



WATER RESOURCES RESEARCH GRANT PROPOSAL

Project ID: 2002GU4B

Title: Impact of Ordot Dump on Water Quality of Lonfit River Basin in Central Guam

Project Type: Research

Focus Categories: Surface Water, Water Quality, Toxic Substances

Keywords: Water Quality, Pollution, Waste Disposal, Contaminants

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Non-Federal Matching Funds: \$0

Congressional District:

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Abstract

Guam's only municipal solid waste disposal site is centrally located in the village of Ordot and has been in use for over fifty years. Lacking in the conventional technology built in to modern day sanitary landfills, the site is essentially an open dump covering ~20 acres of the upper Lonfit River valley. The dump was operated by the US Navy at the end of WWII and transferred to the Government of Guam shortly thereafter. Although slated for closure more than 20 years ago, it still receives around 200 tons of solid waste per day from the civilian community. Early records of the types of materials disposed of at the Ordot Dump are nonexistent but are suspected to include the same array of toxic chemicals found at other military dumpsites on island. Today, there is some control over the bulk disposal of industrial chemicals, waste oil, and metallic waste at Ordot Dump. However, household waste is rarely screened and is known to contain a variety of hazardous substances, both biological and chemical. Leachate streams occur in several places around the perimeter of the dump and course their way down gradient into the Lonfit River and out into Pago Bay. Their chemical composition is largely unknown and their impact on the local environment in terms of ecology, agriculture, and human health remains to be investigated. As a first step in this direction, we propose to characterize the primary biological and chemical contaminants in leachate water emanating from the Ordot Dump and trace their respective movements down the watershed out into the ocean. We will focus primarily on a time-series analysis of aqueous samples with secondary emphasis on soil and biota where appropriate. Lysimeters will be used to extract interstitial waters from soil inundated by the leachate streams down gradient from the dump, and downstream in the Lonfit-Pago River system. Differential mobilization rates of primary contaminants will be evaluated by comparing their surface and subsurface distributions and abundances. Finally, their potential impact on the receiving waters will be

assessed from an ecological and public health standpoint. The intended study will take two years to complete and will be divided into two phases of approximately equal duration. Funds are sought here to support the initiation of Phase I, which will focus on nutrients, heavy metals and disease causing microorganisms. Our laboratories are adequately equipped to analyze water samples for all three contaminant groups (the latter using fecal indicator bacteria, Enterococci and E. coli). We propose to send a one-time leachate sample to an off-island laboratory (Montgomery Watson Harza, Pasadena, CA) to screen for priority pollutants listed under the Clean Water Act and identify organic chemicals of potential concern. Once these have been identified we will develop the necessary analytical techniques to monitor their abundance and distribution in the watershed during Phase II of the study to be submitted for consideration next year.