STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY PETE WILSON, *Governor*

DEPARTMENT OF TRANSPORTATION
BOX 23660
OAKLAND, CA 94623-0660
(510) 286-4444
TDD (510) 286-4454

93 NOV 10 AM 10:58
ALCO HAZMAT

January 12, 1993

Mr. Frank Zichichi
548-1/2 Cleveland Avenue,
Albany, CA 94710

Dear Mr. Zichichi:

Enclosed is a copy of the Final Site Investigation Report, conducted by Nations Groundwater Associates on the Zichichi Property, 703-715 Cleveland Avenue, Albany, California.

If you have any further questions, please contact me at (510) 286-5629 or Zenaida Villamor at (510) 286-5624.

Sincerely,

PRESTON W. KELLEY
District Director

By: James W. Ross

JAMES W. ROSS
District Hazardous
Waste Coordinator

SITE INVESTIGATION REPORT
Zichichi Property
703-715 Cleveland Avenue
Albany, California

Prepared for
California Department of Transportation
Contract Number 53P614
Task Order 04-180151-01

October 30, 1992

Prepared by
Nations Groundwater Associates
3050 Fite Circle, Suite 104
Sacramento, California

APPENDIX

SITE INVESTIGATION REPORT
Zichichi Property
703-715 Cleveland Avenue
Albany, California

Caltrans Task Order No. 04-180151-01

1.0 INTRODUCTION

Nations Groundwater Associates (NGA) has been authorized by the California Department of Transportation (Caltrans) to prepare this Site Investigation Report. This report describes the results of recent subsurface environmental activities at 703-715 Cleveland Avenue, Albany, California. The work performed by NGA for this project has been completed in accordance with Caltrans Contract Number 53P614 and Caltrans District 04 Task Order No. 04-180151-01 and a *Site Investigation Work Plan* previously submitted by NGA.

1.1 Purpose

The purpose of this investigation is to evaluate whether soil and/or ground water contamination has occurred on a portion of the site.

1.2 Scope of Work

Activities that have been completed to achieve the purpose of this investigation include the following:

- preparing a site investigation work plan describing procedures and methods;
- preparing a site specific Health and Safety Plan discussing the precautions and protective equipment required for work at the site;
- contacting Underground Services Alert (USA) at least 48 hours prior to drilling to identify public utility lines at the site;
- drilling seven 8-inch-diameter borings to depths ranging from about nine to 15 feet below ground surface;
- collecting relatively undisturbed soil samples from each boring at depths ranging from 3.5 to 14 feet below ground surface;
- evaluating drill cuttings and soil samples for evidence of hydrocarbons using a photoionization detector (PID);
- submitting selected soil and sludge samples to a California-certified laboratory for analysis of total petroleum hydrocarbons as gasoline (TPHg) and diesel (TPHd), aromatic volatile organics, 17 metals listed in

the California Assessment Manual (CAM), total recoverable petroleum hydrocarbons, and organochlorine pesticides by EPA methods 8015 (modified), 8020, 6010, 418.1, and 8080 respectively;

- collecting water samples from the sump within the Metric Motion building and from the sump behind Expert Auto Repair;
- submitting water samples to a California-certified laboratory for analysis of TPHg, TPHd, purgeable aromatic organics, halogenated volatile organics, 17 CAM metals, and organochlorine pesticides by EPA methods 8015 (modified), 602, 601, 6010, and 8080 respectively;
- interpreting field and laboratory data of soil and water analyses to evaluate the site for the presence of subsurface contamination;
- preparing this site investigation report.

2.0 BACKGROUND

2.1 Site Description

The site is located between the east- and west-bound lanes of Interstate Highway 80 in Albany, California (Figure 1). The City of Albany is located in the East Bay area of the San Francisco Bay Region. The site is at an approximate elevation of 20 feet above mean sea level (U.S. Geological Survey 7.5 Minute Richmond Quadrangle) and is located about 400 feet east of the San Francisco Bay.

The site is owned by Messrs. Robert Zichichi, Frank Zichichi, and Andrew Zichichi. Businesses at the site include Cabello Brothers Automotive, Expert Auto Repair, D & M Body Shop, and Metric Motion automobile repair. The general configuration of on-site structures is shown on Figure 1. We understand that an initial Site Assessment (ISA) performed by Caltrans personnel revealed the presence of an abandoned underground storage tank, probably gasoline, at the Metric Motion site. Information provided by Caltrans indicates that, in addition, an underground diesel storage tank may have been removed from beneath the building occupied by Metric Motion. No details concerning the removal are available.

Gasoline pumps remain at the Metric Motion site. A concrete-lined sump is present inside the Metric Motion building; the sump receives waste water from washing of the concrete slab floor. Waste water drains from the sump into a sanitary sewer. An Additional sump is present at the rear of Expert Auto Repair,

outside the building. This sump is used to collect runoff from the fill slope of adjacent eastbound lanes of Interstate Highway 80. Runoff is collected in the sump, then pumped into a sanitary sewer for disposal. Information provided by Caltrans indicates that the previous ISA did not identify possible hazardous waste concerns at the three other on-site businesses.

3.0 FIELD INVESTIGATION RESULTS

3.1 Drilling and Soil Sampling

On July 6, 1992, a geologist from NGA supervised the drilling of seven soil borings (B-1 through B-7) at the site. Soil borings were advanced to depths ranging from 8.5 (B-4 and B-7) to 15.0 (B-2) feet using hollow-stem auger drilling equipment.

Soil samples were obtained using a California-modified, split-spoon sampler equipped with clean brass sleeves. During drilling, samples were collected by advancing the drill bit to a point immediately above the sampling depth and driving the sampler 18 inches into the underlying soils. A total of 19 soil samples were collected from the soil borings.

A sludge sample (S-MM-1) was collected in a clean brass sleeve from the sump inside the Metric Motion Building. Water samples were collected by use of a clean, disposable bailer from the Metric Motion sump and the sump at the rear of the Expert Auto Repair building.

All soil samples were examined in the field and described for color, grain size, moisture content, mineral content, and odor. Soil samples were screened in the field for total organic vapors with a PID. Soil samples have been classified in accordance with the Unified Soil Classification System. Ground-water was not encountered in any of the soil borings. Soil samples were stored in an iced cooler and transported under chain-of-custody to a California-certified laboratory for chemical analysis. Soil boring logs are presented in Appendix A. Soil boring locations are shown on Figure 2.

All drilling and sampling equipment was cleaned prior to drilling using a high-pressure, steam-cleaner apparatus. All down-hole sampling equipment was cleaned with phosphate-free soap and rinsed with water following each sample collection. Drill cuttings and rinsate water were stored in 55-gallon drums on-site. Drums were dated and labeled with the task order number and drum content. Recommendations for disposal of soil cuttings and rinsate water and

an estimate of disposal costs will be transmitted under separate cover.

3.2 Site Soils

Subsurface geology at the site has been inferred from the examination of soil samples and drill cuttings from the soil borings. The shallow soils underlying the property which were examined as part of this investigation consist primarily of silt, sandy silt, silty sand and clay. In four of the seven borings auger refusal occurred at depths ranging from 8.5 feet to 15 feet below ground surface. Either indurated sandstone or gravel composed of sandstone was encountered at the base of each soil boring. Ground water was not encountered in any of the soil borings. Soil boring logs are presented in Appendix A.

3.3 Soil Sample Analytical Results

3.3.1 Hydrocarbons

Laboratory analytical results of hydrocarbon analyses indicate that hydrocarbons were detected in four of 19 soil and sludge samples submitted for laboratory analysis. Hydrocarbon analytical results are shown in Table 1. Laboratory analytical reports for hydrocarbon analyses are presented in Appendix B.

3.3.2 Nonhalogenated Volatile Organics

Soil samples S-3-B1, S-5-B2, and S-3-B7 were analyzed for nonhalogenated volatile organics. Nonhalogenated volatile organics were not detected in these soil samples.

3.3.3 Metals

Soil or sludge samples collected from borings B-1, B-2, B-7, and the Metric Motion sump were submitted to a California-certified laboratory for analysis of the seventeen separate metals identified in the California Assessment Manual (CAM). Mercury, selenium, and silver were not detected in any of the soil samples. Laboratory analytical for metals are shown in Table 2. Laboratory analytical reports for metal analyses are presented in Appendix B.

TABLE 1

Soil Sample Analytical Results
(Hydrocarbons)

Sample Id	Benzene	Toluene	Ethyl-benzene	Xylenes	Chloro-benzene	1,3-Dichloro-benzene	1,4-Dichloro-benzene	1,2-Dichloro-benzene	TPHg	TPHd	TRPH
S-3-B1	0.52	ND	ND	2.1	0.86	4.0	4.0	0.78	68.0	180.0	9500.0
S-8-B1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-3-B2	ND	ND	ND	0.013	ND	ND	ND	ND	ND	ND	ND
S-5-B2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
S-9-B2	ND	ND	ND	ND	0.011	0.017	0.014	0.016	ND	22.0	NA
S-3-B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-5-B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-10-B3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-3-B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-5-B4	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-3-B5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-5-B5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-10-B5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-3-B6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-5-B6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-10-B6	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-3-B7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	4100.0
S-5-B7	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	NA
S-MM-1	34.0	80.0	29.0	76.0	56.0	15.0	95.0	130.0	1200.0	240.0	89000.0

Notes: NA = Not Analyzed, ND = Not Detected, TPHg = Total Petroleum Hydrocarbons as gasoline, TPHd = Total Petroleum Hydrocarbons as diesel
TRPH = Total Recoverable Petroleum Hydrocarbons
All concentrations reported as parts per million (ppm)

TABLE 2

Soil Sample Analytical Results
(Metals)

	S-3-B1	S-5-B2	S-3-B7	S-MM-1	STLC	TTLC
Antimony	ND	ND	ND	11.0	15.0	50.0
Arsenic	94.0	86.0	100.0	76.0	5.0	500.0
Barium	57.0	100.0	58.0	350.0	100.0	10000.0
Beryllium	0.25	0.65	0.50	ND	0.75	75.0
Cadmium	ND	ND	ND	9.0	1.0	100.0
Chromium	20.0	34.0	25.0	92.0	5.0	500.0
Cobalt	ND	ND	ND	6.0	80.0	8000.0
Copper	33.0	14.0	13.0	800.0	25.0	2500.0
Lead	ND	7.2	ND	3000.0	5.0	1000.0
Mercury	ND	ND	ND	ND	0.2	20.0
Molybdenum	ND	ND	ND	210.0	350.0	3500.0
Nickel	15.0	25.0	22.0	170.0	20.0	2000.0
Selenium	ND	ND	ND	ND	1.0	100.0
Silver	ND	ND	ND	ND	5.0	500.0
Thallium	10.0	6.5	7.0	13.0	7.0	700.0
Vanadium	29.0	36.0	32.0	6.0	24.0	2400.0
Zinc	28.0	25.0	24.0	860.0	250.0	5000.0

Notes: ND = Not Detected
All concentrations reported as parts per million (ppm).

3.3.4 Orgnochlorine Pesticides

Soil and sludge samples collected from borings B-1, B-2, B-7 and the Metric Motion sump were submitted to a California-certified laboratory for analysis of organochlorine pesticides. Pesticide results are shown in Table 3. Laboratory analytical reports for pesticides are presented in Appendix B.

TABLE 3

Soil Sample Analytical Results
(Organochlorine Pesticides)

	S-3-B1	S-5-B2	S-MM-1	S-3-B7	STLC	TTLC
Aldrin	6.0	ND	ND	ND	140.0	1400.0
BHC-alpha	680.0	ND	ND	ND	----	----
BHC-beta	ND	ND	66000.0	ND	----	----
BHC-delta	ND	ND	15000.0	ND	----	----
BHC-gamma	ND	ND	26000.0	ND	----	----
Chlordane	ND	ND	ND	ND	250.0	2500.0
4,4'-DDD	710.0	ND	ND	ND	[1]100.0	[1]1000.0
4,4'-DDE	170.0	ND	ND	ND	100.0	1000.0
4,4'-DDT	ND	ND	ND	ND	100.0	1000.0
Dieldrin	ND	ND	ND	ND	800.0	8000.0
Endosulfan I	620.0	ND	ND	ND	----	----
Endosulfan II	ND	ND	3100.0	ND	----	----
Endosulfan sulfate	3700.0	ND	ND	ND	----	----
Endrin	650.0	ND	11000.0	ND	20.0	200.0
Endrin Aldehyde	ND	ND	ND	ND	----	----
Heptachlor	ND	ND	24000.0	ND	470.0	4700.0
Heptachlor epoxide	ND	ND	38000.0	ND	----	----
Methoxychlor	ND	ND	ND	ND	10000.0	100000.0
Toxaphene	ND	ND	ND	ND	50.0	500.0

Notes: [1]STLC and TTLC equal to the sum of the concentrations of DDD, DDE and DDT.
Leaders (----) indicate STLC and TTLC not established.
ND = Not Detected
All concentrations reported as parts per billion (ppb).

3.4 Water Sample Analytical Results

3.4.1 Hydrocarbons

Water samples collected from the Metric Motion sump and the sump at the rear of Expert Auto Repair were submitted to a California-certified laboratory and analyzed for TPHg, TPHd, BTEX, and aromatic volatile organics. The results of these analyses are shown in Table 4. Laboratory analytical reports for hydrocarbons are presented in Appendix B.

TABLE 4

Water Sample Analytical Results
(Hydrocarbons)

	W-MM-1	W-EAR-1
Benzene	8.7	ND
Toluene	370.0	ND
Ethylbenzene	74.0	ND
Xylenes	190.0	ND
Chlorobenzene	100.0	ND
1,3-Dichlorobenzene	15.0	ND
1,4-Dichlorobenzene	110.0	ND
1,2-Dichlorobenzene	160.0	ND
TPHg	1100.0	ND
TPHd	ND	ND

Notes: ND = Not Detected
All concentrations reported as parts per billion (ppb).

3.4.2 Halogenated Volatile Organics

The water sample collected from the Metric Motion Sump was submitted to a California-certified laboratory and analyzed for halogenated volatile organics. Those compounds found at concentrations above the detection limit are shown in Table 5. Laboratory analytical reports are presented in Appendix B.

TABLE 5

Water Sample Analytical Results
(Halogenated Volatile Organics)

	W-MM-1
Chloroethane	29.0
1,1-Dichloroethane	532.0
Tetrachloroethene	48.0
1,1,1-Trichloroethane	86.0
Trichloroethene	1.3

Notes: All concentrations reported as micrograms per liter (ppb).

3.4.3 Metals

The water sample collected from the Metric Motion Sump was submitted to a California-certified laboratory and analyzed for the 17 CAM metals. Results of that analysis are shown in Table 6. Laboratory analytical reports are presented in Appendix B.

3.4.4 Organochlorine Pesticides

The water sample collected from the Metric Motion Sump was submitted to a California-certified laboratory and analyzed for organochlorine pesticides. Results of that analysis are shown in Table 7. Laboratory analytical reports are presented in Appendix B.

TABLE 6

Water Sample Analytical Results
(Metals)

	W-MM-1
Antimony	ND
Arsenic	120.0
Barium	1900.0
Beryllium	0.6
Cadmium	ND
Chromium	130.0
Cobalt	8.0
Copper	1900.0
Lead	14.0
Mercury	ND
Molybdenum	ND
Nickel	45.0
Selenium	ND
Silver	ND
Thallium	12.0
Vanadium	10.0
Zinc	3800.0

Notes: ND = Not Detected
All concentrations reported as micrograms per liter (ppb).

TABLE 7

Water Sample Analytical Results
(Organochlorine Pesticides)

	W-MM-1
Aldrin	ND
BHC-alpha	120.0
BHC-beta	ND
BHC-delta	ND
BHC-gamma	84.0
Chlordane	ND
4,4'-DDD	ND
4,4'-DDE	ND
4,4'-DDT	ND
Dieldrin	ND
Endosulfan I	ND
Endosulfan II	ND
Endosulan sulfate	ND
Endrin	ND
Endrin aldehyde	ND
Heptachlor	150.0
Heptachlor epoxide	ND
Methoxychlor	ND
Toxaphene	ND

Notes: ND = Not Detected
All concentrations reported as micrograms per liter (ppb).

4.0 DISCUSSION OF RESULTS

4.1 Soils

4.1.1 Hydrocarbons

Hydrocarbons were only detected in soil and sludge samples collected from borings B-1, B-2, B-7 and the Metric Motion sump. TPHg, TPHd, and TRPH were detected in the sample collected from a depth of three feet in boring B-1 at concentrations of 68, 180, and 9500 parts per million (ppm) respectively. Hydrocarbons were not detected in the sample collected from eight feet in this boring.

In boring B-2 individual hydrocarbon constituents were detected at concentrations less than 0.017 ppm in soil samples collected from three and nine feet. Petroleum constituents were not detected in the sample collected from five feet in this boring. TPHd was detected at a concentration of 22 ppm in the soil sample collected from nine feet in this boring. TPHg and TRPH was not detected in soil samples collected from B-2.

TRPH was detected in the sample collected from three feet in boring B-7 at a concentration of 4100 ppm. Individual petroleum constituents, TPHg, and TPHd were not detected in B-7.

The method by which TRPH is determined (418.1) uses freon as the extraction solvent. Following extraction, TRPH is determined by an infrared technique in which any substance that absorbs light within the prescribed wavelength is identified as Total Recoverable Petroleum Hydrocarbons. Any molecules having the hydrocarbon backbone (CH_2-CH_3) will be extracted by freon. This includes lipids, polymers, copolymers, proteins, natural resins, cellular components, viruses, steroids, and dispersed high molecular weight compounds. All of these substances can contribute to a TRPH concentration.

TPHg, TPHd, and TRPH were detected at concentrations of 1200, 240, and 89,000 ppm respectively in the sludge sample from the Metric Motion sump. Individual petroleum constituents were detected in this sample at concentrations ranging from 15 (1,3-Dichlorobenzene) to 130 (1,2-Dichlorobenzene) ppm.

Soil sample analytical results for hydrocarbons are presented in Table 1. The interpreted areal extent of hydrocarbons in site soils is shown in Figure 2. In delineating the extent of hydrocarbons in soils shown in Figure 2 we have assumed that the high concentration of TRPH detected in boring B-7 indicates that high molecular weight hydrocarbons are present in soils at this

location. An analytical technique more discriminating that EPA method 418.1 could be used to confirm this assumption.

4.1.2 Metals

Lead, detected in the sludge sample from the Metric Motion sump, was the only metal detected during this investigation at a concentration above the Total Threshold Limiting Concentration (TTLC). If a metal exceeds its TTLC concentration, the state of California (Title 22 of the California Code of Regulations, Division 4, Chapter 30, S 66700) establishes that a waste or other substance containing the metal is "hazardous". If a metal is found at concentrations below the TTLC but ten times the Soluble Threshold Limiting Concentration (STLC), the material containing the metal can potentially be determined by the state of California to be "hazardous".

For materials with concentrations below the TTLC but ten times greater than the STLC, the determination of whether a material is classified as hazardous is made following the Waste Extraction Test (WET). If following the WET procedure, the extract of a sample contains metals at concentrations above the STLC, the material is classified as hazardous.

Arsenic (all soil and sludge samples analyzed for metals), and copper (sample S-MM-1) were detected at concentrations greater than ten times the STLC. Total chromium was detected in samples (samples S-5-B2, S-3-B7, and S-MM-1), at concentrations exceeding the STLC for chromium VI. In order to determine if the chromium VI portions of the total chromium concentrations exceed the STLC for chromium VI soil samples S-5-B2 and S-3-B7 were analyzed specifically for chromium VI. Results of these analyses indicate that chromium VI was not detected in either soil sample. Based on these results site soils would not be classified as hazardous based on chromium concentrations.

In order to determine if site soils in which arsenic was detected at ten times the STLC would be classified as hazardous soil samples S-3-B1, S-5-B2, and S-3-B7 were processed using the WET procedure and the extract analyzed for arsenic. Results of these analyses indicate that arsenic was not detected in the extract from samples S-3-B1 and S-3-B7 and was detected at a concentration of 1.4 ppm in sample S-5-B2. These results indicate that site soils would not be classified as hazardous based on arsenic concentrations.

4.1.4 Orgnochlorine Pesticides

Pesticides were detected in samples S-3-B1 and S-MM-1 (Metric Motion sump sample) at concentrations ranging from 6.0 (Aldrin in S-3-B1) to 66,000 (BHC-beta in S-MM-1) parts per billion (ppb). Pesticides were not detected in samples S-5-B2 and S-3-B7.

The pesticides endrin and heptachlor were detected in sample S-MM-1 at concentrations exceeding the TTLC (Table 3). Endrin was also detected in sample S-3-B1 at a concentration exceeding the TTLC. Based on the concentrations of pesticides detected in sample S-MM-1 it is likely that sludge from the Metric Motion sump would be classified as hazardous by the state of California.

Pesticides were found in boring B-1 at concentrations much lower than detected in the Metric Motion sump sample. Soils excavated from the vicinity of B-1 could contain pesticides at concentrations requiring soil disposal as a hazardous waste.

4.2 Water

4.2.1 Hydrocarbons, Halogenated Volatile Organics, Metals and Organochlorine Pesticides

Hydrocarbons, halogenated volatile organics, various metals and organochlorine pesticides were all detected at elevated concentrations in the water sample collected from the Metric Motion sump. These constituents were also detected in the sludge sample collected from this sump.

Results of the sludge and water samples collected from this sump indicates that washing of the concrete slab floor within the Metric Motion building results in the collection of water and sludge containing elevated concentrations of the above named constituents in the concrete lined sump. The scope of this investigation has not included an examination of the integrity of this sump.

Hydrocarbons and halogenated volatile organics were not detected in the water sample collected from the sump at the rear of the Expert Auto Repair building.

5.0 CONCLUSIONS/RECOMMENDATIONS

Based upon the results of this investigation we conclude the following:

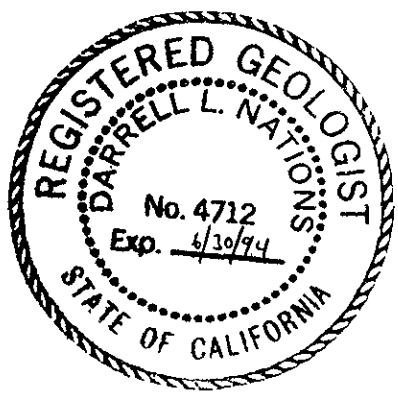
- soils at the site are unsaturated to a depth of 15 feet at the time of this investigation;
- soils beneath the site consist predominantly of silt, sandy silt, silty sand, and clay;
- sandstone, either indurated or weathered, is found at depths ranging from about eight to 15 feet below ground surface at the site;
- site soils in the vicinity of the 2000-gallon UST contain hydrocarbons at concentrations that will require remediation;
- soils in the vicinity of boring B-1 may contain pesticides at concentrations that would cause the soils to be classified as hazardous by the state of California;
- site soils would not be classified by the state of California as hazardous based upon arsenic and chromium concentrations detected in soil samples collected from soil borings during this investigation;
- hydrocarbons, halogenated volatile organics, various metals and organochlorine pesticides were detected in sludge and water samples collected from the Metric Motion sump at elevated concentrations;
- sludge removed from the Metric Motion sump will require disposal as a hazardous waste.

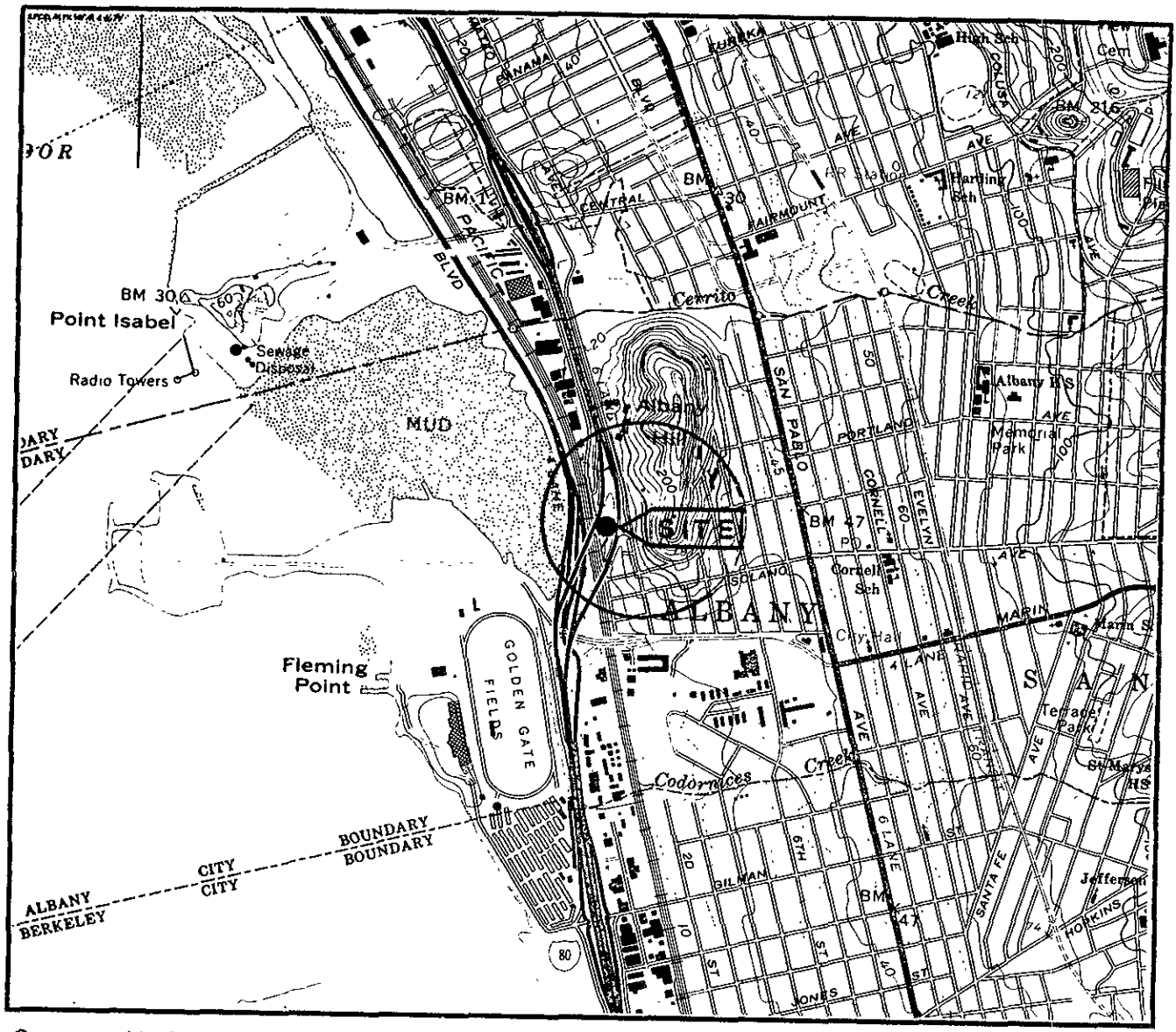
6.0 REMARKS/SIGNATURES

The conclusions/recommendations contained in this report represent our professional opinions. These opinions are based on currently available information and are developed in accordance with currently accepted geologic and hydrogeologic practices at this time and location. Other than this, no warranty is implied or intended.

This report was prepared by: Darrell Nations Date: 10/30/92

Darrell Nations, R.G.
California Registered
Geologist #4712





Source: Modified U.S.G.S. 7.5-Minute Quadrangle
Richmond, California (1980)

QUADRANGLE LOCATION

0 2000 4000

Approximate Scale (feet)

FIGURE 1
SITE LOCATION MAP
ZICHICHI PROPERTY
703-715 CLEVELAND AVENUE
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO.
04-180151-01

Nations Groundwater Associates

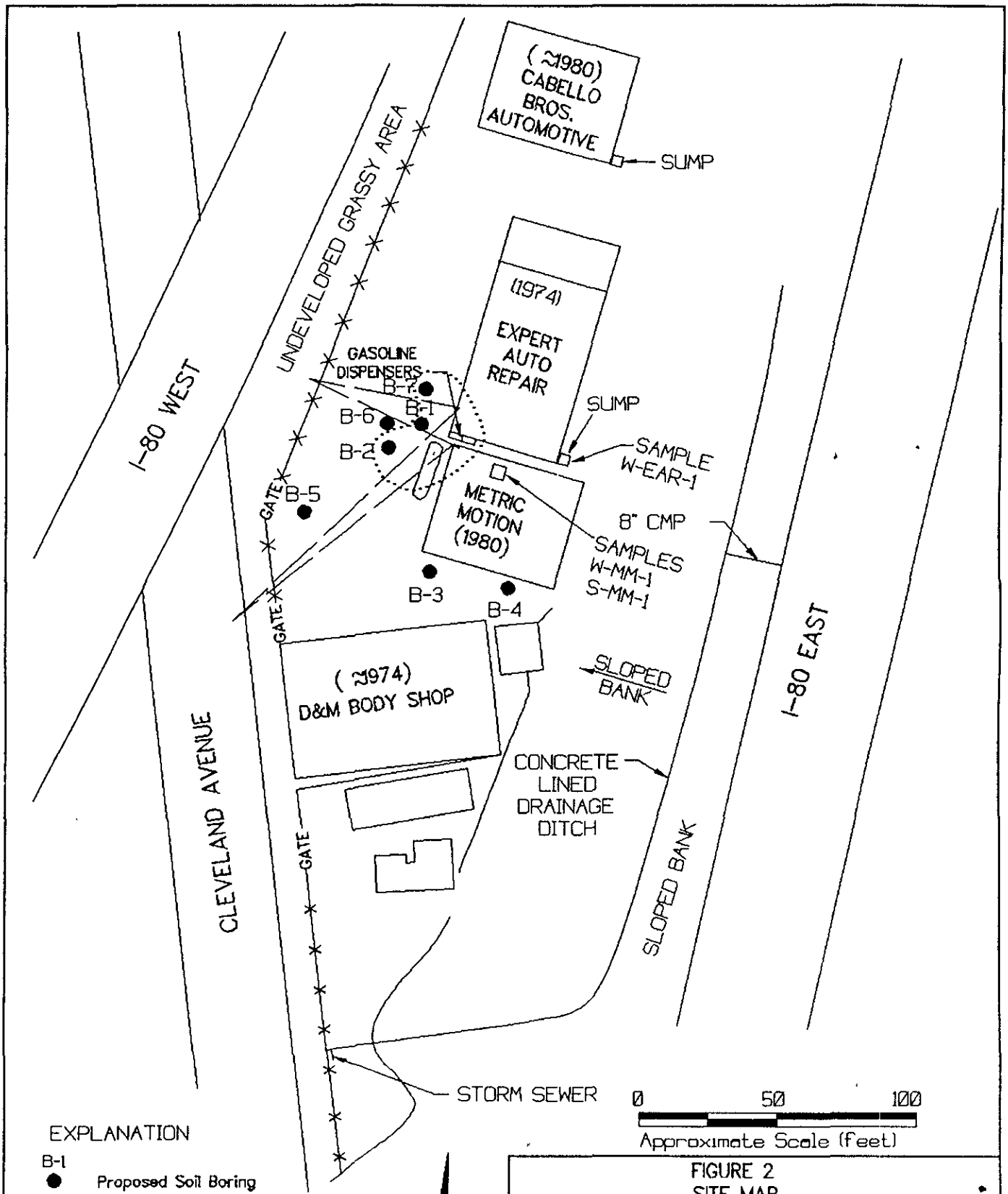


FIGURE 2
SITE MAP
ZICHCHI PROPERTY
703-715 CLEVELAND AVENUE
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO.
04-180151-01

Nations Groundwater Associates

APPENDIX A

Soil Boring Logs

Total depth of boring: 12 FT. Diameter of boring: 8 IN. Date drilled: 07/06/92

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Clearheart Driller: Tim Teller, Bill Blake

Method Used: Hollow Stem Auger Field Geologist: B. Marcus

SAMPLE TYPE S/W	BLOWS	P.I.D.	SAMPLE DEPTH	SAMPLE NO.	USCS CODE	DESCRIPTION	WELL CONST.
			0			6" Concrete. Surface soil produces noticable hydrocarbon odor; appears discolored dark green to black.	
	4/5/4	0			MH	Sandy silt, dark olive-green, moist, high plasticity, stiff.	
	2/2/4		5			Missed sample (slough in tube = 20 ppm PID).	
	7/35/20	0			MH	Silt, trace sand, mottled light olive-green and light brown, damp, high plasticity. Drill cuttings appear to be wet.	
			10		SM	Silty sand, some gravel, fine to medium-grained, light yellow-brown, damp, hard. Gravel is sandstone fragments.	
						Sampler refusal - cuttings are sandstone fragments.	
						Total depth = 12 feet. Ground water not encountered in boring.	
			15				
			20				

LOG OF BORING B-1
ZICHICHI PROPERTY
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO. 04-180151-01

Nations Groundwater Associates

Total depth of boring: 15 FT. Diameter of boring: 8 IN. Date drilled: 07/06/92

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Clearheart Driller: Tim Teller, Bill Blake

Method Used: Hollow Stem Auger Field Geologist: B. Marcus

SAMPLE TYPE S/W	BLOWS	P.I.D.	SAMPLE DEPTH	SAMPLE NO.	USCS CODE	DESCRIPTION	WELL CONST.
			0			6" Concrete. 6" – 24" Clay, olive–green, damp, high plasticity (drill cuttings).	
	4 5 4	0			ML	Silt, light yellow–brown, slightly damp, no plasticity, hard.	
	2 2 4		5		MH	Silt, olive–green, moist, high plasticity, stiff.	
	7 35 20	0			ML	Silt, light yellow–brown with light green mottling, damp, no plasticity, hard.	
			10			11–1/2' Hard drilling – sandstone fragments in drill cuttings.	
						Sampler refusal – bouncing on rock. Drilling rate reduces to about 3' per hour at 3,000 psi. down pressure, 10,000 psi torque. Abandon hole at 15'.	
			15			Total depth = 15 feet. Ground water not encountered in boring.	
			20				

LOG OF BORING B–2
ZICHICHI PROPERTY
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO. 04–180151–01

Nations Groundwater Associates

Total depth of boring: 10.5 FT. Diameter of boring: 8 IN. Date drilled: 07/06/92

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Clearheart Driller: Tim Teller, Bill Blake

Method Used: Hollow Stem Auger Field Geologist: B. Marcus

SAMPLE TYPE S/W	BLOWS	P.I.D.	SAMPLE DEPTH	SAMPLE NO.	USCS CODE	DESCRIPTION	WELL CONST.
			0			6" Concrete. 6" – 2' Clay, olive-green, damp, high plasticity, (drill cuttings).	
	4 5 4	0			ML	Silt, trace sand, light yellow-brown, slightly damp, slight plasticity, hard.	
	2 2 4		5		ML	As above; iron-staining; light yellow-brown and light green.	
	7 35 20	0					
			10		CH	Clay, trace sand, silt, gravel (weathered-in-place bedrock), light green to white, damp, high plasticity; sandstone rock fragments.	
						Total depth = 10-1/2 feet. Ground water not encountered in boring.	
			15				
			20				

LOG OF BORING B-3
ZICHICHI PROPERTY
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO. 04-180151-01

Nations Groundwater Associates

Total depth of boring: 8.5 FT. Diameter of boring: 8 IN. Date drilled: 07/06/92

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Clearheart Driller: Tim Teller, Bill Blake

Method Used: Hollow Stem Auger Field Geologist: B. Marcus

SAMPLE TYPE S/W	BLOWS	P.I.D.	SAMPLE DEPTH	SAMPLE NO.	USCS CODE	DESCRIPTION	WELL CONST.
						Surface 6" concrete.	
	16 19 17	0			ML	Clayey silt, trace sand, light yellow-brown, slightly damp, hard, no plasticity.	
	27 50 (6")	0	5		SP/ML	Silty sand to sandy silt, fine-grained, light yellow-brown, slightly damp, hard (appears to be weathered-in-place bedrock). 6' Drilling becomes harder; cuttings include angular pieces of sandstone. 8-1/2' Auger grinding on indurated sandstone. Do not attempt to sample.	
			10			Total depth = 8-1/2 feet. Ground water not encountered in boring.	
			15				
			20				

LOG OF BORING B-4
ZICHICHI PROPERTY
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO. 04-180151-01

Nations Groundwater Associates

Total depth of boring: 10.5 FT. Diameter of boring: 8 IN. Date drilled: 07/06/92

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Clearheart Driller: Tim Teller, Bill Blake

Method Used: Hollow Stem Auger Field Geologist: B. Marcus

SAMPLE TYPE S/W	BLOWS	P.I.D.	SAMPLE DEPTH	SAMPLE NO.	USCS CODE	DESCRIPTION	WELL CONST.
			0			6" Concrete. 6" – 24" Silty clay, olive-green, damp, high plasticity (drill cuttings).	
	3 7 10	0			CH	Clay, light brown with green mottling, damp, high plasticity; trace charcoal.	
	8 16 18	0	5		ML	Silt, trace gravel, light yellow-brown, damp, slight plasticity, hard; charcoal.	
	29 30 27 (2")		10		SM/SC	Silty to clayey sand, fine to medium-grained, damp, very dense; charcoal.	
						Total depth = 10-1/2 feet. Ground water not encountered in boring.	
			15				
			20				

LOG OF BORING B-5
ZICHICHI PROPERTY
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO. 04-180151-01

Nations Groundwater Associates

Total depth of boring: 10 FT. Diameter of boring: 8 IN. Date drilled: 07/06/92

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Clearheart Driller: Tim Teller, Bill Blake

Method Used: Hollow Stem Auger Field Geologist: B. Marcus

SAMPLE TYPE S/W	BLOWS	P.I.D.	SAMPLE DEPTH	SAMPLE NO.	USCS CODE	DESCRIPTION	WELL CONST.
			0			6" Concrete.	
						18" Silt, light brown, damp, slight plasticity.	
	6 6 12	0			MH	Silt, light brown, damp, high plasticity, very stiff.	
	3 5 7	0	5			As above; iron-staining; charcoal-bearing.	
					SM	Silty sand, fine to medium-grained (weathered sandstone), light brown to tan, damp, very dense; iron-staining.	
	19 50 (5")		10			Total depth = 10 feet. Ground water not encountered in boring.	
			15				
			20				

LOG OF BORING B-6
ZICHICHI PROPERTY
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO. 04-180151-01

Nations Groundwater Associates

Total depth of boring: 8.5 FT. Diameter of boring: 8 IN. Date drilled: 07/06/92

Casing diameter: N/A Length: N/A Slot size: N/A

Screen diameter: N/A Length: N/A Material type: N/A

Drilling Company: Clearheart Driller: Tim Teller, Bill Blake

Method Used: Hollow Stem Auger Field Geologist: B. Marcus

SAMPLE TYPE S/W	BLOWS	P.I.D.	SAMPLE DEPTH	SAMPLE NO.	USCS CODE	DESCRIPTION	WELL CONST.
		0	0			6" Concrete. 6" – 22" Silty clay, trace sand, dark green, moist, high plasticity (drill cuttings).	
						22" Changes to light brown.	
	17 14 30	0			MH	Silt, mottled light olive-green and light brown, moist, high plasticity.	
	6 8 12	0	5			As above; charcoal bearing.	
						Hard drilling at 7 feet; sandstone fragments in drill cuttings.	
						Sampler refusal.	
						Total depth = 8-1/2 feet. Ground water not encountered in boring.	
			10				
			15				
			20				

LOG OF BORING B-7
ZICHICHI PROPERTY
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO. 04-180151-01

Nations Groundwater Associates

APPENDIX B

Laboratory Analytical Reports

Sparger Technology Analytical Laboratory

3100 FITE CIRCLE, SUITE 108
SACRAMENTO, CA 95827

SAMPLE # 1365

CHAIN OF CUSTODY RECORD

FIELD SECTION Nº 1564

CLIENT NAME NATIONS GROUNDWATER ASSOC. PROJECT ADDRESS CALTRANS ALBANY
(Number Street City Zip)

SAMPLED BY BARRY MARCUS (Name (PRINT) Organization) CONTAINERS OBTAINED FROM _____

PRESERVATIVE USED _____ STORAGE TEMPERATURE ☐ Ambient ☒ 4° C ☐ -10° C Other _____

☐ HAZARDOUS ☒ NON-HAZARDOUS SPECIAL HANDLING INSTRUCTIONS _____

FIELD REMARKS TASK ORDER 04-180151-01

COLLECTOR SAMPLE NO.	DATE	COMP	GRAB	TYPE (Soil/ H_2O)	FIELD DATA			STATION LOCATION (grid, depth, etc.)	# OF CONTAINERS	ANALYSES REQUIRED: TPHg	TPHd	FULL BOLD	The 17 CAM Metals by 1640	EPA 418.1	EPA 8080	EPA 8015	REMARKS
S-3-B1	7-6-92			SOIL					1	✓	✓	✓	✓	✓	✓	✓	NORMAL TURNAROUND TIME
S-8-B1									1	✓	✓	✓					
S-3-B2									1	✓	✓	✓					
S-5-B2									1	✓	✓	✓	✓	✓	✓	✓	
S-9-B2									1	✓	✓	✓					
S-3-B3									1	✓	✓	✓					
S-5-B3									1	✓	✓	✓					
S-10-B3									1	✓	✓	✓					
S-3-B4									1	✓	✓	✓					
S-5-B4									1	✓	✓	✓					

Released by	Organization	Date/Time	Received by	Organization	Date/Time
[signature]		7/7/92	[signature]	STAL	7-7-92 10:15 AM.

LABORATORY SECTION

TEMPERATURE RECEIVED _____ FEDX AIRBILL# _____ HAND DELIVERED _____

ANALYSIS RECORD

TYPE OF ANALYSIS	PERFORMED BY (Signed)	DATE OF ANALYSIS	RECORDED (Lab Book No.)	COMMENTS

White - Original Yellow - Laboratory Supervisors Copy Pink - Originators Copy

Sparger Technology Analytical Laboratory

3100 FITE CIRCLE, SUITE 108
SACRAMENTO, CA 95827

SAMPLE # _____

CHAIN OF CUSTODY RECORD

FIELD SECTION Nº 1565

CLIENT NAME NATIONS GROUNDWATER ASSOCIATES PROJECT ADDRESS CALTRANS ALBANY
(Number / Street / City / Zip)

SAMPLED BY BARRY MARCUS (Name (PRINT) / Organization) CONTAINERS OBTAINED FROM _____

PRESERVATIVE USED N/A for Soil HCL for H_2O STORAGE TEMPERATURE ☐ Ambient ☒ 4° C ☐ -10° C Other _____

☐ HAZARDOUS ☒ NON-HAZARDOUS SPECIAL HANDLING INSTRUCTIONS _____

FIELD REMARKS TASK ORDER 04-180151-01

COLLECTOR SAMPLE NO.	DATE	COMP	GRAB	TYPE (Soil / H_2O)	FIELD DATA	STATION LOCATION (grid, depth, etc.)	# OF CONTAINERS	ANALYSIS REQUIRED: TPHG	TPHd	Full 8010	17 CAM metals by ICAP	EPA 418.1	EPA 8080	EPA 8015	EPA 602	EPA 601	REMARKS
S-3-B5	7-6-92			Soil in brass tube			1	✓	✓	✓							NORMAL TURNAROUND TIME
S-5-B5							1	✓	✓	✓							
S-10-B5							1	✓	✓	✓							
S-3-B6							1	✓	✓	✓							
S-5-B6							1	✓	✓	✓							
S-10-B6							1	✓	✓	✓							
S-3-B7							1	✓	✓	✓	✓	✓	✓	✓	✓		
S-5-B7							1	✓	✓	✓							
W-MM-1	7-6-92			H_2O			5	✓	✓		✓	✓	✓	✓			
W-EAR-1	7-6-92			H_2O			5	✓	✓						✓		

Released by	Organization	Date/Time	Received by	Organization	Date/Time
[signature]		7/7/92	[signature]	STAL	7-7-92 10:15 A.M.

LABORATORY SECTION

TEMPERATURE RECEIVED _____ FEDX AIRBILL# _____ HAND DELIVERED _____

ANALYSIS RECORD

TYPE OF ANALYSIS	PERFORMED BY (Signed)	DATE OF ANALYSIS	RECORDED (Lab Book No.)	COMMENTS

White - Original Yellow - Laboratory Supervisors Copy Pink - Originators Copy

Sparger Technology Analytical Laboratory

3100 FITE CIRCLE, SUITE 108
SACRAMENTO, CA 95827

SAMPLE #_____

CHAIN OF CUSTODY RECORD

FIELD SECTION Nº 1566

CLIENT NAME NATIONS GROUNDWATER ASSOCIATES PROJECT ADDRESS CALTRANS ALBANY
(Number Street City Zip)

SAMPLED BY BARRY MARCUS CONTAINERS OBTAINED FROM _____
(Name (PRINT) Organization)

PRESERVATIVE USED N/A STORAGE TEMPERATURE ☐ Ambient ☒ 4° C ☐ -10° C Other _____

☐ HAZARDOUS ☒ NON-HAZARDOUS SPECIAL HANDLING INSTRUCTIONS _____

FIELD REMARKS TASK ORDER 04-180151-01

COLLECTOR SAMPLE NO.	DATE	COMP	GRAB	TYPE (Soil/ H_2O)	FIELD DATA			STATION LOCATION (grid, depth, etc.)	# OF CONTAINERS	ANALYSIS REQUIRED: TPH g	TPH d	Full 8020	Title 17 Cam Metals by ICAP	EPA 418.1	EPA 8080	EPA 8015	REMARKS
S-MM-1	7-6-92		SLUDGE						1	✓	✓	✓	✓	✓	✓	✓	NORMAL T.A.T.

Released by	Organization	Date/Time	Received by	Organization	Date/Time
Barry Marcus		7/7/92		STAL	7-7-92 10:15 AM

LABORATORY SECTION

TEMPERATURE RECEIVED _____ FEDX AIRBILL# _____ HAND DELIVERED _____

ANALYSIS RECORD

TYPE OF ANALYSIS	PERFORMED BY (Signed)	DATE OF ANALYSIS	RECORDED (Lab Book No.)	COMMENTS

White - Original Yellow - Laboratory Supervisors Copy Pink - Originators Copy

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

EPA 418.1 Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B1	LAB ID:	ST92-07-185A
Matrix:	Soil	Dilution:	1:50

Name	Amount	Detection Limit	Units
Hydrocarbons	9500	50	ug/g

ppb = parts per billion = ug/kg = microgram per kilogram

ppm = parts per million = ug/g = microgram per gram

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

7-21-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B1	LAB ID:	ST92-07-182A ST92-07-183A
Matrix:	Soil	Dilution:	8020 & TPHgas 1:50

Name	Amount	Detection Limit	Units
Benzene	0.52	0.25	ug/g
Toluene	ND	0.25	ug/g
Ethylbenzene	ND	0.25	ug/g
Xylenes	2.1	0.25	ug/g
Chlorobenzene	0.86	0.25	ug/g
1,3 - Dichlorobenzene	4.0	0.25	ug/g
1,4 - Dichlorobenzene	0.78	0.25	ug/g
1,2 - Dichlorobenzene	10	0.25	ug/g
TPHgas	68	50	ug/g
TPHdiesel	180	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	113%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Method 8015 Nonhalogenated Volatile Organics

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B1	LAB ID:	ST92-07-187A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limits	Units
Acrylamide	ND	120	ug/kg
Diethyl ether	ND	60	ug/kg
Ethanol	ND	10	ug/kg
Methyl ethyl ketone (MEK)	ND	10	ug/kg
Methyl isbutyl ketone (MIBK)	ND	10	ug/kg
Paraldehyde	ND	10	ug/kg
Surrogate % Recovery of TFT =	113%		

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.
NR = Not Requested.
* = Matrix Interference.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B1	LAB ID:	ST92-07-186A
Matrix:	Soil	Dilution:	

Name	Amount	Reporting Limit	Units
Aldrin	6.0	2.7	ug/kg
BHC-alpha	680	2.0	ug/kg
BHC-beta	ND	4.0	ug/kg
BHC-delta	ND	6.0	ug/kg
BHC-gamma	ND	2.7	ug/kg
Chlordane	ND	9.4	ug/kg
4,4'-DDD	710	7.4	ug/kg
4,4'-DDE	170	2.7	ug/kg
4,4'-DDT	ND	8.0	ug/kg
Dieldrin	ND	1.3	ug/kg
Endosulfan I	620	9.4	ug/kg
Endosulfan II	ND	2.7	ug/kg
Endosulan sulfate	3700	44	ug/kg

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.

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B1	LAB ID:	ST92-07-186A
Matrix:	Soil	Dilution:	

Name	Amount	Reporting Limit	Units
Endrin	650	4.0	ug/kg
Endrin aldehyde	ND	15	ug/kg
Heptachlor	ND	2.0	ug/kg
Heptachlor epoxide	ND	56	ug/kg
Methoxychlor	ND	120	ug/kg
Toxaphene	ND	160	ug/kg

Surrogate % Recovery of Dibutylchlorendate (DBC) = 87%

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

7-21-92
Date Reported

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metals, CAM 17
EPA Method 6010

Attention: Mr. Darrell Nations
Nations Groundwater Associates
3050 Fite Circle, Sutie 104
Sacramento, CA 95827

Date Sampled: Jul. 6, 1992
Date Received: Jul. 7, 1992
Date Analyzed: Jul. 10, 1992

Project #: 04-180151-01

Project Name: Caltrans Albany

Client ID: S-3-B1

LAB ID: ST92-07-184A

Matrix: Soil

Dilution:

Name	Amount	TTLC Max. Limit	Reporting Limit	Units
Antimony (Sb)	ND	500	2.5	mg/Kg
Arsenic (As)	94	500	5.0	mg/Kg
Barium (Ba)	57	1000	1.0	mg/Kg
Beryllium (Be)	0.25	75	0.25	mg/Kg
Cadmium (Cd)	ND	100	0.5	mg/Kg
Chromium (Cr)	20	2500	1.0	mg/Kg
Cobalt (Co)	ND	8000	1.0	mg/Kg
Copper (Cu)	33	2500	1.0	mg/Kg
Lead (Pb)	ND	1000	2.5	mg/Kg
Mercury (Hg)	ND	20	1.0	mg/Kg
Molybdenum (Mo)	ND	3500	1.0	mg/Kg
Nickel (Ni)	15	2000	1.0	mg/Kg
Selenium (Se)	ND	100	5.0	mg/Kg
Silver (Ag)	ND	500	1.0	mg/Kg
Thallium (Tl)	10	700	5.0	mg/Kg
Vanadium (V)	29	2400	1.0	mg/Kg
Zinc (Zn)	28	5000	1.0	mg/Kg

ppm = parts per million = mg/Kg = milligram per Kilogram

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

7-10-92
Date

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-8-B1	LAB ID:	ST92-07-188A ST92-07-189A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	87%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B2	LAB ID:	ST92-07-190A ST92-07-191A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	0.013	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	103%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 13, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B2	LAB ID:	ST92-07-192A ST92-07-193A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	103%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-13-92
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. 1814)

3950 Fite Circle, Suite 110, Sacramento, California 95827 • (916) 362-8047 • FAX (916) 362-8047

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

EPA 418.1 Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B2	LAB ID:	ST92-07-195A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Hydrocarbons	ND	1.0	ug/g

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

R. L. James, Principal Chemist

7-21-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Method 8015 Nonhalogenated Volatile Organics

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 13, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B2	LAB ID:	ST92-07-197A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limits	Units
Acrylamide	ND	120	ug/kg
Diethyl ether	ND	60	ug/kg
Ethanol	ND	10	ug/kg
Methyl ethyl ketone (MEK)	ND	10	ug/kg
Methyl isbutyl ketone (MIBK)	ND	10	ug/kg
Paraldehyde	ND	10	ug/kg
Surrogate % Recovery of TFT =	103%		

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.
NR = Not Requested.
* = Matrix Interference.

R. L. James, Principal Chemist

7-13-92
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)

(916) 362-8047 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B2	LAB ID:	ST92-07-196A
Matrix:	Soil	Dilution:	

Name	Amount	Reporting Limit	Units
Aldrin	ND	2.7	ug/kg
BHC-alpha	ND	2.0	ug/kg
BHC-beta	ND	4.0	ug/kg
BHC-delta	ND	6.0	ug/kg
BHC-gamma	ND	2.7	ug/kg
Chlordane	ND	9.4	ug/kg
4,4'-DDD	ND	7.4	ug/kg
4,4'-DDE	ND	2.7	ug/kg
4,4'-DDT	ND	8.0	ug/kg
Dieldrin	ND	1.3	ug/kg
Endosulfan I	ND	9.4	ug/kg
Endosulfan II	ND	2.7	ug/kg
Endosulan sulfate	ND	44	ug/kg

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.

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B2	LAB ID:	ST92-07-196A
Matrix:	Soil	Dilution:	

Name	Amount	Reporting Limit	Units
Endrin	ND	4.0	ug/kg
Endrin aldehyde	ND	15	ug/kg
Heptachlor	ND	2.0	ug/kg
Heptachlor epoxide	ND	56	ug/kg
Methoxychlor	ND	120	ug/kg
Toxaphene	ND	160	ug/kg

Surrogate % Recovery of Dibutylchlorendate (DBC) = 72%

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

7-21-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metals, CAM 17
EPA Method 6010

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Sutie 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 10, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B2	LAB ID:	ST92-07-194A
Matrix:	Soil	Dilution:	

Name	Amount	TTLC Max. Limit	Reporting Limit	Units
Antimony (Sb)	ND	500	2.5	mg/Kg
Arsenic (As)	86	500	5.0	mg/Kg
Barium (Ba)	100	1000	1.0	mg/Kg
Beryllium (Be)	0.65	75	0.25	mg/Kg
Cadmium (Cd)	ND	100	0.5	mg/Kg
Chromium (Cr)	34	2500	1.0	mg/Kg
Cobalt (Co)	ND	8000	1.0	mg/Kg
Copper (Cu)	14	2500	1.0	mg/Kg
Lead (Pb)	7.2	1000	2.5	mg/Kg
Mercury (Hg)	ND	20	1.0	mg/Kg
Molybdenum (Mo)	ND	3500	1.0	mg/Kg
Nickel (Ni)	25	2000	1.0	mg/Kg
Selenium (Se)	ND	100	5.0	mg/Kg
Silver (Ag)	ND	500	1.0	mg/Kg
Thallium (Tl)	6.5	700	5.0	mg/Kg
Vanadium (V)	36	2400	1.0	mg/Kg
Zinc (Zn)	25	5000	1.0	mg/Kg

ppm = parts per million = mg/Kg = milligram per Kilogram

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

7-10-92
Date

SPARGER TECHNOLOGY ANALYTICAL LABORATORY, INC. IS CERTIFIED BY THE STATE OF CALIFORNIA
DEPARTMENT OF HEALTH SERVICES AS A HAZARDOUS WASTE TESTING LABORATORY
(Certification No. 1814)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 14, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-9-B2	LAB ID:	ST92-07-198A ST92-07-199A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	0.011	0.005	ug/g
1,3 - Dichlorobenzene	0.017	0.005	ug/g
1,4 - Dichlorobenzene	0.014	0.005	ug/g
1,2 - Dichlorobenzene	0.016	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	22	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	107%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-14-92
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)

2950 Fite Circle, Suite 110 • Sacramento, California 95827 • (916) 362-8847 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B3	LAB ID:	ST92-07-200A ST92-07-201A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	90%		

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.

NR = Analysis not requested.

R.L. James, Principal Chemist

7-19-92
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)

2950 Fite Circle, Suite 112 • Sacramento, California 95827 • (916) 362-8047 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B3	LAB ID:	ST92-07-203A ST92-07-202A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	97%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

3050 Fite Circle, Suite 113 • Sacramento, California 95827 • (916) 362-8847 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 14, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-10-B3	LAB ID:	ST92-07-204A ST92-07-205A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	107%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-14-92
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)

... (916) 362-9047 • FAX (916) 362-9047

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 14, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B4	LAB ID:	ST92-07-206A ST92-07-207A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	90%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-14-92
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)

• (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 13, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B4	LAB ID:	ST92-07-208A ST92-07-209A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	87%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-13-92
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)

... (916) 362-9047 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 14, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B5	LAB ID:	ST92-07-210A ST92-07-211A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	100%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-14-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 14, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B5	LAB ID:	ST92-07-212A ST92-07-213A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	103%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-14-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 14, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-10-B5	LAB ID:	ST92-07-214A ST92-07-215A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	93%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-14-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B6	LAB ID:	ST92-07-216A ST92-07-217A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	100%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B6	LAB ID:	ST92-07-218A ST92-07-219A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	90%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 13, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-10-B6	LAB ID:	ST92-07-220A ST92-07-221A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	90%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-13-92
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)

... (916) 362-9047 • FAX (916) 362-9047

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention: Mr. Darell Nations
Nations Groundwater Associates
3050 Fite Circle, Suite 104
Sacramento, CA 95827

Date Sampled: Jul. 6, 1992
Date Received: Jul. 7, 1992
Date Analyzed: Jul. 13, 1992

Project #: 04-180151-01

Project Name: Caltrans Albany

Client ID: S-3-B7

LAB ID: ST92-07-222A
ST92-07-223A

Matrix: Soil

Dilution:

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	77%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-13-92
Date Reported

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

EPA 418.1 Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B7	LAB ID:	ST92-07-225A
Matrix:	Soil	Dilution:	1:10

Name	Amount	Detection Limit	Units
Hydrocarbons	4100	10	ug/g

ppb = parts per billion = ug/kg = microgram per kilogram

ppm = parts per million = ug/g = microgram per gram

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

7-21-92
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)

... (916) 362-8047 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Method 8015 Nonhalogenated Volatile Organics

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 13, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B7	LAB ID:	ST92-07-227A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limits	Units
Acrylamide	ND	120	ug/kg
Diethyl ether	ND	60	ug/kg
Ethanol	ND	10	ug/kg
Methyl ethyl ketone (MEK)	ND	10	ug/kg
Methyl isbutyl ketone (MIBK)	ND	10	ug/kg
Paraldehyde	ND	10	ug/kg
Surrogate % Recovery of TFT =	77%		

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.
NR = Not Requested.
* = Matrix Interference.

R. L. James, Principal Chemist

7-15-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B7	LAB ID:	ST92-07-226A
Matrix:	Soil	Dilution:	

Name	Amount	Reporting Limit	Units
Aldrin	ND	2.7	ug/kg
BHC-alpha	ND	2.0	ug/kg
BHC-beta	ND	4.0	ug/kg
BHC-delta	ND	6.0	ug/kg
BHC-gamma	ND	2.7	ug/kg
Chlordane	ND	9.4	ug/kg
4,4'-DDD	ND	7.4	ug/kg
4,4'-DDE	ND	2.7	ug/kg
4,4'-DDT	ND	8.0	ug/kg
Dieldrin	ND	1.3	ug/kg
Endosulfan I	ND	9.4	ug/kg
Endosulfan II	ND	2.7	ug/kg
Endosulan sulfate	ND	44	ug/kg

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.

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-3-B7	LAB ID:	ST92-07-226A
Matrix:	Soil	Dilution:	

Name	Amount	Reporting Limit	Units
Endrin	ND	4.0	ug/kg
Endrin aldehyde	ND	15	ug/kg
Heptachlor	ND	2.0	ug/kg
Heptachlor epoxide	ND	56	ug/kg
Methoxychlor	ND	120	ug/kg
Toxaphene	ND	160	ug/kg

Surrogate % Recovery of Dibutylchlorendate (DBC) = 77%

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

7-21-92
Date Reported

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metals, CAM 17
EPA Method 6010

Attention: Mr. Darrell Nations
Nations Groundwater Associates
3050 Fite Circle, Sutie 104
Sacramento, CA 95827

Date Sampled: Jul. 6, 1992
Date Received: Jul. 7, 1992
Date Analyzed: Jul. 10, 1992

Project #: 04-180151-01

Project Name: Caltrans Albany

Client ID: S-3-B7

LAB ID: ST92-07-224A

Matrix: Soil

Dilution:

Name	Amount	TTLC Max. Limit	Reporting Limit	Units
Antimony (Sb)	ND	500	2.5	mg/Kg
Arsenic (As)	100	500	5.0	mg/Kg
Barium (Ba)	58	1000	1.0	mg/Kg
Beryllium (Be)	0.50	75	0.25	mg/Kg
Cadmium (Cd)	ND	100	0.5	mg/Kg
Chromium (Cr)	25	2500	1.0	mg/Kg
Cobalt (Co)	ND	8000	1.0	mg/Kg
Copper (Cu)	13	2500	1.0	mg/Kg
Lead (Pb)	ND	1000	2.5	mg/Kg
Mercury (Hg)	ND	20	1.0	mg/Kg
Molybdenum (Mo)	ND	3500	1.0	mg/Kg
Nickel (Ni)	22	2000	1.0	mg/Kg
Selenium (Se)	ND	100	5.0	mg/Kg
Silver (Ag)	ND	500	1.0	mg/Kg
Thallium (Tl)	7	700	5.0	mg/Kg
Vanadium (V)	32	2400	1.0	mg/Kg
Zinc (Zn)	24	5000	1.0	mg/Kg

ppm = parts per million = mg/Kg = *milligram per Kilogram*

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

7-10-92
Date

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-5-B7	LAB ID:	ST92-07-228A ST92-07-229A
Matrix:	Soil	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.005	ug/g
Toluene	ND	0.005	ug/g
Ethylbenzene	ND	0.005	ug/g
Xylenes	ND	0.005	ug/g
Chlorobenzene	ND	0.005	ug/g
1,3 - Dichlorobenzene	ND	0.005	ug/g
1,4 - Dichlorobenzene	ND	0.005	ug/g
1,2 - Dichlorobenzene	ND	0.005	ug/g
TPHgas	ND	1.0	ug/g
TPHdiesel	ND	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	83%		

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.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

EPA 418.1 Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-MM-1	LAB ID:	ST92-07-240A
Matrix:	Soil	Dilution:	1:100

Name	Amount	Detection Limit	Units
Hydrocarbons	89000	100	ug/g

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

R. L. James, Principal Chemist

7-21-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-MM-1	LAB ID:	ST92-07-237A ST92-07-238A
Matrix:	Sludge	Dilution:	TPHgas & 8020 1:400

Name	Amount	Detection Limit	Units
Benzene	34	2.0	ug/g
Toluene	80	2.0	ug/g
Ethylbenzene	29	2.0	ug/g
Xylenes	76	2.0	ug/g
Chlorobenzene	56	2.0	ug/g
1,3 - Dichlorobenzene	15	2.0	ug/g
1,4 - Dichlorobenzene	95	2.0	ug/g
1,2 - Dichlorobenzene	130	2.0	ug/g
TPHgas	1200	400	ug/g
TPHdiesel	240	1.0	ug/g
Surrogate % Recovery of Trifluorotoluene =	117%		

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Method 8015 Nonhalogenated Volatile Organics

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-MM-1	LAB ID:	ST92-07-242A
Matrix:	Sludge	Dilution:	

Name	Amount	Detection Limits	Units
Acrylamide	ND	120	ug/kg
Diethyl ether	ND	60	ug/kg
Ethanol	ND	10	ug/kg
Methyl ethyl ketone (MEK)	ND	10	ug/kg
Methyl isbutyl ketone (MIBK)	ND	10	ug/kg
Paraldehyde	ND	10	ug/kg
Surrogate % Recovery of TFT =	117%		

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.
NR = Not Requested.
* = Matrix Interference.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metals, CAM 17
EPA Method 6010

Attention: Mr. Darrell Nations
Nations Groundwater Associates
3050 Fite Circle, Sutie 104
Sacramento, CA 95827

Date Sampled: Jul. 6, 1992
Date Received: Jul. 7, 1992
Date Analyzed: Jul. 10, 1992

Project #: 04-180151-01

Project Name: Caltrans Albany

Client ID: S-MM-1

LAB ID: ST92-07-239A

Matrix: Soil

Dilution:

Name	Amount	TTLC Max. Limit	Reporting Limit	Units
Antimony (Sb)	11	500	2.5	mg/Kg
Arsenic (As)	76	500	5.0	mg/Kg
Barium (Ba)	350	1000	1.0	mg/Kg
Beryllium (Be)	ND	75	0.25	mg/Kg
Cadmium (Cd)	9.0	100	0.5	mg/Kg
Chromium (Cr)	92	2500	1.0	mg/Kg
Cobalt (Co)	6	8000	1.0	mg/Kg
Copper (Cu)	800	2500	1.0	mg/Kg
Lead (Pb)	3000	1000	2.5	mg/Kg
Mercury (Hg)	ND	20	1.0	mg/Kg
Molybdenum (Mo)	210	3500	1.0	mg/Kg
Nickel (Ni)	170	2000	1.0	mg/Kg
Selenium (Se)	ND	100	5.0	mg/Kg
Silver (Ag)	ND	500	1.0	mg/Kg
Thallium (Tl)	13	700	5.0	mg/Kg
Vanadium (V)	6.0	2400	1.0	mg/Kg
Zinc (Zn)	860	5000	1.0	mg/Kg

ppm = parts per million = mg/Kg = milligram per Kilogram

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

7-10-92
Date

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-MM-1	LAB ID:	ST92-07-241A
Matrix:	Sludge	Dilution:	1:10

Name	Amount	Reporting Limit	Units
Aldrin	ND	27	ug/kg
BHC-alpha	ND	20	ug/kg
BHC-beta	66000	40	ug/kg
BHC-delta	15000	60	ug/kg
BHC-gamma	26000	27	ug/kg
Chlordane	ND	94	ug/kg
4,4'-DDD	ND	74	ug/kg
4,4'-DDE	ND	27	ug/kg
4,4'-DDT	ND	80	ug/kg
Dieldrin	ND	13	ug/kg
Endosulfan I	ND	94	ug/kg
Endosulfan II	3100	27	ug/kg
Endosulan sulfate	ND	440	ug/kg

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.

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	S-MM-1	LAB ID:	ST92-07-241A
Matrix:	Sludge	Dilution:	1:10

Name	Amount	Reporting Limit	Units
Endrin	11000	40	ug/kg
Endrin aldehyde	ND	150	ug/kg
Heptachlor	24000	20	ug/kg
Heptachlor epoxide	38000	560	ug/kg
Methoxychlor	ND	1200	ug/kg
Toxaphene	ND	1600	ug/kg

Surrogate % Recovery of Dibutylchlorendate (DBC) = *

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.

* = Loss Recovery of Surrogate upon dilution.

R.L. James, Principal Chemist

7-21-92
Date Reported

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

EPA 418.1 Laboratory Control Spike (LCS) Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	LCS	LAB ID:	ST92-07-21LCS
Matrix:	Soil	Dilution:	

Name	Conc. Spike Added	Sample Result	Conc. LCS	Units	LCS % Recovery
Hydrocarbons	50	ND	49	ug/g	98%

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

7-21-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

602/8015 Modified Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-MM-1	LAB ID:	ST92-07-230A ST92-07-231A
Matrix:	Water	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	8.7	0.3	ug/L
Toluene	370	0.3	ug/L
Ethylbenzene	74	0.3	ug/L
Xylenes	190	0.3	ug/L
Chlorobenzene	100	0.3	ug/L
1,3 - Dichlorobenzene	15	0.3	ug/L
1,4 - Dichlorobenzene	110	0.3	ug/L
1,2 - Dichlorobenzene	160	0.3	ug/L
TPHgas	1100	50	ug/L
TPHdiesel	ND	50	ug/L
Surrogate % Recovery of Trifluorotoluene =	147%		

ppb = parts per billion = ug/L = micrograms per Liter

ppm = parts per million = ug/mL = micrograms per milliliter

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

2950 Fite Circle, Suite 110, Sacramento, CA 95827 (916) 362-9047 FAX (916) 362-9047

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 *Sacramento, CA 95827*	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-MM-1	LAB ID:	ST92-07-230A ST92-07-231A
Matrix:	Water	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	8.7	0.3	ug/L
Toluene	370	0.3	ug/L
Ethylbenzene	74	0.3	ug/L
Xylenes	190	0.3	ug/L
TPHgas	1100	50	ug/L
TPHdiesel	ND	50	ug/L
Surrogate % Recovery of Trifluorotoluene =	147%		

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8010 Halogenated Volatile Organics
Analysis Report

Attention:	Mr. Darell Nations	Date Sampled:	Jul. 6, 1992
	Nations Groundwater Assoicates	Date Received:	Jul. 7, 1992
	3050 Fite Circle, Suite 104	Date Analyzed:	Jul. 20, 1992
	Sacramento, CA 95827		
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-MM-1	LAB ID:	ST92-07-234A
Matrix:	Water	Dilution:	

Name	Amount	Reporting Limit	Units
1. Bromodichloromethane	ND	1.0	ug/L
2. Bromoform	ND	2.0	ug/L
3. Bromomethane	ND	0.8	ug/L
4. Carbon tetrachloride	ND	1.2	ug/L
5. Chlorobenzene	ND	2.5	ug/L
6. Chloroethane	29	5.2	ug/L
7. Chloroform	ND	0.5	ug/L
8. 2-Chloroethyl Vinyl ether	ND	1.3	ug/L
9. Chloromethane	ND	0.8	ug/L
10. Chlorotoluene	ND	2.5	ug/L
11. Dibromochloromethane	ND	0.9	ug/L
12. Dibromomethane	ND	0.9	ug/L
13. 1,2-Dichlorobenzene	ND	1.5	ug/L
14. 1,3-Dichlorobenzene	ND	3.2	ug/L
15. 1,4-Dichlorobenzene	ND	2.4	ug/L
16. Dichlorodifluoromethane	ND	2.0	ug/L
17. 1,1-Dichloroethane	532	0.7	ug/L
18. 1,2-Dichloroethane	ND	0.3	ug/L
19. 1,1-Dichloroethylene	ND	1.3	ug/L

ppb = parts per billion = ug/L = micrograms per Liter

ppm = parts per million = ug/mL = micrograms per milliliter

ND = Not Detected. Compound(s) may be present at concentrations below the reporting limit.

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8010 Halogenated Volatile Organics
Analysis Report

Attention:	Mr. Darell Nations Nations Groundwater Assoicates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 20, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-MM-1	LAB ID:	ST92-07-234A
Matrix:	Water	Dilution:	

Name	Amount	Reporting Limit	Units
20. Trans-1,2-Dichloroethylene	ND	1.0	ug/L
21. Dichloromethane	ND	5.0	ug/L
22. 1,2-Dichloropropane	ND	0.4	ug/L
23. Trans-1,3-Dichloropropylene	ND	3.4	ug/L
24. 1,1,2,2-Tetrachloroethane	ND	0.3	ug/L
25. 1,1,1,2-Tetrachloroethane	ND	0.3	ug/L
26. Tetrachloroethylene	48	0.3	ug/L
27. 1,1,1-Trichloroethane	86	0.3	ug/L
28. 1,1,2-Trichloroethane	ND	0.2	ug/L
29. Trichloroethylene	1.3	1.2	ug/L
30. Trichlorofluoromethane	ND	3.0	ug/L
31.Trichloropropane	ND	3.0	ug/L
32. Vinyl Chloride	ND	1.8	ug/L

Surrogate % Recovery 1,2 - dichloroethone -d4 = 101%
Surrogate % Recovery toluene - d8 = 102%
Surrogate % Recovery 4- bromoflourobenzene = 105%

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

R. L. James, Principal Chemist

7-20-92
Date Reported

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 536 Galveston Street West Sacramento, CA 95691	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-MM-1	LAB ID:	ST92-07-233A
Matrix:	Water	Dilution:	

Name	Amount	Reporting Limit	Units
Aldrin	ND	0.04	ug/L
BHC-alpha	120	0.03	ug/L
BHC-beta	ND	0.06	ug/L
BHC-delta	ND	0.09	ug/L
BHC-gamma	84	0.04	ug/L
Chlordane	ND	0.14	ug/L
4,4'-DDD	ND	0.11	ug/L
4,4'-DDE	ND	0.04	ug/L
4,4'-DDT	ND	0.12	ug/L
Dieldrin	ND	0.02	ug/L
Endosulfan I	ND	0.14	ug/L
Endosulfan II	ND	0.04	ug/L
Endosulan sulfate	ND	0.66	ug/L

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.

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 536 Galveston Street West Sacramento, CA 95691	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 21, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-MM-1	LAB ID:	ST92-07-233A
Matrix:	Water	Dilution:	

Name	Amount	Reporting Limit	Units
Endrin	ND	0.06	ug/L
Endrin aldehyde	ND	0.04	ug/L
Heptachlor	150	0.12	ug/L
Heptachlor epoxide	ND	0.02	ug/L
Methoxychlor	ND	0.14	ug/L
Toxaphene	ND	0.04	ug/L

Surrogate % Recovery of Dibutylchlorendate (DBC) = 67%

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

7-21-92
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)

2950 Fite Circle, Ste 112 • Sacramento, California 95827 • (916) 362-8947 • FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metals, CAM 17
EPA Method 6010

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 10, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-MM-1	LAB ID:	ST92-07-232A
Matrix:	Water	Dilution:	

Name	Amount	Reporting Limit	Units
Antimony (Sb)	ND	50	ug/L
Arsenic (As)	120	100	ug/L
Barium (Ba)	1900	20	ug/L
Beryllium (Be)	0.6	5	ug/L
Cadmium (Cd)	ND	10	ug/L
Chromium (Cr)	130	10	ug/L
Cobalt (Co)	8	20	ug/L
Copper (Cu)	1900	20	ug/L
Lead (Pb)	14	100	ug/L
Mercury (Hg)	ND	5	ug/L
Molybdenum (Mo)	ND	20	ug/L
Nickel (Ni)	45	20	ug/L
Selenium (Se)	ND	100	ug/L
Silver (Ag)	ND	10	ug/L
Thallium (Tl)	12	100	ug/L
Vanadium (V)	10	20	ug/L
Zinc (Zn)	3800	20	ug/L

ppb = parts per billion = ug/L = microgram per Liter

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

7-10-92
Date

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020 Modified Laboratory Control Spike (LCS) BTEX Analysis Report

Attention: Mr. Darrell Nations
Nations Groundwater Associates
3050 Fite Circle, Suite 104
Sacramento, CA 95827

Date Sampled: Jul. 6, 1992
Date Received: Jul. 7, 1992
Date Analyzed: Jul. 19, 1992

Project ID: QA/QC

Project Name: Caltrans Albany

Client ID: LCS

LAB ID: ST92-07-19LCS

Matrix: Water

Dilution:

Name	Sample Spike Added	Results	Conc. Units	LCS	Units	% Recovery
Benzene	30 ppb	ND	ug/L	30	ug/L	100%
Toluene	30 ppb	ND	ug/L	34	ug/L	113%
Ethylbenzene	30 ppb	ND	ug/L	32	ug/L	107%
Xylenes	30 ppb	ND	ug/L	34	ug/L	113%
Surrogate % Recovery of TrifluoroToluene =				100%		

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

R.L. James, Principal Chemist

7-19-92
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)

FAX (916) 362-0947

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metals, CAM 17 Soil
LCS / LCSD Recoveries

Date of Analysis: 7/10/92

Units : (mg/Kg)

Element	Spike Conc.	LCS	% Recovery	Duplicate LCS	Duplicate % Recovery	% RSD
Antimony (Sb)	25	30	120.0%	24	96.0%	22%
Arsenic (As)	100	92	92.0%	108	108.0%	16%
Barium (Ba)	100	106	106.0%	117	117.0%	10%
Beryllium (Be)	2.5	2.7	108.0%	2.8	112.0%	4%
Cadmium (Cd)	3.75	4.3	114.7%	4.8	128.0%	11%
Chromium (Cr)	10	104	1040.0%	108	1080.0%	4%
Cobalt (Co)	25	22	88.0%	24	96.0%	9%
Copper (Cu)	12.5	17	136.0%	17	136.0%	0%
Lead (Pb)	25	25	100.0%	28	112.0%	11%
Nickel (Ni)	25	27	108.0%	29	116.0%	7%
Selenium (Se)	100	92	92.0%	108	108.0%	16%
Silver (Ag)	2.5	1.5	58.0%	1.35	54.0%	7%
Thallium (Tl)	100	93	93.0%	102	102.0%	9%
Vanadium (V)	25	30	120.0%	30	120.0%	0%
Zinc (Zn)	25	20	80.0%	23	92.0%	14%

ppm = parts per million = mg/Kg = milligram per Kilogram

ND = Not Detected. Compound(s) may be present at concentrations below the *detection limit.*

NR = Not Requested

R. L. James, Principal Chemist

7-10-92
Date

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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention: Mr. Darrell Nations
Nations Groundwater Associates
3050 Fite Circle, Suite 104
Sacramento, CA 95827

Date Sampled: Jul. 6, 1992
Date Received: Jul. 7, 1992
Date Analyzed: Jul. 19, 1992

Project #: 04-180151-01

Project Name: Caltrans Albany

Client ID: W-EAR-1

LAB ID: ST92-07-235A
ST92-07-236A

Matrix: Water

Dilution:

Name	Amount	Detection Limit	Units
Benzene	ND	0.3	ug/L
Toluene	ND	0.3	ug/L
Ethylbenzene	ND	0.3	ug/L
Xylenes	ND	0.3	ug/L
Chlorobenzene	ND	0.3	ug/L
1,3 - Dichlorobenzene	ND	0.3	ug/L
1,4 - Dichlorobenzene	ND	0.3	ug/L
1, 2 - Dichlorobenzene	ND	0.3	ug/L
TPHgas	ND	50	ug/L
TPHdiesel	ND	50	ug/L
Surrogate % Recovery of Trifluorotoluene =	117%		

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/mL = micrograms per milliliter
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
Date Reported

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8020/8015 Modified Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Jul. 7, 1992 Jul. 19, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-EAR-1	LAB ID:	ST92-07-235A ST92-07-236A
Matrix:	Water	Dilution:	

Name	Amount	Detection Limit	Units
Benzene	ND	0.3	ug/L
Toluene	ND	0.3	ug/L
Ethylbenzene	ND	0.3	ug/L
Xylenes	ND	0.3	ug/L
TPHgas	ND	50	ug/L
TPHdiesel	ND	50	ug/L
Surrogate % Recovery of Trifluorotoluene =	117%		

ppb = parts per billion = ug/L = micrograms per Liter
ppm = parts per million = ug/mL = micrograms per milliliter.
ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.
NR = Analysis not requested.

R. L. James, Principal Chemist

7-19-92
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)

Sparger Technology Analytical Laboratory

3100 FITE CIRCLE, SUITE 108
SACRAMENTO, CA 95827

SAMPLE #_____

CHAIN OF CUSTODY RECORD

FIELD SECTION No 1352

CLIENT NAME NATIONS GROUNDWATER PROJECT ADDRESS CACTIANS ALBANY
(Number Street City Zip)

SAMPLED BY LARRY MARCUS CONTAINERS OBTAINED FROM _____
(Name (PRINT) Organization)

PRESERVATIVE USED _____ STORAGE TEMPERATURE ☐ Ambient ☐ 4° C ☐ -10° C Other _____

☐ HAZARDOUS ☐ NON-HAZARDOUS SPECIAL HANDLING INSTRUCTIONS _____

FIELD REMARKS TASK ORDER 04-180151-01

COLLECTOR SAMPLE NO.	DATE	COMP	GRAB	TYPE (Soil/ H_2O)	FIELD DATA	STATION LOCATION (grid, depth, etc.)	# OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
W-DRUM	7/18/92			H_2O			1	✓	48 HR TAT

Larry Marcus / 7/21/92 / _____ / TAL 7/21/92 2:50 PM
Released by / Organization / Date/Time / Received by / Organization / Date/Time

Released by / Organization / Date/Time / Received by / Organization / Date/Time

Released by / Organization / Date/Time / Received by / Organization / Date/Time

LABORATORY SECTION

TEMPERATURE RECEIVED _____ FEDX AIRBILL# _____ HAND DELIVERED _____

ANALYSIS RECORD

TYPE OF ANALYSIS	PERFORMED BY (Signed)	DATE OF ANALYSIS	RECORDED (Lab Book No.)	COMMENTS

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Sep. 18, 1992 Sep. 21, 1992 Oct. 2, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-Drum	LAB ID:	ST92-09-333A
Matrix:	Water	Dilution:	

Name	Amount	Reporting Limit	Units
Aldrin	ND	0.04	ug/L
BHC-alpha	ND	0.03	ug/L
BHC-beta	35	0.06	ug/L
BHC-delta	5.1	0.09	ug/L
BHC-gamma	ND	0.04	ug/L
Chlordane	15	0.14	ug/L
4,4'-DDD	ND	0.11	ug/L
4,4'-DDE	ND	0.04	ug/L
4,4'-DDT	ND	0.12	ug/L
Dieldrin	3.2	0.02	ug/L
Endosulfan I	ND	0.14	ug/L
Endosulfan II	ND	0.04	ug/L
Endosulan sulfate	ND	0.66	ug/L

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.

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

8080 Organochlorine Pesticides
Analysis Report

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Sep. 18, 1992 Sep. 21, 1992 Oct. 2, 1992
Project #:	04-180151-01	Project Name:	Caltrans Albany
Client ID:	W-Drum	LAB ID:	ST92-09-333A
Matrix:	Water	Dilution:	

Name	Amount	Reporting Limit	Units
Endrin	ND	0.06	ug/L
Endrin aldehyde	ND	0.04	ug/L
Heptachlor	ND	0.12	ug/L
Heptachlor epoxide	ND	0.02	ug/L
Methoxychlor	23	0.14	ug/L
Toxaphene	ND	0.04	ug/L
Surrogate % Recovery of Dibutylchlorendate (DBC) =		98%	

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

10-2-92
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)

Sparger Technology Analytical Laboratory

3100 FITE CIRCLE, SUITE 108
SACRAMENTO, CA 95827

SAMPLE # _____

CHAIN OF CUSTODY RECORD

FIELD SECTION No 1345

CLIENT NAME NATIONS GROUNDWATER ASSOCIATES PROJECT ADDRESS CALTRANS ALBANY
(Number / Street / City / Zip)

SAMPLED BY NA (Name (PRINT) / Organization) CONTAINERS OBTAINED FROM _____

PRESERVATIVE USED NONE STORAGE TEMPERATURE ☐ Ambient ☒ 4° C ☐ -10° C Other _____

☐ HAZARDOUS ☒ NON-HAZARDOUS SPECIAL HANDLING INSTRUCTIONS _____

FIELD REMARKS _____

COLLECTOR SAMPLE NO.	DATE	COMP	GRAB	TYPE (Soil/ H_2O)	FIELD DATA	STATION LOCATION (grid, depth, etc.)	# OF CONTAINERS	ANALYSIS REQUIRED	REMARKS
S-3-B1	7-6-92		X	SOIL			1		WET PROCEDURE AND
S-5-B2	↓		X	↓			1		ANALYZE FOR
S-3-B7	↓		X	↓			1		ARSENIC IN
									EXTRACT
S-5-B2	7-6-92		X	SOIL			1		CHROMIUM VI IN
S-3-B7	↓		X	↓			1		CHROMIUM VI ORIGINAL
									SAMPLE
									DUE DATE: 10 WORKING
									DAYS FRIDAY 10/16/92

Released by	Organization	Date/Time	Received by	Organization	Date/Time
Darell Miller	NGA	10/16/92		STAL	9/16/92 9:20 A
Released by	Organization	Date/Time	Received by	Organization	Date/Time
Released by	Organization	Date/Time	Received by	Organization	Date/Time

LABORATORY SECTION

TEMPERATURE RECEIVED _____ FedX AIRBILL# _____ HAND DELIVERED _____

ANALYSIS RECORD

TYPE OF ANALYSIS	PERFORMED BY (Signed)	DATE OF ANALYSIS	RECORDED (Lab Book No.)	COMMENTS

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metal (STLC)
EPA Method: WET

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Sep. 16, 1992 Sep. 24, 1992
Project #:		Project Name:	Caltrans Albany
Client ID:	S-3-B1	LAB ID:	ST92-09-277A
Matrix:	Water	Dilution:	

Name	Amount	Detection Limit	Units
Arsenic (As)	ND	1.0	mg/L

ppm = parts per million = mg/L = milligrams per Liter

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

9-24-92
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)

3050 Fite Circle, Suite 113 · Sacramento, CA 95827 · (916) 362-9047 · FAX (916) 362-9847

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metal (STLC)
EPA Method: WET

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Sep. 16, 1992 Sep. 24, 1992
Project #:		Project Name:	Caltrans Albany
Client ID:	S-5-B2	LAB ID:	ST92-09-278A
Matrix:	Water	Dilution:	

Name	Amount	Detection Limit	Units
Arsenic (As)	1.4	1.0	mg/L

ppm = parts per million = mg/L = milligrams per Liter

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

9-24-92
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)

3050 Fite Circle, Suite 113 • Sacramento, California 95827 • (916) 362-8247 • FAX (916) 362-8247

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metal (STLC)
EPA Method: WET

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 6, 1992 Sep. 16, 1992 Sep. 24, 1992
Project #:		Project Name:	Caltrans Albany
Client ID:	S-3-B7	LAB ID:	ST92-09-279A
Matrix:	*Water*	*Dilution:*	

Name	Amount	Detection Limit	Units
Arsenic (As)	ND	1.0	mg/L

ppm = parts per million = mg/L = milligrams per Liter

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

R. L. James, Principal Chemist

9-24-92
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)

Sparger Technology, Inc.
With Automation in Mind

Analytical Laboratory Division
Mobile Laboratory Division
Scientific Division

Metal, (STLC)
LCS / LCSD Recoveries

Attention:	Mr. Darrell Nations Nations Groundwater Associates 3050 Fite Circle, Suite 104 Sacramento, CA 95827	Date Sampled: Date Received: Date Analyzed:	Jul. 06, 1992 Sep. 16, 1992 Sep. 24, 1992
Project #:		Project Names:	Caltrans Albany
Client ID:	LCS/LCSD	LAB ID:	ST92-09-24LCS ST92-09-24LCSD
Matrix:	Water	Dilution:	

Units : (mg/L)

Element	Spike Conc.	LCS	% Recovery	Duplicate LCS	Duplicate % Recovery	% RSD
Lead (Pb)	20	21.6	108.0%	22.0	110.0%	2%

ppm = parts per million = mg/L = milligram per Liter

ND = Not Detected. Compound(s) may be present at concentrations below the detection limit.

NR = Not Requested

R. L. James, Principal Chemist

9-24-92
Date

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)

ANALYTICAL SERVICES

751 S. Kellogg, Suite A • San Luis Obispo, CA 93401 • (805) 543-2553 • FAX (805) 543-2685
6006 Egret Ct. • Goleta, CA 93117 • (805) 964-7838 • FAX (805) 967-4386
2400 Cumberland Dr. • Benicia, CA 94510 • (707) 747-2757 • FAX (707) 747-2765
• Valparaiso, Indiana 46383 • (219) 464-2389 • FAX (219) 462-2953

Chain of Custody

• PLEASE PRINT IN PEN

Client: NATIONS GROUNDWATER ASSOCIATES	Contact: DANNELL NATIONS	Phone #: (916) 361-8095	FAX #: (916) 362-4912
Address: 3050 FITE Circle, Suite 104 City: SACRAMENTO State: CA Zip: 95827			
Project Name/Number: CALTRANS ALBANY		Project MGR: D. NATIONS	
Bill (if different than above): Address:			
Sampler (Print and sign):	Due Date: 7 days From Sample / Receipt — Circle for RUSH*	Copies To:	Auth. Init.

Sample Description	Date/Time Coll'd	*Matrix	# of Containers	Pres.	Filt. y/n	* Subject to Availability Analysis	Remarks	Lab ID #
S-5-B2	7-6-92	soil	1			Chromium VI		
S-3-B7	7-6-92	soil	1			chromium VI		

Relinquished By	Date/Time	Received By	Relinquished By	Date/Time	Received By
Dannell Nations	10/8/92 1:30 p.m.				

FOR LAB USE ONLY

Shipping Method	Shipping #	Received By	Date/Time	Condition (See Remarks) Cold	Sealed	Intact

REMARKS

* Matrix:
DW – Drinking Water
WW – Wastewater
GW – Groundwater
SW – Surface Water
IM – Impinger
FI – Filter
FP – Free Product
A/G – Air/Gas
SL – Sludge/Soil/Solid
OT – Other

ORIGINAL

CONTINUED (707) 747-2765

002

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories
San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

San Luis Obispo Division
141 Suburban Road, San Luis Obispo, California 93401
(805) 543-2553
FAX (805) 543-2685

Lab Number : BD-0669-1
Project : Caltrans Albany

CLIENT: Darrell Nations
Nations Groundwater Associates
3050 Fite Circle Suite 104
Sacramento, CA 95827

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
S-5-B2	Soil		07/06/92	10/14/92

CONSTITUENT	*PQL	RESULT	UNITS	METHOD	ANALYZED	BY	NOTES
Chromium, Hexavalent	0.1	ND	mg/Kg	EPA 7196	10/29/92	MH	

Lab Certifications: CAELAP#1598, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

11/13/92

MH/oro/mdh
IJ29W6

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

Lab Number : BD-0669-2
Project : Caltrans Albany

CLIENT: Darrell Nations
Nations Groundwater Associates
3050 Fite Circle Suite 104
Sacramento, CA 95827

REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
S-3-B7	Soil		07/06/92	10/14/92

CONSTITUENT	*PQL	RESULT	UNITS	METHOD	ANALYZED	BY	NOTES
Chromium, Hexavalent	0.1	ND	mg/Kg	EPA 7196	10/29/92	MH	

Lab Certifications: CAELAP#1598, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

11/13/92

MH/oro/mdh
IJ29W6

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

QC Batch ID: IJ29W6

CLIENT: Coast-to-Coast Analytical Services, Inc.

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE	Solid			

CONSTITUENT	*PQL	SPIKE	RESULT	%REC	UNITS	METHOD	ANALYZED	BY	NOTE
Chromium, Hexavalent	0.1	0.50	0.53	106.	mg/Kg	EPA 7196	10/29/92	MH	

Lab Certifications: CAELAP#1598, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

11/13/92

MH/oro/mdh
BD0669-2

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

COAST - TO - COAST ANALYTICAL SERVICES

Air, Water & Hazardous Waste Sampling, Analysis & Consultation
Certified Hazardous Waste, Chemistry, Bacteriology & Bioassay Laboratories

San Luis Obispo, CA • Benicia, CA • Camarillo, CA • San Jose, CA
Anaheim, CA • Tempe, AZ • Valparaiso, IN • Westbrook, ME • Indianapolis, IN

San Luis Obispo Division (805) 543-2553
141 Suburban Road, San Luis Obispo, California 93401 FAX (805) 543-2685

QC Batch ID: IJ29W6

CLIENT: Coast-to-Coast Analytical Services, Inc.

QC SPIKE
REPORT OF ANALYTICAL RESULTS

SAMPLE DESCRIPTION	MATRIX	SAMPLED BY	SAMPLED	DATE RECEIVED
QC SPIKE DUPLICATE	Solid			

CONSTITUENT	*PQL	SPIKE	RESULT	%DIFF	UNITS	METHOD	ANALYZED	BY	NOTE
Chromium, Hexavalent	0.1	0.50	0.49	7.8	mg/Kg	EPA 7196	10/29/92	MH	

Lab Certifications: CAELAP#1598, UTELAP#E-142, A2LA#0136-01, L.A.Co.CSD#10187.
*RESULTS listed as 'ND' were not detected at or above the listed PQL (Practical Quantitation Limit)

11/13/92

MH/oro/mdh
BD0669-2

Respectfully submitted,
COAST-TO-COAST ANALYTICAL SERVICES, INC.

Mary Havlicek

Mary Havlicek, Ph.D.
President

APPENDIX C

Remedial Action Options

APPENDIX C
REMEDIAL ACTION OPTIONS
ZICHICHI PROPERTY
703-715 CLEVELAND AVENUE
ALBANY, CALIFORNIA

Caltrans Task Order No. 04-180151-01

1.0 INTRODUCTION

At the request of the California Department of Transportation (Caltrans) Nations Groundwater Associates (NGA) has prepared this Appendix describing remedial action options at the Zichichi property located at 703-715 Cleveland Avenue in Albany, California. This report describes remedial option alternatives and associated costs that may be required at this site in conjunction with Caltrans purchase of this property in conjunction with the reconstruction of the Interstate Highway 80/580 interchange.

The work performed by NGA for this appendix has been completed in accordance with Caltrans Contract Number 53P614, Caltrans District 04 Task Order No. 04-180151-01, and a *Site Investigation Work Plan* previously submitted by NGA.

1.1 Purpose

The purpose of this appendix is to recommend a remedial alternative for soil at the site.

1.2 Assumptions and Limitations

In preparing this appendix the following assumptions have been made:

- the extent of hydrocarbons in soil at the site is as depicted in Figure 1;
- site structures will be removed prior to excavation and removal of the 2000-gallon UST;
- the accuracy of laboratory analytical results of all soil samples collected during this investigation are within typical limits for the types of analyses performed;

The recommendation of a remedial alternative presented in this appendix is based on the results of work completed at the site to-date. The collection of additional data at the site could result in changes to this recommendation.

2.0 BACKGROUND INFORMATION

2.1 Site Description

The site is located between the east- and west-bound lanes of Interstate Highway 80 in Albany, California. The City of Albany is located in the East Bay area of the San Francisco Bay Region. The site is at an approximate elevation of 20 feet above mean sea level (U.S. Geological Survey 7.5 Minute Richmond Quadrangle) and is located about 400 feet east of the San Francisco Bay.

The site is owned by Messrs. Robert Zichichi, Frank Zichichi, and Andrew Zichichi. Businesses at the site include Cabello Brothers Automotive, Expert Auto Repair, D & M Body Shop, and Metric Motion automobile repair. The general configuration of on-site structures is shown on Figure 1. We understand that an initial Site Assessment (ISA) performed by Caltrans personnel revealed the presence of an abandoned underground storage tank, probably gasoline, at the Metric Motion site. Information provided by Caltrans indicates that, in addition, an underground diesel storage tank may have been removed from beneath the building occupied by Metric Motion. No details concerning the removal are available.

Gasoline pumps remain at the Metric Motion site. A concrete-lined sump is present inside the Metric Motion building; the sump receives waste water from washing of the concrete slab floor. Waste water drains from the sump into a sanitary sewer. An Additional sump is present at the rear of Expert Auto Repair, outside the building. This sump is used to collect runoff from the fill slope of adjacent eastbound lanes of Interstate Highway 80. Runoff is collected in the sump, then pumped into a sanitary sewer for disposal. Information provided by Caltrans indicates that the previous ISA did not identify possible hazardous waste concerns at the three other on-site businesses.

2.2 Results of Recent Investigation

Activities recently completed at the site as part of a subsurface environmental investigation conducted by NGA include the following:

- drilling seven 8-inch-diameter borings to depths ranging from about nine to 15 feet below ground surface;
- collecting relatively undisturbed soil samples from each boring at depths ranging from 3.5 to 14 feet below ground surface;
- evaluating drill cuttings and soil samples for evidence of hydrocarbons using a photoionization detector (PID);
- submitting selected soil and sludge samples to a California-certified laboratory for analysis of total petroleum

hydrocarbons as gasoline (TPHg) and diesel (TPHd), aromatic volatile organics, 17 metals listed in the California Assessment Manual (CAM), total recoverable petroleum hydrocarbons, and organochlorine pesticides by EPA methods 8015 (modified), 8020, 6010, 418.1, and 8080 respectively;

- collecting water samples from the sump within the Metric Motion building and behind Expert Auto Repair;

- submitting water samples to a California-certified laboratory for analysis of TPHg, TPHd, purgeable aromatic organics, halogenated volatile organics, 17 CAM metals, and organochlorine pesticides by EPA methods 8015 (modified), 602, 601, 6010, and 8080 respectively;

- interpreting field and laboratory data of soil and water analyses to evaluate the site for the presence of subsurface contamination;

- preparing a site investigation report.

Hydrocarbons were only detected in soil and sludge samples collected from borings B-1, B-2, B-7 and the Metric Motion sump. TPHg, TPHd, and TRPH were detected in the sample collected from a depth of three feet in boring B-1 at concentrations of 68, 180, and 9500 parts per million (ppm) respectively. Hydrocarbons were not detected in the sample collected from eight feet in this boring.

In boring B-2 individual hydrocarbon constituents were detected at concentrations less than 0.017 ppm in soil samples collected from three and nine feet. Petroleum constituents were not detected in the sample collected from five feet in this boring. TPHd was detected at a concentration of 22 ppm in the soil sample collected from nine feet in this boring. TPHg and TRPH was not detected in soil samples collected from B-2.

TRPH was detected in the sample collected from three feet in boring B-7 at a concentration of 4100 ppm. Individual petroleum constituents, TPHg, and TPHd were not detected in B-7.

The method by which TRPH is determined (418.1) uses freon as the extraction solvent. Following extraction, TRPH is determined by an infrared technique in which any substance that absorbs light within the prescribed wavelength is identified as Total Recoverable Petroleum Hydrocarbons. Any molecules having the hydrocarbon backbone (CH_2-CH_3) will be extracted by freon. This includes lipids, polymers, copolymers, proteins, natural resins, cellular components, viruses, steroids, and dispersed high molecular weight compounds. All of these substances can contribute to a TRPH concentration.

TPHg, TPHd, and TRPH were detected at concentrations of 1200, 240, and 89,000 ppm respectively in the sludge sample from the Metric Motion sump. Individual petroleum constituents were detected in

this sample at concentrations ranging from 15 (1,3-Dichlorobenzene) to 130 (1,2-Dichlorobenzene) ppm.

Soil sample analytical results for hydrocarbons are presented in Table 1. The interpreted areal extent of hydrocarbons in site soils is shown in Figure 1. In delineating the extent of hydrocarbons in soils shown in Figure 1 we have assumed that the high concentration of TRPH detected in boring B-7 indicates that high molecular weight hydrocarbons are present in soils at this location. An analytical technique more discriminating that EPA method 418.1 could be used to confirm this assumption.

Pesticides were detected in samples S-3-B1 and S-MM-1 (Metric Motion sump sample) at concentrations ranging from 6.0 (Aldrin in S-3-B1) to 66,000 (BHC-beta in S-MM-1) parts per billion (ppb). Pesticides were not detected in samples S-5-B2 and S-3-B7.

The state of California has established Total Threshold Limiting Concentrations (TTLCs) for the pesticides aldrin, chlordane, dieldrin, endrin, heptachlor, methoxychlor, toxaphene, the sum of the concentrations of DDD, DDE, and DDT. If a pesticide exceeds its TTLC concentration, the state of California (Title 22 of the California Code of Regulations, Division 4, Chapter 30, S 66700) establishes that a waste or other substance containing the pesticide is "hazardous". If a pesticide is found at concentrations below the TTLC but ten times the Soluble Threshold Limiting Concentration (STLC), the material containing the pesticide can potentially be determined by the state of California to be "hazardous".

The pesticides endrin and heptachlor were detected in sample S-MM-1 at concentrations exceeding the TTLC (Table 2). Endrin was also detected in sample S-3-B1 at a concentration exceeding the TTLC. Based on the concentrations of pesticides detected in sample S-MM-1 it is likely that sludge from the Metric Motion sump would be classified as hazardous by the state of California.
Pesticides were found in boring B-1 at concentrations much lower than detected in the Metric Motion sump sample. Soils excavated from the vicinity of B-1 could contain pesticides at concentrations requiring soil disposal as a hazardous waste. Prior to disposal of any soils excavated from the vicinity of B-1, we recommend that composite soil samples be analyzed for organochlorine pesticides.

Lead was detected in the sludge sample from the Metric Motion sump at concentrations exceeding the TTLC. Arsenic (all soil and sludge samples analyzed for metals), chromium (samples S-5-B2, S-3-B7, and S-MM-1), and copper (sample S-MM-1) were detected at concentrations greater than ten times the STLC.

3.0 SOIL REMEDIATION ALTERNATIVES

Possible alternatives for the remediation of site soils in the vicinity of the 2000-gallon UST include no action, in-situ bioremediation and excavation. Each of these remedial alternatives will be discussed in the following sections.

3.1 No Action Alternative

The no action alternative is receiving increasing scrutiny from the U.S.E.P.A. as a viable alternative to costly remediation measures. In soils where hydrocarbon concentrations are low, where there is no threat to ground-water quality, and where there is evidence that passive bioremediation is taking place due to the presence of indigenous bacteria the no action alternative should receive careful consideration. However, at this site appreciable concentrations of TPHg, TPHd, and TRPH were detected in soils. Concentrations of TPHg, TPHd, and TRPH could pose a potential threat to ground-water quality beneath the site if left in place. For this reason we do not believe the no action alternative is viable at this site.

3.2 In-Situ Bioremediation

In-situ bioremediation of site soils in the vicinity of the UST would be accomplished through stimulation of common soil bacteria and fungi which use organic constituents as a food source. Stimulation of native aerobic bacteria would consist of introducing nutrients into the unsaturated zone at the site to "feed" native bacteria, thereby increasing their population and capacity for consumption of fuel in soil. These nutrients typically consist of oxygen, nitrogen, phosphorous, and other nonorganic nutrients. The nutrients would be introduced in liquid form via injection wells and/or infiltration galleries. The advantages and disadvantages of in-situ bioremediation at this site are summarized below.

Advantages:

- Relatively high concentrations of petroleum constituents can be reduced in a relatively short time period.
- Petroleum constituents are destroyed on-site, and no harmful waste products are generated.
- The in-situ bioremediation system could be designed in a manner to minimize impact to continuing site activities and/or Caltrans future use of the property.

Disadvantages:

- Introduction of nutrients into the soil with a liquid phase solution could adversely affect ground-water quality beneath the site.

- Introduction of nutrients into site soils would likely require a Waste Discharge Permit issued by the regional Water Quality Control Board. Acquisition of Waste Discharge Permits are typically time-consuming and relatively expensive.

- In-situ bioremediation of heavier molecular weight hydrocarbons is typically more difficult and/or time consuming than lighter molecular weight hydrocarbons, because site soils contain elevated concentrations of TPHd and TRPH it is possible that in-situ bioremediation could result in some hydrocarbons remaining in site soils following remediation.

All of the heavier molecular weight hydrocarbons detected in site soils could potentially not be removed through in-situ bioremediation. In-situ bioremediation would likely require the injection of nutrients into the unsaturated zone. This would likely result in ground-water monitoring for the injected nutrients. If nutrient concentrations in ground-water exceed mcls it is likely that remediation of elevated nutrient concentrations in ground water would be required. For these reasons in-situ bioremediation does not appear to be the best remedial option for this site.

3.3 Soil Excavation

Hydrocarbons have been detected in site soils only in the vicinity of the 2000-gallon UST. The interpreted areal extent of hydrocarbons in site soils is shown in Figure 1. It is our understanding that the on-site UST will be removed following purchase of the property by Caltrans. It is not unlikely that additional soils containing hydrocarbons will be detected during tank removal.

Because of the relatively limited areal extent of hydrocarbons in site soils and the fact that it is likely that during tank removal additional site soils containing hydrocarbons at concentrations requiring disposal will be encountered, it is our opinion that the most cost-effective remediation alternative for site soils containing hydrocarbons is additional excavation and soil sampling at the time of tank removal.

Following excavation site soils could be either transported directly to the nearby Redwood Landfill in Novato, California for final disposal (if concentrations permit) or could be land farmed on-site and then disposed following a reduction in hydrocarbon concentrations.

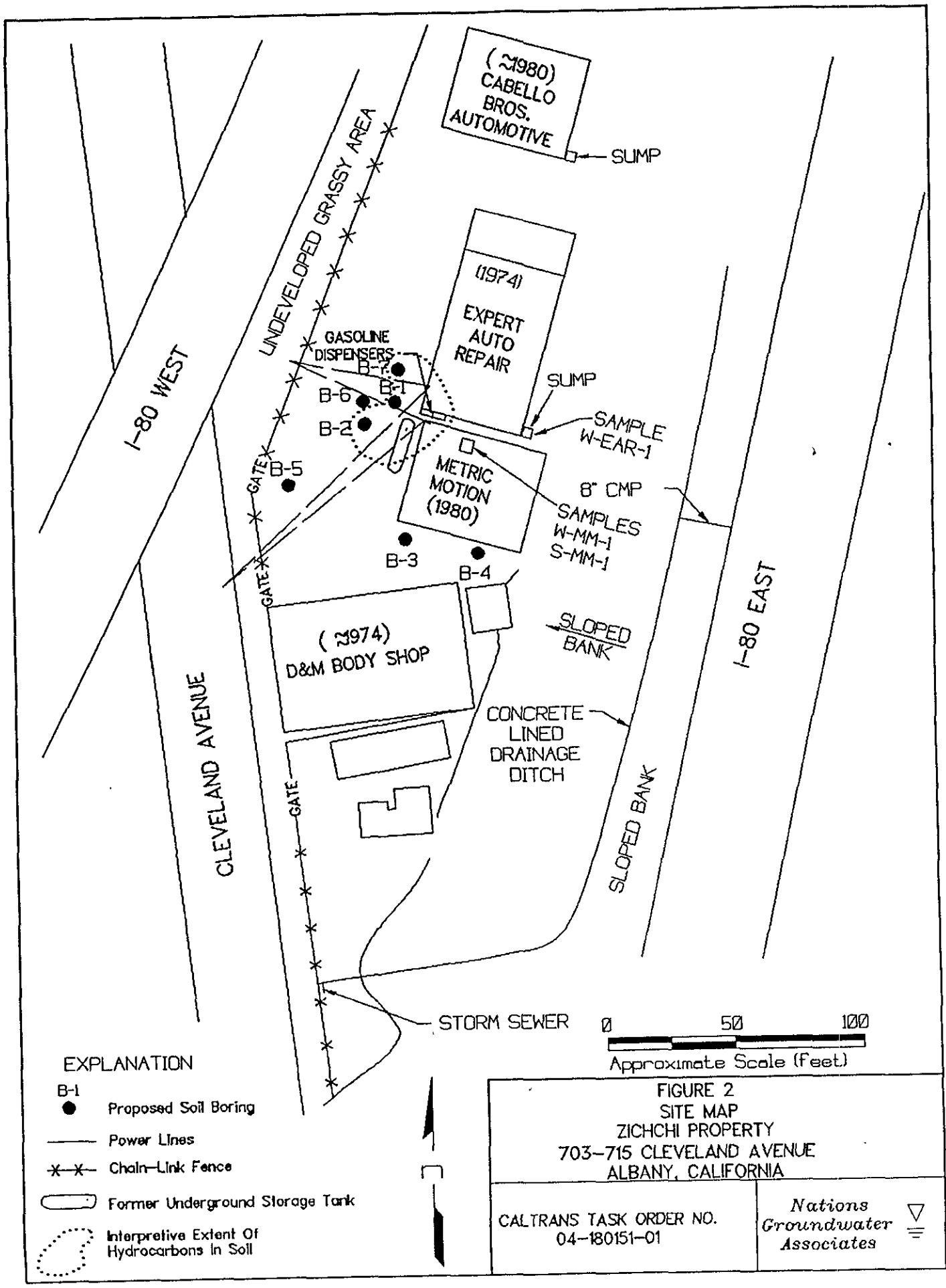


FIGURE 2
SITE MAP
ZICHCHI PROPERTY
703-715 CLEVELAND AVENUE
ALBANY, CALIFORNIA

CALTRANS TASK ORDER NO.
04-180151-01

Nations Groundwater Associates