



CITY OF EMERYVILLE

INCORPORATED 1888

1333 PARK AVENUE
EMERYVILLE, CALIFORNIA 94608-3517

TEL: (510) 596-4300 FAX: (510) 658-8095

February 9, 2015

RECEIVED

By Alameda County Environmental Health at 3:45 pm, Feb 10, 2015

Mr. Mark Detterman, PG, CEG
Senior Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

Subject: Response to ACEH Directive Letter of December 31, 2013
for City of Emeryville Marina UST Site

Reference: Alameda County Fuel Leak Case No. RO0000267
GeoTracker Global ID T0600101590

Dear Mr. Detterman:

The City of Emeryville is pleased to submit the attached response to Alameda County Environmental Health (ACEH) directive letter dated December 31, 2013. The response letter was prepared by OTG EnviroEngineering Solutions, Inc. (OTG) under a consultant service contract with the City of Emeryville.

Certification

I certify under penalty of law that this document and all attachments are prepared by OTG under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please contact Mr. Xinggang Tong at (510) 465-8982 or me at (510) 596-3728 if you have questions or comments.

Sincerely,
City of Emeryville

Nancy Humphrey
Environmental Programs Analyst

February 9, 2015

Mr. Mark Detterman, PG, CEG
Senior Hazardous Materials Specialist
Alameda County Environmental Health
1131 Harbor Bay Parkway
Alameda, CA 94502

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GeoTracker Global ID T0600101590

Dear Mr. Detterman:

On behalf of the City of Emeryville (the City), OTG EnviroEngineering Solutions, Inc. (OTG) prepared this response to a 31st December 2013 directive letter from Alameda County Environmental Health (ACEH) for the Marina Underground Storage Tank (UST) site, which is located at 3310 Powell Street, Emeryville, California (the Site). Site background and the City's response to the ACEH directive letter are presented below.

BACKGROUND

As shown on Figure 1, the narrow strip of land into the San Francisco Bay (west of Highway 80) was originally part of the Bay that was filled from around 1954 through 1960s. The land at the UST location has an elevation of about 14 feet above mean sea level and has a width of only approximately 300 feet at high tide from the eastern shoreline to the western shoreline. The Marina was constructed in 1972 and the original USTs were also placed in service that same year. The original USTs were constructed of single-wall steel material, and consisted of one 2,500-gallon unleaded gasoline UST, one 10,000-gallon unleaded gasoline UST, and two 10,000-gallon diesel USTs. Their locations are shown on Figure 2.

The four original single-walled USTs and associated piping were removed in April 1992 and were replaced with a 20,000-gallon double-walled steel and fiberglass UST and associated double-contained piping. The new UST is divided into three compartments: a 5,000-gallon gasoline compartment, a 15,000-gallon diesel compartment, and a 5,000-gallon compartment that is currently unused. The new UST was installed in the same location as the removed USTs.

At the time of the removal of the original single-walled USTs, a groundwater sample was collected from the excavation pit and two soil samples were collected from the excavation floor at both ends of each of the four USTs (Tank Project Engineering, April 24, 1992). The water

sample and the eight soil samples were analyzed for total petroleum hydrocarbons (TPH) as gasoline (TPHg) and as diesel (TPHd) and for benzene, toluene, ethyl benzene, and total xylenes (BTEX). Groundwater analytical results are summarized in Table 1 and soil data are presented in Table 2. The groundwater sample reported 46,115 ug/L TPHg, 12,700 ug/L TPHd, 5 ug/L benzene, 30.6 ug/L toluene, 8.4 ug/L ethyl benzene, and 61.8 ug/L total xylenes. The highest concentrations reported among the eight soil samples were 172 mg/kg TPHg, 0.025 mg/kg benzene, 0.0064 mg/kg ethyl benzene, and 0.045 mg/kg total xylenes. TPHd and toluene were not detected at or above their respective reporting limits of 10 mg/kg and 0.005 mg/kg from the eight soil samples.

On April 8, 1993, a 2-inch diameter monitoring well (MW-1) was installed approximately 5 feet north of the UST location by Environmental Science & Engineering, Inc. (ESE, May 6, 1993). Its location is shown on Figure 2. The well has the total depth of 18.5 feet, with 0.02-inch slots screen from 3.5 feet to 18.5 feet below ground surface (bgs). The static groundwater level was at 4.5 feet bgs at the time of well installation. Pieces of bricks, metal, and wood were found in the boring from a point below six inches of gravel to the bottom of the boring (18.5 feet bgs), confirming that this area was constructed with fill material. Soil samples were not collected for laboratory chemical analysis during the well installation. The well was initially sampled on April 13, 1993, for TPHg, TPHd, and BTEX analyses and results are included in Table 1. No free-phase product was observed during the well purging and sampling activities. TPHg and TPHd were reported at 170 ug/L and 4,000 ug/L, respectively. BTEX were not detected at or above their reporting limit of 0.5 ug/L.

The well was redeveloped on September 15, 2008 and sampled again on September 19, 2008. Results are also included in Table 1. The total TPH level (gas plus diesel) attenuated from 4,170 ug/L in April 1993 to 540 ug/L in September 2008.

RESPONSE TO TECHNICAL COMMENTS

The ACEH's directive letter (December 31, 2013) presented five (5) technical comments based on a review of case files for applicability of the State Water Resources Control Board's (SWRCB) Low Threat Underground Storage Tank Case Closure Policy (LTCP). The City's responses to the five technical comments are presented below.

ACEH Comment #1 – LTCP General Criteria d (Free Product)

ACEH's review of the case files indicates that insufficient data collection and analysis has been presented to assess the potential for free product at the site. Specifically, a concentration of 172 milligrams per kilogram (mg/kg) TPH as gasoline in soil was detected beneath the site within the former underground storage tank (UST) pit. This concentration is above concentrations that the Technical Justification for Vapor Intrusion Media-Specific Criteria (generated in support of the LTCP), suggest is "indirect" evidence of Light Non-Aqueous Phase Liquids (LNAPL; >100 to 200 mg/kg TPH as gasoline in soil).

Response to ACEH Comment #1

At the time of the four USTs' removal in April 1992, one soil sample was collected at the bottom of each end of the four USTs for a total of eight (8) soil samples. The four soil samples collected at the eastern ends of the four USTs reported no detection of BTEX, TPHg, or TPHd. The soil sample (labeled as S-3) that reported 172 mg/kg TPHg was collected at the western end of a diesel UST. However, the two soil samples collected at the western ends of the two gas USTs had TPHg reported only at 4.7 mg/kg and 45 mg/kg, respectively, which were far below the 172 mg/kg TPHg detected at the western end of the diesel UST. The data suggests that the detected 172 mg/kg TPHg may not be necessarily associated with the gas USTs. Since the land of the entire Marina area was created by filling the bay, there is a possibility that this isolated detection of TPHg at 172 mg/kg may be associated with the original fill material.

Relevant pages from the UST removal report are included in Appendix A at the end of this letter. The tank excavation pit was approximately 35 ft wide by 35 ft long by 5 ft deep. Eight soil samples were collected within this relatively small excavation area. Of the eight samples collected, only one sample (S-3) had a single parameter (TPHg) that exceeded the low-end indirect evidence (100 mg/kg) of LNAPL. The sample did not exceed the high-end indirect evidence (200 mg/kg). The two soil samples (S-2 and S-4) that were collected within approximately 10 ft north and south of S-3 had TPHg concentration at 5.7 mg/kg and 45 mg/kg, respectively. The data suggests that the area that had TPHg exceeding the low-end indirect evidence of LNAPL is very small and has already been defined. Given the fact that over 20 years of time has passed since the sample was collected, the TPHg concentration has likely attenuated to significantly lower levels, even if it was caused by release from the gas USTs. It is, therefore, concluded that further investigation is unnecessary.

It is also worth noting that one of the two references cited by the *Technical Justification for Vapor Intrusion Media-Specific Criteria* (SWRCB, March 21, 2012) does not give the range of 100 to 200 mg/kg as indirect evidence of LNAPL, but gives 200 mg/kg as the sole criterion (Alaska DEC, 2011). In the first paragraph of Page 14 it states that "...GRO soil test results above about 200 mg/kg may generally be interpreted to indicate the presence of NAPL."

Given the fact that only one out of the eight soil samples collected within the UST excavation pit had a single parameter (TPHg) that exceeded the low-end indirect evidence of LNAPL, but did not exceed the high-end indirect evidence of LNAPL; and since over 22 years has passed since the soil was collected and analyzed, it is very reasonable to assume that the TPHg concentration has attenuated to a lower level and the existence of LNAPL should not be of a concern at the present time.

ACEH Comment #2 – LTCP General Criteria e (Site Conceptual Model)

Our review of the case files indicates that insufficient data collection and analysis has been presented to assess the nature, extent, and mobility of the release and to support compliance

with the General Criteria d, and the Media Specific Criteria for Groundwater and Vapor intrusion, as described below.

Response to ACEH Comment #2

We would agree with this comment if the Site were located inland and surrounded by other commercial and/or residential sites. The fact that this Site is located on a narrow strip of human filled land into the San Francisco Bay, and the maximum width of the land at high tide is only approximately 300 feet, the extent of the plume had to be limited (further explained in response to Comment #3 below). In addition, as documented in the well installation log for MW-1, pieces of brick, metal, and wood were found in the borehole from the surface to the bottom of the well, at 18.5 ft below grade. It is apparent that the fill material that created the land contained construction wastes and possibly municipal wastes. This presents challenges to further investigation beyond the immediate UST location area: what has been identified could be associated with fill material and not attributed to the USTs. As discussed in response to Comment #1 above, the presence of this fill has already presented challenges to interpreting the reason why the highest detected TPHg (172 mg/kg) is from a soil sample collected beneath a diesel UST, while the four soil samples collected beneath the two gas USTs reported significantly lower TPHg concentrations (between less than 1mg/kg and 45 mg/kg). It is possible that the detected 172 mg/kg TPHg may be in part or as a whole contributed by the fill material.

Overall, we believe further investigation is unnecessary given the nature of fill materials that created the land. The eight soil samples collected during the UST removal represent the best ability to characterize UST-related TPH impact on soil, and the analytical results showed the impact is very limited. Groundwater characterization is discussed in response to Comment #3 below.

ACEH Comment #3 – LTCP Media Specific Criteria for Groundwater

Our review of the case files indicates that insufficient data collection and analysis has been presented to support the requisite characteristics of plume stability or plume classification as follows:

- a. Plume length and lateral extent – The length and lateral extent of the plume from the subject site has not been defined.*
- b. Plume Stability – Plume stability does not appear to have been determined.*
- c. Distance to Closest Surface Water – The closest known surface water is the San Francisco Bay, at an approximate distance of 125 feet, and sewer, water, and storm drains in the immediate vicinity of the former UST complex may intersect with shallow groundwater, providing a preferential pathway to the Bay.*

Response to ACEH Comment #3

Since, as discussed in the response to Comment #2 above, the total width of the land from eastern shoreline to western shoreline is only approximately 300 ft at high tide, the maximum potential spread in the western-eastern direction is no more than 300 ft. The City has identified a water line that is located very close to the USTs and runs from east to west. Underground utility information is presented in the report *Request for Case Closure* (OTG, December 5, 2008). The City has performed an extensive search of all available utility drawings and was unable to locate cross-section drawings for utilities near the USTs. Field investigation along utility lines presents a high risk of interference with utility functions. However, the City is committed to investigate utility lines near the UST location at the time when utility repair or upgrading work is performed.

The plume showed significant decrease in TPH concentration from the on-site monitoring well MW-1 in the time between the initial sampling on April 13, 1993 and the last monitoring event on September 19, 2008. TPHd concentration decreased from 4,000 ug/L to 110 ug/L. Part of the diesel may have been partially biodegraded to shorter-chain hydrocarbons and thus been measured as TPHg in laboratory analysis. This may explain the TPHg concentration increase from 1993 to 2008. However, if the TPHg and TPHd are combined as a single TPH parameter for assessment, the TPH concentration decreased from 4,170 ug/L in 1993 to 540 ug/L in 2008, an 87% decrease. The data suggest the Site satisfies LTCP media specific criteria for groundwater.

ACEH Comment #4 – LTCP Media Specific Criteria for Vapor Intrusion to Indoor Air

Our review of the case files indicates that due to the shallow depth of groundwater the site does not have a bioattenuation zone as defined by the LTCP and no soil gas samples have been collected (Appendices 1 to 4 of the LTCP).

Although a review of the soil and groundwater analytical data indicates low volatiles, the lack of shallow soil samples above groundwater has not been evaluated and therefore a potential for vapor intrusion to future site buildings can exist.

Please provide justification of why the site satisfies the Media-Specific Criteria for Vapor Intrusion to Indoor Air in the SCM that assures that exposure to petroleum vapors in indoor air will not pose unacceptable health risks to future buildings at the site.

Please note, that if direct measurement of soil gas is proposed to fill this data gap, ensure that your strategy is consistent with the field sampling protocols described in the Department of Toxic Substances Control's Final Vapor Intrusion Guidance (October 2011). Consistent with the guidance, ACEH requires installation of permanent vapor wells to assess temporal and seasonal variations in soil gas concentrations.

Response to ACEH Comment #4

A new 20,000-gallon UST with three compartments was installed in the same location right after the four former USTs were removed in April 1992. The Site has since continuously provided fueling service to the Marina boating operations and will continue to do so in the foreseeable future. It is our understanding that as an active fuel service station it is not required to evaluate potential vapor intrusion to indoor air. In addition, the UST is located outdoors, surrounded by parking lots and open space.

ACEH Comment #5 – Data Gap Investigation Work Plan and Focused Site Conceptual Model

Please prepare Data Gap Investigation Work Plan to address the technical comments listed above. Please support the scope of work in the Data Gap Investigation Work Plan with a focused SCM and Data Quality Objectives (DQOs) that relate the data collection to each LTCP criteria. For example please clarify which scenario within each Media-Specific Criteria a sampling strategy is intended to apply to.

Response to ACEH Comment #5

As presented in the responses to ACEH Comments #1 through #4 above, it is concluded that sufficient data exists for the Site to support low threat case closure.

Certification

I certify under penalty of law that this document and all attachments are prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who managed the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Please call Xinggang Tong at (510) 465-8982 or Nancy Humphrey at (510) 596-3728 if you have questions or comments.

Sincerely,
OTG EnviroEngineering Solutions, Inc.



Xinggang Tong, PhD, PE
Project Manager



Attachments:

Figure 1 – Site Location Map

Figure 2 – Site Plan

Table 1 – Summary of Groundwater Analytical Data

Table 2 – Results of Soil Samples Collected During UST Replacement in April 1992

Appendix A – Relevant Pages from Original UST Removal Report

REFERENCES

Alameda County Environmental Health, 2013, Request for a Focused SCM and Data Gap Investigation Work Plan (December 31, 2013).

State Water Resources Control Board, 2012, Low Threat Underground Storage Tank Case Closure Policy (LTCP).

State Water Resources Control Board, 2012, Technical Justification for Vapor Intrusion Media-Specific Criteria (March 21, 2012).

Tank Project Engineering, Underground Storage Tank Removal, Emeryville Marina Site, April 24, 1992.

Environmental Science & Engineering, Inc., Emeryville Marina Fuel Tank Farm, Emeryville, CA, May 6, 1993.

OTG EnviroEngineering Solutions, Inc., Request for Case Closure, Emeryville Marina UST Site, December 5, 2008.





Table 1
Groundwater Analytical Data
3310 Powell Street, Emeryville, CA

Chemicals	Unit	MW-1 4/13/1993	MW-1 9/19/2008	Trip Blank 9/19/2008	W-1** 4/15/1992
TPH gas	ug/L	170	430		46,115
TPH diesel	ug/L	4,000	110 (y)		12,700
Benzene	ug/L	ND (0.5)	0.8	ND (0.5)	5
Toluene	ug/L	ND (0.5)	9.7	ND (0.5)	30.6
Ethylbenzene	ug/L	ND (0.5)	2.1	ND (0.5)	8.4
total Xylenes	ug/L	ND (0.5)	12.7	ND (0.5)	61.8
MTBE	ug/L		4.6	ND (0.5)	
DIPE	ug/L		ND (0.5)	ND (0.5)	
ETBE	ug/L		ND (0.5)	ND (0.5)	
TAME	ug/L		ND (0.5)	ND (0.5)	
TBA	ug/L		ND (10)	ND (10)	
1,2-Dichloroethane	ug/L		ND (0.5)	ND (0.5)	
1,2-Dibromoethane	ug/L		ND (0.5)	ND (0.5)	
Ethanol	ug/L		ND (1000)	ND (1000)	
y: sample exhibits chromatographic pattern which does not resemble standard					
Monitoring well MW-1 was installed by Environmental Science & Engineering, Inc. on April 8, 1993.					
** W-1 was taken within excavation pit of tank replacement in April 1992.					

Table 2
 Results of Soil Samples Collected During UST Replacement in April 1992
 3310 Powell Street, Emeryville, CA

Sample ID	Date of Sampling	Depth (ft, bgs)	TPH gas mg/kg	TPH diesel mg/kg	Benzene mg/kg	Toluene mg/kg	Ethyl benzene mg/kg	Xylenes mg/kg	Sample Location (samples were taken during UST replacement in 1992)
S-1	4/15/1992	5	4.7	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	west end of former UST #4 - gas
S-2	4/15/1992	5	5.7	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	west end of former UST #3 - diesel
S-3	4/15/1992	5	172	ND (10)	0.013	ND (0.005)	0.0055	ND (0.005)	west end of former UST #2 - diesel
S-4	4/15/1992	5	45	ND (10)	0.025	ND (0.005)	0.0064	0.045	west end of former UST #1 - gas
S-5	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #1 - gas
S-6	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #2 - diesel
S-7	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #3 - diesel
S-8	4/15/1992	5	ND (1)	ND (10)	ND (0.005)	ND (0.005)	ND (0.005)	ND (0.005)	east end of former UST #4 - gas

Appendix A

Relevant Pages from April 1992 UST Removal Report

3310 Powell St. Emeryville, California



LETTER OF TRANSMITTAL

DATE	4/24/92	JOB NO.	203A
ATTENTION	Susan L. Hugo		
RE:	Samples		

TO: Alameda County Health Care Services Agency
 Department of Environmental Health
 Hazardous Material Program
 80 Swan Way, Room 200
 Oakland, CA 94621

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

- Shop drawings Prints Plans Samples Specifications
 Copy of letter Change Order _____

COPIES	DATE	NO.	DESCRIPTION
1	4/23/92		Underground Storage Tank Unauthorized Release(Leak)/Contamination Site Report
1	4/21/92		Analytical Results and Chain-of-Custody
1			Tank Removal Site Map

THESE ARE TRANSMITTED as checked below:

- For approval Approved as submitted Resubmit _____ copies for approval
 For your use Approved as noted Submit _____ copies for distribution
 As requested Returned for corrections Return _____ corrected prints
 For review and comments _____
 FOR BIDS DUE _____ 19 _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS _____

COPY TO _____

SIGNED:

If enclosures are not as noted, kindly notify us at once.



TANK PROTECT ENGINEERING

2021 WHIPPLE ROAD
UNION CITY, CA 94587
(415) 429-8088
(800) 523-8088
FAX (415) 429-8089

LAB: S&W Laboratory
TURNAROUND: Normal
P.O. #: 0384

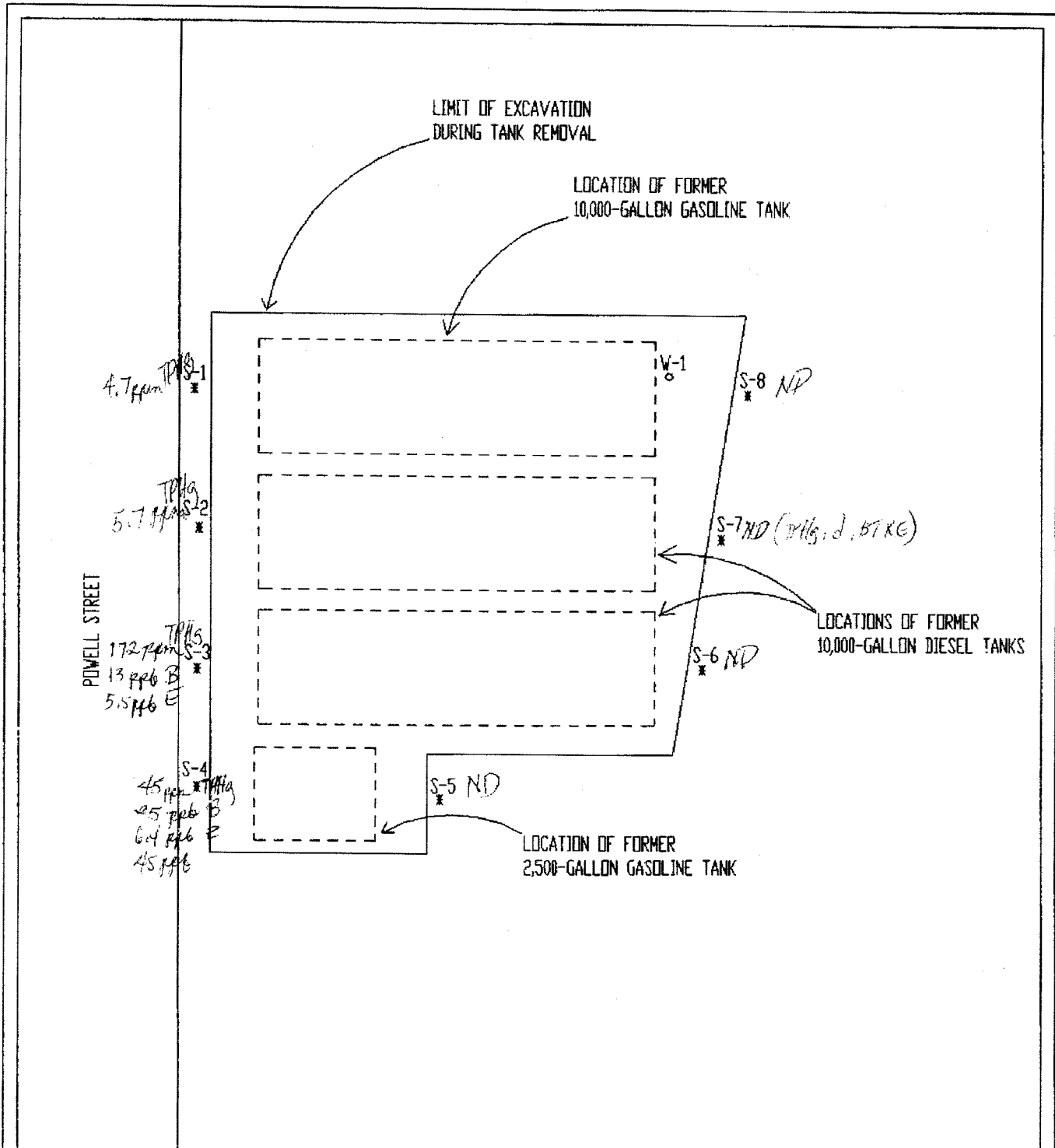
PAGE 1 OF 1

CHAIN OF CUSTODY

PROJECT NO. 2CA-041592		SITE NAME & ADDRESS City of Emeryville 3360 Phoebe Street Emeryville, CA				(1) TYPE OF CONTAINER	ANALYTES REQUESTED							REMARKS
OPERATOR NAME ADDRESS AND TELEPHONE NUMBER Michael Casso TPE 251 WHIPPLE ROAD, UNION CITY, CA 94587 (415) 429-8088							TOTAL LIGHT HC	AROMATIC HC	TOTAL HEAVY HC	OIL & GREASE	PCB SCAN	OTHER	Total Lead (AA)	
ID.	DATE	TIME	SOIL	WATER	SAMPLING LOCATION									
✓ S-1	4/15/92	4:12	✓		W. End of Tank #4 Depth = 5.0'	Brass Tube	✓	✓	✓			✓	A	
✓ S+1		5:24			W. End of Tank #3 Depth = 5.0'								B	
✓ S+1		5:25			W. End of Tank #2 Depth = 5.0'								C	
✓ S4		5:32			W. End of Tank #1 Depth = 5.0'								D	
✓ S5		5:41			E. End of Tank #1 Depth = 5.0'								E	
✓ S6		5:50			E. End of Tank #2 Depth = 5.0'								F	
✓ S7		6:12			E. End of Tank #3 Depth = 5.0'								G	
✓ S1		6:22	✓		E. End of Tank #4 Depth = 5.0'		✓	✓	✓			✓	H	
✓ W1	4/15/92	3:59		✓	NE corner of excavation	2-1.6 BRIS 2-40ml vials	✓	✓	✓			✓	I	
Relinquished by: (Signature) <i>Michael Casso</i>		Date / Time 4/16/92 12:15		Received by: (Signature) <i>Liz Cloutier</i>		Relinquished by: (Signature)		Date / Time		Received by: (Signature)				
Relinquished by: (Signature) <i>Liz Cloutier</i>		Date / Time 4/16/92 1:20		Received by: (Signature) <i>Valerie Conroy</i>		Relinquished by: (Signature)		Date / Time		Received by: (Signature)				
Relinquished by: (Signature)		Date / Time		Received for Laboratory by: (Signature)		Date / Time		Remarks						

DATE: April 16, 1992

1072-~~PI~~ TP1



POWELL STREET

4.7 ppm TPAS-1 *

5.7 ppm TPAS-2 *

172 ppm TPAS-3 *

13 ppb B

5.5 ppb E

S-4

45 ppm TPAS *

25 ppb B

64 ppb E

45 ppb

LIMIT OF EXCAVATION DURING TANK REMOVAL

LOCATION OF FORMER 10,000-GALLON GASOLINE TANK

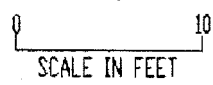
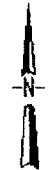
S-7 ND (with d. BTKE) *

LOCATIONS OF FORMER 10,000-GALLON DIESEL TANKS

LOCATION OF FORMER 2,500-GALLON GASOLINE TANK

LEGEND

- S-8 * NAME AND LOCATION OF SOIL SAMPLE
- W-1 NAME AND LOCATION OF WATER SAMPLE



TANK PROTECT ENGINEERING

TANK REMOVAL SITE PLAN

3310 POWELL STREET
EMERYVILLE, CA 94608

DATE	4/15/92
FIGURE	2
FILE #	203A-1
DRAWN BY	NAC
CHECKED BY	JVN