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Orange County Sanitation District
Ocean Monitoring
Annual Report

Year 2012-2013

Orange County Sanitation District

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March 13, 2014

Kurt V. Berchtold, Executive Officer
California Regional Water Quality Control Board
Santa Ana Region 8
3737 Main Street, Suite 500
Riverside, CA 92501-3339

**SUBJECT: Board Order No. R8-2012-0035, NPDES Permit No. CA0110604
2012-13 Marine Monitoring Annual Report**

Enclosed is the Orange County Sanitation District's 2012-13 Marine Monitoring Annual Report. This report focuses on the findings and conclusions for the monitoring period July 1, 2012 to June 30, 2013. Overall, the results of the monitoring program document that the disposal of our treated and disinfected effluent into coastal marine waters continues to protect the environment and human health.

The results of the 2012-13 monitoring effort showed only minor impacts to the benthic infauna community within and adjacent to the zone of initial dilution (ZID). There had been a decline in benthic community health near the outfall that began in 2005 and peaked in 2010-11. As of January 2013, the invertebrate communities at all stations outside the ZID are classified as reference and within-ZID communities are near reference. Permit-regulated sediment contaminants remained at or near background levels. The low levels of contaminants in fish tissues and the low incidents of external abnormalities and diseases in fish populations demonstrated that the outfall was not an epicenter of disease.

There were limited and minimal changes in the receiving water conditions. Plume-related changes in temperature, salinity, dissolved oxygen, pH, and transmissivity beyond the ZID were well within the range of natural variability, and compliance with numeric receiving water criteria was achieved over 97% of the time. Consequently, our ocean monitoring program continues to demonstrate that the coastal receiving water environment outside the ZID has not been degraded by the District's wastewater discharge. Finally, the low concentrations of bacteria in water contact zones, together with the limited distributions of ammonia, suggest that the wastewater discharge has had no discernible impact on human health and recreational use.





Kurt V. Berchtold
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March 13, 2014

Should you have questions regarding the information provided in this report, or wish to meet with District's staff to discuss any aspect of our ocean monitoring program, please feel free to contact me at (714) 593-7080. However, you may also contact Dr. Jeff Armstrong, the supervisor of our Ocean Monitoring section, who may be reached at (714) 593-7455 or at jarmstrong@ocsd.com.

A handwritten signature in black ink, appearing to read 'E. M. Torres'.

Edward M. Torres, P.E.
Director of Operations and Maintenance

ET:DP:lm

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Enclosure

c: Jared Blumenfeld, U.S. EPA, Region IX

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March 13, 2014

Certification Statement

The following certification satisfies Section A.10 and A.15 of the Orange County Sanitation District's Monitoring and Reporting Program No. R8-2012-0035, NPDES No. CA0110604, for the submittal of the attached OCSD Annual Report 2013 – Marine Monitoring.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fines and imprisonment for known violations.



Edward M. Torres, P.E.
Director of Operations and Maintenance

3/14/14
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ANNUAL REPORT 2013

MARINE MONITORING

**Orange County Sanitation District
10844 Ellis Avenue
Fountain Valley, CA 92728-8127
(714) 962-2411**

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ABBREVIATIONS AND ACRONYMS

The following is a list of abbreviations and acronyms used in the Marine Monitoring Volume. A table of metric equivalents is included to allow conversions from metric to U.S. units.

acidity/alkalinity	pH
acoustic Doppler current profiler	ADCP
aluminum	Al
ammonium	NH ₄ ⁺
antimony	Sb
arsenic	As
accelerated solvent extractor	ASE
advisory tissue limit	ATL
Benthic Response Index	BRI
beryllium	Be
biochemical oxygen demand	BOD
cadmium	Cd
California Department of Health Services	CDHS
centimeter	cm
chlorophyll- <i>a</i>	Chl- <i>a</i>
chromium	Cr
Clean Water Act	CWA
conductivity/temperature/depth	CTD
copper	Cu
correlation coefficient	R
cubic centimeter	cm ³
cubic meter	m ³
degree Celsius	°C
differential Global Positioning System	dGPS
dissolved oxygen	DO
dry weight	dry wt
Effects Range-Low	ERL
Effects Range-Median	ERM
Environmental Laboratory and Ocean Monitoring	ELOM
Environmental Protection Agency	EPA
epibenthic macroinvertebrates	EMI
Effects Range-Low	ER-L
Effects Range-Medium	ER-M
foot	ft
Fish Response Index	FRI
Food and Drug Administration	FDA
frequency of occurrence	FO
gallon	gal
gallons per day	gpd
gas chromatograph with dual electron capture detector	GC/ECD/ECD
gas chromatograph with tandem mass spectrometer	GC/MS/MS
gas chromatography/mass spectrometry	GC/MS
gram	g
greater than	>
greater than or equal to	≥
Ground Water Replenishment System	GWRS
high-density polyethylene	HDPE
inductively coupled emission spectroscopy	ICPES
inductively coupled mass spectrometry	ICPMS
inch	in
Infaunal Trophic Index	ITI
iron	Fe

ABBREVIATIONS AND ACRONYMS

Joint Water Pollution Control Plant	JWPCP
kilogram	kg
kilometer	km
lead	Pb
less than	<
less than or equal to	≤
linear alkyl benzenes	LAB
liter	L
liters/day	L/day
magnesium sulfate	MgSO ₄
mass emission rate	MER
mean	\bar{x}
mean abundance per haul	MAH
mean abundance per occurrence	MAO
mercury	Hg
meter	m
method detection limit	MDL
metric tons per day	MT/day
metric tons per year	MT/yr
microgram	μg
micrograms per kilogram	μg/kg
micrograms per liter	μg/L
mile	mi
milligram	mg
milligrams per kilogram	mg/kg
milligrams per liter	mg/L
milliliter	mL
millimeter	mm
million gallons per day	MGD
most probable number	MPN
multidimensional scaling	MDS
nanogram	ng
nanograms per gram	ng/g
National Marine Fisheries Service	NMFS
National Oceanic and Atmospheric Administration	NOAA
National Pollutant Discharge Elimination System	NPDES
National Research Council	NRC
National Status and Trends	NS&T
nickel	Ni
not analyzed	NA
not applicable	N/A
not detected	ND
not significant	ns
number (of)	n
oil and grease	O&G
Office of Environmental Health Hazard and Assessment	OEHHA
Orange County Sanitation District	District or OCSD
Orange County Health Care Agency	OCHCA
Orange County Water District	OCWD
out-of-range occurrence	ORO
parts per billion	ppb
parts per million	ppm
parts per thousand	ppt
percent	%
plus or minus	±

ABBREVIATIONS AND ACRONYMS

polychlorinated biphenyls	PCB
polycyclic aromatic hydrocarbons	PAH
pound	lb
practical salinity unit	psu
probability	p
publicly owned treatment works	POTW
quality assurance	QA
quality control	QC
Quality Assurance Project Plan	QAPP
quality assurance/quality control	QA/QC
Regional Water Quality Control Board	RWQCB
regression coefficient	R ²
relative percent difference	RPD
Science Applications International Corporation	SAIC
Scripps Institution of Oceanography	SIO
second	sec or s
sediment quality triad	SQT
selenium	Se
Shannon-Wiener Diversity Index	H'
silver	Ag
similarity percentages	SIMPER
similarity profile	SIMPROF
Southern California Association of Marine Invertebrate Taxonomists	SCAMIT
Southern California Bight	SCB
Southern California Bight Pilot Project	SCBPP
Southern California Coastal Water Research Project	SCCWRP
species (singular)	sp
species (plural)	spp
square centimeter	cm ²
square kilometer	km ²
square meter	m ²
standard operating procedure	SOP
standard reference material	SRM
station cluster	SC
Statistical Analysis System	SAS
Strategic Process Study	SPS
Swartz's 75% Dominance Index	SDI
three dimensional	3D
tons per year	tons/yr
total DDT	tDDT
total linear alkyl benzenes	tLAB
total organic carbon	TOC
total polycyclic aromatic hydrocarbons	tPAH
total polychlorinated biphenyls	tPCB
total suspended solids	TSS
total volatile solids	TVS
two dimensional	2D
U.S. Environmental Protection Agency	USEPA
U.S. Fish and Wildlife Service	USFWS
weight	wt
wet weight	wet wt
year	yr
zinc	Zn
zone of initial dilution	ZID

ABBREVIATIONS AND ACRONYMS

Metric System With U.S. Equivalents		
Metric Unit		U.S. Equivalent
Length		
millimeter (mm)		0.04 inches
centimeter (cm)		0.39 inches
meter (m)		39.37 inches/3.28 ft
kilometer (km)		0.62 miles, 0.54 nm
nautical mile (nm)		1.151 miles
Area		
square centimeter (cm ²)		0.155 sq. inches
square meter (m ²)		1.196 sq. yards
sq. kilometer (km ²)		0.3861 sq. miles
Weight		
milligram (mg)		0.015 grains
gram (g)		0.035 ounces
kilogram (kg)		2.2046 pounds
metric ton (MT)		1.1 tons
Volume		
cubic centimeter (cm ³)		0.061 cubic inches
cubic meter (m ³)		1.31 cubic yards
liter (L)		0.2642 gallons
Capacity, Cubic		
milliliter (mL)		0.06 cubic inches
liter (L)		61.02 cubic inches
kiloliter (kL)		1.31 cubic yards
Temperature		
°C (Centigrade)		$(9/5)(^{\circ}\text{C}) + 32 = ^{\circ}\text{F}$ (Fahrenheit)
Speed		
meters per second (m/s)		2.237 miles per hour (mph)
nautical mile per hour (knot)		1.151 miles per hour (mph)

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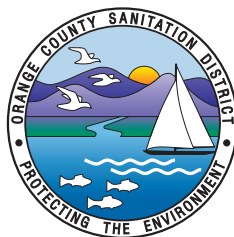
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