DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
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N30519_000235
NFD POINT MOLATE
SSIC NO. 5090.3.A

5090
Ser 06CM.MS/082
February 8, 2000

Ms. Linda Dorn
Project Manager
California Regional Water Quality Control Board
San Francisco Bay Region
1515 Clay Street, Suite 1400
Oakland, CA 94612

Subj: RESPONSE TO COMMENTS ON DRAFT PHASE II REMEDIAL INVESTIGATION REPORT, NAVAL FUEL DEPOT POINT MOLATE

Dear Ms. Dorn:

Enclosed is the Response to Comments on the Draft Phase II Remedial Investigation Report for Naval Fuel Depot, Point Molate. This document has also been provided to Mr. Phillip Ramsey of the U.S. Environmental Protection Agency and Mr. Kent Kitchingman of the City of Richmond. Please review and provide either concurrence or comments to Ms. Michelle Gallice Sondrup no later than February 18, 2000.

Sincerely,

FAIQ ALJABI
Environmental Baseline Team Leader
By direction of the Commander

Copy to:
Mr. Phillip Ramsey
United States Environmental Protection Agency
Region IX
75 Hawthorne Street
San Francisco, CA 94105

Mr. Kent Kitchingman
City of Richmond
330 25th Street
Richmond, CA 94804

5090
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Blind copy to:
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Tetra Tech EM Inc.

1099 18th Street, Suite 1960 ◆ Denver, CO 80202 ◆ (303) 295-1101 ◆ FAX (303) 295-2818

February 3, 2000

Ms. Michelle Gallice Sondrup
Remedial Project Manager
Southwest Division
Naval Facilities Engineering Command
1220 Pacific Highway
San Diego, California 92132-5181

Subject: **Response to Comments on Draft Phase II Remedial Investigation Report, Naval Fuel Depot Point Molate**

Dear Ms. Gallice Sondrup:

Please find enclosed the Tetra Tech EMI (TtEMI) responses to comments on the Draft Phase II Remedial Investigation Report for Naval Fuel Depot Point Molate in Richmond, California. All comments received from Base Realignment and Closure (BRAC) Cleanup Team (BCT) members including the California Regional Water Quality Control Board (RWQCB), U.S. Environmental Protection Agency (EPA) Region 9, and the City of Richmond are addressed in the enclosed responses.

After the BCT members concur with the responses to comments, the Final Phase II Remedial Investigation Report will be prepared at the Navy's direction. Please call me at (303) 312-8834 if you have any questions.

Sincerely,

Gary Miller

Gary Miller, P.G.
Senior Hydrogeologist
Project Manager

GM/rkr

cc: Ms. Violetta Limcolioc

contains recycled fiber and is recyclable

RESPONSES TO COMMENTS
DRAFT PHASE II REMEDIAL INVESTIGATION REPORT
NAVAL FUEL DEPOT POINT MOLATE
RICHMOND, CALIFORNIA
JUNE 30, 1999

1.0 INTRODUCTION

This document presents the Navy's responses to comments received from the Base Realignment and Closure (BRAC) Cleanup Team (BCT) made up of the Regional Water Quality Control Board (RWQCB), the U.S. Environmental Protection Agency (EPA), and the City of Richmond on the Draft Phase II Remedial Investigation (RI) Report for Naval Fuel Depot (NFD) Point Molate, dated June 30, 1999. Comments were received from Ms. Linda Dorn of RWQCB in a letter dated September 27, 1999 (Section 2.0). Comments were received from Mr. Phillip Ramsey of the U.S. EPA Region 9 in a letter dated October 11, 1999 (Section 3.0). Comments were received from Mr. Kent Kitchingman of Richmond in a letter dated November 11, 1999 (Section 4.0).

2.0 RESPONSES TO RWQCB COMMENTS

GENERAL COMMENTS

Comment 1: The report is comprehensive in nature and does a good job of summarizing and centrally locating historical data from previous investigative work over the last 10 years. Generally, the presentation of the data is not confusing, therefore allowing the reader to agree or disagree with the conclusions proposed in Section 8.

Response: Comment acknowledged.

Comment 2: Information collected as part of the current UST [underground storage tank] investigation should be included where the data is relevant to an installation restoration (IR) site. Please include this data where appropriate in the Draft Final RI Report. The site conceptual model for the site has historically shown the primary migration of contaminants along the backfill of buried pipelines. The laboratory analytical results of soil samples collected during the Site 4 pipeline removal do not indicate the backfill of the pipelines is a preferential product migration pathway. The site conceptual models should be refined to reflect all information collected to date.

Response: Pertinent data from the UST investigation will be included. However, please note that many areas of the UST investigation are not proximal to IR sites and have no relevance to IR site characterization. IR Site 4 pipeline removals at the time the Draft Phase II RI Report was written were mostly in areas where pipelines were shallow and perpendicular to the shorelines. These areas may not be representative of all pipelines based on previous results. Conceptual models have been and are being refined for the Final Phase II RI Report.

Comment 3: In discussing fate and transport of bunker fuel please expand on what actions can be taken to better understand the future significance of hydraulic flushing in the migration of contaminants at the site.

Response: Information about hydraulic flushing will be added. No specific actions have been taken in the field to investigate hydraulic flushing at this time.

Comment 4: Preferential migration pathways should include a discussion of geologic features such as bedding planes, fractures, and faults. Point Molate is located in an area dominated by highly fractured Franciscan Formation bedrock. The interbedded shale observed in outcrops at Point Molate should be evaluated as a preferential migration pathway for pollution.

Response: The bedrock has not functioned as a significant migration pathway at Point Molate because light nonaqueous phase liquid (LNAPL) contaminants tend to remain at the capillary fringe and upper water table. In addition, the water table is within fill or colluvium at most areas of IR Site 1 and at all areas of IR Sites 3 and 4. Some discussion of the potential for migration within fractured rock and other structural features will be included; however, it is not considered a significant pathway. As pointed out in Chevron documents (BDEM 1992), fractures are often short, do not cross bedding planes, are usually filled with clay or secondary minerals, and are omnidirectional. This information is presented in Section 3.4.3 of the Draft Phase II RI Report.

Comment 5: The Final Phase II Remedial Investigation Report must be signed and stamped by a California registered civil engineer, California registered geologist, or a California certified engineering geologist, according to the Business and Professions Code for the State of California, Division 3, Section 6735 and Chapter 12.5, Articles 3, Sections 7835 and 7835.1.

Response: The Final Phase II RI Report will be reviewed and signed by a California registered geologist.

Comment 6: A summary table of all groundwater measurements in all wells, not just wells measured as part of a quarterly or semi-annual monitoring event, should be supplied either with each IR site discussion of the nature and extent of contamination or as an appendix.

Response: A table of all groundwater and product elevations and measured free product thicknesses since 1994 will be included in an appendix in the final report.

SPECIFIC COMMENTS

Comment 1: Section 1.3.1, Site Description and Regulatory Stakeholders. The RWQCB is the lead agency and has issued Board Order 97-124 specifying Site Cleanup Requirements and Board Order 97-125 setting a Time Schedule for cleanup and establishing administrative civil liabilities for late reports.

On page 1-5, What removal action occurred at IR1?

Response: RWQCB was identified as the lead regulatory agency in Section 1.3.1. The board orders will be added.

No previous removal action occurred at IR Site 1. The statement refers to the June 1998 BCT strategy meetings that advocated moving the IR Site 1 Waste Disposal Area into an engineering evaluation and cost analysis (EE/CA) and a removal action rather than pursuing a lengthy feasibility study (FS) process.

Comment 2: Section 1.3.3.10, Chevron Richmond Investigations. Chevron completed an Additional Hydrogeologic Investigation, S.P. Hill Tankfield, by BEDM, April 30, 1993. Wells 366F and 423F, installed adjacent to tanks which previously did not have leak detection bottoms, contained measurable separate phase petroleum hydrocarbons. Well 366F was installed with a screen interval starting at approximately 80 feet bgs and well 423F was installed with a screen interval starting at approximately 125 feet bgs. Both wells were installed in the interbedded Sandstone, mudstone, and siltstone (KJss).

Response: Relevant bedrock data from the 1993 Chevron report will be added to Section 1.3.3.10.

Comment 3: Table 2-2, Soil Borings, Monitoring Wells Development and Sampling Data. Please include material/soil type, with screen interval.

Response: The material and soil type and the screened interval will be included in Table 2-2.

Comment 4: Section 2.3.3, Groundwater Sampling, page 2-8. Not all new wells were sampled. Well MW02-15 was not sampled. Please include field data sheets for wells not sampled due to groundwater not recharging into the well.

Second paragraph on page 2-8, please identify which existing wells were redeveloped for sampling and specify method used to redevelop the wells.

Response: The text will be changed to indicate that well MW02-15 was not sampled because it was pumped dry and did not recharge sufficiently during the sampling event.

The field development sheet for well MW02-15 will be included as a figure.

Redevelopment information will be added to this section.

Comment 5: Section 3.4.2, Point Molate Geology. The Chevron facility at S.P. Hill tank field contains geologic information from the western side of the Potrero Hills, the same side of the ridge as Point Molate. Why was the Additional Hydrogeologic Investigation, S.P. Hill Tankfield, by BEDM, April 30, 1993 not used to compare or add additional geologic information?

Response: The referenced report was not located in the RWQCB library at the time these records were researched in July 1998. This material will be reviewed for comparison, and additional information will be added as appropriate.

Comment 6: Section 3.4.3, Bedrock Structures, page 3-8. The majority of fractures are noted as being closed or healed with quartz and oxidation. Please quantify the extent to which the bedrock fractures were closed.

Response: The geologist who logged the bedrock cores estimated that 90 to 95 percent of the fractures were filled with secondary minerals, clay, and silt. The extent of closure of these fractures in situ is impossible to estimate because drilling and coring stresses tend to reopen these existing fractures by breaking this mineralization.

Comment 7: Section 3.6, Hydrogeology, The Additional Hydrogeologic Investigation, S.P. Hill Tankfield, by BEDM, April 30, 1993 should be used as a source for hydrogeologic conditions similar to Point Molate since these two sites are in the same groundwater basin, the San Francisco Basin.

The statement is made "A true aquifer....does not exist at Point Molate." Looking at bedrock wells in the IR1 area, there exists a saturated permeable geologic unit, which appears by the calculated hydraulic conductivity values to be transmitting water. Please discuss why this does not qualify as a true aquifer.

The third paragraph of page 3-13 states "bedrock of a lower permeability than the overlying fill or naturally occurring sediments." In reviewing table 3-2, Hydraulic parameters, the hydraulic conductivity and Darcy Flow velocity indicate greater permeability of the bedrock than the colluvium, fill, and Bay mud. This discrepancy needs to be discussed.

Please discuss in detail your suspicions regarding a groundwater divide. Do you propose to collect more data to verify the groundwater divides?

Page 3-14, Please clearly identify on Plate 16, in cross-section, where the bedrock groundwater divide is located.

Page 3-20, Thank you for stating the bedding planes provide secondary porosity in the bedrock. This could also be considered a potential preferential pathway for migration.

Response: See response to Comment 5 regarding the inclusion of geologic information from Chevron.

There are many definitions of an aquifer. A geologic unit that is saturated and exhibits (at least localized) moderate hydraulic conductivity are a portion of the possible criteria. Several definitions from well-known hydrogeologic texts are:

"An *aquifer* is best defined as a saturated permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients (Freeze and Cherry 1979)."

"An *aquifer* may be defined as a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs. This implies an ability to store and to transmit water" (Todd 1980).

"Webster defines and aquifer as 'a water-bearing bed or stratum of earth, gravel, or porous stone.' Some strata are good aquifers, whereas others are poor. The most important requirement is that the stratum must have interconnected openings or pores through which water can move. The nature of each aquifer depends on the material of which it is composed, its origin, the relationship of the constituent grains or particles and associated pores, its relative position in the Earth's surface, its exposure to a recharge source, and other factors" (BOR 1981).

"An aquifer is a saturated bed, formation, or group of formations which yields water in sufficient quantity to be economically useful. Water-bearing formations and groundwater reservoirs are synonyms for the word aquifer. To be an aquifer, a geologic formation must contain pores or open spaces (both of these are often called interstices) that are filled with water. These interstices must be large enough to transmit water toward wells at a useful rate" (Driscoll 1986).

As shown in these examples, there are many definitions of an aquifer. The characteristics of saturation (localized at Point Molate) and possessing moderate hydraulic conductivity (also a variable characteristics that may not be representative over areas outside of the immediate vicinity of a specific well) are not a definite indication that a geologic unit is an aquifer. The Navy does not believe the majority of

Point Molate could sustain long-term groundwater withdrawal without dewatering in upland areas or ravines, or causing salt water intrusion in shoreline areas. The text will be modified to describe Point Molate as overlying a poor-quality aquifer unlikely to be used as a source of potable water.

The text does not specify that all bedrock is of lower permeability than overlying fill or naturally occurring sediments. It states that there may be some effects on groundwater flow in areas where it is of lower permeability.

The interpretation of existing groundwater divides has been presented in Point Molate documents since the early investigations. Because this interpretation has no effect on characterizing the nature and extent of petroleum-hydrocarbon contamination, this interpreted feature will not be investigated further.

Plate 16 will not be modified per the above response.

Regarding bedding planes and their effectiveness is providing secondary permeability, also see response to RWQCB General Comment 4. As noted in the response to General Comment 4, the fractures are generally short in the KJMS units (interbedded sandstones and mudstones), do not cross bedding planes, are usually filled with secondary minerals, silt, or clay, and are omnidirectional, providing poorly connected flow paths. The KJMS unit is interpreted to underlie the IR Site 1 area, and would provide a poor migration pathway for contaminant movement.

Comment 8. Section 3.6.5, Hydraulic Gradients and Velocities states, "Data indicate the bedrock is saturated, under water table, and possibly localized confined conditions..." does not correspond with the statement in Section 3 regarding whether a true aquifer exists at Point Molate.

The interpretation of the high hydraulic head in the ravine area being attributed to recharge in the coarse colluvium and weathered bedrock to the bedrock fracture system in IR Site 1 should be related to preferential migration pathways for migration of pollution.

Response: The text in Section 3 will be changed to further discuss the migration pathway's potential for containment movement. See response to Comment 7.

The Navy does not consider recharge to the bedrock fractures in IR Site 1 a potential preferential pathway. The term preferential pathway is intended to define areas where petroleum hydrocarbon or other contaminants would tend to migrate in a relatively confined area such as in pipeline bedding rather than within the primary matrix of the surrounding geologic unit. The bedrock fracture system at IR Site 1 and potential contaminants in the area probably do not constitute such a pathway for the following reasons: the bedrock flow may be too diffuse if the fractures (secondary porosity) are not interconnected enough to concentrate contaminant movement; the bedrock exhibits an upward gradient; and the contaminants in the area are LNAPLs and are prone to transport at the top of the water table. Analytical results from groundwater in bedrock wells upgradient and downgradient of IR Site 1 (BR02-18, BR02-19, and BR02-20) were all nondetect for total petroleum hydrocarbon (TPH) constituents. These results also indicate the lack of petroleum hydrocarbon migration within bedrock underlying the IR Site 1 ravine.

Comment 9: Section 3.7, Preferential Migration Pathways. The Navy should discuss why geologic features such as bedding plane, fractures, and faults are not mentioned as potential migration pathways.

Page 3-22, Geology, and geomorphology control topography. Perhaps the preferential migration pathway for the Tank 19 spill is fractured/weathered bedrock. Also, well MW02-07 is completed with 8 feet of a 10-foot screen completed in bedrock. Please include all the potential preferential pathways.

Response: See the response to the second part of Comment 8. Discussion will be added to Section 3.7 about the potential for bedding planes, fractures, and faults to function as migration pathways. Please note that no significant transport of hydrocarbons has ever been documented in bedrock at Point Molate. The Navy included all available information on the characteristics of bedrock bedding planes, fractures, and faults in Section 3.0 to document these features as possible migration pathways. However, the relatively low volume of secondary permeability, especially effective secondary permeability, makes these bedrock pathways unlikely transport paths for the majority of contaminant transport. The Navy's discussion of preferential pathways is focused, and has been focused for some time at Point Molate, on the routes of transport for the bulk of petroleum hydrocarbons, which pose the largest threat of contamination.

Anecdotal information from site personnel suggests that most of the release at Tank 19 traveled as surface flow. Phase I UST investigations in the vicinity of Tank 19 substantiate that hydrocarbon staining downgradient of the tank was encountered only in soil from 0.3 to 2.0 feet below ground surface (bgs) in fill and colluvial materials. Recent results from Phase II of the UST field program revealed no hydrocarbon staining below 0.75 feet bgs in a trench downgradient of Tank 19 near the confluence of "C" and "D" Roads (John DeAngelis, Tetra Tech EM Inc., personal communication, December 6, 1999).

It appears the release was carried off rapidly by the roadside drainage ditches and steep topography and migrated primarily on the surface until it spread out on lower-gradient soils near Catch Basin 2. A large amount of product was captured in Catch Basin 2 and recovered. There is no record of the volume captured.

Monitoring well MW02-07 is screened with 2.4 feet above the interpreted bedrock contact. The history of measured product in well MW02-07 does indicate it is within a path of petroleum migration in this area. However, it is not interpreted to be caused by a preferential pathway within the unweathered bedrock. As discussed in the geology section (3.0) of the Draft Phase II RI Report, the transition from colluvium downward to weathered bedrock is a gradational contact in some areas such as this area. The boring log for SB02-07 indicates a "sandstone and mudstone, severely fractured, clayey sand between fragments."

When the soil boring was logged, the first stained interval was noted to be approximately 14 feet bgs, coincident with the top of the horizon logged as weathered bedrock. The weathered bedrock is the primary horizon conducting water in this area.

The well was constructed to intercept and characterize groundwater, and not to monitor an overlying, dry horizon. Research on historical water levels in monitoring well MW02-07 indicates the shallowest recorded depth to groundwater was 13.56 feet bgs (January 1997) and that the deepest recorded depth to groundwater was 17.94 feet bgs (July 1994). These records indicate that the groundwater table is within, or just over, the logged depth of the weathered bedrock. These records describe a water table condition within a horizon of fractured rock fragments within a clayey sand matrix. This horizon has already been defined in Section 3.0 as water-bearing materials in this ravine.

Comment 10: Table 3-2, Hydraulic Parameters, SB02-01 was collected at 24-24.5'. The boring log written description calls the material collected at this depth colluvium, but the unified soil classification system (USCS [US Geological Survey]) calls it a gravel (GM). Also looking at the blow counts indicates a different material from what was located immediately above the 24-24.5' range.

Response: The colluvium generally consists of varying amounts of angular, weathered bedrock fragments in a matrix of varying proportions of sand and clay. In some areas, it could be described as a gravel, although this description generally does not account for the finer-grained matrix materials.

The variation in blow count occurs when the driven split spoon encounters the numerous large rock fragments in the materials. Higher blow counts indicate the spoon was being driven onto a rock fragment until it shattered, displaced out of the spoon's path, or caused refusal.

Comment 11: Table 3-3, Vertical Gradients Between Bedrock and Unconsolidated Materials. The first well pair is completed in bedrock, therefore the vertical gradient is between bedrock wells, not unconsolidated material and bedrock wells. Well MW02-07 has 8' of a ten-foot screen interval completed in bedrock; therefore two of the four well pairs are comparing vertical gradients between bedrock wells. The Navy should use well pairs screened appropriately in unconsolidated material and bedrock to compare a vertical gradient between the two material types.

Response: The title of Table 3-3 will be changed to "Vertical Gradients Between Well Pairs." As discussed extensively in the response to Comment 9, even though monitoring well MW-02-07 is completed in material logged as weathered bedrock, the water table is virtually always below the horizon regarded as the base of the colluvium. Therefore, the data on upward vertical gradients presented are a valid representation of the hydraulic regime in this area.

In regards to the first well pair, BR02-09 and MW02-13, a careful review of the boring log for monitoring well MW02-13 indicates that during drilling, "no evidence of water saturation" was logged in the 9.4 to 14.6 foot bgs interval, coincident with the base of the colluvium. The footnote on the base of the log indicates, "saturated conditions not observed during drilling." Based on actual observations made while drilling, the experienced field geologist installed the well in an interval, using professional judgment, likely to provide enough groundwater to enable collection of samples.

The judgment was made in the field to obtain a representative sample of groundwater downgradient of the IR Site 1 fill rather than target a potentially dry geologic unit that would provide no characterization data on groundwater quality and that may essentially waste a portion of the field budget.

Based on this information, the data will be used to define vertical gradients within the saturated zone and not between materials (in other words, the potentially dry overlying colluvium).

Comment 12: Section 4.1.1, Site History and Previous Investigations, page 4-2. The first paragraph of this section states the area was actively used for waste disposal from the 1940's to the mid 1980's. Please provide documentation to show the last time waste was deposited in the waste disposal area. The Basewide EBS Report provides documentation for Site 1 disposal history (PRC 1996a).

Response: According to reviews of aerial photographs, disposal was first visible in a 1957 photograph, but was not apparent in the previous facility aerial photograph in 1953. Aerial photographs show that disposal ceased by 1979, but the area appeared active in the previous facility aerial photograph in 1975 (PRC 1996a). After 1979, some debris and green waste were dumped on the surface of the disposal area. This text will be included in the Final Phase II RI Report.

Comment 13: Section 4.1.2 Sources. Three sources are identified in this section. The first source, petroleum wastes disposed of in the landfill is discounted as "not a significant source", the second identified source, upgradient sources is considered "to be dissipating", and the third source, releases from pipelines paralleling D road and the landfill, is discounted as "no longer a large mass". Separate phase free product measurements in well ERM-EW1 are increasing. Please address the source for this free product.

Also a 1990 release, identified in Waste Disposal Area Draft Phase I Report October 7, 1994, page 2-3, along D Road between vault boxes 7 and 8 is primarily JP-5. Therefore, it is understandable that the TPH-e found during the Phase II RI is primarily JP-5 and appeared "relatively fresh".

The fact the newly installed wells downgradient of the waste disposal area did not contain significant concentrations of petroleum hydrocarbons most likely can be explained by the screen interval being completed in bedrock and artesian groundwater conditions. These wells are not measuring any petroleum constituents leaching from the waste disposal area through the colluvium. Well MW02-15 is the closest in proximity to the waste disposal area that is appropriately screened to measure concentrations of petroleum leaching from the landfill. I understand this well was not sampled because it bailed dry quickly, please supply the field data sheets with the Draft Final Report for all wells sampled, or attempted to be sampled.

In IR Site 1, please explain why the groundwater sample collected from BR02-19 did not have any detectable petroleum hydrocarbon constituents. The bedrock sample collected at 24-25 feet below ground surface (bgs) contained greater than 18,000 parts per million (ppm) Total Petroleum Hydrocarbons (TPH) (summing TPH as gasoline and TPH extractable as JP-5 range organics).

Response: The free product in well ERM-EW1 is attributed to possible leaks near Tank 18, piping from Tank 18 to Valve Box 7, Valve Box 7 releases, and releases between Valve Box 7 and Valve Box 8. Preliminary results from the Phases I and II UST investigations appear to substantiate this interpretation. Well ERM-EW1 is cross-gradient from (and at a higher elevation than) the IR Site 1 waste disposal area footprint, so that the waste disposal area proper cannot be the source of product in well ERM-EW1. As to the thickness of product in well ERM-EW1, it appears to be fluctuating based on measurements during product removal, and is probably apparent only and overestimates the amount of free product on the water table. Based on Phase I UST characterization, the section of pipeline near Valve Box 7 was recommended for inclusion in the basewide pipeline removal.

The JP-5 leak near Valve Box 7 was identified in 1990 and can be assumed to be "relatively fresh" at that time.

Although detectable TPH was found in soil samples from newly installed monitoring well BR02-19, no TPH was detected in groundwater samples. This difference likely occurred because the soil TPH represents residual, low solubility compounds that are strongly sorbed upon the soil matrix and are not receptive to dissolution. In effect, the mobile phase of the hydrocarbons is gone and the residual phase is all that remains. Thus, the retention capacity can be very high, depending on soil texture and natural soil organic carbon content.

The Navy does not agree with "The fact the newly installed wells downgradient of the waste disposal area did not contain significant concentrations of petroleum hydrocarbons most likely can be explained by the screen interval being completed in bedrock and artesian groundwater conditions." As stated in the responses to comments 9 and 11, much of the shallower geological material (colluvium) is unsaturated or irregularly saturated with only minor staining from petroleum hydrocarbons. Monitoring well MW02-15 is a good example. No saturation was observed during drilling. A well was still installed but yielded very small quantities of water. No free product was observed. Colluvium within the landfill footprint is partially saturated, however. The Navy interprets the lack of "significant concentrations of petroleum hydrocarbons" simply to the prior passage of mobile-phase hydrocarbons and the result that only residual, sorbed petroleum remains in the fill. Data for monitoring well MW02-06 support this interpretation, as only low levels of dissolved TPH and no free product are present. This well is far enough downgradient in the fill (and appropriately screened) that any "significant concentrations" would have been detected.

Comment 14: Section 4.1.3, Soil. The first paragraph discusses sludge deposited in the fill area. Please identify the industrial processes that generated the sludge. On page 4-6 describe the seasonal water table fluctuation in terms of feet. Also, describe the petroleum hydrocarbon wastes below the water table in terms of feet. When will the mapping of the waste disposal area be complete? Collecting samples to document the worst case scenario is the best sampling practice when using models to evaluate risk.

Response: All waste materials referred to as "sludge" (a terminology first used in the Phase I RI for the Waste Disposal Area) are petroleum-hydrocarbon wastes possibly from cleaning tanks (tank bottoms) or excavated materials. These wastes may have been generated when the former wooden valve boxes were demolished and replaced by concrete valve boxes.

The water table fluctuations will be described in terms of feet in this section.

The potential hydrocarbon wastes will be discussed in terms of feet below the water table.

Mapping of the Waste Disposal Area is complete. The footprint of the landfill shows where the majority of the waste is present. Additional debris at and immediately below the surface was found downgradient of the landfill footprint. This miscellaneous debris will be identified in the Engineering Evaluation and Cost Analysis (EE/CA) and included as part of any remedy at IR Site 1.

Nearly all judgmental samples at the IR sites have been collected because they represented potentially the most contaminated part of the population of the matrix encountered. However, for risk assessment, using the worst-case samples is not recognized as a representative method. Rather, the reasonable maximum exposure (RME) method is the most correct method for evaluating risk.

Comment 15: Section 4.1.4 Groundwater. When discussing free product measurements please use the most current data collected and discuss the amount of product historically in terms of feet. The data from the January 1999 sampling event shows .48 feet of floating product in well ERM-EW1. Please include historical cumulative tables for all wells summarizing groundwater elevations, depth to water, free product thickness, screen intervals, and unit the screen interval is completed in. Well MW02-07 has increasing concentrations of Total Petroleum Hydrocarbons (TPH) when the concentrations of all petroleum hydrocarbons are summed. The concentrations for summed TPH for well MW02-07 are summarized in the following table.

Sample Date	8/3/94	12/21/94	10/30/97	04/09/98	1/20/99
TPH-summed (micrograms/Liter)	73,071	340	338	16,580	52,400

Regional Board staff agrees the hydraulic conductivity value of weathered fractured bedrock is higher and therefore the flow rate is greater. Table 4-14 is referred to in the text on page 4-7, but is actually located in Section 3, as Table 3-3.

The Regional Board staff does not agree with the statement of a steady decline in free product, a decline in concentrations in groundwater downgradient of IR Site 1, and a diminishing source. The Regional Board developed guidance for low risk groundwater sites. The following three requirements have not been met:

A. Free product/source removal
B. Decreasing concentrations
C. Stable and attenuating plume.

Additionally there is not a plan to continue groundwater monitoring at this IR site to demonstrate whether product levels and increasing concentrations of Total TPH are due to seasonal changes and whether natural attenuation is occurring. Therefore, Regional Board staff does not agree with the conclusion that unless a human health risk assessment indicates a risk, no further scoping of remedial action for groundwater is warranted.

Response: The most recent data were provided in the Draft Phase II RI Report in Table 2-4. Comprehensive tables are being created. Because of the amount of data, these specific parameters may be divided between two or more tables.

These data for MW02-07 were reviewed and recalculated, and the following sums for all TPH constituents were:

Date	Results
8/3/94	473 mg/L
12/21/94	21 mg/L
10/30/97	38 mg/L
4/9/98	17 mg/L
1/20/99	52 mg/L

Note: mg/L = milligrams per liter

Summing TPH concentrations tends to "double count" hydrocarbons because of the chromatographic overlap of these purgeable and extractable carbon ranges analyzed. Also, for different standards of each fuel type. Benzene, toluene, ethylbenzene, and xylene (BTEX) compounds are already accounted for in the individual product types. Summing is in fact an overly conservative mean to estimate total hydrocarbons present.

The typographical error on Table 3-3 will be corrected.

Sources from the Waste Disposal Area fill and the ravine upgradient have demonstrated a decrease in petroleum hydrocarbon concentrations based on groundwater data. Cross gradient areas near well ERM-EW-1 have not shown steady decline, but are *unassociated* with the Waste Disposal Area fill. This area is part of the ongoing UST characterization.

In response to the three requirements of the regional board:

B. Free product is being removed and UST characterization may lead to further removal of sources, including pipelines near Valve Box 7.

C. Concentrations, when viewed over the whole area and not just in samples from one well, are decreasing.

D. The plume may still be migrating, as possibly shown in samples from well MW02-07, but attenuation has and is taking place. Also, wells ERM-EW1, MW02-14, MW02-15, MW02-16, MW02-17 and MW02-07 will be evaluated during the UST characterization and remediation work.

There are plans to continue groundwater monitoring at this IR site. For example, the area of the ravine downgradient of the Waste Disposal Area, including monitoring wells MW02-14, MW02-15, MW02-16, MW02-17 and MW02-07 are being sampled quarterly under the UST site characterization program. Monthly water levels and product measurements have been collected in monitoring well ERM-EW1 since September 1999.

Comment 16: Section 4.1.5, Surface Water, Plate 7B indicates artesian conditions at the toe of the waste disposal area. Are wetlands associated with this surface water? If a small wetland area exists please include the area on all plates associated with IR1.

Have the two ponds upgradient of ERM-EW2 ever been sampled for petroleum constituents? If the ponds have not been sampled please explain why they have never been sampled.

Why are these surface water bodies not discussed in the Surface Water section?

Response: Surface water ephemerally collects at three locations downgradient of IR Site 1. Characteristics of these three areas are common to coastal freshwater marshes, as described in an assessment of wetland resources at Point Molate (Tetra Tech Inc. 1996). These characteristics include the presence of hydrophytic vegetation, hydric soils, and a hydrologic regime that includes periodic soil saturation for some period during the growing season. Hydrophytic vegetation observed in the three areas includes arroyo willows (*salix lasiolepsis*) with sedges (*Cyperus eragrostis, Scirprus* spp.) and rushes (*Juncus* spp.) in the understory (Tetra Tech Inc. 1996).

Even though characteristics of these three areas are common to freshwater marshes, these three low-lying areas were specifically developed as collection ponds during the 1970s. The low-lying, manmade areas tend to accumulate water, particularly after rain, from natural seeps associated with the ravine. Petroleum products associated with past UST, pipeline, and valve box releases have affected groundwater and surface water (as seeps) that eventually may drain into these three areas. This area will be indicated on plan maps for IR Site 1.

These ponds have not been sampled. They were excavated to collect surface flows of fuels from releases, probably from Valve Box 9. A hydrocarbon sheen is occasionally visible around these areas. Sampling would only confirm the areas once captured fuel releases and not be indicative of natural surface waters, the same as other containment basins. They are ephemeral also and may not always contain enough water to sample.

These surface water collection basins will be discussed in the text as above.

Comment 17: Section 4.2.1, Site History and Investigations. Please explain what is meant by "high K based on recharge of the well."

When was the light non-aqueous phase detected in well MW11-22?

What aquifer tests were performed?

Why was boring SB11-95 not completed as a well? The last paragraph of this page is confusing. Only two wells were to be installed per the Field Work Plan, but 4 soil borings were installed. Three of the soil borings were converted to monitoring wells-2 unconsolidated, and one bedrock. Why were the extra borings drilled? Why was the fourth boring not converted to a monitoring well?

Please list the pilot tests that have been or are being performed.

Please convert pounds of free product to gallons.

Response: The phrase "high K based on recharge of the well" simply means the observed recharge of the given well is very rapid in response to water withdrawal, which infers a relatively high hydraulic conductivity in the immediate area of the well. That is, the well recharges rapidly when bailed or pumped.

LNAPL was detected one time in samples from well MW11-22 in July 1992. The well had been sampled once previously, on May 29, 1992, and contained no LNAPL. The LNAPL may have been induced to enter the well after extensive well development (250 gallons removed) and purging (80 gallons removed during purging for the May 1992 sampling). See PRC Environmental Management, Inc. (PRC) 1994, the Treatment Ponds Final Site Characterization Report, for further information on this event. No LNAPL has been detected again in samples from this well during or since the May 1994 quarterly sampling program.

Aquifer tests (limited pumping tests) were performed to estimate potential sustainable pumping rates for the extraction trench wells, the potential radius of influence for extraction wells, and the potential for salt-water intrusion caused by pumping. Analysis of data from these tests was limited to these specific objectives.

As stated in the Field Sampling and Analysis Plan (TtEMI 1998b), soil borings at SB11-94 and SB11-95 were proposed to "Further evaluate residual product and areas for product removal under the Site 3 pilot test." Neither boring was originally scoped to be completed as a monitoring well. Boring SB11-94 encountered silty clay fill with bunker fuel, but the geologist on site used field judgment that the boring would not produce a good well in the clay material. Boring SB11-95 encountered good water-producing fill (sandy gravel), and the field geologist judged this downgradient location a more useful place for a monitoring well.

Originally, the field work plan called only for an unconsolidated monitoring well, MW03-02, (to evaluate B and C tanks and the diesel road area) and a bedrock monitoring well, BR11-96, to be used to evaluate bedrock. The other two borings were for soil information only, as stated above.

The Phase I Pilot Test Memorandum was presented as Appendix G of the Draft Phase II RI Report.

The units will be converted to gallons; however, as stated on page 4-11 of the Draft Phase II RI Report, pounds were used as units because removals included vapor-phase as well as liquid-phase petroleum hydrocarbons. Product removed consisted of several types (densities) of product as well as mixtures. Therefore, establishing a representative density to convert to gallons will necessarily be an estimate and not necessarily accurate.

Comment 18: Section 4.2.2, Sources, page 4 -12. When are the treatment ponds scheduled for closure?

Page 4-11/4-12, Please include the data collected from well MW03-02 and any other data relevant to an IR site which was collected under the current UST investigation into the Draft Final Phase II RI.

Appendix G shows three samples analyzed for viscosity, not two. At 15 degrees Celsius viscosity was 208.24 not 20824 and 2244.36. Also mention that viscosities at 65 degrees Celsius showed an order of magnitude decrease in centistokes. Please include a brief description of what the unit of measurement for viscosity actually means.

Response: The schedule for closure of the treatment ponds has not been finalized. Currently, the treatment ponds are being used to treat stormwater runoff.

Data collected from well MW03-02 were included in the Draft Phase II RI Report (the well was installed as part of the Phase II RI). Relevant validated data from the UST investigations will be included in the Final Phase II RI Report.

Three samples were analyzed for viscosity, and the text will be changed accordingly.

The typographical error reporting viscosity will be corrected.

The decrease in viscosity will be noted in the text, although the reference in the text was intended to characterize the existing conditions at IR Site 3 and the petroleum hydrocarbons in situ, and not to discuss pilot-bench scale manipulation of these materials.

Centistoke is a measure of kinematic viscosity. The definition will be added to this section.

Comment 19: Section 4.2.3, Soil. What is the significance of more widespread pollution in the treatment pond area?

Page 4-15, In discussing each cross section, please explain exactly how the geologic condition will affect the potential remedial options of excavation, water extraction or circulation of fluids and water.

Have bedrock samples ever been analyzed for TPH in the treatment pond area? If so please identify the borings that have been sampled and analyzed for TPH and discuss the results. Boring SB11-44 showed elevated levels of volatile organic compounds (VOCs) at 17 feet bgs. Were these concentrations ever verified?

Response: The significance of more widespread contamination involves estimates of materials and contaminant mass for assessing remedial options.

The purpose of the remedial investigation is to assess the nature and extent of potential contamination and document physical conditions at the site. Normally, detailed discussion of the effects of geologic materials on remedial technologies is deferred to the feasibility study or an EE/CA.

A discussion of how the geologic characteristics may affect remedial options will be added, but should not be construed as limiting or excluding any potential remedial options for the Treatment Pond Area.

Bedrock samples have never been analyzed for TPH at IR Site 3 or any IR site.

Photoionization detector (PID) readings recorded on the borelog for SB11-44 were elevated in the interval at 17 feet bgs. Samples from this interval were submitted only for TPH analysis. Groundwater samples from June 1992 contained several VOCs. These data were discussed in the Treatment Ponds Area Final Site Characterization Report (PRC 1994). The VOCs detected were attributed to localized soil that remained after the former sump pond was excavated and not to widespread VOC contamination. This well has not been sampled again. Wells in this area have not been sampled regularly since the containment wall and extraction trench system were installed.

Comment 20: Section 4.3.2, Soil. Was the area around SB11-85 and SB11-86 exposed or excavated during pipeline removal?

Response: This area was excavated to the depth of the pipeline (approximately 6 to 7 feet bgs). This will be stated in the Final Phase II RI Report.

Comment 21: Section 4.3.4, Groundwater. Were water level measurements taken in May 1999? If so please supply this data in a groundwater measurement summary table.

We do not agree no further action is an appropriate recommendation for this IR site at this time because the soil sampling results of the pipeline removal could indicate the need for additional investigation. At a minimum, a monitoring schedule should be to demonstrate natural attenuation.

Response: Water levels were actually measured in late April 1999. These data were presented in Table 2-4 of the Draft Phase II RI Report.

Additional monitoring needs for the IR Site 4 pipeline removal area will be evaluated as part of facility-wide groundwater monitoring program.

Comment 22: Section 5.1.1, Bunker Fuel. Please compare book values to field measured values for viscosity of bunker fuel (page 5-3).

Response: Literature values for bunker fuel viscosity will be researched and included for comparison to the measured values presented.

Comment 23: Section 5.2.1, Hydrogeology. Please identify preferential flow pathways observed along Diesel Road and Tank G.

Response: Fuel migrating from Tanks B and C, as well as pipeline leaks along Diesel Road, have been identified as following the pipeline bedding down Diesel Road. This will be discussed in Section 5.2.1.

Comment 24: Section 5.3.1, Contaminant Fate at Sites 1, 3, and 4. Please add dissolution to groundwater to the fate options for migration to San Francisco Bay for IR Sites 1, 3, and 4.

Response: Dissolution will be added to the section.

Comment 25: Section 5.3.1.2, Site 3. Please explain why the Bunker Fuel migration will eventually stop.

Response: A finite mass of bunker fuel was left in soil and groundwater when the sump pond was closed in 1975. No new fuel bunker sources have been available. Removal of bunker fuel by the Navy and natural attenuation continue to reduce the finite mass of bunker fuel. Eventually, only bunker fuel sorbed on soil as a residual phase will remain and no significant amount of the mobile phase will be released without human physical intervention such as soil heating. However, the timeframe of attenuation is likely to be prolonged so that action will be necessary.

Comment 26: Section 5.3.2.5, Biodegradation. Is bunker fuel released during storm events? If it is then how effective is the extraction trench during storm events?

Response: Bunker fuel is sometimes affected by prolonged rainfall (rainy season) and appears to migrate into wells. This process is not completely understood in terms of where and how much of the petroleum is moving during these events. In fact, these changes may be attributable to capillary fringe effects on wells that cause changes in apparent thickness of LNAPL.

The extraction trench was designed to control water levels behind the containment wall. The containment wall has effectively controlled migration (that is, prevents migration to the bay) of bunker fuel, during both storm events and clear weather. The containment wall was not designed to control fuel migration on groundwater upgradient of the wall.

Comment 27: Section 6.1, Risk Assessment Scope, IR Site 1. As discussed in the August 4, 1999 BCT meeting a presumptive remedy of a CAP on the landfill may require a Risk Assessment before implementing a remedy.

Response: Consistence with EPA's landfill presumptive remedy guidance, alternatives being evaluated in the EE/CA for Site 1 will prevent future potential exposure pathways to debris, contaminated soils, and groundwater within the footprint of the landfill. No risk assessment is necessary before implementing these alternatives. However, future risk assessment may be necessary for the vicinity of Site 1 if potentially complete exposure pathways are identified (for example, to downgradient groundwater).

Comment 28: Section 6.4.2.2, Exposure Pathways. Deliberate soil and sediment ingestion is not uncommon among children under the age of four, which are not being evaluated.

Surface water does exist as freshwater in the IR 1 site area.

Are any additional discharges expected from Point Molate to the public beach area?

Response: The text will be revised to delete statements on pica behavior in children. The soil ingestion rate (200 milligrams per day) used for the child recreational visitor is consistent with Department of Toxic Substances Control (DTSC) (1992) and EPA (1991a) risk assessment guidance.

The text will be revised to state that fresh water does not exist at the public beach or at IR Site 4, the only area evaluated in this human health risk assessment (HHRA).

No discharges from other areas of Point Molate to the public beach area are expected.

Comment 29: Section 6.4.4.4.1, General Exposure Parameters, Exposure Frequency, Exposure Time, and Exposure Duration. What is the source for the child recreational visitor exposure parameters? Is the 95% Upper Confidence Limit used in estimating these parameters? Please clarify why the adult shellfisher is exposed for 2h/day for 26 days but the adult shellfisher is exposed for 350 days for the shellfish ingestion pathway.

Response: As stated in Sections 6.4.4.1 through 6.4.4.5, the exposure parameters for the child (and adult) recreational visitors were based on professional judgment. Available EPA and DTSC risk assessment guidance does not provide default values for the assessment of recreational receptor. Although general information is available on time-activity patterns (EPA 1997b), this information does not address the site-specific factors that would influence the amount of time and types of activities that would occur at the public beach area. Thus, exposure parameters for recreational receptors are typically based on professional judgment, taking into consideration site location, physical features, regional climate, and other determinants of exposure. The selected values were intended to represent the reasonable maximum exposure (RME) case for these receptors.

One of the purposes of the RI work plan prepared for Point Molate (TtEMI 1998b) was to reach agreement with the regulatory agencies on the exposure parameters to be used in the risk assessment, particularly given the absence of default values for the recreational visitor. The work plan was reviewed by the regulatory agencies and the exposure parameters were accepted at that time. With one exception (adjustment of the total shellfish consumption rate by the fraction of shellfish collected at the site), the exposure parameters were unchanged from the work plan. (Shellfish consumption is discussed further under RWQCB Comment 30.)

As noted on page 6-15 of the Draft Phase II RI Report, the shellfish ingestion rate of 9.2 milligrams per day (mg/day) was selected to correspond to the average daily ingestion rate rather than the amount of shellfish ingested per meal. Typically, agency guidance list fish (and shellfish) ingestion rates as a daily average, rather than the amount ingested per meal. Assuming a daily ingestion rate of 9.2 grams per day from all sources, the total amount of shellfish ingested per year would be 3,200 grams (9.2 g/day x 350 days/year). This total amount was modified in the risk assessment to reflect the fraction of shellfish ingested that were collected at Point Molate. (See also response to RWQCB Comment 30.)

Comment 30: Section 6.4.4.5, Equation and Exposure Parameters for Ingestion of Shellfish. The sporadic sightings should refer to who is making the sightings and a specific frequency. Therefore adjusting the total consumption rate to 20% may not be appropriate, and to error on the side of conservatism would be better to reduce concerns about uncertainties.

Also, a child is included as a shellfish receptor, but Section 6.4.2.1 states only an adult shellfisher will be considered for ingestion of shellfish. What is the rational for the child ingestion rate of shellfish?

Response: The shoreline and intertidal areas at the public beach area are distant from the former operations areas of Point Molate. Therefore, observations of shellfishing were incidental to activities by remedial investigation personnel working in the field; dates and frequency of sightings were not documented. Staff relating these sightings stated that sightings were infrequent. No information on species or quantity of shellfish collected is available.

Additional discussion of the uncertainties associated with the shellfish pathway will be presented in the final report. In particular, a range of risks associated with shellfish ingestion will be presented. That is, risks will be presented assuming that 20 to 100 percent of the shellfish ingested by an individual are collected from along the Point Molate shoreline. This information will provide a more complete characterization of the potential risks associated with this pathway and address uncertainties regarding the amount of shellfish that could be collected along the shoreline in the future. Information on risks associated with ingestion of shellfish collected from a reference location (that is, background risks) will also be presented.

Section 6.4.2.1 will be revised to state that shellfish ingestion is evaluated for both the adult shellfisher and a child.

As stated in Section 6.4.4.5, the shellfish ingestion rate was based on the body weight ratios of the child (38 kg) and adult (70 kg), or 54 percent. This is, the shellfish ingestion rate for the child was assumed to be 54 percent of the adult rate.

Comment 31: Section 6.5.3, Assessment of Total Petroleum Hydrocarbons. At Point Molate in general the primary pollutant is heavier fuels, but heavier fuels are not the "only" fuels expected to be present.

Response: In general, light fuels and VOCs have not been detected in samples of sediment or surface soils at Point Molate. No hydrocarbon constituents other than heavier-end fuels and their constituents have been detected at the public beach area and no releases in this area have been documented. This information will be added to Section 6.5.3.

Comment 32: Section 6.6.2, Cancer Risks. The Navy states U.S. EPA guidance generally does not address risks less than 10^{-4}. The U.S. EPA actually generally requires remediation when a cancer risk level exceeds 10^{-4}. The range of cancer risk between 10^{-4} to 10^{-6} is considered a risk management range where remediation may or may not be required based on site specific conditions. The current land use is recreational and a potential future land use of adjacent property is residential therefore a cancer risk level of 10^{-6} should be used as a point of departure.

Response: Consistent with the EPA position outlined in "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions" (EPA 1991b), the Navy contends that action is generally not required unless risks exceed 10^{-4}. However, the Navy recognizes that EPA Region 9 and DTSC generally consider cancer risks between 10^{-4} and 10^{-6} to be within the risk management range where remediation may or may not be required based on site-specific conditions. The discussion in Section 6.6.2 was intended to provide the reader with benchmarks to help interpret the risk results and not to make risk management decisions. The text will be revised to better achieve this purpose.

Comment 33: Section 7.0, Background Soil Investigation for PAHs. Where were the background soil samples collected?

Response: Plate 1 shows the background sample locations. A citation to Plate 1 will be added to the text.

Comment 34: Section 8.1.1, Nature and Extent of Contamination. Please see specific comments in Section 4.1.2, Sources.

Response: Please see response to RWQCB comment 13.

Comment 35: Section 8.1.2, Fate and Transport. Increasing amounts of floating product at ERM-EW1 and increasing concentrations of total TPH in well MW-02-07 do not indicate attenuation is occurring. In August 12, 1999 the Regional Board requested the Navy to submit a plan for free product removal by September 14, 1999. To date the plan has not been received.

Not enough groundwater monitoring events have been performed to demonstrate natural attenuation. Proving seasonal fluctuation is difficult with only one sampling event from the fall, representing the dry season.

Response: A plan for free product removal (TtEMI 1999a) was submitted on September 17, 1999. Free product has been removed monthly since September 1999. A monthly report on product removal has been submitted to RWQCB after each removal event. Personnel from the Regional Board were present and observed product removal in November 1999.

Please see response to RWQCB comment 15.

Comment 36: Section 8.1.4, Conclusions IR Site 1. Additional data needs should be identified as part of the Draft EE/CA. The identified data gaps need to be completed before finalizing the Draft EE/CA.

The last sentence of the first paragraph states there is little evidence of floating product, well ERM EW-1 has over ½ a foot as evidence of floating product.

The last paragraph should state "Additional groundwater remediation measures maybe needed downgradient and cross gradient of the Waste Disposal Area." Selected clean up levels alone will not determine appropriate responses and the need for additional groundwater monitoring. The RWQCB's low risk guidance should be followed:

B. Removal of floating product as a primary source
C. Demonstrate stable plume
D. Decreasing concentrations of contaminants

Groundwater monitoring in this area should occur by fall 1999. On July 7, 1999 the Navy and their consultant, Tetra Tech EM, were sent a list of wells, via e-mail, which should be sampled.

Response: These data gaps appear to be relevant to the UST program, but not to IR Site 1. Well ERM-EW1 is not within the footprint of the Waste Disposal Area fill. This well is cross gradient and is influenced by releases that do not originate in IR Site 1. The Phase I and Phase II UST investigations have examined this area. Based on Phase I UST characterization findings, the pipelines near wells UB 7 and ERM-EW1 are recommended for removal as part of the basewide pipeline removal. Results of the Phase II investigation are not available at the time of this response, but will be submitted during early 2000.

RWQCB's low-risk guidance will be followed under the UST program. Product removal is being implemented. (See response to comment 35.) Plume stability and contaminant concentrations have been monitored since 1992 and will continue to be monitored.

Groundwater monitoring has been conducted in this area as part of the UST program.

Comment 37: Section 8.2, Summary for IR Site 3-Treatment Pond Area. The fourth bullet under "Data gathered during the phase II RI have" states the confirmation of decreasing free product volumes.

In evaluating table 4-13, Historic Product Thickness at IR Site 3, wells PZ11-31A, PZ11-27A, MW11-37, PZ11-37B, MW11-45, ZMW11-49, and well MW13+27 have all shown increasing amounts of free product since the facility quit operations in 1995. Perhaps a plate in Section 4 with wells with historic floating product measurements would be helpful to quickly see the big picture.

Response: Although some wells have shown increasing thickness of free product during specific events (usually connected to rainfall or other recharge events), overall, nearly all wells show a continued decrease in product thickness since 1994. A table will be added with all water levels and product thicknesses for IR site wells. A figure with historical product measurements will also be added.

Comment 38: Section 8.2.1, Nature and Extent. As mentioned in the last comment not all wells have shown a decreasing amount of floating product. Also it does not appear many samples (5), were taken where the current treatment ponds and former waste disposal pond overlap.

Response: See response to Comment 37. The area where the current treatment ponds and former sump pond overlap is difficult to access with a drilling rig (the distance between the current ponds is less than 10 feet), and extensive underground pipelines and utility lines create hazardous drilling conditions. Therefore, most sampling has been peripheral to these ponds.

Comment 39: Section 8.2.2, Fate and Transport. Why will the hydrocarbon concentrations continue to decrease?

The source discussion in Section 4.2.2 does not include tanks B and C.

How has containment "measurably" removed hydrocarbon mass? Please specify the attenuation mechanisms, especially for Bunker C.

Please add currently to the statement about the Offshore Ecological Risk Assessment indicating environmental receptors in the Bay are not being impacted. Conditions could change in the future, such as hydrologic, geologic, future land use changes, that could allow for the source in the treatment pond area to impact the organisms in the Bay.

Please put an estimated date in for the fuel Risk Assessment, UST program, and product action level development report (FPALDR) development.

Are the Diesel Road pipelines leaks and sources at tank B and C the same?

Response: The mass of petroleum hydrocarbons that remained in the ground at the time of base closure in 1995 is finite. Removal and attenuation can only cause a decrease. See the response to comment 25.

Tanks B and C will be discussed in Section 4.4.2

A statement will be added indicating that the no impact results from the Offshore Ecological Risk Assessment is a current condition. The Navy does not consider future releases to have potential for impacts equal to or exceeding documented releases in the past.

The Navy will revise the master schedule in January 2000.

The Diesel Road leaks and sources at Tanks B and C are not the same; however, the migration pathways for the releases all appear to follow the pipeline bedding downgradient, along Diesel Road.

Figures

Figure 4-1: Site 1-Waste Disposal Area and Site 4 Shoreline Areas Conceptual Site Model. The March 1990 line leak between Valve Box 7 and 8 is identified as F-76, but the 1994 Phase I Remedial Investigation identified this release as JP-5. A more recent JP-5 release occurred at Valve Box 9, please identify the release as JP-5.

Response: The release will be identified as JP-5.

Figure 4-2: Site 3-Treatment Ponds Area Conceptual Site Model. Tanks B and C should be identified as sources for continuing contamination. The extraction trench should be called the extraction trench and not 1995 containment wall. Please identify where the bedrock outcrops or subcrops in this area.

Response: Tanks B and C will be identified as potential sources. The extraction trench is ancillary to the containment wall and was added to control groundwater mounding. This terminology has been employed since 1996 (PRC 1996b) and will therefore continue to be used. Bedrock outcrops will be noted.

Plates

Plate 4: IR Site 1 Waste Disposal Area Groundwater Elevations and Cross Section Locations. The line of section should be extended to include well MW02-13, and labeled A'.

Response: The line of section will be extended to MW02-13 and labeled A'.

Plates 5 and 6: IR Site 1 Waste Disposal Area Trench Cross-Sections. Under each trench title please identify which wall (north, south, east, and west) was logged.

Response: The trenches were only 36 inches wide, and danger of soil collapse required that no one enter the trenches. Therefore, trenches were logged by viewing both sides of each trench and creating a composite view representing materials exposed on both walls of each trench. All measurements and materials logged were conservative and documented the most extensive and worst potential materials encountered. As a result, no one wall was logged.

Plates7A, 7B, 8, and 9: Please include groundwater and soil concentrations at all sampling points along the lines of section.

Response: These data will be added to the plates.

Plate 11: IR Site 1 Waste Disposal Area Soil Sampling Results. Please include all soil sample results for the soil samples with DA-identifications.

Response: The DA soil samples were analyzed by Eureka Laboratories. The EPA fined this laboratory for fraudulent analysis shortly after these samples were analyzed.

Therefore, the Navy decided, with EPA guidance, not to use these data in risk assessment or other decision making. These data are included, however, in the site inspection report (PRC 1992). Also, newer data better represent current conditions.

These data are not included in the Oracle database for Point Molate for these reasons. This issue was discussed with all BCT members, including RWQCB, in scoping meetings for the Phase II RI in March 1998, May 1998, and June 1998.

Plate 14: IR Site 3 Treatment Ponds Area Geological Cross-Section Locations. Please identify the extraction trench and the cut off wall.

Response: The containment wall will be identified on Plate 14.

Plate 15: IR Site 3 Treatment Ponds Area Shoreline Cross-Section A-A' Previous Soil Sampling Results. Some soil sample laboratory results have an "x" qualifying the concentration reported but the notes do not explain what the "x" means.

Response: The "X" qualifier appearing on results for several TPH samples on Plate 15, IR Site 3, indicates the chromatographic response did not resemble a typical fuel pattern. This qualifier is comparable to the "Z" qualifier also used in the data. The "X" qualifier was used before the "Y" and "Z" qualifiers were developed. This definition will be added to figures where the "X" qualifier is used and will also be added to the list of data qualifiers in Appendix A2.

Plate 16: IR Site 3 Treatment Ponds Area and IR Site 4 Drum Lot No. 1 Cross Sections Previous Soil Sampling Results. Please clearly identify in cross-section where the bedrock groundwater divide is located.

Response: The bedrock groundwater divide is an interpreted feature. The location is approximated and will be shown as such.

Plates 15-18: Please include:

B. Well construction details on each boring completed as a well.
C. Most recent groundwater elevation in addition to June 1993 groundwater elevation.

Response: These plates were constructed to show geologic conditions and the estimated extent of soil contamination. It would be very difficult in the computer-aided drafting and design (CADD) environment to include well construction details into these already very detailed color plates and would make the plates overly crowded. A supplemental set of black- and white-plates with the well construction details may be created if the existing plates cannot be properly modified.

The most recent groundwater elevations will be added to all cross sections for IR Site 3.

Plate 18: IR Site 3 Treatment Ponds Area and IR Site 4 Drum Lot No. 1 Cross Sections Previous Soil Sampling Results. Please check the connecting of strata between SB11-22 and SB11-44.

Response: SB11-22 does not appear on Plate 18. The stratigraphic correlations on Plate 18 will be reviewed.

Plate 19: IR Site 3 Treatment Ponds Area Primary Hydrocarbon Isopach in Soil. Does the bedrock outcrop have a primary hydrocarbon thickness of 0-5'.

Response: No. The bedrock contact with the fill is dipping at an extremely steep angle and the 0- to 5-foot contour interval is meant to show the potentially contaminated soils as pinching out against this outcrop.

Plate 24B: IR Site 4 Drum Lot No 1 Pre 1997 Groundwater Sampling Results. Contouring the 1994 sampling event as was done for the 1999 sampling event, on plate 24A would help see plume configuration changes over time.

Response: These 1994 data will be contoured. However, it should be noted that the linear array of wells (whose spacing was meant to detect migration to the bay) and the large number of non-detect data may result in a plume definition with little relationship to the 1999 well array and data.

3.0 RESPONSES TO U.S. EPA COMMENTS

GENERAL COMMENTS

Comment 1: While U.S. EPA believes the Navy has made a good effort to prepare the Pt. Molate Draft RI for the former Waste Disposal Area (Site 01), the Treatment Pond Area (former sump pond) (Site 03) and Drum Lot No. 1/Shoreline Areas (Site 04), there is one major deficiency: the failure of the Navy to address Groundwater Beneficial Use.

Response: Comments acknowledged on the effort to prepare the draft RI.

Based on discussions with and the recommendation of RWQCB during the November 2, 1999, BCT meeting, the groundwater beneficial use evaluation will not be included in the Final Phase II RI Report. The more appropriate documents for beneficial use evaluation include the corrective action plan (CAP) for the UST program sites, and documents that present post-action risk assessments, if necessary, or that establish cleanup levels for the IR and environmental baseline survey (EBS) sites. The RI will identify areas where groundwater is within 10 feet of the ground surface. These are areas where a pathway would be complete for a construction worker. The construction worker exposure pathway is considered the most likely risk scenario for groundwater exposure based on projected reuse plans for Point Molate.

Comment 2: The draft RI does not evaluate Groundwater Beneficial Use based upon federal groundwater classification guidelines. The Navy statement on page 3-13, that "[a] true aquifer, a saturated permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients (Freeze and Cherry, 1979), generally does not exist at Point Molate" does not represent an acceptable application of state and federal groundwater classification guidelines and evaluation of groundwater Beneficial Use Determination. If the Navy has data that indicates that groundwater is not a potential drinking water source, as defined by state and federal groundwater classification guidelines, please include this information.

Response: Please see the response to EPA General Comment 1 above and RWQCB Specific Comment 7.

Comment 3: Please note that the Navy was previously notified by U.S. EPA of a potential deficiency regarding Groundwater Beneficial Use Determination following EPA's review of a draft RI outline. Also, in early June, the Navy was provided with additional clarification on applying federal criteria for determining groundwater beneficial uses for Comprehensive Environmental Response and Compensation Liability Act (CERCLA) cleanups. This information was acknowledged by the Navy, but no clarification from the Navy was requested. A copy of this Groundwater Beneficial Use Determination clarification is enclosed (see Enclosure 2).

Response: Please see the response to EPA General Comments 1 and 2 for clarification.

Comment 4: For the Waste Disposal Area (IR Site 1), please clarify how the Navy has accurately estimated the volume of hazardous waste, waste oils/sludges, and fuel contaminated soils disposed at the site which will provide necessary cost information for an alternatives evaluation. U.S. EPA notes that on a number of plates (for example, Plates 5, 6, 7B, 8, and 9) the lateral and/or vertical extent of hydrocarbon stained material is undefined.

Response: The Navy believes the Phase I RI and Phase II RI field characterization work provide an adequate volume estimate of total fill materials and potentially fuel contaminated soils for the EE/CA. Please note, for example, that the linear feet of trenching conducted at the Waste Disposal Area was greater than 2.5 times the estimated footage in the final field work plan. These collective data for the Waste Disposal Area define the nature and extent of the fill materials adequately to satisfy EPA guidance (EPA 1993a, 1993b, 1996, and 1997a) for presumptive remedies for landfills and the requirements of the EE/CA.

In the EE/CA, 20 percent of fill is considered clean. This estimate was conservatively estimated based on the top 5 to 7 feet of visibly clean soil.

Comment 5: Also for the Waste Disposal Area (IR Site 1), the Draft RI indicates that the Navy will evaluate risks after completion of the Engineering Evaluation/Cost Analysis (EE/CA). While it is clear how this process would be applied to a removals action, it is unclear how the Navy would be able to recommend a cap/containment alternative(s) for the site without first completing a Risk Assessment. This issue is further complicated by the Navy's failure to address groundwater Beneficial Use Determination. Because of these concerns, at the August 18, 1999 BCT mid-month conference call, U.S. EPA encouraged the Navy to continue an ongoing dialog regarding the Site 1 EE/CA, in order to assist the BCT in accelerating the production of an acceptable document and maximize the use of limited financial and human resources.

Response: For presumptive remedies no HHRA is required prior to implementation. In the event of a removal by excavation and disposal, a preremoval HHRA would be unnecessary. This approach was discussed with the BCT while scoping the Phase II RI in June 1998.

Comment 6: Data and data validation components of the Draft RI have been reviewed by Mr. Joe Eidelberg, U.S. EPA's Quality Assurance Program (QAP) chemist in Memorandum dated July 27, 1999. While QAP staff conclude that, (1) soil and groundwater samples were generally collected and analyzed as described in the planning documents; (2) the report documents cases where variances to the planned activities have been necessary; and (3) data validation was performed in accordance with the planning documents and agency guidance, a number of specific comments are provided that should be addressed. For example, QAP identifies the Navy's volatile organic compound "grab" sampling techniques as inappropriate and inconsistent with U.S. EPA sampling guidance and U.S. EPA Region 9's recent *Regional Interim Policy for the Determination of Volatile Organic Compound (VOC) Concentrations in Soil and Soil Matrices*. June 23, 1999.

Response: Mr. Eidelberg's comments are addressed in the comment and response section following Mr. Ramsey's comments.

Comment 7: U.S. EPA's Interim Policy on VOC sampling was discussed on several occasions during the RI work plan stage, and despite efforts by U.S. EPA to reach a compromise, the Navy did not comply to U.S. EPA's request, citing "Navy policy". However, U.S. EPA staff has subsequently learned that the Navy at Mare Island has agreed to sample for VOCs using techniques consistent with the June 23, 1999 Regional Interim Policy. Additional comments are provided in U.S. EPA's Quality Assurance Program Memorandum (see Enclosure 3).

Response: See response to EPA Comment 6.

Comment 8: The Human Health Risk Assessment components of the Draft RI were reviewed by Dr. Jeffrey Paul of U.S. EPA's Technical Support Section. Based upon Dr. Paul's review, no major risk assessment concerns were identified.

Response: Comment acknowledged.

Comment 9: The Navy does not reference nor present Environmental Baseline Survey (EBS) sampling data in the Draft RI Report. Analytical data collected as part of the EBS Field Sampling Program needs to be integrated into the RI. Also, regarding the EBS, has the Navy considered bringing any or all portions of the Phase II EBS sampling work plan into the IR program? Given the multiple environmental areas of concern at Building 87, Parcel 30, the Navy should consider bringing Parcel 30 into the IR program in order to consolidate Feasibility Studies.

Response: The final report of the Phase I EBS sampling was completed during the Navy internal review of the draft Phase I RI and a few days before the draft Phase I RI was released to the EPA; therefore, these data could not be included in the draft. These data, as appropriate, will be included in the Final Phase II RI Report. However, it should be noted that the Phase II EBS focuses on several narrowly defined areas with releases of a different nature than the more widespread hydrocarbon spills and leaks in the IR sites. The Navy has decided the area of Building 98 and Parcel 30 will remain under the EBS program.

Please note the Phase II EBS sampling work plan was completed during November 1999.

SPECIFIC COMMENTS

Comment 1: Executive Summary, page ES-2. The first bullet, describing potential remedial actions for the Former Waste Disposal Area (Site 1) is incomplete. As discussed by the BCT, potential remedial actions must be evaluated to address contaminated groundwater, which may be determined to be a potential drinking, agricultural or industrial water supply.

Response: As discussed in the draft Site 1 EE/CA, no active remediation of groundwater is recommended based on the declining, low-level concentrations of petroleum hydrocarbons in groundwater; however, future monitoring is recommended. In addition, institutional controls are included with alternatives that leave waste in place to prohibit use of groundwater.

Comment 2: Executive Summary, Section 1.0, Introduction, and Plate 1, Facility Base Map and IR Sites: Additional text is needed preferably in both the Executive Summary and Introduction that identifies and lists the BRAC Parcels containing each IR Site. Also, Plate 1, Facility Base Map and IR Sites, should be revised to identify the BRAC Parcels and parcel boundaries.

Response: The BRAC Parcels that contain each site will be identified in the text and on Plate 1 or a new plate.

Comment 3: Introduction, page 1-3: Text indicates "[i]f capping is the selected remedy, streamlined risk assessments will be prepared..." As indicated in the general comments, please clarify how the Navy can evaluate the effectiveness of a cap if risks have not been first evaluated. Also, in the Navy's evaluation of a capping remedy, please clarify how groundwater beneficial use determination will be integrated into the evaluation. Given that groundwater may be suitable for drinking water and/or agricultural (i.e., irrigation) please clarify how will risks to humans be evaluated. Also, please clarify what is meant by "streamlined risk assessment."

Response: A presumptive remedy (a cap) may be implemented for the Waste Disposal Area without first completing an HHRA (EPA 1993a, 1993b, 1996, and 1997a).

The groundwater beneficial use evaluation will be separate from the Waste Disposal Area presumptive remedy. (See response to the first general comment.)

A "streamlined risk assessment" means that the Navy would target specific exposure pathways based on projected land use scenarios provided in the planning documents.

Comment 4: Section 1.3.3.5, SCAPS Investigation: U.S. EPA notes that this section concludes with the statement, "[r]esults of this program have been of limited usefulness in site characterization." Given the fact that Site Characterization and Analysis Penetrometer System (SCAPS) can be a cost effective tool that has been widely used by the Navy, please briefly describe why the Navy believes SCAPS was "of limited usefulness" at Point Molate. U.S. EPA staff would also like to point out that SCAPS data collected near the fuel pier (2 or 3 years ago) identified potential product, near the fuel pump substation where contaminated soil has recently been removed.

Response: The Site Characterization and Analysis Penetrometer System (SCAPS) is acknowledged as a useful field screening tool in many applications. The SCAPS program at Point Molate was conducted as a field test. No interpretive report of findings or other characterization report was written.

Data critical to quantitative and qualitative interpretation of the penetration logs, like calibration curves, were not provided. Data were mostly collected in areas of previously known petroleum hydrocarbon contamination. Therefore, previous and subsequent soil borings, groundwater analyses, and free product measurements have been a more reliable quantification for nature and extent analysis of the IR sites.

Comment 5: Section 1.3.3.6, IR Site 4 Removal Actions (1996-1998): Please indicate if the Navy has monitored groundwater elevations up and down-gradient of the containment wall wing-wall extension and evaluated the effectiveness of the extension. If fuel product has been detected in well MW11-22, it is likely that the trench extension may not have captured all the fuel product originally detected around well MW11-54. Also, please indicate the volume of fuel product that has been removed from well MW11-54.

Response: The Navy has monitored groundwater elevations both up- and down-gradient of the wing-wall extension and the extension appears effective. No free product has been detected in well MW11-22 since 1992 (before the containment well was constructed). Approximately 20 gallons of product have been recovered from well MW11-54 as of December 1999.

Comment 6: Section 1.3.3.7, IR Site 2 Sandblast Grit Removal Action: Please update this section and indicate when the Site 2 Record of Decision (ROD) is targeted for completion.

Response: This section will be updated. The ROD should be complete February 2000.

Comment 7: Section 2.5, Aquifer Testing: It is unclear why all aquifer tests were completed from bedrock monitoring wells. As indicated by U.S. EPA in November 19, 1998 (commenting on the Navy's *Draft Final Evaluation of Beneficial Uses for Groundwater Naval Fuel Depot Point Molate*, June 26, 1998), we are concerned that the Navy has not collected adequate shallow aquifer data. In addition to re-evaluating the need for additional shallow aquifer tests, the Navy should present in Section 3.6, Hydrology, all existing aquifer test data collected at the site, (i.e., pumping test data from Drum Lot No. 1).

Response: Bedrock borings have been amenable to packer testing. The shallow, unconsolidated materials will not survive packer testing because the stresses induced will cause the formation to slough or cave into the borehole and a long-term pumping rate cannot be sustained in most areas; therefore, a pumping test cannot be conducted, and single well slug testing has not been considered a useful indicator of the overall hydraulic properties of the formation.

Pumping test data from the 1996 pumping tests in Drum Lot Number 1 will be included in the appendix with other hydraulic data.

Comment 8: Section 2.7, Deviations from the Field Work Plan, page 2-12: On the first bullet, text indicates a "stilling well" was installed in lieu of the proposed well MW02-14, due to access limitations and muddy conditions. While it is unclear how the Navy was able to install MW02-13, located further to the north of the access road, the elimination of well MW02-14 is not acceptable to U.S. EPA and needs to be installed to determine what the shallow groundwater contaminant concentrations are at the base of the Waste Disposal Area. Also, for clarity please briefly define "stilling well." The Navy should also describe this design in Section 2.3, Groundwater Monitoring Well Installation, Development, and Sampling.

Response: Continuing rain during field operations made the site inaccessible after well MW02-13 was installed.

The necessity of an additional well is questionable. A number of wells are within and downgradient of the Waste Disposal Area. Wells downgradient (MW02-13, MW02-15, and BR02-19) show little to no contamination, as does well MW02-06, which is in the middle of disposed wastes. In addition, future actions to be taken at IR Site 1 will significantly reconfigure the area, requiring existing wells to be destroyed.

A "stilling well" was meant to be a gravel-packed, slotted pipe set in a shallow backhoe hole (less than 5 feet deep) to allow a shallow seepage sample to be obtained. Extensive surface seepage was observed during the Phase II field work and it was determined after drilling the deeper well MW02-13 that a monitoring well constructed to state specifications, with a 10-foot grout surface seal, would be screened below the groundwater flow. Well MW02-13 did not encounter water in the subsurface until the boring reached 20 feet below ground surface in weathered bedrock. The concept of this "stilling well" will be eliminated based on EPA and RWQCB comments and therefore will not be described in Section 2.3.

Comment 9: Section 3.6. Hydrology: As indicated in general comments, this section must be revised to include a discussion of groundwater beneficial use based upon both state and federal groundwater classification criteria and guidelines.

Response: Please see the response to EPA General Comments 1 and 2.

Comment 10: Section 4.1.1, Site History and Previous Investigations: Consistent with past BCT discussions on the Waste Disposal Area (Site 1), U.S. EPA requests that the Navy evaluate aerial photographs as part of the RI to better characterize disposal practices.

Response: The Navy has evaluated aerial photographs of the Waste Disposal Area during the Basewide EBS. Please see the response to RWQCB Comment 12.

Comment 11: Section 4.1.1, page 4-3: Text indicates one water sample was collected from the augers during drilling SB02-09. This method of collecting a water sample is not approved by U.S. EPA and is of questionable quality, especially if collected for VOC analysis. Please include this work plan deviation in Section 2.7.

Response: The sample was considered a field screening application and will not be used for the HHRA. This addition to the field work will be included in Section 2.7.

Comment 12: Section 4.1.2, Sources: U.S. EPA does not agree with and requests clarification regarding the Navy's statement that polynuclear aromatic hydrocarbons (PAHs) "are not interpreted to be a significant source for future groundwater contamination because the remaining compounds have low solubilities". While it is true that PAHs have low solubilities, the Navy should not ignore the fact that, based upon its own estimates approximately 20,000 cubic yards of waste oil contaminated soils and sludges were disposed of in the subject area, which U.S. EPA believe represents a significant and discrete source.

Response: The Navy has not ignored the petroleum-hydrocarbon stained soils in the Waste Disposal Area and is preparing alternatives to prevent exposure through the EE/CA process. This source is acknowledged to be discrete. The significance is believed to be low in terms of potential impact to groundwater. For example, well MW02-06, directly downgradient and within only a few feet of these wastes, shows only trace levels of petroleum constituents. The Navy believes these wastes exist only at near residual, nonmobile, concentrations.

Comment 13: Section 4.1.3, Soil: Text on page 4-5 indicates "[o]ne old, rusted empty drum was encountered" during trenching work. Please verify that the RI also makes reference to the one newer 55 gallon barrel labeled "Malathion" that has been observed in the brush at the base of the Waste Disposal Area by U.S. EPA and Navy representatives during various site visits.

Response: This reference will be added to the RI. Please note this drum was removed by the Navy, found to be empty of residue, and properly disposed of in May 1999. (See response to City of Richmond Comment 11.)

Comment 14: Section 4.1.4, Groundwater, page 4-7: The statement at the end of page 4-7 states that "[u]nless a HHRA [human health risk assessment]" indicates a risk, no further scoping of remedial actions for groundwater is indicated". As indicated in General Comments, U.S. EPA is unclear how the Navy could potentially support an remedial action alternative that is not supported by a HHRA or how the Navy could potentially exclude a risk pathway without support of a HHRA.

Response: Please see response to EPA General Comment 5.

Comment 15: Section 4.2.1, Site History and Investigations: Please clarify what the Navy means by "closure [of the sump pond]" in the first and third paragraphs.

Response: "Closure" in this case indicates the sump pond was taken out of use, partially excavated, and backfilled. This information was previously presented in the Treatment Ponds Site Characterization Report (PRC 1994).

Comment 16: Section 4.2.1: On page 4-10, text indicates salt water intrusion was not evident at MW11-27. Please verify if this is the correct well, because MW11-27 is located on the upgradient side of the containment trench.

Response: The text will be modified to clarify that these results were from characterization work at the Treatment Ponds Area in 1994 before the containment wall and extraction trench were installed in 1995 and 1996.

Comment 17: Section 4.2.1: On page 4-11, please provide additional support for the statement that "[t]the trench has been effectively capturing contaminated groundwater. For example, please indicate if the Navy's determination of effectiveness was based upon a review of technical information (i.e., water elevations) and/or costs. Also, in the same paragraph, please indicate the maximum treatment/flow capacity of the package groundwater treatment system.

Response: Effectiveness of the containment wall and extraction trench in controlling migration of free product has been evaluated based on technical information, including:

B. The observed effects of trench construction
C. Visual inspection for shoreface seepage
D. Results of the Offshore Ecological Risk Assessment (Entrix and Tetra Tech EM Inc. 1999)
E. Results of the Treatment Ponds Area Extraction Trench Performance Evaluation Report (PRC 1996c)
F. Evaluation of groundwater elevation contours through time.

Text will be added to address this comment including the treatment capacity of the system.

Comment 18: Section 4.3.1, (Drum Lot No. 1/Shoreline Areas) Site History and Investigations: Third paragraph should be modified to include Phase I Environmental Baseline Survey (EBS) sampling results for BRAC Parcel 30, Building 87, where recent sampling detected the highest concentrations of volatile organic compounds (VOCs) in groundwater to date. A similar comment applies to Section 4.3.4, Groundwater.

Response: Text will be added to Sections 4.3.1 and 4.3.4 to present the results of the Phase I EBS sampling. The text will also indicate these issues in BRAC Parcel 30, Building 87 will be addressed under the EBS program and not included in further RI investigations.

Comment 19: Section 5.1.4, (Fate and Transport) BTEX: Replace "adjective" with "advective" in second paragraph.

Response: This change will be made.

Comment 20: Second 7.1 (Background PAH Data) Summary Statistics: U.S. EPA is unclear about background sample SSBK-05. Based upon text, it appears that the laboratory raised the detection limits for this one sample. Has the Navy assessed why the laboratory modified the analysis? Does the chain-of-custody sheet request low-level detections? If so, the laboratory could be requested to recollect and reanalyze a replacement sample. Also, please explain why the Navy could not eliminate this "outlier" from the background data set given the unusually high (non-detect) detection limit and the relatively low detected PAH concentrations (the maximum detected PAH was Pyrene at 5.6 μg/kg or parts per billion).

Response: A dilution of 5 times (5X) was required for sample SSBK-05. The adjusted contract required quantitation limit (CRQL) for sample SSBK-05 is below the preliminary remediation goal (PRG) for the PAHs of interest. In accordance with Navy guidance and standard statistical practices, non-detected values above the highest detected value are not used in comparisons between background and site data sets. Therefore, reanalysis of sample SSBK-05 is not considered necessary at this time.

Comment 21: Section 7.4, (Background PAH Data) Conclusion and Recommendations: Text indicates that "...it is recommended that site data for PAH compounds be evaluate by comparison with the risk-based concentrations (that is PRG values)." The recommended risk screening would be acceptable for evaluating ambient concentrations only.

Response: Comment noted. Site data will be compared with background data sets in accordance with Navy guidance (Navy 1997). PRGs were presented in Table 7-1 to evaluate the utility of the data collected. This background data set was developed for comparison with site results. See also response to Comment 20.

Comment 22: Figures 1-1 through 4-1: In general U.S. EPA found the figures to be fairly well prepared; however, some minor changes are requested for the following figures:

A. Figure 1-1, Facility Location Map: Please add Richmond, California to the map.

B. Figure 4-1, Site 1 - Waste Disposal Area and Site 4 - Shoreline Areas Conceptual Site Model: The illustrated conceptual site model (CSM) does not include any groundwater pathways. U.S. EPA recommends that a tabular CSM be developed to identify groundwater exposure pathways (see for example Alameda Point (former Naval Air Station Alameda) August 9, 1999 final OU-3 (Site 1 - Landfill) RI Report, Figure 5-3, CSM Potential Complete Exposure Pathways. Figure 4-1 should also be modified to illustrate buried waste which does represent a residual source.

Response:

A. Richmond will be added to Figure 1-1.

B. These Conceptual Site Models (CSMs) are graphic and schematic. The pink arrows on the figure and in the explanation indicate the potential groundwater pathways. Buried waste will be indicated as a potential source.

Comment 23: Plates 1 - 27A. In general, U.S. EPA found the plates fairly well prepared and organized; however, some minor changes are requested for the following plates:

A. Plate 1: U.S. EPA notes that the boundary of the Waste Disposal Area (Site 1) has an area marked "IR Site 1 Waste Disposal Area", and a downgradient area marked "Area Investigated As Part of IR Site 1". However, wells have been installed slight east of the "IR Site 1 Waste Disposal Area" that are not indicated as "Area Investigated As Part of IR Site 1". Also, given the fact the Navy has in the last year modified the boundary of the Site 1, please verify that the text includes a discussion of past boundaries for this IR site.

B. Plate 1 also identifies five "Background Areas". With the exception of Background Area 1 which conforms to the one Comprehensive Environmental Restoration and Facilitation Act (CERFA) "clean" Parcel, the "background areas" have no relevance to U.S. EPA.

C. Plate 27A, IR Site 4 South Shoreline Recent Groundwater Sampling Results. U.S. EPA requests that this plate also include EBS groundwater sampling results.

Response: A. The Navy cannot identify the wells EPA describes to the east of IR Site 1. New wells installed at Tanks 15 and 18 are related to the Phase 1 UST investigations and were not specifically targeted for IR Site 1. Please clarify the specific wells in question.

The Navy has not modified the boundary of IR Site 1. The only variation in this area boundary was presented in the sitewide EBS and indicated as the boundary of IR Site 1. The EBS boundary was a direct, and incorrect, carryover from the Phase I RI for the Waste Disposal Area, which evaluated both the landfill and UST releases. The Phase II RI indicated this boundary as the boundary for the area investigated under contract task order (CTO) 248 not as the boundary for IR Site 1. The text will indicate this issue was discussed with the BCT in June 1998.

B. Comment noted.

C. The EBS groundwater results will be added to the plates (see response to Paragraph 9 of EPA general comments).

3.1 RESPONSES TO U.S. EPA REGION 9 QAP CHEMISTS COMMENTS FROM MR. JOE EIDELBERG

CONCERNS ON QUALITY ASSURANCE ISSUES

Concern 1A: [General] Analytical data are provided in Appendix A-2 (Volume III of the report) and includes results from previous as well as the current investigation. The conclusions in the report are based on this data. Although the data are transcribed accurately from these tables to figure and tables in the report, the laboratory data were not provided and could not be compared to the results in the report. Based on the lack of substantial findings, the QA Office will not be requesting raw data for further review.

Response: Concern noted.

Concern 1B: It is recommended that the DVRs [data validation reports] include data tables with qualifier flags.

Response: Concern noted. The Navy will consider this recommendation for future sampling programs.

Concern 2: [Section 2.2.2, Hollow Stem Auger Borehole Soil Sampling] Section 2.2.2 describes the collection of soil boring samples for VOC analysis, indicating that screening with a photo-ionization detector (PID) and visual observation of staining was performed immediately upon opening the split spoon or extruding the sample from the core barrel. If PID readings were high or staining present, the sample was quickly transferred to wide-mouth sample bottles. Note that the current Region 9 policy on collection of soil samples for VOC analysis requires that samples are handled as intact soil cores in the field and laboratory, with samples transferred using a coring device which can be reliably sealed to prevent volatilization losses (such as the EnCore sampler).

Samples must be analyzed or chemically preserved (using sodium bisulfate or methanol) within 48 hours of collection if any contaminant may undergo biodegradation (such as benzene, toluene, ethylbenzene, and xylenes (BTEX)). For future investigations, these measures must be implemented. It is recommended that subject report provide a discussion of this discrepancy and a rationale for why the data is of acceptable quality. In the discussion, the level of VOCs and purgeable total petroleum hydrocarbons (TPH) found in site samples should be considered as the minimum concentration in the soil.

Response: The procedure described in Section 2.2.2, Hollow Stem Auger Borehole Soil Sampling, in the final RI field work plan (TtEMI 1998b) was selected, after considerable evaluation, to (1) collect data that would be comparable to previously collected data, and (2) to avoid collection and analysis of nonrepresentative samples.

Updated EPA procedures for collection of soil samples will be considered for future investigations, per this recommendation. Text in Section 2.0 will also be amended to include a discussion of the possible impact on soil concentrations resulting from this method of sample collection.

Concern 3: [Section 2.2.3, Mud Rotary Borings] Section 2.2.3 describes the collection of groundwater samples for volatile organic compound (VOC) analyses, including purgeable total petroleum hydrocarbons (TPH-p). The description indicates if head space was present in any sample vials they were topped-off or refilled accordingly. Regional guidance recommends that sample vials be discarded if bubbles or head space are visible. Note that if vials are pre-preserved with HCl, refilling will result in an unpreserved sample. It is recommended that the subject report indicate the number of affected samples.

Response: Text in Section 2.2.3, Mud Rotary Borings, will be amended to clarify the discussion regarding topping off or refilling samples. In some instances, samples were topped off if a small amount of headspace remained after the sample container was filled. This procedure was included in the final RI field work plan (TtEMI 1998b). TtEMI does not believe this procedure affects the quality of the data.

The reference to refilling samples is misleading and will be rewritten. The intent of the statement "refilled accordingly" was to describe a situation in which the sample container could not be topped off. In this case, the sample was discarded and a new sample container was used.

Concern 4: [DVRs; General] Sample preservation, including temperature control, is not included in the list of data validation requirements, therefore verification of proper preservation and temperature control is not included in the DVRs. It is recommended that copies of the chain-of-custody forms be included as an appendix.

Since preservation is not included in the requirements, it is not certain that the proper holding time was utilized in certain cases. For example, for the analysis of benzene, toluene, ethylbenzene, and xylene (BTEX) in water samples, the holding time is 7 days without chemical preservation, but 14 days when preserved with hydrochloric acid. It is not clear from the DVRs which holding time was applied. Although the collection date is included in the data validation report, the analysis dates are not. It is recommended that these issues be resolved by inclusion in the subject report narrative text.

Response: Sample preservation, including temperature control, has not been specifically listed in the data validation requirements of the data validation reports (DVRs): however, sample preservation, including temperature control, was reviewed during the validation process. As stated in Section 5.2.3.1 of the Final Quality Assurance Project Plan dated July 17, 1998, "In accordance with the TtEMI SOW [statement of work] for data validation services, all analytical data will be validated in accordance with the EPA data validation functional guidelines for organic analyses." The stated criteria for evaluating organic holding times in the functional guidelines requires an evaluation of both sample temperature and preservation.

Therefore, even though sample preservation, including temperature control, was not explicitly identified as a review parameter on the DVR, it was reviewed during data validation. Chain-of-custody records are on file and available if additional information is requested. Text will be added to the data quality assessment in Appendix A-2 stating that preservation, including temperature control, was evaluated during data validation.

COMMENTS

Comment 1: [Appendix A1, Data Quality Assessment] The explanation of the Z flag in Appendix A1 states that the flag could indicate the presence of a volatile compound that is not a petroleum hydrocarbon, such as carbon tetrachloride, plant waxes, or other naturally-occurring organic compounds. Note the result for gasoline range organics in sample SB11-94 (1.0-2.0) is flagged Z, but no volatile constituent is reported near that concentration (6200 mg/kg) for the sample.

It is recommended that the subject report indicate whether or how, the flagged data were used.

Response: The volatile compound indicated by the "Z" qualifier flag, as described in the data quality assessment, Appendix A1, is not necessarily a target analyte and may appear as a tentatively identified compound (TIC) in the data. Since TICs are not reported, the use of "Z" qualified gasoline range organics data will actually result in a more conservative representation of this data. Text will be added to the data quality assessment in Appendix A1 which discusses this issue.

Comment 2: [General] The DVRs use one system of J (estimation) flags, while Tetra Tech uses another. For instance, DVR uses 'Jc' to indicate a qualification due to calibration problems, while the analytical tables use 'Je' to indicate a qualification due to calibration problems. It is recommended that flags be made consistent throughout the report.

Response: The inconsistency of "J" qualified estimated result flags is a result of a change in abbreviations used in data qualification. The Navy contractor, Tetra Tech EM Inc. (TtEMI), uses a system of subqualifiers that provide additional information about the sample, beyond the primary "J" qualifier. The subqualifiers used to qualify analytical data collected through approximately 1998 were changed in 1999 to be consistent with those used by other Engineering Field Activity (EFA) West facilities. The changed subqualifier does not alter the reason for qualifying the data; it merely changes the abbreviation for that qualification. TtEMI will provide a cross reference of the old and new qualifiers in Appendix A1, which can be used for reference.

4.0 RESPONSES TO CITY OF RICHMOND COMMENTS

GENERAL COMMENTS

Comment 1: Section ES-4. The "closure" mentioned in the first bullet isn't part of the CERCLA process, and its significance should be explained.

Response: This use of "closure" means removal of the former sump pond. The text will be modified to clarify the intended meaning.

Comment 2: Section 1.0. Need to mention Site 2 status.

Response: The status of IR Site 2 will be provided. The final ROD will be submitted for signature by December 31, 1999.

Comment 3: Figure 1-1. City of Richmond not indicated on map.

Response: The City of Richmond will be included on Figure 1-1.

Comment 4: Section 1.3.1. Isn't the City a BCT member?

Response: This oversight will be corrected.

Comment 5: Section 1.3.3.5. Spell out SCAPS.

Response: Site Characterization and Analysis Penetrometer System (SCAPS) will be included in the text.

Comment 6: Section 1.3.3.7. Provide latest information on Site 2.

Response: The latest information on the status of IR Site 2 will be included in the text. The final ROD will be submitted for signature by December 31, 1999.

Comment 7: Section 3.3, 4.3.5. Clarify whether Pt. Molate is on San Francisco or San Pablo Bay.

Response: Point Molate is bordered by San Francisco Bay, and the location will be clarified in these sections.

Comment 8: Figure 4-1. Does the drawing depict the total extent of migration from leaks at Tanks 5, 7, and 20. Indicate which are impacting Site 1.

Response: The figure is meant to be schematic and indicate the release. The exact extent of this release migration is not known so it cannot be accurately shown on the figure. Releases from Valve Box 9 and pipelines near Valve Box 7 are likely to have flowed into the Waste Disposal Area.

Comment 9: Figure 4-3. You may want to use a different color than dark brown, which denoted fuel leaks in other Figures.

Response: The coloring will be changed per the comment.

Comment 10: Table 4-1. Explain how the "mean" can exceed the "maximum detected level" for some contaminants. It would be nice to know the DLs, or at least know for which samples the detection limit (DL) exceeds the PRG.

Response: The "mean" values in the data summary tables, Tables 4-1 through 4-10, exceed the maximum detected concentration in several instances. This occurrence is unusual, but resulted when concentrations of detected values are low and the reporting limits for one or more values were higher for non-detected values.

The mean was calculated using a standard procedure (EPA 1989) which substitutes a value of one-half of the non-detected reporting limit into the mean calculation where results are non-detect. Higher reporting limits may be a result of interferences encountered during analysis and may also be caused by different laboratory reporting limits used for some of the samples.

Tables 4-1 through 4-10 will be modified to present a summary of the number of non-detected results that exceed established PRG values.

Comment 11: Section 4.1.3. EPA and the city observed a 55-gallon drum labeled "Malathion" in the landfill, and reported it to the BCT.

Response: The 55-gallon drum labeled "Malathion" was removed by the Navy, found to be empty of residue, and properly disposed of in May 1999. This information will be included in Section 4.1.3.

Comment 12: Section 4.1.4. Discuss the impact of closing the ORS system on groundwater. More monitoring may be necessary to support the conclusions about free product level trends (some are actually rising, i.e., MW 11-28).

Response: The oil recovery system (ORS) system was closed during October and November of 1999. The impacts of closing the ORS are not fully known but will be monitored during the rainy, winter season as a part of the UST program. Additional product measurements are being taken as part of the monthly product removal program.

Comment 13: Section 4.2. The third sentence should refer to the groundwater (GW) treatment plant as well as the extraction system.

Response: The text has been changed to also refer to the groundwater treatment plant.

Comment 14: Section 4.2.1. What is the likely source of the LNAPL described in the 1st paragraph on pg. 4-10?

Response: The LNAPL in well MW11-92 was measured at 0.66 feet in December 1994. This LNAPL (Bunker fuel) was part of the floating product plume on groundwater downgradient from the Treatment Ponds and former sump pond location and is attributed to the ponds or local pipeline leaks.

Comment 15: Section 6.4.2.2. Pg. 6-9 (soil) – Is eliminating the pica behavior consistent with EPA risk assessment guidance?

Pg. 6-10 (surface water) – On hot days (maybe 25 days/year) numerous swimmers can be found in the Bay water at Keller Beach, only 2 miles away. If Pt. Molate Beach becomes popular, there will be swimmers.

Response: Pica behavior is not typically evaluated in a HHRA. Furthermore, pica behavior is generally associated with children younger than the age group evaluated in this risk assessment. EPA (1991a) and DTSC (1992) guidance provide soil ingestion rates for evaluating the RME scenario for a child, and these rates were used in the risk assessment. The RME is defined as the highest exposure that is reasonably expected to occur at a site. The rate used in the HHRA (200 mg/day) is that recommended for younger children (1 to 6 years of age) and is higher than the ingestion rate (100 mg/day) that would typically be used for older children.

The field work plan stated that exposures to surface water would not be evaluated in the risk assessment for two reasons (TtEMI 1998b). First, any contaminants released to San Francisco Bay would disperse quickly; because concentrations from potential sources are low, concentrations in the bay would quickly reach nondetectable levels. Documentation was cited indicating that up to 24 percent of the volume of water in the bay is exchanged during each tidal cycle (TtEMI 1998b). Secondly, the work plan cited strong currents and cold water as a deterrent to swimming. Although it is still possible that individuals could wade or swim at Point Molate, potential risks associated with swimming would be similar to those incurred elsewhere in the bay. For these reasons (and as previously agreed in the work plan), this pathway will not be addressed at this time.

Comment 16: Section 6.4.3.3. Explain why Asian clams are a conservative indicator species for PAH tissue levels.

Response: Asian clams do not readily metabolize PAH compounds and tend to bioaccumulate them more than other species. This was fully discussed in the Draft Final Ecological Risk Assessment addendum to the Phase II Remedial Investigation Field Work Plan (TtEMI 1998c)

Comment 17: Section 6.5. Address the need to or not to conduct risk assessment on the following contaminants: metals; chlorinated solvents including dichloroethene (DCE), vinyl chloride; methyl tertiary butyl ether (TBE).

Response: The HHRA for the Point Molate Public Beach Area was focused on viable exposure pathways for recreational users. Chemicals of potential concern (COPCs) were chosen based on previous uses in this area, possible releases in this area, and previous analytical detections in this area. Data from the 1994 Shoreline Investigation Soil and Sediment Data Summary and the Quarterly Groundwater Sampling Program did not indicate metals, chlorinated solvents (including DCE), vinyl chloride, or MTBE to be present in elevated concentrations in soil, sediment, or groundwater. Nor have data been discovered to support any use, disposal, or releases of these contaminants in the Point Molate Public Beach area. Therefore, these COPCs were not evaluated in the HHRA, consistent with the original program presented in the Phase II RI work plan.

Comment 18: Section 6.6.2. The statement that action by the Navy generally will not be taken unless the risk exceeds 10^{-4} seems too strong, and it involves risk management, not assessment.

Response: This statement will be deleted from the text. Please also refer to the response to RWQCB Specific Comment 32.

Comment 19: Section 7.0. Refer to the map where the 16 background samples sites are shown. Explain how were they selected/determined to be background.

Response: The background sample locations are shown on Plate 1. Section 5.0 of the Phase II RI work plan contains an extensive discussion of the methodology used in selecting these samples. Basically, historical aerial photographs taken shortly after construction of the hillside tanks revealed areas that were undisturbed by construction. These areas are the shaded areas on Plate 1 that were presented in the work plan.

Comment 20: Section 8.1.4. There is 0.69' of floating product in ERM-EW1 (Table 2-4).

Response: This statement was true in April 1999. Please note that this well is cross gradient from the fill footprint of IR Site 1 and does not contribute groundwater flow through the fill of IR Site 1 at the Waste Disposal Area. This well has been further investigated during the Phase I and Phase II UST program.

Comment 21: Section 8.2.2. Mentions tanks B and C as the only source of contaminants in the area – what about the source of contamination below Diesel Road?

Response: This source will be mentioned also.

Comment 22: Section 8.2.4. Floating product levels in some wells have risen in recent years (Fig. 4-32, 4-33).

Response: This comment is correct. However, the long-term trend in product thickness has decreased since 1994. Plots of thickness against time were included for these wells as well as others showing more recent decreases to emphasize the longer-term trends since base closure. A comprehensive table of water levels and product thickness since the site investigation (SI) is being compiled for inclusion in the report.

Comment 23: Several. Note the document refers to CERCLA removal actions as remedial actions in several places (i.e., prepare an EE/CA to perform a remedial action.) This may cause some confusion.

Non-fuel related contaminants such as MTBE, chlorinated organics and metals, don't receive sufficient discussion relative to the need to gather more data, risk assessment potential, and evaluating cleanup options (biodegradation potential).

Given their importance and proximity, should contaminants around the DVECC building be included in the Site 4 RI?

Response: The text has been changed to reflect CERCLA terminology more correctly.

MTBE is a fuel-related contaminant and will be addressed concurrent with fuels. Chlorinated organics detected in the area of the Disease Vector Environmental Control Center (DVECC) building, adjacent to IR Site 4, are being addressed by the ongoing EBS program. The only other area where chlorinated organics were detected, IR Site 3, is currently contained by the containment wall and extraction trench, and will be included in the future EE/CA at IR Site 3.

Metals have been discussed during several BCT meetings. The presence of metals related to fuels is not expected nor been found at elevated concentrations. The only other source of metals at Point Molate was the sand blast grit that constituted IR Site 2. This grit has been removed and a final ROD will be submitted by February 2000.

The Navy has retained the DVECC building in the EBS program and will continue to address characterization and potential remediation under the EBS program. The Phase II EBS field investigation of this area took place in December 1999 and the results will be presented in the Phase II EBS Report in 2000.

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