SECTION I

INTRODUCTION

The South Honolulu Sewer System, also known as the East Mamala Bay Subdistrict, and part of the Mamala Bay District, is located on the southern coast of Oahu and has the highest concentration of population in the State. It originally extended from Niu Valley to Barbers Point and included the City of Honolulu and the satellite communities of Aiea, Pearl City, Waipahu, Ewa Beach and Makakilo. Although the Pearl Harbor-Hickam military complex is located in the district, it is served by the Fort Kamehameha Sewage Treatment Plant (STP), an independent and separate military treatment and disposal system. However several military housing units and military installations throughout the district are served by municipal facilities.

The military facilities in the East Mamala Bay Subdistrict include Fort Shafter, Tripler Medical Center, Aliamanu Housing, Radford Terrace, Halsey Terrace and the Coast Guard Red Hill Housing.

The Mamala drainage area is served by two separate municipal treatment and disposal systems. The Sand Island system, also called the East Mamala Subdistrict, includes the areas from Niu Valley to Aliamanu, and the Honouliuli or West Mamala system extends from Halawa Valley to Barbers Point. The two Mamala Bay ocean outfalls were originally designed to meet Section 301 (h) requirements of the Act for discharge into deep waters of the territorial seas, which have strong favorable tidal movement and other hydrological and geological characteristics that will allow compliance with the State water quality standards. These requirements were met for a discharge into deep oceanic waters about two miles offshore at a depth of 200+ feet.

The Sand Island sewer system serves the entire East Mamala Bay Subdistrict, which extends from Niu Valley-Paiko Peninsula on the east to Moanalua-Aliamanu on the west, and from the coastal waters to the Forest Reserve boundaries in the north-south direction. The tributary areas are part of three subsystems: South Honolulu system from Niu Valley-Paiko Peninsula to River Street-Pacific Heights/Dowsett; North Honolulu system from Aala-Puunui/Nuuanu to Moanalua-Aliamanu; and the U.S. Army Fort Shatter sewer system serving Fort Shatter, Tripler Medical Center and Aliamanu military housing . Each of the subsystems terminates at a pumping station, which discharges into the intake structure of the Sand Island Wastewater Treatment Plant.

Although located in Mamala Bay, the Fort Kamehameha STP is a separate treatment and disposal system, operated by the U.S. Navy Public Works Center near Hickam Harbor. The treatment works was built in 1970 with a capacity of 7.5 mgd with a 1, 725 feet outfall sewer discharging off the main Pearl Harbor ship channel at a depth of 46 feet. The flow in the 1990s was 7 mgd. In 1997, the plant was enlarged and modified as an "advanced"

secondary treatment facility with sand filters with a capacity of 13 mgd. The tributary areas of the Fort Kamehameha system include Pearl Harbor Navy Base, Pearl Harbor shipyard, Hickam Air Force Base, Hickam Village, Moanalua Terrace, Ford Island, Makalapa and Camp Smith. Sludge from the plant is treated by anaerobic digesters and dewatered by centrifuges and disposed of at a private landfill.

Plans to construct a new proposed 2.4-mile 42-inch diameter ocean outfall extending into coastal waters beyond the Honolulu International Airport's reef runway at a depth of 150 feet with a 656-foot diffuser was revealed in a 1997 Navy Public Works Center Drat EIS. The proposed effluent disposal site will be beyond the seaward boundary of the Pearl Harbor WQLS and will enable the plant to increase its volume of discharge and meet the plant NPDES permit requirements.

In 1974, an industrial wastewater treatment plant (IWTP) was constructed within the Pearl Harbor Naval Base complex to treat industrial wastes generated by the shipyard. The effluent from the IWTP is discharged into the Fort Kamehameha STP for further treatment. Sludge from the IWTP is shipped to the Continental United States for disposal at EPA-approved land disposal sites.

The South Honolulu tributaries encompass the following areas: Niu Valley/Paiko, Waialae-Kahala, Kaimuki, Diamond Head/Kapahulu, Palolo, Manoa, McCully/Moiliili, Waikiki, Makiki/Tantulus, Ala Moana/Kakaako, Downtown Honolulu, and portions of Nuuanu/Punchbowl.

Areas that are part of the North Honolulu system include Kalihi Valley, Liliha/Kapalama, portions of Nuuanu/Punchbowl, Kalihi/Palama, portions of Aliamanu/Salt Lake, portions of lower Moanalua, Moanalua Valley, and Honolulu International Airport.

All three subsystems are located in the Primary Urban Center Development Plan area. The eastern tributary areas of the South Honolulu system are located in the East Honolulu Development Plan area.

The Honolulu sewer system consists of a regional wastewater treatment plant on Sand Island; a deep ocean outfall extending 9,000 feet offshore with a 3,350 feet long diffuser section at a depth of 220-240 feet and three major influent pump stations at Ala Moana, Hart Street and Fort Shatter. The major components of the treatment and disposal systems were designed for an ultimate average daily flow of 106 mgd based on the1971 projected WQPO 2020 population of 669,000 people. Unit I of the plant was designed as an advanced primary plant with air diffusion flotation units to remove floatable solids at a capacity of 82 mgd for a design population of 451,000. The ocean disposal system and the plant hydraulic conveyance system were designed for the 2020 peak flow of 202 mgd. The existing sewer system is shown in Figure II.A.1.

The present Sand Island WWTP has the following treatment facilities: headworks with mechanical screens, flotation-clarifiers, effluent screens, flotation thickeners, heat treatment units, decant tanks, centrifuges, and incinerators. The average annual daily flow

in 1987-88 was 73.96 mgd and the current annual average flow in 1997-98 was 69.5 mgd, a reduction of about 4.5 mgd, possibly of groundwater infiltration or reduction of inflow because of dry weather. In addition to the treatment plant, there are a total of 15 pumping stations and 566 miles of sewers, 42 percent of the City's total of about 1,300 miles.

The initial 301(h) NPDES permit for Sand Island was issued in 1990. A reapplication for the 301(h) permit was submitted to EPA and DOH on August 18, 1994. After a protracted delay, a renewed 301(h) permit was issued on September 30, 1998, effective on November 2, 1998.

The City and County of Honolulu (CCH) has met most of the effluent and receiving water quality requirements established in their National Pollutant Discharge Elimination System (NPDES) permit for the Sand Island Wastewater Treatment Plant effective on November 3, 1998. The NPDES permit incorporates a waiver of the secondary treatment requirements for the treatment plant. This document supports the CCH's permit reapplication for continuation of the 301(h) waiver subsequent to expiration of the NPDES permit on November 3, 2003.

The waiver was approved by the Environmental Protection Agency (EPA) following the submittal of two previous permit applications. The initial Section 301(h) final application was submitted on September 7, 1979. The 1979 application was based on utilization of advanced primary treatment (primary treatment sedimentation with dissolved air flotation, or DAF) and received tentative approval from the EPA on September 8, 1981. A reapplication for a waiver with reduced level of treatment was submitted on October 31, 1983 in accordance with amended 301(h) regulations following observations and conclusions noted during operational experience.

The 1983 reapplication proposed the use of conventional primary treatment in lieu of advanced primary treatment (DAF). Reducing the level of treatment was proposed due to (1) relatively high operational expense of DAF, (2) effluent quality could be achieved without DAF, and (3) reduction in the operating schedule of the pineappie industry would minimize variations in waste strength resulting in stabilization of effluent quality. The 1983 reapplication was approved and the NPDES permit was issued in 1990. Finally, around August 1994, the CCH submitted another reapplication permit. The waiver was approved by EPA on September 30, 1998 and became effective November 3, 1998.

Since the CCH has met most of the effluent quality requirements set forth in the NPDES permit, this reapplication will continue to be based on the use of primary treatment using sedimentation. For those parameters for which the CCH has experienced noncompliance, we are working with EPA, through a Notice of Violation, to address these incidents.

Several activities are now underway at the facility. We are nearing completion of our expansion phase, which takes the facility from a design flow of 82 mgd to 90 mgd, as specified in the East Mamala Bay Facility Plan. The expansion work includes grit removal, installation of a metal salts/polymer injection system, improved hydraulic control, incorporation of new technology for primary treatment, installation of a standby UV effluent

disinfection system, and increased effluent pumping capacity. We have also contracted a private firm to effect beneficial solids reuse. Our monitoring program is being expanded to include measurements of ocean currents through drogues and analyses for the presence of viral or bacterial components.

Other activities currently being address but not necessarily associated specifically to the Sand Island Wastewater Treatment Plant include: improvements with our collection system through, in part, incorporation of a computer based management system and our infiltration and inflow program and department reorganization to optimize operations.

Despite challenges with limited resources, the CCH has moved forward in many areas to improve the quality of our services at a reasonable cost. Because Hawaii is a tourist-based economy, we have a responsibility to protect our environment and the public health.