SITE INVESTIGATION REPORT

Port of Oakland
Port of Oakland Tanks Numbers CF-35, CF-06, and CF-07
801 Maritime Street
Oakland, California

Aug 96

Project No. 10-339-01-04

August 1996

PORT OF OAKLAND

August 12, 1996

Ms. Jennifer Eberle
Hazardous Materials Specialist
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway
Alameda, CA 94502-6577

SUBJECT: SITE INVESTIGATION REPORT
801 MARITIME STREET
STID #3780

Dear Jennifer:

On the behalf of the Port of Oakland, Alisto Engineering Group has prepared a document titled "Site Investigation Report, Port of Oakland, Port of Oakland Tank Numbers CF-35, CF-06, and CF-07, 801 Maritime Street, Oakland, California, dated August 7, 1996. This report documents soil sampling and monitoring well construction and sampling at a site described as 801 Maritime Street. Alisto Engineering experienced significant delays performing the investigation work due to the presence of numerous shipping containers that are presently stored at the site. Approximately 40 to 60 containers were temporarily moved to gain access to the site. In the future, quarterly monitoring events could be similarly delayed due to the same problem.

A copy of the investigation report is enclosed for your review and comment. Should you have any questions regarding the report, please contact me at 272-1373.

Sincerely,

John Prall, R.G.
Associate Environmental Scientist

Enclosure
cc: Neil Werner

96 AUG 13 PM 2:30
ENVIRONMENTAL PROTECTION

530 Water Street ■ Jack London's Waterfront ■ P.O. Box 2064 ■ Oakland, California 94604-2064
Telephone (510) 272-1100 ■ Fax (510) 272-1172 ■ TDD (510) 763-5703 ■ Cable address, PORTOFOAK, Oakland

SITE INVESTIGATION REPORT

Port of Oakland
Port of Oakland Tanks Numbers CF-35, CF-06, and CF-07
801 Maritime Street
Oakland, California

Project No. 10-339-01-004

Prepared for:

Port of Oakland
530 Water Street
Oakland, California

Prepared by:

Alisto Engineering Group
1575 Treat Boulevard, Suite 201
Walnut Creek, California

August 7, 1996

Brady Nagle
Project Manager

Al Sevilla, P.E.
Principal

REGISTERED PROFESSIONAL ENGINEER
ALBERTO SANCHEZ SEVILLA
26392
Exp. Date 3/31/00
CIVIL
STATE OF CALIFORNIA

TABLE OF CONTENTS

1.0 INTRODUCTION

Alisto Engineering Group was retained by the Port of Oakland to perform a site investigation of a suspected hydrocarbon release at 801 Maritime Street, Oakland, California. The work was performed under Port of Oakland Work Order No. 202863. A site vicinity map and a site plan are shown in Figure 1.

1.1 Purpose and Scope of Work

This work was performed to assess the nature and extent of hydrocarbons in the subsurface soil and/or groundwater at the site and to comply with applicable regulations of the governing regulatory agencies. The scope of work for this investigation included:

- Procuring a permit to install 1 groundwater monitoring well
- Drilling and logging 1 exploratory soil boring and collecting soil samples
- Installing, developing, sampling, and surveying Monitoring Well MW-1
- Analyzing soil and groundwater samples for specific hydrocarbon constituents
- Evaluating the data and analytical results and preparing this report

The above tasks and related field and sampling activities were performed in accordance with the requirements of the Alameda County Health Care Services Agency (ACHCSA) and the California Regional Water Quality Control Board, San Francisco Bay Region (RWQCB).

1.2 Site Description and Background

The site is at the southwest corner of the intersection of Petroleum and Maritime Streets in Oakland, California, and is currently used for storage of cargo containers.

On February 16, 1989, two 10,000 and one 20,000-gallon, single-walled steel underground storage tanks (USTs) were removed from the site. Analysis of soil samples collected from the excavation detected up to 3600 milligrams per kilogram (mg/kg) total extractable hydrocarbons (TEH), and 25 mg/kg total volatile hydrocarbons. Approximately 1500 cubic yards of soil with TEH concentrations greater than 1000 mg/kg were excavated from the former tank cavity and treated onsite by bioremediation (Baseline Environmental, 1989).

What hpm to it?

"ET" code

Analysis of composite of grab groundwater samples collected from the excavation pit detected 21,000 parts per billion (ppb) TEH, 480 ppb total volatile hydrocarbons, and 19 ppb benzene. As an interim remedial effort, an unknown volume of groundwater that accumulated in the excavation was removed and disposed of offsite. The excavation was backfilled with debris from a building demolition (Baseline Environmental, 1989).

2.0 FIELD METHODS

The field methods used during this investigation included soil sampling, well construction, development, sampling, and surveying. A permit to install the monitoring well was acquired from Alameda County Flood Control and Water Conservation District Zone 7 and is presented in Appendix A.

2.1 Drilling and Soil Sampling

On July 3, 1996, an exploratory soil boring was drilled to 18.5 feet below grade. Drilling was performed by V&W Drilling, Rio Vista, California, using a BK-81 drilling rig equipped with 8-inch-diameter, hollow-stem augers. Soil samples were collected using a split-spoon sampler. Drilling and soil sampling procedures are presented in Appendix B. The soil samples were transported in an iced cooler to a state-certified laboratory following chain of custody procedures.

A boring log was prepared using the Unified Soil Classification System, which included a description of soil characteristics such as color, moisture, consistency, and grain size. The boring log generated during this investigation is presented in Appendix C.

2.2 Monitoring Well Installation and Construction

The soil boring was converted into Monitoring Well MW-1 in accordance with the procedures for groundwater monitoring well installation presented in Appendix B. The well was constructed of 2-inch-diameter, flush-threaded, Schedule 40 PVC blank casing from surface grade to 4 feet below grade and 0.010-inch slotted casing from 4 to 15 feet below grade. Well construction details are included on the boring log in Appendix C.

2.3 Monitoring Well Development and Sampling

Well development and sampling was performed in accordance with the guidelines of the governing regulatory agencies (State Water Resources Control Board, 1989 and United States Environmental Protection Agency, 1986). The field procedures for groundwater monitoring well development and sampling are presented in Appendix D.

Monitoring Well MW-1 was developed on July 8, 1996 by removing over 10 casing volumes. The well development data are presented in the field survey forms in Appendix E.

On July 10, 1996, groundwater samples were collected from Monitoring Well MW-1. The well was purged of at least 3 casing volumes before sample collection, while monitoring pH, specific conductivity, and temperature. The samples were transported in an iced cooler to a state-certified laboratory following chain of custody procedures. The groundwater sampling data are presented in the field survey forms in Appendix E.

2.4 Groundwater Level Monitoring and Well Surveying

Monitoring Well MW-1 was surveyed to the top of the well casing by a licensed land surveyor, James H. Frame, Davis, California, in reference to the Port of Oakland datum. On July 10, 1996, the depth to groundwater in Well MW-1 was measured from the top of well casing to the nearest 0.01 foot, using an electronic sounder. The survey data and groundwater elevation is presented in Table 2. The well survey coordinates for the monitoring well is presented in Appendix F.

3.0 SITE GEOLOGY AND HYDROGEOLOGY

The site is in Oakland, California, to the east of San Francisco Bay, which is situated in the Coastal Range geomorphic province, characterized by northwesterly-trending mountains and valleys. San Francisco Bay occupies a Pliocene age structural depression. The San Francisco Bay Area is underlain by Late Pliocene-Early Pleistocene alluvial sediment. The upper 500 feet of this coarse, poorly-sorted sediment is derived mainly from the Sacramento-San Joaquin drainage system. The recent sediment load in this system has been greatly increased by hydraulic mining and farming. Bay mud, the youngest deposit in San Francisco Bay, is a soft, unconsolidated sediment generally consisting of 90 percent clay and silt-size detritus and is prevalent in the area (Ben M. Page, 1966).

Soil types encountered at the site during drilling include sand, silt, and clay. Silty to gravelly sands were encountered from surface grade to approximately 8 feet below grade, which was underlain by sandy silty to sandy clay to the total depth of the boring at 18 feet.

During drilling of the boring, groundwater was observed at approximately 6 feet below grade. After well development, groundwater was measured at 7.36 feet below the top of the casing on July 10, 1996.

4.0 ANALYTICAL METHODS

Soil and groundwater samples were analyzed by Pace Analytical Services, Inc., a state-certified laboratory, using standard test methods of the U.S. Environmental Protection Agency (EPA) and the California Department of Health Services. Soil and groundwater samples were analyzed for the following:

- Total petroleum hydrocarbons as gasoline (TPH-G) and benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Methods 8015/8020
- Total petroleum hydrocarbons as diesel (TPH-D) using EPA Method 8015 (modified)

The laboratory results for the soil and groundwater samples are summarized in Tables 1 and 2. The field procedures for chain of custody documentation and the laboratory reports and chain of custody records are included in Appendix G.

5.0 DISCUSSION OF RESULTS

The results of this site investigation, based on field observations and laboratory analysis are:

- Soil types encountered during drilling of the boring consisted of silty to gravelly sand from surface grade to approximately 8 feet below grade, underlain by sandy silt to sandy clay to the total depth of the boring at 18 feet.

- Groundwater was observed at approximately 6 feet below grade during installation of Well MW-1. After development, groundwater level was measured at 7.36 feet below the top of the casing.

- Free product or sheen was not observed in Monitoring Well MW-1.

- Analysis of the soil sample collected from Boring MW-1 at 5.5 feet below grade detected 7.1 mg/kg TPH-D. TPH-G and BTEX constituents were not detected above reported detection limits.

- Dissolved-phase petroleum hydrocarbons were detected at concentrations of 180 ug/l TPH-G, 7100 ug/l TPH-D, and 27 ug/l benzene in the groundwater sample collected from Well MW-1.

REFERENCES

Baseline Environmental, 1989. Report on Tank Removal and Remediation Activities, 801 Maritime Street, April.

Page, Ben M., 1966. Geology of the Coastal Ranges of California. California Division of Mines and Geology, Bulletin 190, pp. 255-276.

State Water Resources Control Board, 1989. Leaking Underground Fuel Tank Field Manual. October.

United States Environmental Protection Agency, 1986. RCRA Ground-Water Monitoring Technical Enforcement Guidance Document. September.

TABLES

TABLE 1 - SUMMARY OF RESULTS OF SOIL SAMPLING
PORT OF OAKLAND TANKS CF-35, CF-06, and CF-07
801 MARITIME STREET, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-339

WELL ID	SAMPLE DEPTH (fbg)	DATE OF SAMPLING	TPH-G (mg/kg)	TPH-D (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	LAB
MW-1	5.5	07/03/96	ND<0.2	7.1	ND<0.001	ND<0.001	ND<0.001	ND<0.002	PACE

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
fbg	Feet below grade
mg/kg	Milligrams per kilogram
ND	Not detected above reported detection limit
PACE	Pace Analytical Services, Inc.

F:\0\10-339\SOIL.WQ2

TABLE 2 - SUMMARY OF RESULTS OF GROUNDWATER SAMPLING
PORT OF OAKLAND TANKS CF-35, CF-06, and CF-07
801 MARITIME STREET, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-339

WELL ID	DATE OF SAMPLING/ MONITORING	CASING ELEVATION (Feet) (a)	DEPTH TO WATER (Feet)	GROUNDWATER ELEVATION (Feet)	TPH-G (ug/l)	TPH-D (ug/l)	B (ug/l)	T (ug/l)	E (ug/l)	X (ug/l)	LAB
MW-1	07/10/96	10.61	7.36	3.25	180	7100	27	14	5.4	23	PACE
QC-2 (b)	07/10/96	---	---	---	ND<50	ND<0.5	ND<0.5	ND<0.5	ND<0.5	ND<1	PACE

ABBREVIATIONS:

TPH-G	Total petroleum hydrocarbons as gasoline
TPH-D	Total petroleum hydrocarbons as diesel
B	Benzene
T	Toluene
E	Ethylbenzene
X	Total xylenes
ug/l	Micrograms per liter
ND	Not detected above reported detection limit
PACE	Pace Analytical Services, Inc.

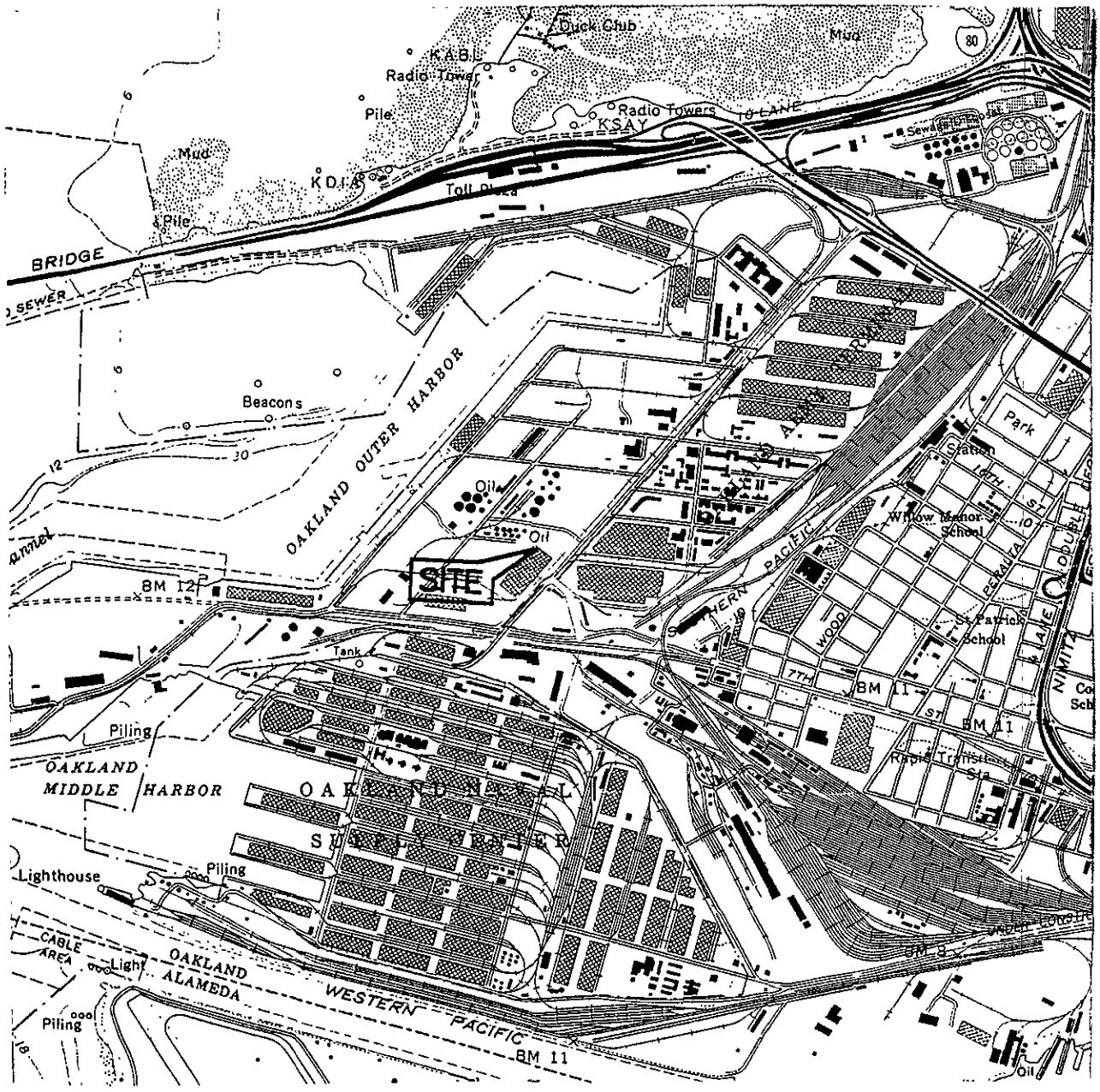
NOTES:

(a) Top of casing elevations surveyed in reference to Port of Oakland Datum

(b) Trip blank.

F:\0\10-339\WATER.WQ2

FIGURES



SOURCE:
USGS MAP, OAKLAND WEST QUADRANGLE,
7.5 MINUTE SERIES. 1959.
PHOTOREVISED 1980.

N

0 1000' 2000'

FIGURE 1

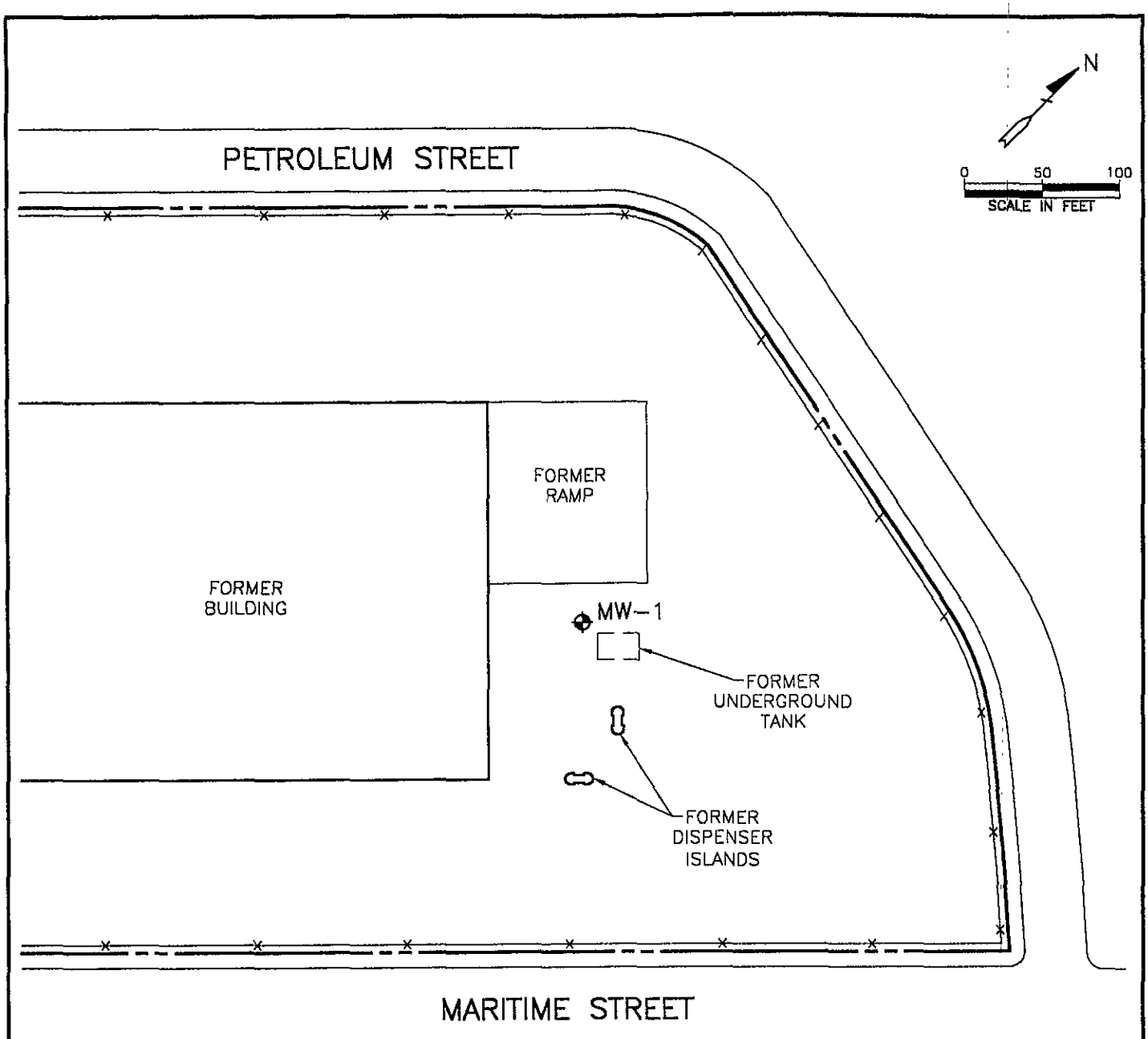
SITE VICINITY MAP

PORT OF OAKLAND
801 MARITIME STREET
OAKLAND, CALIFORNIA

PROJECT NO. 10-339

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

103369—DWG 8-5-96 DDM 1=1



LEGEND

⊕ GROUNDWATER MONITORING WELL

FIGURE 2

SITE PLAN

PORT OF OAKLAND
801 MARITIME STREET
OAKLAND, CALIFORNIA

PROJECT NO. 10-339

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

10339C---.DWG 8-5-96 ODM 1=100

APPENDIX A

WELL INSTALLATION PERMIT

ZONE 7 WATER AGENCY

5997 PARKSIDE DRIVE PLEASANTON, CALIFORNIA 94588 VOICE (510) 484-2600
FAX (510) 462-3914

DRILLING PERMIT APPLICATION

FOR APPLICANT TO COMPLETE

LOCATION OF PROJECT 501 Maritime St. Oakland CA

CLIENT
Name Port of Oakland
Address 530 Water ST. Voice
City Oakland CA Zip 94607

APPLICANT
Name Alisto Engineering Group Fax (510) 295-1823
Address 1575 Treat Blvd (201) Voice (510) 295-1650
City Walnut Creek CA Zip 94598

TYPE OF PROJECT

Well Construction		Geotechnical Investigation	
Cathodic Protection	___	General	___
Water Supply	___	Contamination	___
Monitoring	✓	Well Destruction	___

PROPOSED WATER SUPPLY WELL USE
Domestic ___ Industrial ___ Other ___
Municipal ___ Irrigation ___

DRILLING METHOD:
Mud Rotary ___ Air Rotary ___ Auger ✓
Cable ___ Other ___

DRILLER'S LICENSE NO. C57-710678

WELL PROJECTS
Drill Hole Diameter 8 in. Maximum
Casing Diameter 2 in. Depth 20 ft.
Surface Seal Depth 5 ft. Number 1

GEOTECHNICAL PROJECTS
Number of Borings ___ Maximum
Hole Diameter ___ in. Depth ___ ft.

ESTIMATED STARTING DATE 1/26/96
ESTIMATED COMPLETION DATE 1/26/96

I hereby agree to comply with all requirements of this permit and Alameda County Ordinance No. 73-68.

APPLICANT'S SIGNATURE Fred Moss Date 1/12/96

FOR OFFICE USE

PERMIT NUMBER 96116
LOCATION NUMBER ___

PERMIT CONDITIONS

Circled Permit Requirements Apply

(A.) GENERAL
1. A permit application should be submitted so as to arrive at the Zone 7 office five days prior to proposed starting date.
2. Submit to Zone 7 within 60 days after completion of permitted work the original Department of Water Resources Water Well Drillers Report or equivalent for well Projects, or drilling logs and location sketch for geotechnical projects.
3. Permit is void if project not begun within 90 days of approval date.

(B.) WATER WELLS, INCLUDING PIEZOMETERS
1. Minimum surface seal thickness is two inches of cement grout placed by tremie.
2. Minimum seal depth is 50 feet for municipal and industrial wells or 20 feet for domestic and irrigation wells unless a lesser depth is specially approved. Minimum seal depth for monitoring wells is the maximum depth practicable or 20 feet.

C. GEOTECHNICAL. Backfill bore hole with compacted cuttings or heavy bentonite and upper two feet with compacted material. In areas of known or suspected contamination, tremied cement grout shall be used in place of compacted cuttings.

D. CATHODIC. Fill hole above anode zone with concrete placed by tremie.

E. WELL DESTRUCTION. See attached.

Approved Wyman Hong Date 22 Feb 96
Wyman Hong

91992

APPENDIX B

FIELD PROCEDURES FOR DRILLING, SOIL SAMPLING, AND GROUNDWATER MONITORING WELL INSTALLATION

FIELD PROCEDURES
FOR
DRILLING, SOIL SAMPLING,
AND GROUNDWATER MONITORING WELL INSTALLATION

Drilling Procedures

The soil borings were drilled using 8-inch-diameter, continuous-flight, hollow-stem augers. To avoid cross-contamination, drilling equipment in contact with potentially contaminated material was decontaminated by steam cleaning before and after each use. Decontamination fluids were placed into DOT-approved drums for disposal.

Soil Sampling Procedures

During drilling, samples were collected at about 5-foot intervals below grade. Before and after each use, the sampler was washed using a phosphate-free detergent followed by tap water and deionized water rinses. Soil sampling was accomplished using a California-modified split-spoon sampler lined with brass tubes. A 140-pound slide hammer falling 30 inches was used to advance the sampler 18 inches ahead of the hollow-stem augers into undisturbed soil, and blow counts were recorded for every 6 inches of penetration to evaluate the consistency of the soil.

After retrieval from the augers, the sampler was split, the sample tubes removed, and a soil sample was selected for possible chemical analysis. The sample was retained within the brass tube, and both ends were immediately covered with Teflon sheeting and polyurethane caps. The caps were sealed with tape and labeled with the following information: Alisto Engineering project number, boring number, sample depth interval, sampler's initials, and date of collection. The soil sample was immediately placed in a waterproof plastic bag and stored in a cooler containing blue or dry ice. Possession of the soil samples was documented from the field to a state-certified analytical laboratory by using a chain of custody form.

Soil samples and, when representative, drill cuttings were described by Alisto personnel using the Unified Soil Classification System, and field estimates of soil type, color, moisture, density, and consistency were noted on the boring logs. The logs were reviewed by a civil engineer registered in the State of California.

Groundwater Monitoring Well Installation

Construction of the groundwater monitoring well was based on the stratigraphy encountered in the soil borings. The well construction materials were introduced into the boring through the hollow-stem augers to centralize the well casing and minimize the possibility of native material entering the annular space of the well.

The 2-inch-diameter PVC well casing consisted of 0.010-inch slotted casing from the bottom of the boring to a depth interval above the highest anticipated water level, and solid casing was installed from the top of the slotted casing to approximately 4 inches below grade.

The annular space surrounding the screened portion was backfilled with No. 2/12 Lonestar sand (filter pack) to approximately 0.5 foot above the top of the screened section. An interval of bentonite pellets about 0.5-feet-thick was added to the annulus above the filter pack and hydrated with approximately 2 gallons of deionized water to minimize intrusion of well seal into the filter pack. A 0.5-foot-thick interval of concrete was placed above the bentonite and a traffic-rated utility box was installed around the top of the well casing. An expanding, watertight well cap and lock were installed on the top of the well casing to secure the well from surface fluid and tampering.

APPENDIX C

BORING LOGS AND WELL CONSTRUCTION DETAILS

ALISTO ENGINEERING GROUP
WALNUT CREEK, CALIFORNIA

LOG OF BORING MW-1

SEE SITE PLAN

ALISTO PROJECT NO: 10-339-01 DATE DRILLED: 07/03/96
CLIENT: Port of Oakland
LOCATION: 801 Maritime Street, Oakland, California
DRILLING METHOD: Hollow-Stem Auger (8")
DRILLING COMPANY: V & W Drilling CASING ELEVATION: 10.61 'MSL
LOGGED BY: C. Ladd APPROVED BY: Al Sevilla

BLOWS/6 IN.	PID VALUES	WELL DIAGRAN	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
						SM SP	silty to gravelly SAND: gray, damp; gravel to 2-inch diameter.
38,50/6"		2" Sch.40 PVC; 2" 0.010" Slotted PVC Screen; Bentonite Seal; Neat Cement; #2/12 Sand	5			SP	gravelly SAND: gray, wet, very dense; medium- to coarse-grained sand; approximately 30% angular gravel to 1/2-inch.
10,12,32			10			ML	sandy SILT: dark gray, wet; approximately 30% very fine- to fine-grained sand; driftwood (approximately 50% of 11-11.5 foot sample).
2,3,3			15			CL	sandy CLAY: dark gray, wet; approximately 15% very fine- to fine-grained sand.
3,3,3			20				Same
			25				Stabilized water level measured on July 10, 1996.
			30				

APPENDIX D

FIELD PROCEDURES FOR GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING

FIELD PROCEDURES
FOR
GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING

Groundwater Monitoring Well Development

The groundwater monitoring well was developed to consolidate and stabilize the filter pack to optimize well production, and to reduce the turbidity of subsequent groundwater samples. The monitoring well was developed by evacuating 10 well volumes and the groundwater was relatively free of sediment. Well development fluids were placed into DOT-approved drums for disposal.

Groundwater Level Measurement

Before sampling, the groundwater level in each well was measured from the permanent survey reference point at the top of the well casing. The groundwater in the well was monitored for free-floating product or sheen. The depth to groundwater was measured to an accuracy of 0.01 feet from the top of the PVC well casing using an electronic sounder.

Groundwater Monitoring Well Sampling

To ensure that the groundwater samples were representative of the aquifer, the well was purged of 3 casing volumes while monitoring stabilization of pH, electrical conductivity, and temperature.

The groundwater samples were collected using a disposable bailer and transferred into laboratory-supplied containers. The samples were labeled with well number, site identification, date of collection, and sampler's initials, and transported in an iced cooler to a state-certified laboratory following preservation and chain of custody protocol. The sampling technician wore nitrile gloves during purging and well sampling.

APPENDIX E

GROUNDWATER MONITORING WELL DEVELOPMENT AND SAMPLING FIELD SURVEY FORMS

ALISTO

Field Report / Sampling Data Sheet

ENGINEERING
GROUP
1575 TREAT BOULEVARD, SUITE 201
WALNUT CREEK CA 94598 (510) 295-1650 FAX 295-1823

Project No. 10-339 Date: 7/8/96
Address Port of Oakland Day: (M) T W TH F
~~Contract No.~~ Oakland, Ca City: Oakland
~~Station No.~~ Sampler: LG

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
MW-1	7.36	2"	OK	Ø	Y (N)	4	1450	62.6	8.62	5.57ms	1.5	O EPA 601 ; TPH-G/BTEX ; O TPH Diesel ; O TOG 5520
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.						8		67.3	8.41	5.42ms		
15.06 - 7.36 = 7.70 x .16 = 1.23 x 10 = 12.30						12.5	1500	68.1	8.20	5.38ms	2.5	
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port												TIME/SAMPLE ID
Comments:												NS

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
					Y N							O EPA 601___ ; O TPH-G/BTEX___ ; O TPH Diesel___ ; O TOG 5520 ___
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.												
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port												TIME/SAMPLE ID
Comments:												

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
					Y N							O EPA 601___ ; O TPH-G/BTEX___ ; O TPH Diesel___ ; O TOG 5520 ___
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.												
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port												TIME/SAMPLE ID
Comments:												

Well ID	Depth to Water	Diam	Cap/Lock	Product Dept	Iridescence	Gal.	Time	Temp *F	pH	E.C.	D.O.	
					Y N							O EPA 601___ ; O TPH-G/BTEX___ ; O TPH Diesel___ ; O TOG 5520 ___
Total Depth - Water Level= x Well Vol. Factor= x#vol. to Purge PurgeVol.												
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port												TIME/SAMPLE ID
Comments:												

ALISTO

Field Report / Sampling Data Sheet

ENGINEERING
GROUP
1575 TREAT BOULEVARD, SUITE 201
WALNUT CREEK CA 94598 (510) 295-1650 FAX 295-1823

Project No. 10-339-01/003
Address Port of Oakland
~~Contract No.~~
~~Station No.~~
Oakland, CA

Date: 7/10/96
Day: M T (W) TH F
City: Oakland
Sampler: LB

Well ID	Depth to Water	Diam	Cap/Lock	Product Depth	Iridescence	Gal.	Time	Temp °F	pH	E.C.	D.O.
MW-1	7.28	2"	OIL	Ø	Y (N)	1	1150	63.2	8.49	5.38ms	1.9
Total Depth - Water Level=	x Well Vol. Factor=	x#vol. to Purge	PurgeVol.			2		67.3	8.22	5.29ms	
15.02 - 7.28 = 7.74	X .16 = 1.24	X3 = 3.72				4	1200	68.4	8.26	5.22ms	3.1
Purge Method: OSurface Pump ODisp.Tube OWinch ODisp. Bailer(s)___ OSys Port											
Comments:											

O EPA 601_____
⊗ TPH-G/BTEX HCl
⊗ TPH Diesel HCl
O TOG 5520 __

TIME/SAMPLE ID
1205

PAGE_____ OF_____

APPENDIX F

WELL ELEVATION SURVEY COORDINATES

FRAME SURVEYING & MAPPING
609 A Street Davis, CA 95616
(916) 756-8584 (TEL) (916) 756-8201 (FAX)

Please note our new address, effective June 1, 1996. Our telephone numbers have not changed.

July 10, 1996

Ted Moise
Alisto Engineering Group
1575 Treat Boulevard
Suite 201
Walnut Creek, CA 94598

Re: Port of Oakland

Dear Ted:

We have completed the survey of the new well at 801 Petroleum Drive. The coordinates of the well are as follows:

DESCRIPTION	NORTHING	EASTING	ELEV (GROUND)	ELEV (PVC)
MW-1	3065.2	7875.3	10.9	10.61

I have enclosed a diskette with the AutoCAD project file, updated to include the new well, and an invoice. Please call me if you have any questions.

Regards,

Jim Frame

RECEIVED
JUL 11 1996

LICENSED LAND SURVEYOR
JAMES H. FRAME III
No. 5435
STATE OF CALIFORNIA

License expires September 30, 1996

C:\WINWORD\960710A.DOC

APPENDIX G

FIELD PROCEDURES FOR CHAIN OF CUSTODY DOCUMENTATION, LABORATORY REPORTS, AND CHAIN OF CUSTODY RECORDS

FIELD PROCEDURES
FOR
CHAIN OF CUSTODY DOCUMENTATION

Samples collected were handled in accordance with the California Department of Health Services guidelines. Each sample was labeled in the field and immediately stored in a cooler and preserved with blue ice for transport to a state-certified laboratory for analysis.

A chain of custody record accompanied the samples and included the site and sample identification, date of collection, analysis requested, and the name and signature of the sampling technician. When transferring possession of the samples, the transferee signed and dated the chain of custody record.

Pace Analytical

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

July 29, 1996 REVISED REPORT

Mr. Brady Nagle
Alisto Engineering
1575 Treat Boulevard, Suite 201
Walnut Creek, CA 94598

RE: PACE Project Number: 706041 REVISED REPORT
Client Project ID: Port of Oakland-801 Maritime

Dear Mr. Nagle:

Enclosed are the results of analyses for sample(s) received on July 5, 1996. This report has been revised to include gasoline results. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

David A. Pichette
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

DATE: 07/29/96
PAGE: 1

Kleinfelder Engineering
1575 Treat Blvd.
Suite 201
Walnut Creek, CA 94598

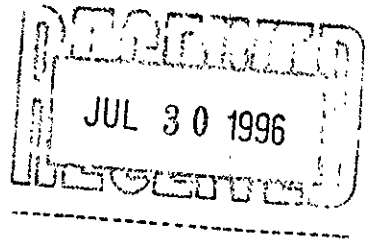
Attn: Mr. Brady Nagle
Phone: (510)295-1650

PACE Project Number: 706041
Client Project ID: Port of Oakland-801 Maritime

PACE Sample No: 70654892
Client Sample ID: MW-1-5.5

Date Collected: 07/03/96
Date Received: 07/05/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Soil								
Gasoline	ND	ug/kg	200	07/09/96	CA LUFT	AMH		
Benzene	ND	ug/kg	1	07/09/96	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/kg	1	07/09/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/kg	1	07/09/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/kg	2	07/09/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	100	%		07/09/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	95	%		07/09/96	CA LUFT	AMH	460-00-4	
GC								
TPH in Soil by 8015 Modified								
Diesel Fuel	7.1	mg/kg	5	07/10/96	TPH by EPA 8015M	DLL	11-84-7...	1,2
n-Pentacosane (S)	110	%		07/10/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				07/08/96				



REPORT OF LABORATORY ANALYSIS

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PACE Project Number: 706041
Client Project ID: Port of Oakland-801 Maritime

PARAMETER FOOTNOTES

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
(S)	Surrogate
[1]	Hydrocarbons present do not match profile of laboratory standard.
[2]	High boiling point hydrocarbons are present in sample.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Pace Analytical

QUALITY CONTROL DATA

Kleinfelder Engineering
1575 Treat Blvd.
Suite 201
Walnut Creek, CA 94598

Attn: Mr. Brady Nagle
Phone: (510)295-1650

PACE Project Number: 706041
Client Project ID: Port of Oakland-801 Maritime

QC Batch ID: 15421
QC Batch Method: CA LUFT
Date of Batch: 06/25/96
Analysis Method: TPH by EPA 8015M
Analysis Description: TPH in Soil by 8015 Modified
Associated PACE Samples: 70654892

METHOD BLANK: 70655782
Associated PACE Samples: 70654892

Parameter	Units	Method Blank Result	PRL	Footnotes
Diesel Fuel	mg/kg	ND	5	
n-Pentacosane (S)	%	88		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70642236 70642244

Parameter	Units	70641980	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	27.3	33	53.3	78	59.3	96	21	1,1
n-Pentacosane (S)					71		69		

LABORATORY CONTROL SAMPLE & LCSD: 70642251 70642269

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/kg	33	23	69	17.7	53	26	
n-Pentacosane (S)				81		62		

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

Alisto Engineering
1575 Treat Blvd.
Suite 201
Walnut Creek, CA 94598

PACE Project Number: 706041
Client Project ID: Port of Oakland-801 Maritime

Attn: Mr. Brady Nagle
Phone: (510)295-1650

QC Batch ID: 15692
QC Batch Method: CA LUFT
Date of Batch: 07/08/96
Analysis Method: CA LUFT
Analysis Description: GAS/BTEX by CA LUFT, Soil
Associated PACE Samples: 70654892

METHOD BLANK: 70655873
Associated PACE Samples:
70654892

Parameter	Units	Method Blank Result	PRL	Footnotes
Benzene	ug/kg	ND	1	
Toluene	ug/kg	ND	1	
Ethylbenzene	ug/kg	ND	1	
Xylene (Total)	ug/kg	ND	2	
a,a,a-Trifluorotoluene (S)	%	97		
4-Bromofluorobenzene (S)	%	95		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70654900 70654918

Parameter	Units	70647771	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/kg	ND	100	96.6	97	103	103	6	
Toluene	ug/kg	ND	100	97.7	98	104	104	6	
Ethylbenzene	ug/kg	ND	100	97.2	97	102	102	5	
Xylene (Total)	ug/kg	ND	300	281	94	294	98	4	
a,a,a-Trifluorotoluene (S)					102		105		
4-Bromofluorobenzene (S)					97		98		

REPORT OF LABORATORY ANALYSIS

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Pace Analytical

QUALITY CONTROL DATA

PACE Project Number: 706041
Client Project ID: Port of Oakland-801 Maritime

LABORATORY CONTROL SAMPLE: 70654462

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Benzene	ug/kg	100	93.2	93	
Toluene	ug/kg	100	95.7	96	
Ethylbenzene	ug/kg	100	97.9	98	
Xylene (Total)	ug/kg	300	286	95	
a,a,a-Trifluorotoluene (S)				96	
4-Bromofluorobenzene (S)				96	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706041
Client Project ID: Port of Oakland-801 Maritime

QUALITY CONTROL DATA PARAMETER FOOTNOTES

The Quality Control Sample Final Results listed above have been rounded to reflect an appropriate number of significant figures. Consistent with EPA guidelines unrounded concentrations have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate
[1]	Due to high analyte concentration the matrix spike and/or matrix spike duplicate do not provide reliable recovery data.

REPORT OF LABORATORY ANALYSIS

Pace Analytical

336576

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: Alisto Engineering Group
Address: 1575 Treat Blvd. Suite 201
Walnut Creek CA 94598
Phone: (510) 295-1650

Report To: Brady Nagle
Bill To: Port of Oakland
P.O. # / Billing Reference: 202863
Project Name / No.: 801 Maritime

Pace Client No.:
Pace Project Manager:
Pace Project No.: 706041
*Requested Due Date:

Sampled By (PRINT): Ted Morse
Sampler Signature: Ted Morse
Date Sampled: 7/3/96

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	ANALYSES REQUEST: TPH-G/BTEX	TPH-D	REMARKS
1	MW-1 → 5.5		Soil	154892	1					✓	✓	
2												
3												
4												
5												
6												
7												
8												

COOLER CUSTODY SEALS INTACT ☐ NOT INTACT ☐
COOLER TEMPERATURE 4° °C

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT DATE	SHIPMENT METHOD RETURNED DATE

Additional Comments

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
	Ted Morse / Alisto	Mike Maynard	7/5	10:31
	Mike Maynard	Jack Hermann	7/5	13:40

SEE REVERSE SIDE FOR INSTRUCTIONS

ORIGINAL

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

July 19, 1996

Mr. Brady Nagle
Alisto Engineering
1575 Treat Boulevard, Suite 201
Walnut Creek, CA 94598

RE: PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

Dear Mr. Nagle:

Enclosed are the results of analyses for sample(s) received on July 11, 1996. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Stephanie Matzger
for
David A. Pichette
Project Manager

Enclosures

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

DATE: 07/19/96
PAGE: 1

Alisto Engineering
1575 Treat Blvd.
ite 201
lnut Creek, CA 94598

PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

ttn: Mr. Brady Nagle
one: (510)295-1650

PACE Sample No: 70659347 Date Collected: 07/10/96
ient Sample ID: MW-1 Date Received: 07/11/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	180	ug/L	50	07/15/96	CA LUFT	AMH		
Benzene	27	ug/L	0.5	07/15/96	CA LUFT	AMH	71-43-2	
Toluene	14	ug/L	0.5	07/15/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	5.4	ug/L	0.5	07/15/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	23	ug/L	1	07/15/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	103	%		07/15/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	100	%		07/15/96	CA LUFT	AMH	460-00-4	
TPH in Water by 8015 Modified								
Diesel Fuel	7.1	mg/L	0.05	07/18/96	TPH by EPA 8015M	DLL	11-84-7...	1
n-Pentacosane (S)	114	%		07/18/96	TPH by EPA 8015M	DLL	629-99-2	
Date Extracted				07/17/96				

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
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Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

PACE Sample No: 70659404 Date Collected: 07/10/96
Client Sample ID: QC-2 (TRIP BLANK) Date Received: 07/11/96

Parameters	Results	Units	PRL	Analyzed	Method	Analyst	CAS#	Footnotes
GC -- Volatiles								
GAS/BTEX by CA LUFT, Water								
Gasoline	ND	ug/L	50	07/15/96	CA LUFT	AMH		
Benzene	ND	ug/L	0.5	07/15/96	CA LUFT	AMH	71-43-2	
Toluene	ND	ug/L	0.5	07/15/96	CA LUFT	AMH	108-88-3	
Ethylbenzene	ND	ug/L	0.5	07/15/96	CA LUFT	AMH	100-41-4	
Xylene (Total)	ND	ug/L	1	07/15/96	CA LUFT	AMH	1330-20-7	
a,a,a-Trifluorotoluene (S)	105	%		07/15/96	CA LUFT	AMH	2164-17-2	
4-Bromofluorobenzene (S)	73	%		07/15/96	CA LUFT	AMH	460-00-4	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

ARAMETER FOOTNOTES

ND	Not Detected
C	Not Calculable
RL	PACE Reporting Limit
(S)	Surrogate
[1]	High boiling point hydrocarbons are present in sample.

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

QUALITY CONTROL DATA

DATE: 07/19/96
PAGE: 4

Alisto Engineering
1575 Treat Blvd.
Suite 201
Walnut Creek, CA 94598

PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

Attn: Mr. Brady Nagle
Phone: (510)295-1650

QC Batch ID: 15781
Analysis Method: CA LUFT
Associated PACE Samples: 70659347 70659404

QC Batch Method: CA LUFT
Analysis Description: GAS/BTEX by CA LUFT, Water

Date of Batch: 07/10/96

METHOD BLANK: 70660246
Associated PACE Samples: 70659347 70659404

Parameter	Units	Method Blank Result	PRL	Footnotes
Gasoline	ug/L	ND	50	
Benzene	ug/L	ND	0.5	
Toluene	ug/L	ND	0.5	
Ethylbenzene	ug/L	ND	0.5	
Xylene (Total)	ug/L	ND	1	
a,a,a-Trifluorotoluene (S)	%	102		
4-Bromofluorobenzene (S)	%	87		

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 70657135 70657143

Parameter	Units	70653118	Spike Conc.	Matrix Spike Result	Spike % Rec	Matrix Sp. Dup. Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/L	ND	100	104	104	103	103	1	
Toluene	ug/L	ND	100	105	105	104	104	1	
Ethylbenzene	ug/L	ND	100	109	109	109	109	0	
Xylene (Total)	ug/L	ND	300	324	108	322	107	1	
a,a,a-Trifluorotoluene (S)					103		100		
4-Bromofluorobenzene (S)					107		104		

REPORT OF LABORATORY ANALYSIS

Pace Analytical

Pace Analytical Services, Inc.
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Tel: 707-792-1865
Fax: 707-792-0342

QUALITY CONTROL DATA

PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

LABORATORY CONTROL SAMPLE & LCSD: 70657150 70657168

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Benzene	ug/L	100	98.1	98	99.3	99	1	
Toluene	ug/L	100	101	101	102	102	1	
Ethylbenzene	ug/L	100	104	104	107	107	3	
Xylene (Total)	ug/L	300	301	100	307	102	2	
a,a-Trifluorotoluene (S)				97		97		
Bromofluorobenzene (S)				97		105		

LABORATORY CONTROL SAMPLE: 70660766

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	Footnotes
Benzene	ug/L	100	102	102	
Toluene	ug/L	100	104	104	
Ethylbenzene	ug/L	100	106	106	
Xylene (Total)	ug/L	300	309	103	
a,a-Trifluorotoluene (S)				102	
Bromofluorobenzene (S)				99	

REPORT OF LABORATORY ANALYSIS

Pace Analytical Services, Inc.
1455 McDowell Blvd. North, Suite D
Petaluma, CA 94954
Tel: 707-792-1865
Fax: 707-792-0342

Pace Analytical

QUALITY CONTROL DATA

DATE: 07/19/96

Alisto Engineering
1575 Treat Blvd.
Suite 201
Walnut Creek, CA 94598

PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

Attn: Mr. Brady Nagle
Phone: (510)295-1650

QC Batch ID: 15936
QC Batch Method: EPA 3520
Date of Batch: 07/17/96
Analysis Method: TPH by EPA 8015M
Analysis Description: TPH in Water by 8015 Modified
Associated PACE Samples: 70659347

METHOD BLANK: 70662572
Associated PACE Samples:
70659347

Parameter	Units	Method Blank Result	PRL	Footnotes
Diesel Fuel	mg/L	ND	0.05	
n-Pentacosane (S)	%	73		

LABORATORY CONTROL SAMPLE & LCSD: 70662580 70662598

Parameter	Units	Spike Conc.	LCS Result	Spike % Rec	LCSD Result	Spike Dup % Rec	RPD	Footnotes
Diesel Fuel	mg/L	1	0.717	72	0.832	83	14	
n-Pentacosane (S)				85		99		

REPORT OF LABORATORY ANALYSIS

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Fax: 707-792-0342

Pace Analytical

PACE Project Number: 706073
Client Project ID: Port of Oakland-Airport

QUALITY CONTROL DATA PARAMETER FOOTNOTES

The Quality Control Sample Final Results listed above have been rounded to reflect an appropriate number of significant figures. Consistent with EPA guidelines unrounded concentrations have been used to calculate % Rec and RPD values.

ND	Not Detected
NC	Not Calculable
PRL	PACE Reporting Limit
RPD	Relative Percent Difference
(S)	Surrogate

REPORT OF LABORATORY ANALYSIS

336577

Pace Analytical

CHAIN-OF-CUSTODY RECORD
Analytical Request

Client: Alisto Engineering
Address: 1575 Treat Blvd #201
W.C. Ca 94598
Phone: (510) 295-1650 Fax# 295-1823

Report To: Ted Moise
Bill To: Port Of Oakland
P.O. # / Billing Reference:
Project Name / No.: Port of Oakland 10-339-1-3

Pace Client No.:
Pace Project Manager:
Pace Project No.: 706073
*Requested Due Date:

Sampled By (PRINT): Larry Buenvenida
Sampler Signature: [signature]
Date Sampled: 7/10/96

ITEM NO.	SAMPLE DESCRIPTION	TIME	MATRIX	PACE NO.	NO. OF CONTAINERS	PRESERVATIVES: UNPRESERVED	H_2SO_4	HNO_3	VOA	HCl	ANALYSES REQUEST: TPH-G/BTXE	TPH-D	REMARKS
1	MW-1	7/10/96	W	659347	5						X	X	
2	~~QC-1~~	↓	↓								↓	↓	NO QC-1
3	QC-2	↓	↓	659404	2						X		
4													
5													
6													
7													
8													

COOLER CUSTODY SEALS INTACT ☐ NOT INTACT ☐
COOLER TEMPERATURE 5° °C

COOLER NOS.	BAILERS	SHIPMENT METHOD OUT DATE	RETURNED DATE

ITEM NUMBER	RELINQUISHED BY / AFFILIATION	ACCEPTED BY / AFFILIATION	DATE	TIME
1	[signature]	Mike Mainard	7/10/96	2:52
	Mike Mainard	Gail Gersman	7/11	16:10

Additional Comments

SEE REVERSE SIDE FOR INSTRUCTIONS

ORIGINAL