California Regional Water Quality Control Board
San Francisco Bay Region

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TREASURE ISLAND
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Gray Davis
Governor

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

Subject: Response to (1) Draft Field Sampling and Analysis Plan for Corrective Action Sites and (2) Final Remedial Investigation Work Plan for UST Sites, Naval Station Treasure Island, San Francisco, California

Dear Mr. Galang:

Introduction

Regional Board staff (Board staff) has reviewed the two above-referenced work plans proposing the investigation of petroleum hydrocarbons in soil and ground water at Treasure Island. Board staff also met with you and other Navy representatives on October 25, 1999 to discuss the work plans. Per our report review and meeting discussions, Board staff is providing the following comments.

Rather than revise and resubmit the documents, Board staff is recommending that the Navy implement the work plans and incorporate Board staff's comments into the scope of work as appropriate. If issues raised by Board staff in this letter are not resolved through the implementation of the work plans, outstanding issues can be addressed at a later date through a supplemental investigation program.

General Comments

Discharge of Contaminants to San Francisco Bay

Based on data included in the CAP and UST work plans, Board staff believes that it is likely that contaminants are being discharged to San Francisco Bay at CAP Site14/22, CAP Site 15, and CAP Site 25, and possibly UST Site 227. This conclusion is based on grab ground water sampling and monitoring well sampling at locations in close proximity to the shoreline. In some cases, the concentration of one or more contaminants exceeds numerical values that are considered to be protective of the beneficial uses of saltwater aquatic organisms. In concert with the investigation activities, the Navy should immediately initiate appropriate actions to abate this condition in a prompt and reasonable manner.

Corrective Action Program (CAP) and Underground Storage Tank (UST) Sites

Board staff understands that CAP sites are generally the nine former Installation Restoration (IR) sites that have been determined to be "petroleum only". In some cases, one or more USTs are being addressed separately but lie within the boundaries of a CAP site. For the purposes of remedial decisions, Board staff suggests that the Navy combine CAP and UST sites that are geographically connected and/or connected by contaminant issues.

Non-Petroleum Contaminants at CAP and UST Sites

In some cases, non-petroleum contaminants are present in the ground water at CAP and UST sites. Board staff understands that these sites were removed from the IR program with agreement from the regulatory agencies provided that the concentrations of non-petroleum contaminants were below drinking water standards. The Navy should be aware that all contaminants will need to be fully evaluated and considered during the remedial decision process for the CAP and UST sites. Regardless of the concentrations, the Navy will need to fully understand the source(s), nature and extent of all contaminants in soil and ground water in order to make supportable remedial decisions.

Ground Water Screening Levels for Total Petroleum Hydrocarbons (TPH)

The work plans propose a ground water screening level for TPH of 1.4 mg/L. Board staff previously provided concurrence with this TPH cleanup goal for Site 12 at Treasure Island. The cleanup goal is intended to be protective of saltwater aquatic organisms. Board staff has not provided concurrence with ground water cleanup goals for any other sites on Treasure Island.

State Water Resources Control Board Resolution 68-16 (Res. 68-16) is a part of the Water Quality Control Plan for the San Francisco Bay Region (Basin Plan) and, regardless of assigned beneficial uses, describes a policy of non-degradation for ground and surface waters. The final cleanup goal for any site lies between background water quality and some numerical value that is protective of all assigned beneficial uses. The final cleanup goal is typically developed in consideration of technical and economic factors.

The Regional Board has not formally concurred that 1.4 mg/L of TPH will be considered protective of the beneficial uses of the ground water for any CAP or UST sites at Treasure Island. Furthermore, the Navy has not yet evaluated the economic and technical feasibility of performing site cleanup for these sites. In consideration of Regional Board's non-degradation policy and the uncertainty surrounding the final TPH cleanup goal, Board staff recommends that the Navy define the extent of ground water degradation to the fullest extent practical. Specifically, the Navy should not limit an investigation based solely on a cleanup goal of 1.4 mg/L for TPH in ground water.

Soil Screening Levels

Board staff understands that the Navy, based on a ground water screening level of approximately 22 mg/L, developed the proposed soil screening level for total petroleum hydrocarbons (TPH) of 447 mg/kg. In general, this screening level was developed on the basis that 447mg/kg of TPH in soil would theoretically leach 22 mg/L of TPH into the ground water. The 22 mg/L of TPH in ground water was proposed as a cleanup goal by the Navy in lieu of the 1.4 mg/L value discussed above in this letter, and was not accepted by Board staff.

Board staff has not formally provided concurrence with any soil screening level for TPH at Treasure Island. Furthermore, Board staff has not provided concurrence with leachability studies recently performed by the Navy to assess the leachability of TPH in soil. Board staff understands that the Navy is using 447 mg/kg as a screening level for investigation purposes, and that the Navy is aware that ground water cleanup goals have yet to be fully determined. Additional site investigation may be required at a later date to further define the extent of contaminants in the soil if the Regional Board determines that a soil cleanup goal lower than 447 mg/kg is appropriate to achieve cleanup goals for ground water.

Comparison of Grab Samples and Monitoring Well Samples

Board staff has noted that TPH concentrations are typically higher in grab ground water samples than in samples collected from ground water monitoring wells. Grab ground water samples are typically collected both from auger borings using the Hydropunch$_{TM}$ method and from geoprobe borings. Board staff's position has consistently been that grab ground water samples are useful for preliminary site assessment, and that monitoring well data is necessary to accurately assess site conditions and develop remedial decisions. However, considering that the grab ground water samples are consistently higher in contaminant concentration, Board staff is compelled to evaluate the accuracy of the grab ground water and monitoring well data.

As discussed during our recent meeting, one thought is that grab ground water samples are typically taken from the upper section of the aquifer where the majority of light non-aqueous phase liquids would be concentrated. In contrast, monitoring wells at Treasure Island have typically been screened over a ten-foot saturated interval. In theory, the lower portion of the well would draw in less contaminated water, thereby "diluting" the concentration of contaminants.

Board staff understands that the Navy is receptive to an evaluation of grab ground water and monitoring well data. To compare these two types of data, Board staff recommends that the Navy collect geoprobe and/or Hydropunch$_{TM}$ samples from one or more locations immediately adjacent to existing or new monitoring wells. Grab ground water samples should be collected at the same time as monitoring well samples to compare the laboratory analytical results. Samples should also be collected as both filtered and unfiltered to assess the impact of sediment on the laboratory analytical results.

Another method of site investigation to consider would be discrete ground water sampling within an individual well. Methods are available to collect discrete ground water samples at multiple depths within a single well. These data may be useful to accurately delineate the vertical extent and distribution of contaminants in the ground water over a known vertical profile.

1998 Annual Ground Water Sampling Data

The two work plans reference ground water data that was collected in 1998 as part of the Treasure Island annual ground water monitoring event. In most cases, the concentrations of contaminants decreased in 1998 in comparison to earlier sampling events. In general, the two work plans attribute the decrease to natural attenuation processes. In some cases, additional sampling is not being proposed because the concentration of TPH detected in ground water during the 1998 event was less than the 1.4 mg/L value.

Board staff believes that it would be presumptuous to conclude that natural attenuation processes are responsible for the reduction in contaminant concentrations. This is especially true considering that sources of petroleum hydrocarbons are generally several decades old, and source removal was not conducted at most sites between the ground water sampling events. Other factors such as depth to ground water and tide conditions may also effect the concentration of contaminants between sampling events and should be considered in developing conclusions regarding trends in contaminant concentrations. Board staff believes that it would be prudent for the Navy to make conclusions based on several sampling events.

Ground Water Monitoring Well Development

Board staff recommends that monitoring wells be preliminarily developed after installation of the filter pack and prior to installation of the bentonite seal. If settling of the filter pack materials occurs, additional filter pack materials should be added during the preliminary development process. If during the field investigations, the Navy finds that the filter packs consistently do not settle during this preliminary development process, Board staff will concur that preliminary development will not be necessary during the remainder of the investigations.

Stabilization of Field Parameters

The UST work plan does not clearly indicate how the field personnel will determine when field parameters such as electrical conductivity (EC) and pH are stable for sampling. The USEPA and the USGS have published documents that provide recommendations for protocol in determining field parameter stability. Board staff suggests that the Navy utilize and reference one or more of these sampling guidance documents for determining and reporting field parameter stabilization.

Well Screen Length

The two work plans propose approximately 10 feet of well screen below the ground water table for monitoring well construction. In consideration of the discussion in this letter above regarding grab ground water sampling, Board staff suggests that well screen lengths be shorter than 10 feet unless data can be presented indicating that longer screen lengths are necessary to accommodate seasonal fluctuations in water table elevations. Well screens should be no longer than necessary to effectively monitor the zone of ground water than has been impacted by contaminant releases. For light non-aqueous phase liquids at Treasure Island, the vertical extent of impacted ground water is likely less than 10 feet unless contaminated soil extends to a significant depth below the water table surface.

Site-Specific Comments

CAP Site 6

- Page 21 – It is misleading to state that TPH was not present in the ground water of Area of Concern AOC 06-GW2 during the 1998 sampling event. Ground water monitoring wells in this area that previously contained TPH and other related contaminants (MW-06 and MW-012) were not sampled during the 1998 event.

CAP Site 14/22

- Page 28 - Considering the proximity to the shoreline, Board staff recommends that all three ground water monitoring wells be installed regardless of the results of the grab ground water sampling event.

CAP Site 16

- If ground water is encountered in this area, the Navy should develop a plan for installation of one or more ground water monitoring wells to evaluate water quality associated with petroleum hydrocarbons.

CAP Site 20

- Figure 15 - No ground water monitoring is proposed in the area immediately downgradient of former UST 225A. A grab ground water sample in this area (20-HP007) collected in 1995 contained TPH at a concentration of 8,000 µg/L. Additional ground water sampling is necessary in this area to fully evaluate the nature and extent of contaminants associated with UST 225A.

CAP Site 25

- Figure 17 – Grab ground water sampling immediately adjacent to Clipper Cove indicates elevated concentrations of TPH and petroleum related constituents in the ground water at this location. These data suggest that petroleum hydrocarbon constituents are being discharged to surface water at concentrations greater than numerical limits that are believed to be protective of saltwater aquatic organisms. Unless the Navy would prefer to make remedial decisions based solely on these grab ground water samples, Board staff recommends that the Navy install a sufficient number of monitoring wells along the shoreline to fully assess the nature of petroleum hydrocarbons near the shoreline.

  Note that Board staff is not implying that wells along the shoreline will be used as the point of compliance in future remedial decisions at any CAP or UST site. However, monitoring wells near the shoreline will be useful tools to fully assess the nature and extent of impacts associated with petroleum hydrocarbon releases.

- Figure 17 - An additional monitoring well should be added near previous boring B-7 to assess the presence of methyl-t-butyl-ether (MTBE) that was previously detected in the ground water at this location at a concentration of 230 µg/L.

UST 227

- Board staff has concerns regarding the direction of ground water flow that has been calculated and is illustrated as being consistently to the northeast. A northeast ground water flow direction would indicate that ground water is flowing toward the center of the island at a location that is in close proximity to the shoreline (west). In consideration of ground water flow behavior noted across the island, a ground water flow direction toward the center of the island is doubtful. The UST work plan acknowledges that the flow direction is "...inconsistent with the anticipated westerly flow direction toward the Bay". Surveying problems and/or the presence of free phase petroleum hydrocarbons may cause the error in calculated flow direction.

  Board staff concurs with the proposed well location for MW-4 because this well is situated in the area where free phase petroleum hydrocarbons were noted during the 1995 investigation. Proposed well MW-5 is likely in an upgradient direction and is not well positioned to evaluate the downgradient extent of petroleum hydrocarbons in the ground water.

  Based on the iso-concentration map for TPH in ground water as presented in Figure 16, the plume of TPH in ground water appears to be migrating beneath Building 227 to the west and southwest. A westerly plume migration pattern would be consistent with an expected off-shore ground water flow direction. No monitoring wells are proposed to the west or southwest to evaluate the nature and extent of ground water impacts in this direction.

Based on figures provided in the UST work plan, the presence of Building 227 may inhibit the Navy's ability to conduct further investigation immediately to the west and southwest of UST 227. However, additional ground water investigation will be necessary between Building 227 and the shoreline to assess the potential for contaminants to migrate into San Francisco Bay. Board staff suggests that the Navy evaluate the site access conditions and develop a scope of work for further assessment of the ground water to the west and southwest of Building 227.

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

Sincerely,

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