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NFD POINT MOLATE
SSIC NO. 5090.3.A

5090
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October 5, 1993

California Regional Water Quality Control Board
San Francisco Bay Region
Attn: Miss Gina Kathuria
2101 Webster Street, Suite 500
Oakland, California 94612

Subj: Naval Fuel Depot, Point Molate, CA

Dear Miss Kathuria:

Please find the enclosed responses to your review comments on the Treatment Pond Draft Characterization Report and the Interim Corrective Action Evaluation. Once the review comments are resolved, we will proceed to finalize the documents and send copies to your office.

Should you have any questions, please contact me at (415) 244-2536.

Sincerely,

Original signed by:

LUCIANO A. OCAMPO
Remedial Project Manager

Encl: (1) Response to comments on the Interim Corrective Action Evaluation
(2) Response to comments on the Treatment Pond Site Characterization Report

Copy to:
CAL-EPA, Department of Toxic Substance Control (Attn: Mr. Joseph Chou) w/encl
Naval Supply Center Oakland (Attn: Mr. Ron Samuel) w/o encl

Blind copy to:
T2B1LO w/o encl
T2B1 w/o encl
Admin file w/encl
Chron, blue, pink, green
File: NSC Oakland w/encl

# RESPONSE TO COMMENTS
# NFD POINT MOLATE TREATMENT PONDS AREA
# INTERIM CORRECTIVE ACTION EVALUATION

**NOVEMBER 5, 1992**

## INTRODUCTION

This report presents responses to the California Regional Water Quality Control Board (RWQCB), San Francisco Bay Region, comments on the Treatment Ponds Area Interim Corrective Action Evaluation prepared November 5, 1992 by PRC Environmental Management, Inc. (PRC) for Naval Fuel Depot (NFD) Point Molate in Richmond, California. Ms. Gina Kathuria of RWQCB submitted comments to the Navy in a letter dated June 11, 1993.

RECEIVED

## GENERAL COMMENTS:

Comment Number 1: All of the sources of contamination have not been identified. The Site Characterization report makes references to numerous unknown sources. Once the sources are known the appropriate remediation technique can be determined. After further investigation of the sources, the likelihood that extraction wells will be appropriate is marginal.

*Response:* *This comment is essentially the same as RWQCB General Comment No. 4 written for the Treatment Ponds Area Draft Site Characterization Report (PRC 1992b). See response to that comment (Comment No. 4) in addition to response to Comment No. 38, which discusses the use of extraction wells as an interim corrective action.*

Comment Number 2: Additional investigation is needed to determine the impacts on the groundwater and the bay from the contamination. If there are any impacts that could be harmful to humans or aquatic life (immediate or long-term), the contaminated groundwater must be treated.

*Response:* *Quarterly groundwater sampling at an established network of shoreline monitoring wells is a planned component of upcoming Contract Task Order (CTO) 0248 activities. A baseline sediment quality evaluation is also planned under this CTO to assess the potential impact of petroleum constituents on near-shore sediment quality and biological activity. See also response to RWQCB Comment Nos. 33 and 34 in the Draft Site Characterization Report responses (PRC 1992b).*

Comment Number 3: The Treatment Ponds are unlined, 6 feet deep, and approximately 140 feet from the San Francisco Bay. This raises an area of concern as to why the treatment ponds were built under these conditions. An investigation is

required to explore the possibility that current operations at the Treatment Ponds site affect the groundwater.

*Response:* *One can only speculate as to the Navy's design and location considerations in place at the time of construction of the ponds. The investigation under CTO 0143 has already thoroughly evaluated the groundwater in the vicinity of the ponds. The investigation indicated a significant groundwater mound in the vicinity of the ponds resulting from a combination of (1) leakage from the ponds and (2) the sharp hydraulic gradient developed downgradient of the ponds resulting from the sheetpile cutoff wall installed when the former sump pond existed.*

*The groundwater quality in the vicinity of the ponds may be affected to some extent by the water circulating through the ponds. However, the contribution of the untreated pond water compared to known soil contamination within the saturated zone is probably negligible. The fact that the ponds are unlined, and possibly contributing to groundwater contamination, is not considered a key issue given the extent of hydrocarbons (predominantly bunker fuel) associated with the former sump pond already existing in the soil, or specifically, at the capillary fringe and floating on the shallow water table.*

*Modification of the existing wastewater treatment plant may be required with the remedial design planned under upcoming CTO 0248. Lining, enlarging, or removing treatment ponds will be considered as part of a predesign study.*

**SPECIFIC COMMENTS**

Comment Number 1: Page 2-3, 2nd paragraph: If the integrity of the cutoff wall is unknown, how can it be assumed that it provides a partial barrier to subsurface flow toward the bay.

*Response:* *A very steep hydraulic gradient exists directly adjacent and downgradient to the treatment ponds. This gradient is too sharply developed, particularly in the vicinity of wells MW11-33 and PZ11-33A, to exist without some form of mechanical or hydraulic barrier. The groundwater mounding that exists in the vicinity of the treatment ponds exhibits a smooth gradient in most directions except toward the monitoring wells located along Pond Road, again providing evidence of a subsurface hydraulic barrier. The hydraulic barrier may not be intact or provide cutoff of water flow, but it does apparently impede water flow at specific locations.*

*See also response to the previous comment.*

Comment Number 5: Page 2-8, Figure 2-4: After reviewing the sediment sample locations map, the RWQCB questions if enough samples were taken to achieve a thorough investigation along the shoreline. The RWQCB would like to see more samples taken closer to the shoreline and additional samples taken in the vicinity of the stormwater outfalls.

*Response:* *Additional sampling of near-shore sediments is planned under upcoming CTO 0248. Samples will be collected along the entire length of the fuel depot shoreline (up to 24 samples maximum) with specific locations chosen at stormwater outfall locations (see CTO 0248 basemap).*

*Sediment samples that were collected under CTO 0143 were chosen to assess worst case conditions at areas of historical hydrocarbon seepage, and to characterize the interface between tidal flats sediments and the fill material used to build up the wastewater treatment plant over previously existing sediments.*

*See also response to Comment Nos. 18, 29, 30, and 43 provided in the responses to comments on the Draft Site Characterization Report (PRC 1992b).*

Comment Number 6: Page 2-17, 3rd paragraph: The migration of JP-5 sighted at MW11-22 seems to be coming from an upgradient unknown source. Are there any plans in the near future to identify this unknown source? If so, how?

*Response:* *See response to Comment Nos. 20 and 26 provided in the responses to comments on the Draft Site Characterization Report (PRC 1992b).*

Comment Number 7: Page 6-2, Table 6-1: Why are MW11-09, MW11-31, MW11-45 not considered proposed extraction wells. What is the radius of influences for the proposed extraction wells presented in Table 6-1?

*Response:* *These wells do not provide adequate yield to serve as extraction wells using a typical two-pump drawdown and recovery system. Immiscible phase hydrocarbons had not developed in well MW11-09 as of the September 1, 1993 water level monitoring data. Thin layers (less than 0.05 foot) and globules of bunker fuel do exist in wells MW11-31 and MW11-45. However, with the current emphasis on a containment design which would be located downgradient of these monitoring wells, they will not be considered as potential extraction wells.*

*Table 6-2 provides the distances and observed drawdowns for each observation well monitored during the performance of pumping tests. The radius of influence measured during the aquifer tests varied specifically for each pumping test well as seen in Table 6-2, with the maximum straight-line influence measured at 61.5 feet in well MW11-36 during test No. 1.*

Comment Number 7: Page 6-5, Figure 6-1: RWQCB requests that considerations for air emissions/air quality also be included in the design plan. Also, is there any possibility of sludge being produced as a by-product from the chemical reactions illustrated in the "Treatment Plan Process flow Diagram." If so, what are the future plans for the sludge?

*Response:* *There is no emphasis on design considerations for air emissions or air quality for the remedial actions being planned for the treatment ponds and near shore areas under CTO 0248. This is primarily because of the very low volatility of <u>most</u> of the hydrocarbon types known to be contaminating the soil or groundwater, that is, bunker fuel and diesel or mixtures of both.*

*Some sludge is currently produced as a byproduct in the facilities existing oil-water separators. The sludge is typically removed from these systems and sent to disposal or treatment facility capable of handling this material. It may also be sent to the neighboring Chevron Refinery for processing; however, this information should be verified with the facility.*

## REFERENCES


Department of the Navy, Western Division. Contract Task Order 0248. "Revised Scope of Work, Shoreline Assessment at Naval Fuel Depot, Point Molate, January 29, 1993." Revised August 31, 1993. Naval Facility Engineering Command, Western Division, San Bruno, California.

PRC Environmental Management, Inc., 1990a. Personal communications with Point Molate personnel. September through October 1990.

PRC Environmental Management, Inc., 1990b. "Revised Site Inspection Field Work Plan, Point Molate Naval Fuel Depot, Richmond, California, July 18, 1990." Prepared for Naval Facilities Engineering Command, Western Division, San Bruno, California.

PRC Environmental Management, Inc., 1991a. "Point Molate Naval Fuel Depot, Site Inspection, Summary Report, April 5, 1991." Prepared for Naval Facilities Engineering Command, Western Division, San Bruno, California.

PRC Environmental Management, Inc., 1991b. "Point Molate Naval Fuel Depot, Final Groundwater Monitoring Plan/Site Characterization Study, July 10, 1991." Prepared for Naval Facilities Engineering Command, Western Division, San Bruno, California.

PRC Environmental Management, Inc., 1991c. "Point Molate Naval Fuel Depot, Treatment Ponds Area Characterization and Interim Corrective Actions Field Work Plan, October 22, 1991." Prepared for Naval Facilities Engineering Command, Western Division, San Bruno, California.

PRC Environmental Management, Inc., 1992a. "Point Molate Naval Fuel Depot, Site Inspection, Final Summary Report, August 26, 1992." Prepared for Naval Facilities Engineering Command, Western Division, San Bruno, California.

PRC Environmental Management, Inc., 1992b. "Point Molate Naval Fuel Depot, Treatment Ponds Area, Draft Site Characterization Report, October 19, 1992." Prepared for Naval Facilities Engineering Command, Western Division, San Bruno, California.

PRC Environmental Management, Inc., 1992c. "Point Molate Naval Fuel Depot, Treatment Ponds Area, Interim Corrective Action Evaluation, November 5, 1992." Prepared for Naval Facilities Engineering Command, Western Division, San Bruno, California.

RWQCB, 1992. "San Francisco Bay Pilot Regional Monitoring Program 1991-1992, Summary Progress Report, December 1992."

**RESPONSE TO COMMENTS ON**

**NFD POINT MOLATE**
**TREATMENT PONDS AREA**
**DRAFT SITE CHARACTERIZATION REPORT**

**October 19, 1992**

This report presents responses to the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB), comments on the Treatment Ponds Area Draft Site Characterization Report prepared October 19, 1992 by PRC Environmental Management, Inc. (PRC) for Naval Fuel Depot (NFD) Point Molate in Richmond, California. Ms. Gina Kathuria of RWQCB submitted comments to the Navy in a letter dated June 9, 1993.

**RESPONSE TO GENERAL COMMENTS:**

Comment No. 1: It was indicated that the Point Molate site is still active; specifically what activities transpire on the site to define it as active and are these activities the same as before the need for clean up.

*Response:* *Point Molate remains an active fueling depot for naval vessels. Activities associated with its function include onloading and offloading of fuel, ballast, sediment, and water (BS&W); treatment of BS&W in the facility's existing wastewater treatment plant; routine operation and maintenance (O&M) of the facility's pumping stations, valve boxes, pipelines, underground and aboveground storage tanks (USTs, ASTs); storm drain collection system; oil spill prevention and countermeasures system (SPCS); and maintenance of support vehicles or boats. These activities have taken place since the fuel depot opened. The need for cleanup is not associated with any activity in particular, rather, it is associated with historical spills and leaks, the leaking of contaminated fuels and other liquid wastes from the former sump pond, and incidental leakage from pipelines, valve boxes, or other associated operational facilities.*

Comment No. 2: There are three "hot spots" throughout Point Molate (the Landfill, the Sandblast Grit Disposal Areas, and the Treatment Ponds Area). Only the Treatment Pond Area was significantly investigated, the other two were omitted without a complete investigation of the soil and groundwater contamination.

*Response:* *The focus of the Treatment Ponds Area Investigation (CTO 0143) was, as the title implies, only the Treatment Ponds Area. RWQCB directed the Navy to prioritize the investigation of the Treatment Ponds based on the recommendations from the PRC site inspection (SI) (PRC 1992), and due to an impending direct cleanup order from RWQCB regarding the known "problem*

*areas" at Point Molate. The landfill and sandblast grit disposal areas did not have priority or immediate justification for further study, and were therefore not included in CTO 0143.*

Comment No. 3: Site 2, the sandblast grit disposal area, is still in use. How is the sandblast grit disposed of currently? Have any changes been made as to the sandblasting practices on the site? If not, have any new methods or precautions been implemented to prevent further contamination?

*Response:* *None of the Site 2 sandblast grit disposal areas are still in use. Section 5.0 in the "Final Site Inspection Summary Report" (PRC 1992) incorrectly stated that sandblasting and grit disposal was still active at Building 123. No sandblasting activities have occurred at Point Molate since the mid to late 1980s. In addition, sandblasting was limited to preparation of metal surfaces for painting, and not stripping of metals or other surfaces necessarily containing lead-based paints. The sandblast grit which was disposed was not considered hazardous waste, and the soil and groundwater samples collected during the SI did not contain elevated concentrations of metals. Greater than background (but within the same order of magnitude) concentrations of cadmium, chromium, nickel, lead, and zinc were detected in one sample collected from the actual sandblast grit. These concentrations are probably attributable to the metal surfaces being prepared, and possibly some residual lead-based materials. The concentration of lead in the sandblast grit was 173 mg/kg, which is less than an order of magnitude above the following: background concentrations as determined in CTO 0010, concentrations of lead in all soil samples collected within the sandblast grit disposal areas (CTO 0010), and concentrations of lead in all soil samples collected during the Treatment Ponds Areas Investigation (CTO 0143), all of which range from 4 to 60 mg/kg.*

*As a result of the recommendations from PRC and RWQCB, Point Molate has begun collection of the sandblast grit located behind Building 123. The material collected will be disposed in a municipal waste landfill.*

Comment No. 4: The sources of contamination at Point Molate Fuel Depot have not been accurately identified. Leaks from pipes, valve boxes, tanks, treatment ponds, and french drains are just some of the expected sources of contamination. Identification of the historic and existing sources; and the result of the impacts are very important for remediation of the site.

*Response:* *Known sources of contamination at NFD Point Molate are leaks from pipelines, valve boxes, or associated pump systems; spills from tank overfills; the disposal of contaminated fuel, tank bottom sludges, or other liquid or solid wastes in the landfill or the former sump pond; and other incidental leaks or spills resulting from routine operation or maintenance activities. The majority of information regarding known leaks and spills was obtained from discussions with facility personnel, and very little documentation exists regarding the exact locations, specific pipelines, valve boxes, or operational facilities where these leaks or spills occurred. Information obtained thus far has been summarized in the "Final Site Inspection Summary Report" (PRC 1992) and was originally*

*compiled by ERM-West during its 1990 shallow soil investigation (ERM-West 1990). The report contains tables listing known leak or spill locations, fuel types, and other notes. The ERM-West (1990) report also includes a facility map showing the approximate areas of known leaks and spills. Currently, known sources of groundwater hydrocarbon contamination include (1) residual soil contamination and floating product associated with the former sump pond; (2) residual soil contamination associated with pipeline conduits, particularly near the south end of the Administration Building along Diesel Road and within the inferred paleochannel also along Diesel Road; (3) residual soil contamination associated with numerous leaks upgradient of Tank B, along the topographic ravine near F Road; (4) residual soil contamination associated with the March 1990 JP-5 leak near Valve Box 7 downgradient of the landfill; and (5) some floating product (JP-5 and or diesel) in the vicinity of PRC monitoring well MW11-22. Previous investigations by other contractors have identified general areas of soil contamination, but have not inferred specific sources.*

*At this time, there is no known environmental or human health impacts from any known sources of contamination, even though hydrocarbon contamination exists in beach and near-shore sediments at some locations. The nature of the hydrocarbons in the beach and near-shore sediments in the vicinity of the Treatment Ponds Area is discussed in the "Treatment Ponds Area Site Characterization Report" (PRC 1992b). The bunker fuel contaminating these sediments is essentially insoluble in water, and therefore does not provide an aqueous phase plume into San Francisco Bay. Further assessment of potential impacts to near shore aquatic life will be conducted in a future investigation.*

Comment No. 5: The RWQCB requests a map outlining the stormwater drainage system and the french drain system at PMFD.

*Response:* *A stormwater drainage system map is available for NFD Point Molate, and RWQCB should request a copy from the facility. James M. Montgomery (JMM) evaluated the stormwater system in 1992. Copies of this report are also available from the facility.*

*There may be confusion as to the components of the french drain system. French drains are associated with each of the 50,000 barrel capacity USTs which are designed to intercept minor leakage from the USTs. They are apparently located only on the downgradient sides of the USTs over a short length. The french drains are channeled to skim pits, which are in turn channeled to specific valve boxes. The valve boxes are then connected to the oil recovery system. Reference should be made to the "Treatment Ponds Area Interim Corrective Action Evaluation" (PRC 1992c) which describes components of the facility's wastewater treatment system.*

*Two other french drains were installed as an emergency response to the March 1990 JP-5 leak below Valve Box No. 7. These french drains were designed to intercept JP-5 flowing within the ravine. Their locations are described and shown in the "Final Site Inspection Summary Report" (PRC 1992a).*

Comment No. 6: The site characterization was to include an investigation to determine if a second water bearing zone exists. After studying both the geologic soil profiles and the field borelogs, the RWQCB believes that the investigation was not thorough enough to detect a deeper water bearing zone. The screens only monitored the first zone (20-25 feet). The colluvium channel, located under the bay mud, was not screened. Additional wells are needed to screen the second water bearing zone presumably located in the colluvium channel. Once the possibility of a second water bearing zone has been established, the degree of containment of the groundwater can be addressed in the ICA.

*Response:* *The site characterization included investigation of deeper water-bearing units beneath fill material, including investigation of fill material, bay mud, colluvium, alluvium, and bedrock. Water bearing zones do not exist beneath the fill material, except as alluvial (not colluvial) channels. The alluvial channels (inferred as paleochannels) incise into the bay mud and in some locations the colluvium. The hydraulic conductivity of the bay mud and the colluvium was laboratory tested to confirm their nature as underlying barriers to vertical contaminant flow. Resulting laboratory values of hydraulic conductivity in samples of colluvium ranged from $9.3 \times 10^{-8}$ to $9.1 \times 10^{-9}$ centimeters per second (cm/sec). Laboratory values of hydraulic conductivity in samples of bay mud ranged from $1.5 \times 10^{-7}$ to $9.4 \times 10^{-8}$ cm/sec (PRC 1990b).*

*Results of packer tests on bedrock similarly indicated that water bearing conditions do not exist, and that only a minor component of secondary (fracture induced) porosity exists in the bedrock.*

Comment No. 7: From the geologic soil profile it is observed that the mud pinches out as it moves further inland; as a result the fill eventually comes in contact with the colluvium layer. A complete investigation of the colluvium channel is needed to assess the possibility of this pathway for contaminants. The investigation should include testing the colluvium layer upgradient (where it comes in contact with bay mud) and toward the shoreline as the bay mud layer thickens.

*Response:* *The colluvium, as discussed in this report, is not a channel, but a tight fine-grained clayey silt to sandy clay slope wash deposit. See response to Comment No. 6.*

Comment No. 8: Identifying background locations for both soil and groundwater requires knowing which direction is upgradient/upstream. The locations of background samples must be from areas that are not impacted by any contamination from the site, but that do have the same basic characteristics as the medium of concern at the site. Statistical analysis maybe used sometimes to evaluate background samples collected (EPA 1988b, 1988c, 1988d, 1989b).

*Response:* *Groundwater flow directions (gradient) have been established using the monitoring well network within the Treatment Ponds Area and near-shore area. A dedicated soil boring or monitoring well at an upgradient location was not installed during the Treatment Ponds Area investigation, partly because soil boring/monitoring well B123-2/PRC#1 is located upgradient of*

*the Treatment Ponds Area. Although this boring/well is located downgradient of one of the SI sites (a sandblasting area), elevated concentrations of metals and other constituents analyzed were not detected during the SI nor during the Treatment Ponds Area investigation. This boring/well still represents an upgradient location with respect to the Treatment Ponds Area, regardless of its position relative to other areas. Recognizing that this boring/well was not a dedicated background boring/well, the results of all metals concentrations in soil and groundwater resulting from the Treatment Ponds Area investigation were compared to the values obtained at B123-2/PRC#1. Reference should be made to Tables 4-1, 4-6, 4-7, and 4-2, which demonstrate that concentrations of metals in both soil and groundwater from all samples collected during the Treatment Ponds Area investigation are within the range of metals concentrations for soil and groundwater from B123-2/PRC #1. PRC, therefore, acknowledges the shortcomings of using this boring/well as a background location, but still advocates use of the resulting data as they are within the range of data obtained on an investigation-wide basis. Statistical analysis of the resulting data, or future data as suggested by reference, will likely be incorporated in establishment of background soil and groundwater data in upcoming investigations.*

*The establishment of a dedicated background soil boring/monitoring well location within the facility while maintaining similar geologic control as the study area will be difficult, as the majority of the fuel depot may have been contaminated by fuel spills or leaks over the last 40 years. However, at least one dedicated location will be chosen to establish background soil and groundwater quality in the hillside areas, the shoreline areas, and in near-shore tidal flats sediments.*

**RESPONSE TO SPECIFIC COMMENTS:**

Comment No. 9: Site History: The history of the tanks was not included in the Site History section. The tanks are sources of contamination at Point Molate and they were not thoroughly investigated. How were the tanks originally built in the 1940s? Do all the tanks exist today? What is the capacity of each of the tanks? What was stored in each of the tanks since the 1940s?

*Response:* *The history of the tanks is included in the "Shallow Soil Investigation Report" (ERM-West 1990). The purpose of the ERM-West investigation was to assess shallow soil contamination which may be related to tanks or valve box locations. This report provided useful color diagrams and tables of tank usage and capacities. Tank construction is also discussed in this report, and again summarized in the SI report (PRC 1992a). Tank inventory monitoring is discussed in each of these reports. Newer, sophisticated methods of tank integrity testing recently have been evaluated. The facility should be contacted to discuss what methods have been evaluated and which, if any, are being implemented. Finally, the tanks are not nor have been considered sources of contamination, with the exception of two historical tank overfills which were not related to tank integrity.*

Comment No. 10: Page 1-1, 4th paragraph: One of the three smaller capacity secondary storage tanks is abandoned. Why was this abandonment necessary and what are the future plans for this tank (i.e. removal, future re-use)?

*Response:* *This statement is incorrect or was written out of context. There are 24 underground bulk storage tanks, including one used for ballast (Tank 20). Additionally, there are six secondary storage tanks, including Tanks A, B, C, E, F, and G, all of which are active except Tank F. Tanks A, B, and C are underground tanks and E, F, and G are aboveground tanks. Tank F is currently not in use, and is scheduled for updating.*

*Tank A is a 50,000-barrel capacity concrete tank used to store water for the Richmond Fire Department.*

*Tank D was a 10,000-barrel capacity steel tank used for multiproduct. It was removed due to its age, poor integrity, and its inadequate placement (location) on the fuel depot. It was located near Tank 2.*

Comment No. 11: Page 1-3, 1st paragraph: The large diesel fuel leak discovered in 1981 was not sufficiently described. Where was the leak, what was the duration of the leak, and the volume of the leak (in gallons)?

*Response:* *The diesel (F-76) leak discovered in 1981 was between Tanks 4 and 5, based on the History of Known Leaks (Table 2-3) and a figure depicting Approximate Areas Of Known Leaks and Spills (Figure 2-4) (ERM-West 1990). No other information is currently available about this leak.*

Comment No. 12: Page 1-3, 2nd paragraph: How were the contents of the historical sump pond researched? Is there documentation as to the existence of bunker fuel, tank sludges, contaminated fuels, leaking drums, and other liquid wastes in the vicinity of the former sump pond?

*Response:* *This information was provided in discussions with facility personnel. No documentation exists on the history of the sump pond. Mr. Bill Lewis of NFD Point Molate provided a verbal summary of the historical disposal practices associated with the sump pond on June 16, 1993, when RWQCB was present.*

Comment No. 13: Page 2-4, 5th paragraph: The existence of paleochannels are mentioned in the report. Are their physical characteristics known (e.g. size, location, depth)? Because these channels are potential conduits for contaminants, knowledge of its characteristics are crucial when selecting an appropriate remediation technique.

*Response:* *The inferred location of the primary paleochannel is depicted on Figure 2-4. The channels are depicted on the geologic cross sections as alluvial sands; these cross sections also provide relative reference to their size and depth.*

*Their dimensions and the spatial relationship of interfingering splays from these channels can only be interpreted by relating borelog information between specific boreholes. The lateral extent of these channels (and therefore the*

*preferential pathways) would be intercepted by a continuous extraction trench located along the shoreline throughout the extent of the Treatment Ponds Area.*

Comment No. 14: Page 2-15, 1st paragraph: There have been several previous investigations at PMFD since 1973. Only the studies pertinent to the Treatment Pond Area were discussed in the report. What did the other studies discover about the rest of the base, in particular the landfill and grit disposal areas.

*Response:* *The landfill and sandblast grit disposal areas were not considered areas of concern prior to the preliminary assessment (PA), conducted by Navel Energy and Environment Support Activity (NEESA) in 1988. Therefore, they have not been investigated prior to the SI conducted by PRC in 1990. Again, the purpose of CTO 0143 was a prioritized investigation of the Treatment Ponds Area, not other SI sites; therefore, previous investigations not pertinent to the Treatment Ponds Area or associated shoreline areas were not germane to the discussion in the "Treatment Ponds Area Site Characterization Report." See also response to Comment No. 2.*

Comment No. 15: Page 2-21, 3rd paragraph: Petroleum seepage was discovered along the shoreline near Burma Road. The seep was analyzed but the results were not available at the time of this report; what is the status of their availability at this present time?

*Response:* *The results of the 1983 HLA investigation were not available at the time of its report, and in any event, are 1983 data. The results of this single sample analyzed for oil and grease 10 years ago, are insignificant at this time. Oil and grease content or percentages are not valuable data in terms of current knowledge of the site.*

Comment No. 16: Page 2-22, 3rd paragraph: Could you specify what is meant by TEH contamination.

*Response:* *TEH is an acronym for total extractable hydrocarbons. This term was used by ERM-West during its investigation and is equivalent to total extractable petroleum hydrocarbons or TPH extractable used by PRC in its analyses.*

Comment No. 17: Page 3-11, 1st paragraph: In the report it was mentioned that drums were used as storage facilities for soil cuttings from boreholes. What happened to these drums and how were they disposed of (e.g. put in storage, sent for soil washing)? How were the rest of the investigation derived waste (IDW) discarded; both soil samples and water samples?

*Response:* *Section 5.3 of the report explains the fate of containerized soil cuttings. Hydrocarbon-contaminated soil cuttings from drums were processed using an on-site soil washing technique provided by Unique Products, Inc. The resulting washed soil was left in place at the south drum lot on a concrete surface. It was left here to aerate; residual hydrocarbon contamination will degrade with oxidation or natural biodegradation. The empty drums were left onsite and may be used again, if necessary.*

*Groundwater and soil wash extract derived during the investigation were processed in the facility's existing wastewater treatment plant.*

Comment No. 18: Page 3-18, 4th paragraph: Basing a sample selection of sediments on visual oil contamination is very crude. A type of gradient pattern is frequently implemented to select a representative sample of sediments. If observation with the naked eye is the only manner in which sediments were selected for analysis, the sediment investigation will not be considered thorough.

*Response:* *The text stated that sample selection was based on the presence of visual oil contamination. The intent of this statement was misunderstood. The selection method employed was not used for the aereal selection of sample locations, but for the selection of sediment or fill material from within each trench dug along the beach front or from each near shore hand-driven sediment auger sample. At each auger sample or trench location, the most obvious hydrocarbon-contaminated material was sampled to assess the worst case scenario and provide data on the nature, not necessarily extent, of the hydrocarbons.*

Comment No. 19: Page 4-1, 3rd paragraph: Why was the most downgradient point (B123-2) of Site 2 considered the background soil sample location for PMFD? See Comment 9.

*Response:* *See response to Comment No. 8. This location was not chosen as the background soil boring location for PMFD, but only for the Treatment Ponds Area investigation which is the focus of CTO 0143. RWQCB Comment No. 9 deals with historical tank operation and is unrelated to background boring locations.*

Comment No. 20: Page 4-4, 4th paragraph: Constant reference is made to an unknown source of contamination at MW11-22. Have efforts been made to identify this unknown source? And if so, what efforts.

*Response:* *Frequent, not constant, reference is made to unknown sources of light-end fuel contamination, particularly in the vicinity of monitoring well MW11-22. One of the potential sources of light-end fuels in this area is the storage of fuel in drums at Drum Lot No. 1 during post World War II activities. This potential source probably will not be verified. Other sources include nearby active or abandoned pipelines. Point Molate personnel indicated during the June 14, 1993 meeting with RWQCB that an abandoned fuel line runs between the former drum filling plant (DFP) and the truck-loading rack. This abandoned line may have contained light-end fuels, and the remaining fuel in the line may not have been purged or drained since abandonment. No new information is available regarding efforts to identify remaining fuel in this pipeline.*

Comment No. 21: Page 4-10, 2nd paragraph: The method that was used to determine the concentrations of bunker fuel in the soil is unacceptable. In general, SFRWQCB requires that discreet soil samples be taken for analysis to properly define the extent of contamination in the soil. If two or more samples were collected in the displayed interval, each of them having different

concentration values of bunker fuel, it is unacceptable to take the average of the values to come up will one concentration representing that interval of soil.

*Response:* *The method described above was only used as a means to post soil data where more than one depth-discrete sample was collected from a single borehole in either the 0- to 10-foot, 10- to 15-foot, 15- to 20-foot, 20- to 30-foot, or greater than 30-foot interval.*

*As an addendum to the draft report, or in the final report, the concentration at the actual sampled depth will be posted.*

Comment No. 22: Page 4-30, 1st paragraph: Gasoline was detected in some soil samples and in some groundwater samples (Page 4-75, 3rd paragraph); this is a surprise since gasoline recently has not been stored at PMFD. The RWQCB agrees, it is possible that during the gas chromatography a mixture of other fuel constituents produced peaks similar to gasoline. There is a possibility that no gasoline exists on site. If the current method for analyzing gasoline is inconclusive because of efforts with the gas chromatography, another method should be implemented to identify the peaks so that the existence of gasoline at PMFD can be determined. The RWQCB suggests method GCFID (5030) from the Tri-Regional Board Staff Recommendations.

*Response:* *The high-end ($C_4$ to $C_{12}$ carbon range) peaks associated with the gas chromatography (GC) of light fuels such as gasoline, JP-4, or JP-5 may be misinterpreted, especially when several, possibly degraded fuels are present. However, this is not an error in the GC method but an interpretation made by the lab technician. The chromatogram of gasoline should be distinguishable from low end JP-4, and the full spectrum of JP-5 and diesel. Gas chromatograms were provided with the laboratory data and PRC chemists provided subsequent review of the resulting data in chromatograms. The analytical method used for TPH analyses, EPA Method 3015 modified, is also a GCFID method capable of detection to 0.5 part per billion (ppb).*

*These factors combined lend credence to the existence of gasoline in soil or groundwater at the site, although sources of gasoline are still speculative. It is possible that specific pipelines in the vicinity of Drum Lot No. 1 were not purged or drained upon abandonment, and may provide a limited source of gasoline.*

*Method 5030 will be considered during future sampling activities.*

Comment No. 23: Page 4-55, 3rd paragraph: The RWQCB concurs with the suggestion that additional SVOC sampling may be necessary to define the extent of SVOCs in the Treatment Ponds area.

*Response:* *It is not pertinent to the current efforts to determine the extent of SVOCs in the Treatment Pond Area, but only the extent which may be migrating toward or into near-shore sediments as aqueous phase constituents in groundwater.*

*Additional soil sampling will not be performed within the Treatment Ponds Area; however, additional soil, groundwater, and near-shore sediment sampling will be performed during upcoming activities, targeted at the near-shore environment which has not been investigated under CTO 0143. SVOC analyses will be performed for specific soil, groundwater, or sediment samples collected during the future shoreline investigation, as determined in a field work plan/sampling and analysis plan (FWP/SAP) for this work.*

Comment No. 24: Page 4-64, 1st paragraph: Comparison was made to the background soil values; see comment 9.

*Response:* *See response to Comments No. 8 and 19.*

Comment No. 25: Page 4-62, 1st paragraph: Using PRC #1 (previously B123-2) is unsuitable for background groundwater data for the Treatment Ponds Area. Refer to Comment 9.

*Response:* *See response to Comments No. 8 and 19. This monitoring well represents an upgradiant location with respect to the Treatment Ponds Area.*

Comment No. 26: Page 4-68, 1st paragraph: When monitoring well MW11-22 was first analyzed on May 29, 1992, no immiscible phase had developed and the groundwater had no indication of hydrocarbons. But when MW11-22 was sampled on July 22, 1992, an immiscible phase was present and hydrocarbons were found in the groundwater. It is difficult to understand the behavior of the fuels with such a substantial difference in just two months; has any thought been given to further investigation in that vicinity to better understand the behavior of the fuels?

*Response:* *Further investigation of the extent of the aqueous phase constituents possibly related to the light-end immiscible phases at well MW11-22 has been considered. Although the immiscible phase measured at this well is relatively small, about 0.5 inch, it may account for the detection of benzene, toluene, ethylbenzene, and xylenes (BTEX) in groundwater in this vicinity.*

*The behavior of the fuel detected at well, MW11-22, particularly the light end JP-5, is as expected compared to other monitoring wells where immiscible phases have developed. For example, monitoring well PRC #3, installed in September 1990 during the SI, did not indicate an immiscible phase even several months after its installation. Approximately 8 months later, however, up to 2 feet of product were measured in this well. Similar scenarios were encountered at monitoring well PRC #1, and more recently in several of the monitoring wells installed during the Treatment Ponds Area investigation. It typically takes several months for these monitoring wells to "equilibrate" with the surrounding environment in which they are screened. This is mostly attributable to the heterogenous nature and preferential flow pathways developed in the fill material. In a well-sorted sandy aquifer, the occurrence of immiscible phases in monitoring wells would be expected much sooner, perhaps in days.*

*The immiscible phases in several of the monitoring wells installed within the Treatment Ponds Area are still "developing," as can be observed during routine measurement of water levels and product thicknesses. These measurements have been performed three times since the installation of the Treatment Ponds Area monitoring wells, the most recent on September 1, 1993. Changes in product thicknesses are commonly only tenths of feet, but nevertheless indicate the equilibration of the product associated with the aquifer's capillary fringe and that observed in the well bore.*

Comment No. 27: Page 4-72, 3rd paragraph: It was mentioned in the report that motor oil in the soil was not included in the extractable TPH analysis; consequently, the source of motor oil in the groundwater is unidentified. This portrays the possibility of an unknown source.

*Response:* *The selection of specific analytical ranges in the TPH extractable analysis, (typically jet fuel, gasoline, diesel or kerosine, and motor oil) is unrelated to the actual occurrence of these fuels or the portrayal of a source of these fuels. The TPH extractable ranges are usually chosen and communicated to the laboratory prior to the collection of samples. Without this information, the laboratory will use fuel standards in the ranges described above. Prior to the submittal of soil or groundwater samples associated with the Treatment Ponds Area investigation, fuel samples of JP-5 (jet fuel), F-76 (marine diesel fuel), and degraded bunker fuel were collected by PRC and submitted to the laboratory for use as comparative standards in the TPH extractable analysis. Motor oil was not included as a standard in the initial TPH extractable analyses, but was subsequently reported in the analytical results. The detection of TPH in the motor oil range is probably attributable to motor oil or heavier oil constituents in the bunker fuel. Many of the soil or groundwater samples collected during the investigation contained unknown mixtures of bunker fuel, diesel, and possibly some JP-5. Other fuels or oil were perhaps disposed in the former sump pond and were detected as TPH in the motor oil range.*

Comment No. 28: Page 4-91, 2nd paragraph: The MCL value for chloride is 250 ppm. Please confirm the MCL value for phosphate.

*Response:* *The secondary maximum contaminant level (SMCL), not maximum contaminant level (MCL), for chloride is 250 milligrams per liter (mg/L) for drinking water. No drinking water standards have been established for phosphate. Concentrations of phosphate present in solution in natural water are normally a few tenths of a mg/L (HEM 1989).*

Comment No. 29: Page 4-101, 2nd paragraph: Concentration of metals in tidal flats sediment samples should not be compared to TTLC values. TTLC values are used for disposal purposes in determining hazardous waste levels; TTLC values are not to be used for clean-up target values. Again, reference to background soil data is invalid; please refer to comment 17.

*Response:* *PRC acknowledges that TTLC values are inappropriate to determine anomalous or elevated concentrations of metals in sediment. Site-specific*

*background concentrations of metals in sediments have not been established (see response to Comment No. 8.) However, the ranges of metals detected in sediment samples are in accordance with the ranges determined in the San Francisco Bay Pilot Regional Monitoring Program 1991-1992 Summary Progress Report (RWQCB 1992). In fact, many of the metals concentrations detected in Point Molate beach and sediment samples are less than the ranges resulting from the RWQCB study. Also, RWQCB compared metal concentrations in sediment samples to TTLC values in its discussion of critical habitat investigations.*

*Comment No. 17 is unrelated to Comment No. 29.*

Comment No. 30: Page 4-107, 1st paragraph: QA/QC samples are required to be taken at the same time the samples for analysis are obtained. This approach helps in establishing the validity of the data acquired from the samples. No QA/QC samples were taken for beach sediment sampling; therefore, the results of the sampling are accepted only for screening purposes.

*Response:* *QA/QC samples are required according to the protocol established in the FWP/SAP, which for CTO 0143 was approved prior to implementation of the field program. QA/QC samples for the beach and sediment samples, if collected, would have included one or two duplicate samples (approximately 10 percent) and an equipment rinsate blank. It is doubtful that either of these QA/QC samples would have invalidated the results of the beach or sediment analyses. Soil samples are inherently difficult to reproduce analytically due to heterogeneity in the soil matrix and commonly result in varied comparisons. The beach soil (in some cases rock rubble or fragments) was profusely contaminated with oil at numerous locations, and these samples were specifically chosen as such to provide worst case scenario results with regard to the extent of the known oil plume. The tidal flats sediment samples exhibited much less, if any, evidence of contamination; however, only 5 of the 19 samples collected along the shoreline were actual tidal flats sediment (samples SS11-01 to SS11-05), as compared to the beach soil (sand, silt, and rock fragment) mixtures (samples SS11-06 to SS11-19).*

*Subsequent sediment sampling events will include appropriate QA/QC samples, particularly if the sediment sampling program is also designed to establish background sediment quality data.*

Comment No. 31: Page 7-1, 3rd paragraph: Basing fuel contamination in surficial soil solely on visual observation is unsatisfactory. Surficial soil samples should have been taken to assess a runoff situation (e.g. storm drainage system). It was stated in the report that soil was monitored with field screening methods. Were strictly visual screening methods utilized or were others implemented and if so where is the data for this field monitoring to satisfy the statement "surficial soil contamination does not present an immediate threat to the environment or to the San Francisco Bay"? It is noted in the report that there was soil contamination present in the 0 - 10 feet zone.

*Response:* *All soil samples including surficial were immediately screened with a photoionization detector (PID) upon opening the 5-foot long CME split-spoon sample barrel. The PID was used to select the interval of soil having the highest PID readings, particularly where the highly obvious hydrocarbon-stained and sometimes completely oil-saturated soil was encountered. If gross contamination was not encountered, the PID was still used to screen the interval for less obvious presence of contamination. Contaminated soils were generally not encountered in the upper 3 to 4-foot soil profile. PID readings for each soil boring are indicated on the field borelogs located in Appendix F.*

*This investigation was not intended to assess potential contamination of near surface soil, from surface runoff, or from the storm drain system. An assessment of the storm drain system and surface runoff was completed by JMM under another study. The potential near surface contamination from surface runoff represents an insignificant contribution to the scope of the known and potential hydrocarbons existing in the soil at depth or floating on the water table.*

Comment No. 32. Page 7-3, 1st paragraph: PAHs discovered in the beach sediment samples were diagnosed as not being a threat to San Francisco Bay or aquatic species in the bay, but in the third paragraph the report mentions PAHs as being bioaccumulative and possibly affecting certain aquatic species and the near-shore environment. What is the affect of PAHs to the bay and to the aquatic life in the bay? What combination of elements did the lab consider as the definition of PAH?

*Response:* *The first paragraph on page 7-3 states that it is not known if fuel products, VOCs, and PAHs detected in the beach sediments may be threatening San Francisco Bay or aquatic species in the bay. The third paragraph states that PAHs are bioaccumulative and could affect certain aquatic species in the near-shore beach environment. These statements are, therefore, not contradictive. It is not known at this time what effects, if any, PAHs have on the near-shore aquatic life at NFD Point Molate, and as stated, further assessment may be necessary. It should be noted, however, that 2-methylnaphthalene, one of the PAHs of concern, although bioaccumulative has low toxicity.*

*A bioaccumulation study was completed as part of the San Francisco Bay Pilot Regional Monitoring Program 1991-1992 (RWQCB 1992) in which uptake rates were measured and compared between oysters and muscles. Chemical analysis of tissue samples included analyses for metals, polychlorinated biphenyls (PCBs), dichlorodiphenyltrichloroethane (DDT), and PAHs. Results from this study may provide useful data with which to compare site-specific conditions at NFD Point Molate. Future sediment sampling activities are anticipated at NFD Point Molate in an effort to establish baseline sediment quality. Whether a bioaccumulation study is necessary or can be justified for NFD Point Molate has not been determined. The sediment data collected under the Treatment Ponds Area investigation (CTO 0143) was limited in aereal extent and, as stated earlier (see response to Comment No. 30), included collection of several samples that were transitional between tidal flats*

*sediment and artificial fill material making up the near-shore beach environment.*

*Interestingly, the highest concentrations of PAHs in the entire RWQCB Regional Monitoring program (RWQCB 1992) were measured in sediments in Castro Cove, directly across the peninsula on which NFD Point Molate is located. The PAHs detected at Castro Cove were related to the Chevron Refinery and were derived principally from petroleum and complex mixtures of other petroleum hydrocarbons. PAH concentrations closest to the source were 21 ppm (geometric mean) in deep sediments, 8.4 ppm (geometric mean) in shallow sediments, and 1.1 to 0.9 ppm (geometric mean) at the deep sediment intermediate sampling station. PAHs detected in oil-saturated beach sediments (transitional fill material) at NFD Point Molate ranged from 0.5 to 7 mg/kg (roughly equivalent to ppm). No PAHs were detected in the actual tidal flats sediment sample, sample SS11-01 to SS11-05.*

*The PAHs detected in the SVOC analyses of beach samples included 2-methylnaphthalene, n-nitrosodiphenylamine, fluoranthene, pyrene, benzo(a)anthracene, and chrysene. PAHs are a group of SVOCs having a carbon-hydrogen ring structure. They are characterized by very low solubility in water, very low mobilities, and high octanol-water coefficient ($K_{oc}$) values. The following values of these parameters are provided for reference for specific VOCs and SVOCs.*

| Compound | Solubility (ppm) | $K_{oc}$ | Mobility Class |
|---|---|---|---|
| benzene | 1,780 | 97 | high |
| toluene | 500 | 242 | moderate |
| p-xylene | 156 | 552 | low |
| m-xylene | 146 | 588 | low |
| naphthalene | 31.7 | 1,300 | low |
| 2-methylnaphthalene | 25.4 | 8,500 | slight |
| fluoranthene | 0.275 | 19,800 | slight |
| phenanthrene | 1.29 | 23,000 | immobile |
| pyrene | 0.135 | 63,400 | immobile |
| chrysene | 0.022 | 420,108 | immobile |

*Source: Griffin 1985.*

Comment No. 33: Page 7-3, 2nd paragraph: It is stated in the report that the oil contained in the beach sediment equilibrated with the surrounding environment, but there is a presence of a hydrocarbon sheen on occasion in the tidal flats and beach sediments. This sheen seems to be an argument against the possible "equilibrium" between the oil and the environment. Further investigation is warranted to determine the behavior of the oil in the beach sediment.

*Response:* *The statement regarding the equilibrium between the oil and the surrounding environment was qualified. The report states that a continuous oil sheen or a direct continuous pathway does not exist in the transition between coarser-grained fill material (beach sediments) and finer-grained tidal flats sediments.*

*The behavior of the oil in the beach sediments is largely dictated by the factors described above for PAHs: solubility, mobility, $K_{oc}$. Pumping tests have demonstrated that preferential flow pathways exist, particularly in the fill material. The preference for the heavier oils (bunker fuel) to remain adsorbed within the soil profile has also been discussed. The existence and migration of aqueous phase constituents into the true tidal flats sediments will be assessed further as part of CTO 0248.*

Comment No. 34: Page 7-3, 4th paragraph: The RWQCB strongly disagrees with the statement that "soil contamination (at PMFD) is not considered a threat to human health." Of course, humans must have exposure to the contaminants in order to be affected by them. Human exposure to contaminants can be accomplished through several pathways: future vegetation in contaminated soil, ecological food chain beginning from groundwater and sediment dwellers (i.e., clams, fish). An Ecological Risk Assessment must be performed before any conclusions can be made concerning human health and water quality risk.

*Response:* *The demonstration of risk to human health under a future use scenario would require a human health risk assessment. However, under current use, PRC still contends that soil contamination is not considered a threat to human health. There is no activity at NFD Point Molate by which worker exposure to contaminated soil, short of direct ingestion, would cause a threat to human health, particularly considering the nature of the hydrocarbons in the soil. However, a health and safety plan would be required to address workers' potential exposure to hydrocarbon-contaminated soil during remedial activities.*

*Baseline sediment quality data will be collected under CTO 0248 which will provide the basis for an ecological risk assessment. The issue of potential risk to near-shore aquatic life may then be addressed. Assessment of near-shore sediment quality will also be compared to results from the San Francisco Bay Pilot Regional Monitoring Program (RWQCB 1992) to interpret ecological risk.*

Comment No. 35: Page 7-5, 1st paragraph: Along with providing sufficient data to provide a comprehensive investigation of the Treatment Ponds Area, additional investigations must be performed at the other two sites suspected of contamination. This includes defining a groundwater gradient for the waste disposal area and the sandblast grit disposal area (e.g., installing more monitoring wells in those areas), defining the vertical and lateral extent of soil and groundwater contamination.

*Response:* *See response to Comment No. 2. Justification for further action at the other SI sites should be provided by RWQCB, and the existing data should be reviewed carefully prior to initiating further actions. The vertical extent of potential metals contamination was identified for the Building 123 sandblasting area in boreholes B123-1 and B123-2 as was the lateral extent with the same boreholes.*

*justification to further define the vertical or lateral extent of what is not considered a contaminant of concern. Similarly, without detection of a contaminant of concern in the most probable area of potential contamination, there is no justification to further define a site-specific groundwater flow direction that is expected to be coincident to the regional groundwater flow direction.*

*The groundwater flow direction in both the sandblasting areas and the landfill is west to southwest (toward San Francisco Bay). In the landfill, it follows the gradient of the steeply carved ravine in which the landfill is located. There is no justification to further verify the groundwater flow direction in these areas, unless the installation of monitoring wells serves a more practical purpose. For example, one monitoring well is proposed downgradient of landfill under CTO 0248 activities to verify the lateral extent of hydrocarbon constituents from the March 1990 JP-5 leak as well as potential contaminants from the landfill.*

*The sandblast areas are recommended for no further action upon establishment of background soil and groundwater quality, which was assessed already (see response to Comment No. 8) and will be further assessed in CTO 0248. The landfill area is recommended for limited further investigation, which will be addressed in upcoming CTO 0248.*

Comment No. 36: <u>Page 7-7, 3rd paragraph</u>: What is heterotrophic plate count?

*Response:* *Heterotrophic plate count is a measure of the naturally occurring biological diversity in soil or groundwater samples. It is measured in colony forming units per gram (CFU/g). Its measurement is important in assessing existing microbiological activity in evaluating in-situ bioremediation as a potential remedial activity.*

Comment No. 37: <u>Page 7-8, 9th recommendation</u>: Could you explain what is meant by assessment of limited access on the PMFD property?

*Response:* *This recommendation was suggested based upon a worst-case scenario where access to the beach or waterfront areas along the facilities' shoreline would be restricted. The fuel depots' property boundary extends several hundred feet into San Francisco Bay; floating markings could be established identifying the extent of the property. This scenario was predicated upon risk or potential risk to human health in the beach or waterfront areas; however, any assessment of human or ecological risk is speculative at this time.*

Comment No. 38: <u>Page 8-2, 3rd paragraph</u>: Under the partial containment option, was modeling performed to prove that partial containment by the use of extraction wells alone is sufficient in containing floating fuel product from entering the bay? If so, explain.

*Response:* *Modeling was not performed in the development of containment options; however, information derived from the pump test analyses was used as a basis for this option.*

*It was acknowledged in the text that complete containment of all migrating hydrocarbons is not likely using this option due to the heterogeneity of the site and the existence of preferential flow paths within the fill material.*

*It is important to understand the objectives of the interim actions as stated in Section 8.1, when evaluating the preferred approach. The partial containment option using existing and new extraction wells was evaluated because as an interim corrective action it provides expeditious and advantageous source control measures to mitigate the movement of floating hydrocarbons toward San Francisco Bay.*

*Since the submittal of this report, the Navy has undertaken a stronger approach toward remedial actions at Navy sites. This commitment has resulted in greater justification for a complete, rather than partial, containment design.*

Comment No. 39: Page 8-3, 1st paragraph: A one month agency and Navy review period conceivably won't be enough time. RWQCB requests 2 months to review documents.

*Response:* *The review period for each design submittal should be expedited to maintain the design and construction schedules. The appropriate review period required for each submittal may require further discussion.*

Comment No. 40: Page 8-5, 1st paragraph: The RWQCB requests to look at all documents created by PRC and submitted to the Navy; this includes geotechnical reports, construction cost estimate reports, and any other reports.

*Response:* *Most reports submitted to the Navy will be forwarded to RWQCB for review or for informational purposes. These include field work plans/sampling analysis plans (FWP/SAP); draft and final reports resulting from investigations; 35 percent, 100 percent, and final design basis reports; and revisions or addenda to these reports. Construction cost estimates are considered confidential between the Navy and its subcontractors and will, therefore, not be submitted to RWQCB. Geotechnical reports may be requested from the Navy by RWQCB, but will not be included in standard submittals to RWQCB.*

Comment No. 41: Page 9-1, 2nd paragraph The investigation was targeted at four points none of which were completely satisfied.

(1) The contaminants were identified and the high concentration areas were located. No effort was made to pinpoint the source of contamination, it was consistently labeled an unknown source. Although it is important to find where the "hot spots" exist, it is equally important to determine the full extent of contamination especially along the shoreline.

*Response:* *See response to Comment No. 4. Known hydrocarbon sources exist within the vicinity of the former sump pond (bunker fuel) and along pipeline conduits and the inferred paleochannel along Diesel Road (diesel-bunker fuel mixtures).*

*Other sources of hydrocarbons are related to facility-wide pipelines or pipeline conduits, valve boxes, or historical leaks or spills. The identification of exact locations of other hydrocarbon sources is not feasible, justified, or necessary. The identification of the nature and extent of the resulting hydrocarbons in the subsurface, and the potential impact to San Francisco Bay, is justified and necessary. The extent of contamination along the area of shoreline investigated under CTO 0143 has been assessed. This assessment has identified areas along the shoreline requiring further investigation. These areas, as well as a more thorough investigation of the tidal flats sediments are currently proposed under CTO 0248.*

(2) Assessing the potential impacts on the San Francisco Bay by the contaminants requires an Ecological Risk Assessment. Before the assessment is completed, any theories describing the potential impact on the bay is purely speculation.

*Response:* *The assessment of potential impact to San Francisco Bay does not require performance of an ecological risk assessment. There are risk-based data available for many of the contaminants of concern, primarily hydrocarbon constituents, which may be used to evaluate potential risk to potential receptors. In addition, information provided in the San Francisco Bay Pilot Regional Monitoring Program (RWQCB 1992) may be used to compare site-specific organic, metal, and toxicity conditions to the regional results. The collection of toxicity information (performance of toxicity bioassays) has not been performed at NFD Point Molate, but is proposed in CTO 0248 or further investigations.*

*Based on existing data, for example, PAH concentrations detected in beach sediments, there is no strong chemical evidence that oil in beach sediments is resulting in toxic conditions in the near-shore aquatic environment.*

(3) The hydraulic and hydrogeologic parameters were sufficiently investigated for the Treatment Ponds Area, but the same parameters need to be analyzed for the other two sites (landfill, sandblast grit disposal areas).

*Response:* *Areas identified in the PA/SI process which then undergo further investigation (an RI, for example) should be evaluated with respect to hydrogeologic conditions if the nature or potential impact of contaminants justifies such characterization. As stated in the response to Comment No. 2, the other SI sites did not pose a threat to the environment or San Francisco Bay. The need for extensive (RI) data in these areas is not justified based on the results of the SI. The landfill, however, will undergo minimal additional investigation under CTO 0248 to verify the nature and extent of contaminants in groundwater within and downgradient of the landfill. The need for localized containment downgradient of the landfill will also be evaluated, in lieu of base-wide containment along the facility shoreline.*

*Under CTO 0248, the sandblast areas are recommended for no further action upon establishment of base-wide background soil and groundwater data.*

Comment No. 42: Page 9-4, 2nd paragraph: The conclusion on the affects of bunker fuel to the bay to be insignificant is unacceptable. Additional sediment sampling and sampling of the storm drainage system (e.g., outfalls, storm drains, and drainage pathways) is necessary for an accurate conclusion.

*Response:* *See responses to Comment Nos. 32 and 41 (Part 2). The low mobility, solubility, and high $K_{oc}$ values for many of the PAHs of concern support the statement that bunker fuel is not significantly affecting groundwater quality in this area.*

*Additional monitoring of the near-shore water quality is proposed under CTO 0248 to establish consistent (seasonal) groundwater quality data.*

*Also proposed under CTO 0248 is additional sediment sampling, including stormwater outfall locations, to establish baseline sediment quality data.*

Comment No. 43: Page 9-4, 3rd paragraph: The RWQCB suggests that the sandbags near wells MW11-15 and MW11-16 be tested as a source for contamination under stormwater runoff scenarios directly impacting the bay.

*Response:* *Stormwater runoff does not channel toward the sandbags, but into the storm drain collection system, and subsequently into outfall locations. The sandbags are completely indurated, similar to concrete, and are not saturated with hydrocarbons. They will not be tested. More importantly, the beach and tidal flats sediments on the bay side of the sandbags have been thoroughly sampled. Sediment sample nos. SS11-03 to SS11-07 results are included in Appendix B, Tables B-11 to B-14.*

*Follow-up Response:* *It is important to understand the significance of areas at NFD Point Molate which have known hydrocarbon contamination and those which have potential contamination from hydrocarbons, metals, or other constituents. The effort to characterize specific areas throughout the facility should be carefully weighed with the potential benefits of such investigation. The nature of the facility is such that all potential or known contamination will migrate toward the shoreline. Efforts, therefore, to monitor groundwater quality along the shoreline are in essence monitoring the impact from the entire area above the shoreline. Remedial actions which are directed at protecting San Francisco Bay have an overlapping influence at areas upgradient from the shoreline with known or potential contamination. Source control measures or remedial actions at specific areas within the facility may have little influence when the entire facility has a history of fuel oil leaks or spills. The cumulative migration of these hydrocarbons will be into the steeply carved topographic ravines, and subsequently into pipeline conduits or other preferential pathways of migration. The effort to identify every potential pathway of migration (among some 25 miles of buried pipeline) must be weighed with the effort to monitor and provide remedial control where the environmental impact is the most prevalent (that is, at specific locations along the shoreline).*

*As an aid to understanding future efforts proposed under CTO 0248, a copy of the CTO 0248 base map has been provided with these responses. This base*

*map depicts proposed locations for additional shoreline soil borings and monitoring wells; proposed sediment sample locations; stormwater outfall locations; proposed locations of additional monitoring wells associated with the landfill; and the proposed alignment of the containment system for the Treatment Ponds Area.*

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