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.

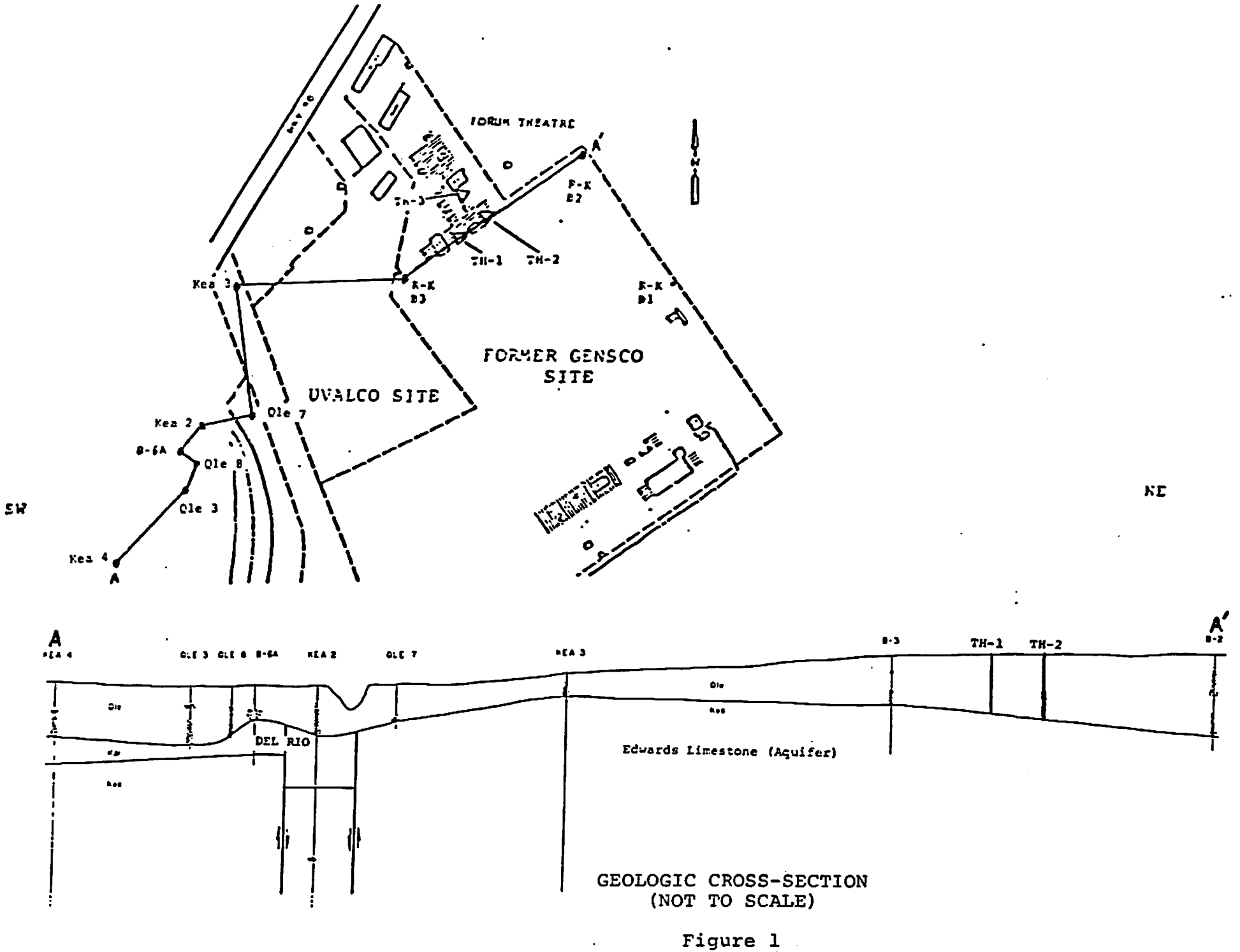
The Edwards aquifer is the major regional water resource and sole source aquifer to Uvalde and many cities including San Antonio. It is a highly anisotropic and productive karst aquifer.

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.



GEOLOGIC CROSS-SECTION
(NOT TO SCALE)

Figure 1

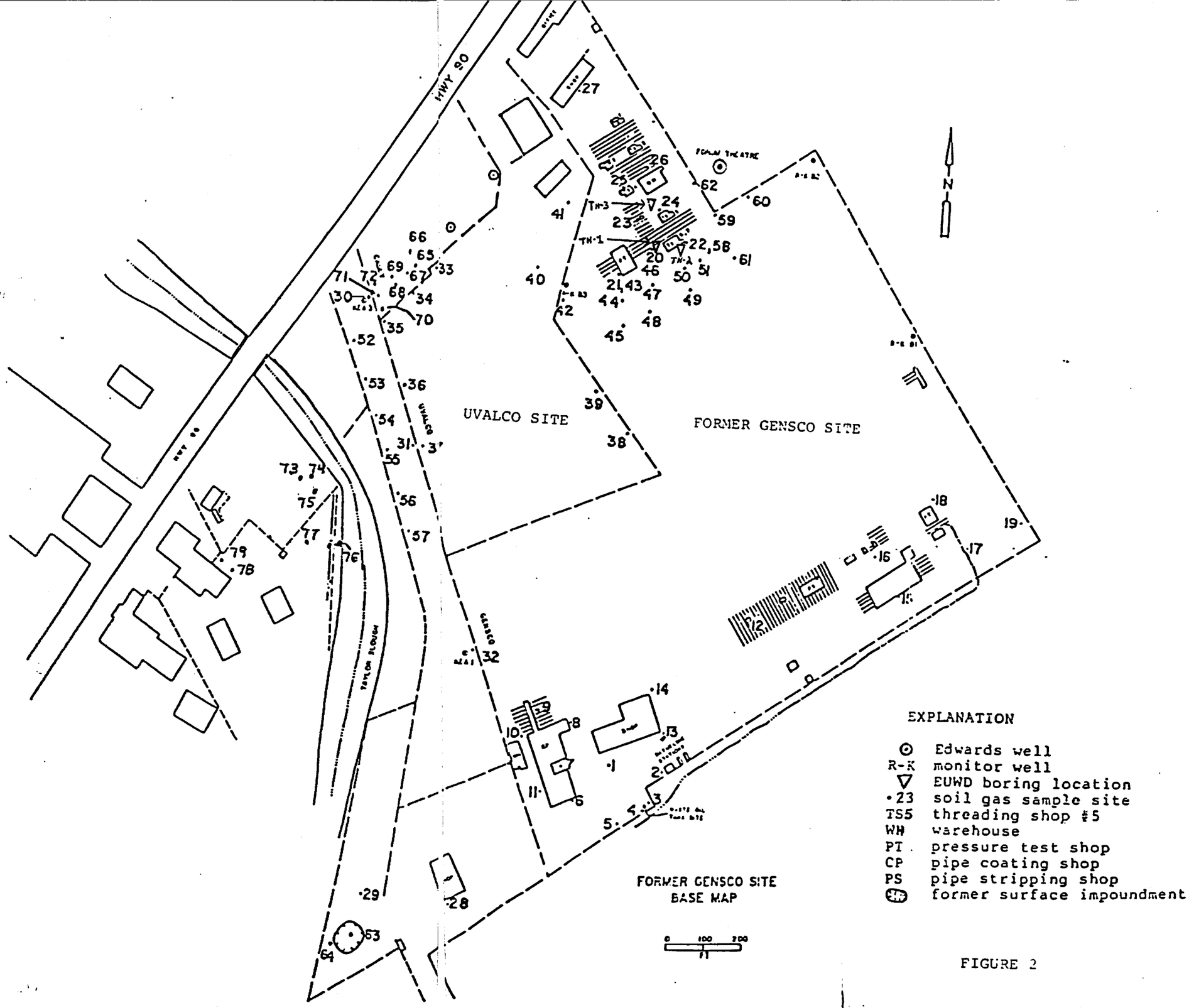
SOIL GAS SURVEY TECHNIQUE

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.



FORMER GENSCO SITE
BASE MAP

EXPLANATION

⊙	Edwards well
R-K	monitor well
▽	EUWD boring location
•23	soil gas sample site
TS5	threading shop #5
WH	warehouse
PT	pressure test shop
CP	pipe coating shop
PS	pipe stripping shop
	former surface impoundment

FIGURE 2

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 preceeding 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)

Sample Site/depth	PCE	TCE	Toluene	Benzene	DCE
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)

Sample Site/depth	PCE	TCE	Toluene	Benzene	DCE
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
San Antonio, Texas 78238
512/680-5023

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.

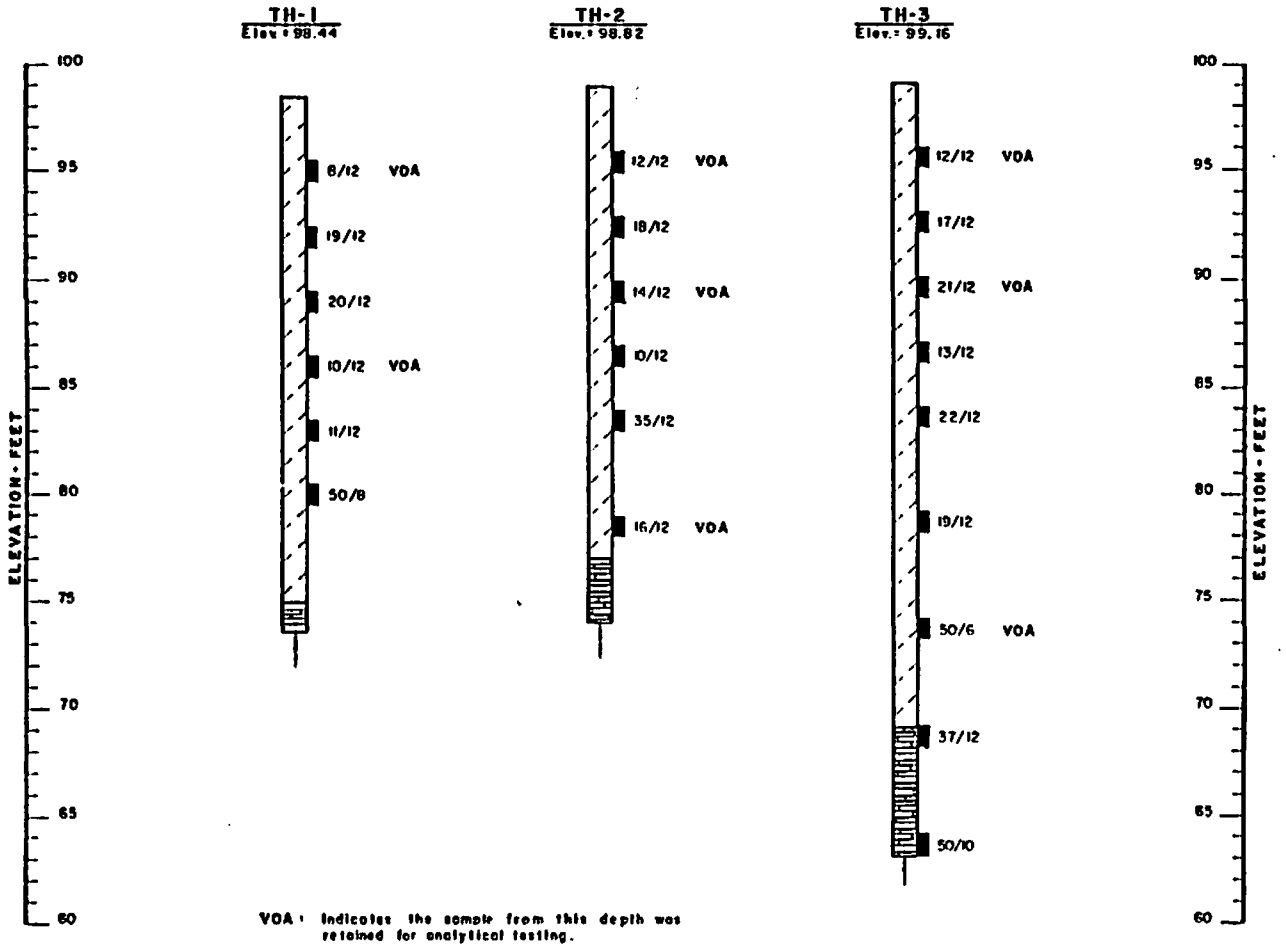
Sincerely,

CHEN-NORTHERN, INC.

By: _____
Mark M. Briggs, Geologist

Rev. By: _____
Pat Bullinger, P.E.

MMB/irb



VOA : Indicates the sample from this depth was retained for analytical testing.

9-084-88	**Chen & Associates**	LOGS OF EXPLORATORY HOLES	Fig. 1

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.

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 boundries 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

Sample @ Depth	PCE Concentration (ppm)	TCE Concentration (ppm)	Toluene Concentration (ppm)	Benzene Concentration (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

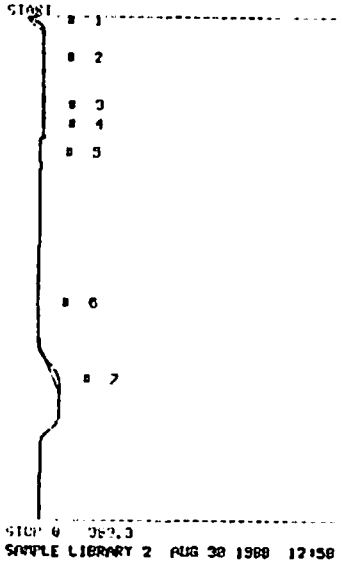
ND = Not Detected

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

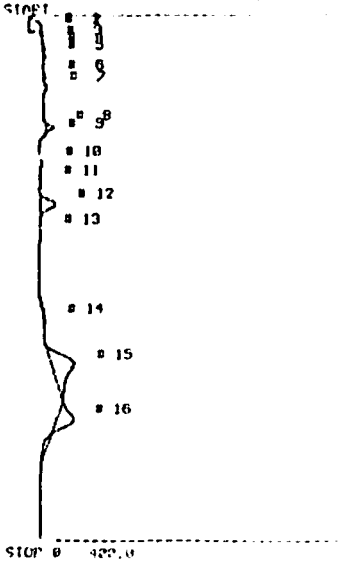
PHOTOVAC



STOP @ 362.3
SAMPLE LIBRARY 2 AUG 30 1988 12:50
ANALYSIS # 29 EUWD UWALDE 4
INTERNAL TEMP 29 INJ@0 SYR1 FL10
GAIN 10 BLK CHK

COMPOUND NAME	PEAK	R.T.	AREA/FIELD
UNKNOWN	1	12.0	120.9 mVS
[illegible]	7	285.8	200.1 mVS

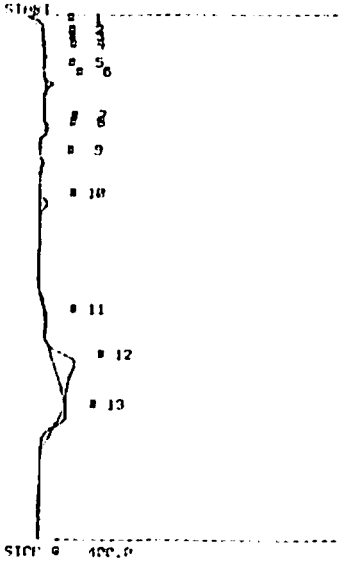
PHOTOVAC



STOP @ 422.0
SAMPLE LIBRARY 2 AUG 30 1988 12: 0
ANALYSIS # 22 EUWD UWALDE 4
INTERNAL TEMP 28 INJ@0 SYR1 FL10
GAIN 10 1 AT 3

COMPOUND NAME	PEAK	R.T.	AREA/FIELD
UNKNOWN	1	12.2	313.6 mVS
UNKNOWN	8	86.4	111.2 mVS
TCE	12	146.1	245.8 PPB
TOLUENE	15	262.2	[illegible]
PCE	16	318.1	312.4 PPB

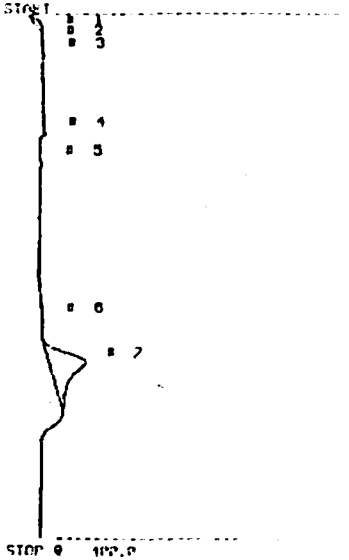
PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 12: 0
ANALYSIS # 23 EUWD UWALDE 4
INTERNAL TEMP 28 INJ@0 SYR1 FL10
GAIN 10 1 AT 6

COMPOUND NAME	PEAK	R.T.	AREA/FIELD
UNKNOWN	1	11.7	110.2 mVS
UNKNOWN	6	53.9	106.9 mVS
TCE	10	146.1	111.4 PPB
TOLUENE	12	269.0	2,105 PPB

PHOTOVAC

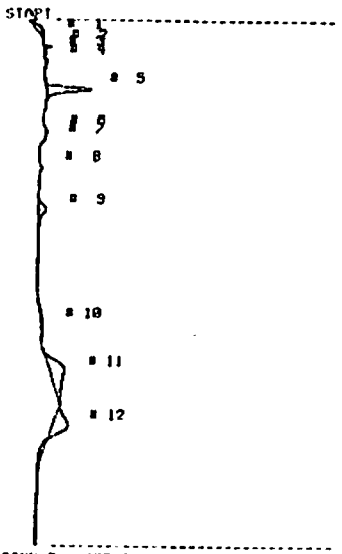


STOP @ 402.0
SAMPLE LIBRARY 2 AUG 30 1988 12:10
ANALYSIS # 24 EUWD UWALDE 4
INTERNAL TEMP 28 INJ@0 SYR1 FL10
GAIN 10 SYR CHK

COMPOUND NAME	PEAK	R.T.	AREA/FIELD
UNKNOWN	1	14.3	142.9 mVS
TOLUENE	7	269.1	[illegible]

9-084-88	**Chen & Associates**	HEAD-SPACE CHROMATOGRAMS	Fig. Ap.1

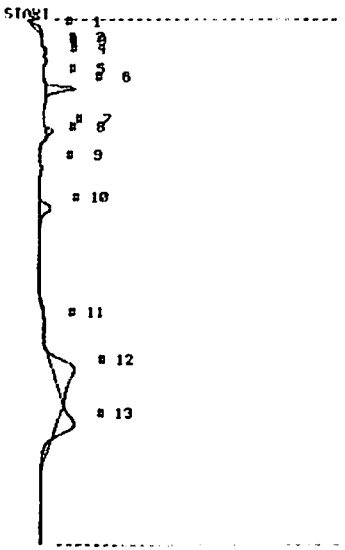
PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 12:24
ANALYSIS # 25 EUWD UVALDE 4
INTERNAL TEMP 28 INJ@@ STR1 FL1@
GAIN 10 1 AT 9

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	1	13.6	145.5 mVS
UNKNOWN	5	53.8	635.5 mVS
TCE	9	146.1	111.3 PPB
TOLUENE	11	269.0	1,353 PPB
PCE	12	309.9	239.1 PPB

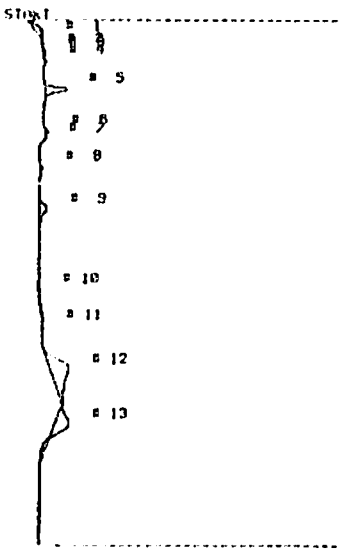
PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 12:32
ANALYSIS # 26 EUWD UVALDE 4
INTERNAL TEMP 29 INJ@@ STR1 FL1@
GAIN 10 1 AT 12

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	1	12.9	131.3 mVS
UNKNOWN	6	53.2	123.3 mVS
TCE	10	146.1	166.0 PPB
TOLUENE	12	268.7	2,093 PPB
PCE	13	309.1	268.6 PPB

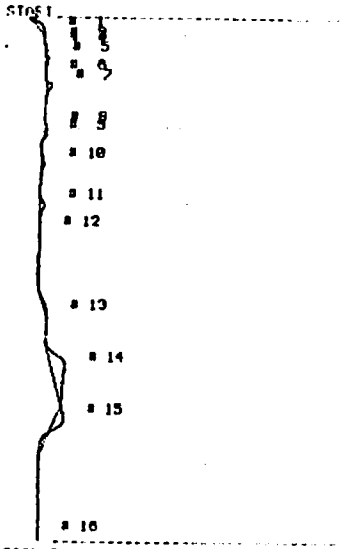
PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 12:40
ANALYSIS # 27 EUWD UVALDE 4
INTERNAL TEMP 29 INJ@@ STR1 FL1@
GAIN 10 1 AT 15

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	1	14.2	146.3 mVS
UNKNOWN	5	53.2	391.1 mVS
TCE	9	146.1	118.2 PPB
TOLUENE	12	268.1	1,678 PPB
PCE	13	309.2	218.8 PPB

PHOTOVAC

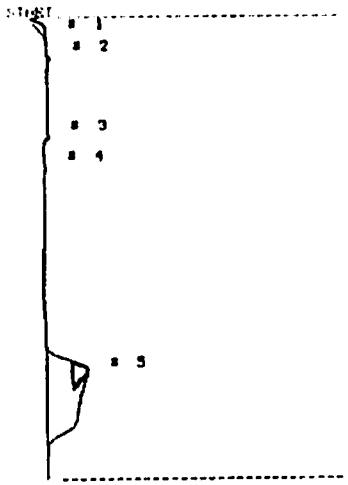


STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 12:49
ANALYSIS # 28 EUWD UVALDE 4
INTERNAL TEMP 28 INJ@@ STR1 FL1@
GAIN 10 ~~1 AT 15~~ 1 AT 18

COMPOUND NAME	PEAK	R.T.	AREA/PPB
UNKNOWN	1	13.0	122.4 mVS
TOLUENE	14	269.3	1,299 PPB
PCE	15	309.6	88.88 PPB

9-084-88	**Chen & Associates**	HEAD-SPACE CHROMATOGRAMS	Fig. Ap. 2

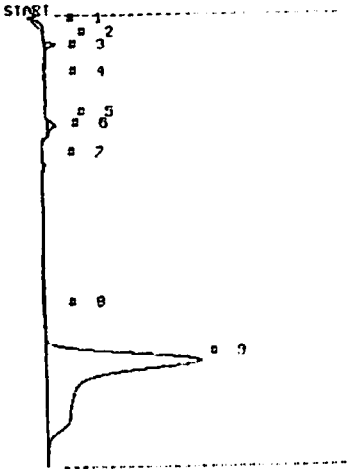
PHOTOVAC



STOP @ 350.0
SAMPLE LIBRARY 2 AUG 30 1988 13: 5
ANALYSIS # 30 EUWD UVALDE 4
INTERNAL TEMP 29 INJ1@@ SYR1 FL1@
GAIN 10 STR CHK

COMPOUND NAME	PEAK	R.T.	AREA/FFD
UNKNOWN	1	15.0	178.7 mVS
TOLUENE	5	221.1	0.952 PPM

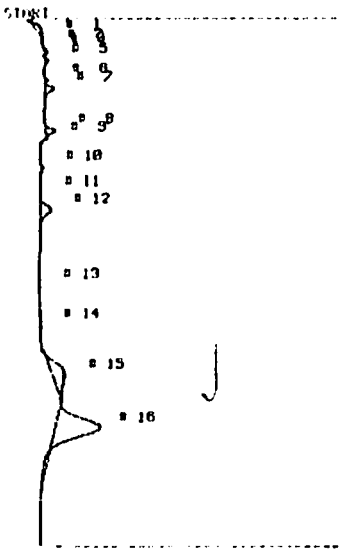
PHOTOVAC



STOP @ 342.0
SAMPLE LIBRARY 2 AUG 30 1988 13:12
ANALYSIS # 31 EUWD UVALDE 4
INTERNAL TEMP 29 INJ1@@ SYR1 FL1@
GAIN 10 TOL CHK

COMPOUND NAME	PEAK	R.T.	AREA/FFD
UNKNOWN	1	11.6	115.4 mVS
UNKNOWN	2	22.5	104.7 mVS
UNKNOWN	5	84.5	130.5 mVS
TOLUENE	9	204.9	1.03 PPM

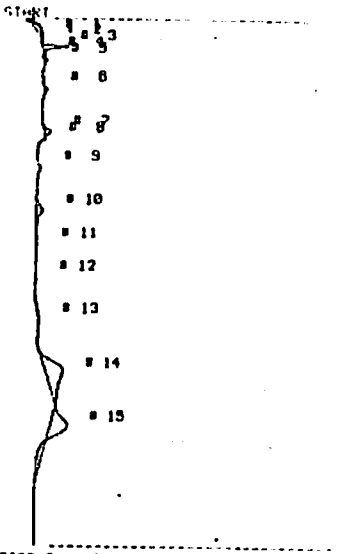
PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 13:21
ANALYSIS # 32 EUWD UVALDE 4
INTERNAL TEMP 30 INJ1@@ SYR1 FL1@
GAIN 10 2 AT 3

COMPOUND NAME	PEAK	R.T.	AREA/FFD
UNKNOWN	1	14.2	109.2 mVS
UNKNOWN	2	54.1	121.3 mVS
UNKNOWN	8	88.2	121.0 mVS
TCE	12	146.2	159.4 PPB
TOLUENE	15	271.1	1.100 PPM
PCE	16	312.5	1.002 PPM

PHOTOVAC

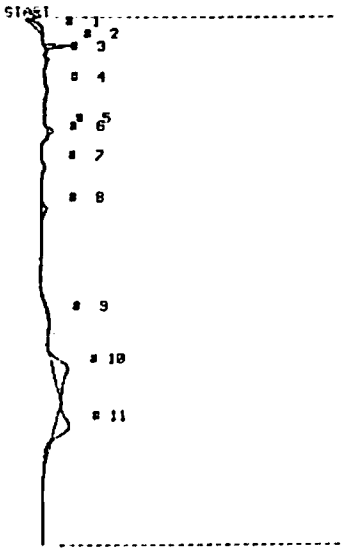


STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 13:30
ANALYSIS # 33 EUWD UVALDE 4
INTERNAL TEMP 30 INJ1@@ SYR1 FL1@
GAIN 10 2 AT 6

COMPOUND NAME	PEAK	R.T.	AREA/FFD
UNKNOWN	1	14.3	129.5 mVS
UNKNOWN	3	22.4	13[illegible] mVS
TCE	10	146.5	80.19 PPB
TOLUENE	14	269.6	1.410 PPM
PCE	15	311.0	281.0 PPB

9-084-88	**Chen & Associates**	HEAD-SPACE CHROMATOGRAMS	Fig. Ap. 3

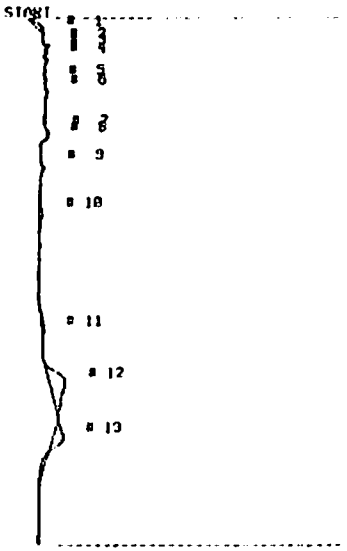
PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 13:39
ANALYSIS # 34 EUAD UUALDE 4
INTERNAL TEMP 29 INJ1@0 STR1 FL1@
GAIN 10 2 AT 9

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.9	162.3 mVS
UNKNOWN	2	22.4	106.1 mVS
TCE	8	140.5	72.39 PPB
TOLUENE	10	207.5	1.295 PPM
PCE	11	311.0	238.0 PPB

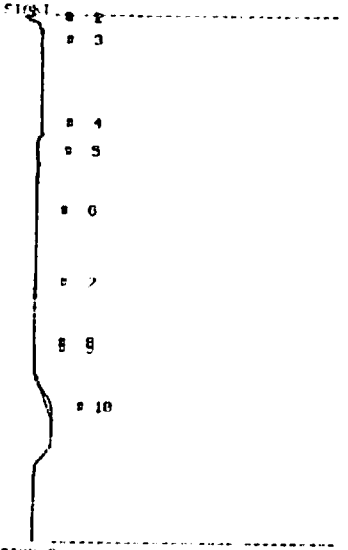
PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 13:48
ANALYSIS # 35 EUAD UUALDE 4
INTERNAL TEMP 30 INJ1@0 STR1 FL1@
GAIN 10 2 AT 12

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.0	112.0 mVS
TOLUENE	12	276.0	1.495 PPM
PCE	13	320.3	73.96 PPB

PHOTOVAC



STOP @ 400.0
SAMPLE LIBRARY 2 AUG 30 1988 13:56
ANALYSIS # 36 EUAD UUALDE 4
INTERNAL TEMP 30 INJ1@0 STR1 FL1@
GAIN 10 BLK CHK

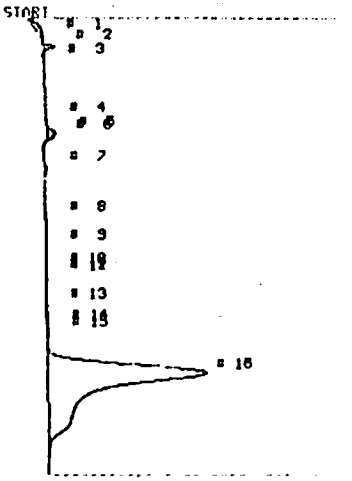
COMPOUND NAME	PEAK	R.T.	AREA/PPM
PCE	10	302.4	104.0 PPB

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENTENE	1	115.6	500.0 PPM
PCE	2	312.0	0.000 PPB
TOLUENE	3	264.2	500.0 PPM
TCE	5	148.7	0.000 PPB

PHOTOVAC



STOP @ 345.0
SAMPLE LIBRARY 2 AUG 30 1988 14:13
ANALYSIS # 38 EUAD UUALDE 4
INTERNAL TEMP 30 INJ1@0 STR1 FL1@
GAIN 10 EOL CAL 2

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	11.9	155.4 mVS
UNKNOWN	5	88.2	128.2 mVS
TOLUENE	10	220.6	13.72 PPM

9-084-88	**Chen & Associates**	HEAD-SPACE CHROMATOGRAMS	Fig. Ap. 4

PHOTOVAC

CALIBRATED PEAK 10,TOLUENE

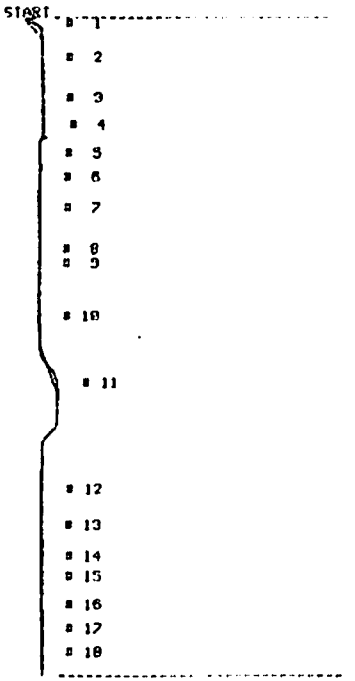
SAMPLE LIBRARY 2 AUG 30 1988 14:14
ANALYSIS # 38 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 STRI FL10
GAIN 10 TOL CAL 2

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.9	155.4 mVS
UNKNOWN	5	88.7	128.9 mVS
TOLUENE	10	270.8	10.00 PPM

PHOTOVAC

2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	118.5	500.0 PPM
PCE	2	319.8	0.020 PPB
TOLUENE	3	270.8	500.0 PPM
TCE	5	150.4	0.020 PPB

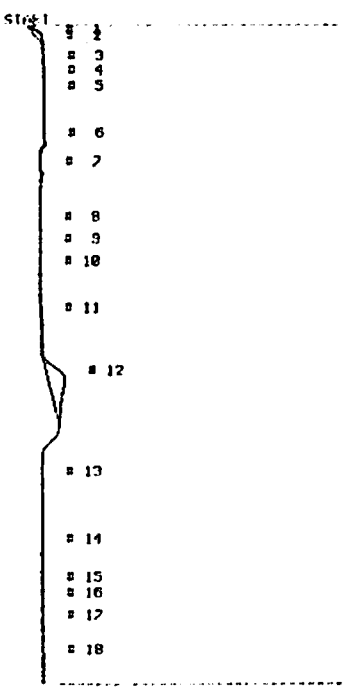
PHOTOVAC



STOP @ 500.0
SAMPLE LIBRARY 2 AUG 30 1988 14:29
ANALYSIS # 39 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 STRI FL10
GAIN 10 BLK CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.5	129.6 mVS
UNKNOWN	11	268.4	122.5 mVS

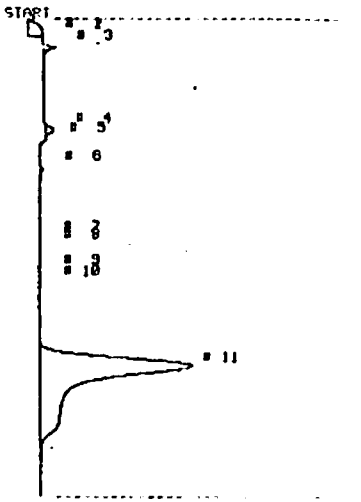
PHOTOVAC



STOP @ 500.0
SAMPLE LIBRARY 2 AUG 30 1988 14:38
ANALYSIS # 40 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 STRI FL10
GAIN 10 ~~BLK CHK~~ SYR CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.4	151.3 mVS
TOLUENE	12	271.4	2,082 PPM

PHOTOVAC



STOP @ 500.0
SAMPLE LIBRARY 2 AUG 30 1988 14:47
ANALYSIS # 41 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 STRI FL10
GAIN 10 TOL CAL 3

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.2	325.1 mVS
UNKNOWN	3	22.2	183.1 mVS
UNKNOWN	4	84.9	132.8 mVS
TOLUENE	11	264.8	10.00 PPM

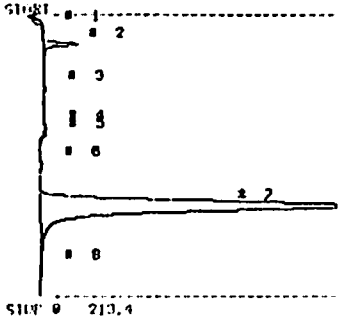
PHOTOVAC

CALIBRATED PEAK 11,TOLUENE

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

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.2	325.1 mVS
UNKNOWN	3	22.2	183.1 mVS
UNKNOWN	4	84.9	132.8 mVS
TOLUENE	11	264.8	10.00 PPM

PHOTOVAC



STOP @ 213.4
SAMPLE LIBRARY 2 AUG 30 1988 14:54
ANALYSIS # 42 EUAD UVALDE 4
INTERNAL TEMP 31 INJ100 STRI FL10
GAIN 10 TCE CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
[illegible]	2	23.5	315.8 mVS
TCE	7	145.6	7.173 PPM

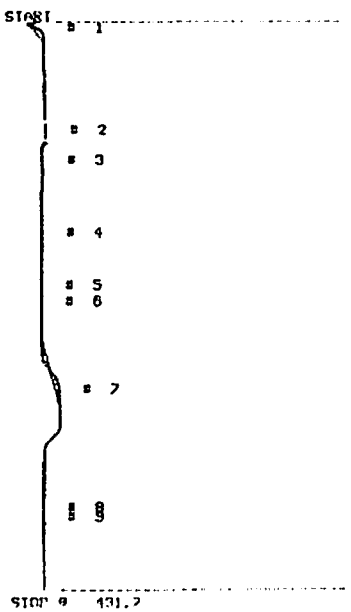
PHOTOVAC

CALIBRATED PEAK 7,TCE

SAMPLE LIBRARY 2 AUG 30 1988 14:55
ANALYSIS # 42 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 STRI FL10
GAIN 10 TCE CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	23.5	315.8 mVS
TCE	7	145.6	10.00 PPM

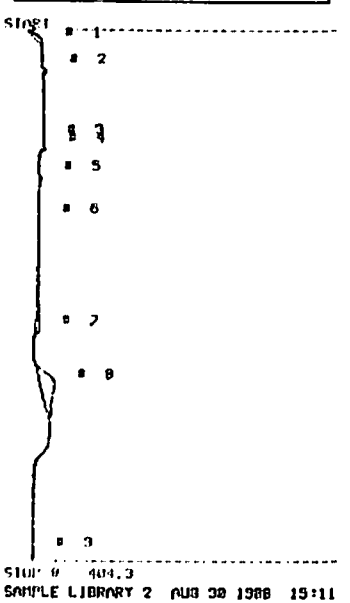
PHOTOVAC



STOP @ 431.2
SAMPLE LIBRARY 2 AUG 30 1988 15:14
ANALYSIS # 43 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 STRI FL10
GAIN 10 BLK CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.1	115.3 mVS

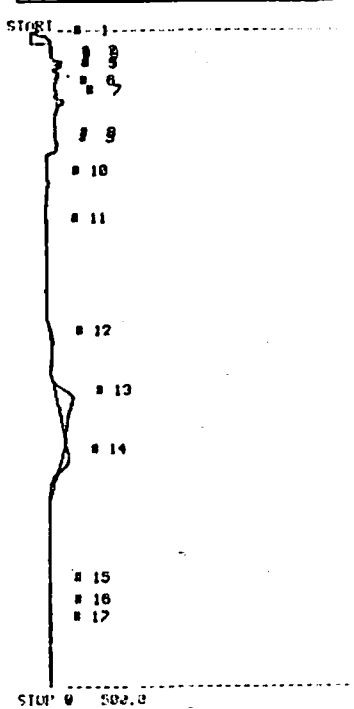
PHOTOVAC



STOP @ 404.3
SAMPLE LIBRARY 2 AUG 30 1988 15:11
ANALYSIS # 44 EUAD UVALDE 4
INTERNAL TEMP 31 INJ100 STRI FL10
GAIN 10 ~~BLK~~ CHK
5 YR

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	2	223.9	139.2 mVS
TCE	8	221.2	2.593 PPM

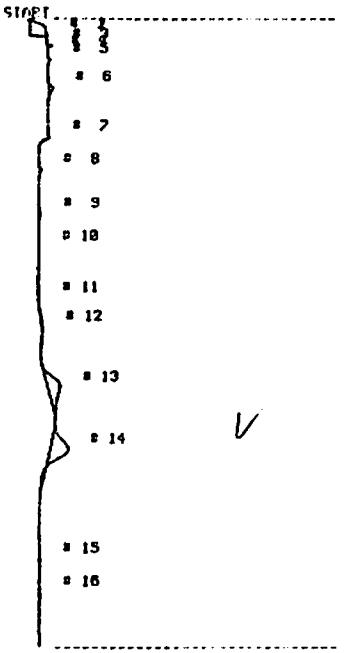
PHOTOVAC



STOP @ 502.8
SAMPLE LIBRARY 2 AUG 30 1988 15:21
ANALYSIS # 45 EUAD UVALDE 4
INTERNAL TEMP 31 INJ100 STRI FL10
GAIN 10 2 AT 15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	9.8	342.1 mVS
UNKNOWN	2	55.2	104.[illegible] mVS
UNKNOWN	13	282.8	1.0 [illegible]
UNKNOWN	14	328.1	301.3 mVS

PHOTOVAC



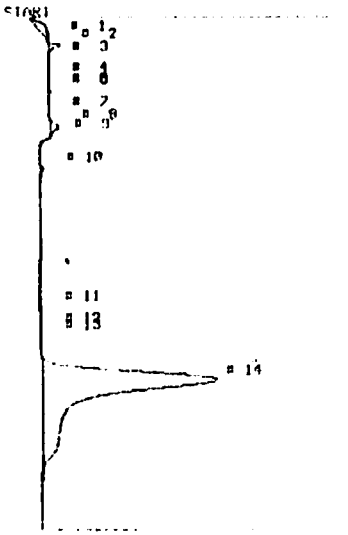
STOP @ 476.8
SAMPLE LIBRARY 2 AUG 30 1988 15:49
ANALYSIS # 47 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL18
GAIN 10 2 AT 20

COMPOUND NAME	PEAK	R.T.	AREA/FFD
UNKNOWN	1	13.0	168.6 mVS
TOLUENE	13	281.0	302.5 PPB
PCE	14	328.1	425.4 PPB

PHOTOVAC

2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	114.7	500.0 PPM
PCE	2	309.5	0.000 PPB
TOLUENE	3	262.1	500.0 PPM
TCE	5	145.6	0.000 PPB

PHOTOVAC



STOP @ 382.1
SAMPLE LIBRARY 2 AUG 30 1988 15:38
ANALYSIS # 46 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL18
GAIN 10 TOL CAL 4

COMPOUND NAME	PEAK	R.T.	AREA/FFD
UNKNOWN	1	16.3	251.0 mVS
UNKNOWN	8	81.4	117.3 mVS
TOLUENE	14	228.3	18.00 PPM

PHOTOVAC

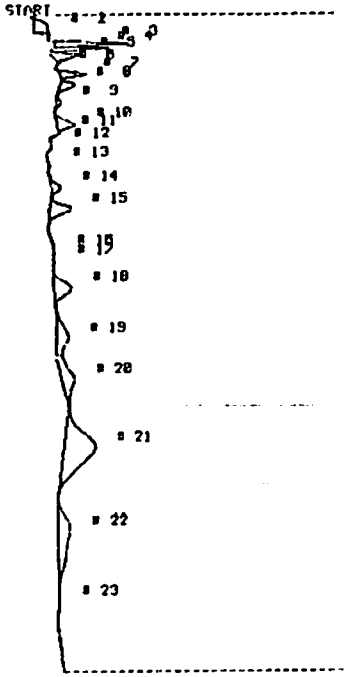
CALIBRATED PEAK 14, TOLUENE

SAMPLE LIBRARY 2 AUG 30 1988 15:40
ANALYSIS # 46 EUAD UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL18
GAIN 10 TOL CAL 4

COMPOUND NAME	PEAK	R.T.	AREA/FFD
UNKNOWN	1	16.3	251.0 mVS
UNKNOWN	8	81.4	117.3 mVS
TOLUENE	14	228.3	18.00 PPM

9-084-88	**Chen & Associates**	HEAD-SPACE CHROMATOGRAMS	Fig. Ap.7

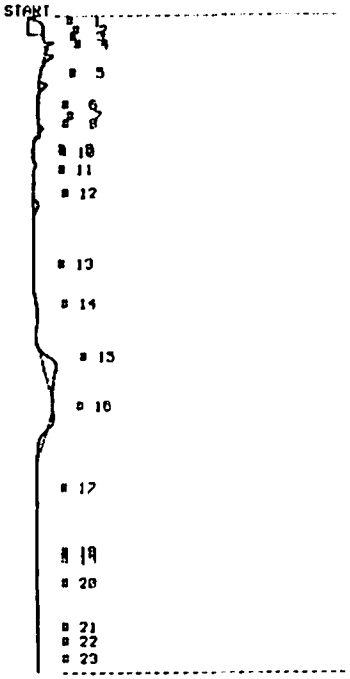
PHOTOVAC



STOP @ 500.0
SAMPLE LIBRARY 2 AUG 30 1988 16:0
ANALYSIS # 48 EUAD UVALDE 4
INTERNAL TEMP 29 INJ100 SYR1 FL18
GAIN 10 3 AT 3

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.3	414.2 mVS
UNKNOWN	3	23.3	628.7 mVS
UNKNOWN	4	2*.4	435.2 mVS
UNKNOWN	5	31.6	351.6 mVS
UNKNOWN	7	46.7	387.1 mVS
UNKNOWN	8	54.3	243.0 mVS
UNKNOWN	10	85.5	363.6 mVS
UNKNOWN	14	133.7	272.5 mVS
TCE	15	143.9	349.4 PPB
UNKNOWN	18	208.9	621.2 mVS
UNKNOWN	19	246.8	788.2 mVS
TOLUENE	20	278.9	1.338 PPM
PCE	21	338.2	1.568 PPM
UNKNOWN	22	393.3	1.2 VS

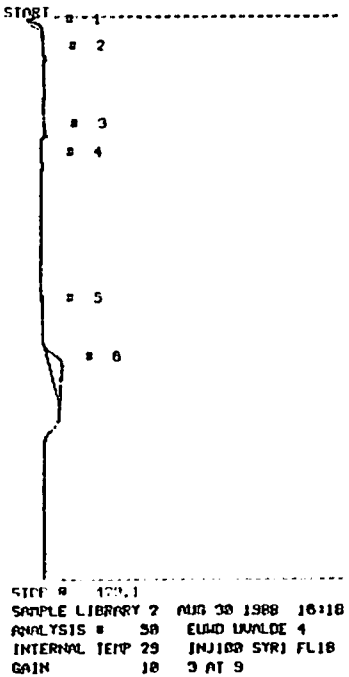
PHOTOVAC



STOP @ 500.0
SAMPLE LIBRARY 2 AUG 30 1988 16:1
ANALYSIS # 49 EUAD UVALDE 4
INTERNAL TEMP 29 INJ100 SYR1 FL18
GAIN 10 3 AT 6

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.2	4[illegible] mVS
UNKNOWN	12	145.2	119.4 mVS
TOLUENE	15	268.2	1.213 PPM

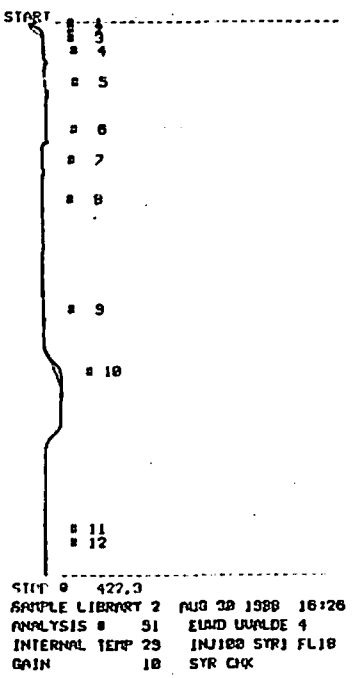
PHOTOVAC



STOP @ 429.1
SAMPLE LIBRARY 2 AUG 30 1988 16:18
ANALYSIS # 50 EUAD UVALDE 4
INTERNAL TEMP 29 INJ100 SYR1 FL18
GAIN 10 3 AT 9

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.0	110.1 mVS
TOLUENE	6	268.4	1.365 PPM

PHOTOVAC

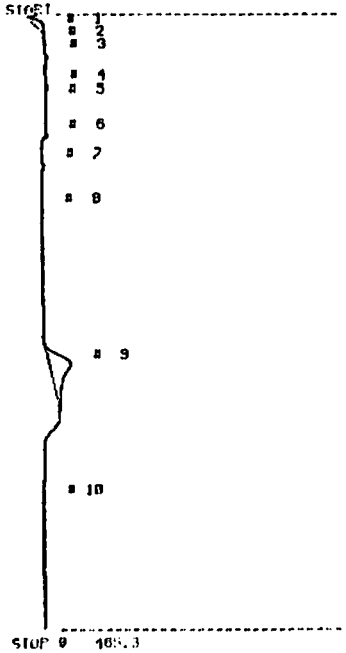


STOP @ 422.3
SAMPLE LIBRARY 2 AUG 30 1988 16:26
ANALYSIS # 51 EUAD UVALDE 4
INTERNAL TEMP 29 INJ100 SYR1 FL18
GAIN 10 SYR CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
TOLUENE	10	278.5	313.2 PPB

9-084-88	**Chen & Associates**	HEAD-SPACE CHROMATOGRAMS	Fig. Ap. 8

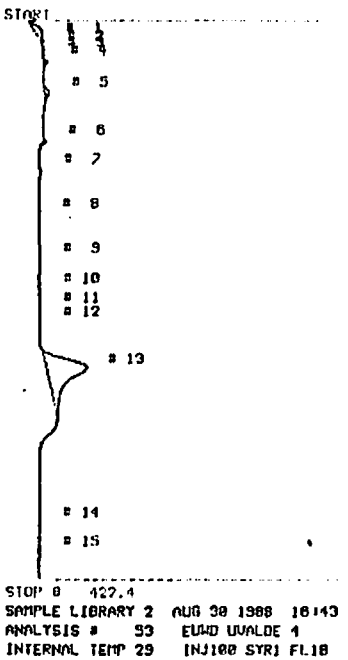
PHOTOVAC



STOP @ 165.3
SAMPLE LIBRARY 2 AUG 30 1988 16:35
ANALYSIS # 52 EUWD UVALDE 4
INTERNAL TEMP 29 INJ100 SYR1 FL18
GAIN 10 3 AT 12

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.4	158.8 mVS
TOLUENE	9	266.0	2.078 PPM

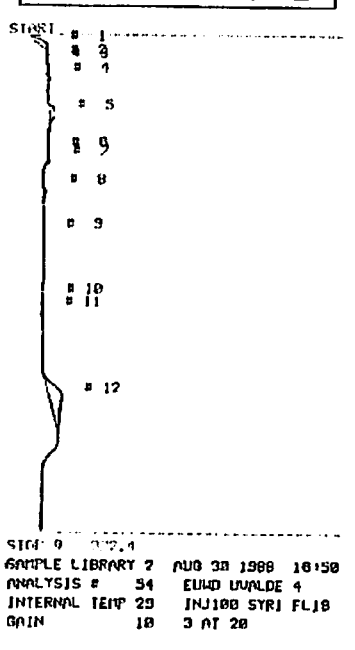
PHOTOVAC



STOP @ 422.4
SAMPLE LIBRARY 2 AUG 30 1988 16:43
ANALYSIS # 53 EUWD UVALDE 4
INTERNAL TEMP 29 INJ100 SYR1 FL18
GAIN 10 3 AT 15

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	15.9	142.9 mVS
UNKNOWN	13	361.8	2.5 PPM

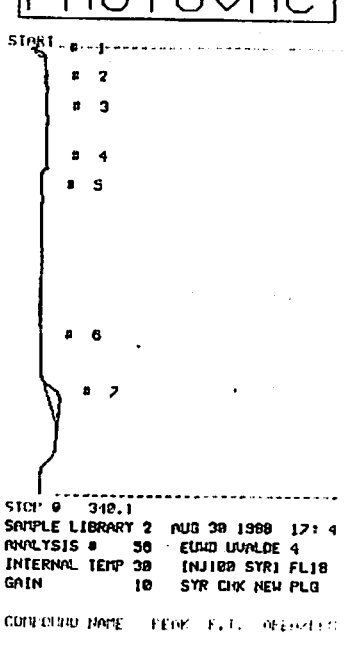
PHOTOVAC



STOP @ 332.4
SAMPLE LIBRARY 2 AUG 30 1988 16:50
ANALYSIS # 54 EUWD UVALDE 4
INTERNAL TEMP 29 INJ100 SYR1 FL18
GAIN 10 3 AT 20

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	10.9	105.2 mVS
TOLUENE	12	325.3	1.294 PPM

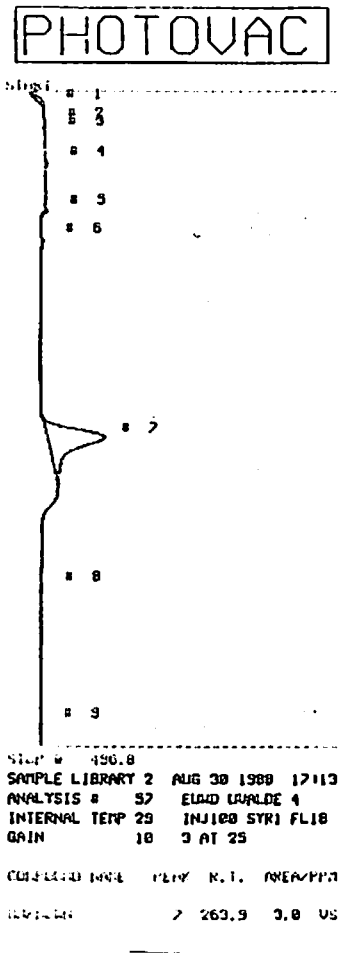
PHOTOVAC

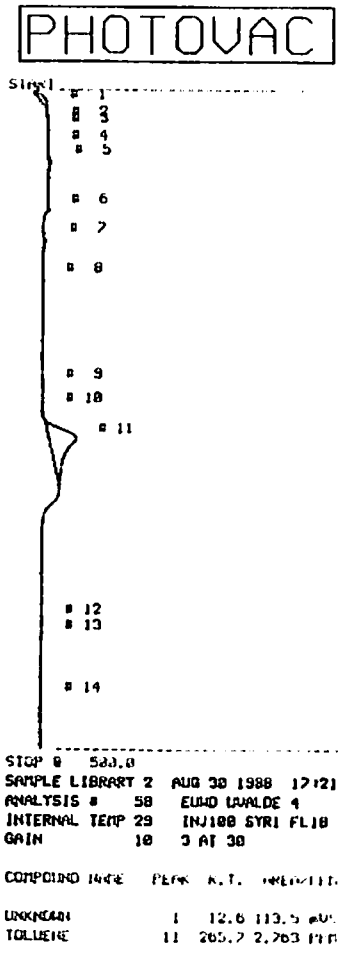


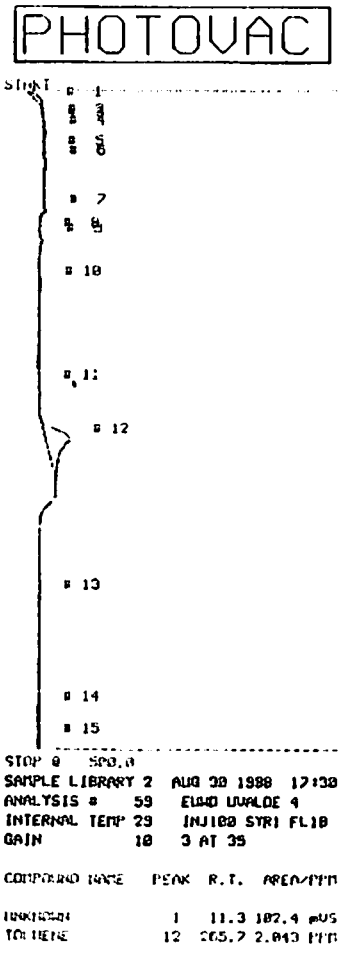
STOP @ 340.1
SAMPLE LIBRARY 2 AUG 30 1988 17:4
ANALYSIS # 56 EUWD UVALDE 4
INTERNAL TEMP 30 INJ100 SYR1 FL18
GAIN 10 SYR CHK NEW PLG

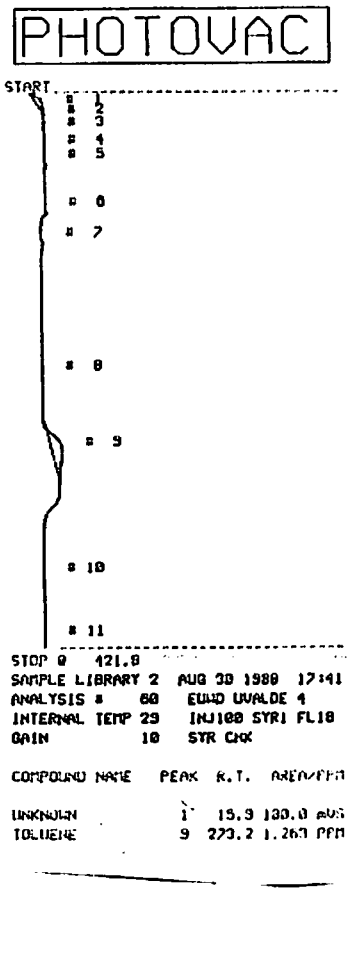
COMPOUND NAME	PEAK	R.T.	AREA/PPM
TOLUENE	7	221.1	001.7 PPM

9-084-88	Chen & Associates	HEAD-SPACE CHROMATOGRAMS	Fig. Ap. 9









9-084-88	**Chen & Associates**	HEAD-SPACE CHROMATOGRAMS	Fig. Ap. 10

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	5
Acetone	67-64-1	8J	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		U	5

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 dection 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 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	5
Acetone	67-64-1	6J	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		3J	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 dection 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'	Chen Project No.:	9-084-88
Lab Sample Number	: X5849	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	5
Acetone	67-64-1	8J	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		3J	5

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 dection 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 @ 9-10'	Chen Project No.: 9-084-88	
Lab Sample Number	: X5850	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	5
Acetone	67-64-1	6J	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		3J	5

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 dection limits are less than the numbers shown in this column.

Approved: _____
John D Parker

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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	4J	5
Acetone	67-64-1	6J	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		U	5

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 dection 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 3 @ 3-4'	Chen Project No.:	9-084-88
Lab Sample Number	: X5852	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	3J	5
Acetone	67-64-1	130	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		4J	5

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 dection 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 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	8	5
Acetone	67-64-1	15J	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		3J	5

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4	88%	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 dection 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 3 @ 25-26'	Chen Project No.:	9-084-88
Lab Sample Number	: X5854	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	8	5
Acetone	67-64-1	11J	100
Carbon Disulfide	75-15-0	U	5
1,1-Dichloroethene	75-35-4	U	5
1,1-Dichloroethane	75-34-3	U	5
Trans-1,2-Dichloroethene	156-60-5	U	5
Chloroform	67-66-3	U	5
1,2-Dichloroethane	107-06-2	U	5
2-Butanone	78-93-3	U	100
1,1,1-Trichloroethane	71-55-6	U	5
Carbon Tetrachloride	56-23-5	U	5
Vinyl Acetate	108-05-4	U	50
Bromodichloromethane	75-27-4	U	5
1,2-Dichloropropane	78-87-5	U	5
Trans-1,3-dichloropropene	10061-02-6	U	5
Trichloroethene	79-01-6	U	5
Dibromochloromethane	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	110-75-8	U	10
Bromoform	75-25-2	U	5
4-Methyl-2-pentanone	591-78-6	U	50
2-Hexanone	108-10-1	U	50
Tetrachloroethene	127-18-4	U	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		U	5

SURROGATE RECOVERIES:

1,2-Dichloroethane-d4	88%	Toluene-d8	91%	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 dection limits are less than the numbers shown in this column.

Approved: _____ _____

John D Parker — 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, ~~Geologist~~

MMB/irb

Enclosure

TABLE I

SOIL-VAPOR SAMPLING CONCENTRATIONS
GENSCO SITE
UVALDE, TEXAS

Sampling Point	PCE Concentration (ppb)	TCE Concentration (ppb)	DCE Concentration (ppb)	Toluene Concentration (ppb)
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

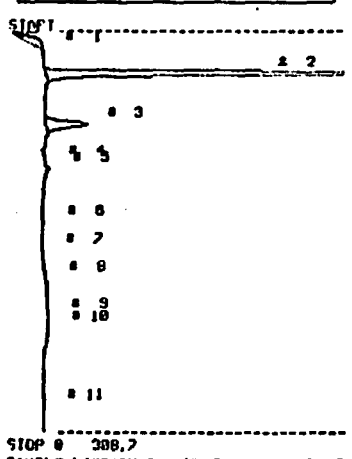
calibrant CHECK?

* 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

(are suspect readings likely higher or lower?)

Chen & Associates

PHOTOVAC



STOP @ 308.7
SAMPLE LIBRARY 2 JUL 28 1988 8:49
ANALYSIS # 12 EUND
INTERNAL TEMP 28 GENSCO
GAIN 20 TCE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.9	288.3 mVS
UNKNOWN	2	32.4	4.4 VS
UNKNOWN	3	72.1	739.8 mVS
UNKNOWN	4	101.7	21.7 mVS
UNKNOWN	5	106.8	43.4 mVS
UNKNOWN	9	228.3	20.9 mVS

PHOTOVAC

CALIBRATED PEAK 2,TCE

ANALYSIS # 12 EUND
INTERNAL TEMP 28 GENSCO
GAIN 20 TCE CAL

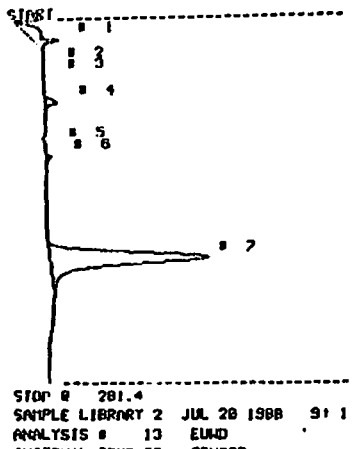
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.9	288.3 mVS
TCE	2	32.4	71.10 PPM
UNKNOWN	3	72.1	739.8 mVS
UNKNOWN	4	101.7	21.7 mVS
UNKNOWN	5	106.8	43.4 mVS
PCE	9	228.3	10.00 PPB

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



STOP @ 281.4
SAMPLE LIBRARY 2 JUL 28 1988 9:1
ANALYSIS # 13 EUND
INTERNAL TEMP 25 GENSCO
GAIN 20 TOL CAL

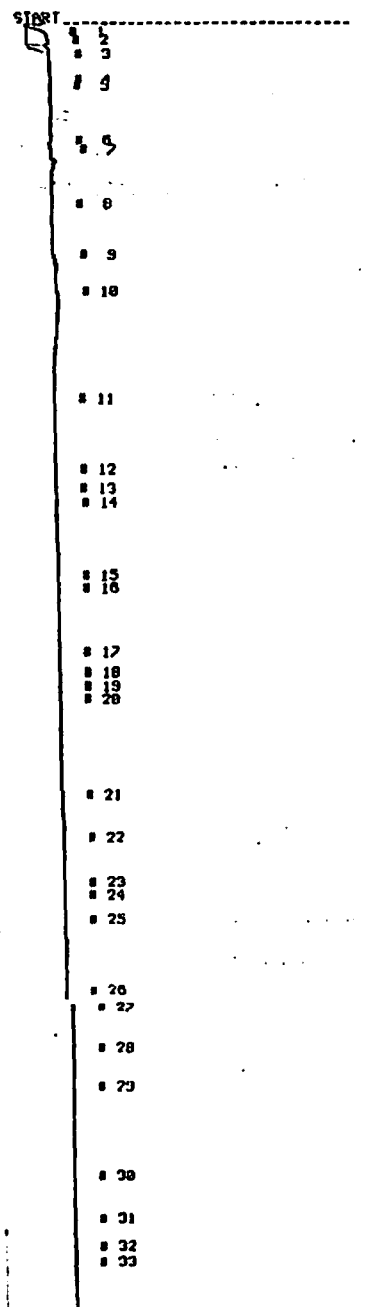
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.2	642.9 mVS
UNKNOWN	4	84.3	188.1 mVS
UNKNOWN	5	97.0	5.2 mVS
UNKNOWN	6	108.8	32.8 mVS
UNKNOWN	7	187.3	5.5 VS

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 PPB

PHOTOVAC



STOP @ 1800.0
SAMPLE LIBRARY 2 JUL 28 1988 9:23
ANALYSIS # 14 EUND
INTERNAL TEMP 25 GENSCO
GAIN 20 SV ONE

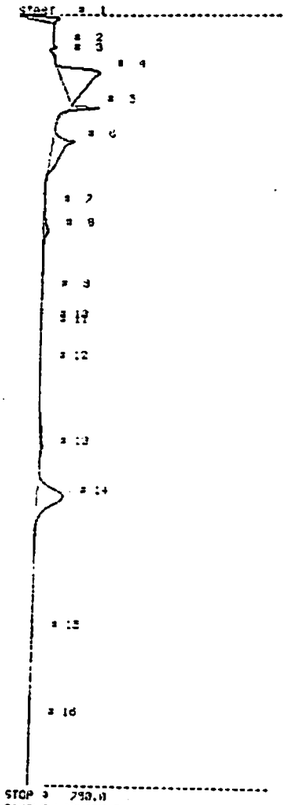
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	16.3	789.6 mVS
UNKNOWN	2	22.4	175.2 mVS
UNKNOWN	6	100.1	14.2 mVS
UNKNOWN	7	108.7	35.8 mVS
TOLUENE	9	188.9	74.48 PPB
PCE	10	217.5	12.95 PPB
UNKNOWN	22	634.1	12.4 mVS

PHOTOVAC

PHOTOVAC

Fig.

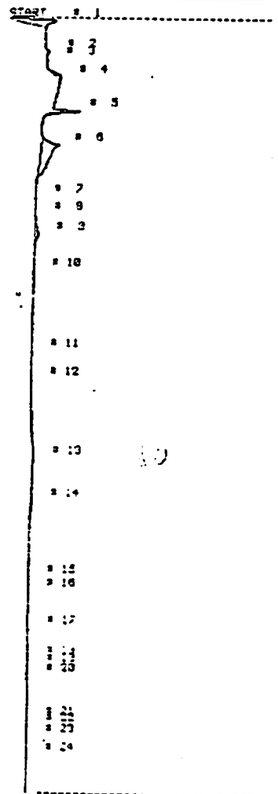
PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 14:21
ANALYSIS # 28 EUHO
INTERNAL TEMP 33 GENSCO
GAIN 50 SU TWENTY EIGHT

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.3	329.2	AUS
UNKNOWN	2	32.6	24.1	AUS
UNKNOWN	3	42.3	27.3	AUS
TCE	4	58.1	3.0	US
UNKNOWN	5	92.2	231.1	AUS
UNKNOWN	6	126.3	1.2	US
UNKNOWN	9	212.7	169.2	AUS
	13	424.3	37.10	PPB
PCE	14	472.3	753.7	PPB

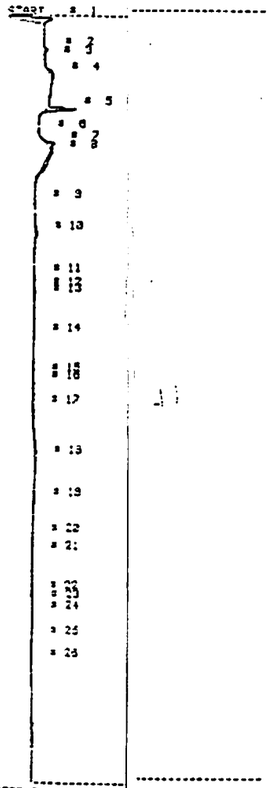
PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 14:42
ANALYSIS # 29 EUHO
INTERNAL TEMP 42 GENSCO
GAIN 50 SU TWENTY NINE

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.4	714.3	AUS
UNKNOWN	2	34.3	33.9	AUS
TCE	4	58.1	412.4	PPB
UNKNOWN	5	92.2	239.6	AUS
UNKNOWN	6	126.3	1.2	US
UNKNOWN	9	212.7	122.2	AUS
PCE	13	428.1	65.38	PPB

PHOTOVAC

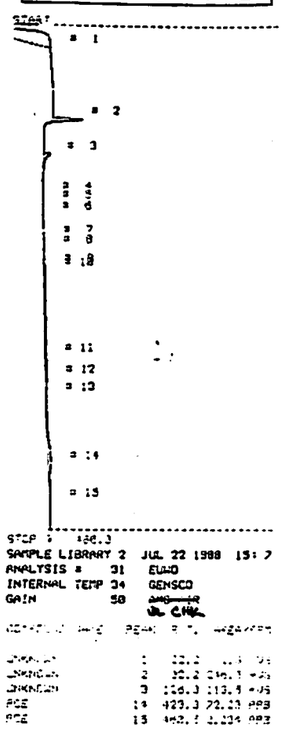


STOP # 750.0
SAMPLE LIBRARY 2
ANALYSIS # 28
INTERNAL TEMP 33
GAIN 50

UL 22 1988 14:58
EUHO
GENSCO
AVG AIR

COMPOUND NAME	PE	R.T.	AREA/PPM	
UNKNOWN		4.3	130.2	AUS
UNKNOWN		34.4	33.7	AUS
UNKNOWN		58.1	42.2	AUS
UNKNOWN		92.2	232.3	AUS
UNKNOWN		126.3	43.1	AUS
UNKNOWN		136.1	177.3	AUS
UNKNOWN	18	212.1	36.9	AUS
PCE	13	426.3	60.54	PPB
PCE	13	447.7	5.819	PPB
UNKNOWN	25	681.7	3.3	AUS

PHOTOVAC

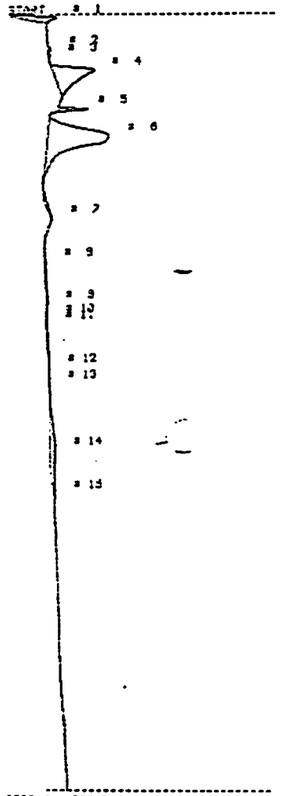


STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 15:7
ANALYSIS # 31 EUHO
INTERNAL TEMP 34 GENSCO
GAIN 50

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	32.3	41.5	AUS
UNKNOWN	2	35.2	340.1	AUS
UNKNOWN	3	126.3	113.4	AUS
PCE	14	429.3	72.23	PPB
PCE	15	448.7	1.334	PPB

TCE - 28
PCE - .5

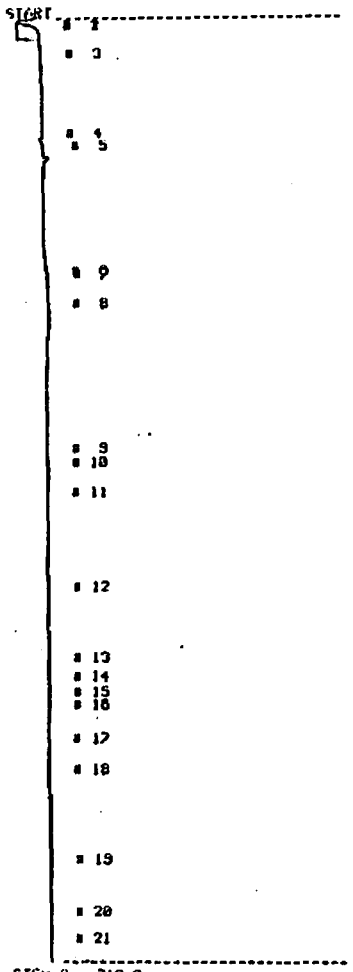
PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 15:21
ANALYSIS # 32 EUHO
INTERNAL TEMP 34 GENSCO
GAIN 50 SU THIRTY

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.2	525.9	AUS
UNKNOWN	2	34.3	13.8	AUS
UNKNOWN	3	41.5	4.0	AUS
TCE ?	4	54.3	2.2	US
UNKNOWN	5	92.1	251.3	AUS
UNKNOWN	6	113.1	5.2	US
UNKNOWN	9	232.4	55.1	AUS
UNKNOWN	12	342.2	13.0	AUS
PCE	14	472.9	354.1	PPB
PCE	15	494.1	15.3	PPB

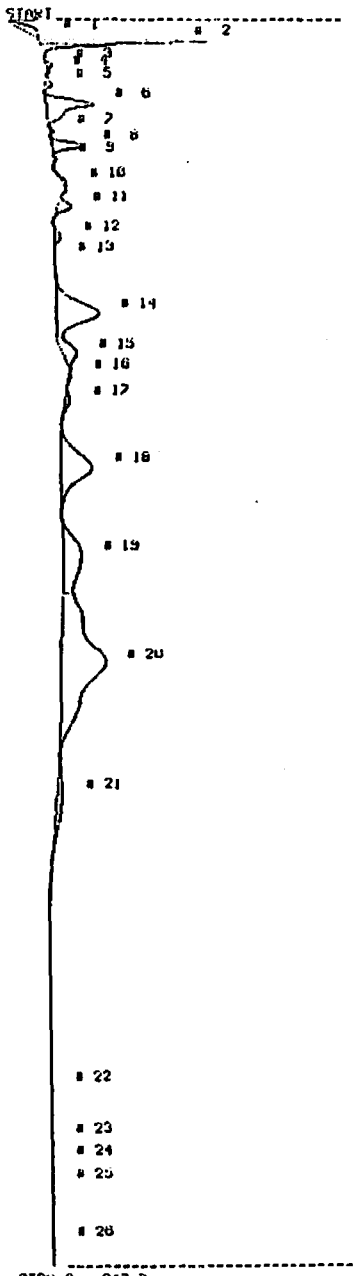
9-084-88 | **Chen & Associates** | Fig.



STOP @ 718.2
SAMPLE LIBRARY 2 JUL 28 1988 9:48
ANALYSIS # 15 EUAD
INTERNAL TEMP 25 GENSCO
GAIN 20 BL CHECK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.5	598.2 aUS
UNKNOWN	2	15.8	46.5 aUS
UNKNOWN	4	37.4	6.4 aUS
UNKNOWN	5	106.8	32.3 aUS
UNKNOWN	6	203.3	28.1 aUS
UNKNOWN	12	445.7	12.3 aUS
UNKNOWN	19	850.3	29.3 aUS

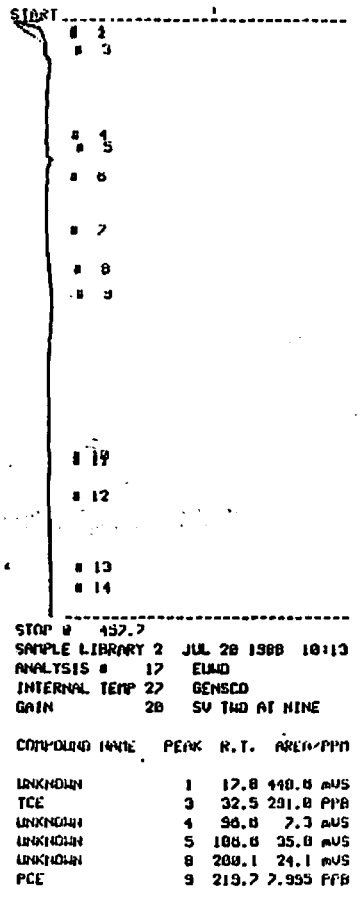
PHOTOVAC



STOP @ 947.7
SAMPLE LIBRARY 2 JUL 28 1988 10: 3
ANALYSIS # 16 EUAD
INTERNAL TEMP 26 GENSCO
GAIN 20 SV TWO AT SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.7	268.4 aUS
UNKNOWN	2	17.4	1.3 US
UNKNOWN	3	36.2	73.1 aUS
UNKNOWN	5	58.5	101.2 aUS
UNKNOWN	6	64.8	1.4 US
UNKNOWN	7	85.4	54.4 aUS
UNKNOWN	8	96.7	653.3 aUS
UNKNOWN	9	106.8	26.6 aUS
UNKNOWN	10	125.7	80.5 aUS
UNKNOWN	11	143.7	306.3 aUS
UNKNOWN	12	166.7	207.8 aUS
UNKNOWN	14	225.1	2.7 US
UNKNOWN	15	258.7	663.3 aUS
UNKNOWN	16	272.3	15.8 aUS
UNKNOWN	17	283.8	158.3 aUS
UNKNOWN	18	344.6	2.3 US
UNKNOWN	19	412.1	2.2 US
UNKNOWN	20	494.6	8.8 US
UNKNOWN	21	591.6	458.1 aUS

PHOTOVAC

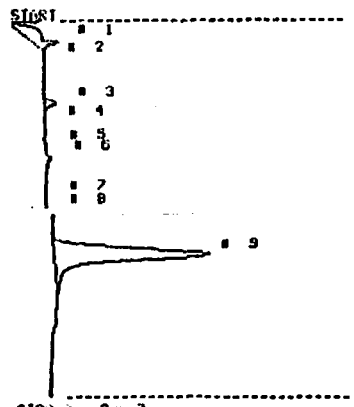


STOP @ 457.7
SAMPLE LIBRARY 2 JUL 28 1988 10:13
ANALYSIS # 17 EUAD
INTERNAL TEMP 27 GENSCO
GAIN 20 SV TWO AT NINE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.8	440.6 aUS
TCE	3	32.5	291.8 PPB
UNKNOWN	4	36.8	7.3 aUS
UNKNOWN	5	106.6	35.8 aUS
UNKNOWN	8	200.1	24.1 aUS
PCE	9	219.7	7.995 PPB

6
Trichloroethene
TCE

PHOTOVAC



STOP @ 256.7
SAMPLE LIBRARY 2 JUL 28 1988 10:19
ANALYSIS # 18 EUAD
INTERNAL TEMP 27 GENSCO
GAIN 20 TOL CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.2	838.5 aUS
UNKNOWN	3	64.4	155.4 aUS
UNKNOWN	5	97.9	7.7 aUS
UNKNOWN	6	106.7	33.3 aUS
TOLUENE	9	187.1	17.63 PPM

PHOTOVAC

CALIBRATED PEAK 9,TOLUENE

SAMPLE LIBRARY 2 JUL 28 1988 10:21
ANALYSIS # 18 EUAD
INTERNAL TEMP 27 GENSCO
GAIN 20 TOL CAL

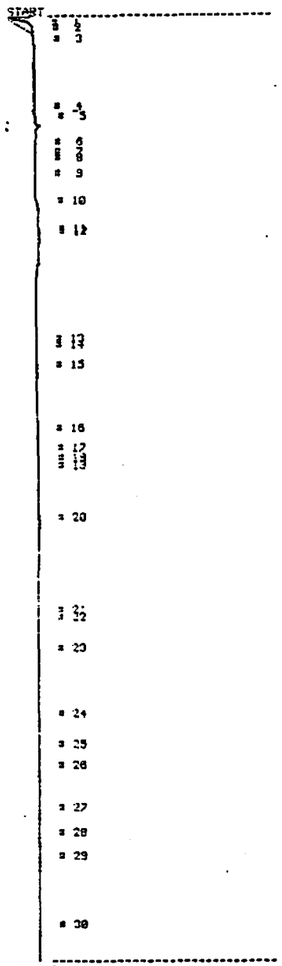
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.2	838.5 aUS
UNKNOWN	3	64.4	155.4 aUS
UNKNOWN	5	97.9	7.7 aUS
UNKNOWN	6	106.7	33.3 aUS
TOLUENE	9	187.1	10.00 PPM

PHOTOVAC

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	0.000 PPB

Fig.

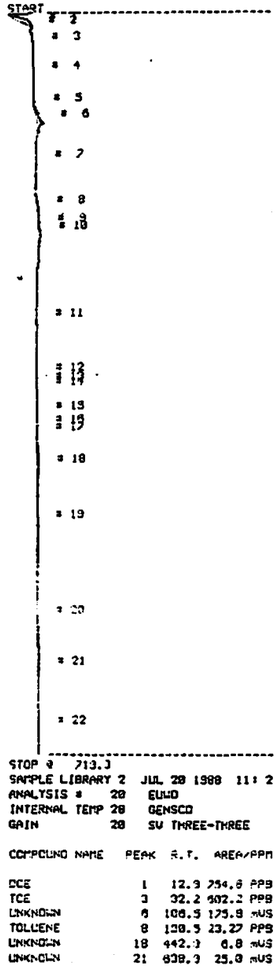
PHOTOVAC



STOP @ 919.3
SAMPLE LIBRARY 2 JUL 20 1988 10:42
ANALYSIS # 19 ELWD
INTERNAL TEMP 27 GENSCO
GAIN 20 SV ONE AT SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	16.6	528.6	mVS
UNKNOWN	4	37.3	7.7	mVS
UNKNOWN	5	108.7	35.1	mVS
TOLUENE	10	189.7	124.7	PPB
UNKNOWN	13	349.1	8.2	mVS
UNKNOWN	20	498.3	65.3	mVS
UNKNOWN	23	625.1	9.5	mVS

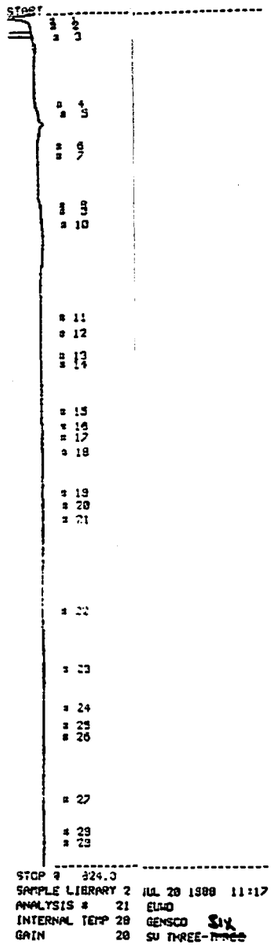
PHOTOVAC



STOP @ 713.3
SAMPLE LIBRARY 2 JUL 20 1988 11: 2
ANALYSIS # 20 ELWD
INTERNAL TEMP 28 GENSCO
GAIN 20 SV THREE-THREE

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
DCE	1	12.9	754.8	PPB
TCE	3	32.2	602.2	PPB
UNKNOWN	8	108.5	175.9	mVS
TOLUENE	8	108.5	23.27	PPB
UNKNOWN	18	442.3	6.8	mVS
UNKNOWN	21	608.3	25.0	mVS

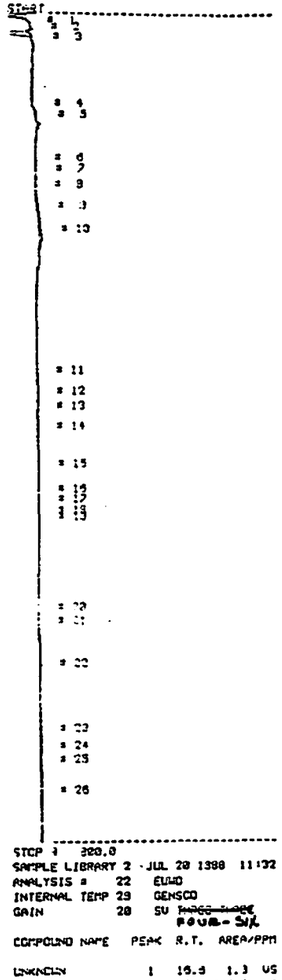
PHOTOVAC



STOP @ 824.3
SAMPLE LIBRARY 2 JUL 20 1988 11:17
ANALYSIS # 21 ELWD
INTERNAL TEMP 28 GENSCO ~~Six~~
GAIN 20 SV ~~THREE-THREE~~

COMPOUND NAME	Peak	R.T.	AREA/PPM	
UNKNOWN		16.8	2.1	VS
UNKNOWN		21.1	380.1	mVS
TCE		32.2	769.4	PPB
UNKNOWN		37.0	13.3	mVS
UNKNOWN		108.6	33.6	mVS
TOLUENE		133.1	75.93	PPB
UNKNOWN	2	644.3	43.3	mVS

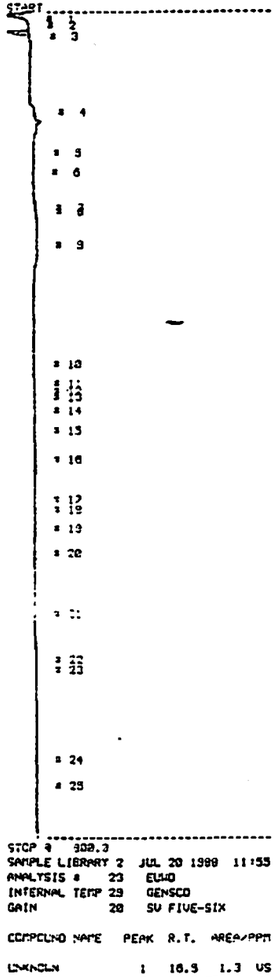
PHOTOVAC



STOP @ 920.0
SAMPLE LIBRARY 2 JUL 20 1988 11:32
ANALYSIS # 22 ELWD
INTERNAL TEMP 29 GENSCO
GAIN 20 SV ~~THREE-THREE~~ FOUR-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	16.8	1.3	VS
UNKNOWN	2	22.9	419.3	mVS
TCE	3	31.3	106.3	PPB
UNKNOWN	4	35.6	13.7	mVS
UNKNOWN	5	108.7	33.1	mVS
TOLUENE	9	135.3	55.93	PPB
PCE	10	219.3	108.3	PPB
UNKNOWN	15	445.7	11.3	mVS
UNKNOWN	22	657.7	25.3	mVS

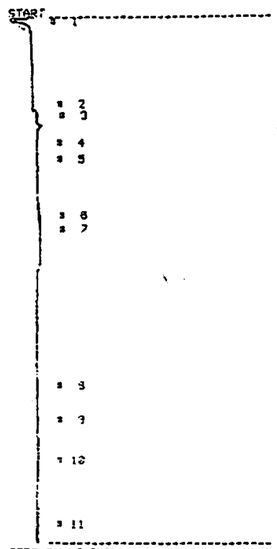
PHOTOVAC



STOP @ 938.3
SAMPLE LIBRARY 2 JUL 20 1988 11:55
ANALYSIS # 23 ELWD
INTERNAL TEMP 29 GENSCO
GAIN 20 SV FIVE-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	16.5	1.3	VS
UNKNOWN	2	22.2	277.5	mVS
TCE	3	33.5	213.2	PPB
UNKNOWN	4	126.5	136.1	mVS
UNKNOWN	7	209.1	25.0	mVS
UNKNOWN	16	444.1	10.3	mVS
UNKNOWN	22	637.1	24.2	mVS
UNKNOWN	24	733.3	16.3	mVS

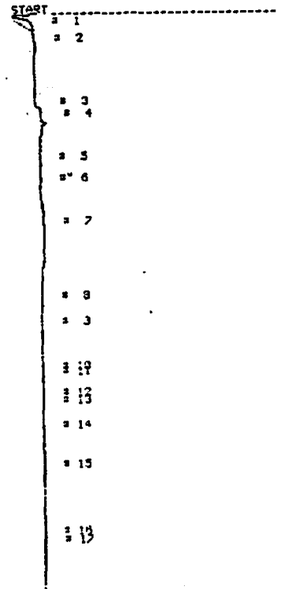
PHOTOVAC



STOP # 313.0
SAMPLE LIBRARY 2 JUL 28 1988 12: 5
ANALYSIS # 24 EUAD
INTERNAL TEMP 29 GENSCO
GAIN 28 BL CHECK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.0	238.2 mVS
UNKNOWN	2	25.7	29.7 mVS
UNKNOWN	3	106.9	33.8 mVS
UNKNOWN	8	234.1	29.2 mVS

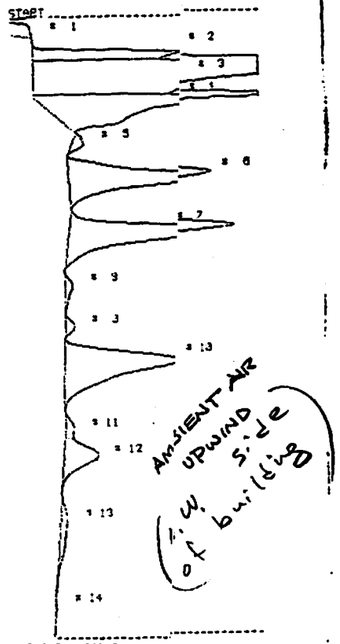
PHOTOVAC



STOP # 603.0
SAMPLE LIBRARY 2 JUL 28 1988 12:31
ANALYSIS # 25 EUAD
INTERNAL TEMP 29 GENSCO
GAIN 28 SU SIX-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	18.4	306.7 mVS
UNKNOWN	3	35.3	27.5 mVS
UNKNOWN	4	106.7	37.2 mVS
PCE	7	211.5	88.43 PPB
UNKNOWN	15	448.1	9.9 mVS

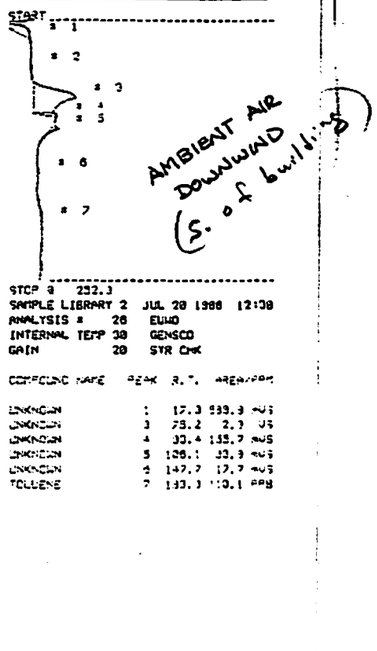
PHOTOVAC



STOP # 660.0
SAMPLE LIBRARY 2 JUL 28 1988 12:49
ANALYSIS # 27 EUAD
INTERNAL TEMP 30 GENSCO
GAIN 28 STR CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	19.3	2.4 VS
UNKNOWN	2	26.4	5.1 VS
UNKNOWN	3	33.3	47.4 VS
UNKNOWN	4	81.3	15.8 VS
UNKNOWN	5	85.1	586.3 mVS
UNKNOWN	6	88.9	10.3 VS
PCE	7	89.1	11.30 PPM
UNKNOWN	9	93.0	576.2 mVS
UNKNOWN	9	93.2	444.5 mVS
UNKNOWN	10	96.9	11.6 VS
UNKNOWN	11	92.9	555.3 mVS
UNKNOWN	12	29.1	3.1 VS
UNKNOWN	13	30.3	1.3 VS

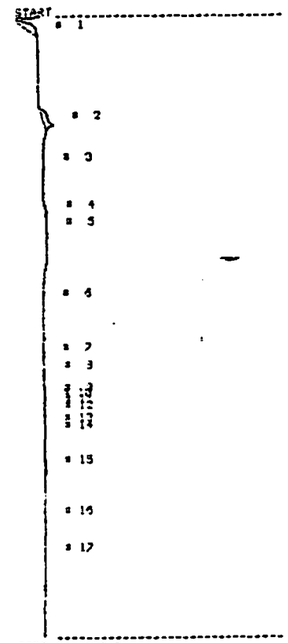
PHOTOVAC



STOP # 252.3
SAMPLE LIBRARY 2 JUL 28 1988 12:08
ANALYSIS # 26 EUAD
INTERNAL TEMP 30 GENSCO
GAIN 28 STR CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.3	589.3 mVS
UNKNOWN	3	25.2	2.3 VS
UNKNOWN	4	33.4	135.7 mVS
UNKNOWN	5	106.1	33.3 mVS
UNKNOWN	6	147.7	17.7 mVS
TOLUENE	7	193.3	110.1 PPB

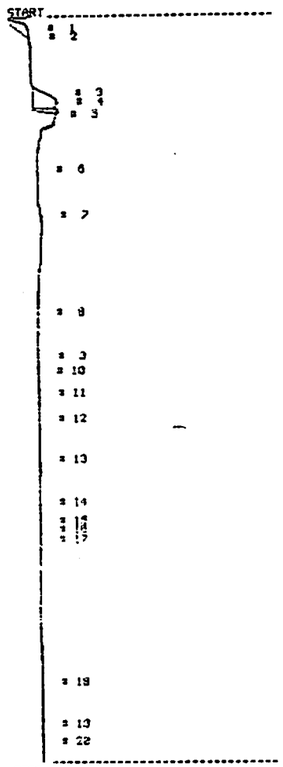
PHOTOVAC



STOP # 620.0
SAMPLE LIBRARY 2 JUL 28 1988 13: 1
ANALYSIS # 28 EUAD
INTERNAL TEMP 29 GENSCO
GAIN 28 SU SEVEN-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	18.1	334.3 mVS
UNKNOWN	2	106.4	368.8 mVS
TOLUENE	4	131.7	67.40 PPB
PCE	5	283.1	9.250 PPB

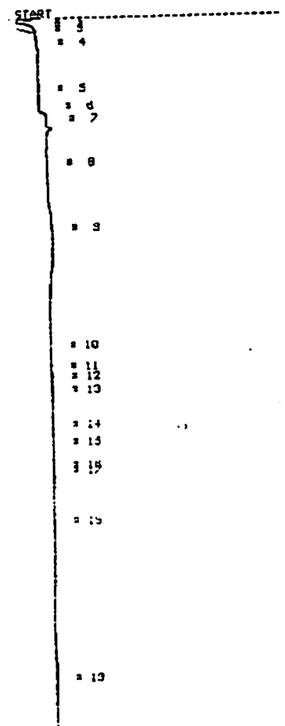
PHOTOVAC



STOP @ 725.2
SAMPLE LIBRARY 2 JUL 28 1988 13:24
ANALYSIS # 29 EUWD
INTERNAL TEMP 38 GENSCO
GAIN 28 SU EIGHT-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	21.6	597.7	mVS
UNKNOWN	3	85.5	1.4	VS
UNKNOWN	4	93.8	188.3	mVS
UNKNOWN	7	283.1	83.2	mVS
UNKNOWN	18	659.1	37.9	mVS

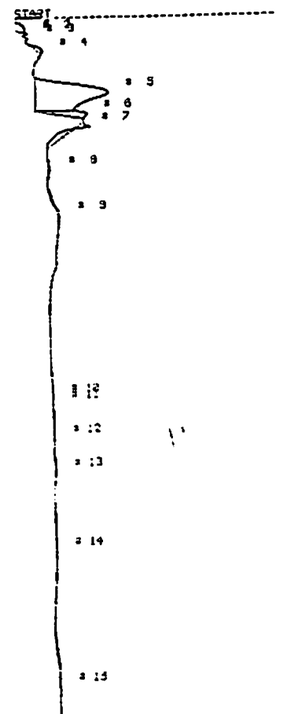
PHOTOVAC



STOP @ 735.5
SAMPLE LIBRARY 2 JUL 28 1988 14:11
ANALYSIS # 31 EUWD
INTERNAL TEMP 38 GENSCO
GAIN 28 SU NINE-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
DCE	1	13.7	1.693	PPM
UNKNOWN	6	34.5	36.2	mVS
UNKNOWN	7	108.7	45.3	mVS
PCE	9	212.3	62.11	PPB
UNKNOWN	13	647.3	64.9	mVS

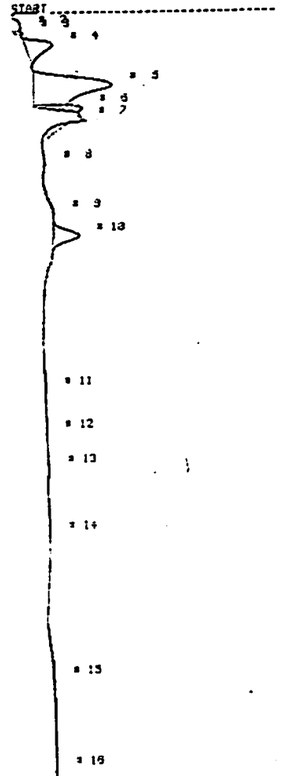
PHOTOVAC



STOP @ 753.0
SAMPLE LIBRARY 2 JUL 28 1988 14:37
ANALYSIS # 32 EUWD
INTERNAL TEMP 38 GENSCO
GAIN 58 SU TEN-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	14.1	276.2	mVS
UNKNOWN	2	19.5	7.7	mVS
UNKNOWN	3	28.7	21.8	mVS
TCE	4	33.1	873.0	PPB
UNKNOWN	5	79.7	6.8	VS
UNKNOWN	6	93.7	208.9	mVS
UNKNOWN	9	147.3	38.1	mVS
UNKNOWN	10	368.1	7.5	mVS
UNKNOWN	12	409.5	11.8	mVS
UNKNOWN	13	440.3	11.9	mVS
UNKNOWN	14	516.3	38.3	mVS
UNKNOWN	15	647.3	125.7	mVS
UNKNOWN	16	722.3	48.1	mVS

PHOTOVAC



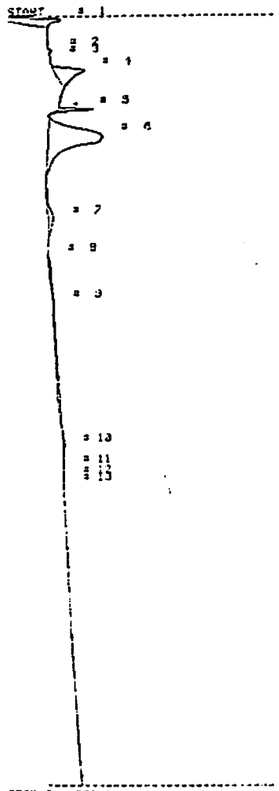
STOP @ 753.0
SAMPLE LIBRARY 2 JUL 28 1988 15: 5
ANALYSIS # 33 EUWD
INTERNAL TEMP 38 GENSCO
GAIN 58 SU ELEV-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	2.9	12.1	mVS
UNKNOWN	2	19.4	530.3	mVS
UNKNOWN	3	28.7	102.2	mVS
TCE	4	32.3	3.102	PPM
UNKNOWN	5	71.9	6.4	VS
UNKNOWN	6	93.3	594.1	mVS
UNKNOWN	9	147.3	96.3	mVS
PCE	10	216.5	450.1	PPB
UNKNOWN	11	367.3	8.8	mVS
UNKNOWN	13	442.5	137.3	mVS
UNKNOWN	14	597.8	20.8	mVS
UNKNOWN	15	647.3	209.2	mVS
UNKNOWN	16	714.7	48.3	mVS

Chen & Associates

Fig.

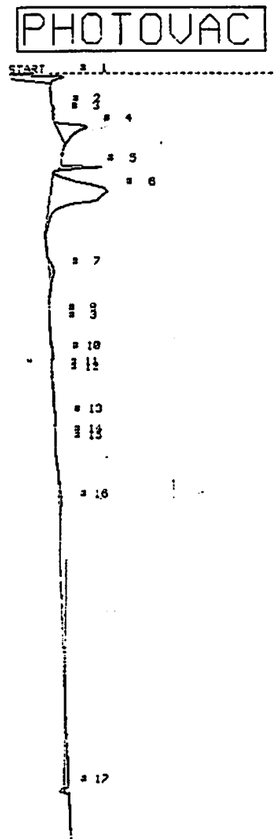
PHOTOVAC



STOP 9 750.0
SAMPLE LIBRARY 2 JUL 22 1988 15:37
ANALYSIS # 33 EUAD
INTERNAL TEMP 34 GENSCO
GAIN 50 SV THIRTY ONE

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.3	323.8 mVS
UNKNOWN	2	34.9	21.0 mVS
TCE	4	54.4	1.1 US
UNKNOWN	5	92.1	288.4 mVS
UNKNOWN	6	113.2	4.5 US
UNKNOWN	7	139.1	487.6 mVS
UNKNOWN	9	230.4	6.2 mVS

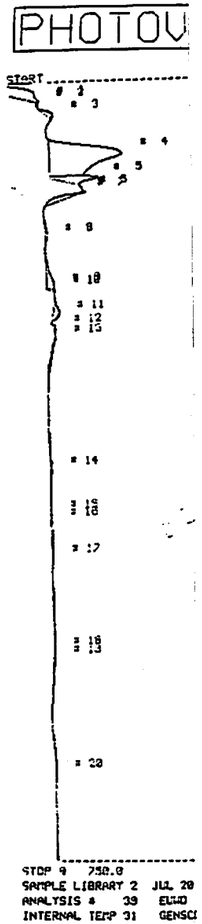
PHOTOVAC



STOP 9 750.0
SAMPLE LIBRARY 2 JUL 22 1988 16: 2
ANALYSIS # 34 EUAD
INTERNAL TEMP 34 GENSCO
GAIN 50 SV THIRTY TWO

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	4.3	977.2 mVS
UNKNOWN	2	34.3	21.8 mVS
UNKNOWN	4	53.5	1.1 US
UNKNOWN	5	92.1	346.7 mVS
UNKNOWN	6	114.7	4.7 US
UNKNOWN	7	132.9	259.3 mVS
UNKNOWN	10	273.5	139.1 mVS
UNKNOWN	16	416.3	267.7 mVS
UNKNOWN	17	692.1	4.3 US

PHOTOV AC



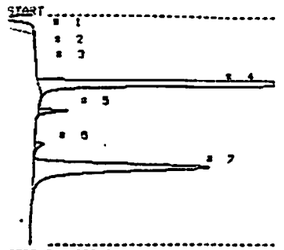
STOP 9 750.0
SAMPLE LIBRARY 2 JUL 20
ANALYSIS # 39 EUAD
INTERNAL TEMP 31 GENSCO
GAIN 50 SV TWE

1988 15:52

LVE-SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.	4 1.9 US
TCE	3	32.	3 343.3 PPB
UNKNOWN	4	70.	3 6.5 US
UNKNOWN	5	92.	3 266.3 mVS
UNKNOWN	8	149.	3 115.5 mVS
UNKNOWN	9	199.	3 471.9 mVS
UNKNOWN	10	208.	5 43.5 mVS
PCE	11	224.	1 101.8 PPB
UNKNOWN	12	237.	3 27.3 mVS
UNKNOWN	14	324.	3 136.9 mVS
UNKNOWN	17	453.	1 15.3 mVS
UNKNOWN	18	547.	3 43.2 mVS
UNKNOWN	20	665.	3 112.3 mVS

PHOTOVAC



STOP 9 220.0
SAMPLE LIBRARY 2 JUL 22 1988 8:35
ANALYSIS # 11 EUAD
INTERNAL TEMP 25 GENSCO
GAIN 50 TCE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.0	1.8 US
UNKNOWN	4	65.8	10.1 US
UNKNOWN	5	92.4	303.3 mVS
UNKNOWN	6	125.3	137.3 mVS
UNKNOWN	7	148.5	5.3 US

PHOTOVAC

CALIBRATED PEAK 1,TCE

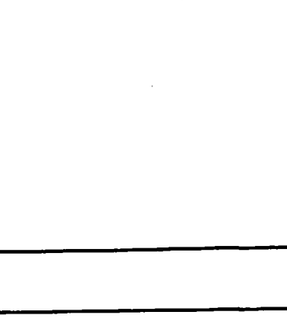
SAMPLE LIBRARY 2 JUL 22 1988 8:36
ANALYSIS # 11 EUAD
INTERNAL TEMP 25 GENSCO
GAIN 50 TCE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	17.0	1.8 US
TCE	4	65.8	71.10 PPM
UNKNOWN	5	92.4	309.3 mVS
UNKNOWN	6	125.3	137.3 mVS
UNKNOWN	7	148.5	5.3 US

PHOTOVAC

2 COMPOUND	ID #	R.T.	LIMIT
TCE	1	65.8	500.0 PPM
PCE	2	442.3	500.0 PPM
DCE	3	26.8	500.0 PPM
TOLUENE	4	300.0	0.000 PPB

PHOTOVAC



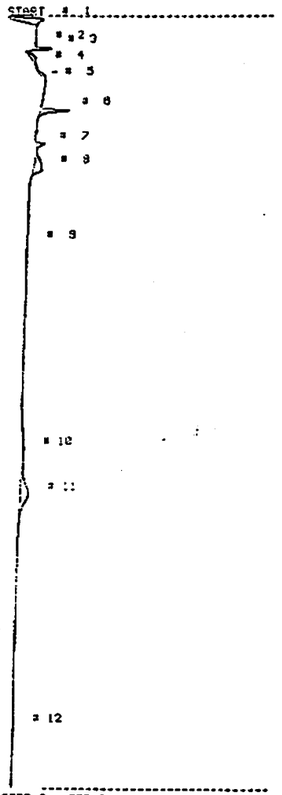
STOP 4 342.3
SAMPLE LIBRARY 2 JUL 22 1988 8:44
ANALYSIS # 12 EUAD
INTERNAL TEMP 25 GENSCO
GAIN 50 BL CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	22.5	2.0 US
UNKNOWN	3	32.4	201.1 mVS
UNKNOWN	4	129.3	147.8 mVS

Chen & Associates

Fig.

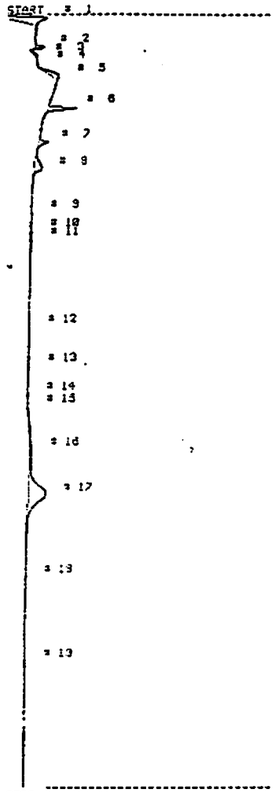
PHOTOVAC



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

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.3	432.9	mVS
UNKNOWN	3	32.8	163.2	mVS
UNKNOWN	4	47.7	127.0	mVS
TCE	5	83.1	477.4	PPB
UNKNOWN	6	92.3	233.3	mVS
UNKNOWN	7	125.3	188.1	mVS
UNKNOWN	8	148.7	447.8	mVS
[illegible]	10	423.7	37.33	PPB
PCE	11	467.3	426.1	mVS

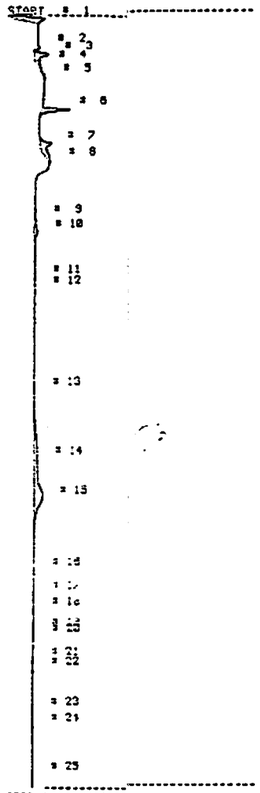
PHOTOVAC



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

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.6	697.9	mVS
UNKNOWN	2	33.0	32.5	mVS
UNKNOWN	3	41.8	27.2	mVS
TCE	5	82.1	141.6	mVS
UNKNOWN	6	92.3	233.0	mVS
UNKNOWN	7	125.2	34.9	mVS
UNKNOWN	8	131.3	233.2	mVS
[illegible]	16	425.3	13.69	PPB
PCE	17	469.3	1.3	US

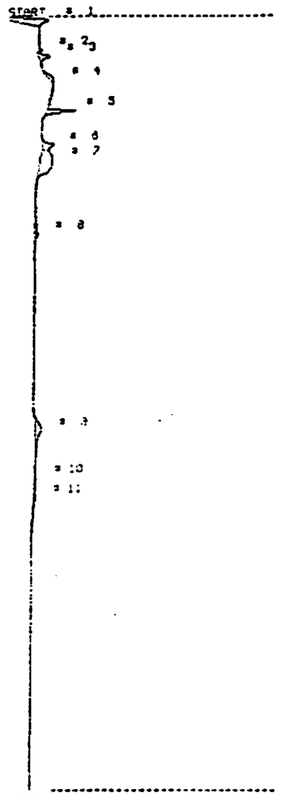
PHOTOVAC



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

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.5	326.5	mVS
UNKNOWN	2	32.5	18.2	mVS
UNKNOWN	3	39.3	245.6	mVS
UNKNOWN	4	48.4	50.4	mVS
TCE	5	81.4	103.9	PPB
UNKNOWN	6	92.1	293.4	mVS
UNKNOWN	7	128.1	242.3	mVS
UNKNOWN	8	141.7	232.3	mVS
UNKNOWN	9	212.3	47.1	mVS
[illegible]	4	431.7	120.9	PPB
PCE	5	470.1	382.6	PPB

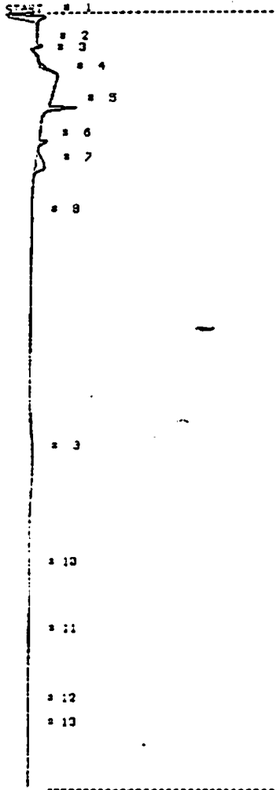
PHOTOVAC



STOP # 733.3
SAMPLE LIBRARY 2 JUL 22 1988 10: 9
ANALYSIS # 16 EUMO
INTERNAL TEMP 28 GENSCO
GAIN 50 SU SIXTEEN

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.6	531.7	mVS
UNKNOWN	2	33.1	21.8	mVS
UNKNOWN	3	39.4	144.2	mVS
TCE	4	82.3	526.9	PPB
UNKNOWN	5	92.3	261.5	mVS
UNKNOWN	6	125.1	242.5	mVS
UNKNOWN	7	148.7	388.3	mVS
UNKNOWN	8	212.5	66.5	mVS
TOLUENE	9	423.3	513.8	PPB
[illegible]	10	443.3	3.123	PPB
PCE	11	468.5	5.511	PPB

PHOTOVAC

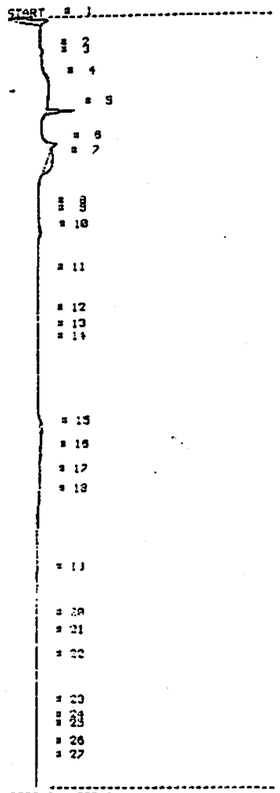


STOP # 733.0
SAMPLE LIBRARY 2 JUL 22 1988 10:23
ANALYSIS # 17 EUMO
INTERNAL TEMP 28 GENSCO
GAIN 50 SU SEVENTEEN

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.5	481.3	mVS
UNKNOWN	2	32.3	53.7	mVS
UNKNOWN	3	42.9	31.0	mVS
UNKNOWN	5	92.3	264.9	mVS
UNKNOWN	6	126.3	100.1	mVS
UNKNOWN	7	150.3	422.5	mVS
PCE	3	423.1	12.93	PPB

9-084-80	**Chen & Associates**		Fig.

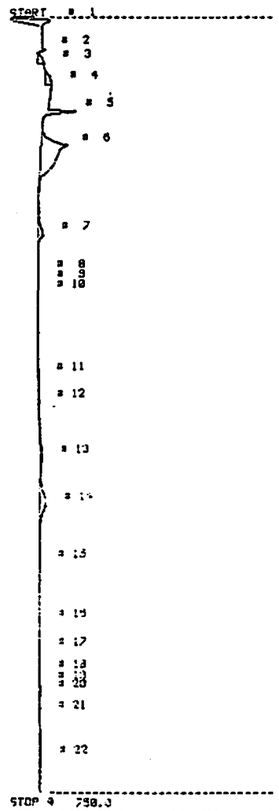
PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 10:42
ANALYSIS # 18 EUAD
INTERNAL TEMP 28 GENSCO
GAIN 50 SU EIGHTEEN

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.5	421.3	mVS
UNKNOWN	2	34.5	28.1	mVS
TCE	4	62.5	187.4	PPB
UNKNOWN	5	92.3	252.3	mVS
UNKNOWN	6	126.1	183.5	mVS
UNKNOWN	7	140.0	354.3	mVS
UNKNOWN	10	212.5	64.3	mVS
TOLUENE	15	404.5	217.8	PPB
[illegible]	16	426.3	2.474	PPB
PCE	18	428.1	3.643	PPB

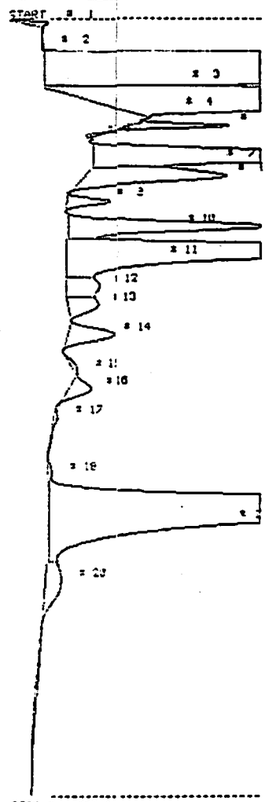
PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 11:12
ANALYSIS # 19 EUAD
INTERNAL TEMP 29 GENSCO
GAIN 50 SU NINETEEN

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.4	508.0	mVS
UNKNOWN	2	32.8	31.9	mVS
UNKNOWN	3	45.3	174.7	mVS
TCE	4	65.8	1.761	PPM
UNKNOWN	5	92.3	249.8	mVS
UNKNOWN	6	126.1	2.8	VS
UNKNOWN	7	212.5	137.2	mVS
[illegible]	13	428.3	60.41	PPB
PCE	14	473.7	102.2	PPB
UNKNOWN	22	713.3	9.0	mVS

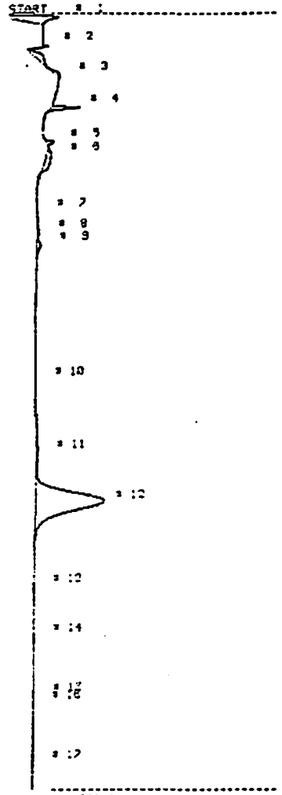
PHOTOVAC



STOP # 732.3
SAMPLE LIBRARY JUL 22 1988 11:38
ANALYSIS # 2 EUAD
INTERNAL TEMP 2 GENSCO
GAIN 5 SU TWENTY AT THR

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.4	445.0	mVS
UNKNOWN	3	47.7	251.9	VS
UNKNOWN	4	78.3	33.8	VS
UNKNOWN	5	105.3	2.3	VS
UNKNOWN	6	116.8	43.2	mVS
UNKNOWN	7	134.5	23.4	VS
UNKNOWN	8	154.5	9.3	VS
UNKNOWN	9	178.5	1.2	VS
UNKNOWN	10	232.7	3.3	VS
UNKNOWN	11	226.2	42.2	VS
UNKNOWN	12	261.2	2.3	VS
UNKNOWN	13	279.2	1.3	VS
UNKNOWN	14	308.3	2.6	VS
UNKNOWN	15	342.9	132.3	mVS
TOLUENE	16	380.5	1.887	PPM
TOLUENE	17	388.1	229.5	PPB
[illegible]	18	442.3	37.70	PPB
PCE	19	475.5	43.37	PPM
UNKNOWN	20	554.8	1.4	VS

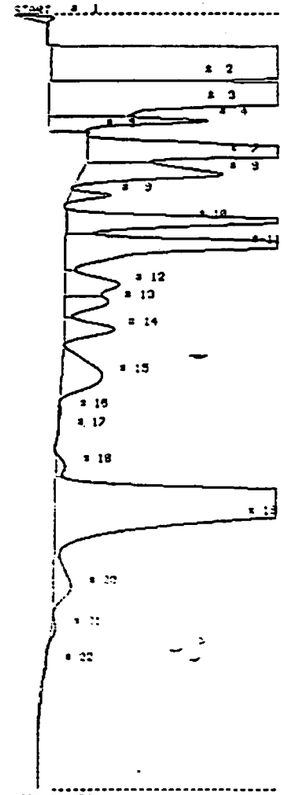
PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 11:47
ANALYSIS # 21 EUAD
INTERNAL TEMP 30 GENSCO
GAIN 50 SU TWENTY ONE

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.5	834.7	mVS
UNKNOWN	2	32.8	59.6	mVS
TCE	3	61.4	1.931	PPM
UNKNOWN	4	92.2	248.4	mVS
UNKNOWN	5	124.3	34.7	mVS
UNKNOWN	6	133.7	357.7	mVS
UNKNOWN	9	213.3	27.8	mVS
UNKNOWN	1	226.1	34.6	mVS
[illegible]	11	426.3	66.34	PPB
PCE	12	474.3	2.131	PPM

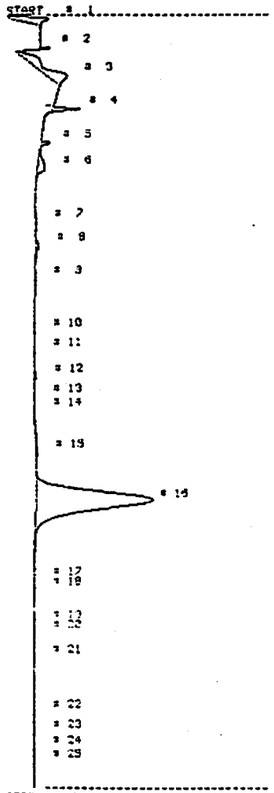
PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 JUL 22 1988 12: 2
ANALYSIS # 22 EUAD
INTERNAL TEMP 30 GENSCO
GAIN 50 SU TWENTY TWO

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	4.4	458.8	mVS
UNKNOWN	2	42.4	237.3	VS
UNKNOWN	3	77.3	49.3	VS
UNKNOWN	4	104.3	5.2	VS
UNKNOWN	5	115.2	178.6	mVS
UNKNOWN	7	135.2	20.6	VS
UNKNOWN	8	158.5	7.4	VS
UNKNOWN	9	178.3	1.1	VS
UNKNOWN	10	232.7	11.2	VS
UNKNOWN	11	225.2	10.2	VS
UNKNOWN	12	264.8	3.9	VS
UNKNOWN	13	281.6	2.3	VS
UNKNOWN	14	308.5	2.8	VS
[illegible]	15	353.9	6.668	PPM
TOLUENE	16	388.1	76.78	PPB
[illegible]	17	435.3	60.51	PPB
[illegible]	18	448.3	232.0	PPB
PCE	19	474.2	56.43	PPM
UNKNOWN	20	557.9	2.1	VS
UNKNOWN	21	637.3	248.2	mVS

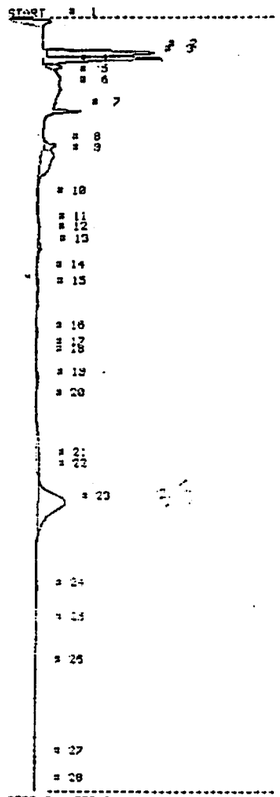
PHOTOVAC



STOP # 758.3
SAMPLE LIBRARY 2 JUL 22 1988 12:20
ANALYSIS # 23 EUHD
INTERNAL TEMP 30 GENSCO
GAIN 50 SU TWENTY THREE

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	1	4.4	545.2	mUS
UNKNOWN	2	32.6	122.5	mUS
UNKNOWN TCE	3	39.6	1.3	US
UNKNOWN	4	42.2	240.6	mUS
UNKNOWN	5	126.3	30.3	mUS
UNKNOWN	6	150.9	348.5	mUS
UNKNOWN	8	225.9	33.1	mUS
~~[illegible]~~	15	427.7	12.40	PPB~~%~~
PCE	16	473.3	3,733	PPB✓

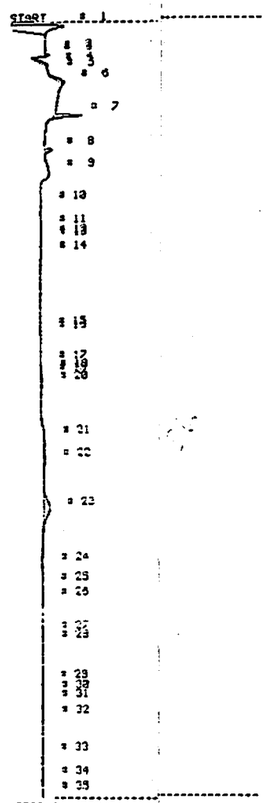
PHOTOVAC



STOP # 758.3
SAMPLE LIBRARY 2 JUL 22 1988 12:33
ANALYSIS # 24 EUHD
INTERNAL TEMP 31 GENSCO
GAIN 50 SU TWENTY FOUR ~~THREE~~

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	1	4.3	535.7	mUS
UNKNOWN	2	33.8	2.0	US
UNKNOWN	3	41.1	1.8	US
UNKNOWN	4	48.9	220.3	mUS
UNKNOWN TCE	5	59.6	9.1	mUS
~~[illegible]~~	6	70.5	34.35	PPB
UNKNOWN	7	72.2	242.7	mUS
UNKNOWN	8	126.5	262.3	mUS
UNKNOWN	9	137.1	833.3	mUS
UNKNOWN	11	204.3	25.0	mUS
UNKNOWN	12	212.3	5.2	mUS
UNKNOWN	13	223.5	78.3	mUS
UNKNOWN	15	260.3	3.0	mUS
UNKNOWN	16	309.8	23.4	mUS
TOLUENE	19	354.9	29.82	PPB
~~[illegible]~~	21	433.7	173.3	PPB~~%~~
~~[illegible]~~	22	444.3	13.30	PPB~~%~~
PCE	23	474.1	818.6	PPB✓
UNKNOWN	24	559.9	77.3	mUS
UNKNOWN	25	653.5	10.0	mUS

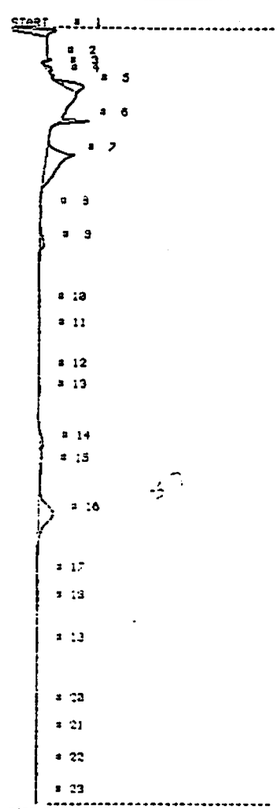
PHOTOVAC



STOP # 758.3
SAMPLE LIBRARY 2 JUL 22 1988 13:30
ANALYSIS # 25 EUHD
INTERNAL TEMP 32 GENSCO
GAIN 50 SU TWENTY FIVE

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	1	4.7	1.3	US
UNKNOWN	3	33.0	46.3	mUS
UNKNOWN	4	42.6	78.0	mUS
UNKNOWN	5	48.6	6.4	mUS
~~[illegible]~~ TCE	6	59.8	78.0	mUS
UNKNOWN	7	82.2	238.3	mUS
UNKNOWN	8	126.5	30.2	mUS
UNKNOWN	9	137.9	37.4	mUS
UNKNOWN	11	204.1	5.3	mUS
UNKNOWN	14	260.9	6.4	mUS
TOLUENE	21	355.5	116.9	PPB
~~[illegible]~~	22	433.5	7,773	PPB~~%~~
PCE	23	474.9	287.3	PPB✓

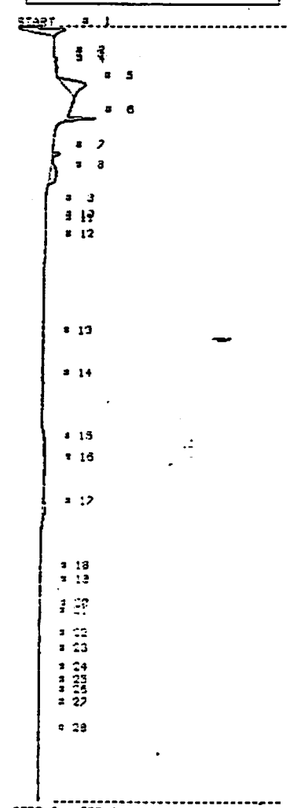
PHOTOVAC



STOP # 758.3
SAMPLE LIBRARY 2 JUL 22 1988 13:46
ANALYSIS # 26 EUHD
INTERNAL TEMP 32 GENSCO
GAIN 50 SU TWENTY SIX

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	1	4.3	579.4	mUS
UNKNOWN	2	32.7	32.1	mUS
UNKNOWN	3	41.7	21.4	mUS
UNKNOWN	4	48.3	13.7	mUS
~~[illegible]~~ TCE	5	58.9	537.1	mUS
UNKNOWN	6	82.1	224.5	mUS
UNKNOWN	7	126.3	1.3	US
UNKNOWN	8	178.7	11.3	mUS
UNKNOWN	9	211.7	228.1	mUS
~~[illegible]~~	13	286.3	18.58	PPB
TOLUENE	14	405.3	232.2	PPB
~~[illegible]~~	15	426.9	4,163	PPB~~%~~
PCE	16	474.5	422.8	PPB✓
UNKNOWN	22	715.7	5.4	mUS

PHOTOVAC



STOP # 758.3
SAMPLE LIBRARY 2 JUL 22 1988 14:17
ANALYSIS # 27 EUHD
INTERNAL TEMP 33 GENSCO
GAIN 50 SU TWENTY SEVEN

COMPOUND NAME	PEAK	R.T.	AREA/PPB	
UNKNOWN	1	4.3	784.8	mUS
UNKNOWN	2	33.2	23.3	mUS
UNKNOWN	4	41.9	18.2	mUS
~~[illegible]~~ TCE	5	58.6	786.6	mUS
UNKNOWN	6	82.2	235.9	mUS
UNKNOWN	7	126.5	31.1	mUS
UNKNOWN	8	144.7	339.2	mUS
TOLUENE	15	428.9	79.28	PPB
~~[illegible]~~	16	428.5	12,83	PPB~~%~~
PCE	17	478.9	43.21	PPB✓
UNKNOWN	22	697.3	6.7	mUS

Chen & Associates

Fig.

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

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, ~~Geologist~~

MMB/irb
Enclosure

TABLE I

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

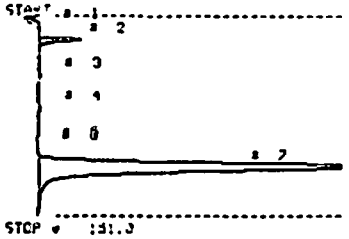
Sampling Point	PCE Concentration (ppb)	TCE Concentration (ppb)	Benzene Concentration (ppb)	Toluene Concentration (ppb)
SV-33 @ 5'	545	ND	ND	5375
SV-34 @ 5'	612	ND	ND	4950
SV-35 @ 5'	ND	3	16	12,145
SV-36 @ 4'	ND	ND	ND	2924
SV-37 @ 5'	ND	2	ND	2270
SV-38 @ 5'	1792	3	ND	2790
SV-39 @ 5'	1640	ND	ND	3755
SV-40 @ 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

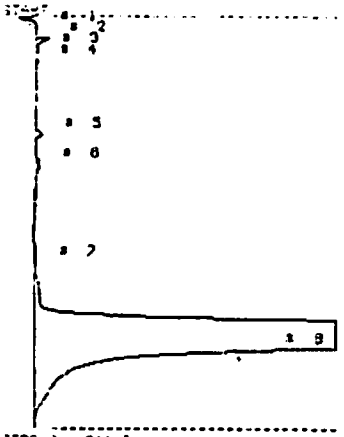
PHOTOVAC



STOP # 131.3
SAMPLE LIBRARY 2 AUG 11 1988 9:27
ANALYSIS # 7 ELWD UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 ~~Benzene~~ TCE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	8.6	31.2 AUS
UNKNOWN	2	18.9	332.0 AUS
UNKNOWN	3	45.8	5.4 AUS
UNKNOWN	4	69.9	16.0 AUS
PCE	7	113.3	2.417 PPM

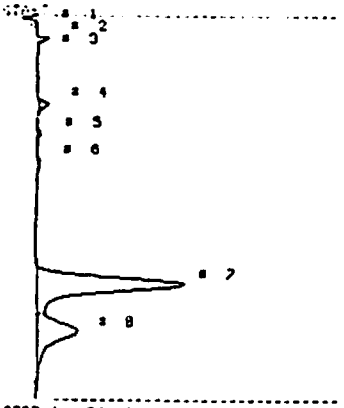
PHOTOVAC



STOP # 311.7
SAMPLE LIBRARY 2 AUG 11 1988 9:43
ANALYSIS # 9 ELWD UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 PCE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	9.1	112.4 AUS
UNKNOWN	2	19.0	331.4 AUS
UNKNOWN	3	45.8	5.4 AUS
UNKNOWN	4	69.9	16.0 AUS
TCE	6	113.3	28.33 PPB
UNKNOWN	7	224.1	4.2 AUS
PCE	8	241.1	2.417 PPM

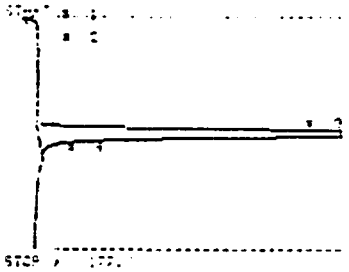
PHOTOVAC



STOP # 283.1
SAMPLE LIBRARY 2 AUG 11 1988 9:58
ANALYSIS # 10 ELWD UVALDE 2
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 TOL CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	8.6	32.1 AUS
UNKNOWN	2	18.9	332.7 AUS
UNKNOWN	4	69.9	144.9 AUS
BENZENE	5	82.2	61.55 PPB
TCE	6	113.3	9.759 PPB
UNKNOWN	7	224.1	4.2 AUS
PCE	8	241.1	2.417 PPM

PHOTOVAC



STOP # 177.1
SAMPLE LIBRARY 2 AUG 11 1988 9:35
ANALYSIS # 8 ELWD UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 BENZENE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	8.6	32.1 AUS
UNKNOWN	3	45.8	5.4 AUS

PHOTOVAC

2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	89.3	500.0 PPM
PCE	2	241.3	0.000 PPB
TCE	5	113.3	0.000 PPB

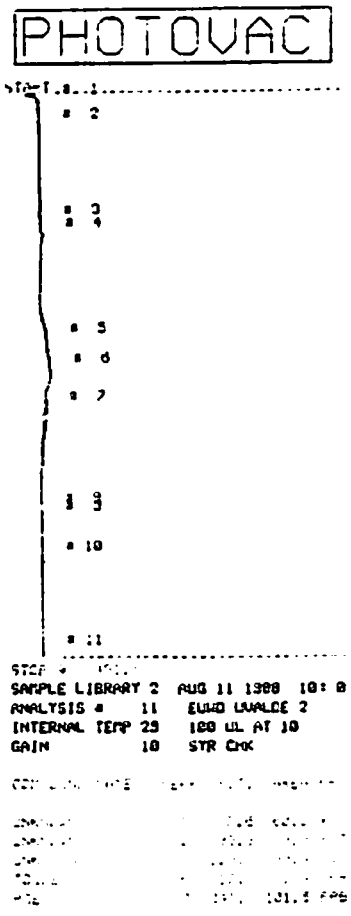
PHOTOVAC

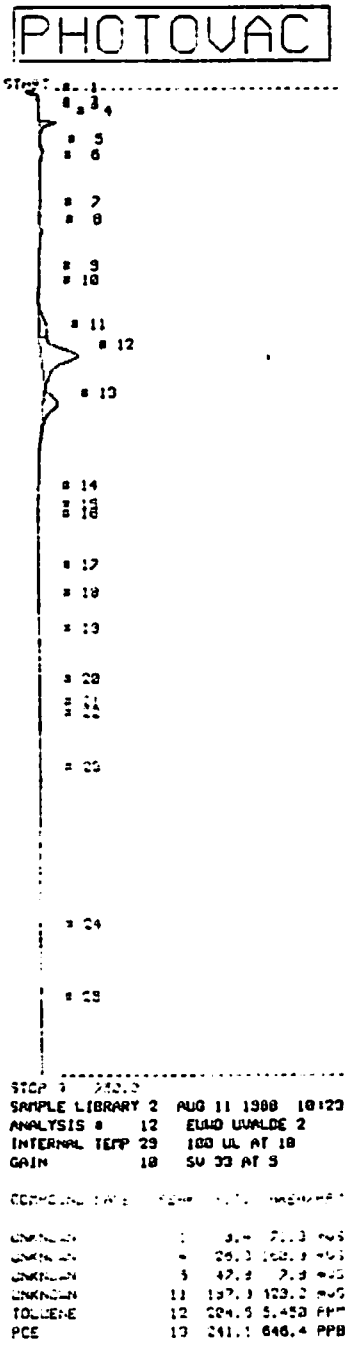
2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	89.3	500.0 PPM
PCE	2	241.0	0.000 PPB
TOLUENE	3	284.1	500.0 PPM
TCE	5	113.3	0.000 PPB

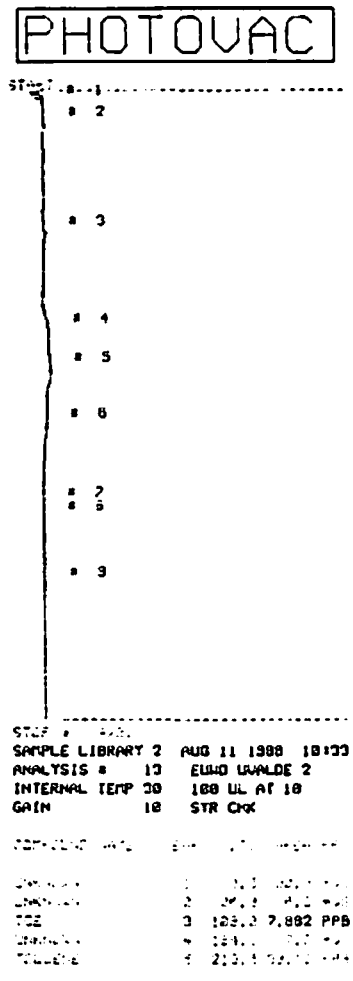
PHOTOVAC

2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	89.3	500.0 PPM
TOLUENE	4	36.1	0.000 PPB
TCE	5	113.3	0.000 PPB

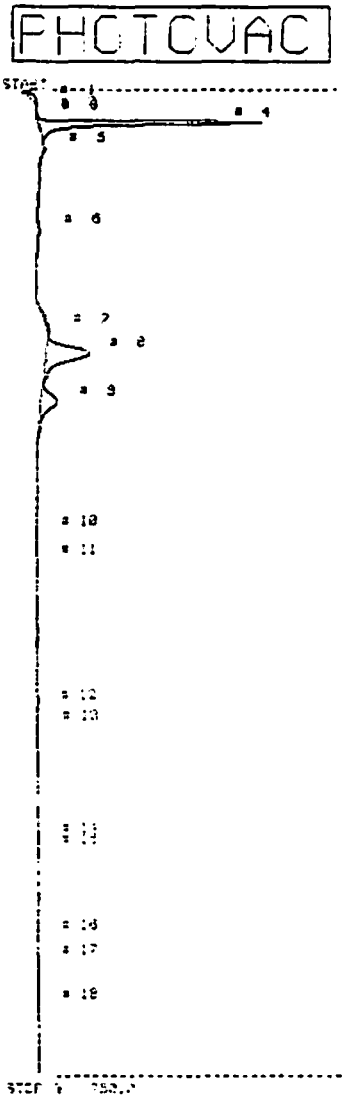
9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-1

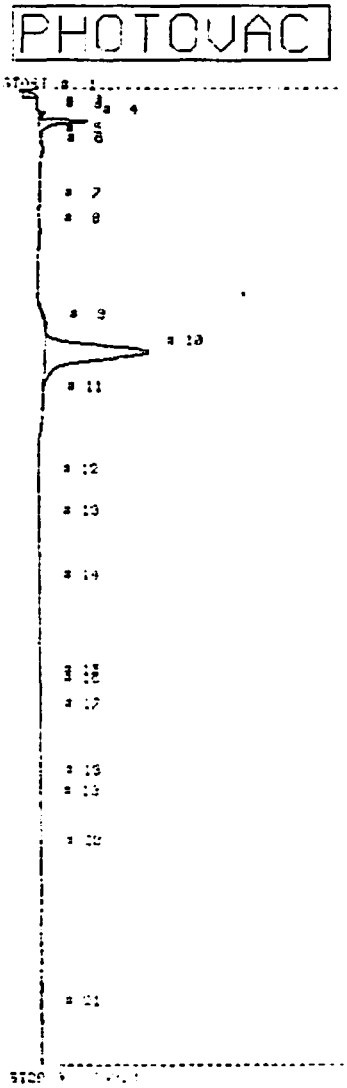


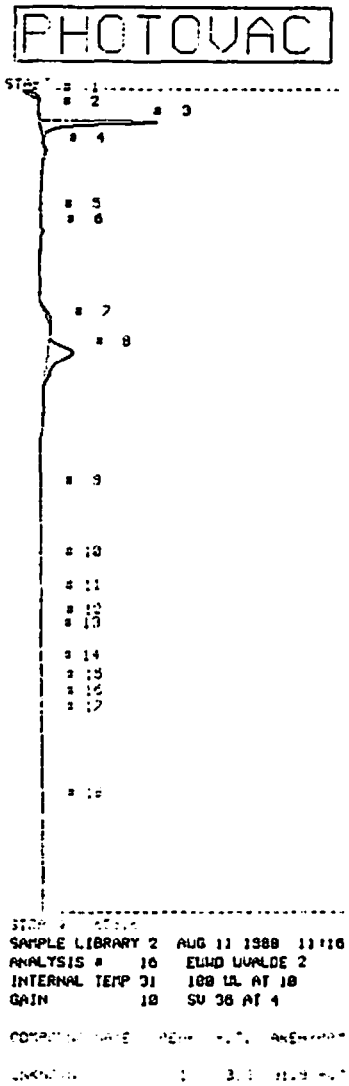




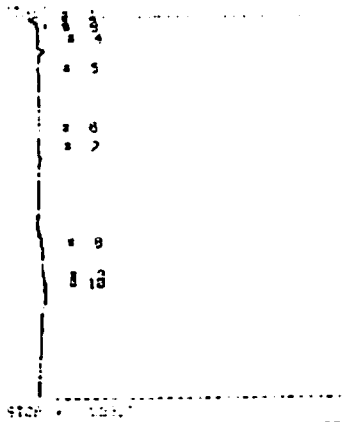
9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A - 2



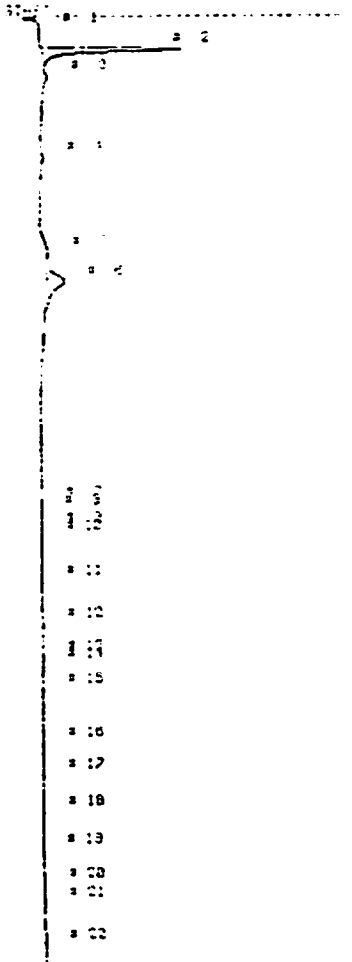




9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-3

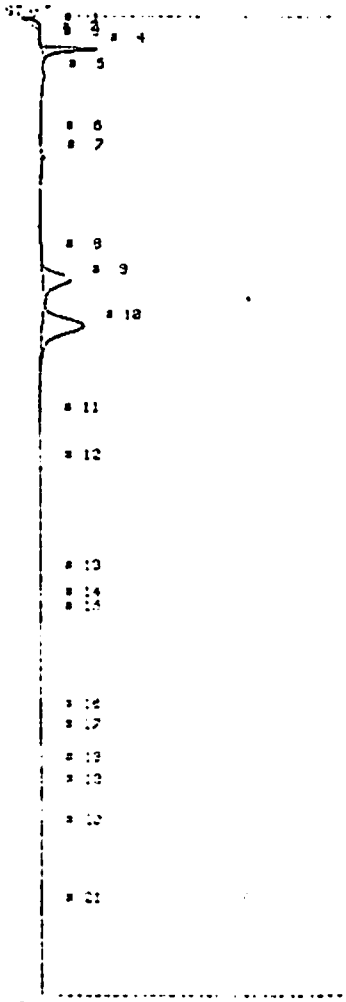


SAMPLE LIBRARY 2 AUG 11 1988 11:23
ANALYSIS # 17 EUHD UVALDE 2
INTERNAL TEMP 32 100 UL AT 10
GAIN 10 STR CHK



SAMPLE LIBRARY 2 AUG 11 1988 11:36
ANALYSIS # 18 EUHD UVALDE 2
INTERNAL TEMP 33 100 UL AT 10
GAIN 10 SU 37 AT 5

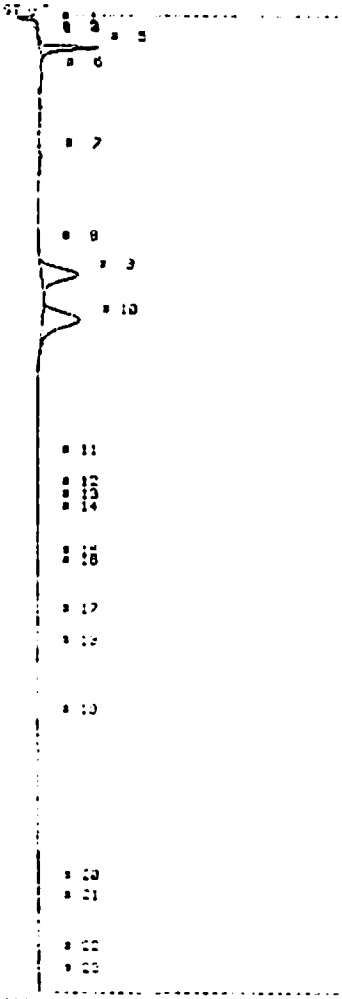
PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 11:55
ANALYSIS # 19 EUHD UVALDE 2
INTERNAL TEMP 33 100 UL AT 10
GAIN 10 SU 38 AT 5

TCE	12	11.08	PPB
	13	1.894	PPB

PHOTOVAC

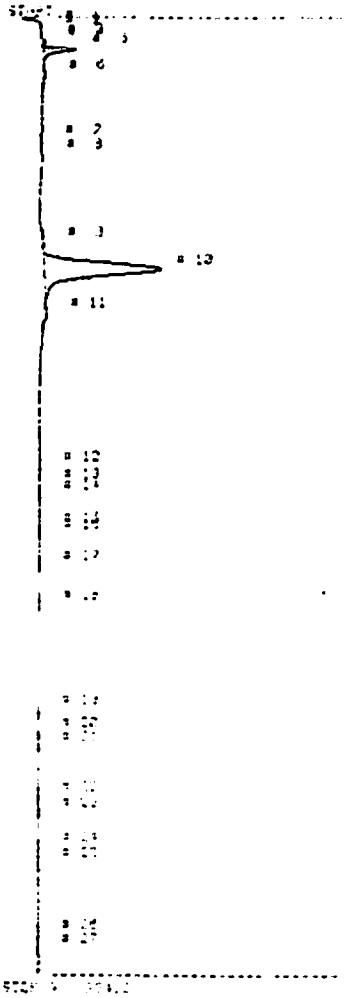


SAMPLE LIBRARY 2 AUG 11 1988 12:13
ANALYSIS # 20 EUHD UVALDE 2
INTERNAL TEMP 34 100 UL AT 10
GAIN 10 SU 39 AT 5

TOLUENE	9	3.891	PPB
PCE	10	1.742	PPB

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-4

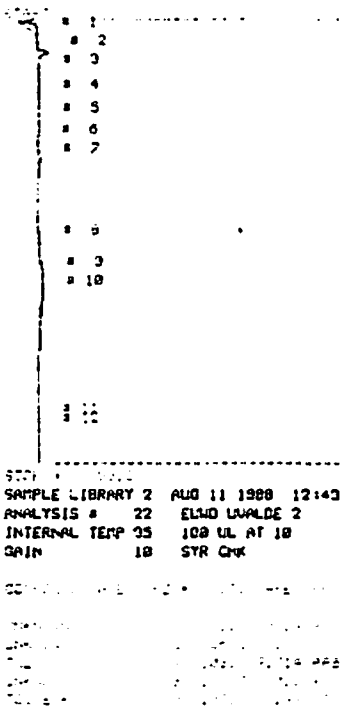
PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 12:36
ANALYSIS # 21 ELWD LVALDE 2
INTERNAL TEMP 34 100 UL AT 10
GAIN 10 SU 48 AT 5

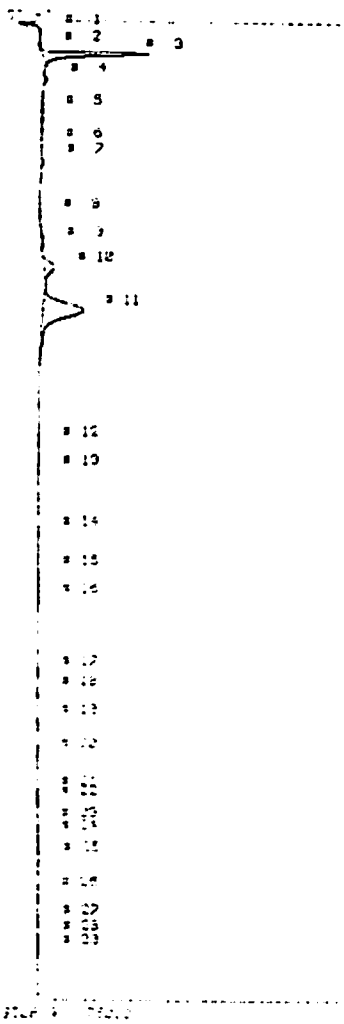
PCE

PHOTOVAC



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

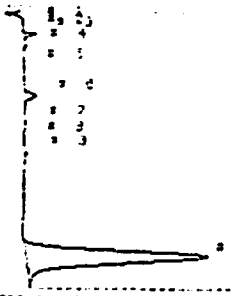
PHOTOVAC



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

TCL
PCE

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A - 5



SAMPLE LIBRARY 2 AUG 11 1988 13: 5
ANALYSIS # 24 EUAD UVALDE 2
INTERNAL TEMP 36 100 UL AT 10
GAIN 10 TOL CAL

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE 1 83.3 500.3 PPM
PCE 2 241.0 0.000 PPB
TOLUENE 3 [illegible] [illegible] PPM
TCE 5 113.3 0.000 PPB

PHOTOVAC

CALIBRATED PEAK IS TOLUENE

SAMPLE LIBRARY 2 AUG 11 1988 13: 7
ANALYSIS # 24 EUAD UVALDE 2
INTERNAL TEMP 36 100 UL AT 10
GAIN 10 TOL CAL

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE 1 82.4 500.0 PPM
PCE 2 222.3 0.000 PPB
TOLUENE 3 198.3 500.3 PPM
TCE 5 134.5 0.000 PPB

PHOTOVAC

SAMPLE LIBRARY 2 AUG 11 1988 13:25
ANALYSIS # 25 EUAD UVALDE 2
INTERNAL TEMP 35 100 UL AT 10
GAIN 10 SV 42 AT 5

TCE [illegible] 0.000 PPB

PHOTOVAC

SAMPLE LIBRARY 2 AUG 11 1988 14:40
ANALYSIS # 28 EUAD UVALDE 2
INTERNAL TEMP 40 100 UL AT 10
GAIN 10 TOL CHK

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE 1 82.4 500.3 PPM
PCE 2 222.3 0.000 PPB
TOLUENE 3 198.3 500.3 PPM
TCE 5 134.5 0.000 PPB

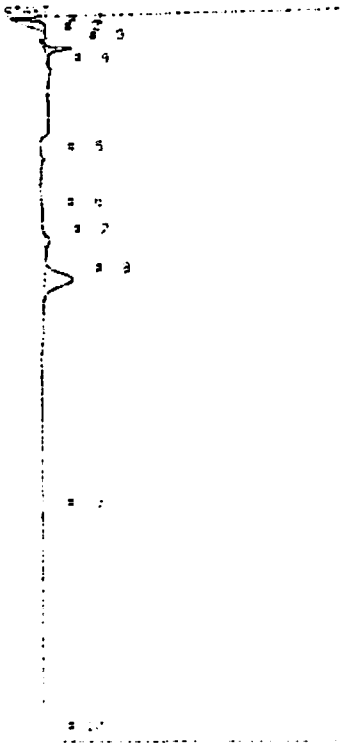
PHOTOVAC

CALIBRATED PEAK IS TOLUENE

SAMPLE LIBRARY 2 AUG 11 1988 14:50
ANALYSIS # 29 EUAD UVALDE 2
INTERNAL TEMP 40 100 UL AT 10
GAIN 10 TOL CHK

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A - 6

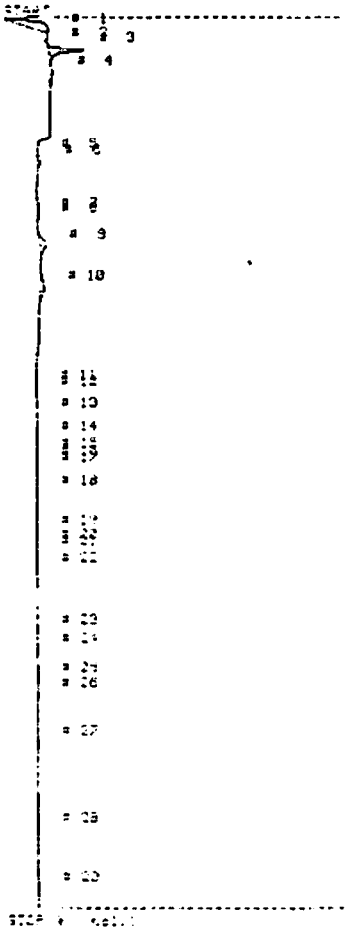
PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 15: 4
ANALYSIS # 23 EUWD UVALDE 2
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 SU 43 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/HT
UNKNOWN	1	11.1	194.1 AUS
UNKNOWN	2	27.1	192.1 AUS
UNKNOWN	4	42.1	3.1 AUS
UNKNOWN	6	118.1	10.1 AUS
TOLUENE	7	134.1	788.1 PPB
PCE	8	165.1	1,308 PPB

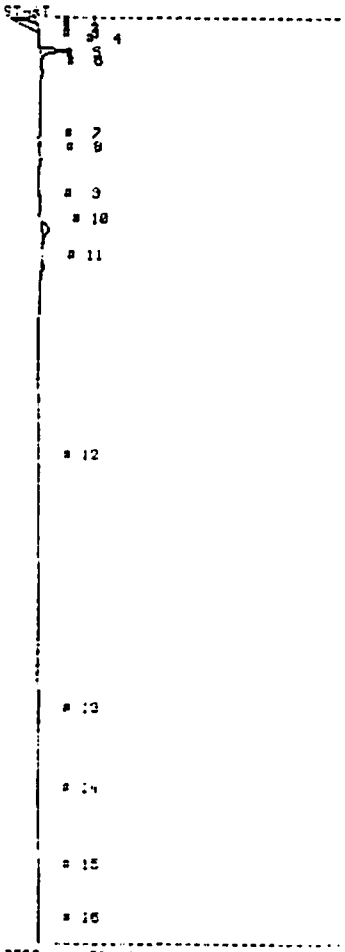
PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 15:28
ANALYSIS # 38 EUWD UVALDE 2
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 SU 44 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/HT
UNKNOWN	1	11.1	194.1 AUS
UNKNOWN	2	21.1	2.1 AUS
UNKNOWN	3	28.1	192.1 AUS
UNKNOWN	4	42.1	3.1 AUS
UNKNOWN	6	118.1	10.1 AUS
TOLUENE	8	134.1	896.1 PPB
PCE	10	165.1	218.3 PPB
UNKNOWN	28	232.1	6.1 AUS

PHOTOVAC

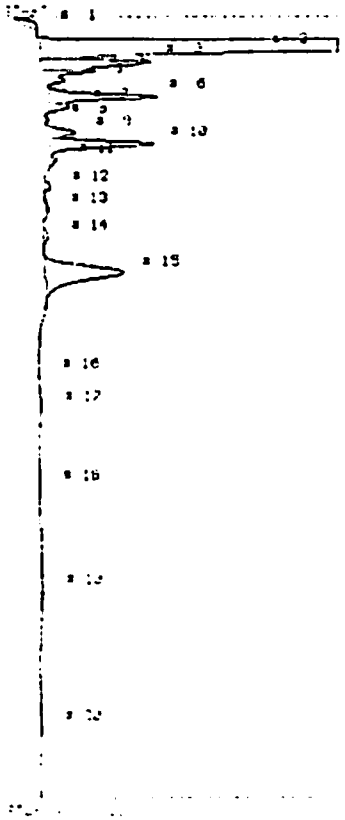


SAMPLE LIBRARY 2 AUG 11 1988 15:51
ANALYSIS # 31 EUWD UVALDE 2
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 SU 45 AT 5

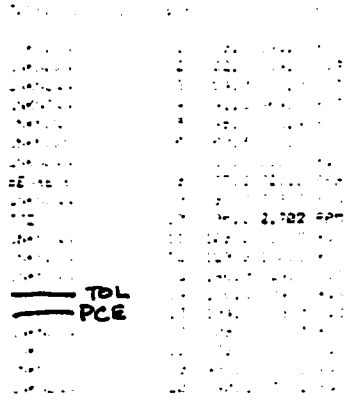
COMPOUND NAME	PEAK	R.T.	AREA/HT
UNKNOWN	1	11.1	197.1 AUS
UNKNOWN	4	25.1	192.1 AUS
UNKNOWN	5	41.1	3.1 AUS
UNKNOWN	8	137.1	10.1 AUS
UNKNOWN	9	144.1	20.1 AUS
TOL	10	165.1	192.1 AUS
PCE	11	180.1	40.1 AUS

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-7

PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 16:06
ANALYSIS # 32 ELMO UVALDE 2
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SV 46 AT 5

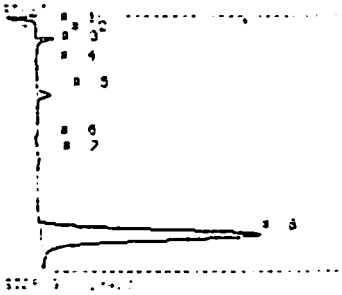


PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	77.2	500.0 PPM
PCE	2	238.4	0.000 PPB
TOLUENE	3	176.5	500.0 PPM
TCE	5	38.0	0.000 PPB

PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 16:12
ANALYSIS # 33 ELMO UVALDE 2
INTERNAL TEMP 38 100 UL AT 10
GAIN 10
TOL CAL

PHOTOVAC

CALIBRATED PEAK 3,TOLUENE

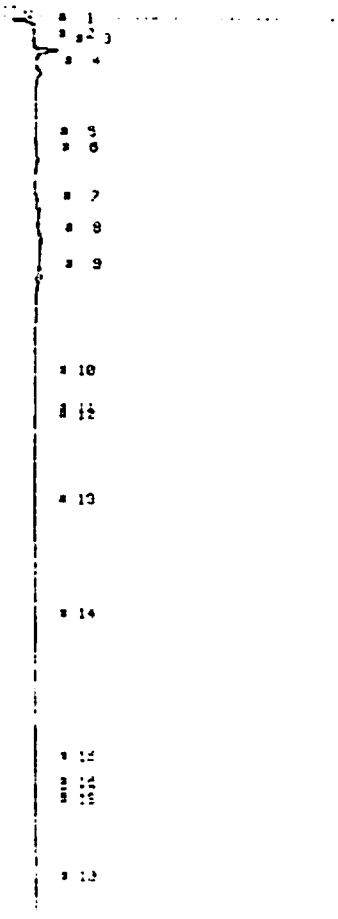
SAMPLE LIBRARY 2 AUG 11 1988 16:13
ANALYSIS # 33 ELMO UVALDE 2
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 SV 46 AT 5

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	79.3	500.0 PPM
PCE	2	197.9	0.000 PPB
TOLUENE	3	177.1	500.0 PPM
TCE	5	39.0	0.000 PPB

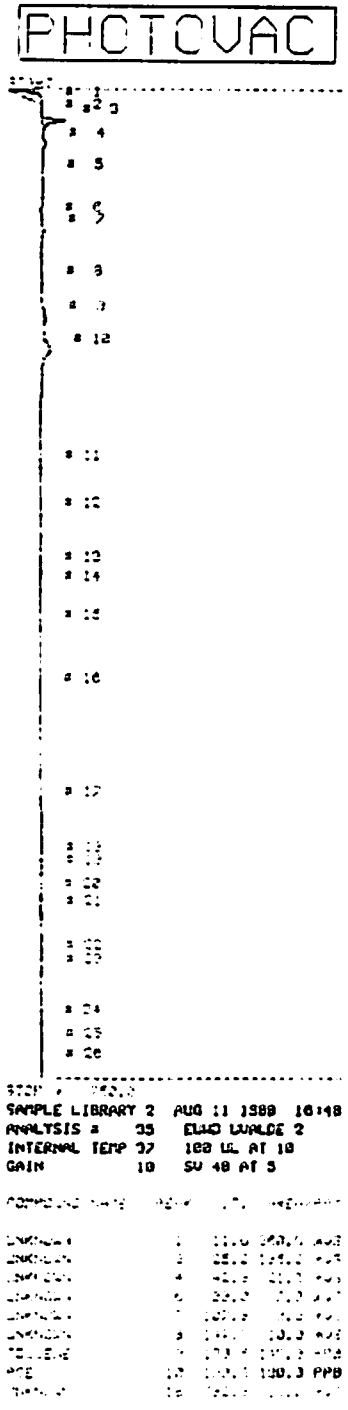
PHOTOVAC

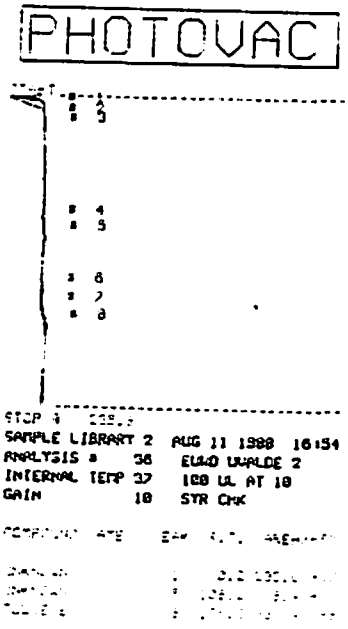


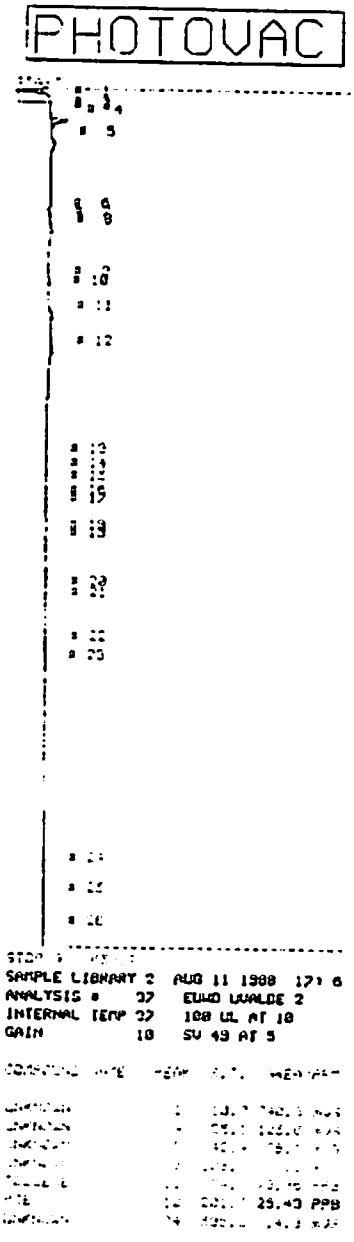
SAMPLE LIBRARY 2 AUG 11 1988 16:20
ANALYSIS # 31 ELMO UVALDE 2
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SV 47 AT 5

PCE	2	75.16	PPB

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-8

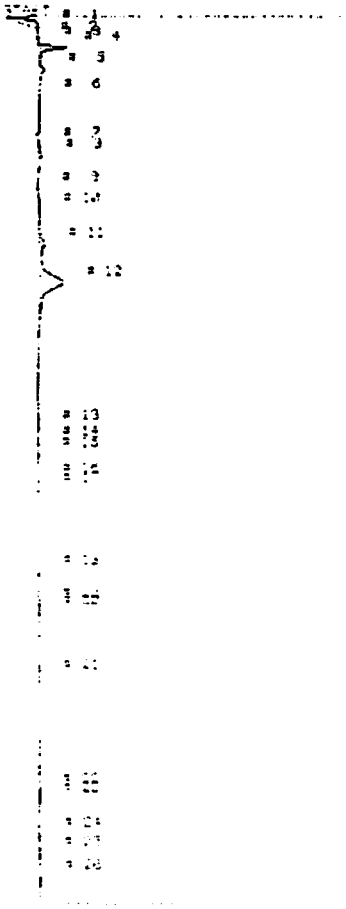






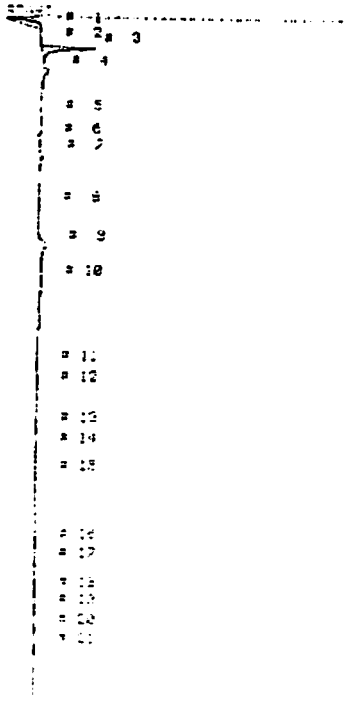
9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A - 9

PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 17:21
ANALYSIS # 38 EL&D LVALDE 2
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SV 50 AT 5

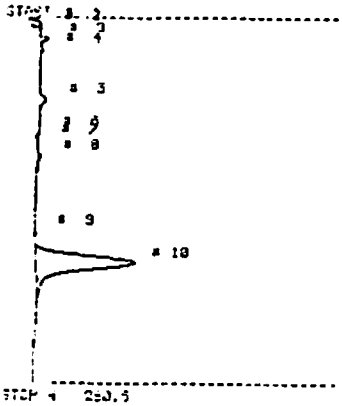
PHOTOVAC



SAMPLE LIBRARY 2 AUG 11 1988 17:37
ANALYSIS # 39 EL&D LVALDE 2
INTERNAL TEMP 36 100 UL AT 10
GAIN 10 SV 51 AT 5

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-10

PHOTOVAC



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

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	6.9	114.1 AUS
UNKNOWN	2	9.1	27.9 AUS
UNKNOWN	3	17.9	61.5 AUS
UNKNOWN	4	24.2	7.3 AUS
UNKNOWN	5	64.1	10.3 AUS
UNKNOWN	6	132.9	11.2 AUS
TCE	10	183.1	15.87 PPM

PHOTOVAC

CALIBRATED PEAK 10,TOLUENE

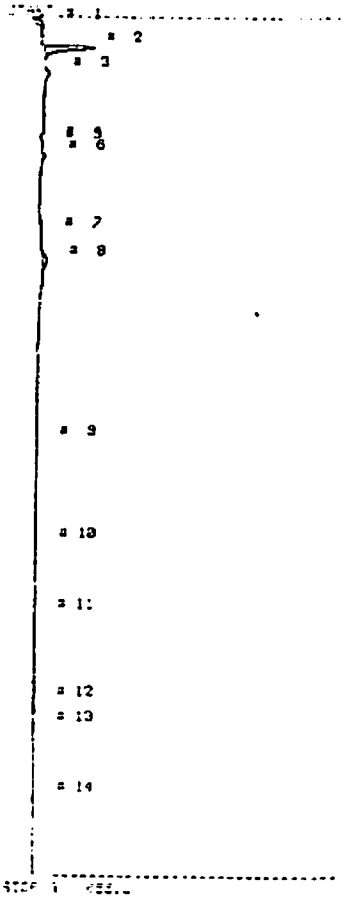
SAMPLE LIBRARY 2 AUG 12 1988 8:15
ANALYSIS # 7 EUWD UVALDE 2
INTERNAL TEMP 24 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	6.9	114.1 AUS
UNKNOWN	2	9.1	27.9 AUS
UNKNOWN	3	17.9	61.4 AUS
UNKNOWN	4	24.2	7.3 AUS
UNKNOWN	5	64.1	10.3 AUS
TCE	8	137.9	21.91 PPB
TOLUENE	10	183.1	13.33 PPM

PHOTOVAC

2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	82.8	500.0 PPM
PCE	2	220.3	0.000 PPB
TOLUENE	3	189.1	500.0 PPM
TCE	5	105.0	0.200 PPB

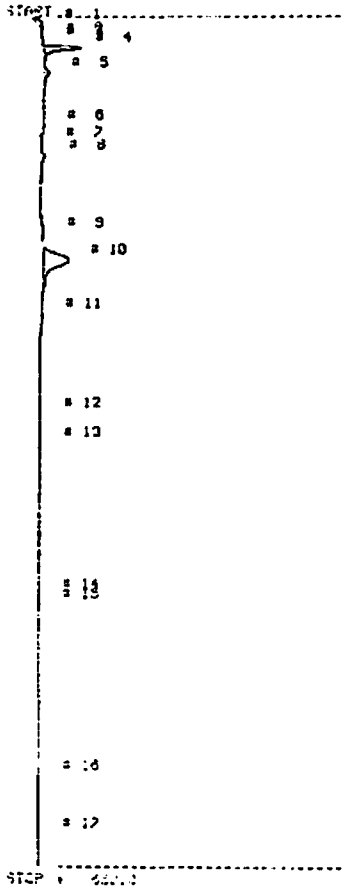
PHOTOVAC



STOP 4 [illegible]
SAMPLE LIBRARY 2 AUG 12 1988 8:27
ANALYSIS # 8 EUWD UVALDE 2
INTERNAL TEMP 25 100 UL AT 10
GAIN 10 SV 52 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	7.3	46.5 AUS
UNKNOWN	2	24.7	934.3 AUS
UNKNOWN	3	44.3	18.3 AUS
TCE	6	137.6	28.35 PPB
UNKNOWN	7	167.3	13.9 AUS
TOLUENE	9	188.0	700.3 PPB

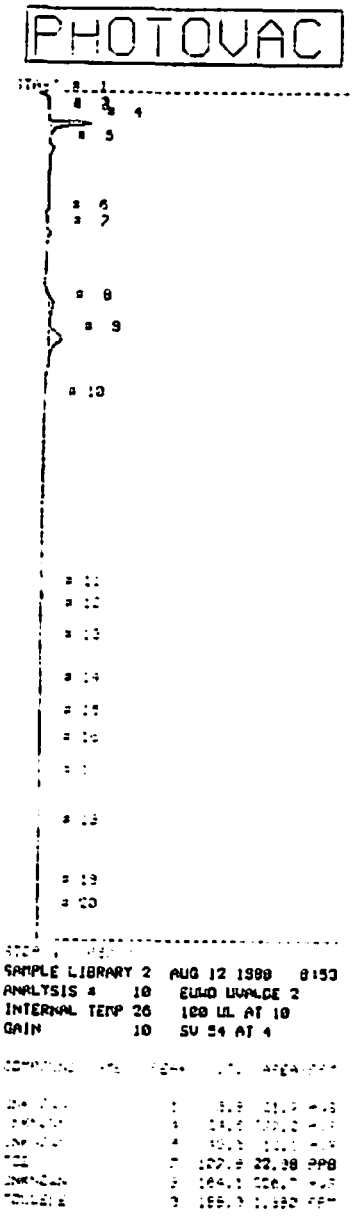
PHOTOVAC

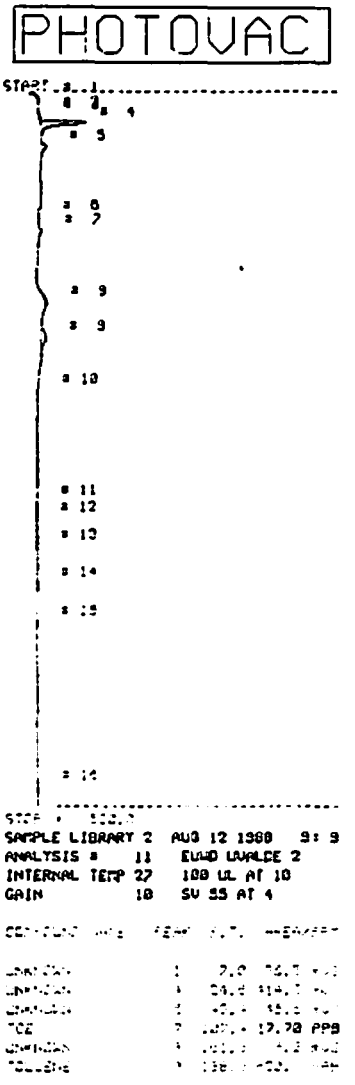


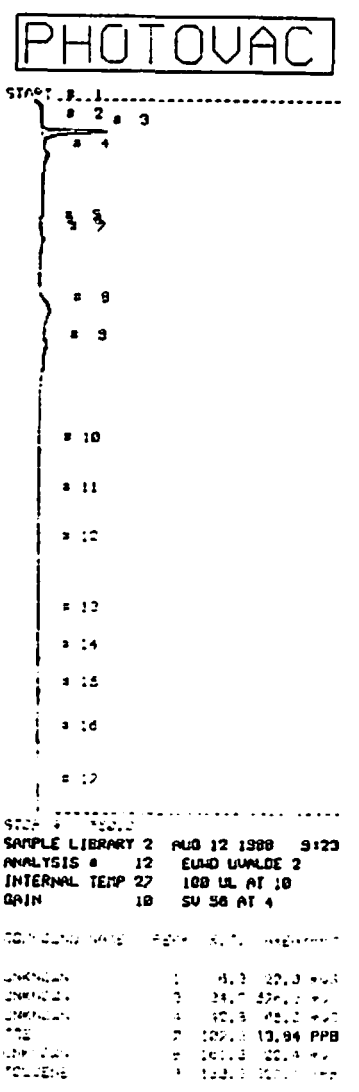
STOP 4 [illegible]
SAMPLE LIBRARY 2 AUG 12 1988 8:40
ANALYSIS # 9 EUWD UVALDE 2
INTERNAL TEMP 26 100 UL AT 10
GAIN 10 SV 53 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	7.3	44.3 AUS
UNKNOWN	4	24.7	881.0 AUS
UNKNOWN	9	44.1	35.3 AUS
UNKNOWN	7	88.9	6.6 AUS
TCE	8	137.4	15.16 PPB
UNKNOWN	9	166.3	64.7 AUS
TOLUENE	12	188.2	4.102 PPM

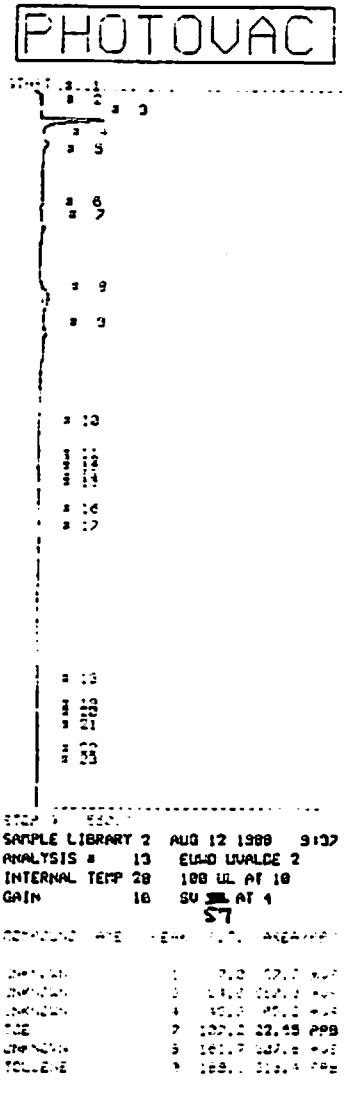
9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-11

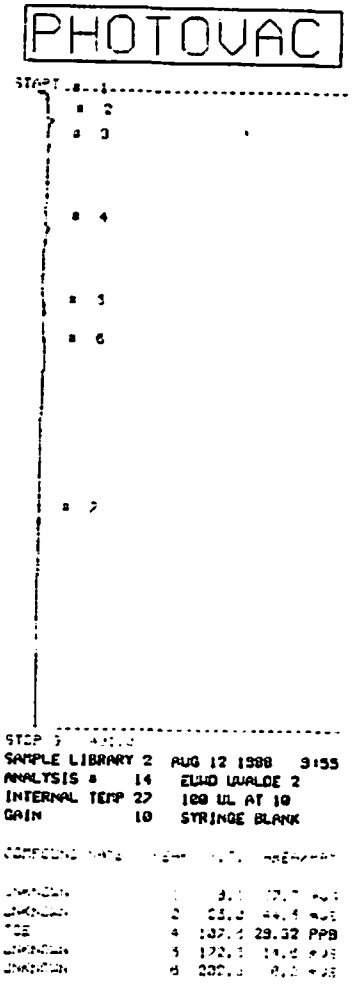


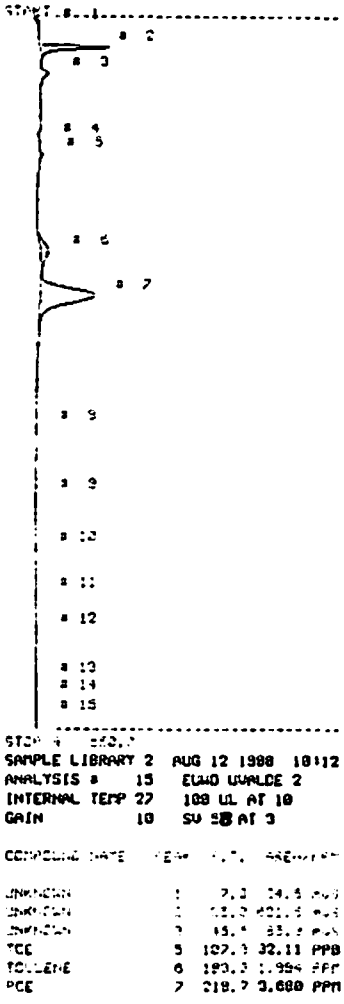




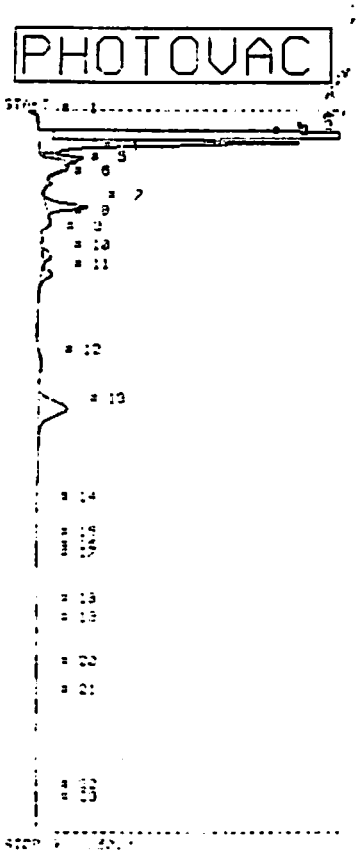
9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-12

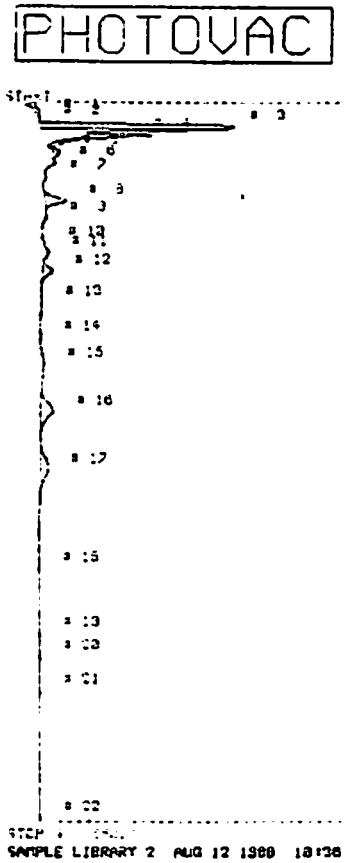


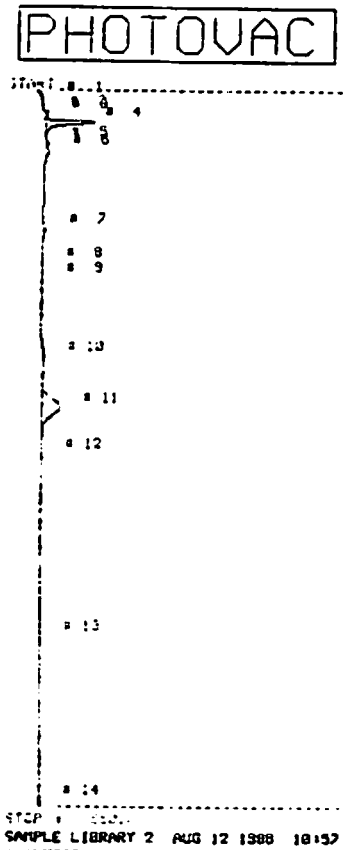




9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-13

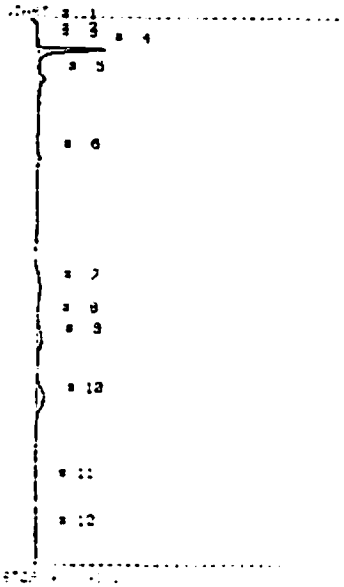






9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-14

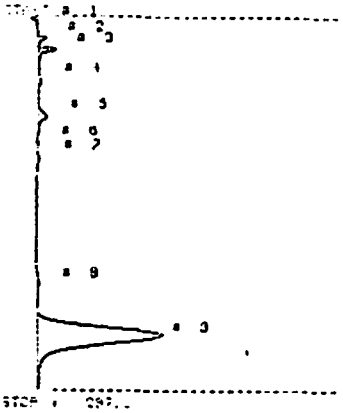
PHOTOVAC



SAMPLE LIBRARY 2 AUG 12 1988 11: 9
ANALYSIS # 19 ELMO UVALDE 2
INTERNAL TEMP 27 100 UL AT 10
GAIN 10 SV 60 AT 5

TOL
PCE

PHOTOVAC



SAMPLE LIBRARY 2 AUG 12 1988 11:15
ANALYSIS # 20 ELMO UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 TOLUENE CAL

PHOTOVAC

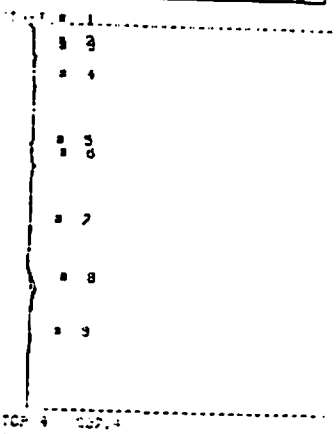
CALIBRATED PEAK 3,TOLUENE

SAMPLE LIBRARY 2 AUG 12 1988 11:17
ANALYSIS # 20 ELMO UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 TOLUENE CAL

PHOTOVAC

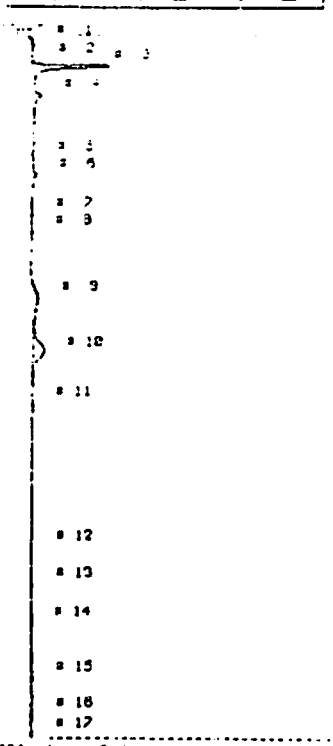
2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	100.7	500.0 PPM
PCE	2	293.2	0.000 PPB
TOLUENE	3	248.3	520.0 PPM
TCE	5	137.9	0.000 PPB

PHOTOVAC



SAMPLE LIBRARY 2 AUG 12 1988 11:24
ANALYSIS # 21 ELMO UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 STRINGE BLANK

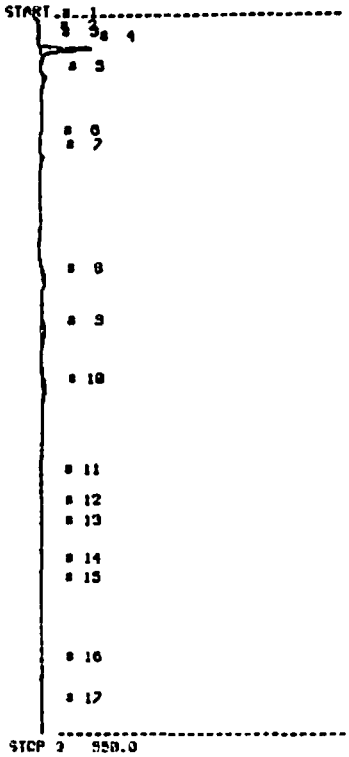
PHOTOVAC



SAMPLE LIBRARY 2 AUG 12 1988 11:34
ANALYSIS # 22 ELMO UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 SV 61 AT 5

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A-15

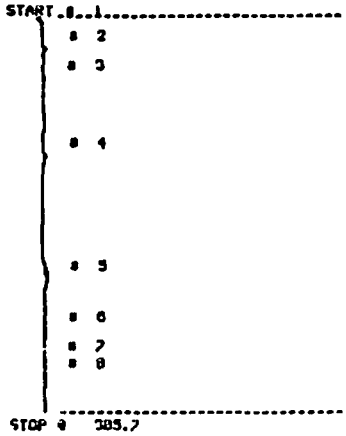
PHOTOVAC



STOP @ 550.0
SAMPLE LIBRARY 2 AUG 12 1988 11:54
ANALYSIS # 23 EUAD UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 SV 62 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	6.3	19.4	AVS
UNKNOWN	3	21.5	6.3	AVS
UNKNOWN	4	25.6	457.9	AVS
UNKNOWN	5	49.2	39.9	AVS
BENZENE	7	108.4	18.49	PPB
UNKNOWN	9	283.5	22.4	AVS
TOLUENE	9	243.9	332.1	PPB
PCE	10	288.2	166.9	PPB

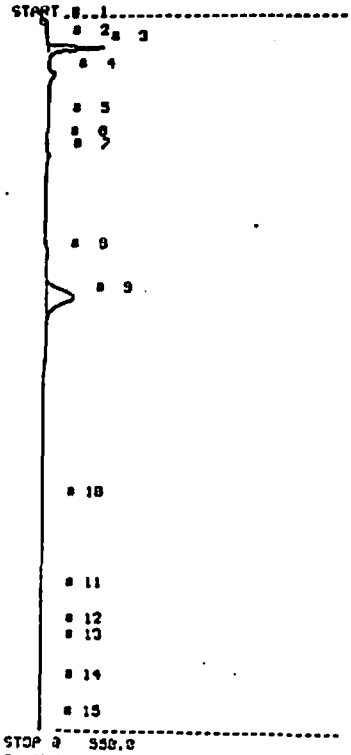
PHOTOVAC



STOP @ 385.7
SAMPLE LIBRARY 2 AUG 12 1988 12: 1
ANALYSIS # 24 EUAD UVALDE 2
INTERNAL TEMP 28 100 UL AT 10
GAIN 10 STRINGE CHECK

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	5.9	13.8	AVS
UNKNOWN	2	25.6	13.5	AVS
BENZENE	4	108.5	18.42	PPB
UNKNOWN	5	202.3	33.2	AVS
TOLUENE	6	242.6	39.23	PPB

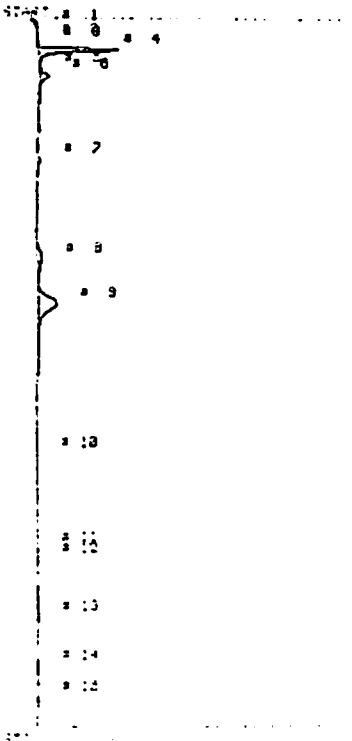
PHOTOVAC



STOP @ 550.0
SAMPLE LIBRARY 2 AUG 12 1988 13:36
ANALYSIS # 25 EUAD UVALDE 2
INTERNAL TEMP 31 100 UL AT 10
GAIN 10 SV 63 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM	
UNKNOWN	1	6.2	23.1	AVS
UNKNOWN	2	28.6	5.8	AVS
UNKNOWN	3	25.1	472.8	AVS
UNKNOWN	4	45.3	12.5	AVS
BENZENE	7	107.9	11.82	PPB
UNKNOWN	8	185.7	15.0	AVS
TOL	9	219.9	1.0	VS

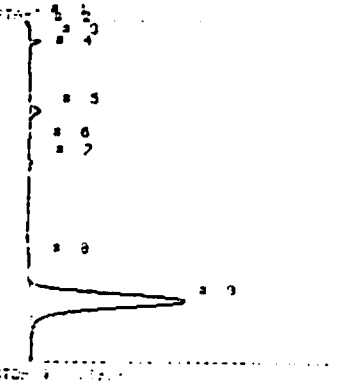
PHOTOVAC



SAMPLE LIBRARY 2 AUG 12 1988 13:51
ANALYSIS # 26 ELMO UVALDE 2
INTERNAL TEMP 32 100 UL AT 10
GAIN 10 ~~SU 63 AT 5~~
SU 63 @ 5

TOL

PHOTOVAC



SAMPLE LIBRARY 2 AUG 12 1988 13:57
ANALYSIS # 27 ELMO UVALDE 2
INTERNAL TEMP 31 100 UL AT 10
GAIN 10 ~~SU 63 AT 5~~ TOLCAL

PHOTOVAC

CALIBRATED PEAK 1,TOLUENE

SAMPLE LIBRARY 2 AUG 12 1988 13:58
ANALYSIS # 27 ELMO UVALDE 2
INTERNAL TEMP 31 100 UL AT 10
GAIN 10 SU 63 AT 5

PHOTOVAC

2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	93.6	500.0 PPB
PCE	2	252.6	0.000 PPB
TOLUENE	3	213.9	520.0 PPB
TCE	5	116.3	0.000 PPB

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig. A - 17

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

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 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, Geologist

MMB/irb
Enclosure

TABLE I

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

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

ND = Not Detected

APPENDIX A

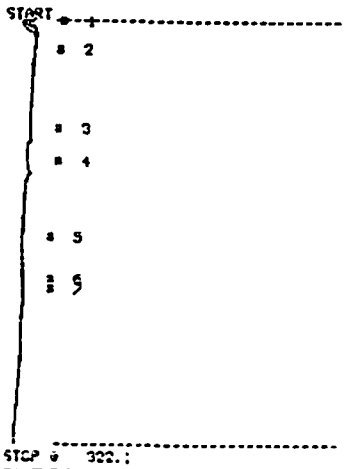
CHROMATOGRAMS

PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	93.6	500.0 PPM
PCE	2	252.6	0.000 PPB
TOLUENE	3	213.9	500.0 PPM
TCE	5	118.8	0.000 PPB

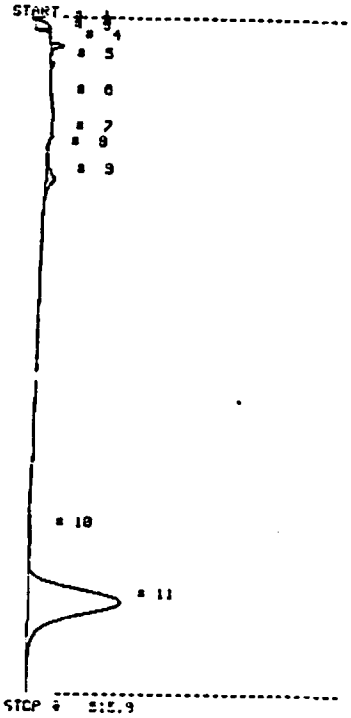
PHOTOVAC



STOP # 322.1
SAMPLE LIBRARY 2 AUG 25 1988 9:0
ANALYSIS # 1 EUHO UVALDE 3
INTERNAL TEMP 23 100 UL AT 10
GAIN 10 BASELINE CHK

COMPOUND NAME PEAK R.T. AREA/PPM

PHOTOVAC

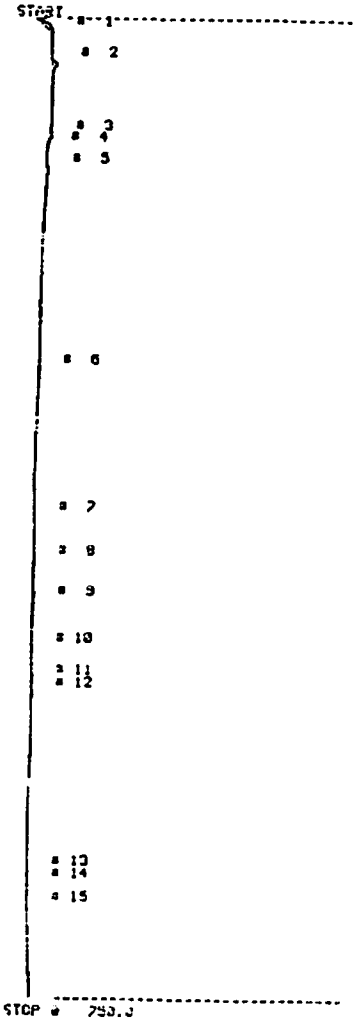


STOP # 515.9
SAMPLE LIBRARY 2 AUG 25 1988 9:10
ANALYSIS # 2 EUHO UVALDE 3
INTERNAL TEMP 24 100 UL AT 10
GAIN 10 ~~BASELINE CHK~~
TOL CAL

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	8.6	231.9 #US
UNKNOWN	4	22.5	117.8 #US
TCE	5	124.9	249.7 PPB
UNKNOWN	11	449.3	0.5 US

PHOTOVAC



STOP # 750.0
SAMPLE LIBRARY 2 AUG 25 1988 9:20
ANALYSIS # 3 EUHO UVALDE 3
INTERNAL TEMP 25 100 UL AT 10
GAIN 10 SYRINGE CHECK

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	12.3	123.2 #US
TOLUENE	9	448.9	200.0 PPB

PHOTOVAC

CALIBRATED PEAK 11, TOLUENE

SAMPLE LIBRARY 2 AUG 25 1988 9:12
ANALYSIS # 2 EUHO UVALDE 3
INTERNAL TEMP 24 100 UL AT 10
GAIN 10 ~~BASELINE CHK~~
TOL CAL

COMPOUND NAME PEAK R.T. AREA/PPM

UNKNOWN	1	8.6	231.9 #US
UNKNOWN	4	22.5	117.8 #US
UNKNOWN	9	124.9	207.5 #US
TOLUENE	11	449.3	10.00 PPM

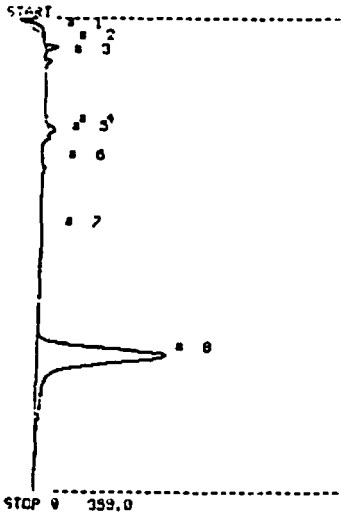
PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	138.6	500.0 PPM
PCE	2	538.6	0.000 PPB
TOLUENE	3	449.3	500.0 PPM
TCE	5	249.5	0.000 PPB

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig.

PHOTOVAC



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

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.1	226.4 mVS
UNKNOWN	2	22.5	118.9 mVS
UNKNOWN	4	96.0	109.7 mVS
TCE	5	259.8	8.555 PPM

PHOTOVAC

CALIBRATED PEAK 8,TOLUENE

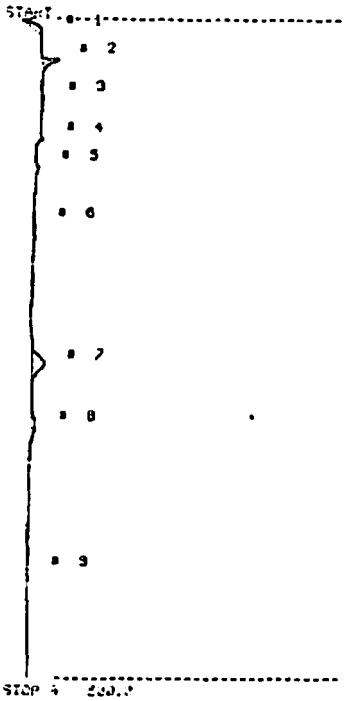
SAMPLE LIBRARY 2 AUG 25 1988 9:42
ANALYSIS # 4 EUGO UVALDE 3
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.1	226.4 mVS
UNKNOWN	2	22.5	119.9 mVS
UNKNOWN	4	96.0	109.7 mVS
TOLUENE	8	259.8	10.00 PPM

PHOTOVAC

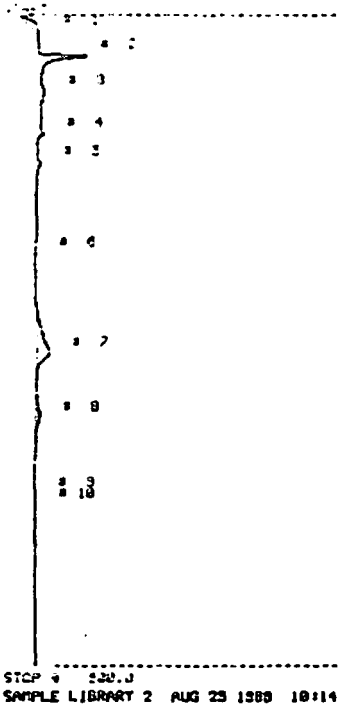
2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	113.2	500.0 PPM
PCE	2	205.8	0.020 PPB
TOLUENE	3	258.8	500.0 PPM
TCE	5	143.7	0.020 PPB

PHOTOVAC



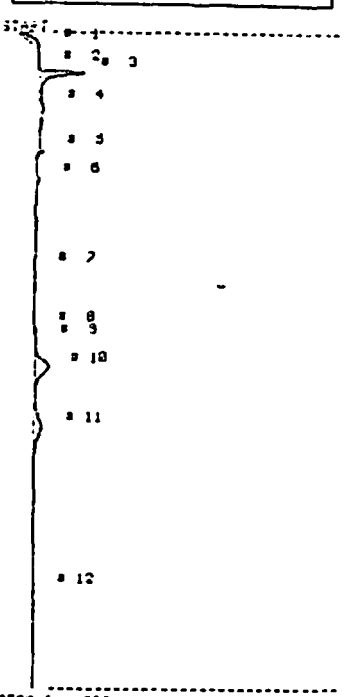
STOP # 530.0
SAMPLE LIBRARY 2 AUG 25 1988 9:55
ANALYSIS # 5 EUGO UVALDE 3
INTERNAL TEMP 29 100 UL AT 10
GAIN 10 SV 65 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	11.3	141.0 mVS
UNKNOWN	2	22.3	171.2 mVS
TOLUENE	7	261.1	1.021 PPM
PCE	9	331.1	222.1 PPB



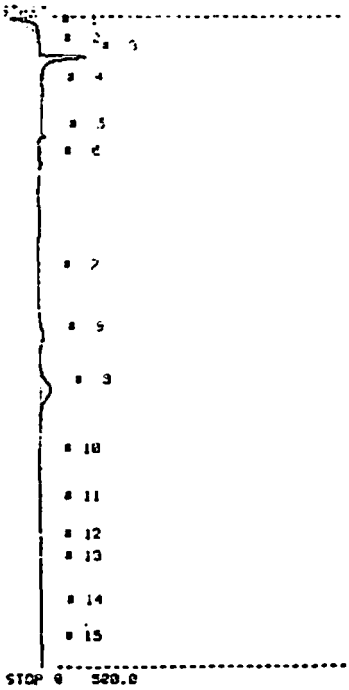
STOP # 530.0
SAMPLE LIBRARY 2 AUG 25 1988 10:14
ANALYSIS # 6 EUGO UVALDE 3
INTERNAL TEMP 31 100 UL AT 10
GAIN 10 SV 66 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.2	132.0 mVS
UNKNOWN	2	22.6	103.0 mVS
TOLUENE	7	261.3	2.429 PPM
PCE	9	331.4	182.6 PPB



STOP @ 533.0
SAMPLE LIBRARY 2 AUG 25 1988 10:30
ANALYSIS # 7 EUGO UVALDE 3
INTERNAL TEMP 33 100 UL AT 10
GAIN 10 SV 67 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.3	122.3 mVS
UNKNOWN	3	22.2	109.7 mVS
TOLUENE	10	259.2	1.580 PPM
PCE	11	329.9	322.6 PPB

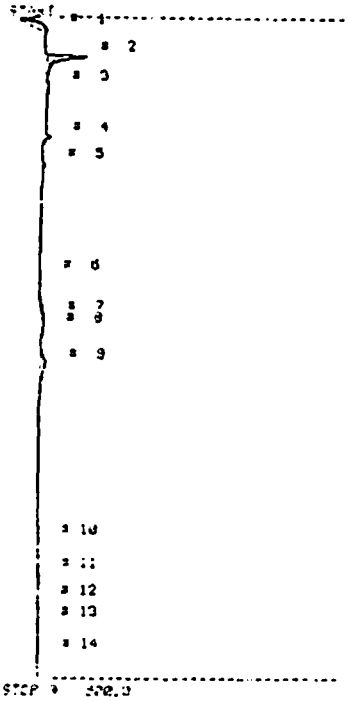


STOP @ 520.0
SAMPLE LIBRARY 2 AUG 25 1988 10:46
ANALYSIS # 8 EUGO UVALDE 3
INTERNAL TEMP 35 100 UL AT 10
GAIN 10 SV 68 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	11.4	238.3 mVS
UNKNOWN	3	21.3	450.1 mVS
TOLUENE	8	249.3	492.2 PPB
UNKNOWN	9	329.1	106.7 mVS

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig.

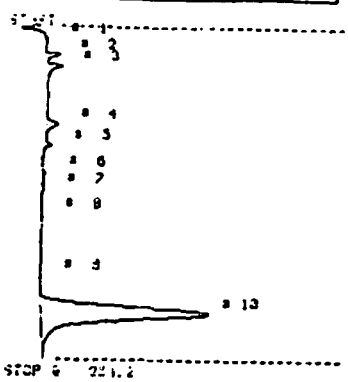
PHOTOVAC



STOP # 220.0
SAMPLE LIBRARY 2 AUG 25 1988 11: 3
ANALYSIS # 9 EL&D UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 69 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	10.1	210.4 AVG
UNKNOWN	2	21.1	134.3 AVG
TOLUENE	3	245.7	AVG/0 PPB

PHOTOVAC



STOP # 251.2
SAMPLE LIBRARY 2 AUG 25 1988 11: 3
ANALYSIS # 10 EL&D UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 TCL CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	10.1	176.8 AVG
UNKNOWN	2	22.1	138.7 AVG
UNKNOWN	3	31.1	128.0 AVG
UNKNOWN	4	75.3	149.5 AVG
UNKNOWN	10	219.7	5.9 AVG

PHOTOVAC

CALIBRATE PEAK 10, TOLUENE

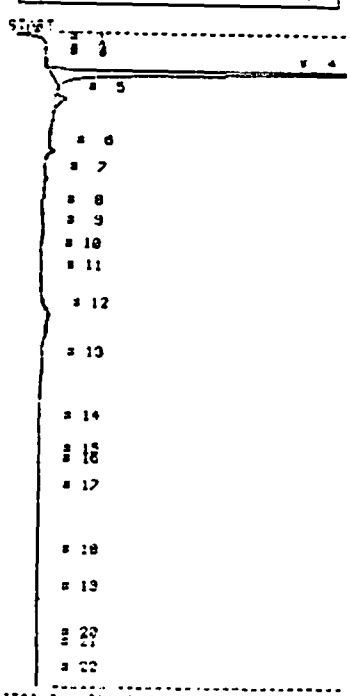
SAMPLE LIBRARY 2 AUG 25 1988 11:10
ANALYSIS # 10 EL&D UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 TCL CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	10.1	176.8 AVG
UNKNOWN	2	22.1	138.7 AVG
UNKNOWN	3	31.1	128.0 AVG
UNKNOWN	4	75.3	149.5 AVG
TOLUENE	10	219.7	10.00 PPM

PHOTOVAC

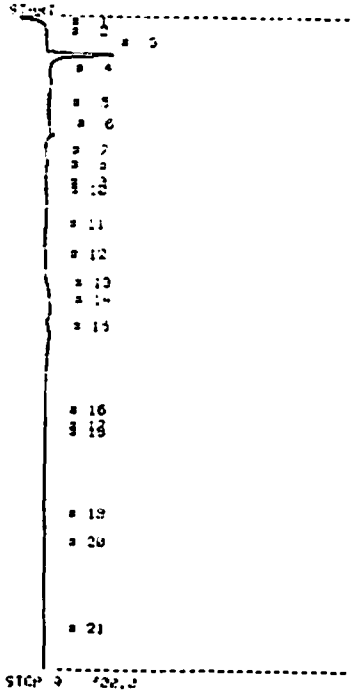
2 COMPOUND	ID #	R.T.	LIMIT
BENZENE	1	10.1	500.0 PPM
PCE	2	259.4	0.000 PPB
TOLUENE	3	219.7	500.0 PPM
TCE	5	122.8	0.000 PPB

PHOTOVAC



STOP # 332.2
SAMPLE LIBRARY 2 AUG 25 1988 11:10
ANALYSIS # 11 EL&D UVALDE 3
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 SU 20 AT 5

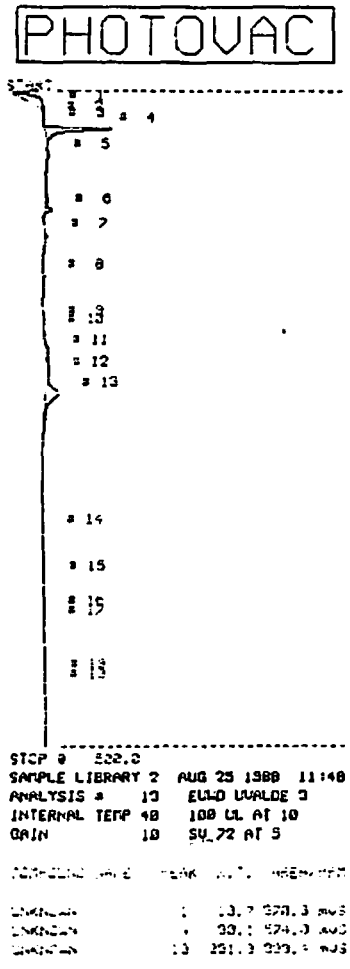
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	10.1	201.3 AVG
UNKNOWN	2	22.1	141.3 AVG
UNKNOWN	3	31.1	131.1 AVG
TOLUENE	10	219.7	9.93 PPM



STOP # 432.2
SAMPLE LIBRARY 2 AUG 25 1988 11:34
ANALYSIS # 12 EL&D UVALDE 3
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 SU 21 AT 5

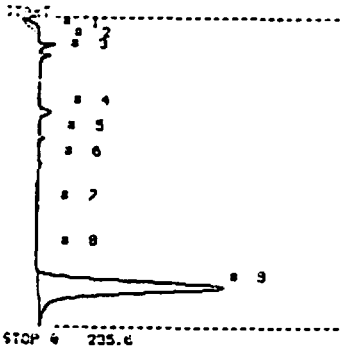
COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	10.1	520.4 AVG
UNKNOWN	2	22.1	421.2 AVG

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig.



9-084-88	Chen & Associates	CHROMATOGRAMS	Fig.

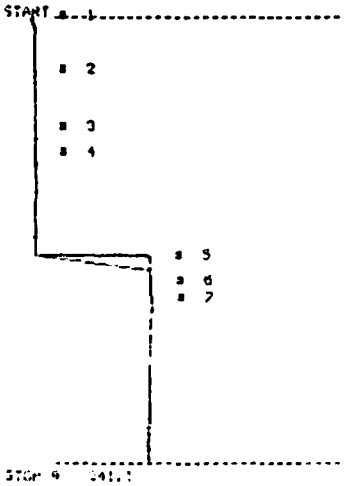
PHOTOVAC



STOP # 235.6
SAMPLE LIBRARY 2 AUG 25 1988 12: 7
ANALYSIS # 2 EUAD UARLCE 3
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.8	156.9 AVS
UNKNOWN	2	21.3	113.2 AVS
UNKNOWN	4	73.2	158.4 AVS
UNKNOWN	8	236.7	4.2 VS

PHOTOVAC



STOP # 241.7
SAMPLE LIBRARY 2 AUG 25 1988 12: 2
ANALYSIS # 1 EUAD UARLCE 3
INTERNAL TEMP 38 100 UL AT 10
GAIN 10 EL CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	5	138.0	1.6 VS

PHOTOVAC

CALIBRATED PEAK J.'TOLUENE

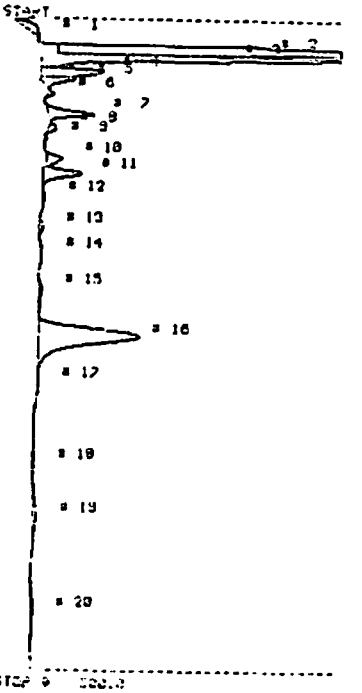
SAMPLE LIBRARY 2 AUG 25 1988 12: 8
ANALYSIS # 2 EUAD UARLCE 3
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 TOLUENE CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.3	152.9 AVS
UNKNOWN	2	21.9	110.2 AVS
UNKNOWN	4	73.2	152.4 AVS
TOLUENE	8	236.7	10.00 PPM

PHOTOVAC

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

PHOTOVAC



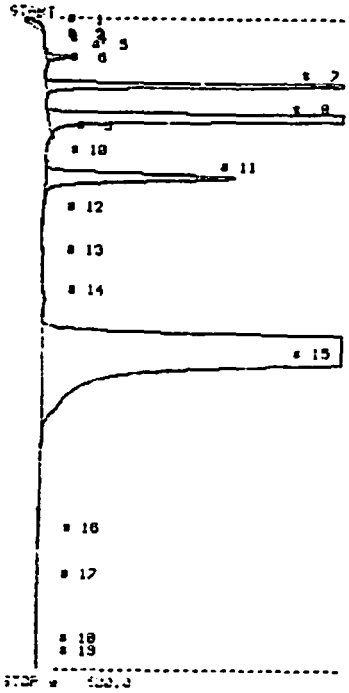
STOP # 250.0
SAMPLE LIBRARY 2 AUG 25 1988 12:31
ANALYSIS # 3 EUAD UARLCE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10

THREAD SHOP

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.8	156.9 AVS
UNKNOWN	2	21.3	113.2 AVS
UNKNOWN	4	73.2	158.4 AVS
UNKNOWN	8	236.7	4.2 VS
UNKNOWN	9	94.1	126.3 AVS
UNKNOWN	10	106.3	232.1 AVS
TCE	11	113.9	919.3 PPB
PCE	12	243.8	4.489 PPM
UNKNOWN	13	284.4	247.1 AVS
UNKNOWN	20	457.7	175.8 AVS

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig.

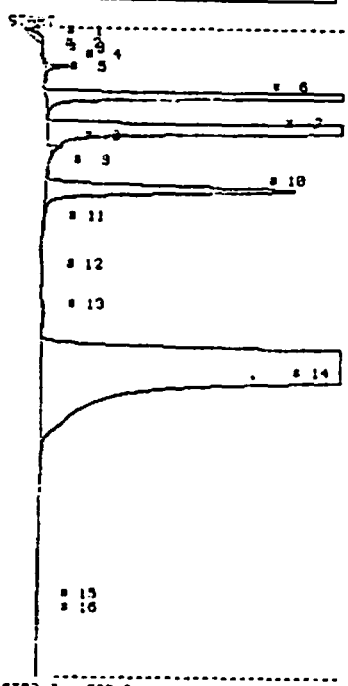
PHOTOVAC



STOP # 530.0
SAMPLE LIBRARY 2 AUG 25 1988 13:14
ANALYSIS # 4 EUWD UVALDE 3
INTERNAL TEMP 36 100 UL AT 10
GAIN 10 SU 73 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	11.3	125.1 AVS
UNKNOWN	2	21.7	134.4 AVS
UNKNOWN	5	76.6	153.9 AVS
UNKNOWN	7	221.7	6.2 VS
TCE	10	123.1	5.2 VS
PCE	12	281.8	115.0 PPB

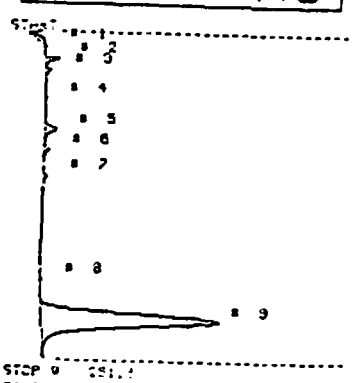
PHOTOVAC



STOP # 530.0
SAMPLE LIBRARY 2 AUG 25 1988 13:19
ANALYSIS # 5 EUWD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 74 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	11.3	125.1 AVS
UNKNOWN	2	21.7	134.4 AVS
UNKNOWN	5	76.6	153.9 AVS
UNKNOWN	7	221.7	6.2 VS
UNKNOWN	9	281.8	104.2 PPB
TCE	10	123.1	5.2 VS
PCE	14	283.4	151.9 VS

PHOTOVAC



STOP # 281.8
SAMPLE LIBRARY 2 AUG 25 1988 13:25
ANALYSIS # 6 EUWD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 TOL CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	11.3	125.1 AVS
UNKNOWN	2	21.7	134.4 AVS
UNKNOWN	5	76.6	153.9 AVS
UNKNOWN	7	221.7	6.2 VS

PHOTOVAC

CALIBRATED PEAK # TOLUENE

SAMPLE LIBRARY 2 AUG 25 1988 13:25
ANALYSIS # 6 EUWD UVALDE 3
INTERNAL TEMP 36 100 UL AT 10
GAIN 10 TOL CAL

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	11.3	125.1 AVS
UNKNOWN	2	21.7	134.4 AVS
UNKNOWN	5	76.6	153.9 AVS
TOLUENE	7	221.7	13.02 PPM

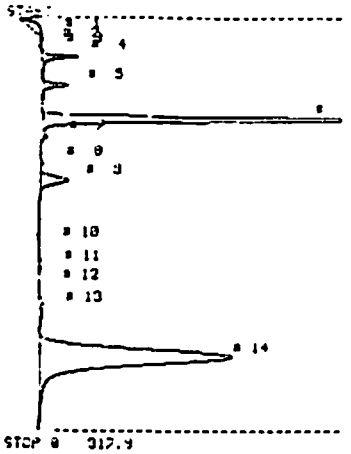
PHOTOVAC

2 COMPOUND ID # R.T. LIMIT

BENZENE	1	97.0	500.0 PPM
PCE	2	281.8	0.000 PPB
TOLUENE	3	221.7	500.0 PPM
TCE	5	123.1	0.000 PPB

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig.

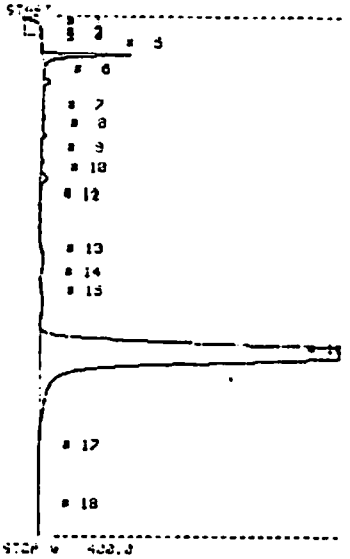
PHOTOVAC



STOP @ 317.9
SAMPLE LIBRARY 2 AUG 25 1988 10:48
ANALYSIS # 7 EUMD UVALDE 3
INTERNAL TEMP 36 100 UL AT 10
GAIN 10 SU 75 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.1	560.1 AUS
UNKNOWN	4	30.4	231.8 AUS
UNKNOWN	7	42.1	222.6 AUS
UNKNOWN	9	72.	4.7 AUS
[illegible]	9	105.1	666.8 PPB
PCE	14	260.3	9.947 PPM

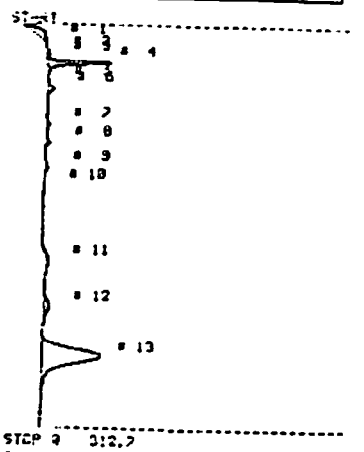
PHOTOVAC



STOP @ 408.3
SAMPLE LIBRARY 2 AUG 25 1988 14:23
ANALYSIS # 9 EUMD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 77 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	14.3	550.7 AUS
UNKNOWN	9	30.3	727.2 AUS
PCE	10	107.3	131.8 PPB
PCE	10	260.1	26.86 PPM

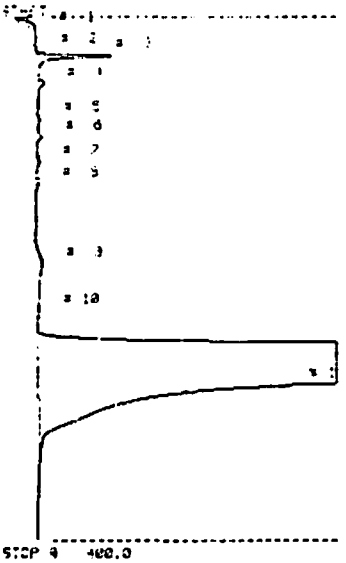
PHOTOVAC



STOP @ 312.7
SAMPLE LIBRARY 2 AUG 25 1988 15: 0
ANALYSIS # 11 EUMD 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 AUS
UNKNOWN	4	30.3	135.3 AUS
TOLUENE	10	102.7	421.8 PPB
PCE	13	253.1	2.481 PPM

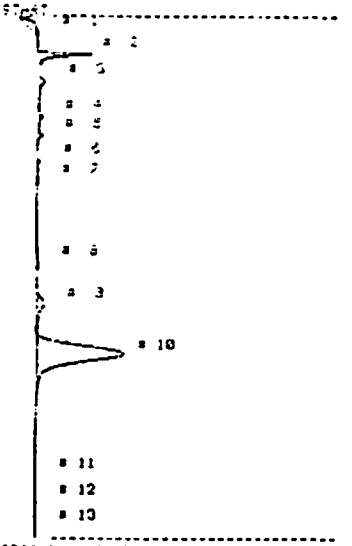
PHOTOVAC



STOP @ 402.0
SAMPLE LIBRARY 2 AUG 25 1988 14:18
ANALYSIS # 8 EUMD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 78 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	3.9	123.4 AUS
UNKNOWN	9	28.3	428.9 AUS
PCE	11	266.1	233.9 PPM

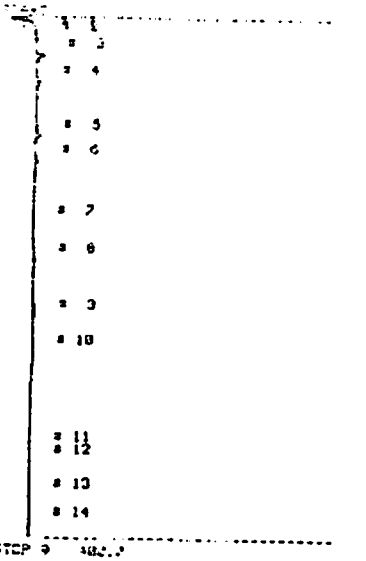
PHOTOVAC



STOP @ 403.3
SAMPLE LIBRARY 2 AUG 25 1988 14:44
ANALYSIS # 10 EUMD UVALDE 3
INTERNAL TEMP 37 100 UL AT 10
GAIN 10 SU 78 AT 5

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	13.7	132.3 AUS
UNKNOWN	2	28.1	428.1 AUS
TCE, PCE	9	101.5	749.9 PPB
PCE	10	261.2	3,799 PPM

PHOTOVAC



STOP @ 402.7
SAMPLE LIBRARY 2 AUG 25 1988 15: 0
ANALYSIS # 12 EUMD UVALDE 3
INTERNAL TEMP 39 100 UL AT 10
GAIN 10 STR CHK

COMPOUND NAME	PEAK	R.T.	AREA/PPM
UNKNOWN	1	12.9	574.8 AUS

9-084-88	Chen & Associates	CHROMATOGRAMS	Fig.