

**SOIL GAS SURVEY AND SOIL SAMPLE ANALYSES
OF FORMER GENSCO, INC. SITE AND
PROPERTIES ADJACENT TO TAYLOR SLOUGH
UVALDE, TEXAS**

**EDWARDS UNDERGROUND WATER DISTRICT
FIELD INVESTIGATION**

JULY 1988 THROUGH OCTOBER 1988

MARCH 1, 1989

**SOIL GAS SURVEY AND SOIL SAMPLE ANALYSES
OF FORMER GENSCO, INC SITE AND
PROPERTIES ADJACENT TO TAYLOR SLOUGH**

ABSTRACT

A series of soil gas surveys and a soil sampling event was conducted on properties adjacent to Taylor Slough in Uvalde, Texas from July through October 1988. The focus of these investigative efforts was the site of the former Gensco, Inc. pipe finishing facility. The purpose of the investigation was to assess potential source(s) of volatile organic compound (VOC) contamination to the Edwards and Leona aquifers.

Results of the survey indicate the presence of VOC in soil gas beneath the study area. The highest VOC concentrations were detected beneath the site of the former Texas Industrial Services property west of the Taylor Slough. Tetrachloroethylene (PCE) is the predominant contaminant of these shallow soil gases.

An area of relatively high PCE concentrations in soil gas was found within the former Gensco Inc. site. These concentrations were three orders of magnitude less than those found under the former Texas Industrial Services site. Cores obtained from this area were tested by field head space and laboratory analyses. Head space analyses confirmed the presence of PCE. Laboratory analyses revealed the presence of only acetone and xylenes.

INTRODUCTION

A series of soil gas surveys was conducted as part of a continuing investigation by the Edwards Underground Water District (District) to determine the source(s) of tetrachloroethylene (PCE) and other volatile organic compound (VOC) contamination to the Edwards and Leona aquifers in Uvalde, Texas. The intent of this investigative phase was to evaluate the VOC source potential of the former Gensco, Inc. site in eastern Uvalde and surrounding properties not previously investigated by the District.

This investigation included soil gas and soil sample extractions from properties east and west of the Taylor Slough (creek). These properties overlie an area which has been delineated as the approximate up-gradient extent of VOC contamination within the Edwards aquifer.

Since PCE is a prevalent contaminant in the Edwards aquifer in the Uvalde area its distribution and concentration in soil gas is used as a guide to assess the potential of a site as a source of VOC contamination to the Leona-Edwards aquifer system. Trichloroethylene (TCE) and trans-1,2 dichloroethylene (DCE) are potential degradation products of PCE, so their presence at a site may be indicative of precursor PCE contamination.

Soil gas techniques are used as a reconnaissance tool to approximate contaminated groundwater plumes or identify contaminated soils. The approach of this investigation was to locate high vapor concentrations of PCE and other selected compounds in fine grained, shallow soils which may exist as a consequence of near surface point sources.

SITE GEOLOGY

On-site borehole and trench lithologic descriptions provide local geologic control. Three distinct geologic units are present in the shallow (less than 50') subsurface. These include the Edwards Group limestone (Edwards aquifer) and the overlying Del Rio Formation. These Cretaceous age units are overlain by the Quaternary age Leona Formation. Figure 1 illustrates a northeast-southwest geologic cross-section of the study area.

The Edwards aquifer is the major regional water resource and sole source aquifer to Uvalde and many cities including San Antonio. It is a highly anisotropic and productive karst aquifer.

The Del Rio Formation is a predominantly clay unit which functions as an aquitard providing upper confinement to the Edwards aquifer. This unit has been eroded to an irregular thickness and is absent beneath much of the study area east of the Taylor Slough. It is overlain by the exposed, Quaternary age Leona Formation (Leona aquifer).

The Leona Formation is an alluvial fan remnant which underlies the study area and consists of interbedded silt, clay, gravel and cobble within an overall fining upward sequence. The Leona is an important aquifer locally.

Core descriptions obtained from borings in the area show the Leona Formation to be 21 to 46 feet in thickness beneath the north end of the former Gensco site. Here the Leona formation is in erosional contact with the Edwards Group limestone (aquifer).

The Leona was unsaturated beneath the former Gensco property at the time of these borings and probably remains unsaturated under most conditions. In this area the Edwards and Leona aquifers are in probable hydraulic communication.

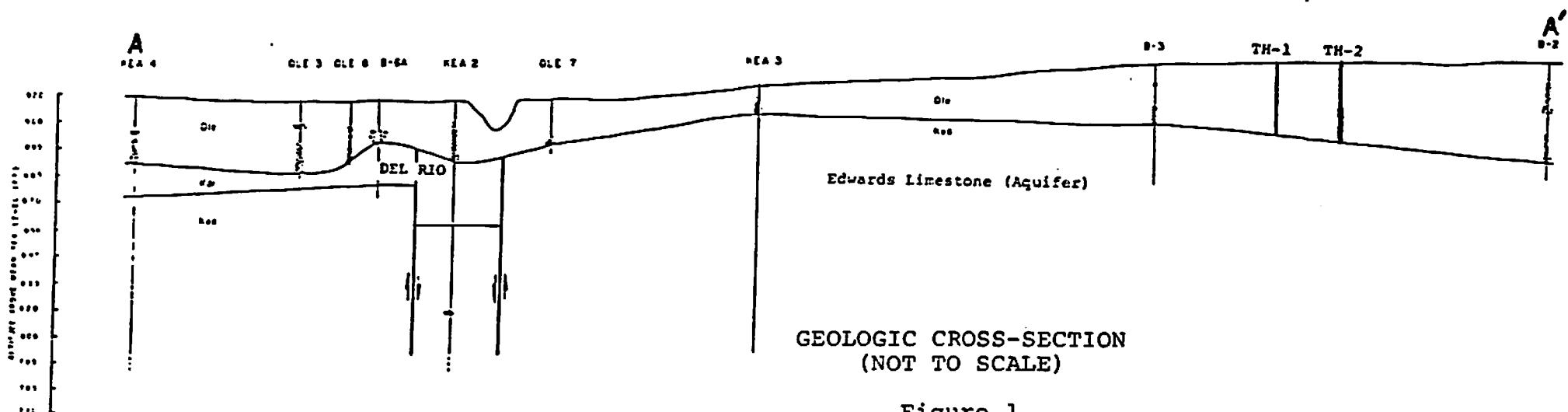
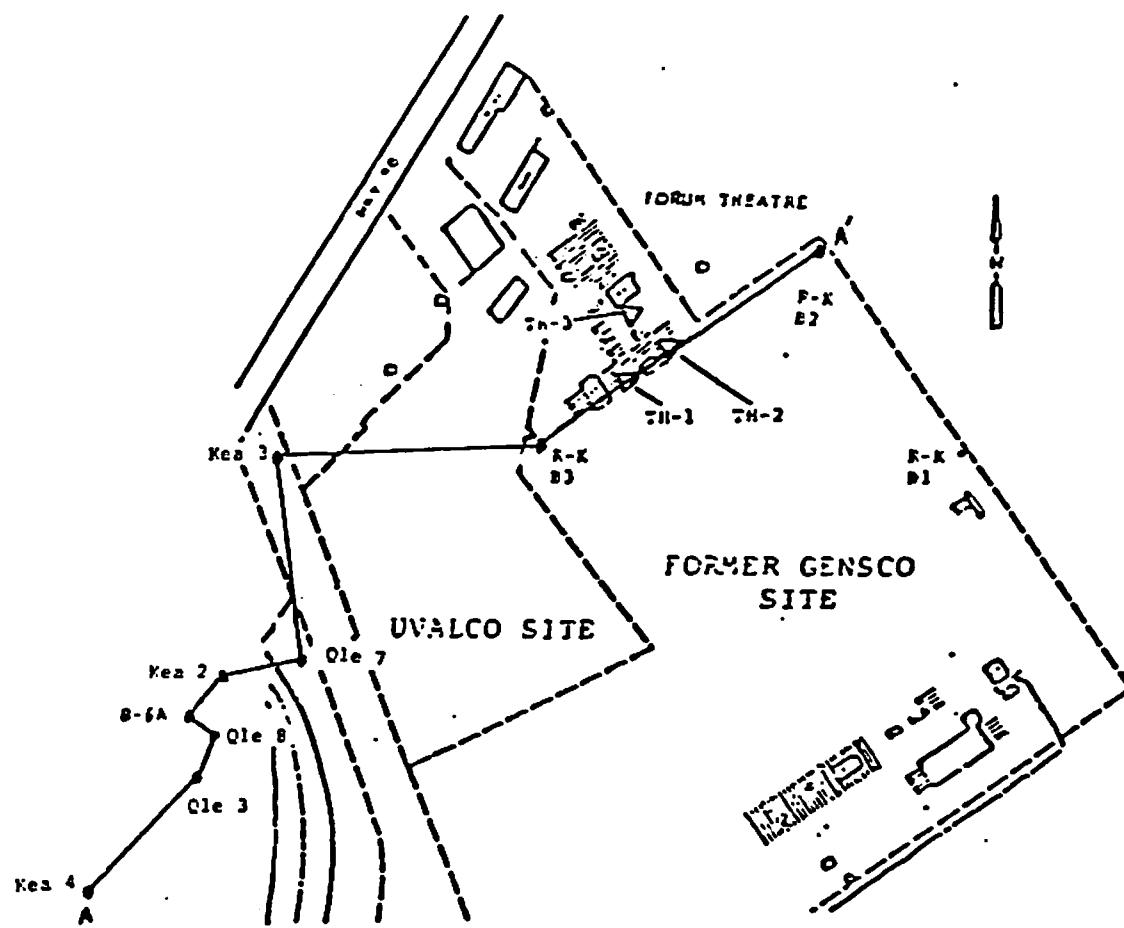


Figure 1

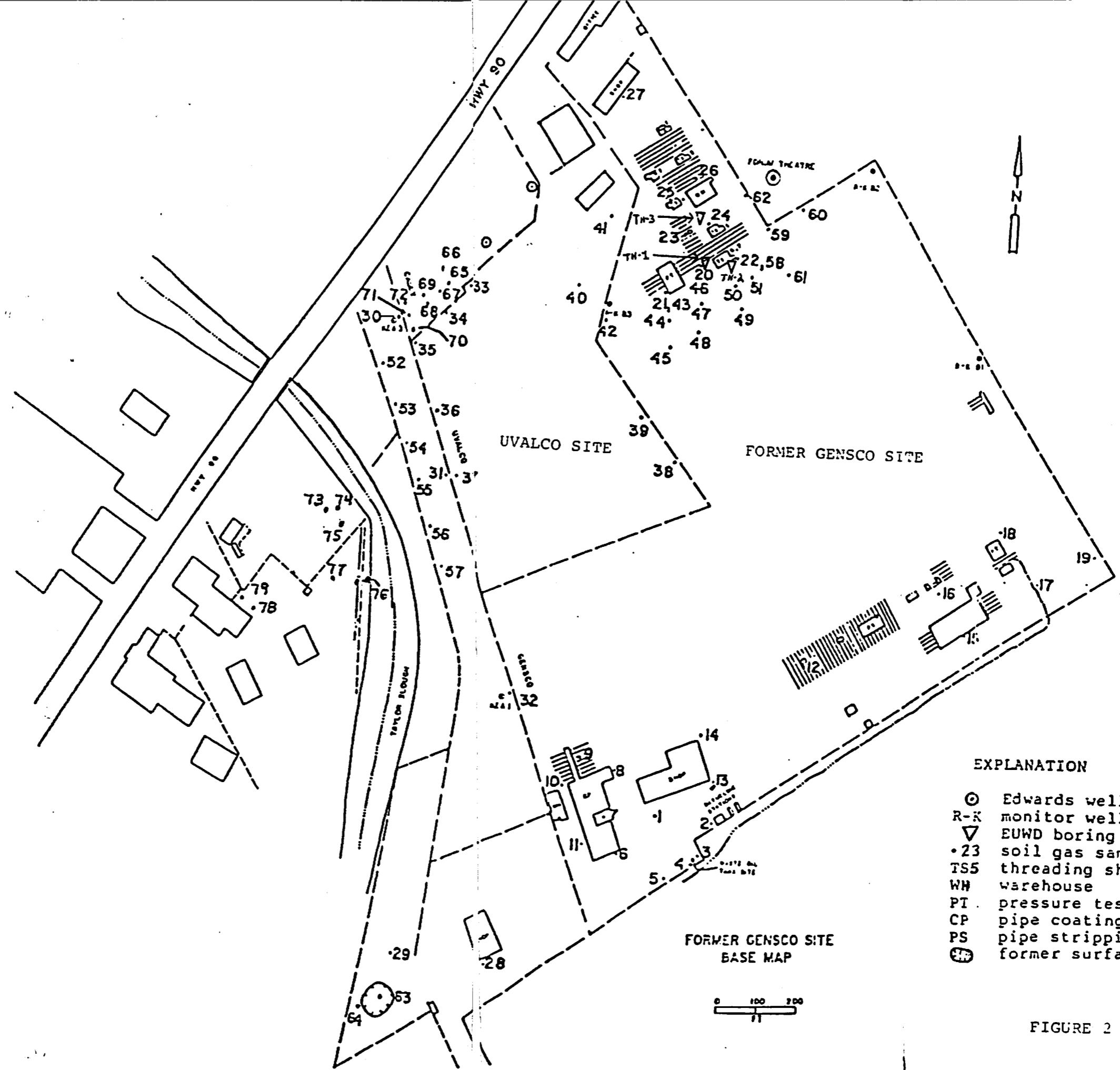
SOIL GAS SURVEY TECHNIQUE

Soil gas extraction and gas chromatography was provided by Chen and Associates under contract by the Edwards Underground Water District on July 21 and 22, August 11, 12 and 28, 1988. Because of the volatile nature of the compounds of interest, samples were ideally extracted from depths greater than 3 feet below land surface.

Vapor samples were extracted via a driven point-vacuum pump system beneath sites chosen on the basis of known or perceived hazardous chemical storage or use. These sites were typically adjacent to maintenance facilities and pipe finishing equipment; pipe storage areas were not investigated. Other sites where wastes were disposed were also investigated. See figure 2 for sampling locations.

After emplacement of the driven point the probe was purged of approximately 7 to 11 liters of gas prior to sample collection. Samples were extracted from the inert tubing connecting the pump to the driven point by a gas tight syringe. They were subsequently analyzed using a Photovac 10S50 portable gas chromatograph. The gas chromatograph was calibrated with tetrachloroethylene (PCE) and toluene for each survey. Trichloroethylene (TCE), trichloroethane (TCA), dichloroethylene (DCE) and benzene were additional calibrants for select surveys.

For clarification purposes, note that SV-46, SV-43, and SV-58 were collected in proximity to SV-20, SV-21, and SV-22 respectively. The results listed as thread shop in table 1 are also from the SV-22 and SV-58 vicinity.



BOREHOLE INVESTIGATIVE TECHNIQUE

Three borehole investigations were initiated to obtain formation samples for field and laboratory analysis. Their locations (shown with TH prefix in figure 2) are within the area of relatively high PCE soil vapor concentrations. The holes were drilled with a 7.5 inch O.D. hollow stem auger with a hand driven, 1.38 inch I.D. split spoon for sample collection. Samples were split into duplicates and immediately placed into 40 ml VOA bottles. After a 15 to 20 minute equilibration period, field screening using gas chromatography consistent with those methods described above was used to select samples for laboratory analyses.

The laboratory contracted to perform these analyses exceeded the sample holding time, thereby compromising the accuracy of the analyses. These samples were discarded and offset boreholes were drilled for the collection of new samples. Proper analytical services yielded the valid results which are provided herein.

RESULTS

The results of the soil gas analyses are shown in Table I. Owing to an inappropriate change in sample injection size it is likely that samples including SV-10 through SV-32 yielded erroneously high results. Efforts to normalize the results of samples SV-10 through SV-32 to the appropriate injection volume of the preceding instrument calibration were not completely successful; the results of which may be slightly elevated sample results. Nonetheless, PCE was present in the majority of samples and all compounds tested for were present in one or more locations within the study area. It is interesting to note that an ambient air sample taken near SV-8 yielded high (11 PPM) PCE vapor concentrations. The highest VOC concentrations continue to be found west of the Taylor Slough. This area has been previously investigated by District personnel, and is considered a source area.

Contouring of the data provides limited insight into the movement of soil vapors in this study. This is in part due to the distribution of the sampling locations. Contours possibly reflect the spotty point of use of these compounds. For example, the highest toluene concentrations occur in areas of present day activity.

Samples taken by thread shops #6 and #7 on the former Gensco site show abundant chromatograph peaks and relatively high concentrations of PCE. This area is the site of previously excavated, predominantly oil-contaminated soils. All PCE and TCE vapor concentrations collected from this site were three or more orders of magnitude less than those found beneath the former Texas Industrial Services (TIS) site west of the Taylor Slough.

TABLE 1
SOIL-VAPOR SAMPLE CONCENTRATIONS
(Reported in PPB)

<u>Sample Site/depth</u>	<u>PCE</u>	<u>TCE</u>	<u>Toluene</u>	<u>Benzene</u>	<u>DCE</u>
SV-1 @ 3'	13 *	ND	75	X	ND
SV-1 @ 6'	ND	ND	125	X	ND
SV-2 @ 6'	ND **	ND	ND	X	ND
SV-2 @ 9'	8 ***	291	ND	X	ND
SV-3 @ 3'	ND	602 *	23 *	X	754 *
SV-3 @ 6'	ND	765 *	76 *	X	ND
SV-4 @ 6'	109	107 *	56	X	ND
SV-5 @ 6'	ND	213 *	ND	X	ND
SV-6 @ 6'	58 *	ND	ND	X	ND
SV-7 @ 6'	5 *	ND	67 *	X	ND
SV-8 @ 6'	ND	ND	ND	X	ND
SV-9 @ 6'	62 *	ND	ND	X	ND
SV-10 @ 6'	ND	176	ND	X	ND
SV-11 @ 6'	90	1832	ND	X	ND
SV-12 @ 6'	25	189	ND	X	ND
SV-13 @ 6'	77	96	ND	X	ND
SV-14 @ 6'	202	96	ND	X	ND
SV-15 @ 6'	77	21	ND	X	ND
SV-16 @ 6'	1 *	105	103	X	ND
SV-17 @ 6'	7 *	ND	ND	X	ND
SV-18 @ 6'	1 *	37	43	X	ND
SV-19 @ 6'	32	352	ND	X	ND
SV-20 @ 3'	10,800	NOTE	373	X	ND
SV-21 @ 6'	420	379	ND	X	ND
SV-22 @ 5'	11,320	NOTE	15	X	ND
SV-23 @ 3'	740	1662	ND	X	ND
SV-24 @ 3'	178	11	6	X	ND
SV-25 @ 6'	42	73	23	X	ND
SV-26 @ 2'	84	670	46	X	ND
SV-27 @ 3'	10	995	16	X	ND
SV-28 @ 4'	151	3872	ND	X	ND
SV-29 @ 5'	13 *	54	ND	X	ND
SV-30 @ 5'	29 *	2860 *	ND	X	ND
SV-31 @ 5'	ND	1430 *	ND	X	ND
SV-32 @ 6'	ND	1430 *	ND	X	ND
SV-33 @ 5'	545	ND	5375	ND	X
SV-34 @ 5'	612	ND	4950	ND	X
SV-35 @ 5'	ND	3	12,145	16	X
SV-36 @ 4'	ND	ND	2924	ND	X
SV-37 @ 5'	ND	2	2270	ND	X
SV-38 @ 5'	1792	3	2790	ND	X
SV-39 @ 5'	1640	ND	3755	ND	X

TABLE I (Cont'd)

<u>Sample Site/depth</u>	<u>PCE</u>	<u>TCE</u>	<u>Toluene</u>	<u>Benzene</u>	<u>DCE</u>
SV-40 @ 5'	64	ND	12,374	ND	X
SV-41 @ 5'	126	ND	936	ND	X
SV-42 @ 5'	ND	ND	2997	ND	X
SV-43 @ 5'	1206	ND	503	ND	X
SV-44 @ 5'	108	ND	620	ND	X
SV-45 @ 5'	51	ND	601	ND	X
SV-46 @ 5'	3252	2694	320	53	X
SV-47 @ 5'	75	ND	117	ND	X
SV-48 @ 5'	190	ND	48	ND	X
SV-49 @ 5'	25	ND	ND	ND	X
SV-50 @ 5'	707	ND	154	ND	X
SV-51 @ 5'	ND	ND	322	ND	X
SV-52 @ 5'	ND	ND	620	ND	X
SV-53 @ 5'	ND	ND	4067	ND	X
SV-54 @ 5'	ND	ND	1778	ND	X
SV-55 @ 5'	ND	ND	528	ND	X
SV-56 @ 4'	ND	ND	225	ND	X
SV-57 @ 4'	ND	ND	216	ND	X
SV-58 @ 3'	3578	ND	1892	ND	X
SV-58 @ 5'	1882	ND	ND	ND	X
SV-58 @ 6.5'	501	ND	ND	ND	X
SV-59 @ 5'	822	ND	ND	ND	X
SV-60 @ 5'	431	ND	407	ND	X
SV-61 @ 5'	ND	ND	1239	ND	X
SV-62 @ 5'	65	ND	198	ND	X
SV-63 @ 5'	ND	ND	3050	ND	X
SV-64 @ 5'	ND	ND	580	ND	X
SV-65 @ 5'	222	ND	1331	ND	X
SV-66 @ 5'	184	ND	2629	ND	X
SV-67 @ 5'	323	ND	1273	16	X
SV-68 @ 4'	425	ND	157	ND	X
SV-69 @ 5'	ND	ND	387	ND	X
SV-70 @ 5'	ND	ND	138	ND	X
SV-71 @ 5'	ND	ND	ND	ND	X
SV-72 @ 5'	ND	ND	117	ND	X
THREAD SHOP (adjacent to SV-22, 58)					
	4470	919	ND	ND	X
SV-73 @ 5'	115,000	660	ND	ND	X
SV-74 @ 5'	116,000	904	ND	ND	X
SV-75 @ 5'	8847	666	ND	ND	X
SV-76 @ 5'	233,900	ND	ND	ND	X
SV-77 @ 5'	26,860	132	ND	ND	X
SV-78 @ 5'	3799	ND	470	ND	X
SV-79 @ 5'	2481	ND	152	ND	X

TABLE I (Cont'd)

EXPLANATION OF NOTES

X Not Tested
ND Not detected
* Suspect reading - see baseline check.
** Possible PCE - 2.7 Volt-seconds: peak 14.
*** Moisture on probe.
NOTE Abundant peaks may mask TCE.

Data collected during July-August 1988.

RESULTS Cont'd.

Analyses of samples obtained during the borehole investigation yielded contrasting results. Head space analyses confirmed the results of the soil gas extractions. However, the absence of PCE and TCE in the laboratory analyses suggests escape of the more volatile constituents between the time of collection and laboratory analysis. Laboratory analyses revealed the presence of acetone and xylenes only. This data is presented in the appendix.

CONCLUSIONS

All compounds targeted in this investigation were found in one or more locations in the study area. Individual properties within the study area may all have contributed, to varying degrees, to the degradation of groundwater quality. However, information from this and other District studies regarding the magnitude and three dimensional distribution of VOC in soil gas suggests the former TIS site is the major contributor of PCE, TCE and DCE to local groundwater.

The area of relatively high soil-vapor concentrations of PCE at the thread shops on the former Gensco Inc. site probably indicates some use of the compound at these locations. Concentrations of PCE in soil vapor on the former Gensco Inc. site are not known to be high enough in any one area to be a significant source to groundwater.

Studies into the hydraulic connection between contaminated wells on the northern boundary of the former Gensco property and wells on and around the former T.I.S. site are recommended. These studies should provide more conclusive evidence towards determining if wells near the former Gensco site have been contaminated by a source on the former Gensco site or by a source on the former T.I.S. site.

Copies of the data reports submitted to the District by Chen and Associates are attached. These include a report on the soil sampling event and reports of three soil vapor studies.

APPENDIX

ANALYTICAL LAB RESULTS OF SOIL SAMPLES

AND RESULTS OF SOIL VAPOR STUDIES

SUBSURFACE INVESTIGATION
GENSCO SITE
UVALDE, TEXAS



Chen & Associates
Consulting Engineers and Scientists



Chen & Associates

Consulting Geotechnical
and Materials Engineers

1850 Grandstand Drive
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Casper
Colorado Springs
Denver
Ft. Collins
Glenwood Springs
Phoenix
Rock Springs
Salt Lake City

SUBSURFACE INVESTIGATION
GENSCO SITE
UVALDE, TEXAS

PREPARED FOR:

Edwards Underground Water District
1615 N. St. Mary's Street
P.O. Box 15830
San Antonio, Texas 78212

Attn: Mr. John Hoyt, Geologist

9-084-88

October 17, 1988

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PURPOSE AND SCOPE

This report presents the results of a subsurface investigation at the Gensco Site located in Uvalde, Texas. The investigation was performed for the purpose of establishing concentrations of volatile organic aromatics (V.O.A.) in the soil at the site. This study was authorized by Mr. John Hoyt with the Edwards Underground Water District.

A soil-vapor survey was conducted at the site under this same job number in July and August, 1988. The reports of those studies were submitted on July 26, August 17, and September 12, 1988.

SUBSURFACE INVESTIGATION

The field exploration was conducted on August 30, 1988. Three exploratory holes were drilled at locations designated by the Edwards Underground Water District. The holes were drilled with 7.5 inch hollow stem augers and logged by a representative of Chen & Associates, Inc. Samples of the subsurface soils were obtained with a 1 3/8 inch I.D. split spoon sampler. After sampling, soil samples were removed from the split spoon sampler and placed in 40 ml vials and allowed to volatilize for approximately 15 to 20 minutes. A syringe sample of the head-space vapors was then extracted from the vials and injected into a Photovac 10S50 portable gas chromatograph. The 10S50 had previously been calibrated with perchlorethylene (PCE), trichloroethylene (TCE), benzene and toluene. The data obtained from the soil-vapor head-space analysis, adjusted for syringe and base line checks, is presented in Table I. Selected samples from each exploratory hole were transmitted to an analytical laboratory for determination of volatile organic aromatics (V.O.A.). Upon return of the analytical results it was determined that the holding time of 14 days had been

exceeded. The drill rig was remobilized to the project site on October 6, 1988 and the subsurface soils were resampled and the samples were transmitted to an analytical laboratory for retesting. Visual classifications of the subsurface soils are presented on the Logs of Exploratory Holes, Fig. 1.

SUBSURFACE CONDITIONS

The subsurface conditions encountered across the site generally consisted of 22.0 to 24.0 feet of clay, silty sand and gravel overlying weathered limestone to the depth investigated, 35 feet.

LABORATORY RESULTS

Analytical tests were conducted on selected soil samples for determination of volatile organic aromatics (V.O.A.) using EPA method SW846/8240. The analytical results are shown on the analytical data sheets presented in Appendix B. PCE or TCE concentrations were not detected in the soil samples tested.

LIMITATIONS

This subsurface investigation was conducted for the purpose of collecting data for the Edwards Underground Water District. Any conclusions formulated from this data are strictly those of the client, and do not reflect the opinions or conclusions of Chen & Associates, Inc.

All statements and observations have been based on the scope of work performed. Subsurface variations may occur between exploratory holes; therefore, if any additional information is known or encountered concerning the project site, this office should be notified for possible reevaluation of the data presented in this report.

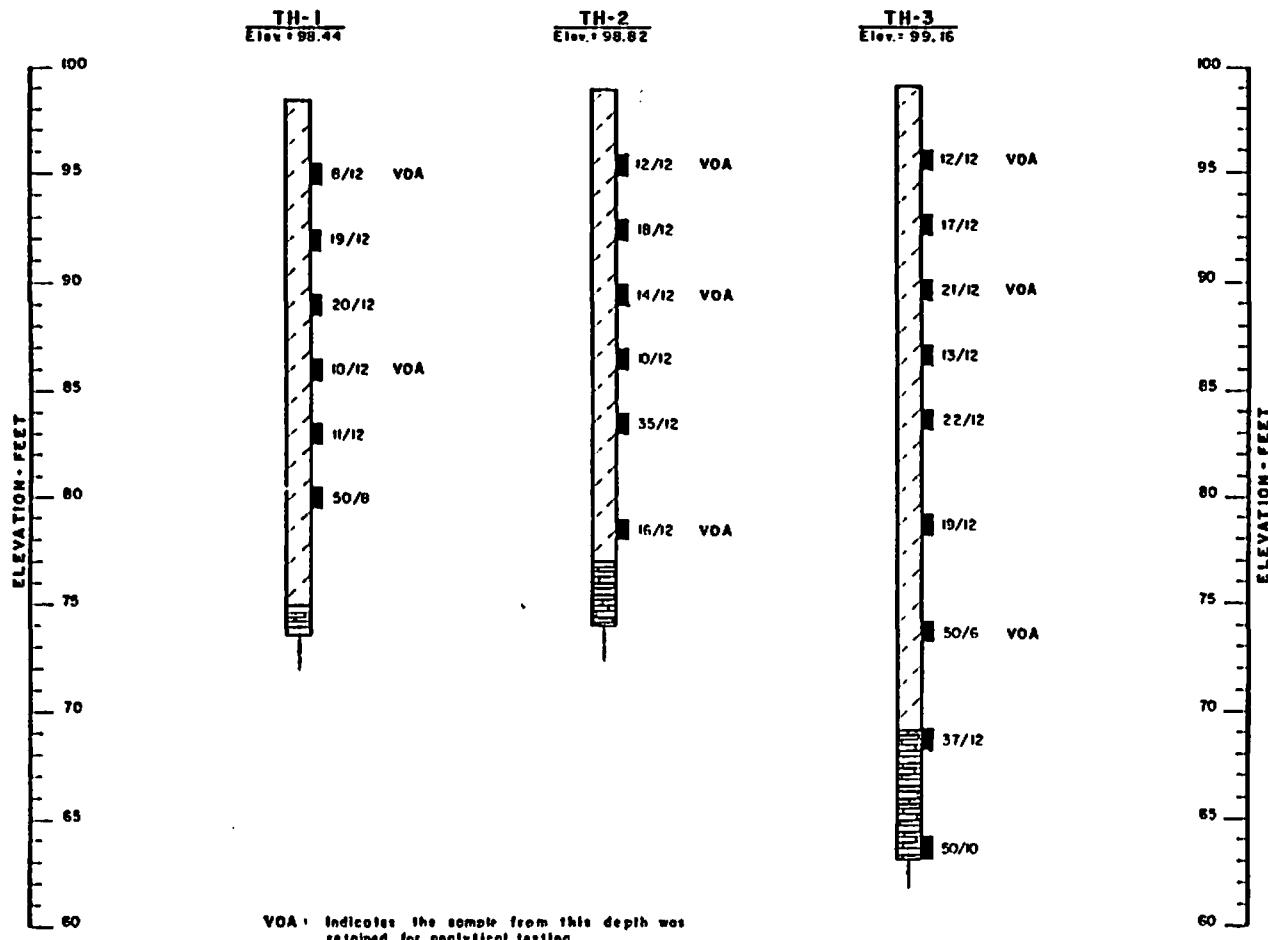
Sincerely,

CHEN-NORTHERN, INC.

By: Mark M. Briggs
Mark M. Briggs, Geologist

Rev. By: Pat Bullinger, P.E.

MMB/irb



LEGEND

 Clay, silty to sandy with gravel, firm to hard, light brown to brown slightly moist to moist.

 Limestone, hard, light brown to tan slightly moist to dry.

 8/12 Disturbed drive sample. The symbol 8/12 indicates 8 blows with a 140 lb. hammer falling 30 inches were required to drive a split spoon sampler 12 inches.

 Practical rig refusal.

NOTES:

- (1) The exploratory holes were drilled on August 30, and October 6, 1988 using a 7½ inch hollow stem auger.
- (2) The exploratory holes were located by Edwards Underground Water District Personnel.
- (3) The lines between material types indicated on the logs represent approximate boundaries between material types. Actual transitions may be gradual.
- (4) Ground water was not encountered during the investigation.

TABLE I

HEAD-SPACE SAMPLING CONCENTRATIONS
GENSCO SITE
UVALDE, TEXAS

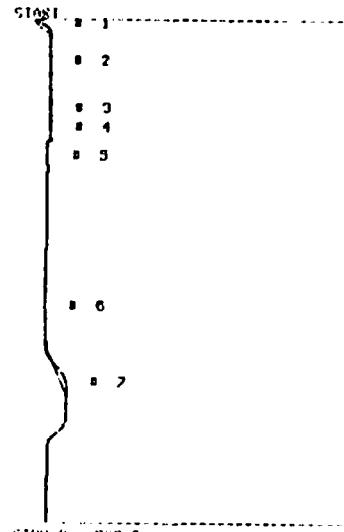
<u>Sample @ Depth</u>	PCE <u>Concentration</u> (ppm)	TCE <u>Concentration</u> (ppm)	Toluene <u>Concentration</u> (ppm)	Benzene <u>Concentration</u> (ppm)
TH-1 @ 3'	0.3	0.2	ND	ND
TH-1 @ 6'	ND	0.1	ND	ND
TH-1 @ 9'	0.2	0.1	ND	ND
TH-1 @ 12'	0.3	0.2	ND	ND
TH-1 @ 15'	0.2	0.1	ND	ND
TH-1 @ 18'	0.1	ND	ND	ND
TH-2 @ 3'	1.1	0.2	ND	ND
TH-2 @ 6'	0.3	0.1	ND	ND
TH-2 @ 9'	0.2	0.1	ND	ND
TH-2 @ 12'	0.1	ND	ND	ND
TH-2 @ 15'	0.1	ND	ND	ND
TH-2 @ 20'	0.5	ND	ND	ND
TH-3 @ 3'	1.6	0.4	ND	ND
TH-3 @ 6'	ND	ND	ND	ND
TH-3 @ 9'	ND	ND	ND	ND
TH-3 @ 12'	ND	ND	ND	ND
TH-3 @ 15'	ND	ND	ND	ND
TH-3 @ 20'	ND	ND	ND	ND
TH-3 @ 25'	ND	ND	1.0	ND
TH-3 @ 30'	ND	ND	ND	ND
TH-3 @ 35'	ND	ND	ND	ND

ND = Not Detected

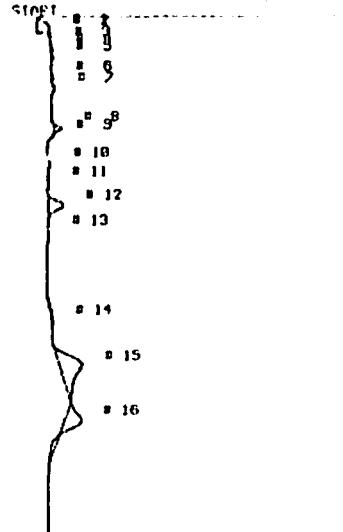
Note: Head-space analysis was conducted at a gain of 10 and a flow rate of 18 ml/min utilizing a 100 microliter sample injection size. Utilizing this setup, the practical quantification limit for the suspect compounds was approximately 0.5 parts per million (ppm)..

APPENDIX A
HEAD-SPACE CHROMATOGRAMS

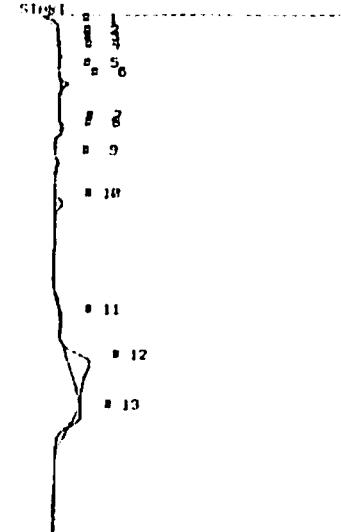
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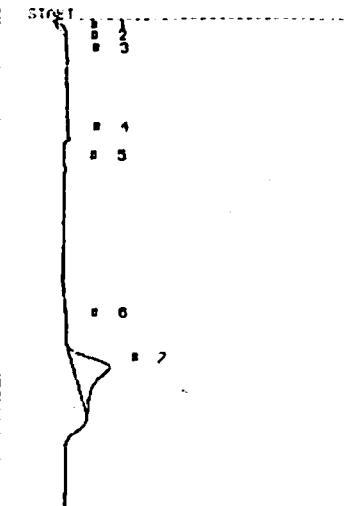
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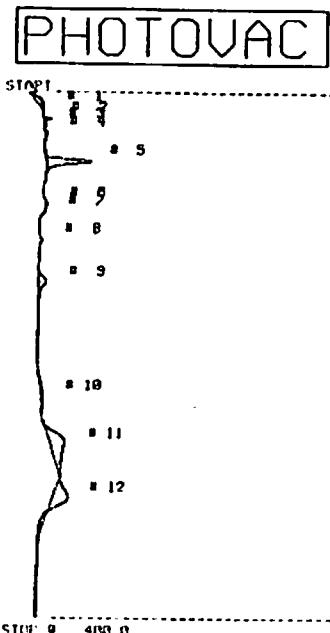


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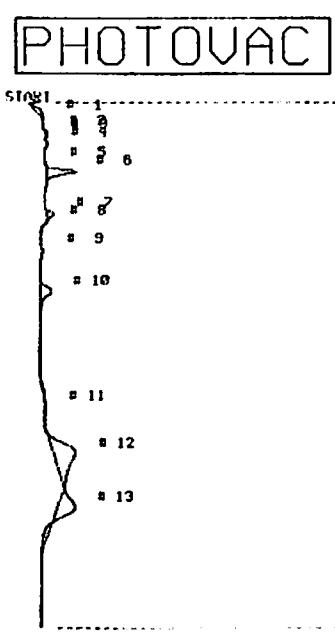


STOP 9 480.0

SAMPLE LIBRARY 2 AUG 30 1988 12:24
ANALYSIS # 25 EUDI UVALDE 4
INTERNAL TEMP 28 INJ100 STR1 FL18
OINN 10 1 AT 9

CONFIDENTIAL SOURCE FERGUSON B.T. PREPRINT

UNKNOWN	1	13.6	145.5	μ US
UNKNOWN	5	53.8	635.5	μ US
TCE	9	146.1	111.3	PPB
TOLUENE	11	263.0	1.33	PPM
PCP	12	209.9	239.1	PPB

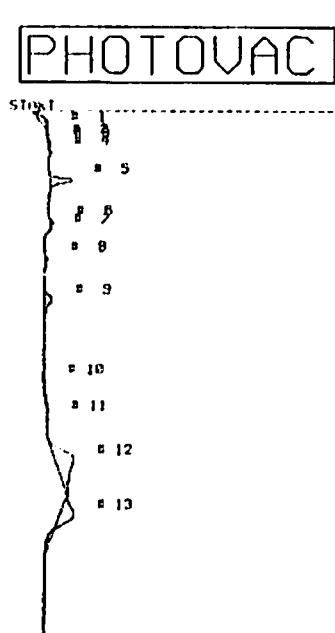


STOP # 4BP.B

SAMPLE LIBRARY 2 RUN 3A 1988 12:32
ANALYSIS # 28 E184D LUWALDE 4
INTERNAL TEMP 29 INJ100 SYR1 F11B
PAIN 10 1.01.12

COMMENDED: NIGUE, ALVIN G., JR.; CHATMAN

UNKNOWN	1	12.0	101.1	100.0
UNKNOWN	8	13.2	123.3	100.0
ICE	10	146.1	166.0	100.0
TOLUENE	12	268.2	219.3	100.0
TIC	13	268.2	219.3	100.0

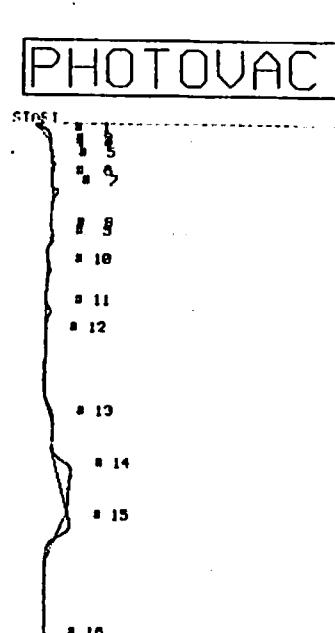


STOP 440, B

SAMPLE LIBRARY 2 AUG 30 1988 12:48
ANALYSIS #: 27 EUHD UVALDE 4
INTERNAL TEMP 23 INJ100 SYR1 FL1B

卷之三

UNITS	1	14.2	146.3	PPM
UNITS	5	50.2	291.1	PPM
TCE	3	146.1	118.2	PPM
TOLUENE	12	208.1	1,629	PPM
DCL	12	203.2	218.8	PPM



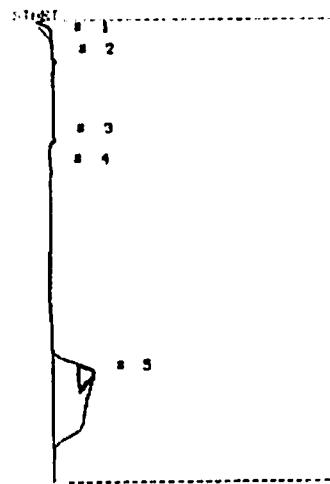
Page 18

SITE # 10P.B
SAMPLE LIBRARY 2 AUG 39 1988 12143
ANALYSIS # 2B ELDIO URALDE 4
INTERNO 10P.B 11-100

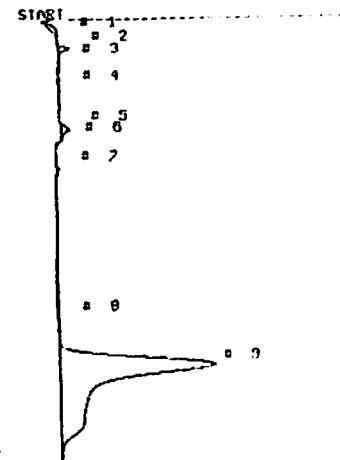
GAIN 10 ~~10.75~~ 10.75 I A T

CONTAMINANT NAME	PEAK	R.T.	ABSORBANCE
CHLOROPHYLL	1	13.0	127.4 FNU
FLUORESCENCE	14	269.3	1.236 FTU
F.F.C.	15	333.6	88.00 FNU

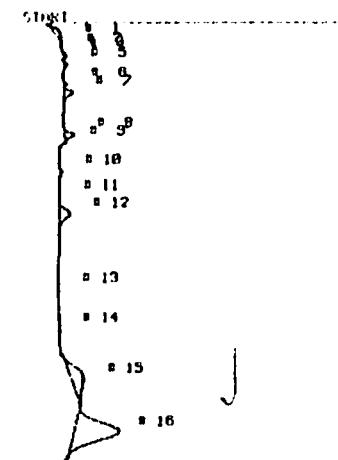
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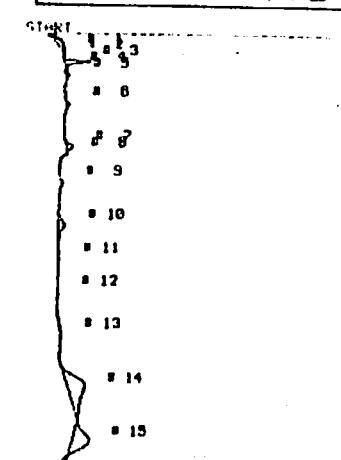
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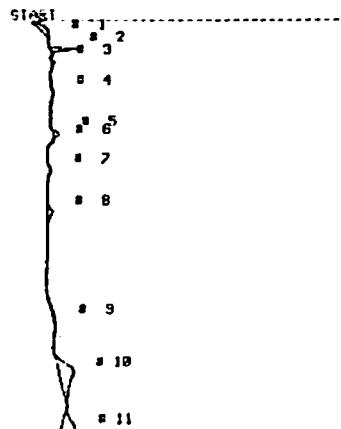
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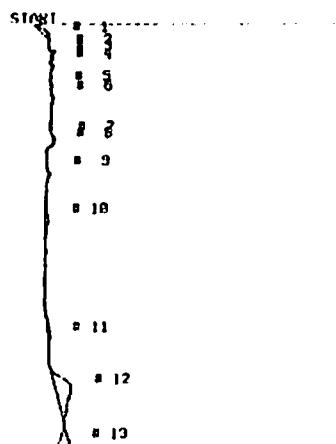
PHOTOVAC



COMPOUND NAME PEAK R.T. AREAPPM

UNKNOWN	1	12.9	162.3	MUS
UNKNOWN	2	22.4	165.1	MUS
TCE	8	140.5	22.39	PPB
TOLUENE	10	202.7	1.210	PPM
TCE	11	311.0	238.6	PPB

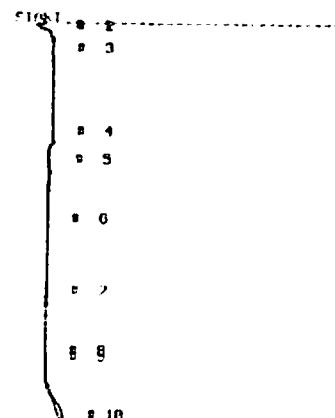
PHOTOVAC



COMPOUND NAME PEAK R.T. AREAPPM

UNKNOWN	1	12.0	112.0	MUS
TOLUENE	12	226.0	1.120	FLU
TCE	13	320.1	73.06	PPB

PHOTOVAC



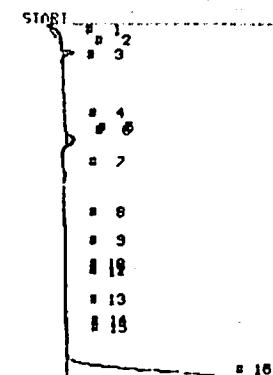
COMPOUND NAME PEAK R.T. AREAPPM

TCE	10	502.4	104.0	PPB
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2	COMPOUND	ID #	R.T.	LIMIT
	BENZENE		1	115.6 560.0 PPM
	PCE		2	312.0 8.000 PPB
	TOLUENE		3	264.2 500.0 PPM
	TCE		5	140.7 8.000 PPB

PHOTOVAC



COMPOUND NAME PEAK R.T. AREAPPM

UNKNOWN	1	11.9	155.4	MUS
UNKNOWN	5	28.2	128.2	MUS
TOLUENE	10	220.6	11.22	PPM

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CALIBRATED PEAK 16, TOLUENE

SAMPLE LIBRARY 2 AUG 30 1988 14:14
ANALYSIS # 38 E100D UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL10
GAIN 10 TOL CAL 2

COMPOUND NAME PEAK R.T. AREA/PFTM

UNKNOWN 1 14.9 155.4 μUS
UNKNOWN 5 88.2 128.9 μUS
TOLUENE 16 220.8 16.00 PPM

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START # 1
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STOP # 300.0
SAMPLE LIBRARY 2 AUG 30 1988 14:29
ANALYSIS # 39 E100D UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL10
GAIN 10 BLK CRK

COMPOUND NAME PEAK R.T. AREA/PFTM

UNKNOWN 1 14.9 122.6 μUS
UNKNOWN 11 200.1 122.5 μUS

PHOTOVAC

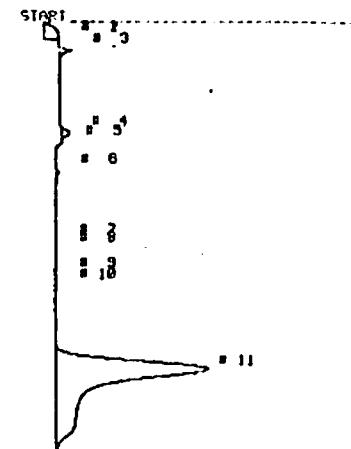
START # 1
2
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STOP # 300.0
SAMPLE LIBRARY 2 AUG 30 1988 14:38
ANALYSIS # 40 E100D UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL10
GAIN 10 PEK-ENK SYR CHK

COMPOUND NAME PEAK R.T. AREA/PFTM

UNKNOWN 1 13.4 181.3 μUS
TOLUENE 12 221.4 2,082 PPM

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STC # 302.7
SAMPLE LIBRARY 2 AUG 30 1988 14:47
ANALYSIS # 41 E100D UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL10
GAIN 10 TOL CAL 3

COMPOUND NAME PEAK R.T. AREA/PFTM

UNKNOWN 1 12.2 310.1 μUS
UNKNOWN 3 22.7 103.1 μUS
UNKNOWN 1 81.9 137.0 μUS
TOLUENE 11 204.8 18.18 PPM

PHOTOVAC

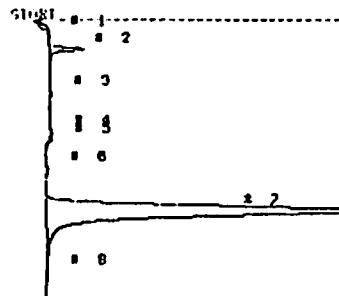
CALIBRATED PEAK 11, TOLUENE

SAMPLE LIBRARY 2 AUG 30 1988 14:48
ANALYSIS # 41 E100D UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL10
GAIN 10 TOL CAL 3

COMPOUND NAME PEAK R.T. AREA/PFTM

UNKNOWN 1 12.2 325.1 μUS
UNKNOWN 3 22.7 103.1 μUS
UNKNOWN 4 84.9 132.8 μUS
TOLUENE 11 204.8 18.00 PPM

PHOTOVAC

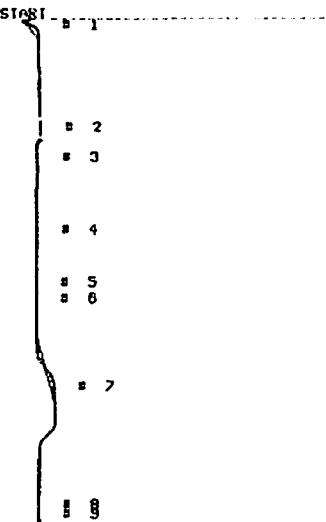


SAMPLE LIBRARY 2 AUG 30 1988 14:54
ANALYSIS # 42 EUWD UVALDE 4
INTERNAL TEMP 31 INJ100 SYRI FL18
GAIN 10 TCE CHX

CONFIRMED NAME PEAK R.T. AREA/PPM

UNKNOWN 2 23.5 215.8 PWS
TCE 2 145.6 7.123 PPM

PHOTOVAC

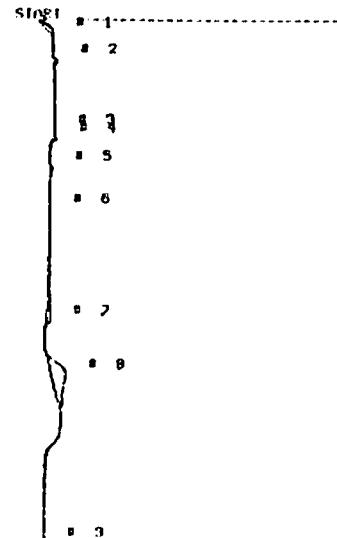


SAMPLE LIBRARY 2 AUG 30 1988 15:4
ANALYSIS # 43 EUWD UVALDE 4
INTERNAL TEMP 38 INJ100 SYRI FL18
GAIN 10 BLK CHX

CONFIRMED NAME PEAK R.T. AREA/PPM

UNKNOWN 1 13.1 15.3 PWS

PHOTOVAC

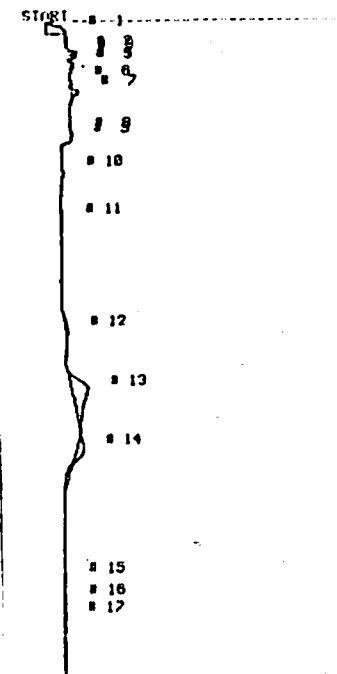


SAMPLE LIBRARY 2 AUG 30 1988 15:11
ANALYSIS # 44 EUWD UVALDE 4
INTERNAL TEMP 31 INJ100 SYRI FL18
GAIN 10 BLK CHX
3YR

CONFIRMED NAME PEAK R.T. AREA/PPM

UNKNOWN 2 223.9 199.2 PWS
TCE 2 221.2 2.513 PPM

PHOTOVAC



SAMPLE LIBRARY 2 AUG 30 1988 15:21
ANALYSIS # 45 EUWD UVALDE 4
INTERNAL TEMP 31 INJ100 SYRI FL18
GAIN 10 2 RT 15

CONFIRMED NAME PEAK R.T. AREA/PPM

UNKNOWN	1	9.8 342.1 PWS
UNKNOWN	2	55.2 194.7 PWS
UNKNOWN	13	282.8 1.0 PWS
UNKNOWN	14	328.1 300.3 PWS

PHOTOVAC

CALIBRATED PEAK 2, TCE

SAMPLE LIBRARY 2 AUG 30 1988 14:55
ANALYSIS # 42 EUWD UVALDE 4
INTERNAL TEMP 38 INJ100 SYRI FL18
GAIN 10 TCE CHX

CONFIRMED NAME PEAK R.T. AREA/PPM

UNKNOWN 2 23.5 215.8 PWS
TCE 2 145.6 10.00 PPM

PHOTOVAC

START
 # 3
 # 6
 # 7
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 # 11
 # 12
 # 13
 # 14
 # 15
 # 16

STOP # 426.8
 SAMPLE LIBRARY 2 AUG 30 1988 15149
 ANALYSIS # 46 EUHQD UVALDE 4
 INTERNAL TEMP 30 INJ100 SYRI FL1B
 GAIN 10 2 AT 20

COMPOUND NAME PEAK R.T. AREAL%

UNKNOWN	1	13.0	168.6	µUS
TOLUENE	13	281.0	302.5	PPB
TCE	14	328.1	425.4	PPB

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT
 BENZENE 1 114.2 500.0 PPB
 PCE 2 309.5 0.000 PPB
 TOLUENE 3 262.1 500.0 PPB
 TCE 5 145.6 0.000 PPB

PHOTOVAC

CALIBRATED PEAK 14, TOLUENE
 SAMPLE LIBRARY 2 AUG 30 1988 15149
 ANALYSIS # 46 EUHQD UVALDE 4
 INTERNAL TEMP 30 INJ100 SYRI FL1B
 GAIN 10 TOL CAL 4

COMPOUND NAME PEAK R.T. AREAL%

UNKNOWN	1	16.3	251.0	µUS
UNKNOWN	9	81.4	117.3	µUS
TOLUENE	14	228.3	18.00	PPB

PHOTOVAC

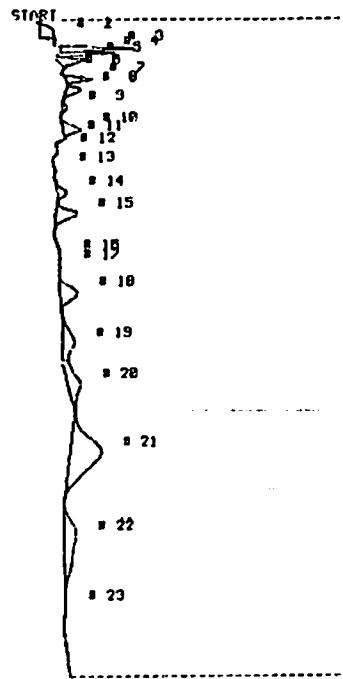
START
 # 12
 # 3
 # 6
 # 7
 # 8
 # 9
 # 10
 # 11
 # 13
 # 14

SIM # 302.1
 SAMPLE LIBRARY 2 AUG 30 1988 15149
 ANALYSIS # 46 EUHQD UVALDE 4
 INTERNAL TEMP 30 INJ100 SYRI FL1B
 GAIN 10 TOL CAL 4

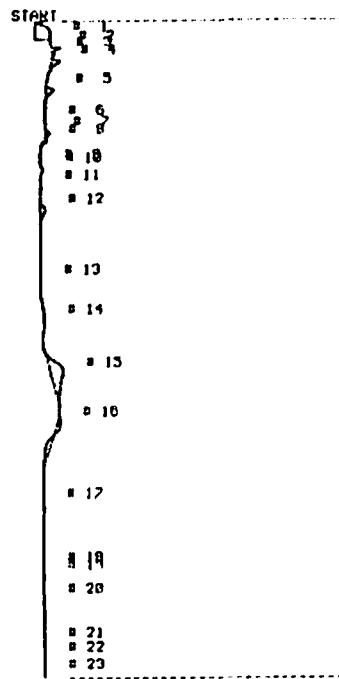
COMPOUND NAME PEAK R.T. AREAL%

UNKNOWN	1	16.3	251.0	µUS
UNKNOWN	9	81.4	142.3	µUS
UNKNOWN	13	228.3	11.4	PPB

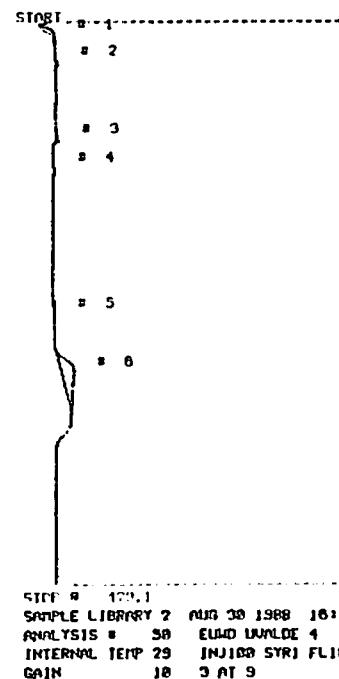
PHOTOVAC



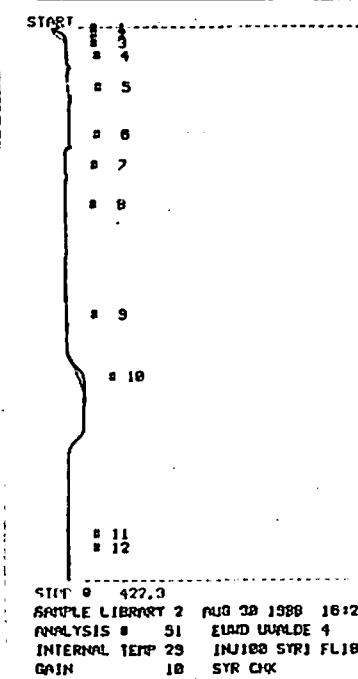
PHOTOVAC



PHOTOVAC



PHOTOVAC



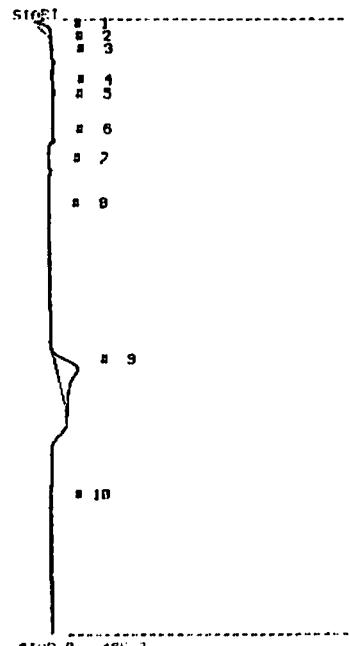
COMPOUND NAME	PEAK	R.T.	ABSEPMIN
UNKNOWN	1	12.3	414.0 μVUS
UNKNOWN	2	23.3	620.2 μVUS
UNKNOWN	4	29.4	436.2 μVUS
UNKNOWN	5	31.6	351.6 μVUS
UNKNOWN	7	46.2	387.1 μVUS
UNKNOWN	8	54.3	243.0 μVUS
UNKNOWN	10	85.5	363.6 μVUS
UNKNOWN	14	133.2	222.9 μVUS
TCE	15	143.9	349.4 PPB
UNKNOWN	18	208.9	621.2 μVUS
UNKNOWN	19	216.8	288.2 μVUS
TOLUENE	20	228.9	1,338 PPB
TCE	21	330.2	1,568 PPB
UNKNOWN	22	333.3	1.2 US

COMPOUND NAME	PEAK	R.T.	ABSEPMIN
UNKNOWN	1	14.2	457.0 μVUS
UNKNOWN	12	145.7	119.4 μVUS
TOLUENE	15	265.2	1,213 PPB

COMPOUND NAME	PEAK	R.T.	ABSEPMIN
UNKNOWN	1	12.0	110.1 μVUS
TOLUENE	6	228.4	1,365 PPB

COMPOUND NAME	PEAK	R.T.	ABSEPMIN
TOLUENE	10	226.5	313.2 PPB

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SAMPLE LIBRARY 2 AUG 30 1988 16:135

ANALYSIS # 52 EUWD UVALDE 4

INTERNAL TEMP 29 INJ100 SYRI FL18

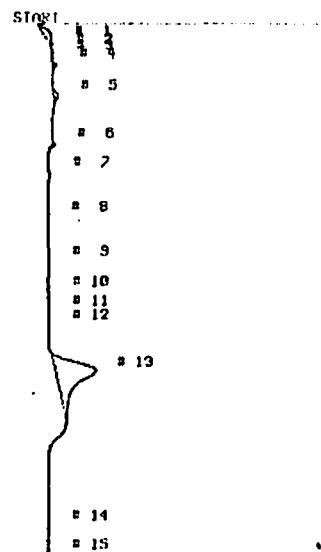
GAIN 10 3 AT 12

COMPOUND NAME FENK R.T. AREA/PPM

UNKNOWN 1 13.4 159.0 PPM

TOLUENE 9 266.0 2.028 PPM

PHOTOVAC



SAMPLE LIBRARY 2 AUG 30 1988 16:135

ANALYSIS # 53 EUWD UVALDE 4

INTERNAL TEMP 29 INJ100 SYRI FL18

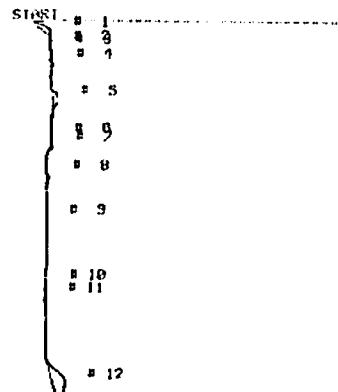
GAIN 10 3 AT 15

COMPOUND NAME FENK R.T. AREA/PPM

UNKNOWN 1 15.9 122.9 PPM

UNKNOWN 13 261.8 2.5 PPM

PHOTOVAC



SAMPLE LIBRARY 2 AUG 30 1988 16:150

ANALYSIS # 54 EUWD UVALDE 4

INTERNAL TEMP 29 INJ100 SYRI FL18

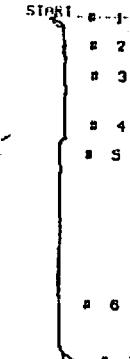
GAIN 10 3 AT 20

COMPOUND NAME FENK R.T. AREA/PPM

UNKNOWN 1 10.7 105.2 PPM

UNKNOWN 12 221.1 1.234 PPM

PHOTOVAC



SAMPLE LIBRARY 2 AUG 30 1988 17:4

ANALYSIS # 56 EUWD UVALDE 4

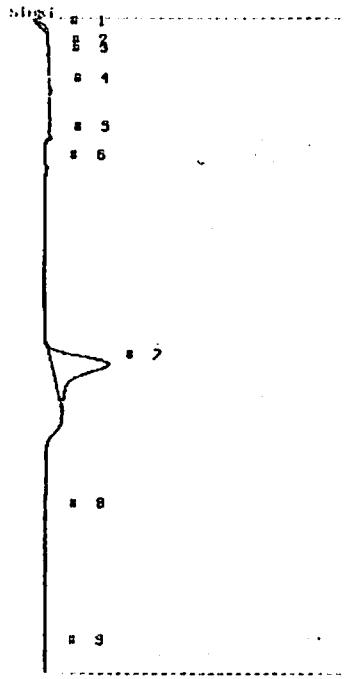
INTERNAL TEMP 30 INJ100 SYRI FL18

GAIN 10 SYR CHK NEW PLG

COMPOUND NAME FENK R.T. AREA/PPM

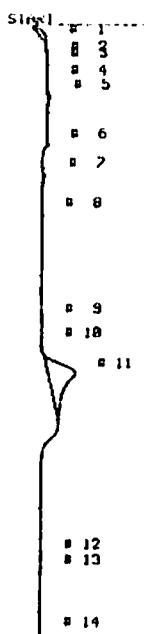
TOLUENE 1 221.1 0.011 PPM

PHOTOVAC



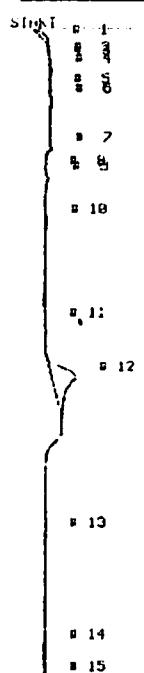
COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 2 263.9 3.0 US

PHOTOVAC



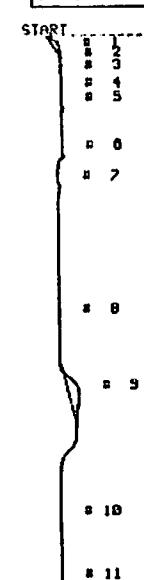
COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 12.6 113.5 µUS
TOLUENE 11 265.7 2,703 µPPM

PHOTOVAC



COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 11.3 102.4 µUS
TOLUENE 12 265.7 2,813 µPPM

PHOTOVAC



COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 15.9 130.0 µUS
TOLUENE 9 223.2 1,261 PPm

APPENDIX B
ANALYTICAL DATA

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number	:	TH1 @ 3-4'	Chen Project No.:	9-084-88
Lab Sample Number	:	X5847	Evergreen Project Number :	5060
Date Sampled	:	10/06/88	Chain of Custody No.:	046
Date Received	:	10/08/88	Method/Matrix :	8240/Soil
Date Extracted/Prepared	:	10/14/88	Dilution Factor :	1
Date Analyzed	:	10/14/88		

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	U	10
Bromomethane	74-83-9	U	10
Vinyl Chloride	75-01-4	U	10
Chloroethane	75-00-3	U	10
Methylene Chloride	75-09-2	U	10
Acetone	67-64-1	85	100
Carbon Disulfide	75-15-0	U	100
1,1-Dichloroethene	75-25-4	U	100
1,1-Dichloroethane	75-24-5	U	100
Trans-1,2-Dichloroethene	156-60-6	U	100
Chloreform	56-26-1	U	100
1,2-Dichloroethane	107-06-2	U	100
2-Butanone	78-95-5	U	100
1,1,1-Trichloroethane	71-55-0	U	100
Carbon Tetrachloride	56-23-5	U	100
Vinyl Acetate	108-05-4	U	100
Bromodichloromethane	75-27-4	U	100
1,2-Dichloropropane	78-87-5	U	100
trans-1,3-dichloropropene	100-51-0	U	100
Trichloroethene	79-01-0	U	100
Dibromochloromethane	124-48-1	U	100
1,1,2-Trichloroethane	79-00-5	U	100
Benzene	71-43-2	U	100
cis-1,3-dichloropropene	10061-01-5	U	100
2-Chloroethylvinylether	110-75-8	U	100
Bromoform	75-26-2	U	100
4-Methyl-2-pentanone	591-78-6	U	100
2-Hexanone	108-10-1	U	100
Tetrachloroethene	127-18-4	U	100
1,1,2,2-Tetrachloroethane	79-34-5	U	100
Toluene	108-88-3	U	100
Chlorobenzene	108-90-7	U	100
Ethylbenzene	100-41-4	U	100
Styrene	100-42-5	U	100
Total xylenes			

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 88% Toluene-d8 94% Bromofluorobenzene 89%

QUALIFIERS:

- U = Compound analyzed for, but not detected above the EPA Method Detection Limit (MDL), 40 CFR, Part 136, App. A (7-1-87 Edition), pa. 440.
- J = Indicates an estimated value when the compound is detected, but is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: _____

J D Parker
John D Parker

C M Smith
Quality Assurance Officer

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number	: TH 1 @ 12-13'	Chen Project No.: 9-084-88
Lab Sample Number	: X5848	Evergreen Project Number : 5060
Date Sampled	: 10/06/88	Chain of Custody No.: 046
Date Received	: 10/08/88	Method/Matrix : 8240/Soil
Date Extracted/Prepared	: 10/14/88	Dilution Factor : 1
Date Analyzed	: 10/14/88	

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	U	10
Bromomethane	74-83-9	U	10
Vinyl Chloride	75-01-4	U	10
Chloroethane	75-00-3	U	10
Methylene Chloride	75-09-2	U	10
Acetone	67-64-1	U	100
Carbon Disulfide	75-15-0	U	100
1,1-Dichloroethene	75-35-4	U	100
1,1-Dichloroethane	75-34-3	U	100
Trans-1,2-Dichloroethene	156-60-5	U	100
Chloroform	67-66-3	U	100
1,2-Dichloroethane	107-06-2	U	100
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-9	U	100
Carbon Tetrachloride	56-22-5	U	100
Vinyl Acetate	108-06-4	U	100
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	10
Trichloroethene	79-01-6	U	10
Oibromochloromethane	124-48-1	U	5
1,1,2-Trichloroethane	79-00-5	U	5
Benzene	71-43-2	U	5
Cis-1,3-dichloropropene	10061-01-5	U	5
2-Chloroethylvinylether	110-75-3	U	5
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	5
2-Hexanone	108-10-1	U	5
Tetrachloroethene	127-18-4	U	5
1,1,2,2-Tetrachloroethane	79-34-5	U	5
Toluene	108-88-3	U	5
Chlorobenzene	108-90-7	U	5
Ethylbenzene	100-41-4	U	5
Styrene	100-42-5	U	5
Total xylenes		30	5

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 100% Toluene-d8 107% Bromofluorobenzene 103%

QUALIFIERS:

- U = Compound analyzed for, but not detected above the EPA Method Detection Limit (MDL), 40 CFR, Part 136, App. A (7-1-87 Edition), pa. 440.
- J = Indicates an estimated value when the compound is detected, but, is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: John D Parker

Quality Assurance Officer

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number : TH 2 @ 3-4
 Lab Sample Number : X5849
 Date Sampled : 10/06/88
 Date Received : 10/08/88
 Date Extracted/Prepared : 10/14/88
 Date Analyzed : 10/14/88

Chen Project No.: 9-084-88
 Evergreen Project Number : 5060
 Chain of Custody No.: 046
 Method/Matrix : 8240/Soil
 Dilution Factor : 1

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	0	10
Bromomethane	74-83-9	0	10
Vinyl Chloride	25-01-4	0	10
Chloroethane	75-00-3	0	10
Methylene Chloride	75-09-2	0	10
Acetone	67-64-1	80	100
Carbon Disulfide	75-15-0	0	100
1,1-Dichloroethene	75-35-4	0	100
1,1-Dichloroethane	75-34-3	0	100
Trans-1,2-Dichloroethene	196-60-5	0	100
Chloroform	67-66-3	0	100
1,2-Dichloroethane	107-06-2	0	100
2-Butanone	78-93-3	0	100
1,1,1-Trichloroethane	71-55-8	0	100
Carbon Tetrachloride	56-23-5	0	100
Vinyl Acetate	108-05-4	0	100
Bromodichloromethane	75-27-4	0	100
1,2-Dichloropropene	78-87-5	0	100
Trans-1,3-dichloropropene	10061-02-5	0	100
Trichloroethene	79-01-6	0	100
Dibromochloromethane	124-48-1	0	100
1,1,2-Trichloroethane	79-00-5	0	100
Benzene	71-43-2	0	100
Cis-1,3-dichloropropene	10061-01-5	0	100
2-Chloroethylvinylether	110-75-8	0	100
Bromoform	75-25-2	0	100
4-Methyl-2-pentanone	591-78-8	0	100
2-Hexanone	108-10-1	0	100
Tetrachloroethene	127-18-4	0	100
1,1,2,2-Tetrachloroethane	79-34-5	0	100
Toluene	108-88-3	0	100
Chlorobenzene	108-90-7	0	100
Ethylbenzene	100-41-4	0	100
Styrene	100-42-5	0	100
Total xylenes		30	

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 85% Toluene-d8 94% Bromofluorobenzene 89%

QUALIFIERS:

- U = Compound analyzed for, but not detected above the EPA Method Detection Limit (MDL), 40 CFR, Part 136, App. A (7-1-87 Edition), pa. 440.
- J = Indicates an estimated value when the compound is detected, but is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: _____

John D Parker

Quality Assurance Officer

cm smt

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number : TH 2 @ 9-10' Lab Sample Number : X5850
 Date Sampled : 10/06/88 Date Received : 10/08/88
 Date Extracted/Prepared : 10/14/88 Date Analyzed : 10/14/88

Chen Project No.: 9-084-88
 Evergreen Project Number : 5060
 Chain of Custody No.: 046
 Method/Matrix : 8240/Soil
 Dilution Factor : 1

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	U	10
Bromomethane	74-83-9	U	10
Vinyl Chloride	75-01-4	U	10
Chloroethane	75-00-3	U	10
Methylene Chloride	75-09-2	U	10
Acetone	67-64-1	U	100
Carbon Disulfide	75-15-0	U	100
1,1-Dichloroethene	75-35-4	U	100
1,1-Dichloroethane	75-34-3	U	100
Trans-1,2-Dichloroethene	156-60-9	U	100
Chloroform	67-66-3	U	100
1,2-Dichloroethane	107-06-2	U	100
2-Butanone	78-93-5	U	100
1,1,1-Trichloroethane	71-55-6	U	100
Carbon Tetrachloride	56-23-5	U	100
Vinyl Acetate	108-05-4	U	100
Bromodichloromethane	75-27-4	U	100
1,2-Dichloropropane	79-87-5	U	100
Trans-1,3-dichloropropene	10061-02-6	U	100
Trichloroethene	29-01-6	U	100
Dibromochloromethane	124-48-1	U	100
1,1,2-Trichloroethane	79-00-6	U	100
Benzene	71-43-2	U	100
Cis-1,3-dichloropropene	10061-01-5	U	100
2-Chloroethylvinylether	110-75-8	U	100
Bromoform	75-25-2	U	100
4-Methyl-2-pentanone	591-78-6	U	100
2-Hexanone	108-10-1	U	100
Tetrachloroethene	127-18-4	U	100
1,1,2,2-Tetrachloroethane	79-34-5	U	100
Toluene	108-88-3	U	100
Chlorobenzene	108-90-7	U	100
Ethylbenzene	100-41-4	U	100
Styrene	100-42-5	U	100
Total xylenes		30	

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 89% Toluene-d8 93% Bromofluorobenzene 90%

QUALIFIERS:

- U = Compound analyzed for, but not detected above the EPA Method Detection Limit (MDL), 40 CFR, Part 136, App. A (7-1-87 Edition), pa. 440.
- J = Indicates an estimated value when the compound is detected, but is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: _____

John D Parker

Comments

Quality Assurance Officer

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number	: TH 2 @ 20-21'	Chen Project No.: 9-084-88
Lab Sample Number	: X5851	Evergreen Project Number : 5060
Date Sampled	: 10/06/88	Chain of Custody No.: 046
Date Received	: 10/08/88	Method/Matrix : 8240/Soil
Date Extracted/Prepared	: 10/14/88	Dilution Factor : 1
Date Analyzed	: 10/14/88	

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	U	10
Bromomethane	74-83-9	U	10
Vinyl Chloride	75-01-4	U	10
Chloroethane	75-00-3	U	10
Methylene Chloride	75-09-2	40	100
Acetone	67-64-1	60	100
Carbon Disulfide	75-15-0	U	100
1,1-Dichloroethene	75-35-4	U	100
1,1-Dichloroethane	75-34-3	U	100
Trans-1,2-Dichloroethene	156-60-5	U	100
Chloroform	57-66-3	U	100
1,2-Dichloroethane	107-06-2	U	100
2-Butanone	78-95-5	U	100
1,1,1-Trichloroethane	71-55-0	U	100
Carbon Tetrachloride	56-23-8	U	100
Vinyl Acetate	108-05-4	U	100
Bromodichloromethane	75-27-4	U	100
1,2-Dichloropropane	78-37-5	U	100
Trans-1,3-dichloropropene	10061-02-0	U	100
Trichloroethene	79-01-0	U	100
Dibromochloromethane	124-48-1	U	100
1,1,2-Trichloroethane	79-00-5	U	100
Benzene	71-43-2	U	100
Cis-1,3-dichloropropene	10061-01-9	U	100
2-Chloroethylvinylether	110-79-8	U	100
Bromoform	75-25-2	U	100
4-Methyl-2-pentanone	591-78-3	U	100
2-Hexanone	108-10-1	U	100
Tetrachloroethene	127-18-4	U	100
1,1,2,2-Tetrachloroethane	79-34-5	U	100
Toluene	108-88-3	U	100
Chlorobenzene	108-90-7	U	100
Ethylbenzene	100-41-4	U	100
Styrene	100-42-5	U	100
Total xylenes		U	100

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 88% Toluene-d8 92% Bromofluorobenzene 87%

QUALIFIERS:

- U = Compound analyzed for, but not detected above the EPA Method Detection Limit (MDL), 40 CFR, Part 136, App. A (7-1-87 Edition), pa. 440.
- J = Indicates an estimated value when the compound is detected, but is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: John D Parker

C M Smith

Quality Assurance Officer

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number : TH 3 @ 3-4
 Lab Sample Number : X5852
 Date Sampled : 10/06/88
 Date Received : 10/08/88
 Date Extracted/Prepared : 10/14/88
 Date Analyzed : 10/14/88

Chen Project No.: 9-084-88
 Evergreen Project Number : 5060
 Chain of Custody No.: 046
 Method/Matrix : 8240/Soil
 Dilution Factor : 1

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	0	10
Bromomethane	74-83-9	0	10
Vinyl Chloride	75-01-4	0	10
Chloroethane	75-00-3	0	10
Methylene Chloride	75-09-2	30	5
Acetone	67-64-1	130	100
Carbon Disulfide	75-15-0	0	
1,1-Dichloroethene	75-35-4	0	
1,1-Dichloroethane	75-34-3	0	
Trans-1,2-Dichloroethene	156-60-5	0	
Chloroform	67-66-3	0	
1,2-Dichloroethane	107-06-2	0	
2-Butanone	78-93-3	0	100
1,1,1-Trichloroethane	71-55-8	0	
Carbon Tetrachloride	56-23-5	0	
Vinyl Acetate	108-06-4	0	
Bromodichloromethane	75-27-4	0	
1,2-Dichloropropane	78-87-5	0	
Trans-1,3-dichloropropene	10061-02-6	0	
Trichloroethene	79-01-0	0	
Dibromochloromethane	124-48-1	0	
1,1,2-Trichloroethane	79-00-5	0	
Benzene	71-43-2	0	
Cis-1,3-dichloropropene	10061-01-5	0	
2-Chloroethylvinylether	110-75-8	0	10
Bromoform	75-25-2	0	50
4-Methyl-2-pentanone	591-78-6	0	50
2-Hexanone	108-10-1	0	50
Tetrachloroethene	127-18-4	0	50
1,1,2,2-Tetrachloroethane	79-34-9	0	50
Toluene	108-88-3	0	50
Chlorobenzene	108-90-7	0	50
Ethylbenzene	100-41-4	0	50
Styrene	100-42-5	0	50
Total xylenes		40	50

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 86% Toluene-d8 93% Bromofluorobenzene 86%

QUALIFIERS:

- U = Compound analyzed for, but not detected above the EPA Method Detection Limit (MDL), 40 CFR, Part 136, App. A (7-1-87 Edition), pa. 440.
- J = Indicates an estimated value when the compound is detected, but is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: John D Parker

cm frnt

Quality Assurance Officer

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number	: TH 3 @ 9-10'	Chen Project No.: 9-084-88
Lab Sample Number	: X5853	Evergreen Project Number : 5060
Date Sampled	: 10/06/88	Chain of Custody No.: 046
Date Received	: 10/08/88	Method/Matrix : 8240/Soil
Date Extracted/Prepared	: 10/14/88	Dilution Factor : 1
Date Analyzed	: 10/14/88	

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	U	10
Bromomethane	74-83-9	U	10
Vinyl Chloride	75-01-4	U	10
Chloroethane	75-00-3	U	10
Methylene Chloride	75-09-2	U	10
Acetone	67-64-1	150	100
Carbon Disulfide	75-15-0	U	100
1,1-Dichloroethene	75-35-4	U	100
1,1-Dichloroethane	75-34-3	U	100
Trans-1,2-Dichloroethene	156-50-5	U	100
Chloroform	57-66-3	U	100
1,2-Dichloroethane	107-06-2	U	100
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-53-6	U	100
Carbon Tetrachloride	56-23-5	U	50
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	50
1,2-Dichloropropane	78-87-5	U	50
Trans-1,3-dichloropropene	10061-02-6	U	50
Trichloroethene	79-01-6	U	50
Dibromochloromethane	124-48-1	U	50
1,1,2-Trichloroethane	79-00-5	U	50
Benzene	71-43-2	U	50
Cis-1,3-dichloropropene	10061-01-6	U	50
2-Chloroethylvinylether	110-75-8	U	10
Bromoform	79-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	50
1,1,2,2-Tetrachloroethane	79-34-5	U	50
Toluene	108-88-3	U	50
Chlorobenzene	108-90-7	U	50
Ethylbenzene	100-41-4	U	50
Styrene	100-42-5	U	50
Total xylenes		30	50

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 88% Toluene-d8 95% Bromofluorobenzene 90%

QUALIFIERS:

- U = Compound analyzed for, but not detected above the EPA Method Detection Limit (MDL), 40 CFR, Part 136, App. A (7-1-87 Edition), pa. 440.
- J = Indicates an estimated value when the compound is detected, but is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: John D Parker

John D Parker

Quality Assurance Officer

C M Smith

EVERGREEN ANALYTIC, INC.
VOLATILE ORGANICS ANALYSIS DATA SHEET

Sample Number : TH 3 @ 25-26
 Lab Sample Number : X5854
 Date Sampled : 10/06/88
 Date Received : 10/08/88
 Date Extracted/Prepared : 10/14/88
 Date Analyzed : 10/14/88

Chen Project No.: 9-084-88
 Evergreen Project Number : 5060
 Chain of Custody No.: 046
 Method/Matrix : 8240/Soil
 Dilution Factor : 1

Compound Name	CAS Number	Concentration ug/Kg	PQL* ug/Kg
Chloromethane	74-87-3	U	10
Bromomethane	74-85-9	U	10
Vinyl Chloride	76-01-4	U	10
Chloroethane	75-00-3	U	10
Methylene Chloride	75-09-2	U	10
Acetone	67-64-1	8	100
Carbon Disulfide	75-15-0	113	100
1,1-Dichloroethene	75-35-4	U	100
1,1-Dichloroethane	75-34-3	U	100
Trans-1,2-Dichloroethene	156-60-5	U	100
Chloroform	67-66-3	U	100
1,2-Dichloroethane	107-06-2	U	100
2-Butanone	78-93-2	U	100
1,1,1-Trichloroethane	71-55-8	U	100
Carbon Tetrachloride	56-23-5	U	100
Vinyl Acetate	108-05-4	U	100
Bromodichloromethane	75-27-4	U	100
1,2-Dichloropropane	78-37-5	U	100
Trans-1,3-dichloropropene	10061-02-5	U	100
Trichloroethene	79-01-6	U	100
Dibromochloromethane	124-48-1	U	100
1,1,2-Trichloroethane	79-00-9	U	100
Benzene	71-43-2	U	100
Cis-1,3-dichloropropene	10061-01-7	U	100
2-Chloroethylvinylether	110-75-8	U	100
Bromoform	75-25-2	U	100
4-Methyl-2-pentanone	591-78-8	U	100
2-Hexanone	108-10-1	U	100
Tetrachloroethene	127-18-4	U	100
1,1,2,2-Tetrachloroethane	79-34-5	U	100
Toluene	108-88-3	U	100
Chlorobenzene	108-90-7	U	100
Ethylbenzene	100-41-4	U	100
Styrene	100-42-5	U	100
Total xylenes		U	100

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4 88% Toluene-d8 91% Bromofluorobenzene 89%

QUALIFIERS:

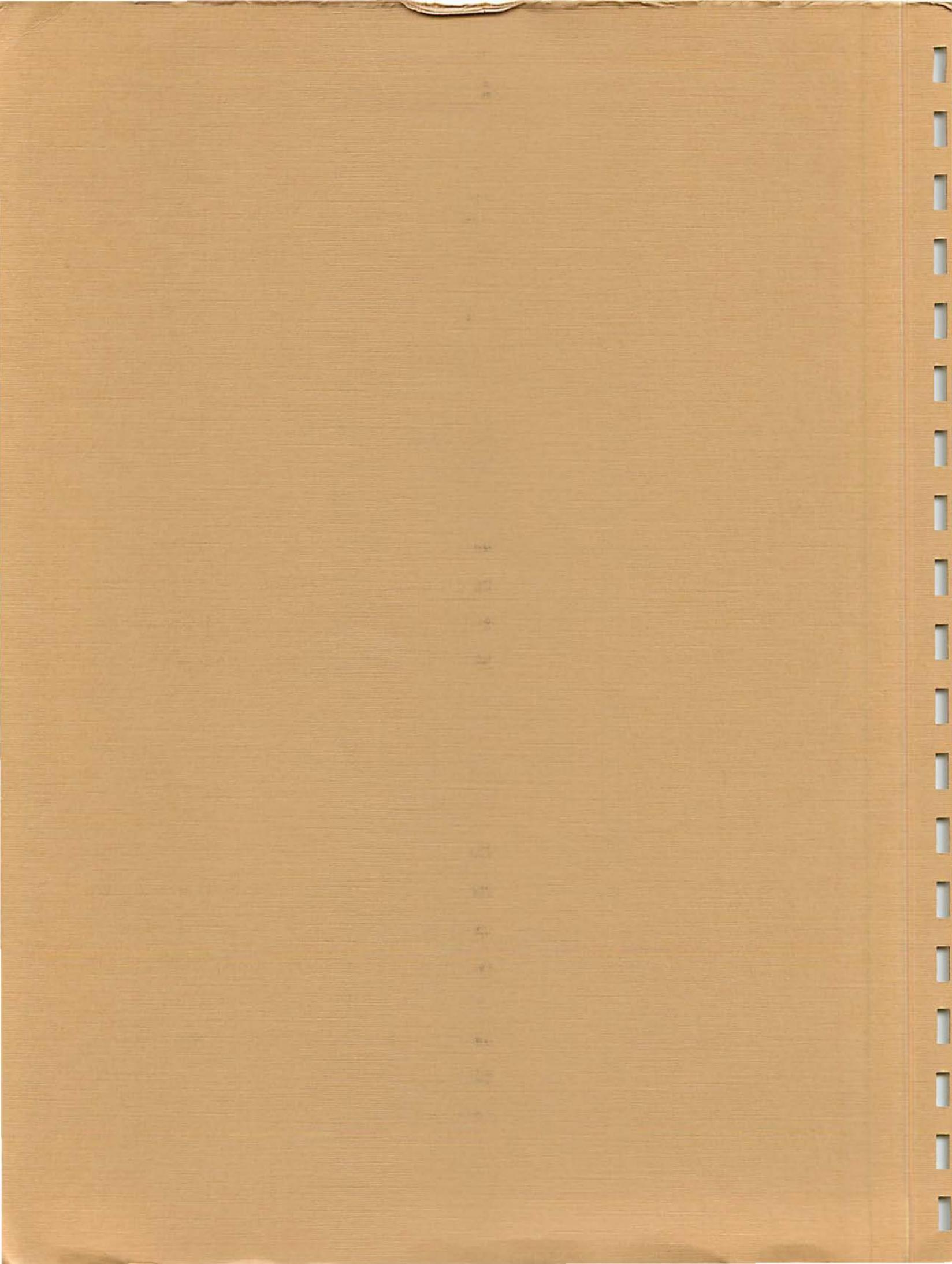
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- J = Indicates an estimated value when the compound is detected, but is below the EPA Practical Quantitation Limit (PQL).
- B = Compound found in blank and sample. Compare blank and sample data.
- * = Practical Quantitation Limits listed in EPA SW846, Vol. 1B, Part II, pa. 8240-4. The minimum instrument detection limits are less than the numbers shown in this column.

Approved: _____

John D Parker

C M Smith

Quality Assurance Officer





Chen & Associates

Consulting Geotechnical
and Materials Engineers

1850 Grandstand Drive
San Antonio, Texas 78238
512/680-5023

Casper
Colorado Springs
Denver
Ft. Collins
Glenwood Springs
Phoenix
Rock Springs
Salt Lake City

July 26, 1988

Subject: Soil-Vapor Data, Gensco Facility,
Uvalde, Texas

Job No.: 9-084-88

Edwards Underground Water District
1615 North St. Mary's
San Antonio, Texas 78212

Attn: Mr. John Hoyt, Geologist

Dear Mr. Hoyt:

This letter transmits the summarized data and chromatograms from a soil-vapor survey conducted at the Gensco facility located in Uvalde, Texas. The soil-vapor survey was conducted on July 21 and 22, 1988. A brief outline of the soil-vapor survey including recommendations for future investigations is discussed below.

SOIL-VAPOR SURVEY

Soil-vapor samples were obtained from the soils by driving a steel sampling point into the ground. A vacuum pump was attached to the sampling probe and the soil-vapor was extracted at a rate of approximately 1.5 liters/minute for 5 to 7 minutes. After evacuation a syringe sample of the soil-vapor was extracted from the inert tubing connecting the vacuum pump to the probe system. The sample was then injected into a Photovac 10S50 portable gas chromatograph. The 10S50 had previously been calibrated with perchlorethylene (PCE), 1,1,1 trichlorethane (TCE), 1,1 dichloroethylene (DCE), and toluene.
TCA

A 50 ul injection at a gain of 20 was utilized for samples SV-1 through SV-9. Carrier gas flow through the analytical column was set to 22 ml/min. The presence of PCE and TCE was detected; however, the chromatogram peaks were not distinct.

Based upon the initial chromatograms the gain was increased to 50 and the sample injection was increased to 250 ul to better identify the compounds present in the soil-vapor samples. On the second day of the survey, the flow rate was decreased to 14 ml/min. Standard calibrations and baseline checks were conducted throughout the survey to verify the machine was operating efficiently and to establish background data.

DATA REDUCTION

Due to the effects of different sample sizes, it was necessary to normalize the 250 ul injection values to the actual concentrations in vapor by comparing them to the standards injected in the 50 ul injection runs. Soil-vapor values presented on the chromatograms were integrated by the appropriate gas standard value. The data obtained from the soil-vapor survey is presented in Table I.

OBSERVATIONS

The highest contaminant concentrations determined from the soil-vapor survey were located in the northeastern pipe area. The subsurface soil tested at the site appeared to be dry, giving a higher confidence to the data collected.

LIMITATIONS

The soil-vapor survey was conducted for the purpose of collecting data for the Edwards Underground Water District. Any conclusions formulated from this

data are strictly those of the client, and do not reflect the opinions or conclusions of Chen & Associates, Inc.

If you should have any questions concerning this data or methods of reduction, please contact our office. We look forward to the opportunity to serve EUWD on this and future projects.

Sincerely,

CHEN & ASSOCIATES, INC.

By: Mark M. Briggs
Mark M. Briggs, Geologist

MMB/irb

Enclosure

TABLE I
SOIL-VAPOR SAMPLING CONCENTRATIONS
GENSCO SITE
UVALDE, TEXAS

<u>Sampling Point</u>	PCE <u>Concentration (ppb)</u>	TCE <u>Concentration (ppb)</u>	DCE <u>Concentration (ppb)</u>	Toluene <u>Concentration (ppb)</u>
SV-1 @ 3'	13 *	ND	ND	75
SV-1 @ 6'	ND	ND	ND	125
SV-2 @ 6'	ND **	ND	ND	ND
SV-2 @ 9'	8 ***	291	ND	ND
SV-3 @ 3'	ND	602*	754 *	23 *
SV-3 @ 6'	ND	765*	ND	76 *
SV-4 @ 6'	109	107*	ND	56
SV-5 @ 6'	ND	213*	ND	ND
SV-6 @ 6'	58 *	ND	ND	ND
SV-7 @ 6'	5 *	ND	ND	67 *
SV-8 @ 6'	ND	ND	ND	ND
SV-9 @ 6'	62 *	ND	ND	ND
SV-10 @ 6'	ND	176	ND	ND
SV-11 @ 6'	90	1832	ND	ND
SV-12 @ 6'	25	189	ND	ND
SV-13 @ 6'	77	96	ND	ND
SV-14 @ 6'	202	96	ND	ND
SV-15 @ 6'	77	21	ND	ND
SV-16 @ 6'	1 *	105	ND	103
SV-17 @ 6'	7 *	ND	ND	ND
SV-18 @ 6'	1 *	37	ND	43
SV-19 @ 6'	32	352	ND	ND
(SV-46) SV-20 @ 3'	10,800	NOTE	ND	373
(SV-43) SV-21 @ 6'	420	379	ND	ND
(SV-48) SV-22 @ 5'	11,320	NOTE	ND	15
SV-23 @ 3'	740	1662	ND	ND
SV-24 @ 3'	178	11	ND	6
SV-25 @ 6'	42	73	ND	23
SV-26 @ 2'	84	670	ND	46
SV-27 @ 3'	10	995	ND	16
SV-28 @ 4'	151	3872	ND	ND
SV-29 @ 5'	13 *	54	ND	ND
SV-30 @ 5'	29 *	2860*	ND	ND
SV-31 @ 5'	ND	1430*	ND	ND
SV-32 @ 6'	ND	1430*	ND	ND

calibration
check?

* Suspect reading - see baseline check.

** Possible PCE - 2.7 Volt-seconds; Peak 14.

*** Moisture on probe; possible below water table.

NOTE Abundant Peaks may mask TCE

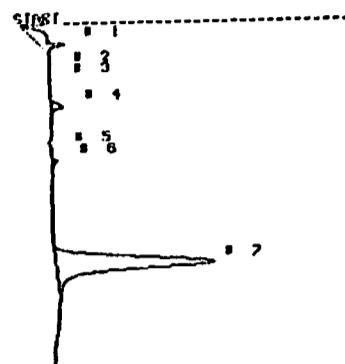
(arc suspect readings; likely higher or lower?)

PHOTOVAC

START # 1
2
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11

STOP # 308.7
SAMPLE LIBRARY 2 JUL 28 1988 9:49
ANALYSIS # 12 EUAD
INTERNAL TEMP 20 GENSCO
GAIN 20 TCE CAL

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 13.9 288.3 μUS
UNKNOWN 2 32.4 4.4 μUS
UNKNOWN 3 72.1 739.0 μUS
UNKNOWN 4 101.2 21.7 μUS
UNKNOWN 5 108.8 43.4 μUS
UNKNOWN 9 228.3 20.9 μUS



STOP # 201.4
SAMPLE LIBRARY 2 JUL 28 1988 9:11
ANALYSIS # 13 EUAD
INTERNAL TEMP 25 GENSCO
GAIN 20 TOL CAL

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 17.2 642.9 μUS
UNKNOWN 4 81.3 188.1 μUS
UNKNOWN 5 97.0 5.2 μUS
UNKNOWN 6 108.8 32.8 μUS
UNKNOWN 7 187.3 5.5 μUS

PHOTOVAC

START # 1
2
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33

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

TCE 1 32.4 500.0 PPM
PCE 2 218.0 500.0 PPM
DCE 3 13.2 500.0 PPM

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

TCE 1 32.4 500.0 PPM
PCE 2 218.0 500.0 PPM
DCE 3 13.2 500.0 PPM
TOLUENE 4 187.3 0.000 PPM

STOP # 1000.0
SAMPLE LIBRARY 2 JUL 28 1988 9:23
ANALYSIS # 14 EUAD
INTERNAL TEMP 25 GENSCO
GAIN 20 SU ONE

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 16.3 789.0 μUS
UNKNOWN 2 22.4 175.2 μUS
UNKNOWN 6 108.1 14.2 μUS
UNKNOWN 7 108.7 35.8 μUS
TOLUENE 9 188.3 74.40 PPM
PCE 10 217.9 12.93 PPM
UNKNOWN 22 634.1 12.4 μUS

PHOTOVAC

CALIBRATED PEAK 2, TCE

ANALYSIS # 12 EUAD
INTERNAL TEMP 20 GENSCO
GAIN 20 TCE CAL

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 13.9 288.3 μUS
TCE 2 32.4 71.10 PPM
UNKNOWN 3 72.1 739.0 μUS
UNKNOWN 4 101.2 21.7 μUS
UNKNOWN 5 108.8 43.4 μUS
PCE 9 228.3 18.68 PPM

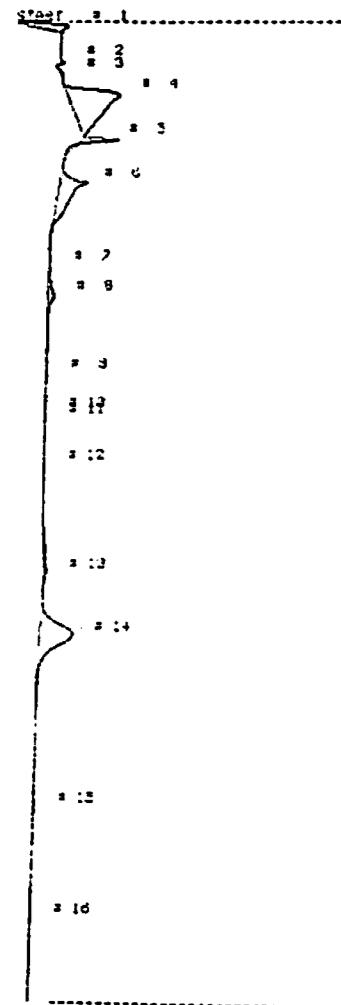
PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

TCE 1 32.4 500.0 PPM
PCE 2 218.0 500.0 PPM
DCE 3 13.2 500.0 PPM

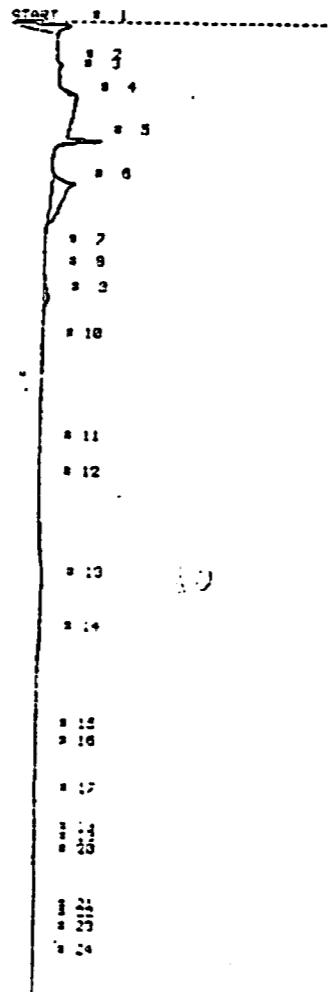
PHOTOVAC

PHOTOVAC



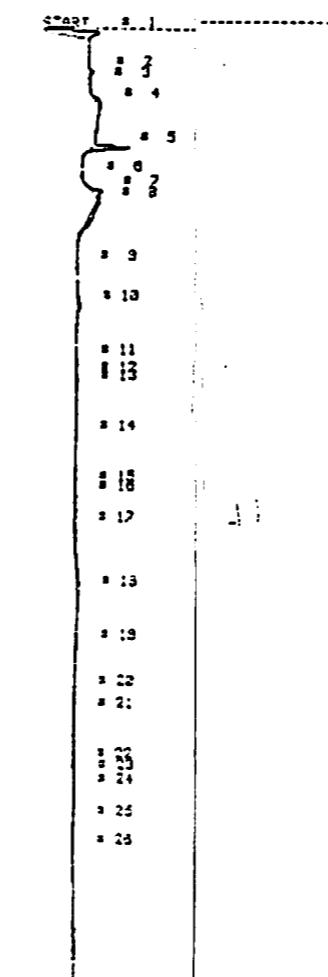
STOP 3 750.H
SAMPLE LIBRARY 2 JUL 22 1988 14:21
ANALYSIS # 28 EUJO
INTERNAL TEMP 33 GENSO
GAIN 59 SU TWENTY EIGHT

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.3	329.2 AUS
UNKNOWN	2	32.5	24.1 AUS
UNKNOWN	3	42.3	27.3 AUS
TCI TCE	4	59.1	3.0 US
UNKNOWN	5	32.2	231.1 AUS
UNKNOWN	6	126.3	1.2 US
UNKNOWN	7	212.7	169.2 AUS
TCE	13	424.3	17.19 FPL
TCE	14	+72.1	225.1 FPL



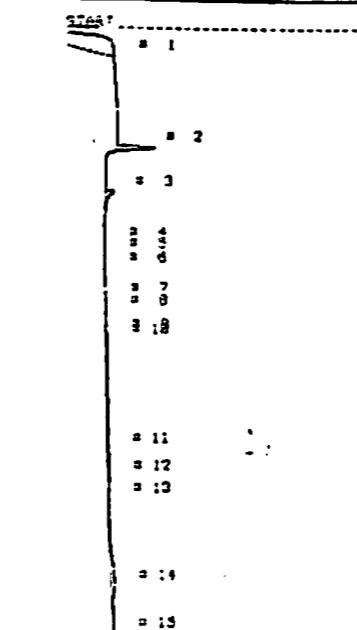
STCP 3 750.3
SAMPLE LIBRARY 2 JUL 22 1988 14:42
ANALYSIS 4 29 EURO
INTERNAL TEMP 42 GENSCO
GAIN 28 SU TWENTY NINE

COMPOUND NAME	PEAK	R. T.	ABSORBANCE
UNKNOWN	1	4.4	714.3 WUS
UNKNOWN	2	31.3	93.9 WUS
TCE	4	60.1	412.4 PPS
UNKNOWN	5	92.2	239.6 WUS
UNKNOWN	6	125.3	1.1 WUS
UNKNOWN	9	212.2	122.2 WUS
TCE	13	428.1	65.98 WUS

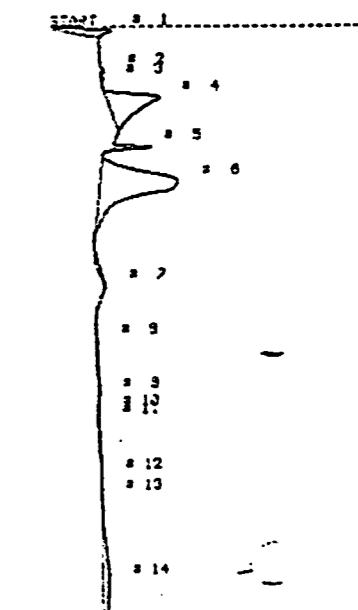


STOP 9 732.5
SAMPLE LIBRARY 2
ANALYSIS # 38
INTERNAL TEMP 33
PON 100

CORPORATE NAME	PER.	%	R.T.	4464
UNKNOWN	4.3	153.2		
UNKNOWN	34.4	123.7		
UNKNOWN	58.3	212.2		
UNKNOWN	92.2	323.3		
UNKNOWN	124.3	43.1		
UNKNOWN	136.1	177.3		
UNKNOWN	212.1	36.9		
PCE	426.3	60.54		
PCE	487.7	5.519		
UNKNOWN	681.7	5.3		



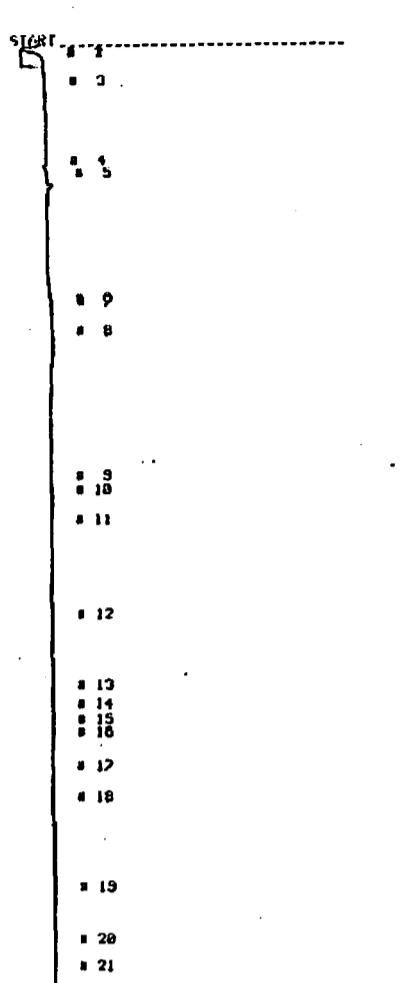
TCE - 2
PCE - .



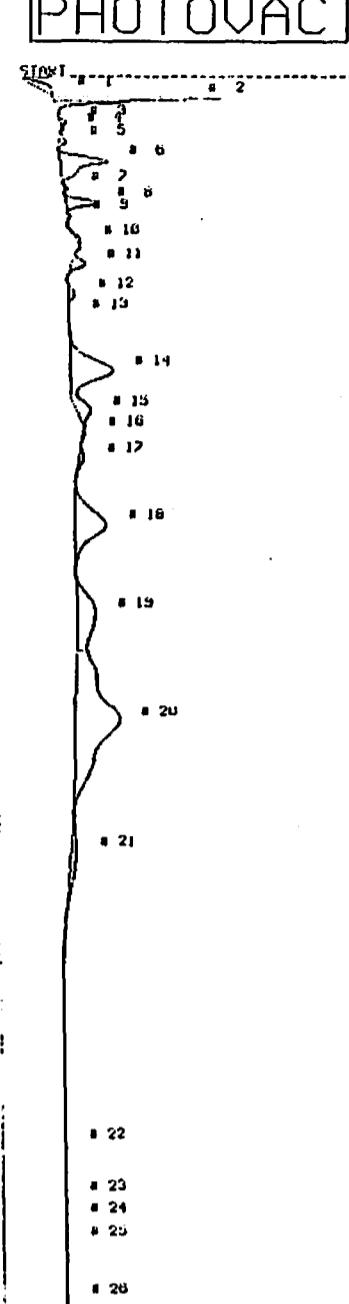
1

STCP # 750.3
SAMPLE LIBRARY 2 JUL 22 1988 15
ANALYSIS # 32 EUHQ
INTERNAL IEP# 34 GENSCM

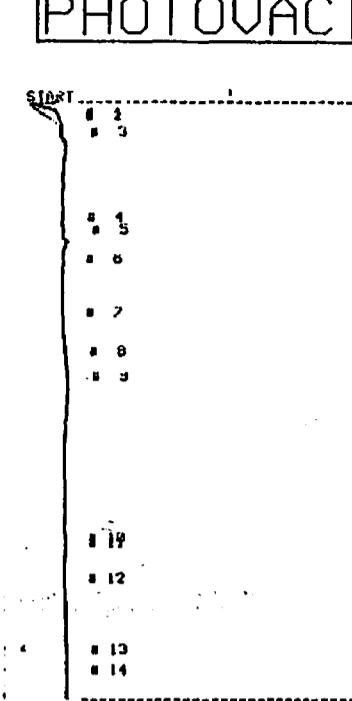
GAIN	50	SU THIRTY	
COMPOUND NAME	PEAK	R.T.	AREAS%
UNKNOWN	1	4.2	225.3
UNKNOWN	2	34.9	13.0
UNKNOWN	3	41.3	6.0
UNKNOWN	4	54.3	2.1
UNKNOWN	5	32.1	251.1
UNKNOWN	6	112.1	3.2
UNKNOWN	7	232.4	59.1
UNKNOWN	12	342.2	13.0
PCE	14	122.3	354.1
PCP	14	14.1	14.0



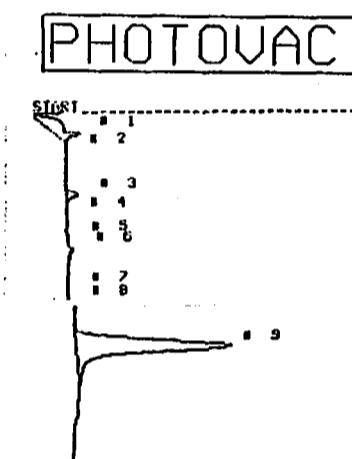
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.5	598.2 μV
UNKNOWN	2	15.8	16.5 μV
UNKNOWN	4	37.4	6.4 μV
UNKNOWN	5	106.0	37.3 μV
UNKNOWN	6	203.3	28.1 μV
UNKNOWN	12	445.7	12.3 μV
UNKNOWN	19	850.0	29.3 μV



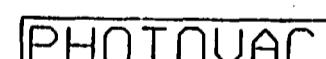
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.2	268.4 μV
UNKNOWN	2	17.4	1.3 μV
UNKNOWN	3	36.2	73.1 μV
UNKNOWN	5	50.5	101.2 μV
UNKNOWN	6	64.0	1.4 μV
UNKNOWN	7	85.4	54.4 μV
UNKNOWN	8	96.2	631.3 μV
UNKNOWN	9	106.8	26.6 μV
UNKNOWN	10	125.2	80.5 μV
UNKNOWN	11	143.2	208.3 μV
UNKNOWN	12	160.7	207.0 μV
UNKNOWN	14	225.1	2.2 μV
UNKNOWN	15	258.2	663.3 μV
UNKNOWN	16	272.3	15.8 μV
UNKNOWN	17	293.0	150.3 μV
UNKNOWN	18	344.6	2.3 μV
UNKNOWN	19	412.1	2.2 μV
UNKNOWN	20	494.6	8.6 μV
UNKNOWN	21	531.6	450.1 μV



COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.8	410.8 μV
TCE	3	32.5	291.8 PPM
UNKNOWN	4	96.0	7.3 μV
UNKNOWN	5	106.8	35.0 μV
UNKNOWN	8	200.1	24.1 μV
PCE	9	219.7	2.955 PPM

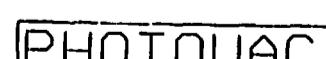


COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.2	838.5 μV
UNKNOWN	3	64.4	155.4 μV
UNKNOWN	5	97.9	7.2 μV
UNKNOWN	6	106.7	33.3 μV
TOLUENE	9	187.1	17.63 PPM



CALIBRATED PEAK 9, TOLUENE
SAMPLE LIBRARY 2 JUL 28 1988 10121
ANALYSIS # 18 ELMID
INTERNAL TEMP 27 GENSCO
GAIN 20 TOL CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.2	800.0 μV
UNKNOWN	3	64.4	155.4 μV
UNKNOWN	5	97.9	7.2 μV
UNKNOWN	6	106.7	33.3 μV
TOLUENE	9	187.1	18.00 PPM



2 COMPOUND ID # R.T. LIMIT
TCE 1 32.4 500.0 PPM
PCE 2 217.8 500.0 PPM
DCE 3 13.2 500.0 PPM
TOLUENE 4 187.1 8.000 PPM

PHOTOVAC

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STOP # 713.3
SAMPLE LIBRARY 2 JUL 28 1988 11:2
ANALYSIS # 20 ELMID
INTERNAL TEMP 28 GENSCO
GAIN 28 SU THREE-THREE

COMPOUND NAME PEAK R.T. AREA/PPM
DCE 1 12.3 254.6 PPB
TCE 3 32.2 502.2 PPB
UNKNOWN 6 106.3 175.9 μUS
TOLUENE 8 139.3 23.27 PPB
UNKNOWN 18 442.3 6.8 μUS
UNKNOWN 21 638.3 25.0 μUS

STOP # 919.3
SAMPLE LIBRARY 2 JUL 28 1988 18:42
ANALYSIS # 19 ELMID
INTERNAL TEMP 27 GENSCO
GAIN 28 SU ONE AT SIX

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 18.6 528.6 μUS
UNKNOWN 4 37.3 2.7 μUS
UNKNOWN 5 106.7 35.1 μUS
TOLUENE 10 189.7 124.7 PPB
UNKNOWN 13 249.1 3.2 μUS
UNKNOWN 20 498.3 65.3 μUS
UNKNOWN 23 635.1 9.5 μUS

PHOTOVAC

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STOP # 324.0
SAMPLE LIBRARY 2 JUL 28 1988 11:17
ANALYSIS # 21 ELMID
INTERNAL TEMP 29 GENSCO SIX
GAIN 29 SU THREE-THREE

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

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STOP # 220.0
SAMPLE LIBRARY 2 JUL 28 1988 11:32
ANALYSIS # 22 ELMID
INTERNAL TEMP 29 GENSCO
GAIN 29 SU THREE-THREE
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COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

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STOP # 309.3
SAMPLE LIBRARY 2 JUL 28 1988 11:53
ANALYSIS # 23 ELMID
INTERNAL TEMP 29 GENSCO
GAIN 29 SU FIVE-SIX

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

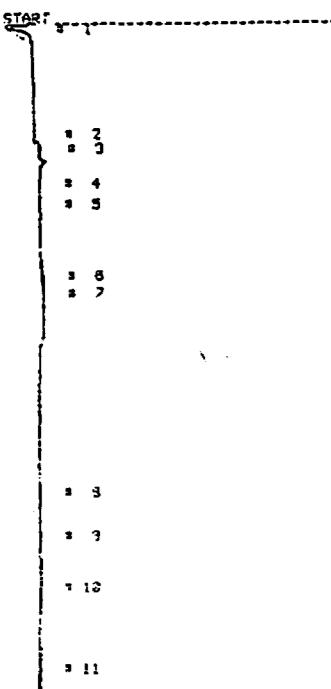
START # 1
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STOP # 309.3
SAMPLE LIBRARY 2 JUL 28 1988 11:53
ANALYSIS # 23 ELMID
INTERNAL TEMP 29 GENSCO
GAIN 29 SU FIVE-SIX

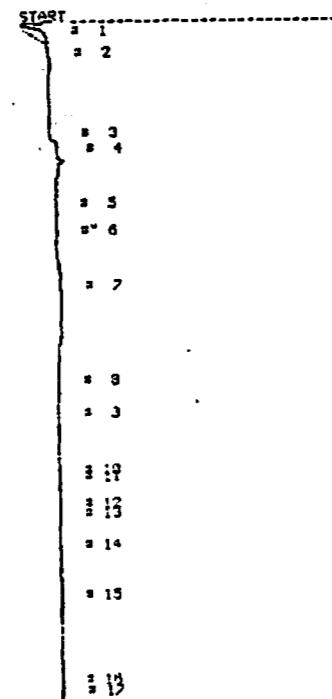
COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC



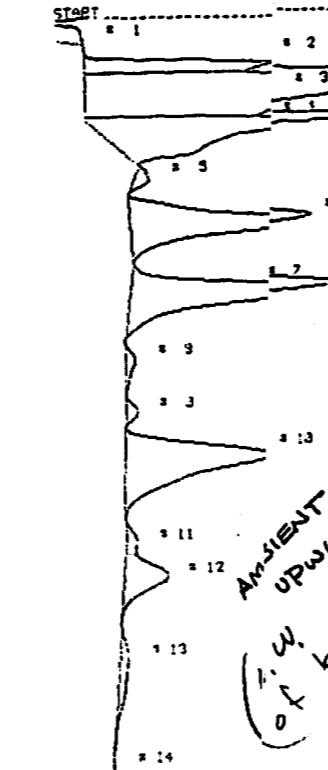
COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 14.0	238.2 μVS
UNKNOWN	2 93.7	29.7 μVS
UNKNOWN	3 106.9	33.8 μVS
UNKNOWN	6 234.1	29.2 μVS

PHOTOVAC



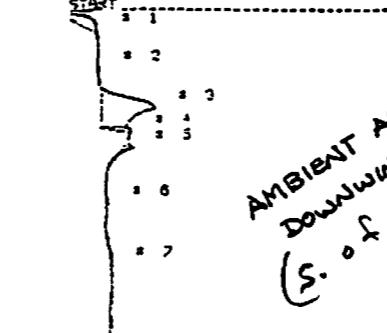
COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 16.4	406.7 μVS
UNKNOWN	3 35.3	27.5 μVS
UNKNOWN	4 106.7	37.2 μVS
PCE	7 211.5	59.43 PPM
UNKNOWN	15 448.1	9.9 μVS

PHOTOVAC



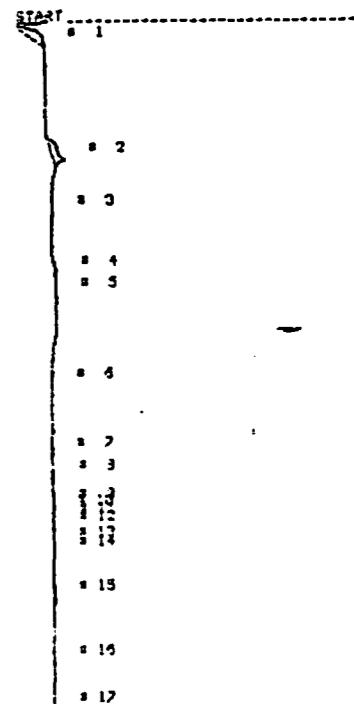
COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 19.3	2.4 μVS
UNKNOWN	2 35.4	5.1 μVS
UNKNOWN	3 33.3	47.4 μVS
UNKNOWN	4 31.3	19.8 μVS
UNKNOWN	5 15.1	586.3 μVS
UNKNOWN	6 18.9	18.3 μVS
PCE	7 19.1	11.38 PPM
UNKNOWN	9 53.0	578.2 μVS
UNKNOWN	9 33.2	444.5 μVS
UNKNOWN	10 36.9	11.8 μVS
UNKNOWN	11 32.9	559.3 μVS
UNKNOWN	12 29.1	3.1 μVS
UNKNOWN	13 38.3	1.3 μVS

PHOTOVAC



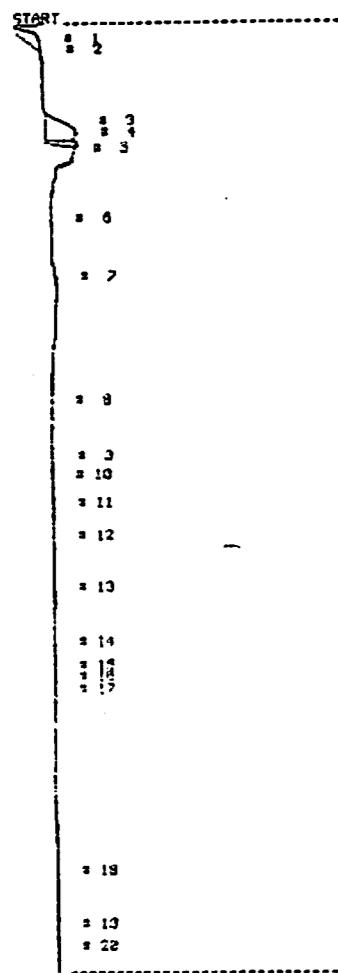
COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 17.3	559.3 μVS
UNKNOWN	3 75.2	2.7 μVS
UNKNOWN	4 30.4	135.7 μVS
UNKNOWN	5 136.1	33.9 μVS
UNKNOWN	6 147.7	12.7 μVS
TOLUENE	7 133.3	110.1 PPM

PHOTOVAC



COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 18.1	334.3 μVS
UNKNOWN	2 106.4	368.9 μVS
TOLUENE	4 131.7	67.40 PPM
PCE	5 283.1	9.253 PPM

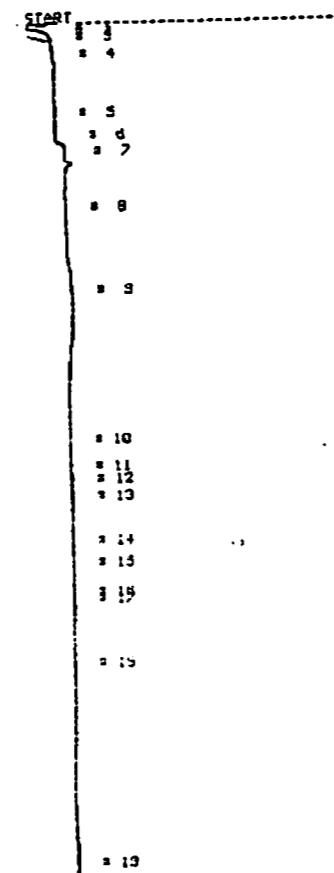
PHOTOVAC



SAMPLE LIBRARY 2 JUL 28 1988 13:24
ANALYSIS # 29 ENUO
INTERNAL TEMP 38 GENSCO
GAIN 20 SU EIGHT-SIX

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1	21.6 397.7 μV
UNKNOWN	3	89.3 1.4 μV
UNKNOWN	4	93.9 188.3 μV
UNKNOWN	7	220.1 63.2 μV
UNKNOWN	18	699.1 37.9 μV

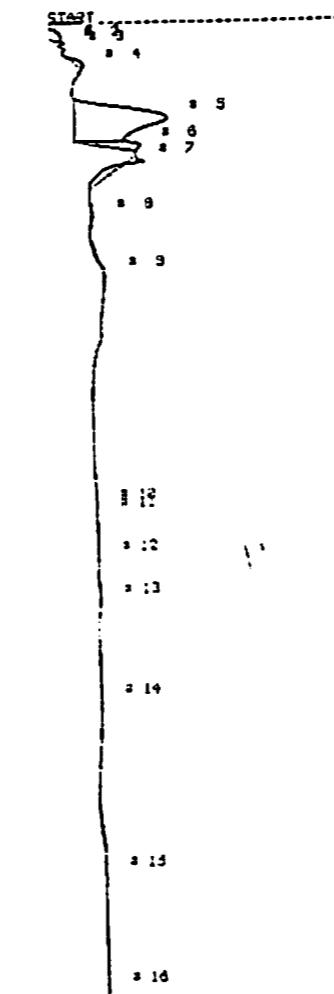
PHOTOVAC



SAMPLE LIBRARY 2 JUL 28 1988 14:11
ANALYSIS # 31 ENUO
INTERNAL TEMP 38 GENSCO
GAIN 20 SU NINE-SIX

COMPOUND NAME	PEAK R.T.	AREA/PPM
DCE	1	13.7 1.673 PPM
UNKNOWN	6	34.1 31.2 μV
UNKNOWN	7	100.7 45.3 μV
PCE	9	212.3 52.11 PPM
UNKNOWN	13	642.1 61.9 μV

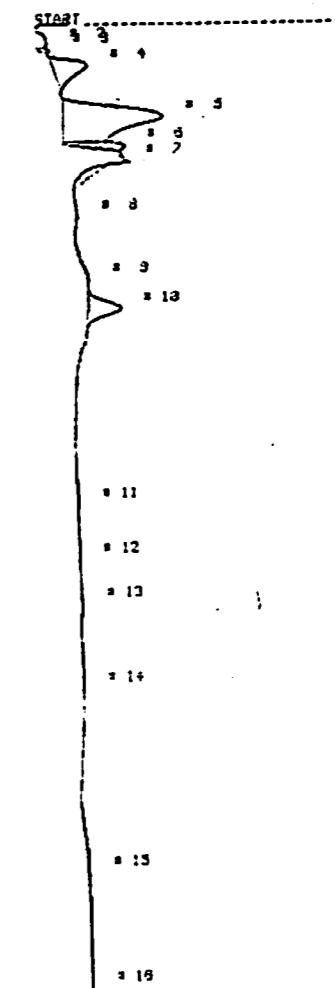
PHOTOVAC



SAMPLE LIBRARY 2 JUL 28 1988 14:32
ANALYSIS # 32 ENUO
INTERNAL TEMP 38 GENSCO
GAIN 38 SU TEN-SIX

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1	14.1 750.2 μV
UNKNOWN	2	15.5 7.7 μV
UNKNOWN	3	20.7 21.3 μV
PCE	4	33.1 973.0 PPM
UNKNOWN	5	70.7 6.0 μV
UNKNOWN	6	93.7 700.7 μV
UNKNOWN	9	147.3 38.1 μV
UNKNOWN	10	268.1 7.3 μV
UNKNOWN	12	409.1 11.3 μV
UNKNOWN	13	440.3 11.3 μV
UNKNOWN	14	516.3 22.3 μV
UNKNOWN	15	547.3 125.7 μV
UNKNOWN	16	772.3 42.1 μV

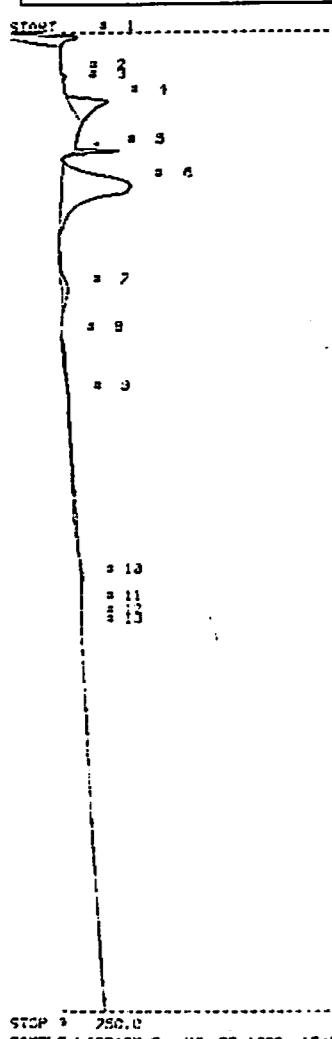
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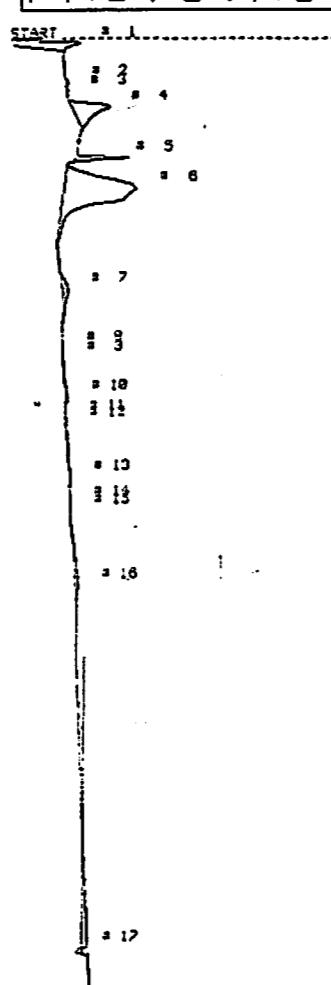
SAMPLE LIBRARY 2 JUL 28 1988 15: 5
ANALYSIS # 33 ENUO
INTERNAL TEMP 38 GENSCO
GAIN 58 SU ELEU-SIX

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1	2.9 12.1 μV
UNKNOWN	2	15.4 530.3 μV
UNKNOWN	3	23.7 102.2 μV
PCE	4	32.3 3.162 PPM
UNKNOWN	5	71.9 6.4 μV
UNKNOWN	6	30.3 594.2 μV
UNKNOWN	9	147.3 96.3 μV
PCE	10	216.3 430.1 PPM
UNKNOWN	11	367.3 3.8 μV
UNKNOWN	13	442.3 137.3 μV
UNKNOWN	14	507.9 20.8 μV
UNKNOWN	15	647.3 205.2 μV
UNKNOWN	16	771.7 40.3 μV

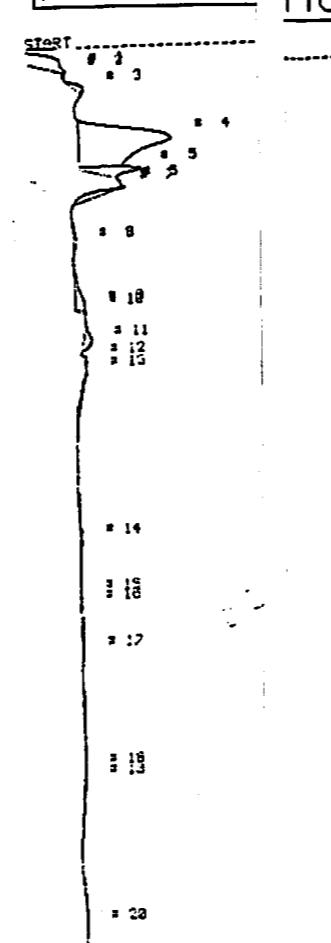
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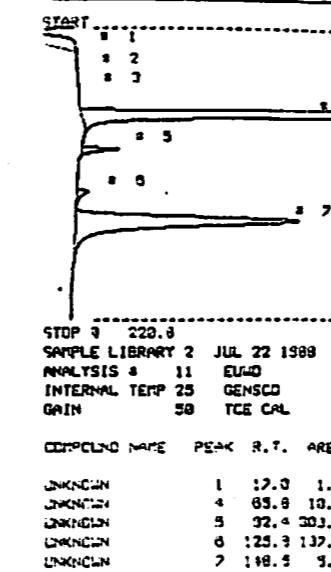
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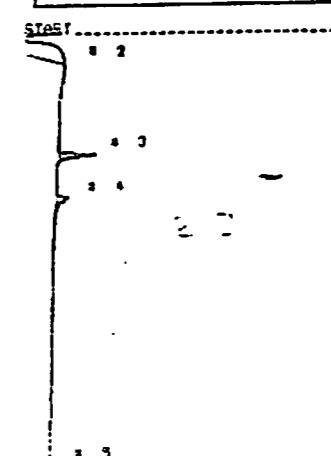
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PHOTOVAC

2 COMPOUND	10 8 R.T.	LIMIT
TCE	1	65.0 500.0 PPM
PCE	2	442.3 500.0 PPM
CCE	3	26.8 500.0 PPM
TOLLENE	4	388.8 0.000 PPM

PHOTOVAC



PHOTOVAC

STOP 3	342.0
SAMPLE LIBRARY 2	JUL 22 1988 8:44

ANALYSIS # 12 ELWD

INTERNAL TEMP 25 GENSCO

GAIN 50 SL CMK

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN 1 22.5 2.0 US

TCE 4 65.0 71.0 PPM

UNKNOWN 3 32.4 201.1 m/s

UNKNOWN 4 125.3 147.8 m/s

PHOTOVAC

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STOP 3 730.0
SAMPLE LIBRARY 2 JUL 22 1988 9:0
ANALYSIS # 13 EU40
INTERNAL TEMP 25 GENSCO
GAIN 50 SU THIRTEEN-SIX

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 4.3 402.5 μRS
UNKNOWN 3 32.8 103.2 μRS
UNKNOWN 4 47.7 127.0 μRS
TCE 5 63.1 477.4 PPB
UNKNOWN 6 32.3 233.0 μRS
UNKNOWN 7 125.3 108.1 μRS
UNKNOWN 8 148.7 447.3 μRS
PCE 10 423.7 32.38 PPB
PCE 11 467.3 490.1 μRS✓

PHOTOVAC

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STOP 4 750.0
SAMPLE LIBRARY 2 JUL 22 1988 9:14
ANALYSIS # 14 EU40
INTERNAL TEMP 26 GENSCO
GAIN 50 SU FOURTEEN

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 4.6 697.3 μRS
UNKNOWN 2 33.8 32.3 μRS
UNKNOWN 3 41.8 27.2 μRS
TCE 5 82.1 141.6 μRS
UNKNOWN 6 92.3 233.0 μRS
UNKNOWN 7 125.3 34.3 μRS
UNKNOWN 8 131.3 233.2 μRS
PCE 10 423.3 13.62 PPB
PCE 11 467.3 490.1 μRS✓

PHOTOVAC

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STOP 3 753.0
SAMPLE LIBRARY 2 JUL 22 1988 9:41
ANALYSIS # 15 EU40
INTERNAL TEMP 27 GENSCO
GAIN 50 SU FIFTEEN

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 4.5 376.5 μRS
UNKNOWN 2 32.9 18.2 μRS
UNKNOWN 3 33.3 245.6 μRS
UNKNOWN 4 48.4 50.4 μRS
TCE 5 61.4 103.5 PPB
UNKNOWN 6 92.1 293.4 μRS
UNKNOWN 7 125.1 242.3 μRS
UNKNOWN 8 141.7 202.3 μRS
UNKNOWN 9 212.3 47.1 μRS
UNKNOWN 10 431.7 109.9 PPB
PCE 11 470.1 281.6 PPB✓

PHOTOVAC

START 3.1.....

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STOP 4 753.0
SAMPLE LIBRARY 2 JUL 22 1988 10:9
ANALYSIS # 16 EU40
INTERNAL TEMP 28 GENSCO
GAIN 50 SU SIXTEEN

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 4.6 531.7 μRS
UNKNOWN 2 33.3 21.8 μRS
UNKNOWN 3 39.4 144.2 μRS
TCE 4 62.3 525.3 PPB
UNKNOWN 5 92.1 293.4 μRS
UNKNOWN 6 125.1 242.3 μRS
UNKNOWN 7 140.7 369.3 μRS
UNKNOWN 8 212.3 47.1 μRS
UNKNOWN 9 431.7 109.9 PPB
PCE 10 470.1 281.6 PPB✓

PHOTOVAC

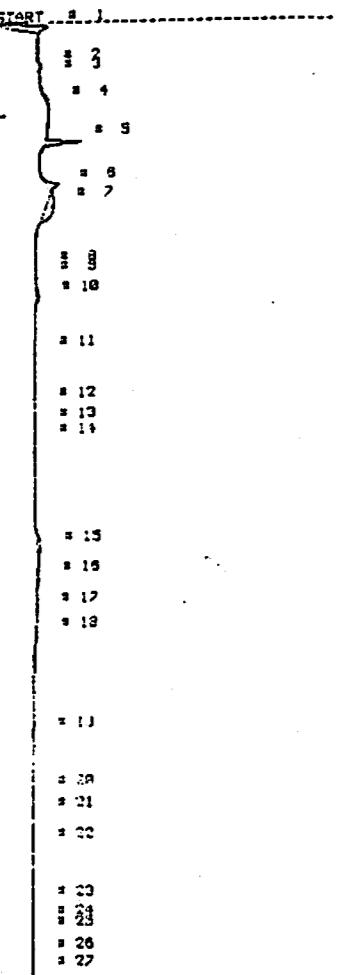
START 3.1.....

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STOP 3 730.0
SAMPLE LIBRARY 2 JUL 22 1988 10:23
ANALYSIS # 17 EU40
INTERNAL TEMP 29 GENSCO
GAIN 50 SU SEVENTEEN

COMPOUND NAME PEAK R.T. AREA/PPM
UNKNOWN 1 4.3 481.3 μRS
UNKNOWN 2 32.3 53.7 μRS
UNKNOWN 3 42.9 31.0 μRS
UNKNOWN 4 32.3 264.5 μRS
UNKNOWN 5 126.3 100.1 μRS
UNKNOWN 6 150.3 129.5 μRS
PCE 7 423.1 12.33 PPB
PCE 8 423.1 12.33 PPB✓

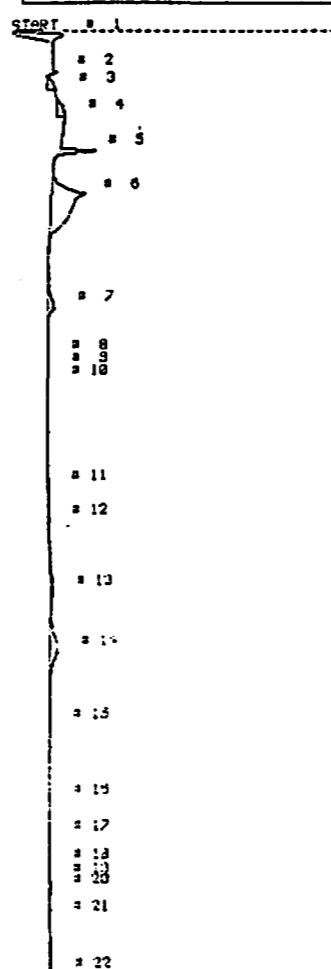
PHOTOVAC



STOP 1 730.0
SAMPLE LIBRARY 2 JUL 22 1988 10:42
ANALYSIS # 18 ELDO
INTERNAL TEMP 29 GENSCO
GAIN 50 SU EIGHTEEN

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 4.5	421.3 μUS
UNKNOWN	2 34.5	20.1 μUS
TCE	4 62.5	187.4 PPB
UNKNOWN	5 32.3	252.3 μUS
UNKNOWN	6 126.1	103.5 μUS
UNKNOWN	7 140.3	354.3 μUS
UNKNOWN	10 212.3	64.3 μUS
TOLLENE	13 404.5	217.0 PPB
PCE	16 428.3	2.74 PPB ✓
PCE	18 426.1	3.643 PPB ✓

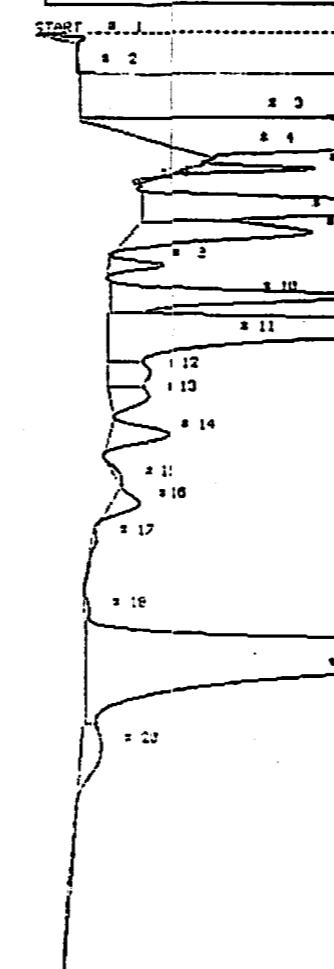
PHOTOVAC



STOP 2 732.3
SAMPLE LIBRARY 2 JUL 22 1988 11:12
ANALYSIS # 19 ELDO
INTERNAL TEMP 29 GENSCO
GAIN 50 SU NINETEEN

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 4.4	308.0 μUS
UNKNOWN	2 32.8	31.5 μUS
UNKNOWN	3 45.3	174.7 μUS
TCE	4 65.8	1.761 PPM
UNKNOWN	5 32.3	219.8 μUS
UNKNOWN	6 126.1	2.0 μUS
UNKNOWN	7 212.5	137.2 μUS
UNKNOWN	10 212.3	64.3 μUS
PCE	13 428.3	63.41 PPB ✓
UNKNOWN	22 713.3	3.0 μUS

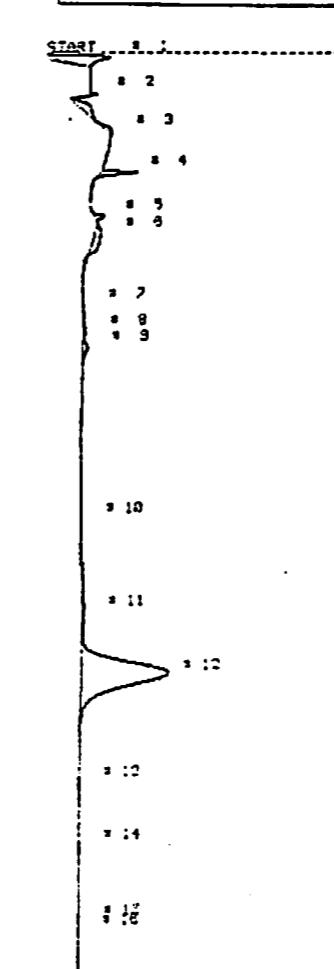
PHOTOVAC



STOP 3 730.0
SAMPLE LIBRARY 2 JUL 22 1988 11:38
ANALYSIS # 20 ELDO
INTERNAL TEMP 30 GENSCO
GAIN 50 SU TWENTY AT THR

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 4.4	443.0 μUS
UNKNOWN	3 47.7	253.3 μUS
UNKNOWN	4 78.3	33.8 μUS
UNKNOWN	5 105.3	2.3 μUS
UNKNOWN	6 116.3	63.2 μUS
UNKNOWN	7 134.3	23.4 μUS
UNKNOWN	9 154.3	9.3 μUS
UNKNOWN	9 178.3	1.2 μUS
UNKNOWN	10 202.7	3.3 μUS
UNKNOWN	11 226.2	42.2 μUS
UNKNOWN	12 261.2	2.3 μUS
UNKNOWN	13 279.2	1.3 μUS
UNKNOWN	14 309.3	2.6 μUS
UNKNOWN	15 342.3	112.3 μUS
TOLLENE	16 368.3	1.007 PPM
TOLLENE	17 398.1	229.5 PPB
PCE	18 442.3	32.33 PPB ✓
PCE	19 425.3	53.17 PPB ✓
UNKNOWN	20 534.3	1.4 μUS

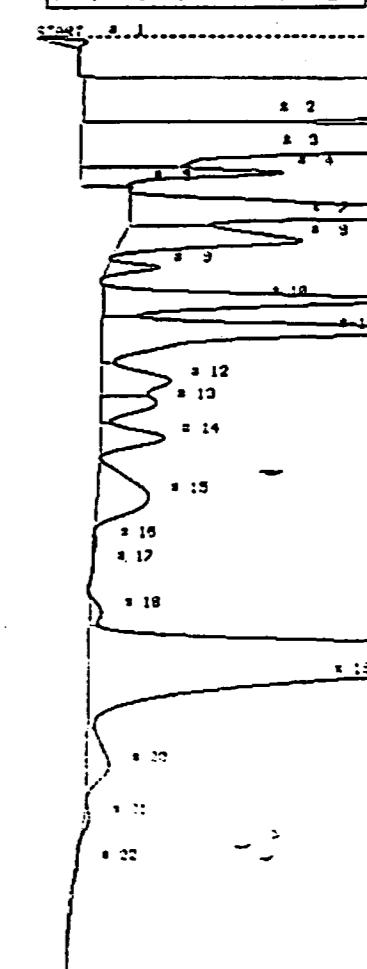
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STOP 4 730.0
SAMPLE LIBRARY 2 JUL 22 1988 11:42
ANALYSIS # 21 ELDO
INTERNAL TEMP 30 GENSCO
GAIN 50 SU TWENTY ONE

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 4.4	834.7 μUS
UNKNOWN	2 32.8	59.6 μUS
TCE	3 61.4	1.931 PPM
UNKNOWN	4 116.2	248.4 μUS
UNKNOWN	5 124.3	19.7 μUS
UNKNOWN	6 133.2	357.7 μUS
UNKNOWN	9 210.3	27.6 μUS
UNKNOWN	10 226.1	34.9 μUS
PCE	11 425.3	44.34 PPB ✓
PCE	12 474.3	2.131 PPM ✓

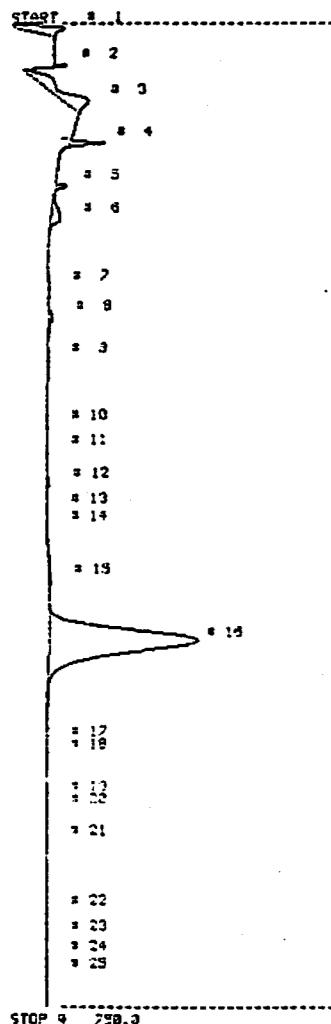
PHOTOVAC



STOP 5 730.0
SAMPLE LIBRARY 2 JUL 22 1988 12:12
ANALYSIS # 22 ELDO
INTERNAL TEMP 30 GENSCO
GAIN 50 SU TWENTY TWO

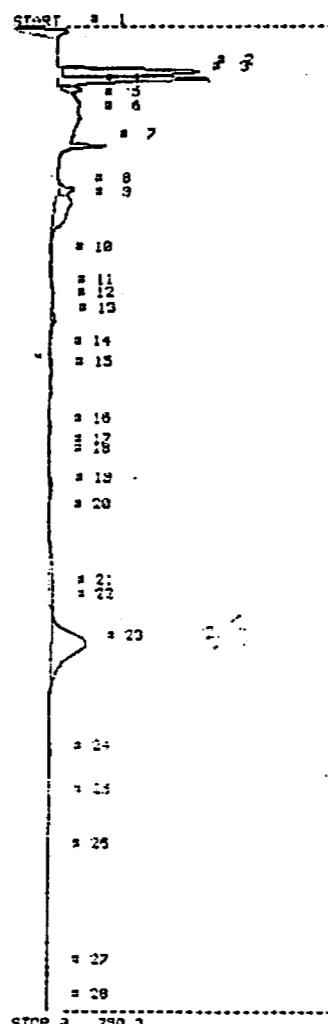
COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1 4.4	458.8 μUS
UNKNOWN	2 47.4	237.3 μUS
UNKNOWN	3 77.3	49.3 μUS
UNKNOWN	4 104.3	3.2 μUS
UNKNOWN	5 115.2	178.6 μUS
UNKNOWN	7 135.2	23.6 μUS
UNKNOWN	9 159.3	7.5 μUS
UNKNOWN	9 178.3	1.1 μUS
UNKNOWN	10 202.7	11.2 μUS
UNKNOWN	11 225.2	18.2 μUS
UNKNOWN	12 254.8	3.2 μUS
UNKNOWN	13 281.8	2.3 μUS
UNKNOWN	14 308.5	2.8 μUS
PCE	15 353.3	6.268 PPM
TOLLENE	16 388.1	76.78 PPB
PCE	17 405.3	60.91 PPB
PCE	18 440.3	237.0 PPB
PCE	19 475.3	59.43 PPM
UNKNOWN	20 557.3	2.1 μUS
UNKNOWN	21 592.3	243.3 μUS

PHOTOVAC



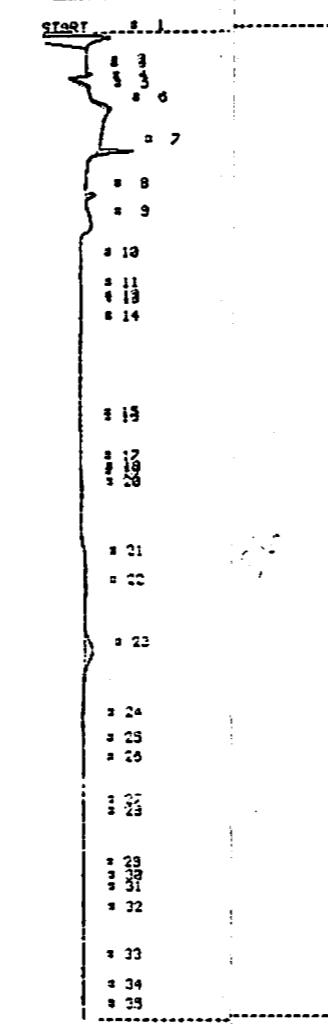
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.4	545.2 μUS
UNKNOWN	2	32.6	122.9 μUS
UNKNOWN TCE	3	59.6	1.3 μS
UNKNOWN	4	92.2	249.8 μUS
UNKNOWN	5	128.3	30.3 μUS
UNKNOWN	6	150.9	348.3 μUS
UNKNOWN	8	205.9	33.1 μUS
PCE	15	427.7	12.40 PPB*
PCE	16	473.1	1,700 PPB*

PHOTOVAC



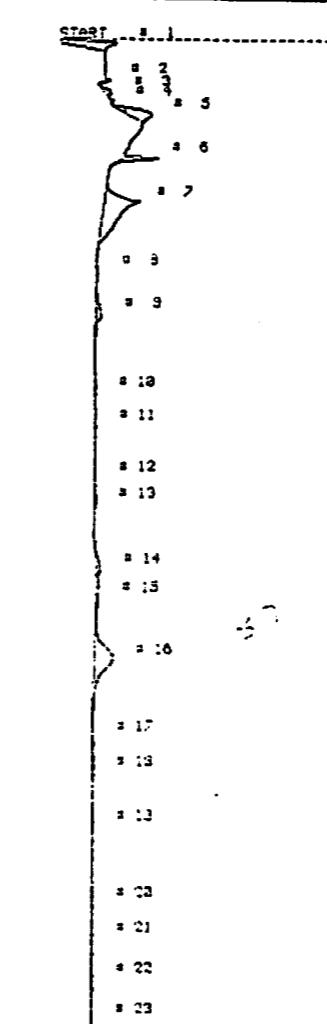
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.3	535.7 μUS
UNKNOWN	2	35.6	2.0 μS
UNKNOWN	3	41.1	1.9 μS
UNKNOWN TCE	4	48.9	200.3 μUS
UNKNOWN	5	59.6	9.3 μUS
TCE	6	70.1	24.35 PPB
UNKNOWN	7	92.2	242.7 μUS
UNKNOWN	8	128.3	262.3 μUS
UNKNOWN	9	137.1	833.0 μUS
UNKNOWN	11	204.3	25.0 μUS
UNKNOWN	12	213.1	5.2 μS
UNKNOWN	13	223.1	78.3 μUS
TOLLENE	13	260.0	3.0 μUS
UNKNOWN	16	309.8	23.4 μUS
TOLLENE	19	354.0	29.82 PPB*
PCE	21	433.7	170.9 PPB*
PCE	22	444.3	11.30 PPB*
UNKNOWN	23	474.1	613.6 PPB*
UNKNOWN	24	559.3	77.3 μS
UNKNOWN	25	633.3	10.0 μUS

PHOTOVAC



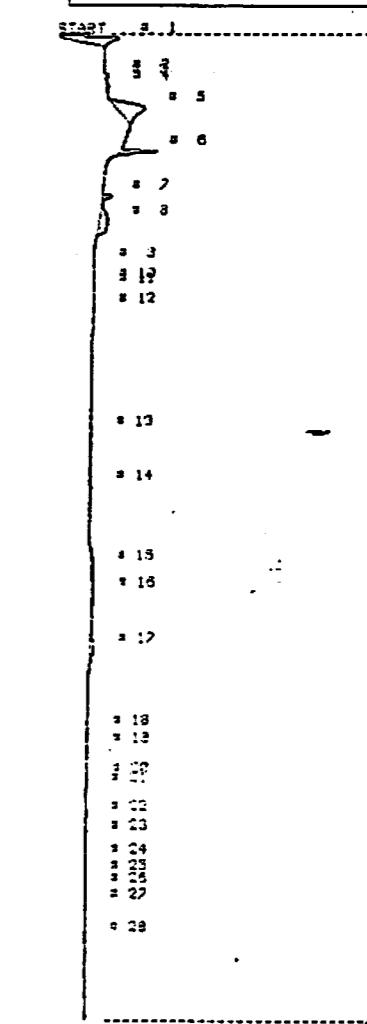
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.7	1.3 μS
UNKNOWN	2	33.8	46.3 μUS
UNKNOWN	3	42.6	78.0 μUS
UNKNOWN	5	59.6	6.4 μUS
TCE	6	59.6	79.0 μUS
UNKNOWN	7	92.2	239.3 μUS
UNKNOWN	8	128.3	262.3 μUS
UNKNOWN	9	137.1	833.0 μUS
UNKNOWN	11	204.3	25.0 μUS
UNKNOWN	12	213.1	5.2 μS
UNKNOWN	13	223.1	78.3 μUS
TOLLENE	13	260.0	3.0 μUS
UNKNOWN	16	309.8	23.4 μUS
TOLLENE	19	354.0	29.82 PPB*
PCE	21	433.7	170.9 PPB*
PCE	22	444.3	11.30 PPB*
UNKNOWN	23	474.1	613.6 PPB*
UNKNOWN	24	559.3	77.3 μS
UNKNOWN	25	633.3	10.0 μUS

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COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.3	579.4 μUS
UNKNOWN	2	32.7	32.1 μS
UNKNOWN	3	41.7	21.4 μS
UNKNOWN	4	43.3	15.7 μS
TCE	5	59.6	512.1 μS
UNKNOWN	6	39.3	79.0 μUS
UNKNOWN	7	92.2	239.3 μUS
UNKNOWN	8	128.3	30.2 μUS
UNKNOWN	9	137.1	37.4 μUS
UNKNOWN	11	204.3	5.3 μS
UNKNOWN	12	213.1	6.4 μS
TOLLENE	13	223.1	116.9 PPB
UNKNOWN	15	234.3	2.773 PPB*
TOLLENE	16	265.3	232.2 PPB
PCE	18	428.9	4.193 PPB*
PCE	19	429.5	422.2 PPB*
UNKNOWN	22	515.7	5.4 μS

PHOTOVAC



COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.3	704.3 μUS
UNKNOWN	2	33.2	23.3 μS
UNKNOWN	4	41.7	18.2 μS
TCE	5	59.6	786.6 μUS
UNKNOWN	6	32.2	235.3 μUS
UNKNOWN	7	129.5	31.1 μS
UNKNOWN	9	144.7	339.2 μS
TOLLENE	15	428.9	79.28 PPB
PCE	16	429.5	12.03 PPB*
PCE	17	430.9	43.31 PPB*
UNKNOWN	22	537.3	6.7 μS



Chen & Associates

Consulting Geotechnical
and Materials Engineers

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San Antonio, Texas 78238
512/680-5023

Casper
Colorado Springs
Denver
Ft. Collins
Glenwood Springs
Phoenix
Rock Springs
Salt Lake City

August 17, 1988

Subject: Soil-Vapor Data, Gensco and Uvalco Sites,
Uvalde, Texas

Job No.: 9-084-88

Edwards Underground Water District
1615 North St. Mary's
San Antonio, Texas 78212

Attn: Mr. John Hoyt, Geologist

Dear Mr. Hoyt:

This letter transmits the summarized data and chromatograms from a soil-vapor survey conducted at the Gensco and Uvalco sites located in Uvalde, Texas. The soil-vapor survey was conducted on August 11 and 12, 1988. A soil-vapor study was previously conducted at the site on July 21 and 22, 1988. The report of that study was transmitted on July 26, 1988.

A brief outline of the soil-vapor survey and the data obtained is discussed below.

SOIL-VAPOR SURVEY

Soil-vapor samples were obtained from the soils by driving a steel sampling point into the ground. A vacuum pump was attached to the sampling point and soil-vapor was extracted at a rate of approximately 1.5 liters/minute for 5 to 7 minutes. After evacuation, a syringe sample of the soil-vapor was extracted from the inert tubing connecting the vacuum pump to the probe system. The sample was then injected into a Photovac 10S50 portable gas chromatograph. The 10S50 had previously been calibrated with perchlorethylene (PCE), trichloroethylene (TCE), benzene, and toluene.

Thirty two locations determined by Edwards personnel were tested during the survey. The soil-vapor samples at each location were collected with a 100 microliter syringe and were injected into the portable gas chromatograph set at a gain of 10. Carrier gas flow through the analytical column was set to 22 ml/min. Standard calibrations and baseline checks were conducted throughout the survey to verify the machine was operating efficiently and to establish background data. The data obtained from the soil-vapor survey, adjusted for syringe and base line checks, is presented in Table I.

LIMITATIONS

The soil-vapor survey was conducted for the purpose of collecting data for the Edwards Underground Water District. Any conclusions formulated from this data are strictly those of the client, and do not reflect the opinions or conclusions of Chen & Associates, Inc.

If you have any questions concerning the soil-vapor data, please contact our office.

Sincerely,

CHEN & ASSOCIATES, INC.

By: Mark M. Briggs
Mark M. Briggs, Geologist

MMB/irb
Enclosure

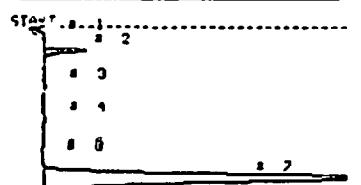
TABLE I
SOIL-VAPOR SAMPLING CONCENTRATIONS
GENSCO AND UVALCO SITES
UVALDE, TEXAS

<u>Sampling Point</u>	PCE <u>Concentration (ppb)</u>	TCE <u>Concentration (ppb)</u>	Benzene <u>Concentration (ppb)</u>	Toluene <u>Concentration (ppb)</u>
SV-33 @ 5'	545	ND	ND	5375
SV-34 @ 5'	612	ND	ND	4950
SV-35 @ 5'	ND	3	16	12,145
SV-36 @ 4'	ND	ND	ND	2924
SV-37 @ 5'	ND	2	ND	2270
SV-38 @ 5'	1792	3	ND	2790
SV-39 @ 5'	1640	ND	ND	3755
SV-40 @ 5'	64	ND	ND	12,374
SV-41 @ 5'	1626	ND	ND	936
SV-42 @ 5'	ND	ND	ND	2997
SV-43 @ 5'	1206	ND	ND	553
SV-44 @ 5'	108	ND	ND	620
SV-45 @ 5'	51	ND	ND	601
SV-46 @ 5'	3252	2694	53	320
SV-47 @ 5'	75	ND	ND	117
SV-48 @ 5'	190	ND	ND	48
SV-49 @ 5'	25	ND	ND	ND
SV-50 @ 5'	707	ND	ND	154
SV-51 @ 5'	ND	ND	ND	322
SV-52 @ 5'	ND	ND	ND	620
SV-53 @ 5'	ND	ND	ND	4067
SV-54 @ 5'	ND	ND	ND	1778
SV-55 @ 5'	ND	ND	ND	528
SV-56 @ 4'	ND	ND	ND	225
SV-57 @ 4'	ND	ND	ND	216
SV-58 @ 3'	3578	ND	ND	1892
SV-58 @ 5'	1882	ND	ND	ND
SV-58 @ 6.5'	501	ND	ND	ND
SV-59 @ 5'	822	ND	ND	ND
SV-60 @ 5'	431	ND	ND	407
SV-61 @ 5'	ND	ND	ND	1239
SV-62 @ 5'	65	ND	ND	198
SV-63 @ 5'	ND	ND	ND	3050
SV-64 @ 5'	ND	ND	ND	580

ND = Not Detected

APPENDIX A
CHROMATOGRAMS

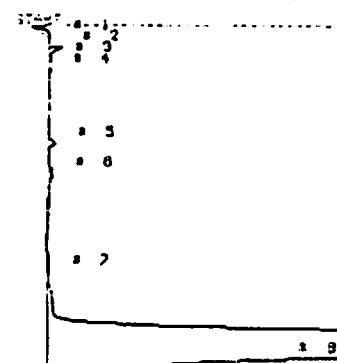
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COMPOUND NAME PEAK R.T. AREA/PPM

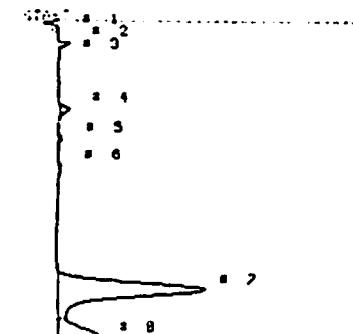
UNKNOWN	1	8.0	01.1	MUS
UNKNOWN	2	18.2	032.0	MUS
UNKNOWN	3	45.2	5.4	MUS
UNKNOWN	4	69.3	16.0	MUS
PCE	7	113.3	10000	PPM

PHOTOVAC



COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	2.1	12.1	MUS
UNKNOWN	2	18.2	32.0	MUS
UNKNOWN	3	45.2	14.9	MUS
TCE	4	69.3	28.33	PPB
UNKNOWN	7	113.3	1000	PPM
UNKNOWN	8	124.1	1000	PPM

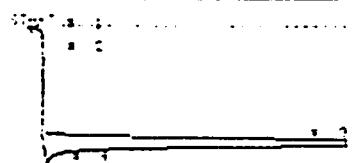
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COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	8.0	32.1	MUS
UNKNOWN	2	18.2	32.7	MUS
UNKNOWN	3	45.2	14.9	MUS
BENZENE	5	82.0	61.68	PPB
TCE	6	113.3	9.739	PPB
UNKNOWN	7	124.1	1000	PPM
PCE	8	241.0	2,417	PPM

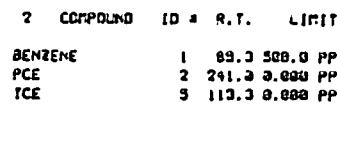
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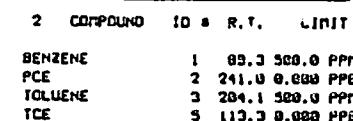
COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	8.0	12.1	MUS
UNKNOWN	2	18.2	32.0	MUS

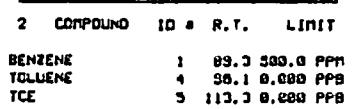
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PHOTOVAC

STOP 1 18:0
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11

STOP 1 18:0
SAMPLE LIBRARY 2 AUG 11 1988 18:0
ANALYSIS # 11 EU40 UVALDE 2
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 STR CMK

COMPOUND NAME CONC. (PPB)
CHPENE 1 3.4 21.3 PPB
CHPENE 2 2 26.3 162.3 PPB
CHPENE 3 3 42.3 2.3 PPB
UNKNOWN 11 127.3 123.3 PPB
TOLUENE 12 224.5 5.453 PPB
PCE 13 241.1 646.4 PPB

PHOTOVAC

STOP 1 18:0
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STOP 1 18:0
SAMPLE LIBRARY 2 AUG 11 1988 18:0
ANALYSIS # 13 EU40 UVALDE 2
INTERNAL TEMP 30 100 UL AT 10
GAIN 10 STR CMK

COMPOUND NAME CONC. (PPB)
CHPENE 1 3.4 21.3 PPB
CHPENE 2 2 26.3 162.3 PPB
CHPENE 3 3 42.3 2.3 PPB
UNKNOWN 11 123.2 7.882 PPB
TOLUENE 12 224.5 5.453 PPB
PCE 13 241.1 646.4 PPB

PHOTOVAC

STOP 1 18:0
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STOP 1 18:0
SAMPLE LIBRARY 2 AUG 11 1988 18:0
ANALYSIS # 13 EU40 UVALDE 2
INTERNAL TEMP 30 100 UL AT 10
GAIN 10 STR CMK

COMPOUND NAME CONC. (PPB)
CHPENE 1 3.4 21.3 PPB
CHPENE 2 2 26.3 162.3 PPB
CHPENE 3 3 42.3 2.3 PPB
UNKNOWN 11 123.2 7.882 PPB
TOLUENE 12 224.5 5.453 PPB
PCE 13 241.1 646.4 PPB

PHOTOVAC

START # 1
 1 2 3 4
 5
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 18

STEP 7 750.0
 SAMPLE LIBRARY 2 AUG 11 1988 10142
 ANALYSIS # 14 ELMID UVALDE 2
 INTERNAL TEMP 31 100 LL AT 10
 GAIN 10 SU 34 AT 5

COMPARISON DATA - 100.0% INTERNAL

UNKNOWN	1	12.1	137.1	PPB
UNKNOWN	4	20.4	21.0	PPB
UNKNOWN	5	40.0	51.2	PPB
TCE	6	126.3	9,373	PPB
UNKNOWN	7	125.2	134.3	PPB
TOLUENE	8	224.3	3,054	PPB
ACB	9	141.1	213.1	PPB

PHOTOVAC

STOP # 1
 1 2 3 4
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 7 8
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 21

STEP 8 750.0
 SAMPLE LIBRARY 2 AUG 11 1988 11116
 ANALYSIS # 15 ELMID UVALDE 2
 INTERNAL TEMP 31 100 LL AT 10
 GAIN 10 SU 36 AT 4

COMPARISON DATA - 100.0% INTERNAL

UNKNOWN	1	70.0	131.6	PPB
UNKNOWN	2	13.1	47.2	PPB
UNKNOWN	3	21.5	26.1	PPB
UNKNOWN	4	26.0	30.4	PPB
UNKNOWN	5	47.1	51.8	PPB
BENZENE	6	10.0	11.0	PPB
TCE	7	104.1	11,139	PPB
UNKNOWN	8	10.0	11.0	PPB
TOLUENE	9	104.1	11,139	PPB

PHOTOVAC

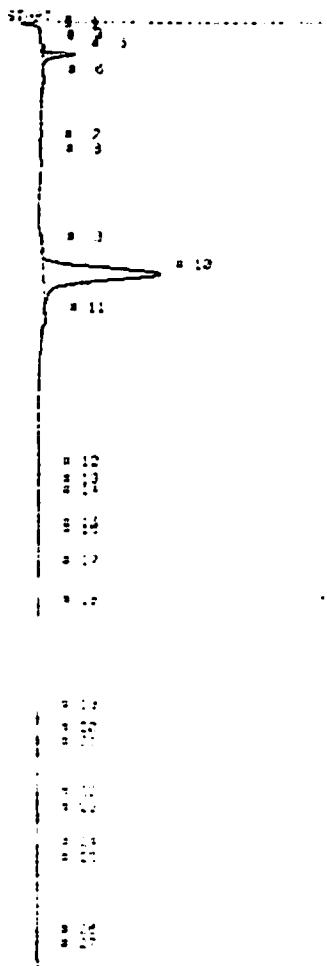
STOP # 1
 1 2 3 4
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 7 8
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 14
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 17
 18

STEP 9 750.0
 SAMPLE LIBRARY 2 AUG 11 1988 11116
 ANALYSIS # 16 ELMID UVALDE 2
 INTERNAL TEMP 31 100 LL AT 10
 GAIN 10 SU 36 AT 4

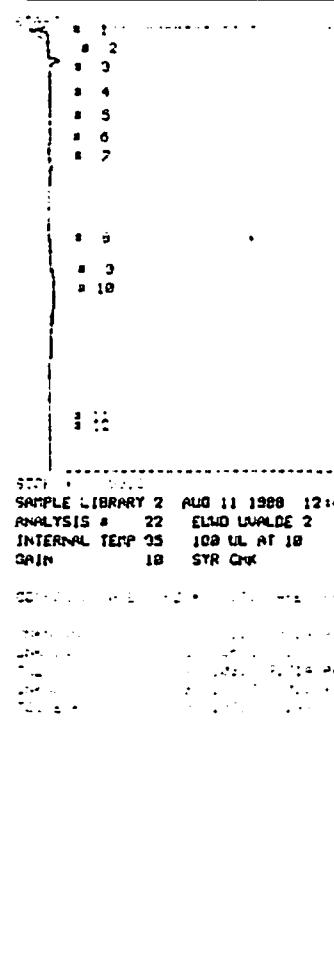
COMPARISON DATA - 100.0% INTERNAL

UNKNOWN	1	3.1	31.9	PPB
UNKNOWN	2	20.1	1.2	PPB
UNKNOWN	3	14.1	1.4	PPB
TCE	4	10.0	2,047	PPB
UNKNOWN	5	10.0	1,047	PPB
TOLUENE	6	104.1	11,139	PPB

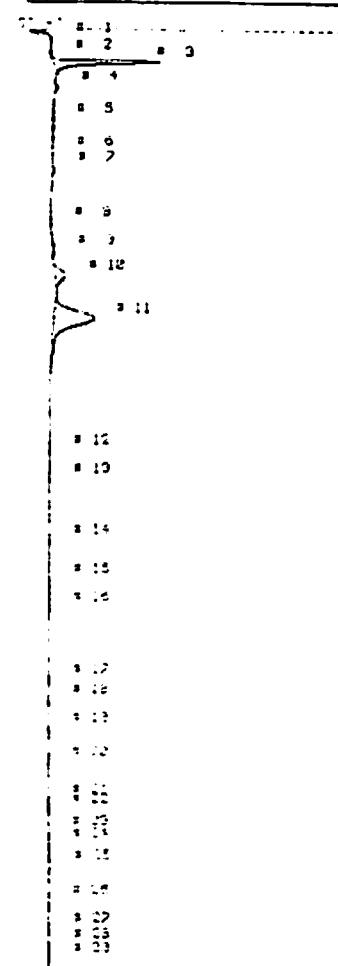
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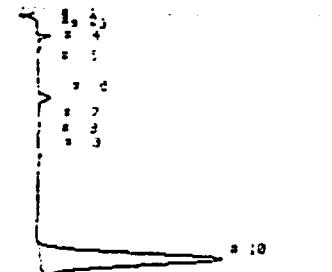
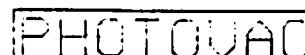
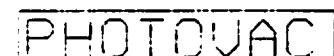


SAMPLE LIBRARY 2 AUG 11 1988 12:43
ANALYSIS # 22 ELMOD LVALDE 2
INTERNAL TEMP 35 100 UL AT 10
GAIN 10 STR QWK

COMPOUND NAME % AREA
BENZENE 100.0 100.0
TOLUENE 0.0 0.0
CHLOROBENZENE 0.0 0.0
CHLOROTOLUENE 0.0 0.0
PCE 100.0 100.0

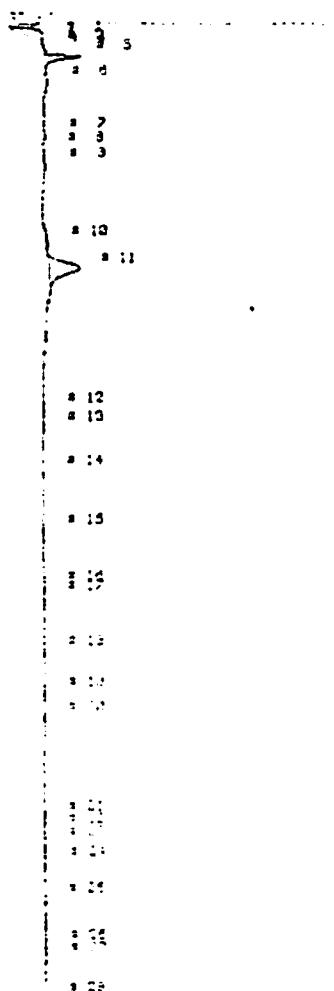
SAMPLE LIBRARY 2 AUG 11 1988 12:59
ANALYSIS # 23 ELMOD LVALDE 2
INTERNAL TEMP 35 100 UL AT 10
GAIN 10 SU 41 AT 5

COMPOUND NAME % AREA
BENZENE 100.0 100.0
TOLUENE 0.0 0.0
CHLOROBENZENE 0.0 0.0
CHLOROTOLUENE 0.0 0.0
PCE 100.0 100.0



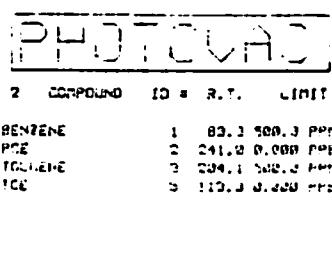
SAMPLE LIBRARY 2 AUG 11 1989 1315
ANALYSIS 3 24 ELDU LUDWIK 2
INTERNAL TEPF 36 188 UL AF 10
GAIN 10 TOL CAL

the first time in the history of the world, the people of the United States have been called upon to decide whether they will submit to the law of force, and let a一小部分 of their country be held at bay by a一小部分 of their neighbors, or whether they will, as a nation, assert the right which every nation has of self-government, and which every man has a right to exercise, of determining for himself what government he will be under.

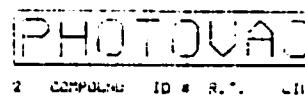


SAMPLE LIBRARY 2 AUG 11 1989 14:48
ANALYSIS 4 28 ELLD WILADE 2
INTERNAL TEMP 18 100 UL AT 10
GAIN 10 TOL CMK

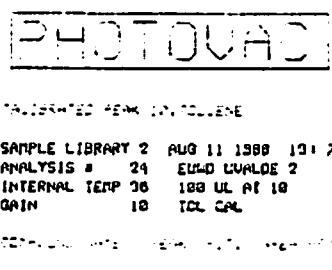
NAME	AGE	SEX	STATE
John Doe	35	M	California
Jane Doe	32	F	California
Bob Smith	40	M	Illinois
Susan Smith	38	F	Illinois
David Johnson	28	M	Texas
Elizabeth Johnson	25	F	Texas



2	COMPOUND	ID #	R.T.	LIMIT
BENZENE		1	83.3	900.0 PPM
PCB		2	241.0	0.000 PPM
TOLUENE		3	204.1	100.0 PPM
ICE		5	110.3	0.000 PPM

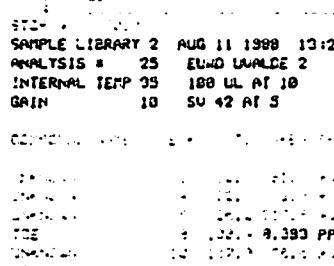


BENZENE	1	62.4	500.3	PPM
TCE	2	222.3	3,000	PPB
TOLUENE	3	163.3	300.3	PPM
TCE	3	184.5	2,000	PPB

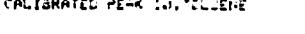


TRIQUETRIC PEAK 10% COLLENE
SAMPLE LIBRARY 2 AUG 11 1988 1317
ANALYSIS # 24 EUDIOLICOLE 2
INTERNAL TEMP 36 180 UL RT 18
GAIN 10 TEL CAL

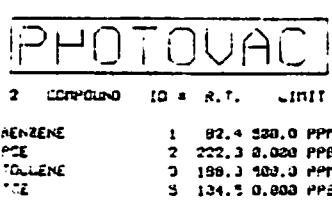
Category	Number of records	Number of records with missing values	Percentage of missing values
Geographic area	1	0	0.0%
Geographic area and time period	1	0	0.0%
Geographic area and time period and gender	1	0	0.0%
Geographic area and time period and gender and age group	1	0	0.0%



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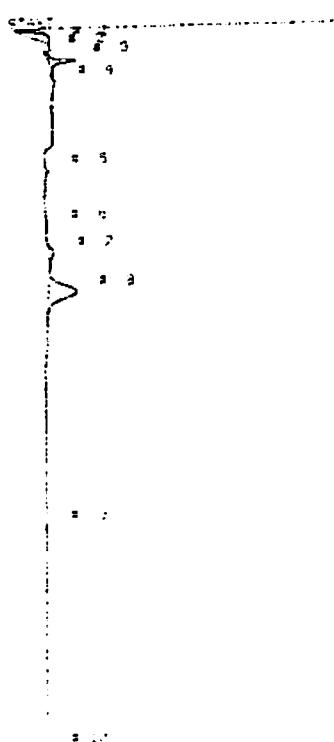


SAMPLE LIBRARY 2 AUG 11 1988 14158
ANALYSIS 8 20 EUD WULDE 2
INTERNAL TEMP 48 180 °L AT 10
GAIN 10 TOL CRK



2 COMPOUND	ID #	R.T.	LIMIT
ARENZENE	1	82.4	520.0 PPM
PCE	2	222.3	0.2000 PPM
TOLUENE	3	108.3	100.0 PPM
TC	4	134.5	0.0003 PPM

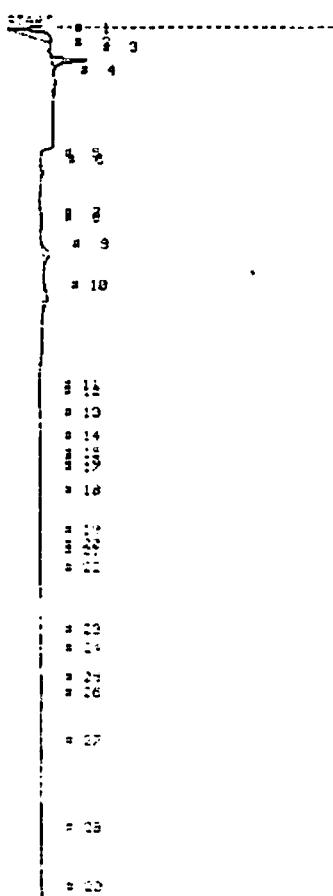
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STOP / 15:15
SAMPLE LIBRARY 2 AUG 11 1988 15:4
ANALYSIS # 23 EUD LVALDE 2
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 SU 43 AT 5

COMPOUND NAME - PERCENT AREA PERCENT
BENZYLIC ACID 1.000 1.000
BENZYLIC ACID 4 0.700 0.700
BENZYLIC ACID 5 0.100 0.100
BENZYLIC ACID 6 0.000 0.000
BENZYLIC ACID 7 0.000 0.000
BENZYLIC ACID 8 0.000 0.000
PCE 4 0.010 0.000 PPB

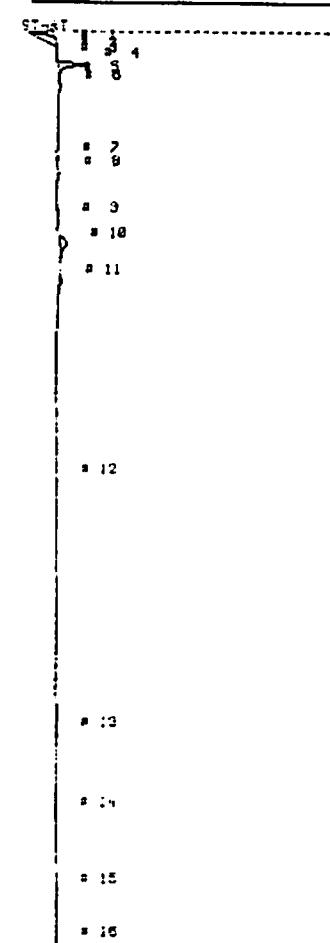
PHOTOVAC



STOP / 15:15
SAMPLE LIBRARY 2 AUG 11 1988 15:8
ANALYSIS # 30 EUD LVALDE 2
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 SU 44 AT 5

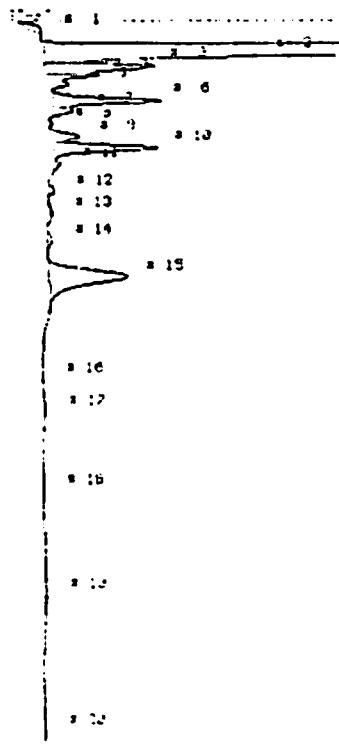
COMPOUND NAME - PERCENT AREA PERCENT
UNKNOWN 1 0.000 0.000
UNKNOWN 2 0.000 0.000
UNKNOWN 3 0.000 0.000
UNKNOWN 4 0.000 0.000
UNKNOWN 5 0.000 0.000
TOLUENE 3 0.000 0.000 PPB
PCE 13 0.000 0.000 PPB
UNKNOWN 20 0.000 0.000 PPB

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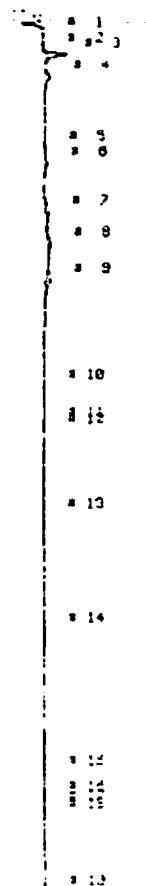
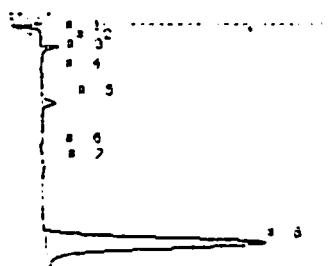
STOP / 15:15
SAMPLE LIBRARY 2 AUG 11 1988 15:15
ANALYSIS # 31 EUD LVALDE 2
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 SU 45 AT 5

COMPOUND NAME - PERCENT AREA PERCENT
UNKNOWN 1 0.000 0.000
UNKNOWN 2 0.000 0.000
UNKNOWN 3 0.000 0.000
UNKNOWN 4 0.000 0.000
UNKNOWN 5 0.000 0.000
TOL
PCE 10 0.000 0.000 PPB
UNKNOWN 20 0.000 0.000 PPB

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2 COMPOUND ID # P.T. LIMIT

BENZENE	1	22.2 500.0 PPM
PCE	2	230.0 0.000 PPB
TOLLENE	3	170.0 500.0 PPM
TCE	9	30.0 0.000 PPB

PHOTOVAC**PHOTOVAC**

SAMPLE LIBRARY 2 AUG 11 1988 16:12
ANALYSIS # 32 EIU-D UVALDE 2
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 TOL CAL

SAMPLE LIBRARY 2 AUG 11 1988 16:16
ANALYSIS # 32 EIU-D UVALDE 2
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 46 NT 5

TOL
PCE

PHOTOVAC

CALIBERATED FERNK 3, TOLLENE

SAMPLE LIBRARY 2 AUG 11 1988 16:13
ANALYSIS # 33 EIU-D UVALDE 2
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 SU 46 AT 5

COMPOUND ID # P.T. LIMIT

BENZENE	1	22.2 500.0 PPB
CHLORINE	2	22.2 100.0 PPB
CHLORINE	3	170.0 500.0 PPB
CHLORINE	7	100.0 500.0 PPB
TCE	9	30.0 0.000 PPB

SAMPLE LIBRARY 2 AUG 11 1988 16:13
ANALYSIS # 31 EIU-D UVALDE 2
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 47 AT 5

COMPOUND ID # P.T. LIMIT

BENZENE	1	22.2 500.0 PPB
CHLORINE	4	22.2 100.0 PPB
CHLORINE	6	170.0 500.0 PPB
CHLORINE	8	100.0 500.0 PPB
TCE	9	30.0 0.000 PPB
TCE	11	30.0 0.000 PPB

PHOTOVAC

2 COMPOUND ID # P.T. LIMIT

BENZENE	1	22.2 500.0 PPM
PCE	2	230.0 0.000 PPB
TOLLENE	3	170.0 500.0 PPM
TCE	5	30.0 0.000 PPM

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21

STOP 3 115.7
SAMPLE LIBRARY 2 AUG 11 1988 1615
ANALYSIS # 36 ELKO WURDIE 2
INTERNAL TEMP 37 160 LL AT 18
GAIN 18 STA CHG

CONFIDENTIAL - 4000

2000-2000 : 2.2 1000.0 +
2000-2000 : 1250.0 500.0 +
2000-2000 : 500.0 500.0 +

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STOP 3
SAMPLE LIBRARY 2 AUG 11 1988 171
ANALYSIS # 22 EUMO LUMALDE 2
INTERNAL TEMP 27 168 LL RT 18
GAIN 10 SV 49 RT 5

SAMPLE LIBRARY 2 AUG 11 1988 10:14
ANALYSIS 2 35 ELMO LUDVIE 2
INTERNAL TEMP 37 102 LF RT 18
GAIN 10 SU 48 RT 3

Compound	Time	PPM	Reference
CH ₃ COCH ₃	1	110.0	200.0, 400.
CH ₃ COCH ₃	2	220.0	100.0, 200.
CH ₃ COCH ₃	4	44.0	21.0, 40.
CH ₃ COCH ₃	6	22.0	11.0, 20.
CH ₃ COCH ₃	7	22.0	11.0, 20.
CH ₃ COCH ₃	8	110.0	100.0, 400.
CH ₃ COCH ₃	9	110.0	100.0, 400.
CH ₃ COCH ₃	10	110.0	100.0, 400.
CH ₃ COCH ₃	11	110.0	100.0, 400.
CH ₃ COCH ₃	12	110.0	100.0, 400.
CH ₃ COCH ₃	13	110.0	100.0, 400.
CH ₃ COCH ₃	14	110.0	100.0, 400.

Condition	Time	Temp.	PPM	Notes
Control	0	13.7	240.3	no
Control	+	23.1	222.0	no
Control	+	23.1	78.7	no
Control	+	23.1	10.0	no
Control	+	23.1	10.0	no
Control	+	23.1	25.43	PPM
Control	+	23.1	4.3	PPM

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5 4
x 3
x 6
x 7
x 8
x 10
x 11
x 12

x 13
x 14
x 15

x 16
x 17
x 18

x 19
x 20
x 21

x 22
x 23
x 24
x 25
x 26

SAMPLE LIBRARY 2 AUG 11 1988 17:21
ANALYSIS # 38 ELLD LVALDE 2
INTERNAL TEMP 38 180 UL AT 10
GAIN 10 SU 50 AT 5

CHROMATOGRAMS
100% 100% 100%
100% 100% 100%
100% 100% 100%
100% 100% 100%
100% 100% 100%
100% 100% 100%

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x 1
x 2
x 3
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x 8
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x 10

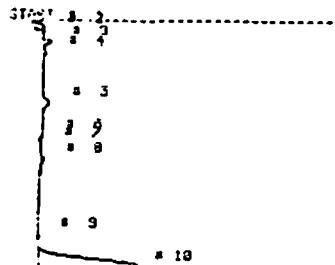
x 11
x 12
x 13
x 14
x 15

x 16
x 17
x 18
x 19
x 20
x 21

SAMPLE LIBRARY 2 AUG 11 1988 17:37
ANALYSIS # 39 ELLD LVALDE 2
INTERNAL TEMP 38 180 UL AT 10
GAIN 10 SU 50 AT 5

CHROMATOGRAMS
100% 100% 100%
100% 100% 100%
100% 100% 100%
100% 100% 100%
100% 100% 100%
100% 100% 100%

PHOTOVAC

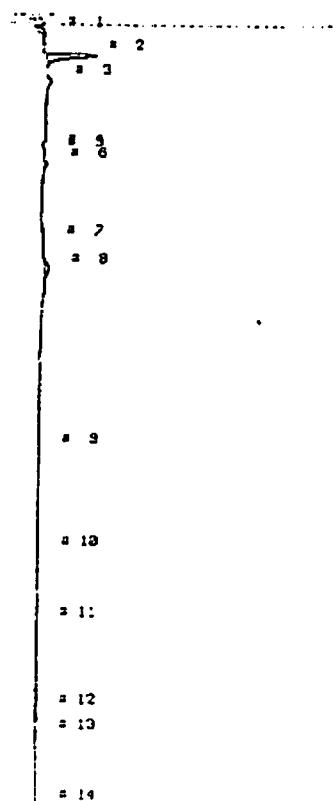


STOP 4 250.5
SAMPLE LIBRARY 2 AUG 12 1988 8:13
ANALYSIS # 7 EUOD UVALDE 2
INTERNAL TEMP 24 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	6.9	14.1	MUS
UNKNOWN	2	9.1	27.9	MUS
UNKNOWN	3	12.5	61.3	MUS
UNKNOWN	4	24.2	2.0	MUS
UNKNOWN	5	34.1	10.2	MUS
UNKNOWN	6	127.5	11.2	MUS
TCE	13	133.1	15.67	PPM

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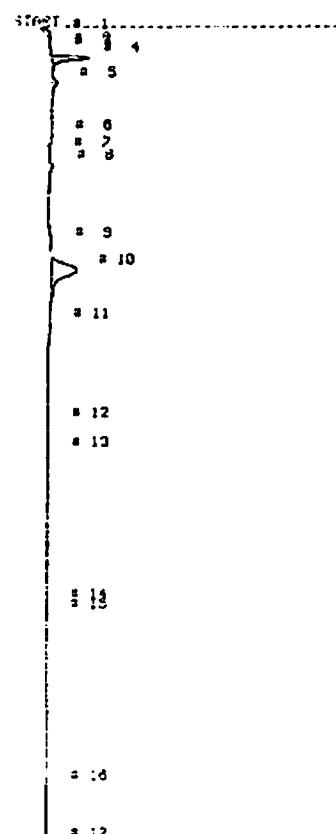


STOP 4 250.5
SAMPLE LIBRARY 2 AUG 12 1988 8:27
ANALYSIS # 8 EUOD UVALDE 2
INTERNAL TEMP 25 100 UL AT 10
GAIN 10 SU 52 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	7.3	46.5	MUS
UNKNOWN	2	24.7	734.3	MUS
UNKNOWN	3	44.3	16.3	MUS
TCE	6	127.5	28.05	PPB
UNKNOWN	7	152.5	13.3	MUS
TOLUENE	9	133.0	702.0	PPB

PHOTOVAC



STOP 4 250.5
SAMPLE LIBRARY 2 AUG 12 1988 8:40
ANALYSIS # 9 EUOD UVALDE 2
INTERNAL TEMP 26 100 UL AT 10
GAIN 10 SU 53 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	7.3	44.3	MUS
UNKNOWN	4	24.7	591.0	MUS
UNKNOWN	6	44.3	35.3	MUS
UNKNOWN	7	152.5	13.3	MUS
TCE	8	127.5	15.16	PPB
UNKNOWN	9	133.0	74.7	MUS
TOLUENE	10	132.5	4.102	PPB

PHOTOVAC

CALIBRATED PEAK 10, TOLUENE

SAMPLE LIBRARY 2 AUG 12 1988 8:15
ANALYSIS # 7 EUOD UVALDE 2
INTERNAL TEMP 24 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME PEAK R.T. AREA/PPM

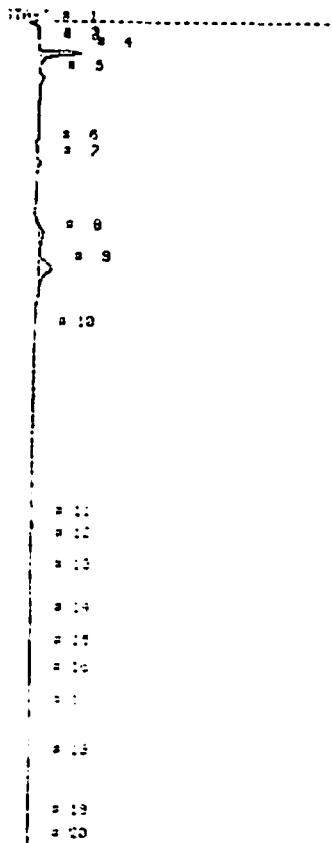
UNKNOWN	1	6.5	14.1	MUS
UNKNOWN	2	9.1	27.9	MUS
UNKNOWN	3	12.5	61.3	MUS
UNKNOWN	4	24.2	2.0	MUS
UNKNOWN	5	34.1	10.2	MUS
TCE	6	127.5	21.51	PPB
TOLUENE	13	133.1	13.03	PPM

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	82.8	500.0	PPM
PCE	2	223.3	0.000	PPB
TOLUENE	3	189.1	500.0	PPM
TCE	5	105.0	0.000	PPB

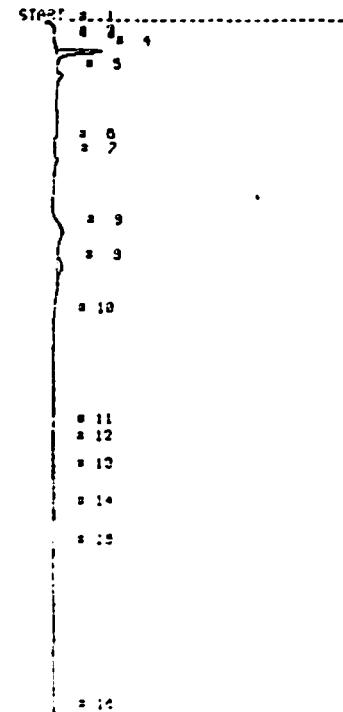
PHOTOVAC



STEP 1: 100.0
SAMPLE LIBRARY 2 AUG 12 1988 9:3
ANALYSIS # 11 ELMOD UV/ALICE 2
INTERNAL TEMP 27 100 LL AT 10
GAIN 10 SU 55 AT 4

COMPOUND NAME PERCENT
DINITROBENZENE 1 7.0 70.7 +/-
DINITROBENZENE 1 0.4 0.4 +/-
DINITROBENZENE 1 0.1 0.1 +/-
TOLUENE 2 107.1 22.38 PPB
DINITROBENZENE 3 104.1 22.0 +/-
TOLUENE 2 105.7 2.380 PPB

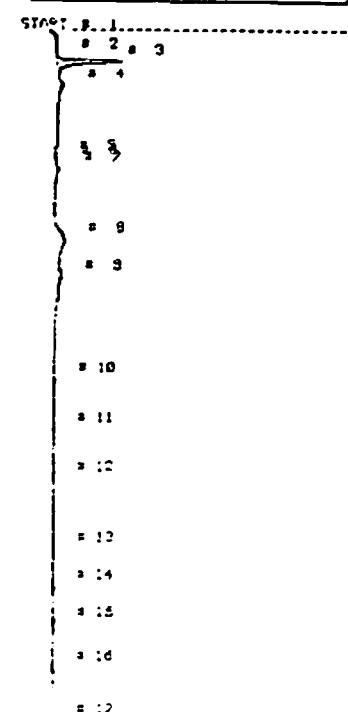
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STEP 1: 100.0
SAMPLE LIBRARY 2 AUG 12 1988 9:3
ANALYSIS # 11 ELMOD UV/ALICE 2
INTERNAL TEMP 27 100 LL AT 10
GAIN 10 SU 55 AT 4

COMPOUND NAME PERCENT
DINITROBENZENE 1 7.0 70.7 +/-
DINITROBENZENE 1 0.4 0.4 +/-
DINITROBENZENE 1 0.1 0.1 +/-
TOLUENE 2 107.1 22.38 PPB
DINITROBENZENE 3 104.1 22.0 +/-
TOLUENE 2 105.7 2.380 PPB

PHOTOVAC



STEP 1: 100.0
SAMPLE LIBRARY 2 AUG 12 1988 9:23
ANALYSIS # 12 ELMOD UV/ALICE 2
INTERNAL TEMP 27 100 LL AT 10
GAIN 10 SU 56 AT 4

COMPOUND NAME PERCENT
DINITROBENZENE 1 6.3 20.3 +/-
DINITROBENZENE 2 24.7 57.1 +/-
DINITROBENZENE 3 40.3 48.6 +/-
TOLUENE 2 107.1 13.94 PPB
DINITROBENZENE 3 104.1 22.4 +/-
TOLUENE 2 105.7 2.380 PPB



SAMPLE LIBRARY 2 AUG 12 1989 9132
ANALYSIS # 13 ELEO LIVALCE 2
INTERNAL TEMP 28 100 UL AF 18
GAIN 16 SU ~~1~~ AT 1

RECEIVING	DATE	ITEM	U.T.	AMOUNT
2010-01-01			1	12.0 12.0 PPE
2010-01-01			2	12.0 12.0 PPE
2010-01-01			3	12.0 12.0 PPE
2010-01-01			4	12.0 12.0 PPE
2010-01-01			5	12.0 12.0 PPE
2010-01-01			6	12.0 12.0 PPE
2010-01-01			7	120.0 22.45 PPE
2010-01-01			8	161.7 347.1 PPE
2010-01-01			9	161.7 347.1 PPE
2010-01-01			10	161.7 347.1 PPE

STEP 3 40113
SAMPLE LIBRARY 2 AUG 12 1998 9:55
ANALYSIS 8 14 ELWD LVALOE 2
INTERNAL TEMP 27 100 UL AT 10
GAIN 10 STRINGE BLANK

STC# 4 243.2
SAMPLE LIBRARY 2 AUG 12 1988 10112
ANALYSIS 3 13 ELMO UMLDE 2
INTERNAL TEMP 22 103 UL AT 10

COMPOUND	NAME	%	PPM	PPM ₂
UNKNOWN		1	2.3	14.5
UNKNOWN		1	12.3	621.5
UNKNOWN		3	15.1	83.2
TCE		5	102.3	32.11
TOLUENE		6	193.3	1.954
PFPE		2	218.2	3.688



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SAMPLE LIBRARY 2 AUG 12 1988 18:23
ANALYSIS 8 18 ELKO LUMALEE 2
INTERNAL TEMP 25 188 UL AT 10
GAIN 18 SU 38 AT 5

SAMPLE LIBRARY 2 AUG 12 1980 18130
ANALYSIS 8 17 ELIOT WALLACE 2
INTERNAL TEMP 26 180° UL AT 10
GAIN 18 SU 50 AT 0.5

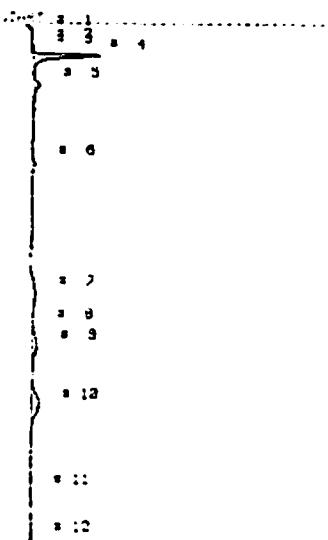
SAMPLE LIBRARY 2 AUG 12 1988 1815Z
ANALYSIS 8 18 E140 W140L 2
INTERNAL TEMP 27 120 UL AT 10
GAIN 10 SU 59 AT 3

CO-OP-100	PPM	CO-OP-100	PPM
CHLORINE	1	90.0	90.0 PPM
CHLORINE	2	100.0	100.0 PPM
CHLORINE	3	120.0	120.0 PPM
CHLORINE	4	140.0	140.0 PPM
CHLORINE	5	160.0	160.0 PPM
CHLORINE	6	180.0	180.0 PPM
CHLORINE	7	200.0	200.0 PPM
CHLORINE	8	220.0	220.0 PPM
CHLORINE	9	240.0	240.0 PPM
CHLORINE	10	260.0	260.0 PPM
CHLORINE	11	280.0	280.0 PPM
CHLORINE	12	300.0	300.0 PPM
CHLORINE	13	320.0	320.0 PPM
CHLORINE	14	340.0	340.0 PPM
CHLORINE	15	360.0	360.0 PPM
CHLORINE	16	380.0	380.0 PPM
CHLORINE	17	400.0	400.0 PPM
CHLORINE	18	420.0	420.0 PPM
CHLORINE	19	440.0	440.0 PPM
CHLORINE	20	460.0	460.0 PPM
CHLORINE	21	480.0	480.0 PPM
CHLORINE	22	500.0	500.0 PPM
CHLORINE	23	520.0	520.0 PPM
CHLORINE	24	540.0	540.0 PPM
CHLORINE	25	560.0	560.0 PPM
CHLORINE	26	580.0	580.0 PPM
CHLORINE	27	600.0	600.0 PPM
CHLORINE	28	620.0	620.0 PPM
CHLORINE	29	640.0	640.0 PPM
CHLORINE	30	660.0	660.0 PPM
CHLORINE	31	680.0	680.0 PPM
CHLORINE	32	700.0	700.0 PPM
CHLORINE	33	720.0	720.0 PPM
CHLORINE	34	740.0	740.0 PPM
CHLORINE	35	760.0	760.0 PPM
CHLORINE	36	780.0	780.0 PPM
CHLORINE	37	800.0	800.0 PPM
CHLORINE	38	820.0	820.0 PPM
CHLORINE	39	840.0	840.0 PPM
CHLORINE	40	860.0	860.0 PPM
CHLORINE	41	880.0	880.0 PPM
CHLORINE	42	900.0	900.0 PPM
CHLORINE	43	920.0	920.0 PPM
CHLORINE	44	940.0	940.0 PPM
CHLORINE	45	960.0	960.0 PPM
CHLORINE	46	980.0	980.0 PPM
CHLORINE	47	1000.0	1000.0 PPM
CHLORINE	48	1020.0	1020.0 PPM
CHLORINE	49	1040.0	1040.0 PPM
CHLORINE	50	1060.0	1060.0 PPM
CHLORINE	51	1080.0	1080.0 PPM
CHLORINE	52	1100.0	1100.0 PPM
CHLORINE	53	1120.0	1120.0 PPM
CHLORINE	54	1140.0	1140.0 PPM
CHLORINE	55	1160.0	1160.0 PPM
CHLORINE	56	1180.0	1180.0 PPM
CHLORINE	57	1200.0	1200.0 PPM
CHLORINE	58	1220.0	1220.0 PPM
CHLORINE	59	1240.0	1240.0 PPM
CHLORINE	60	1260.0	1260.0 PPM
CHLORINE	61	1280.0	1280.0 PPM
CHLORINE	62	1300.0	1300.0 PPM
CHLORINE	63	1320.0	1320.0 PPM
CHLORINE	64	1340.0	1340.0 PPM
CHLORINE	65	1360.0	1360.0 PPM
CHLORINE	66	1380.0	1380.0 PPM
CHLORINE	67	1400.0	1400.0 PPM
CHLORINE	68	1420.0	1420.0 PPM
CHLORINE	69	1440.0	1440.0 PPM
CHLORINE	70	1460.0	1460.0 PPM
CHLORINE	71	1480.0	1480.0 PPM
CHLORINE	72	1500.0	1500.0 PPM
CHLORINE	73	1520.0	1520.0 PPM
CHLORINE	74	1540.0	1540.0 PPM
CHLORINE	75	1560.0	1560.0 PPM
CHLORINE	76	1580.0	1580.0 PPM
CHLORINE	77	1600.0	1600.0 PPM
CHLORINE	78	1620.0	1620.0 PPM
CHLORINE	79	1640.0	1640.0 PPM
CHLORINE	80	1660.0	1660.0 PPM
CHLORINE	81	1680.0	1680.0 PPM
CHLORINE	82	1700.0	1700.0 PPM
CHLORINE	83	1720.0	1720.0 PPM
CHLORINE	84	1740.0	1740.0 PPM
CHLORINE	85	1760.0	1760.0 PPM
CHLORINE	86	1780.0	1780.0 PPM
CHLORINE	87	1800.0	1800.0 PPM
CHLORINE	88	1820.0	1820.0 PPM
CHLORINE	89	1840.0	1840.0 PPM
CHLORINE	90	1860.0	1860.0 PPM
CHLORINE	91	1880.0	1880.0 PPM
CHLORINE	92	1900.0	1900.0 PPM
CHLORINE	93	1920.0	1920.0 PPM
CHLORINE	94	1940.0	1940.0 PPM
CHLORINE	95	1960.0	1960.0 PPM
CHLORINE	96	1980.0	1980.0 PPM
CHLORINE	97	2000.0	2000.0 PPM
CHLORINE	98	2020.0	2020.0 PPM
CHLORINE	99	2040.0	2040.0 PPM
CHLORINE	100	2060.0	2060.0 PPM
CHLORINE	101	2080.0	2080.0 PPM
CHLORINE	102	2100.0	2100.0 PPM
CHLORINE	103	2120.0	2120.0 PPM
CHLORINE	104	2140.0	2140.0 PPM
CHLORINE	105	2160.0	2160.0 PPM
CHLORINE	106	2180.0	2180.0 PPM
CHLORINE	107	2200.0	2200.0 PPM
CHLORINE	108	2220.0	2220.0 PPM
CHLORINE	109	2240.0	2240.0 PPM
CHLORINE	110	2260.0	2260.0 PPM
CHLORINE	111	2280.0	2280.0 PPM
CHLORINE	112	2300.0	2300.0 PPM
CHLORINE	113	2320.0	2320.0 PPM
CHLORINE	114	2340.0	2340.0 PPM
CHLORINE	115	2360.0	2360.0 PPM
CHLORINE	116	2380.0	2380.0 PPM
CHLORINE	117	2400.0	2400.0 PPM
CHLORINE	118	2420.0	2420.0 PPM
CHLORINE	119	2440.0	2440.0 PPM
CHLORINE	120	2460.0	2460.0 PPM
CHLORINE	121	2480.0	2480.0 PPM
CHLORINE	122	2500.0	2500.0 PPM
CHLORINE	123	2520.0	2520.0 PPM
CHLORINE	124	2540.0	2540.0 PPM
CHLORINE	125	2560.0	2560.0 PPM
CHLORINE	126	2580.0	2580.0 PPM
CHLORINE	127	2600.0	2600.0 PPM
CHLORINE	128	2620.0	2620.0 PPM
CHLORINE	129	2640.0	2640.0 PPM
CHLORINE	130	2660.0	2660.0 PPM
CHLORINE	131	2680.0	2680.0 PPM
CHLORINE	132	2700.0	2700.0 PPM
CHLORINE	133	2720.0	2720.0 PPM
CHLORINE	134	2740.0	2740.0 PPM
CHLORINE	135	2760.0	2760.0 PPM
CHLORINE	136	2780.0	2780.0 PPM
CHLORINE	137	2800.0	2800.0 PPM
CHLORINE	138	2820.0	2820.0 PPM
CHLORINE	139	2840.0	2840.0 PPM
CHLORINE	140	2860.0	2860.0 PPM
CHLORINE	141	2880.0	2880.0 PPM
CHLORINE	142	2900.0	2900.0 PPM
CHLORINE	143	2920.0	2920.0 PPM
CHLORINE	144	2940.0	2940.0 PPM
CHLORINE	145	2960.0	2960.0 PPM
CHLORINE	146	2980.0	2980.0 PPM
CHLORINE	147	3000.0	3000.0 PPM
CHLORINE	148	3020.0	3020.0 PPM
CHLORINE	149	3040.0	3040.0 PPM
CHLORINE	150	3060.0	3060.0 PPM
CHLORINE	151	3080.0	3080.0 PPM
CHLORINE	152	3100.0	3100.0 PPM
CHLORINE	153	3120.0	3120.0 PPM
CHLORINE	154	3140.0	3140.0 PPM
CHLORINE	155	3160.0	3160.0 PPM
CHLORINE	156	3180.0	3180.0 PPM
CHLORINE	157	3200.0	3200.0 PPM
CHLORINE	158	3220.0	3220.0 PPM
CHLORINE	159	3240.0	3240.0 PPM
CHLORINE	160	3260.0	3260.0 PPM
CHLORINE	161	3280.0	3280.0 PPM
CHLORINE	162	3300.0	3300.0 PPM
CHLORINE	163	3320.0	3320.0 PPM
CHLORINE	164	3340.0	3340.0 PPM
CHLORINE	165	3360.0	3360.0 PPM
CHLORINE	166	3380.0	3380.0 PPM
CHLORINE	167	3400.0	3400.0 PPM
CHLORINE	168	3420.0	3420.0 PPM
CHLORINE	169	3440.0	3440.0 PPM
CHLORINE	170	3460.0	3460.0 PPM
CHLORINE	171	3480.0	3480.0 PPM
CHLORINE	172	3500.0	3500.0 PPM
CHLORINE	173	3520.0	3520.0 PPM
CHLORINE	174	3540.0	3540.0 PPM
CHLORINE	175	3560.0	3560.0 PPM
CHLORINE	176	3580.0	3580.0 PPM
CHLORINE	177	3600.0	3600.0 PPM
CHLORINE	178	3620.0	3620.0 PPM
CHLORINE	179	3640.0	3640.0 PPM
CHLORINE	180	3660.0	3660.0 PPM
CHLORINE	181	3680.0	3680.0 PPM
CHLORINE	182	3700.0	3700.0 PPM
CHLORINE	183	3720.0	3720.0 PPM
CHLORINE	184	3740.0	3740.0 PPM
CHLORINE	185	3760.0	3760.0 PPM
CHLORINE	186	3780.0	3780.0 PPM
CHLORINE	187	3800.0	3800.0 PPM
CHLORINE	188	3820.0	3820.0 PPM
CHLORINE	189	3840.0	3840.0 PPM
CHLORINE	190	3860.0	3860.0 PPM
CHLORINE	191	3880.0	3880.0 PPM
CHLORINE	192	3900.0	3900.0 PPM
CHLORINE	193	3920.0	3920.0 PPM
CHLORINE	194	3940.0	3940.0 PPM
CHLORINE	195	3960.0	3960.0 PPM
CHLORINE	196	3980.0	3980.0 PPM
CHLORINE	197	4000.0	4000.0 PPM
CHLORINE	198	4020.0	4020.0 PPM
CHLORINE	199	4040.0	4040.0 PPM
CHLORINE	200	4060.0	4060.0 PPM
CHLORINE	201	4080.0	4080.0 PPM
CHLORINE	202	4100.0	4100.0 PPM
CHLORINE	203	4120.0	4120.0 PPM
CHLORINE	204	4140.0	4140.0 PPM
CHLORINE	205	4160.0	4160.0 PPM
CHLORINE	206	4180.0	4180.0 PPM
CHLORINE	207	4200.0	4200.0 PPM
CHLORINE	208	4220.0	4220.0 PPM
CHLORINE	209	4240.0	4240.0 PPM
CHLORINE	210	4260.0	4260.0 PPM
CHLORINE	211	4280.0	4280.0 PPM
CHLORINE	212	4300.0	4300.0 PPM
CHLORINE	213	4320.0	4320.0 PPM
CHLORINE	214	4340.0	4340.0 PPM
CHLORINE	215	4360.0	4360.0 PPM
CHLORINE	216	4380.0	4380.0 PPM
CHLORINE	217	4400.0	4400.0 PPM
CHLORINE	218	4420.0	4420.0 PPM
CHLORINE	219	4440.0	4440.0 PPM
CHLORINE	220	4460.0	4460.0 PPM
CHLORINE	221	4480.0	4480.0 PPM
CHLORINE	222	4500.0	4500.0 PPM
CHLORINE	223	4520.0	4520.0 PPM
CHLORINE	224	4540.0	4540.0 PPM
CHLORINE	225	4560.0	4560.0 PPM
CHLORINE	226	4580.0	4580.0 PPM
CHLORINE	227	4600.0	4600.0 PPM
CHLORINE	228	4620.0	4620.0 PPM
CHLORINE	229	4640.0	4640.0 PPM
CHLORINE	230	4660.0	4660.0 PPM
CHLORINE	231	4680.0	4680.0 PPM
CHLORINE	232	4700.0	4700.0 PPM
CHLORINE	233	4720.0	4720.0 PPM
CHLORINE	234	4740.0	4740.0 PPM
CHLORINE	235	4760.0	4760.0 PPM
CHLORINE	236	4780.0	4780.0 PPM
CHLORINE	237	4800.0	4800.0 PPM
CHLORINE	238	4820.0	4820.0 PPM
CHLORINE	239	4840.0	4840.0 PPM
CHLORINE	240	4860.0	4860.0 PPM
CHLORINE	241	4880.0	4880.0 PPM
CHLORINE	242	4900.0	4900.0 PPM
CHLORINE	243	4920.0	4920.0 PPM
CHLORINE	244	4940.0	4940.0 PPM
CHLORINE	245	4960.0	4960.0 PPM
CHLORINE	246	4980.0	4980.0 PPM
CHLORINE	247	5000.0	5000.0 PPM
CHLORINE	248	5020.0	5020.0 PPM
CHLORINE	249	5040.0	5040.0 PPM
CHLORINE	250	5060.0	5060.0 PPM
CHLORINE	251	5080.0	5080.0 PPM
CHLORINE	252	5100.0	5100.0 PPM
CHLORINE	253	5120.0	5120.0 PPM
CHLORINE	254	5140.0	5140.0 PPM
CHLORINE	255	5160.0	5160.0 PPM
CHLORINE	256	5180.0	5180.0 PPM
CHLORINE	257	5200.0	5200.0 PPM
CHLORINE	258	5220.0	5220.0 PPM
CHLORINE	259	5240.0	5240.0 PPM
CHLORINE	260	5260.0	5260.0 PPM
CHLORINE	261	5280.0	5280.0 PPM
CHLORINE	262	5300.0	5300.0 PPM
CHLORINE	263	5320.0	5320.0 PPM
CHLORINE	264	5340.0	5340.0 PPM
CHLORINE	265	5360.0	5360.0 PPM
CHLORINE	266	5380.0	5380.0 PPM
CHLORINE	267	5400.0	5400.0 PPM
CHLORINE	268	5420.0	5420.0 PPM
CHLORINE	269	5440.0	5440.0 PPM
CHLORINE	270	5460.0	5460.0 PPM
CHLORINE	271	5480.0	5480.0 PPM
CHLORINE	272	5500.0	5500.0 PPM
CHLORINE	273	5520.0	5520.0 PPM</td

COMPANY	PERCENT	TYPE	PERCENT	AMOUNT
GEICO	1	100.0	100.0	\$100.00
GEICO	1	100.0	10.0	\$10.00
GEICO	1	100.0	100.0	\$100.00
GEICO	1	100.0	100.0	\$100.00
GEICO	1	100.0	100.0	\$100.00
GEICO	1	100.0	100.0	\$100.00
GEICO	1	100.0	100.0	\$100.00
TCE	13	100.0	13.00	\$13.00 PPS
UNIFIRST	11	100.0	21.0	\$21.00
UNIFIRST	10	100.0	10.0	\$10.00
UNIFIRST	10	100.0	10.0	\$10.00
UNIFIRST	10	100.0	10.0	\$10.00
UNIFIRST	10	100.0	10.0	\$10.00
TCE	10	100.0	10.0	\$10.00

COMPONENT	WEIGHT	PERCENT	PPM	MEASURED PPM
CHROMIUM	1	4.3	24.2	24.2
COPPER	2	10.6	56.3	56.3
CHROMIUM	3	13.3	73.7	73.7
CHROMIUM	4	11.1	61.1	61.1
CHROMIUM	5	10.0	55.6	55.6
CHROMIUM	6	10.0	55.6	55.6
CHROMIUM	7	10.0	55.6	55.6
TOTAL	7	35.0	19.18	19.18 PPM
CHROMIUM	10	46.7	22.3	22.3
PCP	11	51.6	27.8	27.8

PHOTOVAC



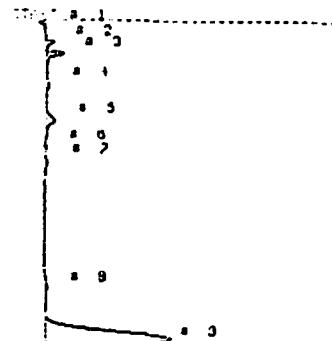
SAMPLE LIBRARY 2 AUG 12 1989 11:9
ANALYSIS # 19 ELIO LVALDE 2
INTERNAL TEMP 27 100 LL AT 10
RAIN 10 SU 60 AT 3

1998-2000: The first three years of the new millennium.

TDL
PCE

~~TOL
PCE~~

PHOTOCUAC

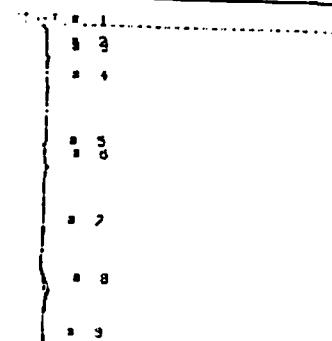


STOP : 29%
SAMPLE LIBRARY 2 AUG 12 1988 11:15
ANALYSIS : 28 EUHO LUMALE 2
INTERNAL TEMP 28 180 LL AT 10
GAIN 18 TOLUENE CAL

CONFIDENTIAL - AGREEABLE

DATA	Y	Y [*]	R ²
ZINC120	1	0.9	0.98
ZINC140	2	0.9	0.98
ZINC160	3	0.9	0.98
ZINC180	4	0.9	0.98
ZINC200	5	0.9	0.98
ZINC220	6	0.9	0.98
ZINC240	7	0.9	0.98
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ZINC280	9	0.9	0.98
ZINC300	10	0.9	0.98
ZINC320	11	0.9	0.98
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ZINC620	26	0.9	0.98
ZINC640	27	0.9	0.98
ZINC660	28	0.9	0.98
ZINC680	29	0.9	0.98
ZINC700	30	0.9	0.98
ZINC720	31	0.9	0.98
ZINC740	32	0.9	0.98
ZINC760	33	0.9	0.98
ZINC780	34	0.9	0.98
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ZINC820	36	0.9	0.98
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ZINC880	39	0.9	0.98
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ZINC920	41	0.9	0.98
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ZINC5100	250	0.9	0.98
ZINC5120	251	0.9	0.98
ZINC5140	252	0.9	0.98
ZINC5160	253	0.9	0.98
ZINC5180	254	0.9	0.98
ZINC5200	255	0.9	0.98
ZINC5220	256	0.9	0.98
ZINC5240	257	0.9	0.98
ZINC5260	258	0.9	0.98
ZINC5280	259	0.9	0.98
ZINC5300	260	0.9	0.98
ZINC5320	261	0.9	0.98
ZINC5340	262	0.9	0.98
ZINC5360	263	0.9	0.98
ZINC5380	264	0.9	0.98
ZINC5400	265	0.9	0.98
ZINC5420	266	0.9	0.98
ZINC5440	267	0.9	0.98
ZINC5460	268	0.9	0.98
ZINC5480	269	0.9	0.98
ZINC5500	270	0.9	0.98
ZINC5520	271	0.9	0.98
ZINC5540	272	0.9	0.98
ZINC5560	273	0.9	0.98
ZINC5580	274	0.9	0.98
ZINC5600	275	0.9	0.98
ZINC5620	276	0.9	0.98
ZINC5640	277	0.9	0.98
ZINC5660	278	0.9	0.98
ZINC5680	279	0.9	0.98
ZINC5700	280	0.9	0.98
ZINC5720	281	0.9	0.98
ZINC5740	282	0.9	0.98
ZINC5760	283	0.9	0.98
ZINC5780	284	0.9	0.98
ZINC5800	285	0.9	0.98
ZINC5820	286	0.9	0.98
ZINC5840	287	0.9	0.98
ZINC5860	288	0.9	0.98
ZINC5880	289	0.9	0.98
ZINC5900	290	0.9	0.98
ZINC5920	291	0.9	0.98
ZINC5940	292	0.9	0.98
ZINC5960	293	0.9	0.98
ZINC5980	294	0.9	0.98
ZINC6000	295	0.9	0.98
ZINC6020	296	0.9	0.98
ZINC6040	297	0.9	0.98
ZINC6060	298	0.9	0.98
ZINC6080	299	0.9	0.98
ZINC6100	300	0.9	0.98
ZINC6120	301	0.9	0.98
ZINC6140	302	0.9	0.98
ZINC6160	303	0.9	0.98
ZINC6180	304	0.9	0.98
ZINC6200	305	0.9	0.98
ZINC6220	306	0.9	0.98
ZINC6240	307	0.9	0.98
ZINC6260	308	0.9	0.98
ZINC6280	309	0.9	0.98
ZINC6300	310	0.9	0.98
ZINC6320	311	0.9	0.98
ZINC6340	312	0.9	0.98
ZINC6360	313	0.9	0.98
ZINC6380	314	0.9	0.98</td

PHOTOVAC



STOP # 1074
SAMPLE LIBRARY 2 AUG 12 1988 11:24
ANALYSIS # 21 ELAND UVALDE 2
INTERNAL TEMP 28 180 UL AT 10
GAIN 10 STRINGE BLANK

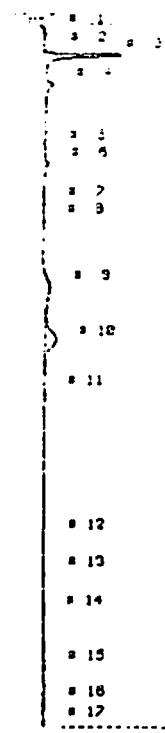
Country	Year	Value	Region
Argentina	2002	14.3	South America
Bolivia	2002	13.3	South America
Brazil	2002	12.0	South America
Chile	2002	11.0	South America
Ecuador	2002	10.0	South America

PHOTOCUAC

CALIBRATED PEAK 3, TOLUENE

SAMPLE LIBRARY 2 AUG 12 1988 11:17
ANALYSIS # 2B ENUO UVALDE 2
INTERNAL TEMP 2B 188 °L AT 10
GAIN 10 TOLUENE CAL

PHOTOVAC



SCH 1 42.1
SAMPLE LIBRARY 2 AUG 12 1998 11:34
ANALTSIS 8 22 ELSID LAVALDE 2
INTERNAL TEMP 28 180 UL AT 10
GAIN 10 SU 81 AT 5

Category	Sub-Category	Description	Notes
Geography	Geography	Geographical features, regions, and locations.	
Geography	Geography	Geographical features, regions, and locations.	
Geography	Geography	Geographical features, regions, and locations.	
Geography	Geography	Geographical features, regions, and locations.	

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	188.7	520.0	PPB
PCE	2	292.2	8,080	PPB
TOLUENE	3	240.1	520.0	PPB
TCE	5	137.9	8,080	PPB

JLH

PHOTOVAC

START 0..1.....

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STOP 0 335.0

SAMPLE LIBRARY 2 AUG 12 1988 12:1

ANALYSIS 0 23 ELMOD UNKNOWN 2

INTERNAL TEMP 20 100 UL AT 10

GAIN 10 SU 62 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN 1 0.3 19.4 μVFS
UNKNOWN 3 21.5 6.0 μVFS
UNKNOWN 4 25.6 452.9 μVFS
UNKNOWN 5 40.2 39.9 μVFS
BENZENE 7 108.4 18.49 PPB
UNKNOWN 9 283.5 77.4 μVFS
TOLUENE 9 243.1 306.1 PPB
PCE 10 288.2 166.9 PPB

PHOTOVAC

START 0..1.....

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STOP 0 335.7

SAMPLE LIBRARY 2 AUG 12 1988 12:1

ANALYSIS 0 24 ELMOD UNKNOWN 2

INTERNAL TEMP 20 100 UL AT 10

GAIN 10 STRING CHECK

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN 1 9.9 13.8 μVFS
UNKNOWN 2 23.6 13.5 μVFS
BENZENE 4 108.5 13.42 PPB
UNKNOWN 5 202.3 39.2 μVFS
TOLUENE 6 242.6 39.23 PPB

PHOTOVAC

START 0..1.....

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STOP 0 335.0

SAMPLE LIBRARY 2 AUG 12 1988 13:36

ANALYSIS 0 25 ELMOD UNKNOWN 2

INTERNAL TEMP 21 100 UL AT 10

GAIN 10 SU 63 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN 1 9.2 23.3 μVFS
UNKNOWN 2 29.5 5.0 μVFS
UNKNOWN 3 35.1 472.6 μVFS
UNKNOWN 4 45.3 12.5 μVFS
BENZENE 7 107.9 11.02 PPB
UNKNOWN 8 185.7 15.0 μVFS
~~TOL~~ 9 219.9 1.0 μVFS

RECEIVED

MAR 2 1989

E. U. W. D.
FILE NO. _____
SUBJECT _____



Chen & Associates
Consulting Geotechnical
and Materials Engineers

1850 Grandstand Drive
San Antonio, Texas 78238
512/680-5023

Casper
Colorado Springs
Denver
Ft. Collins
Glenwood Springs
Phoenix
Rock Springs
Salt Lake City

September 12, 1988

Subject: Soil-Vapor Data, Gensco and Uvalco Sites,
Uvalde, Texas

Job No.: 9-084-88

RECEIVED
SEP 14 1988

Edwards Underground Water District
1615 North St. Mary's
San Antonio, Texas 78212

Attn: Mr. John Hoyt, Geologist

E. U. W. D.

FILE NO. _____
SUBJECT _____

Dear Mr. Hoyt:

This letter transmits the summarized data and chromatograms from a soil-vapor survey conducted at the Gensco and Uvalco sites located in Uvalde, Texas. The soil-vapor survey was conducted on August 25, 1988. A soil-vapor study was previously conducted at the site on July 21 and 22, August 11 and 12, 1988.

A brief outline of the soil-vapor survey and the data obtained is discussed below.

SOIL-VAPOR SURVEY

Soil-vapor samples were obtained from the soils by driving a steel sampling point into the ground. A vacuum pump was attached to the sampling point and soil-vapor was extracted at a rate of approximately 1.5 liters/minute for 5 to 7 minutes. After evacuation, a syringe sample of the soil-vapor was extracted from the inert tubing connecting the vacuum pump to the probe system. The sample was then injected into a Photovac 10S50 portable gas chromatograph. The 10S50 had previously been calibrated with perchlorethylene (PCE), trichloroethylene (TCE), benzene, and toluene.

Sixteen locations determined by Edwards personnel were tested during the survey. The soil-vapor samples at each location were collected with a 100 microliter syringe and were injected into the portable gas chromatograph set at a gain of 10. Carrier gas flow through the analytical column was set to 22 ml/min. Standard calibrations and baseline checks were conducted throughout the survey to verify the machine was operating efficiently and to establish background data. The data obtained from the soil-vapor survey, adjusted for syringe and base line checks, is presented in Table I.

LIMITATIONS

The soil-vapor survey was conducted for the purpose of collecting data for the Edwards Underground Water District. Any conclusions formulated from this data are strictly those of the client, and do not reflect the opinions or conclusions of Chen & Associates, Inc.

If you have any questions concerning the soil-vapor data, please contact our office.

Sincerely,

CHEN & ASSOCIATES, INC.

By: Mark M. Briggs
Mark M. Briggs, Geologist

MMB/irb
Enclosure

TABLE I
SOIL-VAPOR SAMPLING CONCENTRATIONS
GENSCO AND UVALCO SITES
UVALDE, TEXAS

<u>Sampling Point</u>	PCE Concentration (ppb)	TCE Concentration (ppb)	Benzene Concentration (ppb)	Toluene Concentration (ppb)
SV-65 @ 5' SV-66 @ 5' SV-67 @ 5' SV-68 @ 4' SV-69 @ 5' SV-70 @ 5' SV-71 @ 5' SV-72 @ 5'	222	ND	ND	1,331
	184	ND	ND	2,629
	323	ND	16	1,273
	425	ND	ND	157
	ND	ND	ND	387
	ND	ND	ND	138
	ND	ND	ND	ND
	ND	ND	ND	117
Thread Shop	4,470	919	ND	ND
SV-73 @ 5'	115,000	660	ND	ND
SV-74 @ 5'	116,000	904	ND	ND
SV-75 @ 5'	8,847	666	ND	ND
SV-76 @ 5'	233,900	ND	ND	ND
SV-77 @ 5'	26,860	132	ND	ND
SV-78 @ 5'	3,799	ND	ND	470
SV-79 @ 5'	2,481	ND	ND	152

ND = Not Detected

APPENDIX A
CHROMATOGRAMS

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	93.6 588.0 PPM
PCE	2	232.6 0.000 PPB
TOLUENE	3	213.3 589.0 PPM
TCE	5	118.8 0.000 PPB

PHOTOVAC

START -----

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STOP # 512.9
SAMPLE LIBRARY 2 AUG 25 1988 9:10
ANALYSIS # 2 EU4D UVALDE 3
INTERNAL TEMP 24 100 UL AT 10
GAIN 10 BASELINE-CURK
TDL CAL

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	8.6 231.3 MUS
UNKNOWN	4	22.5 117.8 MUS
TCE	3	124.3 249.7 PPB
UNKNOWN	11	449.3 0.5 US

STOP # 322.1
SAMPLE LIBRARY 2 AUG 25 1988 9:08
ANALYSIS # 1 EU4D UVALDE 3
INTERNAL TEMP 23 100 UL AT 10
GAIN 10 BASELINE CUR

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

START -----

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STOP # 753.0
SAMPLE LIBRARY 2 AUG 25 1988 9:20
ANALYSIS # 3 EU4D UVALDE 3
INTERNAL TEMP 25 100 UL AT 10
GAIN 10 SPRING CHECK

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	12.3 123.2 MUS
TOLUENE	3	148.0 288.0 PPB

PHOTOVAC

CALIBRATED PEAK 11, TOLUENE

SAMPLE LIBRARY 2 AUG 25 1988 9:12
ANALYSIS # 2 EU4D UVALDE 3
INTERNAL TEMP 24 100 UL AT 10
GAIN 10 BASELINE-CUR
TDL CAL

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	8.6 231.3 MUS
UNKNOWN	4	22.5 117.8 MUS
UNKNOWN	9	124.3 287.9 MUS
TOLUENE	11	449.3 18.00 MPP

PHOTOVAC

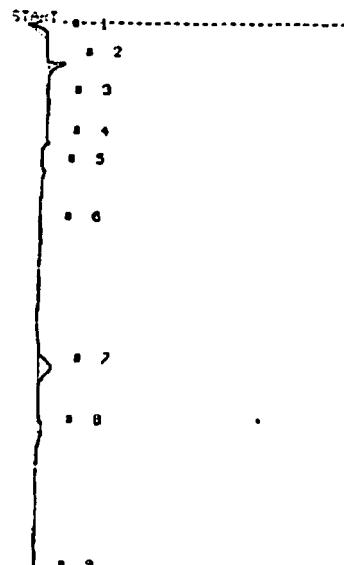
2 COMPOUND ID # R.T. LIMIT

BENZENE	1	93.6 588.0 PPM
PCE	2	530.6 0.000 PPB
TOLUENE	3	213.3 589.0 PPM
TCE	5	243.3 0.000 PPB

PHOTOVAC

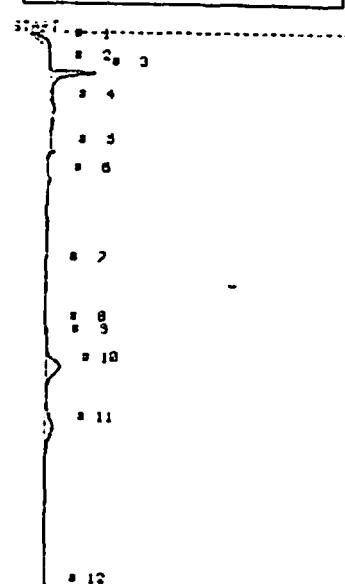
STOP 8 359.0
SAMPLE LIBRARY 2 AUG 25 1988 9:41
ANALYSIS # 4 EUDU UVALDE 3
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME PEAK R.T. (MIN)PPM
UNKNOWN 1 13.1 226.4 PPS
UNKNOWN 2 22.3 119.2 PPS
UNKNOWN 4 96.0 100.7 PPS
TCE 9 255.2 6.555 PPM

PHOTOVAC

STOP 8 359.0
SAMPLE LIBRARY 2 AUG 25 1988 9:55
ANALYSIS # 5 EUDU UVALDE 3
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 SU 65 AT 5

COMPOUND NAME PEAK R.T. (MIN)PPM
UNKNOWN 1 11.3 141.0 PPS
UNKNOWN 2 22.3 119.2 PPS
TOLUENE 7 24.1 119.2 PPS
TCE 9 255.2 6.555 PPM

PHOTOVAC

STOP 8 359.0
SAMPLE LIBRARY 2 AUG 25 1988 10:30
ANALYSIS # 2 EUDU UVALDE 3
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 SU 67 AT 5

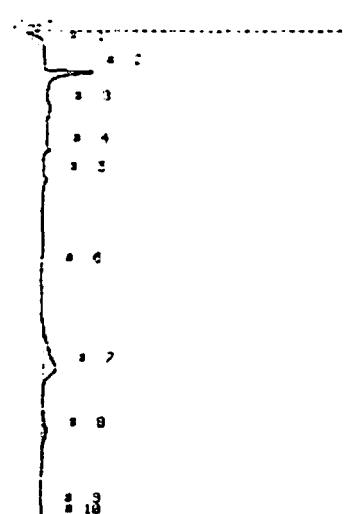
COMPOUND NAME PEAK R.T. (MIN)PPM
UNKNOWN 1 13.3 122.3 PPS
UNKNOWN 2 22.3 119.2 PPS
TOLUENE 7 24.1 119.2 PPS
TCE 9 255.2 6.555 PPM

PHOTOVAC

CALIBRATED PEAK 8, TOLUENE

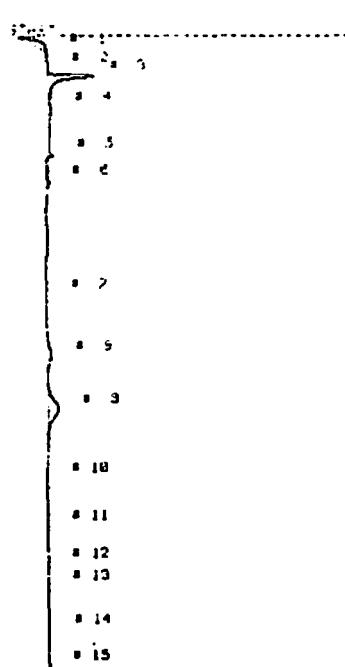
SAMPLE LIBRARY 2 AUG 25 1988 9:42
ANALYSIS # 4 EUDU UVALDE 3
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME PEAK R.T. (MIN)PPM
UNKNOWN 1 13.1 226.4 PPS
UNKNOWN 2 22.3 119.2 PPS
UNKNOWN 4 96.0 100.7 PPS
TOLUENE 9 255.2 10.00 PPM



STOP 8 359.0
SAMPLE LIBRARY 2 AUG 25 1988 10:14
ANALYSIS # 6 EUDU UVALDE 3
INTERNAL TEMP 31 100 UL AT 10
GAIN 10 SU 66 AT 5

COMPOUND NAME PEAK R.T. (MIN)PPM
UNKNOWN 1 13.2 132.0 PPS
UNKNOWN 2 22.4 120.0 PPS
TOLUENE 7 24.3 119.0 PPS
TCE 9 255.2 10.00 PPM



STOP 8 359.0
SAMPLE LIBRARY 2 AUG 25 1988 10:14
ANALYSIS # 6 EUDU UVALDE 3
INTERNAL TEMP 35 100 UL AT 10
GAIN 10 SU 66 AT 5

COMPOUND NAME PEAK R.T. (MIN)PPM
UNKNOWN 1 13.4 233.0 PPS
UNKNOWN 3 21.3 160.0 PPS
TOLUENE 7 23.3 137.2 PPS
TCE 9 255.2 10.00 PPM

PHOTOVAC

START 8-4
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STOP 8 221.2
 SAMPLE LIBRARY 2 AUG 25 1988 11:3
 ANALYSIS # 9 ELMO VALVE 3
 INTERNAL TEMP 37 100 UL AT 10
 GAIN 10 SU 69 AT 5

COMPOUND NAME PEAK R.T. %REL/FPPM
 UNKNOWN 1 12.1 100.0 PPM
 UNKNOWN 2 22.3 100.0 PPM
 UNKNOWN 3 31.1 100.0 PPM
 UNKNOWN 4 25.3 143.5 PPM
 UNKNOWN 10 219.7 5.9 0%

PHOTOVAC

START 8-3
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STOP 8 221.2
 SAMPLE LIBRARY 2 AUG 25 1988 11:3
 ANALYSIS # 10 ELMO VALVE 3
 INTERNAL TEMP 37 100 UL AT 10
 GAIN 10 TCL CAL

COMPOUND NAME PEAK R.T. %REL/FPPM
 UNKNOWN 1 12.1 100.0 PPM
 UNKNOWN 2 22.3 100.0 PPM
 UNKNOWN 3 31.1 100.0 PPM
 UNKNOWN 4 25.3 143.5 PPM
 UNKNOWN 10 219.7 5.9 0%

PHOTOVAC

START 8-3
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STOP 8 221.2
 SAMPLE LIBRARY 2 AUG 25 1988 11:18
 ANALYSIS # 11 ELMO VALVE 3
 INTERNAL TEMP 38 100 UL AT 10
 GAIN 10 SU 70 AT 5

COMPOUND NAME PEAK R.T. %REL/FPPM
 UNKNOWN 1 12.1 100.0 PPM
 UNKNOWN 2 22.3 100.0 PPM
 UNKNOWN 3 31.1 100.0 PPM
 UNKNOWN 4 25.3 143.5 PPM

PHOTOVAC

CALIBRATED 100% TOLLENE

SAMPLE LIBRARY 2 AUG 25 1988 11:18
 ANALYSIS # 10 ELMO VALVE 3
 INTERNAL TEMP 37 100 UL AT 10
 GAIN 10 TCL CAL

COMPOUND NAME PEAK R.T. %REL/FPPM
 UNKNOWN 1 12.1 100.0 PPM
 UNKNOWN 2 22.3 100.0 PPM
 UNKNOWN 3 31.1 100.0 PPM
 UNKNOWN 4 25.3 143.5 PPM
 TOLLENE 10 219.7 10.00 FPPM

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT
 BENZENE 1 36.1 500.0 PPM
 PCE 2 259.4 0.000 PPM
 TOLLENE 3 219.7 500.0 PPM
 ICE 5 122.0 0.000 PPM

START 8-3
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STOP 8 221.2
 SAMPLE LIBRARY 2 AUG 25 1988 11:24
 ANALYSIS # 12 ELMO VALVE 3
 INTERNAL TEMP 39 100 UL AT 10
 GAIN 10 SU 71 AT 5

COMPOUND NAME PEAK R.T. %REL/FPPM
 UNKNOWN 1 12.1 500.0 PPM
 UNKNOWN 2 22.3 500.0 PPM

PHOTOVAC

STCPL 2 222.0
SAMPLE LIBRARY 2 AUG 23 1988 11:48
ANALYSIS # 13 E14D UVALDE 3
INTERNAL TEMP 40 100 UL AT 10
GRIN 10 54.72 AT 5
STCPL 2 222.0
STCPL 2 222.0
STCPL 2 222.0

DETECTOR VALVE 1 13.7 222.0 m/s
DETECTOR 2 222.0 m/s
DETECTOR 3 13.7 222.0 m/s

PHOTOVAC



PHOTOVAC

START -----

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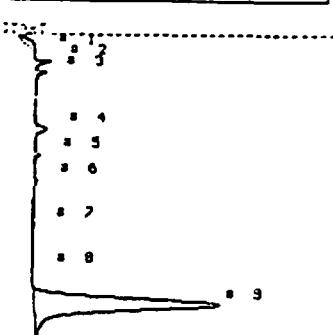
STOP 4 141.1

SAMPLE LIBRARY 2 AUG 25 1988 12:2
ANALYSIS # 1 ELMO VALVE 3
INTERNAL TEMP 39 180 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN 5 120.0 1.6 uS

PHOTOVAC



STOP 6 235.6
SAMPLE LIBRARY 2 AUG 25 1988 12:2
ANALYSIS # 2 ELMO VALVE 3
INTERNAL TEMP 39 180 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME PEAK R.T. AREA/PPM

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1	12.6 16.9 uS
UNKNOWN	2	21.3 110.2 uS
UNKNOWN	3	73.2 150.0 uS
UNKNOWN	4	236.7 6.2 uS

PHOTOVAC

CALIBRATED PEAK .4 TOLUENE

SAMPLE LIBRARY 2 AUG 25 1988 12:8
ANALYSIS # 2 ELMO VALVE 3
INTERNAL TEMP 39 180 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME PEAK R.T. AREA/PPM

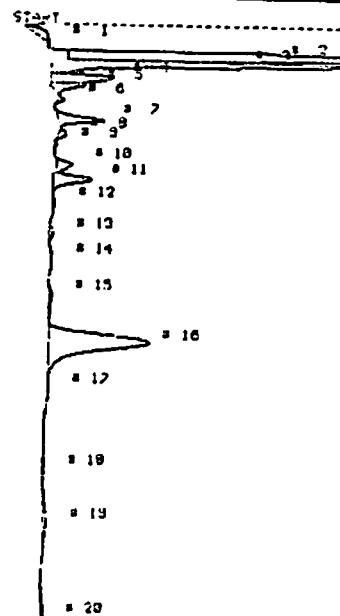
COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1	12.3 155.3 uS
UNKNOWN	2	21.6 110.2 uS
UNKNOWN	4	72.2 152.4 uS
TOLUENE	5	236.7 15.08 PPB

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	98.4	500.0 PPB
PCE	2	244.1	0.000 PPB
TOLUENE	3	236.7	500.0 PPB
TCE	5	114.8	0.020 PPB

PHOTOVAC



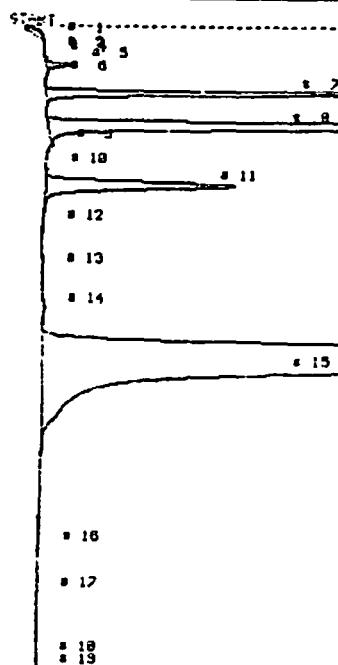
STOP 9 100.0
SAMPLE LIBRARY 2 AUG 25 1988 12:31
ANALYSIS # 3 ELMO VALVE 3
INTERNAL TEMP 37 180 UL AT 10
GAIN 10

THE BAD SHOP

COMPOUND NAME PEAK R.T. AREA/PPM

COMPOUND NAME	PEAK R.T.	AREA/PPM
UNKNOWN	1	11.4 251.0 uS
UNKNOWN	2	11.7 21.2 uS
UNKNOWN	3	11.8 1.0 uS
UNKNOWN	4	12.1 1.0 uS
UNKNOWN	5	12.1 20.0 uS
UNKNOWN	6	12.1 150.0 uS
UNKNOWN	7	12.1 150.0 uS
UNKNOWN	8	12.1 120.0 uS
UNKNOWN	9	12.1 120.0 uS
UNKNOWN	10	120.3 132.3 uS
TCE	11	113.9 919.3 PPB
PCE	12	145.0 4,489 PPB
TOLUENE	13	264.4 247.1 uS
UNKNOWN	14	427.7 175.0 uS

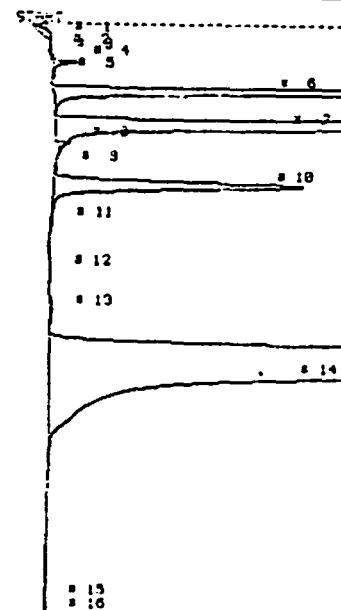
PHOTOVAC



STOP 4 130.0
SAMPLE LIBRARY 2 AUG 25 1988 13:14
ANALYSIS 4 6 ELMOD UV/ALDE 3
INTERNAL TEMP 36 100 UL AT 10
GAIN 10 SU 73 AT 5

COMPOUND NAME PEAK R.T. AREAVPPM
BENZENE 1 129.4 100.0 PPM
TOLUENE 2 129.4 100.0 PPM
PCP 3 129.4 100.0 PPM
TCE 4 129.4 100.0 PPM
PCE 5 129.4 100.0 PPM

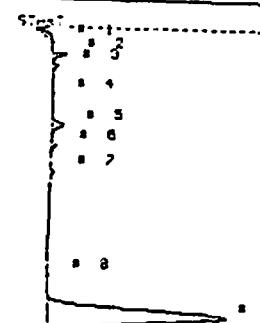
PHOTOVAC



STOP 4 130.0
SAMPLE LIBRARY 2 AUG 25 1988 13:19
ANALYSIS 4 5 ELMOD UV/ALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 74 AT 5

COMPOUND NAME PEAK R.T. AREAVPPM
BENZENE 1 129.4 100.0 PPM
TOLUENE 2 129.4 100.0 PPM
PCP 3 129.4 100.0 PPM
TCE 4 129.4 100.0 PPM
PCE 5 129.4 100.0 PPM

PHOTOVAC



STOP 9 131.1
SAMPLE LIBRARY 2 AUG 25 1988 13:23
ANALYSIS 4 6 ELMOD UV/ALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 TOL CAL

COMPOUND NAME PEAK R.T. AREAVPPM
UNKNOWN 1 111.3 125.1 PWS
UNKNOWN 2 211.7 124.4 PWS
UNKNOWN 5 75.5 123.3 PWS
UNKNOWN 9 221.7 6.2 PWS

PHOTOVAC

CALIBRATED PEAK % TOLUENE

SAMPLE LIBRARY 2 AUG 25 1988 13:25
ANALYSIS 4 6 ELMOD UV/ALDE 3
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 TOL CAL

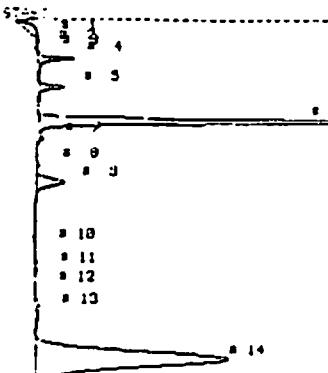
COMPOUND NAME PEAK R.T. AREAVPPM
UNKNOWN 1 111.3 125.1 PWS
UNKNOWN 2 211.7 124.4 PWS
UNKNOWN 5 75.5 123.3 PWS
TOLUENE 9 221.7 19.32 PPM

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	97.0	500.0 PPM
PCE	2	261.8	0.000 PPM
TOLUENE	3	221.7	500.0 PPM
TCE	5	123.1	0.000 PPM

PHOTOVAC

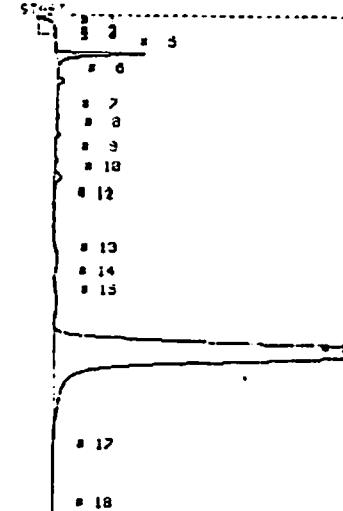


STOP # 312.3
SAMPLE LIBRARY 2 AUG 25 1988 13:48
ANALYSIS # 7 EUUD UVALDE 3
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 SU 75 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	14.0	680.3	MUS
UNKNOWN	4	22.4	221.3	MUS
UNKNOWN	7	42.0	220.2	MUS
UNKNOWN	8	42.1	221.4	MUS
UNKNOWN	9	127.1	666.0	PPM
ICE	11	245.0	9,847	PPM

PHOTOVAC



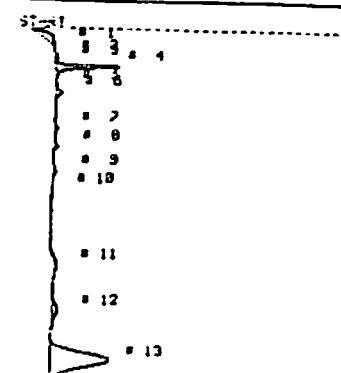
STOP # 403.0
SAMPLE LIBRARY 2 AUG 25 1988 14:23

ANALYSIS # 9 EUUD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 22 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	14.0	650.7	MUS
UNKNOWN	4	22.3	221.2	MUS
ICE	10	127.0	131.8	PPM
ICE	11	222.1	26.86	PPM

PHOTOVAC

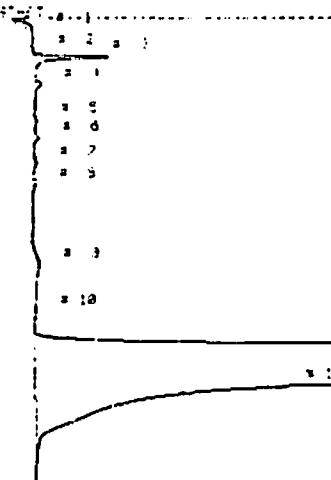


STOP # 312.7
SAMPLE LIBRARY 2 AUG 25 1988 13:0
ANALYSIS # 11 EUUD UVALDE 3
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 SU 79 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	12.3	221.3	MUS
UNKNOWN	1	22.3	135.3	MUS
UNKNOWN	10	127.7	421.8	PPM
ICE	11	222.1	2,481	PPM

PHOTOVAC

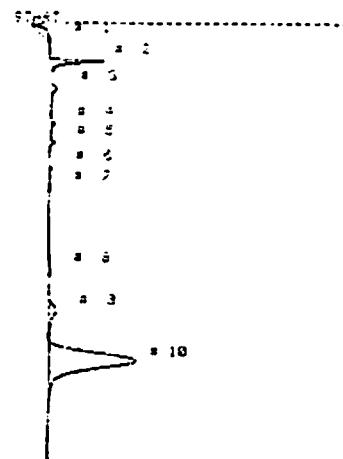


STOP # 400.0
SAMPLE LIBRARY 2 AUG 25 1988 14:18
ANALYSIS # 8 EUUD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 28 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	3.9	123.4	MUS
UNKNOWN	2	22.3	422.3	MUS
ICE	11	221.1	233.9	PPM

PHOTOVAC



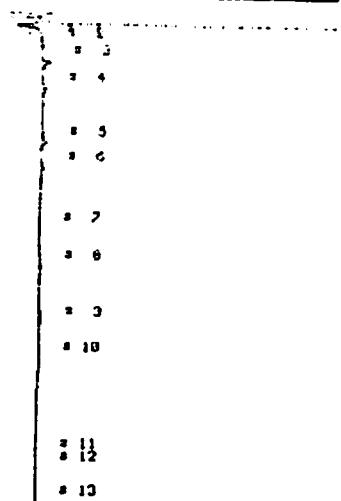
STOP # 403.0
SAMPLE LIBRARY 2 AUG 25 1988 14:44

ANALYSIS # 10 EUUD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 28 AT 5

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	13.7	132.3	MUS
UNKNOWN	2	23.1	428.1	MUS
ICE	9	221.5	749.2	PPM
ICE	10	221.2	3,799	PPM

PHOTOVAC



STOP # 312.7
SAMPLE LIBRARY 2 AUG 25 1988 13:8

ANALYSIS # 12 EUUD UVALDE 3
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 STR CRK

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	12.7	224.8	MUS
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