

## E-Tech International

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### E-Tech Releases Study on Water Quality at Goldcorp's Marlin Mine

E-Tech International, an environmental technical support organization that assists communities, has released “**Evaluation of Predicted and Actual Water Quality Conditions at the Marlin Mine, Guatemala.**” The study assesses the reliability of water quality predictions made in the mine’s environmental impact study (EIA&S), which was used by the International Finance Corporation (IFC) when it decided to fund the mine. The E-Tech study compared these predictions against operational conditions using publicly available data collected by Goldcorp, Guatemalan agencies, and Guatemalan non-profit organizations. We anticipate conducting similar studies of three other mines.

Although no moderate or serious negative environmental effects were predicted before mining began, E-Tech findings suggest that some important predictions underestimated the environmental effects of the mine.

E-Tech Chief Scientist Dr. Ann Maest identified the following concerns about the original environmental and social impact study:

- The baseline (pre-mining) water resource monitoring period was too short and provided limited information about surface water, groundwater, and aquatic biological resources in the vicinity of the Marlin Mine.
- Hydrologic connections between groundwater and surface water and pathways for movement of contaminants from the mine were not studied sufficiently to design a reliable monitoring network.
- Mine wastes were predicted to generate little pollution, but no supporting documentation was provided.
- Moderate to strong *improvements* to the environment were predicted as a result of mining, yet these were wrongly compared to post-mining rather than pre-mining conditions.

**The primary findings** of the E-Tech study include:

- *The mine wastes have a moderate to high potential to generate acid and leach contaminants to the environment. Wastes with higher acid generation potential will release higher concentrations of metals and pose a greater risk to water and aquatic biological resources.*
- *Although more information is needed, existing data suggest that tailings seepage may be migrating to the drainage downstream of the tailings dam. A hydrogeologic and water quality study is needed to fully assess potential leakage from the tailings impoundment.*
- *Water in the tailings impoundment does not meet IFC effluent guidelines. Maximum concentrations of cyanide, copper, and mercury measured in 2006*

were over three, ten, and 20 times IFC guidelines, respectively. The EIA&S predicted that tailings water would meet IFC effluent guidelines. Treatment is planned for tailings water discharged to the environment, but treatment will not address leakage of contaminants to groundwater.

- *Groundwater flow directions and seepage pathways from contaminant sources to groundwater and surface water are poorly understood.* Concentrations of mine-related contaminants are increasing in groundwater near the open pit, but the source and direction of movement of the contaminants are unknown. More groundwater monitoring is needed.

**Technical recommendations** include:

- Monitoring: The groundwater, surface water, and discharge monitoring systems should be expanded.
- “Adaptive Management”: An “adaptive management” plan with citizen involvement and annual meetings should be created. Monitoring results from the previous year should be reviewed, and changes in operations should be recommended and carried out.
- Studies needed: A hydrogeologic study of groundwater flow directions, pollutant transport pathways, and the extent of hydrologic connection between mine facilities and water resources and downgradient water resources should be conducted quickly.

**Policy Recommendations** include:

- Water quality standards: MARN should develop water quality standards for protection of all possible surface water and groundwater uses.
- Bonding requirements: The Ministry of Energy and Mines should develop mechanisms and requirements for bonding of hard rock mines in Guatemala. A bond is an amount of money held in reserve to cover unforeseen expenses associated with environmental impacts that occur after mine closure. Actual costs of reclamation, closure, and post-closure should be incorporated into bonding.
- Independent monitoring: A well funded, independent, transparent, and scientifically rigorous monitoring system is needed with participation from all stakeholders.

“It is our belief that, given the level of tension and suspicion surrounding the Marlin Mine and uncertainty about the degree of environmental impact, the recommendations from our report should be implemented as quickly as possible by the mine and the appropriate Guatemalan authorities,” said E-Tech Director Richard Kamp.

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