Global Mercury Project

Project EG/GLO/01/G34: Removal of Barriers to Introduction of Cleaner Artisanal Gold Mining and Extraction Technologies

Technical Measures

For Incorporation into the

U.N. International Guidelines on Mercury Management in Artisanal and Small-Scale Gold Mining

Draft

June 2007

I. PREAMBLE

The *U.N. International Guidelines on Mercury Management in Artisanal and Small-Scale Gold Mining* are proposed for the purpose of assisting governments in the development of policy, legislation and regulation that will lead to improved practices of artisanal and small-scale gold mining (ASM). These measures are formulated based on health, environmental, technical, socio-economic and legal assessments that were undertaken by the Global Mercury Project. This project was initiated with the support of the Governments of Zimbabwe, Tanzania, Sudan, Indonesia, Brazil and Laos, with the United Nations Industrial Development Organization (UNIDO), the Global Environmental Facility (GEF) and the United Nations Development Program (UNDP).

In more than 50 developing countries across Asia, Africa and South America, an estimated 15 million people are involved in artisanal and small scale gold mining (ASM). This activity usually involves the use of substantial amounts of mercury in mineral processing, often in highly unsafe and environmentally hazardous conditions. As many as 100 million people may be affected, directly and indirectly, by mercury emitted from ASM. Mercury is a neurotoxin that bio-accumulates through the food chain, and mercury misuse in ASM is responsible for an estimated 1000 tonnes of mercury polluted annually into the environment, with negative impacts in diverse ecosystems including international waters. Globally, many of the hazards are similar – extensive emissions in tailings, contamination of water bodies, vapor inhalation, etc. However, environmental regulations are minimally developed for ASM in most countries or not yet developed, and consequently, mercury is generally unaddressed.

In the absence of an international management code for mercury management in ASM, many governments have been unsure how to address policy in ASM, what hazards are most pressing, and what technical practices should be regulated. These guidelines are aimed at providing technical assistance on standards of operation to promote the minimization of mercury use as well as the elimination of major pollution point sources and occupational health risks in mercury management

II. SCOPE

These guidelines provide minimum threshold standards that significantly reduce mercury emission and exposure where properly implemented. However, in all cases possible, miners should be encouraged to adopt appropriate mercury-free mineral processing methods. Various technical and environmental aspects of mercury management in ASM are addressed in these guidelines. The central aims of these guidelines are to assist governments in the development of legislation and/or regulation to accomplish the following goals:

(1) reduce ASM-related mercury emissions into the environment;
(2) reduce occupational exposures to mercury;
(3) reduce second-hand exposures by non-miners as well as miners;
(4) eliminate the major inefficient and unsafe practices of mercury use; and
(5) reduce unsafe storage and disposal of mercury

III. IMPLEMENTATION

Governments should identify the appropriate authority responsible for implementation of these guidelines, and make any appropriate modifications to the technical measures to include in developing new mercury laws, policies or regulations. It is recommended that such policies be adopted under the clear jurisdiction of authorities that are responsible for small-scale mining issues, in consultation with other relevant authorities, recognizing that such authorities may be best suited to conduct monitoring.

Strong emphasis should be placed on encouraging local-level governance and community-based monitoring systems. Community stakeholder participation in the processes of policy development and field implementation are critically important.

Governments should provide education of small-scale miners on environmental management. Technological assistance and capacity/education services should be provided in all areas where there is a high concentration of small-scale miners.

IV. PRINCIPAL TECHNICAL MEASURES

1. MERCURY AMALGAM BURNING

No person should heat mercury amalgam to recover the gold without using a retort, which must be used to contain the mercury vapour releases. Retorts should be used to recycle mercury (in the form of a bowl retort, pipe retort, hood, filter, etc).

2. NO WHOLE ORE MERCURY AMALGAMATION

No person should amalgamate the entire ore, through the use of a mercury-copper plate or putting mercury into any gravity concentrator, centrifuge, or ball mill.

3. AMALGAM BARRELL

Mercury may be used through a gold recovery unit equipped with an amalgam barrel, provided that the barrel has an amalgam separator.

4. NO MERCURY-CYANIDE INTERACTION

No person should use mercury in conjunction with cyanide, or conduct cyanidation of mercury-rich tailings.

5. PROTECTION OF WATER BODIES

No person should use mercury for amalgamation or any other purposes in any natural water body or within a distance of 100 metres from any natural water body, including rivers, streams, lakes, and other water bodies.

6. PROTECTION OF RESIDENTIAL AREAS

No person should use mercury for amalgamation or any other purposes in residential areas or within a distance of 100 metres from any residential areas, including villages, towns, cities, or settlement areas.

7. STORAGE OF MERCURY

Mercury should be stored safely at all times when not used; in (a) a secure location that is inaccessible to children; and (b) unbreakable air-tight containers that are covered with a thin layer of water (e.g. 1 centimetre) to prevent mercury evaporation.

8. DISPOSAL OF MERCURY OR MERCURY-CONTAMINATED TAILINGS

Any disposal of mercury should be done in a safe and proper way. No person should discharge mercury, or mercury-contaminated tailings, into a water body. Disposal of mercury must be done by placing mercury in a clay or laterite soil-lined pit of 5 metres depth, located 100 metres away from any water body. When the hole is filled with mercury and/or mercury-contaminated tailings, this must be covered with 0.5 metres of clay or laterite, then compacted, covered with soil, and revegetated.

9. CENTRALIZED AMALGAMATION SITES

Amalgamation should only be allowed in designated sites (amalgamation pools). For any mining location where amalgamation occurs, the primary license holder or mine manager shall designate a portion of the mining location as the prescribed structure, facility or locale where amalgamation may take place. Amalgamation may only take place in such structure, facility or locale. The holder of an ASM license shall ensure that washing or settling ponds are constructed in his or her license area to provide for washing and sluicing, and no such washing and sluicing shall be done along or close to rivers, streams or any other water sources.

10. PROTECTION FROM FLOODING

The location of amalgamation, and the building where mercury is kept after and before the amalgamation process, bust be situated in areas free of flooding.

11. RESPONSIBILITY OF EMPLOYERS

On a mine location where mercury is used, the primary license holder or mine manager should be held responsible for safe mercury-related practices as well as the individuals who use mercury. The license holder or manager should: (a) institute reasonable safety measures to prevent the exposure of employees or other persons to mercury fumes; (b) provide retorts and instruction on how to use retorts; and (c) ensure that no employee or other person handles mercury unless they are wearing suitable protective clothing, including gloves; and should provide such protective clothing free of charge

12. PROTECTION OF PREGNANT WOMEN AND CHILDREN

People who perform amalgamation must ensure that no pregnant women, or children under the age of sixteen, enter the structure, facility or locale in which amalgamation is carried out;

13. AMALGAMATION LICENSE

In a location where amalgamation occurs, the manager of the location should hold an amalgamation license.

14. PRIOR DEMONSTRATION OF MERCURY AWARENESS

When miners apply for mining licenses and before beginning operations, they should demonstrate awareness of how to comply with these guidelines.

15. MERCURY-FREE METHODS

The above guidelines demonstrate minimum *threshold requirements*. These measures significantly reduce mercury emission and exposure where properly implemented. However, in all cases possible, miners should be encouraged to adopt appropriate mercury-free mineral processing methods.