

M501: MEASUREMENT OF HAZARDOUS SUBSTANCES INCLUDING RISK ASSESSMENT

CASE STUDY 3 - SUPPLEMENTARY INFORMATION FOR COURSE PRESENTER

As with all case studies the aim is to reinforce the knowledge previously transmitted in lectures by application of those learnings to a practical situation.

As described in the Teaching Guide, students should break into their groups and use the information provided to undertake the required tasks.

As gold extraction may be an unfamiliar process to many students, a short overview of the process using the supplementary information in the case study should be provided.

Students should be challenged with the question: *If you were the hygienist asked to assess this situation how would you go about that process?*

There are two parts to the process that students are being asked to consider. These are:

- a) The transportation of crushed ore including the extraction of gold, using added chemicals (photographs 1 & 2).
- b) The smelting of impure gold following electrolysis (photograph 3).

Key points that students should note as part of their initial appraisal are:

- a) **Extraction Process**
 - Transportation of the crushed ore via conveyor does not produce significant dust levels due to the ore being wet (photograph 1).
 - Addition of the hydrated lime does give rise to significant levels of dust (fine hydrated lime) as can be observed in photograph 2.

- The person adding the hydrated lime appears to be wearing respiratory protection and a raincoat so as to protect themselves from exposure to the corrosive dust.

While not part of this course it may be useful to point out that the use of an impervious plastic raincoat in this manner in a tropic West African climate could give rise to other issues such as heat stress.

- Maintenance of pH levels is critical so as to minimise the evolution of hydrogen cyanide.

b) **Smelting Process**

- The smelting process can release other metals such as mercury as a vapour.
- The extraction system is not well maintained thus reducing the capture velocity of the hood.
- As the extraction system is inefficient, not only is there potential for the metal impurities in the gold that are liberated as a vapour (eg mercury) to build up, but also the combustion gases of the furnace (eg carbon monoxide).
- Heat may also be a problem as radiant heat from the furnace.

Students should be encouraged to use the material in Section 5 of the manual to assist them in designing their surveys and presentation.