E&B Oil Development Project

City of Hermosa Beach

Planning Application

Appendix G

Remedial Action Plan

E&B Natural Resources

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CITY OF HERMOSA BEACH
MAINTENANCE YARD
PROPOSED
REMEDIAL ACTION PLAN

555 6th Street
Hermosa Beach, California
October 30, 2012

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CITY OF HERMOSA BEACH
MAINTENANCE YARD
PROPOSED
REMEDIAL ACTION PLAN

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1.0 INTRODUCTION

This document presents the proposed Remedial Action Plan (RAP) for the City of Hermosa Beach Maintenance Yard (the Site). The Site is located at 555 6th Street in Hermosa Beach. The Site is currently utilized as a City Maintenance Yard and is being proposed to be leased to E&B Natural Resources Management Corp as a crude oil production facility. This document outlines the remedial actions related to chemicals of concern (COCs) identified as present within portions of the subsurface soil on the Site. This RAP has been developed specifically to address the conditions on the Site in the event that Phase 3, Final Design and Constructions, of the proposed E&B Oil Development Project (proposed project) as described in the project application would be implemented. This proposed RAP would be finalized and presented to the City of Hermosa Beach Fire Department for approval upon confirmation that Phase 3 of the proposed project would proceed.

1.1 OBJECTIVE OF THE RAP

Environmental Site Assessment (ESA) has shown that lead impacted soils and total petroleum hydrocarbon impacted soils are present at concentrations above regulatory action levels within a former landfill located on the northeastern portion of the Site. The purpose of the proposed remedial action (RA) that is the subject of this plan is to mitigate the risk to health and the environment associated with the identified COCs. The nature and extent of the impacted soil is discussed in Section 3. Remedial action objectives (RAOs) have been established that will allow for the intended use of the Site. These RAOs are:

- Reduce the concentrations of COCs present onsite to cleanup levels that are protective of the future use of the Site as a crude oil production facility.
- Reduce the concentrations of COCs present onsite to cleanup levels that are protective of the groundwater beneath the Site in compliance with the Los Angeles Region Water Quality Control Plan.
- Complete RA in a timely manner in compliance with all applicable rules and regulations.

The proposed remedial goals (RGs) developed and adopted for the impacted soils onsite will be responsive to these RAOs. The RGs are performance based and focus on restoring the soil to conditions that are protective of human health and the environment.

The goal of this RAP is to remove all significant shallow impacted soil and dispose of offsite while treating deeper, TPH impacted soils by soil vapor extraction. The area and volume estimates for both the shallow and deep soil impacts have been estimated utilizing the Site RGs. As part of the No Further Action (NFA) decision, the Fire Department will certify that all necessary response actions have been completed in accordance with the approved RAP and that Site conditions do not pose a significant threat to workers at the Site.

This RAP was prepared in accordance with the project applicable sections of the United States Environmental Protection Agency (USEPA) (1995) Remedial Design/Remedial Action Handbook.

1.2 ORGANIZATION OF REPORT

This report is organized as follows: Section 1 presents the objectives and organization of the RAP. Section 2 provides the background information about the Site. Section 3 contains the COC information. Section 4 summarizes the risk evaluation and remedial goals. Section 5 outlines the remedial alternatives and preferred remedy. Section 6 reviews the applicable or relevant and appropriate requirements. Section 7 provides the implementation protocol for the RAP. The project schedule and report of completion are outlined in Section 8. Section 9 is a list of the references cited and used in this RAP.

2.0 SITE BACKGROUND

The following subsections will present site background information including site ownership and location, site vicinity and description, topography, geology and hydrogeology, meteorology, and previous site investigations.

2.1 SITE OWNERSHIP AND LOCATION

The subject Site consists of one parcel (APN # 4167-031-900) that is approximately 1.3 acres in size and is owned by the City of Hermosa Beach. The site is located at 555 6th Street in the City of Hermosa Beach, California (Figure 1).

2.2 SITE VICINITY AND DESCRIPTION

The area in the vicinity of the Site is primarily developed with industrial/commercial uses to the north, south and west with a Greenbelt/City Park built on a center street median to the east (Figure 2). The Site is currently utilized as a City Maintenance Yard which includes a maintenance building, a new steel building, vehicle washout area, a construction material storage area, and a former (now abandoned) oil well location (Stinnett well). The site has been formerly utilized as a city landfill as early as the 1920s. The site is currently overlaid with concrete pads and asphalt with a small portion of the site unpaved.

2.3 PHYSICAL SETTING

The following Sections outline the physical setting for the Site location. A discussion of the topography and geologic/hydrogeologic setting follows:

2.3.1 Topography

The topography is relatively flat at an elevation of 55 feet above mean sea level. However, the area was historically more topographically varied, with the northeast portion of the site filled in over time (former landfill area).

2.3.2 Geologic/Hydrogeologic Information

The site is located on the Los Angeles Coastal Plain (LACP), an area that encompasses 480 square miles, and is bounded by the Santa Monica Mountains to the north, the low-lying Elysian, Repetto, Merced and Puente Hills to the northeast, Coyote Creek to the east and the Pacific Ocean to the south and west (California Department of Water Resources (DWR, 1961)).

The area around Hermosa Beach includes the Coastal Plain which is within the southwestern block of the Los Angeles Basin. The Newport-Inglewood uplift divides the Coastal Plain into two distinct groundwater basins: the Central Basin and the West Coast Basin. The Site is located near the center of the West Coast Basin. The West Coast Basin extends from the Ballona Escarpment (Playa del Rey) and Baldwin Hills, on the northwest, to the Long Beach Plain, on the southeast.

Shallow groundwater in the area is characterized as unconfined or semi-perched and is typically found in unconsolidated Quaternary sediments less than 100 feet below ground surface (bgs). The semi-perched aquifer has been found to depths of 50 to 100 feet within the area. In general, the semi-perched aquifer is of little beneficial use due to poor water quality and low yield and the intrusion of seawater. In many areas of the West Coast Basin, groundwater is not detected in sediments of the semi-perched aquifer.

Historically groundwater beneath the Site was reported at depths estimated at 50 to 100 feet bgs. In, 1994 ENTRIX completed environmental borings on the Site and did not encounter groundwater at depths of up to 46 feet bgs. Recent geotechnical investigation identified the presence of groundwater between 47.7 and 49.3 feet bgs. (NMG 2012) Surface water in the area is primarily limited to the Pacific Ocean which is located to the west and southwest of the Site.

Groundwater beneath the Site is within the coastal salt water intrusion zone. The West Basin Barrier, a series of water injection wells managed by the Los Angeles County Water Replenishment District, is located east of the Site. There are no known potable drinking water wells west of the West Basin Barrier. The water beneath the Site is not considered of beneficial use.

2.4 METEOROLOGY

The climate in the region is described as a Mediterranean style climate, dominated by mild and relatively stable conditions. Winter temperatures average 58 degrees Fahrenheit (F) and summer temperatures average 75 degrees F. Minimum and maximum temperatures generally range from the high 40s in the winter months to the low 90s during the summer months. The average precipitation is about 11 inches per year, with 90 percent of the percipitation falling between the months of November and April.

2.5 PREVIOUS INVESTIGATIONS

The Site has been the subject of previous environmental evaluation by GeoResearch (1989) ENTRIX (1994, 1995), GEO-CAL. Inc (1998), and Brycon, LLC (2012). The scope and results of the previous environmental assessments, based upon Brycon's review of the previous reports, are discussed below. The locations of previous exploration, to the extent known, are shown on Figure 2-1.

2.5.1 GeoResearch

GeoResearch completed a report outlining the closure of two 550 gallon underground storage tanks on the Site in 1989. The tanks were filled with concrete and abandoned in place as part of the reported on project.

A total of 5 soil borings were completed to depths of 40 feet bgs, although only 3 of the 5 were identified as being pertinent to the tank closure (Borings 3, 4, and 5). A total of 18 soil samples were obtained from the 3 pertinent borings and analyzed for total petroleum hydrocarbons (TPH). The results for all 18 samples were none detected for TPH. It should be noted that analytical results for the other 2 borings (12 additional soil samples) was included in an Appendix to the report, the results of which were also none detected for TPH.

The County of Los Angeles, Department of Public Works issued a closure letter with no further action required for the project on April 10, 1989 (Appendix A).

2.5.2 ENTRIX, Inc.

ENTRIX - 1994
ENTRIX, Inc. completed a Phase I ESA (October 1994) on the site. The principal findings were:
1) Several current uses of the Site may have released petroleum and/or solvents at the Site. These included a maintenance building, a drum storage area, a vehicle washout area, an asphalt batching area, the Stinnett Oil Well #1, and two underground storage tank settings. Additional sampling was recommended.

2) A soil gas survey was performed on underground storage tanks (USTs) located on the Site. Low to non-detectable concentrations of TPH, benzene, toluene, ethylbenzene and xylenes (BTEX), and volatile organic compounds (VOCs) were encountered, indicating a significant release from the USTs was not likely.
3) The site history and aerial photo study indicated several concerns including a City dump, possible spills near the Stinnett well, former above ground storage tanks (ASTs) and the former Hermosa Glass Company located on the site of the maintenance building (subsequent investigation (Brycon 2012) uncovered data that indicated the Site was in all likelihood not the former Hermosa Glass Company site). Additional sampling was recommended.
4) The regulatory database review did not reveal any significant concerns.

ENTRIX - 1995
ENTRIX, Inc. completed a Phase II ESA (April 1995) on the Site in order to evaluate the environmental subsurface condition of the property. Fifteen soil borings were completed across the Site at depths of up to 46 feet bgs. Soil samples were obtained and analyzed from various depths within specific soil borings.

ENTRIX concluded that petroleum hydrocarbon impacted soil was present on the northeastern portion of the Site near the base of the old landfill area in a circular pattern 40 feet in diameter and 20 feet thick at a depth of up to 30 feet. The highest concentration of impacted soil identified by ENTRIX was within soil sample B14D, which was 36,000 milligrams per kilogram (mg/kg) at 20 feet bgs. The calculated volume of petroleum impacted soil by ENTRIX was 700 cubic yards.

The analytical reports contained within the ENTRIX document indicated that the TPH present was primarily of longer chain hydrocarbons (C23+). A single point of elevated lead and cadmium impacted soil was identified within the former City landfill area at a depth of 15 feet bgs. ENTRIX concluded that the area of elevated metals was most likely localized and further evaluation was necessary.

2.5.3 GEO-CAL, INC

GEO-CAL, INC., issued a report in 1998 outlining the work completed in regards to the removal of 3 USTs and associated piping and dispensers. The USTs included two (2) 4,000 gallon gasoline tanks and one (1) 2,000 gallon diesel tank. A total of 12 soil samples were collected and analyzed. Samples were obtained from immediately below each tank (2 per tank), below each dispenser (1 per dispenser), and below the piping trench (1). Three samples were also obtained from the fill material removed from around the tanks.

Soil samples collected from below the gasoline tanks and dispenser were analyzed for total petroleum hydrocarbons-gasoline range (TPHg), for benzene, toluene, ethylbenzene, and total zylenes (BTEX), and for Methyl Tertiary Butyl Ether (MTBE). Soil samples from below the diesel tanks and dispenser were analyzed for total petroleum hydrocarbons-diesel range (TPHd), BTEX, and MTBE. Soil samples from the trench and surrounding removed material were analyzed for TPHg, TPHd, BTEX and MTBE.

The results of all analytical were none detected with the exception of the sample below the diesel dispenser. The result for that sample was 15 mg/kg TPHd. The County of Los Angeles, Department of Public Works issued a closure certification and no further action required letter for the project on January 13, 1999. (Appendix A)

2.5.4 Brycon, LLC

Brycon, LLC completed a Phase I ESA in June 2012. The principal findings were:

- Petroleum hydrocarbon impacted soil is present within the former landfill area of the Site.
- Metals impacted soil may be present within the former landfill area.
- Brycon recommended the completion of additional soil sampling and analysis to further delineate the horizontal and vertical extent of the petroleum hydrocarbon impacted soils onsite and to evaluate the presence of heavy metals in the soil.
- After completing the delineation of soil impacts on the Site, Brycon recommended that a remedial action plan (RAP) be prepared.
- Current Site operations may be impacting surface areas of the Site.
- Brycon recommended the completion of soil sampling and analysis of the surface areas to determine if impacts have occurred.
- Brycon recommend conducting an asbestos containing material and lead paint survey of the Site prior to any demolition activities to confirm the absence or presence of these materials.

Brycon – Phase II ESA (2012)
Brycon issued Phase II ESA completed for the Site in August 2012. This Phase II ESA included the completion and sampling of 11 GeoProbe Borings from surface to a maximum of 44 feet below ground surface (bgs). The borings were located both within and outside a former landfill that existed on the property. Additionally, 5 surface samples were collected from locations onsite where current operations indicated the potential for environmental impacts.

The report indicate that soil impacted with metals (lead) exceeding the Environmental Protection Agency (EPA) Region 9 Industrial Regional Screening Levels (RSLs) were present onsite at depths of up to 25 feet (bgs) within the former landfill area. Total Petroleum Hydrocarbon (TPH) impacted soil exceeding California Regional Water Quality Control Board (CRWQCB) guidelines were also present onsite at depths of 25 to 44 feet bgs within the central portion of the former landfill area and to a lesser extent within an isolated shallow portion of the former landfill. Surface sample analytical results indicated that chemicals of concern were not present in specified sampled operation areas of the Site (all outside of the former landfill area).

A total of 73 soil samples were obtained from the GeoProbe borings. All 73 soil samples were analyzed for Total Petroleum Hydrocarbons (TPH-EPA Method 8015M). Thirteen of the 73 samples (those with the highest TPH concentrations) were additionally analyzed for Volatile Organic Compounds (VOC's-EPA Method 8260B). Ten of the 73 samples exceeded CRWQCB quidelines for TPH, all within the mid range hydrocarbons (C13-C22). VOC's were not present in any of the samples at concentrations above the EPA Region 9 Industrial Regional Screening Levels (RSLs). The location and highest concentration for TPH and VOC's were as follows:

CONSTITUENT	**MAXIMUM TEST RESULT** (mg/kg)	**REGULATORY GUIDELINE** (mg/kg)	**LOCATION**
TPH (C4-C12)	350	500	GP10-35
TPH (C13-C22)	10,500	1,000	GP1-3
TPH (C23+)	1,440	10,000	GP1-3
VOCs			
Benzene	0.015	5.4	GP4-32

(continued)

CONSTITUENT	MAXIMUM TEST RESULT (mg/kg)	REGULATORY GUIDELINE (mg/kg)	LOCATION
2-Butanone(MEK)	1.2	200,000	GP4-25
sec-butylbenzene	0.27	220	GP10-40
Ethlybenzene	0.2	27	GP10-40
Isopropylbenzene	0.19	11,000	GP10-40
Naphthalene	1.9	18	GP10-35
n-propylbenzene	0.2	21,000	GP10-40
n-butylbenzene	0.11	51,000	GP4-39.5
1,3,5 Trimethylbenz	0.11	10,000	GP10-30
1,2,4 Trimethylbenz	0.88	260	GP10-35
4 – Isopropyltoluene	0.014	NA	GP3-40

A total of 26 of the soil samples were analyzed for metals and/or lead. Six of the 26 samples exceeded the EPA Region 9 Industrial RSLs for lead (800 mg/kg). All 6 of the soil samples, with the exception of GP4-25, were located at 15 feet bgs or less. Lead was not detected uniformly throughout the shallow former landfill area, but was detected rather sporadically. The highest concentration of lead occurred at boring GP2-15 (9,680 mg/kg and 82.9 mg/l for total and soluble lead respectively).

3.0 NATURE AND EXTENT OF CHEMICALS OF CONCERN

This section summarizes the nature and extent of COCs in the soil. The COCs identified are limited to the area of the former landfill in the northeast section of the Site. For clarity purposes, all references to identified COCs and remedial actions refer to the landfill portion of the Site only.

3.1 CHEMICALS OF CONCERN

As part of previous environmental investigations, soil samples were collected and analyzed for metals, total petroleum hydrocarbons (TPH), volatile organic compounds (VOCs), pesticides and polychlorinated biphenyls (PCBs) to characterize the nature and extent of impacts throughout the Site. The results of the ESAs identified the presence of lead and TPH within portions of the former landfill area. Results from samples obtained from outside the landfill area were all none detected or well below actionable concentrations.

Metals - Lead
Lead was encountered at concentrations exceeding the Environmental Protection Agency (EPA) Regional Screening Level (RSL) for an industrial site (800 mg/kg). The lead was primarily limited to the shallow areas (less than 25 feet bgs) within the former landfill (Figures 3-1, 3-2 and 3-3). The lead was not uniformly detected across the landfill area. Its presence corresponded to a dark silty-sand layer.

TPH
TPH was encountered at concentrations exceeding the California Regional Water Quality Control Board – Los Angeles Region (CRWQCB-LAR) screening levels within the diesel range hydrocarbons (C13-C23). The elevated TPH was found within the lower portions of the former landfill (25 to 44 feet bgs) and in an isolated area near the surface of the landfill (Figures 3-4, 3-5 and 3-6).

VOCs, Pesticides, PCBs
VOCs, Pesticides and PCBs were not detected onsite above the EPA RSLs for an industrial site. Therefore, these compounds are not considered COCs for the Site.

3.2 EXTENT AND VOLUME OF IMPACTED SOIL

Lead
During the implementation of this RAP, soil impacted with lead will be removed within the top 15 feet of the former landfill and hauled offsite to a Class 1 disposal facility. Additional spot removal may occur based upon site conditions encountered during excavation. Based upon the site characterization data available and the lateral and vertical extent of the former landfill as mapped by NMG (2012), the estimated quantity of lead impacted soil to be excavated is 9,000 cubic yards. The volume is based upon the removal of the top 15 feet of the landfill, excluding the top few feet of clean over burden (although lead characterization data has shown that portions of the top 15 feet may be below the industrial EPA RSLs). This volume is an “in place” estimate and could increase due to soil “fluffing” during excavation. The location and extent of the proposed soil removal is shown in Figures 3-1, 3-2 and 3-3.

Additional excavations may be necessary, based on the results of confirmation sampling of the area, post removal (Section 7.6.2).

TPH

Soil impacted with TPH will be treated by in situ soil vapor extraction (SVE) during the implementation of this RAP. The TPH impacted soil contemplated for treatment by SVE is located within the deeper portions of the former landfill (25 to 44 feet bgs). All TPH identified in the shallow zones will be removed and hauled in conjunction with the lead removals previously discussed in this document. The estimated volume of TPH impacted soil within the deep zone is 4,500 cubic yards. The location and extent of the TPH impacted area is shown in Figures 3-4, 3-5 and 3-6.

4.0 RISK EVALUATION AND REMEDIAL GOALS

This section outlines the screening level evaluation performed on the Site and the corresponding remedial goals (RGs) for each COC. The RGs represent numerical cleanup goals that are used to support decisions regarding remediation and to determine the extent of the proposed remediation.

4.1 SUMMARY OF RISK EVALUATION

The United States Environmental Protection Agency (USEPA) has established Regional Screening Levels (RSLs) for a wide variety of chemical contaminants that are risked-based concentrations derived from standardized equations combining exposure information assumptions with EPA toxicity data. RSLs are considered by the EPA to be protective for humans, including sensitive groups, over a lifetime (EPA 2012). Chemical concentrations above the RSL would not automatically designate a site as "dirty" or trigger a response action; however for sites where contaminant concentrations fall below RSLs, no further action or study is warranted. For this Site, the RSLs will be utilized as the RGs.

While TPH in and of itself, is not considered a risk to human health, the California Regional Water Quality Control Board (CRWQCB) has established clean up goals based upon the protection of water resources. Typically these clean up goals are utilized for the protection of beneficial water resources. Under the subject Site, the groundwater is not considered of beneficial use due to the intrusion of salt water from the Pacific Ocean. A groundwater barrier to mitigate the intrusion of ocean water into the beneficial aquifers of the Los Angeles Basin has been established to the east of the Site by the Los Angeles County Water Replenishment District. The subject Site is located between the groundwater barrier and the Pacific Ocean.

Although the groundwater beneath the Site is not of beneficial use, the proposed RA will utilize the CRWQCB TPH clean up goals as the RGs for the Site.

4.2 SITE SPECIFIC REMEDIAL GOALS

The overall remedial action objective is to ensure that concentrations of COCs remaining at the Site are protective of human health and the environment. The development of numerical RGs was based upon the human health risk discussed above. For all chemicals not designated as COCs for the Site, the USEPA Industrial RSLs will be utilized for all chemicals, with the exception of Arsenic. For Arsenic, the DTSC screening level of 12 mg/kg will be utilized (2007).

The COCs identified in previous ESA reports are lead and TPH. The proposed soil RGs for COCs are discussed below.

Lead- the USEPA Industrial RSL for lead is 800 mg/kg. This will be used as the soil RG for lead. Site conditions may exist where removal of lead at concentrations above the proposed RG is impractical. In such cases, the Fire Department will be contacted and approval granted prior to leaving elevated concentrations in place.

TPH- The CRWQCB-LAR soil-to-groundwater screening values for impacted soils within 20 feet of groundwater will be used as the RG for this Site. The RG for heavier end TPH (C23 to C32) is 1,000 mg/kg. The RG for medium range TPH (C13-C22) is 100 mg/kg. The RG for lighter end TPH (C4-C12) is 100 mg/kg.

5.0 REMEDIAL ALTERNATIVES

This section summarizes the remedial action scope and objectives, the identification and screening of remedial alternatives, and the recommendations and rationale for the selected remedial action.

5.1 REMEDIAL ACTION SCOPE AND OBJECTIVES

The scope of the remedial action (RA) involves the remediation of shallow soils impacted with lead and deeper soils impacted with TPH. The goals and objectives of the proposed RA are presented in Section 1.1 and are reiterated in this Section. The Site-specific RGs for the identified COCs are described in Section 4.2. The volume of impacted soil requiring remedial action, based upon the RGs, is as follows:

- 9,000 cubic yards of lead impacted soil within the top 15 feet (excludes clean overburden in upper 3 feet) of the former landfill are RCRA hazardous waste.
- Within the 9,000 cubic yards of RCRA material, a small portion (500 cubic yards) is further impacted with TPH.
- 4,500 cubic yards of TPH impacted soil are present within the bottom portion of the former landfill.

The areas requiring the proposed RA are shown in Figures 3-1 and 3-4 for lead and TPH respectively. The objectives of the proposed RA are:

- Reduce the concentrations of COCs present onsite to cleanup levels that are protective of the future use of the Site as a crude oil production facility
- Reduce the concentrations of COCs present onsite to cleanup levels that are protective of the groundwater beneath the Site in compliance with the Los Angeles Region Water Quality Control Plan.
- Complete RA in a timely manner in compliance with all applicable rules and regulations upon project approval and subsequent initiation of Phase 3 of the E&B Oil Development Project

5.2 IDENTIFICATION AND SCREENING OF REMEDIAL ACTION ALTERNATIVES

The National Contingency Plan's (NCP) nine criteria were used for the screening of remedial alternatives for this project. These nine evaluation criteria were developed to select a site remedy to address the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) requirements, as well as additional technical policy and considerations. The nine criteria are divided into two threshold criteria, five balancing criteria and two modifying criteria.

The nine criteria as listed in the NCP were slightly modified for purposes of this RAP screening. The State acceptance criteria was further evaluated based upon the lead agency involved in this RAP approval (City of Hermosa Beach Fire Department). It is our understanding that the City of Hermosa Beach Fire Department will forward this RAP to the Los Angeles County Fire Department for review (LACoFD). As such LACoFD RA requirements were included in the screening process outlined in this document. The nine criteria and divisions are summarized below.

Threshold Criteria	• Overall protection of human health and the environment • Compliance with ARARs
Balancing Criteria	• Long-term effectiveness and permanence • Reduction of toxicity, mobility, or volume through treatment • Short-term effectiveness • Implementability • Cost
Modifying Criteria	• State acceptance • Community acceptance

The overall protection of human health and the environment evaluates how the remedial action alternatives reduce the risk to human health and the environment from potential exposure pathways, using treatment, engineering, or institutional controls. It also examines whether alternatives pose any unacceptable cross-media impacts.

Compliance with the ARARs evaluates the ability of each alternative to attain the federal and state ARARs. If the ARAR cannot be met, the analysis of the alternative must provide a grounds for a waiver.

Long-term effectiveness and permanence are evaluated with respect to the magnitude of residual risk and the adequacy and reliability of controls used to manage the remaining waste (untreated waste and residual waste) over the long term. Alternatives that offer the highest degree of long-term effectiveness are those that leave little or no waste on the Site, thus eliminating long term maintenance and monitoring and minimizing reliance on institutional controls.

Reduction of toxicity, mobility, or volume through treatment addresses the expected performance of treatment technologies used by considering the amount of waste treated or destroyed, the irreversibility of the treatment process, and the type and quantity of residuals resulting from the treatment process.

Short-term effectiveness addresses the capability of an alternative to protect human health and the environment during the construction of and the implementation of the remedy.

Implementability examines the technical and administrative feasibility of implementing an alternative and the availability of necessary goods and services. Where proven technologies are proposed, an assessment of technical feasibility examines the performance history of the technologies in direct applications, or considers the expected performance for similar applications.

The cost estimates are rough order-of-magnitude (ROM) estimates ranging from plus 50% to minus 30% of the actual cost. This is the level of accuracy dictated by the USEPA (1988) guidance for developing the cost estimate.

State acceptance reflects the states preferences or concerns about the alternatives; community acceptance reflects the community's apparent preferences among, or concerns about, the alternatives.

5.2.1 Identification and Analysis of Alternatives

An evaluation of various clean up alternatives was performed as part of the preparation of this RAP. Technologies were screened from further consideration because they would not meet the RAO of the project and/or future construction considerations dictated their use as non-feasible. Technologies retained for further consideration included: soil excavation, onsite treatment, offsite disposal, and soil vapor extraction. These technologies were combined into the following remedial alternatives:

Alternative 1 - No Action taken
Alternative 2 - Excavation of shallow lead impacted soil, onsite treatment of lead impacted soil and haul off of treated material as non-hazardous waste. VES treatment of deep TPH impacted soil
Alternative 3- Excavation of shallow lead impacted soil, haul off of lead impacted soil as hazardous waste. VES treatment of deep TPH impacted soil.

5.2.2 Alternative 1 – No Action

Under Alternative 1, the Site is left in its existing condition without any control or remedial action. Although no cost is associated with this alternative, there is no reduction in concentrations of COCs.

Under this alternative, there would be no additional short-term risk posed to the community or the environment because no remedial action would be performed. No implementability concerns or costs are associated with this alternative. However, potential long term risks would be high as the alternative would not be protective of receptors under the proposed land use. Without any form of remediation proposed under this alternative, potential future site receptors would have a potential risk of exposure to onsite COCs. Further, groundwater could be impacted by the existing conditions. There would not be any reduction in toxicity, mobility, or volume of COCs under this alternative. This alternative would likely not be acceptable to the Fire Department and the local community.

5.2.3 Alternative 2 – Excavation of Shallow Lead Impacted Soil, Onsite Treatment of Lead Impacted Soil, Offsite Disposal of Treated Lead Soils and Vapor Extraction of Deeper TPH Impacted Soils

Description of Alternative 2

Alternative 2 is the excavation, onsite treatment, and offsite disposal of shallow lead impacted soils and the treatment of deeper TPH impacted soils via vapor extraction. The lead impacted soils would be excavated to up to 15 feet bgs in the former landfill area. The sidewalls and bottom of the excavation would be sampled in compliance with the implementation discussion of this RAP (Section 6). Spot removal of lead impacted soil above the proposed RGs would be conducted if confirmation sampling indicated that RGs had not been met, and/or the removal is feasible due to physical site constraints (if not feasible, high levels may be left in place). All excavated lead impacted soil would be treated onsite via a transportable treatment unit (TTU) and subsequently hauled offsite as a non-hazardous waste (the shallow area containing both TPH and high levels of lead would be put through the onsite treatment process). Engineered shoring would be required along the north and east property lines of the site (in the former landfill area).

As the future construction of the Site considers the removal of the 9,000 cubic yards in preparing a balanced grading plan for the Site no import of clean fill is anticipated as part of this project. Existing Site "clean" soil would be utilized to backfill areas, as required. The minimum depth of "clean" backfill for the site is 5 feet (and may be as much as 15 feet).

After excavations and backfill have been completed, and construction of the crude oil production facility is completed, a soil vapor extraction (SVE) system would be installed in the area of deeper TPH impacts. The SVE system would be comprised of installing SVE wells to a depth of 45 feet bgs in the area of TPH impacts. The exact number of wells will be determined by completing a study prior to installation. A permitted SVE treatment system would be installed onsite, behind an enclosure, and operated in conjunction with the crude oil production operations.

Analysis of Alternative 2

Protection of Human Health and the Environment

Alternative 2 would protect human receptors because lead impacted soil exceeding the RGs would be physically removed and transported offsite (after treatment). The small amount of lead impacted soil that may remain in place would be covered with a minimum of 5 feet of clean fill. The Site construction design would result in a capping of the entire Site with asphalt, concrete and/or equipment and equipment pads. The removal of lead soil to the RGs and subsequent site capping would therefore be protective of human health and the environment.

The deep TPH impacted soils would be mitigated to below CRWQCB-LAR guideline concentrations via implementation of the VES system. The guidelines were prepared to establish the protection of groundwater resources. Therefore the proposed mitigation system would be protective of human health and the environment.

Compliance with ARARs

Alternative 2 would comply with the ARARs, including air permitting and RCRA requirements for hazardous waste treatment, storage and disposal. The clean closure requirements in 22 CCR are met by excavating soils with concentrations of COCs in excess of the proposed RGs. SCAQMD Rules 403 and 1166 and permit requirements for the VES equipment are ARARs relating to air emissions from the site activities. The proposed remedial alternatives would comply with all SCAQMD Rules and permit requirements.

CRWQCB construction site and industrial site Storm Water Pollution Prevention Plan (SWPPP) and therefore the National Pollutant Discharge Eliminations System (NPDES) requirements would be met for the site by completing SWPPP plans and applying for the appropriate permits prior to the initiation of any RAs. A Site Transportation Plan would be prepared as part of project submittal documents, which complies with Fire Department transportation requirements.

Permits from the City of Hermosa Beach for Site grading and excavation would be obtained prior to initiating any RAs as part of this plan. City permits will also be obtained for the construction of the VES treatment compound required to implement the SVE portion of this Alternative. Therefore all City requirements would have been met prior to initiating RAs.

Long-Term Effectiveness and Permanence

Alternative 2 would provide a high degree of long-term effectiveness and permanence because lead impacted soil above the RGs would be removed from the site and TPH impacted soil would be treated to concentrations protective of groundwater. The excavation and/or treatment of impacted soil provides a permanent solution for protecting human receptors and groundwater and results in an adequate and reliable reduction of exposure pathways. Because the lead impacted

soil would be permanently removed from the Site and the TPH impacting deeper soils would be reduced to concentrations not considered a threat to groundwater, future remedial activities would not be necessary.

Confirmation soil sampling during the excavation process and confirmation sampling of the SVE area would result in the evaluation of the effectiveness of this alternative. This alternative satisfies the RAOs. Based on these considerations, this alternative would have a high degree of long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume

Alternative 2 involves the treatment of lead impacted soil onsite which results in the reduction of toxicity and mobility of the lead compounds. The implementation of the SVE system results in the removal and destruction of TPH compounds thereby decreasing the volume of impacted soil.

Short-Term Effectiveness

Protection of Community – The primary potential impact to the community would be from inhalation of dust during the excavation, stockpiling, treatment, loading and transportation components of the proposed RA. To a lesser extent the implementation of the SVE system would result in air emissions from the treatment unit. The impact of the excavation, stockpiling, treatment, loading and transportation components would be mitigated by implementation of dust control and suppression measures. These would include wetting of surface soil, covering exposed soil and ceasing work during high wind periods. The transportation component impacts would be reduced by cleaning of trucks onto plastic liner and employing “shaker plates” for the trucks to drive on prior to exiting the Site. Trucks would be covered with tarps and the truck haul route established to minimize impacts to the community. The maximum number of truck trips per day will be limited to18.

The proposed SVE system would meet all SCAQMD required emission standards per permit requirements.

Noise will result from the physical operations onsite. A noise study has been completed as part of the project submittals. Work activities have been adjusted to ensure that site work meets the project noise requirements.

Protection of Workers – Workers executing this RA would be exposed to the COCs during the execution of this RAP. The routes of potential exposure include inhalation, dermal absorption and ingestion. A site specific health and safety plan (HASP) would be implemented to meet the requirements of the California Health and Safety Code, Title 8 CCR and Proposition 65 as well as HAZWOPPER requirements. The HASP would outline appropriate personal protective equipment (PPE), such as coveralls, gloves, dust masks, respirators, etc, as required by Site workers that may come in contact with COCs. Monitoring would be conducted throughout the implementation of this RAP to ensure the health and safety of the workers.

Environmental Impact – During the implementation of this RAP, primarily as a result of excavation, treatment and transportation of lead impacted soils dust emissions would occur from the Site. These emissions would be mitigated and controlled at the source by implementation of the dust control and suppression measures stated above to minimize the dispersal radius. The impacts are expected to be minimal.

Time to Achieve Objectives – Excavation of the shallow lead impacted soil, treatment, and subsequent hauling offsite is expected to be a relatively short duration. However, treatment of deeper TPH impacted soils is expected to be considerably longer in duration. It is assumed that the soil excavation, treatment and offsite transportation would be conducted concurrently and that

the expected duration of work is 20 weeks to complete. This could be delayed due to unexpected Site condition (inclement weather, excavation problems, etc.).

The implementation and completion of remediation associated with the SVE system will take considerably longer. Past project experience has shown that the treatment by SVE will take in the range of 3 to 8 years to complete.

Implementability

The implementability of Alternative 2 is considered high. The excavation, treatment and disposal of lead impacted soil at an offsite disposal facility as non-hazardous waste is considered readily implementable. Soil removal and treatment as proposed is common practice at sites with relatively shallow lead impacted soil. Standard construction equipment is available to accomplish excavation activities, and shoring installation contractors are readily available. No significant administrative issues are anticipated for this work. Disposal facilities capable of accepting the treated soil exists within California.

The TTU used to treat the soil may require additional lead time to acquire and obtain required permits. However, the lead time is not considered significant.

Transportation from the Site has been identified as a limiting factor. The maximum allowable truck loads per day has been established as 18. The restriction to 18 loads will results in a longer project duration time than projects of a similar nature to this. However, the limitation is not considered a significant factor in the implementability of the proposed RA.

The installation of an SVE system is considered common practice for the treatment of TPH in deeper soils. Equipment for testing, installing wells, and treatment is readily available locally in California.

Cost

The total estimated cost for Alternative 2 would be $2.5 MM with a range of $1.75 MM to $3.75 MM. Direct costs would consist of excavation, treatment, transportation, disposal, restoration, well installation, treatment system installation, treatment system maintenance and monitoring, and closure sampling. Indirect costs include engineering design, permitting and reporting. The cost sensitivity depends on final quantities, duration of remedial action, and unit cost for treatment, transportation and disposal.

Acceptance

It is anticipated that the Fire Department would accept Alternative 2 because it achieves protection of human health and the environment and permanently removes the excavated impacted soils out of the Site.

Community Acceptance

Alternative 2 would involve the excavation, treatment and offsite transportation of impacted soils that would create the potential for nuisance dust, noise and traffic issues. It is not expected to encounter community objections if dust and noise issues are well controlled and the Transportation Plan (to be developed) implemented. The onsite treatment of soil may be problematic for community noise concerns and/or limitations.

The criterion will be further addressed in the final RAP by incorporating comments received from the community during the public review process associated with the Site environmental review process by the City. Community concerns would be documented and addressed in the final RAP.

5.2.4 Alternative 3 – Excavation, Offsite Disposal of Shallow Soils and Vapor Extraction of Deeper TPH Impacted Soils

Alternative 3 is similar to Alternative 2 with the exception that the shallow soils will not be treated onsite, but will instead be directly hauled offsite for disposal at a permitted Class 1 disposal facility. With land ban restriction, the receiving facility may be required to treat the soil at the receiving site (for compliance with applicable laws and regulations). Deeper TPH impacted soils will be treated using in situ Vapor extraction in Alternative 3.

For this alternative, the identified lead and TPH impacted soils would be excavated to a maximum of 15 feet bgs in the former landfill area. After excavation, the sidewalls and bottom of the excavation would be sampled in compliance with the implementation discussion of this RAP (Section 6). Spot removal of lead impacted soil above the proposed RGs would be conducted if confirmation sampling indicated that RGs had not been met, and/or the removal is feasible due to physical site constraints (if not feasible, high levels may be left in place). Engineered shoring would be required along the north and east property lines of the site (in the former landfill area).

As the future construction of the Site considers the removal of the 9,000 cubic yards in preparing a balanced grading plan for the Site no import of clean fill is anticipated as part of this project. Existing Site “clean” soil would be utilized to backfill areas, as required. The minimum depth of “clean” backfill for the Site in the former landfill area is 5 feet (and may be as much as 15 feet).

After excavations and backfill have been completed, and construction of the crude oil production facility is completed, a soil vapor extraction (SVE) system would be installed in the area of deeper TPH impacts. The SVE system would be comprised of installing SVE wells to a depth of 45 feet bgs in the area of TPH impacts. The exact number of wells will be determined by completing a study prior to installation. A permitted SVE treatment system would be installed onsite, behind an enclosure, and operated in conjunction with crude oil production facility operations

Analysis of Alternative 3

Protection of Human Health and the Environment

Alternative 3 would protect human receptors because lead impacted soil exceeding the RGs would be physically removed and transported offsite. The small amount of lead impacted soil that may remain in place would be covered with a minimum of 5 feet of clean fill. The Site construction design would result in a capping of the entire Site with, asphalt, concrete and/or equipment and equipment pads. The removal of lead soil to the RGs and subsequent backfill and site capping would therefore be protective of human health and the environment.

The deep TPH impacted soils would be mitigated to below CRWQCB-LAR guideline concentrations via implementation of the VES system. The guidelines were prepared to establish the protection of groundwater resources. Therefore the proposed mitigation system would be protective of human health and the environment.

Compliance with ARARs

Alternative 3 would comply with the ARARs, including air permitting and RCRA requirements for hazardous waste treatment, storage and disposal. The clean closure requirements in 22 CCR are met by excavating soils with concentrations of COCs in excess of the proposed RGs. SCAQMD Rules 403 and 1166 and permit requirements for the VES equipment are ARARs

relating to air emissions from the Site activities. The proposed remedial alternatives will comply with all SCAQMD Rules and permit requirements.

CRWQCB construction site and industrial site Storm Water Pollution Prevention Plan (SWPPP) and therefore the National Pollutant Discharge Eliminations System (NPDES) requirements would be met for the Site by completing SWPPP plans and applying for the appropriate permits prior to the initiation of any RAs. A site Transportation Plan will be prepared as part of project submittal documents, which complies with Fire Department transportation requirements.

Permits from the City of Hermosa Beach for Site grading and excavation will be obtained prior to initiating any RAs as part of this plan. City permits will also be obtained for the construction of the VES treatment compound required to implement the SVE portion of this Alternative. Therefore all City requirements will have been met prior to initiating RAs.

Long-Term Effectiveness and Permanence

Alternative 3 would provide a high degree of long-term effectiveness and permanence because lead impacted soil above the RGs would be removed from the site and TPH impacted soil would be treated to concentrations protective of groundwater. The excavation and/or treatment of impacted soil provides a permanent solution for protecting human receptors and groundwater and results in an adequate and reliable reduction of exposure pathways. Because the lead impacted soil would be permanently removed from the Site and the TPH impacted deeper soils would be reduced to concentrations not considered a threat to groundwater, future remedial activities would not be necessary.

Confirmation soil sampling during the excavation process and confirmation sampling of the SVE area would result in the evaluation of the effectiveness of this alternative. This alternative satisfies the RAOs. Based on these considerations, this alternative would have a high degree of long-term effectiveness and permanence.

Reduction of Toxicity, Mobility, or Volume

Alternative 3 involves the removal of lead impacted soil onsite and subsequent haul off to a permitted disposal facility, which results in the reduction of toxicity and mobility of the lead compounds for the Site. The implementation of the SVE system results in the removal and destruction of TPH compounds thereby decreasing the volume of impacted soil.

Short-Term Effectiveness

Protection of Community – The primary potential impact to the community would be from inhalation of dust during the excavation, loading and transportation components of the proposed RA. To a lesser extent the implementation of the SVE system would result in air emissions from the treatment unit. The impact of the excavation, loading, and transportation components would be reduced by implementation of dust control and suppression measures. These would include wetting of surface soil, covering exposed soil and ceasing work during high wind periods. The transportation component impacts would be reduced by cleaning of trucks onto plastic liner and employing “shaker plates” for the trucks to drive on prior to exiting the Site. Trucks would be covered with tarps and the truck haul route established to minimize impacts to the community. The maximum number of truck trips per day will be limited to18.

The proposed SVE system would meet all SCAQMD required emission standards per permit requirements.

Noise will result from the physical operations onsite. A noise study has been completed as part of the project submittals. Work activities have been adjusted to ensure that Site work meets the project noise requirements.

Protection of Workers – Workers executing this RA would be exposed to the COCs during the execution of this RAP. The routes of potential exposure include inhalation, dermal absorption and ingestion. A site specific health and safety plan (HASP) will be implemented to meet the requirements of the California Health and Safety Code, Title 8 CCR and Proposition 65 as well as HAZWOPPER requirements. The HASP will outline appropriate PPE, such as coveralls, gloves, dust masks, respirators, etc, as required by Site workers that may come in contact with COCs. Monitoring will be conducted throughout the implementation of this RAP to ensure the health and safety of the workers.

Environmental Impact – During the implementation of this RAP, primarily as a result of excavation, loading, and transportation of lead impacted soils dust emissions can be expected from the Site. These emissions would be controlled at the source by implementation of dust and if needed odor control measures to minimize the dispersal radius. The impacts are expected to be minimal.

Time to Achieve Objectives – Excavation of the shallow lead impacted soil and subsequent hauling offsite is expected to be a relatively short duration. However, treatment of deeper TPH impacted soils is expected to be considerably longer in duration. It is assumed that the soil excavation and offsite transportation would be conducted concurrently and that the expected duration of work is 10 weeks to complete. This could be delayed due to unexpected Site condition (inclement weather, excavation problems, etc.).

The implementation and completion of remediation associated with the SVE system will take considerably longer. Past project experience has shown that the treatment by SVE will take in the range of 3 to 8 years to complete.

Implementability

The implementability of Alternative 3 is considered high. The excavation and disposal of lead impacted soil at an offsite disposal facility is considered readily implementable. Soil removal as proposed is common practice at sites with relatively shallow lead impacted soil (and also for the small amount of TPH impacted shallow soil). Standard construction equipment is available to accomplish excavation activities, and shoring installation contractors are readily available, no significant administrative issues are anticipated for this work. Disposal facilities capable of accepting the soil exist within California and/or surrounding States.

Transportation from the Site has been identified as a limiting factor. The maximum allowable truck loads per day has been established as 18. The restriction to 18 loads will results in a longer project duration time than projects of a similar nature to this. However, the limitation is not considered a significant factor in the implementability of the proposed RA.

The installation of an SVE system is considered common practice for the treatment of TPH in deeper soils. Equipment for testing, installing wells, and treatment is readily available locally in California.

Cost

The total estimated cost for Alternative 3 would be $3.7 MM with a range of $2.6 MM to $5.5 MM. Direct costs would consist of excavation, transportation, disposal, restoration, well installation, treatment system installation, treatment system maintenance and monitoring, and closure sampling. Indirect costs include engineering design, permitting and reporting. The cost

sensitivity depends on final quantities, duration of remedial action, and unit cost for treatment, transportation and disposal.

Acceptance

It is anticipated that the Fire Department would accept Alternative 3 because it achieves protection of human health and the environment and permanently removes the impacted soils out of the Site.

Community Acceptance

Alternative 3 would involve the excavation, and offsite transportation of impacted soils that would create the potential for nuisance dust, noise and traffic issues. It is not expected to encounter community objections if dust and noise issues are well controlled and the Transportation Plan implemented.

The criterion will be further addressed in the final RAP by incorporating comments received from the community during the public review process associated with the Site environmental review process by the City. Community concerns would be documented and addressed in the final RAP.

5.3 COMPARATIVE ANALYSIS OF REMEDIAL ALTERNATIVES

Alternatives 1, 2, and 3 were evaluated against the NCP criteria. Alternatives 2 and 3 would adequately remediate the impacted soil and would be protective of human health and the environment, while Alternative 1 would not be protective. A comparative analysis of the 3 alternatives in relation to the nine outlined criteria follows:

Overall Protection of Human Health and the Environment

The overall ranking of protection of human health and the environment (from high to low) is Alternative 3, 2, then 1. Alternative 1 would have little protectiveness as all impacted soil remains in place with no remediation taking place. Alternative 1 leaves a threat to future receptors. Alternatives 2 and 3 have a high level of protectiveness because of the removal of shallow lead and TPH impacted soils to achieve the Site RGs and subsequent treatment of deeper TPH impacted soils with soil vapor extraction technologies to achieve the Site RGs.

Alternative 2 involves the onsite treatment of the shallow excavated lead and TPH impacted soils. The onsite treatment would generate additional air emissions associated with dust and potential off gassing, which could pose an additional increase in short-term worker health risks.

Compliance with ARARs

Alternative 1 would not meet the Fire Department requirements for environmental remediation and clean up of the Site for future development as a crude oil production facility. Alternatives 2 and 3 would comply with ARARs

Long Term Effectiveness and Permanence

Long-term effectiveness is defined as the ability of each alternative to protect human health and the environment by managing the risk posed by site residuals and or untreated material left onsite. Alternative 1 is rated low for long-term effectiveness and permanence because no measures or controls are associated with the “do nothing” option. Alternatives 2 and 3 would provide a high degree of long-term effectiveness and permanence because both involve the removal and/or treatment of impacted soil to Site RGs, which are protective of human health and the environment.

Reduction of Toxicity, Mobility, or Volume through Treatment

Alternative 1 is rated as low as no treatment is involved therefore no reduction occurs. Alternatives 2 and 3 are rated high. Alternative 2 involves treatment onsite of the shallow lead impacted soils, which will reduce the toxicity and mobility of the lead. Also, the deeper TPH impacted soil volume will be reduced due to the implementation of the SVE process. For Alternative 3, the lead impacted soil will most likely be treated at the receiving facility due to land ban restrictions. The hauled off wastes would be placed into a properly designed and engineered Class I disposal facility and managed in a manner that would greatly limit chemical mobility. The reduction in volume for deeper TPH impacted soil would be identical to that of Alternative 2 or Alternative 3.

Short-Term Effectiveness

Short-term effectiveness is defined as the ability of each alternative to protect human health and the environment during construction and remedial action implementation. Alternative 1 is rated high for this category as no action is taken, so no impacts would result. Alternatives 2 and 3 are ranked as moderate, although Alternative 3 is ranked slightly ahead of Alternative 2 in this category.

Both Alternatives 2 and 3 involve the excavation and transportation of impacted soil that would generate short-term fugitive dust (and possibly odors/vapors). Both Alternatives would have potential worker safety issues, including accidents and exposure. Alternative 2, which includes onsite treatment, would generate additional short-term air emissions and pose some minor additional potential risk to the community and workers health that would require management and monitoring.

Implementability

Alternative 1, the No Action Alternative is not rated as no activities would occur. Alternatives 2 and 3 are readily implementable and involve commonly performed remedial operations. Alternative 2 is ranked as moderate because of additional lead time for permitting, installation and operation of the onsite lead impacted soil treatment system thereby extending the construction schedule which is a conflict with the currently approved Conditional Use Permit for the Project. Alternative 3 is ranked as high as it is easier to implement.

Cost

Alternative 1 has no cost as it involves no action. Alternative 2 which is estimated at $2.5MM with a range of $1.75 to $3.75MM is ranked high as it has considerable cost savings in comparison to Alternative 3. Alternative 3 is estimated at $3.7 MM with a range of $2.6 to $5.5 MM is ranked as medium for this evaluation. The cost sensitivity is based upon the actual extent of impacted soil, landfill disposal options available, and duration of remediation operations.

State/Fire Department Acceptance

Alternative 1 would likely not be acceptable. Alternatives 2 and 3 would likely be acceptable to the State/Fire Department. This will be further reviewed upon receipt of comments anticipated as part of the environmental review process by the City.

Community Acceptance

Alternative 1 would likely not be acceptable to the community. Alternatives 2 and 3 would likely be acceptable to the community, with mitigating provisions. This will be further evaluated upon receipt of comments anticipated as part of the environmental review process by the City.

Summary

The results of the comparative analysis are summarized in the following table.

CRITERIA	Alternative 1	Alternative 2	Alternative 3
Threshold Criteria			
Overall Protection of Human Health and the Environment	NO	YES	YES
Compliance with ARARs	NO	YES	YES
Balancing Criteria			
Long-Term Effectiveness and Permanence	LOW	HIGH	HIGH
Reduction of Toxicity, Mobility, or Volume by Treatment	LOW	HIGH	HIGH
Short-Term Effectiveness	NOT RATED	MODERATE	MODERATE
Implementability	NOT RATED	MODERATE	HIGH
Cost – in $ million	0	2.5 (1.75-2.75)	3.7 (2.6-5.5)

5.4 RECOMMENDED REMEDIAL ACTION ALTERNATIVE

Based upon the comparative analysis discussed in section 5.2.3, the preferred alternative is Alternative 3. Alternatives 2 and 3 are similar, however under Alternative 2 onsite treatment of excavated shallow lead impacted soil would take place. Alternative 3 contemplates direct load of trucks for offsite disposal of the shallow excavated lead impacted soils. Alternative 3 is more costly than Alternative 2, but Alternative 3 reduces the potential impacts to the surrounding community and reduces the project schedule by 10 weeks.

The detailed elements of the Alternative 3 RAs are as follows:

- Removal of shallow lead impacted soil to 15 feet bgs in former landfill
- Concurrent removal of shallow TPH impacted soil in upper 15 feet bgs of former landfill
- Direct loading of trucks, for transportation offsite
- Confirmation sampling and analysis of excavation area
- Placement of a minimum of 5 feet of clean fill over the excavation area after removals are completed
- Transportation of the excavated soil to a Class I offsite disposal facility
- Installation of a soil vapor extraction (SVE) system for the deeper TPH impacted soils
- Preparation of a Closure Report outlining all project details

Details of the proposed implementation plan for Alternative 3 are found in Section 7 of this RAP.

5.5 RATIONALE FOR SELECTED REMEDIAL ACTION

Alternative 1 was not acceptable as it was the “do nothing” alternative. Alternative 2 and 3 are similar in scope, results, protection of human health and the environment and implementability. Alternative 3 is significantly more costly than Alternative 2, however, Alternative 3 provides for the greatest protection to the surrounding community. Both Alternatives 2 and 3 can be accomplished in relatively short time frames, with Alternative 2 taking about twice as long for onsite work to be accomplished.

Based upon the Project time constraints, Alternative 3 was chosen over Alternative 2.

6.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

Previous investigations of the Site indicate the presence of COCs in the soil exceeding the Site RGs. The remedial action (RA) of soil excavation, offsite disposal and in situ soil vapor extraction (SVE) has been proposed. This section discusses the applicable or relevant and appropriate requirements (ARARs) for the proposed RA.

6.1 PUBLIC PARTICIPATION

The overall Site development is subject to the environmental review process under the requirements of the California Environmental Quality Act (CEQA). As part of the environmental review process the proposed RAP will be included with the document submittals and distributed for public review. The community will participate in the public review and comment process associated with the CEQA process. As such, public comments will be taken into consideration and potential amendments made to the RAP prior to submittal for final approval with the Fire Department.

6.2 HAZARDOUS WASTE MANAGEMENT

Lead impacted soils transported offsite will be required to be managed as hazardous waste. As such, a USEPA ID number will be obtained for the project. Compliance with the DTSC requirements for hazardous waste generation, temporary storage, transportation and disposal is required. Containers used onsite will have proper hazardous waste labeling with date identified to ensure removal within 90 days. All shipments of hazardous waste will be transported by a registered hazardous waste hauler under a uniform hazardous waste manifests. Land ban requirements will be adhered to.

6.3 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

The South Coast Air Quality Management District (SCAQMD) has rules that the proposed RA will be subject to. The general rules include Rule 403 for fugitive dust emissions and Rule 1166 for excavation of volatile organic compounds. In addition, the proposed VES system will be required to obtain applicable SCAQMD operating permits.

SCAQMD Rule 1166 applies to the excavation of VOC contaminated soils. Although no elevated levels of VOCs are expected onsite, an approved Rule 1166 plan and permit will be obtained and implemented during all excavation of Site soils.

SCAQMD Rule 403 requires notification for large operation projects only (disturbing more than 50 acres or moving more than 5,000 cubic yards per day). For this project, no notification or filing of a Fugitive Dust Emission Control Plan is required as the project site is 1.3 acres and excavation per day is limited. Provisions of Rule 403 will strictly be adhered to including the prevention, reduction and mitigation of fugitive dust emissions.

The in situ VES system will be required to obtain SCAQMD permits to operate. Pre-permitted units with various locations permits are available from various vendors. However, given the expected duration of this project, a site specific permitted unit may be more appropriate.

6.4 CITY OF HERMOSA BEACH

Permits will be required from the City of Hermosa Beach for grading and construction operations for the Site. Permits will be obtained prior to initiation of the RA proposed in this document.

6.5 TRANSPORTATION PLAN

As part of the final RAP submittals a transportation plan will be prepared. The transportation plan will outline transportation routes, hours and days of operations, weight limitations, required signaling and any other conditions imposed for transportation to and from the Site. The transportation plan will be approved by all applicable entities prior to initiation of this RAP. The bulk of the requirements for the transportation plan have already been included in a traffic study prepared by Arch Beach Consulting (E&B Oil Development Project Traffic Impact Analysis) for submittal as part of the project documents.

6.6 HEALTH AND SAFETY PLAN (HASP)

A Site specific Health and Safety Plan will be prepared for this project under the supervision of a certified professional in accordance with current health and safety standards as specified by the Federal and California Occupational Safety and Health Administration (OSHA). The HASP will be included in the final submittal of RAP documents for the Site. All site workers and contractors will be required to operate in accordance with the requirements of Title 8, California Code of Regulations (CCR), section 5192 and Title 29, Code of Federal Regulations (CFR) section 1910.120, Standards for Hazardous Waste Operations and Emergency Response (HAZWOPPER).

The provisions of the HASP are mandatory for all personnel working on the project. All personnel shall read the HASP and sign a Training Acknowledgment form certifying that they have read the HASP and understand the health and safety requirements of the project.

The HASP will further outline the requirements for daily Site safety meetings that will outline daily activities and health and safety provisions for those activities. The daily safety meetings will further review previous conditions encountered and any concerns or changes to safety protocol based upon project history.

6.7 QUALITY ASSURANCE PROJECT PLAN

Quality assurance/quality control (QA/QC) measures that will be used during project execution are documented in the Quality Assurance Project Plan that will be developed for the Site prior to initiation of RAs. The QAPP will ensure that Site field and analytical data collected meet project data quality objectives (DOQs) and remedial action objectives to support decisions for development of the Site.

6.8 FIRE DEPARTMENT

This RAP will be submitted to the City of Hermosa Beach Fire Department for approval. The City of Hermosa Beach will forward the RAP to the Los Angeles County Fire Department for review. The RAP has been prepared by a California registered Civil Engineer and personnel that have sufficient knowledge and experience in remedial actions similar in nature to this Site. The RAP complies with the requirements for submittal to the City of Hermosa Beach Fire Department.

7.0 REMEDIAL ACTION IMPLEMENTATION

Site investigation completed and documented for the Site has shown that COCs in the soil are present at concentrations exceeding the Site-specific remedial goals (RGs). The most effective remedial action has been determined to be excavation and offsite disposal of lead impacted soils to 15 feet bgs and in situ soil vapor extraction of total petroleum hydrocarbons found in deeper soils. Upon receipt of Fire Department approval, soil removal and subsequent construction of in situ treatment system will begin under the direct supervision of a California registered Professional Geologist or Professional Civil Engineer.

All soil removal, treatment, facility construction, transportation and disposal activities will be performed in accordance with all applicable federal, state, and local laws, regulation, and ordinances.

7.1 FIELD DOCUMENTATION

Site personnel will maintain field records that document Site activities through the use of a field logbook, chain of custody records and site photographs. The minimum requirements for each of the listed items is discussed in the following sections

7.1.1 Field Logbook

A field logbook will be maintained by Site personnel for the duration of remedial activities. The field logbook will serve to document observations, personnel onsite, equipment arrival and departure time, and all other vital project information. The entries will be complete and accurate enough to permit reconstruction of field activities. Logbook(s) will be bound with pages consecutively numbered. All entries will be dated and the time of entry noted in military time. Entries will be made in ink and signed by the individual making the entry. If an error is made in an entry, corrections will be made by crossing a line through the error and then entering the correct information. No entries will ever be completely obliterated or otherwise rendered illegible. All corrections will be dated.

The minimum daily entry in the field logbook will include:

- Site name and address.
- Recorders name.
- All personnel onsite and their responsibilities.
- Time of arrival and departure onsite.
- Summary of any onsite meetings, including daily safety meetings
- Quantity of soil excavated
- Manifests of material hauled offsite
- Name of waste transporters
- Classification of waste hauled offsite
- Any deviations from the RAP and/or HASP
- Levels of safety protection
- Document equipment calibration, model and serial numbers
- Quantity of import fill material by truck load count
- Documentation of environmental soil samples collected

7.1.2 Chain of Custody Records

All soil samples will be identified on a Chain of Custody. For purposes of this project, Chain of Custody records should be sequentially numbered. In addition the additional documentation of environmental soil samples collected will include a record of:

- Sample identification number
- Sample location and description
- Samplers name
- Date and time of sample collection
- Sample type: grab or composite
- Sample matrix: soil, water, etc.
- Preserving agents, if any
- Container type: glass jar, brass sleeve, etc.
- Sampling equipment used
- Field observations of sample
- Instrument readings
- Sample seal numbers if appropriate
- Laboratory Name

7.1.3 Photographs

Photographs will be taken of the excavation area, confirmation sample locations and other areas of interest on the Site. The photos will serve to verify information outlined in the field logbook. When a photograph is taken, the following information will be written in a separate photo logbook.

- Time, date, location and weather conditions
- Description of subject photo
- Name of person taking photo

7.2 SITE PREPARATION AND SECURITY MEASURES

In order to ensure that the site is prepared for the RAs outlined in this RAP, the following site preparation and security measures will be completed and instituted prior to proceeding with the proposed work.

7.2.1 Utility Clearance

An “Underground Service Alert” (USA) will be completed at least 72 hours prior to initiation of any remedial activities. For purposes of this project, the entire site will be marked for USA. Water, gas, electrical, phone, communications, sewer and other utilities have been identified onsite. All utilities should be removed and cut or capped outside of the excavation zone, prior to commencing excavation. Cut and cap work should be coordinated with the respective utility companies.

7.2.2 Delineation of Excavation Area

The limits of the excavation area will be delineated, in consultation with the Fire Department, prior to commencing remedial activities. Both the excavation area and an appropriate buffer zone will be clearly demarked utilizing stakes. The area including both the buffer zone and excavation area will be identified as the exclusion zone. The exclusion zone will only be entered upon by appropriately trained personnel with appropriate health and safety gear. Anyone entering the

exclusion zone must undergo proper decontamination procedures upon exiting the exclusion zone.

7.2.3 Security Measures

Privacy fencing will be installed on the perimeter of the site prior to beginning the excavation process to ensure that all work areas are secure and safe. Access gates will be limited to one gate on Valley Drive and one gate on 6th Street. Security will be put in place to prevent trespassers and/or unauthorized personnel from entering the site. To ensure this occurs security measures may included:

- The posting of notices forbidding entrance and directing visitors to an adjoining Site office
- Requiring visitors to have prior approval from the Site manager to enter the Site and requiring said visitors to sign in a Visitors Log Book
- Provide for site security personnel to ensure no unauthorized persons enter the Site
- Maintaining security fencing for the duration of the project
- Securing the Site at the end of each day with closed and locked gates

Persons requesting Site access will be required to demonstrate a valid purpose for access. If access is to be within work areas and/or contaminated material areas the person(s) must provide appropriate documentation to demonstrate they have received the proper training in accordance with the Site specific HASP.

7.2.4 Contaminant Control

In order to prevent any potential exposure of material to the adjacent properties, site control measures will be implemented prior to soil excavation and treatment activities to minimize impact to the community. Proper placement of fencing and windscreens, and the use of water spray and covering of stockpiles will be implemented to reduce fugitive dust so that surrounding properties are not impacted. The project work plan calls for the installation of a minimum of 10 feet of noise reduction fencing around the Site. The placement of the 10 feet of noise screening will act as the windscreen for the Site.

7.2.5 Permits and Plans

As outlined in Section 6 of this document, all necessary permits and/or approvals will be obtained from the various entities with jurisdiction over their specific aspects of this project prior to the implementation of the RA.

7.3 EXCAVATION

The proposed RA for shallow soils involves the excavation and subsequent transportation offsite to a permitted landfill facility. The excavation process will involve the most potential for impacts to the surrounding communities, therefore the mitigation measures and a brief outline of the excavation process follows:

7.3.1 Mitigation Procedures

The removal of impacted soil will be completed in such a way to minimize fugitive dust. Impacted soil will be removed to the appropriate depth and lateral limits with an excavator(s) or other earth moving equipment as necessary and direct loaded onto trucks for transportation offsite. Direct loading of trucks will minimize equipment movement onsite. Equipment operators will be instructed to utilize low bucket height drops when loading the trucks. In addition, water spraying

will occur during the excavation activities within the excavation zone to further minimize fugitive dust.

Site operating restrictions dictate that the maximum allowable truck trips per day is 18, with the allowable transportation hours of 9 am to 3 pm. The restriction of the number of loads per day transported offsite will further work to reduce fugitive dust emissions to a minimum as the required equipment to accomplish loading and management of dust is limited.

Excavation areas will be controlled to avoid dust generation with physical barriers (perimeter fencing with windscreen to 10 foot height minimum which will also double as the noise screen), soil wetting and air monitoring (at both the work area and property perimeter). When/if wind speeds onsite exceed 25 miles per hour, all excavation activities will cease.

Although high levels of volatile organic compounds (VOCs) have not been identified on the Site, all excavation work will be completed in accordance with South Coast Air Quality Management District (SCAQMD) Rule 1166. An approved SCAQMD Rule 1166 plan will be in place and available onsite during the entire execution of the RAP. As part of the Rule 1166 plan, a photo ionization detector (PID) or equivalent will be used to monitor VOC emissions from the excavation activities. If elevated readings are recorded (greater than 50 parts per million (ppm)), excavation work will cease until mitigation measures as outlined in the Rule 1166 plan, are implemented and excavation operation can be brought into compliance with the plan. Monitoring for VOCs will be conducted at a minimum of every 15 minutes during excavation activities (or as required by the approved Rule 1166 plan, whichever frequency is greater).

7.3.2 Excavation Methods

The Site excavation plan calls for the removal of impacted soils to a depth of 15 feet bgs within the former landfill area. Shoring of the north and east boundaries of the former landfill, along the Site property line will be required to facilitate the proposed removal. Other areas (not shored) will be cut slope of 2:1. Geotechnical analyses have been completed onsite to support the shoring and slope design parameters (NMG Geotechnical).

For shored areas, where removal of soils is not feasible to the north and east of the former landfill, a barrier membrane, such as Liquid Boot will be installed on the inside of the shoring system prior to backfill.

As excavation is limited in depth, a track style excavator will be utilized to excavate material. The excavator will excavate from the same level as that of trucks entering and exiting the Site. This will allow the excavator to remove soil, then swing and load trucks in one motion, without the need for a separate movement of the excavator onsite to load the trucks. Excavation is anticipated to proceed from the northeast corner of the property, to the west to facilitate this type of operation.

Once excavation is complete, and subsequent initial confirmation sampling completed, the excavator may be required to enter the excavation zone at a lower level than the truck traffic, to perform spot removal of impacted soil. If this type of operation is required, the excavator will stockpile excavated soil in such a manner to minimize dust emissions.

Upon confirmation that lead impacted soil has been removed to the extent identified in this RAP, the excavations will be backfilled with a minimum of 5 feet of clean soil. The clean soil from onsite sources will be utilized for this purpose.

7.4 DECONTAMINATION OF EQUIPMENT

The decontamination of equipment and personnel that are exposed or have the potential to be exposed to the COCs onsite is of paramount importance. All site workers must adhere to the conditions of the Site HASP when performing any work operations which will include decontamination procedures. For equipment the following procedures will apply:

7.4.1 Large Equipment and Trucks

Entry of equipment to the impacted soil area will be limited to avoid unnecessary exposure and transfer of contaminants. If entry can not be avoided, any equipment and/or trucks leaving the site will be decontaminated in a designated decontamination area as described below.

The decontamination area will be placed at an egress point just outside the work exclusion zone, within the confines of the project site. At a minimum of each work day, or more frequently if site conditions dictate, plastic sheeting will be placed onto the ground at the point of equipment egress. The plastic sheeting will be placed in a large enough section to accommodate all equipment anticipated to be decontaminated on any given day, plus enough excess area to ensure that during the decontamination process, no material falls onto the exposed ground.

All trucks and excavation equipment that enter the job site that come into direct contact, or have the potential to come into direct contact, with contaminated soil will be decontaminated prior to leaving the Site. Trucks and equipment will pull onto the plastic sheeting and be visually inspected for the presence of any dirt adhering to the exterior surfaces (includes but is not limited to: wheels, cab, bed, wheel wells, etc.). All adhered dirt will be brushed off and collected onto the plastic sheeting. Each truck will further be inspected to verify that the load is properly covered and secured. Upon exiting the inspection and cleaning area, truck tread plates will be placed to further reduce the potential for track out. Once a truck or other piece of equipment has left the cleaning and inspection area, the plastic sheeting and tread plates will be broom cleaned to prevent the next truck from being cross contaminated.

7.4.2 Small Equipment

Small equipment that comes into direct contact with potentially contaminated soil will be decontaminated to assure: the quality of samples collected; that no cross contamination takes place; and, to prevent contaminated soil from being transported out of the exclusion zone. Decontamination will occur prior to and after each use (for non disposable equipment), using the following triple rinse procedures:

1) Clean equipment with non-phosphate based detergent and tap water wash (use brush if required).
2) Rinse equipment with tap water.
3) Perform initial water rinse with de-ionized or distilled water.
4) Perform final water rinse with de-ionized or distilled water.

Disposable equipment that is intended for one time use will not be decontaminated. Such equipment will be packaged for appropriate disposal as required by law. All water generated from small equipment decontamination procedures will be placed into a properly marked 55 gallon drum for storage. When the 55 gallon drum is full, the water will be hauled offsite to an appropriate disposal facility.

Other equipment will be decontaminated in a pre-designated area onsite. Said decontamination will consist of placement onto plastic sheeting or pallets and cleaning, wiping or brushing as appropriate. If the equipment is to remain onsite, it will be stored on plastic sheeting in

uncontaminated areas and covered. If the equipment is small in nature it may be stored in plastic bags.

7.5 AIR, METEOROLOGICAL, AND NOISE MONITORING

Air monitoring will be performed during Site activities in which contaminated or potentially contaminated materials are being disturbed, excavated, or otherwise handled. The Site will be staffed with an air monitoring/health and safety professional whose responsibilities will include:

- Monitoring of dust levels in the exclusion zone and other locations.
- Monitoring of onsite meteorological instrumentation.
- Assure that all real time aerosol monitors and industrial hygiene air sampling equipment are properly calibrated and in good working order.
- Coordinate general Site safety activities including all daily communications for safety practices and procedure briefings.
- Oversight of personal decontamination procedures and practices.
- SCAQMD Rule 1166 monitoring.
- Recordkeeping of all safety records.

Air monitoring of dust levels and airborne concentrations of COCs will be conducted at the following general locations:

- Upwind (offsite, if possible or at property line)
- Within the exclusion zone adjacent to the operating equipment and downwind of the equipment
- Downwind at the property line
- Other points as deemed necessary to monitor worker exposure

Air monitoring samples will be collected over the 7 hour work day for each day that remedial activities are ongoing. The 7 hour work day is based upon the work conditions imposed on the Site by the City of Hermosa Beach. Air monitoring equipment will be checked every 15 to 30 minutes by the assigned personnel to ensure that it is working and obtaining the required samples. Site conditions encountered during the remedial activities may result in changing the frequency, with approval of the Fire Department.

The air monitoring results will be compared to applicable SCAQMD dust emission charts available on the SCAQMD website for a comparative analysis of the dust produced. All emissions must fall within the SCAQMD guidelines. Any variance will require additional dust mitigation measures.

For lead monitoring, the Site HASP will outline personal lead monitoring requirements for Site workers. The results of Site worker analysis, in addition to the required perimeter monitoring outlined above, will be utilized to verify that Site mitigation procedures are appropriate. Any variance from acceptable parameters will require additional mitigation measures.

An ambient weather station will be installed onsite and will measure the wind speed, direction and relative humidity at a minimum. During excavation activities, an anemometer will also be in use onsite. If wind speeds exceed 25 miles per hour, all excavation activities will cease.

Construction noise is a high concern to the surrounding community. The environmental documentation for the proposed Project will include an ambient noise study and proposed Site noise mitigation and control measures. The RAs proposed in this RAP will adhere to the required project procedures.

7.6 EXCAVATION SAMPLING AND ANALYSIS PLAN

This Section outlines the proposed methods for sampling and analysis of the excavation areas of the Site. In addition, the waste profile is discussed.

7.6.1 Waste Profile

Based upon the analytical results obtained in Phase II ESA completed on the Site, all excavated soils to be transported offsite, excluding "clean" overburden, will be managed as hazardous waste for offsite disposal purposes. The concentrations of lead encountered during the site investigation indicated that the material will be characterized as a RCRA hazardous waste. As such, disposal will be at a permitted Class I facility such as Kettlemen City (or equivalent.) A small portion of the material anticipated to be excavated also contains TPHd at elevated concentrations. The waste profile will also include a notation for the TPHd materials.

7.6.2 Confirmation Sampling

As excavation progresses and is completed, confirmation samples will be obtained from the excavation. In consultation with the Fire Department, bottom and sidewall samples will be obtained to confirm that COCs have been removed to below the RGS. The frequency of sampling will be, at a minimum, for the bottom of excavations, one sample per every 250 square feet. For sidewall samples the frequency of collection will be one sample per 20 feet of linear sidewall. Sidewall samples will be collected at 2 points, one-third and two thirds from the top of the excavation to the bottom of the excavation. Based upon the results of analytical testing performed, the excavation would be deemed complete, or additional lateral or vertical removal completed until the RGs are achieved. If initial samples mandate the removal of additional soils, the confirmation sampling process will again be performed in the re-excavated area.

All samples will be properly covered, labeled and stored in a cooled ice chest prior to deliver to a California (Environmental Laboratory Accreditation Program (ELAP)-certified laboratory under appropriate Chain-of-Custody. Soil samples will be analyzed using the following analysis.

- EPA Method 8015 M Gasoline
- EPA Method 8015 M (C13-C32+)
- EPA Method 8260 for VOCs
- Method 6020/7471 for metals

Upon completion of confirmation sampling and clearance from the Fire Department, the Site excavations will be backfilled with a minimum of 5 feet of clean soil. Clean soil will be obtained from within the Site boundaries.

7.7 TRANSPORTATION PLAN FOR OFFSITE DISPOSAL

The lead impacted material excavated within the top 15 feet bgs of the former landfill area will be hauled to a permitted Class 1 disposal site as a Hazardous Waste under the appropriate Hazardous Waste Manifest. The final determination of the facility for disposal will be based on acceptance approval from the facility and concurrence of the City of Hermosa Beach. A detailed transportation plan will be developed and included with final RAP submittal documents.

7.8 BACKFILL AND SITE RESTORATION

Based upon the Site conditions and construction plans, no import of backfill material is anticipated at this time. If conditions change all backfill must be tested and verified clean prior to import.

This RAP includes the backfill of 5 feet of clean fill above the former landfill area (at a minimum). No site utilities, equipment, or appurtenances of any kind will be placed within the 5 feet of clean fill. Site construction activities may result in the placement of greater than 5 feet of fill within portions of the former landfill area. Any additional fill beyond the 5 feet will be completed as part of the Project construction and is not a part of this RAP.

7.9 IN SITU SOIL VAPOR EXTRACTION

Soils impacted with TPH will be treated by in situ vapor extraction (VE). Prior to installing VE wells a study will be completed to determine the appropriate well spacing for the project. In general it is anticipated that 4 extraction wells will be sufficient to effectively treat the identified area of TPH impacts (to be verified by the study). Each well will be drilled to approximately 44 feet bgs, with 2 inch VE wells installed at each location. Perforated pipe would be placed from 20 feet bgs to the total depth of the well. Wells will be connected to the SVE treatment system via underground piping.

A SVE treatment system will be placed onsite, within a designated treatment compound. The placement of the treatment compound will be such that it will not interfere with the anticipated future Site operations. The compound will meet all applicable regulations and codes for the installation of such systems, and will be placed to maximize remedial activities.

The SVE system will be monitored on a quarterly basis and a quarterly monitoring report provided to the Fire Department. Monitoring will include the sampling of inlet and outlet concentrations for soil vapors within the system. As the system reaches asymptotic conditions, the Fire Department will be notified. A vapor rebound test may be run to verify site conditions. If the vapor rebound test indicates that remediation has been completed, a soil confirmation sampling plan will be produced and forwarded to the Fire Department outlining the site confirmation sampling protocol.

Upon acceptance and approval of the Fire Department of the soil confirmation sampling plan onsite sampling of the soil conditions existing post remediation will be completed. If post remediation sampling proves COCs of concern have been reduced to acceptable concentrations, a request for site closure will be forwarded to the Fire Department. Confirmation soil samples associated with the SVE system will include the following analytical:

- EPA Method 8015 M Gasoline
- EPA Method 8015 M (C13-C32+)
- EPA Method 8260 for VOCs

7.10 CLOSURE DOCUMENTS

The proposed project addresses two distinct elements of the RAs. The first involves the excavations of shallow soils and subsequent haul off for disposal while the second involves the in situ treatment of deeper TPH impacted soils. A project Remedial Action Completion Report will be prepared for each of the distinct RAs within 60 days of completion of the RAs. These reports will provide all documentation related to the respective RAs.

The Completion Reports will request the respective project closure and a request for No Further Action. The reports will contain all appropriate documentation, including sampling and analysis, manifests, system design, site conditions encountered, final conditions encountered, etc., in sufficient detail to provide the Fire Department with sufficient data for Closure of the respective areas of the Site.

8.0 PROJECT SCHEDULE

The scheduled start date for initiating the proposed remedial activities is not known at this time. The proposed Project is subject to an environmental review process by the City consistent with CEQA and a ballot measure, the exact timing of which are not known.

Upon completion of the environmental review process by the City, review of community and agency comments, and discussions with the Fire Department, a final RAP will be prepared for the proposed Project. Included with the final RAP submittal will be a detailed project timeline.

9.0 REFERENCES

Arch Beach Consulting *E&B Oil Development Project Traffic Impact Analysis, 2012*

ASTM, 2008. Standard Guide for Risk-Based Corrective Action. ASTM Method E 2081-00, April 10, 2000.

Brycon, LLC, (2012) *Phase I Environmental Site Assessment: City of Hermosa Beach Maintenance Yard.* 6/15/12

Brycon, LLC, (2012) *Phase II Environmental Site Assessment: City of Hermosa Beach Maintenance Yard.* 8/30/12

California Well Standards Bulletin 74-81

California Laws for Water Wells, Monitoring Wells, Cathodic Protection Wells, and Geothermal Heat Exchange Wells, State of California, Department of Water Resources, Division of Planning and Local Assistance, dated March 2003

California Regional Water Quality Control Board, 1996, Interim Site Assessment & Cleanup Guidebook Los Angels and Ventura Counties, Region 4, May 1996.

California Department of Water Resources. *Water Data Library Homepage* http://www.water.ca.gov/waterdatalibrary/

Department of Water Resources (DWR), *Planned Utilization of Ground Water Basins of the Coastal Plain of Los Angeles County*, Appendix A (April 1988)

Division of Oil, Gas & Geothermal Resources-DOGGR Home Page, State of California Department of Conservation, http://maps.conservation.ca.gov/doms/index.html.

Environmental Protection Agency, Region 9, Regional Screening Levels. EPA Website: **www.epa.gov/region9/superfund/prg/** updated May 2012

ENTRIX, Inc. (1994), *Environmental Assessment: Hermosa Beach Maintenance Facility Site and Project Drill Site*

ENTRIX, Inc. (1995), *Subsurface Investigation: Hermosa Beach Maintenance Facility Site and Project Drill Site*

GEO-CAL, INC. (1998), *Environmental Closure Report for the Removal of Underground Storage Tank (UST) at City of Hermosa Beach-City Yard*

GeoResearch, (1989), *Tank Closure Report for 555 6th Street, Hermosa Beach, CA*

NMG Geotechnical, Inc., *Geotechnical Exploration and Design Report for the Proposed E&B Oil Development Project at 555 6th Street, City of Hermosa Beach, CA,* October 2012

Poland, J.F., Piper A.M., et al., 1956, *Ground Water Geology of the Coastal Zone*, Long Beach-Santa Ana Area, California: United States Geological Survey Water Supply Paper 1109, 162 p.

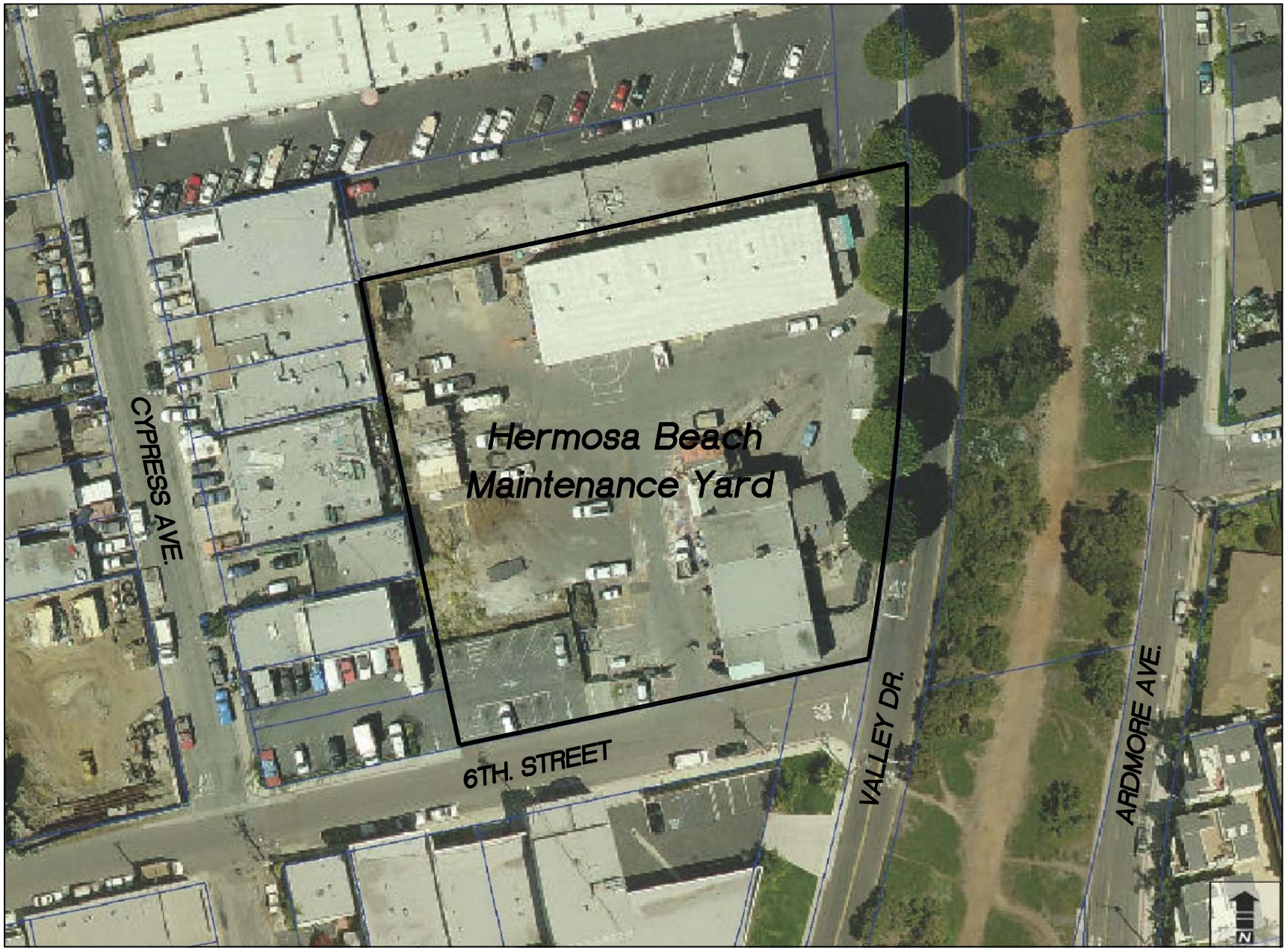
Poland, J.F., 1959, *Hydrology of the Long Beach-Santa Ana Area*, California: United States Geological Survey Water Supply Paper 1471, 257p.

LEGEND
SITE BOUNDARY

NORTH

VICINITY MAP	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 1



SITE MAP	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.:	DRAWN BY:
G. B. PASPALOF	M. T. WILSON

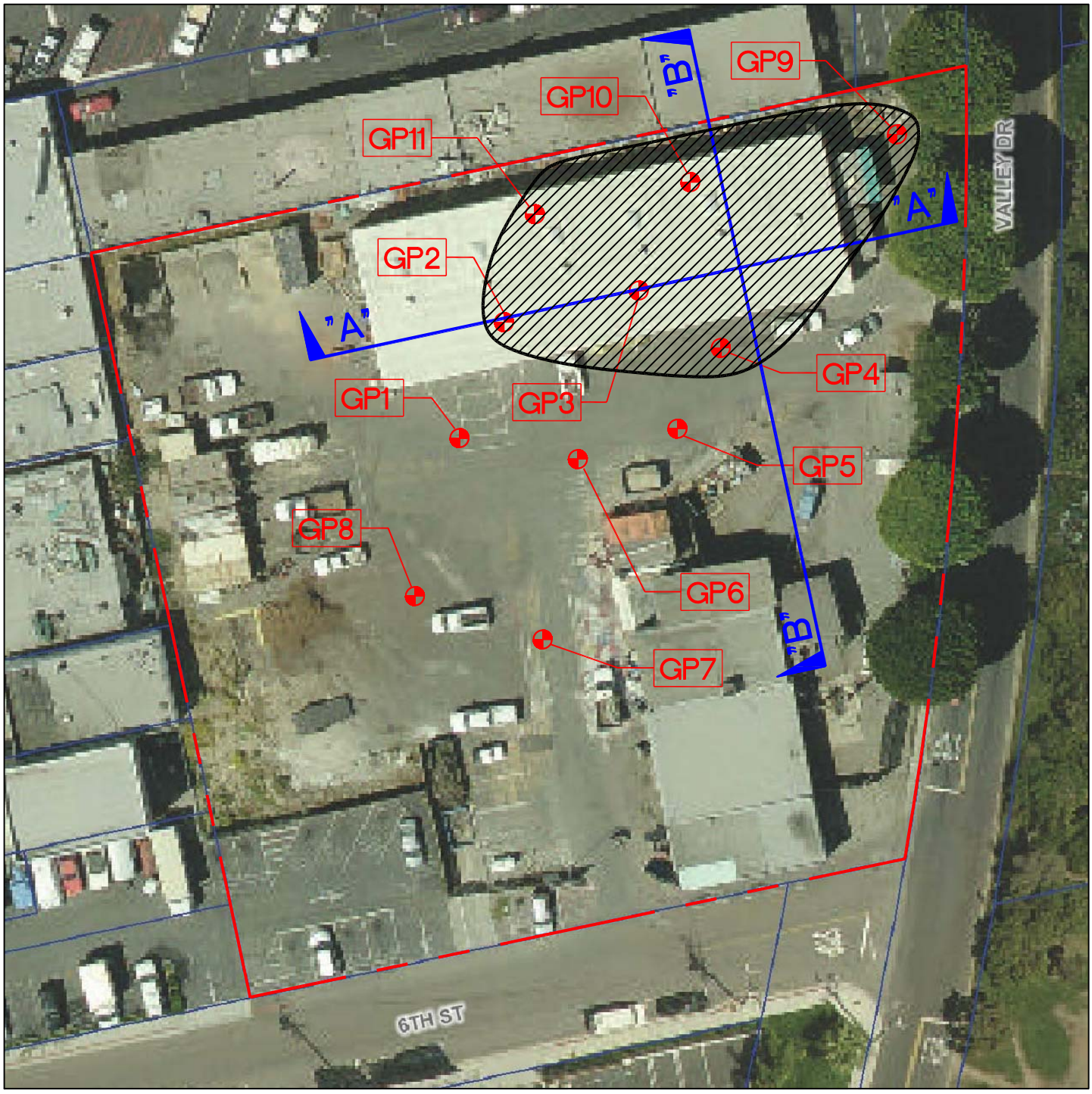
FIGURE NO. 2

LEGEND	
	SITE BOUNDARY
	BRYCON, INC. GEOPROBE BORING LOCATION
	BRYCON, INC. SURFACE SAMPLE LOCATION
	ENTRIX, INC. – 1995 BORING LOCATIONS

NORTH

ESA BORING LOCATIONS	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 2-1

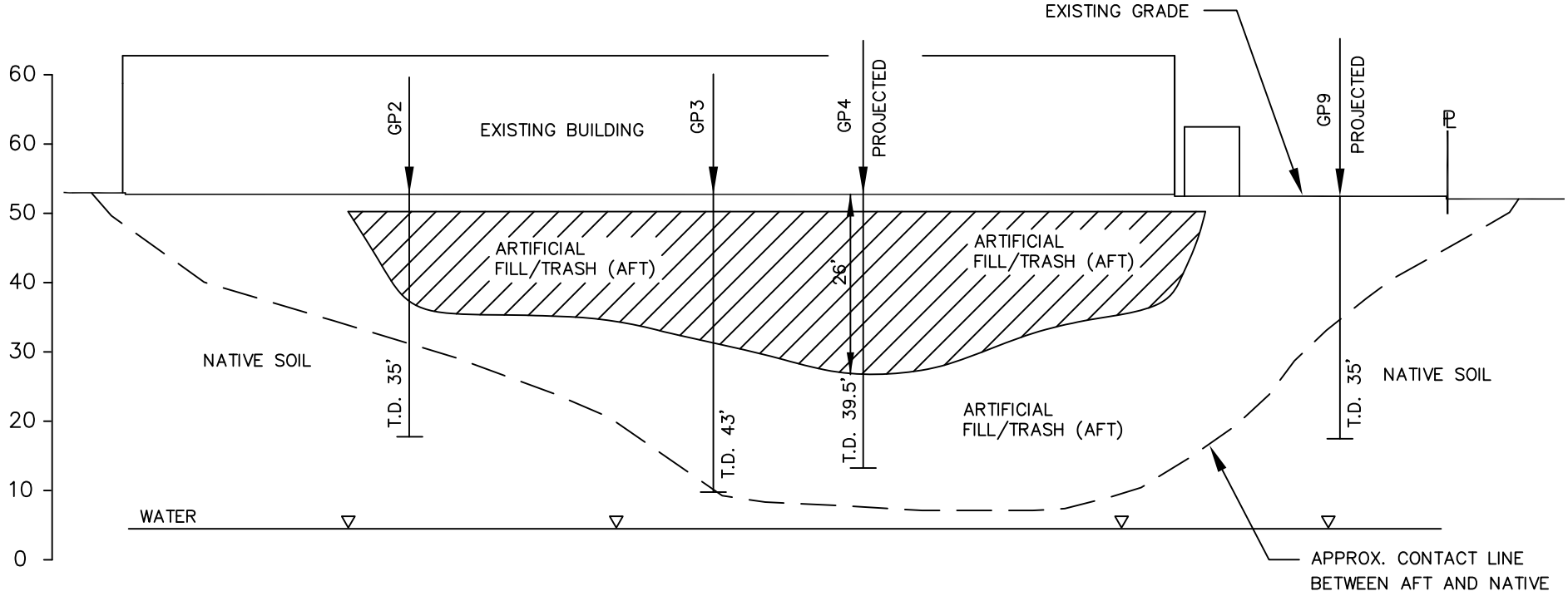


LEGEND	
	SITE BOUNDARY
	BRYCON, INC. GEOPROBE BORING LOCATION
	LEAD IN SOIL EXCEEDING GUIDELINE LIMITS

NORTH

LEAD LATERAL CONTOUR	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 3-1

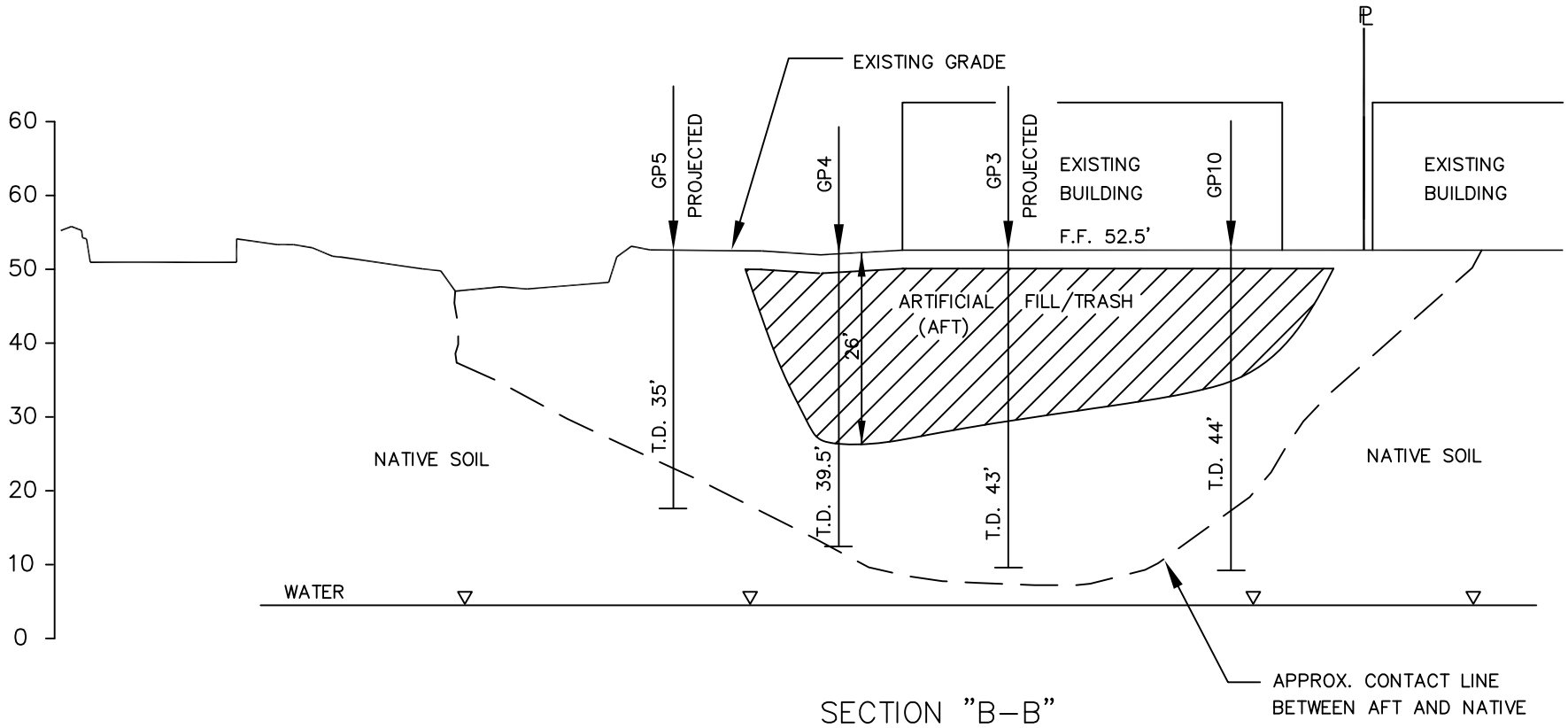


SECTION "A–A"

LEGEND
LEAD IN SOIL EXCEEDING GUIDELINE LIMITS

LEAD – CROSS–SECTION "A–A"	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 3-2

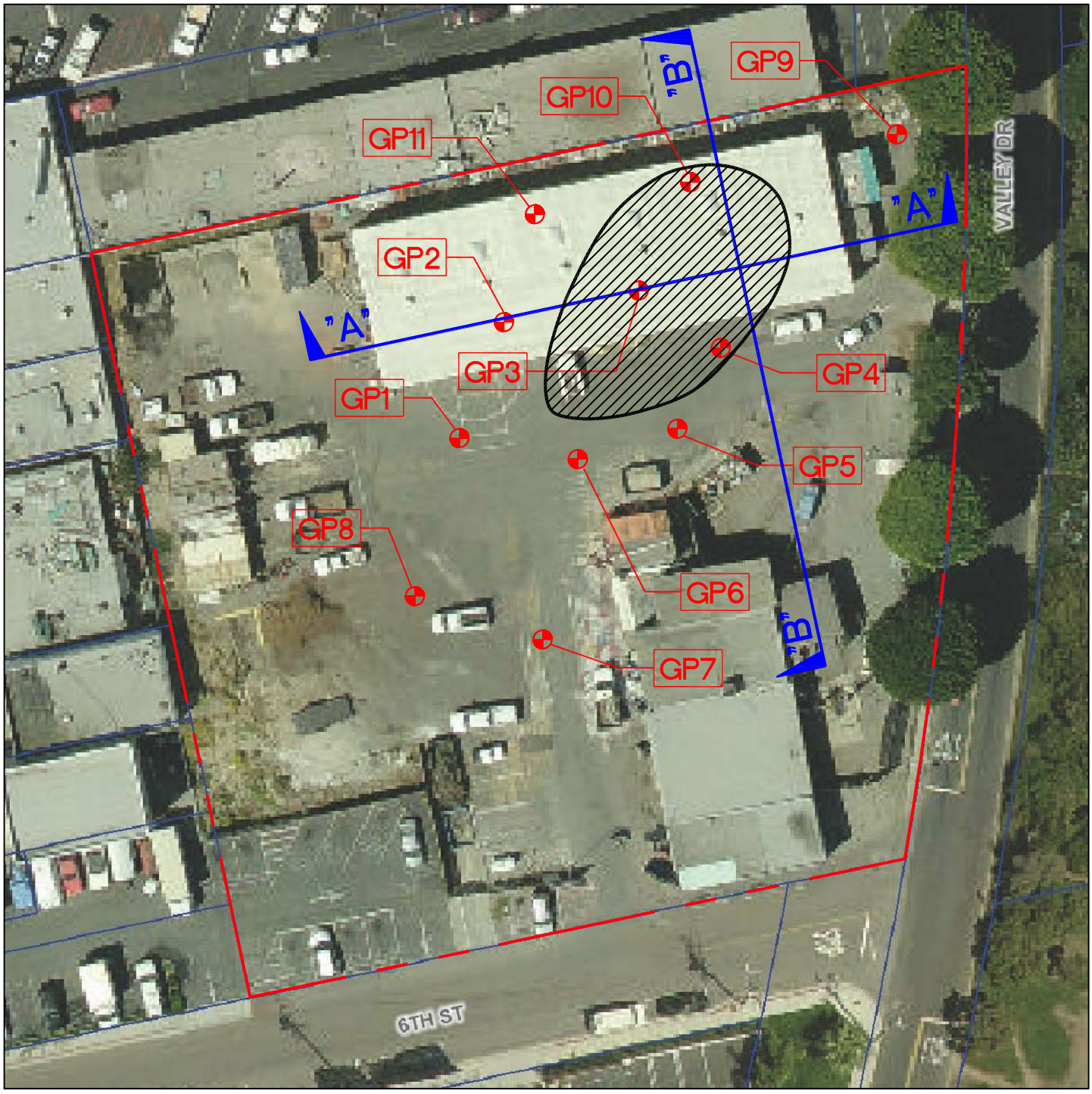


SECTION "B–B"

LEGEND
LEAD IN SOIL EXCEEDING GUIDELINE LIMITS

LEAD – CROSS–SECTION "B–B"	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 3-3

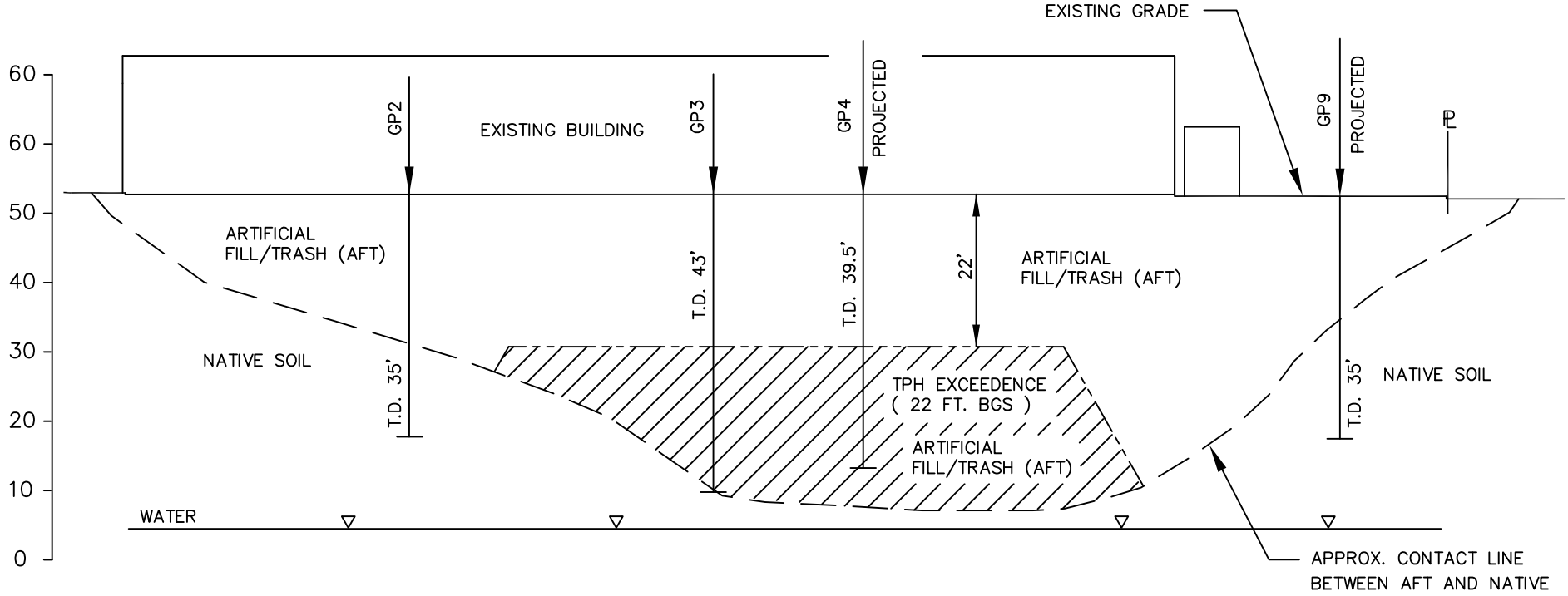


LEGEND	
	SITE BOUNDARY
	BRYCON, INC. GEOPROBE BORING LOCATION
	TPH IN SOIL EXCEEDING GUIDELINE LIMITS

NORTH

TPH LATERAL CONTOUR	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 3-4

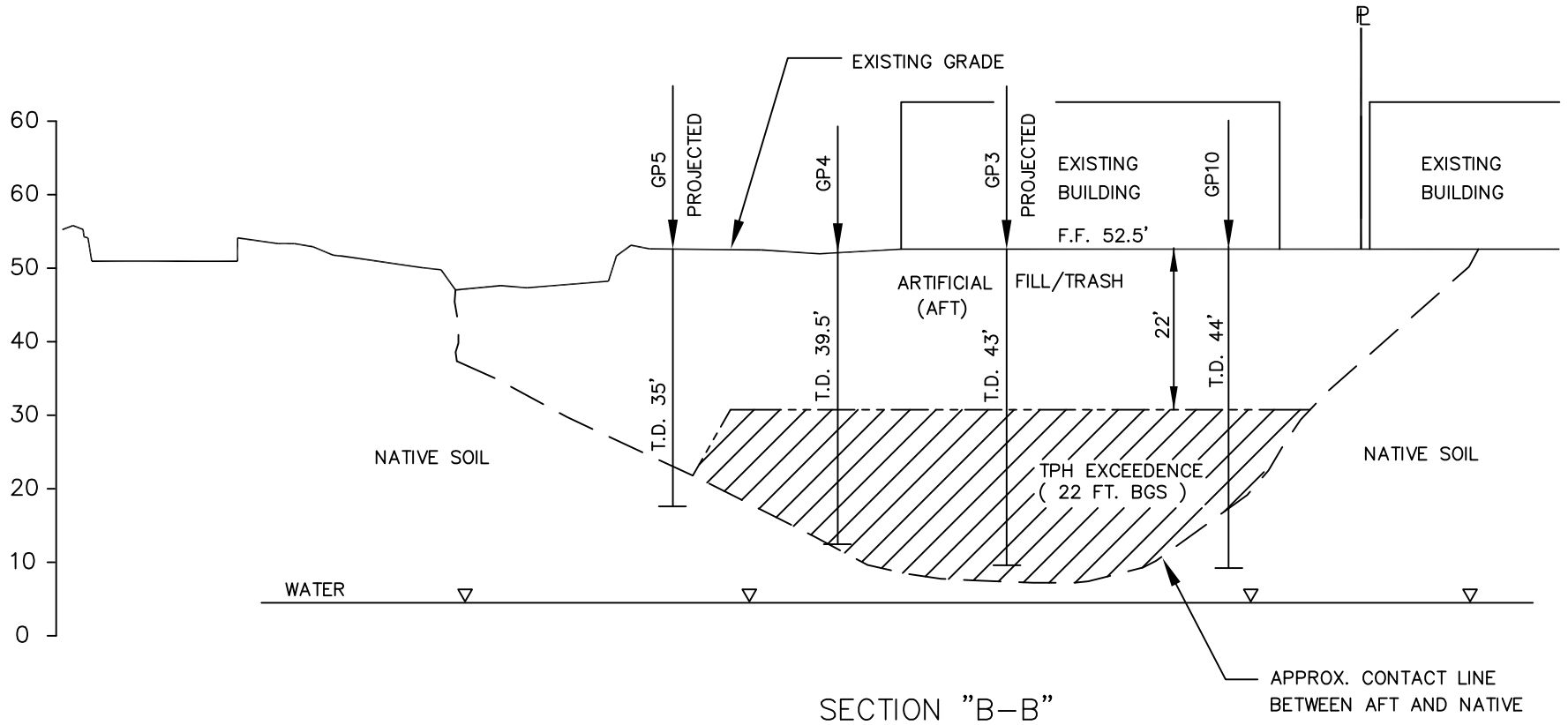


SECTION "A–A"

LEGEND
TPH IN SOIL EXCEEDING GUIDELINE LIMITS

TPH – CROSS–SECTION "A–A"	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 3-5



SECTION "B–B"

LEGEND
TPH IN SOIL EXCEEDING GUIDELINE LIMITS

TPH – CROSS–SECTION "B–B"	
555 6th. STREET, HERMOSA BEACH	
HERMOSA BEACH MAINTENANCE FACILITY	
E & B RESOURCES MANAGEMENT GROUP	
PROJECT MGR.: G. B. PASPALOF	DRAWN BY: M. T. WILSON

FIGURE NO. 3-6

APPENDIX A

CLOSURE LETTERS

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (818) 458-5100

THOMAS A. TIDEMANSON, Director

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

April 10, 1989

IN REPLY PLEASE
REFER TO FILE
I-11582 2V
I-11552

City of Hermosa Beach
1315 Valley Drive
Hermosa Beach, CA 90254

HAZARDOUS MATERIALS UNDERGROUND STORAGE
CLOSURE PERMIT NO. 3851B
FACILITY LOCATION: 555 6th Street

This office has reviewed the soil/groundwater assessment report submitted on March 20, 1989 required as a part of the subject closure procedure. Based on the information submitted, we find that:

[x] The closure is final and no further action is required.

[ ] The soils removed during the tank excavation are unrestricted and may be used as backfill material. The closure is final and no further action is required.

[ ] Excavated soils may be a hazardous waste and are not suitable for fill material or disposal on-site. Contaminated soils must be manifested, transported and disposed of pursuant to Chapter 6.5, California Health and Safety Code, unless evidence is presented indicating that disposal is proper at a less restricted facility. Copies of completed manifests or other appropriate evidence indicating legal disposal shall be submitted to this office before this project can be considered closed.

[ ] The permanent closure of the tank(s) in place shall comply with requirements set by the local Fire Department. Verification must be submitted to this office indicating proper closure and completion of all work.

If you have any questions concerning this matter, please contact John Huff at (818) 458-3510.

Very truly yours,

T. A. TIDEMANSON
Director of Public Works

By Nicole Long
Waste Management Division

cc: Georesearch

CL204 Rev. 3/88

File

COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100

HARRY W. STONE, Director

ADDRESS ALL CORRESPONDENCE TO
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

IN REPLY PLEASE
REFER TO FILE: EP-1
011507-011552

January 13, 1999

Mr. Amy Amirani
Director of Public Works
City of Hermosa Beach
1315 Valley Dr.
Hermosa Beach, CA 90254

Dear Mr. Amirani:

HAZARDOUS MATERIALS UNDERGROUND STORAGE
CLOSURE CERTIFICATION
FACILITY LOCATION: 555 6TH ST., HERMOSA BEACH
CLOSURE APPLICATION NUMBER 229101

This office has reviewed the final closure report dated November 10, 1998, required as a part of the subject closure permit. Based on the information submitted, we find that all closure requirements have been completed. With the provision that the information provided to this agency was accurate and representative of existing conditions, it is our position that no further action is required at this time.

Please be advised that this letter does not relieve you of any liability under the California Health and Safety Code or Water Code for past, present, or future operations at this site. Nor does it relieve you of the responsibility to clean up existing, additional, or previously unidentified conditions at the site which cause or threaten to cause pollution or nuisance or otherwise pose a threat to water quality or public health.

Additionally, be advised that changes in the present or proposed use of the site may require further site characterization and mitigation activity. It is the property owner's responsibility to notify this agency of any changes in report content, future contamination findings, or site usage.

If you have any questions regarding this matter, please contact Mr. John Awujo of this office at (626) 458-3507, Monday through Thursday, 7:00 a.m. to 5:30 p.m.

Very truly yours,

HARRY W. STONE
Director of Public Works

CARL W. SJOBERG
Chief, Industrial Waste Planning & Control
Environmental Programs Division

JA:nh
MIC11\AMIRANI
C245896

cc: California Regional Water Quality Control Board (Dave Bachrowski)

bc: Materials Engineering (Shuttleworth)