

## **1. INTRODUCTION**

The American Samoa Environmental Protection Agency (ASEPA) conducted a study of sediment characteristics and contamination in Pago Pago Harbor on the island of Tutuila, American Samoa. This report summarizes the findings of the study, which describes the distribution of sediment types and concentrations of potential contaminants of concern (COCs) in the sediments throughout the Harbor. The sources, sinks, and transport of the identified principal COCs were also evaluated. The overall study was phased into four study elements:

Study Element 1 – Sediment Screening Study: The first element provided sediment sampling and analysis to define the distribution of sediment types and COCs on the surface of the seabed. Specific objectives of Study Element 1 were to develop, define, and verify the list of COCs that are present in the sediments of Pago Pago Harbor, identify those COCs that may be of particular concern, characterize the sediment properties, and provide data and guidance for subsequent study elements.

Study Element 2 – Seabed Characterization and Mapping: This study element consisted of a multi-component marine geophysical program conducted to provide detailed characterization of the seabed. The objectives of the investigation were to provide information on the lateral and vertical distribution of fine-grained sediment and to describe the physical environmental characteristics of the seabed. This information was presented on a series of maps of the seabed including water depth, sediment thickness, and major features on the bottom of the Harbor. The information collected was used in combination with the results of Study Element 1 to plan the subsequent elements of the overall study.

Study Element 3 – Detailed Sediment Analysis: This element of the study provided targeted sediment sampling and analysis to define the vertical distribution of sediment types and COCs in the Harbor sediments. This effort refined and supplemented the previous sampling and mapping conducted for the overall study during Study Elements 1 and 2.

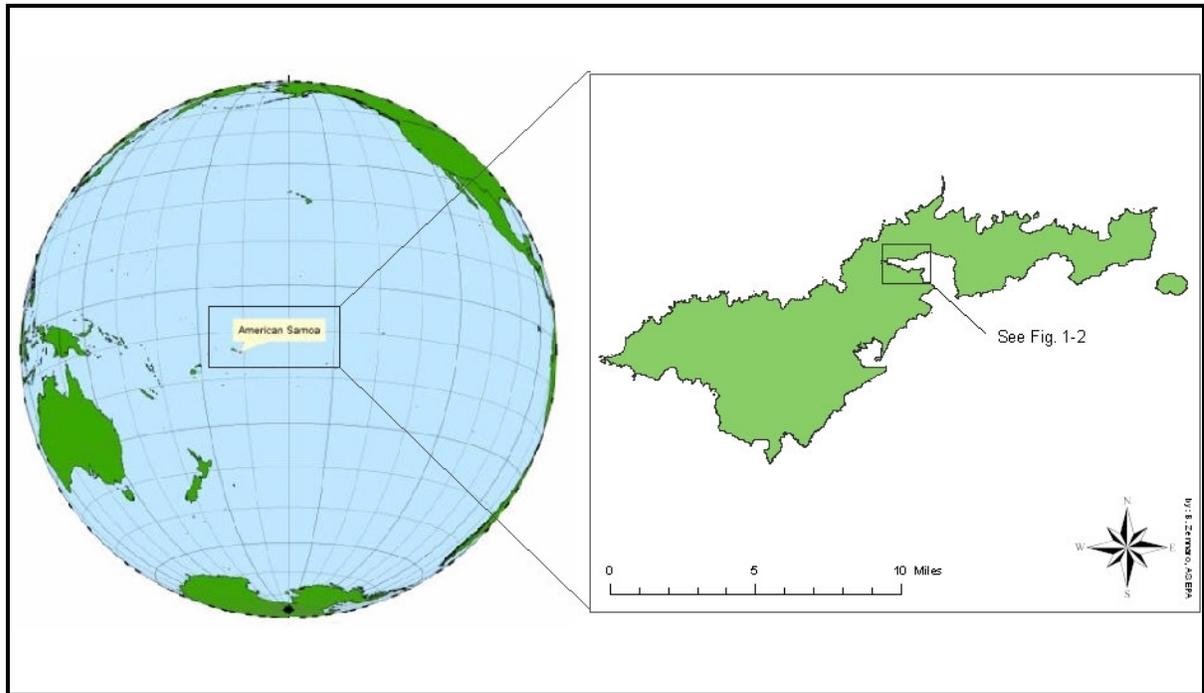
Study Element 4 – Fate and Transport Analysis: The fourth study element provided targeted sediment sampling and analysis to provide information required to further assess the sources, sinks, and distribution of the identified COCs of most significance in the Harbor sediments. Study Element 4 supplemented the previous sampling and mapping conducted for the overall study during Study Elements 1, 2, and 3.

### **1.1 Purpose**

The primary purpose of this summary report is to provide an overall description of the study and a summary of the important findings. The report describes the distribution and concentrations of the identified principal COCs, and summarizes the cumulative findings concerning the origins, transport, and fate of the Pago Pago Harbor sediments and associated COCs. This report briefly reviews the sample collection methodology and corresponding results from each study element. More detailed descriptions can be found in the reports prepared for each of the individual study elements.

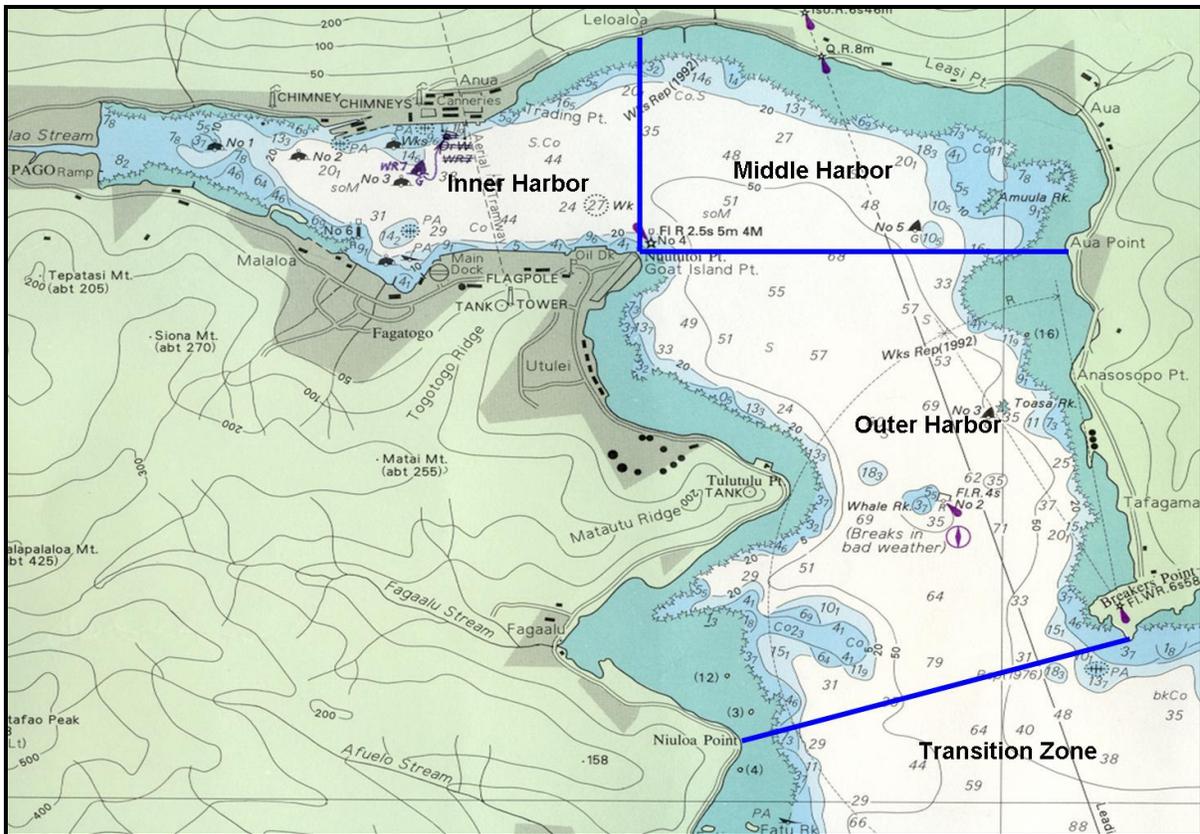
## 1.2 Background

The United States Territory of American Samoa is a group of seven islands (five volcanic islands and two coral atolls) located in the South Pacific Ocean (Figure 1-1). The total land area of the islands is approximately 76 mi<sup>2</sup>. Pago Pago Harbor is American Samoa's main port and is located on the island of Tutuila, the largest and most populous island (land area of 58 mi<sup>2</sup>, population of 58,000 estimated in 2007) and the center of government and commerce. Pago Pago Harbor (Figure 1-2) exhibits environmental concerns typical of industrialized and developed areas.



**Figure 1-1. Location of American Samoa and the Island of Tutuila**

Recent toxicity studies for Pago Pago Harbor indicate elevated levels of some COCs in fish, macro-invertebrates, and sediments in the Inner Harbor and Middle Harbor. The source of the contaminants in fish and invertebrates is suspected to be the Harbor sediments, since water quality data indicates no significant contamination in the water column. Water quality monitoring data collected over the past decade indicates that the water column of the Harbor overall (including the Inner Harbor) typically meets applicable United States Environmental Protection Agency (USEPA) and ASEPA water quality criteria and standards for aquatic life. The highest levels of tissue contamination appear to be in organisms whose feeding regimes incorporate sediment or sediment dwelling organisms. It is therefore important to understand the extent of sediment contamination in Pago Pago Harbor, and to determine probable origins, transport, and fate of COCs.



**Figure 1-2. Pago Pago Harbor, American Samoa**

Study Elements 1 and 2 were conducted simultaneously in February/March 2004. The results of these study elements were used to refine the work for Study Element 3 conducted in March 2005. The data and evaluations from these three study elements were used to define the data gaps and additional information and analyses needed in study Element 4. Study Element 4 was conducted in May 2006. Each study element was described in a separate detailed report provided to ASEPA and USEPA.

### **1.3 Approach**

This summary report is based on an evaluation and synthesis of the data obtained from the four separate study elements and is divided into the following sections:

- Section 1 – Introduction: This section provides an introduction to the study and describes the arrangement of this report.
- Section 2 – Methods: This section provides a summary description of the sampling methods, locations, COCs considered, and analytical methods used to conduct the various study elements. Additional detail is presented in the individual study element reports.

- Section 3 – Results and Discussion: This section provides a summary and evaluation of the important findings from each study element and how the data from the individual study elements relates to other study elements and the overall study.
- Section 4 – Conclusions: This section presents overall conclusions drawn from the cumulative results of the four study elements. Recommendations based on the results are provided.

### ***1.4 Scope and Limitations***

This document is intended to provide an overall summary of the four study elements and only provides a cursory review of the methods used during each study element. Discussion of results concentrates on COCs encountered at noteworthy levels and does not provided detailed descriptions of all potential COCs that were not detected, or those COCs detected at low levels relative to available evaluation criteria. Detailed reviews of methods and QA/QC procedures and laboratory analytical QA/QC documents are provided in the individual study element reports and are not discussed here.