LOS ANGELES COUNTY
SANITATION DISTRICTS
Converting Waste Into Resources

Robert C. Ferrante
Chief Engineer and General Manager

1955 Workman Mill Road, Whittier, CA 90601-1400
Mailing Address: P.O. Box 4998, Whittier, CA 90607-4998
(562) 699-7411 • www.lacsd.org

March 5, 2021
File No. 31-300.25

VIA ELECTRONIC MAIL

Ms. Renee Purdy, Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 W. 4th Street, Suite 200
Los Angeles, CA 90013

Dear Ms. Purdy:

2021 Special Study Proposals for the
Joint Water Pollution Control Plant, Joint Outfall System
(NPDES Permit No. CA0053813, CI-1758)

The Joint Outfall System[1] (Sanitation Districts) submit the attached proposals for the following Special Studies, for consideration by the California Regional Water Quality Control Board (Regional Board), Los Angeles Region:

1) Palos Verdes Shelf Superfund Site Remediation: Second Monitored Natural Recovery (MNR) Sediment Core Sampling and Chemical Contamination Characterization

2) The Use of Chemical Scans to Characterize Toxic Effluent Samples

These proposals are being submitted in accordance with the Special Studies provision (Provision I.Q.3, p. E-5) of the Monitoring and Reporting Program (MRP) for the Joint Water Pollution Control Plant (JWPCP) NPDES permit (Order No. R4-2017-0180). The JWPCP MRP requires the Sanitation Districts to annually consult with the Regional Board on the need for special studies related to the permitted discharge. The Sanitation Districts met with Regional Board staff on December 20, 2020 to discuss these proposed special studies, which will support the Environmental Protection Agency's remediation efforts at the Palos Verdes Shelf Superfund Site and an internal effort to evaluate tools that may assist in identifying toxicity-causing compounds.

Proposals describing the goals, objectives, general approaches, benefits, deliverables, and expected duration of the proposed studies are enclosed.

[1] Ownership and operation of the Joint Outfall System is proportionally shared among the signatory parties to the amended Joint Outfall Agreement effective July 1, 1995. These parties include County Sanitation Districts of Los Angeles County Nos. 1, 2, 3, 5, 8, 15, 16, 17, 18, 19, 21, 22, 23, 28, 29, and 34, and South Bay Cities Sanitation District of Los Angeles County.

If you have any questions regarding this letter or proposed study, please contact me at nmunakata@lacsd.org or (562) 908-4288, extension 2830.

Very truly yours,

Naoko Munakata, e-signed

Naoko Munakata
Supervising Engineer
Reuse and Compliance

NM:PM:nm

Enclosures

cc: Jeong-Hee Lim, Xiaofei Cui, CRWQCB – Los Angeles Region

Los Angeles County Sanitation Districts
Joint Water Pollution Control Plant

Proposed Special Study 2021

The Use of Chemical Scans to Characterize Toxic Effluent Samples

BACKGROUND:

Inspired by recent work which applied non-targeted analysis (NTA) using high-resolution, time-of flight, mass spectrometry to identify the cause of salmon mortality in the Pacific Northwest[1], a 2019-2020 Los Angeles County Sanitation Districts (Sanitation Districts) special study[2] used broad-spectrum chemical scans to identify baseline chemical characteristics of non-toxic effluents. This study employed metals scans, current use pesticide screens, and GCMS scans to identify clusters of non-toxic samples from four water reclamation plants (WRPs). This study represented a paradigm shift for the Sanitation Districts, who had previously relied upon targeted analyses and comparison to established toxicological thresholds for evaluation of candidate toxicants. As a result of the analyses and data processing of non-toxic samples, the Sanitation Districts successfully identified clusters that appear to be differentiated by WRP. The Sanitation Districts propose building on the initial study by incorporating samples identified as toxic into the analyses. The goals would be to differentiate these samples from non-toxic samples, identify the specific parameters driving the difference between toxic and non-toxic samples, and use this information to assist in toxicity investigations.

OBJECTIVES:

The objectives of this proposed special study are two-fold. First, this study aims to continue the previous study by developing a baseline of the broad-spectrum screen chemical fingerprint in non-toxic effluent samples from an additional WRP. Second, this study will evaluate whether these non-toxic fingerprints can be used to aid in the identification of toxicants in samples identified as toxic or otherwise reflecting atypical operating conditions.

[1] Peter, Katherine T., et al. 2018 "Using High-Resolution Mass Spectrometry to Identify Organic Contaminants Linked to Urban Stormwater Mortality Syndrome in Coho Salmon." *Environmental Science & Technology* 52.18 : 10317-10327.

[2] Joint Water Pollution Control Plant CI No. 1758; Resolution R019-002; NPDES No. CA0053813. "The Use of Chemical Scans to Establish Chemical Baselines in Effluent (JWSS-19-004)"

APPROACH:

- To further characterize the non-toxic baselines, this study shall include the collection of non-toxic samples from each toxicity test from the Pomona WRP for one-year, beginning in July 2021. A minimum of one chronic toxicity test (evaluated using three samples) are conducted monthly at Pomona WRP resulting in at least 36 chemical scans being conducted over the project duration.
- To further identify patterns in chemical fingerprints and how they relate to toxicity, chemical scans will be conducted on all final effluent samples collected at the Sanitation Districts' facilities and exhibiting toxicity from July 2021 through June 2022. Additionally, chemical scans conducted on Saugus and San Jose Creek East WRP final effluent samples exhibiting toxicity and collected from July 2019 through June 2020 will be included in this evaluation.

PROJECT SCHEDULE AND DELIVERABLES:

- Samples will be collected July 2021 through June 2022.
- Chemical analyses will be completed by September 2022.
- Data for the Pomona WRP baseline and toxic samples will be aggregated and processed by December 2022.
- The data will be analyzed, and a final report summarizing the findings will be submitted by March 31, 2023. At a minimum, this final report shall include the following:
    - Incorporation of the Pomona WRP non-toxic baseline into the analysis of non-toxic baselines from the previously evaluated facilities' (Saugus, San Jose Creek East, Whittier Narrows, and Los Coyotes WRPs)
    - Assessment of toxic WRP chemical baselines and an assessment of comparability to non-toxic baselines
- Until the final report is completed, quarterly progress reports will be submitted to the Regional Water Quality Control Board, Los Angeles Region.

Los Angeles County Sanitation Districts
Joint Water Pollution Control Plant

Proposed Special Study 2021
Palos Verdes Shelf Superfund Site Remediation:
Second Monitored Natural Recovery (MNR) Sampling

1. BACKGROUND

From 1953 until 1971, Montrose Chemical (Montrose) discharged wastes containing DDT from its manufacturing operations to the sanitary sewer collection system operated by the Los Angeles County Sanitation Districts (Sanitation Districts). Other industries also sent wastes containing PCBs and metals to the sanitary sewer. The Sanitation Districts' sewer system carried wastes to the Joint Water Pollution Control Plant (JWPCP) at Carson, and treated wastewater containing contaminants including DDT, PCBs, and metals reached the Pacific Ocean via the Sanitation Districts' White Point outfall system. The wastes were released through the diffuser portions of the outfall pipes situated on the seafloor. The estimated mass of DDTs discharged from the White Point outfalls from the 1950s through 1971 was 1,000 metric tons.

In 1994, the U.S. Geological Survey (USGS) characterized an area of 44 km^2 (17 sq. miles) on the Palos Verdes Shelf (PVS) with elevated levels of DDT and PCBs in surface sediments. Subsequent data showed that DDT- and PCB- contaminated sediments covered a larger area, and the U.S. Environmental Protection Agency (EPA) expanded the PVS study to include the area from Point Fermin in the southeast to the southern edge of the Redondo canyon, northwest of the Palos Verdes peninsula, to a depth of 200 meters down the PVS slope.

Since 1985, fish consumption advisories and health warnings have been posted in southern California because of elevated DDT and PCB levels. Bottom-feeding fish are particularly at risk for high contamination levels. In June 2009, the state Office of Environmental Health Hazard Assessment (OEHHA), issued a new health advisory and safe eating guidelines for fish from coastal areas of Southern California, including the PVS. The advisory warns anglers against eating certain species of fish from specific locations between Ventura Harbor and San Mateo Point. In the PVS area, the guidance advises against consumption of white croaker, barred sand bass, and topsmelt caught from the coastal area between Santa Monica Pier and Seal Beach Pier. Consumption of other fish from this area, including kelp bass, sardines and sculpin, should be limited.

In September of 2009, the EPA issued an Interim Record of Decision (IROD) for the Palos Verdes Shelf (PVS) Superfund site remediation. The selected remedy was an interim action that follows an iterative approach to remediation. This remedy specifically included: (1) placement of an *in-situ* isolation cap over the erosive edge of the deposit that also contains

the most highly contaminated sediment, (2) continuation of an Institutional Controls program to educate anglers about the risks of local fish, and (3) monitoring natural recovery to determine when sediment, water, and fish reach target levels. After assessing the feasibility and effectiveness of the interim remedy, EPA will decide whether additional actions are warranted and include those in a final Record of Decision.

The EPA has been implementing the interim actions since 2009, including implementing a test cap and conducting surveys in 2009 and 2013 to measure DDT and PCB concentrations in sediment cores, fish tissue, and the water column. The Sanitation Districts have collaborated with EPA on their efforts over the past decade, and in the process have completed five Special Studies:

i. Palos Verdes Shelf Baseline Sediment Coring and Chemical Contamination Characterization (R9-008, JWSS-09-001);
ii. Measuring the Flux of Persistent Organic Pollutants (POPs) Across the Sediment-Water Interface on the Palos Verdes Shelf Using Passing Samplers (R11-005, JWSS-11-001);
iii. Palos Verdes Shelf Baseline Sediment Coring and Chemical Contamination Characterization (R14-002, JWSS-14-001);
iv. Passive Sampling to Characterize Dissolved Persistent Organic Pollutant Concentrations in the Water Column of the Palos Verdes Shelf Superfund Site (R14-002, JWSS-14-002);
v. Palos Verdes Shelf Superfund Site White Croaker and Barred Sand Bass Tissue Contamination Characterization (R14-002, JWSS-14-003).

2. PROPOSED SPECIAL STUDIES RELATED TO EPA PALOS VERDES SHELF SUPERFUND REMEDIATION

The goal of the proposed Special Study is to assist EPA in their efforts to remediate the PVS Superfund site and meet their requirement to conduct the second five-year review following the 2009 IROD. More specifically, the study aims to provide information on status and trends of DDT and PCB concentrations in the sediment, water column, and fish tissue. Each of these components is detailed in the following sections.[1]

2.1 PALOS VERDES SHELF SUPERFUND SITE SEDIMENT CORE SAMPLING AND CHEMICAL CONTAMINATION CHARACTERIZATION

Objectives:

The objectives for this component of the special study are as follows:

[1] The details provided herein are based on the EPA's current plans and may be adjusted as the plans are further developed.

- Determine status and trends in DDT and PCB contamination levels on the PVS. Collected data will be used to analyze the rate of change in contaminant concentrations and provide the basis for evaluating the effectiveness of any future remediation actions.

- Conduct intense sampling in the vicinity of the outfall area to inform the design of the proposed sediment cap over the most contaminated sediments near the Sanitation Districts' outfall. If necessary, these data will be used to determine the size and shape of a sediment cap that will maximize the isolation of the most contaminated sediments while minimize the risk of damaging or diminishing operational effectiveness of the Sanitation Districts' outfalls.

Benefits:

The data from this study will add to the historical record of data obtained from the Baseline and Outfall Area surveys in 2009 and 2013. These data will support the enhanced Monitored Natural Recovery (MNR) component of the IROD and will allow EPA to forecast natural recovery, model sediment transport, and track the effectiveness of possible future remediation actions. This information will also be vital for defining the size and shape of the final cap, if needed. The benefits to the Sanitation Districts include training/maintenance of skills in sediment core sampling and slicing as well as updating the Sanitation Districts long-term sediment core monitoring data record.

Approach:

Sanitation Districts' staff and boat crew expect to spend approximately ten days at sea collecting up to 80 sediment cores from the PVS between 40 and 150 m water depth. Sampling locations occupied in the 2013 survey will be revisited for trends analysis and confirmation of results obtained in 2013. An inclinometer (tilt sensor) will be loaded on top of the gravity corer to ensure that vertical sediment cores are collected.

The gravity core sampler originally developed by the Southern California Coastal Water Research Project (SCCWRP) will be used for the survey. Once the cores are collected, they are quickly frozen onboard as intact cores using liquid nitrogen and dry ice. Following operations each day, the frozen cores will be offloaded and transported to freezers at the Sanitation Districts' JWPCP Water Quality Laboratory until processed for physical and chemical analyses.

JWPCPWQL staff will slice the cores and prepare samples for shipping to the analytical laboratories. Specifically, frozen cores will be sliced at 2-cm intervals and approximately equal amounts of sediment subsampled and distributed to four sample jars. The samples will be analyzed for DDTs and PCB congeners. Additionally, total organic carbon, specific gravity, percent moisture and grain size will also be measured. In order to reduce analytical costs, EPA will analyze every 2- centimeter interval from top 8-centimeters (biologically active layer) and every 4-centimeter interval for the remainder of each core. The study is expected to generate up to 3,500 samples for chemical, physical and geotechnical analyses.

2.2 PASSIVE SAMPLING TO CHARACTERIZE DISSOLVED PERSISTENT ORGANIC POLLUTANT CONCENTRATIONS IN THE WATER COLUMN OF THE PALOS VERDES SHELF SUPERFUND SITE

Additional Background:

Monitoring of the persistent organic pollutant concentrations in the water column before, during, and after the capping is necessary to evaluate the effectiveness of the remediation as well as any adverse effects from sediment resuspension induced contaminant release. Measurement of the very low dissolved concentrations of persistent organic pollutants (POPs), including DDTs and PCBs, is technically challenging and time consuming using the traditional techniques. In recent years, *in-situ* passive sampling methods, including solid-phase Microextraction (SPME) and low-density polyethylene (PE) strips have reduced the labor involved in sampling and post-collection processing, while allowing for dissolved POPs measurement at very low concentrations. Furthermore, passive sampling avoids many of the artifacts associated with traditional methods that result in over- or under-estimating dissolved concentrations.

Objectives:

The objectives of this component of the proposed Special Study are to use passive sampling devices to: 1) measure the dissolved concentrations of DDTs and PCBs in different horizons of the water column, both along a spatial gradient away from the highly contaminated zone and at stations up-current of the most highly contaminated sediments, and 2) compare dissolved DDT and PCB concentrations to those measured using the same methods in September 2013 and 2010.

Benefits:

The proposed Special Study will provide status and trend information relative to the interim and final remediation goals for DDTs and PCBs within the water column. Further, these data will add significantly to our limited knowledge of the concentrations and movement of DDTs and PCBs in water column within PVS superfund site and as a source of these contaminants into Santa Monica Bay in support of the associated DDT/PCB TMDL. Sanitation Districts' field crew will also obtain valuable training in the rigging, deployment, and retrieval of passive sampling devices.

Approach:

The Sanitation Districts will spend up to three days at sea to deploy passive sampling devices at approximately 15 stations targeting between 40- and 60-meters isobaths. One station at the south rim of San Pedro Shelf will serve as a reference site for the 60 meters isobath.

PE samplers will be mounted at three water depths: five meters below surface, mid-depth, and five meters from the bottom. SPME devices will be co-deployed at selected

locations. The passive samplers will be immersed in the water column for 30-day in order to equilibrate with contaminant concentrations in the surrounding seawater. The Sanitation Districts' field crew expects retrieval of the passive sampling devices to take three days with assistance of scientists from SCCWRP and EPA's Office of Research and Development (ORD) in Narragansett, Rhode Island.

Retrieved passive samples will be analyzed for DDTs and breakdown products and PCB congeners using gas chromatography/mass selective detection (GC/MSD) in the selected-ion monitoring (SIM) mode. PE sample data will be quantified by EPA scientists while SPME sample data will be quantified by chemists at the SCCWRP.

2.3 PALOS VERDES SHELF SUPERFUND SITE FISH TISSUE SAMPLING AND CHEMICAL CONTAMINATION CHARACTERIZATION

Objectives:

The objective of this component of the proposed Special Study is to assess the status and trends of contamination in White Croaker caught on the PVS in relation to remediation goals for human and wildlife health protection. Results will also be used to assess correlations among contaminant concentrations in fish tissue, water column and sediment and potentially refine the models used to set the associated remediation targets for water and sediment.

Benefits:

This component of the proposed Special Study will support the enhanced MNR program of the IROD by providing field support for fish and tissue types allowing EPA's resources to be focused on maximizing the number of individual fish being analyzed. This will allow for an understanding of the risk to wildlife that consume the entire fish and humans who typically consume skin off muscle fillets.

Approach:

The Sanitation Districts' field crew will collect, by otter trawl, up to 30 adult white croakers (170 mm to 220 mm standard length) from established fishing Zones off PVS. These fish will be frozen onboard and transferred in a cooler on ice to freezers at the JWPCP after collection. These fish will be provided to EPA for individual analysis. EPA will analyze each fish for percent moisture, percent lipids, and DDTs and PCB congeners.

2.4 PROJECT SCHEDULE AND DELIVERABLES

Field work is scheduled for late 2021, including sediment core sampling (winter), deployment and retrieval of passive sampling devices (winter), and night trawls for White Croaker (early November), with delivery of the fish to EPA before the end of 2021. Analytical results from the EPA contract laboratories are expected to be available in 2022.

The final technical report will be prepared and published by EPA and is expected to be released in the 2024. This report will signify the completion of this Special Study. Until release of EPA's final report, Sanitation Districts' staff will provide quarterly progress reports to the Los Angeles Regional Water Quality Control Board.