site and inhabited area	Visual for blasting; Specialised equipment for engines	Monthly and when a new equipment is bring on site	The Engineer of the Contract
v. **Mud** generated by • traffic on site and public roads	On site and inhabited area	Visual	Daily	The Engineer of the Contract
vi. **Soil pollution** by fuel oil • Fuel and lubricants (tank leaks, engines leaks, other operations involving fuel and lubricants) • Cement or concrete	• Where fuel and lubricants are stored; • Where equipment is refilled; • Where equipment is maintained • Where fuel/lubricants are used;	Visual	Daily	The Engineer of the Contract

Issue	Where is parameter to be monitored	How is parameter to be monitored	Frequency of measurement	Responsible for the measurement
• Contaminated material (tailing material, chemicals)	• Where concrete is prepared, transported, used • Tailing storage facilities and flotation			
vii. Water pollution • Fuel and lubricants • Suspensions carried out by rain fall	Where working near or in water course Effluent waters; Monitoring points on receptor stream OLT River	Laboratory analysis	Monthly during the works or as specified in monitoring program	The Engineer of the Contract
B. POST CLOSURE				
i. Water - heavy metals - pH	Afluent rivers - OLT and monitoring TSF	Laboratory analysis	Monthly until the parameters become compliant with approved limits by the Governmental Decision 188/2002	Conversmin
ii. Soil - heavy metals - pH	Rehabilitated surfaces	Laboratory analysis	Yearly until the parameters become compliant with approved limits by the Order 756/1997 issued by Ministry of Waters Forestry and	Conversmin

Issue	Where is parameter to be monitored	How is parameter to be monitored	Frequency of measurement	Responsible for the measurement
			Environmental Protection	
iii. vegetation - vegetation density - vegetation	Cultivated and planted surfaces on curtilage, waste tips	Visual	Yearly	Conversmin
iv. stability of waste tips or impoundments - settlement - erosion	Stabilised or deposition areas	Visual and topographic survey Standpipes and piezometers	Yearly	Conversmin