



Heavy Metal Status of Soils and Stream Sediments Impacted by Leachate from a Municipal Dump in Yap State, Federated States of Micronesia



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The main public dump in Yap State, FSM, is an open, unsanitary facility located approximately 2 miles west of Colonia in the municipalities of *Rull* and *Dalipebinaw*. It was officially opened by the State government in the late 1970s and has served as the main repository of non-segregated wastes from Yap Proper/Main Island since then. The dump receives around 4 tons of garbage and other residential wastes per day from Colonia town area and surrounding rural communities. Currently, it covers an area of approximately 1,460 square meters, and rises to a height of 10 meters at its highest point.

The dump is maintained by the Department of Public Works & Transportation who focuses largely on trash compaction and site stability. While soil cover is used to reduce odor, flies and vermin, it is applied only intermittently and largely inadequate. Of far greater concern, however, is the fact that the dump is not lined and there are no leachate retention systems in place. As a consequence, leachate that exudes at intervals around the dump perimeter during wet weather conditions flow down gradient into a nearby stream known as *Lul nu Tamthaw*. This stream flows east for about 1 km before emptying into a forest of mangroves at the coast. Both the stream and the mangroves are popularly used by local residents for fishing, food gathering and recreational activities. The potential impact of the raw leachate on aquatic resources in these areas has been of long-standing concern to the people of Yap both from an ecological and human health standpoint.

The proposal described herein seeks funding to perform preliminary heavy metal analysis of

soil and stream sediments down gradient of the Yap dump and addresses a critical need recently identified by the FSM-WERI Advisory Council Meeting at their annual meeting in Yap. Heavy metals are common contaminants of concern in unmitigated leachate flows from such solid waste facilities as the one described above. Moreover, certain metals some such as lead, cadmium and mercury are highly persistent poisons that are readily accumulated by fish, shellfish, crustaceans and other aquatic resources commonly harvested for food.

Soil samples will be collected for heavy metal analysis at strategic points around the dump perimeter and down gradient of the facility. Sediments from the impacted *Lul nu Tamthaw* stream (upstream and downstream of the dump) will also be examined at discrete intervals between the dump and the coast. All Chemical analysis will be performed by the WERI Water Quality Testing Laboratory at the University of Guam where adequate facilities and infrastructure exist.

Results are especially crucial at this juncture in view of heightened community concerns, as well as need for baseline information to aid Government & Non-Government planning for improved management and rehabilitation of the dump site over the next five years. The project receives support from the Department of Public Works & Transportation and the Safe Disposal Management Group which leads waste improvement efforts in the State. This project follows current efforts for information gathering and collection in and relating to the current dump site and its possible effects on the surrounding environment and people.