



Cal/EPA

**San Francisco Bay
Regional Water
Quality Control
Board**

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Marty A. Gilles, Manager
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P.O. Box 1272
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Attention: Mr. Don Kinkela

Date:
File No. 2119.1044G(EAC)



Pete Wilson
Governor

Castro Cove
RL

SUBJECT: Request for Castro Cove Sediment Characterization Work Plan

Dear Ms. Gilles:

This letter discusses the next steps in determining whether and to what degree remediation of contaminated sediments in Castro Cove is needed.

As discussed with Don Kinkela of your staff in a meeting on April 28, 1997, Castro Cove has been identified as a candidate toxic hot spot pursuant to California Water Code Sections 13390 – 13396.5, otherwise known as the Bay Protection and Toxic Cleanup Program (BPTCP). Based on the volume of petroleum products processed at the refinery since the turn of the century and the presence of petroleum-related contaminants in the sediments, staff have determined that the Chevron Refinery is a likely source of sediment contamination in Castro Cove.

As mandated by the BPTCP, Regional Board staff have prepared a Proposed Regional Toxic Hot Spot Cleanup Plan (December, 1997) that includes the specific regional definition of a toxic hot spot and the criteria used to rank sites as "high priority" for listing purposes. Castro Cove has been listed as a candidate toxic hot spot because it has exhibited recurrent high toxicity associated with high chemical concentrations and bioaccumulation of pollutants in test organisms exposed to the sediments. Several studies conducted since 1987 have shown high levels of polynuclear aromatic hydrocarbons (PAHs, up to 227,800 µg/kg) in the sediment in the southwest portion of Castro Cove in the area where the refinery's historic NPDES outfall was located. Significant toxicity has been observed in several species of amphipods and in sea urchin and bivalve mollusc development tests on multiple occasions in the southwest portion of the cove. A sample location in the northeastern portion of the cove has also shown significant toxicity to test organisms during two different studies. On three separate occasions from 1988 to 1990, the State Mussel Watch Program deployed mussels in Castro Cove near the mouth of Castro Creek. PAHs were measured at increasingly elevated concentrations (up to 44,210 µg/kg) in mussel tissue during the three years of this study. More detailed descriptions of and references for the studies mentioned

above and other reasons for listing Castro Cove as a candidate toxic hot spot are contained on pages 53 to 64 of the Proposed Regional Toxic Hot Spot Cleanup Plan.

In addition to listing and describing candidate toxic hot spots, the Proposed Regional Toxic Hot Spot Cleanup Plan also contains a preliminary assessment of the actions required to remedy or restore these sites as required by Water Code Section 13394. The first action described is the preparation of a sampling and analysis plan to delineate the horizontal and vertical extent of sediment contamination. Although past sampling events have shown significant aquatic toxicity associated with high concentrations of contaminants in the southwest portion of the cove, it is unknown to what extent this relationship holds true for the rest of the cove. The data from past studies is very limited in terms of areal coverage of sampling locations and the types of chemical analyses performed. **We request, therefore, that Chevron submit a work plan and schedule, acceptable to the Executive Officer, for the characterization of sediment contamination in Castro Cove due to sources from the refinery. In the interest of moving forward with the investigation during the 1998 dry season, we request that the plan be submitted to this office no later than August 31, 1998.**

In order for the plan to be acceptable to the Executive Officer, it must include the rationale for each sampling and analytical method proposed. Staff consider the following information essential to an adequate sediment characterization in Castro Cove.

1. A delineation of sediment contaminant gradients originating from suspected refinery-related source areas. An effort should be made to identify and investigate potential refinery-related sources of sediment contamination in addition to the historic NPDES outfall, e.g., ship channel dredge dumping sites, offshore areas where accidental releases have been documented or observed, historic storm water discharge points into Castro Cove such as the first pass of #1 Oxidation Pond, and waste management units near the shoreline that could have released pollutants into the cove. The investigation should include the lower reach of Castro Creek as well as the cove itself.
2. An evaluation of the effects of the bioavailable layer of sediment on aquatic organisms by means of toxicity and chemistry testing of surficial sediments, to a depth of 5 cm. Components of this evaluation should include:
 - a. Analysis of all samples for total petroleum hydrocarbons (TPH), PAHs, Hg, Se, and As. In addition, at least ten percent of all samples should be analyzed for an extended suite of contaminants including organochlorine pesticides, PCBs and priority pollutant metals not listed above;

- b. Toxicity testing performed concurrently with analytical chemistry on surface sediment samples to correlate toxic effects to aquatic organisms with chemical causative agents in the sediment. Sediment grain size, total organic carbon, unionized ammonia, and hydrogen sulfide concentrations should be measured to differentiate pollutant effects from natural factors ;
 - c. For quality assurance, ten percent of all samples should be split with a secondary laboratory approved by Board staff for concurrent analysis.
 3. A characterization of the vertical extent of sediment contamination and an estimation of the degree of mixing of surficial sediment with deeper layers. The objective is to demonstrate whether natural capping or re-suspension of contaminants is occurring. This study should include the analyses listed in 2. (a) and (c), above. To demonstrate the degree of vertical mixing, Chevron will need to provide evidence of sediment deposition and/or erosion using existing bathymetric data, radioisotope dating of core samples, or other approved methods.
 4. A field-study evaluation of the potential for bioaccumulation and biomagnification of contaminants in the sediment.

We appreciate your continued cooperation in this matter. Please note that this is a request for a technical report pursuant to California Water Code Section 13267. If you have any questions, please contact Elizabeth Christian at (510) 286-3980.

Sincerely,

Loretta K. Barsamian
Executive Officer