BLYMYER
ENGINEERS, INC.
1829 Clement Avenue
Alameda, California 94501-1396
(510) 521-3773 FAX: (510) 865-2594

LETTER OF TRANSMITTAL

DATE July 22, 1996	BEI Job No. 88288.1
ATTENTION: Mr. Dale Klettke	
SUBJECT: G.I. Trucking Facility	
San Leandro, California	

Alameda County Health Care Services
Agency
Department of Environmental Health

1131 Harbor Bay Parkway, 2nd Floor

Alameda, CA 94502-6577

96 JUL 23 PM 2:56
ENVIRONMENTAL PROTECTION

We are sending you
☐ Invoice
☐ Copy of letter
☐ Report
☐ Prints
☐ Plans
☐ Work Order
☐ Change Order
☐ Specifications
☐ _____

Copies	Date	Number	Description
1	7/22/96		Final copy; *Installation of Recovery Well RW-2*

These are transmitted as checked below:

☐ For signature
☐ For payment
☐ As requested
☐ For approval
☐ FOR BIDS DUE
☐ Approved as submitted
☐ Approved as noted
☐ Returned for Corrections
☐ For review and comment
☐ For your use
☐ Resubmit___copies for approval
☐ Submit___copies for distribution
☐ Return___corrected prints

REMARKS: This document has been additionally transmitted to the individuals listed below.

COPY TO: File
Mr. Eddy So, San Francisco Bay Regional Water Quality Control Board
Mr. Mike Bakaldin, San Leandro Fire Department
Mr. Mike Rogers, ABF Freight System, Inc.
Mr. Bob Hogancamp, G.I. Trucking Company
Mr. Tom McGuire, G.I. Trucking Company

SIGNED: Mark Detterman

If enclosures are not as noted, kindly notify Blymyer Engineers, Inc. at once.

BLYMYER
ENGINEERS, INC.

July 22, 1996
BEI Job No. 88288

Mr. Dale Klettke
Alameda County Health Care Services Agency
Department of Environmental Health
1131 Harbor Bay Parkway, 2nd Floor
Alameda, CA 94502-6577

Subject: **Installation of Recovery Well RW-2**
G.I. Trucking Facility
1750 Adams Avenue
San Leandro, California
STID 1373

Dear Mr. Klettke:

Blymyer Engineers, Inc. has completed the scope of work outlined in our April 19, 1996, workplan for the subject site. This letter documents the installation of recovery well RW-2 at the subject site (Figure 1). This letter represents a report of the work.

1.0 Introduction

1.1 Background

Blymyer Engineers was retained by Milne Truck Lines in July 1986 to conduct precision testing and to install a monitoring system for three 12,000-gallon diesel, one 12,000-gallon gasoline, and one 800-gallon waste oil underground storage tank (UST) at the site, which is currently occupied by G.I. Trucking Co. All of the USTs were constructed of fiberglass. During precision testing, which required that the USTs be filled to capacity with product, all of the USTs tested tight except the waste oil UST. The waste oil UST was uncovered to identify the source of the leak and to attempt to repair the UST. It was observed by a representative of the UST manufacturing company that the bottom of the waste oil UST was ruptured and damaged beyond repair. In December 1986, when the waste oil UST was removed, it was observed that the pea gravel and native soil surrounding the UST contained waste oil and there was approximately 3 inches of waste oil on the groundwater surface.

Groundwater and waste oil were removed from the waste oil UST basin during two pumping events, leaving only a sheen on groundwater. Approximately 45 cubic yards of contaminated pea gravel and native soil were removed and disposed of. It was noted that once the contaminated soil was removed, diesel fuel flowed into the excavation from the direction of the diesel USTs. The diesel fuel was removed via pumping on two occasions, leaving a sheen on groundwater. The excavation was subsequently filled to just below grade surface (bgs) with pea gravel and

1829 CLEMENT AVENUE ALAMEDA, CA 94501-1395 PHONE 510-521-3773 FAX 510-865-2594
3475 LENOX ROAD N.E. SUITE 400 ATLANTA, GA 30326 PHONE 404-238-0550 FAX 404-238-0553

resurfaced. A 12-inch-diameter free product recovery well, presently designated MW-1, was installed in 1988, in the center of the former waste oil UST basin to recover any available diesel fuel that accumulated after backfilling the excavation. A passive skimmer was installed in the well in October 1993.

Four monitoring wells of total depths of approximately 25 feet bgs were also installed in the vicinity of the UST system to assess the extent of soil and groundwater contamination associated with the diesel USTs. The native soil consisted predominantly of sandy clay or clayey sand and silty clay. The soil samples collected from the soil bores contained petroleum hydrocarbon concentrations ranging from 71 to 210 parts per million (ppm), quantified using EPA Method 3550. No concentrations of Total Oil and Grease, by an unspecified analytical method, were detected in groundwater samples collected from the four monitoring wells.

The diesel USTs were re-tested in April 1987 during which all three USTs were certified as tight. Based on the test results, it was assumed by Blymyer Engineers that the diesel fuel removed from the excavation was not the result of a recent UST leak, but was likely due to releases from past site operations, including a knocked over diesel dispenser which may have damaged one or more product lines, as reported by site workers. Any released diesel fuel was likely contained in the relatively higher permeability pea gravel.

Quarterly groundwater monitoring of the monitoring wells, presently designated MW-2 through MW-5, began in Fourth Quarter 1988. Since monitoring began, only groundwater samples collected from monitoring wells MW-2 and MW-3 have contained detectable concentrations of the analytes. Therefore, groundwater sample analysis for monitoring wells MW-4 and MW-5 was discontinued after Third Quarter 1995. Low concentrations of Total Petroleum Hydrocarbons (TPH) as diesel have been detected in groundwater samples collected from monitoring well MW-2 since Fourth Quarter 1994 and TPH as diesel has consistently been detected in groundwater samples collected from monitoring well MW-3 since First Quarter 1990. Low concentrations of toluene, below California Department of Health Services and Environmental Protection Agency Maximum Contaminant Level (MCLs), have been detected in a groundwater sample collected from monitoring well MW-2 during First Quarter 1995 and in a groundwater sample collected from monitoring well MW-3 during Third Quarter 1994.

Less than 0.2 feet to a sheen of free product has been measured on groundwater in well MW-1 since quarterly monitoring began in February 1989, and less than 1 gallon of free product has been recovered since recovery activities began in October 1993.

During Second Quarter 1995, additional analyses of the waste oil suite were performed in accordance with the request of the Alameda County Health Care Services Agency (ACHCSA). Although the waste oil released from the former waste oil UST was removed, the ACHCSA requested that the waste oil suite of analyses be performed for confirmation. Analysis of TPH

as motor oil was also performed to provide additional groundwater contaminant data. The analytical results, which were either non-detectable or below MCLs, indicated that diesel fuel, not waste oil, was the cause of groundwater contamination at the site.

In order to move the site toward closure, installation of a downgradient monitoring well for groundwater plume definition was anticipated. However, prior to installing the well, Blymyer Engineers requested site closure from the ACHCSA, considering the recent changes in the regulatory climate regarding plume definition and necessary closure conditions. The ACHCSA only granted a reduced sampling frequency at that time, and stated that the concentrations of toluene, the "unstabilized" TPH as diesel concentrations, and the presence of free product, although minimal, needed to be addressed before closure could be granted. Blymyer Engineers discussed these issues with the ACHCSA case regulator, Mr. Dale Klettke, on August 2 and November 13, 1995. Because of a misreading of the toluene concentrations in units of milligrams per liter, instead of micrograms per liter, he believed the toluene concentrations detected in groundwater collected from monitoring well MW-3 exceeded MCLs. Mr. Klettke stated that the ACHCSA's main concern is that a sheen to product layer still exists in well MW-1 at the site and that his secondary concern is that the TPH as diesel concentrations were the highest during First Quarter 1995. It was concluded that if the product was removed, the TPH as diesel concentrations in groundwater would likely decrease.

1.2 Site Conditions

The property is located at the intersection of Bigge and Adams Avenues near the western edge of the City of San Leandro, Alameda County, California (Figure 1). The area around the site consists of light industry and commercial establishments. The property is located approximately 1/4 mile west of Interstate 880 and 2/3 mile east of the Oakland International Airport. The site is paved with asphalt, with limited areas of concrete.

1.3 Scope of Work

Blymyer Engineers proposed to perform the following scope of work:

- Prepare a site-specific health and safety plan
- Prepare a workplan and secure all required permits
- Drill one soil bore to approximately 14 feet bgs, the total depth of the bottom of the UST basin, using a hollow-stem auger drill rig. The soil bore will be located in the southwest, downgradient corner of the UST basin (Figure 2). In order to miss a UST or product line, the contact between native soil and the backfill material will be accurately located before

2.2 Climate

The East Bay Plain exhibits a Mediterranean-type climate with cool, wet winters and warmer, dry summers. Mean annual precipitation in Oakland is 25.42 inches. Mean monthly rainfall is 4.03 inches in January and 0.05 inches in August. Mean maximum temperatures are 54.5 degrees Fahrenheit (°F) in January and 70.6°F in July; mean minimum temperatures are 43.4°F in January and 56.8°F in July; average temperatures are 49°F in January and 63.7°F in July (National Oceanic and Atmospheric Administration, *Monthly Station Normals of Temperature, Precipitation, and Heating and Cooling Degree Days 1961-1990*, 1990).

3.0 Data Collection

3.1 Soil Sample Collection

On June 6, 1996, one 8.25-inch-diameter soil bore, RW-2 (Figure 2), was advanced under the supervision of a Blymyer Engineers geologist by Gregg Drilling and Testing, Inc., using a Mobile B-53 drill rig. A copy of the Zone 7 Water Agency Drilling Permit is enclosed as Attachment A. Prior to bore installation, the concrete pad was saw cut in order to locate the edge of the UST excavation and to properly place the recovery well. Cutting samples were used to characterize the subsurface materials. No samples of subsurface materials were collected for laboratory analysis. The soil bore was advanced to 13 feet bgs. Soil samples were field-screened for organic vapors using a photoionization detector (PID) and lithologically described using the Unified Soil Classification System. Soil bore logs were not prepared for this project due to the location of the recovery well within the UST basin. The soil descriptions and PID results are described in Section 4.1, below.

Blank well casing was installed from 0.25 feet bgs to 3 feet bgs. Slotted, 4-inch diameter, PVC casing (0.020-inches) was installed from 3 feet bgs to 13 feet bgs. A bentonite seal was placed between 2 to 3 feet bgs and a well manway was set in concrete between the surface and 1 foot bgs.

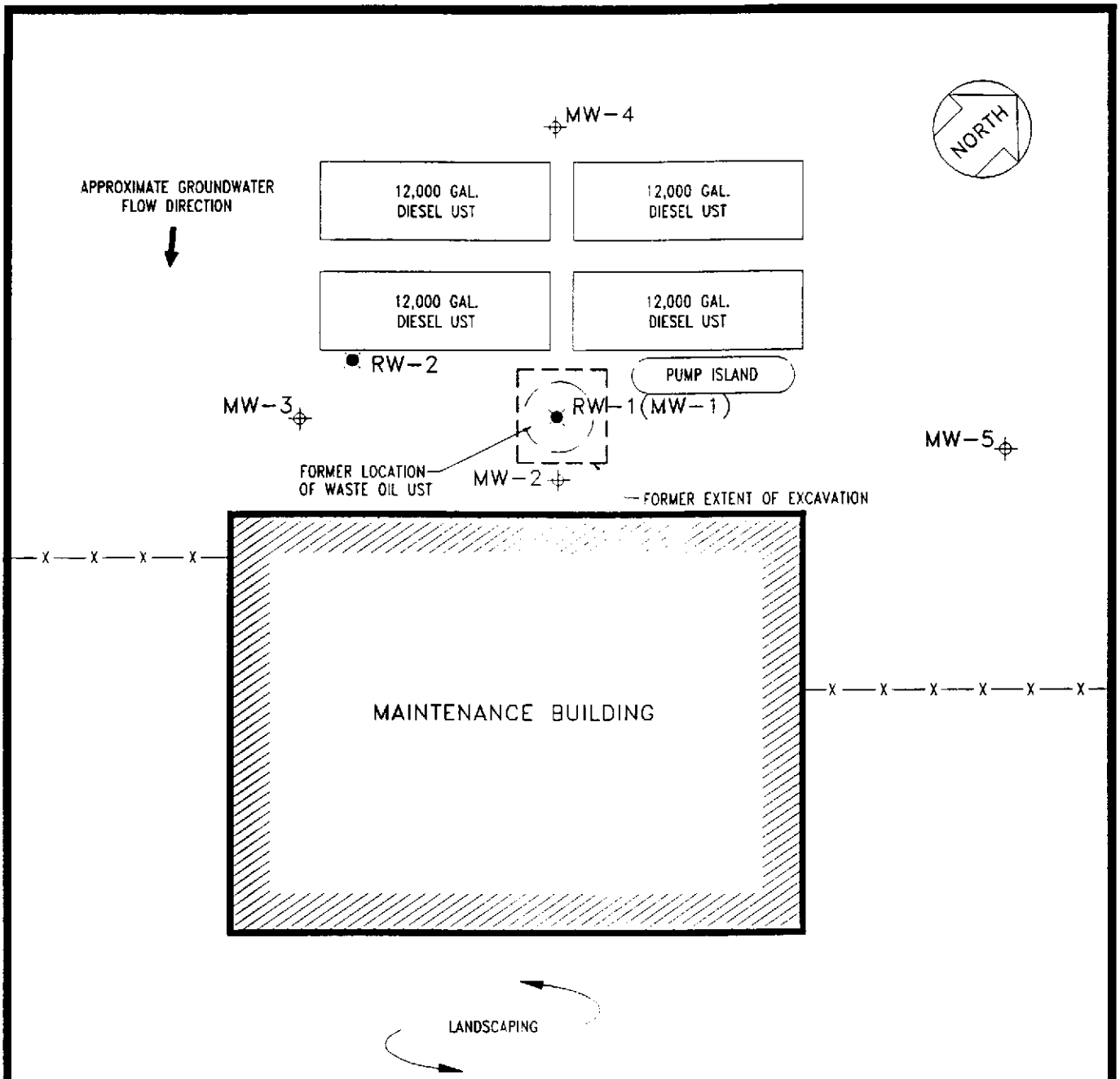
A sample of the drummed cuttings was collected for analysis for later disposal purposes.

All samples were collected in accordance with the enclosed Blymyer Engineers Standard Operating Procedure No. 1, entitled *Soil and Grab Groundwater Sampling Using a Hollow-Stem Auger Drill Rig, Revision No. 1*, dated May 31, 1994 (Attachment B).

UNITED STATES GEOLOGICAL SURVEY 7.5' QUAD. "SAN LEANDRO, CA". ED. 1959. PHOTOREVISED 1980.

QUADRANGLE LOCATION

BLYMYER ENGINEERS, INC.	0 1000 2000 SCALE IN FEET	**SITE LOCATION MAP** G.I. TRUCKING FACILITY 1750 ADAMS AVE. SAN LEANDRO, CA	FIGURE 1
BEI JOB NO. 88288	DATE 9/19/95		



BLYMYER ENGINEERS, INC.

BEI JOB NO.	DATE
88288.001	4/4/96

LEGEND

- UST UNDERGROUND STORAGE TANK
- MONITORING WELL
- RECOVERY WELL

SITE PLAN

JUNE 6, 1996
G.I. TRUCKING FACILITY
1750 ADAMS AVE.
SAN LEANDRO, CA

FIGURE 2

REVISED 7-10-96 H:\PUBLIC\ACADLW\8828802

Attachment A

Zone 7 Water Agency Drilling 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 G.I. TRUCKING FACILITY
1750 ADAMS AVENUE
SAN LEANDRO, CA

CLIENT
Name G.I. TRUCKING CO. c/o ABF FREIGHT SYSTEM, INC.
Address 3801 OLD GREENWOOD RD.
City FORT SMITH, AR Zip 72903

APPLICANT
Name DEB UNDERWOOD of BLYMYER ENGINEERS, INC.
Address 1829 CLEMENTINA Phone 521-3773
City ALAMEDA Zip 94501

TYPE OF PROJECT

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

PROP. RECOVERY WELL X

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

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

DRILLER'S LICENSE NO. 485165

WELL PROJECTS
Drill Hole Diameter ~8 in. Maximum
Casing Diameter 4 in. Depth ~14 ft.
Surface Seal Depth ~1-3 ft. Number RW-2

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

ESTIMATED STARTING DATE 6/6/96
ESTIMATED COMPLETION DATE 6/6/96

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

APPLICANT'S SIGNATURE [signature] for GIT, c/o ABF Date 5/23/96

FOR OFFICE USE

PERMIT NUMBER 96384
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 30 May 96
Wyman Hong

31992

Attachment B

Blymyer Engineers' Standard Operating Procedure No. 1

Soil and Grab Groundwater Sampling Using

a Hollow-Stem Auger Drill Rig, Revision No. 1,

dated May 31, 1994

BLYMYER
ENGINEERS, INC.

Standard Operating Procedure No. 1

Soil and Grab Groundwater Sampling Using a Hollow-Stem Auger Drill Rig

Revision No. 1

Approved By:

Michael Lewis
Quality Assurance/Quality Control Officer
Blymyer Engineers, Inc.

5/31/94
Date

Table of Contents

Attachments:

Boring Log
Drum Inventory Sheet

1.0 Introduction and Summary

This Standard Operating Procedure (SOP) describes methods for drilling with the use of hollow-stem augers, soil sampling with the use of split-spoon samplers, and grab groundwater sampling through an open borehole. Drilling activities covered by this SOP may be conducted to obtain soil and grab groundwater samples or to create a borehole within which a well may be constructed. Soil samples may be obtained to log subsurface materials, to collect samples for chemical characterization, or to collect samples for physical parameter characterization.

The soil sampling techniques described in this SOP are generally suitable for chemical characterization and physical classification tests; because a driven split-spoon sampler is employed, the resulting soil samples should generally be considered "disturbed" with respect to physical structure and may not be suitable for measuring sensitive physical parameters, such as strength and compressibility. The augering techniques described in this SOP generally produce a borehole with a diameter corresponding to the outside diameter of the auger flights, a relatively small annulus of remolded soil surrounding the outside diameter of the auger flights, and limited capability for cross-contamination between subsurface strata as the leading flights of the augers pass from contaminated strata to uncontaminated underlying strata. However, should conditions require strict measures to help prevent cross-contamination or maintain the integrity of an aquitard, consideration should be given to augmenting the procedures of this SOP, for example, by using pre-drilled and grouted isolation casing.

The procedures for hollow-stem auger drilling and split-spoon soil sampling generally consist of initial decontamination, advancement of the augers, driving and recovery of the split-spoon sampler, logging and packaging of the soil samples, decontamination of the split-spoon and continued augering and sampling until the total depth of the borehole is reached. Withdrawal of the augers upon reaching the total depth requires completion of the borehole by grouting, by constructing a well, or other measures; well construction is not covered in this SOP.

2.0 Equipment and Materials

- Drill rig, drill rods, hollow-stem augers, and drive-weight assembly (for driving the split-spoon sampler) should conform to ASTM D 1586-Standard Method for Penetration Test and Split-Barrel Sampling of Soils, except: (1) hollow-stem augers may exceed 6.5 inches inside diameter as may be necessary for installing 4-inch diameter well casing, (2) hollow-stem augers should have a center bit assembly (end plug), (3) alternative drive-weight assemblies or downhole hammers are acceptable as long as the type, weight, and equivalent free fall are noted on the boring log.

- Split-spoon sampler should conform to ASTM D 1586-Standard Method for Penetration Test and Split-Barrel Sampling of Soils, except: (1) split-spoon should be fitted with liners for collection of chemical characterization samples, and (2) allowable split-spoon diameters include nominal 1.5-inch inside diameter by nominal 2-inch outside diameter (Standard Penetration Test split-spoon), nominal 2-inch inside diameter by nominal 2.5-inch outside diameter (California Modified split-spoon), or nominal 2-1/2-inch inside diameter by nominal 3-inch outside diameter (Dames & Moore split-spoon). The split-spoon type and length of the split barrel portion of the sampler should be noted on the boring log, as should the use of a sample catcher if employed.

- Liners should be 3- to 6-inch length, fitted with plastic end caps, brass or stainless steel, with a nominal diameter corresponding to that of the inside diameter of the split-spoon sampler. The boring log should note whether brass or stainless steel liners were used.

- Teflon® sheets, approximate 6-mil thickness, precut to a diameter or width of the liner diameter plus approximately 1 inch.

- Plastic end caps.

- Adhesiveless silicone tape.

- Disposable polyethylene bailer.

- Type I/Type II Portland cement.

- Groundwater sample containers (laboratory provided only).

- Kimwipes®, certified clean silica sand, or deionized water (for blank sample preparation).

- Sample labels, boring log forms, chain-of-custody forms, drum labels, Drum Inventory Sheet, and field notebook.

- Ziploc® plastic bags of size to accommodate a liner.

- Stainless steel spatula and knife.

- Cooler with ice or dry ice (do not use blue ice) and packing material.

- Field organic vapor monitor. The make, model, and calibration information for the field

organic vapor monitor (including compound and concentration of calibration gas) should be noted on the boring log.

- Pressure washer or steam cleaner.
- Large trough (such as a water tank for cattle), plastic-lined pit, or equivalent for decontamination of hollow-stem augers, drill rod, and end plug.
- Buckets and bristle brushes for decontamination of liners, split-spoon sampler, and other small gear.
- Low-residue, organic-free soap such as Liquinox® or Alconox®.
- Distilled water.
- Heavy plastic sheeting such as Visqueen.
- Steel, 55-gallon, open-top drums conforming to the requirements of DOT 17H, if required.

As specified in the Site Safety Plan, additional safety and personnel decontamination equipment and materials may be needed.

3.0 Typical Procedures

The following typical procedures are intended to cover the majority of drilling and sampling conditions. However, normal field practice requires re-evaluation of these procedures and implementation of alternate procedures upon encountering unusual or unexpected subsurface conditions. Deviations from the following typical procedures may be expected and should be noted on the boring log.

1. Investigate location of the proposed boreholes for buried utilities and obstructions. At least 48 hours before drilling, contact known or suspected utility services individually or through collective services such as "Underground Service Alert."

2. Decontaminate drill rig, drill rods, hollow-stem augers, split-spoon sampler and other drilling equipment immediately prior to mobilization to the site.

3. Calibrate field organic vapor monitor equipment in accordance with the manufacturer's specifications. Note performance of the calibration in the geologist's field notebook.

4. Conduct "tail-gate" meeting and secure the work area in accordance with the Site Safety Plan.

5. Core concrete, if required.

6. Using hand-augering device, hand auger to a depth of 5 feet, if feasible, to clear underground utilities and structures not located by a utility service or on drawings. As appropriate, retain private buried utility location services or geophysical investigation services to search for buried utilities and obstructions. During initial advancement of each borehole, drill cautiously and have the driller pay particular attention to the "feel" of drilling conditions. The suspected presence of an obstruction, buried pipeline or cable, utility trench backfill, or similar may be cause for suspension of drilling, subject to further investigation.

7. Advance hollow-stem auger, fitted with end plug, to the desired sampling depth. Note depth interval, augering conditions, and driller's comments on boring log. Samples should be taken at intervals of 5 feet or less in homogeneous strata and at detectable changes of strata.

8. Remove drill rod and the end plug from the hollow-stem auger and note presence of water mark on drill rod, if any. If below the groundwater table in clean sand, allow water level in hollow-stem auger to equilibrate prior to removing end plug and remove plug slowly so as to minimize suction at the base of the plug. Also, monitor the top of the hollow-stem auger using field organic vapor monitor, as appropriate. In situations where heaving sand occurs, the use of a clean, inert knock-out plate may be employed, if necessary, to set wells. Also, clean water may be introduced into the hollow-stem auger to create a positive head pressure to exceed the hydrostatic pressure of the heaving sand formation.

9. Decontaminate split-spoon sampler, liners, spatulas and knives, and other equipment that may directly contact the chemical characterization sample. Fit the split-spoon sampler with liners and attach to drill rod.

10. Lower split-spoon sampler through hollow-stem of auger until sampler is resting on soil. Note in field notebook discrepancy between elevation of tip of sampler and leading edge of augers, if any. If more than 6 inches of slough exists inside the hollow-stem augers,

consider the conditions unsuitable and re-advance the hollow-stem augers and end plug to a new sampling depth.

11. Drive and recover split-spoon sampler according to the requirements of ASTM D 1586 - Standard Method for Penetration Test and Split-Barrel Sampling of Soils. Record depth interval, hammer blows for each 6 inches, and sample recovery on boring log (copy attached). Monitor the recovered split-spoon sampler with the field organic vapor monitor, as appropriate.

12. Remove either bottom-most or second-from-bottom liner (or both) from split-spoon sampler for purposes of chemical characterization and physical parameter testing. Observe soil at each end of liner(s) for purposes of completing sample description. Place Teflon® sheet at each end of liner, cover with plastic caps, and tape plastic caps with adhesiveless silicone tape (do not use electrical or duct tape) to further minimize potential loss of moisture or volatile compounds. Label liner(s) and place in Ziploc® bag on ice or dry ice inside cooler.

13. Extrude soil from remaining liner(s) and subsample representative 1-inch cube (approximate dimensions). Place subsample in Ziploc® bag and seal. Allow bag to equilibrate at ambient conditions for approximately 5 minutes and screen for organic vapors by inserting the probe of the field organic vapor monitor into the bag. Record depth interval, observed sample reading, and ambient (background) reading on the boring log. Discard bag and sample after use in the solid waste stockpile.

14. Classify soil sample in approximate accordance with ASTM D 2488-Standard Practice for Description and Identification of Soils (Visual-Manual Procedure) and in accordance with the Unified Soil Classification System (USCS). Description should include moisture content, color, textural information, group symbol, group name, and odor. Optional descriptions, especially if classification is performed with protective gloves, include particle angularity and shape, clast composition, plasticity, dilatancy, dry strength, toughness, and reaction with HCl. Add notes on geologic structure of sample, as appropriate. Record depth interval, field organic vapor monitor reading, USCS classification, and other notes on the boring log.

15. Repeat steps 7 through 14 until total depth of borehole is reached.

16. If grab groundwater sample is to be collected, slowly lower bailer through the open borehole or partially retracted hollow-stem augers to minimize agitation and aeration of the sampled water. Transfer the grab groundwater sample into sample container(s).

Label sample container(s), place packing materials around containers, and place on ice or dry ice inside cooler.

17. After augers are removed, complete borehole according to the requirements specified elsewhere or by abandonment in accordance with section 8.0.

18. Decontaminate hollow-stem augers, drill rod, and end plug between boreholes and after finishing last borehole prior to drill rig leaving site.

19. Change decontamination solutions and clean decontamination trough, buckets, and brushes between boreholes.

20. Containerize decontamination liquids in 17H steel drums. Affix completed "Caution - Pending Analysis" labels to the drums.

21. Store bore cuttings on and cover with heavy plastic sheeting. If required by local regulations or due to site constraints, store bore cuttings in 17H steel drums. Affix completed "Caution - Analysis Pending" labels to drums.

22. Complete Drum Inventory Sheet (copy attached).

23. Complete pertinent portion of the chain-of-custody form and enter descriptions of field work performed in the field notebook.

4.0 Quality Assurance and Quality Control (QA/QC)

Optional quality control sampling consists of sequential replicates, collected at an approximate frequency of one sequential replicate for every 10 collected soil samples. Sequential replicates are collected by packaging two adjacent liners of soil from a selected split-spoon drive. Each sample is labeled according to normal requirements. The replicate samples obtained in such a manner are suitable for assessing the reproducibility of both chemical and physical parameters. Interpretations of data reproducibility should recognize the potential for significant changes in soil type, even over 6-inch intervals. Accordingly, sequential replicates do not supply the same information as normally encountered in duplicate or split samples. Duplicate or split samples are better represented by the laboratory performing replicate analyses on adjacent subsamples of soil from the same liner.

Optional quality control samples may be collected to check for cross-contamination using field blanks. Field blanks may be prepared by (1) wipe sampling decontaminated liners and split-spoon with Kimwipes®, (2) pouring clean silica sand into a decontaminated split-spoon sampler that has been fitted with liners, or (3) pouring deionized water over the decontaminated liners and split-spoon sampler and collecting the water that contacts the sampling implements for aqueous analysis. Field blanks may be prepared at the discretion of the field staff given reasonable doubt regarding the efficacy of the decontamination procedures.

The comparability of the field soil classification may be checked by conducting laboratory classification tests. Requests for laboratory testing verification of the field classification should be left to the discretion of the field staff.

Field decisions that may also affect the quality of collected data include the frequency of sampling and the thoroughness of documentation. Subject to reasonable limitations of budget and schedule, the completeness, comparability, and representativeness of data obtained using this SOP will be enhanced by decreasing the sampling interval (including collecting continuous samples with depth) and increasing the level of detail for sample classification and description of drilling conditions. More frequent sampling and more detailed documentation may be appropriate in zones of chemical concentration or in areas of critical geology (for example, zones of changing strata or cross-correlation of confining strata).

As required, rinse or wipe samples may be collected from the sampling equipment before the initial sampling is conducted to establish a baseline level of contamination present on the sampling equipment. Rinse or wipe samples may also be collected at intervals of decontamination wash and rinse events or after the final decontamination wash and rinse event.

5.0 Documentation

Observations, measurements, and other documentation of the drilling and soil sampling effort should be recorded on the following:

- Field notebook
- Boring log
- Sample label
- Chain-of-custody form

Documentation should include any deviations from this SOP, notations of unusual or unexpected conditions, and documentation of the containerization and disposal of investigation-derived waste. Information to be documented on the sample label and boring log is listed below.

5.1 Sample Label

- Project name and project number
- Borehole or well number
- Sample depth interval (feet below ground surface), record the depth interval using notation similar to "19.2-19.7;" generally do not record just one depth "19.2" because of uncertainty regarding the location such depth corresponds to (midpoint, top, etc.)
- Sample date and sample time
- Name of on-site geologist
- Optional designation of orientation of sample within the subsurface, for example, an arrow with "up" or "top" designated

5.2 Boring Log

- Project name, project number, and name of on-site geologist
- Borehole number
- Description of borehole location, including taped or paced measurements to noticeable topographic features (a location sketch should be considered)
- Date and time drilling started and completed
- Name of drilling company and name of drilling supervisor, optional names and responsibilities of driller's helpers
- Name of manufacturer and model number of drill rig

- Inside and outside diameter of the auger flights of the hollow-stem augers, type and size of sampler, optional description of type of bit on end plug and leading edge of auger, optional description of the size of drill rod
- USCS classification
- Number of blow counts, sampling interval, and total depth of borehole.
- Depth at which groundwater was first encountered with the notation "initial" and any other noted changes in groundwater movement or stabilized water level.
- Field organic vapor monitor readings
- Method of boring completion
- Other notations and recordings described previously in section 2.0, Equipment and Materials, and section 3.0, Typical Procedures

6.0 Decontamination

Prior to entering the site, the drill rig and appurtenant items (drill rod, hollow-stem augers, end plug, split-spoon sampler, shovels, troughs and buckets, driller's stand, etc.) should be decontaminated by steam cleaning or pressure washing. Between each borehole, appurtenant items that contacted downhole soil (essentially all appurtenant items including drill rod, hollow-stem augers, end plug, split-spoon sampler, shovels, troughs and buckets, etc.) should be decontaminated by steam cleaning or pressure washing. The drill rig should be steam cleaned or pressured washed as a final decontamination event. On-site decontamination should be conducted within the confines of a trough or lined pit to temporarily contain the wastewater. Between each borehole and prior to demobilization, the trough or lined pit should be decontaminated by steam cleaning or pressure washing. If a rack or other support is used to suspend appurtenant items over the trough or lined pit during decontamination, only the rack or other support needs to be decontaminated between boreholes.

Prior to collection of each sample, the split-spoon sampler, liners, sample catcher, spatulas and knives, and other equipment or materials that may directly contact the sample should be decontaminated. Decontamination for these items should consist of a soap wash (Alconox®, Liquinox®, or other organic-free, low-residue soap), followed by a clean water rinse. If testing for metals, a final rinse of deionized water should be conducted. Wastewater should be

temporarily contained.

Between each borehole, buckets and brushes should be decontaminated by steam cleaning or pressure washing. Before installation of each borehole is begun, fresh decontamination solutions should be prepared. Decontaminated equipment should be kept off of the ground surface. Cleaned equipment should be placed on top of plastic sheeting, which is replaced after completion of each borehole or on storage racks.

More rigorous decontamination procedures may be employed if necessary to meet sampling or QA/QC requirements.

7.0 Investigation-Derived Waste

Wastes resulting from the activities of this SOP may include soil cuttings, excess soil samples, decontamination liquids, and miscellaneous waste (paper, plastic, gloves, bags, etc.).

Solid waste from each borehole should be placed on and covered with heavy plastic sheeting unless required to be containerized in 17H steel drums. Solids from multiple boreholes may be combined within a single stockpile if field observations (presence or absence of chemical staining and field organic vapor monitoring) indicate the solids are similarly uncontaminated or similarly contaminated. Given sufficient space and reasonable doubt, separate stockpiles should be used for solid waste from each borehole.

Decontamination liquids for each borehole should be placed in individual 17H steel drums with completed "Caution - Analysis Pending" labels affixed. Liquids from multiple boreholes may be combined, subject to the same limitations as solids.

8.0 Borehole Abandonment

Each borehole that is not to be completed as a monitoring well should be completely filled with a neat cement (5.5 gallons of water in proportion to one 94-pound bag of Type I/Type II Portland cement, ASTM C-150) from the bottom of the bore to grade surface. Water used to hydrate cement should be free of contaminants and organic material. Bentonite may be added to reduce shrinkage and improve fluidity. Add 3 to 5 pounds of bentonite with 6.5 gallons of water and one 94-pound bag of Type I/Type II Portland cement. The water and bentonite should be mixed first before adding the cement. The borehole should be filled from the bottom first to grade surface. A tremie pipe should be used in small diameter boreholes or in formations prone to

bridging or collapse. The tremie pipe should be lifted as the cement grout is poured, but should never be lifted above the surface of the neat cement. In boreholes deeper than 50 feet, the neat cement may need to be applied with pressure.

9.0 References

Aller, L., Bennett T.W., Hackett G., Petty R.J., Lehr J.H., Sedoris H., and Nielson D.M., 1989. Handbook of Suggested Practices for the Design and Installation of Ground-Water Monitoring Wells. National Water Well Association, Dublin, OH, 1989.

American Society for Testing and Materials, 1992. ASTM Standards On Ground Water and Vadose Zone Investigations. ASTM, Philadelphia, PA, 1992.

Driscoll, F.G., 1986. Groundwater and Wells. Johnson Filtration Systems Inc., St. Paul, MN, 1986.

Neilson, D.M., 1991. Practical Handbook of Ground-Water Monitoring. Lewis Publishers, Chelsea, MI, 1991.

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

BLYMYER
ENGINEERS, INC.

BORING & WELL CONSTRUCTION LOG:

Job No.:
Client:
Site:

Date Drilled:
Sample Container:

Driller:
Drilling Contractor:
Logged By:
Drilling Equipment:
Bore Diameter:
Total Depth: Ft.

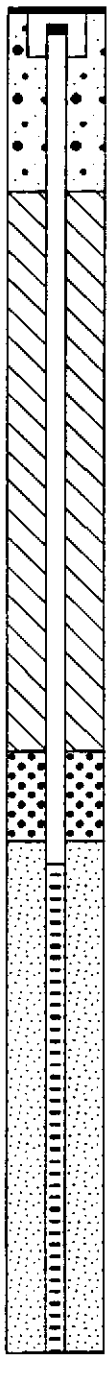
Well Completion Depth: '
Component Size/Type

Depths in Feet
From To

Surface Completion:
Blank Casing:
Slotted Casing:
Filter Pack:
Seal:
Annular Seal:
Surface Seal:
Bottom Seal:

Initial Water Level:
Stabilized water level:

Depth (ft)	Blows/6 In.	P.I.D. (ppm)	Samples	DESCRIPTION	Unified Soil Classification	Graphic Log	Water Depth
0							
5							
10							
15							
20							
25							
30							



(continued on next page)

BLYMYER ENGINEERS DRUM INVENTORY FORM

Number of Drums	Date Generated	Person on-site when generated	Soil or Groundwater	Contents (Cuttings, Purge Water, Development Water, Decon Water, PPE)	% Full	Bore or Monitoring Well ID	Do Lab Results Exist for Contents?

[illegible]

Date Client Informed? _____ All drums labeled? _____

Attachment C

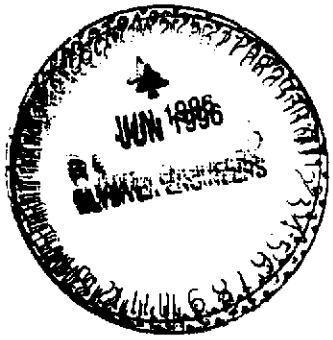
Analytical Report

National Environmental Testing, Inc.

dated June 18, 1996

NATIONAL ENVIRONMENTAL TESTING, INC.

Santa Rosa Division
3636 North Laughlin Road
Suite 110
Santa Rosa, CA 95403-8226
Tel: (707) 526-7200
Fax: (707) 541-2333



Deborah Underwood
ABF Freight Systems, Inc.
c/o Blymeyer Engineers
1829 Clement Avenue
Alameda, CA 94501

Date: 06/18/1996
NET Client Acct. No: 11290
NET Job No: 96.01822
Received: 06/08/1996

Client Reference Information

G.I. Trucking/Job No. 88288.001

Sample analysis in support of the project referenced above has been completed and results are presented on the following pages. Results apply only to the samples analyzed. Reproduction of this report is permitted only in its entirety. Please refer to the enclosed "Key to Abbreviations" for definition of terms. Should you have questions regarding procedures or results, please feel free to call me at (707) 541-2307.

Submitted by:

Judy Ridley
Project Coordinator

Enclosure(s)

Client Name: ABF Freight Systems, Inc. Date: 06/18/1996
Client Acct: 11290 ELAP Cert: 1386
NET Job No: 96.01822 Page: 2

Ref: G.I. Trucking/Job No. 88288.001

SAMPLE DESCRIPTION: SP-1
Date Taken: 06/06/1996
Time Taken:
NET Sample No: 264961

Parameter	Results	Flags	Reporting Limit	Units	Method	Date Extracted	Date Analyzed	Run Batch No.
8020 (GC,Solid)								
DILUTION FACTOR*	100						06/12/1996	1992
Benzene	ND		250	ug/kg	8020		06/12/1996	1992
Toluene	ND		250	ug/kg	8020		06/12/1996	1992
Ethylbenzene	260	C	250	ug/kg	8020		06/12/1996	1992
Xylenes (Total)	1,200	C	250	ug/kg	8020		06/12/1996	1992
SURROGATE RESULTS	--						06/12/1996	1992
Bromofluorobenzene (SURR)	83			% Rec.			06/12/1996	1992
M8015 (EXT., Solid)						06/12/1996		
DILUTION FACTOR*	50						06/14/1996	1183
as Diesel	1,500		50	mg/kg	3550		06/14/1996	1183

Ref: G.I. Trucking/Job No. 88288.001

CONTINUING CALIBRATION VERIFICATION STANDARD REPORT

Parameter	CCV Standard % Recovery	CCV Standard Amount Found	CCV Standard Amount Expected	Flags	Units	Date Analyzed	Analyst Initials	Run Batch Number
8020 (GC,Solid)								
Benzene	108.0	108.0	100.0		ug/kg	06/12/1996	lss	1992
Toluene	100.0	100.0	100.0		ug/kg	06/12/1996	lss	1992
Ethylbenzene	99.0	99.0	100.0		ug/kg	06/12/1996	lss	1992
Xylenes (Total)	97.0	291.0	300.0		ug/kg	06/12/1996	lss	1992
Bromofluorobenzene (SURR)	79.0	79	100		% Rec.	06/12/1996	lss	1992
M8015 (EXT., Solid)								
as Diesel	99.8	998	1000		mg/kg	06/13/1996	aal	1183
M8015 (EXT., Solid)								
as Diesel	98.2	982	1000		mg/kg	06/13/1996	aal	1183
M8015 (EXT., Solid)								
as Diesel	93.9	939	1000		mg/kg	06/14/1996	aal	1183
M8015 (EXT., Solid)								
as Diesel	94.3	943	1000		mg/kg	06/15/1996	aal	1183

Client Name: ABF Freight Systems, Inc. Date: 06/18/1996
Client Acct: 11290 ELAP Cert: 1386
NET Job No: 96.01822 Page: 4

Ref: G.I. Trucking/Job No. 88288.001

METHOD BLANK REPORT

Parameter	Method Blank Amount Found	Reporting Limit	Flags	Units	Date Analyzed	Analyst Initials	Run Batch Number
8020 (GC,Solid)							
Benzene	ND	2.5		ug/kg	06/12/1996	lss	1992
Toluene	ND	2.5		ug/kg	06/12/1996	lss	1992
Ethylbenzene	ND	2.5		ug/kg	06/12/1996	lss	1992
Xylenes (Total)	ND	2.5		ug/kg	06/12/1996	lss	1992
Bromofluorobenzene (SURR)	83			% Rec.	06/12/1996	lss	1992
M8015 (EXT., Solid)							
as Diesel	ND	1.0		mg/kg	06/13/1996	aal	1183

Ref: G.I. Trucking/Job No. 88288.001

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

Parameter	Matrix Spike % Rec.	Matrix Spike Dup % Rec.	RPD	Spike Amount	Sample Conc.	Matrix Spike Conc.	Matrix Spike Dup. Conc.	Flags	Units	Date Analyzed	Run Batch	Sample Spiked
8020 (GC,Solid)												264968
Benzene	95.0	92.5	2.7	36.75	ND	34.9	34.0		ug/kg	06/12/1996	1992	264968
Toluene	96.9	94.3	2.7	194	ND	188	183		ug/kg	06/12/1996	1992	264968
Bromofluorobenzene (SURR)	78.0	77.0	1.3	100	76	78	77		% Rec.	06/12/1996	1992	264968
M8015 (EXT., Solid)												264850
as Diesel	81.4	86.2	5.7	16.7	ND	13.6	14.4		mg/kg	06/13/1996	1183	264850

Client Name: ABF Freight Systems, Inc. Date: 06/18/1996
Client Acct: 11290 ELAP Cert: 1386
NET Job No: 96.01822 Page: 6

Ref: G.I. Trucking/Job No. 88288.001

LABORATORY CONTROL SAMPLE REPORT

Parameter	LCS % Rec.	DUP LCS % Rec.	RPD	LCS Amount Found	DUP LCS Amount Found	LCS Amount Exp.	Flags	Units	Date Analyzed	Analyst Initials	Run Batch
M8015 (EXT., Solid) as Diesel	76.6			12.8		16.7		mg/kg	06/13/1996	aal	1183

KEY TO RESULT FLAGS

*	: RPD between sample duplicates exceeds 30%.
*M	: RPD between sample duplicates or MS/MSD exceeds 20%.
+	: Correlation coefficient for the Method of Standard Additions is less than 0.995.
<	: Sample result is less than reported value.
B-I	: Value is between Method Detection Limit and Reporting Limit.
B-0	: Analyte found in blank and sample.
C	: The result confirmed by secondary column or GC/MS analysis.
CNA	: Cr+6 not analyzed; Total Chromium concentration below Cr+6 regulatory level.
COMP	: Sample composited by equal volume prior to analysis.
D-	: The result has an atypical pattern for Diesel analysis.
D1	: The result for Diesel is an unknown hydrocarbon which consists of a single peak.
DH	: The result appears to be a heavier hydrocarbon than Diesel.
DL	: The result appears to be a lighter hydrocarbon than Diesel.
DR	: Elevated Reporting Limit due to Matrix.
DS	: Surrogate diluted out of range.
DX	: The result for Diesel is an unknown hydrocarbon which consists of several peaks.
FA	: Compound quantitated at a 2X dilution factor.
FB	: Compound quantitated at a 5X dilution factor.
FC	: Compound quantitated at a 10X dilution factor.
FD	: Compound quantitated at a 20X dilution factor.
FE	: Compound quantitated at a 50X dilution factor.
FF	: Compound quantitated at a 100X dilution factor.
FG	: Compound quantitated at a 200X dilution factor.
FH	: Compound quantitated at a 500X dilution factor.
FI	: Compound quantitated at a 1000X dilution factor.
FJ	: Compound quantitated at a greater than 1000x dilution factor.
FK	: Compound quantitated at a 25X dilution factor.
FL	: Compound quantitated at a 250X dilution factor.
G-	: The result has an atypical pattern for Gasoline.
G1	: The result for Gasoline is an unknown hydrocarbon which consists of a single peak.
GH	: The result appears to be a heavier hydrocarbon than Gasoline.
GL	: The result appears to be a lighter hydrocarbon than Gasoline.
GX	: The result for Gasoline is an unknown hydrocarbon which consists of several peaks.
HT	: Analysis performed outside of the method specified holding time.
HTC	: Confirmation analyzed outside of the method specified holding time.
HTP	: Prep procedure performed outside of the method specified holding time.
HX	: Peaks detected within the quantitation range do not match standard used.
J	: Value is estimated.
MI	: Matrix Interference Suspected.
MSA	: Value determined by Method of Standard Additions.
MSA*	: Value obtained by Method of Standard Additions; Correlation coefficient is <0.995.
NI1	: Sample spikes outside of QC limits; matrix interference suspected.
NI2	: Sample concentration is greater than 4X the spiked value; the spiked value is considered insignificant.
NI3	: Matrix Spike values exceed established QC limits, post digestion spike is in control.
P7	: pH of sample > 2; sample analyzed past 7 days.
RSC	: Refer to subcontract laboratory report for QC data.
S2	: Matrix interference confirmed by repeat analysis.
SCN	: Thiocyanate not analyzed separately; total value is below the Reporting Limit for Free Cyanide.
UMDL	: Undetected at the Method Detection Limit.

1499

BLYMER
ENGINEERS, INC.
1829 Clement Avenue
Alameda, CA 94501 (510) 521-3773 FAX (510) 865-2594

CHAIN OF CUSTODY RECORD

PAGE 1 OF 1

JOB # 88288.001

PROJECT NAME/LOCATION G. I. TRUCKING
1750 ADAMS AVE.
SAN LEANDRO, CA

SAMPLERS (SIGNATURE) D. Underwood

TURNAROUND TIME: normal DAY(S)

REMARKS:

DATE	TIME	COMP	GRAB	SAMPLE NAME/LOCATION	# OF CONTAINERS	~~TPH AS GASOLINE + BTXE (8020)~~ ~~(MOD. EPA 8015/8020)~~	TPH AS DIESEL (MOD EPA 8015)	VOC (EPA 624/8240)	SEMI-VOC (EPA 625/8270)	TRPH (EPA 418.1)	BTXE (EPA 8020/602)					HOLD
6/6/96		X		SP-1	1	X	X									

CUSTODY SEALED
Date 6/7/96 Time 1618 Initials BB
SEAL INTACT?
Yes Initials BB
No
VIA NCS

STORED SECURELY OVER NIGHT

REQUESTED BY: D. Underwood

RESULTS AND INVOICE TO: ABF FREIGHT SYSTEM, INC.
c/o BLYMER ENGINEERS, INC.
ATTN: DEBORAH UNDERWOOD

RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)	RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED BY: (SIGNATURE)
D. Underwood	6/7/96 12:24	6/7/96 1228		6/7/96 1618	
RELINQUISHED BY: (SIGNATURE)	DATE / TIME	RECEIVED FOR LABORATORY BY: (SIGNATURE)	DATE / TIME	REMARKS:	
			6/8/96 0700	TEMP.: 0.1°C	

WHITE: Accompany Sample YELLOW: BEI, After Lab Signs PINK: Original Sampler