3.0 EXISTING ENVIRONMENT

Chapter 3:

3.0 Existing Environment

3.1 Physical Environment

3.2 Biological Environment

3.3 Socioeconomic Environment

Section 3.0, Existing Environment, and Section 4.0, Environmental Consequences, are organized by the USEPA general and specific selection criteria for designating an ODMDS (40 CFR 228.5 and 228.6). This organization by criteria is different from the typical NEPA EIS of other federal actions, but the key environmental resources are addressed.

The geographic area described and assessed for each selection criteria/resource area varies. The Region of Influence (ROI) for each resource is a geographic area within which the proposed action may exert some influence. For example, discussions of climate or commercial traffic would cover a large geographic ROI, while bathymetry and sediment discussions would be limited to a narrowly defined ROI, such as the immediate vicinity of alternative ODMDSs located within two study areas. Surveys were conducted by Weston Solutions to obtain measurements of various physical oceanographic and biological parameters. Results of surveys are incorporated into the following discussions of the Physical Environment (Section 3.1) and the Biological Environment (Section 3.2). Physical and chemical parameters measured were selected to provide data on the background concentrations of potential contaminants of concern in the receiving sediments collected from the two study areas, a proposed reference site, and the surrounding study region, in accordance with the guidance document for designation of ODMDS (Pequegnat et al. 1990). Current USEPA SW-846 analytical methods were used in chemical analysis (USEPA 2001). The specific sediment analyses and target detection limits are specified in the SAP developed for this project (Weston Solutions and Belt Collins 2007a). Detailed results from these surveys are included in Weston Solutions and TEC (2008b), which comprises the field report resulting from these surveys. Section 3.3 contains a discussion of the Socioeconomic Environment.

3.1 PHYSICAL ENVIRONMENT

The physical environment in the study region includes waters offshore of Guam from the surface to the seafloor and the associated physical and oceanographic characteristics of this environment. The following sections include descriptions of the overall climate and air quality, physical oceanography, characteristics of the water column, regional geology, and characteristics of marine sediments. Gathering information on characteristics of the various physical parameters allows for a determination of baseline conditions that may be affected by dredged material disposal operations.

3.1.1 Climate and Air Quality

3.1.1.1 Climate

The ROI for climate is the general region of Guam, which includes the ODMDS study areas, the Island of Guam, and the offshore area between them. Guam consistently has warm and humid weather, typical of a tropical marine climate. The average daily temperature range is between 76 and 88°Farenheit (°F) (24 and 31°Celcius [°C]). The relative humidity ranges between 65-75% during the day and 85-100% at night (DON 2003). Tradewinds are fairly consistent throughout the year with an average wind speed of 10 miles per hour (mph) (16 kilometers per hour [kph]) from the east (National Weather Service [NWS] 2004). Table 3-1 summarizes the basic meteorological conditions for Guam.

Guam has two primary seasons. The dry season occurs from January to April with a monthly average of 3.25 in (8.3 cm) of rain. July through October comprise the wet season with rainfall averaging approximately 12 inch (in)/month (0.3 m/month) (NWS 2004). The remaining months, May/June and November/December are transitional with no distinct pattern of dry or wet conditions (DON 2003).

Typhoons can occur at any time on Guam; however, they typically occur during the wet months. Typhoons are tropical storms originating in the South Pacific that have sustained winds of at least 75 mph (121 kph). Along with high winds, typhoons bring heavy rains and storm surge. Between the years 1959 and 2007, an annual mean of 31 typhoons occurred in the western North Pacific (U.S. Naval Maritime Forecast Center/Joint Typhoon Warning Center 2007); however, only 19 typhoons passed over Guam in a 57 year span from 1948 to 2005 (e.g., 1 typhoon every 3 years) (Guam Power Authority 2005). In recent years, the frequency of typhoons impacting Guam has risen, with the most devastating occurring in late 2002. Super Typhoon Pongsona occurred on December 8, 2002 with sustained winds greater than 150 mph (241 kph) and gusts exceeding 180 mph (290 kph).

Table 3-1. Summary of Meteorological Conditions for Guam

Weather Elements	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean Wind Speed (mph)	11.9	12.8	12.5	12.8	11.3	10.2	8.7	8.3	7.7	8.6	11.1	12.9	10.7
Prevailing Wind Direction (deg. N)	080E	070E	080E	090E	090E	100E	100E	100E	100E	100E	080E	090E	090E
Precipitation (in)	3.91	2.78	2.88	3.46	5.66	5.93	9.83	12.32	14.04	11.69	8.02	5.27	85.78
Mean Temperature (°C)	24	25	26	26	26	27	27	27	26	27	27	26	26.17
Mean Relative Humidity (%)	77	76	75	74	73	76	76	81	81	80	80	78	77.25

3.1.1.2 Air Quality

The ROI for air quality is the general region of Guam, which includes the ODMDS study areas, the Island of Guam, and the offshore area between them. The Clean Air Act (CAA) designated the EPA to establish primary air quality standards to protect public health and secondary air quality standards to protect ecosystems, including plants and animals, and to protect against decreased visibility and damage to crops, vegetation and buildings. The USEPA set national ambient air quality standards (NAAQS) for six criteria pollutants which include nitrogen dioxide, ozone, sulfur dioxide, particulate matter, carbon monoxide (CO) and lead. Monitors measure the air quality throughout the country, including U.S. Territories, and determine areas that have met (attainment) or not met (nonattainment) these standards (USEPA 2003).

Guam has "attained" the USEPA's air quality standards with the exception of two areas classified as nonattainment for sulfur dioxide (SO_2) as of September 1999. These areas are within a 2.2 mi (3.5 km) radius of the Piti Power Plant and the Tanguisson Power Plant (USEPA 2003) (Figure 3-1). The Piti Power Plant is approximately 13.7 nm (25.4 km) south-southeast of the North Study Area and 13.5 nm (25.0 km) southeast of the Northwest Study Area. The Tanguisson Power Plant is approximately 14.9 nm (27.6 km) southeast of the Northwest Study Area and 19.3 nm (35.7 km) east of the Northwest Study Area. None of nonattainment areas around Piti Power Plant or Tanguisson Power Plant encompass either of the proposed study areas.

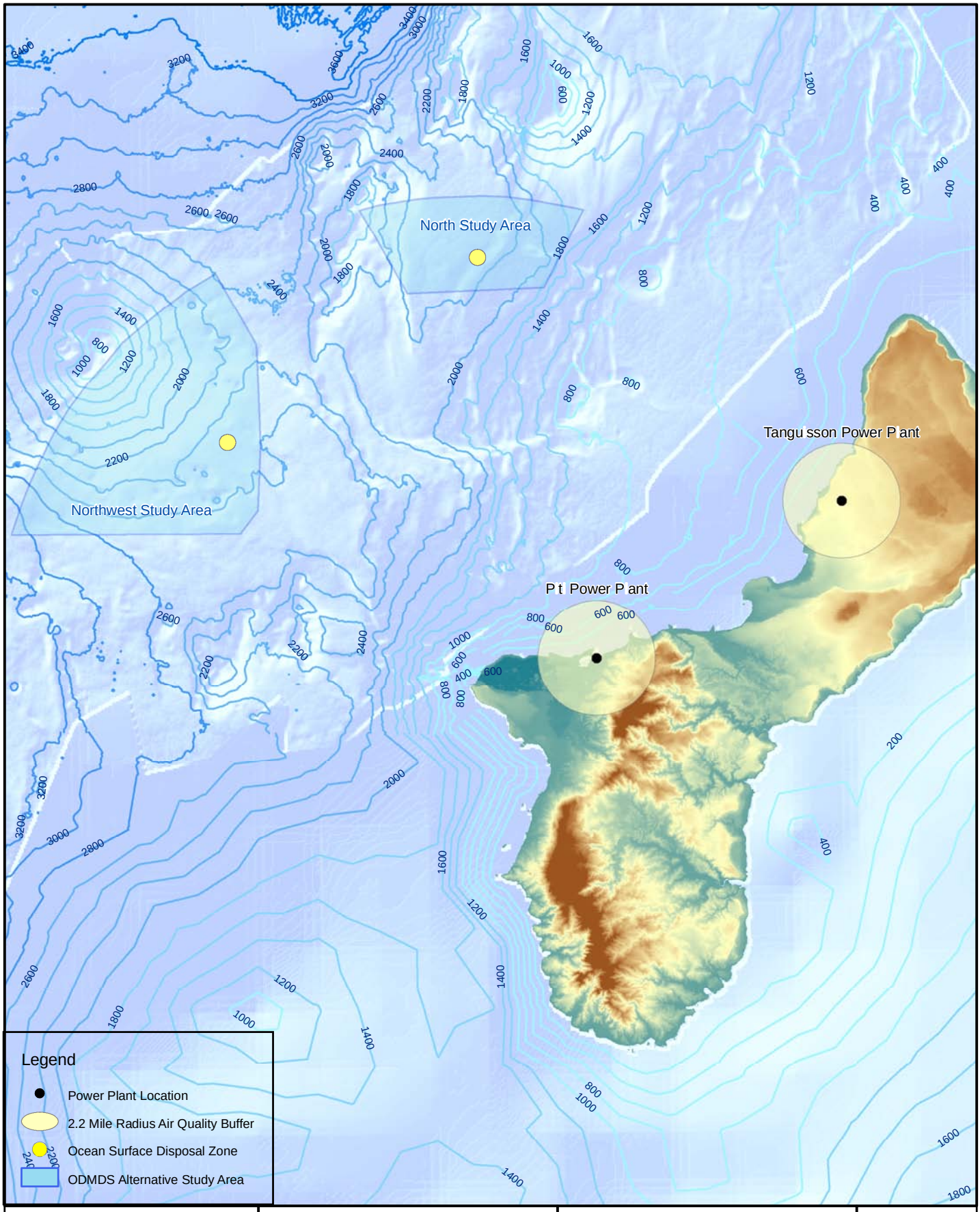

Figure 3-1.
USEPA Designated Non-attainment Areas for Sulfur Dioxide Around the Piti and Tanguisson Power Plants