



BP OIL

February 7, 1997

BP Oil Company
Environmental Resources Management
Building 13, Suite N
295 SW 41st Street
Renton, Washington 98065-4931
(206) 251-0667
Fax No: (206) 251-0736

Ms. Eva Chu
Alameda County Health Care Services Agency
1131 Harbor Bay Parkway, Room 250
Alameda, CA 94542-6577

RE: **BP OIL FACILITY #11133**
2220 98th Avenue
Oakland CA *Jan 1997*

Dear Ms Chu:

Attached please find our report on additional well installation titled **WELL INSTALLATION REPORT, Dated JANUARY 27, 1997** for the above referenced facility.

If you should have any questions regarding this site, I may be reached at (206) 251-0689.

Respectfully,

[Signature]
Scott T. Hooton
Environmental Resources Management
Corrective Action Manager

STH:sb msword\ERM11133

cc: Mr. Brady Nagle, Alisto Engineering Group, 1575 Treat Blvd., Ste 201, Walnut Creek, CA 94598

TOSCO Northwest Co., 601 Union Street, Suite 2500, Seattle, WA 98101

Mr. Richard Hiett, CRWQCB, San Francisco Bay Region, 2101 Webster Street, Suite 500, Oakland CA 94612

Site File

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ENVIRONMENTAL PROTECTION

JAN 3 1 1997

BP OIL CO.
ENVIRONMENTAL DEPT.

WELL INSTALLATION REPORT

BP Oil Company Service Station No. 11133
2220 98th Avenue
Oakland, California

Project No. 10-025

ALISTO ENGINEERING GROUP
1575 Treat Boulevard, Suite 201
Walnut Creek, California 94598
(510) 295-1650
(510) 295-1823 FAX

7160 S.W. Hazelfern Road
Portland, Oregon 97224
(503) 620-8420
(503) 620-1923 FAX

1102 Industry Drive
Tukwila, Washington 98188
(206) 575-9013
(206) 575-9327 FAX

January 1997

97 FEB 13 AM 9:36

ENVIRONMENTAL
PROTECTION



WELL INSTALLATION REPORT

**BP Oil Company Service Station No. 11133
2220 98th Avenue
Oakland, California**

Project No. 10-025-12-001

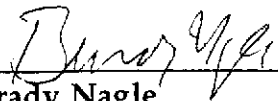
Prepared for:

**BP Oil Company
Environmental Resources Management
295 S.W. 41st Street
Building 13, Suite N
Renton, Washington**


Prepared by:

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

January 27, 1997



**Brady Nagle
Project Manager**



**Al Sevilla, P.E.
Principal**



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1.0 INTRODUCTION

BP Oil Company retained Alisto Engineering Group to install an additional offsite groundwater monitoring well at BP Oil Service Station No. 11133, 2220 98th Avenue, Oakland, California. The work was performed under BP Oil Contract Release No. G787579, dated June 3, 1996. A site vicinity map is shown on Figure 1.

1.1 Purpose and Scope of Work

This work was performed to further assess the nature and extent of petroleum hydrocarbons in the subsurface soil and groundwater and the hydrogeologic characteristics of the site. The scope of work for this investigation, which was presented in the approved work plan dated June 11, 1996, included the following tasks:

- Drilled and logged one exploratory soil boring and collected soil samples during installation of groundwater Monitoring Well AW-9.
- Developed Monitoring Well AW-9 and surveyed the top of casing relative to the monitoring wells at the site.
- Analyzed the soil samples for specific hydrocarbon constituents.
- Evaluated the data and analytical results.
- Prepared this report.

The above tasks and related field and sampling activities were performed in accordance with the technical specifications of BP Oil Company and 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 Location and Description

The BP Oil station is located near the eastern corner of the intersection of 98th Avenue and Bancroft Avenue, Oakland, California. The layout of the site, including the location of underground fuel storage tanks and product dispensers, is shown on Figure 2.

Properties neighboring the site are residential consisting of apartment buildings and single-family houses. A survey of basements in the immediate vicinity of the site was performed to identify any subsurface enclosed spaces where hydrocarbon vapors may accumulate. **The single-family houses adjacent to the site are constructed on concrete slabs, with no basements or crawl spaces existing below grade.**

2.0 FIELD METHODS

The well installation permit was obtained from the Zone 7 Water Agency and an encroachment permit was obtained from the City of Oakland Office of Planning and



Building. Copies of the permits are presented in Appendix A. The methods and procedures used during field activities are described in the following sections.

2.1 Drilling and Soil Sampling

On December 3, 1996, Soil Boring AW-9 was drilled offsite in Warner Avenue, approximately 300 feet southeast of the site. The boring was drilled to a depth of 33.5 feet. Drilling was performed by V&W Drilling, Inc., Rio Vista, California, using a Mobile B-61 drilling rig equipped with 8-inch-diameter hollow-stem augers. Soil samples were collected at selected intervals, beginning at 5 feet to the total depth of the borings. Each soil sample was field screened using a Thermo Model 580B organic vapor meter. The drilling and soil sampling procedures are presented in Appendix B.

Soil samples were described in accordance with the Unified Soils Classification System on the boring logs including color, moisture, density, and consistency. The soil boring log is presented in Appendix C.

2.2 Monitoring Well Installation and Construction

Soil Boring AW-9 was converted into Monitoring Well AW-9 in accordance with the field procedures described in Appendix B. The well was constructed of 2-inch-diameter flush threaded, Schedule 40 PVC blank casing from the surface to 12.5 feet below grade, and 0.010-inch slotted screen from 12.5 to 27.5 feet below grade. Well construction details are included on the boring logs in Appendix C.

2.3 Monitoring Well Development and Well Surveying

Field procedures used for well development during this investigation are presented in Appendix D. During well construction, after placing the filter pack and before installing the bentonite pellets and cement seal, a surge block was used to settle the sand pack. On December 3, 1996, AW-9 was additionally developed by removing at least 10 casing volumes with a bailer until groundwater was relatively free of sediment. During well development, purgewater samples were collected to measure sediment content. The samples were collected after removal of approximately 2 gallons of purge water and again after development and removal of approximately 21 gallons of purge water. The sediment measured after each one liter of purge water sample was allowed to settle in an Imhoff Cone is as follows:



Well ID	Date	Time	Purged Volume (gallons)	Sediment Concentration (ml/l)
AW-9	12/3/96	13:30	2	70
AW-9	12/3/96	13:38	21	10

The well development data are presented in the field survey forms in Appendix E.

Monitoring Well AW-9 was surveyed to the top of the well casing relative to other onsite wells by a licensed land surveyor, Frame Surveying and Mapping, Davis, California. The well elevation survey map is presented in Appendix F.

3.0 ANALYTICAL METHODS

The soil samples collected during this investigation were analyzed by Southern Petroleum Laboratories, Inc., Houston, Texas, a state-certified laboratory, using standard test methods of the United States Environmental Protection Agency (EPA) and the California Department of Health Services.

The soil samples collected from AW-9 were analyzed for the following:

- Total petroleum hydrocarbons as gasoline (TPH-G) using EPA Methods 5030/8015.
- Benzene, toluene, ethylbenzene, and total xylenes (BTEX) using EPA Methods 5030/8020.
- Methyl tert butyl ether using EPA Methods 5030/8020.

The laboratory results are summarized in Table 1. The field procedures for chain of custody documentation and the laboratory reports and chain of custody records are presented in Appendix G.



TABLE 1 - SUMMARY OF RESULTS OF SOIL SAMPLING
 BP OIL COMPANY SERVICE STATION NO. 11133
 2220 98TH AVENUE, OAKLAND, CALIFORNIA

ALISTO PROJECT NO. 10-025

BORI ID	SAMPLE DEPTH (feet)	DATE OF SAMPLING	TPH-G (mg/kg)	B (mg/kg)	T (mg/kg)	E (mg/kg)	X (mg/kg)	MTBE (mg/kg)	LAB
AW-9	16.5-17	12/03/96	ND<0.1	ND<0.001	ND<0.002	ND<0.002	ND<0.002	ND<0.1	SPL
AW-9	19-19.5	12/03/96	ND<0.1	ND<0.001	ND<0.002	ND<0.002	ND<0.002	ND<0.1	SPL

ABBREVIATIONS:

TPH-G Total petroleum hydrocarbons as gasoline
 B Benzene
 T Toluene
 E Ethylbenzene
 X Total xylenes
 MTBE Methyl tert butyl ether
 mg/kg Milligrams per kilograms
 SPL Southern Petroleum Laboratories

F:\0\10-025\SOIL.WQ2



SOURCE:
 USGS MAP, OAKLAND EAST AND SAN LEANDRO
 QUADRANGLES, CALIFORNIA. 7.5 MINUTE SERIES. 1958.
 PHOTOREVISED 1980.

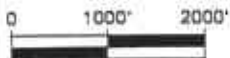
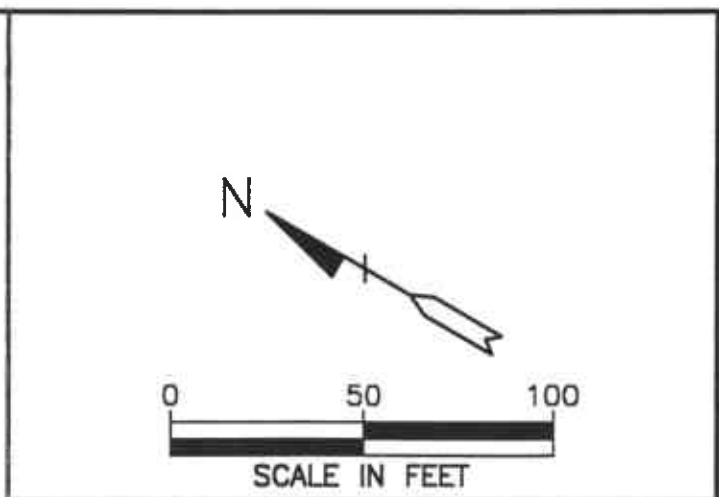
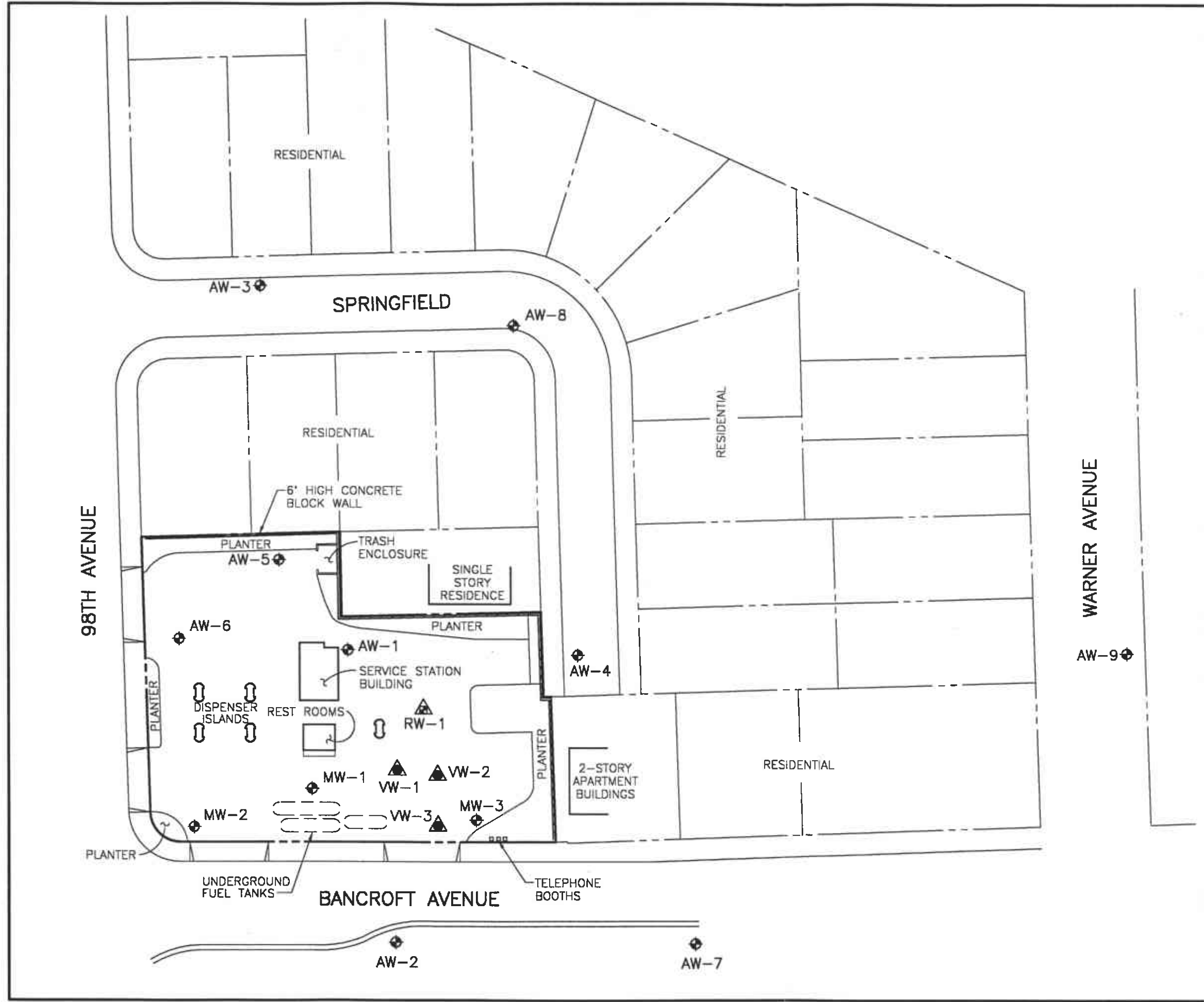


FIGURE 1
SITE VICINITY MAP

BP OIL SERVICE STATION NO. 11133
2220 98TH AVENUE
OAKLAND, CALIFORNIA
PROJECT NO. 10-025



ALISTO ENGINEERING GROUP
 WALNUT CREEK, CALIFORNIA



- LEGEND**
- ◆ GROUNDWATER MONITORING WELL
 - ▲ VAPOR EXTRACTION WELL
 - ▲ COMBINED GROUNDWATER RECOVERY/VAPOR EXTRACTION WELL

FIGURE 2
SITE PLAN
 BP OIL SERVICE STATION NO. 11133
 2220 98TH AVENUE
 OAKLAND, CALIFORNIA
 PROJECT NO. 10-025

APPENDIX A
WELL INSTALLATION PERMITS



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

FOR OFFICE USE

LOCATION OF PROJECT In the public right-of-way of Warner Ave Oakland; 4000' NE of Bancroft Ave

PERMIT NUMBER 96833

LOCATION NUMBER _____

CLIENT

Name BP Oil Company
Address 295 SW 41st 1st. Voice 206.251.0689
City Renton, WA Zip 98055

PERMIT CONDITIONS

Circled Permit Requirements Apply

APPLICANT

Name Alisto Engineering Group
Brady Nade Fax 510.295.1650
Address 1575 J Street Blvd Voice 510.295.1823
City Walnut Creek CA Zip 94598

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.

TYPE OF PROJECT

Well Construction	Geotechnical Investigation
Cathodic Protection _____	General _____
Water Supply _____	Contamination _____
Monitoring <u>X</u>	Well Destruction _____

PROPOSED WATER SUPPLY WELL USE

Domestic _____	Industrial _____	Other <u>Sampling</u>
Municipal _____	Irrigation _____	

DRILLING METHOD:

Mud Rotary _____ Air Rotary _____ Auger X
Cable _____ Other _____

DRILLER'S LICENSE NO. C-57# 658786

WELL PROJECTS

Drill Hole Diameter <u>8</u> in.	Maximum
Casing Diameter <u>2</u> in.	Depth <u>40</u> ft.
Surface Seal Depth <u>20</u> ft.	Number <u>1</u>

GEOTECHNICAL PROJECTS

Number of Borings _____	Maximum
Hole Diameter _____ in.	Depth _____ ft.

ESTIMATED STARTING DATE 12/3/96

ESTIMATED COMPLETION DATE 12/3/96

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

Approved

Wyman Hong
Wyman Hong

Date 27 Nov 96

APPLICANT'S

Alisto Engineering

EXCAVATION PERMIT

Job Site 2231 WARNER AV

Parcel# 046 -5477-006-00

Appl# X9600906

Descr excavate to install a monitoring well. encroachment permit a Permit Issued 11/14/96
pproved per r. tam

Work Type EXCAVATION-PRIVATE P

USA #

Util Co. Job #
Util Fund #

Acctg#:

Applicant

Phone#

Lic#

License Classes--

Owner FULLER JAMES & THERESIE & JOHN

Contractor ALISTO ENGINEERING GROUP INC

X

(510) 798-4070 652511 A

Arch/Engr

Agent

Applic Addr 1000 BURNETT AVE #150, CONCORD, CA. 94520

\$245.00 TOTAL FEES PAID AT ISSUANCE
\$40.00 Applic \$205.00 Permit
\$.00 Process \$.00 Rec Mgmt
\$.00 Gen Plan \$.00 Invsig
\$.00 Other

CITY OF OAKLAND

Date: 11/14/96 Amt Paid: \$245.00

By: MAC Register #91 Receipt# 989812



EXCAVATION PERMIT

TO EXCAVATE IN STREETS OR OTHER SPECIFIED WORK

CIVIL
ENGINEERING

PAGE 2 of 2

PERMIT NUMBER X9600906		SITE ADDRESS/LOCATION 2231 WARNER AV	
APPROX. START DATE	APPROX. END DATE	24-HOUR EMERGENCY PHONE NUMBER (Permit not valid without 24-Hour number)	
CONTRACTOR'S LICENSE # AND CLASS		CITY BUSINESS TAX #	
<p>ATTENTION:</p> <p>1) State law requires that the contractor/owner call <i>Underground Service Alert (USA)</i> two working days before excavating. This permit is not valid unless applicant has secured an inquiry identification number issued by USA. The USA telephone number is 1 (800) 642-2444. UNDERGROUND SERVICE ALERT (USA) #: 325478</p> <p>2) 48 hours prior to starting work, YOU MUST CALL (510) 238-3651 TO SCHEDULE AN INSPECTION.</p>			
<p>OWNER/BUILDER</p> <p>I hereby affirm that I am exempt from the Contractor's License Law for the following reason (Sec. 7031.5 Business and Professions Code: Any city or county which requires a permit to construct, alter, improve, demolish, or repair any structure, prior to its issuance, also requires the applicant for such permit to file a signed statement that he is licensed pursuant to the provisions of the Contractor's License law Chapter 9 (commencing with Sec. 7000) of Division 3 of the Business and Professions Code, or that he is exempt therefrom and the basis for the alleged exemption. Any violation of Section 7031.5 by any applicant for a permit subjects the applicant to a civil penalty of not more than \$500):</p> <p><input type="checkbox"/> I, as an owner of the property, or my employees with wages as their sole compensation, will do the work, and the structure is not intended or offered for sale (Sec. 7044, Business Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who does such work himself or through his own employees, provided that such improvements are not intended or offered for sale. If however, the building or improvement is sold within one year of completion, the owner-builder will have the burden of proving that he did not build or improve for the purpose of sale).</p> <p><input type="checkbox"/> I, as owner of the property, am exempt from the sale requirements of the above due to: (1) I am improving my principal place of residence or appurtenances thereto, (2) the work will be performed prior to sale, (3) I have resided in the residence for the 12 months prior to completion of the work, and (4) I have not claimed exemption on this subdivision on more than two structures more than once during any three-year period. (Sec. 7044 Business and Professions Code).</p> <p><input type="checkbox"/> I, as owner of the property, am exclusively contracting with licensed contractors to construct the project, (Sec. 7044, Business and Professions Code: The Contractor's License Law does not apply to an owner of property who builds or improves thereon, and who contracts for such projects with a contractor(s) licensed pursuant to the Contractor's License law).</p> <p><input type="checkbox"/> I am exempt under Sec. _____, B&PC for this reason _____</p>			
<p>WORKER'S COMPENSATION</p> <p><input type="checkbox"/> I hereby affirm that I have a certificate of consent to self-insure, or a certificate of Worker's Compensation Insurance, or a certified copy thereof (Sec. 3700, Labor Code).</p> <p>Policy # _____ Company Name _____</p> <p><input type="checkbox"/> I certify that in the performance of the work for which this permit is issued, I shall not employ any person in any manner so as to become subject to the Worker's Compensation Laws of California (not required for work valued at one hundred dollars (\$100) or less).</p>			
<p>NOTICE TO APPLICANT: If, after making this Certificate of Exemption, you should become subject to the Worker's Compensation provisions of the Labor Code, you must forthwith comply with such provisions or this permit shall be deemed revoked. This permit is issued pursuant to all provisions of Chapter 6, Article 2 of the Oakland Municipal Code. It is granted upon the express condition that the permittee shall be responsible for all claims and liabilities arising out of work performed under the permit or arising out of permittee's failure to perform the obligations with respect to street maintenance. The permittee shall, and by acceptance of the permit agrees to defend, indemnify, save and hold harmless the City, its officers and employees, from and against any and all suits, claims, or actions brought by any person for or on account of any bodily injuries, disease or illness or damage to persons and/or property sustained or arising in the construction of the work performed under the permit or in consequence of permittee's failure to perform the obligations with respect to street maintenance. This permit is void 90 days from the date of issuance unless an extension is granted by the Director of the Office of Planning and Building.</p>			
<p>I hereby affirm that I am licensed under provisions of Chapter 9 of Division 3 of the Business and Professions Code and my license is in full force and effect (if contractor), that I have read this permit and agree to its requirements, and that the above information is true and correct under penalty of law.</p> <p><i>[Signature]</i> _____ Date <u>11/14/96</u></p> <p>Signature of Permittee <input type="checkbox"/> Agent for <input type="checkbox"/> Contractor <input type="checkbox"/> Owner</p>			
DATE STREET LAST RESURFACED	SPECIAL PAVING DETAIL REQUIRED? <input type="checkbox"/> YES <input type="checkbox"/> NO	HOLIDAY RESTRICTION? (NOV 1 - JAN 1) <input type="checkbox"/> YES <input type="checkbox"/> NO	LIMITED OPERATION AREA? (7AM-9AM & 4PM-6PM) <input type="checkbox"/> YES <input type="checkbox"/> NO
ISSUED BY <i>M. Miller</i>		DATE ISSUED <u>11/14/96</u>	

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

The soil boring was drilled using 8-inch-diameter 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

During drilling, samples were collected at intervals of up to 5 feet, beginning at 5 feet below grade to the total depth of the borings. Before and after each use, the sampler was washed using a phosphate-free detergent followed by tap water and deionized water rinses. Soil was sampled using a California-modified split-spoon sampler lined with stainless steel 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 18 inches of penetration to evaluate the density of the soil.

After retrieval from the augers, the sampler was split, the sample tubes were removed, and a soil sample was selected for possible chemical analysis. The sample was retained within the stainless steel 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's project number, boring number, sample depth interval, sampler's initials, and date of collection. The sample was immediately placed in a waterproof plastic bag and stored in a cooler containing blue ice. Possession of the 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's personnel using the Unified Soils 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.

**FIELD PROCEDURES
FOR
DRILLING, SOIL SAMPLING,
AND GROUNDWATER MONITORING WELL INSTALLATION
(continued)**

The annular space surrounding the screened portion was backfilled with No. 2/12 Lonestar sand (filter pack) to approximately 1 to 2 feet above the top of the screened section. An approximately 2-foot-thick interval of bentonite pellets was added to the annulus above the filter pack and hydrated with approximately 2 to 3 gallons of deionized water to minimize intrusion of well seal into the filter pack. A 10- to 11-foot-thick interval of Portland Type I/II neat cement 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 top of the well casing to secure the well from surface fluid and tampering.

APPENDIX C

BORING LOGS AND WELL CONSTRUCTION DETAILS



SEE SITE PLAN

ALISTO PROJECT NO: 10-025-12

DATE DRILLED: 12/03/98

CLIENT: BP Oil Company

LOCATION: 2231 Warner Avenue, Oakland, California

DRILLING METHOD: Hollow-stem Auger (8")

DRILLING COMPANY: V & W Drilling Inc.

CASING ELEVATION: 'MSL

LOGGED BY: Chris Reinheimer

APPROVED BY: Al Sevilla

BLOWS/6 IN.	PTD VALUES	WELL DIAGRAM	DEPTH feet	SAMPLES	GRAPHIC LOG	SOIL CLASS	GEOLOGIC DESCRIPTION
		<p>2" Sch. 40 PVC 2" 0.010" slotted PVC screen #12 Sand Bentonite Pellets Bentonite seal Grout</p>					4" asphalt; 8" concrete. Fill: Clayey to sandy GRAVEL; gray-green; damp.
17,20,21	0		5			ML	silty CLAY: medium red-brown, damp, medium-grained sand to 5%, root traces and organics to 5%, hard.
17,20,25	0		10				Same: damp to moist, sand <2%, organics <2%, hard.
20,21,23	0		15			SM	clayey to silty SAND: medium red-brown, moist to wet, sand med-coarse, gravel to 1.5 cm 10%, dense.
13,14,14	0		20				Same
17,11,21	0		25			GM GC	clayey to silty GRAVEL: medium red-brown, wet, gravel to 1.5 cm 80%, fines to 20%, medium to coarse grained sand to 20%, dense.
17,19,31	NM		30			CL	Same, very dense.
16,18,28	NM						CLAY: medium red-brown, wet, coarse-grained sand <5%, hard.
11,18,24	NM					Same Boring terminated at 33 feet. Stabilized water level measured on	

APPENDIX D

**FIELD PROCEDURES FOR GROUNDWATER
MONITORING WELL DEVELOPMENT**

**FIELD PROCEDURES
FOR
GROUNDWATER MONITORING WELL DEVELOPMENT**

The groundwater monitoring well was developed to consolidate and stabilize the filter pack to optimize well production and reduce the turbidity of subsequent groundwater samples. The monitoring well was developed by alternately using a surge block and pump to evacuate the water and sediment. Development continued until the groundwater was relatively free of sediment (approximately 10 casing volumes). Well development fluids were placed into DOT-approved drums for disposal.

APPENDIX E

GROUNDWATER MONITORING WELL DEVELOPMENT
FIELD SURVEY FORMS

10-075-12-1

ALISTO

Field Services Sheet

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

Project No. 10-075-12-1 Date: 12/3/96
Address 2220 98th (Herman Ave well) Day: MTWTHF
Contract No. _____ City: Oakland
Station No. 11133 Sampler: Reinheimer

Field Activity: Groundwater Monitoring Groundwater Sampling Water Disposal

Equipment Used Well Development

- Water Level Indicator
- pH, Temp, Conductivity meter
- Dissolved Oxygen Meter
- Turbidimeter
- Surface Pump
- Electric Subsurface Pump
- Tank Trailer
- Organic Vapor Meter

Disposable and repair items used:
Disposable bailers 1 Disposable poly tubing _____ Feet
2 Inch Locking caps _____ 4 Inch Locking Caps _____ 6 Inch Locking Caps _____
Locks _____ Nitrile gloves _____ Disp. Gloves _____ Replacement Traffic Box _____

Time and Mileage:
_____ to _____ Preparation/ Mobilization Time
_____ to _____ Travel to Site One Way Mileage to site 29 miles x 2 = 58 miles
_____ to _____ Time at Site

Waste at site:
 Drums of Water, 6 Drums of Soil, Empty Drums, Dbl Cont. Drums, Cu Yd Soil Pile

Notes: $(\text{well TD} - \text{DTW}) \times (0.16) \times 10$
Well Volume: $27.5 - 15.8 = 11.7 \text{ feet} \times 0.16 \text{ gal/ft} = 1.87 \times 10 = 18.7 \text{ gallons}$

Gallons	Observations	Time	
2	very silty	12:00	Collect Imhoff sample (1 Liter)
5		12:20	
10		12:35	
15	clearing	12:50	
21	clearing	1:10	Collect Imhoff sample (1 Liter)

Items charged on site investigation field form

Blu

APPENDIX F
WELL ELEVATION SURVEY



FRAME SURVEYING & MAPPING

609 A Street
(916) 756-8584 (TEL)

Davis, CA 95616
(916) 756-8201 (FAX)

January 10, 1997

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

Re: BP Station No. 2220, 98th & Bancroft, Oakland

Dear Brady:

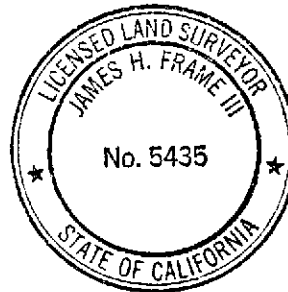
We have located the new well installed at the referenced site. The tabular data for the well is as follows:

DESCRIPTION	NORTHING	EASTING	ELEV (PVC)	ELEV (GROUND)
AW-9	135.6	528.2	37.78	38.0

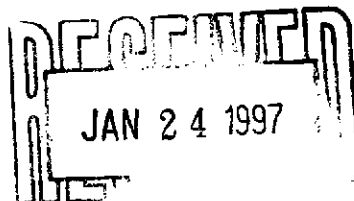
Please contact me if you have any questions.

Regards,

Jim Frame



License expires 9/30/00



APPENDIX G

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

**FIELD PROCEDURES
FOR
CHAIN OF CUSTODY DOCUMENTATION**

Samples 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 or dry 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.



HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

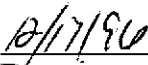
Southern Petroleum Laboratories, Inc.

Certificate of Analysis Number: 96-12-142

Approved for Release by:



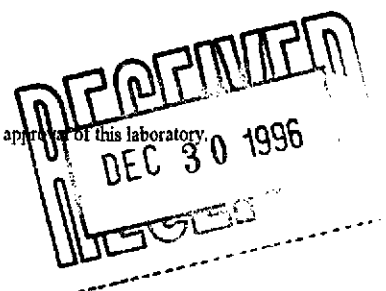
Ed Fry, Project Manager


Date: 12/17/96

Greg Grandits
Laboratory Director

Idelis Williams
Quality Assurance Officer

The attached analytical data package may not be reproduced except in full without the express written approval of this laboratory.





HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9612142-03

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 G-787579 , COC#078797
 DATE: 12/17/96

PROJECT: BP Oil #11133
 SITE: 2220 98th Ave Oakland, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: AW-9 at 16.5'

PROJECT NO: 10-025-04-001
 MATRIX: SOIL
 DATE SAMPLED: 12/03/96 10:00:00
 DATE RECEIVED: 12/04/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	ND	100 P	µg/Kg
Benzene	ND	1.0 P	µg/Kg
Toluene	ND	2.0 P	µg/Kg
Ethylbenzene	ND	2.0 P	µg/Kg
Total Xylene	ND	2.0 P	µg/Kg

Surrogate % Recovery
 1,4-Difluorobenzene 110
 4-Bromofluorobenzene 100
 METHOD 8020***
 Analyzed by: LJ
 Date: 12/06/96

Gasoline Range Organics ND 0.1 P mg/kg

Surrogate % Recovery
 1,4-Difluorobenzene 97
 4-Bromofluorobenzene 97
 California LUFT Manual
 Analyzed by: LJ
 Date: 12/06/96 04:16:00

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
 SPL California License # 1903



HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Certificate of Analysis No. H9-9612142-04

BP Oil Company
 295 SW 41st St, Bldg 13, Ste N
 Renton, WA 98055
 ATTN: Scott Hooton

P.O.#
 G-787579 , COC#078797
 DATE: 12/17/96

PROJECT: BP Oil #11133
 SITE: 2220 98th Ave Oakland, CA
 SAMPLED BY: Alisto Engineering
 SAMPLE ID: AW-9 at 19.0'

PROJECT NO: 10-025-04-001
 MATRIX: SOIL
 DATE SAMPLED: 12/03/96 10:07:00
 DATE RECEIVED: 12/04/96

ANALYTICAL DATA

PARAMETER	RESULTS	DETECTION LIMIT	UNITS
MTBE	ND	100 P	µg/Kg
Benzene	ND	1.0 P	µg/Kg
Toluene	ND	2.0 P	µg/Kg
Ethylbenzene	ND	2.0 P	µg/Kg
Total Xylene	ND	2.0 P	µg/Kg

Surrogate % Recovery
 1,4-Difluorobenzene 113
 4-Bromofluorobenzene 103

METHOD 8020***
 Analyzed by: LJ
 Date: 12/06/96

Gasoline Range Organics ND 0.1 P mg/kg

Surrogate % Recovery
 1,4-Difluorobenzene 97
 4-Bromofluorobenzene 90

California LUFT Manual
 Analyzed by: LJ
 Date: 12/06/96 04:44:00

ND - Not detected. (P) - Practical Quantitation Limit

Notes: *Ref: Methods for Chemical Analysis of Water and Wastes, 1983, EPA
 **Ref: Standard Methods for Examination of Water & Wastewater, 18th ed.
 ***Ref: Test Methods for Evaluating Solid Waste, EPA SW846, 3rd Ed.

QUALITY ASSURANCE: These analyses are performed in accordance with EPA guidelines for quality assurance.
 SPL California License # 1903

QUALITY CONTROL

DOCUMENTATION



AMOUNT CONC. RECOVERY
ADDED MEASURED

METHOD 8020*** BATCH#:HP_0961205173800
WORK ORDER: 9612142-03A CLIENT SAMPLE ID:AW-9 at 16.5'

1,4-Difluorobenzene	30	33	110	60- 136
4-Bromofluorobenzene	30	30	100	37- 168

METHOD 8020*** BATCH#:HP_0961205173800
WORK ORDER: 9612142-04A CLIENT SAMPLE ID:AW-9 at 19.0'

1,4-Difluorobenzene	30	34	113	60- 136
4-Bromofluorobenzene	30	31	103	37- 168

METHOD 8020*** BATCH#:HP_0961205173800
WORK ORDER: Method Blank CLIENT SAMPLE ID:

1,4-Difluorobenzene	30	33	33.4	60- 136
4-Bromofluorobenzene	30	31	30.6	37- 168

METHOD 8020*** BATCH#:HP_0961205173800
WORK ORDER: LCS CLIENT SAMPLE ID:

1,4-Difluorobenzene	30	34	113	60- 136
4-Bromofluorobenzene	30	31	103	37- 168

METHOD 8020*** BATCH#:HP_0961205173800
WORK ORDER: Matrix Spike CLIENT SAMPLE ID:9612142-03A

1,4-DIFLUOROBENZENE	30	34	113	60- 136
4-BROMOFLUOROBENZENE	30	31	103	37- 168

METHOD 8020*** BATCH#:HP_0961205173800
WORK ORDER: Matrix Spike Dup. CLIENT SAMPLE ID:9612142-03A

1,4-Difluorobenzene	30	33	110	60- 136
4-Bromofluorobenzene	30	32	107	37- 168

California LUFT Manual BATCH#:HP_0961206013100
WORK ORDER: 9612142-03A CLIENT SAMPLE ID:AW-9 at 16.5'

1,4-Difluorobenzene	30	29	97	-
4-Bromofluorobenzene	30	29	97	-

State of Tennessee Method BATCH#:HP_0961206013100
WORK ORDER: 9612142-04A CLIENT SAMPLE ID:AW-9 at 19.0'

4-Bromofluorobenzene	30	27	90	50- 150
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AMOUNT CONC. RECOVERY LIMITS
ADDED MEASURED

1,4-Difluorobenzene	30	29	97	50- 150
---------------------	----	----	----	---------

State of Tennessee Method
WORK ORDER: Method Blank

BATCH#:HP_0961206013100
CLIENT SAMPLE ID:

4-Bromofluorobenzene	30	29	28.6	50- 150
1,4-Difluorobenzene	30	30	30.0	50- 150

State of Tennessee Method
WORK ORDER: Matrix Spike

BATCH#:HP_0961206013100
CLIENT SAMPLE ID:9612142-04A

4-Bromofluorobenzene	30	32	107	50- 150
1,4-Difluorobenzene	30	38	127	50- 150

State of Tennessee Method
WORK ORDER: Matrix Spike Dup.

BATCH#:HP_0961206013100
CLIENT SAMPLE ID:9612142-04A

4-Bromofluorobenzene	30	29	97	50- 150
1,4-Difluorobenzene	30	36	120	50- 150

- < = Recovery outside of control limits
- * = Methods for Chemical Analysis of Water & Wastes, 1983, EPA
- ** = Standard Methods for Examination of Water & Wastewater, 17th
- *** = Test Methods for Evaluating Solid Waste, EPA SW846, 3rd



** SPL BATCH QUALITY CONTROL REPORT **
METHOD 8020***

HOUSTON LABORATORY
8880 INTERCHANGE DRIVE
HOUSTON, TEXAS 77054
PHONE (713) 660-0901

Matrix: Soil
Units: µg/Kg

Batch Id: HP_0961205173800

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
MTBE	ND	50	55	110	22 - 110
Benzene	ND	50.0	41	82.0	66 - 123
Toluene	ND	50.0	44	88.0	74 - 125
EthylBenzene	ND	50.0	48	96.0	84 - 125
O Xylene	ND	50.0	47	94.0	76 - 137
M & P Xylene	ND	100.0	94	94.0	81 - 131

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
MTBE	ND	20	23	115	17	85.0	30.0 *	22	27 - 196
BENZENE	ND	20.0	19	95.0	18	90.0	5.41	33	47 - 143
TOLUENE	ND	20.0	18	90.0	17	85.0	5.71	35	46 - 148
ETHYLBENZENE	ND	20.0	19	95.0	17	85.0	11.1	40	32 - 151
O XYLENE	ND	20.0	18	90.0	16	80.0	11.8	24	35 - 143
M & P XYLENE	ND	40.0	38	95.0	34	85.0	11.1	38	25 - 139

Analyst: LJ

Sequence Date: 12/05/96

SPL ID of sample spiked: 9612142-03A

Sample File ID: OOL6213.TX0

Method Blank File ID:

Blank Spike File ID: OOL6202.TX0

Matrix Spike File ID: OOL6208.TX0

Matrix Spike Duplicate File ID: OOL6209.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = [(<1> - <2>) / <3>] x 100

LCS % Recovery = (<1> / <3>) x 100

Relative Percent Difference = | (<4> - <5>) | / [(<4> + <5>) x 0.5] x 100

(**) = Source: SPL-Houston Historical Data (4th Q '95)

(***) = Source: SPL-Houston Historical Data (4th Q '95)

SAMPLES IN BATCH(SPL ID):

9612114-08A 9612114-09A 9612114-10A 9612142-03A
 9612142-04A 9612114-11A 9612114-12A 9611D94-01A
 9612114-01A 9611F00-01A 9612114-02A 9612114-03A
 9612114-04A 9612114-05A 9612114-06A 9612114-07A



** SPL BATCH QUALITY CONTROL REPORT **
 State of Tennessee Method

HOUSTON LABORATORY
 8880 INTERCHANGE DRIVE
 HOUSTON, TEXAS 77054
 PHONE (713) 660-0901

Matrix: Soil
 Units: mg/Kg

Batch Id: HP_0961206013100

LABORATORY CONTROL SAMPLE

SPIKE COMPOUNDS	Method Blank Result <2>	Spike Added <3>	Blank Spike		QC Limits(**) (Mandatory) % Recovery Range
			Result <1>	Recovery %	
Gasoline Range Organics	ND	1.0	0.89	89.0	50 - 100

MATRIX SPIKES

SPIKE COMPOUNDS	Sample Results <2>	Spike Added <3>	Matrix Spike		Matrix Spike Duplicate		MS/MSD Relative % Difference	QC Limits(***) (Advisory)	
			Result <1>	Recovery <4>	Result <1>	Recovery <5>		RPD Max.	Recovery Range
GASOLINE RANGE ORGANICS	ND	0.9	0.72	80.0	0.77	85.6	6.76	18	40 - 158

Analyst: LJ

Sequence Date: 12/06/96

SPL ID of sample spiked: 9612142-04A

Sample File ID: O_L6214.TX0

Method Blank File ID:

Blank Spike File ID: O_L6205.TX0

Matrix Spike File ID: O_L6210.TX0

Matrix Spike Duplicate File ID: O_L6211.TX0

* = Values Outside QC Range

NC = Not Calculated (Sample exceeds spike by factor of 4 or more)

ND = Not Detected/Below Detection Limit

% Recovery = $[(<1> - <2>) / <3>] \times 100$

LCS % Recovery = $(<1> / <3>) \times 100$

Relative Percent Difference = $| (<4> - <5>) | / [(<4> + <5>) \times 0.5] \times 100$

(**) = Source: METHOD LIMITS

(***) = Source: SPL-Houston Historical Data ((3rd Q '94)

SAMPLES IN BATCH(SPL ID):

9612142-04A 9611D94-01A 9611D94-02A 9611D94-03A
 9611D94-04A 9611F00-01A 9612142-03A

CHAIN OF CUSTODY
AND
SAMPLE RECEIPT CHECKLIST



96-12-142

CHAIN OF CUSTODY

No. 078797

Page 1 of 1

CONSULTANT'S NAME AUSTO ENGINEERING		ADDRESS 1575 Treat Blvd Ste 201 Walnut Creek CA		CITY	STATE	ZIP CODE 94596
BP SITE NUMBER BP 11133	BP CORNER ADDRESS/CITY 2220 98th Ave Oakland CA				CONSULTANT PROJECT NUMBER 10-025-04-001	
CONSULTANT PROJECT MANAGER Brady Nagle		PHONE NUMBER 510 295 1650	FAX NUMBER 510 295 1823		CONSULTANT CONTRACT NUMBER 6787579	
BP CONTACT Scott Hoofen	BP ADDRESS Rendon WA		PHONE NUMBER -		FAX NO. -	
LAB CONTACT	LABORATORY ADDRESS		PHONE NUMBER -		FAX NO. -	
SAMPLED BY (Please Print Name) Chris Reinheimer		SAMPLED BY (Signature) 		SHIPMENT DATE 12-3-96		SHIPMENT METHOD Feed Ex

TAT: 24 Hours 48 Hours 1 Week Standard 2 Weeks

ANALYSIS REQUIRED

AIRBILL NUMBER
9404779252

SAMPLE DESCRIPTION	COLLECTION DATE	MATRIX SOIL/WATER	CONTAINERS		PRESERVATIVE	TTA-G	STEX	MTGC											COMMENTS
	COLLECTION TIME		NO.	TYPE (VOL.)	LAB SAMPLE #														
AW-9 @ 6.5'	12/3/96 9:40A	Soil	1	2X6															Hold
AW-9 @ 11.5'	9:46A	↓	1	↓															Hold
AW-9 @ 16.5'	10:00A	↓	1	↓		X	X												
AW-9 @ 19.0'	10:07A	↓	1	↓		X	X												
AW-9 @ 26.5'	10:17A	↓	1	↓															Hold

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	ADDITIONAL COMMENTS
	12/3/96	1530	Patricia Yelton	12/3/96	1530	40c ROI, in fact
Patricia Yelton	12/3/96	1600	James [unclear] / [unclear]	12/4/96	0930	

SPL Houston Environmental Laboratory

Sample Login Checklist

Date: 12-4-96	Time: 0930
---	--

SPL Sample ID:
96-12-142

		<u>Yes</u>	<u>No</u>
1	Chain-of-Custody (COC) form is present.	✓	
2	COC is properly completed.	✓	
3	If no, Non-Conformance Worksheet has been completed.		
4	Custody seals are present on the shipping container.	✓	
5	If yes, custody seals are intact.	✓	
6	All samples are tagged or labeled.	✓	
7	If no, Non-Conformance Worksheet has been completed.		
8	Sample containers arrived intact	✓	
9	Temperature of samples upon arrival:	46	C
10	Method of sample delivery to SPL:	SPL Delivery	
		Client Delivery	
		FedEx Delivery (airbill #)	9404779252
		Other:	
11	Method of sample disposal:	SPL Disposal	
		HOLD	
		Return to Client	

Name: 	Date: 12/4/96
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