

# *Executive Summary*

The monitoring and reporting requirements for the City of San Diego (City) Point Loma Wastewater Treatment Plant (PLWTP) are outlined in NPDES Permit No. CA0107409 and Monitoring and Reporting Program No. R9-2002-0025. The main objectives of the Point Loma ocean monitoring program is to assess the impact of wastewater discharged through the Point Loma Ocean Outfall (PLOO) on the marine environment off San Diego, provide data that satisfy NPDES permit requirements, demonstrate compliance with the 2001 California Ocean Plan (COP) as specified in the above permit, monitor dispersion of the waste field, and identify any environmental changes that may have occurred. Specifically, the program was designed to assess the effects of wastewater discharge on ocean water quality, sediment conditions and marine organisms. The study area is centered around the PLOO discharge site, which is located approximately 7.2 km offshore of the PLWTP at a depth of nearly 100 m. Monitoring at sites along the shore extends from Mission Beach southward to the tip of Point Loma, while offshore monitoring occurs in an adjacent area overlying the coastal continental shelf at sites ranging from 9 to 116 m in depth.

Prior to the initiation of wastewater discharge through the extended outfall in late 1993, the City conducted a 2½-year baseline study designed to characterize background environmental conditions in the Point Loma region in order to provide information against which post-discharge data could be compared. Additionally, each year the City also typically conducts a region-wide survey of benthic conditions at randomly selected sites from Del Mar to the Mexico border as part of NPDES requirements for the South Bay Water Reclamation Plant. Both of the above types of studies are useful for evaluating patterns and trends over a broader geographic area, thus providing additional information to help distinguish reference areas from sites impacted by anthropogenic influences.

The receiving waters monitoring effort for the Point Loma region is divided into several major components, each comprising a separate chapter in this report: Oceanographic Conditions, Microbiology, Sediment Characteristics, Macrobenthic Communities, Demersal Fishes and Megabenthic Invertebrates, and Bioaccumulation of Contaminants in Fish Tissues. Chapter 1 presents a general introduction and overview of the ocean monitoring program for the Point Loma outfall region. In Chapter 2 monitoring data regarding various physical and chemical oceanographic parameters are evaluated to characterize water mass transport potential in the region. Chapter 3 presents the results of water quality monitoring conducted along the shore and in offshore waters, which includes the measurement of bacteriological indicators to assess potential effects of both natural and anthropogenic inputs, and to determine compliance with 2001 COP water contact standards. The results of benthic sampling and analyses of soft-bottom sediments and their associated macrofaunal communities are presented in Chapters 4 and 5, respectively. Chapter 6 presents the results of trawling activities to assess the status of bottom dwelling (demersal) fish and megabenthic invertebrate communities. Bioaccumulation studies to determine whether contaminants are present in the tissues of local fishes supplement the monitoring of demersal fish populations and are presented in Chapter 7. In addition to these activities, the City supports other projects relevant to assessing ocean quality in the region (see Chapter 1). One such project is a remote sensing study of the San Diego and Tijuana coastal regions. These results are incorporated herein into the interpretations of oceanographic and microbiological data (see Chapters 2 and 3).

The present report focuses on the results of all ocean monitoring activities conducted in the Point Loma region during 2007. An overview and summary of the main findings for each of the major component of the monitoring program are included below.

Analysis of the receiving waters monitoring data off San Diego indicates that the PLOO has had only a limited effect on the local marine environment after 14 years of wastewater discharge at the present location. For example, water samples collected at sites within the Point Loma kelp bed were 100% compliant with 2001 COP bacterial water-contact standards in 2007. Compliance with COP standards was also very high along the shore, with all but two stations being 100% compliant during the year. Shore stations D8 and D11 were the only stations with seawater samples where bacteria levels fell below 100% compliance. Station D8, located near a tidally influenced storm drain, was 78% compliant with the 60-day fecal coliform standard, 92% compliant with the fecal geometric mean standard, and 100% compliant with the other two COP standards. Station D11, located near the mouth of the San Diego River, was 92% compliant with the 60-day fecal coliform standard and 100% compliant with the other three COP standards. Elevated bacterial concentrations in offshore waters that could be attributable to wastewater discharge were mostly limited to depths of 60 m or below. Three samples from shallower waters that were indicative of contaminated water occurred south of Point Loma and were likely related to non-outfall sources. Additionally, there was no evidence that the waste field from the outfall reached or affected any shoreline station in 2007, which is consistent with previous findings since the outfall was extended to the present deep discharge site.

Overall, there continues to be no evidence of change in any physical or chemical water quality parameter such as dissolved oxygen or pH that can be attributed to the discharge of wastewater off Point Loma. Instead, historical changes in these parameters have primarily been associated with natural events such as storm activity and the presence of phytoplankton blooms. Finally, drought conditions for the San Diego region that began in late 2005 continued into 2007, thus resulting in reduced runoff of storm water or other inputs to coastal waters (e.g., river flows) during the year. Consequently, fewer turbidity plumes were observed along the San Diego coast relative

to wetter years such as in 2005, with ocean waters in the PLOO region generally appearing clearer throughout 2007.

Benthic conditions off Point Loma continued to show some changes in 2007 that may be expected near large ocean outfalls, although these were restricted to a relatively small, localized region within about 300 m of the outfall. For example, sediment quality data have indicated slight increases over time in terms of sulfide and BOD concentrations at sites nearest the Zone of Initial Dilution (ZID), an area where relatively coarse sediment particles have also tended to accumulate. However, other measures of environmental impact such as concentrations of sediment contaminants (e.g., trace metals, pesticides) showed no patterns related to wastewater discharge. Some descriptors of benthic community structure (e.g., infaunal abundance, species diversity) or indicators of environmental disturbance (e.g., brittle star populations) have shown temporal differences between reference areas and sites nearest the ZID. However, results from environmental disturbance indices such as the BRI (benthic response index) that are used to evaluate benthic conditions suggest that macrofaunal communities in the Point Loma region remain characteristic of natural conditions. Analyses of bottom dwelling (demersal) fish and trawl-caught megabenthic invertebrate communities during the past year also reveal no spatial or temporal patterns that can be attributed to effects of wastewater discharge. Additionally, a review of long-term data from 1991 through 2007 indicates that patterns of change in fish assemblages appear related to large-scale oceanographic events (e.g., El Niño) or proximity to other contaminant sources (e.g., dredge material disposal sites). The paucity of pathological evidence from local fishes and the results of bioaccumulation studies also suggest that local fish assemblages remain healthy and are not adversely affected by wastewater discharge or other anthropogenic inputs. Consequently, there is currently no evidence of significant long-term negative impacts on water quality, sediment quality, or biotic communities in the coastal waters surrounding the Point Loma outfall off San Diego.