Baia de Aries - Complex Vechi Put Iosif Mine, Alba County, Deva **Design: CEPROMIN**

DESCRIPTION OF MINE AND PREVIOUS ACTIVITY

Main activity of Baia de Aries - Complex Vechi Put Iosif Mine is: Extraction of Au, Ag and Cu ore by underground methods. It is extended on a surface of 18 Hectares including mine curtilages, waste tips, tailing storage facilities and ancillary activities. The activity was ceased in 2000

Associated with former mining operations there are 4 Waste tips, containing 900,000 cubic meters of mine waste, 1 Tailing storage facilities with a volume of 2,500,000 million cubic meters

The nearest community is Baia de Aries Town situated at 2,300 m from mine, having 11,000 inhabitants and local water course is River Aries situated at 1500 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, removing of scrap metal and demolition of 11 buildings and structures, having a total volume of 1600 cubic meters of demolition materials (mainly concrete and bricks) which will be disposed off at waste tips and crown holes
- Collection of contaminants and contaminated materials and disposed off at 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.
- Decontamination of equipment and buildings of cyanide
- Filling and sealing of 2 adits. Closing of boreholes or minor mine workings connected with surface.
- Excavating and moving of 45000 mc. of material from waste tips, curtilages, benches and slopes.
- Reshape all mine waste dumps and TSF to appropriate slope angle, generally below 1/3. Construction of erosion fences and gabion walling to ensure long term stability and erosion control.
- Seeding of 23 Ha, and planting of 8.5 Ha with local species of trees or shrubs, including waste dumps, TSF and other mine lands
- Protection of rehabilitated surfaces and affluent river by guard ditches and drainage systems in total length of 1500 m.

- Rehabilitation of tailing storage facilities by:

- *Fencing the lagoon(s)*
- *Draining off the water still contained in the tailing dam*
- *Strengthening the retaining structure*
- *Construction of deep perimeter drain, side and toe drains*
- *Regrading, capping and revegetation of the dam*

KEY ENVIRONMENTAL ISSUES DURING THE CONSTRUCTION

Based on works, equipment and methods used for execution of works 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
BAIA DE ARIES COMPLEX VECHI – PUT IOSIF 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 Baia de Aries 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)	Contract	Engineer of Contract
(b) Processing of demolition materials	**i. Dust:** - Dust suppressors (wet processing) **ii. Noise:** - 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;	Contract	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; **ii. Dust** - Sprinkling of demolition materials on lorries and at dumping location;	Contract	Engineer of Contract
B Earth Works			**Contractor**

Phase/Operation	Issue - Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
(a) Excavation and loading of materials	**i. Lubricant and/or fuel spillage;** - Each equipment should be inspected[1] by the Engineer monthly. Equipment which will not pass the inspection will be removed from the site; **ii. Spillage of tailing materials during of works on tailing dams** - Access roads will be prepared before to commence any works; - Using of sealed lorries for haulage of tailing material outside of TSF; - Have equipment (sweeping machines or such) on site for tailings spill cleanup; **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;	Contract	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 lorries during the transport by sealing off; **iii. Noise** - Noise suppressors at the exhaust pipes;	Contract	Engineer of Contract
C Concrete works			**Contractor**
(a) preparing and placing of	**i. Concrete outside of construction areas:**	Contract	Engineer of

[1] Inspection is referred to visual to identify possible oil or fuel spillage, level of noise and level of smoke produced by the equipment's engine (fummeter), status of tires and legal status related to periodic Technical Inspection as law asks for. (Note: according with Romanian Law for Public Road Circulation each vehicle should to pass periodic technical inspection. The inspection refers to: brakes efficiency, steering efficiency, emissions in exhaust system, lighting system, horns and noise. The vehicles, which pass the inspection, receive a licence). For other equipment used on site like Bulldozers, tractors, excavators this is not compulsory.

Phase/Operation	Issue - Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
concrete in situ	- Using only mechanical batching equipment for preparing of concrete; - Location of batching facilities for concrete to be approved by the site Engineer;		Contract
(b) haulage of concrete	i. **Pollution of public roads because of concrete spillage during the transport** - Using only specialised lorries for haulage of concrete; - Cleaning of site at the end of each day;	Contract	Engineer of Contract
D General Works			**Contractor**
(a) Working adjacent over or in water courses or any body of water	**i. Surface waters pollution** - Working with equipment free of any pollutant in vicinity of water courses; - Fencing or erecting of barriers near river Aries; **ii. Rainfall control** - Construction of guard ditches to control runoff and to protect water courses **iii. Underground water pollution** - Interdiction to use filling material for underground workings which contains deleterious materials	Contract	Engineer of Contract
(b) Cultivating re-vegetation and curing of existing vegetation	**i. Pollution with unacceptable pesticides** - Using only approved fertilizers (standard); - 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 areas, having all necessary facilities to deal with domestic and industrial waste; - industrial and domestic waste should be disposed off daily at site landfill	Contract	Engineer of Contract
E Hazardous materials			**Contractor**
(a) Decontamination of buildings and equipment	**i. Accidents involving contaminated materials** - Storage of hazardous chemicals, in areas approved by the Engineer of the contract;	Contract	Engineer of Contract

Phase/Operation	Issue - Mitigation Measure	Cost	Institutional Responsibility / Approval and inspection
by flotation reactants (cyanide)	- Collection of contaminated materials still contained in the flotation building and equipment and disposal at tailing dam; - Washing of flotation equipment and location before to be demolished or decommissioned. The resulted materials will be disposed off at tailing dam;		
(b) Storage, handling/ using of explosives	**i. 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;	Contract	Engineer of Contract
(c) Storage using distributing of fuel and lubricants	**i. Spill of lubricants and/or fuel** - Using of spillage collection tanks in storage facilities. Cleaning of the storage area every day disposing off any contaminated material. ii. **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]	Contract	Engineer of Contract

[2] Depend on size of storage facilities the fire extinguish equipment and means must be supplied. Fire extinguishers (water, CO_2, foam etc). and hand shovels, picks, hook and 1 cubic meter of sand. For large fuel storage facilities is compulsory a permanent water source and necessary hoses etc.

ANNEX 2 – MONITORING PLAN
Baia de Aries COMPLEX VECHI 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 Baia de Aries	Noise measurement equipment (dB-meter)	Daily	The Engineer of the Contract
ii. **Vibration** generated by: • Blasting; • heavy machinery • lorries	near sensitive buildings within Baia de Aries at TSF, if blasting is carried out closer than 500 m	Visual	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 • trafic 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; • Where concrete is prepared, transported, 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)	• Tailing storage facilities and flotation			
vii. Water pollution • Fuel and lubricants • Contaminated water seepage from waste tips, tailing lagoons (Cu, Pb, Zn,) • Suspensions carried out by rain fall	Where working near or in water course Effluent waters; Monitoring points on receptor stream Aries	Laboratory analysis	Monthly during the works	The Engineer of the Contract
B. POST CLOSURE				
i. water - heavy metals (Cu, Pb and Zn) - pH	Affluent rivers – Aries	Collection of samples and laboratory analysis for Heavy metals and pH	Monthly until the parameters become compliant with approved limits by GD 188/2002	Conversmin
ii. soil - heavy metals - pH	Rehabilitated surfaces	Laboratory analysis for Heavy metals and pH	Yearly until the parameters become compliant with approved limits	Conversmin
iii. vegetation - vegetation density - vegetation	Cultivated and planted surfaces on curtilage, waste tips and tailing storage facilities	Visual	Yearly	Conversmin
iv. stability of waste tips or impoundments - settlement - erosion - seepage line, phreatic surface	Stabilised or deposition areas	Visual and topographic survey Standpipes and piezometers	Yearly	Conversmin