

TECHNICAL REPORT

FYR MACEDONIA

SITE: 1 Radovis Municipality: Bucim copper mine

SITE: 2 Lojane Municipality : Chromium & Antimony Beneficiation Plant

ENVIRONMENTAL/HUMAN HEALTH PROBLEM

Bucim is an open cut copper mine with several sources of waste water and dust that can impact harmfully on human health and the environment. There is currently contaminated water with extremely high levels of harmful metals (i.e. Cadmium) leaving the site and moving downstream where they would impact on humans, environmental health and livestock for many kilometers. There are a number of sources of dust from the tailings ponds, the active mine activities and a number of other sources that can be carried onto the surrounding country side and nearby villages where the heavy metals again could pose a risk of harm to human and environmental health and the consumption of agricultural products grown in the immediate area.

Lojane is a relatively small underground mine with associated metals processing for Chromium and Antimony. The nature of the ore and the subsequent processing residues produced from past activities has left the site highly contaminated with toxic heavy metals including Arsenic, Cadmium, Mercury etc. The very close proximity of the school and the local village to the uncovered process wastes, degraded drums of arsenic oxide, tailings and contaminated waters presents an extreme risk of harm to human health and the environment.

INTERVENTION & WORKS

For Bucim the proposed intervention aims to reduce heavy metal impacts from dust and drainage waters through diverting clean water from the contaminated drainage waters, constructing a waste water collection and treatment system for the mine, tailings and waste rock drainage, re-vegetation of **stabilized tailings, and stabilization of temporary sources of dust with "boom and barrier sprays"**.

For Lojane removal and/or containment of concentrated mining wastes, process and tailing wastes are proposed with a particular emphasis on the improvement of air quality in the school.

CURRENT POSITION

For Bucim a company has been appointed to finalize the design for the (i) mine water collection and treatment system. At this point a feasibility study has been produced with several technical solutions presented. All have the capability of preventing any of the waste rock drainage from being discharged downstream.

A preferred option has been identified that has the advantage of lower operating costs (through recovery of saleable copper) but with the disadvantage of much greater construction costs. Bucim mine management is considering the preferred option but the economic advantages of this system may have been eroded by the recent plunge of copper price to 1/3rd of its recent value. Bucim Mine

has provided assurances that it will meet its commitments in relation to the remediation works despite the current economic difficulties which has included a temporary shutdown of the mine.

In relation to the (ii) tailing dump re-vegetation, this has now been completed on 10 hectares of the site while for the (iii) short term dust control measures technical designs have been finalized and are undergoing independent review before tendering is conducted for the final procurement and construction.

For Lojane there has been little progress as the necessary approvals from the mine concessionaire have still not been obtained and under National Law this is required to gain access to the site to conduct the necessary physical works. The latest information is that the concessionaire will move the ore concentrate from the site for export but it appears they have missed some critical dates by which a (reduced scope) Environmental Assessment is required. The NPC and UNDP Country Office have been working closely with the relevant ministries to try and address the impasse and have sought further legal opinion regarding access to the site and status of the concentrated mining wastes.

NEXT STEPS

In relation to the waste rock drainage collection and treatment system the next step is for Bucim Mine to confirm it will be proceeding with the preferred choice or pick one of the other treatment technologies. The detailed technical design can then be finalized and once reviewed the procurement and construction phase can commence. In relation to the short term dust control measures procurement and construction can be contracted once the independent review is finalized.

For Lojane if access to the site cannot be gained by early 2009 it is recommended that another high priority hotspot is identified and that intervention funds are used to remediate that site instead. Although this would mean there would not have been a physical intervention on the site it is still recommended that a comprehensive community education program be conducted based on the studies conducted on areas and crops which are more likely to represent a risk to the community and education be conducted on minimizing the effects of heavy metal impact through surface dusts (i.e. living with lead approaches) as part of the public awareness raising campaign efforts in the programme.

Further environmental monitoring/modeling is required to demonstrate the positive impact on human and environmental health resulting from the physical works conducted to reduce heavy metals, acid drainage and dust from impacting on the area. While some monitoring has been conducted there is a need to conduct specific monitoring/modeling to show the reduction in load and concentration of dust and heavy metals on the environment. Specific areas to monitor include further downstream sampling of contaminants of concern, characterization of the tailings dam materials, monitoring of dust deposition and heavy metal profiles in nearby villages.

CTA and technical PA will work closely with the NPC, UNDP Country Office and partners in further developing a monitoring program.