

LETTER OF TRANSMITTAL

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Phone: (805) 835-7700 FAX: (805) 835-7717

TO: Ms. Eva Chu DATE: <u>July 23, 1993</u> Alameda County Department of Scotsman Corporation RE: 6055 Scarlett Court Environmental Health 80 Swan Way, Room 200 Dublin, California Oakland, CA 94621 Site Closure Report, 7/20/93 WE ARE SENDING YOU X Attached Under separate cover via ______ the following: Site Assessment Report ☐ Closure Report ☐ Workplan for Site Assessment Proposal ☐ Preacquisition Site Assessment X Site Closure Report ■ THESE ARE TRANSMITTED as checked below: ▼ For approval ☐ As requested For review and comment ☐ For your use FOR BIDS DUE_____19__ REMARKS Enclosed you will find the above mentioned report for your use. If you should have any questions, please do not hesitate to call me at (805)835-7700. COPY TO: Mr. Rich Hiett, Regional Water Quality Control Board Mr. Pete Fagrell, First Interstate Bank of California Ms. Tommi Lee Gill, First Interstate Bank of California

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1500 So. Union Avenue Bakersfield, California 93307 Phone: (805) 835-7700 FAX: (805) 835-7717

> SCOTSMAN CORPORATION 6055 Scarlett Court Dublin, California

> > SITE CLOSURE REPORT July 20, 1993

Report Prepared for:
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REN 6-30-94

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1.0 INTRODUCTION

This report is a compilation of the environmental assessment and remedial work performed at the property located at 6055 Scarlett Court, Dublin California. This report will list the site work performed and a summary of the results. Based on the information collected throughout the project and other supplemental data, a recommendation is made for case closure of the site.

2.0 SITE DESCRIPTION

The project site is located at the former Scotsman Corporation facility located at 6055 Scarlett Court in Dublin California (Plate 1). The site is situated in a commercial/industrial district and occupies approximately 7.5 acres. It is estimated that 1/4 to 1/3 of the site covered with concrete or asphalt. The property is bounded to the West by a drainage canal and to the South by Scarlett Court, which parallels the Interstate 580 Freeway. Adjacent properties include active commercial retail businesses and unoccupied industrial sites.

3.0 PREVIOUS WORK

On October 23, 1987, two 500 gallon underground gasoline storage tanks were removed from the site by Geonomics Inc. The water table was observed near the tank bottoms at six and one-half feet. During the removal, corrosion was noted on the tanks and one of the tanks was described as having a hole by the fill point. Laboratory analysis of soil samples collected during the removal reported substantial levels of hydrocarbons. Based on this preliminary assessment, the Alameda County Department of Environmental Health ordered a site investigation.

On December 9, 1988, Groundwater Resources, Inc. (GRI), now RESNA Industries Inc. (RESNA), performed a preliminary site investigation to determine if the soil and groundwater around the former tank locations had been impacted. It was determined that the soil around the tanks had minimal impact, however the groundwater below was reported to have significant levels of hydrocarbons. This report was submitted to the Alameda County Department of Environmental Health (GRI, Jan. 19, 1989). The Department requested that further work be performed to establish aquifer characteristics and further define the extent of the groundwater hydrocarbon plume. On May 24, 1989, GRI constructed a series of groundwater monitoring wells to determine the groundwater gradient and to assess the extent of downgradient hydrocarbon migration. The report titled "Site Characterization Report, June 30, 1989" stated that the hydrocarbon plume had migrated downgradient of the tank location. The report recommended the drilling of a series of boreholes to the groundwater around the suspected plume to collect water samples and determine the lateral extent of the plume. An addendum to the report was sent to Alameda County recommending that one of the downgradient boreholes be completed as a monitoring well. Verbal approval of the plan was received on October 3, 1989. This phase of the site characterization was completed on November 30, 1989. A report titled "Site Characterization Report and Remediation Plan, December 20, 1989" was submitted to the Alameda County Department of Environmental Health. The report demonstrated that the plume had been defined and recommended the installation of a recovery well and startup of groundwater remediation (Plates 2&3). Approval of the plan was received on January 23, 1990.

Full operation of the treatment system began on April 13, 1990. On June 6, 1991, the installation of two additional recovery wells was proposed. The wells RW-2 and RW-3 were installed on July 18, 1991. A subsequent review of the project showed that the groundwater plume had been reduced to a small area around MW-1, MW-6 and RW-2 (see Plate 4).

On April 13, 1992, a plan was submitted for the over excavation of the soil around the three affected monitoring wells. The excavation of the soil was completed on August 20, 1992. Approximately 75 cubic yards of clean soil and 50 yards of contaminated soil were removed. Three groundwater monitoring wells were abandoned during the excavation. MW-1 and MW-6 were completely removed while RW-2 was filled with bentonite and the well casing was removed from the bottom of the excavation to the surface. Soil samples collected from the sidewalls of the excavation were below detection levels. A four point composite sample was collected from the clean pile for every twenty cubic yards of soil. Since the clean pile contained approximately 75 cubic yards of soil, four composite samples were collected and analyzed for BTX&E and TPH gasoline constituents. The hydrocarbon concentrations for these samples were also reported to be below detection levels. A four point composite sample was also collected from the contaminated soil pile. This sample was analyzed for BTX&E, TPH gasoline, Toxicity Characteristic Leaching Procedures (TCLP) for BTX&E, Soluble Threshold Limit Concentration (STLC) and Corrosivity, Ignitability and Reactivity. The reported concentration for TPH gasoline was 10 ppm, 0.018 ppm for Ethylbenzene, and 0.055 ppm for Total Xylenes. The results of the other analyses were reported to be below detection levels or action levels. Since the concentration in the soil was only 10 ppm, it was decided that spread aeration of the soil would be the most economical method for remediation. On August 27, 1992, approval was sought from the Alameda County Department of Environmental Health for the aeration of the soil. Approval was received from Mr. Scott Seery for the aeration of the soil and the backfilling of the excavation. It was stipulated that the excavation should be backfilled with clean imported soil first. The clean soil previously excavated would be used to fill the remainder of the excavation. The Bay Area Air Quality Management District (BAAQMD) was notified of the proposed soil aeration. A representative of the BAAQMD stated that it was not necessary to obtain a permit for any soil containing less than 50 ppm. On September 9, the excavation was backfilled and the contaminated soil was spread on the vacant land at the site. The soil was spread to an average thickness of 6 inches (RESNA, September 14, 1992).

Upon completion of the over excavation, groundwater extraction was discontinued. A groundwater monitoring report for the third quarter of 1992 was submitted to Alameda County on December 1, 1992. The report showed the results of the latest monitoring event and requested closure of the site based on the historic record of clean analysis for the remaining wells. A letter from Alameda County, dated January 6, 1993, stated that closure cannot be recommended until it is shown that MW-5, MW-7, RW-1 or RW-3 are in a verified downgradient location.

In the Fourth Quarter Monitoring Report, March 8, 1993, the results of the analysis for February 1993 were reported to be below detection. The results of the analysis indicated that all the wells in the vicinity of the former plume location remain clean. It was also shown that the groundwater elevations recorded for February 1993 were the highest since March 1990. Gradient calculation showed that at least three wells are located in the downgradient direction from the former plume location. Closure was recommended based on the data showing that the last five Quarterly Reports for the wells remaining near the plume location had shown that hydrocarbon concentration have remained below California drinking water standards since September 1991 (Table 1). A letter from Alameda County,

dated March 17, 1993, stated that closure could not be recommended and monitoring should continue. A subsequent letter from Alameda County, April 15, 1993, stated that closure would be considered after either three consecutive monthly or two consecutive quarterly sampling events are performed. Three sampling events were performed on April 27, 1993, May 27, 1993, and July 2, 1993. The results of the analysis are included in this report.

						······································	<u></u>	<u>.</u>
DATE	MW-2	MW-3	MW-4	MW-5	MW-7	MW-8	RW-1	R
Benzene (p	dqq							
TPH(ppb)								
9/17/91	ND	ND	NA	ND	ND	ND	ND	N
	ND	ND	NA	ND	ND	ND	ND	N
4/23/92	ND	ND	ND	ND	ND	ND	ND	1
	ND	ND	ND	110	ND	ND	ND	N
7/10/92	ND	ND	ND	ND	ND	ND	ND	N
	ND	ND	ND .	ND	ND	ND	ND	N
10/21/92	ND	ND	ND	ND	ND	ND	ND	N
	ND	ND	ND	ND	ND	ND	ND	N
2/11/93	NA	NA	NA	ND	ND	NA	ND	N
	NA	NA	NA	ND	ND	NA	ND	N
2200			NA = Not Ana	lyzed; ND = N	o Detection			
127175				NO	ND		-NO	-/
7-2-93				NO	NO		NO	N
ノーシニンノ	ATIVE ME			NO	ND		NO	

The investigation of the soil and groundwater at the project site utilized drill rigs for soil borings, soil sample collection and the installation of monitoring wells. Typically a Mobil Drill B53 or B61 rig was used on all soil borings and well installations using either six-inch solid stem augers or eight- to twelve-inch hollow stem augers. A total of 14 soil borings and 11 groundwater monitoring wells were constructed during the investigation and cleanup of the site.

4.1 Soil Borings and Sampling

All borings were made in the area of the tank excavation using either six-inch solid stem or eight-inch, hollow-stem continuous flight augers. Core samples were obtained with a two and one-half inch diameter California modified split spoon sampler. All cores were described as they were acquired and a log of each boring was prepared (see Boring and Well Logs, Appendix C). The undisturbed cores selected for laboratory analysis were immediately sealed inside the brass tubes with Teflon lined plastic end-caps and integrity tape. All samples were immediately labeled and placed on ice. A Chain of Custody was maintained for the samples transported to the laboratory for analysis. The augers were steam cleaned and the core-samplers were washed and rinsed after each use to avoid cross-contamination (see Sampling Protocol, Appendix D).

4.2 Monitoring Well Construction

All monitoring wells were constructed using eight-inch hollow-stem augers. Typically each boring was drilled to a depth five to ten feet below groundwater. Two-inch and four-inch PVC well casing was installed in the boring with ten to fifteen feet of slotted casing. Clean filter pack sand was placed in the annulus of the boring up to two feet above the top of the slotted casing. A bentonite seal was then placed from the top of the sand to approximately one foot below grade. A flush mounted traffic box was placed over each well for security. Each well was developed by surging and bailing until relatively few fines were produced.

4.3 Groundwater Sampling

Each groundwater monitoring well sampled was purged a minimum of three well volumes or until dry according to the attached Sampling Protocol, Appendix D. Samples were collected using disposable bailers and placed in 40 ml VOA bottles for analysis. Each sample was labeled, chilled and transported, under a Chain of Custody, to a State Certified laboratory for analysis. A duplicate sample was collected from each well. A travel blank was provided to determine whether cross contamination may have occurred during transport.

4.4 Analytical Methods

Soil and water samples were analyzed per California DOHS LUFT Manual recommendations using EPA Method 5030/8015/8020. Samples were analyzed for gasoline constituents Benzene, Toluene, Ethyl Benzene, Total Xylenes and for Total Petroleum Hydrocarbons.

5.0 EXTENT OF HYDROCARBONS IN SOIL AND GROUNDWATER

5.1 Hydrocarbons in Vadose Soil

All soil samples collected in the vadose zone from each monitoring well and boring were reported to have little or no significant contamination. Since the tanks were situated directly above the water table, all vadose contaminated soil was excavated during the tank removals. No evidence of lateral spread of hydrocarbons in the unsaturated soil was observed.

5.2 Hydrocarbons in Groundwater

A total of nine groundwater monitoring and recovery wells were constructed in the vicinity of the former tank locations. In addition, seven borings were drilled to a depth of five feet below the water table. Water samples were collected from these borings to help determine the extent of the hydrocarbon plume (Plate 4). The only samples to have detectable concentrations of hydrocarbons were in MW-1, MW-6, MW-5, RW-1, RW-2, RW-3 and in borings B-8 and B-9. The extent of the groundwater plume was therefore defined to an area of approximately 1250 ft2. The highest recorded concentrations of Benzene and Total Petroleum Hydrocarbons in the groundwater were 1000 ppb and 72,000 ppb respectively.

6.0 GEOLOGY AND HYDROLOGY

The site is situated in the north side of the Livermore Valley which is, in part, the surface expression of a structural fold which underlies it. Alluvium which fills this portion of the valley is from the hills northeast of Dublin. Locally, the sediments are very fine textured, reflecting its source, the relatively soft sedimentary bedrock to the North. Underlying the fine textured surface deposits are Livermore Gravel beds derived from the hills bordering the Valley to the South (University of California Pubs. Geol. Sci. Bull, 1958).

The project area is in the Dublin subbasin, which covers 4,957 acres of land in the northwest portion of the Livermore Valley Ground Water Basin (see Plate 5). The Dublin subbasin is bounded on the West by nonwater-bearing marine sediments. Continental water-bearing sediments of the Tassajara Formation occur along the northwest and northeast boundary. A section of the southern boundary is along the contact between valley-fill materials and the sediments of the Livermore Formation. All other boundaries are fault controlled (California Department of Water Resources, 1974).

The Dublin subbasin is composed of both unconfined and confined aquifers. The shallower, unconfined aquifers, are generally about 20 feet below the ground surface and have a potentiometric surface which slopes southward at about 20 feet per mile. The potentiometric surfaces of the deeper, confined aquifers demonstrate the complexities of a multiple aquifer system. The northern part of the subbasin is about 80 feet below grade and slopes southward at about 30 feet per mile. The southern portion of the subbasin is only about 50 feet below grade and slopes southward at about 20 feet per mile. Aquifers of the subbasin are essentially flatlying. There are, however, local variations which cause dips of up to eight degrees and result in slightly undulating aquifer horizons (California Department of Water Resources, 1974).

The local stratigraphy at the project site displayed the same fine textured sediments described for the region. All soils encountered near the former tank locations are exclusively grayish black to light brownish gray silty clay or clayey silt. Typically, the soil was described as having high plasticity.

7.0 BENEFICIAL USES OF GROUNDWATER

7.1 Well Inventory

A total of four groundwater supply wells have been located within one-half mile of the site (Plate 6). None of the wells are located in the verified down gradient direction from the project site. A well designated 3S1E 6G4 is located on the adjacent property to the north at 6085 Scarlett Ct. This well is reported to be screened from 108 feet to 186 feet and is not currently in use. The well 3S1E 6G6 is located at 6015 Scarlett Ct., to the West of the site. This well is screened from 285 feet to 292 feet. A well designated 3S1E 6G5 is located east of the site. This well is screened from 103 feet to 178 feet. The fourth well is located northeast of the site and has the designation 2S1E 6C5. No information is listed on the screened intervals, however, the well is reported to be for non-consumptive use (Personal communication, Craig Mayfield, Alameda County Flood Control District, July 14, 1993).

7.2 Contaminant Fate Transport

An approximation for the groundwater velocity at the site has been calculated based on information collected throughout the project.

A chart showing the historic water levels in MW-7 is presented on Plate 7. This chart demonstrates that during April 1993, the groundwater was the highest since measurements started in July 1989. A groundwater gradient map was constructed using the April 1993 water elevations (Plate 8). The direction of groundwater flow has consistently trended to the South or Southwest throughout the life of the project. This agrees with the reported regional flow direction as stated in Section 6.0.

Since the April 1993 measurements had the highest calculated gradient, these values were used to calculate a maximum aquifer seepage velocity for the site. Aquifer parameters were calculated using the results of a Slug Test performed on MW-6 in May 1989. From this data, the Conductivity of the aquifer was calculated to be 0.0006482 ft/min. Using a groundwater gradient of 0.52 the Discharge Velocity was calculated to be approximately 176 ft/year (Fetter, 1980, pg. 116). Since the actual plume has not migrated more than 40 feet, it can be reasoned that the actual velocity is at least four times lower. Using the higher velocity, it would take approximately 15 years for the groundwater at the site to move one-half mile down gradient, assuming all conditions remain constant (Appendix A).

Vertical movement of the groundwater is considered to be substantially less than that calculated for the horizontal. A Groundwater Level Contour Map developed by the Zone 7 Water Agency shows the depth to the first primary aquifer at the site is between 320 feet and 330 feet (Plate 9). Since no vertical conduits are identified down gradient of the site, vertical contaminant transport to the lower aquifer is not considered to be a factor.

7.3 Sources of Drinking Water Policy Determination

Monitoring and extraction wells constructed at the site varied greatly in recharge rates. Low range recharge was typically 0.25 gallons per minute with the highest recharge at 5.0 gallons per minute. These rates demonstrate that the shallow aquifer is capable of producing water at quantities greater than 200 gallons per day. However, due to the proximity of the water table to the ground surface, typically three to eight feet, it is not recommended as a potable water source.

8.0 REMEDIATION ACTIVITIES AND EFFECTIVENESS

8.1 Groundwater Remediation

Active remediation began at the site on April 13, 1990. Due to the low recovery rates observed in MW-5 and MW-6, a deeper, larger diameter well (RW-1) was constructed. The produced water was treated with a Cavitation/Oxidation unit and deposited into the sewer system. Hydrocarbon concentrations dropped significantly around the perimeter, however concentrations remained high in the center of the

plume (Plate 4). Two more large diameter extraction wells (RW-2 and RW-3) were constructed to accelerate the cleanup of the plume. Due to the reduced influent hydrocarbon levels and larger influent flow rate, the Cavitation/Oxidation unit was replaced with a 500 pound carbon canister. Due to the predominantly clavey texture occurring at the site, removal of the heavily contaminated water in the center of the plume progressed slower than anticipated. On August 20, 1992, the soil and water in the plume center were excavated and backfilled with clean imported soil and the remaining clean overburden excavated above the water table. Treatment was discontinued and the remaining monitoring wells around the plume area were sampled. During the last three months, groundwater samples were collected from MW-5, MW-7, RW-1 and RW-3. The results of the sampling have shown that BTXE levels in the groundwater have remained below the Maximum Contaminant Levels (MCLs) for drinking water in California (DOHS, October 24, 1990). TPH concentrations in the wells have remained below detection with the exception of RW-3. The concentrations in RW-3, have fluctuated between non detect and 150 ppb, however, no trend to higher concentrations can be found (see Table 2 and Appendix B). To date, the treatment system has processed over 1.5 million gallons of groundwater.

TABLE 2	٠.		` '
Hydrocarbon Concentrations • April 27, May	27,	July 2,	1993
BTEX, TPH(Gasoline) in ppb	٠.,		. * 4 *

DATE	MW-5	MW-7	RW-1	RW-3
4/27/93				
В	ND	ND	ND	0.65
T	ND	ND	ND	ND
E	4.7	ND	ND	1
X	ND	ND	ND	0.95
TPH (gasoline)	ND	ND	ND	150
5/27/93				
В	ND	ND	ND	0.6
T	ND	ND	ND	ND
E	0.5	0.9	ND	ND
X	ND	ND	ND	ND
TPH (gasoline)	ND	ND	ND	ND
7/2/93		,		
В	ND	ND	ND	ND
T	ND	ND	ND	ND
E	ND	ND	1.6	2.8
X	ND	ND	ND	ND
TPH (gasoline)	ND	ND	ND	83
		ND = No Detection)

8.2 Impact of Residual Hydrocarbons on Beneficial Uses

As stated in Section 8.1, all regulated contaminants are below the levels set by the California Department of Health Services (DOHS) for drinking water (see Table 2). Since TPH is not regulated by the DOHS, maximum levels must be considered on a site specific basis. The maximum TPH concentration reported was 150 ppb since September 1991. This concentration is well below any single allowable level for Ethyl Benzene and Xylene. As shown in Section 7.2, transport of any remaining hydrocarbons will be extremely slow, thus allowing for contaminant dispersion and breakdown through natural occurring biological action. The shallow groundwater at the site is not suitable for use as a potable water source without pretreatment. Based on this data, the remaining residual hydrocarbons should not adversely impact any future beneficial use of the groundwater.

TABLE 3 California Department of Health Services California Drinking Water Standards (October 24, 1990)												
Constituent	MCL(ppb)	AL(ppb)										
Benzene	1.0											
Toluene	Unregulated	100										
Ethyl Benzene	680											
Xylene (single isomer or sum of isomers)	1,750											
MCL = Maximum Contamin	nant Levels; AL = Action Lev	vels										

9.0 CONCLUSIONS

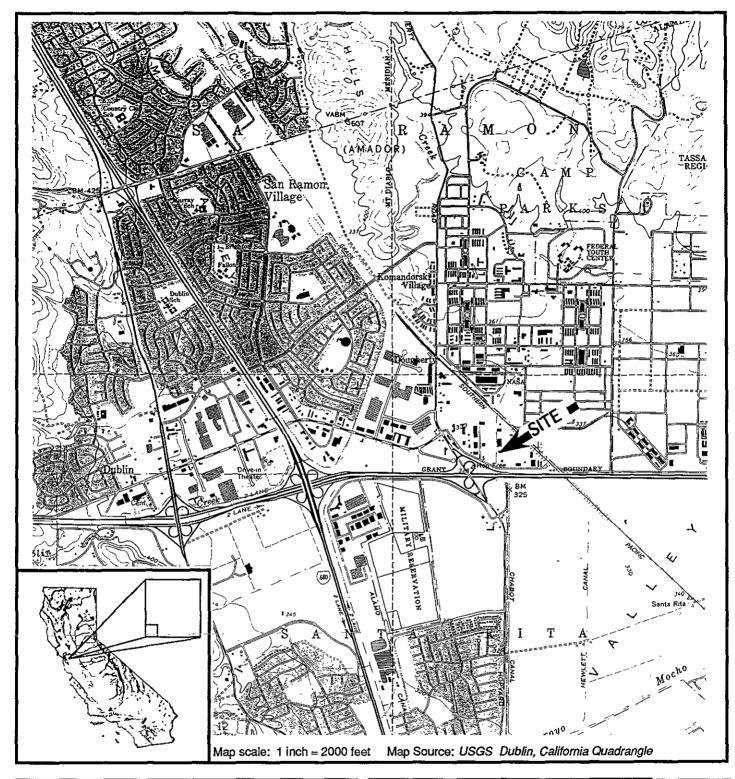
In review of the data and findings presented above, it is clear that gasoline hydrocarbons significantly impacted the shallow unconfined groundwater at the site. No vadose soil contamination was observed. Through groundwater pumping and excavation, the hydrocarbon levels in the groundwater have been reduced to levels below the limits imposed by the DOHS. Groundwater velocities calculated for the site are less than 100 feet per year. Vertical migration will be through dispersion only. The primary aquifer in the area is at a depth greater than 300 feet, therefore, vertical migration of any residual hydrocarbons to the lower aquifer has been ruled out. Due to the shallow unconfined groundwater's proximity to the surface, any use as a potable drinking water source is not recommended. Any remaining hydrocarbons will not exclude other uses, such as irrigation. It has, therefore, been determined that any remaining hydrocarbons should not impact the beneficial use of the groundwater.

10.0 RECOMMENDATIONS

Based on the conclusions presented in this report, RESNA recommends that steps be taken by the Alameda County Department of Environmental Health to recommend site closure and have the site removed from the Regional Water Quality Control Board list of contaminated sites. All wells should be abandoned in a manner approved by the Zone 7 Flood Control District.

11.0 REFERENCES

- Alameda County Flood Control and Water Conservation District Zone 7, June 24, 1993. "Spring 1993 Groundwater Contour Map."
- California Department of Health Services, State of California. October 24, 1990. "Summary of California Drinking Water Standards."
- California Department of Water Resources. 1966. "Evaluation of Groundwater Resources, Livermore and Sunol Valleys, Appendix A: Geology." Bulletin No. 118-2.
- California Department of Water Resources. 1974. "Evaluation of Groundwater Resources, Livermore and Sunol Valleys." Bulletin No. 118-2.
- Fetter, C. W. Jr. Applied Hydrogeology. Columbus, Ohio: Charles E. Merril Pub. Co., 1980.
- "Geology and Paleontology of the Pleasonton Area, Alameda and Contra Costa Counties, California," by Hall, C.A., Jr., 1958: University of California Pubs. Geol. Sci. Bull. v. 34, no. 1.
- Groundwater Resources, Inc. January 19, 1989. "Site Investigation Report, Scotsman Corporation, 6055 Scarlett Court, Dublin, California." Project No. 55018.
- Groundwater Resources, Inc. June 30, 1989. "Site Characterization Report, Scotsman Corporation, 6055 Scarlett Court, Dublin, California." Project No. 55018.
- Groundwater Resources, Inc. December 20, 1989. "Site Characterization Report and Remediation Plan, Scotsman Corporation, 6055 Scarlett Court, Dublin, California." Project No. 55018.
- RESNA Industries Inc. September 14, 1992. "Letter Report Groundwater Remediation and Soil Excavation, Scotsman Corporation, 6055 Scarlett Court, Dublin, California." Project No. 7172-42.
- RESNA Industries Inc. December 1, 1992. "Letter Report Third Quarter Groundwater Remediation 1992, Scotsman Corporation, 6055 Scarlett Court, Dublin, California." Project No. 7172-42.
- RESNA Industries Inc. March 8, 1993. "Fourth Quarter Monitoring Report, Scotsman Corporation, 6055 Scarlett Court, Dublin, California." Project No. 7172-42.





DATE: 7-12-93

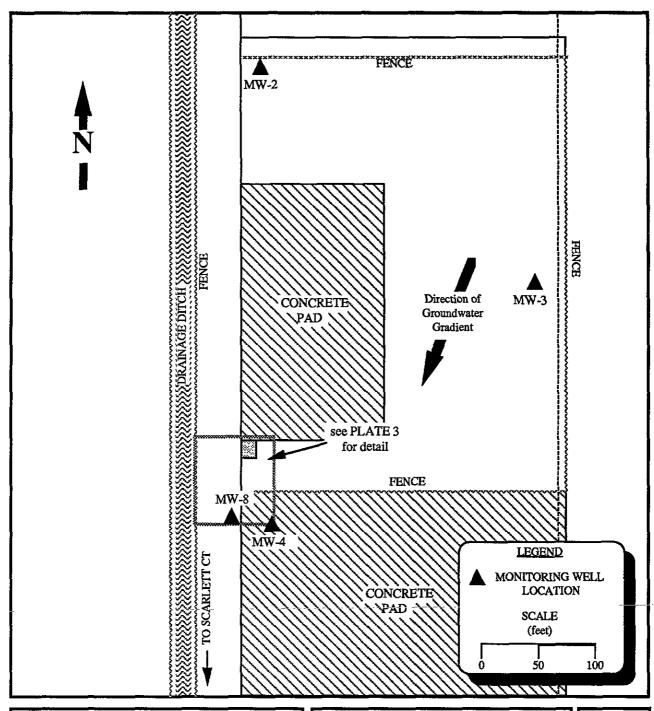
PROJECT NUMBER: B7172.42

SCOTSMAN COPRORATION 6055 Scarlett Ct. Dublin, California

LOCATION MAP

PLATE

1



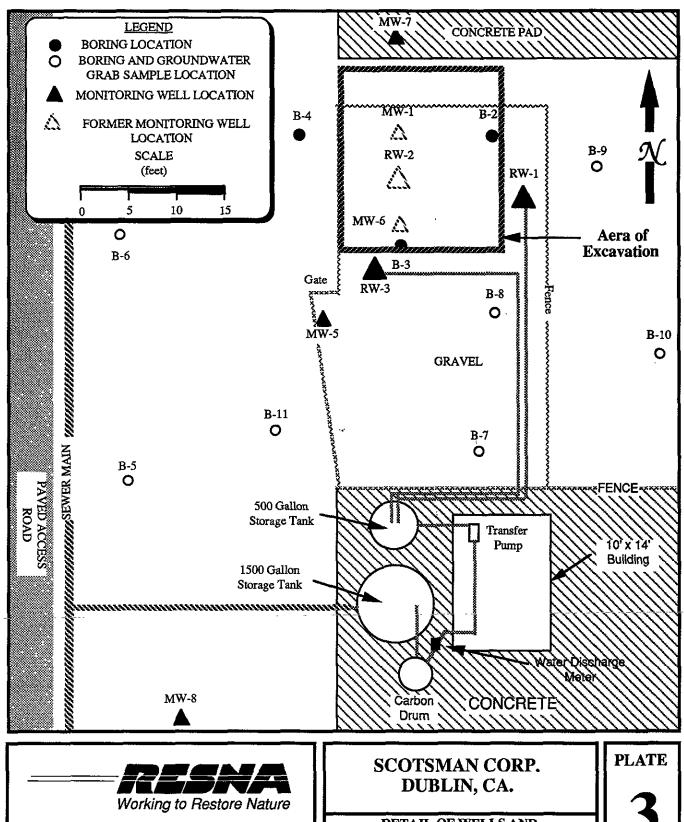


SCOTSMAN CORP. DUBLIN, CA.

PLOT PLAN

PLATE

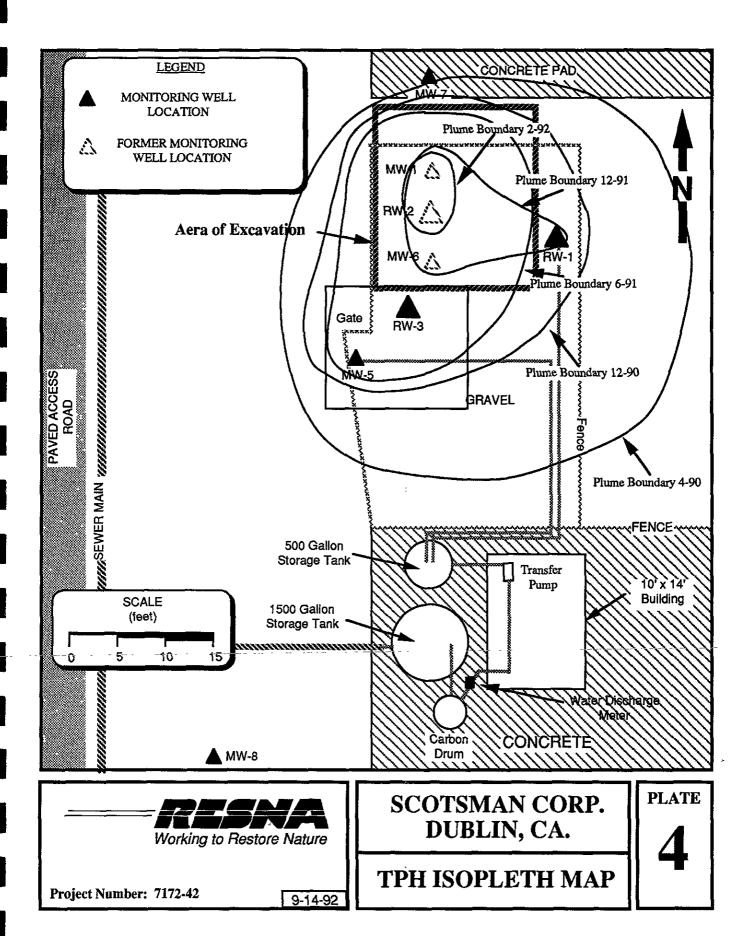
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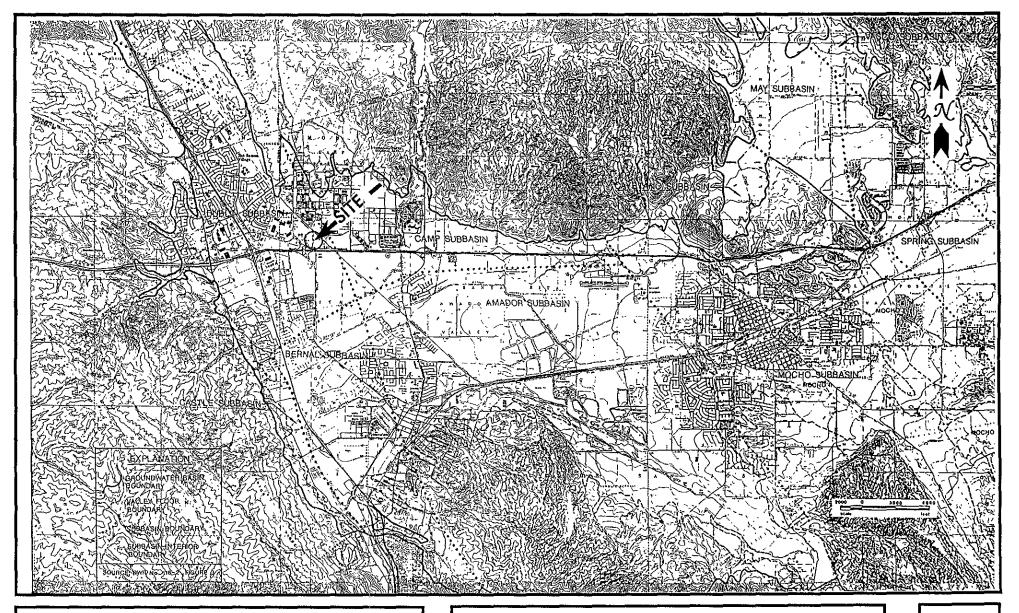


Project Number: B7172.42

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DETAIL OF WELLS AND REMEDIATION EQUIPMENT LOCATIONS





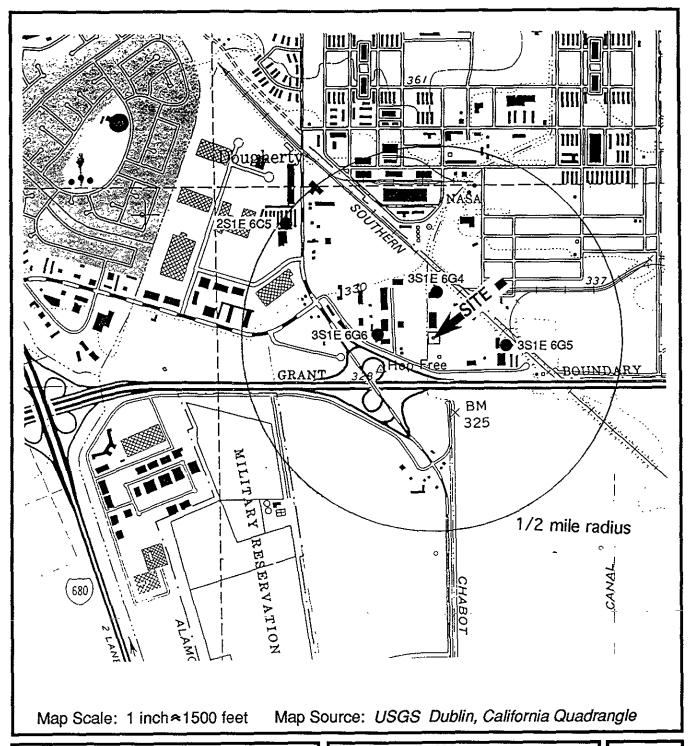


DATE: 7-16-93 PROJECT NUMBER: 7172..42 **SCOTSMAN CORPORATION 6055 SCARLETT COURT DUBLIN, CALIFORNIA**

LIVERMORE VALLEY GROUNDWATER BASIN BOUNDARIES

Map Source: Alameda County Flood Control Zone 7 , February, 1989

PLATE





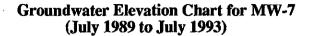
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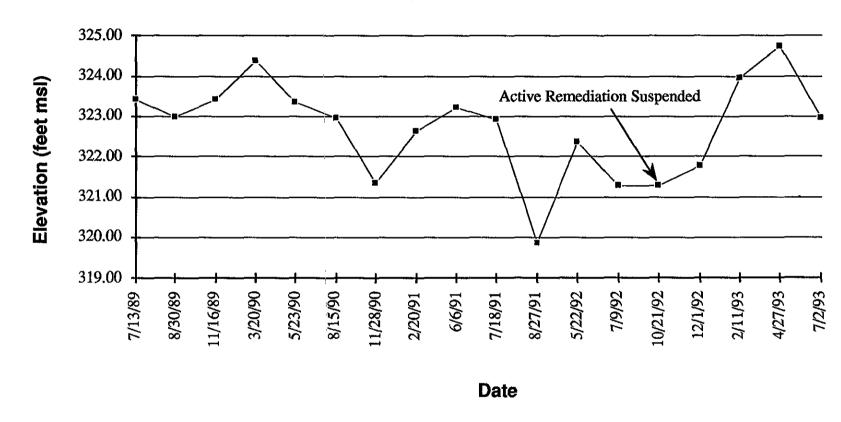
7-16-93

SCOTSMAN CORP. DUBLIN, CA.

WATER WELLS WITHIN 1/2 MILE RADIUS OF PROJECT SITE **PLATE**

6





PLATE

7

Scotsman Corporation

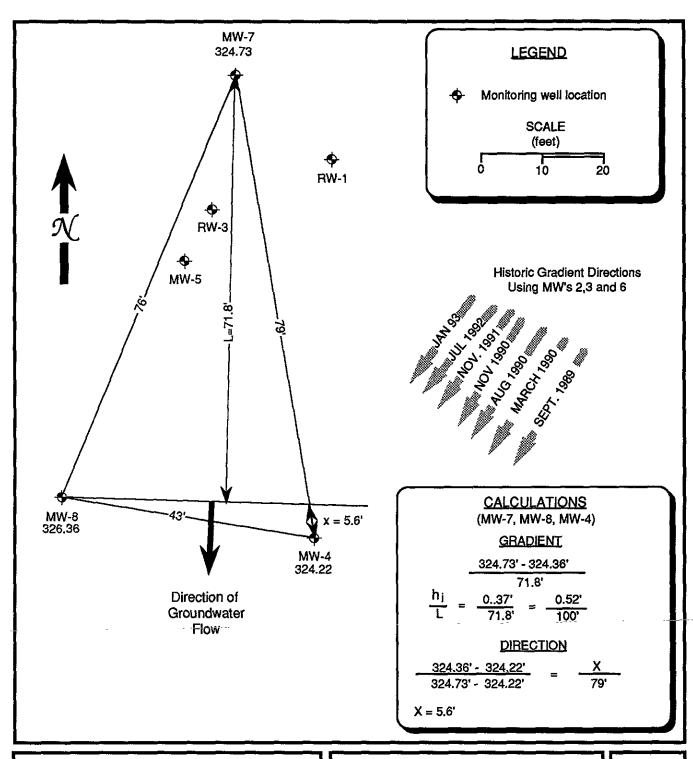
6055 Scarlett Ct. Dublin, California

KEY WELL HYDROGRAPH



DATE: 7-14-93

PROJECT NUMBER: B7172.42





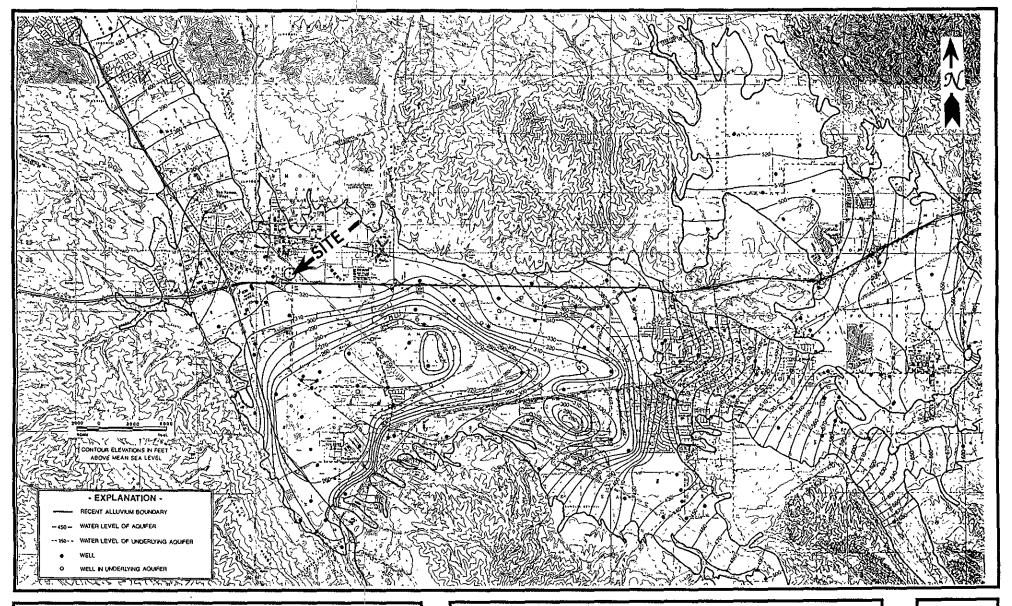
Project Number: B7172.42

7-16-93

SCOTSMAN CORP. DUBLIN, CA.

SHALLOW GROUNDWATER GRADIENT MAP (April 27, 1993) **PLATE**

8





DATE: 7-16-93

PROJECT NUMBER: 7172..42

SCOTSMAN CORPORATION 6055 SCARLETT COURT DUBLIN, CALIFORNIA

REGIONAL GROUNDWATER CONTOUR MAP

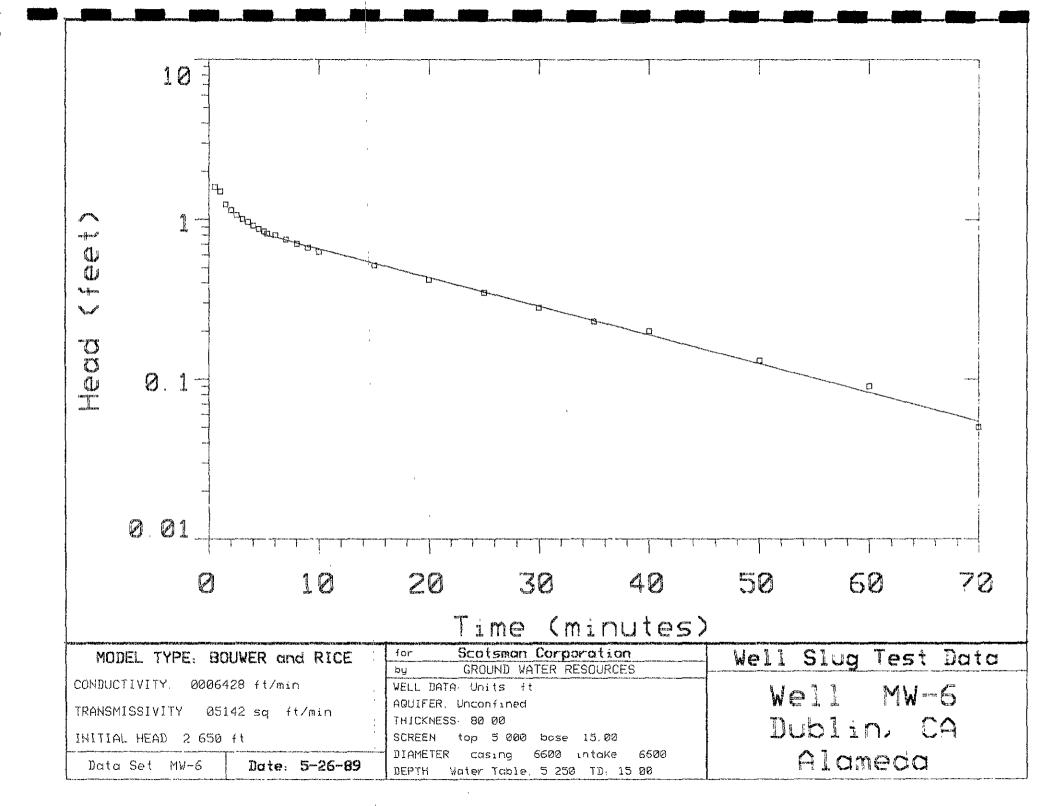
Map Source: Alameda County Flood Control Zone 7, June, 1993

PLATE

9

APPENDIX A

Groundwater Discharge Velocity Calculations



DATA SET: SCOTMW-6

CLIENT: Scotsman Corporation DATE: 5-26-89 LOCATION: Dublin, CA WELL NO.: MW-6 COUNTY: Alameda WELL DEPTH: 15.00 ft PROJECT: Well Slug Test Data WATER TABLE: 5.250 ft AQUIFER: Unconfined THICKNESS: 80.00 ft INTAKE RADIUS: 0.330 ft CASING RADIUS: 0.330 ft SCREEN TOP: 5.000 ft SCREEN BASE: 15.00 ft INITIAL HEAD: 2.650 ft TRANS. RATIO: 1.0000

MODEL PARAMETERS:

TRANSMISSIVITY: .0514 square ft/min

CONDUCTIVITY: .000643 ft/min

MODEL TYPE: UNCONFINED PARTIALLY PENETRATED AQUIFER (Bouwer & Rice)

)

TIME (mins)	Head, H (ft DATA
0.500	1.60
1.00	1.50
1.50	1.25
2.00	1.15
2.50	1.07
3.00	1.01
3.50	0.970
4.00	0.920
4.50	0.880
5.00	0.850
5.30	0.820
6.00	0.800
7.00	0.750
8.00	0.710
9.00	0.670
10.00	0.630
15.00	0.520
20.00	0.420
25.00	0.350
30.00	0.280
35.00	0.230
40.00	0.200
50.00	0.130
	(mins) 0.500 1.00 1.50 2.00 2.50 3.00 3.50 4.00 4.50 5.00 5.30 6.00 7.00 8.00 9.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00

No.	TIME (mins)	Head, H (ft) DATA
24	60.00	0.0900
25	70.00	0.0500

CURRENT RESOLUTION MATRIIX NOT AVAILABLE

Calculations

Where:

 $\begin{array}{ll} V_d & = \text{Discharge Velocity} \\ K & = \text{Conductivity} \\ i & = \text{Gradient} \end{array}$

Therefore:

$$V_d = Ki$$

 $V_d = (0.000643 \text{ ft/min}) (0.52)$

 $V_d = 3.34 \times 10^{-4} \text{ ft/min}$

 $V_d = (3.34 \times 10^{-4} \text{ ft/min}) (60 \text{ min/hr}) (24 \text{ hr/day}) (365 \text{ day/yr}) =$

 $V_d = 176 \, \text{ft/yr}$

APPENDIX B

Laboratory Analyses Reports and Purge Data





JUL 2 2 1993

RESNA

1500 South Union Avenue

Client Project ID:

B7172.42, Scotsman Corp

Sampled:

Jul 2, 1993

Bakersfield, CA 93307

Sample Matrix: Analysis Method:

Water EPA 5030/8015/8020 Received:

Jul 6, 1993

Attention: Tim Reid

First Sample #:

3G36101

Reported:

Jul 15, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Analyte	Reporting Limit μg/L	Sample I.D. 3G36101 W-7.5-MW7	Sample I.D. 3G36102 W-RW-1	Sample I.D. 3G36103 W-RW-3	Sample I.D. 3G36104 W-12-MW5	Sample I.D. 3G36105 W-FB	
Purgeable Hydrocarbons	50	N.D.	N.D.	83	N.D.	N.D.	
Benzene	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	
Toluene	0.50	N.D.	N.D.	N.D.	N.D.	0.69	
Ethyl Benzene	0.50	N.D.	1.6	2.8	N.D.	N.D.	
Total Xylenes	0.50	N.D.	N.D.	N.D.	N.D.	N.D.	
Chromatogram Pat	tern:			Weathered Gas			

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	7/13/93	7/13/93	7/13/93	7/13/93	7/13/93
Instrument Identification:	GCHP-1	GCHP-1	GCHP-1	GCHP-1	GCHP-1
Surrogate Recovery, %: (QC Limits = 70-130%)	107	105	101	110	115

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard. Analytes reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Vickie Tague Project Manager



RESNA

Client Project ID:

Matrix:

B7172.42, Scotsman Corp

1500 South Union Avenue Bakersfield, CA 93307 trix: Water

Attention: Tim Reid

QC Sample Group: 3G36101-05

Reported: Jul 15, 1993

QUALITY CONTROL DATA REPORT

ANALYTE			Ethyl-		
	Benzene	Toluene	Benzene	Xylenes	
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	
Analyst:	P. Madden	P. Madden	P. Madden	P. Madden	
Conc. Spiked:	10	10	10	15	
Units:	µg/∟	μg/L	μg/L	μg/L	
LCS Batch#:	BLK071393	BLK071393	BLK071393	BLK071393	
Date Prepared:	6/23/93	6/23/93	6/23/93	6/23/93	
Date Analyzed:	7/13/93	7/13/93	7/13/93	7/13/93	
Instrument I.D.#:	GCHP-1	GCHP-1	GCHP-1	GCHP-1	
LCS %					
Recovery:	79	95	99	91	
Control Limits:	76-111	82-114	83-118	87-117	

MS/MSD Batch #:	MS071393	MS071393	MS071393	MS071393
Date Prepared: Date Analyzed: Instrument I.D.#:	7/13/93 7/13/93 GCHP-1	7/13/93 7/13/93 GCHP-1	7/13/93 7/13/93 GCHP-1	7/13/93 7/13/93 GCHP-1
Matrix Spike % Recovery:	102	107	109	100
Matrix Spike Duplicate % Recovery:	105	112	113	105
Relative % Difference:	2.9	4.6	3.6	4.9

SEQUOIA ANALYTICAL

Vickie Tague

Vickie Tague Project Manager Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.



CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.	PROJECT N/	AME/SITE													ANAL'	YSIS	REQL	JEST	ED				P.O.	#:A94	110
PROJECT NO. B7172.42 SAMPLERS.	SCOTEM	ANC	ORP A	D .					ı				7	77	7	7	7	7	7	7	7	77	-	7.77	10
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RESNA

1500 S. UNION AVENUE

BAKERSFIELD, CA 93307

Attn.: TIM REED

805-835-7700

Date of

Report: 06/09/93

Lab #:

93-05120-1

Sample Description: #B7172.42 SCOTTSMAN: RW-1 (WATER) 05-27-93 @ 1245 SAMPLED BY TIM

REED

TEST METHOD:

TPH by D.O.H.S. / L.U.F.T. Manual Method - Modified EPA 8015

Individual constituents by EPA Method 5030/8020.

Sample Matrix:

Water

Date Sample Collected: 05/27/93

Date Sample Received @ Lab:

05/28/93

Date Analysis

Completed: 06/04/93

<u>Constituents</u>	Analysis Results	Reporting Units	Minimum Reporting <u>Level</u>
Benzene	None Detected	$\mu { m g}/{ m L}$	40.5
Toluene	None Detected	μg/L	.0.5 0.5
Ethyl Benzene	None Detected	μg/L	Ó.5
Total Xylenes Total Petroleum	None Detected	μg/L	1.
Hydrocarbons (gas)	None Detected	μ g/L	50.

California D.O.H.S. Cert. #1186



RESNA

1500 S. UNION AVENUE

BAKERSFIELD, CA 93307

Attn.: TIM REED

805-835-7700

Date of

Report: 06/09/93

Lab #:

93-05120-2

Sample Description:

#B7172.42 SCOTTSMAN: RW-3 (WATER) 05-27-93 @ 1250 SAMPLED BY TIM

REED

TEST METHOD:

TPH by D.O.H.S. / L.U.F.T. Manual Method - Modified EPA 8015

Individual constituents by EPA Method 5030/8020.

Sample Matrix:

Water

Date Sample Collected: 05/27/93

Date Sample Received @ Lab:

05/28/93

Date Analysis

Completed: 06/04/93

<u>Constituents</u>	Analysis Results	Reporting <u>Units</u>	Minimum Reporting Level
Benzene Toluene	0.6 None Detected	μg/L μg/L	0.5
			9.3
Ethyl Benzene	None Detected	μ g/L	0.5
Total Xylenes	None Detected	μ g/L	1. **
Total Petroleum			•
Hydrocarbons (gas)	None Detected	μ g/L	50.

California D.O.H.S. Cert. #1186



RESNA

1500 S. UNION AVENUE

BAKERSFIELD, CA 93307

Attn.: TIM REED

805-835-7700

Date of

Report: 06/09/93

Lab #:

93-05120-3

Sample Description: #B7172.42 SCOTTSMAN: RW-7 (WATER) 05-27-93 @ 1230 SAMPLED BY TIM

REED

TEST METHOD:

TPH by D.O.H.S. / L.U.F.T. Manual Method - Modified EPA 8015

Individual constituents by EPA Method 5030/8020.

Sample Matrix:

Water

Date Sample Collected: 05/27/93

Date Sample Received @ Lab:

05/28/93

Date Analysis

Completed: 06/04/93

<u>Constituents</u>	Analysis <u>Results</u>	Reporting <u>Units</u>	Minimum Reporting <u>Level</u>
Benzene Toluene	None Detected None Detected	μg/L μg/L	0.5
Ethyl Benzene	0.9	μg/L μg/L	0.5
Total Xylenes	None Detected	$\mu { m g}/{ m L}$	1
Total Petroleum Hydrocarbons (gas)	None Detected	$\mu { m g/L}$	50.

California D.O.H.S. Cert. #1186



RESNA

1500 S. UNION AVENUE

BAKERSFIELD, CA 93307

Attn.: TIM REED

805-835-7700

Date of

06/09/93 Report:

Lab #:

93-05120-4

Sample Description:

#B7172.42 SCOTTSMAN: RW-5 (WATER) 05-27-93 @ 1240 SAMPLED BY TIM

REED

TEST METHOD:

TPH by D.O.H.S. / L.U.F.T. Manual Method - Modified EPA 8015

Individual constituents by EPA Method 5030/8020.

Sample Matrix:

Water

Date Sample Collected: 05/27/93

Date Sample

Received @ Lab: 05/28/93

Date Analysis

Completed: 06/04/93

Constituents	Analysis Results	Reporting <u>Units</u>	Minimum Reporting <u>Level</u>
Benzene Toluene Ethyl Benzene Total Xylenes	None Detected None Detected 0,5 None Detected	μg/L μg/L μg/L	0.5 0.5 0.5
Total Petroleum Hydrocarbons (gas)	None Detected	μ g/L	50.

California D.O.H.S. Cert. #1186



RESNA

1500 S. UNION AVENUE BAKERSFIELD, CA 93307

Report: 06/09/93

Attn.: TIM REED

805-835-7700

Date of

Lab #: 93-05120-TB

Sample Description: #B7172.42 SCOTTSMAN: TRIP BLANK

TEST METHOD:

TPH by D.O.H.S. / L.U.F.T. Manual Method - Modified EPA 8015

Individual constituents by EPA Method 5030/8020.

Sample Matrix:

Water

Date Sample Collected:

Date Sample Received @ Lab:

05/28/93

Date Analysis Completed: 06/04/93

<u>Constituents</u>	Analysis Results	Reporting <u>Units</u>	Minimum Reporting <u>Level</u>
Benzene	None Detected	μg/L	0.5
Toluene	None Detected	μg/L	0.5
Ethyl Benzene	None Detected	μg/L	0.5
Total Xylenes Total Petroleum	None Detected	μg/L	1.
Hydrocarbons (gas)	None Detected	μ g/L	50.

California D.O.H.S. Cert. #1186



CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

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RESNA

1500 South Union Avenue Bakersfield, CA 93307

Attention: Tim Reed

Client Project ID: Sample Matrix:

Analysis Method:

B7172.42, Scotsman Corp.

Water EPA 5030/8015/8020

First Sample #: 3E25201 Sampled:

Apr 27, 1993

Received:

May 5, 1993

Reported: May 12, 1993

TOTAL PURGEABLE PETROLEUM HYDROCARBONS with BTEX DISTINCTION

Reporting Limit µg/L	Sample I.D. 3E25201 RW-3	Sample I.D. 3E25202 RW-1	Sample I.D. 3E25203 MW-7	Sample I.D. 3E25204 MW-5	Sample I.D. 3E25205 TB	
50	150	N.D.	N.D.	N.D.	N.D.	
0.50	0.65	N.D.	N.D.	N.D.	N.D.	
0.50	N.D.	N.D.	N.D.	N.D.	N.D.	
0.50	12	N.D.	N.D.	4.7	N.D.	
0.50	0.95	N.D.	N.D.	N.D.	N.D.	
ttern:	Gas			Discrete Peaks		
	Limit μg/L 50 0.50 0.50	Limit μg/L I.D. 3E25201 RW-3 50 150 0.50 0.65 0.50 N.D. 0.50 12 0.50 0.95	Limit μg/L I.D. 3E25201 3E25202 RW-3 I.D. 3E25202 RW-1 50 150 N.D. 0.50 0.65 N.D. 0.50 N.D. N.D. 0.50 12 N.D. 0.50 0.95 N.D.	Limit μg/L I.D. 3E25201 3E25202 3E25203 RW-3 I.D. 3E25202 3E25203 RW-1 50 150 N.D. N.D. 0.50 0.65 N.D. N.D. 0.50 N.D. N.D. N.D. N.D. N.D. 0.50 12 N.D. N.D. N.D. 0.50 0.95 N.D. N.D. N.D.	Limit μg/L I.D. 3E25201 RW-3 I.D. 3E25202 RW-1 I.D. 3E25203 RW-7 I.D. 3E25204 RW-7 I.D. MW-5 50 150 N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D. 0.50 0.65 N.D. N.D. N.D. N.D. N.D. N.D. N.D. N.D. 0.50 12 N.D. N.D. N.D. 4.7 0.50 0.95 N.D. N.D. N.D. N.D. N.D. N.D.	Limit μg/L I.D. 3E25201 RW-3 I.D. 3E25202 RW-1 I.D. 3E25203 RW-7 I.D. 3E25204 RW-5 I.D. 3E25205 RW-7 I.D. 3E25205 RW-7 <th< td=""></th<>

Quality Control Data

Report Limit Multiplication Factor:	1.0	1.0	1.0	1.0	1.0
Date Analyzed:	5/10/93	5/10/93	5/10/93	5/10/93	5/11/93
Instrument Identification:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	GCHP-3
Surrogate Recovery, %: (QC Limits = 70-130%)	103	99	98	102	98

Purgeable Hydrocarbons are quantitated against a fresh gasoline standard. Analyte's reported as N.D. were not detected above the stated reporting limit.

SEQUOIA ANALYTICAL

Vickie Tague Project Manager



SEQUOIA ANALYTICAL

680 Chesapeake Drive . Redwood City, CA 94063 (415) 364-9600 • FAX (415) 364-9233

RESNA

Client Project ID:

B7172.42, Scotsman Corp.

1500 South Union Avenue Bakersfield, CA 93307

Matrix: Water

Attention: Tim Reed

QC Sample Group 3E25201-5

Reported: May 12, 1993

QUALITY CONTROL DATA REPORT

ANALYTE			Ethyl-		
	Benzene	Toluene	Benzene	Xylenes	
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp	
Conc. Spiked:	10	10	10	30	
Units:	μg/L	μg/L	μg/L	μ g/L	
LCS Batch#:	BLK051093	BLK051093	BLK051093	BLK051093	
Date Prepared:	N/A	N/A	N/A	N/A	
Date Analyzed:	5/10/93	5/10/93	5/10/93	5/10/93	
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	
LCS %					
Recovery:	107	107	107	107	
Control Limits:	80-120	80-120	80-120	80-120	

MS/MSD Batch #:	3E15401	3E15401	3E15401	3E15401	
Date Prepared: Date Analyzed: Instrument I.D.#:	N/A 5/10/93 GCHP-3	N/A 5/10/93 GCHP-3	N/A 5/10/93 GCHP-3	N/A 5/10/93 GCHP-3	
Matrix Spike % Recovery:	110	110	110	103	
Matrix Spike Duplicate % Recovery:	110	110	110	107	
Relative % Difference:	0.0	0.0	0.0	3.2	

SEQUOIA ANALYTICAL

Vickie Tague 1 Project Manager Please Note:

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.



SEQUOIA ANALYTICAL

680 Chesapeake Drive . Redwood City, CA 94063 (415) 364-9600 • FAX (415) 364-9233

RESNA

1500 South Union Avenue

Bakersfield, CA 93307

Attention: Tim Reed

Client Project ID:

Matrix:

QC Sample Group 3E25201-5

t Project ID: B7172.42, Scotsman Corp. x: Water Sample Group 3E25201-5 Reported: May 12, 1993

QUALITY CONTROL DATA REPORT

ANALYTE			Ethyl-		
	Benzene	Toluene	Benzene	Xylenes	
					
Method:	EPA 8020	EPA 8020	EPA 8020	EPA 8020	
Analyst:	M. Nipp	M. Nipp	M. Nipp	M. Nipp	
Conc. Spiked:	10	10	10	30	
Units:	μg/L	μg/L	μg/L	μg/L	
LCS Batch#:	BLK051193	BLK051193	BLK051193	BLK051193	
Date Prepared:	N/A	N/A	N/A	N/A	
Date Analyzed:	5/11/93	5/11/93	5/11/93	5/11/93	
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	
LCS %					
Recovery:	110	110	100	107	
Control Limits:	80-120	80-120	80-120	80-120	
MS/MSD					
Batch #:	3E36602	3E36602	3E36602	3E36602	
Date Prepared:	N/A	N/A	N/A	N/A	
Date Analyzed:	5/11/93	5/11/93	5/11/93	5/11/93	
Instrument I.D.#:	GCHP-3	GCHP-3	GCHP-3	GCHP-3	
Matrix Spike % Recovery:	110	110	100	107	
20 HEOGVELY.	110	110	100	107	
Matrix Spike Duplicate %					
Recovery:	110	110	110	107	

9.5

SEQUOIA ANALYTICAL

Relative % Difference:

0.0

Vickie Tague **Project Manager**

0.0

The LCS is a control sample of known, interferent free matrix that is analyzed using the same reagents, preparation and analytical methods employed for the samples. The LCS % recovery data is used for validation of sample batch results. Due to matrix effects, the QC limits for MS/MSD's are advisory only and are not used to accept or reject batch results.

0.0



CHAIN OF CUSTODY RECORD AND ANALYSIS REQUEST

PROJECT NO.	PROJECT NAM		 γ			·							A	NALY	'SIS F	REQU	JESTI	ED				P.O. #: A. 508	7
87172,42	30073	いいへつつ	CORP	>,				ဟ		<u></u>	$\overline{}$	7	7	7	7	7	7	7	7	7	77	1 11 300) /
SAMPLERS Dicon Os	(SIGN	(PRINT)	Dea	0	<u></u>	å151		CONTAINERS	TYPE		(08) (08) (14) (14) (14) (14) (14) (14) (14) (14	(s) (s)					//						
SAMPLE IDENTI	FICATION	DATE	TIME	COMP	GRAB	PRES. USED	ICED	NO. CO	SAMPLE TYPE	10/10/10		(8) PH (80)	((/_9	30 525 2 REMARKS	-
BW- 3A, =	3B	4/27/9	93 12 5	5	1	1101	V	2	W		7	1	\uparrow	1							WI	304327	
BW- 14,3		1/	13.3			1401	~	2	W	1	<i>i</i>			111	A-L	S	5/	14	IA	1		328	
MW- 7A,		//	14:05			HCI	~	2	W	/	~									, -		329	
MN- JA, E	B	//	14:3	5		Hel	2	2	W	v.												330	
TB-A, B		11	-		-	HCI	~	2	W	r	-	-	-	-								<u>33/</u>	
					 							-									Run-	TBONLY	
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			 -	4-	 							ļ	 _					ļ			VTPE	UTR4/29/	93
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RELINQUISHED BY:	DAT 4./;	E T	IME 7:30	RECE	WED Ru	/// //	//		LAE	2	FORY:	<i>j4</i>)	 عاد	16			<i>_</i>	PL			ND RESUL	TS TO:	
HOLINDUISHED BY:	DAT	ΈĮΤ	IME 1440	RECE	IVED	BY:		i		F	75 ~2^	<i>ບ /</i> າσກ	ť,	C4).)		15	50	0 50	outh Union	1
RELINQUISHED BY:	DAT	· 1	IME	RECE	IVED	BY:			REC	QUEST	ED TI	JRNA	ROUN	וד סו	ME:							9330	7
				i				i	1	Vo.	em.	4-6-	フ	U/21	1912	00	احد	1	ーフフ	ÐV	1: 77	M REED	
RELINQUISHED BY:	DAT 90	E	IME	RECE	IVED	BY LABO	RATO	RY:	REC	CEIPT	CONE	OITIO	۷:	,				PR	OJE	CT M	ANAGER:		
	(46)	9193 [19	440 1	:\//\	1 14	The			0	M	\mathcal{L}	10	ስለ				- 1	•	7	11	n Ale	ed	

Project No. <u> </u>	Project Name SC 0 7	snam corp	Well Name ののよう		Date . 4.27.93	Working to R	Initials
WELL DATA				, 	1 4,27,73		24
Well Depth (ft.) 29.90	Sounded Depth (ft.)	Weil Type Monitor Weil	CHEMICAL DATA Time	Ph Probe I	Vo. Temp Probe ?	Na. Cond Prohe N	0.
01W(ft.)	Date/Time	Other (describe) ### RECOVERY WELL	1 /1:50	7.7			×/ umhos
Well Diem. (in.)	LHC Present? Yes No	LHC Thickness	2 12:45	7.6			-
EVACUATION			SAMPLING	,		· · · · · · · · · · · · · · · · · · ·	······································
Initial Height of Water in Casing (tt)	Formulae and Conversions r = well radius in ft. h = ht. of water column in ft.	Sampling Equipment Defloated D Bladder Pump	Point of Collection PEHose D End of B.	lafter	Time Samples Taken • 12:5	Dete	22/93
Volume (gel) 35	vol. of column o x 1 h 7.48 gal/te	System	Dother:		Depth to Weter (ft) 27:35	Refrie	erated?
alt was a	V, "casing = 0.163 gal/ft. V. casing = 0.367 gal/ft. V. casing = 0.853 gal/ft.	Sh. work to complete the	Sample Color Cloudy	किर्नेश्वीत्रस्तुं सुन्द्रः स्ट	October 1985 in the State of th	dor none	and the same
Volume to be Evacuated XX x3	V _s casing = 0.828 gal / ft. V casing = 1.470 gal / ft. V casing = 2.810 gal / ft.	Sampling Port No.	Sediment/Foreign			· ,	, ,
·· —	A desired a lively dat \ 15	Value (and)	1 """ <i>為</i> /カ <i>a.仏*</i>	ame))/1 /72= ア カデームし	V3) Mer / /:	
105	V _a casing = 2.610 gal / ft. V _b casing = 4.080 gal / ft.	Volume (gal) Rate (gpm)	Sampling Sequence	amo.	unter of w	ine / Greys	<i>56_3₁</i> -
Evacuation	V _H casing = 4.080 gai / π.	Volume (gal) Rate (gpm)	Sampling Sequence Sample ID No. Vokume	· · · · · · · · · · · · · · · · · · ·		Analysis »	ر <u>د</u> رکاه
	V ₁₀ casing ≈ 4.080 gai / T.	Volume (gal) Rate (gpm) racusted Evacuated	Sampling Sequence Sample ID No. Volume (mi)	· · · · · · · · · · · · · · · · · · ·	or Preservative	Analysis -	رد کر اهام (کر کریز
Evacuation Evacuated	V ₁₀ casing ≈ 4.080 gai / T.		Sampling Sequence Sample ID No. Vokume	· · · · · · · · · · · · · · · · · · ·	or Preservative	Analysis » TP 140-/BE	الم الم الم
Evacuation Evacuated	Evacuated Ev		Sampling Sequence Sample ID No. Vokume (mi) SW-3A 40	Contain	or Preservative	Analysis -	رد کرد امام ایم کر کرکر ایم کرکر کرکر
Evacuation Evacuated Stop Time 12 0	Evacuated Evacua	racuated Evacuated	Sampling Sequence Sample ID No. Vokume (mi) PW-3A 40 3B	Contain V	H . Preservative /	Analysis - TP HG-/BE	
Evacuation Evacuated Stop Time 12 0 Start Time Minutes	Evacuated Evacua	racusted Evacuated	Sampling Sequence Sample ID No. Volume (mi) SW-3A 40	Contain	er. Preservetive	Analysis . TP HO-/BE.	or o
Evacuation Evacuated Stop Time 12 0 Start Time Minutes Amt Evac'd	Evacuated Evacua	racuated Evacuated	Sampling Sequence Sample ID No. Volume (mi) PW-3A 40 38	Contain	HC/	Analysis - TP HO-/BE No. 100 100 100 100 100 100 100 100 100 10	10 1 20 14 (20) 20 44 (20)
Evacuation Evacuated Stop Time 12 0 Start Time Minutes Amt Evac'd Total Evac'd	Evacuated Evac	racusted Evacuated	Sempling Sequence Semple ID No. Volume (mi) SW-3A 40 3B	Contain	HC/	Analysis - TP HO-/BE	10 1 21 14 75 1 1 21 44 55 1 1
Evacuation Evacuated Stop Time 12 C Start Time Minutes Annt Evac'd Total Evac'd	Evacuated Evacua	racusted Evacuated	Sempling Sequence Semple ID No. Vokume (mi) SW-3A 40 3B	Contain	HC/	Analysis - TP HO-/BE	10 1 21 14 75 1 1 21 44 55 1 1
Evacuation Evacuated Stop Time 12 0 Start Time Minutes Amt Evac'd Total Evac'd	Evacuated Evacua	racusted Evacuated	Sempling Sequence Semple ID No. Volume (mi) SW-3A 40 3B	Contain	HC/	Analysis - TP HO-/BE	10 1 21 14 75 1 1 21 44 55 1 1
Evacuation Evacuated Stop Time 12 C Start Time Minutes Amt Evac'd Fotal Evac'd Fotal Minutes Evac Rate 5 C	Evacuated Evacua	racusted Evacuated	Sempling Sequence Semple ID No. Vokume (mi) SW-3A 40 3B	Contain	HC/	Analysis - TP HO-/BE	10 1 20 12 70 1 20 42 1 20 42 1
Evacuation Evacuated Stop Time 12 4 Start Time Minutes Amt Evac'd Total Evac'd Total Minutes	Evacuated Evacua	gal gal	Sampling Sequence Sample ID No. Vokume (mi) SW-3A 40 3B	Contain V B = Brown	HC/	Analysis TP HO-/BE N N N N N N N N N N N N N	10 1 21 14 75 1 1 21 4 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Evacuation Evacuated Stop Time 12 0 Start Time Minutes Amt Evac'd Total Evac'd Total Minutes Evac Rate Pumped Dry? Tyes No Depth to Water During	Evacuated Evac	gal gal	Sempling Sequence Semple ID No. Vokume (mi) SW-3A 40 3B Container P-Plastic Sortie Codes: V.= VOA	Contain	of . Preservative HC/	Analysis TP HO-/BE N N N N N N N N N N N N N	10 1 21 14 75 1 1 21 4 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Evacuation Evacuated Stop Time 12 C Stert Time 11 A Minutes Amt Evac'd Total Evac'd Total Minutes Evac Rate Pumped Dry?	Evacuated Evacua	gal gal gal gal covery Time DTW 12.05 23.40	Sampling Sequence Sample ID No. Vokume (mi) SW-3A 40 3B Container P-Plastic Sortie	Contain V B = Brown	HC/	Analysis TP HO-/BE N N N N N N N N N N N N N	10 1 21 14 75 1 1 21 4 4 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
Evacuation Evacuated Stop Time 12 C Stert Time 11 A Total Evac'd Total Evac'd Total Minutes Evac Rate Cumped Dry? Tyes No Depth to Water During Pumping (ft)	Evacuated Evacua	gal gal	Sempling Sequence Semple ID No. Vokume (mi) SW-3A 40 SB Container P-Plastic Bottle Codes: V-YOA COMMENTS	Contain V B = Brown	HC/	Analysis TP HO-/BE N N N N N N N N N N N N N	10 1 20 12 70 1 20 42 1 20 42 1
Evacuation Evacuated Stop Time 12 0 Start Time Minutes Amt Evac'd Total Evac'd Total Minutes Evac Rate Pumped Dry? Tyes No Depth to Water During	Evacuated Evac	gal gal gal gal covery Time DTW 12.05 23.40	Sempling Sequence Semple ID No. Vokume (mi) SW-3A 40 3B Container P-Plastic Sortie Codes: V.= VOA	Contain V B = Brown	HC/	Analysis TP HO-/BE N N N N N N N N N N N N N	10 1 20 12 70 1 20 42 1 20 42 1

PLING DATA			Working to	Restorě Natur
Project Name	OTEMAN CORP	Well Name 多ルー/	Date Time	Initials DKO
,	·	CHEMICAL DAYA	•	1240
3/. 45 Date/Time LHC Present?	Monttor Well Sampling Port Dither (describe)	Time Ph Probe No. 1 13:15 8.40 2.38	73.85 .43 73.95 .42	• No.
☐ Yes Ø No		3 <u>73:23</u> <u>8:37</u>	74.0 .42	
V. *casing = 0 183 cel / 4	□ 11/4 ln.	PE Hose	73: 35 4:20 Papth to Water Re Ddor Odor	27 93 Ver
V _s casing = 0.653 gal / ft. V _s casing = 0.826 gal / ft. V _s casing = 1.470 gal / ft. V _s casing = 2.610 gal / ft. V _s casing = 4.080 gal / ft.	Sampling Port No. Volume (gel) Rate (gpm)	Sediment/Foreign Matter one. Sampling	1	and the state of t
pal gal min gpm	gal gal	3 N - YA - 40 V "	HOI TPAG/857	
After (gal) Time Recovery Rate (gpm) % Recovery at Time of Sampling	Time DTW 1 /3:20			
	Project Name SC	Sounded Depth (ft.) Well Type Sampling Fort Sampling Fort Sampling Fort Other (describe) Recovery Dell'	Project Name SC 07200 CO20 Well Name SW Name SW	Project Name

1,7,14

VVATER SAIVIP				Wo	orking to Restore Nature
Project No. 2/72, 42	2. Project Name SCOT:	SMANN CORP	Well Name MW - 7		Time Initials /3・イケーシャク
WELL DATA			CHEMICAL DATA		
Well Depth (ft.) / 3 . 5 DTW (ft.)	Sounded Depth (ft.) Date/Time	Well Type Monitor Well Sempling Port	Time Ph Probe h		Cond Probe No.
4.05		Other (describe)	1 13:50 7.5	78.2	· 43 umhos
Well Diam. (in.)	LHC Present?	LHC Thickness	2 13:55 7.3 3 14:05 7.45	77.9 78.0	.43
EVACUATION			SAMPLING		
Initial Height of Water In Casing (ft) 9. 45	Formulas and Conversions r = well radius in ft. h = ht. of water column in ft.	Sampling Equipment Dedicated	Salat of Ballandin	Time Samples Taken	Ceta 4-27-93
Volume (gai)	vol. of column = π th 7,40 gal / ft*	System Baller PVC Baller D 1/2 in.		Depth to Water (ft) 9. @	Refrigerated?
6.17	V, casing = 0.183 gal/ft. V, casing = 0.387 gal/ft. V, casing = 0.853 gal/ft.	2 1 1/4 ln.	Sample Color	Odor	
Yolume to be Evacuated ⊠ x3 □ x4 .	V _a "casing = 0.653 gal /ft. V _a "casing = 0.826 gal /ft. V _a "casing = 1.470 gal /ft.	Sampling Port No.	Sediment / Foreign		
18.51	V, casing = 2.610 gai / ft. V _m casing = 4.080 gai / ft.	Volume (gal) Rate (gpm)	Sampling Sequence	· · · · · · · · · · · · · · · · · · ·	
Evacuation Evacuated Stop Time /3: 53	5	recueted Evecueted	Sample ID No. Volume (mi) Contains (mi)	Preservative Analysis HCI 7794	Leb
Minutes 5	7.5 gal and and	tal gal	- ARTON 1		
Total Evec'd	01		1. 18 10 10 10 10 10 10 10 10 10 10 10 10 10		
Total Minutes Evec Rate 5.0	min		And from a great party state		
	Abu				
Pumped Dry? TYes X No	After (gai) Re	covery DTW	Container P= Plastic Bottle B = Brow Codes: V= VOA C= Clear		
Depth to Water During Pumping (ft)	Time .	1 13:55 /2*/0	COMMENTS		
Depth to Water for 80% Recovery	Recovery Rate (gpm)	3	•	· •	•
Sampled After: 80% Rec. 2 hours	% Recovery at Time of Sampling	5			
	12 / 90				Tona A

Project No. B テノテス・	Y7 Project Name	COTSMAN CORP		Well Name	Date	Working to R	Initials
WELL DATA	72 3	COTOTOTIA (OCT	,	MW-5	4.27.93	<u></u>	DNO
Well Depth (fL)	Sounded Depth (ft.)	Well Type	CHEMICAL DAT	,			· · · · · · · · · · · · · · · · · · ·
13. 7 DTW(ft.)	Data/Time	Monitor Wall Sampling Port Other (describe)	Tin	10 Ph Proba N 	• • •	, •	
Well Diam. (In.)	LHC Present?	LHC Thickness		4:30 7.5 14:35 7.5	Y 78.40	•	_ umhos 🗶 ,
EVACUATION TO THE PROPERTY OF			<u> </u>			· · · · · · · · · · · · · · · · · · ·	,
A STATE OF THE STA	Formulas and Conversions (COANAS).		SAMPLING Point of Calleggie	Marie Committee		· · · · · · · · · · · · · · · · · · ·	
Initial Height of Water in Casing (ft)	an well ending in the " Marin County from	Dedicated D Bladder Pure	PE Hose	☐ End of Beller	Time Semples Taken	Date 4:2	7.93
Volume (gal)	h = ft. of water solume in ft. vol. of solume = f h 7,48 get / ft*	System Baller PVC Baller 1/2 b.	Other.		Depth to Water (n)	Refrig	erated? ##\$\$
2.12	. I V casing will 183 and / to calls	O 1 Win.	Semple Color: 43	Mittaliana - Maria Saturdo	the transport of the Ode		Transit Disk
Volume to be Evecuated	V. casing = 0.367 gai / ft. V. casing = 0.663 gal / ft. V.s casing = 0.626 gal / ft. V.s casing = 1.470 gal / ft.	Sampling Port No.	Radiment / Foreir	TiGHTUY Cloudy		none	1.0 哈克
6.76	1 V Caeine - 7 R10 cel / Hr .	Volume (gal) Rate (gpm)	Metter	none.			** •.
	V _H casing = 4.080 gal / ft.		Sempling Sequence				
Evacuation			Sample ID No.	Yolume Contains (ml)	r Preservative . As	nalygia; "	Lab
Evacueted	Evacuated E	vacuated Evacuated	MW-5	• • • • • • • • • • • • • • • • • • • •	nel	TP HZ /865	x Ross
Stop Time <u>14, 3</u>	<u>:3</u>		513	u v	/1	. "	1
Start Time 14.2	·						
Minutes		THE PARTY OF THE P	Transfer as	(Martin Charles of Alberta	建设本地运行共和的地产(共心)	HARALINA AND CO.	HALL STATESTICS
	gal gal	gal (projection) and					
Total Evac'd	Call day	Salar Commence of the salar salar salar salar	* 10° \$ 10.7 }		·		
Total Minutes	mîn						
Evac Rate <u>- 87</u>	- <u>5</u> gpm						
							
Pumped Dry? ☐ Yes	After (gal) R	ecovery	Container P	* Plastic Bottle B = Brown	Gless		
/	·	. Time DTW	Codes: V	I.m VOA C Clear	Blass Other: Descr	ibe	
Pepth to Water During Pumping (ft)	Time	1 14:30 13:40	COMMENTS				
lepth to Water	Recovery	2	Bace	Do one The	w das m		
or 80% Recovery	Rate (gpm)	3			στοων	•	
Sampled After;	% Recovery at Time of Sampling	5					
	,						

WATER SAMPLING DATA **Working to Restore Nature** Project No. **Project Name** Well Name B7172.42 Date ... Initials SCOTSMAN CORR 4127/93 DISP **WELL DATA** CHEMICAL DATA Well Depth (ft.) Sounded Depth (ft.) Monttor Well Time Ph Probe No. Cond Probe No. Temp Probe No. Sampling Port DTW (ft.) Date/Time "Qther (describe) " Att. ... Well Diam, (in.) LHC Present? LHC Thickness ☐ Yes □ No The December of the State of th EVACUATION " Initial Height of Water Formulas and Conversions 200 STAR Point of Collection Sampling Equipment in Casing (10) Time Samples Taken To well radius in ft. he ht of water column in it. Betilogted / Bladder Pump System / D Beller Other: 7.40 pol/ft Depth to Weter (ft) PVC Baffer [] 1/2 in. Mary Yes W. P. D No. 0 11/4 h casing = 0.183 cal /ft. Semple Color C/CaR " casing = 0.367 gal / ft. "casing = 0.653 gal / ft. none Volume to be Evacuated casing = 0.826 gal / ft Sempling Port No. Sediment / Foreign . 🗀 x3 ... □ ×4 casing = 1,470 gal / ft. Matter Volume (gal) casing = 2.610 gal /ft/ Rate (gpm) casing = 4.080 gal / # Sempline Bequence Evacuation Sample ID No. Container Preservative Analysis! (ml) Evacuated Evecuated Evacuated Evacuated. 7B- B Stop Time Start Time Minutes Amount was the beautiful and the parties of the par Amt Evac'd 🤌 🐍 Total Evac'd Total Minutes Evac Rate Pumped Dry? After (gal) Recovery Conteiner P = Piestic Bottle B = Brown Blass ☐ Yes □ No Codes: V.= VCA C = Clear Glass Other: Describe Time DTW Depth to Water During Pumping (ft) COMMENTS Depth to Water Recovery

Rate (gpm)

% Recovery st

Time of Sampling

for 80% Recovery

Sampled After:

□ 80% Rec.

2 hours

LIQUIU-LIGHT	UATA SHEE!	= .							
Project No. 87172.0	Project Nar		1A2			Well Name MW-5	Date 5-27-93	Time	Initials
Well Data Well Depth (ft) 14, 0 DTW (ft) 4,33	Sounded Depth (ft) Date/Time		ഥ ` Sa	onitor Well Impling Port ther (describe)		Time PH	Probe Na. Temp	Probe No. Co	ond Probe No.
Well Diam. (in)	LHC Present?	ØL No	LHC Thickness			7.3	b 21.		41
Initial Height of Water in Casing (ft) 7.67 Volume (gall) 6.3/ Volume to be Evacuated 22 x 3	Vs casing = 2.6 Vio casing = 4.0 led Evacuated gal gal	mn in ft. h 163 gal / ft. 367 gal / ft. 353 gal / ft. 326 gal / ft. 370 gal / ft. 380 gal / ft. Evacus	System PVC Baller Sampling Port N Volume (gal)	 □ Bladder Pump □ Bailer □ 1/2 in. □ 1 1/4 in. □ 3 in. 	O Other:	CCAL atter	Depth to Water (ft)	12,70	Lab
Total Minutes Evac Rate Pumped Day?	min gpm	-			Container Codes:	P = Plastic Bottle V = VOA	B = Brown Glass C = Clear Glass	Other: Describe	
Depth to Water During Duriphing (III)	After (gal)	Re∞very 1	Time	DTW	COMMENTS				
Depth to Water or 80% Recovery	Recovery Ratio (gorn)	3							
Ampied Atlan Discription Discription	% Recovery at Time of Sumpling	4 5							
	ESHA	i.						Page	of

Project Name Project Name SCOTT MAKE Well Name Date Time Unitals	MONID-FL 5	DATA SHEET							3 - 1
STEP DIATE Sounded Depth (N) Well Type Stand Depth (N) Well Type Stand Depth (N) Stand D	Project No. 137172,	42 Project Name	BEOTSMAN				Date 5-27-93	Time	Initials
Summer Dept. (g) Summer Dept				•	CHEMICAL DATA	1			
DETWIND PLANTING Detailing Ford Other (describe) Web Diam. (iii)		Sounded Depth (II)	Well Type		11				
Cher (discrete) Cher (disc	13.5				Tim	e PH Prod	be No. Temp I	Probe No. (Cond Probe No.
Well Diam, (iii) HC Present? HC Trickriess	PTW (ft) 445	Date/Time		Other (describe)	1 //:00		2/	.5	,40 umhos
SYNCHION Casing (N) Formulas and Conversions Sampling Equipment Desicated Bladder Pump System Bailer Desire (N) Company The Total Earth Total Minutes min Evacuated Sampling Routh Total Earth Total Minutes Total Earth Descript Time DTW Sampling Routh Total Minutes Time Day Time DTW Total Earth Time Day Time DTW Tim	, ,			•		7.42	21.	4	. 42
SAME DIG Supplied	Well Diam. (in)			ss	3 11:10	<u> 7.40</u>	21.	4	.41
Intellet Height of Water In Casing (10) In Casing (10) In - Mit of water column in ft. In - Mi	<u> </u>	D Yes 10	l No		<u>.} </u>				
Intellet Height of Water in Cashing (10) 1. Cashing (10) 1. A. H. of water cotumn in ft. vol. of orbitan = x ft. h. Th. of water cotumn in ft. vol. of orbitan = x ft. h. Th. of water cotumn in ft. vol. of orbitan = x ft. h. Th. of water cotumn in ft. vol. of orbitan = x ft. h. Th. of water cotumn in ft. vol. of orbitan = x ft. h. Th. of water cotumn in ft. vol. of orbitan = x ft. h. Th. of water cotumn in ft. vol. of orbitan = x ft. h. Th. of water cotumn in ft. vol. of orbitan = x ft. h. of spain. Seq. V. 1. casing = 0.557 gal / ft. V. 1. casing = 0.552 gal / ft. V. 1. casing =	EVACUATION	•	1		CHUCLBIE	· · · · · · · · · · · · · · · · · · ·			
In Casing (i) F = well radius in it.	Initial Height of Water	Formulas and Conversion	s Sampling B	quipment			Tiene Samine Talen		Con
County C		f = well radius in it.		~ ~	11 - 25.	End of Bailer			
Volume (pai) 7.48 galnt V. casing = 0.163 gal / h. V. casing = 0.857 gal / h. V. casing = 0.857 gal / h. V. casing = 0.858 gal / h. Sampling Port No. Sampling Port No. Sampling Port No. Sampling Sequence Sampling Seq	7,05	h = ht. of water column		of mula second in the			Depth to Water (ft)		Religions (7)
S	Volume (call)	7.48 gal/n ³			Sample Color CCO	104	Odor 1	DAG	
Vi casing = 0.657 gal / ft. Vi casing = 0.650 gal / ft. Vi vi vi vi vi vi vi vi		1	cal/fL PVC Ea	lier □ 1/2 in.	Sediment / Foreign Matter		· <u>'</u>		
Volume to be Evacuated Vis * casing = 0.825 gal / ft. Vis * casing = 0.825 gal / ft. Vis * casing = 0.825 gal / ft. Vis * casing = 1.470 gal / ft. Vis * casing = 2.610 gal / ft. Vis * casing = 2.610 gal / ft. Vis * casing = 4.080 gal / ft. Volume (gal) Fate (gpm) Sampling Port No. Sampling Port No. Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling Port No. Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling Port No. Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling Port No. Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling Port No. Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling Port No. Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling Port No. Sampling ID No. Volume (mit) Container Preservitive Aralysis Lab Sampling Port No. Sampling ID No. Volume (mit) Container Codes: P - Plastic Bortle B - Brown Glass Other, Describe V - VOA Container Codes: P - Plastic Bortle B - Brown Glass Other, Describe V - VOA Container Codes: P - Plastic Bortle B - Brown Glass Other, Describe V - VOA Container Codes: P - Plastic Bortle B - Brown Glass Other, Describe V - VOA Container Preservitive Aralysis Lab Sampling Port No. Sampling	5.9	V ₃ casing = 0.367	'cal/ft.	☐ 3 in.	Sampling Sequence		·		
Casing = 1.470 gal / ft Vs casing = 1.470 gal / ft Vs Vs casing = 1.470 gal / ft Vs Vs casing = 2.610 gal / ft Vs Vs casing = 2.610 gal / ft Vs Vs casing = 2.610 gal / ft Vs Casing = 4.080 gal / ft Casing = 4.080	Mahimada ka Firesi atad	V ₄ casing = 0.653	gal/It. Sampling P	ort No.		Volume (mb Contai	ner Precionthe	A-skein	Lib.
Vs. casing = 2.510 gal / ft. ZO Vso casing = 4.080 gal / ft. ZO Stop Time Start Time Mittules Ant Evac'd gal gal gal gal gal Total Evac'd gal Evac'd gal Total Evac'd gal Total Evac'd gal Time DTW ECALULIANTS ECALULIANTS Time of Samplag		V. casing = 0.826		· · · · · · · · · · · · · · · · · · ·]	•••		~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	
Vio * Casing # 4.080 gal / ft. C		$V_{\bullet} = \frac{1.470}{2.810} = 2.610$	1001/4	Rate (gpm)]				
Evacuated Evacuated Evacuated Evacuated Evacuated Stop Time Start Time Minutes Minutes Amil Evacid gal gal gal gal gal Total Evacid gal Total Evacid gal Total Minutes min Evac Rate gpm Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe V - VOA C - Clear Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe Container Codes: P - Plastic Bottle B - Brown Glass Other: Describe B		Vio casing = 4.080	0al/h 20	- 1					
Slop Time Start Time Minutes Amil Evac'd gal gal gal gal Total Evac'd gal Total Evac'd gal Total Minutes min Evac Rate gom Container Codes: P - Pastic Bottle B - Brown Glass Other, Describe V - VOA C - Clear Glass Other, Describe Container Codes: P - Pastic Bottle C - Clear Glass Other, Describe V - VOA C - Clear Glass Other, Describe Container Codes: P - Pastic Bottle C - Clear Glass Other, Describe V - VOA C - Clear Glass Other, Describe	Evacuation Evacuation								
Start Time Minutes Ami Evac'd gai gai gai gai gai gai Total Evac'd gai Total Evac'd gai Total Minutes min Evac Rate gpm Container Codes: P - Plastic Bordle B - Brown Glass V - VOA C - Clear Glass Other: Describe V - VOA C - Clear Glass Other: De		ed Evacagled	Evaciated	Evacualed					
Minutes Ami Evac'd gal gal gal gal gal Total Evac'd gal Container Codes: P - Plastic Bottle B - Brown Glass Other, Describe V - VOA C - Clear Glass Other, Describe V - VOA C - Clear Glass Other, Describe V - VOA C - Clear Glass Other, Describe V - VOA C - Clear Glass Other, Describe Other, De			*************						
Total Evacid									
Total Evacid		gai gai	gal	oai					
Evac Rate		gal .							
Time DTW Port to Water During Port to Water (gal) Port Recovery Time Time				•	Container Codes:	D. Drasta Basis		·	
After (sall) Recovery Time DTW 1		<u>g</u> pm						Other: Describ	•
aph it Water During unphry (it) aph to Water Plan (gm) 2 unphot After: A Recovery at Time of Sampling D son Rec. D 2 hrs Time of Sampling	Author, DJJ	After (gall) Re	covery _		{			•	
pp to Water Recovery Rate (gpm) 3		_	(IMB	DTW	COMMENTS				
pph to Water Recovery Rate (gpm) 3 ampired After; % Recovery at Time of Sampling 5	क्रों Is Water During	Time	1	-					
SCN Recovery Rate (gpm) 3 Limpled After; St Recovery at Time of Sampling 5		1	2 _						
Limphof After; % Recovery at Time of Sampling 5	epth to Water	Necessia.							
O sow Rec O 2 hrs Three of Sampling 5	, no w command	erus (Cour)	3						
O sow Rec. O 2 hrs Three of Sampling 5	empired After;	S. Recovery at	4		11				
	· .	ine of Surpling		·	[]				
			5] [
		ESMA							

Project No. 87172,42	Project Name Scott L	1AL/		Well Name アレー)	Date 5-27-93	Time	Initials
Well DATA Well Depth (ft) 30' DTW (ft) 6.2.5 Well Diam. (in) 6	Sounded Depth (It) Date/Time LHC Present? D Yes GL No	Well Type Ge: Monitor Well Di Sampling Port Other (describe) LHC Thickness	Tim 1 //:35 2 //:45 3 //:55	_	<u>21.</u> 21.	2	Cond Probe No 45 umhos . 41
Initial Height of Water in Casing (It) 2375 Volume (gal) 35 Volume to be Evacuated 5 x 3 x 4 /55 Evacuation Evacuated Start Time Minutes Ant Evac'd	Formulas and Conversions I = well radius in ft. h = ht. of water column in ft. vol. of column = π r² h 7.45 gal/tl³ V₂ * casing = 0.163 gal / ft V₃ * casing = 0.653 gal / ft V₄ * casing = 0.826 gal / ft V₄ * casing = 1.470 gal / ft V₃ * casing = 2.610 gal / ft V₃ * casing = 4.080 gal / ft Evacuated Eva	Sampling Port No. Volume (gal) Rale (gpm)	O Other: Sample Color CC6 Sediment / Foreign Matter Sampling Sequence		Depth to Water (ft)	2.73	Dario 5-27-93 Fieliziarand? XV Yes Q No
Total Minutes III Evac Rate III Evac Rate III Imped Dry? After II Imped Dry? Time Impire III Impi	nin Ipm Isah Recovery 1 2 pm) 3	Time DTW	Container Codes:	P - Plastic Bortle V - YOA	B = Brown Glass C = Clear Glass	Other, Describe	3
U STARKE U 2hrs	Surpling 5 _						

LOUD-L(, DATA SHEET					
Project No. Project Na. St. St.	TOTSHAL	Well Nam RW-	Date 5-2	7-93 Time	Initials
MEL DATA		CHEMICAL DATA		· · · · · · · · · · · · · · · · · · ·	
Well Depth (ft) Sounded Depth (ft) DTW (ft) C. 52 Velt Diam. (in) C. Yes	Well Type #SI Monitor Well Sampling Port Other (describe) LHC Thickness	Time 1 //:30 2 //:40 3 //:50	PH Probe No. 7.25 7.35 7.36	Temp Probe No. 21. 0 21. 0 21. 0	Cond Probe No. - 45 umhos - 43 - 46
The standard of the standar	Dedicated Bladder Pump System Bailer PVC Bailer 1/2 in. 163 gal / ft. 367 gal / ft. 533 gal / ft. 536 gal / ft. 5470 gal / ft. 5490 gal / ft. 5490 gal / ft. 5590 gal / ft.	SAMPING Point of Collection PE Hose D End of Balk D Other: Sample Color CLOPA Sediment / Foreign Matter Sampling Sequence Sample ID No. Volume (m)	Depth is Wa	AN NONQ	Dario 5-27-93 Fishiperatura? Dari Yest D. No.
Start Time Minutes Ant Evac'd gal gal Total Evac'd gal Total Minutes min	al gal gal	Container Codes: P - P'astic			
	Re∞very Time DTW	V-VOA	c Bortle B = Brown (C = Clear G		
aph to Water During Tame Impirity (ft) sph to Water Recovery Facts Recovery Rate (spm) Impired Ahan Schooling at	Time DTW 1 2 3	COMMENTS		· · · · · · · · · · · · · · · · · · ·	
C) box Rec. C) 2 hrs. Three of Sumpling	5				

FIGURAL C	UAIN SHEE!						. 4 2				ATT ST
Project No. 87172.42	Project Nan	18	AW COR	ρ.		Well Name MW-		Date 7-2.9	Time		nitials
Well Data	Sounded Depth (ft)		Man T		CHEMICAL DAT			1/4/.	-		
Well Depth (ft)		Í		Monitor Well		Time	PH Probe	No.	Temp Probe No.	Cond Pro	obe No.
DTW (ft) ~ 5,0	Date/Time			Sampling Port Other (describe)		10:15	7.50 7.62		70.5 71.9	1.25	
Well Diam. (in)	LHC Present?	4	HC Thickness			0,30	7.69		72.3	1.32	
<u> </u>	D Yes	Ø No]						
EVACUATION	<u> </u>				SAMPLING						
Initial Height of Water in Casing (ft)	Formulas and Conversi r = Well radius in ft.	ons	Sampling Equ	ipment	Point of Collection		 -	Time Samples T	'eken /:40	Date	7.2.93
9	h = ht. of water colur	nn In ft.	Dedicated		D PEHose D Other:	☐ End of Bailer	7	Depth to Water (, · · · .	Refrigerat	ad?
Volume (gal)	vol. of ∞ lumin = π r ² 7.48 gal/ π ³	h	System	☐ Bailer	Sample Color			Odo		ex ve	es O Ho
	V ₂ casing = 0.1	63 cal / ft.	PVC Baile	r 🗆 1/2 in.	Sediment / Foreign	Matter					
5.9	V ₃ casing = 0.3	67 gal / ft.		☐ 3 in.	Sampling Sequence	×e					
Volume to be Evacuated	V4 casing = 0.8 V4.5 casing = 0.8	53 gal/ft. 26 gal/ft.	Sampling Por	l No.	Sample ID No.	. Volums (mi)	Container	Preservative	Anal	rsis	Lab
1 1 x 3 1 1 x	. V. * casing = 1.4	70 gal / ft.	Volume (gal)	Rate (gpm)	<u> </u>						
17.60	V _a casing = 2.6 V ₁₀ casing = 4.0	10 gal / ft.	30	(35)							
Evacuation											
Stop Time Evacua	aled Evacualed	Evacu	aled	Evacuated .							
Start Time	 										
Minutes											
Ami Evac'd	ga) ga	J	gal	cal							
Total Evac'd	oal	· · · · · · · · · · · · · · · · · · ·			·						
Total Minutes					Container Codes:	P • Plastic	Datio .	D 72 - Ch			
Evac Rate	gpm					V- VOA		B = Brown Glas C = Clear Glas		eschdel	
Shuber DAS	After (gal)	Recovery	Time	WTG	COMMENTS			···			
Depth to Water During Pumping (III)	Time	1									
Depth to Water	Facereny				1						
or 80% Recovery	Rate (com)	3			1						
Sampled After:	% Recovery at	4									
□ 80% Rec. □ 2 hrs	Time of Sampling	5									: !
	ESMA	1									
Workii	ng to Restore Nature	L							Pa	je	of

Project No. 87172.42	Projed Name SCOTS)	JAN!	Wel	Name MW-7	Date 7.2.97	Time	Initials
MELL DATA Well D-pth (ft) /3.5/ DTW (ft) 5.82 Well Diam. (in)	Sounded Depth (ft) Cate/Time LHC Present? D Yes Ci No	Well Type Monitor Well Sampling Port Other (describe) LHC Thickness	Time 1 //:50 2 12:00 3 PUMPEO	PH Pid 3.5 6.9	be No. Temp	Probe No. 16.9 8.3	Cond Probe No. ///5 umhos
Initial Height of Water in Casing (It) 7.69 Volume (gal) 5.0 Volume to be Evacuated	Formulas and Conversions I = well radius in fit. In = Int. of water column in fit. vol. of column = In in Int. 7.48 gaint Va	t. Sampling Port No.	Point of Collection D PE Hase D End of D Other: Sample Color Sediment / Foxeign Matter Sampling Sequence Sampling Sequence Volume		The Samples Taken Depth to Water (it) Odor Preservative	1:45 And	Date 7.2-93 Retripe stad? D Yes D No
Total Evacid	Vs casing = 2.610 gal / 1 Vio casing = 4.080 gal / 1	1 (april)					
Evec Rate	3,0	Time DTW		Plastic Bortle VOA	B = Stown Gizes C = Cipzr Gizes	Other, D	ಜಲಾಶಿಕ
Profit (III) aph is Water Filt's Ferrory Rate (2 _						

FIGUID-FIE SON	ITA SHEET						Jan Lang
Project No. B7172.42	Projed Name S2073)			Well Name RW-3	Date 7-2-93	Time	initials
MELDATA			CHEMICAL DATA		1		
Well Depth (ft) 29.70 DTW (ft) 9.00	Sounded Depth (N) Cale/Time	Well Type II Monitor Well II Sampling Port II Other (describe)	1 /0:3 2 /0:4	PH Pro 7.3	<u>4</u> 72	'. <u> </u>	nd Probe No.
Well Dizm. (in)	LHC Present?	LHC Thickness	3 10:5	0 7.5	b 69	7.3	22
EVACUATION	•		J [_			· · · · · · · · · · · · · · · · · · ·
Initial Height of Water in Casing (II) 20.7	Formules and Conversions f = Well radius in ft. h = ht. of water column in ft. vol. of column = n r ² h 7.45 gaint ³	Sampling Equipment Dedicated D Stadder Pump System D Bailer	Point of Collection PE Hose Other: Sample Color	End of Bailer	Tre Sarp is Talen Dept to Warer (tt) Odor	Re'	8-2-97 (ign state) Of Yes O No
Ï	V ₂ casing = 0.163 gal / ft	PVC Baller 🖸 1/2 in.	Sedment / Foxeign Matter				
30	V ₃ casing = 0.367 gal / h	T 3 in ""	Sampling Sequence				
	V4	Volume (921) Fale (92m)	Sarpie ID No.	Voire (m) Com	her Presentative	Exter	
Total Minutes	_min _epm	**-	Container Codes:	P - Plastic Bottle V - VOA	B - Bown Glass C - Clear Glass	Other, Describe	
क्रों स Water During Tim भारतीय (हि)	12	Time DTW	COMMENTS -			······································	
eph to Water Reco is BY's Recovery Rate	(spm) 3						
Unpick Aher Rec D 2 hrs Pro-	তল্প						
	ISHA		L		· · · · · · · · · · · · · · · · · · ·		

FOUNDATION ZOA	TA SHEET						
Project No. 187172,42	Projed Name SCOTSMA	\sim		Well Name RW-)	Date 7.2.93	Time	Initials
EEL DAYA			CHEMICAL DATA				
Weli Depth (N) 31.22 DTW (N) 8.89	Sounded Depth (ft) Cale/Time	Well Type Monitor Well Sampling Port Other (describe)	Till 1 //// C	<u>7.</u>	73 72	.5 1	nd Probe No.
Heli Diam. (in)	HC Present?	LHC Thickness	3 7/:25) <u> </u>		$\frac{c_j}{c_j}$ $\frac{1}{1}$	0.
in Casing (M) 22.33 Volume (gal)	Formulas and Conversions I = Well radius in ft. h = ht. of water column in ft. vol. of column = n i h 7.45 gaint? V2	Sampling Equipment Designated D Blacker Pump System D Bailer PVC Bailer D 1/2 in. D 1 1/4 in.	SAMPING Point of Collection PE Hose Other: Sample Color Sediment / Foreign Matter	End of Bailer	Time Samples Taken Depth to Water (त) Odor	Fi	110 7,2,53 Priperson D.Yes D.No
32.8	V ₃ casing = 0.367 gal / h V ₄ casing = 0.653 gal / h	a 3 in.	Sampling Sequence				
Total Evacid	Vus casing = 0.826 gal / ft Vu casing = 1.470 gal / ft Vu casing = 2.610 gal / ft Vu casing = 4.080 gal / ft Evacuated	Volume (gal) Rate (gpm)	Sarpa ID No.	Vol. ra (m) Co-	Preservative	EzteA	
	min gpm (p4) Fecovery	Time DTW	Container Codes:	P - Plastic Bottle V - YOA	B = 50mn Gizss C = Ciez: Gizss	Other Describe	
क्टे I: Water During Time भारतेष्ट्र (पि)	1		COMMENTS				
eph is Water Record or ATX Recovery Rate (s	3						
Urpind After	ञ्जा सं 4 (Sumpley 5						
	SHA						

APPENDIX C

Boring and Well Logs

		CHEMICAL AN	ALYSES			S/	MPLE		_	
		Laboratory	Field	ł.	₽			ğ	Ġ	
WE	LL COMPLETION	Benzene TPH	Hnu P.I.D.	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
		mgg	ppm	_	Ö	ll l		≣	n.8	
ļ	locking cap			_	-0				_	
	traffic box									Pea-gravel backfill
blank	bentonite — seal —	** 50			-5 -		B-1-5		a.	Clay, gry brn, backfill
perfd	#2/12	** 5.6 210 ** 4.0 170	96 156	7	10		B-1-8 B-1-10		a. a.	Clay, dk gry, med plasticity, moist, gasoline odor Clay, grnsh gry, med-high plasti- city, wet, strng gas odor
7	D 15 feet	** Sample collected below Water Table			-15 -20 -25 -30					*Rainbow noted on auger and cuttings at T.D. Water encountered at 10.3 ft. while augering.
	-	_			-40 -45 -50					

SURFACE ELEVATION: 325 feet LOGGED BY: TCR SUPERVISED BY: RJY TOTAL DEPTH: 15 feet **DIAMETER of BORING: 8 inches** DATE DRILLED: 12-09-88 **WATER TABLE AT: 7.5 feet** GROUNDWATER RESOURCES, INC. LOCATION:SCOTSMAN CORP. PLATE **CENTER OF EXCAVATION** (805)835-7700 environmental/geotechnical services LOG OF BORING MW-1 (B-1) page 1 of 1 **PROJECT NUMBER: 55018**

	ANALYS	ES		-	SA	MPLE			
WELL COMPLETION	Lab Benzene TPH ppm	Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
Traffic Box Value of the poor	4	0	6	-0		MW-2-5		a. a.	CLAY- grysh brn, silty, tr vfn-med sand, damp, high plast, no odor, no stn CLAY- grysh brn, silty, tr vfn-med sand, damp, high plast, no odor, no stn CLAY- grysh brn, silty, tr vfn-med sand, damp, high plast, no odor, no stn

LOGGED BY: TCR **SURFACE ELEVATION: 329 ft TOTAL DEPTH: 16.5 ft** SUPERVISED BY: RJY DIAMETER of BORING: 8 inch DATE DRILLED: 5-24-89 WATER ENCOUNTERED AT: 4.9 ft **GROUNDWATER RESOURCES, INC.** LOCATION: PLATE (805)835-7700 334' NORTH OF MW-1 environmental/geotechnical services **LOG OF BORING MW-2** page 1 of 1 **PROJECT NUMBER: 55018**

	TANIAL NO		Γ				_		
	ANALYS		 		SA	MPLE	5	_	
WELL COMPLETION	Lab Benzene TPH ppm	Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
Traffic Box				-0 -					
Cemeut A" PVC, Sch 40, 0.01" 4" PVC Blank Storied, flush thread Blank Sand Cemeut Blank Sand Blank Sand Blank Sand Blank Sand Blank Blank Sand Blank B	ND ND Water (ppb) 4.6 ND	0	6	-5 - 10 - 15 - 10 - 20 - 25 - 1 - 35 - 1 - 40 - 1 - 50 -		MW-3-15		ප් ප් න	CLAY- grysh brn, silty, vfn-fn sand, mod plast, moist, no odor, no stn CLAY- brnsh gry, tr silt, mod-high plast, moist, no odor, no stn SAND- med brn, vfn-fn, v silty, saturated, no odor, no stn

LOGGED BY: TCR SURFACE ELEVATION: 327.7 ft SUPERVISED BY: RJY TOTAL DEPTH: 16.5 ft DIAMETER of BORING: 8 inch DATE DRILLED: 5-24-89 WATER ENCOUNTERED AT: 3.5 ft **GROUNDWATER RESOURCES, INC.** LOCATION: **PLATE** (805)835-7700 285' NORTH EAST OF MW-1 environmental/geotechnical services **LOG OF BORING MW-3** page 1 of 1 **PROJECT NUMBER: 55018**

	ANALYS	ES			SA	MPLE			
WELL COMPLETION	Lab Benzene TPH	Field Hnu P.I.D.	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
	ppm	ppm	8	DEF	N		lithol	u.s.	
Traffic Box Cement Bentonite # borc, Sch 40, 0.01" 4" PVC, Sch 40, 0.01" Bentonite # bord # company # com	ND ND Water (ppb) ND ND	0		9 1 5 1 1 1 1 1 1 2 1 1 2 1 1		MW-4-5		ਰ ਰ ਰ	CLAY- grysh brn, silty, high plast, moist, no odor, no stn CLAY- grysh brn, silty, high plast, moist, no odor, no stn CLAY- grysh brn, silty, high plast, moist, no odor, no stn CLAY- med brn, v silty, tr sand, high plast, no odor, no stn

SURFACE ELEVATION: 329.2 ft LOGGED BY: TCR TOTAL DEPTH: 21.5 ft SUPERVISED BY: RJY **DIAMETER of BORING: 8 inch** DATE DRILLED: 5-24-89 WATER ENCOUNTERED AT: 7.1 ft GROUNDWATER RESOURCES, INC. LOCATION: PLATE (805)835-7700 60' SOUTH OF MW-1 environmental/geotechnical services LOG OF BORING MW-4 **PROJECT NUMBER: 55018** page 1 of 1

	ANALYS	ES	1		SAI	VPLE			
WELL COMPLETION	Lab Benzene TPH ppm	Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
Traffic Box Cement Bentonite #0/30 Sand To 16.5' To 16.5'	ND ND Water (ppb) 270 1400	0	6	-0		MW-5-15		a a a	odor, no stn

SURFACE ELEVATION: 328.9 ft LOGGED BY: TCR TOTAL DEPTH: 16.5 ft SUPERVISED BY: RJY DIAMETER of BORING: 8 inch DATE DRILLED: 5-25-89 WATER ENCOUNTERED AT: 6 ft **GROUNDWATER RESOURCES, INC.** LOCATION: PLATE (805)835-7700 20' SOUTH WEST OF MW-1 environmental/geotechnical services **LOG OF BORING MW-5** page 1 of 1 **PROJECT NUMBER: 55018**

	ANALYS	ES			SA	MPLE			
WELL COMPLETION	Lab Benzene TPH ppm	Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
Traffic Box Ochent Bentonite #0/30 Sand TD 16.5'	ND ND Water (ppb) 6200 76000	0	8	-01015253040		MW-6-10 MW-6-15		a a a	CLAY- dk grysh blk, silty, mod plast, vfnt odor, no stn (possible fill material) CLAY- brnsh gry, silty, tr sand, mod plast, no odor, no stn CLAY- dk gry, tr silt, high plast, strng gas odor, no stn

SURFACE ELEVATION: 328.2 ft LOGGED BY: TCR TOTAL DEPTH: 16.5 ft SUPERVISED BY: RJY **DIAMETER of BORING: 8 inch** DATE DRILLED: 5-24-89 WATER ENCOUNTERED AT: 5.8 ft GROUNDWATER RESOURCES, INC. LOCATION: PLATE (805)835-7700 10' SOUTH OF MW-1 environmental/geotechnical services **LOG OF BORING MW-6** page 1 of 1 **PROJECT NUMBER: 55018**

	ANALYS	ES			SA	MPLE			
WELL COMPLETION	Lab Benzene TPH ppm	Field Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
Traffic Box					_				
Cement Bentonite # boc, Sch 40, 0.01" 4" PVC, Sch 40, 0.01" 4" PVC	ND ND Water (ppb) 67 1100	0	8	-0 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15		MW-6-5			CLAY- dk gry, v silty, mod plast, moist, no odor, no stn CLAY- med brn, v silty, mod-high plast, wet, no odor, no stn CLAY- gnsh brn, v sitly, high plast, saturated, no odor, no stn

LOGGED BY: TCR **SURFACE ELEVATION: 328.9 ft** SUPERVISED BY: RJY TOTAL DEPTH: 16.5 ft DIAMETER of BORING: 8 inch DATE DRILLED: 5-25-89 WATER ENCOUNTERED AT: 6 ft **GROUNDWATER RESOURCES, INC.** LOCATION: **PLATE** (805)835-7700 10' NORTH OF MW-1 environmental/geotechnical services **LOG OF BORING MW-7** page 1 of 1 **PROJECT NUMBER: 55018**

	ANALYS	ES			SA	MPLE			
WELL	Lab Benzene	Field	BLOWCOUNT	feet)	AL	Æ	lithology symbol	lesig.	CON DECODIDEDA
COMPLETION	TPH	Hnu P.I,D.	OWC	DEPTH (feet)	INTERVAL	NUMBER	logy s	u.s.c.sdesig.	SOIL DESCRIPTION
	ppm	ppm	8	DE	Z		lith	U.S	
Traffic Box Cement Bentonite Slotted, flush thread Blank TD 20' TD 20'	ND ND Water (ppb) ND	0	9 9 12	-0 -15 -10 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15		MW-8-5			high plast, moist, no odor, no stn

LOGGED BY: TCR SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 20 ft SUPERVISED BY: RJY DIAMETER of BORING: 8 inch DATE DRILLED: 11-30-89 WATER ENCOUNTERED AT: 5.23 ft GROUNDWATER RESOURCES, INC. LOCATION: PLATE (805)835-7700 **45' DOWNGRADIENT OF MW-5** environmental/geotechnical services LOG OF BORING MW-8 page 1 of 1 **PROJECT NUMBER: 55029**

	ANALYS	ES			SAI	VIPLE .		_	
WELL	Lab	Field	BLOWCOUNT	et)		~	oqu.	sig.	
COMPLETION	Benzene TPH		Š	H (fe	INTERVAL	NUMBER	gy sy	sde	SOIL DESCRIPTION
		P.I,D.	읦	DEPTH (føet)	INTE	2	lithology symbol	u.s.c.sdesig.	
Locking Cap	ppm	ppin					<u>:</u>		
			<u> </u>	┢╌					
Bentonite									
	1			E5 _				aL	CLAY- grysh blk, tr silt, high plast, moist,
]			=				-	no odor, no stn
	1			-10 -				CL.	CLAY- grysh grn, tr silt, high plast, wet,
#2/16 - Sand	1			= =				\ \frac{\sigma_{\text{\chi}}}{\text{\chi}}	fnt odor, no stn
	1		l	-15 ·					
6" PVC, Sch 40, 0.02" slotted, flush thread]		ļ	E"=					CLAY- brnsh gry, high plast, saturated, fr odor, no stn
# #	1			 =					
	Í			20_				a	CLAY- It brnsh gry, high plast, saturated, fr odor, no stn
	1		ŀ	ΕΞ					
	3	[ļ	-25		:		QL.	CLAY- It brnsh gry, high plast, saturated,
			ł	<u> </u>					fr odor, no stn
	-			30				a.	CLAY- it brnsh gry, high plast, saturated,
	-		ļ	F =			F		fr odor, no stn
TD 32'	-			-35			1		•
]			Ë =					
] =	1		1	上 =					
		ļ		40_	ĺ	[ļ		
[=	1			E					
† -	<u></u>	<u> </u>		-45 <u>-</u>	1	ĺ	-		
1 =	}				1	[Į		
	<u> </u>			<u>├</u> , -	<u> </u>		<u>Ц</u>		

SURFACE ELEVATION: 328.2 ft LOGGED BY: TCR SUPERVISED BY: RJY TOTAL DEPTH: 32 ft DIAMETER of BORING: 13 inch DATE DRILLED: 2-27-90 WATER ENCOUNTERED AT: 6 ft GROUNDWATER RESOURCES, INC. LOCATION: PLATE (805)835-7700 SCOTSMAN CORPORATION environmental/geotechnical services **LOG OF BORING RW-1** page 1 of 1 **PROJECT NUMBER: 55029**

<u> </u>	ANALYS	ES			SA	MPLE			
WELL	Lab	Field	喜	et)			چ ا	desig.	
COMPLETION	Benzene	Hnu	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	sde	SOIL DESCRIPTION
CONTRACTOR	TPH	P.I.D.	ğ	PT	ME	NEW	olog	S.C.S.	
Locking	ppm	ppm		ă	=		퍒	'n.	
Cap									
O Y Cement Bentonite	1			= =					
Bentonite	1		ļ	 					
│ │ │ │	4			_ 5_				a.	
	!			 					no odor, no stn
	;			-10 -				aL.	CLAY- grysh grn, tr silt, high plast, wet,
#2/16 Sand				=				-	fnt odor, no stn
	1 '								
6" PVC, Sch 40, 0.02" slotted, flush thread	4 4			-15 -				CL	CLAY- brnsh gry, high plast, saturated, fr odor, no stn
8 ∰ = =	[,				0001, 110 011
	1		l	-20		1		CL	
	1			FΞ					fr odor, no stn
	1	1	Ì	E_=				аL	OLAV It hypothesis bish plact posturated
	1			25_				G.	CLAY- It brnsh gry, high plast, saturated, fr odor, no stn
	1	 	<u> </u>	E =					
	}		ĺ	-30				(CL	
] =			ļ	E=			F		fr odor, no stn
TD 32'				-35					
_									
_	3		}	E =					
	1			-40	1	ļ			
]	-			E=	ĺ				
. -]-			L_=	ŀ				
	}	[E =	}				1
]			L =	1				
<u></u>		L	<u> </u>	上 ₅₀ .	ــــ	<u> </u>		<u> </u>	

SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 30 ft DATE DRILLED: 7-18-91	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 13 inch WATER ENCOUNTERED AT: 7 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOCATION: SCOTSMAN CORPORATION	PLATE
PROJECT NUMBER: 3721-42	LOG OF BORING RW-2	page 1 of 1

	ANALYS	ES			SA	MPLE	-		
WELL	Lab	Field	喜	€			Joqu	sig.	
COMPLETION	Benzene TPH	Hnu P.I.D.	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
Locking	ppm	ppm		ä	2		Ħ	ä	
Сар									
Cement Softed, flush thread Blank Blan				-10 - 10 - 10 - 10 - 10 - 10 - 10 - 10					no odor, no stn CLAY- grysh grn, tr sitt, high plast, wet, fnt odor, no stn CLAY- brnsh gry, high plast, saturated, fr odor, no stn CLAY- It brnsh gry, high plast, saturated, fr odor, no stn CLAY- It brnsh gry, high plast, saturated, fr odor, no stn

SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 30 ft DATE DRILLED: 7-18-91	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 13 inch WATER ENCOUNTERED AT: 7 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOCATION: SCOTSMAN CORPORATION	PLATE
PROJECT NUMBER: 3721-42	LOG OF BORING RW-3	page 1 of 1

	CHEMICAL AN	AI VOE	_	r	9/	MPLE		-	
	Laboratory	Field	ł	_	3	AAIL FE	<u>_</u>	ندا	
HOLE ABANDONMENT	Benzene TPH	Hnu P.I.D.	BLOWCOUNT	BLOWCOUN DEPTH (feet)		NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
	ppm	ppm		۵			≣ 1	j	
		<u> </u>		L.					
CLEAN FILL	0.10	20+	4						
BENTONITE SEAL	3.1	; 				B-2-5 B-2-7		a.	moist, fnt odor, no stn
TD 10.5 feet		9	4	-10 - - -		B-2-10		a.	Clay, grysh grn & It brn mottled, wet, med plasticity, silty, fnt odor
		} }		-15					
·				-20 -				t 	
		 		-25	_				
		i 		30					
=======================================						<u> </u>		 	
		,		35]			
				40					
		<u> </u>		-45 -45					
				<u> </u>					

LOGGED BY: TCR SURFACE ELEVATION: 325 feet SUPERVISED BY: RJY **TOTAL DEPTH: 10.5 feet DIAMETER of BORING: 8 inches** DATE DRILLED: 12-09-88 WATER TABLE AT: 6 feet **GROUNDWATER RESOURCES, INC.** LOCATION:SCOTSMAN CORP. PLATE 9.5' EAST OF MW-1 (805)835-7700 environmental/geotechnical services **LOG OF BORING B-2** page 1 of 1 **PROJECT NUMBER: 55018**

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	CHEMICAL AN	ALYSES			S/	MPLE			
	Laboratory	Field		£			lodi	.jg	
HOLE ABANDONMENT	Benzene TPH	Hnu P.I.D.	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
	bbw	ppm	8	Ö	=		ij	n.s	
			_						
CLEAN FILL	ND ND	0	9			B-3-3		a.	Clay, dk gry, silty, med plasticity,
BENTONITE SEAL	** 2.8 65	0	6	[5] 		B-3-6		ан	moist, no odor Clay, dk gry w/wht mott, high plasticity, moist, no odor
TD 10.5 feet		5	6	-10		B-3-9		a.	Clay, brnsh grn, silty, med plasti- city, fnt odor, wet
	** Sample collected below	ļ		-15					
<u>-</u>	Water Table		1	20		,		i	
= = =									
		!	<u> </u>	-25 				ļ	
]		-30 -					
		<u> </u> 		-35 -35					
			 	40					
				-45 					
				<u> </u>					

LOGGED BY: TCR SURFACE ELEVATION: 325 feet SUPERVISED BY: RJY TOTAL DEPTH: 10.5 feet **DIAMETER of BORING: 8 inches** DATE DRILLED: 12-09-88 WATER TABLE AT: 6.75 feet **GROUNDWATER RESOURCES, INC.** LOCATION:SCOTSMAN CORP. **PLATE** 12' SOUTH OF MW-1 (805)835-7700 environmental/geotechnical services **LOG OF BORING B-3** page 1 of 1 **PROJECT NUMBER: 55018**

	CHEMICAL AN	ALYSES			s/	WPLE			
	Laboratory	Field	١.	<u> </u>			졅	Ď	
HOLE ABANDONMENT	Benzene TPH	Hnu P.I.D.	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
	ppm	ppm	8	Ö	-		를	U.S	
				_					
CLEAN FILL	ND ND	0	4			B-4-3		сL	Clay, dk gry, silty, med plasticity, moist, no odor
BENTONITE SEAL	** 0.11 1.0	0	6			B-4-6			Clay, dk gry w/wht mott, high plasticity, moist, no odor
TD 10 feet			7	10		B-4-9		CL.	Clay, grnsh brn, silty, med plasticity, fnt odor, wet
	** Sample collected below Water Table			-15					Water table first observed at 7.5 ft. while augering.

SURFACE ELEVATION: 325 feet LOGGED BY: TCR TOTAL DEPTH: 10 feet SUPERVISED BY: RJY DIAMETER of BORING: 8 inches **DATE DRILLED: 12-09-88 WATER TABLE AT: 6 feet GROUNDWATER RESOURCES, INC.** LOCATION:SCOTSMAN CORP. PLATE 10' WEST OF MW-1 (805)835-7700 environmental/geotechnical services **LOG OF BORING B-4 PROJECT NUMBER: 55018** page 1 of 1

	ANALYS	ES			CA	MPLE			
[Lab	Field	卢		3		ᅙ	က်	
HOLE	Benzene		BLOWCOUNT	DEPTH (feet)	Æ	<u> </u>	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
ABANDONMENT	TPH	P.I.D.	ð	Ĕ	INTERVAL	NUMBER	ξĝ	C.S	OLDBOTH HOW
	ppm	ppm	ā	DE	N	2	ithol	U.S.	
	-	 -		_o					
CompactedCuttings	Water (ppb) ND ND			-1015		B-5-5			CLAY- dk gry w/ wht mottel, v sifty, tr vcrs sand, med plast, damp, no odor, no stn SILT- It brn, clayey, med-high plast, moist, no odor, no stn CLAY- It brn, silty, high plast, waxy, wet, no odor, no stn

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SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 15 ft DATE DRILLED: 11-30-89	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 6 inch WATER ENCOUNTERED AT: 5.5 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOCATION:	PLATE
PROJECT NUMBER: 55029	LOG OF BORING B-5	page 1 of 1

	ANALYS	ES	BLOWCOUNT	et)	SAMPLE				
HOLE	Lab	Field			-	·	oqu	Sig.	
ABANDONMENT	Benzene TPH	Hnu P.I.D.	Ş	H (#	INTERVAL	NUMBER	gy sy	.sde	SOIL DESCRIPTION
	ppm	ppm	OJ8	DEPTH (feet)	INTE	3	lithology symbol	u.s.c.sdesig.	
FWI A				_0					
Bentonite T.D. 15'	Water (ppb) ND ND			-10 -15 -15 -15 -15 -15 -15 -15 -15 -15 -15		B-6-5		a. ML a.	plast, damp, no odor, no stn SILT- It brn, clayey, med-high plast, moist, no odor, no stn

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SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 15 ft DATE DRILLED: 11-30-89	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 6 inch WATER ENCOUNTERED AT: 5.5 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOCATION:	PLATE
PROJECT NUMBER: 55029	LOG OF BORING B-6	page 1 of 1

	ANALYS	ES			SA	MPLE				
HOLE	Lab	Field	\	(] age	sig.		
ABANDONMENT	Benzene TPH		BLOWCOUNT	H (fe	RVAI	NUMBER	\ S \	sde	SOIL DESCRIPTION	
	ppm	P.I.D.	B _O	DEPTH (føet)	INTERVAL	N N	lithology symbol	u.s.c.sdesig.		
Compacted				0 1 1 1 5 1 1 1				ď	CLAY- dk gry w/ wht mottel, v silty, med- high plast, moist, no odor, no stn	
	Water			-10 				ML	no odor, no stn	
T.D. 15'	Water (ppb) ND ND			-15 - -20 - -25 - -30 - -35 -				a	CLAY- It brn, silty, high plast, waxy, wet, no odor, no stn	
				40 - 45 - 45 - 50						

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SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 15 ft DATE DRILLED: 11-30-89	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 6 inch WATER ENCOUNTERED AT: 5.5 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOCATION:	PLATE
PROJECT NUMBER: 55029	LOG OF BORING B-7	page 1 of 1

	ANALYS	ES			SAI	MPLE			
HOLE	Lab	Field	3	et)			og D	sig.	
ABANDONMENT	Benzene TPH	Ï	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
		P.I.D.	SIO B	ЕРТ	NE	2	<u> </u>	.s.c.	
	ppm	ppm					蓋	ם	
Compacted _		·		_o -					
Cuttings —									
=	1								
								СL	
Bentonite							××××		no odor, no stn
				-10 -		1		ML	
							****		strong gas odor, no stn
	Water		1					a.	l CLAY- It brn, silty, high plast, waxy,
T.D. 15'	(ppb)								saturated, strong gas odor, no stn
<u> </u>	890]						
<u> </u>	11,000			20					
]								
<u> </u>				-25					
				 -30 -					
			ļ	===		i		į	
	1								
				-35					phy were k consider
									here?
	1			 -40 -					
1 =	1						_ ^		
<u> </u>	1		.	<u> </u>					~~ ~~
	1			45 -					
] =									
<u> </u>	1			50					

SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 15 ft DATE DRILLED: 11-30-89	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 6 inch WATER ENCOUNTERED AT: 5.5 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700	LOCATION:	PLATE
environmental/geotechnical services PROJECT NUMBER: 55029	LOG OF BORING B-8	page 1 of 1

	ANALYS	ES			SA	MPLE			
HOLE	Lab	Field	喜	₩			m log	sig.	
ABANDONMENT	Benzene TPH		BLOWCOUNT	≗	RVAL	NUMBER	y sy	sde	SOIL DESCRIPTION
	<u> </u>	P.I.D.	O O	DEPTH (feet)	INTERVAL	2	lithology symbol	u.s.c.sdesig.	
	ppm	ppm	_				≝	_	
Compacted	Water (ppb) 12 160			-35 -40 -50				а. м. а.	no odor, no stn

SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 15 ft DATE DRILLED: 11-30-89	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 6 inch WATER ENCOUNTERED AT: 5.5 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOCATION:	PLATE
PROJECT NUMBER: 55029	LOG OF BORING B-9	page 1 of 1

	ANALYS	ES			SAN	IPLE .			
HOLE	Lab	Field	불	et)	\prod		age	sig.	
ABANDONMENT	Benzene TPH ppm	Hnu P.I.D. ppm	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
Compacted	Water (ppb) ND ND			-0 -10 -10 -15 -20 -25 -30 -40 -41 -45 -40 -41 -45				CL ML CL	odor, no stn SILT- It brn, v clayey, high plast, moist, no odor, no stn

SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 15 ft DATE DRILLED: 11-30-89	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 6 inch WATER ENCOUNTERED AT: 5.5 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOCATION:	PLATE
PROJECT NUMBER: 55029	LOG OF BORING B-10	page 1 of 1

	ANALYS	ES			SA	MPLE			
HOLE	Lab	Field	F	€			loqu I	sig.	
ABANDONMENT	Benzene TPH	Hnu P.I.D.	BLOWCOUNT	DEPTH (feet)	INTERVAL	NUMBER	lithology symbol	u.s.c.sdesig.	SOIL DESCRIPTION
	ppm	ppm	4.	ā	١		틢	j	
CVI Comported				-0 -					
Compacted	Water (ppb) ND ND			-1015				a. M. a.	odor, no stn SILT- it brnsh gry, v clayey, high plast, moist, no odor, no stn

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SURFACE ELEVATION: 328.2 ft TOTAL DEPTH: 15 ft DATE DRILLED: 11-30-89	LOGGED BY: TCR SUPERVISED BY: RJY DIAMETER of BORING: 6 inch WATER ENCOUNTERED AT: 5.5 ft	
GROUNDWATER RESOURCES, INC. (805)835-7700 environmental/geotechnical services	LOÇATION:	PLATE
PROJECT NUMBER: 55029	LOG OF BORING B-11	page 1 of 1

SCUTSMAN CURPURATION	ISMAN CORPORA	RATIC
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APPENDIX D

Sampling Protocol

RESNA INDUSTRIES INC. 1500 SOUTH UNION AVENUE BAKERSFIELD, CALIFORNIA 93307

SAMPLING PROTOCOL QUALITY ASSURANCE & QUALITY CONTROL

(QAQC)

Revised April 1991

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	TABLES	
1 2 3	Sample Containers, Holding Times and Preservation Laboratory Test Methodology Abbreviations	9 11 12

RESNA Industries Inc. (RESNA) has adopted the following Site Investigation Quality Assurance/ Quality Control (QA/QC) program intended to facilitate the acquisition of accurate and reliable data. Environmental data gathered during the investigation shall be collected and analyzed following procedures prescribed in the Quality Control Program. A Quality Assurance Program has been established to assure that the Quality Control Program is effective. Both programs are necessary to provide accurate data and documentation for investigations and laboratory analyses. The following field and laboratory procedures shall be implemented to ensure that QA/QC objectives are met.

1.0 RECORDING OF FIELD DATA

All information pertinent to the field investigation shall be kept in a field log book. In addition, boring log and chain-of-custody comprise the field documents in which all of the pertinent information about bore hole soil samples are recorded. Information to be documented includes at least the following:

- Sample number.
- Locations of sample collection.
- Soil boring or well numbers, as applicable.
- Depths at which samples were obtained.
- Names of collectors.
- Dates and times of collection.
- Purpose of sample.
- Sample distribution (e.g., laboratory, archive, etc.).
- Field observations.
- Field measurements (e.g., PID readings, pH, conductivity, water levels).
- Other data records (e.g., development log, soil sampling report, well log, etc.).

2.0 SAMPLE CONTAINERS

Groundwater samples shall be placed in containers supplied by RESNA or an analytical laboratory. Table 1 summarizes the required sample containers.

Soil samples shall be collected in either 8-once widemouth glass jars with screw-on caps lined with teflon or in brass or stainless steel tubes (Table 1). Screw-on caps for the tubes shall be fitted with teflon liners. Tubes shall be tightly capped and sealed with integrity tape.

3.0 QUALITY CONTROL OF WATER SAMPLES

A QC program independent from the laboratory's program shall be maintained. The program entails submittals of travel blanks, duplicates, and field blanks to a certified laboratory. No spiked samples shall be supplied from the field; the laboratory in-house QC program shall include analysis of spiked samples. Field blanks shall be assigned independent sample numbers and made indistinguishable from non quality control samples.

3.1 Travel Blanks

When sampling groundwater, travel blanks shall be used to detect the introduction of contaminants during transportation from the field to the laboratory. The travel blanks shall be provided by RESNA or the analytical laboratory. They shall be taken to the field and accompany the collected groundwater samples to the laboratory for analysis. The blanks shall consist of deionized water or analytically confirmed organic-free water. The blank is numbered, packaged, and sealed in the same manner as the other samples.

3.2 Duplicates

Five percent (1 in 20) or one (1) per sampling set, whichever is more, shall be submitted to the laboratory for analysis as duplicates. Therefore, if a job site has one (1) and up to twenty (20) wells to be sampled, one (1) duplicate shall be analyzed. If twenty-one (21) wells are to be sampled then two (2) duplicates shall be analyzed. The duplicate is acquired by filling two sample bottles from the same well bailer. If more than one bailer volume is required, each bailer volume shall be split between containers. The duplicates shall be labeled as duplicate without identifying the actual well location either on the chain-of-custody or on the actual sample. The actual well location of the duplicate shall be noted in the field log book.

3.3 Field Blanks

Field blanks shall be prepared and submitted to the analytical laboratory for analysis on the same frequency stated for duplicates. A field blank shall be acquired by sampling the deionized water used to rinse the sampling bailer in between sample points.

3.4 Sample Preservation

Sample containers shall be pre-cooled and transported to the site in coolers. All samples shall be preserved as indicated on Table 1 and placed in coolers immediately after collection. Sealed chemical ice shall be used in the coolers to maintain samples at a temperature of 4 degrees celsius. A high level recording thermometer shall accompany the samples during transport conditions.

4.0 GROUNDWATER SAMPLING PROTOCOL

Immediately prior to sampling, the depth to water (DTW) in the well shall be recorded. If there is free product in the well, the thickness of product on top of the groundwater shall be measured using an interface probe.

If free product is detected, analysis of groundwater at the interface for dissolved product shall not be conducted. A product sample shall be collected for source identification. If all free product cannot be removed, an interval-specific sampling device may be utilized to collect a sample from below the

zone of free product. The well shall be purged until indicator parameters (temperature, conductivity and pH) are stabilized. This shall entail the removal of at least four well-casing volumes by bailing or pumping. The criteria for determining well-casing volumes and temporary storage of purged water is outlined in Section 9.0, (Well Development Protocol). The indicator parameter measurements shall be taken both before and after purging of each well-casing volume. Once the well is purged and indicator parameters have stabilized, a sample may be collected after the water level has reached 80 percent of its initial elevation. Where water level recovery is slow, the sample may be collected after stabilization is achieved and enough water is present to fill sample containers.

Cross contamination from transferring pumps (or bailers) from well to well shall be avoided by utilizing dedicated equipment. Where this is not feasible, thorough cleaning of equipment shall be performed between sampling rounds. Sampling shall proceed from the least contaminated to the most contaminated well, if that information is available before sample collection, or if it is indicated by field evidence. Where several types of analysis shall be performed for a given well, individual samples shall be collected in the following order:

- 1. Volatile organics
- 2. Purgeable organics
- 3. Purgeable organic halogens
- 4. Total organics
- 5. Total organic halogens
- 6. Extractable organics
- 7. Total metals
- 8. Dissolved metals
- 9. Phenols
- 10. Cyanide

The specific analytical methods to be utilized for the common volatile/semi-volatile analyses are shown on Table 2.

Duplicate samples shall be transferred to vials or containers that meet Regional Board specifications (Table 1). Groundwater from the bailer shall be transferred to the sample container by allowing the fluid to flow slowly along the sides of the vessel. All containers shall be filled above the top of the opening to form a positive meniscus. No head space should be present in the sample container once it is sealed. After the vial is capped it should be inverted to check for air bubbles. If bubbles are present the sample should be discarded and replaced. If it is not possible to collect a sample without air bubbles, the problem shall be noted in the field log book.

5.0 CHAIN-OF-CUSTODY PROCEDURES

5.1 Sample Labels

Each sample container shall be labeled prior to filling to prevent misidentification. The label shall contain at least the following information:

- Sample number which uniquely identifies the sample
- Project title or number
- Location of sample collection
- Soil boring or well number, as applicable
- Name of collector
- Date and time of collection

5.2 Chain-of-Custody Record and Sample Analysis Request Form

A chain-of-custody record for each container or sample shall 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 record shall contain the following information:

- 1. Site name or project number
- 2. Signature of collector
- 3. Date and time of collection
- 4. Sample identification number(s)
- 5. Number of containers in sample set
- 6. Description of sample and container(s)
- 7. Name and signature of persons, and the companies or agencies they represent, who are involved in the chain-of-custody
- 8. Inclusive dates and times of possession
- 9. Type of analysis requested

5.3 Delivery of Samples to Laboratory

Samples shall be delivered to the laboratory on a daily basis. Samples shall be maintained at approximately 4 degrees celsius for shipping. Shipping containers shall be sealed with security tape to assure sample integrity during shipping. Delivered samples shall be accompanied by a chain-of-custody record. The laboratory shall note on the chain-of-custody that samples were properly preserved and security tape was intact upon arrival.

6.0 SAMPLING AND DRILLING EQUIPMENT DECONTAMINATION

Prior to arriving at the sampling site, all sampling equipment shall be cleaned with laboratory grade detergent (Alconox or equivalent) and rinsed twice with tap water. This procedure shall also be carried out on-site before sampling of any additional monitoring wells.

All decontamination shall be conducted on an impermeable surface and all decontamination effluent shall be contained. All surfaces of the equipment shall be thoroughly decontaminated using a steam cleaner. The equipment shall be placed on a drying rack for air drying. The water used for decontamination shall be stored in containers certified for hazardous materials storage and disposed of in an approved manner.

7.0 FIELD EQUIPMENT CALIBRATION AND MAINTENANCE

The following measuring equipment may be used during the Site Investigation and/or sample collection. Calibration procedures and frequency are listed for each piece.

Soil Borings and Well Dimensions - Steel and coated cloth tape. Calibration: none.

<u>Water Level Measurements in Wells</u> - Water Sensing tape. Calibration: Manufacturer supplied temperature correction shall be applied as applicable for field conditions. Electrical well sounders.

<u>Total Organic Vapors</u> - Foxboro OVA, flame ionization detector (FID). Calibration: Daily field calibration using manufacturer recommended procedures.

<u>Organic Vapors</u> - Photovac, photoionization detector (PID). Calibration: Daily field calibration using an isobutylene standard as per manufacturer instructions.

<u>Groundwater pH Measurement</u> - Digital pH meter. Calibration: Standard pH solutions of 4, 7, and 10 shall be utilized for daily field calibration according to manufacturer instructions.

<u>Electrical Conductivity</u> - Electrical conductivity meter. Calibration: Factory-calibrated annually and periodically calibrated against laboratory prepared standard calibration solution.

<u>Water Temperature</u> - Alcohol or digital thermometers. Calibration: Factory-calibrated once.

<u>Combustible Gas/Oxygen</u> - Gastech LEL, combustible gas/oxygen meter calibration: Factory calibrated, field calibrated monthly, zeroed daily according to manufacturer's instructions.

<u>Miscellaneous Measuring Devices</u> - Calibration procedures for any other measuring device used shall be documented at the request of the regulatory authority.

All equipment shall be checked before use and replaced as necessary. Instrument manuals and an instrument log book shall accompany equipment into the field. Any calibrations, repairs or related information shall be recorded in the log book.

8.0 GROUNDWATER MONITORING PROTOCOL

Monitoring of depth to water and free product thickness within wells at the site shall be conducted using an interface probe or conductivity meter. For consistency, all measurements shall be taken from

the north side of the wellhead at the survey mark. To assess potential infiltration of fine-grained sediments, total well depth shall also be sounded.

Newly installed wells shall be allowed to stabilize for 24 hours after development prior to free product inspection. A clean bailer or sampler shall be used for visual inspection of the groundwater in order to note sheens (difficult to detect with the interface probe), odors, microbial action and sediments.

To reduce the potential for cross contamination between wells, the monitoring shall take place in order from the least to the most contaminated, if known. Wells containing free product shall be monitored last. Between each well monitoring, the equipment shall be decontaminated.

Water level data collected from the wells shall be used to develop a groundwater contour map for the project site. Groundwater flow shall be estimated to be perpendicular to equipotential lines drawn on the map.

9.0 WELL DEVELOPMENT PROTOCOL

Groundwater monitoring wells shall be surged and developed prior to setting the surface seal. Approximately 3 to 5 times the volume of water in the casing shall be withdrawn if possible. Casing volumes shall be calculated in the following manner:

Volume of Schedule 40 PVC Pipe

Diameter (inches)	I.D. (inches)	Volume (gal/linear ft.)
2	2.067	0.17
4	4.026	0.66

If the aquifer is slow to recharge, development shall continue until recharge is too slow to practically continue. The volume of water produced, versus time, shall be recorded.

All withdrawn groundwater shall be stored on-site in 55-gallon waste drums unless permission is granted by the appropriate regulatory agency to discharge the water to the ground surface or sanitary sewer. Drummed water shall be labeled with the source of the water to help ensure appropriate disposal based on contamination levels.

10.0 QUALITY CONTROL OF SOIL SAMPLES

10.1 Travel Blanks

Travel blanks shall not be used for soil sample transportation due to problems associated with obtaining a blank material.

10.2 Duplicates

The effort to collect duplicate soil samples from a bore hole may be compromised by variations of soil texture. This shall be minimized by selecting a duplicate sample location as near as possible to the actual sample. In a split-spoon sampler the lowest tube shall be a duplicate when needed. The middle tube shall be the actual sample. All soil sample tubes shall be marked to show from which end the tube is to be sampled. The ends, where the two sample tubes joined shall be marked. The laboratory shall be instructed to sample the marked end. The upper tube shall be used for soil characterization.

The frequency with which soil duplicates are taken shall be at a minimum five (5) percent (1 in 20). In bore-holes the samples are best collected below the five foot depth in zones of either low or no transition.

When sampling soil piles or tank pits the top inch or two shall be remove before sampling. Efforts shall be made to avoid areas where soil texture changes. Fill the sample jar completely full avoiding any unnecessary head space in the sample jar.

Duplicate soil samples shall be labeled as duplicate without any other identification. A record of its actual sampling point shall be kept in the field log book.

10.3 Field Blanks

A soil field-blank from a bore hole would be best sampled from the top of the bore hole i.e. the first sample depth (not to be greater than five feet) and only if there is no indication of contaminates. The blank should be labeled as to the boring number, depth, and B for blank. For example, a blank obtained from soil boring number two (2), at a depth of five feet would be labeled as SB2-5B. The frequency of blanks may different than that of duplicates, but when possible they shall be of the same frequency, five (5) percent (1 in 20).

A blank from a soil pile or tank pit shall be taken from the surface material only. It shall be taken in a zone where no contamination is indicated.

11.0 SOIL SAMPLING PROTOCOL

11.1 Sample Collection During Drilling Activities

A proposal shall be submitted to the lead Regulatory Authority with proposed boring/sampling locations. The exact location and number of borings at each site shall be determined in the field by the Project Geologist/Engineer.

Prior to arriving at the sample site, the drill rig/augers shall be steam cleaned and all sample equipment shall be cleaned. Cleaning between samples shall be conducted on-site on all sampling equipment.

Soil samples shall be obtained using a California modified split-spoon sampler containing three, six inch long, two inch diameter brass tubes. The sampler shall be driven 18 inches ahead of the hollow stem auger by a 140-pound hammer with a 30-inch drop in accordance with American Society for Testing and Materials (ASTM Method D 1586-84) for split-barrel sampling of soil and (ASTM Method D 1587-83) for thin-walled tube sampling of soils. The blows required to drive the sampler each six-inch interval shall be recorded on the boring log. The sampler shall be removed from the boring and opened to reveal the brass tubes. The middle tube shall be covered with teflon and plastic end caps, taped, labeled, and placed into a cooler containing frozen chemical. A high level temperature recording thermometer shall accompany sample shipments to ensure proper temperature maintenance. The samples shall be delivered to a state certified laboratory, with a chain-of-custody, following all protocols, within 48 hours of sampling.

Soil in the uppermost brass tube shall be described according to ASTM standard practice for physical description and identification of soils (ASTM Method D 2488-84). Stratigraphic, genetic and other data/interpretations shall also be recorded on a log prepared for each boring/well. The second sample tube may be used with the lowermost tube for preparation of duplicates.

Soil samples shall be collected at five foot intervals, at significant changes in lithology and intervals of obvious contamination in order to develop a complete profile of soil contamination.

11.2 Sample Collection During Tank Removal

Soil samples shall be collected as soon as possible after removal of the tank. Where feasible, all preparations for soil sampling shall be made prior to tank removal. Soil samples collected from a backhoe bucket or directly from the excavation floor shall be collected in glass sampling jar with a Teflon lined screw cap. When sampling, the jar should be filled with soil as completely as possible.

11.3 Sampling from Soil Piles or Shallow Soil Pits

Soil samples shall be collected and transported from excavated material in the manner described in the previous section, however, a backhoe shall not be utilized. If composite samples are collected, four sample jars shall be collected for every 50 cubic yards of material to be sampled unless otherwise specified by the lead regulatory agency. The samples shall be composited by the state certified analytical laboratory personnel prior to testing.

TABLE 1
Sample Containers, Holding Times and Preservation

Parameter	Matrix	Container	Holding Time	Preservation
Total Petroleum	Soil	3" stainless steel or brass cylinder	14 days ¹ 40 days ³	4°C
Hydrocarbons	Water	(2) 40ml glass vial teflon-faced silicon septum	7 days ¹ 14 days ²	4°C, HCl to pH 2
Benzene Toluene	Soil	3" stainless steel or brass cylinder	14 days ¹	4°C
Xylene Ethylbenzene	Water	(2) 40ml glass vial teflon-faced silicon septum	7 days ¹ 14 days ²	4°C, HCl to pH 2
Purgeable Hydrocarbon	Soil	3" stainless steel or brass cylinder	14 days ¹	4ºC
	Water	(2) 40ml glass vial teflon-faced silicon septum	7 days ¹ 14 days ²	4°C, HCI to pH 2
Organiclead	Soil	3" stainless steel or brass cylinder	14 days ¹	4°C
	Water	(2) 40ml glass vial teflon-faced silicon septum	14 days ¹	4°C
Ethylene Dibromide	Soil	3" stainless steel or brass cylinder	14 days ³	4°C
	Water	(2) 40ml glass vial teflon-faced silicon septum	14 days ¹	4°C
Polynuclear Aromatic Hydrocarbons	Soil	8 oz. wide mouth glass with teflon seal	14 days ² 40 days ³	4°C
Notes:	Water	1000 ml amber glass with teflon seal	7 days ¹ 40 days ³	4°C

Notes:

Maximum holding time for sample (sample must be extracted within this time or analyze if extraction is not required).

² Maximum holding time for sample if preserved with HCl, Caution: HCl is a strong acid, avoid eye and skin contract

³ Maximum holding time for extract (sample must be analyzed within this time)

TABLE 1
Sample Containers, Holding Times and Preservation

Parameter	Matrix	Container	Holding Time	Preservation
Poly- Chlorinated Biphenyls	Soil	8 oz. wide mouth glass with teflon seal	7 days ¹ 40 days ³	4°C
	Water	1000 ml amber glass with teflon seal	7 days ¹ 40 days ³	4°C
Total Metals	Soil	3" stainless steel or brass cylinder	6 months	
	Water	1000 ml plastic	6 months	pH < 2 HNO ₃
Dissolved Metals	Water	1000 ml plastic .45 Micron Filtration	6 months	pH < 2 HNO ₃
Pesticides	Soil	3" stainless steel or brass cylinder	14 days ³	4ºC
	Water	1000 ml amber glass	7 days ¹ 40 days ³	4°C

Notes:

Maximum holding time for sample (sample must be extracted within this time or analyze if extraction is not required).

² Maximum holding time for sample if preserved with HCI, Caution: HCI is a strong acid, avoid eye and skin contract

³ Maximum holding time for extract (sample must be analyzed within this time)

TABLE 2

Laboratory Test Methodology
Underground Tank Sites

Type Hydroca	rbon	Soil Analysis		Water Analysis		
Unknown Fue	1	TPH-G TPH-D BTX&E	GCFID(5030) GCFID(3550) 8020 or 8240	TPH-G TPH-D BTX&E	GCFID(5030) GCFID(3510) 602 or 624	
Leaded Gas		TPH-G BTX&E	GCFID(5030) 8020 or 8240 ———Optiona	TPH-G BTX&E	GCFID(5030) 602 or 624	
		TEL EDB	DHS-LUFT DHS-AB1803	TEL EDB	DHS-LUFT DHS-AB1803	
Unleaded Gas		TPH-G BTX&E	GCFID(5030) 8020 or 8240	TPH-G BTX&E	GCFID(5030) 602 or 624	
Diesel		TPH-D BTX&E	GCFID(3550) 8020 or 8240	TPH-D BTX&E	GCFID(3510) 602 or 624	
Jet Fuel		TPH-D BTX&E	GCFID(3550) 8020 or 8240	TPH-D BTX&E	GCFID(3510) 602 or 624	
Kerosene		TPH-D BTX&E	GCFID(3550) 8020 or 8240	TPH-D BTX&E	GCFID(3510) 602 or 624	
Fuel Oil		TPH-D BTX&E	GCFID(3550) 8020 or 8240	TPH-D BTX&E	GCFID(3510) 602 or 624	
Chlorinated Solvents		CI HC BTX&E	8010 or 8240 8020 or 8240	CI HC BTX&E	601 or 624 602 or 624	
Non Chlorinated Solvents		TPH-D BTX&E	GCFID(3550) 8020 or 8240	TPH-D TX&E	GCFID(3510) 602 or 624	
Waste Oil or U	Jnknown	TPH-G TPH-D BTX&E O & G CI HC	GCFID(5030) GCFID(3550) 8020 or 8240 418.1 8010 or 8240	TPH-G TPH-D BTX&E O & G CI HC	GCFID(5030) GCFID(3510) 602 or 624 418.1 601 or 624	
	nimum (Cr) I (Pb)	ICAP or AA		ICAP or AA		
Polychlorinated Biphenyls (PCB) Poly Nuclear Aromatic (PNA) (PCP)			8270	8270		

TABLE 3

ABBREVIATIONS

TPH-G =Total Petroleum Hydrocarbon as Gasoline TPH-D = BTX&E = Total Petroleum Hydrocarbon as Diesel Benzene, Toluene, Xylenes, & Ethylbenzene

Gas Chromatograph with a Flame Ionization Detector GCFID =

CI HC Chlorinated Hydrocarbons

Inductively Coupled Argon Plasma ICAP

AA = Atomic Absorption O&G = Oil & Grease

DHS Department of Health Services

AB1803 = Assembly Bill 1803

418.1 = EPA Method for Total Recoverable Petroleum Hydrocarbons

 EPA Method for Volatile Halogenated Ogranics 601

= EPA Method for Volatile Aromatics 602

= EPA Method for Purgeables Halogenated & Aromatics 624 = EPA Method Extraction by Liquid-Liquid Separatory Funnel 3510

= EPA Method Extraction by Sonication 3550 = EPA Method Extraction by Purge and Trap 5030 EPA Method for Halogenated Volatile Organics 8010 = EPA Method for Nonhalogenated Volatile Organics 8015

8020

 EPA Method for Aromatic Volatile Organics
 EPA Method for Volatile Organics/Mass Spectrometry 8240 = EPA Method for Semivolatile Organic/Capillary Column 8270