PHASE II SITE ASSESSMENT REPORT

Alameda Street Widening Project
Anaheim Street to Harry Bridges Blvd.
South Segment
Wilmington, California

October 17, 2014

Prepared for:

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PHASE II SITE ASSESSMENT

ALAMEDA STREET WIDENING PROJECT
FROM ANAHEIM STREET TO HARRY BRIDGES BOULEVARD
SOUTH SEGMENT
WILMINGTON, CALIFORNIA

SOIL INVESTIGATION FOR ROAD CONSTRUCTION

Pinnacle Environmental Technologies has prepared this Phase II Site Assessment for the above subject site. This site investigation was conducted using methods and professional experience consistent with the standard for the industry. The observations, interpretations and recommendations produced by this assessment are based on conditions that exist at the time the study is conducted. These interpretations are based upon Pinnacle's field observations, analytical results and specific field conditions.

PINNACLE ENVIRONMENTAL TECHNOLOGIES

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Principal	Principal
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EXECUTIVE SUMMARY

This report summarizes the field procedures and observations, laboratory analytical procedures and results, and conclusions of a Phase II Site Investigation completed by Pinnacle Environmental Technologies (Pinnacle) along a narrow strip of land east side of Alameda Street between Harry Bridges Boulevard and Anaheim Street in Wilmington, California. The City of Los Angeles intends to use the land for widening Alameda Street.

- Twenty-one soil borings were advanced by hand auger to depths of 5 feet bgs. One other boring encountered refusal after collecting a sample at 0.5-feet bgs. One pit was advanced to a depth of three feet.

- Sixty-four soil samples were collected from the soil borings at depths of 0.5, 2.5 and 5.0 feet bgs. The samples at 2.5 feet were prepared for VOC analysis in accordance with EPA Method 5035. Two soil samples were collected from the pit.

- Selected samples were analyzed for TRPH using EPA Method 418.1, TPH using EPA Method 8105M, VOCs using EPA Method 8260B, SVOCs using EPA Method 8270C, PCBs using EPA Method 8082, OCPs using EPA Method 8081, Herbicides using EPA Method 8158A, and CAM Metals. The single sample with detectable volatile hydrocarbon vapors in a field screening sample was analyzed for volatile organic compounds and fuel oxygenates using EPA Method 8260B.

- Saturated conditions were not encountered in any of the boreholes so no groundwater samples were able to be collected for analysis.

- VOCs, PCBs, OCPs and herbicides were not detected in the analyzed soil samples. One sample contained two SVOCs analytes.

- Petroleum hydrocarbons, as defined by EPA Method 418.1 analyses, were detected at all 22 boring locations. These hydrocarbons were typically heavy-end hydrocarbons with no detectable SVOCs or VOCs.

- Petroleum hydrocarbon concentrations exceeded a typical action level of 1,000 mg/kg at 13 of the 22 boring locations. The highest petroleum hydrocarbon concentrations and the highest frequency of petroleum hydrocarbon-impacted soil were at the 0.5-

foot interval. Based on these results and at this action level, soils along approximately 60 percent of the alignment (4,100 cubic yards) exceed the action level and should be removed from the Site during road construction.

- Soluble lead concentrations exceeding the State regulatory limit were identified at four non-contiguous locations. The lateral extent of these soils along the alignment, which are regarded as California hazardous waste based on these results, is not known. However, if a lateral distance on the alignment of 20 feet from each location is anticipated and an average depth of 2.5 feet is given, approximately 250 cubic yards of lead-impacted soil is present.

Pinnacle has generated the following conclusions from the site investigation completed at the easement.

- Groundwater was not encountered in the borings, and is not expected to be reached during construction at depths of up to 5 feet bgs.

- Material to be uncovered at four non-continuous locations along the alignment will contain a sufficient concentration of soluble lead to be regarded as hazardous. The volume of this material can not be determined since its lateral extent from the four locations is unknown.

- While petroleum hydrocarbons were detected at each boring location, not all of the hydrocarbon was above typical action levels requiring transport and disposal. Most of the hydrocarbon above this level was confined to the upper 2.5 feet of material. The hydrocarbon was typically heavy-end, and did not contain VOCs or SVOCs. An estimated 60 percent of the material to 2.5 feet will require transport and disposal due to petroleum hydrocarbons at an action level of 1,000 mg/kg.

1.0 INTRODUCTION

This report documents the scope of work, field procedures and observations, laboratory methods and results, and conclusions of a site investigation completed by Pinnacle Environmental Technologies (Pinnacle) of a strip comprised of numerous parcels of properties along the east curbline of Alameda Street, between Harry Bridges Boulevard and Anaheim Street in Wilmington, California (Figure 1). The property is currently owned by the City of Los Angeles and is intended for use in widening Alameda Street to the east. This investigation was conducted on behalf of the Geotechnical Engineering Group, Bureau of Engineering, Department of Public Works of the City of Los Angeles (GEO).

The purpose of this investigation was to assess suspected impacts to soil and groundwater (if encountered) along the alignment, as identified by a Phase I Environmental Site Assessment Report prepared by Pinnacle, dated April 2, 2014. The information produced by this investigation will allow GEO to anticipate the presence of impacted soil along the alignment, for construction planning and budgetary purposes.

2.0 BACKGROUND

2.1 Site Setting

The Site is defined as a narrow alignment that follows the current east curb line of Alameda Street, from the southeast corner of Alameda and Anaheim Street, south to the intersection of Alameda Street with Harry Bridges Boulevard. It is approximately 5,000 feet long, with a 5- to 17-foot width of investigation, as defined by the City of Los Angeles. The alignment includes portions of 20 parcels listed in Table 1 of Pinnacle's Phase I report.

Alameda Street is located immediately west of the alignment. It has two asphalt-paved lanes in both north and south directions, separated by a single center auxiliary lane. A concrete area near the southern end of the alignment, on the west side of Alameda Street, is used as a truck check area. There is no sidewalk on the west side of Alameda Street in the area of the alignment. Instead, there is a berm that is approximately 15 to 40 feet wide. It is covered with cut grass, low foliage and mature palm trees. A Union Pacific rail line is located west of the berm. It separates the berm from industrial properties farther to the west. The berm and rail line parallel Alameda Street the length of the alignment. The rail line crosses Alameda Street at the southern end of the alignment, where Alameda Street becomes Harry Bridges Boulevard.

There are no sensitive receptors (public buildings, other schools, parks, hospitals, convalescent homes, and churches) located within 0.25 miles of the Site.

The closest major highways to the subject site are State Highway 47 (the Terminal Island Freeway), which is 0.5 miles southeast of the southern end of the Site, and Interstate 710 (the Seaside Freeway and extension to the Long Beach Freeway), which is 1.25 miles south of the southern end of the Site. Interstate 110 (the Harbor Freeway) is located 1.4 miles west of the southern end of the Site.

The Wilmington area of Los Angeles is immediately north of the Los Angeles Harbor. The closest named or significant flowing water body to the Site is the Dominguez Channel, an engineered channel for flood control that extends from Hawthorne to the Consolidated Slip Marinas. The Marinas, the closest element of the Port of Los Angeles to the alignment, is located 1,000 feet southeast of the Site (Figure 2).

A newer concrete sidewalk or asphalt pavement was present along most of the east curb line while Pinnacle was producing their Phase I report. Much of the asphalt pavement present during the Phase I work has been removed and replaced by a gravelly fill during subsequent construction. The gravelly sand fill on the north end was recently placed after removal of a block wall. Other than power/telephone poles, street light poles and what appeared to be fire water piping in two locations, no other structures are currently located on the alignment.

Construction of an expanded Pacific Harbor Lines (PHL) railyard has recently been completed from Harry Bridges Boulevard to a point approximately 700 feet south from Anaheim Street. The northernmost 700 feet of the Site is bounded by the recently completed construction for a new International Longshore and Warehouse Union (ILWU) Dispatch Hall and a related parking area.

The northernmost point on the Site is at an elevation of approximately 11 feet above mean sea level (MSL). The topography in the vicinity of the Site slopes gently and consistently to the east-southeast, toward the flood channel and Port of Los Angeles

(Figure 1). Since the Site is at the margin of a low-lying swampy area prior to development as the Port, it is possible that at least the southern portion the alignment has been modified by fill to produce the current topography. Additional fill has been applied more recently to raise the grade of the PHL railyard adjacent to the southern portion of the alignment.

2.2 Geology and Hydrology

The alignment is located on the southern margin of the Los Angeles Coastal Plain of the Peninsular Ranges geomorphic province, in Los Angeles County, California. The Los Angeles Coastal Plain is a structural trough filled with unconsolidated sediments of Miocene through Recent age. These sediments have been transported from local mountains by the Los Angeles River and smaller drainages.

Local soil sampling has identified shallow soils consisting of artificial fills and laterally discontinuous interbeds of alluvial sediments ranging from clays to well-sorted sands. These sediments are underlain by the Holocene-age near-shore deposits, consisting of unconsolidated marine, estuarine and beach sediments: well-sorted sand, sandy silt, silt, clay and minor gravel.

The Site is within the Wilmington Oil Field, which was first recognized as a broad anticline that plunged to the northwest. The axis of the Wilmington Anticline passes directly under the Site. Subsequent investigations have identified a series of transform faults that divide the field into separate blocks. Oilfield production resulted in up to 29 feet of subsidence within the Wilmington Oilfield by the late 1950's, and one of the first documented incidences of oil production-related seismicity. The subsidence was halted by the injection of oilfield brines.

The nearest known major fault to the Site is the Palos Verdes Fault, a system of right-lateral strike-slip faults that are parallel to sub-parallel to the axis of the Wilmington Anticline. The most recent surface rupture along this fault was in the Holocene offshore, but Late Quaternary onshore. Earthquakes along this zone have a maximum probable magnitude of between 6.0 and 7.0. The southernmost point on the alignment is 1.7 miles northeast of the Palos Verdes Fault. The Thums-Huntington Beach Fault extends to the east-southeast from this point on the Palos Verdes Fault.

The faults grouped into the Newport-Inglewood Fault Zone (NIFZ) are the nearest known active faults to the Site. The NIFZ is 4.3 miles northeast of the Site at its closest point. Most of the faults of the NIFZ in the area have been well characterized by geophysical studies and have produced a set of linear anticlinal hills that are commonly related to producing oil fields. A graben is located between the NIFZ and the Palos Verdes Fault. The Thums-Huntington Beach Fault generally follows the axis of this graben in the Wilmington/Long Beach area

The Site is located in the southern margin of the West Coast Basin. This subbasin is bounded on the east by the NIFZ, on the north by the Ballona Escarpment, and on the south and west by the Pacific Ocean. Throughout the West Coast Basin, groundwater occurs in Holocene-age Pleistocene-age and Pliocene-age sediments, beginning at relatively shallow depths. Throughout much of the subbasin, the shallowest groundwater, found in the Semi-perched aquifer, is unconfined. Due to relatively limited replenishment of these aquifers versus pumping, seawater intrusion has occurred near the coast. Injection wells have been installed north of the Site from the Los Angeles International Airport to the Palos Verdes Hills, and nearest to the Site in the Dominguez Gap. Groundwater pumping into these wells produces groundwater mounding that prevents further saltwater intrusion. Recent site investigations performed in the vicinity of the Site have shown that static groundwater levels occur at approximately 3 to 11 feet below ground surface (bgs). Groundwater in the Site vicinity flows to the south to south-southeast.

The EDR Radius Map Report provided in Pinnacle's Phase I Report identified 21 groundwater wells within one mile of the Site. All of the wells identified in the Phase I Report are regarded as active monitoring wells for verifying water level.

Groundwater well information was also researched at the following locations:

- United States Geological Survey (USGS) Waterdata database
- Los Angeles County Department of Public Works (LACDPW)
- California Department of Water Resources (DWR) California Statewide Groundwater Elevation Monitoring System (CASGEM)

No additional wells within one mile of the Site were identified on the Waterdata and CASGEM databases. The LACDPW database contained information on 32 additional inactive water wells within 0.5 miles of the Site. The latest measurement from these wells ranged from 1929 to 2008. The majority of the wells were west and north of the alignment. Several of the inactive wells were nested at single locations.

Depth to groundwater data available from these wells generally supports a wide range of depths to water based on monitoring date and the distance from the channel. Since the completion data for most of these wells is not available, it is not certain what aquifer(s) they are screened in. However, those wells with known completion depths were generally deeper wells that had consistently greater depths to groundwater, regardless of the date of monitoring. The inactive wells identified by the Los Angeles County database had shallow groundwater levels, indicative of the water table aquifer in the area. Groundwater levels in these wells were as shallow as 1.80 feet in a well nearest the Channel. Many other wells had a latest groundwater depth measurement of less than 10 feet bgs. Reports of assessments performed on properties contiguous to the alignment show that groundwater at the southern end of the alignment is tidally influenced.

2.3 Previous Investigation

Nine geotechnical borings were advanced along Alameda Street by the City of Los Angeles – Standards Division using a Geoprobe drill rig. They were located along the length of the alignment. Each boring was sampled continuously to a depth of 10 feet bgs. Groundwater was encountered at the five southernmost boreholes. One boring in the northern portion of the alignment encountered petroleum hydrocarbon-impacted soil that was confirmed by laboratory analysis. A second boring in the southern portion of the alignment had slight organic odors.

3.0 SITE INVESTIGATION ACTIVITIES

Pinnacle conducted soil sampling and analysis to assess whether past activities along the alignment resulted in environmental impairments. Preparations were also made to collect groundwater for analysis, but groundwater was not encountered.

3.1 Identification of Contaminants of Concern

Pinnacle's Phase I Assessment identified a variety of historical land uses along the alignment. No pits intended for solid waste disposal were observed on or near the alignment during the Phase I site visits. The widespread use of the alignment and adjacent property for past oil production indicated possible excavation of various pits for local containment and/or disposal of brines, cuttings, drilling mud and other wastes, as well as the potential release of crude oil during drilling, transport and storage. Aerial photographs showed chaotic surfaces along the alignment and to the east, suggesting the random dumping and piling of wastes.

The clusters of tanks observed in the area of the historical wells were likely used for produced oil. Brines produced during oil well pumping were typically not stored for removal. Instead, they were used to produce steam for injection, and for use in boilers to produce energy to power equipment. Most of the brine pumped after the 1930's was injected into the subsurface, usually in a manner to control or enhance flow of oil. Releases of brine would not be unusual, especially prior to the time when environmental regulations became common. In additional to being high in salts, oilfield brines are typically high in a variety of metals, such as barium, cadmium, chromium, lead, selenium, silver and zinc. Releases of these brines into unlined pits or onto open ground may have resulted in elevated concentrations of metals in soils.

The property east of the northern portion of the alignment was used to warehouse and ship lumber. It is not known if this lumber was also treated on the property prior to storage. None of the descriptions of structures on available Sanborn maps indicated this type of purpose. However, it is reasonable that creosote-preserved wood would have had a common local use as railroad ties and marine and foundation piling, and that it was preserved and warehoused at this location.

Based on this varied industrial Site history, Pinnacle and GEO elected to analyze soil samples for a wide variety of potential contaminants. These included the following compounds.

- Total Recoverable Petroleum Hydrocarbons (TRPH)
- Total Petroleum Hydrocarbons with carbon chain breakdown (TPH)
- Volatile organic compounds and Fuel Oxygenates (VOCs)
- Semi-volatile organic compounds (SVOCs)
- California Assessment Metals (CAM Metals)
- Polychlorinated Biphenyls (PCBs)
- Organochlorine Pesticides (OCPs)
- Chlorinated Herbicides

3.2 Soil Sample Collection

GEO elected to focus the investigation on those locations where oilfield activity was conducted. This included oil wells or tank clusters that were on or near the alignment. A total of 22 soil boring locations and one pit location were selected for field access verification. USAlert was notified prior to soil sampling. Each of the locations was in an unpaved area, so concrete/asphalt coring or cutting was not required (Appendix A).

Soil sample collection activities were conducted by Pinnacle personnel on July 30 and 31, 2014. Two soil samples were collected from the pit. Soil samples were collected at 0.5, 2.5 and 5.0 feet below ground surface (bgs) at each boring location except PB-1, where refusal in gravels was encountered at a depth of 1.5 feet bgs. The samples were collected in stainless steel sleeves using a hand auger that was decontaminated between borings. The samples from 2.5 feet bgs were also prepared for VOC analysis in accordance with EPA Method 5035 using Encore samplers. Two EnCore samplers were collected at each 2.5-foot sample interval. Each EnCore sampler was labeled and sealed in the foil bag in which they were shipped. The bag was placed with the other samples in an ice chest cooled with Blue-Ice for transport to a California state-certified environmental laboratory for analysis. A total of 66 soil samples were collected from the soil boring locations and pit location. The soil boring locations were designated PB-1 through PB-22 (Figure 3). The boreholes were backfilled with cuttings.

Soils were classified using the Unified Soil Classification System (ASTM D-2487). Boring logs were prepared for each boring. A split of each sample interval was monitored for the presence of volatile organic vapors using a calibrated PhotoVac Model 2020 Photo-ionization detector and an LEL meter. Results of field headspace screening for volatile organic vapors were low or below the detection limits of the instrument in all samples. There were no detections using the LEL meter. Several borings in the southern portion of the alignment showed soils at depth that were dark gray to black in color. These samples typically had an organic odor. This dark material may have been organic-rich hydraulic fill dredged from the nearby channel.

Appendix A contains the general field procedures and chain-of-custody protocol used by Pinnacle. Appendix B presents the soil boring logs, soil classification results, and field soil monitoring results.

3.3 Soil Sample Analytical Methods

The soil samples collected by Pinnacle were delivered under proper chain-of-custody protocol to C&E Laboratories in Cerritos, California for analysis. Table 1 provides information on the analytical methods used and the number of samples analyzed using each method.

Groundwater was not encountered, thus no samples were collected.

3.4 Soil Sample Analytical Results

Total Recoverable Petroleum Hydrocarbons

Each of the soil samples was analyzed for TRPH (Table 2). A total of 44 of the 64 soil boring samples had detectable concentrations of TRPH. The results ranged from 18 to 13,574 milligrams per kilograms (mg/kg). The shallowest samples had the highest frequency of detectable TRPH and the highest average TRPH (Table 3).

- 0.5 foot samples – 20 of 22 samples with detectable TRPH, average 2,346 mg/kg
- 2.5 foot samples – 17 of 21 samples with detectable TRPH, average 1,727 mg/kg
- 5.0 foot samples – 7 of 21 samples with detectable TRPH, average 365 mg/kg

Total Petroleum Hydrocarbons

Pinnacle selected the 15 soil samples with the highest TRPH for a full scan analysis of TPH. Ten of the samples were collected at 0.5 feet bgs. Five of the samples were collected at 2.5 feet bgs. None of the analyzed soil samples were collected at 5 feet bgs, indicating that the most petroleum-impacted soil samples were found at the surface. The analytical results were divided into three carbon-chain ranges, which are most commonly represented by the petroleum hydrocarbon products gasoline (C4-C12), diesel (C13-C22) and oil (C23-C41) ranges. Detections within these ranges does not necessarily indicate the release of one of these particular products to soil.

Each of the analyzed samples contained TPH in the oil range (Table 3). The TPH-Oil results varied from 109 mg/kg in sample PB12-2.5 to 2,888 mg/kg in sample PB11-2.5. One other TPH-Oil result was above 1,000 mg/kg: 1,588 mg/kg TPH-Oil was detected in sample PB13-0.5. The highest two TPH-Oil results coincided with the two highest TRPH results. However, the correlation between TRPH and TPH-oil results at lower concentrations was not significant.

No diesel-range TPH was detected in the soil samples. One soil sample contained a detectable concentration of TPH-Gasoline. This sample, TPH11-2.5 with 0.5 mg/kg TPH-Gasoline, also contained the highest TRPH and TPH-Oil concentrations.

Semi-Volatile Organic Compounds

Pinnacle selected the 12 soil samples with the highest TRPH for SVOC analysis. One of the samples contained two compounds reported in this list. Fluoranthene [13,154 micrograms per kilogram (ug/kg)] and 15,632 ug/kg of Pyrene were detected in sample PB10-05 (Table 4). This sample had the fourth highest TRPH result, and a detectable concentration of TPH-Oil.

Volatile Organic Compounds and Fuel Oxygenates

No VOCs or fuel oxygenates were detected in the analyzed soil samples (Tables 5 and 6).

CAM Metals

Each sample was analyzed for CAM Metals. Table provides the results for each metal against their respective Title 23 Total Threshold Limit Concentrations (TTLCs) and 10 times their respective Title 23 Soluble Threshold Limit Concentrations (STLCs). Most metals concentrations show considerable variation. Most of the results for a particular metal are clumped at concentrations typical of a background level for the greater Los Angeles area. However, outliers exist for some metals, with some that are close or above the regulatory action level. These outliers are indicative of an outside source for that particular metal. These less frequent higher concentrations might also be indicative of another source for some of these soils, such as the channel, and their emplacement as hydraulic fill. The ranges of results for each metal are provided in Table 2.

While each metal had high outliers, only the higher lead concentrations exceeded a standard regulatory level. None of the lead results exceeded the TTLC. However, seven samples contained a lead concentration exceeding ten times the STLC. All but one of these samples were collected at 0.5 feet bgs. The other sample was collected at a depth of 2.5 feet bgs at a location where the 0.5-foot sample also had elevated lead.

Seven of these samples were selected for analyses for soluble lead under both the Federal (Toxicity Characteristic Leaching Procedure or TCLP) and State (STLC) guidelines. The result for each analyses was less than 5 mg/L using the TCLP methodology. However, five of the seven samples, collected at four boring locations, had a result greater than 5 mg/L when analyzed under the STLC methodology. Based on these results, the samples and the soils they were collected from are regarded as California hazardous wastes (Table 7).

Organochlorine Pesticides

No OCPs were detected in the analyzed soil samples (Table 8).

Chlorinated Herbicides

No herbicides were detected in the analyzed soil samples (Table 9).

Polychlorinated Biphenyls

No PCBs were detected in the analyzed soil samples (Table 10).

Tables 3 through 10 provide the soil analytical results. Appendix C contains the laboratory analytical reports, laboratory QA/QC documentation, and chain-of-custody records for the collected soil samples.

3.5 Discussion

The TRPH analysis using infrared spectrometry (EPA Method 418.1) provides a quantitation of a broad spectrum of petroleum hydrocarbons, from the lightest and more volatile to the heaviest and most complex and includes large hydrocarbon molecules (greases, resins, asphaltenes and paraffins). Due to the sample preparation technique using this method, it typically underestimates the concentration of volatile organics present in the soil sample. It may also include naturally-occurring organics that may be present in the analytical result, which produces either false positives or an exaggerated result. For this reason, Pinnacle was careful to compare these TRPH results with soil characteristics, some of which suggested the presence of organics in hydraulic fill from the nearby channel, or the presence of other organics.

The analytical results indicate that heavy-end petroleum hydrocarbons are present in shallowest soils along the alignment. These shallow samples were not the black soils that were indicative of naturally-occurring organics. The less frequent, deeper samples containing detectable TRPH may have values indicating the presence of these organics.

Full-Scan TPH analyses were performed in an attempt to identify the types of hydrocarbons detected by the TRPH analyses. The results indicate that virtually all of the hydrocarbon detected by the TRPH analyses is oil-range or heavier (not detectable by the EPA 8015M Method). These results, together with the EPA Method 8260B results, also confirm the virtual absence of volatile petroleum hydrocarbons in these soils. The sample with the highest TRPH value (PB11-2.5, 13,574 mg/kg) also had the highest oil-range TPH concentration (2,888 mg/kg) and the only detectable gasoline-range TPH (0.5 mg/kg). The sample with the third highest TRPH result (PB10-0.5, 5,915 mg/kg) had the only detectable SVOCs. Two SVOCs, Pyrene and Fluoranthene, were detected in this sample. They are typically associated with incomplete combustion of petroleum at low temperatures. Their unique presence at this location indicates that there was some type of combustion occurring at this location along the alignment, likely related to the nearby operation of an oil well and group of oil tanks paralleling Alameda Street.

Pinnacle has typically been required to use an action or clean-up level of 100 to 1,000 mg/kg for TPH-impacted soil. The appropriate level is selected based on the type of petroleum hydrocarbons, and whether the hydrocarbons are naturally-occurring and in place. Heavier hydrocarbons, especially if no SVOCs or other Polynuclear Aromatic Hydrocarbons (PAHs) are present, are mitigated to the higher standard. The hydrocarbons present in the soils along the alignment typify this type of heavier hydrocarbon. Due to the shallow location of these impacted soils, they were likely the result of the release of crude oil or other oils used to during the historical oil-field operations.

A total of 13 of the 22 soil borings had a 0.5- or 2.5-foot sample with a TPH/TRPH concentration above 1,000 mg/kg (Figure 4). These soils are normally regarded as non-hazardous wastes using State or Federal criteria, so they should be excavated and handled by individuals properly trained in accordance with Federal HAZWOPER regulations (CFR 29 Part 1910.120). They should be removed from the Site for disposal at an appropriate facility. Los Angeles County Sanitation District soil characterization requirements for sampling frequency will be met by the samples already collected and analyzed. Since the TPH results for 10 these samples using EPA Method 8015M is less than 500 mg/kg, most of the material will be accepted for unrestricted reuse (clean cover). The soils with TPH results exceeding 500 mg/kg at 3 of the 13 locations will require disposal on unlined areas.

There are four known locations along the alignment where soils containing hazardous levels of lead are found (Figure 4). However, the lateral extent of this material along the alignment from each of these points is not known due to the spacing and locations of the borings advanced during this investigation. For this reason, the volume of this material cannot be accurately determined. However, if a lateral distance on the alignment of 20 feet from each location is anticipated and an average depth of 2.5 feet is given, approximately 250 cubic yards of lead-impacted soil is present.

The material at each of these locations should be excavated, loaded, hauled, and disposed/recycled by personnel properly trained in accordance with State HAZWOPER regulations. The final disposal destination will require permits to accept California hazardous waste.

4.0 SUMMARY

Pinnacle has completed the following work at the subject site.

- Twenty-one soil borings were advanced by hand auger to depths of 5 feet bgs. One boring encountered refusal after collecting a sample at 0.5-feet bgs. One pit was advanced to a depth of three feet.

- Sixty-four soil samples were collected from the soil borings at depths of 0.5, 2.5 and 5.0 feet bgs. The samples at 2.5 feet were prepared for VOC analysis in accordance with EPA Method 5035. Two samples were collected from the pit.

- Selected samples were analyzed for TRPH using EPA Method 418.1, TPH using EPA Method 8105m, VOCs using EPA Method 8260B, SVOCs using EPA Method 8270C, PCBs using EPA Method 8082, OCPs using EPA Method 8081, Herbicides using EPA Method 8158A, and CAM Metals. The single sample with detectable volatile hydrocarbon vapors in a field screening sample was analyzed for volatile organic compounds and fuel oxygenates using EPA Method 8260B.

- Since saturated conditions were not encountered in any of the boreholes no groundwater grab samples were collected.

- VOCs, PCBs, OCPs and herbicides were not detected in the analyzed soil samples. One sample contained two SVOCs.

- Petroleum hydrocarbons, as defined by EPA Method 418.1 analyses, were detected at all 22 boring locations. These hydrocarbons were typically heavy-end hydrocarbons with no detectable SVOCs or VOCs.

- Petroleum hydrocarbon concentrations exceeded a typical action level of 1,000 mg/kg at 13 of the 22 boring locations. The highest petroleum hydrocarbon concentrations and the highest frequency of petroleum hydrocarbon-impacted soil were at the 0.5-foot interval. Based on these results, soils along 60 percent of the alignment exceed the action level and should be removed from the Site during road construction. Based on the width of the alignment of 17 feet (telescoping toward the south) and a depth of

2.5 feet, an anticipated volume of 4,100 cubic yards of TPH-impacted soil is present at this action level.

- Soluble lead concentrations exceeding the State regulatory limit were identified at four non-contiguous locations. The lateral extent of these soils along the alignment, which are regarded as California hazardous waste based on these results, is not known. However, if a lateral distance on the alignment of 20 feet from each location is anticipated and an average depth of 2.5 feet is given, approximately 250 cubic yards of lead-impacted soil is present.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Pinnacle has generated the following conclusions from the site investigation completed at the easement.

- Groundwater was not encountered in the borings, and is not expected to be reached during construction at depths up to 5-feet bgs.

- Material to be uncovered at four non-continuous locations along the alignment contains a sufficient concentration of soluble lead to be regarded as hazardous waste. The volume of this material cannot be accurately determined since its lateral extent from the four locations is unknown. If a lateral distance on the alignment of 20 feet from each location is anticipated and an average depth of 2.5 feet is given, approximately 250 cubic yards of lead-impacted soil is present.

- While petroleum hydrocarbons were detected at each boring location, not all of the hydrocarbon was above typical action levels requiring transport and disposal. Most of the hydrocarbon above this level was confined to the upper 2.5 feet of material. The hydrocarbon was typically heavy-end, and did not contain VOCs or SVOCs. An estimated 60 percent of the material to a depth of 2.5 feet (4,100 cubic yards) will require transport and disposal if a petroleum hydrocarbons action level of 1,000 mg/kg is considered.

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