

## **EXECUTIVE SUMMARY**

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The Orange County Sanitation District (District) conducts extensive ocean monitoring to evaluate potential environmental and public health effects from its discharge of highly treated wastewater off of Huntington Beach and Newport Beach, California. The effluent is released over 7 km offshore in 60 m of water. The data collected are used to determine compliance with receiving water conditions as specified in the District's National Pollution Discharge Elimination System (NPDES) permit (R8-2012-0035, CA0110604), jointly issued in 2012 by the U.S. Environmental Protection Agency (EPA), Region IX and the Regional Water Quality Control Board (RWQCB), Region 8. This report focuses on monitoring results and conclusions from July 2013 through June 2014.

### **WATER QUALITY**

Minor changes in dissolved oxygen (DO), pH, and transmissivity related to the discharge of treated wastewater to the coastal ocean were measured beyond the zone of initial dilution (ZID) during some surveys. However, compliance with California Ocean Plan (COP) criteria remained high (97–100%) for these water quality parameters. Moreover, results were consistent with previous findings and none of these changes were determined to be environmentally significant, since they fell within natural ranges to which marine organisms are exposed.

Offshore monitoring of nutrients (ammonium) and bacteria—two measures of the wastewater plume—showed that maximum ammonium concentrations were 20 times less than the COP objective for chronic toxicity to marine organisms and bacterial concentrations remained low and were predominately below measurement detection levels. The low levels of ammonium, along with the lack of association with chlorophyll-*a*, suggests that these concentrations were not environmentally significant.

Overall, the measured environmental effects to the receiving water continue to be relatively small, with values remaining within the ranges of natural variability for the study area. These results support the conclusion that the discharge is not greatly affecting the receiving water environment and that beneficial uses were maintained.

### **SEDIMENT QUALITY**

Sediment parameter values were comparable for within-ZID and non-ZID station groups and were below levels of biological concern (ERM values) at most stations. The exceptions were the high mercury values at within-ZID Station 0 and non-ZID Station 73, as well as the high total dichlorodipheynltrichloroethane (tDDT) value at non-ZID Station 87, recorded in Summer 2013. Nonetheless, whole sediment toxicity tests showed no measureable toxicity at neither Station 0 nor 73, indicating that the mercury was either not bioavailable or was not sufficient to elicit a toxic response. DDT is a legacy contaminant that has not been discharged since the early 1970s and is found

throughout the SCB. Overall, sediment geochemistry results from the 2013-14 monitoring year were consistent with those of previous years, suggesting the wastewater discharge has minimal potential for adverse impact on biota outside the ZID.

## **BIOLOGICAL COMMUNITIES**

### **Infaunal Invertebrate Communities**

The infauna communities were similar within the monitoring area, as within- and non-ZID stations had comparable community measure values and equivalent species assemblages based on multivariate analyses. Also, the infaunal communities at within- and non-ZID station groups remain healthy based on their low BRI values and high ITI values. These results demonstrated that the outfall discharge had an overall negligible effect on the benthic community structure within the monitoring area.

### **Demersal Fishes and Macroinvertebrates**

Results for the epibenthic macroinvertebrates (EMIs) and demersal fishes were generally consistent with past findings. Community measure values of the EMIs and fishes were generally comparable between outfall and non-outfall stations. Multivariate analyses of the EMI and fish species also showed that the biological communities at the outfall and non-outfall stations were generally similar. Furthermore, fish communities at outfall and non-outfall station groups can be classified as reference condition based on their low FRI values. These results indicated that the outfall area was not degraded and that it supported normal fish and EMI populations.

### **Tissue Contaminants in Fish**

Consistent with previous results, 2013-14 tissue concentrations of mercury, DDT, PCB, and other chlorinated pesticides in fishes collected at outfall and farfield locations were below federal and state human consumption guidelines. These results demonstrated that the outfall is not an epicenter of disease due to the bioaccumulation of contaminants in fish tissue.

### **Fish Health**

Examination of fishes for ectoparasites, tumors, fin erosion, and skin lesions showed that fishes in the monitoring area were generally healthy. External parasites and other external abnormalities occurred in less than 1% of the fishes collected. These results were consistent with previous years and indicate that the outfall is not an epicenter of disease.

## **CONCLUSION**

The results for the 2013-14 monitoring effort were consistent with long-term findings that showed limited impacts to the receiving water, sediment, and infaunal, demersal fish, and epibenthic macroinvertebrate communities. Plume-related changes to receiving water DO, pH, and transmissivity detected beyond the ZID were well within the range of natural variability. Low concentrations of bacteria in water contact zones, in concert with the limited distributions of ammonium and absence of associations of the wastewater plume with phytoplankton blooms, suggest that the discharge had no discernible impact on the environment and posed no human health risk. The low levels of contaminants in fish tissues and the low incidence of external abnormalities and diseases in fish demonstrated that the outfall was not an epicenter of disease.