California Regional Water Quality Control Board
San Francisco Bay Region

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TREASURE ISLAND
SSIC NO. 5090.3.A

Gray Davis
Governor

Date: November 23, 1999
File No. 2169.6013 (CRM)

Commanding Officer
Engineering Field Activity, West
Naval Facilities Engineering Command
900 Commodore Drive
San Bruno, CA 94066-2402
Attention: Mr. Ernesto Galang

Subject: Water Quality Issues for Site 12 at Naval Station Treasure Island, San Francisco

Dear Mr. Galang:

Introduction

On October 27, 1999 Regional Board staff (Board staff) met with representatives of the Navy, City of San Francisco, Department of Toxic Substances Control (DTSC), and the United States Environmental Protection Agency (USEPA). The purpose of the meeting was to discuss water quality issues at Naval Station Treasure Island (Treasure Island). During the meeting Board staff committed to provide the Navy with several letters that would clearly outline our position regarding specific water quality related issues for Treasure Island.

Board staff has already provided the Navy with several letters as a follow-up to our October 27th meeting. These letters include: (1) October 27, 1999 – comments regarding field sampling plans for petroleum hydrocarbons at Corrective Action Plan (CAP) and underground storage tank (UST) sites; (2) October 29, 1999 - development of remedial decisions for areas of degraded ground water; and, (3) November 3, 1999 - protection of saltwater aquatic beneficial uses.

On November 17, 1999 Board staff met with representatives of the Navy, DTSC, and USEPA to discuss issues for Site 12 at Treasure Island (Site 12). An additional meeting has been scheduled for the afternoon of December 6, 1999 to discuss issues raised in recent correspondence by Board staff and the DTSC. This letter provides additional follow-up to our October 27th meeting, and is intended to clearly outline water quality issues for Site 12 at Treasure Island (Site 12) to facilitate our December 6th discussion. We recommend that the Navy review this letter and the other letters provided by Board staff and the DTSC to develop a complete understanding of the outstanding regulatory issues for Site 12.

Cleanup Levels for Petroleum Hydrocarbons

During a previous issues resolution meeting, Board staff concurred with a numerical cleanup goal for total petroleum hydrocarbons (TPH) in ground water for Site 12. The cleanup goal is 1.40 mg/L as measured in monitoring wells closest to the shoreline. The cleanup goal is <u>not</u> to be applied at the shoreline, which is the point of exposure for aquatic organisms.

Provided that the numerical cleanup goal for TPH is not currently exceeded, and will not be exceeded in the future, Board staff intends to recommend to the Regional Board Executive Officer that no active remedial measures be required for TPH at Site 12. This recommendation was developed in consideration of technical and economic feasibility, and in accordance with the containment zone provisions of State Water Resources Control Board Resolution No. 92-49 (Res. 92-49). We understand that the Navy will be proposing a complete management action plan for TPH at Site 12, including deed restrictions, as part of the forthcoming final remedial decision document.

Assessment of the Lateral and Vertical Extent of Ground Water Degradation

Regardless of the final cleanup goal for Site 12, the Navy is required in accordance with the provisions of Res. 92-49 to fully assess the lateral and vertical extent of ground water degradation. Specific to Site 12, the Navy has yet to evaluate the impacts to water quality in the additional debris disposal areas and former storage yard area. Contaminants in ground water may include TPH, metals, polychlorinated biphenyls (PCBs), semi-volatile organic compounds (SVOCs) and volatile organic compounds (VOCs). In some cases, monitoring wells may already be adequately located and sampling may have already been completed to assess water quality impacts. In other cases, additional wells and/or sampling will be necessary.

Assessment of the Lateral and Vertical Extent of Contaminants in Soil

Contaminants in soil may provide an on-going source of ground water degradation. It is unlikely that the Navy will be able to fully evaluate possible future impacts to water quality without assessing the lateral and vertical extent of contaminants in soil. Recent investigations conducted by the Navy for the additional debris disposal areas and the former storage yard have not fully assessed the extent of soil contamination, and have only evaluated soils for the protection of human health (i.e., preliminary remediation goals (PRGs)).

We concur that in some cases the initial focus of an investigation should be to look solely at PRGs because of existing exposure pathways to human receptors. However, we have commented on numerous occasions both verbally and in writing that the Navy will ultimately need to fully assess the lateral and vertical extent of contaminants in the soil. The Navy and the City of San Francisco should be fully aware that if remedial decisions are based solely on PRGs, then additional sampling and remedial measures could be necessary in the future to address soil contamination with respect to water quality concerns. Where possible, we suggest that the Navy conduct a complete assessment of soil contamination during the initial field investigation to prevent multiple field investigations that may be intrusive to residents and are exhaustive to the Navy's financial and human resources.

Leaching of Contaminants from Soil

In order to evaluate the possible contribution of contaminants from soil to ground water, the Navy must determine what fraction of contaminants may leach from the soil. The Navy recently failed to accurately determine the amount of TPH that would leach from the soil at Site 12, and has not assessed the leaching potential of other contaminants such as the various metals, SVOCs, VOCs and PCBs that have been detected in soil at Site 12.

The absence of some contaminants in ground water at Site 12 does provide some line of evidence that these contaminants are not currently leaching from soil at significant concentrations. Contaminants may still be leaching, or may have previously leached from the soil, and are being adequately attenuated. The Navy and the City of San Francisco verbally presented this line of reasoning during our October 27th meeting.

While we generally concur with the Navy and the City regarding this point, Board staff believes that the leach analysis is an important part of the justification for final remedial decisions. If one or more contaminants leach from the soil at elevated concentrations in the laboratory environment, then the Navy will need to assess the existing site conditions, the adequacy of the ground water monitoring network, and the accuracy of the available water quality data. The Navy may need to present adequate arguments as to why contaminants that leach from soils in a laboratory environment are not present in the ground water of existing monitoring wells.

Arsenic and Lead in Ground Water

Ground water monitoring data indicate the presence of arsenic in ground water along the shoreline at concentrations exceeding water quality criteria for protection of saltwater aquatic habitat. Our November 3, 1999 letter identified eight monitoring wells at Site 12 where arsenic has been detected in ground water at concentrations greater than applicable saltwater aquatic water quality criteria. The Navy has not fully assessed the source(s), nature and extent of arsenic in the ground water at Site 12.

The 1998 annual ground water monitoring report includes dissolved lead in the laboratory analysis for only two of twenty wells (MW-03 and MW-15) sampled for ground water at Site 12. The two wells sampled contained dissolved lead at concentrations of 5 and 6 µg/L, respectively, indicating the presence of dissolved lead in the ground water. Absent more comprehensive data for dissolved lead in ground water, and in consideration of the elevated total lead concentrations measured in soils at the former Site 12 debris disposal areas, Board staff could not adequately determine if dissolved lead exceeds applicable water quality criteria in ground water at Site 12. Board staff believes that lead may be leaching into the ground water and potentially impacting the beneficial uses of San Francisco Bay. The Navy will need to fully assess the nature and extent of dissolved lead in ground water at Site 12.

Fate and Transport of Contaminants in Ground Water

The fate and transport of contaminants in ground water at Site 12 is important for estimating the future conditions and disposition of contaminants with respect to San Francisco Bay. Most recently, Board staff received a technical report from the Navy in October 1999 in regards to the fate and transport of TPH in ground water. We understand that this issue will be discussed during our upcoming meeting on December 6, 1999. Board staff is delaying our technical comments on the report until after the December 6th meeting.

Fate and transport modeling requires accurate field data and an accurate conceptual hydrologic model. Board staff has concerns regarding both of these items as presented by the Navy for Site 12. First, ground water data collected from monitoring wells generally represents the vertical column of water that is intersected by the well screen. In most cases for Site 12, wells are screened across the upper ten feet of the aquifer. In the case of TPH impacted ground water, it is unlikely that ground water impacts extend more than five feet below the water table surface. As such, water quality samples collected from wells with screens longer than the vertical extent of contaminants will contain a significant quantity of "clean" water. The resultant concentration of TPH has been diluted in comparison to the actual concentration measurable in the upper few feet of the aquifer. While the monitoring well data may be representative for assessing overall impacts to an aquifer, the data may not be adequate for the purposes of fate and transport analysis.

Our second concern is the conceptual hydrologic model for ground water near the shoreline. The numerical modeling completed to date ignores and fails to characterize the mixing of seawater and fresh ground water that occurs on a daily basis as a result of the tides. The extent and nature of tidal mixing and the resultant contaminant dilution has not been quantified. Dilution of contaminants occurring on a daily basis as a result of the tides is likely more extensive than the dilution caused by up-gradient "clean" ground water that moves through the plume area. Failing to account of dilution caused by the tides will likely result in numerical modeling errors.

TPH in the Area of Buildings 1311 and 1313

On October 22, 1999 Board staff provided the Navy with a written response regarding a proposal for monitored natural attenuation of TPH impacted soil and ground water in the area of Buildings 1311 and 1313 at Site 12. Our letter indicated that the lateral extent of TPH impacted ground water has not been fully defined, and that the fate and transport and leaching studies referenced in the proposal were yet to be completed. The issues outlined in our letter have yet to be resolved, and were discussed during our above-referenced meeting on November 17th. We understand that the issues, including contaminant fate and transport, will be further discussed during our upcoming December 6th meeting.

If you have questions regarding these comments, please feel free to call me at (510) 622-2377.

Sincerely,

Chris Maxwell
Associate Engineering Geologist
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