CO. 1475

LUSH GEOSCIENCES

GEOLOGICAL AND ENVIRONMENTAL SERVICES

Rec'd 8/30/02

BASELINE SURVEY REPORT
CONSTRUCTION SERVICES FACILITY
1300 POWELL STREET
EMERYVILLE, CALIFORNIA

For:
Mr. Dick Becker

Lush Geosciences Job No. 510-001

April 13, 1995

Andrew P. Lush
President
RG 4421

REGISTERED GEOLOGIST
ANDREW P. LUSH
No. 4421
10/16
STATE OF CALIFORNIA

LUSH GEOSCIENCES

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GEOLOGICAL AND ENVIRONMENTAL SERVICES

April 13, 1995
510-001

Mr. Dick Becker
Construction Services
1300 Powell Street
Emeryville, CA 94608

Subject: Executive Summary
Baseline Survey Report
Construction Services Site
1300 Powell Street, California

Dear Mr. Becker:

Lush Geosciences prepared the attached report presenting the results of our recent subsurface investigation to evaluate whether soil and groundwater contamination has occurred at the construction Services / Becker Machinery property located at 1300 Powell Street in Emeryville, California. This report was prepared to summarize the work performed to date; the report describes methods and procedures used and presents our conclusions and recommendations.

The site is currently occupied by a construction equipment rental yard, office, and maintenance facility. Equipment stored at the site include pumps, water trucks, cranes, and other equipment; maintenance facilities include aboveground diesel tanks, used oil and hydraulic oil storage, a steam cleaner, and a self-contained parts cleaning unit. The diesel fuel and most of the used oil storage is in a bermed area at the north end of the site building; some used oil is present in 55-gal drums near the north edge of the site.

Areas designated for investigation included:

- Areas near a storm drain where steam cleaner washout was directed and where standing water is common during rainy periods;
- Areas near the aboveground fuel and hydraulic oil storage;

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- Areas of potholed pavement west of the site building;
- Areas below worn asphalt near the northwestern corner of the site;
- An area of bare ground near the north edge of the site where surficial runoff from paved areas is directed;
- An area of exposed soil near the northwestern corner of the site where runoff accumulates during rainy periods prior to being pumped into public sewer systems;
- An area near the west edge of the site where asphalt is warped and worn; and
- An area at the east edge of the exposed soil area at the north edge of the site adjacent to waste oil storage in drums and where some spillage was apparent.

Each of these locations was judged likely to have possible surficial contamination with diesel or oily materials dripping from equipment or being washed in during rainy periods. These areas were investigated by drilling 8 borings within or immediately adjacent to the areas of concern to depths of approximately 5 ft and collecting samples at depths equivalent of approximately 1 ft, 3 ft, and 5 ft.

The materials encountered were generally clayey and showed some positive evidence of contamination in the form of odor or low OVM readings. Shallow groundwater was encountered in two borings; an oily sheen was present on the water in one boring near the steam-cleaning storm drain and a thick sheen or emulsion of oily material was observed in another boring near the aboveground fuel and oil storage area.

Selected samples were analyzed for total petroleum hydrocarbons as diesel fuel (TPHd), motor oil (TPHmo), and as kerosene (TPHk) and for total oil and grease (TOG). Sample analyses showed that contamination was present in each of the locations sampled and all of the samples analyzed. The dominant contaminant was oil and grease with relatively low amounts of lighter hydrocarbons such as diesel fuel or hydraulic fluid. The results of sample analyses showed contamination in all samples analyzed, although the TPHmo analysis often showed lower or non-detectable reported concentrations due to the nature of the analysis, which is better suited for lighter (diesel) hydrocarbons. Average concentrations in samples from the 1-ft depth showed an average concentration of more than 285 ppm TOG. Samples from borings B4 and B5 showed 1,200 and 2,800 ppm, respectively. Average concentrations at the 5 ft depth outside of B2 (3,200 ppm TOG) were approximately 490 ppm.

Based on these data, we conclude that the site has been contaminated with oil and grease, with relatively minor concentrations of lighter hydrocarbons. However, the following factors indicated that the present site activities are not the source of the detected contamination:

- The lack of significant variations in the analytical results despite widely varying types of expected concentrations and settings is not consistent with patterns which would be expected from the wide range of types of settings explored (below asphalt, areas of relatively minor activities) and other factors).

- The depth of contamination and the wide-spread extent of contamination is not expected from the nature of recent sources of possible contamination given the types of possible recent discharges and the contaminants detected.

- The generally higher levels of contamination in the deeper samples than in the shallower samples indicates that surficial sources have not been the dominant points of origin.

- The presence of significant contamination in soil below a buried concrete slab where only surficial sources are currently likely implies that some other type of source is probable.

We examined Sanborn Fire Insurance Maps of the Oakland/Emeryville area dating from 1951. These maps showed that the site was occupied by a bulk oil storage, canning, and warehousing facility labeled as occupied by The Pennzoil Company. The maps also indicate a property to the west was also used for bulk petroleum storage (Cook Oil Co.) and that the site to the north was occupied by Henry Kaiser Motors. We therefore infer that the majority of the contamination detected onsite is related to the prior use of the site as a bulk oil storage facility.

SUMMARY

Contamination has occurred onsite and it is possible that groundwater has been affected. Contamination in some areas exceeds 1,000 ppm TOG. Based on the levels of contamination present, it is our recommendation that:

1. Appropriate regulatory agencies (Alameda County and the California Regional Water Quality Control Board) be notified of the presence of contamination.

2. We recommend that Construction Services explore the possibility that present or former insurance policies may reimburse costs of delineation and mitigation activities, particularly if offsite migration of contaminants is eventually documented.

3. We strongly recommend that the chain of title for the subject property be investigated and possible responsible parties such as Pennzoil be identified and notified that they will be expected to contribute to remedial costs. Additional historical research will be useful in identifying other potential sources and possible responsible parties Agency notification may be very useful in the process of identifying and securing assistance from alternative responsible parties.

4. Legal representation should be procured and brought into the project if and as necessary.

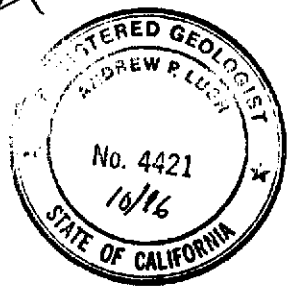
5. Further assessment of the contamination will be required by regulatory agencies and will be critical in evaluating the extent of contamination, in verifying responsible parties, and in identifying appropriate remedial actions.

Please call if you have any questions regarding this project.

Sincerely,

LUSH GEOSCIENCES

Andrew P. Lush
Senior Geologist
R.G. 4421



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1.0 INTRODUCTION

Lush Geosciences prepared this report presenting the results of our recent subsurface investigation to evaluate whether soil and groundwater contamination has occurred at the construction Services / Becker Machinery property located at 1300 Powell Street in Emeryville, California. The site is located on northwest corner of Powell Street and Doyle Street. Figure 1 illustrates the location of the site. The purpose of the assessment was to assess whether site activities may have resulted in contamination of soil or groundwater at the site.

This report was prepared to summarize the work performed to date; the report describes methods and procedures used and presents our conclusions and recommendations. The methods and procedures used during this investigation included:

- Collecting soil samples from eight soil borings;
- Analyzing selected soil samples; and,
- Preparing this report.

1.1 Background

The site is currently occupied by a construction equipment rental yard, office, and maintenance facility. Equipment stored at the site include pumps, water trucks, cranes, and other equipment; maintenance facilities include aboveground diesel tanks, used oil and hydraulic oil storage, a steam cleaner, and a self-contained parts cleaning unit. . The diesel fuel and most of the used oil storage is in a bermed area at the north end of the site building; some used oil is present in 55-gal drums near the north edge of the site. We understand that the site is being considered for lease to another party, and a baseline survey was desired to evaluate site conditions prior to transfer of responsibility for site operations to the lessee.

The site configuration is illustrated in the attached Generalized Site Plan (Figure 2). Areas designated for investigation included:

- Areas near a storm drain where steam cleaner washout was directed and where standing water is common during rainy periods;
- Areas near the aboveground fuel and hydraulic oil storage;
- Areas of potholed pavement west of the site building;

- Areas below worn asphalt near the northwestern corner of the site;
- An area of bare ground near the north edge of the site where surficial runoff from paved areas is directed;
- An area of exposed soil near the northwestern corner of the site where runoff accumulates during rainy periods prior to being pumped into public sewer systems;
- An area near the west edge of the site where asphalt is warped and worn; and
- An area at the east edge of the exposed soil area at the north edge of the site adjacent to waste oil storage in drums and where some spillage was apparent.

Each of these locations was judged likely to have possible surficial contamination with diesel or (dominantly) oily materials dripping from equipment or being washed in during rainy periods. These areas were investigated by drilling borings within or immediately adjacent to the areas of concern to depths of approximately 5 ft and collecting samples at depths equivalent of approximately 1 ft, 3 ft, and 5 ft.

2.0 SITE INVESTIGATION

The work performed included drilling and sampling eight borings, collecting soil samples from each of the borings, conducting analyses on selected soil samples, and compiling and preparing this report. This report summarizes the field and laboratory operations conducted, methods and procedures used, and the data obtained and presents our conclusions and recommendations based on the findings of the assessment.

2.1 Field Methods and Sampling Procedures

All borehole drilling, soil sampling, and monitoring well construction activities were conducted using hollow-stem auger drilling and sampling equipment operated by West HAZMAT, of Newark, California except B8, which was hand-augured due to access limitations. West HAZMAT holds a current, valid C-57 well drillers license. The locations of the soil borings are illustrated on Figure 2. The procedures implemented were as follows:

- Drilling equipment was thoroughly steam-cleaned with clean water prior to drilling each boring.
- Each boring was logged in accordance with the Unified Soil Classification System.

- Samples were collected at depths of 1 ft, 3 ft, and 5 ft except in B8, which was hand-augured and reached refusal at 1 ft; a disturbed soil sample was collected at that depth.

- Soil samples were collected (except for the sample from B8 described above) using a California split-spoon drive sampler lined with three 2-in by 6-in brass tube liners. Soil collected in the first (lowest) liner was preserved for analysis. Care was taken to assure that no headspace was present in the liner following sample collection. Soil collected in the second liner was screened with a portable photoionizing hydrocarbon vapor meter (OVM) to provide field indications of hydrocarbon vapor concentrations. The remaining contents of the second and third liners were extruded and logged in accordance with the Unified Soil Classification System. Immediately after a sample was collected, each end of the brass liner that contained the soil sample to be preserved for analyses was covered with aluminum foil, capped with a polyethylene lid, and sealed with airtight tape. The samples were then labeled, showing the boring number and depth, date, time, and job identification, and placed in iced storage.

- All samples were stored immediately after collection, sealing, and labeling in an ice chest containing ice, and were maintained in a refrigerated condition until they were delivered to the analytical laboratory.

- Chain-of-custody documentation was maintained from the sampling location to the analytical laboratory. The chain-of-custody record was signed by the sampler and placed in the container holding the samples. Condition of the samples was noted on the chain-of-custody record by the laboratory.

- Soil cuttings generated during borehole drilling and sampling were placed and sealed into drums, and left onsite pending the results of the analyses.

2.2 Soil Conditions Encountered

Soil condition encountered are summarized below in Table 1. The materials encountered were generally clayey and showed some positive evidence of contamination in the form of odor or low OVM readings. Shallow groundwater was encountered in borings B1 (less than 1 ft below grade) and B2 (2 ft below grade). An oily sheen was present on the water in B1 and a thick sheen or emulsion of oily material was observed in B2.

TABLE 1
SOIL CONDITIONS ENCOUNTERED
CONSTRUCTION SERVICES FACILITY
EMERYVILLE, CALIFORNIA
Page 1 of 2

Boring/Sample Number	Sample Depth (ft)	Soil Type	Blows Per Ft	OVM Reading
Boring B1				
S-1-B1	1	Gray gravel (1 ft) over dark gray and dark brown clayey silt, very moist to wet, low plasticity, stiff, weak petroleum odor (fill)	31	5 ppm
S-3-B1	3	Mottled orange brown, green-gray, gray silty gravely sand, moist, stiff, low plasticity slight petroleum odor (fill)	29	1.9 ppm
S-5-B1	5	Gray green silty gravely sand, moist, dense silty gravely sand, moist, stiff, low plasticity slight petroleum odor (fill)	33	8 ppm
Boring B2				
S-1-B2	1	1 in asphalt over 4 ins gravel over very dark brown clayey silt, very moist to wet, low plasticity, stiff, moderate petroleum odor; medium yellow brown sand, well sorted, at 1.5 ft. Wood Fragment.	25	18 ppm
S-3-B2	3	No recovery	27	
S-5-B2	5	Layered silty sand and silt, yellow brown, silty gravely sand, moist, stiff, low plasticity, moderate petroleum odor	39	44.5 ppm
Boring B3				
S-1-B3	1	Dark brown clayey silt, moist, non-plastic, stiff, possible brick fragments very weak petroleum odor	28	5 ppm
S-3-B3	3	Yellow brown sandy silt with trace gravel moist, stiff, mod. plastic, no petroleum odor	15	0.8 ppm
S-5-B3	5	Mottled medium yellow brown sandy clayey silt, moist, stiff, low plasticity, slight petroleum odor	29	29 ppm
Boring B4				
S-1-B4	1	1 in asphalt over dark brown clayey silt, moist, non-plastic, stiff, moderate petroleum odor; 3 ins concrete at 0.5 ft	25	18 ppm
S-3-B4	3	Yellow brown to medium gray gravely clayey sandy silt, moist, stiff, slight odor	22	22 ppm
S-5-B4	5	As above	37	14 ppm

Continued on Next Page

TABLE 1
SOIL CONDITIONS ENCOUNTERED
CONSTRUCTION SERVICES FACILITY
EMERYVILLE, CALIFORNIA
Page 2 of 2

Boring/Sample Number	Sample Depth (ft)	Soil Type	Blows Per Ft	OVM Reading
Boring B5				
S-1-B5	1	1 in asphalt over dark brown clayey silt, moist, non-plastic, stiff, moderate petroleum odor; 3 ins concrete at 0.5 ft	40	8 ppm
S-3-B5	3	Yellow brown to medium gray gravely clayey sandy silt, moist, stiff, slight odor	20	
S-5-B5	5	As above	34	64 ppm
Boring B6				
S-1-B6	1	Very dark brown clayey silt, very moist, low plasticity, stiff, no petroleum odor;	39	1.1 ppm
S-3-B6	3	As above	22	0.5 ppm
S-5-B6	5	Blue gray to yellow brown sandy silt, moist, stiff, plastic, slight petroleum odor	41	11.6 ppm
Boring B7				
S-1-B7	1	Dark brown clayey silt, moist, non-plastic, stiff, possible no petroleum odor	22	1.1 ppm
S-3-B7	3	Gray brown sandy silt with trace gravel moist, stiff, low plasticity, no petroleum odor	33	0.1 ppm
S-5-B7	5	Mottled medium yellow brown sandy clayey silt, moist, stiff, low plasticity, slight petroleum odor	22	24 ppm
Boring B8				
S-1-B8	1	Dark brown clayey silt, moist, non-plastic, stiff, slight petroleum odor.	25	8 ppm

2.3 Soil Sample Analyses

Analysis of selected soil samples from the borings were performed by Sparger Technology Laboratories, of Sacramento, California, which is certified for the requested analyses. The samples were analyzed for total petroleum hydrocarbons as diesel fuel (TPHd), motor oil (TPHmo), and kerosene (TPHk) using Environmental Protection Agency (EPA) Method 8015 (modified) and for total oil and grease (TOG) using EPA method 5520-F. Results of the analyses are summarized in Table 1; copies of laboratory reports are attached as Appendix A.

TABLE 2

RESULTS OF LABORATORY ANALYSES
SOIL SAMPLES FROM SOIL BORINGS

CONSTRUCTION SERVICES FACILITY
EMERYVILLE, CALIFORNIA

Sample Number	Sample Depth (ft)	TPHd	TPHk	TPHmo	TOG
Boring B1					
S-1-B1	1	<1.0	<1.0	**24**	**360**
S-5-B1	5	**2.7**	<1.0	**320**	**430**
Boring B2					
S-1-B2	1	<1.0	<1.0	<1.0	**250**
S-5-B2	5	**6.7**	<1.0	**210**	**3,200**
Boring B3					
S-1-B3	1	**1.3**	<1.0	**130**	**360**
S-5-B3	5	<1.0	<1.0	<1.0	**190**
Boring B4					
S-1-B4	1	**17**	<1.0	**880**	**1,200**
S-5-B4	5	<1.0	<1.0	<1.0	**440**
Boring B5					
S-1-B5	1	**110**	<1.0	<1.0	**2,800**
S-5-B5	5	**17**	<1.0	<1.0	**600**
Boring B6					
S-1-B6	1	<1.0	<1.0	**15**	**220**
S-5-B6	5	**12**	<1.0	**230**	**940**
Boring B7					
S-1-B7	1	<1.0	<1.0	<1.0	**200**
S-5-B7	5	**12**	<1.0	<1.0	**320**
Boring B8					
S-1-B8	1	**11**	<1.0	<1.0	**320**

TPHd = Total petroleum hydrocarbons as diesel
TPHk = Total petroleum hydrocarbons as kerosene
TPHmo = Total petroleum hydrocarbons as motor oil
TOG = Total oil and grease
Results given in parts per million (ppm)
< = less than laboratory minimum detection limits

3.0 DISCUSSION

Sample analyses from the soil borings showed that contamination was present in each of the locations sampled and all of the samples analyzed. The dominant contaminant was oil and grease with relatively low amounts of lighter hydrocarbons such as diesel fuel. The differences in reported concentrations between the TPHmo and TOG results is likely due to the presence of relatively heavy hydrocarbons and/or its degradation products. The TOG analysis is judged most appropriate for the heavier hydrocarbons associated with the motor oil contamination judged to be dominant at this site. Until further assessment is performed, we consider the TOG numbers most reliable as a indication of actual site conditions. Each sampled area is discussed below.

3.1 Storm Drain Area

Shallow water was encountered in boring B1 and subjective evidence of contamination was encountered in each sample. An oily sheen was present on the water surface, which was perched above moist soil. Sample analyses showed 360 ppm TOG at 1 ft and 430 ppm at a depth of 5 ft.

3.2 Aboveground Storage Area

Shallow water was encountered in boring B2 and subjective evidence of contamination was encountered in each sample. An oily emulsion or thick sheen was present on the water surface, which was perched above moist soil. A clean sand was found approximately 1.5 ft below the ground surface. Sample analyses showed 250 ppm TOG at 1 ft and 3,200 ppm TOG at a depth of 5 ft.

3.3 Areas of Potholed Pavement

The area of potholed pavement west of the site building was investigated with a boring within the largest and most northerly worn area. Samples from this location showed little or no evidence of contamination; results of laboratory analyses showed TOG concentrations among the lowest reported at the site.

3.4 Areas of Worn Pavement

The area of worn pavement northwest of the site building was investigated with a boring in the central portion of the area. Samples from this location showed high TOG concentrations in the shallow sample and substantial concentrations in the 5-ft sample. This was despite the presence of an apparently competent concrete slab at 6 ins below ground surface.

3.5 Areas of Bare Ground, North Edge

An area of bare ground near the north edge of the site was investigated because runoff from rain water is directed there from adjoining paved areas. As seen with boring B4, high TOG concentrations in were detected in the shallow sample and substantial concentrations were present in the 5-ft sample. This contamination was also present below a concrete slab.

3.6 Area of Bare Ground, Northwest Corner

The area of exposed soil near the northwest corner of the site is where runoff accumulates during rainy periods was explored with boring B6. Very little subjective evidence of contamination was apparent. The shallow sample showed 220 ppm TOG; the deeper sample showed a higher concentration of 940 ppm TOG

3.7 Worn Asphalt Area, West Edge

An area near the west edge of the site, where asphalt is warped and worn below several parked trucks, was explored with boring B7. The shallow soil sample, containing 200 ppm TOG; was similar in concentration to the shallow soil sample in the exposed soil area; the deeper sample (5 ft below grade) showed a higher concentration of 320 ppm TOG.

3.8 Area of Bare Ground, North Edge

An area at the east edge of the exposed soil area at the north edge of the site is adjacent to waste oil storage in drums and where some spillage was apparent. A hand-augured boring was drilled (B8) and encountered refusal at approximately 1 ft. Analysis of a sample composed of disturbed drill cuttings was found to contain 320 ppm TOG.

3.9 Summary

The results of sample analyses showed contamination in all samples analyzed. Average concentrations in samples from the 1-ft depth outside of borings B4 and B5, which had elevated TOG concentrations, showed an average concentration of approximately 285 ppm TOG. Samples from borings B4 and B5 showed 1,200 and 2,800 ppm, respectively. Average concentrations at the 5 ft depth outside of B2 (3,200 ppm TOG) were approximately 490 ppm.

Based on these data, we conclude that the site has been contaminated with oil and grease, with relatively minor concentrations of lighter hydrocarbons. However, the following factors

indicated that the present site activities, judged to be representative of activities during the period Construction Services has operated at the site, are not the source of the detected contamination:

- The lack of significant variations in the shallow TOG analytical results despite widely varying types of expected concentrations and settings is not consistent with patterns which would be expected from the wide range of types of settings explored (below asphalt, areas of relatively minor activities) and other factors).

- The depth of contamination and the wide-spread extent of contamination is not expected from the nature of recent sources of possible contamination given the types of possible recent discharges and the contaminants detected.

- The generally higher levels of contamination in the deeper samples than in the shallower samples indicates that the surficial sources investigated have not been the dominant points of origin.

- The presence of significant contamination in soil below a buried concrete slab where only surficial discharges are likely implies that some other type of source is likely.

Because of these apparent inconsistencies, we examined Sanborn Fire Insurance Maps of the Oakland/Emeryville area dating from 1951, obtained on microfilm from the California State Library. These maps showed that the site was occupied by a bulk oil storage, canning, and warehousing facility labeled as occupied by The Pennzoil Company. Each of the borings drilled were within 20 ft of one or more of 21 large aboveground storage tanks, and concrete pads as noted in two of the borings are indicated to have been present during the 1950's. The maps also indicate a property to the west was also used for bulk petroleum storage (Cook Oil Co.) and that the site to the north was occupied by Henry Kaiser Motors (Figure 3). We therefore infer that the majority of the contamination detected onsite is related to the prior use of the site as a bulk oil storage facility.

4.0 RECOMMENDATIONS

Contamination has occurred onsite and it is possible that groundwater has been affected. Contamination in some areas exceeds 1,000 ppm TOG. Based on the levels of contamination present, it is our recommendation that appropriate regulatory agencies (Alameda County and the California Regional Water Quality Control Board) be notified of the presence of contamination. At this time, we are unable to provide estimates of the vertical or lateral limits of contamination. The distribution of contamination found to date is largely consistent with the distribution of oil storage during operation of the Pennzoil facility.

We further recommend that Construction Services explore the possibility that present or former insurance policies may reimburse costs of delineation and mitigation activities, particularly if offsite migration of contaminants is eventually documented.

We also strongly recommend that the chain of title for the subject property be investigated and possible responsible parties such as Pennzoil be identified and notified that they will be expected to contribute to remedial costs. Additional historical research will be useful in identifying other potential sources and possible responsible parties Agency notification may be very useful in the process of identifying and securing assistance from alternative responsible parties. Legal representation should be procured and brought into the project if and as necessary.

Further assessment of the contamination will be required by regulatory agencies and will be critical in evaluating the extent of contamination, in verifying responsible parties, and in identifying appropriate remedial actions.

Reference: CALIFORNIA STATE AUTOMOBILE ASSOCIATION

SCALE

FEET 0 1000 2000 3000 4000 5280 FEET

MILES 0 0.2 0.4 0.6 0.8 1.0 MILES

SITE LOCATION MAP
CONSTRUCTION SERVICES FACILITY
1300 POWELL STREET

EMERYVILLE, CALIFORNIA

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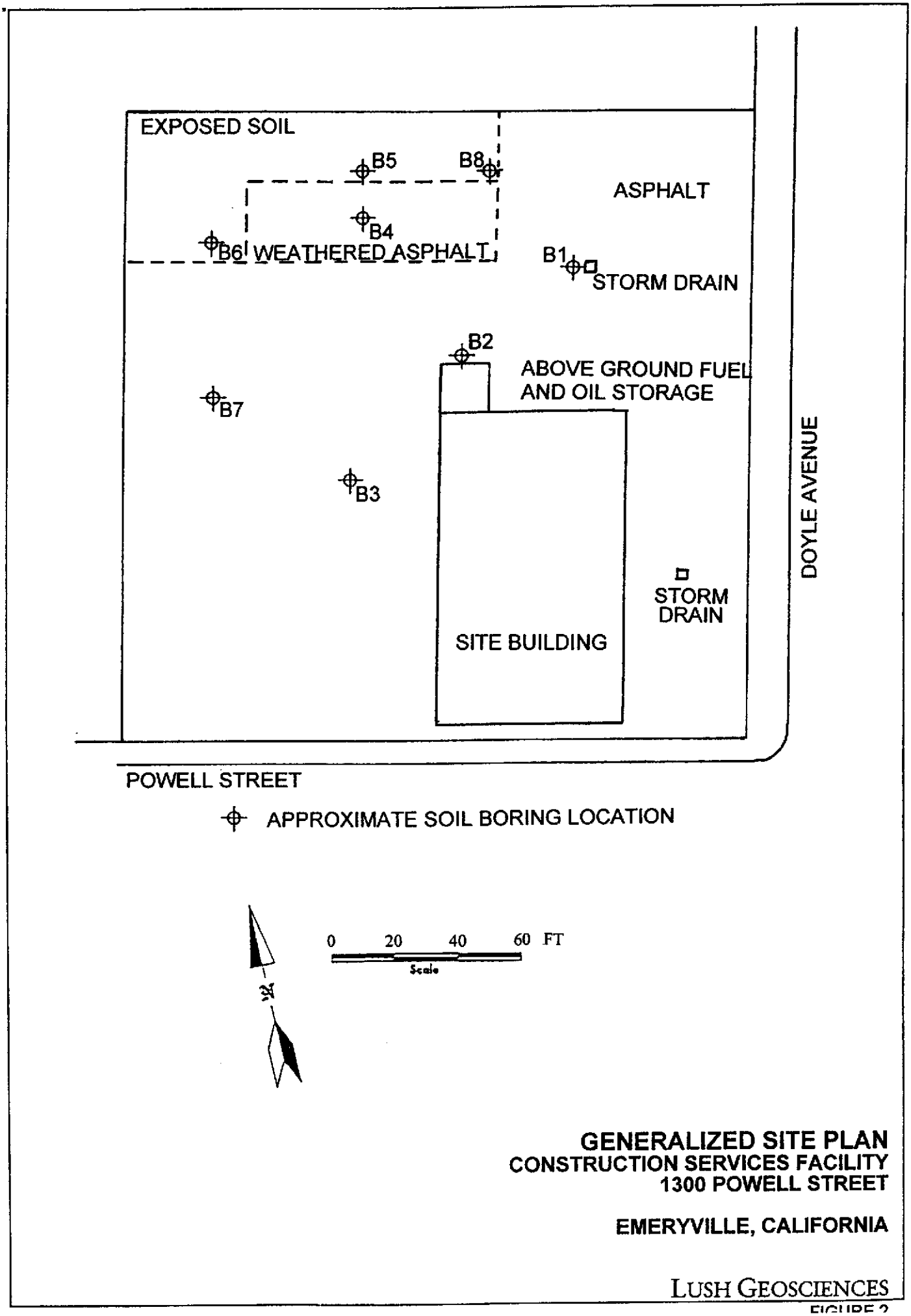
FIGURE 1



GENERALIZED SITE PLAN
CONSTRUCTION SERVICES FACILITY
1300 POWELL STREET

EMERYVILLE, CALIFORNIA

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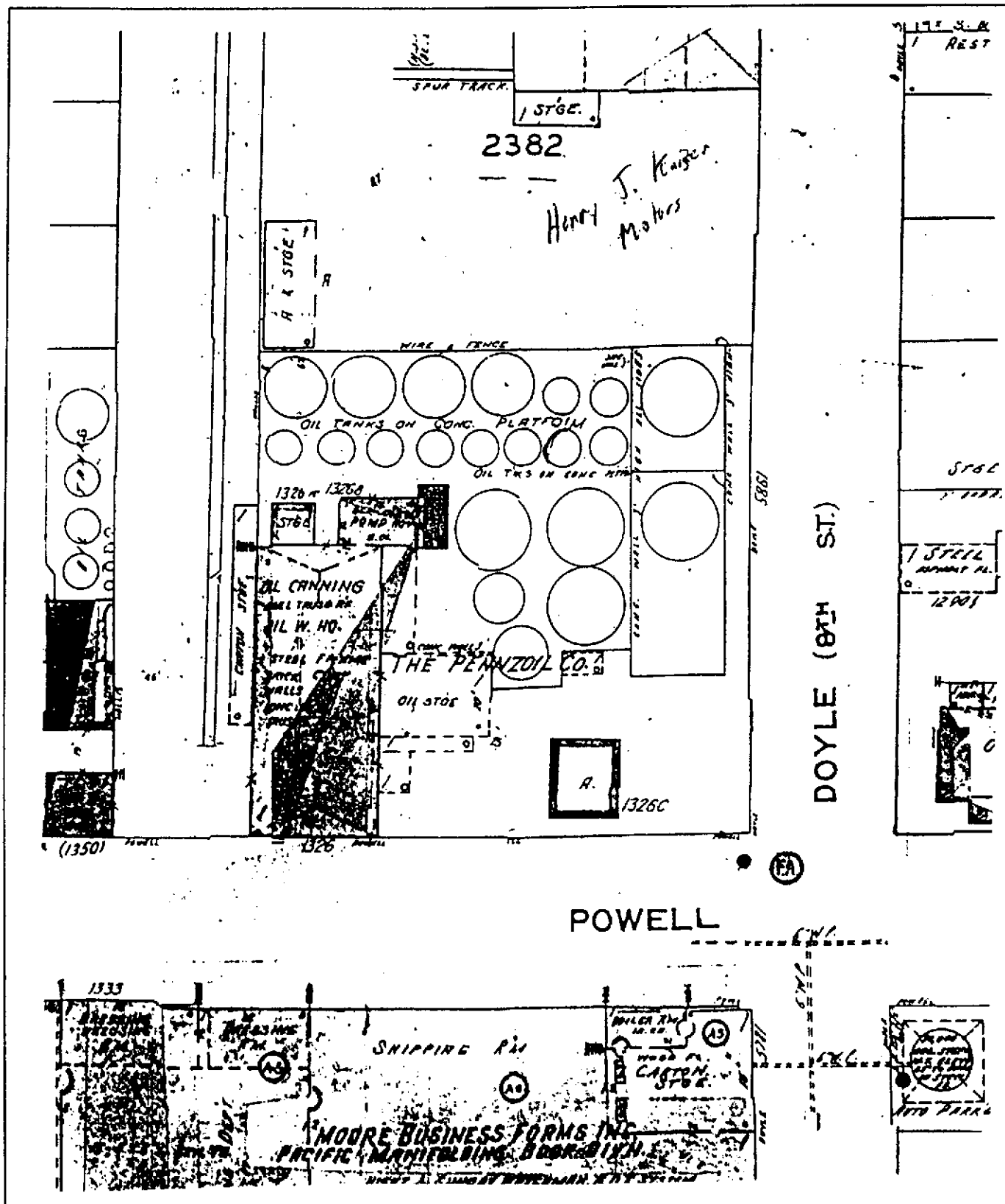
FIGURE 2



1951 SANBORN MAP
CONSTRUCTION SERVICES FACILITY
1300 POWELL STREET

EMERYVILLE, CALIFORNIA

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FIGURE 2

APPENDIX A

Laboratory Results of Sample Analyses from Borings

Chain of Custody Records

SPARGER TECHNOLOGY, INC.
Analytical Laboratory
3050 Fite Circle, #112 Sacramento, CA 95827
Phone: (916) 362-8947
FAX: (916) 362-0947

CHAIN OF CUSTODY RECORD

4588

STAL Invoice Number:

Company: LUSH GEOSCIENCES Phone: (916) 737-9294
Project Manager: ANDREW LUSH FAX (916) 737-9298
Report Address: 1560 BUSINESS DRIVE, SUITE 120 SACRAMENTO, CA 95826
Billing Name & Address:

4/4/95 Sparger confirmed with Mr. Andy Lush to change the analysis from 418.1 to Oil & Grease (5520).

Project Name: Construction Services Project/Job #: 510-001
Project Location: Emeryville P.O. #:

ANALYSIS REQUEST

REMARKS: 1 of 2

SAMPLE ID	Sampling: Date	Sampling: Time	Container: 40 mL VOA	Container: Brass Sleeve	Container: 1 L amber bottle	Container: 250 mL Plastic	Container: Other:	Preservative Used: HCl/HNO3/ICE	Preservative Used: None	Preservative Used: Other:	Matrix: Water	Matrix: Soil	Matrix: Air	Matrix: Other:
S-1-B1	4/3/95			1				1				1		
S-1-B2				1				1				1		
S-1-B3				1				1				1		
S-1-B4				1				1				1		
S-1-B5				1				1				1		
S-1-B6				1				1				1		
S-1-B7				1				1				1		
S-1-B8				1				1				1		
S-5-B1	4/3/95			1				1				1		

TCLP: BTEX (602/8020)/503.1	TCLP: BTEX/TPHgas (602/8020/8015)	TCLP: TPHdiesel/TPHmotor oil/kerosene(8015)	TCLP: EPA 601/8010/502.2/504	TCLP: EPA 602/8020	TCLP: EPA 608/8080 (Pesticides)/505/508	TCLP: EPA 608/8080 (PCB's)	TCLP: EPA 624/8240/524.2	TCLP: EPA 625/8270/525	Total Oil & Grease (5520)	Non-Polar O & G/TRPH (418.1)	Organic Lead	RCI	WET (STLC): CAM-17 Metals	TCLP: CAM-5 Metals (Cd, Cr, Pb, Ni, Zn)	Total: Lead	TAT: Standard	TAT: Rush Services (72hr / 48hr / 24hr / 12hr)	TAT: Holiday/Weekend Rush
		✓							✓								✓	
		✓							✓								✓	
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Received by: [signature] Date: 4/4/95 Time: 10:20 AM
Relinquished by: Date: Time:
Received by: Date: Time:

SPARGER TECHNOLOGY, INC.
Analytical Laboratory
3050 Fite Circle, #112 Sacramento, CA 95827
Phone: (916) 362-8947
FAX: (916) 362-0947

CHAIN OF CUSTODY RECORD

4588

Company: LUSH GEOSCIENCES Phone: (916) 737-9294
Project Manager: ANDREW LUSH FAX (916) 737-9298
STAL Invoice Number:

Report Address: 1560 BUSINESS DRIVE, SUITE 120, SACRAMENTO, CA 95826
Billing Name & Address:

4/4/95 Sparger confirmed with Mr. Andy Lush to change the analysis from 418.1 to Oil & Grease (5520)

Project Name: Construction Service Project/Job #: 510-001
Project Location: Emeryville P.O. #:

ANALYSIS REQUEST

REMARKS: 2 of 2

SAMPLE ID	Sampling: Date	Sampling: Time	Container: 40 mL VOA	Container: Brass Sleeve	Container: 1 L amber bottle	Container: 250 mL Plastic	Container: Other:	Preservative Used: HCl/HNO3 (ICE)	Preservative Used: None	Preservative Used: Other:	Matrix: Water	Matrix: Soil	Matrix: Air	Matrix: Other:	TCLP: BTEX (602/8020)/503.1	TCLP: BTEX/TPHges (602/8020/8015)	TCLP: TPHdiesel/TPHmotor oil/kerosene(8015)	TCLP: EPA 601/8010/502.2/504	TCLP: EPA 602/8020	TCLP: EPA 608/8080 (Pesticides)/505/508	TCLP: EPA 608/8080 (PCB's)	TCLP: EPA 624/8240/524.2	TCLP: EPA 625/8270/525	Total Oil & Grease (5520)	Non-Polar O & G/TRPH (418.1)	Organic Lead	RCI	WET (STLC): CAM-17 Metals	WET (STLC): CAM-5 Metals (Cd, Cr, Pb, Ni, Zn)	WET (STLC): Lead	TCLP: CAM-17 Metals	TCLP: CAM-5 Metals (Cd, Cr, Pb, Ni, Zn)	TCLP: Lead	Total: CAM-17 Metals	Total: CAM-5 Metals (Cd, Cr, Pb, Ni, Zn)	Total: Lead	TAT: Standard	TAT: Rush Services (72hr / 48hr / 24hr / 12hr)	TAT: Holiday/Weekend Rush
S-5-82	4/3/95			1				1				1					✓							✓															
S-5-83	"			1				1				1					✓							✓															
S-5-84	"			1				1				1					✓							✓															
S-5-85	"			1				1				1					✓							✓															
S-5-86	"			1				1				1					✓							✓															
S-5-87	4/3/95			1				1				1					✓							✓															

TAT: Standard ✓ ✓ ✓ ✓ ✓ ✓

Relinquished by:	Date:	Time:	Received by:	Date:	Time:
[signature]	4/4/95		[signature]	4/4/95	11:20 AM
Relinquished by:	Date:	Time:	Received by:	Date:	Time:

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

April 13, 1995

Mr. Andrew Lush
Lush Geosciences
3560 Business Drive, Suite 120
Sacramento, CA 95820

Dear Mr. Lush:

Enclosed is the report for the fifteen (15) soil samples. The samples were received at Sparger Technology Analytical Lab on April 4, 1995.

The samples were received in fifteen (15) brass tubes. The samples were transported and received under documented chain of custody and stored at four (4) degrees C until analysis was performed.

The report consists of the following sections:

I. Sample Description
II. Analysis Request
III. Quality Control Report
IV. Analysis Results

No problems were encountered with the analysis of your samples.

If you have questions, please feel free to call.

Sincerely,

R. L. James
Principal Chemist

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

I Sample Description

See attached Samples Description Information.

The samples were received under chain-of-custody.

II Analysis Request

The following analytical tests were requested:

Lab ID	Your ID	Analysis Description
ST95-04-011A	S-1-B1	TPHdiesel/motor oil/kerosene
ST95-04-012A	S-1-B1	Oil & Grease
ST95-04-013A	S-1-B2	TPHdiesel/motor oil/kerosene
ST95-04-014A	S-1-B2	Oil & Grease
ST95-04-015A	S-1-B3	TPHdiesel/motor oil/kerosene
ST95-04-016A	S-1-B3	Oil & Grease
ST95-04-017A	S-1-B4	TPHdiesel/motor oil/kerosene
ST95-04-018A	S-1-B4	Oil & Grease
ST95-04-019A	S-1-B5	TPHdiesel/motor oil/kerosene
ST95-04-020A	S-1-B5	Oil & Grease
ST95-04-021A	S-1-B6	TPHdiesel/motor oil/kerosene
ST95-04-022A	S-1-B6	Oil & Grease
ST95-04-023A	S-1-B7	TPHdiesel/motor oil/kerosene
ST95-04-024A	S-1-B7	Oil & Grease
ST95-04-025A	S-1-B8	TPHdiesel/motor oil/kerosene
ST95-04-026A	S-1-B8	Oil & Grease
ST95-04-027A	S-5-B1	TPHdiesel/motor oil/kerosene
ST95-04-028A	S-5-B1	Oil & Grease
ST95-04-029A	S-5-B2	TPHdiesel/motor oil/kerosene
ST95-04-030A	S-5-B2	Oil & Grease
ST95-04-031A	S-5-B3	TPHdiesel/motor oil/kerosene
ST95-04-032A	S-5-B3	Oil & Grease
ST95-04-033A	S-5-B4	TPHdiesel/motor oil/kerosene
ST95-04-034A	S-5-B4	Oil & Grease
ST95-04-035A	S-5-B5	TPHdiesel/motor oil/kerosene
ST95-04-036A	S-5-B5	Oil & Grease

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Lab ID	Your ID	Analysis Description
ST95-04-037A	S-5-B6	TPHdiesel/motor oil/kerosene
ST95-04-038A	S-5-B6	Oil & Grease
ST95-04-039A	S-5-B7	TPHdiesel/motor oil/kerosene
ST95-04-040A	S-5-B7	Oil & Grease

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III Quality Control

A. Project Specific QC. No project specific QC (i.e., spikes and/or duplicates) was requested.

B. Method Blank Results. A method blank is a laboratory-generated sample which assesses the degree to which laboratory operations and procedures cause false-positive analytical results for your sample.

No target parameters were detected in the method blank associated with your sample at the reporting limit levels noted on the data sheets in the Analytical Results section.

C. Laboratory Control Spike. A Laboratory Control Spike (LCS) is a sample which is spiked with known analyte concentrations, and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The LCS results associated with your samples are on the attached Laboratory Control Spike and Laboratory Control Spike Duplicate Analysis Report.

D. Matrix Spike Results. A Matrix Spike is a sample which is spiked with known analyte concentrations, and analyzed at approximately 10% of the sample load in order to establish method-specific control limits. The Matrix Spike results associated with your samples are on the attached Matrix Spike and Matrix Spike Duplicate Analysis Report.

Accuracy is measured by Percent Recovery as in:

$$\% \text{ recovery} = \frac{(\text{measured concentration}) \times 100}{(\text{actual concentration})}$$

IV Analysis Results

Results are on the attached data sheets.

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Analytical Laboratory Division
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8015 Modified Analysis Report
Project: Construction Services (510-001)

Attention: Mr. Andrew Lush
Lush Geosciences
3560 Business Drive, Suite 120
Sacramento, CA 95820

Date Sampled: Apr 3, 1995
Date Received : Apr 4, 1995
Date Analyzed: Apr 6, 1995
Invoice #: 4588

Matrix: Soil **Units: ug/g**

Lab ID	Client ID	TPH Diesel	Det. Limit	TPH Motor Oil	Det. Limit	TPH Kerosene	Det. Limit	Dilution 1:
ST95-04-011A	S-1-B1	ND	1.0	24	1.0	ND	1.0	1
ST95-04-013A	S-1-B2	ND	1.0	ND	1.0	ND	1.0	1
ST95-04-015A	S-1-B3	1.3	1.0	130	1.0	ND	1.0	1
ST95-04-017A	S-1-B4	17	1.0	880	1.0	ND	1.0	1
ST95-04-019A	S-1-B5	110	1.0	ND	1.0	ND	1.0	1
ST95-04-021A	S-1-B6	ND	1.0	15	1.0	ND	1.0	1
ST95-04-023A	S-1-B7	ND	1.0	ND	1.0	ND	1.0	1
ST95-04-025A	S-1-B8	11	1.0	ND	1.0	ND	1.0	1

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/g = micrograms per gram
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit

R. L. James, Principal Chemist

Apr 12, 1995
Date Reported

SPARGER TECHNOLOGY ANALYTICAL LABORATORY, INC. IS CERTIFIED BY THE STATE OF CALIFORNIA DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1614)

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Sparger Technology, Inc.
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Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8015 Modified Analysis Report
Project: Construction Services (510-001)

Attention: Mr. Andrew Lush
Lush Geosciences
3560 Business Drive, Suite 120
Sacramento, CA 95820

Date Sampled: Apr 3, 1995
Date Received : Apr 4, 1995
Date Analyzed: Apr 6, 1995
Invoice #: 4588

Matrix: Soil **Units: ug/g**

Lab ID	Client ID	TPH Diesel	Det. Limit	TPH Motor Oil	Det. Limit	TPH Kerosene	Det. Limit	Dilution 1:
ST95-04-027A	S-5-B1	2.7	1.0	320	1.0	ND	1.0	1
ST95-04-029A	S-5-B2	6.7	1.0	210	1.0	ND	1.0	1
ST95-04-031A	S-5-B3	ND	1.0	ND	1.0	ND	1.0	1
ST95-04-033A	S-5-B4	ND	1.0	ND	1.0	ND	1.0	1
ST95-04-035A	S-5-B5	17	1.0	ND	1.0	ND	1.0	1
ST95-04-037A	S-5-B6	12	1.0	230	1.0	ND	1.0	1
ST95-04-039A	S-5-B7	12	1.0	ND	1.0	ND	1.0	1

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/g = micrograms per gram
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

Apr 12, 1995
Date Reported

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Sparger Technology, Inc.
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Scientific Division

8015 Modified Matrix Spike (MS) & Matrix Spike Duplicate (MSD) TPHdiesel Analysis Report

Attention:	Mr. Andrew Lush Lush Geosciences 3560 Business Drive, Suite 120 Sacramento, CA 95820	Date Sampled: Date Received: Date Analyzed:	Apr 3, 1995 Apr 4, 1995 Apr 6, 1995
Project ID:	510-001	Project Name:	Construction Services
Client ID:	MS/MSD-Batch	LAB ID:	ST95-04-060A MS ST95-04-060A MSD
Matrix:	Soil	Dilution:	

Name	Conc. Spike Added	Sample Result	MS Result	MSD Result	Units	MS % Recovery	MSD % Recovery	% RPD Recovery
TPHdiesel	30 ppm	ND	23	23	ug/g	77%	77%	0%

ppb = parts per billion = ug/kg = micrograms per kilogram
ppm= parts per million = ug/g = micrograms per gram
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

Apr. 12, 1995
Date Reported

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Analytical Laboratory Division
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Scientific Division

5520 F. Modified Analysis Report
Project: Construction Services (510-001)

Attention: Mr. Andrew Lush
Lush Geosciences
3560 Business Drive, Suite 120
Sacramento, CA 95820

Date Sampled: Apr 3, 1995
Date Received: Apr 4, 1995
Date Analyzed: Apr 4, 1995
Invoice #: 4588

Matrix: Soil **Units: mg/kg**

Lab ID	Client ID	Amount	Reporting Limit	Dilution 1:
ST95-04-012A	S-1-B1	360	50	1
ST95-04-014A	S-1-B2	250	50	1
ST95-04-016A	S-1-B3	360	50	1
ST95-04-018A	S-1-B4	1200	50	1
ST95-04-020A	S-1-B5	2800	50	1
ST95-04-022A	S-1-B6	220	50	1
ST95-04-024A	S-1-B7	200	50	1
ST95-04-026A	S-1-B8	320	50	1

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/g = micrograms per gram
ppm = parts per million = mg/kg = milligrams per kilogram
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

Apr 6, 1995
Date Reported

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Analytical Laboratory Division
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Scientific Division

5520 F. Modified Analysis Report
Project: Construction Services (510-001)

Attention: Mr. Andrew Lush
Lush Geosciences
3560 Business Drive, Suite 120
Sacramento, CA 95820

Date Sampled: Apr 3, 1995
Date Received: Apr 4, 1995
Date Analyzed: Apr 4, 1995
Invoice #: 4588

Matrix: Soil **Units: mg/kg**

Lab ID	Client ID	Amount	Reporting Limit	Dilution 1:
ST95-04-028A	S-5-B1	430	50	1
ST95-04-030A	S-5-B2	3200	50	1
ST95-04-032A	S-5-B3	190	50	1
ST95-04-034A	S-5-B4	440	50	1
ST95-04-036A	S-5-B5	600	50	1
ST95-04-038A	S-5-B6	940	50	1
ST95-04-040A	S-5-B7	320	50	1

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/g = micrograms per gram
ppm = parts per million = mg/kg = milligrams per kilogram
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

Apr 6, 1995
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