



Impact of Urban Runoff, Wastewater Discharges and Past Solid Waste Disposal Practices on Contaminant Profiles in Fish from Saipan Lagoon



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Saipan is the largest and most densely populated island of the Commonwealth of the Northern Mariana Islands (CNMI) and experiences many of the environmental pollution problems seen in the larger industrialized nations of the world. Solid and hazardous waste disposal, illegal dumping, urban runoff, unregulated waste discharges from various commercial premises, and the disposal of primary treated sewage effluent directly into the ocean, rank among the most critical environmental problems seen on the island today. A large lagoon that borders the western side of the island serves as a sink for many of the more recalcitrant pollutants mobilized into the ocean from land-based sources in wastewater discharges and during major storm events. Locally referred to as Saipan Lagoon, this body of water is geographically divided into three separate lagoonal entities all of which are impacted to some degree by the activities of man. The largest and most northerly of these is Tanapag Lagoon, which extends along some of the most industrialized coastline on island. The smallest and most southerly entity is Chalan Kanoa Lagoon, which borders mostly rural and residential areas. While this body of water receives relatively little in the way of stormwater runoff, it does receive effluent from a sewage treatment plant and was used as a solid waste disposal site until the mid 1970s. Immediately to the north of Chalan Kanoa Lagoon is Garapan Lagoon, a relatively long narrow stretch of water that borders both residential and commercial premises between the villages of Susupe and Garapan. At least 20 storm water drains discharge into this centrally located lagoonal entity.

An ongoing pollution monitoring and assessment program for Saipan Lagoon was initiated by WERI in 1997. We now have a reasonable understanding of the distribution and abundance

of the contaminants of primary concern (heavy metals and PCBs) in biotic and abiotic components of Tanapag Lagoon. Comparable studies from the two lagoonal entities further south have only recently been initiated. Relatively high levels of mercury have subsequently been discovered in fish and several species of intertidal bivalves from the northern end of Garapan Lagoon. The contamination source was traced back to a storm drain that receives drainage from a disused incinerator site at the local hospital about 1 km inland. Intertidal bivalves from the southern end of Chalan Kanoa Lagoon were also found to contain relatively high levels of lead. The source of this contamination remains to be identified. Studies are currently underway to determine distribution profiles of heavy metals in sediments within both of these lagoonal entities. Considering the importance of subsistence and recreational fishing in these waters, the proposal described herein seeks funding to extend the monitoring program to fish inhabiting these waters. Squirrel fish, *Myripristis* spp, and snapper, *Lethrinus* spp. will be the primary bioindicators of interest. Both types of fish have limited foraging ranges and are favored by local fisherman. Samples will be analyzed for total mercury, lead and PCBs.

The study will add significantly to the existing contaminant database and should command the interest of those involved with environmental protection, water quality and resource management. It will also identify potential health risks (if any) associated with the unrestricted consumption of fish from these waters. Overall, the program will provide the necessary foundations for future monitoring, assessment and regulation of pollution problems in the area. Such information is vital for the overall protection and sustainable development of aquatic resources in Saipan's coastal waters.