2118

May 26, 1999

Ms. Farah Naz c/o
Mr. Muhammad Jamil
40092 Davis Street
Fremont, CA 94538

RE: Soil and Groundwater Remediation Workplan
Eagle Gas
4301 San Leandro Street
Oakland, California
Artesian Project # 422-001-01
StID # 2118

? what about dispenser

Dear Mr. Jamil:

Artesian Environmental Consultants (Artesian) was retained by Reliance Petro Chem (RPC) on behalf of the Ms. Farah Naz (Client) to perform Underground Storage Tank Removal (UST) services at 4301 San Leandro Street in Oakland, California (Site) (Figures 1 and 2, contained in Attachment A). Following UST removal activities, confirmational soil samples collected from the vicinity of the UST excavation indicated that petroleum hydrocarbons were released into the subsurface. In response to the confirmed release of petroleum, the Alameda County Health Services Agency, Department of Environmental Health Services (ACDEH), has recommended that soil be remediated by over-excavation / land disposal and that "as much groundwater as possible" be pumped from the excavation. Artesian was then retained directly by the Client to prepare this workplan for soil and groundwater remediation at the Site. The Client is the current owner of the site. The purpose of the work is to remediate soil and groundwater in the vicinity of former USTs.

INTRODUCTION

SCOPE OF WORK

- Obtain permits as needed, (including Permit Fees: East Bay Municipal Utility District for water discharge) and notification of appropriate regulatory authorities;
- Prepare Site Safety Plan;
- Notify Underground Services Alert prior to excavation;
- Excavate from 300 to 600 cubic yards (estimated) of petroleum impacted soil;
- Stockpile excavated soil at the surface and collect soil samples for landfill profiling;
- Collect confirmational soil samples from excavation walls where additional soil is removed;
- Arrange for certified laboratory analysis of samples;
- Arrange for transportation and disposal of petroleum impacted soils to an appropriate land disposal facility;
- Obtain permit from East Bay Municipal Utility District (EBMUD) for discharge of groundwater;
- Pump groundwater from excavation into above-ground holding tank (volume of water pumped will depend largely on recharge rate of aquifer);

- Collect samples of groundwater from holding tank and analyze according to EBMUD requirements;
- Treat groundwater if necessary to meet EBMUD discharge requirements; and
- Prepare a report of field activities, findings, conclusions, and recommendations as appropriate based on results of the field work.

SITE LOCATION

The subject site is located in the southern portion of Oakland, California at the south corner of San Leandro Street and High Street approximately 1,000 feet east of Interstate Highway 880. The site is surrounded by commercial properties and the Bay Area Rapid Transit (BART) railway. The site is bounded by commercial property to the southeast, southwest, and northwest, and by the BART tracks to the northeast.

SITE HISTORY

In December, 1998, the property owner temporarily abandoned the USTs at the site until they could be removed and replaced with new ones. Reliance Petro Chem of Bakersfield, California then began the permitting process for removal of the old USTs and replacement with new ones. Artesian was contracted to permanently close 5 USTs at the site by removal (completed on April 22, 1999). Artesian collected confirmational soil samples from the UST excavation for laboratory analysis. Results of the analysis of confirmational soil samples confirmed an unauthorized release of petroleum had occurred.

A letter from the ACDEH, dated May 10, 1999 was issued recommending that the tank pit be over-excavated and groundwater be pumped from the pit and disposed to remove a source of petroleum contamination. This workplan is designed to comply with ACDEH recommendations and its request that this workplan be prepared and approved by ACDEH before remedial activities begin.

DETAILED SCOPE OF WORK

PERMITTING

Artesian will obtain a groundwater discharge permit from EBMUD and notify the ACDEH when field work is planned. If contaminant concentrations in groundwater exceed EBMUD discharge requirements, groundwater treatment may be necessary. Artesian will determine the most cost-effective treatment option based upon the specific contaminants present in the groundwater to be discharged. Underground utilities will be located by Underground Service Alert (USA) prior to excavating.

FIELD ACTIVITIES

A site-specific health and safety plan (SSP) has been prepared (contained in Attachment B) and will kept onsite during any field activities. Any subcontractors who will be working near potentially impacted soil or groundwater will be provided a copy of the SSP, will be required to be familiar with its requirements, and will be required to comply with all of its procedures and provisions. Artesian will conduct daily "tailgate" health and safety meetings at the beginning of each work day.

Soil Remediation

Artesian anticipates excavating approximately 200 to 600 cubic yards of petroleum impacted soil at the subject site to remove soils which may act as a source for groundwater contamination. Artesian will excavate soils which exhibit indications of petroleum contamination such as elevated photoionization detector (PID) readings, staining, and obvious petroleum odor. Petroleum impacted soils will be removed from the excavation, stockpiled at the site between plastic sheeting, and samples of that material collected for landfill profiling.

Due to site space constraints, soil will likely have to be removed to the surface in 100 to 200 cubic yard increments pending profile approval and transportation of soil to an appropriate disposal facility. Sheet pile type shoring may be used in some areas of the excavation so that soils may be removed nearer to subsurface utilities and site structures. Artesian will not excavate further toward the adjacent building along the south property line due to concerns over the stability of that building. Extending the existing sheet pile type shoring in a southeasterly direction to excavate nearer to the building may destabilize the building foundation. Cost prohibitive shoring methods are the only way to remove additional soils along the southerly property line without an unacceptable level of risk for compromising the integrity of the building.

Soils which do not appear to be impacted will be stockpiled separately at the site between plastic sheeting. Samples of any apparently non-impacted soil will be collected and analyzed for the same analytes as soil samples collected from the excavation and apparently impacted stockpiles. If suitable for re-use, non-impacted soil may be used as backfill pending verification by the field supervisor.

Groundwater Remediation

To remove a source of contamination, Artesian will pump impacted groundwater from the excavation. During soil excavation activities, groundwater will be pumped into an above-ground storage tank. Water in the tank will be sampled in accordance with EBMUD sampling requirements for discharge of water into the sanitary sewer. If contaminant concentrations exceed acceptable levels for the proposed disposal method, Artesian will treat the water or explore other disposal options to determine the most cost-effective disposal method. The total amount of water to be remediated is unknown at this time and will be largely dependent upon the yield of the aquifer and the total depth of the excavation.

Soil and Groundwater Sampling

Soil samples will be collected into 2-inch diameter, 6-inch long brass or stainless steel tubes using a slide hammer. When over- excavation activities are finished, **Artesian will collect one soil sample for every 20 linear feet of excavation wall which has not been already sampled during UST removal activities.** Due to the presence of groundwater in the excavation, soil samples will be collected from the vadose zone (approximately 7 feet below ground surface at this site).

Groundwater will be collected from the above-ground water storage tank in accordance with the requirements of the selected disposal facility. Groundwater samples can be collected from the excavation floor when groundwater remediation has been completed if required by the ACDEH. Any samples collected from the excavation floor will be obtained using a new disposable bailer dropped into the excavation. All samples will be collected in accordance with Artesian standard operating procedures as outlined in Attachment C.

What necessary

LABORATORY ANALYSES

A total of at least 5 soil samples and 5 groundwater samples will be submitted to a state certified laboratory for analyses. Soil samples will be field screened using a PID. A vadose zone sample, or the sample displaying the highest PID reading from each boring will be submitted for analysis.

Soil and Groundwater samples will be submitted for Total Petroleum Hydrocarbons as gasoline (TPHg) by EPA Method 8015; benzene, toluene, ethyl benzene, and total xylenes (BTEX) and methyl tertiary butyl ether (MTBE) by EPA Method 8020; and TPH as diesel (TPHd) by EPA Method 8015. Other analyses may be required by the selected soil and/ or groundwater disposal facilities but, are undetermined on the date of this report.

SITE RESTORATION

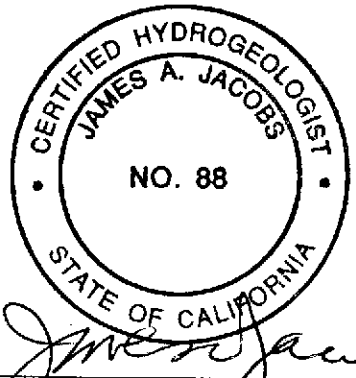
When remediation activities are completed, and approval granted by the City of Oakland Fire Protection Bureau, work will begin on installation of new USTs by RPC in a portion of the final excavation. The excavation will be backfilled with a combination of clean imported fill, and the volume of the new USTs.

REPORT PREPARATION

Following completion of field activities and receipt of the laboratory results, Artesian will prepare a written report describing field activities and results of soil and groundwater remediation activities. The report will include: topographic site location map, site map with sample locations, laboratory reports, chain-of-custody records, laboratory quality control documents, and tabulated laboratory results. This report will also include conclusions of the proposed remediation as well as recommendations for further activities, if appropriate.

Please call Artesian at (510) 307-9943 if you have any questions.

Sincerely,
Artesian Environmental



Paul E. Jones
Project Geologist

James A. Jacobs, RG, REA, CHG #88
President / Certified Hydrogeologist

cc: Mr. Barney Chan, ACDEH
Inspector Hernan Gomez, Oakland Fire
Mr. Don Montgomery, Advanced Financial Services
Ms. Annie Beal, RPC

ARTESIAN ENVIRONMENTAL
(Lic. 624461: A, B, Haz., Asb, C-57) • e-mail: augerpro@jps.net
229 Tewksbury Ave. • Point Richmond, CA 94801 • TEL (510) 307-9943 • FAX (510) 232 2823

ATTACHMENT A:
FIGURES

ARTESIAN ENVIRONMENTAL
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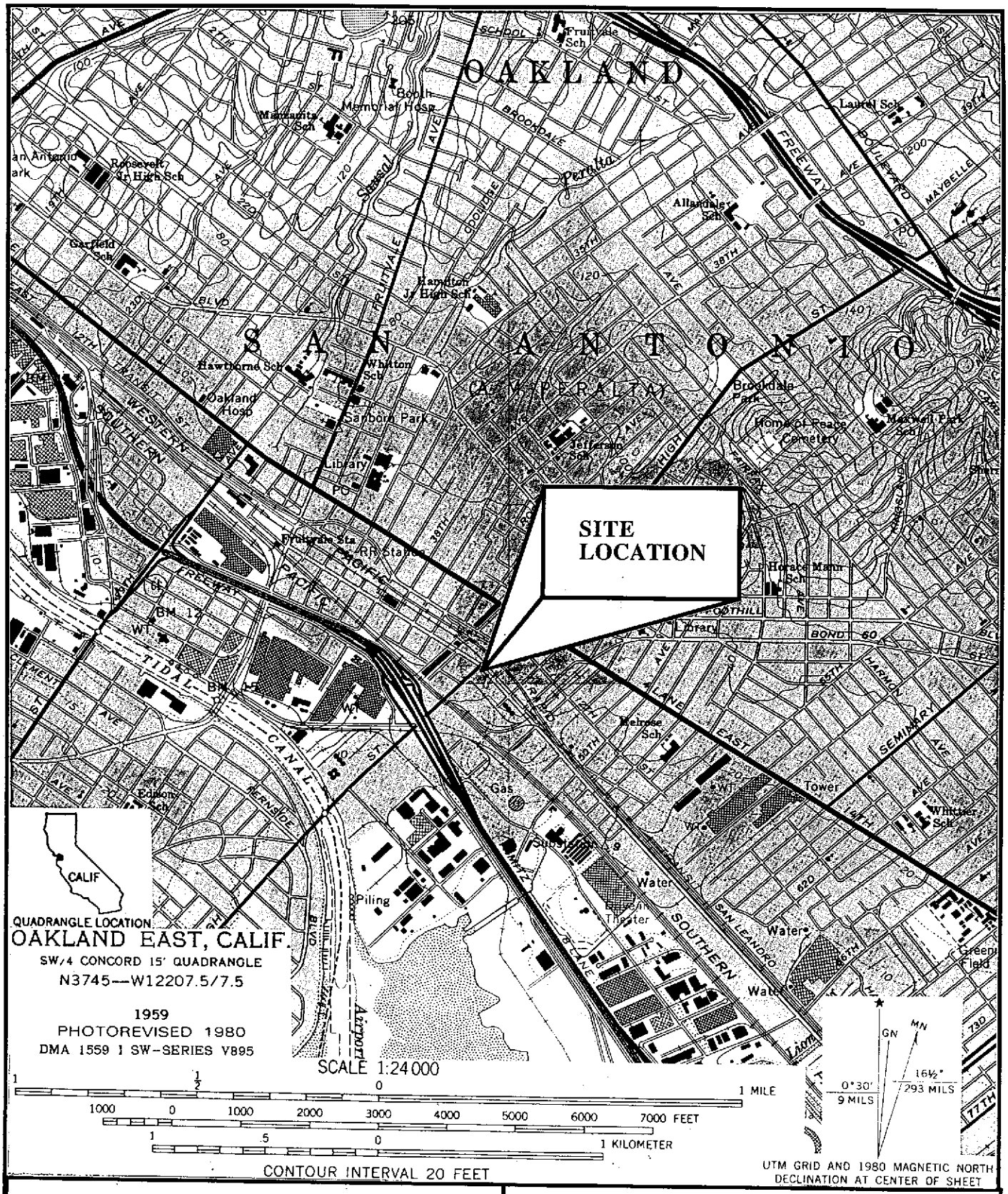
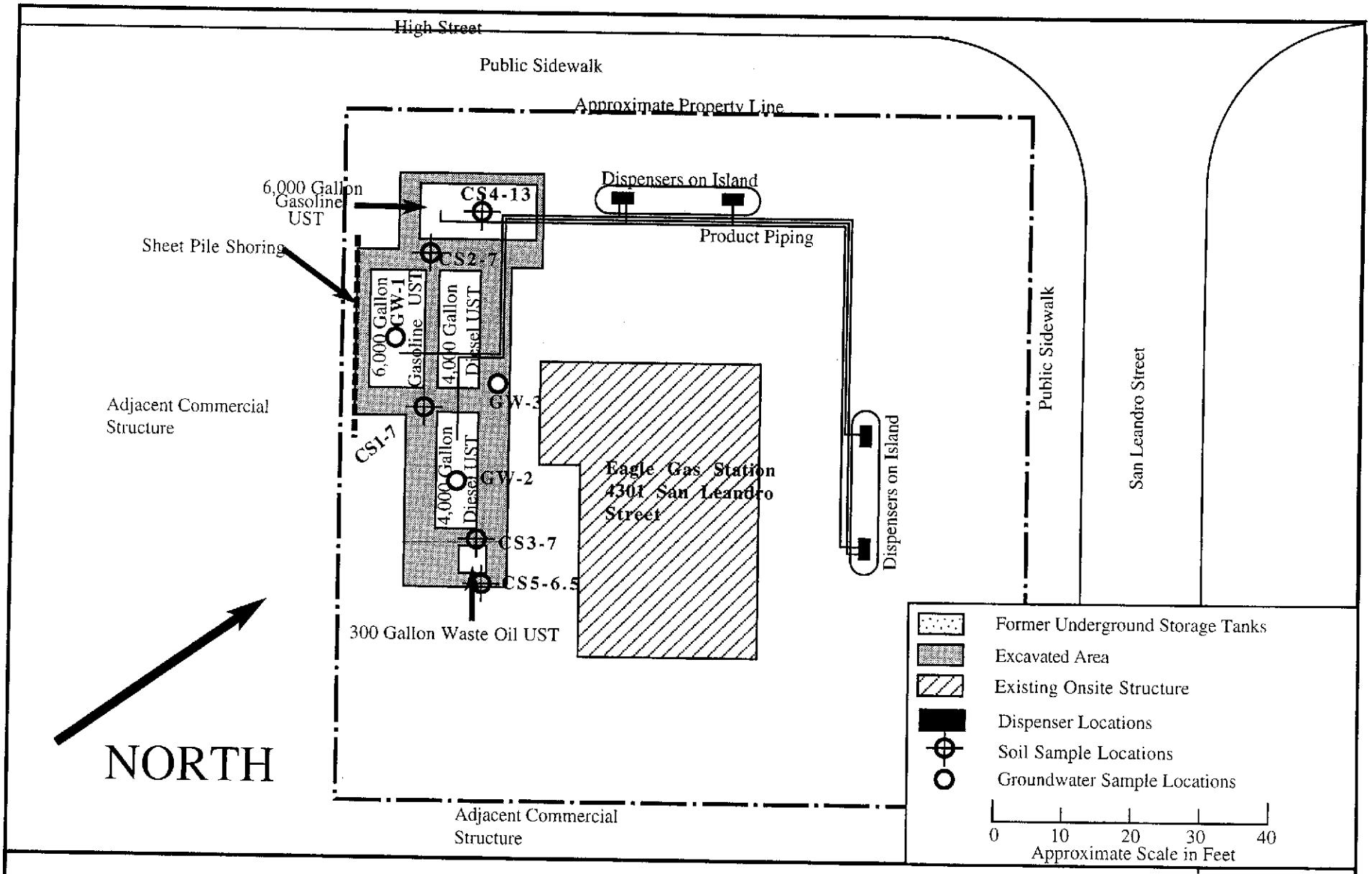


ARTESIAN ENVIRONMENTAL 229 Tewksbury Avenue Point Richmond, California 94801 Phone (510) 307-9943 Fax (510) 232-2823	**SITE LOCATION MAP** Eagle Gas Facility 4301 San Leandro Street Oakland, California

Project No.: 413-001-01	Date: 05/12/99	Prepared by: P. Jones	Figure 1



ARTESIAN ENVIRONMENTAL
229 Tewksbury Avenue
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Site Map
Eagle Gas
4301 San Leandro Street
Oakland, California

Project No.: 413-001-01	Date: 05/13/99	Prepared by: P. Jones	Figure 2

ATTACHMENT B:
SITE-SPECIFIC HEALTH AND SAFETY PLAN

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ARTESIAN ENVIRONMENTAL CONSULTANTS

JOB SAFETY PLAN

1. Site: Eagle Gas 2. Job No.: 422-001-01
3. Location: 4301 San Leandro Street, Oakland
4. Plan Prepared: Paul Jones (Name) 05/26/99 (Date)
5. Plan Approved: _____ (Name) _____ (Date)
6. Plan Revised: _____ (Name) _____ (Date)
7. Revision Approved: _____ (Name) _____ (Date)
8. Facility Description: Service Station
9. Status (active, (inactive) unknown): _____
10. Surroundings (location with respect to residences, businesses, natural features, etc.): Commercial Properties SE, SW, & NW
BART Elevated Rails NE
11. Site map (attach map showing salient features, including location of work and location of contaminated areas).
12. Climate
    12a. Average wind speed and direction: From N.W.

	July	October	January	April
12b. Mean High Temperature				
Mean Low Temperature				

13. Site history (origin of contamination and history of injuries, exposure, complaints, etc.):
2 - 6K gasoline, 2-4K diesel, and 1-0.3K waste oil USTs Removed 4/22/99
Post UST Removal Confirmational Soil & G.W. samples Confirm A Unauthorized Release of Gasoline & Diesel

14. Description of work (including location with respect to areas of known or suspected contamination): Excavate Impacted Soils, Pump & Impacted Groundwater into onsite storage tank pending approval of discharge permit, Sample Soil and Groundwater, and dispose impacted media

15. Chemical Contaminants

15a. Have all chemical contaminants been identified that may be present on-site? Yes

15b. List chemical contaminants that have been identified or are suspected, their concentration, and the environmental media in which they are present. Hazardous property information for selected chemicals appears in the appendix. Review this information for all chemicals listed below. If chemicals are not listed in the appendix, you must enter the hazardous property information in the appendix in the spaces provided.

Chemical	Environmental Media	Measured Minimum Concentration	Maximum Concentration
	Soil - Groundwater	~~PPM~~	PPM
Benzene	Soil - GW	ND - 0.79	8.9 - 1.6
Toluene	S - GW	ND - 0.33	110 - 1.00
Ethyl benzene	S - GW	ND - 0.10	42 - 0.86
Xylenes	S - GW	ND - 0.41	220 - 3.4
MTBE	S - GW	0.09 - 380	92 - 880
PAHs (per constituent)	S - GW	ND - ND	ND - 0.190
Cd	Soil only tested	ND	→ ND
Cr	"	82	→ 82
Pb	"	8.1	→ 8.1
Ni	"	130	→ 130
Zn	"	61	→ 61

Hazard Analysis

List all tasks in the Job Task Column and assign a number to each task (example: 1. Ground Water Sampling). Identify how each category of hazard exists at each task.

Job Task	Mechanical	Electrical	Chemical	Temperature	Acoustical	Radioactive	O_2 Deficiency-Confined Space	Biohazard
1	X	X	X	X	X		X	
2	X	X	X	X	X			
3	X		X	X				
4	X		X	X			X	

17. Procedures to mitigate hazards

List all tasks with corresponding numbers identified in item 16 in the task summary below. Identify procedures to mitigate all hazards listed in item 16 by placing the task number next to the appropriate mitigating measure. Listing of standard procedures is not inclusive. A specific procedure must be entered to mitigate each hazard identified in item 16. If personal protective equipment is to be used, enter "PPE" and select equipment in section 18.

TASK SUMMARY

Task Number	Task Name
1	Excavate Soil
2	Pump Groundwater
3	Sample Soil & Groundwater
4	Clean Water Storage Tank

Mechanical Hazards

X Follow standard safety procedures for working around heavy equipment.

X Stand out of reach of backhoe buckets, etc.

X Verify that all equipment is in good condition.

18. REQUIRED PERSONAL PROTECTIVE EQUIPMENT

Place the task number from Section 17 next to each item of ~~personal protective equipment~~ required for that task:

LEVEL: ___A ___B ___C X D

HEAD

X Hardhat

EYE/FACE

X Safety Glasses ___ Face Shield

___ Goggles

HAND

___ Neoprene X Nitrile ___ PVC

___ Viton ___ Underglove ___ Other _____

BODY NA

___ Full Encapsulating Suit: _____

___ Two Piece rainsuit, material = _____

___ One Piece Splash Suit, material = _____

___ Tyvek suit ___ Tyvek/Saranax suit ___ Tyvek/polyethylene suit

LUNG NA

___ SCBA (open circuit, pressure demand): _____

___ Full Face Respirator, cartridge = _____

___ Half Mask Respirator, cartridge = _____

___ Other: _____

EAR

X Earplug, type = Single Use Foam

or

X Earmuff, type = _____

FOOT

X Boots, type = Steel Toe

___ Disposable Overboots, type = _____

Electrical Hazards

X. Locate and mark buried utilities before drilling.
__. Utilities located by: USA on 4/99
X. Maintain at least 10 foot clearance from overhead power lines.
__ Contact PG&E for minimum clearance from high voltage power lines.
X If unavoidably close to buried or overhead power lines, have power turned off, with circuit breaker locked and tagged.
X Properly ground all electrical equipment.
X Avoid standing in water when operating electrical equipment.
X If equipment must be connected by splicing wires, make sure all connections are taped.
X Be familiar with specific operating instructions for each piece of equipment.

Chemical Hazards

X Use personal protective equipment indicated in section 18.
X Conduct air monitoring to evaluate respiratory and explosion hazards (list instrument action level, monitoring location, and action to be taken in section 19).

Temperature Hazards

X When temperature exceeds 70°F, take frequent breaks in shaded area. Unzip or remove coveralls during breaks. Have water or electrolyte replenishment solution available in squeeze bottles. Drink small amounts frequently to avoid dehydration. If pulse does not return to normal by end of break, reduce length of work periods and increase frequency of breaks.

Acoustical Hazards

X Use earplugs or earmuffs when noise level prevents conversation in normal voice at distance of three feet.

O_2 Deficiency - Confined Space Hazards

Confined spaces include trenches, pits, sumps, elevator shafts, tunnels, or any other area where circulation of fresh air is restricted or ability to readily escape from the area is restricted:

X Monitor O_2 and organic vapors before entering. If following values are exceeded, do not enter:

- O_2 less than 19.5 percent.
- total hydrocarbons greater than 5 ppm above background, if all air contaminants have not been identified.
- concentrations of specific contaminants exceeding action level in Section 19 if all air contaminants are identified.

Monitor O_2 and organic vapors continuously while inside confined space. If values cited in item 1 are exceeded, evacuate immediately.

X Task 4 only If respirator is required, workers must wear safety lines.

X Task 4 only At least one person must be on standby outside the confined space who is capable of pulling workers from confined space in an emergency.

X Task 4 only Use portable fans or blowers to introduce fresh air to confined spaces whenever use of respirator is required.

X Do not enter unshored excavation greater than five feet deep.

___ Radiation Hazards NA

___ Biohazards NA

Action Levels

A. Respiratory protection

Instrument (and Calibration)	Reading	Location	Action
PID	50 ppm	breathing zone	Don respirator (level C)
		breathing zone	Leave area (level C)
		breathing zone	Upgrade to level B
		breathing zone	Upgrade to level A

Explosion Hazard

Instrument (and Calibration)	Reading	Location	Action
Combustible gas indicator	20% LEL	ambient air	Leave area

C. Oxygen Deficiency

Instrument (and Calibration)	Reading	Location	Action
O_2 meter	<19.5% O_2	ambient air	Do not enter area

D. Other

Instrument (and Calibration)	Reading	Location	Action

20. Site Control/Work Zones

Describe location of exclusion zone, hot line, contamination reduction zone, and decontamination area. Show location on site plan.

21. Decontamination Procedures

21a. Equipment Decontamination: Non-Phosphate detergent / Distilled water Rinse

21b. Personnel Decontamination: Non-Phosphate detergent / Potable Water Rinse

22. Investigation-Derived Material Disposal

drill cuttings/well water:

decontamination solutions:

protective clothing:

23. Site Resources

drinking water supply:

telephone:

radio:

other: Cellular Telephone

24. Emergency Equipment Location

safety shower/eyewash: Artesian Support Vehicle

first aid kit: "

other: "

25. Emergency Telephone Numbers

ambulance: 911

police: "

fire department: "

hospital: "

client contact:

26. Emergency Routes: Attach map showing route to nearest hospital.

27. Contingency Plans: Describe contingency plans for emergencies, including emergency signals and evacuation routes. If formal contingency plan document has been prepared, attach a copy.

28. Project Personnel List and Safety Plan Distribution Record

28a. Employees

All project staff must sign, indicating receipt of copy of approved safety plan.

Name	Responsibility	Signature and Date
P. Jones	Foreman	
E. Svoboda	Equipment Operator	
S. Armbruster	Equipment Operator	

28b. Subcontractors

Copy of safety plan must be distributed to all subcontractors.

Firm Name	Responsibility	Date Distributed

JOB SAFETY PLAN APPENDIX 1

HAZARDOUS PROPERTY INFORMATION

This appendix contains hazardous property information for selected compounds. Place a check mark next to each compound identified in Section 15, and review the hazardous property information for those compounds. If you have identified compounds in Section 15 that are not listed in the appendix, you must list the compounds and enter the appropriate information.

(Include copies of Material Safety Data Sheets for selected compounds in addition to or in lieu of completion of Appendix 1.)

HAZARDOUS PROPERTY INFORMATION

CHECK IF PRESENT	MATERIAL	WATER SOLUBILITY a	SPECIFIC GRAVITY	VAPOR DENSITY	FLASH POINT of	VAPOR PRESSURE e	LEL UEL	LD 50 mg/kg	TLV-TWA g	IDLH LEVEL	ODOR THRESHOLD OR WARNING CONCENTRATION	HAZARDOUS PROPERTY	DERMAL TOXICITY	ACCUTE EXPOSURE SYMPTOMS
	1,1-Dichloroethylene (DCE)	2250mg/l @77of	--	3.4	3	591mm	7.3% 16.0%	200	5ppmh	none specified		BCD		BIMN
	Trans-1,2-Dichloroethylene	slightly soluble	1.2565	--	36	400mm	9.7% 12.8%		none established	none specified	.0043mg/l	BCD		ABFILOQ
	1,2 Dichloropropane	0.26%	1.1583	3.9	60	40mm	3.4% 14.5%	1900	75ppm	2,000ppm	50	BCD		ABGKIEHNQ
	Cis-1,3-Dichloropropene	Insoluble	1.2	3.8	83	28mm	5% 14.5%		1ppmh	none specified		BCD		ABGIKLMNP
	Trans-1,3-Dichloropropene	Insoluble	1.2	3.8	83	28mm	5% 14.5%		1ppmh	none specified		BCD		ABGIKLMNP
	Ethylbenzene	0.015g	0.867	3.7	59	7.1mm	1.0% 6.7%	3500	100ppm	2,000ppm		BCD	CIF	ABFKIKLMNPOR
	Methylene Chloride	slightly soluble	1.335	2.9	none	350mm	12%c unavailable	167	100ppmh	5,000ppm	25-320 (200)	CED	CIF	BCIKLMNPR
	1,1,2,2-Tetrachloroethane	0.19%	1.5953	5.8	none	5mm	non flam		1ppmh	150ppm	3-5	CD		ABCFKIKLMNOQ
	Tetrachloroethylene	0.15g/ml	1.6227	5.8	none	15.8mm	non flam	8850	50ppmh	500ppm	4.68%-50 (160-690)	CD		ACFKIKLMNP
	1,1,1-Trichloroethane (TCA)	0.7g	1.3390	4.6	none	100mm	8.0%c 10.5%	10300	350ppm	1,000ppm	20-400 (500-1000)	BCED		ABEFKIKLMOP
	1,1,2-Trichloroethane	0.45	1.4397	4.6	none	19mm	6%c 15.5%	1140	10ppm	500ppm	-0-	C		BEFGHIKMNOP Q
	Trichloroethylene (TCE)	0.1%	1.4642	4.5	90d	58mm	12.5% 90%	4920	50ppmh	1,000ppm	21.4-400	BC		BFKLMOPQ
	Trichlorofluoromethane	0.11g	1.496	--	none	0.91atm	non flam		1000ppm	10,000ppm	135-209	CD		BFMKLQ
	Toluene	0.05g	0.866	3.2	40	22mm	1.3% 7.1%	5000	100ppm	2,000ppm	0.17-40 fatigue (300-400)	BC	BNE	BEFKIKLMNOPQ
	Vinyl Chloride	negligible	0.9100	2.24	-108	3.31atm	3.6% 33%	500	1ppm	none specified	260	BCEQ	DJG	ABFKIKLNR

HAZARDOUS PROPERTY INFORMATION

CHECK IF PRESENT	MATERIAL	WATER SOLUBILITYa	SPECIFIC GRAVITY	VAPOR DENSITY	FLASH POINT oF	VAPOR PRESSUREe	LEL UEL	LD 50 mg/kg	TLV-TWAg	IDLH LEVEL	ODOR THRESHOLD OR WARNING CONCENTRATION	HAZARDj PROPERTY	DERMAL TOXICITY	ACCUTEI EXPOSURE SYMPTOMS
VOLATILE ORGANIC PRIORITY POLLUTANTS														
	Acrolein	22%	0.8410	1.9	-15	214mm	2.8% 31%	46	0.1ppm	5ppm	0.1-16.6 (0.21-0.5)	BCED	BJ	ABDFGHIKLMNO PQR
	Acrylyonitrile	7.1%	0.8060	1.8	30	83mm	3% 17%	82	2ppm	4,000ppm	19-100	BCEGD	DIG	FGIKLMNOR
	Benzene	820ppm	0.8765	2.8	12	75mm	0.339% 7/1%	3800	11ppm	2,000ppm	4.68	BCGD	CIG	BCDFRIKLMNOQ R
	Bromomethane	0.1g	1.732	3.3	none	1.88atm	13.5%c 14.5%		5ppmh	2,000ppm	no odor	CD		BCDEIJKLMNOQ R
	Bromodichloromethane	Insoluble	1.980	--	none	n/a	non flam	916	none established	none specified		CGD		BIMN
	Bromoform	0.01g	2.887	--	none	5mm	non flam	1147	0.5ppm	n/a	530	CED		BCDIOMN
	Carbon Tetrachloride	0.08%	1.5967	5.3	none	91mm	non flam	2800	5ppmh	300ppm	21.4-200	CD	JGR	ABCFGMONQ
	Chlorobenzene	0.01g	1.1058	3.9	84	8.8mm	1.3% 9.6%	2910	75ppm	2,400ppm	0.21-60	BCD	CIF	BCFIKLMNOPQR
	Chloroethane	0.6g	0.8978	2.2	-58	1.36atm	3.8% 15.4%		1000ppm	20,000ppm		BCD		BFNIEMNP
	2-Chloroethylvinyl Ether	Insoluble	1.0475	3.7	80	30mm	--	250	none established	none specified		BCD		RIM
	Chloroform	0.8g	1.4832	4.12	none	160mm	non flam	800	10ppmh	1,000ppm	50-307 fatigue (>4096)	CD		BCEGIKLMN
	Chloromethane	0.74%	0.9159	1.8	32	50atm	7.6% 19%		50ppmh	10,000ppm	10-100 no odor (500-1000)	BCD	DNF	ABCDEFGIJKLO QR
	Dibromochloromethane	Insoluble	2.451	--	--	--	--	848	none established	none specified		BCD		BFXIMNPQ
	1,1-Dichloroethane (DCA)	0.1g	1.1757	8.4	22	182mm	6% 16%	725	100ppm	4,000ppm	5ppm	BCD		ABNIMNO
	1,2-Dichloroethane	0.8%	1.2554	3.4	55	87mm	6.2% 16%	670	10ppmh	1,000ppm	6ppm	BCDG		BCFGOLMNQ

HAZARDOUS PROPERTY INFORMATION

CHECK IF PRESENT	MATERIAL	WATER SOLUBILITYa	SPECIFIC GRAVITY	VAPOR DENSITY	FLASH POINT oF	VAPOR PRESSUREa	LEL UEL	LD 50 mg/kg	TLV-TWAg	IDLH LEVEL	ODOR THRESHOLD OR WARNING CONCENTRATION	HAZARDJ PROPERTY	DERMAL TOXICITY	ACCUTEL EXPOSURE SYMPTOMS
MISCELLANEOUS														
	Asbestos	insoluble	2.5	n/a	none	n/a	non flam		0.2 2 fibers/cc	none specified		CG		RM
	Cyanides	58-72%		n/a	none	n/a	non flam		5mg/m3	50mg/m3		CE		FKLRPQ
	PCB (Generic)	slightly	--	n/a	none	n/a	non flam		1.0ug/m3	none specified		CG		CKLPQ
	Phenol	8.4%	1.0576	3.2	175	0.36mm	1.8% 8.6%	414	5ppm	100ppm	0.47-5 (48)	C		ABCDGIJKMOOR
	Xylene	0.00003%	0.8642	3.7	84	9mm	1.1% 7%	5000	100ppm	10,000ppm	0.5-200 (200)	BCD		ABFHIKLMNPQ
	Acetone	soluble	0.8	2.0	-4	400mm	2.6% 12.8%	9750	750ppm	10,000ppm	100	BCD	D1	R
	Chromic Acid	soluble	1.67-2.82	n/a	none	n/a	non flam		none established	none specified		ACEG		GIM
	Diesel Fuel	insoluble	0.81-0.90	--	130	--	0.6-1.3 6-7.5		none established	none specified	0.08	BC	ABC	IN
	Gasoline	insoluble	0.72-0.76	3-4	-45	variable	1.4% 7.6%		300ppm	none specified	0.005-10 a 0.25	CD	AB	IN
	Kerosene	insoluble	0.83-1.0	--	100-165	5	0.7% 5.0%		none established	none specified	1.0	BCD	AB	IN

HAZARDOUS PROPERTY INFORMATION

CHECK IF PRESENT	MATERIAL	WATER SOLUBILITY[a]	SPECIFIC GRAVITY	VAPOR DENSITY	FLASH POINT oF	VAPOR PRESSURE[e]	LEL UEL	LD 50 mg/kg	TLV-TWA[g]	IDLH LEVEL	ODOR THRESHOLD OR WARNING CONCENTRATION	HAZARD PROPERTY	DERMAL TOXICITY	ACCUTE EXPOSURE SYMPTOMS
METALS														
	Arsenic	b	5.727	n/a	none	n/a	f		10ug/m3	none specified		CEG	CJG	ACDGJMOOR
	Beryllium	b	1.85	n/a	none	n/a	f		2ug/m3	none specified		C		IJMNR
	Cadmium	b	8.642	n/a	none	n/a	f	225	0.5mg/m3	40/mg3		C		ABGRIELMNOR
	Chromium	b	7.20	n/a	none	n/a	f		0.5mg/m3h	500/mg3		C		FMNQ
	Copper	b	8.92	n/a	none	n/a	f		0.1mg/m3	none specified		C		FGIJMOOR
	Lead	b	11.3437	n/a	none	n/a	f		50ug/m3	none specified		C		ACDFGKOOR
	Mercury	b	13.5939	7.0	none	0.0012mm	f		50ug/m3h	28mg/m3		C		AGLMNQ
	Nickel	b	8.9	n/a	none	n/a	f		1mg/m3	none specified		C		DGNLMNQ
	Silver	b	10.5	n/a	none	n/a	f		0.01mg/m3	none specified		C		IN
	Thallium	b	11.85	n/a	none	n/a	f		0.01mg/m3	20mg/m3		C	BQ	ADGLNOQ
	Zinc	b	7.14	n/a	none	n/a	f		none established	none specified		C		DF

k. Dermal Toxicity data is summarized in the following three categories:

Skin Penetration

-	A	-	negligible penetration (solid-polar)
+	B	-	slight penetration (solid-nonpolar)
++	C	-	moderate penetration (liquid/solid-nonpolar)
+++	D	-	high penetration (gas/liquid-nonpolar)

Systemic Potency

E - slight hazard - LD_{50} = 500-15,000 mg/kg
lethal dose for 70 kg man = 1 pint-1 quart

F - moderate hazard - LD_{50} = 50-500 mg/kg
lethal dose for 70 kg man = 1 ounce-1 pint

G - extreme hazard - LD_{50} = 10-50 mg/kg
lethal dose for 70 kg/man = drops to 20 ml

Local Potency

H - slight - reddening of skin
I - moderate - irritation/inflamation of skin
J - extreme - tissue destruction/necrosis

l. Acute Exposure Symptoms

A - abdominal pain
B - central nervous system depression
C - comatose
D - convulsions
E - confusion
F - dizzyness
G - diarrhea
H - drowsiness
I - eye irritation
J - fever
K - headache
L - nausea
M - respiratory system irritation
N - skin irritation
O - tremors
P - unconsciousness
Q - vomiting
R - weakness

HAZARDOUS PROPERTY INFORMATION

EXPLANATIONS AND FOOTNOTES

Water solubility is expressed in different terms in different references. Many references use the term "insoluble" for materials that will not readily mix with water, such as gasoline. However, most of these materials are water soluble at the part per million or part per billion level. Gasoline, for example, is insoluble in the gross sense, and will be found as a discreet layer on top of the ground water. But certain gasoline constituents, such as benzene, toluene, and xylene will also be found in solution in the ground water at the part per million of part per billion level.

a. Water solubility expressed as 0.2g means 0.2 grams per 100 grams water at $20^{o}C$.

b. Solubility of metals depends on the compound in which they are present.

c. Several chlorinated hydrocarbons exhibit no flash point in conventional sense, but will burn in presence of high energy ignition source or will form explosive mixtures at temperatures above $200^{o}F$.

d. Practically non-flammable under standard conditions.

e. Expressed as mm Hg under standard conditions.

f. Explosive concentrations of airborne dust can occur in confined areas.

g. Values for Threshold Limit Value-Time Weighted Average (TLV-TWA) are OSHA Permissable Exposure Limits except where noted in h and i.

h. TLV-TWA adopted by the American Conference of Governmental Industrial Hygienists, which is lower than the OSHA PEL.

i. TLV-TWA recommended by the national Institute for Occupational Safety and Health (NIOSH). A TLV or PEL has not been adopted by ACGIH or OSHA.

j.
A - corrosive
B - flammable
C - toxic
D - volatile
E - reactive
F - radioactive
G - carcinogen
H - infectious

SAFETY AND HEALTH COMPLIANCE PROCESS

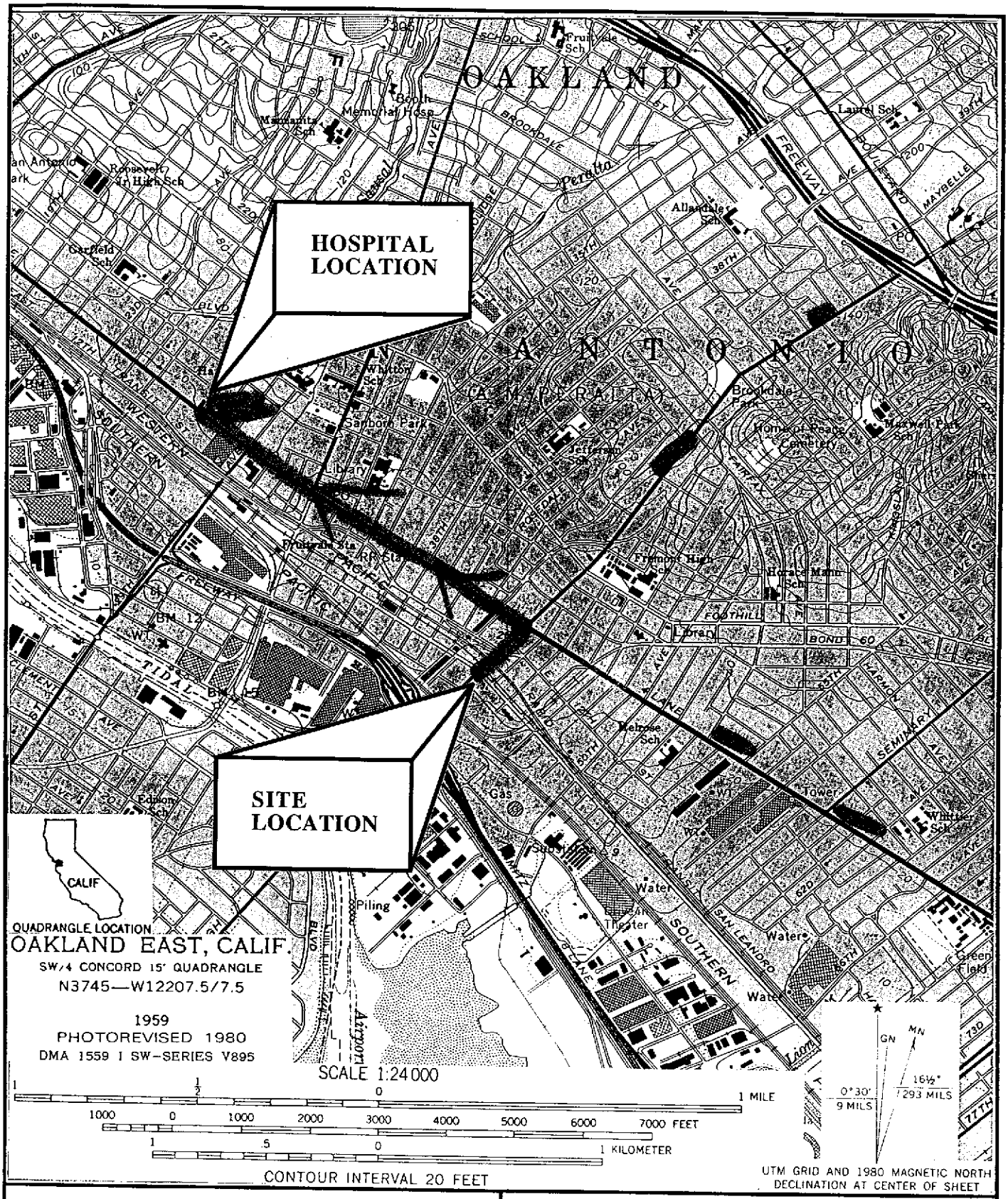
Disciplinary measures are progressive and involve four steps:

1. Should a safety and health violation be noted, the supervisor is to informally discuss the behavior with the employee, stating the potential dangerous result and outlining the correct procedure, then retrain the employee to ensure understanding.

2. A second violation should generate either a formal verbal warning or a written warning to the employee, depending on the severity.

3. The third infraction results in a formal written warning or suspension of the employee.

4. A fourth violation may lead to employee termination.



ARTESIAN ENVIRONMENTAL 229 Tewksbury Avenue Point Richmond, California 94801 Phone (510) 307-9943 Fax (510) 232-2823	**HOSPITAL ROUTE MAP** Eagle Gas 4301 San Leandro Street Oakland, California

Project No.:422-001-01	Date: 05/26/99	Prepared by: P. Jones	Figure 1

ATTACHMENT C:
STANDARD OPERATING PROCEDURES

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ARTESIAN SAMPLING TECHNIQUES

Artesian Environmental Consultants has adopted the following sampling techniques in order to facilitate the collection of accurate and reliable data. Environmental data collected during field activities shall be collected and analyzed according to the following procedures described below:

EQUIPMENT DECONTAMINATION

Prior to arriving at the sampling site, all reusable sampling equipment will be cleaned with phosphate free detergent, and rinsed twice with distilled water. This procedure will be carried out on-site prior to and between sampling. All equipment will be inspected for soils, greases, oils, and visible residues prior to use, and the residues, if found, will be removed.

SAMPLE CONTROL

Proper identification, preparation, packaging, handling, shipping and storage of samples obtained in the field will be the responsibility of field personnel. Samples will be readily identifiable and as representative as possible of in situ conditions.

Sample Labels

Each sample container will be labeled at the time of collection. The label will be attached to the individual sample containers. The label will contain the following minimum information:

- Project name and number
- Date and time of collection
- Name of collector
- Sample number
- Location of sample collection (i.e. boring and depth, or well number)
- Preservation or special handling employed

Chain-of-Custody Request for Analysis

A chain-of-custody form for each sample and container will be used to track possession of the samples from the time they were collected in the field until the time they are analyzed in the laboratory. The chain-of-custody form will contain the following minimum information:

- Project name and number
- Name and signature of collector
- Date and time of sample collection
- Number of containers in a sample set
- Description of sample and container(s)
- Name and signatures of persons who are involved in the chain-of-custody
- Inclusive dates and times of possession
- Type of analysis requested

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Sample Selection, Preparation, Packaging, and Handling

Excavated soil is screened and segregated in the field using a vapor analyzing device such as a photoionization detector (PID) or equivalent instrument. After the removal of soil having obvious staining, odor, or detectable levels of organic vapors as detected on a PID or similar instrument, confirmational soil samples from the walls and/ or floor of the excavation will be selected at intervals of 20 linear feet of wall or 400 square feet of excavation floor. Additional samples may be selected on the recommendation of the onsite geologist or regulator. All sampling will be performed using the bucket of an onsite backhoe or excvator.

Soil samples will be collected in brass or stainless steel tubes. Tube ends will be covered with Teflon tape and plastic end caps, labeled, and sealed in locking plastic bags. Groundwater samples will be placed in laboratory supplied containers which are compatible with the requested analysis. Samples will be placed into a cooler containing chemical ice. Padding (i.e. bubble wrap, foam) will be employed to prevent glass breakage.

Sample Delivery to Laboratory

The samples will be delivered to a state certified laboratory under chain-of-custody within 48 hours of sampling. Samples will be maintained at approximately 4 ° Celsius for shipping. Shipping containers will be sealed with security tape to assure sample integrity during shipping. The chain-of-custody will accompany record the delivered samples.

SOIL SAMPLING PROTOCOL

All soil samples are collected in accordance with California Regional Water Quality Control Board (RWQCB) procedures described in the Leaking Underground Fuel Tank (LUFT) Field Manual, the Tri-Regional Board Staff Recommendations for Preliminary Evaluation and Investigation of Underground Tank Sites (Tri-Regional Guidelines), and local regulatory guidelines.

Standard U.S. Environmental Protection Agency (EPA), RWQCB, and California EPA methodologies for sampling and analysis are routinely utilized. Where required, a workplan and permit application will be submitted to and approved by the lead regulatory agency prior to commencing drilling or excavation activities.

GROUNDWATER SAMPLING

Because volatile organic compounds (VOCs) may be lost if the sample is aerated, vials for VOC analysis (40 ml) will be filled using a restricted flow dispenser at the end of the bailer to minimize sample agitation. The vials will be filled above the top of the opening to form a positive meniscus. No head space will be present in the vial once it is sealed. After the vial is capped, it will be inverted to check for air bubbles. If bubbles are present, the sample will be discarded and replaced. If it is not possible to collect a sample without air bubbles, the problem will be noted in the daily field log.

Where several types of analyses are to be performed for a given sample, individual containers will be collected in the following order:

- Volatile organic compounds
- Purgeable organic compounds
- Purgeable organic halogens
- Total organic compounds
- Total organic halogens
- Extractable organic compounds
- Total metals
- Dissolved metals
- Phenols
- Cyanide

QUALITY CONTROL OF GROUNDWATER SAMPLES

A QC program which is independent from the laboratory's program will be maintained. This program includes the submittal of duplicates, field blanks, and travel blanks to the laboratory. No spiked samples will be supplied from the field. The QC samples will be packaged and sealed in the same manner as the other samples.

To ensure sample integrity, Artesian personnel adhere to the following procedures in the field:

A new, clean pair of latex or nitrile gloves are put on prior to sampling each location.

Wells are gauged and purged and groundwater or soil samples are collected in the expected order of increasing degree of contamination based on historical analytical results or field screening.

All sampling equipment will be thoroughly decontaminated between each location.

- During groundwater sample collection for volatile organic analysis, the amount of air passing through the sample is minimized. This helps prevent the air from stripping the volatiles from the water. Sample bottles are filled by slowly running the sample down the side of the bottle until there is a convex meniscus over the mouth of the bottle. The lid is carefully screwed onto the bottle such that no air bubbles are present within the bottle. If a bubble is present, the cap is removed and additional water is added to the sample container. After resealing the sample container, if bubbles still are present inside, the sample container is discarded and the procedure is repeated with a new container.

Laboratory and field handling procedures may be monitored, if required by the client or regulators, by including quality control (QC) samples for analysis with the groundwater samples. Examples of different types of QC samples are as follows:

- Trip blanks are prepared at the analytical laboratory by laboratory personnel to check field handling procedures. Trip blanks are transported to the project site in the same manner as the laboratory-supplied sample containers to be filled. They are not opened, and are returned to the laboratory with the samples collected. Trip blanks are analyzed for purgable organic compounds.

- Equipment blanks are prepared in the field to determine if decontamination of field sampling equipment has been effective. The sampling equipment used to collect the groundwater samples is rinsed with distilled water which is then decanted into laboratory-supplied containers. The equipment blanks are transported to the laboratory, and are analyzed for the same chemical constituents as the samples collected at the site.

- Duplicates are collected at the same time that the standard groundwater samples are being collected and are analyzed for the same compounds in order to check the reproducibility of laboratory data. They are typically only collected from one well per sampling event. The duplicate is assigned an identification number that will not associate it with the source well.

Generally, trip blanks and field blanks check field handling and transportation procedures. Duplicates check laboratory procedures. The configuration of QC samples is determined by Artesian depending on site conditions and regulatory requirements.

Artesian assesses the quality control data provided with certified analytical laboratory reports for compliance within prescribed limits.

Duplicates

If appropriate, duplicate samples will be collected for approximately five percent (1 in 20) of the samples or one per sampling round, whichever is greater. The duplicate sample will be submitted to the laboratory for the same analyses as the original sample. The duplicate sample is acquired by filling separate containers from the same well bailer as the actual sample. The contents of the bailer will be evenly divided between the actual and duplicate samples, to insure duplication. The duplicate sample will be labeled as a duplicate without identifying the well location on either the chain-of-custody or the sample container. The well location and sample number of the duplicate sample will be noted on the Water Sampling Data Form.

Field Blanks

If appropriate, field blanks will be prepared for either five percent (1 in 20) of the samples or one per sampling set, whichever is greater. The field blank will be submitted to the laboratory for the same analyses as the rest of the sampling set. The field blank will be acquired by dispensing deionized water from the sampling bailer into the containers in the same manner as groundwater samples. The field blank will be assigned an independent sample number.

Travel Blanks

When sampling groundwater for volatile compounds analysis, travel blanks will be used if appropriate to detect the introduction of contaminants during transportation from the filed to the laboratory. The travel blank will be supplied by either Artesian or the laboratory. The travel blank will be taken to the field, and will accompany the collected groundwater samples to the laboratory for analysis. The travel blank will consist of deionized water. The travel blank will be assigned an independent sample number.

Sample Preservation

All samples will be preserved for certain analyses, as appropriate, and placed in coolers immediately following collection. Sealed chemical ice will be placed in the coolers to maintain samples at a temperature of 4 ° Celsius.

REFERENCES

American Society for Testing Materials (ASTM), 1984; Standard Practice for Description and Identification of Soils (Visual-Manual Procedure), Method D 2488-84, December 1984.

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