N00129.AR.000014
NSB NEW LONDON
5090.3a

DATA REPORT - ADDITIONAL BORINGS
CONFORMING STORAGE FACILITY
GROTON, CT

Prepared For:
Donohue and Associates, Inc.
4738 North 40th Street
Sheboygan, Wisconsin 53083

Prepared By:
Goldberg-Zoino & Associates, Inc.
27 Naek Road
Vernon, Connecticut 06066

File No. W-40328
August 1989

Copyright 1989 Goldberg-Zoino & Associates, Inc.

GOLDBERG·ZOINO & ASSOCIATES, INC.
CONSULTING ENGINEERS/GEOLOGISTS/ENVIRONMENTAL SCIENTISTS

27 Nack Road Vernon, Connecticut 06066
(203) 875-7655 FAX (203) 872-2416

August 1, 1989
File No. W-40328-C

Donohue and Associates, Inc.
4738 North 40th Street
Sheboygan, Wisconsin 53083

Attention: Mr. Karl Hokanson

Re: Data Report - Additional Borings
Conforming Storage Facility
Groton, CT

Dear Mr. Hokanson:

In accordance with our proposal dated January 10, 1989, Goldberg-Zoino & Associates, Inc. (GZA) has conducted a supplemental boring, sampling and analytical services program at the U.S. Naval Conforming Storage facility in Groton, Connecticut. This program supplements the program presented in our report dated November 23, 1988.

The objective of GZA's services was to perform three test borings at locations determined by Donohue, to recover samples from these borings and to prepare a brief data report summarizing: test boring locations, sampling methodologies, test boring logs and subsurface materials encountered and analytical results.

This report has been prepared in accordance with the limitations provided in Appendix A.

TEST BORING LOCATIONS

Test boring locations for the six site borings (B1-89, B2-89, B3-89, B1A-89, B2A-89, and B-3A-89) completed for this program are shown on Figure 1 - Site Plan. This figure was developed from a base map provided by Donohue and Associates, prior to initiation of GZA's field program. Borings B1-88, B2-88, B3-88, and B4-88 completed by GZA in October, 1988 are also shown on this plan. The reader is referred to our November 23, 1988 report for additional information on the four 1988 borings.

On April 6, 1989, GZA Drilling, Inc. of South Windsor, Connecticut completed borings B1-89, B2-89, and B3-89 at locations consistent with the figures provided by Donohue and Associates, and with field marked locations. Based on a laboratory quality assurance/quality

control problem on the volatile organic analysis portion of the April 6, 1989 soil samples, GZA Drilling completed three new borings labelled B1A-89, B2A-89, and B3A-89 on June 22, 1989. These new borings were completed at essentially the same locations (within one to two feet) as the April 6, 1989 borings in order to obtain samples for re-analysis of extractible volatile organic compounds (VOCs). On Figure 1 the boring locations refer to both the April 6, and June 22, 1989 borings. These borings were observed and logged by a GZA engineer.

SAMPLING METHODOLOGIES

Borings were advanced using a 3.75 inch (I.D.) hollow stem auger to a completed depth of between approximately six and ten feet below ground surface. Soil samples were obtained continuously (ie two foot intervals) from ground surface to ten feet in borings B2-89, B2A-89, B3-89, and B3A-89, and to approximately five to six feet in boring B1-89 and B1A-89. Boring B1-89 was terminated at approximately 5.7 feet below ground surface during the April sampling based on drilling and sampler refusal. Boring B1A-89 was terminated at approximately 5.5 feet ground surface during the June sampling, also due, to drilling and sampler refusal.

Soil samples were obtained from each boring using a steel, 1-3/8 inch inside diameter (I.D.) split spoon sampler, driven 24 inches by a 140 pound hammer falling 30 inches, in conformance with ASTM D1586-67 procedures. Blow counts were recorded for each six inches of penetration of the sampler, and are recorded on the boring logs included as Appendix B.

SAMPLE SCREENING AND PREPARATION

Individual soil samples were classified by our field engineer and placed in pre-cleaned eight ounce soil jars. Soil samples were placed in an iced cooler prior to delivery to Nanco Analytical Labs (NAL) of Wappingers Falls, New York.

After completion of the boring program, and prior to sample compositing, individual soil samples were screened for total volatile organic compounds (VOCs) in the field using an HNu Model PI-101 photoanalyzer (equipped with a 10.2 ev lamp, calibrated to a benzene standard). The HNu employs a photoionization detector to measure relative levels of VOCs in the headspace of sealed jars. Although the HNu screening cannot be directly translated into quantitative concentrations or identify individual compounds, the screening can serve as a relative indicator of the level of VOCs in the sample. Results of the HNu screening are included on the boring logs in Appendix B.

The four samples (B2-89/S-3, B2-89/S-4, B2-89/S-5, and B3-89/S-4) which exhibited the highest HNu meter responses (0.6 to 4.0 units) in the April sampling were chosen for analysis of for extractible VOCs using the Toxicity Characteristic Leaching Procedure (TCLP). Two of these samples (B2-89/S-3, B3-89/S-4) had meter responses less than 1 HNu unit. Due to the laboratory QA/QC problems referenced above, the April sampling results for TCLP VOCs were invalid. Samples were recollected on June 22, 1989. All samples from the June borings had meter responses less than 1 HNu unit. The same series of samples as originally chosen was picked for TCLP VOC analysis from the June 22, 1989 borings. In summary, the four individual samples chosen for analysis of TCLP VOCs were June 1989 B2A-89 samples S-3, S-4, S-5, and B3A-89 sample S-4.

Composite samples were prepared by GZA personnel in the field for each boring. The composites were prepared in a pre-cleaned stainless steel mixing bowl. Care was taken to composite samples using all remaining soil from each boring after TCLP VOC samples were prepared. April 1989 composites total were analyzed for priority pollutant metals, E.P. Toxicity metals and TCLP metals. The June 1989 composites and the four individual samples were shipped to NAL where the samples were analyzed for TCLP VOC compounds.

SUBSURFACE CONDITIONS ENCOUNTERED

In general, the soils encountered appeared to be fill. The fill was comprised of a fine to coarse sand with varying amounts of gravel and silt. Several samples contained trace amounts of brick. An exception is that an organic silt was encountered from approximately five to ten feet in boring B2-89 and B2A-89.

Information on the materials encountered in each boring are recorded on the boring logs included as Appendix B. Specific information on individual boring logs briefly is summarized below.

Boring B1-89 and B1A-89 encountered approximately six feet of a material which appeared to be a sand and gravel fill. This boring was terminated at auger and split spoon refusal, 5.7 feet below ground surface.

Boring B2-89 and B2A-89 encountered approximately five feet of a sandy fill which included trace amounts of brick, gravel and silt. Organic silt was encountered in this boring from approximately five to ten feet. The organic silt exhibited an organic odor and an oily sheen.

Boring B3-89 and B3A-89 encountered approximately ten feet of a material which appeared to be a sand and gravel fill.

GZA

ANALYTICAL DATA

Three composite soil samples were transmitted to NAL on April 7, 1989. The three composite soil samples (B1-Comp, B2-Comp, B3-Comp) were analyzed for total priority pollutant metals and extractable metals by TCLP and E.P. toxicity procedures. Four individual soil samples (B2A-89) samples S-3, S-4, and S-5, B3A-89 sample S-4) and three composite samples (B1A-89 Composite, B2A-89 Composite, and B3A-89 Composite) were transmitted to NAL on June 23, 1989 and were analyzed for extractable volatile organic compounds by TCLP methods. Laboratory quality assurance/quality control (TCLP blank and method blank samples) results for TCLP VOCs are included on Table 4. A chain of custody was maintained from sample shipment from GZA's Vernon, Connecticut office to NAL. A copy of the chain-of-custodies are included as Appendix C.

Total priority pollutant metals results for the three composite samples are summarized on Table 1. TCLP and EP Toxicity extractable metal results are summarized on Tables 2 and 3 respectively. Extractable VOC results, determined by TCLP methodology are summarized on Table 4. As noted on the NAL data sheets (Appendix C) common laboratory solvents (i.e. methylene chloride, acetone, 2-butanone) should be ignored up to ten times the measured QC blank according to EPA data interpretation rules. Laboratory data sheets are provided in Appendix C.

If you have any questions on the above procedures, methodologies, or attached information please feel free to contact us. We have appreciated the opportunity to assist you on this project.

Very truly yours,

GOLDBERG-ZOINO & ASSOCIATES, INC.

Michael J. Talbot
Reviewer/Consultant

Steven P. Farrick
Project Manager

Kevin J. O'Reilly
Associate-in-Charge

SPF,KJO/bb/HD

TABLES

TABLE 1
CONFORMING STORAGE FACILITY
TOTAL PRIORITY POLLUTANT METALS
RESULTS FOR COMPOSITE SOIL SAMPLES (in mg/kg)

SAMPLE I.D.	B1-89 COMPOSITE		B2-89 COMPOSITE		B3-89 COMPOSITE	
COMPOUND	Results (3)	MRL (4)	Results (3)	MRL (4)	Results (3)	MRL (4)
Antimony	BMRL	13.6	BMRL	14.3	BMRL	13.3
Arsenic	BMRL	2.3	2.8	2.4	BMRL	2.2
Beryllium	BMRL	1.1	7.1	1.2	1.3	1.1
Cadmium	BMRL	1.1	1.2	1.2	BMRL	1.1
Chromium	14.3	2.3	21.4	2.4	21.3	2.2
Copper	35.9	5.7	854.8	6.0	54.4	5.6
Lead	94	1.1	702	1.2	44.7	1.1
Mercury	BMRL	0.11	BMRL	0.12		0.11
Nickel	11.1	9.1	85.0	9.5	14.0	8.9
Selenium	BMRL	1.1	BMRL	1.2	BMRL	1.1
Silver		2.3		2.4		2.2
Thallium	BMRL	2.3	BMRL	2.4	BMRL	2.2
Zinc	157.7	4.5	4,071.4	4.8	133.3	4.4

NOTES:

1. Samples collected on April 6, 1989.
2. Samples analyzed by Nanco Analytical Laboratories of Wappingers Falls, New York.
3. Results indicate the concentration detected by analysis.
   - BMRL indicates the compound was detected Below the Minimum Reporting Level.
   - Blanks indicate the compound was Not Detected.
4. MRL indicates the laboratory Minimum Reporting Level which is the lowest quantifiable concentration the laboratory can detect.

TABLE 2
CONFORMING STORAGE FACILITY
TCLP METALS
RESULTS FOR COMPOSITE SOIL SAMPLES (in mg/l)

SAMPLE I.D.	B1-89 COMPOSITE	B2-89 COMPOSITE	B3-89 COMPOSITE	MINIMUM REPORTING LEVEL
COMPOUND				
Antimony		BMRL		0.060
Arsenic		BMRL		0.05
Beryllium	0.006	0.019	0.008	0.005
Cadmium	0.02	0.03	0.01	0.01
Chromium	BMRL	0.15	BMRL	0.05
Copper	0.706	20.8	1.37	0.025
Lead	1.180	5.600	0.468	0.05
Mercury				0.002
Nickel	0.153	0.60	0.093	0.040
Selenium				0.01
Silver	BMRL			0.05
Thallium				0.010
Zinc	2.56	18.8	4.28	0.20

NOTES:

1. Samples collected on April 6, 1989.
2. Samples analyzed by Nanco Analytical Laboratories of Wappingers Falls, New York.
3. BMRL indicates the compound was detected Below the Minimum Reporting Level. ND indicates the compound was Not Detected.
4. MRL = laboratory Minimum Reporting Level. This is the lowest quantifiable concentration the laboratory can detect.
5. Blanks indicate the compound was not detected.

TABLE 3
CONFORMING STORAGE FACILITY
E.P. TOXICITY METALS
RESULTS FOR COMPOSITE SOIL SAMPLES (in mg/l)

SAMPLE I.D.	B1-89 COMPOSITE	B2-89 COMPOSITE	B3-89 COMPOSITE	MINIMUM REPORTING LEVEL
COMPOUND				
Arsenic				0.150
Barium	0.350	0.260	0.259	0.025
Cadmium	0.006	0.012		0.005
Chromium	0.011	0.047	0.018	0.010
Lead	0.421	2.860	0.284	0.090
Mercury	0.01	0.01		0.0002
Selenium		0.495		0.350
Silver				0.010

NOTES:

1. Samples collected on April 6, 1989.
2. Samples analyzed by Nanco Analytical Laboratories of Wappingers Falls, New York.
3. The laboratory Minimum Reporting Level is the lowest quantifiable concentration that the laboratory can detect.
4. Blanks indicate the compound was not detected.

TABLE 4
CONFORMING STORAGE FACILITY
TCLP VOLATILE ORGANIC COMPOUNDS
RESULTS FOR SOILS (in ug/l)

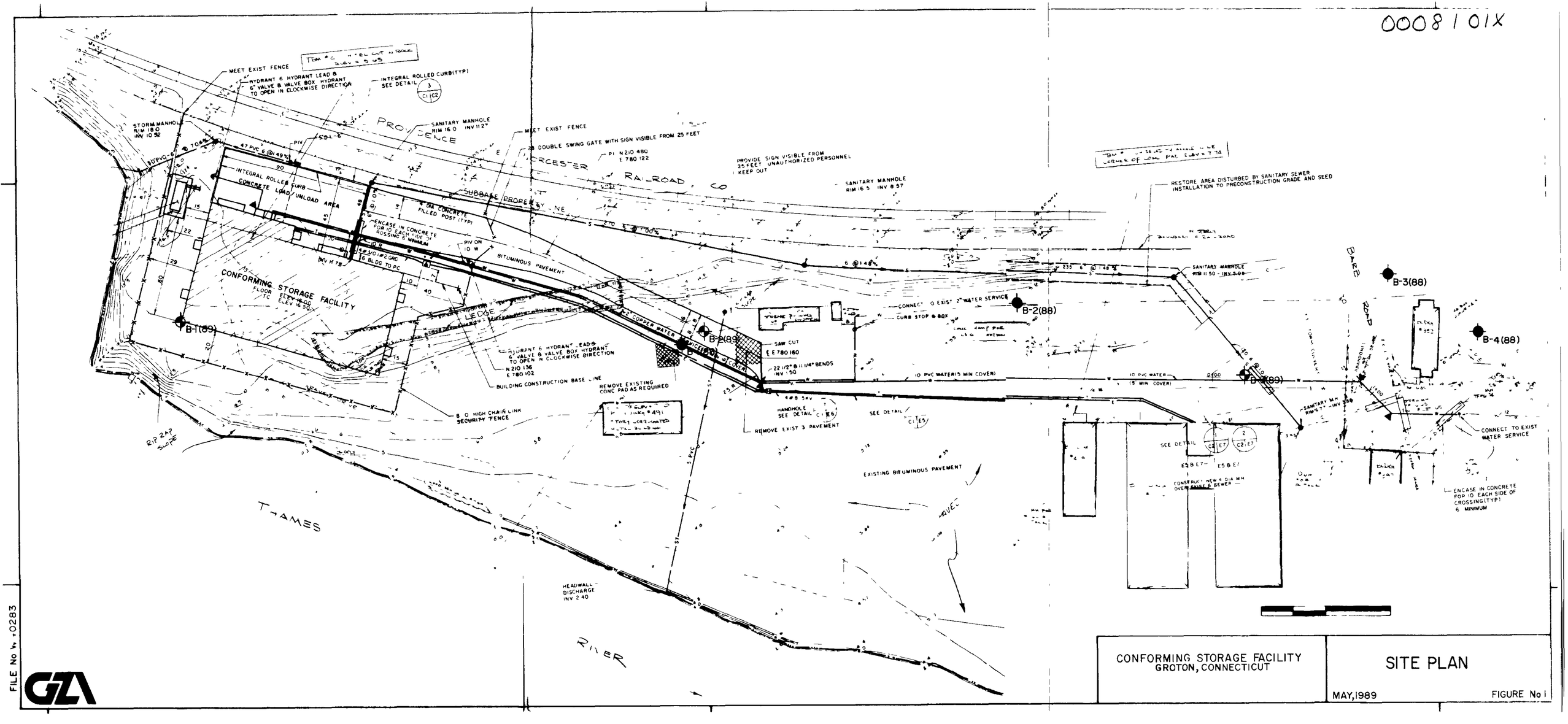
SAMPLE I.D.	B1A-89 COMPOSITE	B2A-89 COMPOSITE	B3A-89 COMPOSITE	B2A-89 S-2	B2A-89 S-4	B2A-89 S-5	B3A-89 S-4	LABORATORY QA/QC DATA		
								TCLP BLANK	METHOD BLANK	LABORATORY MRL
COMPOUND										
Acetone	16	48	13	17	24	22	14	12	BMRL	10
Acrylonitrile	BMRL									500
Methylene Chloride	9.0	9.2	8.6	9.0	9.2	9.2	7.3	12		5
1,1,2-trichloro-1,2,2-triflouroethane	BMRL			BMRL						5
Carbon Disulfide		BRML				24				5
Benzene		BMRL								5
n-Butanol					BMRL					500
Pyridine					4,500	BMRL				500
1,1,1-Trichloroethane								BMRL		5
4-Methyl-2-Pentanone	34	39	37	36	31	36	36	37		10

NOTES:

1. Samples collected on June 22, 1989.
2. Samples analyzed by Nanco Analytical Laboratories of Wappingers Falls, New York.
3. BMRL indicates the compound was detected Below the Laboratory Minimum Reporting Level.
4. Blanks indicate the compound was not detected.

FIGURES

00081 01X



CONFORMING STORAGE FACILITY
GROTON, CONNECTICUT

SITE PLAN

MAY, 1989

FIGURE No 1

FILE No W-0283

GZA

APPENDIX A
LIMITATIONS

APPENDIX A
LIMITATIONS

1. The observations described in this Report were made under the conditions stated therein. The conclusions presented in the Report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services or the time and budgetary constraints imposed by Client. The work described in this report was carried out in accordance with the attached Statement of Terms and Conditions.

2. The generalized soil profile described in the text is intended to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized and have been developed by interpretations of widely spaced explorations and samples; actual soil transitions are probably more gradual. For specific information, refer to the boring logs.

3. The analysis and conclusions submitted in this report are based in part upon chemical data and are contingent upon their validity. It should also be noted that fluctuations in the types and levels of contaminants and variations in their flow paths may occur due to seasonal water table fluctuations, past practices used in disposal, as well as other factors.

4. This report has been prepared for the exclusive use of the Donahue and Associates, Inc. for specific application to the Conforming Storage Facility, Groton, Connecticut in accordance with generally accepted hydrogeologic practices. No other warranty, expressed or implied, is made.

APPENDIX B
BORING LOGS

GOLDBERG ZOINO & ASSOCIATES, INC. 27 NAEK ROAD, VERNON CT 06066 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT CONFORMING STORAGE FACILITY GROTON, CT	REPORT OF BORING No. B1A-89 SHEET 1 OF 1 FILE No. W-40328 CHKD. BY MJT

BORING CO.: GZA DRILLING, INC.
FOREMAN: STEVE COHEN
GZA ENGINEER: STEVE FARRICK

BORING LOCATION SEE PLAN
GROUND SURFACE ELEVATION DATUM
DATE START 6-22-89 DATE END 6-22-89

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 In.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 In.

CASING SIZE: 3.75" ID HSA OTHER:

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME
4-6-89	12:30	-	5.7'	0

DEPTH	CASING BLOWS	SAMPLE No.	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
		S-1	24/15	0-2	4-14-13-28	Medium dense brown fine to coarse SAND, little (+) fine Gravel, trace Silt (Fill)	SAND AND GRAVEL (FILL?)	NO EQUIPMENT INSTALLED	ND	1
		S-2	24/4	2-4	21-27-41-43	Very dense brown to olive fine to coarse SAND and GRAVEL, trace Silt			0.2	
5		S-3	19/5	4-5.4	12-9-100/5"	Top 4": Medium dense olive fine to coarse SAND, little (+) fine Gravel, trace (+) Silt, trace (-) Asphalt	5.5		ND	
		S-4	1/1	5.4-5.5	100/1"	S-4: Very dense grey Rock Fragments	End of Exploration		ND	2
10										
15										
20										
25										
30										
35										
40										

REMARKS:

1. Samples screened with an HNu Model PI-101 photo analyzer calibrated to a benzene standard (9.8 span setting). Meter response in HNu units.
   ND = None Detected.
2. Auger and split spoon refusal encountered at approximately 5.5 feet below grade.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

GZA

BORING No.B1A-89

GOLBDERG ZOINO & ASSOCIATES, INC. 27 NAEK ROAD, VERNON CT 06066 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT CONFORMING STORAGE FACILITY GROTON, CT	REPORT OF BORING No. B2A-89 SHEET 1 OF 1 FILE No. W-40328 CHKD. BY MJT

BORING CO.: GZA DRILLING, INC.
FOREMAN: STEVE COHEN
GZA ENGINEER: STEVE FARRICK

BORING LOCATION SEE PLAN
GROUND SURFACE ELEVATION DATUM
DATE START 6-22-89 DATE END 6-22-89

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 In.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 In.

CASING SIZE: 3.75" ID HSA OTHER:

GROUNDWATER READINGS				
DATE	TIME	DEPTH	CASING	STABILIZATION TIME
6-22-89	10:45	6.0'	10'	0 HOURS

DEPTH	CASING	BLOWS	SAMPLE No.	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
			S-1	24/10	0-2	5-6-10-30	Top 6": Brown fine to coarse SAND, little fine Gravel, trace (-) Silt Rest: Grey to black fine to coarse SAND, some grey Rock Fragments, trace Brick	FILL	NO EQUIPMENT INSTALLED	0.2	1
			S-2	24/5	2-4	11-5-2-4	S-2: Loose red BRICK Fragments, little brown fine to coarse Sand, trace (-) Silt			ND	
5			S-3	24/6	4-6	3-4-1-2	S-3: Medium stiff dark grey Organic SILT, little (+) Fibrous Peat, trace fine to coarse Sand, trace Brick (wet)	5'		ND	2
			S-4	24/4	6-8	5-2-2-8	S-4: Soft dark grey Organic SILT, little (-) Fibrous Peat, little (-) fine to coarse Sand, trace (+) Brick	ORGANIC SILT (FILL?)		0.2	
			S-5	24/24	8-10	6-3-5-7	S-5: Medium stiff dark grey Organic SILT, some (-) Fibrous Peat, little fine to coarse Sand, trace Brick	10'		ND	
10								End of Exploration		0.4	
15											
20											
25											
30											
35											
40											

REMARKS:

1. Samples screened with an HNu Model PI-101 photo analyzer calibrated to a benzene standard (9.8 span setting). Meter response in HNu units.
   ND = None Detected.
2. Observed organic odor.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

GZA

BORING No.B2A-89

GOLDBERG ZOINO & ASSOCIATES, INC. 27 NAEK ROAD, VERNON CT 06066 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT CONFORMING STORAGE FACILITY GROTON, CT	REPORT OF BORING No. B3A-89 SHEET 1 OF 1 FILE No. W-40328 CHKD. BY MJT

BORING CO.: GZA DRILLING, INC.
FOREMAN: STEVE COHEN
GZA ENGINEER: STEVE FARRICK

BORING LOCATION SEE PLAN
GROUND SURFACE ELEVATION DATUM
DATE START 6-22-89 DATE END 6-22-89

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 In.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 In.

CASING SIZE: 3.75" ID HSA OTHER:

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME
6-22-89	11:50	4'	10'	0 HOURS

DEPTH	CASING	BLOWS	SAMPLE No.	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
			S-1	24/14	0-2	14-27-25-26	Very dense brown to grey fine to coarse SAND, some fine Gravel, little Stone Fragments, trace Silt	FINE TO COARSE SAND AND GRAVEL (FILL?)	NO EQUIPMENT INSTALLED	ND	1
			S-2	24/5	2-4	11-5-2-4	Very dense grey-brown fine to coarse SAND and GRAVEL, some (-) Stone Fragments, trace (-) Silt			ND	
5			S-3	24/6	4-6	3-4-1-2	Very dense grey ROCK Fragments (granite) trace fine to coarse Sand (wet), trace Silt			0.2	2
			S-4	24/4	6-8	5-2-2-8	Dense dark grey fine to coarse SAND and STONE Fragments, trace (-) Silt			ND	
			S-5	24/24	8-10	6-3-5-7	Medium dense grey gravel, trace (-) medium to coarse SAND, trace Silt	10'		0.2	
10								End of Exploration			
15											
20											
25											
30											
35											
40											

REMARKS:

1. Samples screened with an HNu Model PI-101 photo analyzer calibrated to a benzene standard (9.8 span setting). Meter response in HNu units.
   ND = None Detected.
2. Material likely represents a washed material based on observation of lack of silt and fine sand.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

GZA

BORING No.B3A-89

GOLDBERG ZOINO & ASSOCIATES, INC. 27 NAEK ROAD, VERNON CT 06066 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT NAVAL CONFORMING STORAGE FACILITY GROTON, CT	REPORT OF BORING No. B1-89 SHEET 1 OF 1 FILE No. W-40328 CHKD. BY MJT

BORING CO.: GZA DRILLING, INC.
FOREMAN: STEVE COHEN
GZA ENGINEER: STEVE FARRICK

BORING LOCATION SEE PLAN
GROUND SURFACE ELEVATION DATUM
DATE START 4-6-89 DATE END 4-6-89

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 In.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 In.

CASING SIZE: 3.75" ID HSA OTHER:

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME
4-6-89	12:30	-	5.7'	0

DEPTH	CASING	BLOWS	SAMPLE No.	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
			S-1	24/18	0-2	7-12-11-14	Dense olive-brown fine to coarse SAND, some (-) fine Gravel, trace Silt	SAND AND GRAVEL (FILL?)	NO EQUIPMENT INSTALLED	0.2	1
			S-2	24/12	2-4	16-12-8-10	Medium dense brown fine to coarse SAND, little (-) fine Gravel, trace (+) Silt			ND	
5			S-3	20/7	4-5.7	8-13-11-100/2"	Medium dense brown fine to coarse SAND and GRAVEL, trace Silt	5.7		0.2	2
								End of Exploration			
10											
15											
20											
25											
30											
35											
40											

REMARKS:

1. Samples screened with an HNu Model PI-101 photo analyzer calibrated to a benzene standard (9.8 span setting). Meter response in HNu units.
   ND = None Detected.
2. Auger and split spoon refusal encountered at approximately 5.7 feet below grade.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED. FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

GZA

BORING No. B1-89

GOLDBERG ZOINO & ASSOCIATES, INC. 27 NAEK ROAD, VERNON CT 06066 GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT NAVAL CONFORMING STORAGE FACILITY GROTON, CT	REPORT OF BORING No. B2-89 SHEET 1 OF 1 FILE No. W-40328 CHKD. BY MJT

BORING CO.: GZA DRILLING, INC.
FOREMAN: STEVE COHEN
GZA ENGINEER: STEVE FARRICK

BORING LOCATION SEE PLAN
GROUND SURFACE ELEVATION DATUM
DATE START 4-6-89 DATE END 4-6-89

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 In.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 In.

CASING SIZE: 3.75" ID HSA OTHER:

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME
4-6-89	10:45	6'	10'	0

DEPTH	CASING BLOWS	SAMPLE No.	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION Burmister CLASSIFICATION	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
		S-1	24/5	0-2	4-9-11-10	Medium dense dark brown to black fine to coarse SAND, little (-) fine Gravel, trace Silt	FILL	NO EQUIPMENT INSTALLED	ND	1
		S-2	24/4	2-4	10-3-8-4	Medium dense brown to black fine to coarse SAND, little (-) fine Gravel, trace (+) Silt, trace Brick			0.2	
5		S-3	24/2	4-6	5-3-1-2	S-3: Loose brown fine to coarse SAND, some (+) Brick, little (-) fine Gravel	5'		0.8	
		S-4	24/7	6-8	1-3-1-3	S-4: Soft black Organic SILT, trace (+) Organics (Fibrous Peat?)	ORGANIC SILT (FILL?)		3.2	2
		S-5	24/5	8-10	1-2-9-15	Medium dense grey SILT, some fine to medium Sand, trace fine Gravel	10'		4.0	
10							End of Exploration			
15										
20										
25										
30										
35										
40										

REMARKS:

1. Samples screened with an HNu Model PI-101 photo analyzer calibrated to a benzene standard (9.8 span setting). Meter response in HNu units.
   ND = None Detected.
2. Sheen observed on sampler wash water and in spoon sample.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

GZA

BORING No. B2-89

GOLDBERG ZOINO & ASSOCIATES, INC.
27 NAEK ROAD, VERNON CT 06066
GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS

PROJECT
NAVAL CONFORMING STORAGE FACILITY
GROTON, CT

REPORT OF BORING No. B3-89
SHEET 1 OF 1
FILE No. W-40328
CHKD. BY MJT

BORING CO.: GZA DRILLING, INC.
FOREMAN: STEVE COHEN
GZA ENGINEER: STEVE FARRICK

BORING LOCATION SEE PLAN
GROUND SURFACE ELEVATION DATUM
DATE START 4-6-89 DATE END 4-6-89

SAMPLER: UNLESS OTHERWISE NOTED, SAMPLER CONSISTS OF A 2" SPLIT SPOON DRIVEN USING A 140 lb. HAMMER FALLING 30 In.

CASING: UNLESS OTHERWISE NOTED, CASING DRIVEN USING A 300 lb. HAMMER FALLING 24 In.

CASING SIZE: 3.75" ID HSA OTHER:

GROUNDWATER READINGS

DATE	TIME	DEPTH	CASING	STABILIZATION TIME
4-6-89	9:00	3.5'	8'	15 MIN

DEPTH	CASING	BLOWS	SAMPLE No.	PEN./REC.	DEPTH (Ft.)	BLOWS/6"	SAMPLE DESCRIPTION (Burmister CLASSIFICATION)	STRATUM DESCRIPTION	EQUIPMENT INSTALLED	FIELD TESTING	REMKS
			S-1	24/14	0-2	16-34-57-100/1"	Top 3" Asphalt; Rest: Very dense brown fine to coarse SAND, little fine Gravel, trace Silt, trace black Sand	FINE TO COARSE SAND LITTLE GRAVEL (FILL?)	NO EQUIPMENT INSTALLED	ND	1
			S-2	24/20	2-4	20-43-29-41	S-2: Very dnese grey-brown fine to coarse SAND, little (+) Gravel, trace Silt			ND	
5			S-3	24/4	4-6	50-36-15-12	S-3: Very dense, brown fine to coarse SAND, some fine to coarse Gravel, trace Silt			0.2	
			S-4	24/5	6-8	8-10-5-9	S-4: Medium dense dark brown fine to coarse SAND, little (+) fine Gravel, trace (+) Silt			0.6	
			S-5	24/16	8-10	25-14-13-15	S-5: Medium dense dark brown fine to coarse SAND, trace (+) fine Gravel, trace Silt	10'		ND	
10								End of Exploration			
15											
20											
25											
30											
35											
40											

REMARKS:

1. Samples screened with an HNu Model PI-101 photo analyzer calibrated to a benzene standard (9.8 span setting). Meter response in HNu units.
ND = None Detected.

NOTES: 1) STRATIFICATION LINES REPRESENT APPROXIMATE BOUNDARY BETWEEN SOIL TYPES, TRANSITIONS MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE AT TIMES AND UNDER CONDITIONS STATED, FLUCTUATIONS OF GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE

GZA

BORING No. B3-89

APPENDIX C
ANALYTICAL DATA SHEETS AND CHAIN-OF-CUSTODY

NANCO
ABORATORIES

May 4, 1989

Goldgerg-Zoina Assoc., Inc.
27 Naek Road
Vernon, Ct. 06066
Attn: Steve Farrick

Re: Your samples received April 10, 1989

At your request, please find the results for the Metal analyses performed upon your samples referenced above. The Volatile TCLP results will be sent to you on May 5, 1989.

We believe our analytical results are of the highest quality, and we would be pleased to discuss your reports with you at your convenience. If you have any questions or comments pertaining to this data package, please reference them to Invoice #28085.

Again, Nanco is pleased to be of service to you. We anticipate working with you in fulfilling your future testing requirements.

Sincerely,

P. L. Gunsch

Patricia L. Gunsch,
QC Manager

PLG:jtc
enc.

enc

Robinson Lane, RD 6 • Wappingers Falls, New York 12590 • (914) 227-4100 • (800) 556-2626

NANCO
ABORATORIES

TECHNICAL REPORT PREPARED FOR

GOLDBERG-ZOINA ASSOC., INC.

SAMPLES RECEIVED:

APRIL 10, 1989

GOLDBERG-ZOINA ASSOC., INC.

CHAINS OF CUSTODY

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

SS Plow - Tank

CHAIN-OF-CUSTODY RECORD

Sample Date	Time (24 hr.)	Sampler ID	Sample Identification	Sample Type*	Other	VOA-GC/MS	VOA-GC	ABN	PESTICIDE	PCB	P.P. METALS (TOTAL)	RCRA METALS	E.P. TOX	TPH-IR	O&G	CN	TOC	SCREEN	TCLP VOC'S	TCLP P.P. METALS				PRESERVED	Total # of Cont.	Note #
4-6-89		SPF	B-1 (COMP)	SOIL							✓		✓						✓	✓				NONE	4	1
4-6-89		SPF	B-2 (COMP.)	SOIL							✓		✓						✓	✓				NONE	4	1
4-6-89		SPF	B-3 (COMP.)	SOIL							✓		✓						✓	✓				NONE	4	1
4-6-89		SPF	B-2 (S-2)	SOIL															✓					NONE	1	2
4-6-89		SPF	B-2 (S-4)	SOIL															✓					NONE	1	2
4-6-89		SPF	B-2 (S-5)	SOIL															✓					NONE	1	2
4-6-89	↓	SPF	B-3 (S-4)	SOIL															✓					NONE	1	2
																									16	

TOTAL NUMBER OF CONTAINERS

*SAMPLE TYPE: W = Water; S = Soil; SL = Sludge; SED = Sediments; or see notes.

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
Steve P. Farrick	4/7/89	
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)

NOTES:

1. ANALYZE FOR TCLP - VOC'S AND P.P. METALS, TOTAL METALS AND E.P. TOXICITY METALS, PLEASE TAKE EXTRA CARE IN REGARDS TO SAMPLE VOLUMES FOR METALS ANALYSIS.
2. ANALYZE FOR TCLP VOC'S.

ANALYTICAL LABORATORY: NANCO LABORATORIES

LABORATORY CONTACT: DIANE KENNY

GZA CONTACT: STEVE FARRICK PHONE:

Goldberg-Zoino & Associates, Inc.
27 Naek Road
VERNON, CT 06066
203-875-7655

GZA FILE NO. W-40328 P.O. NO. V01948

PROJECT

LOCATION GROTON, CONNECTICUT

COLLECTOR(S) STEVE FARRICK

DATE(S) OF COLLECTION 4-6-89 SHEET 1 OF 1

Nanco Sample ID: 89-SS-7680

Client Sample ID: B-1 COMPOSITE

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

PRIORITY POLLUTANT METALS

Nanco Sample ID: 88-SS-7680 Customer Sample ID: B-1 COMPOSITE

# COMPOUNDS	RESULTS SAMP. CONC. *MG/KG	RESULTS MRL. *MG/KG	Q.C. REPLICATES FIRST UG/L	Q.C. REPLICATES SECOND UG/L	Q.C. BLANK & SPIKED BLANK BLANK UG/L	CONC. ADDED UG/L	% RECOVERY	Q.C. MATRIX SPIKE UNSPIKED SAMPLE UG/L	CONC. ADDED UG/L	% RECOVERY
ANTIMONY	BMRL	13.6	ND	ND	ND	1,010	96	ND	500	74
ARSENIC	BMRL	2.3	23	104	ND	47.0	103	23	20	370
BERYLLIUM	BMRL	1.1	ND	ND	ND	481	108	ND	50	98
CADMIUM	BMRL	1.1	BMRL	ND	ND	489	101	BMRL	50	88
CHROMIUM	14.3	2.3	101	22.0	ND	506	96	101	200	41
COPPER	35.9	5.7	BMRL	BMRL	ND	542	99	BMRL	250	93
LEAD	94	1.1	64	61	ND	24.5	107	64	20	25
MERCURY	BMRL	0.11	4.59	4.59	ND	5.2	99	4.59	1	118
NICKEL	11.1	9.1	BMRL	BMRL	ND	496	91	BMRL	400	109
SELENIUM	BMRL	1.1	30.5	23.5	ND	26.0	98	30.5	10	91
SILVER	ND	2.3	ND	ND	ND	509	102	ND	50	94
THALLIUM	BMRL	2.3	BMRL	BMRL	ND	24.3	103	BMRL	50	77
ZINC	157.7	4.5	23.0	23.0	ND	3,100	99	23.0	200	223
% SOLIDS	88	----	----	----	----	----	----	----	----	----

N.D. = Not Detected BMRL = Below Minimum Reporting Level MRL = Minimum Reporting Level

* RESULTS ARE BASED ON DRY WEIGHT.

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

TCLP METALS

Nanco Sample ID: 88-SS-7680 Customer Sample ID: B-1 COMPOSITE

	RESULTS		Q.C. REPLICATES		Q.C. BLANK & SPIKED BLANK			Q.C. MATRIX SPIKE		
# COMPOUNDS	SAMP. CONC. MG/L	MRL. MG/L	FIRST UG/L	SECOND UG/L	BLANK UG/L	CONC. ADDED UG/L	% RECOVERY	UNSPIKED SAMPLE UG/L	CONC. ADDED UG/L	% RECOVERY
ANTIMONY	ND	0.060	ND	ND	ND	1,010	96	ND	500	74
ARSENIC	ND	0.05	23	104	ND	47.0	103	23	20	370
BERYLLIUM	0.006	0.005	ND	ND	ND	481	108	ND	50	98
CADMIUM	0.02	0.01	BMRL	ND	ND	489	101	BMRL	50	88
CHROMIUM	BMRL	0.05	101	22.0	ND	506	96	101	200	41
COPPER	0.706	0.025	BMRL	BMRL	ND	542	99	BMRL	250	93
LEAD	1.180	0.05	64	61	ND	24.5	107	64	20	25
MERCURY	ND	0.002	4.59	4.59	ND	5.2	99	4.59	1	118
NICKEL	0.153	0.040	BMRL	BMRL	ND	496	91	BMRL	400	109
SELENIUM	ND	0.01	30.5	23.5	ND	26.0	98	30.5	10	91
SILVER	BMRL	0.05	ND	ND	ND	509	102	ND	50	94
THALLIUM	ND	0.010	BMRL	BMRL	ND	24.3	103	BMRL	50	77
ZINC	2.56	0.020	23.0	23.0	ND	3,100	99	23.0	200	223

N.D. = Not Detected BMRL = Below Minimum Reporting Level MRL = Minimum Reporting Level

****

NANCO LABS, INC.

****

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

E.P. TOXICITY METALS

Nanco ID: 88-SS-7680 Customer ID: B-1 COMPOSITE

#	COMPOUNDS	RESULTS	UNITS	MCL
1M	ARSENIC	< 0.150	MG/L	5.0
2M	BARIUM	0.350	MG/L	100
3M	CADMIUM	0.006	MG/L	1.0
4M	CHROMIUM	0.011	MG/L	5.0
5M	LEAD	0.421	MG/L	5.0
6M	MERCURY	0.01	MG/L	0.2
7M	SELENIUM	< 0.350	MG/L	1.0
8M	SILVER	< 0.010	MG/L	5.0

MCL = MAXIMUM CONTAMINATION LEVEL

Nanco Sample ID: 89-SS-7681

Client Sample ID: B-2 COMPOSITE

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

PRIORITY POLLUTANT METALS

Nanco Sample ID: 88-SS-7681 Customer Sample ID: B-2 COMPOSITE

# COMPOUNDS	RESULTS SAMP. CONC. *MG/KG	RESULTS MRL. *MG/KG	Q.C. REPLICATES FIRST UG/L	Q.C. REPLICATES SECOND UG/L	Q.C. BLANK & SPIKED BLANK BLANK UG/L	CONC. ADDED UG/L	% RECOVERY	Q.C. MATRIX SPIKE UNSPIKED SAMPLE UG/L	CONC. ADDED UG/L	% RECOVERY
ANTIMONY	BMRL	14.3	ND	ND	ND	1,010	96	ND	500	74
ARSENIC	2.8	2.4	23	104	ND	47.0	103	23	20	370
BERYLLIUM	7.1	1.2	ND	ND	ND	481	108	ND	50	98
CADMIUM	1.2	1.2	BMRL	ND	ND	489	101	BMRL	50	88
CHROMIUM	21.4	2.4	101	22.0	ND	506	96	101	200	41
COPPER	854.8	6.0	BMRL	BMRL	ND	542	99	BMRL	250	93
LEAD	702	1.2	64	61	ND	24.5	107	64	20	25
MERCURY	BMRL	0.12	4.59	4.59	ND	5.2	99	4.59	1	118
NICKEL	85.0	9.5	BMRL	BMRL	ND	496	91	BMRL	400	109
SELENIUM	BMRL	1.2	30.5	23.5	ND	26.0	98	30.5	10	91
SILVER	ND	2.4	ND	ND	ND	509	102	ND	50	94
THALLIUM	BMRL	2.4	BMRL	BMRL	ND	24.3	103	BMRL	50	77
ZINC	4,071.4	4.8	23.0	23.0	ND	3,100	99	23.0	200	223
% SOLIDS	84	----	----	----	----	----	----	----	----	----

N.D. = Not Detected BMRL = Below Minimum Reporting Level MRL = Minimum Reporting Level

* RESULTS ARE BASED ON DRY WEIGHT.

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

TCLP METALS

Nanco Sample ID: 88-SS-7681 Customer Sample ID: B-2 COMPOSITE

	RESULTS		Q.C. REPLICATES		Q.C. BLANK & SPIKED BLANK			Q.C. MATRIX SPIKE		
# COMPOUNDS	SAMP. CONC. MG/L	MRL. MG/L	FIRST UG/L	SECOND UG/L	BLANK UG/L	CONC. ADDED UG/L	% RECOVERY	UNSPIKED SAMPLE UG/L	CONC. ADDED UG/L	% RECOVERY
ANTIMONY	BMRL	0.060	ND	ND	ND	1,010	96	ND	500	74
ARSENIC	BMRL	0.05	23	104	ND	47.0	103	23	20	370
BERYLLIUM	0.019	0.005	ND	ND	ND	481	108	ND	50	98
CADMIUM	0.03	0.01	BMRL	ND	ND	489	101	BMRL	50	88
CHROMIUM	0.15	0.05	101	22.0	ND	506	96	101	200	41
COPPER	20.8	0.025	BMRL	BMRL	ND	542	99	BMRL	250	93
LEAD	5.600	0.05	64	61	ND	24.5	107	64	20	25
MERCURY	ND	0.002	4.59	4.59	ND	5.2	99	4.59	1	118
NICKEL	0.60	0.040	BMRL	BMRL	ND	496	91	BMRL	400	109
SELENIUM	ND	0.01	30.5	23.5	ND	26.0	98	30.5	10	91
SILVER	ND	0.05	ND	ND	ND	509	102	ND	50	94
THALLIUM	ND	0.010	BMRL	BMRL	ND	24.3	103	BMRL	50	77
ZINC	18.8	0.020	23.0	23.0	ND	3,100	99	23.0	200	223

N.D. = Not Detected BMRL = Below Minimum Reporting Level MRL = Minimum Reporting Level

****

NANCO LABS, INC.

****

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

E.P. TOXICITY METALS

Nanco ID: 88-SS-7681 Customer ID: B-2 COMPOSITE

#	COMPOUNDS	RESULTS	UNITS	MCL
1M	ARSENIC	< 0.150	MG/L	5.0
2M	BARIUM	0.260	MG/L	100
3M	CADMIUM	0.012	MG/L	1.0
4M	CHROMIUM	0.047	MG/L	5.0
5M	LEAD	2.860	MG/L	5.0
6M	MERCURY	0.01	MG/L	0.2
7M	SELENIUM	0.495	MG/L	1.0
8M	SILVER	< 0.010	MG/L	5.0

MCL = MAXIMUM CONTAMINATION LEVEL

Nanco Sample ID: 89-SS-7682

Client Sample ID: B-3 COMPOSITE

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

PRIORITY POLLUTANT METALS

Nanco Sample ID: 88-SS-7682 Customer Sample ID: B-3 COMPOSITE

	RESULTS		Q.C. REPLICATES		Q.C. BLANK & SPIKED BLANK			Q.C. MATRIX SPIKE		
# COMPOUNDS	SAMP. CONC. *MG/KG	MRL. *MG/KG	FIRST UG/L	SECOND UG/L	BLANK UG/L	CONC. ADDED UG/L	% RECOVERY	UNSPIKED SAMPLE UG/L	CONC. ADDED UG/L	% RECOVERY
ANTIMONY	BMRL	13.3	ND	ND	ND	1,010	96	ND	500	74
ARSENIC	BMRL	2.2	23	104	ND	47.0	103	23	20	370
BERYLLIUM	1.3	1.1	ND	ND	ND	481	108	ND	50	98
CADMIUM	BMRL	1.1	BMRL	ND	ND	489	101	BMRL	50	88
CHROMIUM	21.3	2.2	101	22.0	ND	506	96	101	200	41
COPPER	54.4	5.6	BMRL	BMRL	ND	542	99	BMRL	250	93
LEAD	44.7	1.1	64	61	ND	24.5	107	64	20	25
MERCURY	ND	0.11	4.59	4.59	ND	5.2	99	4.59	1	118
NICKEL	14.0	8.9	BMRL	BMRL	ND	496	91	BMRL	400	109
SELENIUM	BMRL	1.1	30.5	23.5	ND	26.0	98	30.5	10	91
SILVER	ND	2.2	ND	ND	ND	509	102	ND	50	94
THALLIUM	BMRL	2.2	BMRL	BMRL	ND	24.3	103	BMRL	50	77
ZINC	133.3	4.4	23.0	23.0	ND	3,100	99	23.0	200	223
% SOLIDS	90	----	----	----	----	----	----	----	----	----

N.D. = Not Detected BMRL = Below Minimum Reporting Level MRL = Minimum Reporting Level

* RESULTS ARE BASED ON DRY WEIGHT.

****

NANCO LABS, INC.

****

QUANTITATIVE RESULTS AND QUALITY ASSURANCE DATA

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

TCLP METALS

Nanco Sample ID: 88-SS-7682 Customer Sample ID: B-3 COMPOSITE

	RESULTS		Q.C. REPLICATES		Q.C. BLANK & SPIKED BLANK			Q.C. MATRIX SPIKE		
# COMPOUNDS	SAMP. CONC. MG/L	MRL. MG/L	FIRST UG/L	SECOND UG/L	BLANK UG/L	CONC. ADDED UG/L	% RECOVERY	UNSPIKED SAMPLE UG/L	CONC. ADDED UG/L	% RECOVERY
ANTIMONY	ND	0.060	ND	ND	ND	1,010	96	ND	500	74
ARSENIC	ND	0.05	23	104	ND	47.0	103	23	20	370
BERYLLIUM	0.008	0.005	ND	ND	ND	481	108	ND	50	98
CADMIUM	0.01	0.01	BMRL	ND	ND	489	101	BMRL	50	88
CHROMIUM	BMRL	0.05	101	22.0	ND	506	96	101	200	41
COPPER	1.37	0.025	BMRL	BMRL	ND	542	99	BMRL	250	93
LEAD	0.468	0.05	64	61	ND	24.5	107	64	20	25
MERCURY	ND	0.002	4.59	4.59	ND	5.2	99	4.59	1	118
NICKEL	0.093	0.040	BMRL	BMRL	ND	496	91	BMRL	400	109
SELENIUM	ND	0.01	30.5	23.5	ND	26.0	98	30.5	10	91
SILVER	ND	0.05	ND	ND	ND	509	102	ND	50	94
THALLIUM	ND	0.010	BMRL	BMRL	ND	24.3	103	BMRL	50	77
ZINC	4.28	0.020	23.0	23.0	ND	3,100	99	23.0	200	223

N.D. = Not Detected BMRL = Below Minimum Reporting Level MRL = Minimum Reporting Level

****

NANCO LABS, INC.

****

GOLDBERG-ZOINA ASSOC., INC.

Date Received: 04/10/89
Date Reported: 05/04/89

E.P. TOXICITY METALS

Nanco ID: 88-SS-7682 Customer ID: B-3 COMPOSITE

#	COMPOUNDS	RESULTS	UNITS	MCL
1M	ARSENIC	< 0.150	MG/L	5.0
2M	BARIUM	0.259	MG/L	100
3M	CADMIUM	< 0.005	MG/L	1.0
4M	CHROMIUM	0.018	MG/L	5.0
5M	LEAD	0.284	MG/L	5.0
6M	MERCURY	< 0.0002	MG/L	0.2
7M	SELENIUM	< 0.350	MG/L	1.0
8M	SILVER	< 0.010	MG/L	5.0

MCL = MAXIMUM CONTAMINATION LEVEL

TANCO
LABORATORIES

RECEIVED

JUL 1 7 1989

GOLDBERG-ZOINO & ASSOC.
BY_____

TECHNICAL REPORT PREPARED FOR

GOLDBERG-ZOINO ASSOC., INC.

SAMPLES RECEIVED:

JUNE 24, 1989

NANCO
BORATORIES

July 14 , 1989

00001

Goldberg-Zoino Assoc., Inc.
27 Naek Road
Vernon, Ct. 06066
Attn: Steve Farrick

Re: Your samples received June 24, 1989

Enclosed are results of analyses performed upon your samples referenced above.

According to EPA data interpretation rules, please note that common laboratory solvents (i.e. Methylene Chloride, Acetone, 2-Butanone) in the Volatile fraction should be ignored up to ten times (10x) the measured QC Blank (i.e., Method, Field and Trip) level. In the Semivolatile fraction the same guidelines apply to the phthalate esters.

We believe our analytical results are of the highest quality, and we would be pleased to discuss your reports with you at your convenience. If you have any questions or comments pertaining to this data package, please reference them to Invoice #28632.

Again, Nanco is pleased to be of service to you. We anticipate working with you in fulfilling your future testing requirements.

Sincerely,

Patricia L. Gunsch,
QC Manager

PLG:jtc
enc

Thus, the problem of laboratory contamination is universal. The universality of laboratory contamination is recognized by the USEPA-CLP program. Under this program, laboratory blanks are permitted to contain 5 X CRDL (Contract Required Detection Level) of common laboratory solvents and Phthalate Esters. Table - II below shows these values.

Table - II

Compound	CRDL	Lab Blank Allowable level (ug/l)
Methylene Chloride	5	25
Acetone	10	50
Toluene	5	25
2-Butanone	10	50
Common Phthalate Esters	10	50

In light of the foregoing discussion, it is clear that the answer to the first question is yes. i.e. the lab may have introduced contamination up to the allowable limit as measured by method (or lab) blanks.

The USEPA field sampling protocol requires that the sampling equipment should be cleaned with acetone. If, after the acetone cleaning, the D.I. water rinse is incomplete, then acetone can be introduced in the samples during sampling. This is often seen in the field-blank. Thus, the answer to the second question is yes, also.

00006

Usability of Data. Despite the above limitation of both laboratory and field conditions, the data is none-the-less useable. As per the USEPA Data Usability Guidelines, sample concentrations are **reduced by 10x the contamination found in any blank. i.e. Lab Blank, Field Blank or Trip Blank.** It is thus paramount, for an environmental professional making decisions regarding the contamination level, to have proper quality assurance planning done prior to sampling. i.e. at least one field blank and a trip blank should be analyzed with each sampling episode.

GOLDBERG-ZOINO ASSOC., INC.

CHAINS OF CUSTODY

WHITE COPY - Original (Accompanies Samples) YELLOW COPY - Collector PINK COPY - Project Manager

CHAIN-OF-CUSTODY RECORD

SS 1181 - 1187

Sample Date	Time (24 hr.)	Sampler ID	Sample Identification	Sample Type*	Other	VOA-GC/MS	VOA-GC	ABN	PESTICIDE	PCB	P.P. METALS	RCRA METALS	E.P. TOX	TPH-IR	O&G	CN	TOC	SCREEN	TCLP-VOC'S					PRESERVED	Total # of Cont.	Note #
6/22		SPF	B1-89 COMPOSITE	S															✓					None - COOL	1	1
6/22		SPF	B2-89 COMPOSITE	S															✓						1	
6/22		SPF	B3-89 COMPOSITE	S															✓						1	
6/22		SPF	B2-89 / S-2	S															✓						1	
6/22		SPF	B2-89 / S-4	S															✓						1	
6/22		SPF	B2-89 / S-5	S															✓						1	
6/22		SPF	B3-89 / S-4	S															✓						1	
TOTAL NUMBER OF CONTAINERS																									7	

*SAMPLE TYPE: W = Water; S = Soil; SL = Sludge; SED = Sediments; or see notes.

RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
[signature]	6/23/89	[signature]
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)
RELINQUISHED BY: (Signature)	DATE/TIME	RECEIVED BY: (Signature)

NOTES:

1. ANALYZE ALL SOIL SAMPLES FOR TCLP VOC'S. EXPECTED 21 DAY TURNAROUND TIME, PAYMENT AS PER DISCUSSIONS WITH DR. ARUN GAIND. IF QUESTIONS PLEASE CONTACT ME AT 203-875-7655.

ANALYTICAL LABORATORY: NANCO ANALYTICAL

LABORATORY CONTACT: PAT GUNSCH

GZA CONTACT: STEVE FARRICK PHONE:

Goldberg-Zoino & Associates, Inc.
27 Naek Road
VERNON, CT 06066
203-875-7655

GZA FILE NO. W - 4032P P.O. NO.

PROJECT

LOCATION ~~[illegible]~~ GROTON, CONNECTICUT

COLLECTOR(S) STEVE FARRICK

DATE(S) OF COLLECTION 6/22/89 SHEET 1 OF 1

00008

Q C SUMMARY

2B

SOIL VOLATILE SURROGATE RECOVERY

Lab Name: NANCO LABORATORY INC.

Level (low/med): LOW

	SAMPLE NO.	S1 (TOL) #	S2 (BFB) #	S3 (DCE) #	OTHER	TOTAL OUT
01	89-SS-1181	92.0	93.0	91.0	NONE	
02	89-SS-1182	85.0	89.0	84.0		
03	89-SS-1183	99.0	104.0	98.0		
04	89-SS-1184	96.0	96.0	94.0		
05	89-SS-1185	84.0	88.0	82.0		
06	89-SS-1186	86.0	90.0	85.0		
07	89-SS-1187	91.0	92.0	90.0		
08						
09						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						
25						
26						
27						
28						
29						
30						

00010

S1 (TOL) = Toluene-d8 QC LIMITS (81-117)
S2 (BFB) = Bromofluorobenzene (74-121)
S3 (DCE) = 1,2-Dichloroethane-d4 (70-121)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM II VOA-2

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: NANCO LABORATORY, INC. BLANK # 1

Lab Code: NANCO

Lab File ID: >J3021

Date Analyzed: 07/07/89 Time Analyzed: 16:36

Matrix: (soil/water) SOIL Level:(low/med)LOW

00011

Instrument ID: GC/MS

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CUSTOMER SAMPLE NO.	LAB SAMPLE NO.	LAB FILE ID	TIME ANALYZED
01	B-1-89 COMPOSITE	89-SS-1181	>J3023	18:13
02	B-2-89 COMPOSITE	89-SS-1182	>J3029	22:18
03	B-3-89 COMPOSITE	89-SS-1183	>J3024	19:03
04	B-2-89/S-2	89-SS-1184	>J3025	19:42
05	B-2-89/S-4	89-SS-1185	>J3026	20:21
06	B-2-89/S-5	89-SS-1186	>J3027	21:00
07	B-3-89/S-4	89-SS-1187	>J3028	21:39
08	B-1-89 COMPOSITE	89-SS-1181 MS	>J3030	22:57
09	B-2-89 COMPOSITE	89-SS-1181 MSD	>J3031	23:36
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS :

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: NANCO LABORATORY, INC. BLANK # 2

Lab Code: NANCO

Lab File ID: >J3022

Date Analyzed: 07/07/89 Time Analyzed: 17:33

Matrix: (soil/water) SOIL Level:(low/med)LOW

Instrument ID: GC/MS

00012

THIS METHOD BLANK APPLIES TO THE FOLLOWING SAMPLES, MS AND MSD:

	CUSTOMER SAMPLE NO.	LAB SAMPLE NO.	LAB FILE ID	TIME ANALYZED
01	B-1-89 COMPOSITE	89-SS-1181	>J3023	18:13
02	B-2-89 COMPOSITE	89-SS-1182	>J3029	22:18
03	B-3-89 COMPOSITE	89-SS-1183	>J3024	19:03
04	B-2-89/S-2	89-SS-1184	>J3025	19:42
05	B-2-89/S-4	89-SS-1185	>J3026	20:21
06	B-2-89/S-5	89-SS-1186	>J3027	21:00
07	B-3-89/S-4	89-SS-1187	>J3028	21:39
08	B-1-89 COMPOSITE	89-SS-1181 MS	>J3030	22:57
09	B-2-89 COMPOSITE	89-SS-1181 MSD	>J3031	23:36
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				

COMMENTS :

FORM IV VOA

TUNE SUMMARIES

GC/MS PERFORMANCE STANDARD

Bromofluorobenzene (BFB)

m/z	Ion Abundance Criteria	% Relative Abundance Base Peak	% Relative Abundance Appropriate Peak	Status
50	15-40% of mass 95	18.93	18.93	Ok
75	30-60% of mass 95	45.91	45.91	Ok
95	Base peak, 100% relative abundance	100.00	100.00	Ok
96	5-9% of mass 95	8.31	8.31	Ok
173	Less than 2% of mass 174	0.00	0.00	Ok
174	Greater than 50% of mass 95	79.41	79.41	Ok
175	5-9% of mass 174	6.01	7.57	Ok
176	95-101% of mass 174	78.13	98.39	Ok
177	5-9% of mass 176	5.50	7.04	Ok

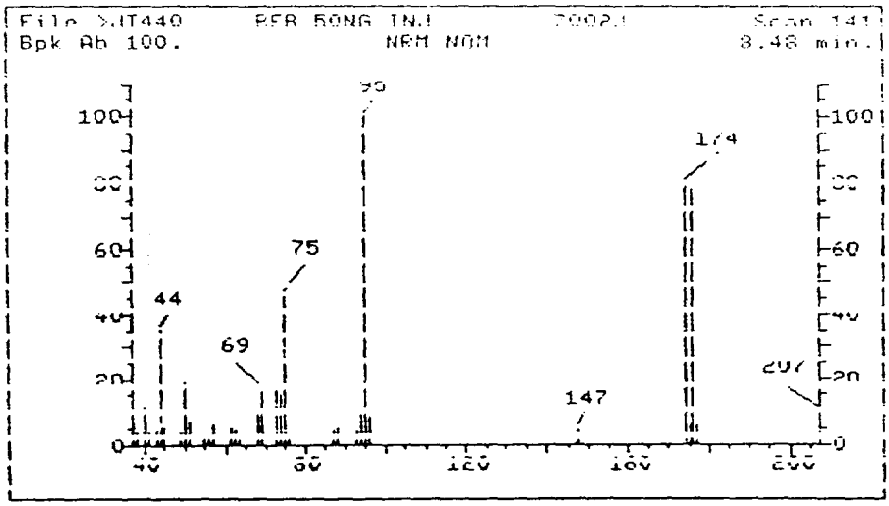
00014

Injection Date: 07/07/89
Injection Time: 11:58
Data File: >JT440
Scan: 141

>JT440 BFB 50NG INJ 7002J
141 NRM NOM

File: >JT440 Scan #: 141 Retn. time: 8.48

m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.	m/z	Int.
37.00	5.371	49.00	3.581	62.00	4.092	76.00	3.325	147.05	4.348
38.00	3.964	50.00	18.926	63.00	3.069	86.95	4.348	173.95	79.412
40.00	11.125	51.00	6.905	68.00	9.207	88.05	4.731	175.05	6.010
41.10	3.708	55.00	3.197	69.00	16.113	93.05	4.220	175.95	78.199
43.00	4.348	56.00	3.197	73.00	17.008	94.05	9.463	176.95	5.499
44.00	35.294	57.10	6.394	74.00	15.473	95.05	100.000	207.05	8.951
45.00	4.859	61.00	4.859	75.00	45.908	96.05	8.312		


Bpk Ab 100.
NRM NOM
8.48 min.
100
60
20
0
44
69
75
147
40
80
120
160
200

Nanco Sample ID: 89-SS-1181

Client Sample ID: B-1-89 COMPOSITE

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89

00018

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

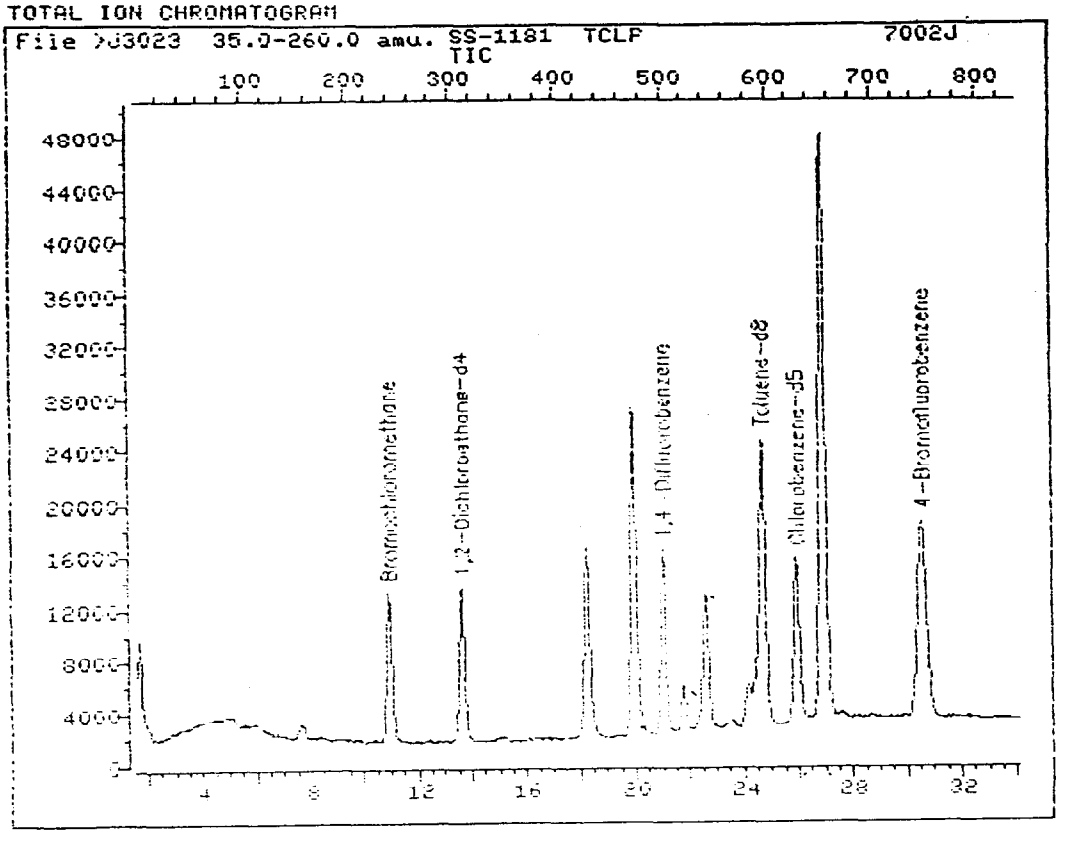
Nanco Sample ID: 89-SS-1181 Customer Sample ID: B-1-89 COMPOSITE

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	RESULTS MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	9.0	5
	67641	ACETONE	16	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	BMRL	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	BMRL	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	34	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5
			N.D.	

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



00019

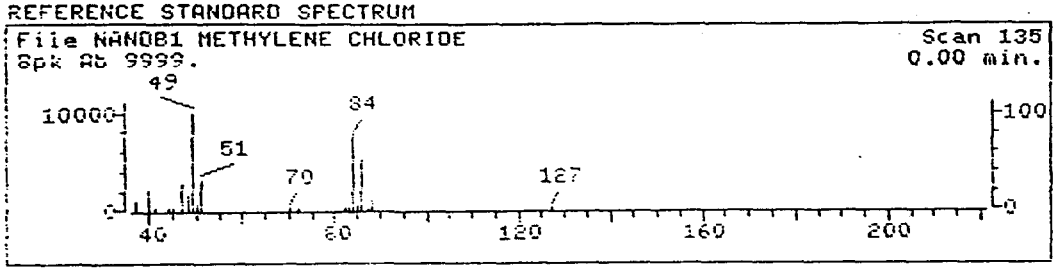
Data File: >J3023::F9
Name: SS-1181 TCLP
Misc: 7002J

Quant Output File: ^J3023::F1

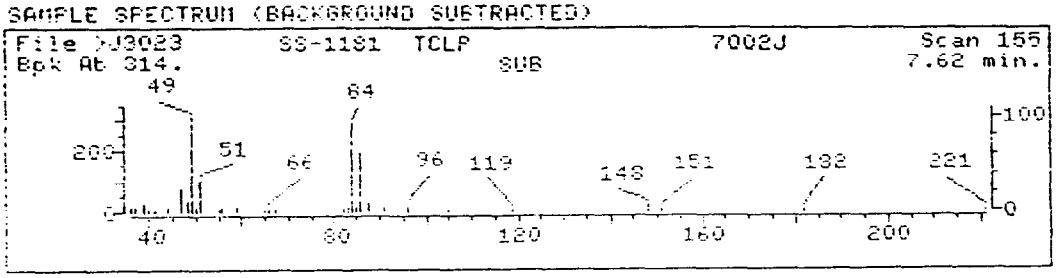
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 18:48
Injected at: 890707 18:13

REFERENCE STANDARD SPECTRUM

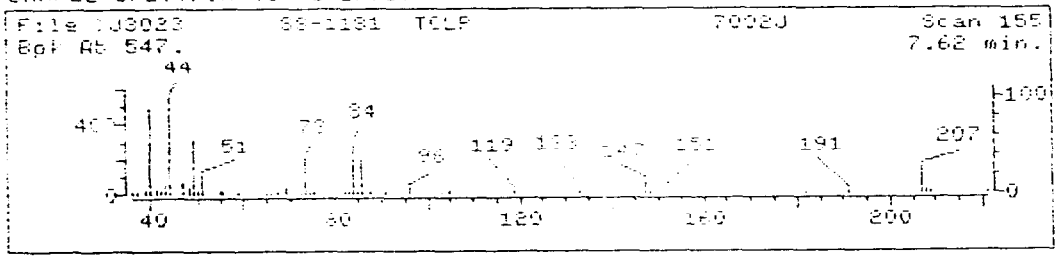


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00020

SAMPLE SPECTRUM (UNALTERED)



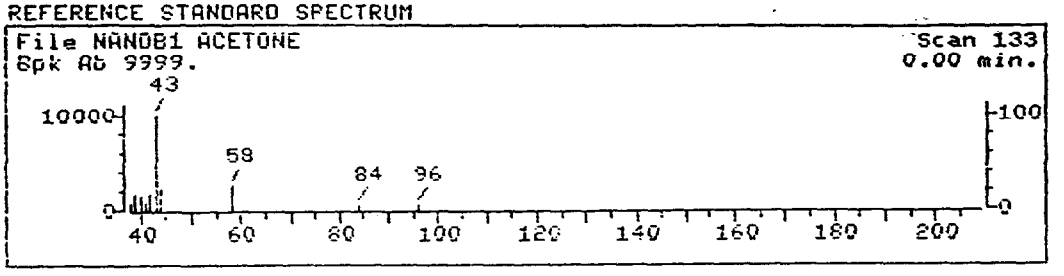
Data File: >J3023::F5
Name: SS-1181 TCLP
Misc: 7002J
Quant Time: 890707 18:48
Injected at: 890707 18:13

Quant Output File: ^J3023::F1

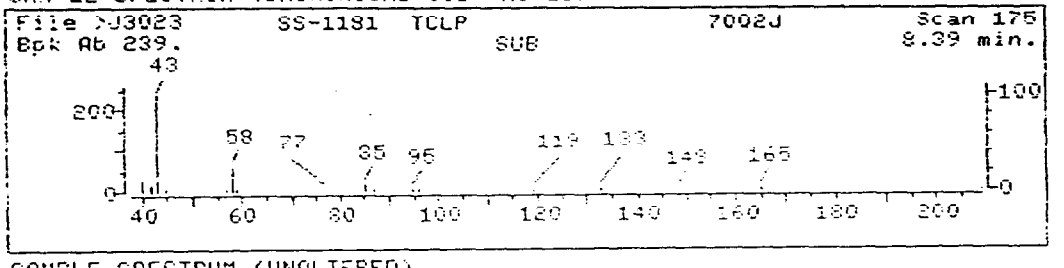
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 3
Compound Name: Methylene Chloride
Scan Number: 155
Retention Time: 7.62 min.
Quant Ion: 84.0
Area: 4476
Concentration: 8.98 UG/L
q-value: 68

REFERENCE STANDARD SPECTRUM

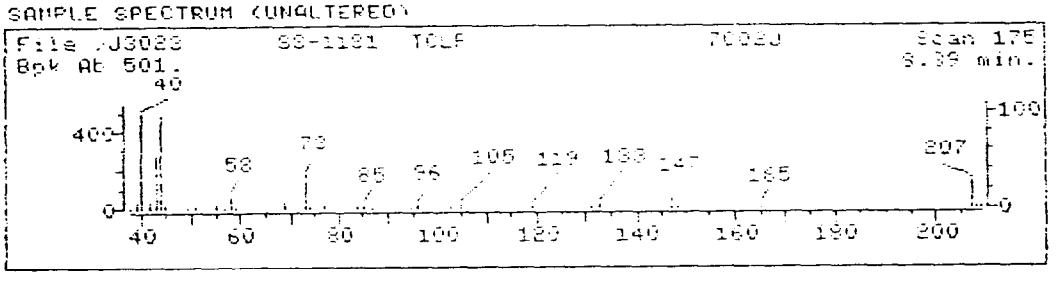


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00021

SAMPLE SPECTRUM (UNALTERED)



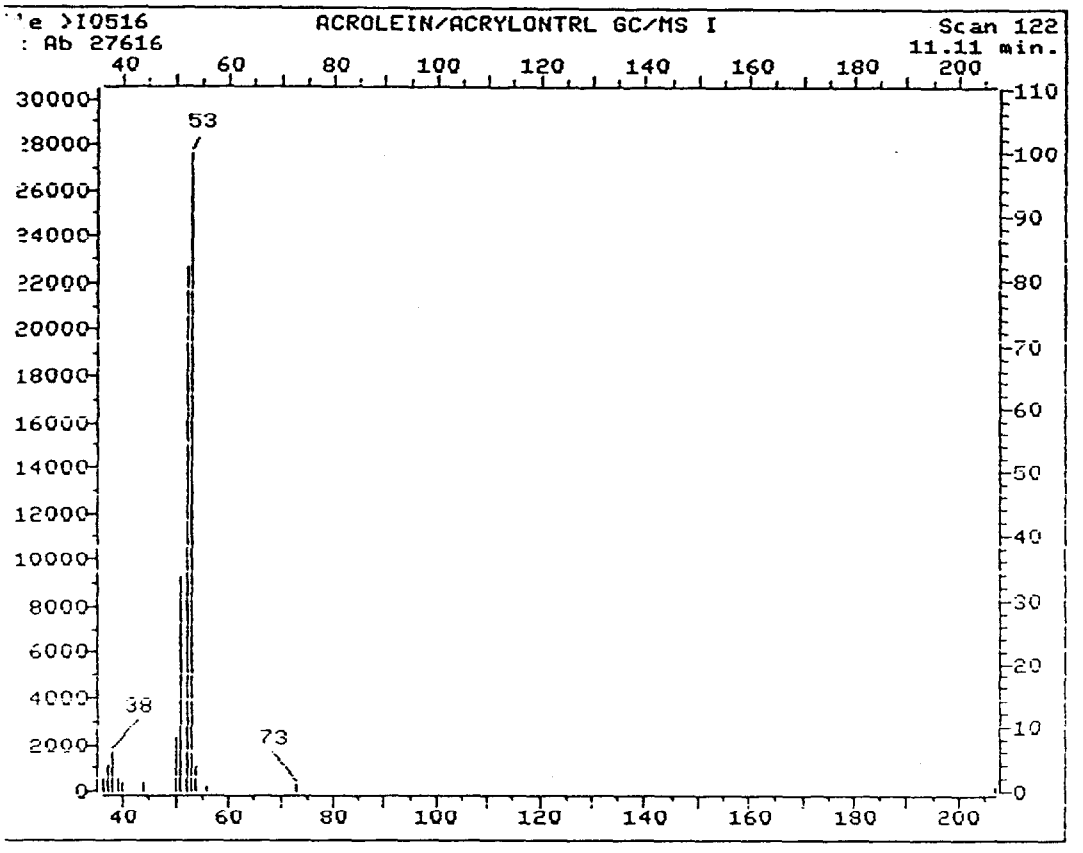
Data File: >J3023::F5
Name: SS-1181 TCLP
Misc: 7002J
Quant Time: 890707 18:48
Injected at: 890707 18:13

Quant Output File: ^J3023::F1

Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

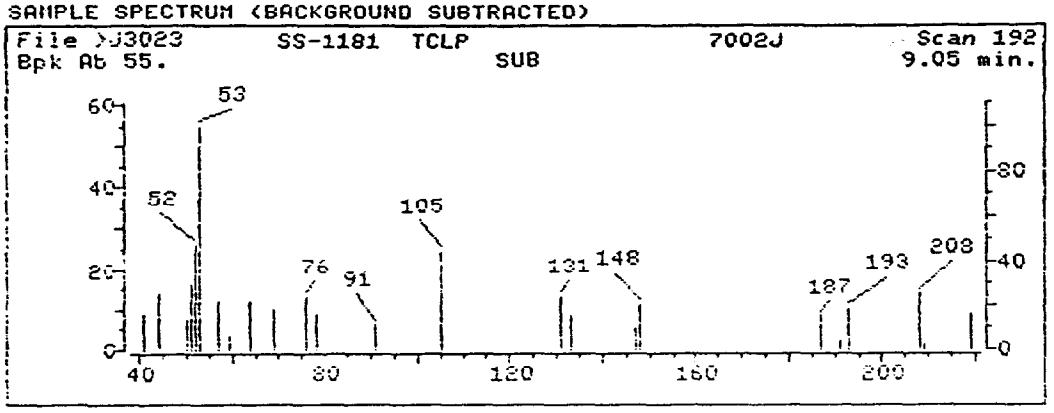
Compound No: 4
Compound Name: Acetone
Scan Number: 175
Retention Time: 8.39 min.
Quant Ion: 43.0
Area: 3375
Concentration: 16.13 UG/L
q-value: 100

REFERENCE SPECTRUM

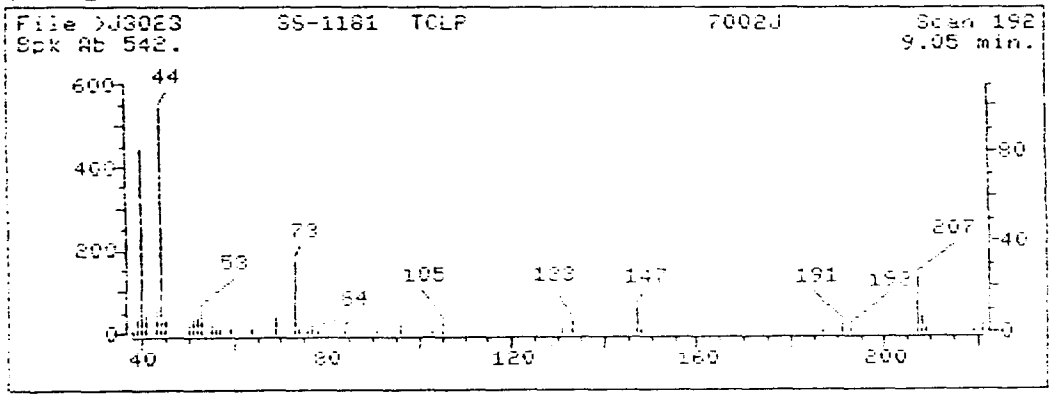


00022

SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00023

Data File: >J3023::F5
Name: SS-1181 TCLP
Misc: 7002J
Quant Time: 890707 18:48
Injected at: 890707 18:13

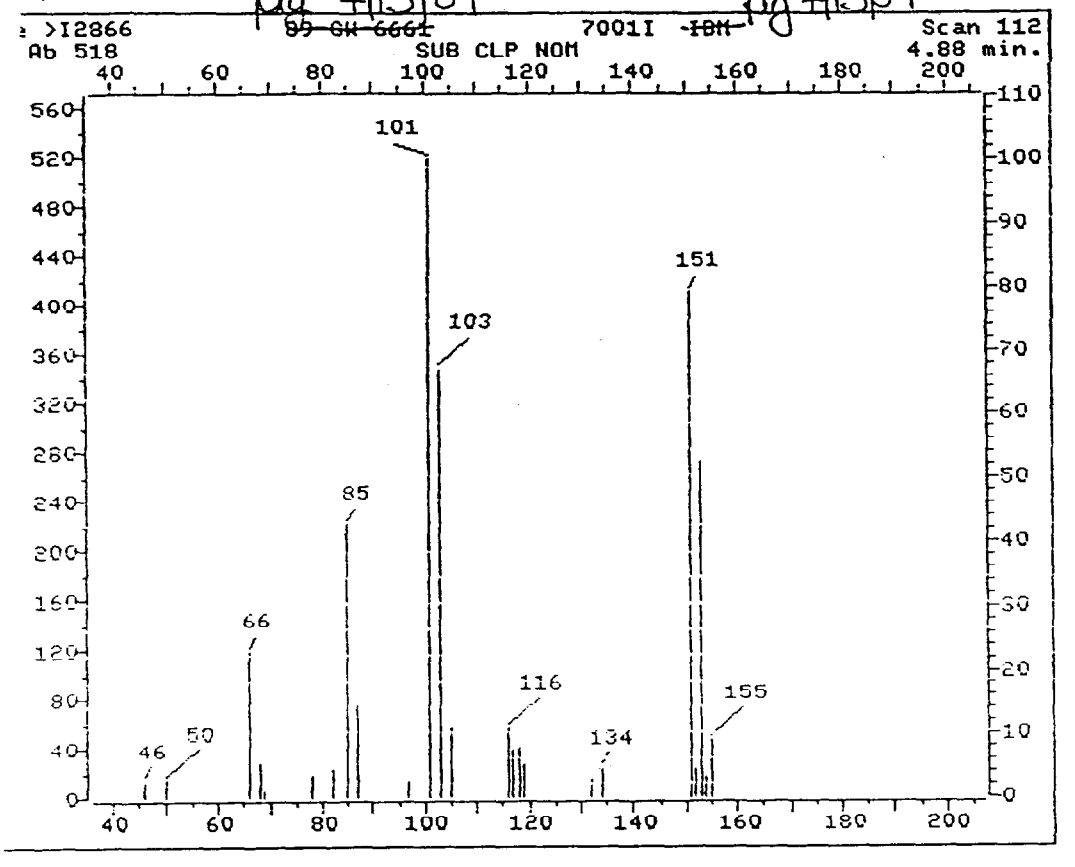
Quant Output File: ^J3023::F1

Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 7
Compound Name: Acrylonitrile
Scan Number: 192
Retention Time: 9.05 min.
Quant Ion: 53.0
Area: 904
Concentration: 36.23 UG/L
q-value: 61

Yes DS

pdg 7/13/89



pdg 7/13/89

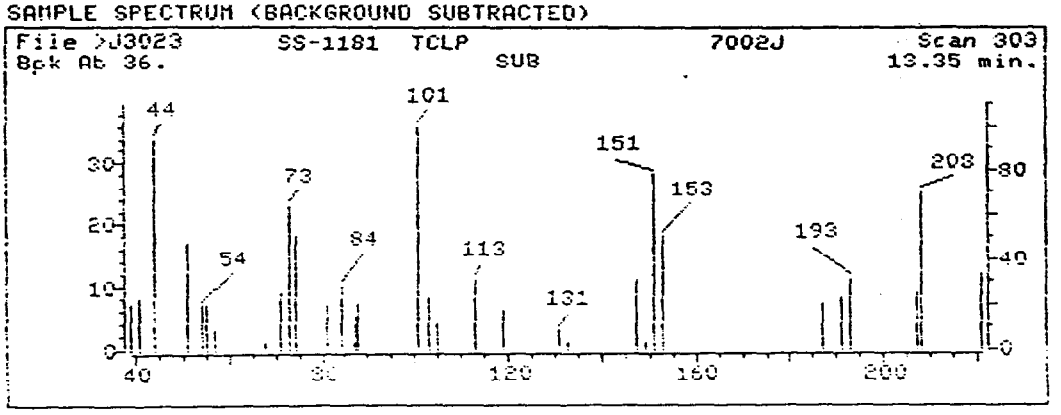
00024

Reference Spectra for

1,1,2-Trichloro-1,2,2-Trifluoroethane

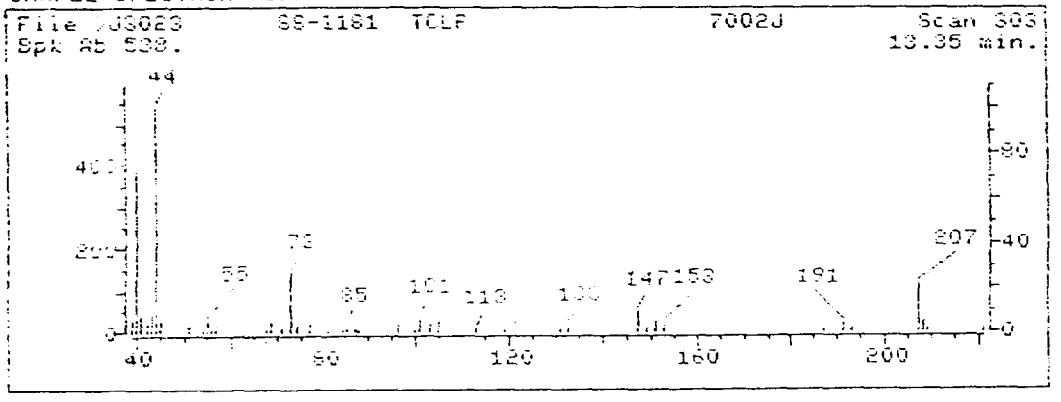
pdg 7/13/89

SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00025

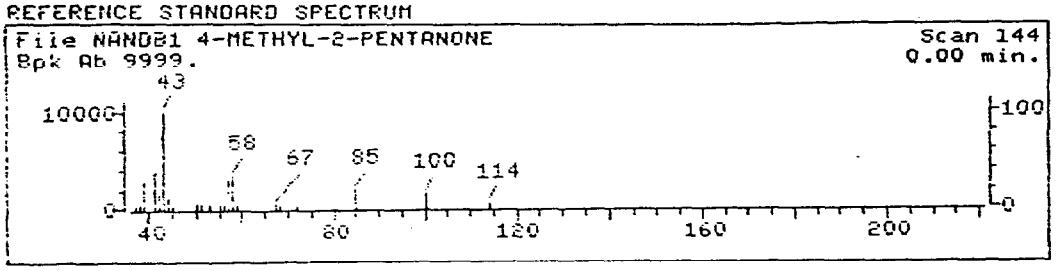
SAMPLE SPECTRUM (UNALTERED)



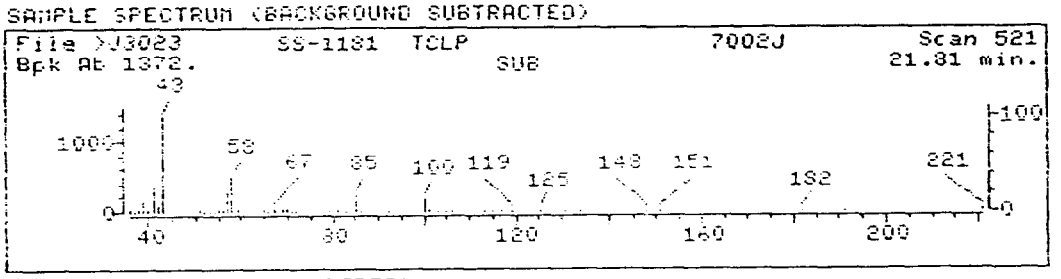
Data File: >J3023::F5 Quant Output File: ^J3023::F1
Name: SS-1181 TCLP
Misc: 7002J
Quant Time: 890707 18:48 Quant ID File: IDTCLP::QT
Injected at: 890707 18:13 Last Calibration: 890707 16:47

Compound No: 11
Compound Name: 1,1,2-Cl3-1,2,2-FL3 Ethane
Scan Number: 303
Retention Time: 13.35 min.
Quant Ion: 101.0
Area: 516
Concentration: 1.86 UG/L
q-value: 68

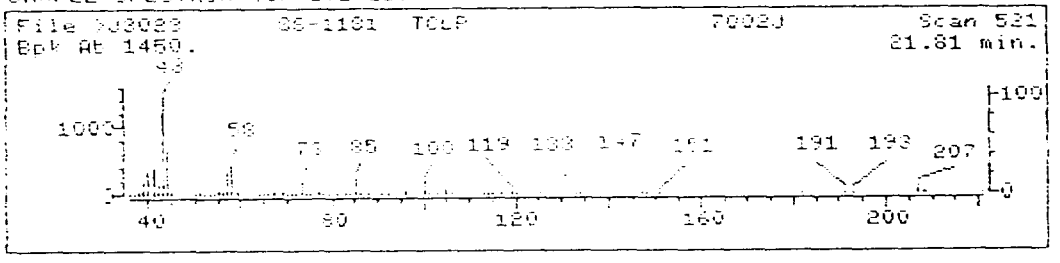
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00026

Data File: >J3023::F5 Quant Output File: ^J3023::F1
Name: SS-1181 TCLP
Misc: 7002J
Quant Time: 890707 18:48 Quant ID File: IDTCLP::QT
Injected at: 890707 18:13 Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 521
Retention Time: 21.81 min.
Quant Ion: 43.0
Area: 18855
Concentration: 34.44 UG/L
q-value: 34

Nanco Sample ID: 89-SS-1182

Client Sample ID: B-2-89 COMPOSITE

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89

00028

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

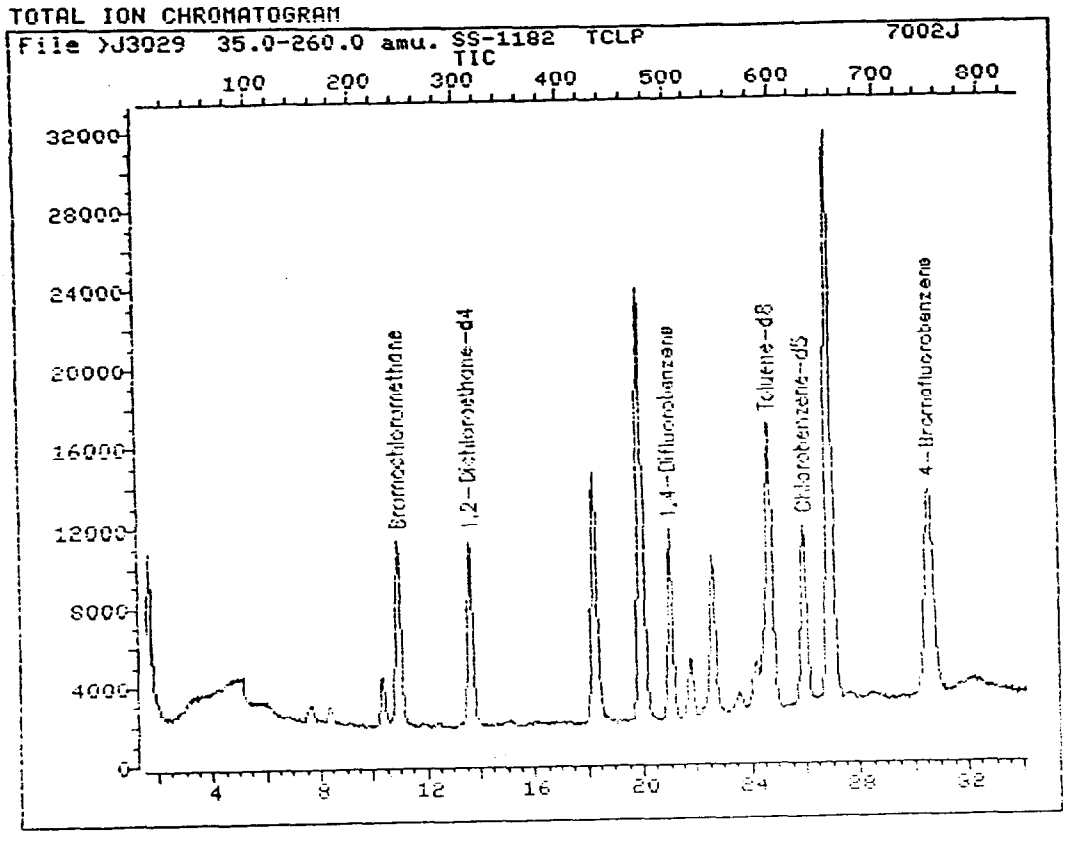
Nanco Sample ID: 89-SS-1182 Customer Sample ID: B-2-89 COMPOSITE

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	RESULTS MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	9.2	5
	67641	ACETONE	48	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	BMRL	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	BMRL	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	39	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



00029

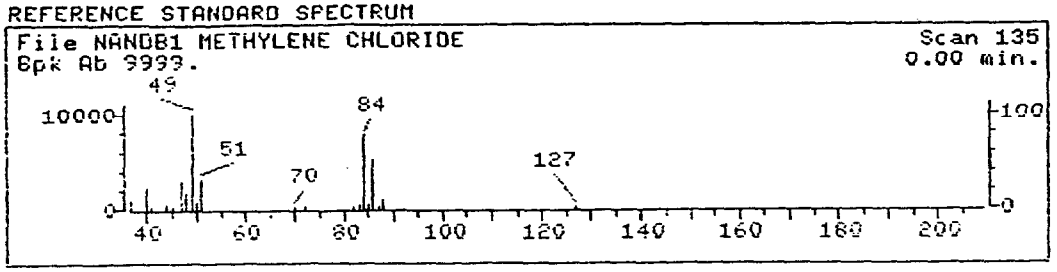
Data File: >J3029::F5
Name: SS-1182 TCLP
Misc: 7002J

Quant Output File: ^J3029::F1

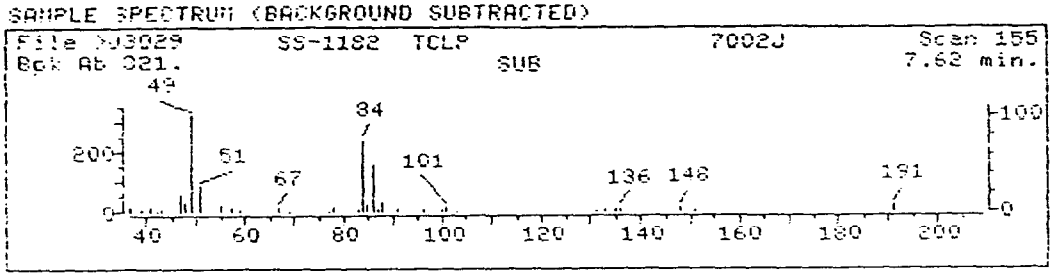
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 22:52
Injected at: 890707 22:18

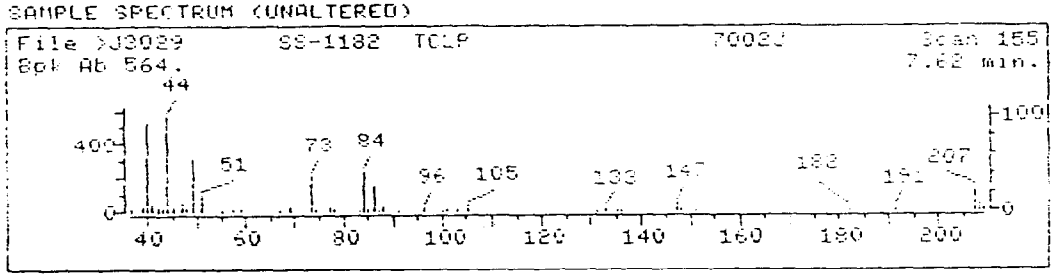
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)

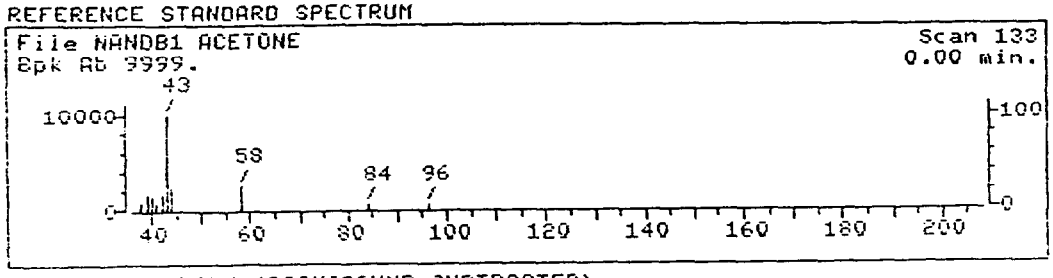


00030

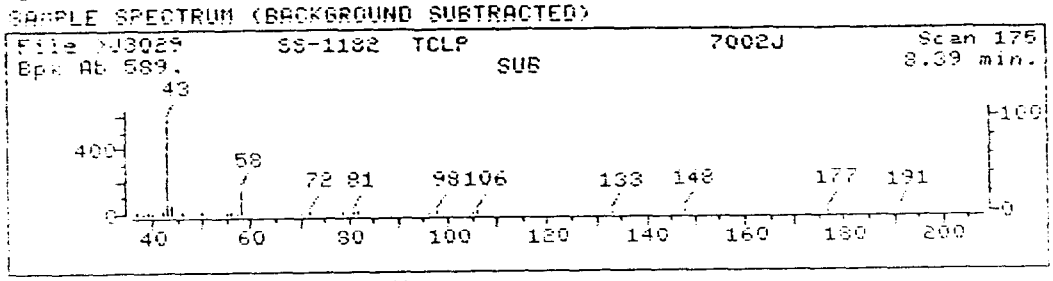
Data File: >J3029::F5 Quant Output File: ^J3029::F1
Name: SS-1182 TCLP
Misc: 7002J
Quant Time: 890707 22:52 Quant ID File: IDTCLP::QT
Injected at: 890707 22:18 Last Calibration: 890707 16:47

Compound No: 3
Compound Name: Methylene Chloride
Scan Number: 155
Retention Time: 7.62 min.
Quant Ion: 84.0
Area: 3711
Concentration: 9.23 UG/L
q-value: 91

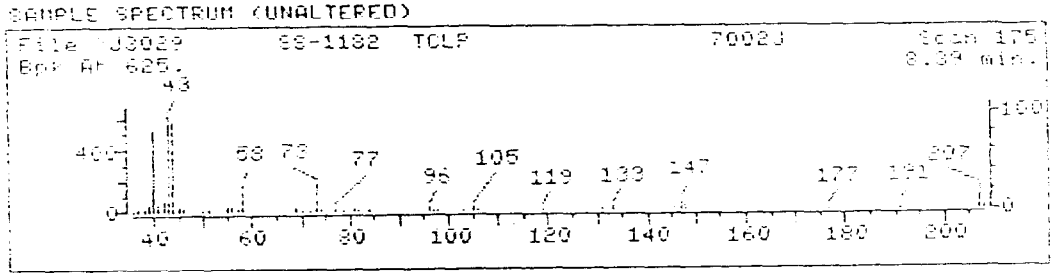
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00031

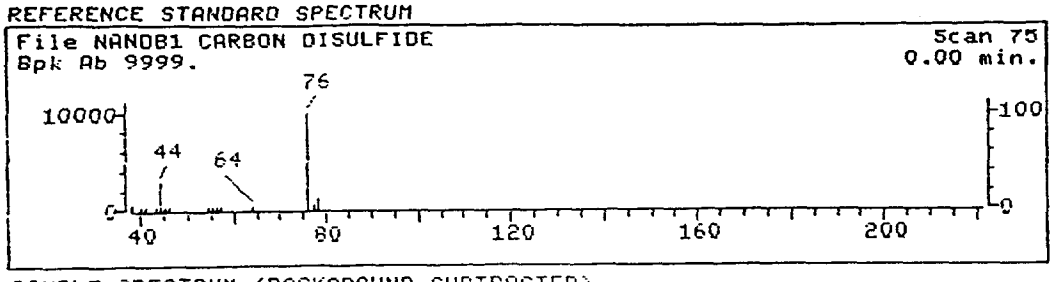
Data File: >J3029::F5
Name: SS-1182 TCLP
Misc: 7002J
Quant Time: 890707 22:52
Injected at: 890707 22:18

Quant Output File: >J3029::F1

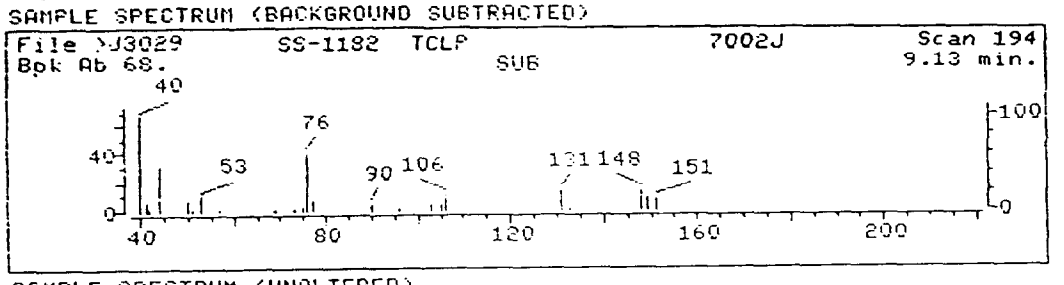
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 4
Compound Name: Acetone
Scan Number: 175
Retention Time: 8.39 min.
Quant Ion: 43.0
Area: 8125
Concentration: 48.17 UG/L
q-value: 100

REFERENCE STANDARD SPECTRUM

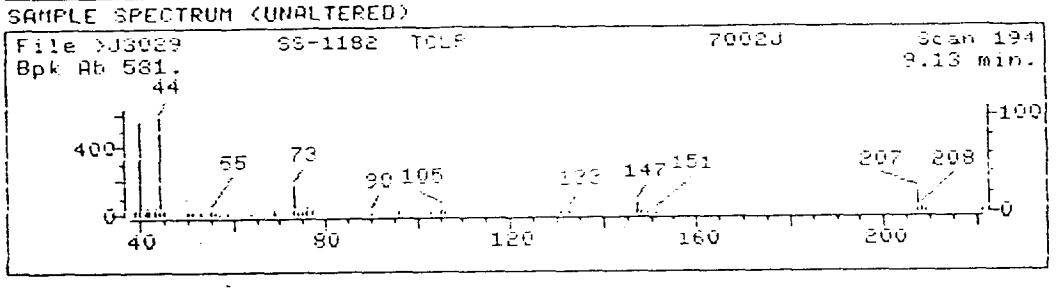


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00032

SAMPLE SPECTRUM (UNALTERED)



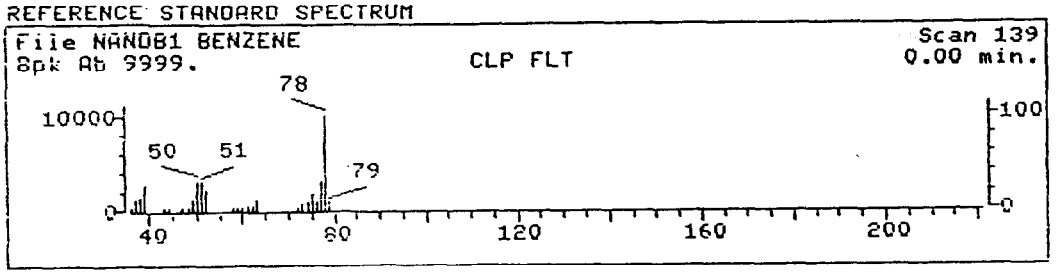
Data File: >J3029::F5
Name: SS-1182 TCLP
Misc: 7002J
Quant Time: 890707 22:52
Injected at: 890707 22:18

Quant Output File: ^J3029::F1

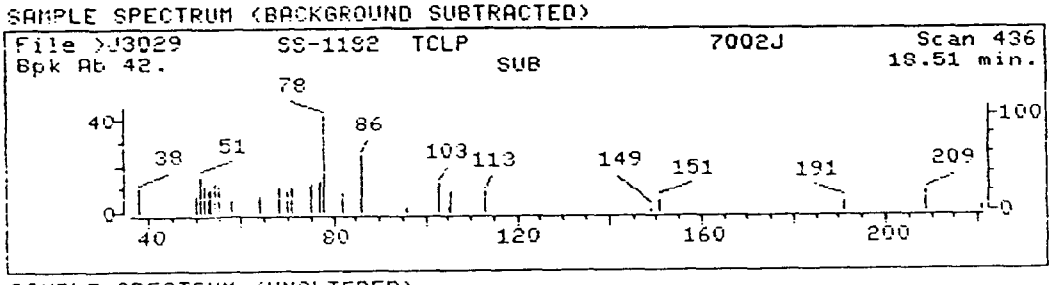
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 6
Compound Name: Carbon Disulfide
Scan Number: 194
Retention Time: 9.13 min.
Quant Ion: 76.0
Area: 658
Concentration: 2.61 UG/L
q-value: 100

REFERENCE STANDARD SPECTRUM

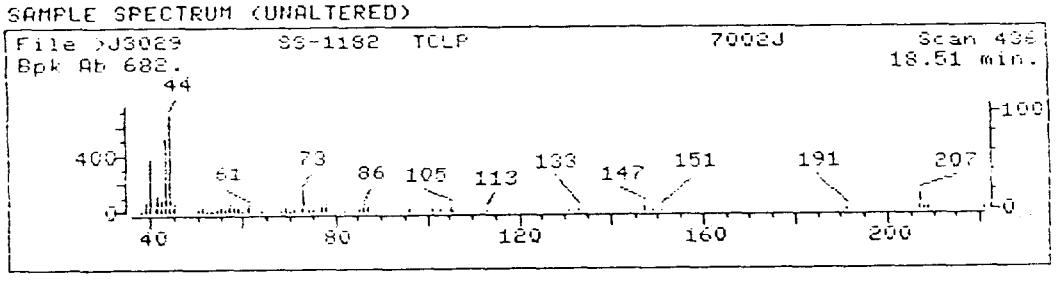


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00033

SAMPLE SPECTRUM (UNALTERED)



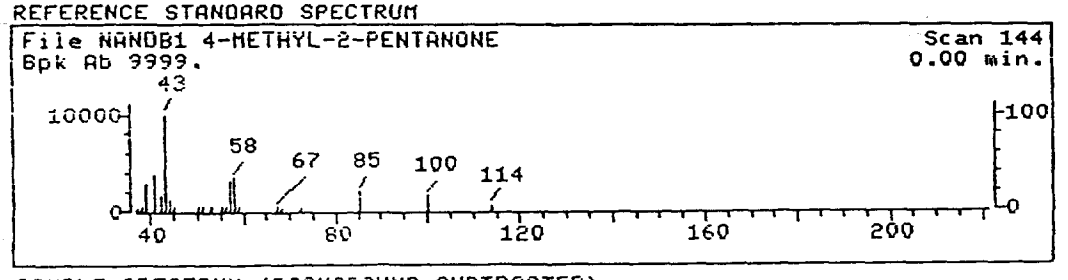
Data File: >J3029::F5
Name: SS-1182 TCLP
Misc: 7002J
Quant Time: 890707 22:52
Injected at: 890707 22:18

Quant Output File: ^J3029::F1

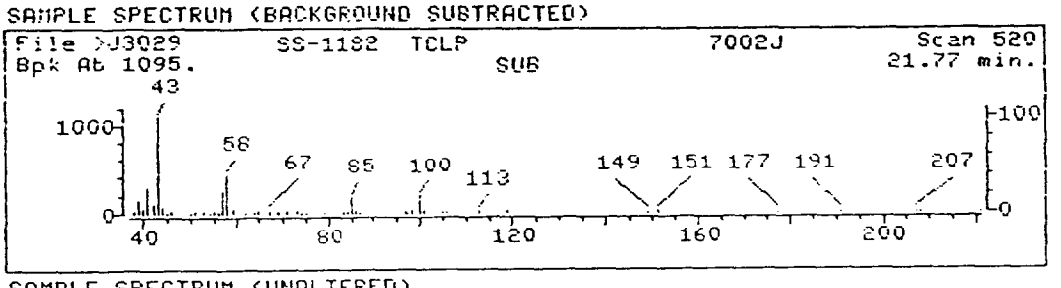
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 23
Compound Name: Benzene
Scan Number: 436
Retention Time: 18.51 min.
Quant Ion: 78.0
Area: 651
Concentration: 1.01 UG/L
q-value: 79

REFERENCE STANDARD SPECTRUM

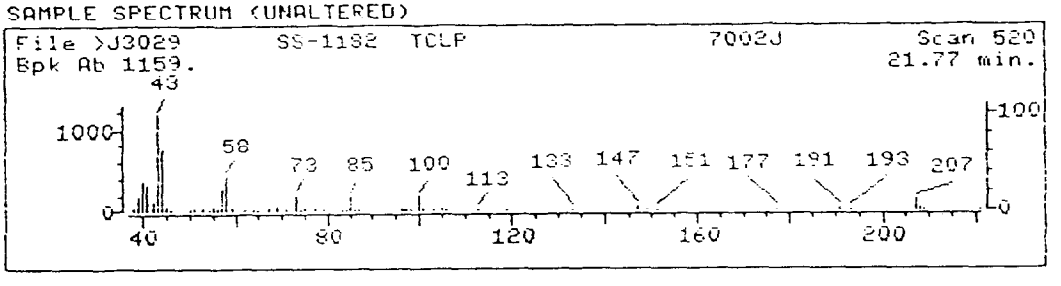


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00034

SAMPLE SPECTRUM (UNALTERED)



Data File: >J3029::F5 Quant Output File: ^J3029::F1
Name: SS-1182 TCLP
Misc: 7002J
Quant Time: 890707 22:52 Quant ID File: IDTCLP::QT
Injected at: 890707 22:18 Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 520
Retention Time: 21.77 min.
Quant Ion: 43.0
Area: 15438
Concentration: 39.20 UG/L
q-value: 34

Nanco Sample ID: 89-SS-1183

Client Sample ID: B-3-89 COMPOSITE

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89

00036

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

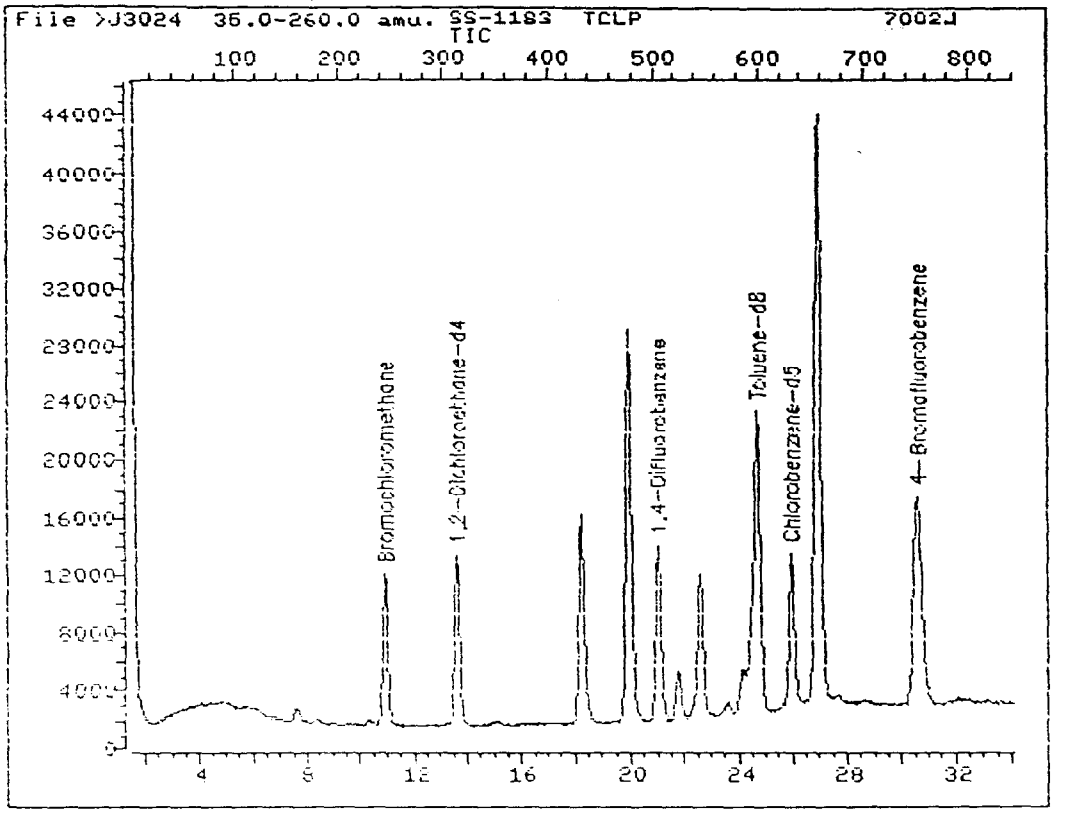
Nanco Sample ID: 89-SS-1183 Customer Sample ID: B-3-89 COMPOSITE

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	8.6	5
	67641	ACETONE	13	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	37	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



00037

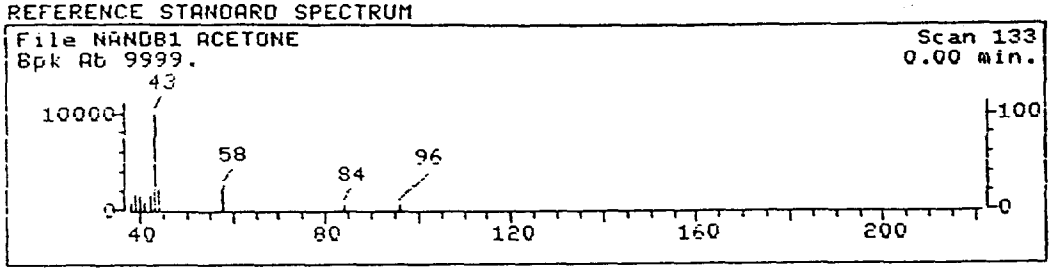
Data File: >J3024::F5
Name: SS-1183 TCLP
Misc: 7002J

Quant Output File: ^J3024::F1

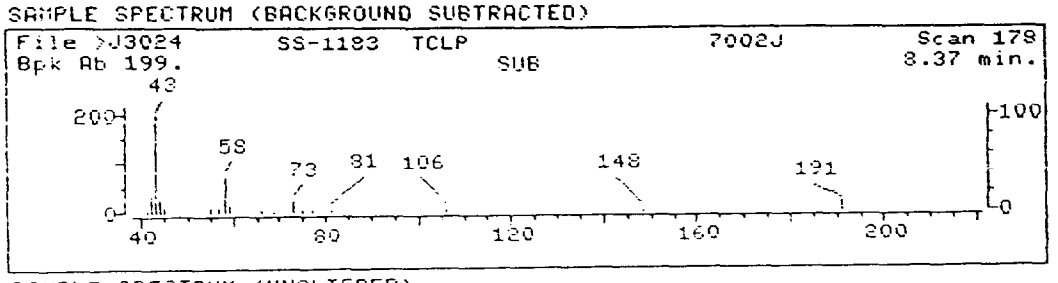
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 19:38
Injected at: 890707 19:03

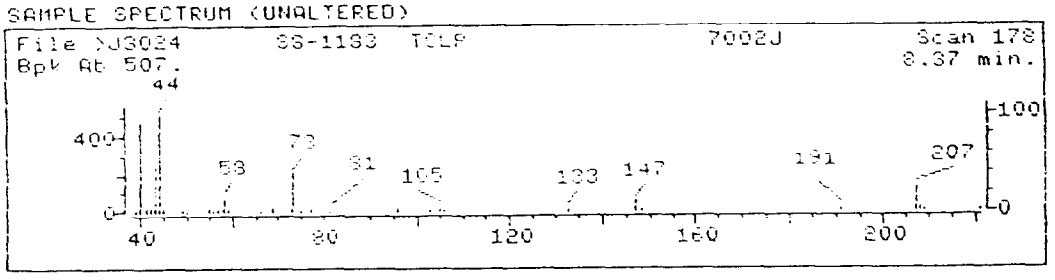
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00039

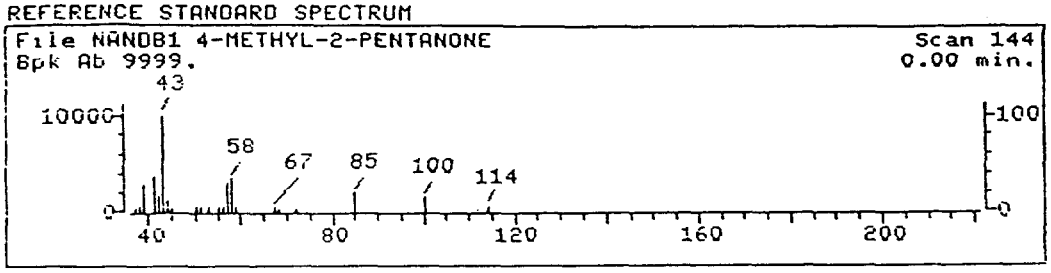
Data File: >J3024::F5
Name: SS-1183 TCLP
Misc: 7002J
Quant Time: 890707 19:38
Injected at: 890707 19:03

Quant Output File: ^J3024::F1

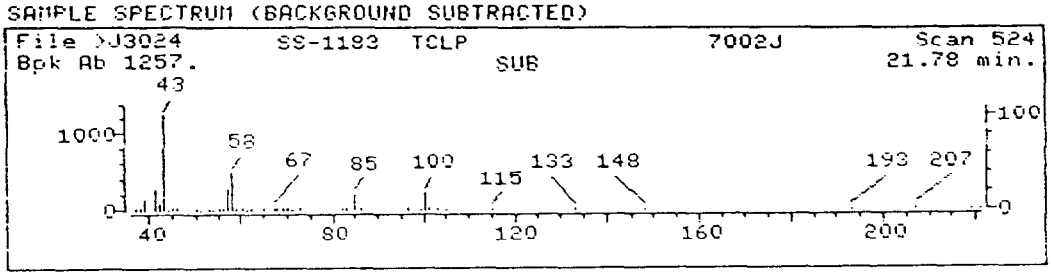
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 4
Compound Name: Acetone
Scan Number: 178
Retention Time: 8.37 min.
Quant Ion: 43.0
Area: 2502
Concentration: 13.17 UG/L
q-value: 100

REFERENCE STANDARD SPECTRUM

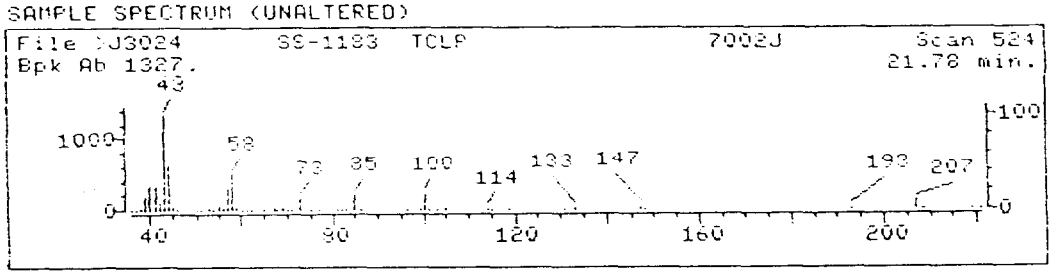


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00040

SAMPLE SPECTRUM (UNALTERED)



Data File: >J3024::F5
Name: SS-1183 TCLP
Misc: 7002J
Quant Time: 890707 19:38
Injected at: 890707 19:03

Quant Output File: ^J3024::F1
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 524
Retention Time: 21.78 min.
Quant Ion: 43.0
Area: 17482
Concentration: 37.34 UG/L
q-value: 34

Nanco Sample ID: 89-SS-1184

Client Sample ID: B-2-89/S-2

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89

00042

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

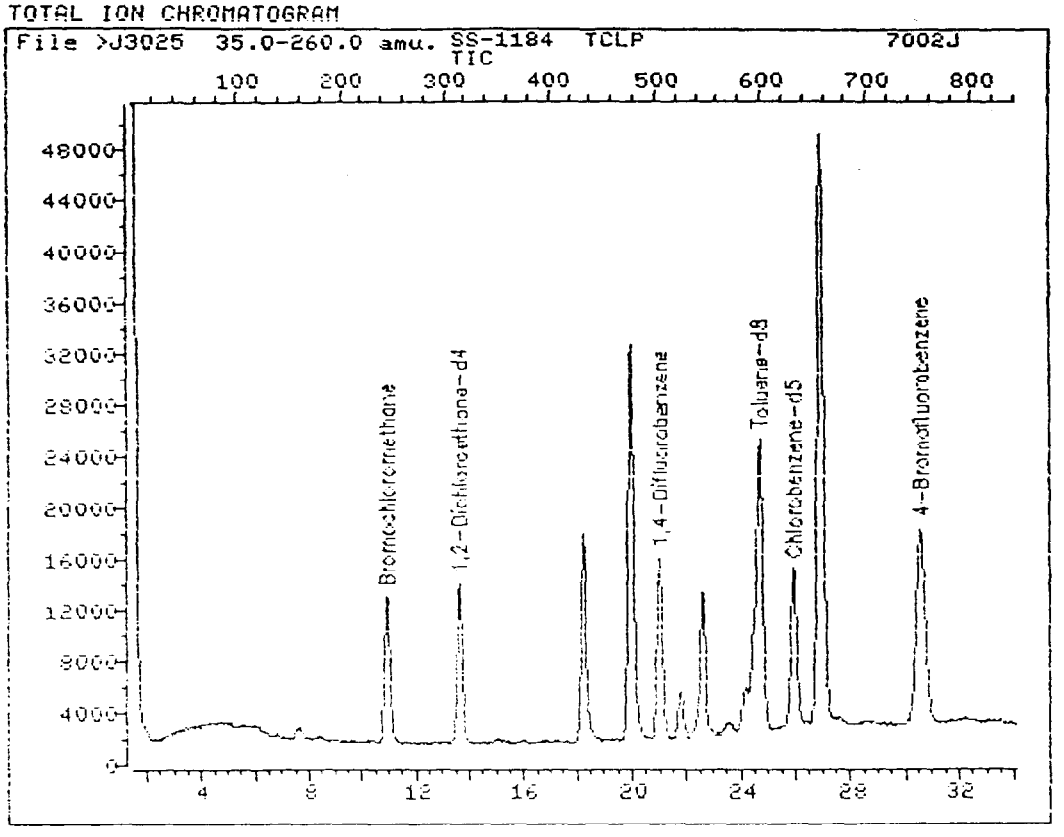
Nanco Sample ID: 89-SS-1184 Customer Sample ID: B-2-89/S-2

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	RESULTS MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	9.0	5
	67641	ACETONE	17	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	BMRL	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	36	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



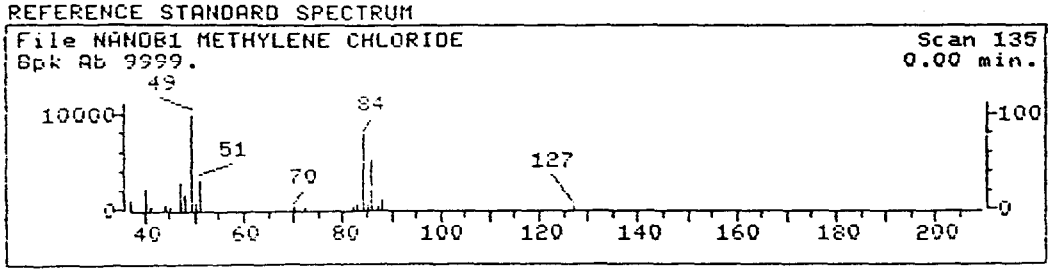
00043

Data File: >J3025::F5 Quant Output File: ^J3025::F1
Name: SS-1184 TCLP
Misc: 7002J

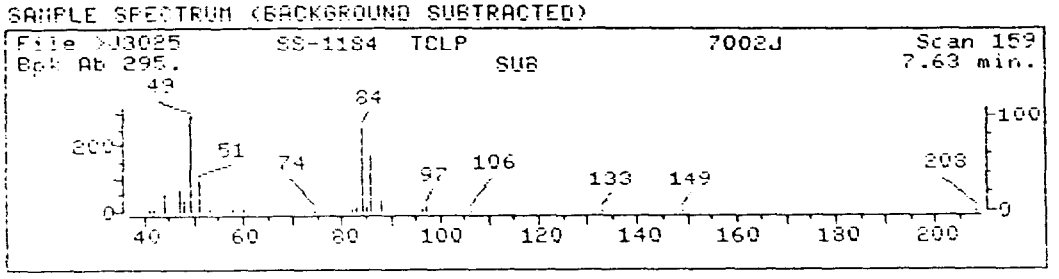
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 20:17
Injected at: 890707 19:42

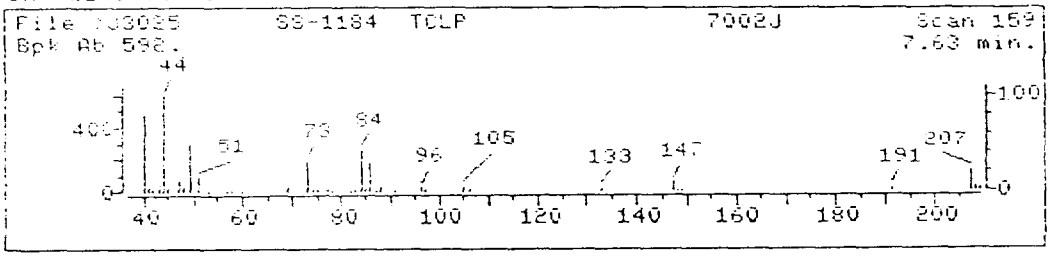
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)

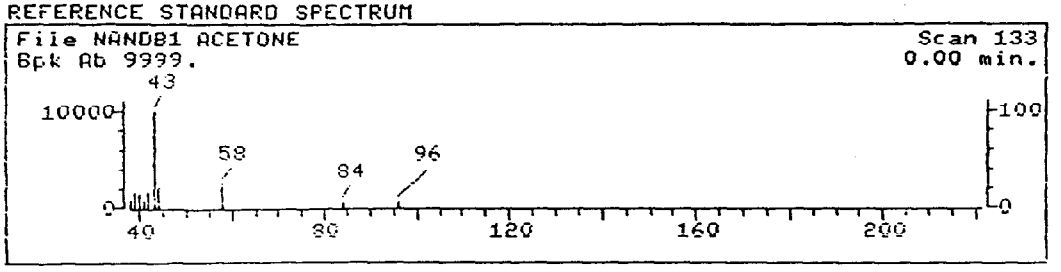


00044

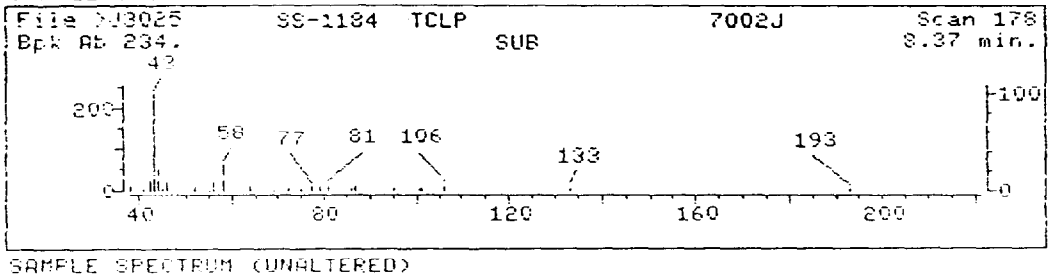
Data File: >J3025::F5 Quant Output File: ^J3025::F1
Name: SS-1184 TCLP
Misc: 7002J
Quant Time: 890707 20:17 Quant ID File: IDTCLP::DT
Injected at: 890707 19:42 Last Calibration: 890707 16:47

Compound No: 3
Compound Name: Methylene Chloride
Scan Number: 159
Retention Time: 7.63 min.
Quant Ion: 84.0
Area: 4432
Concentration: 9.03 UG/L
q-value: 75

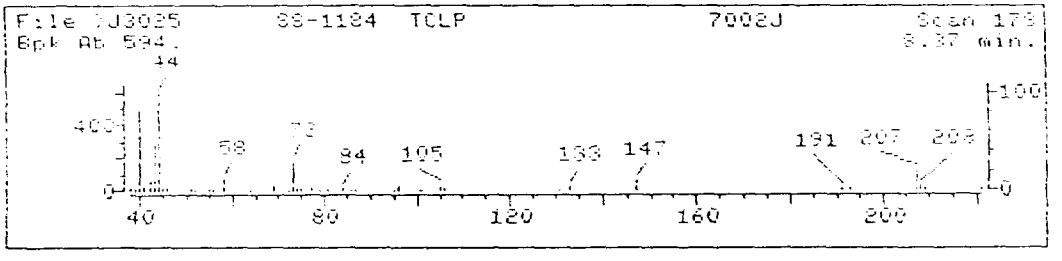
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00045

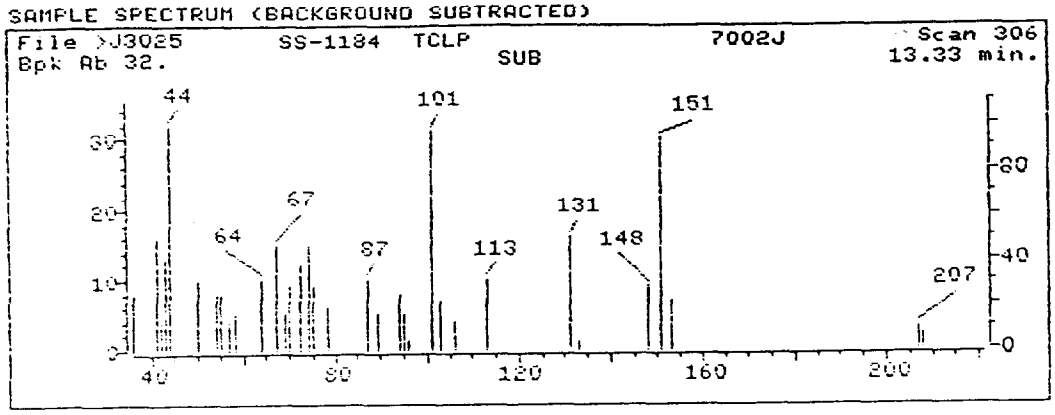
Data File: >J3025::F5
Name: SS-1184 TCLP
Misc: 7002J
Quant Time: 890707 20:17
Injected at: 890707 19:42

Quant Output File: ^J3025::F1

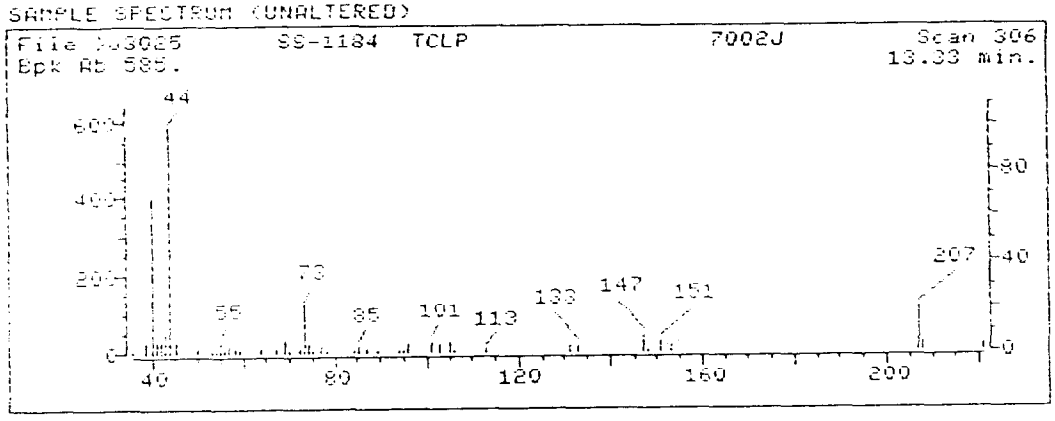
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 4
Compound Name: Acetone
Scan Number: 178
Retention Time: 8.37 min.
Quant Ion: 43.0
Area: 3522
Concentration: 17.10 UG/L
q-value: 100

SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00046

Data File: >J3025::F5
Name: SS-1184 TCLP
Misc: 7002J
Quant Time: 890707 20:17
Injected at: 890707 19:42

Quant Output File: ^J3025::F1
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 11
Compound Name: 1,1,2-Cl3-1,2,2-FL3 Ethane
Scan Number: 306
Retention Time: 13.33 min.
Quant Ion: 101.0
Area: 537
Concentration: 1.96 UG/L
q-value: 67

SAMPLE QUALIFIERS

J-This flag indicates an estimated value. This flag is used either when estimating a concentration for a TIC where a 1:1 response is assumed, or when the mass spectral data indicates the presence of a compound that meets the identification criteria but the result is less than the sample quantitation limit but greater then zero. For example, if the sample quantitation limit is 10 ug/L, but a concentration of 3 ug/L is calculated, 3J will be reported. The sample quantitation limit is adjusted for both dilution and percent moisture so that if a sample with 24% moisture and a 1:10 dilution factor has calculated concentration of 300 ug/L and a sample quantitation limit of 430 ug/kg, the concentration is reported as 300J on the Form I.

C- This flag applies to pesticide results where the identification has been confirmed by GC/MS. Single component pesticides ≥ 10 ng/ul in the final extract are confirmed by GC/MS.

B- This flag is used when the analyte is found in the associated blank as well as in the sample. It indicates possible/probable blank contamination and warns the data user to take appropriate action. This flag is used for a TIC as well as for positively identified TCL compound.

E- This flag identifies compounds whose concentrations exceed the calibration range of the instrument for that specific analysis. If one or more compounds have a response greater than full scale, then the sample or extract will be diluted and re-analyzed. All such compounds with a response greater than full scale will have the concentration flagged with an "E" on the Form I for the original analysis. If the dilution of the extract causes any compounds identified in the first analysis to be below the calibration range in the second analysis, then the results of both analyses will be reported on seperate Form I's. The Form I for the diluted sample will have the "DL" or "REDL" suffix appended to the sample number.

D- This flag identifies all compounds identified in an analysis at a secondary dilution factor. If a sample or extract is re-analyzed at a higher dilution factor, the "DL" or "REDL" suffix is appended to the sample number on the Form I for the diluted sample, and all concentration values reported on that Form I are flagged with a "D".

A- This flag indicates that a TIC is a suspected aldol-condensation product.

X- This flag is used to describe results that are not previously defined. It is fully described in the Case Narrative and such description is attached to the Sample Data Summary Package. If more than one flag is required, then "Y" and "Z" will be used. If more than five qualifiers are required for a sample result, then the "X" flag will be combined with several flags as needed. For example, the "X" flag may be combined with the "A", "B" or "D" flags.

S- This flag indicates compounds that are added to the sample prior to analysis for purposes of quality control.

Organic Compound Methodology

The methods employed for the analysis of your sample are established EPA methods for priority pollutants.

For volatile analysis, EPA Method 624 was used with three internal standards and three surrogate compounds. The sample along with the internal standards and surrogate standards are purged & the volatile compounds trapped on a solid adsorbant. The trap is then heated & the desorbed material is injected into a gas chromatograph. The detector is a mass spectrometer (quadrupole). Tuning and calibration of the GC/MS is performed daily prior to anlysis of Volatiles by using Bromofluorobenzene (BFB).

For the analysis of the Base/Neutral and Acid Extractable priority pollutants, EPA Method 625 was used. Six internal standards were added to the concentrate prior to injection into GC/MS systems set specifically for the separation and measurement of the priority pollutants. Six surrogate standards are added to the sample prior to extraction. Tuning and calibration of the GC/MS system is performed daily by using Decafluorotriphenylphosphine (DFTPP).

Qualitative identification of the priority pollutants was performed initially using the relative retention times and the relative abundance of characteristic ions. The entire mass spectrum was reviewed before an identification was confirmed. Quantitative analysis was performed using the internal standard method.

For the analysis of priority pollutant Pesticides and PCB's EPA Method 608 was used. The analysis was performed using an external standard method. A calibration curve consisting of a minimum of three points was constructed from prepared standards. This calibration curve is checked daily by re-injecting standards.

NANCO TECHNICAL NOTE 001

Practical Limitation of GC/MS Analytical Technology for Determination of Certain TCL Compounds

00005

For the analysis of environmental samples (aqueous and non-aqueous matrices), GC/MS is used for VOA and BNA analysis. Table - I shows a list of compounds which are part of the "Target-Compound-List" and are common laboratory contaminants.

Table - I

Compound	Fraction
Methylene Chloride	VOA
Acetone	VOA
Toluene	VOA
2 - Butanone	VOA
Common Phthalate Esters	BNA

Therefore, presence of the above compounds in a sample immediately raises the following three questions:

1. Did the laboratory add these compounds to the sample (contaminate the sample?)
2. Was the contamination introduced in the field by sampling procedure?
3. How does one utilize the data, despite the contamination?

Before the above questions can be answered, the practical limitations of eliminating the common laboratory contaminants must be considered. Methylene chloride and acetone are solvents for water and soil extraction. These solvents are evaporated in the lab, thus these vapors are present in the lab environment. Precautions to contain these vapors reduces their concentration, but consistent and complete removal is not practical. Toluene and 2-Butanone can be completely removed provided: a) there is no fresh paint (2-Butanone is a solvent in paint), and b) there are no petroleum product fumes in the air (toluene, aside from being an occasional solvent, is present as a form of fuel-oil and other petroleum products). Common phthalate esters are "plasticizers" and are generally present on "plastic" and "rubber" products. From safety considerations, the laboratory technicians must protect their hands while preparing environmental samples. The "gloves" are generally the source of the phthalate esters. Clearly, complete elimination of phthalate esters is not practical. The level of phthalate ester contamination can be reduced by carefully selecting the proper material for gloves.

****

NANCO LABS, INC.

****

00050

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89
Date Reissued: 07/25/89

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

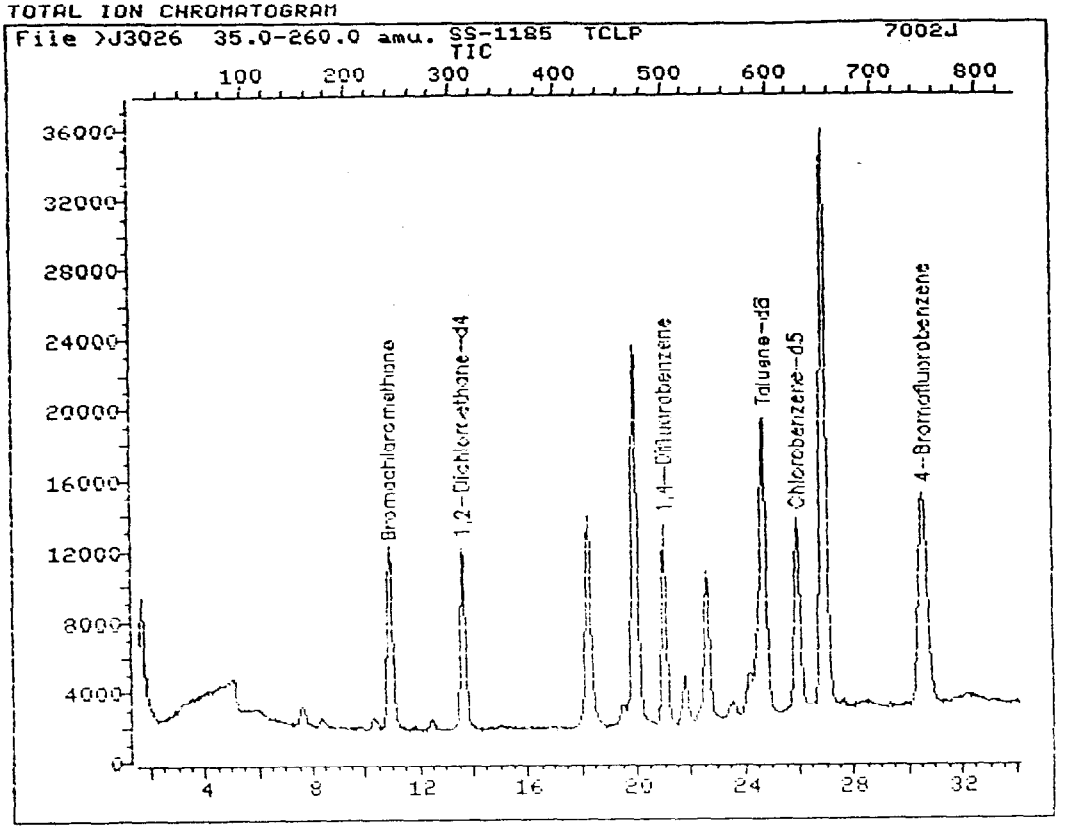
Nanco Sample ID: 89-SS-1185 Customer Sample ID: B-2-89/S-4

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	9.2	5
	67641	ACETONE	24	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	BMRL	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	4,500	500
	108101	4-METHYL-2-PENTANONE	31	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



00051

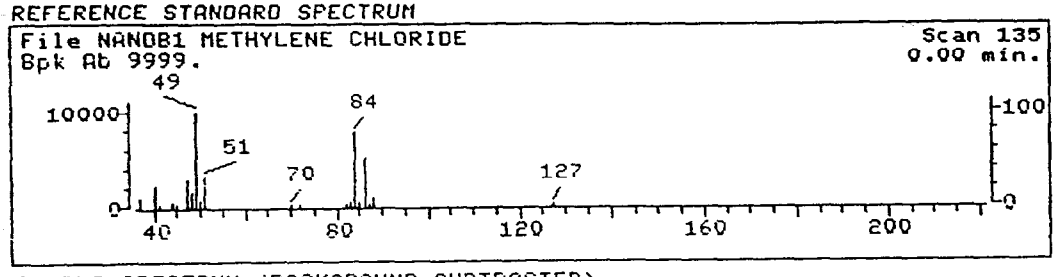
Data File: >J3026::F5
Name: SS-1185 TCLP
Misc: 7002J

Quant Output File: ^J3026::F1

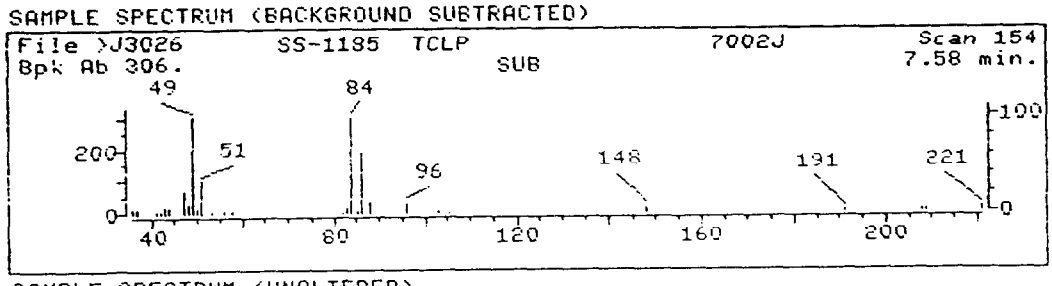
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 20:56
Injected at: 890707 20:21

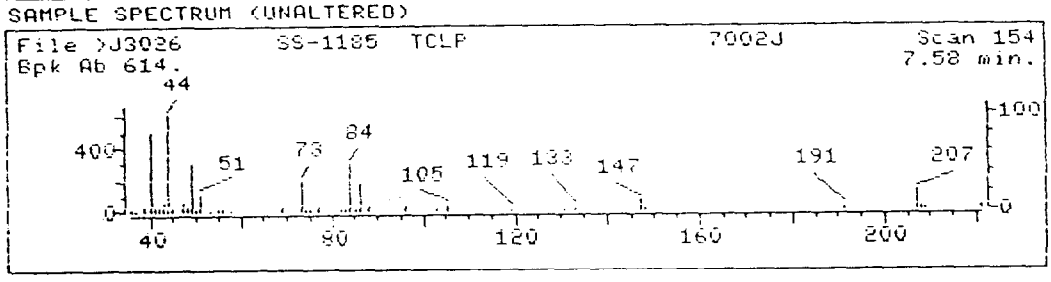
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



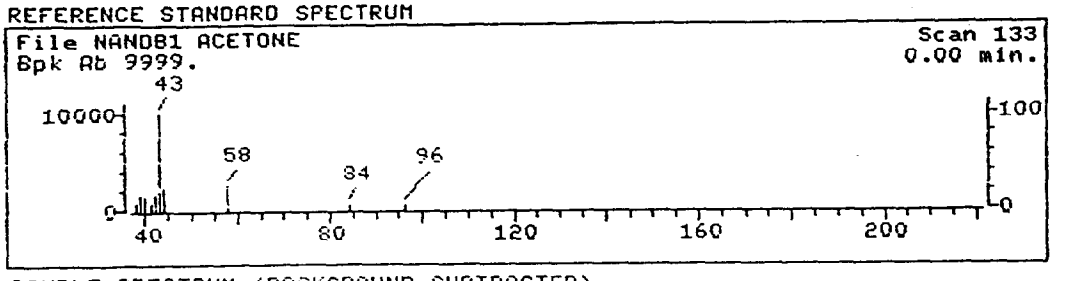
00052

Data File: >J3026::F5
Name: SS-1185 TCLP
Misc: 7002J
Quant Time: 890707 20:56
Injected at: 890707 20:21

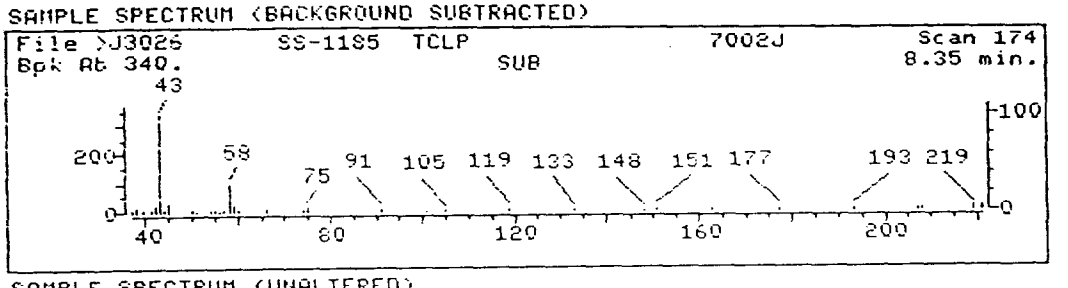
Quant Output File: ^J3026::F1
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 3
Compound Name: Methylene Chloride
Scan Number: 154
Retention Time: 7.58 min.
Quant Ion: 84.0
Area: 4157
Concentration: 9.22 UG/L
q-value: 63

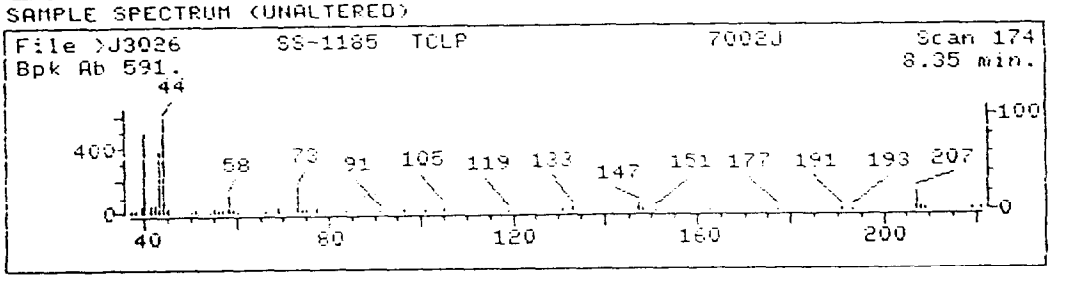
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00053

Data File: >J3026::F5
Name: SS-1185 TCLP
Misc: 7002J
Quant Time: 890707 20:56
Injected at: 890707 20:21

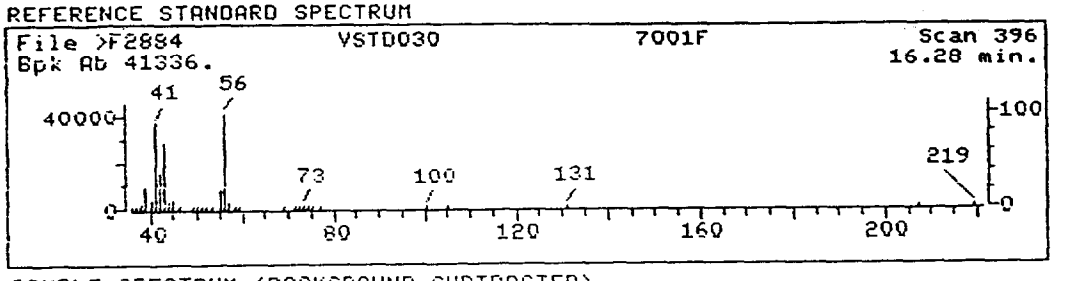
Quant Output File: ^J3026::F1

Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

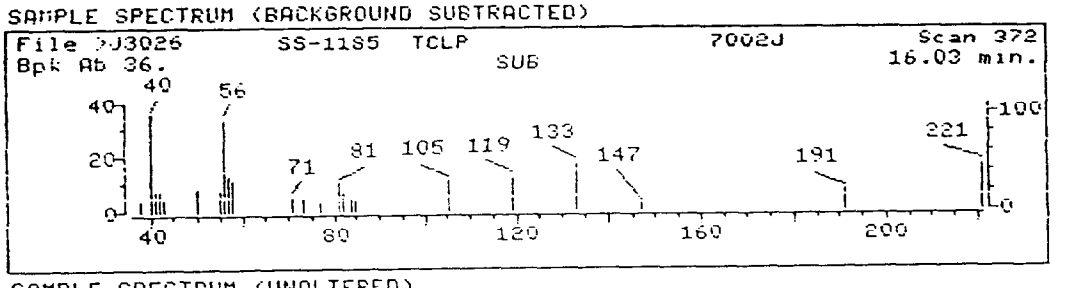
Compound No: 4
Compound Name: Acetone
Scan Number: 174
Retention Time: 8.35 min.
Quant Ion: 43.0
Area: 4505
Concentration: 23.80 UG/L
q-value: 100

√

REFERENCE STANDARD SPECTRUM

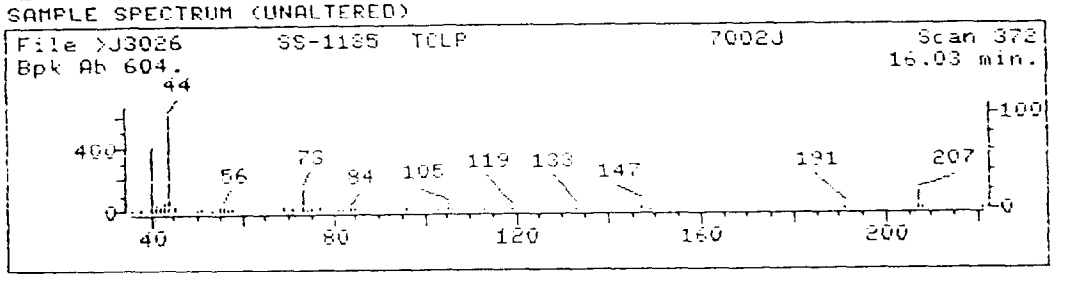


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00054

SAMPLE SPECTRUM (UNALTERED)



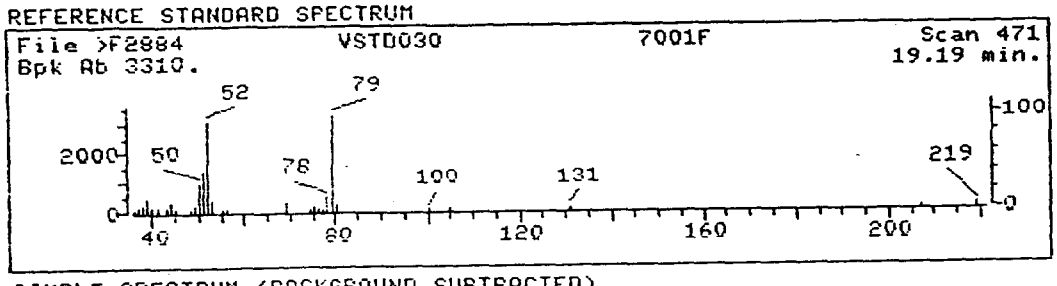
Data File: >J3026::F5
Name: SS-1185 TCLP
Misc: 7002J
Quant Time: 890707 20:56
Injected at: 890707 20:21

Quant Output File: ^J3026::F1

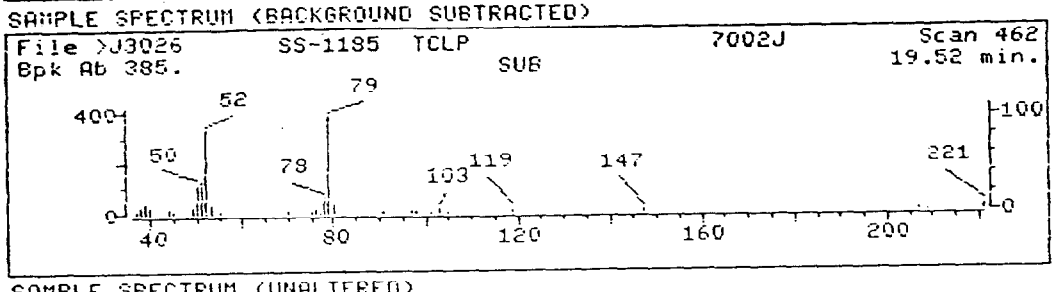
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 20
Compound Name: n-Butanol
Scan Number: 372
Retention Time: 16.03 min.
Quant Ion: 56.0
Area: 511^
Concentration: 196.70 UG/L
q-value: 51

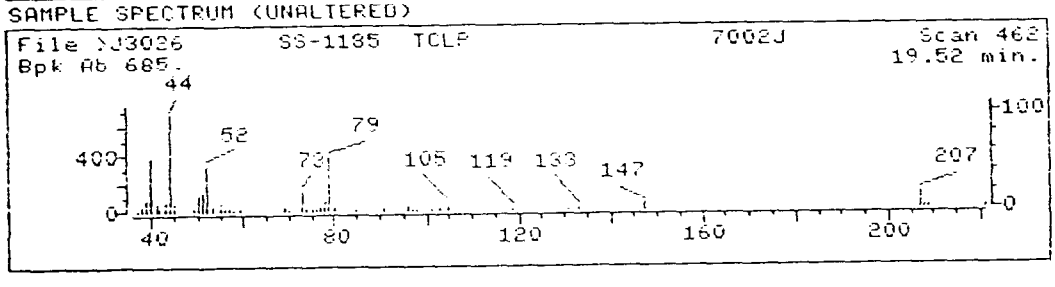
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00055

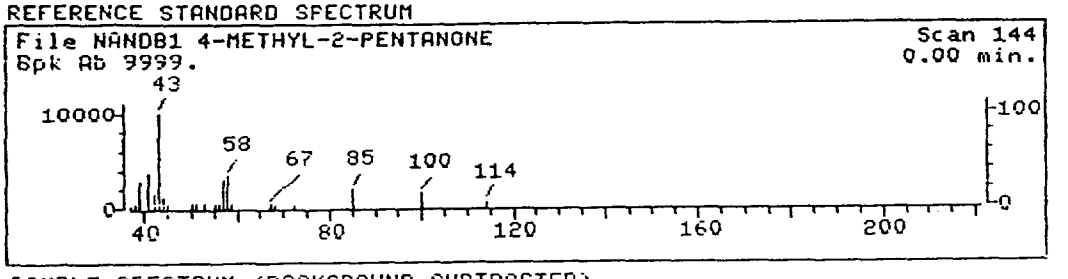
Data File: >J3026::F5
Name: SS-1185 TCLP
Misc: 7002J
Quant Time: 890707 20:56
Injected at: 890707 20:21

Quant Output File: ^J3026::F1

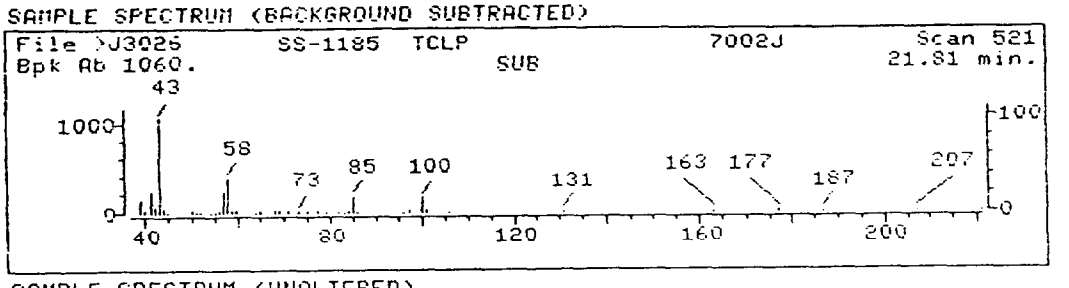
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 24
Compound Name: Pyridine
Scan Number: 462
Retention Time: 19.52 min.
Quant Ion: 52.0
Area: 6659
Concentration: 4520.13 UG/L
q-value: 50

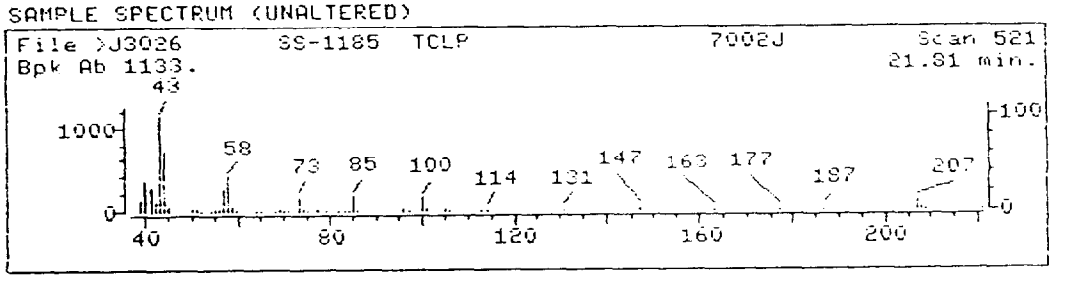
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00056

Data File: >J3026::F5 Quant Output File: ^J3026::F1
Name: SS-1185 TCLP
Misc: 7002J
Quant Time: 890707 20:56 Quant ID File: IDTCLP::QT
Injected at: 890707 20:21 Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 521
Retention Time: 21.81 min.
Quant Ion: 43.0
Area: 14579
Concentration: 31.38 UG/L
q-value: 33

Nanco Sample ID: 89-SS-1186

Client Sample ID: B-2-89/S-5

****

NANCO LABS, INC.

****

00058

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89
Date Reissued: 07/25/89

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

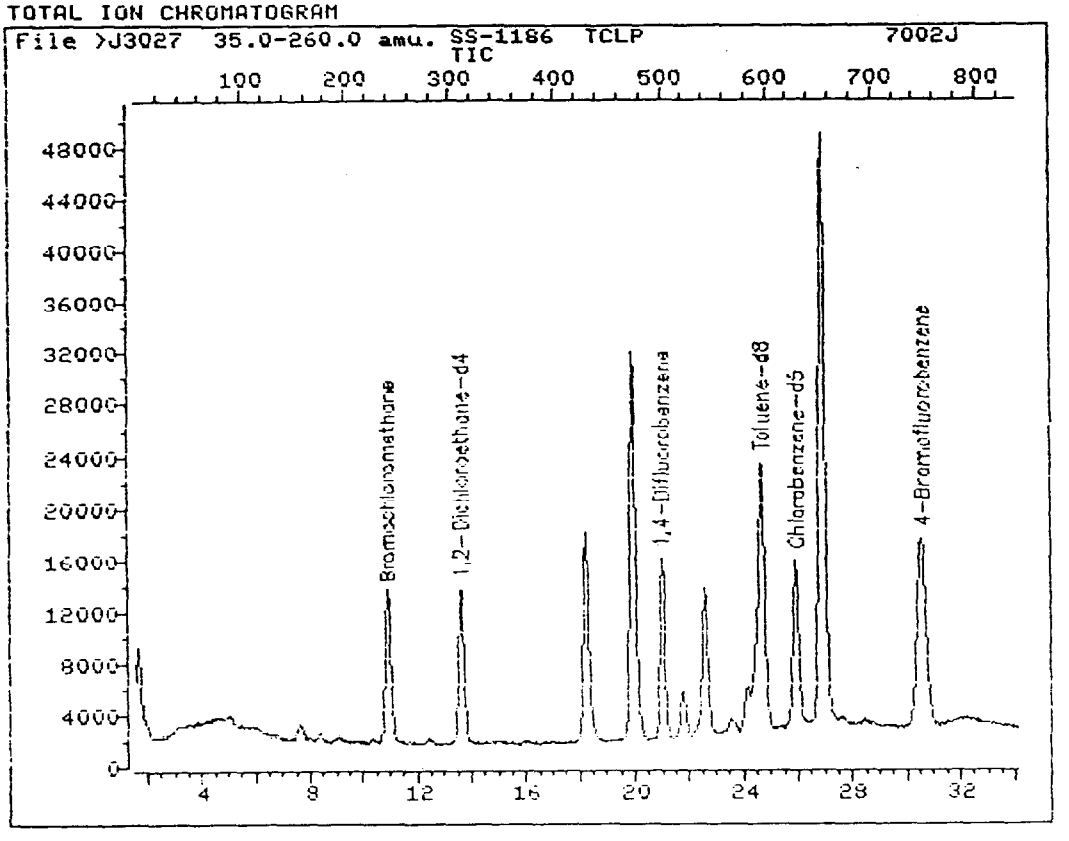
Nanco Sample ID: 89-SS-1186 Customer Sample ID: B-2-89/S-5

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	9.2	5
	67641	ACETONE	22	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	24	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	BMRL	500
	108101	4-METHYL-2-PENTANONE	36	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



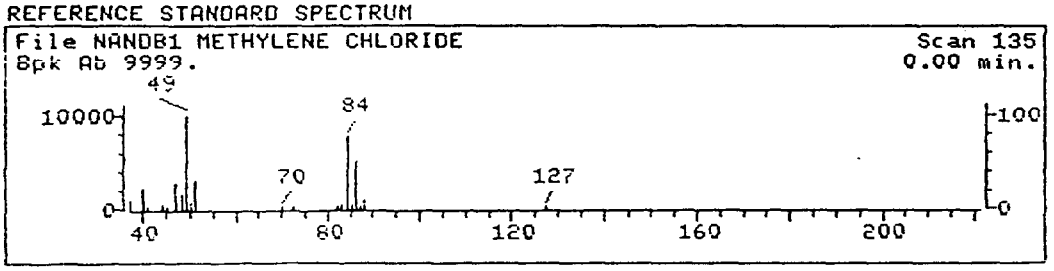
00059

Data File: >J3027::F5 Quant Output File: ^J3027::F1
Name: SS-1186 TCLP
Misc: 7002J

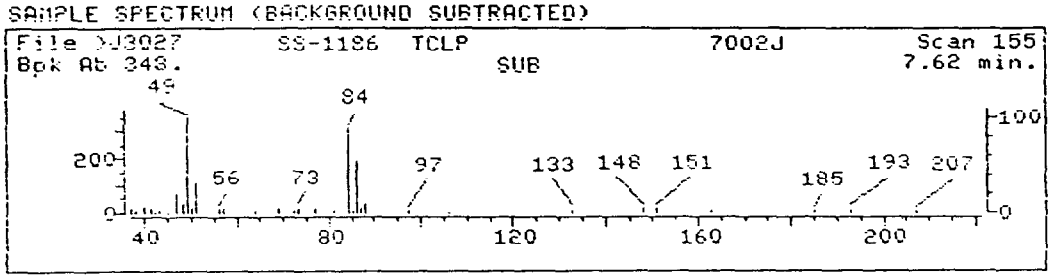
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 21:35
Injected at: 890707 21:00

REFERENCE STANDARD SPECTRUM

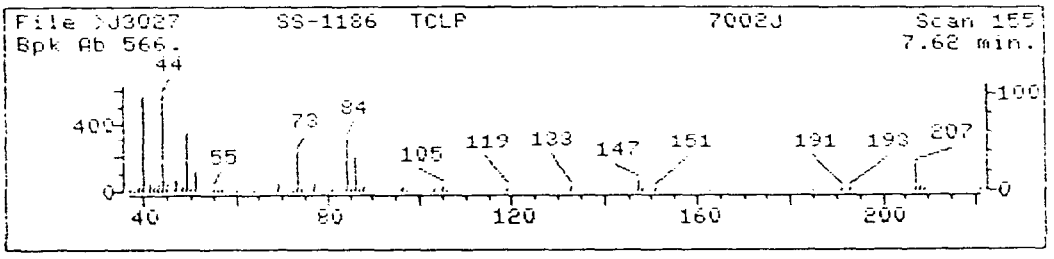


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00060

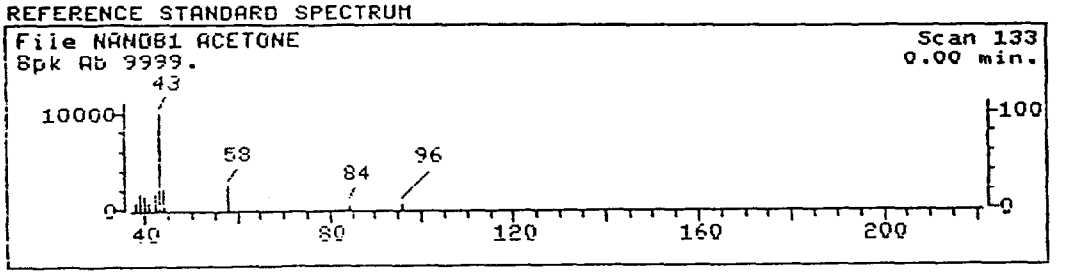
SAMPLE SPECTRUM (UNALTERED)



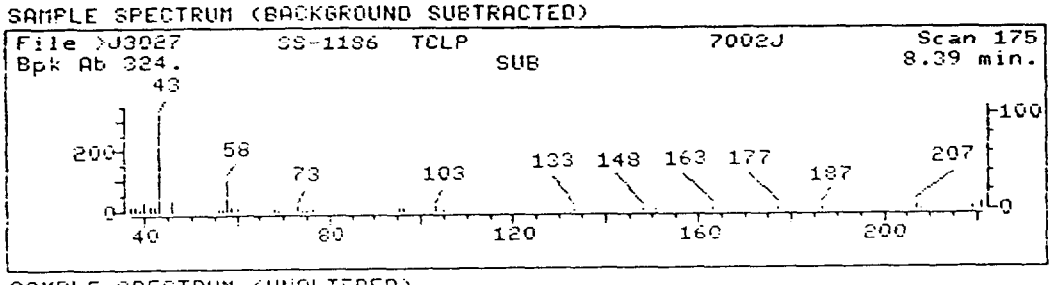
Data File: >J3027::F5 Quant Output File: ^J3027::F1
Name: SS-1186 TCLP
Misc: 7002J
Quant Time: 890707 21:35 Quant ID File: IDTCLP::QT
Injected at: 890707 21:00 Last Calibration: 890707 16:47

Compound No: 3
Compound Name: Methylene Chloride
Scan Number: 155
Retention Time: 7.62 min.
Quant Ion: 84.0
Area: 4809
Concentration: 9.15 UG/L
q-value: 76

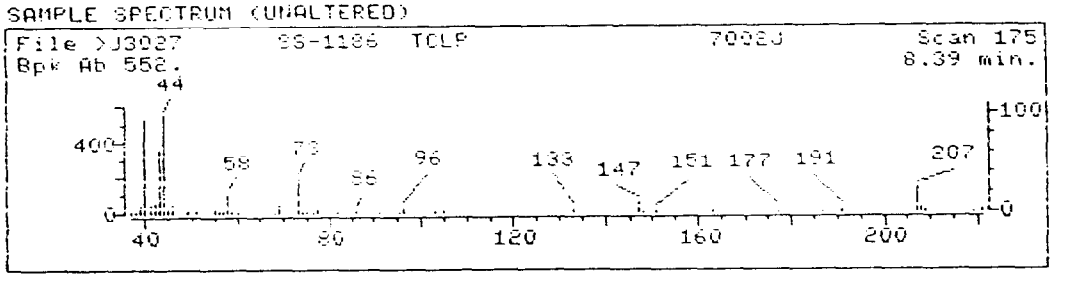
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00061

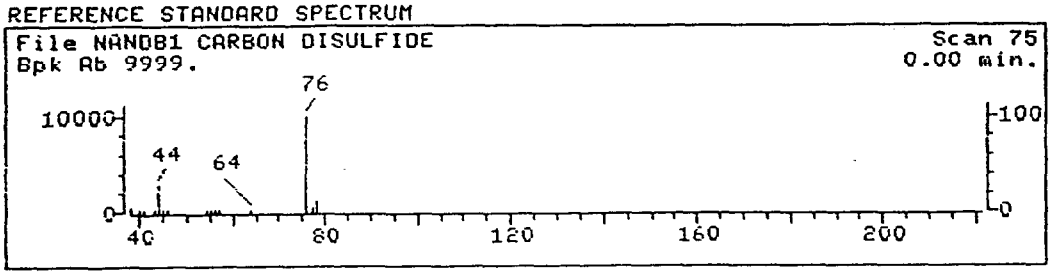
Data File: >J3027::F5
Name: SS-1186 TCLP
Misc: 7002J
Quant Time: 890707 21:35
Injected at: 890707 21:00

Quant Output File: ^J3027::F1

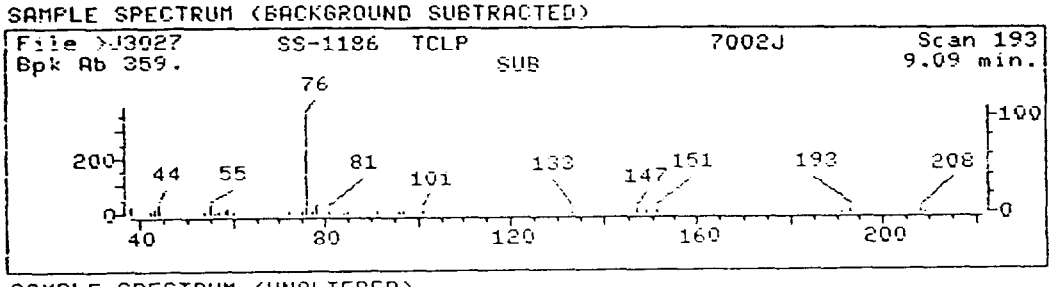
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 4
Compound Name: Acetone
Scan Number: 175
Retention Time: 8.39 min.
Quant Ion: 43.0
Area: 4764
Concentration: 21.60 UG/L
q-value: 100

REFERENCE STANDARD SPECTRUM

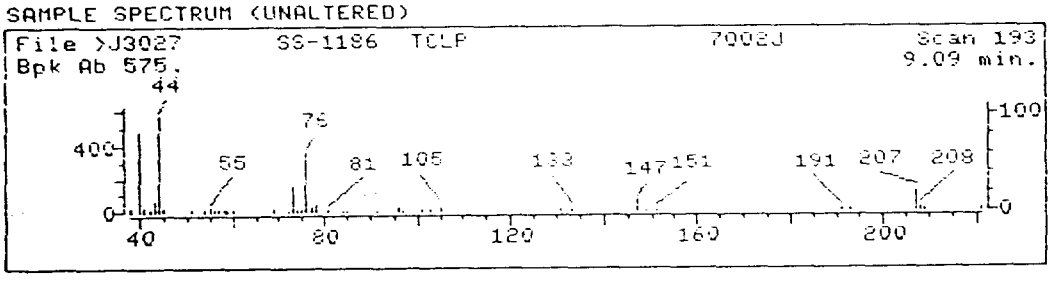


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00062

SAMPLE SPECTRUM (UNALTERED)



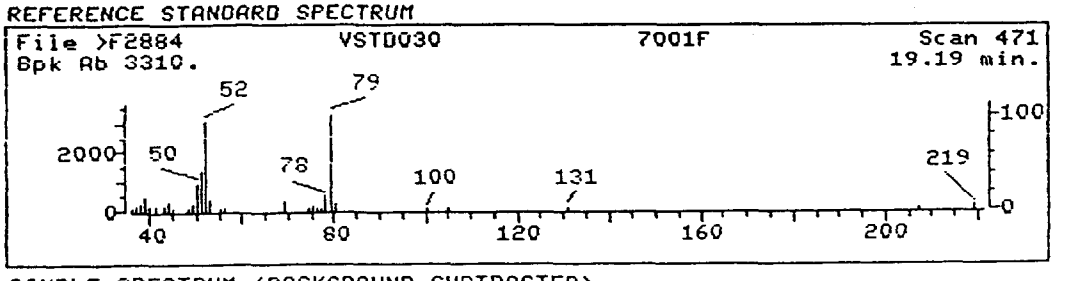
Data File: >J3027::F5
Name: SS-1186 TCLP
Misc: 7002J
Quant Time: 890707 21:35
Injected at: 890707 21:00

Quant Output File: ^J3027::F1

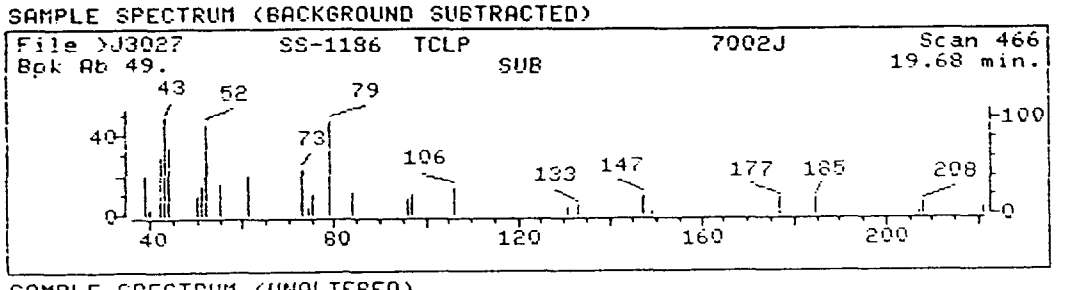
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 6
Compound Name: Carbon Disulfide
Scan Number: 193
Retention Time: 9.09 min.
Quant Ion: 76.0
Area: 8055
Concentration: 24.43 UG/L
q-value: 100

REFERENCE STANDARD SPECTRUM

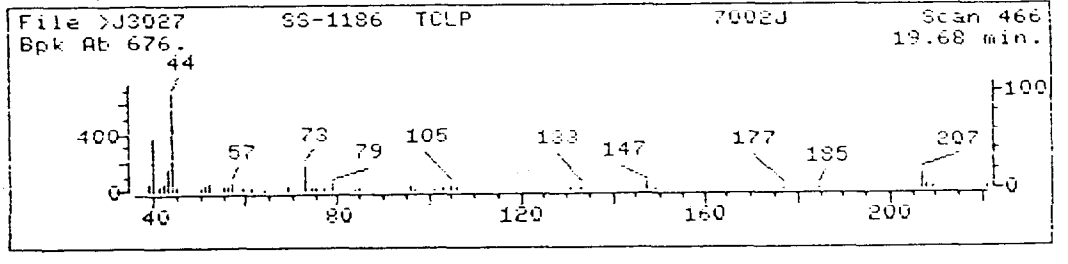


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00063

SAMPLE SPECTRUM (UNALTERED)



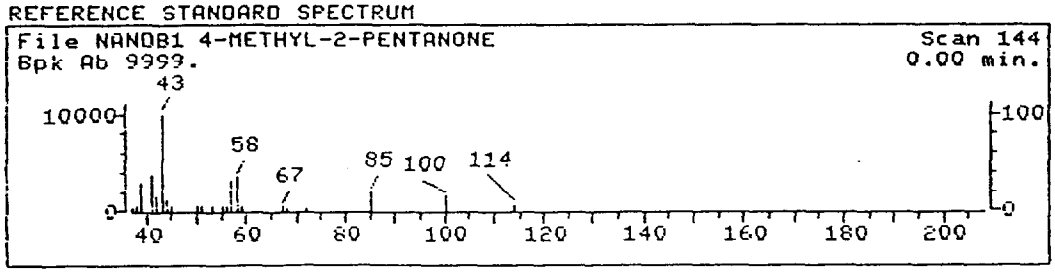
Data File: >J3027::F5
Name: SS-1186 TCLP
Misc: 7002J
Quant Time: 890707 21:35
Injected at: 890707 21:00

Quant Output File: ^J3027::F1

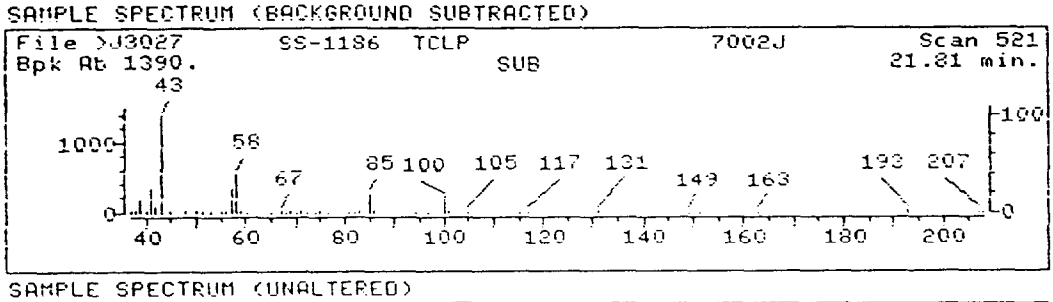
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 24
Compound Name: Pyridine
Scan Number: 466
Retention Time: 19.68 min.
Quant Ion: 52.0
Area: 528
Concentration: 292.88 UG/L
q-value: 56

REFERENCE STANDARD SPECTRUM

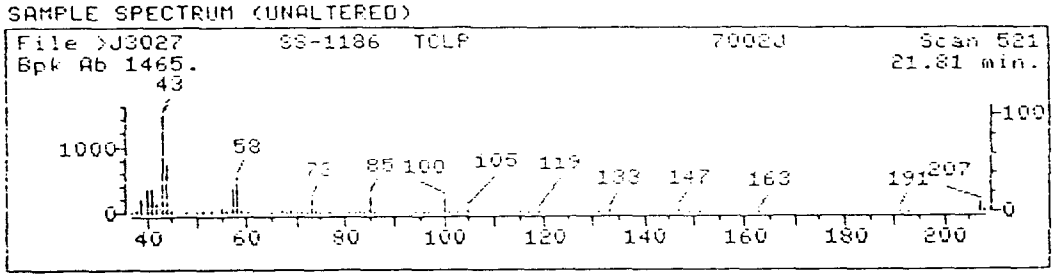


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00064

SAMPLE SPECTRUM (UNALTERED)



Data File: >J3027::F5 Quant Output File: ^J3027::F1
Name: SS-1186 TCLP
Misc: 7002J
Quant Time: 890707 21:35 Quant ID File: IDTCLP::QT
Injected at: 890707 21:00 Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 521
Retention Time: 21.81 min.
Quant Ion: 43.0
Area: 19972
Concentration: 36.24 UG/L
q-value: 33

Nanco Sample ID: 89-SS-1187

Client Sample ID: B-3-89/S-4

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89

00066

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

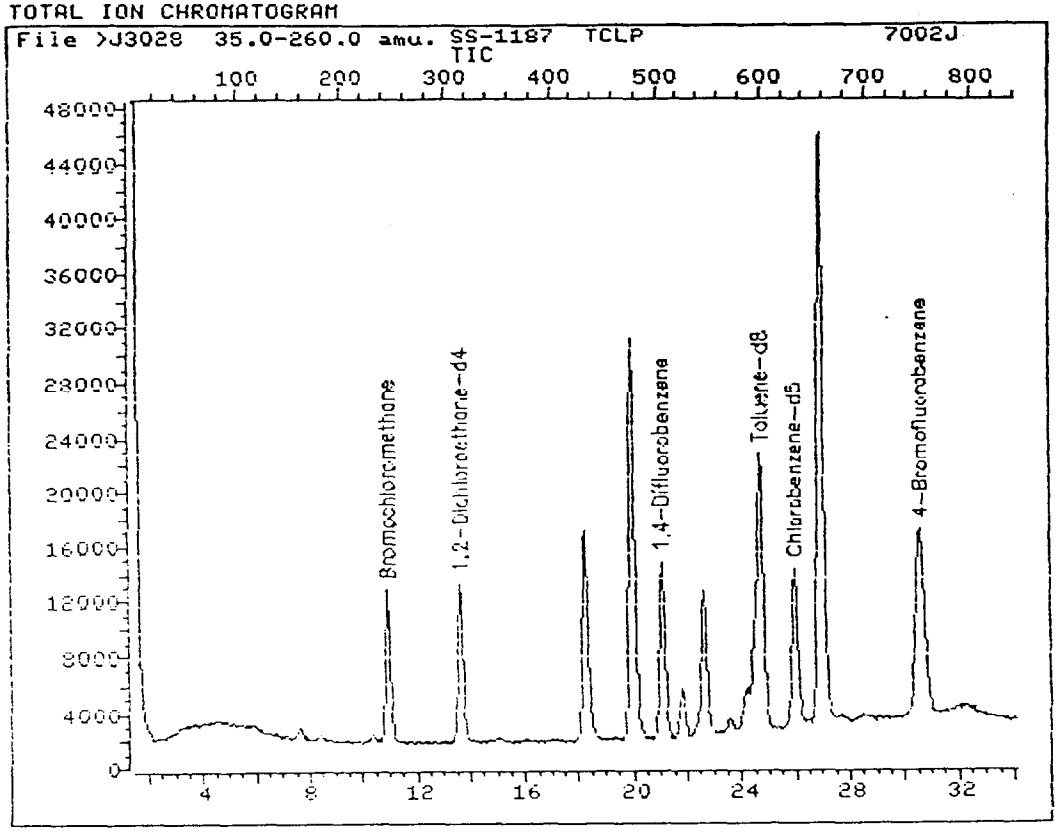
Nanco Sample ID: 89-SS-1187 Customer Sample ID: B-3-89/S-4

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	RESULTS MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	7.3	5
	67641	ACETONE	14	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	36	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



00067

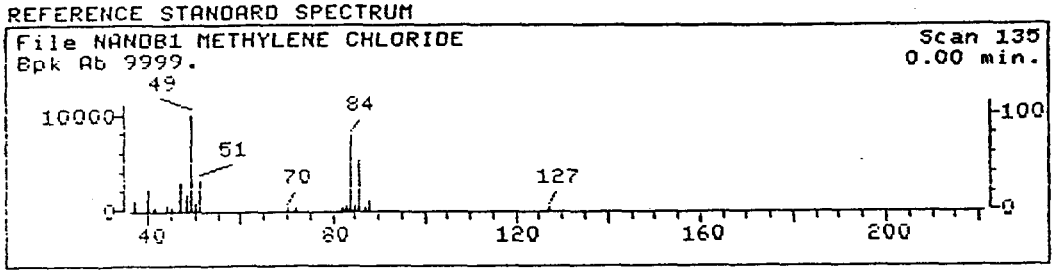
Data File: >J3028::F5
Name: SS-1187 TCLP
Misc: 7002J

Quant Output File: ^J3028::F1

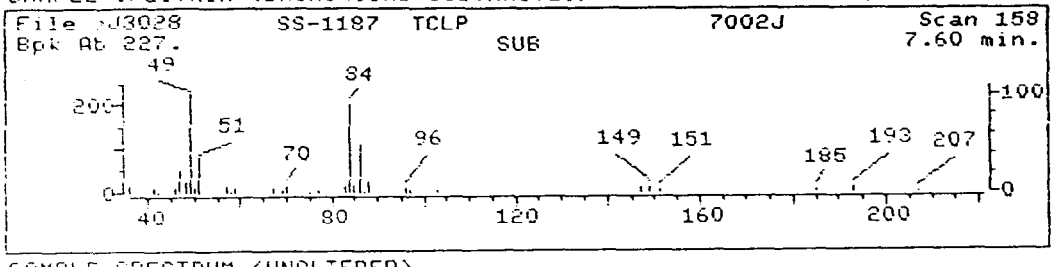
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 22:14
Injected at: 890707 21:39

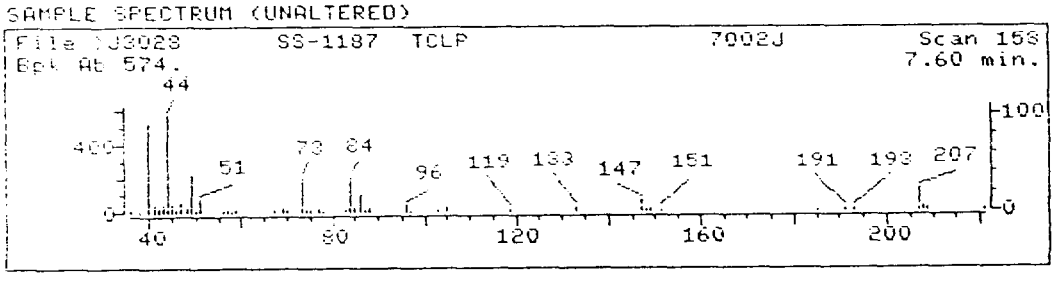
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00068

Data File: >J3028::F5
Name: SS-1187 TCLP
Misc: 7002J
Quant Time: 890707 22:14
Injected at: 890707 21:39

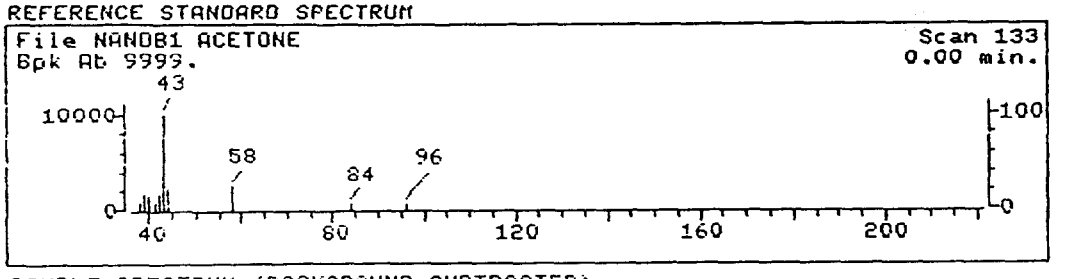
Quant Output File: ^J3028::F1

Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

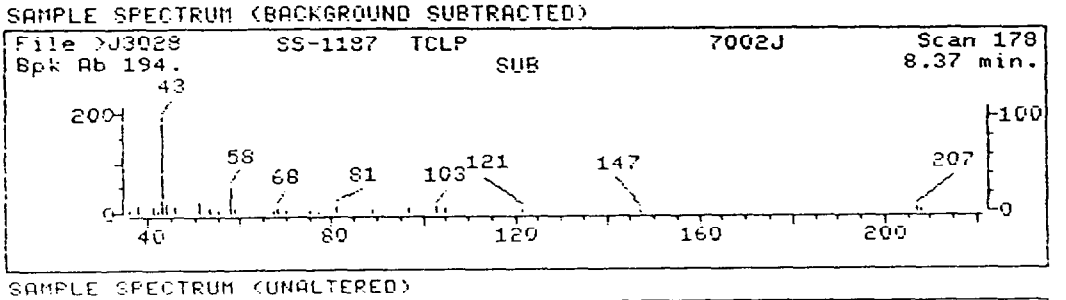
Compound No: 3
Compound Name: Methylene Chloride
Scan Number: 158
Retention Time: 7.60 min.
Quant Ion: 84.0
Area: 3482
Concentration: 7.34 UG/L
q-value: 80

J

REFERENCE STANDARD SPECTRUM

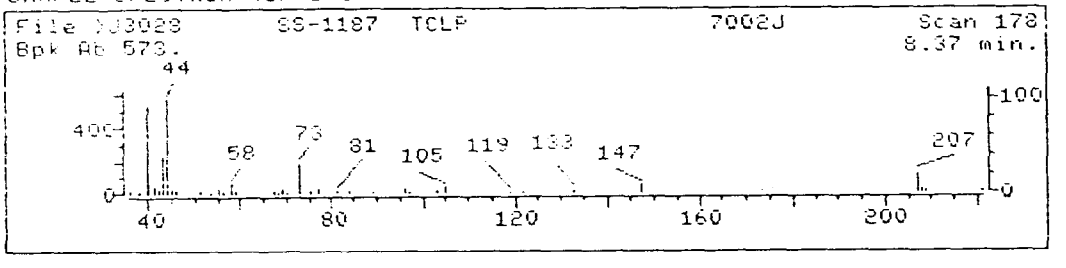


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00069

SAMPLE SPECTRUM (UNALTERED)



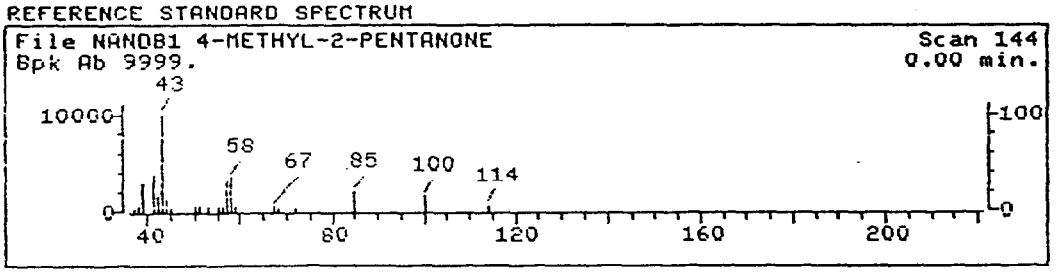
Data File: >J3028::F5
Name: SS-1187 TCLP
Misc: 7002J
Quant Time: 890707 22:14
Injected at: 890707 21:39

Quant Output File: ^J3028::F1

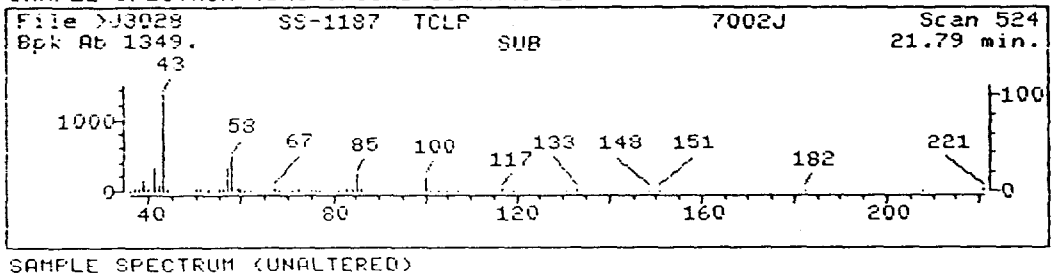
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 4
Compound Name: Acetone
Scan Number: 178
Retention Time: 8.37 min.
Quant Ion: 43.0
Area: 2845
Concentration: 14.29 UG/L
q-value: 100

REFERENCE STANDARD SPECTRUM

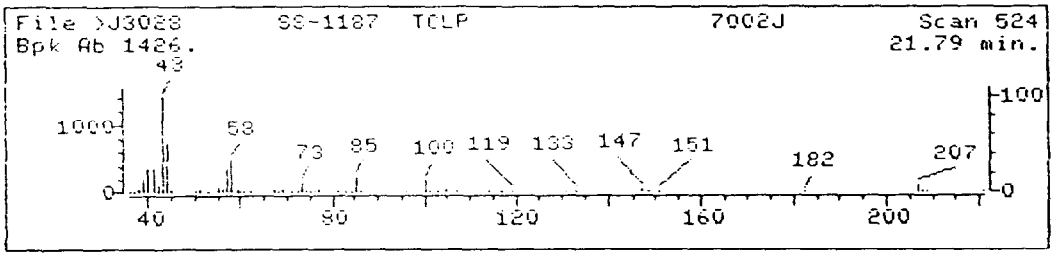


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00070

SAMPLE SPECTRUM (UNALTERED)



Data File: >J3028::F5 Quant Output File: ^J3028::F1
Name: SS-1187 TCLP
Misc: 7002J
Quant Time: 890707 22:14 Quant ID File: IDTCLP::QT
Injected at: 890707 21:39 Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 524
Retention Time: 21.79 min.
Quant Ion: 43.0
Area: 17964
Concentration: 36.19 UG/L
q-value: 34

METHOD BLANK RAW DATA

****
NANCO LABS, INC.
****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: N/A
Date Reported: 07/11/89

00072

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

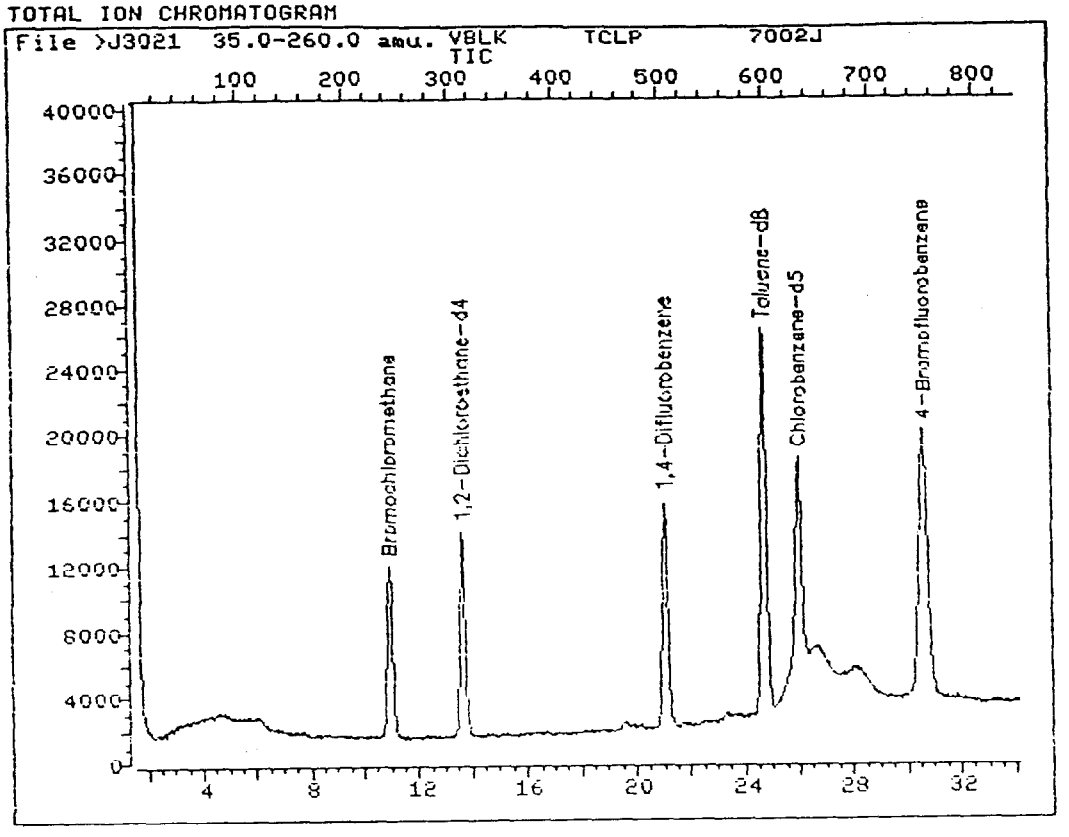
Nanco Sample ID: VBLK TCLP Customer Sample ID: METHOD BLANK

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	RESULTS MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	N.D.	5
	67641	ACETONE	BMRL	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	N.D.	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	N.D.	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



00073

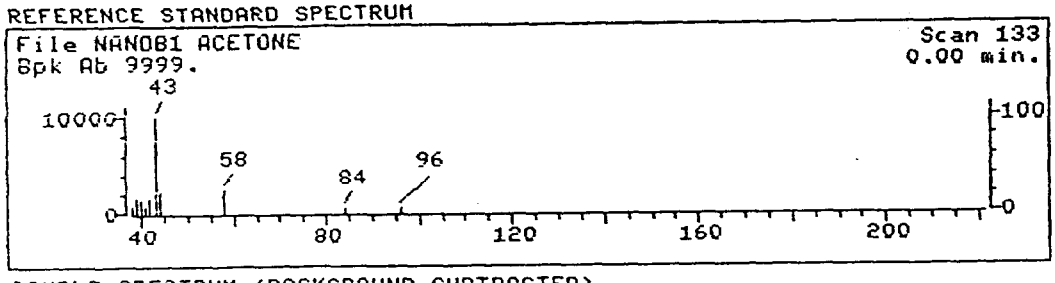
Data File: >J3021::F2
Name: VBLK TCLP
Misc: 7002J

Quant Output File: ^J3021::F1

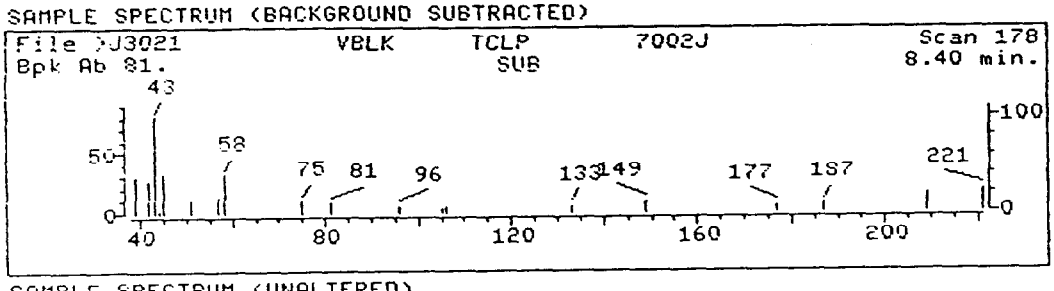
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: ELIZABETH
Quant Time: 890707 17:11
Injected at: 890707 16:36

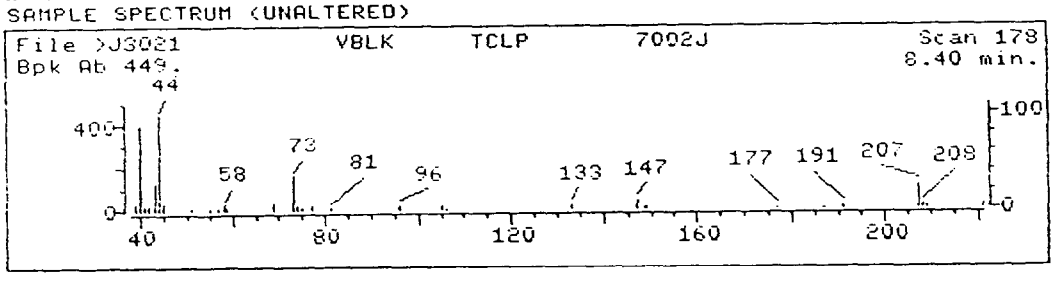
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00074

Data File: >J3021::F2
Name: VBLK TCLP
Misc: 7002J
Quant Time: 890707 17:11
Injected at: 890707 16:36

Quant Output File: ^J3021::F1

Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 4
Compound Name: Acetone
Scan Number: 178
Retention Time: 8.40 min.
Quant Ion: 43.0
Area: 1028
Concentration: 5.23 UG/L
q-value: 100

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: N/A
Date Reported: 07/11/89

00075

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

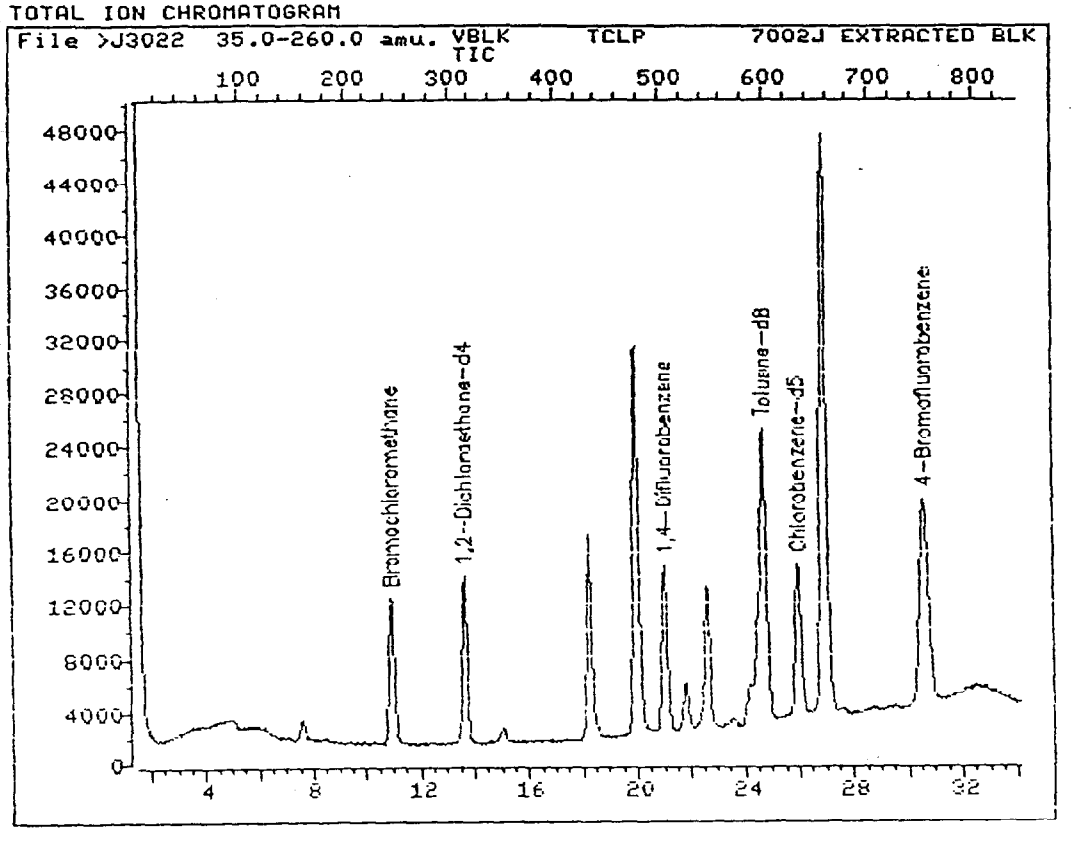
Nanco Sample ID: VBLK TCLP EXTRACTED BLANK Customer Sample ID: TCLP BLANK

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	12	5
	67641	ACETONE	12	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	N.D.	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	BMRL	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	N.D.	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	N.D.	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	37	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	N.D.	5
	108907	CHLOROBENZENE	N.D.	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



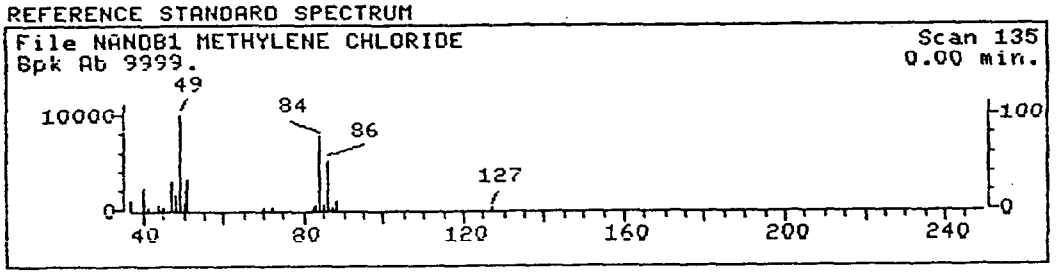
00076

Data File: >J3022::F2 Quant Output File: ^J3022::F1
Name: VBLK TCLP
Misc: 7002J EXTRACTED BLK

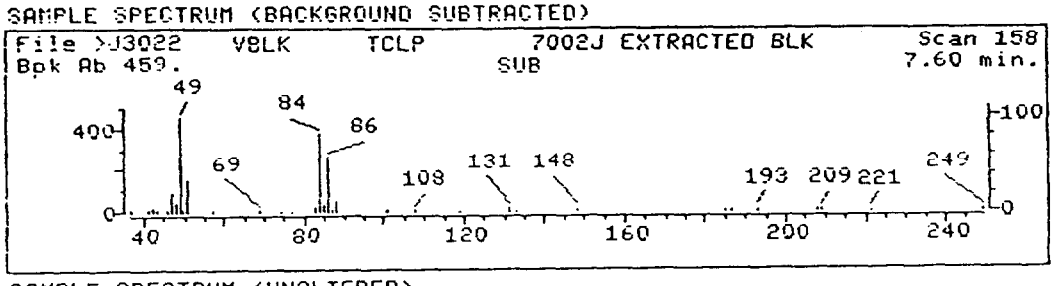
Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 18:08
Injected at: 890707 17:33

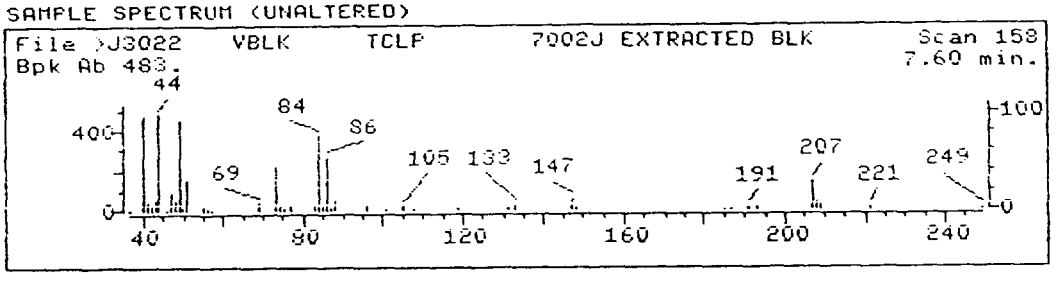
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)

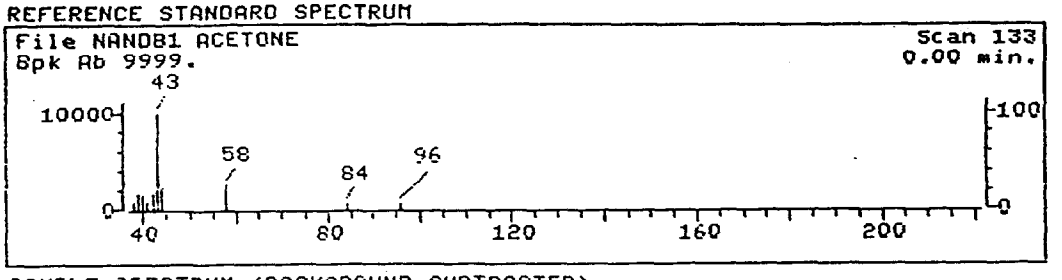


00077

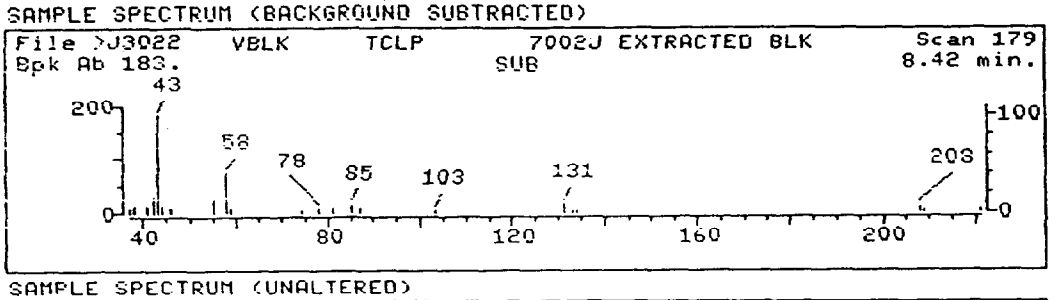
Data File: >J3022::F2 Quant Output File: ^J3022::F1
Name: VBLK TCLP
Misc: 7002J EXTRACTED BLK
Quant Time: 890707 18:08 Quant ID File: IDTCLP::QT
Injected at: 890707 17:33 Last Calibration: 890707 16:47

Compound No: 3
Compound Name: Methylene Chloride
Scan Number: 158
Retention Time: 7.60 min.
Quant Ion: 84.0
Area: 5749
Concentration: 11.85 UG/L
q-value: 81

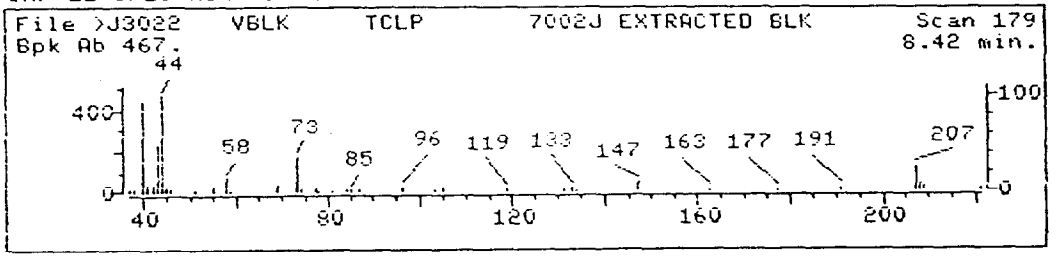
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00078

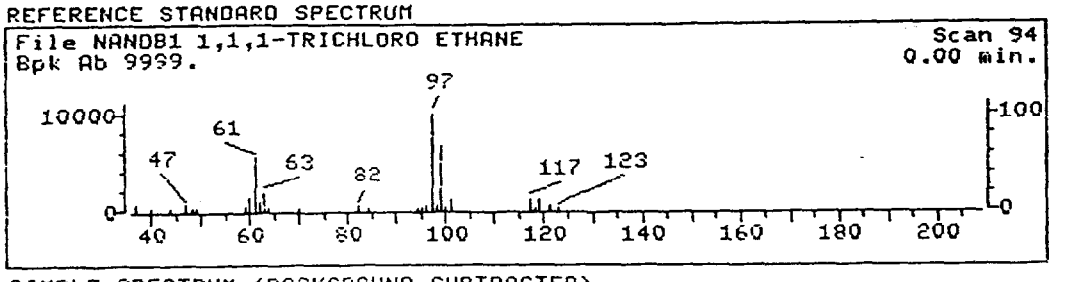
Data File: >J3022::F2
Name: VBLK TCLP
Misc: 7002J EXTRACTED BLK
Quant Time: 890707 18:08
Injected at: 890707 17:33

Quant Output File: ^J3022::F1

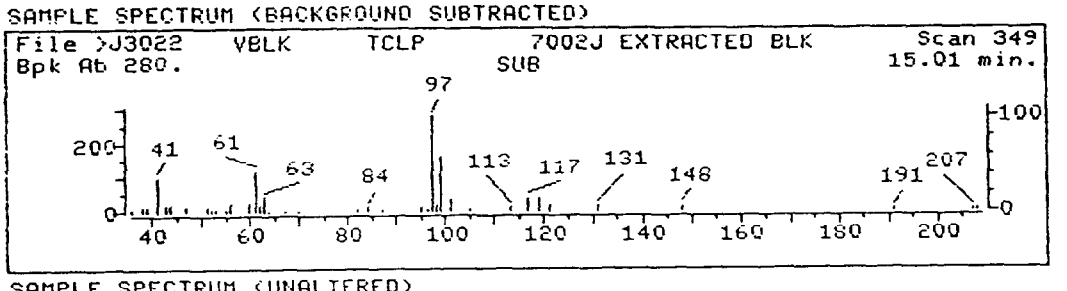
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 4
Compound Name: Acetone
Scan Number: 179
Retention Time: 8.42 min.
Quant Ion: 43.0
Area: 2407
Concentration: 11.82 UG/L
q-value: 100

REFERENCE STANDARD SPECTRUM

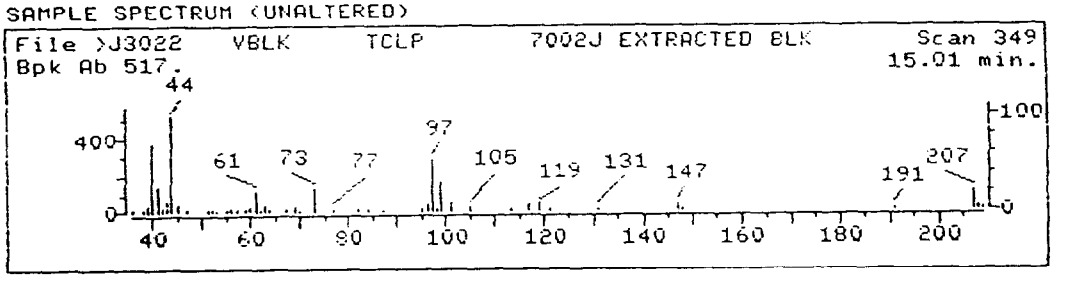


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00079

SAMPLE SPECTRUM (UNALTERED)



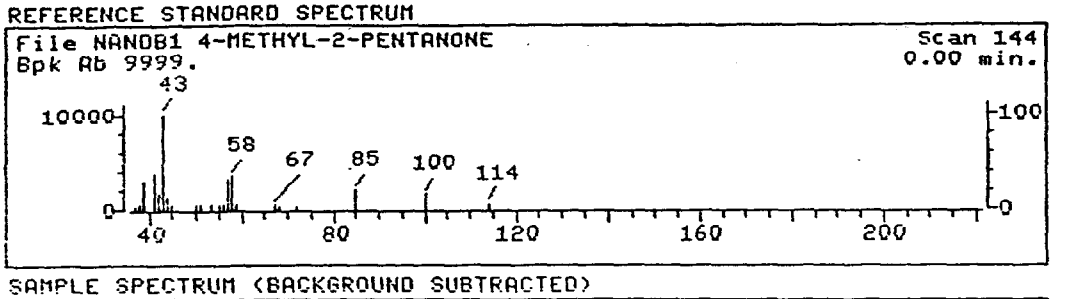
Data File: >J3022::F2
Name: VBLK TCLP
Misc: 7002J EXTRACTED BLK
Quant Time: 890707 18:08
Injected at: 890707 17:33

Quant Output File: ^J3022::F1

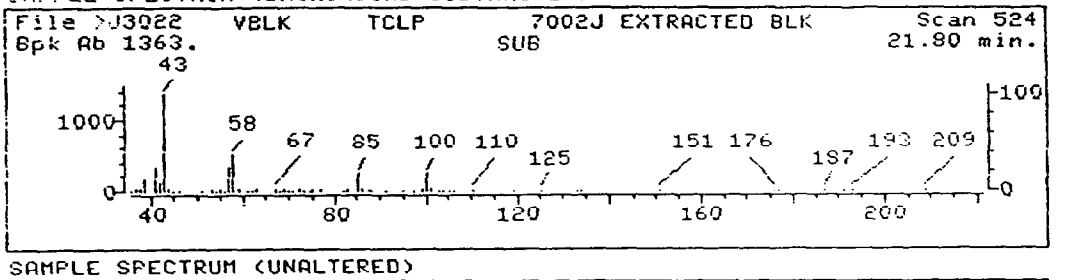
Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 18
Compound Name: 1,1,1-Trichloroethane
Scan Number: 349
Retention Time: 15.01 min.
Quant Ion: 97.0
Area: 3759
Concentration: 4.25 UG/L
q-value: 89

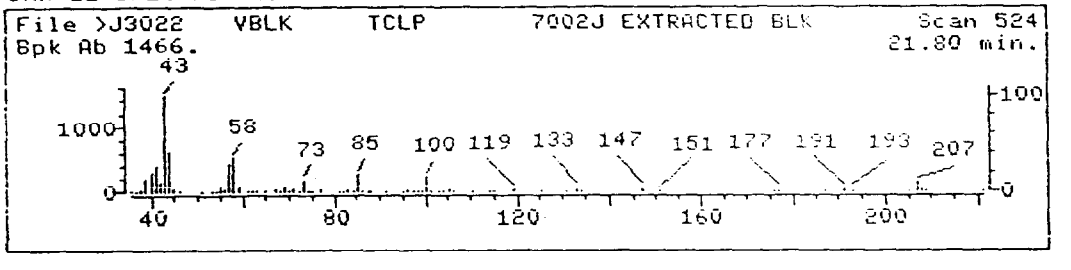
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



00080

Data File: >J3022::F2 Quant Output File: ^J3022::F1
Name: VBLK TCLP
Misc: 7002J EXTRACTED BLK
Quant Time: 890707 18:08 Quant ID File: IDTCLP::QT
Injected at: 890707 17:33 Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 524
Retention Time: 21.80 min.
Quant Ion: 43.0
Area: 18859
Concentration: 37.35 UG/L
q-value: 35

MS, MSD RAW DATA

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89

00082

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

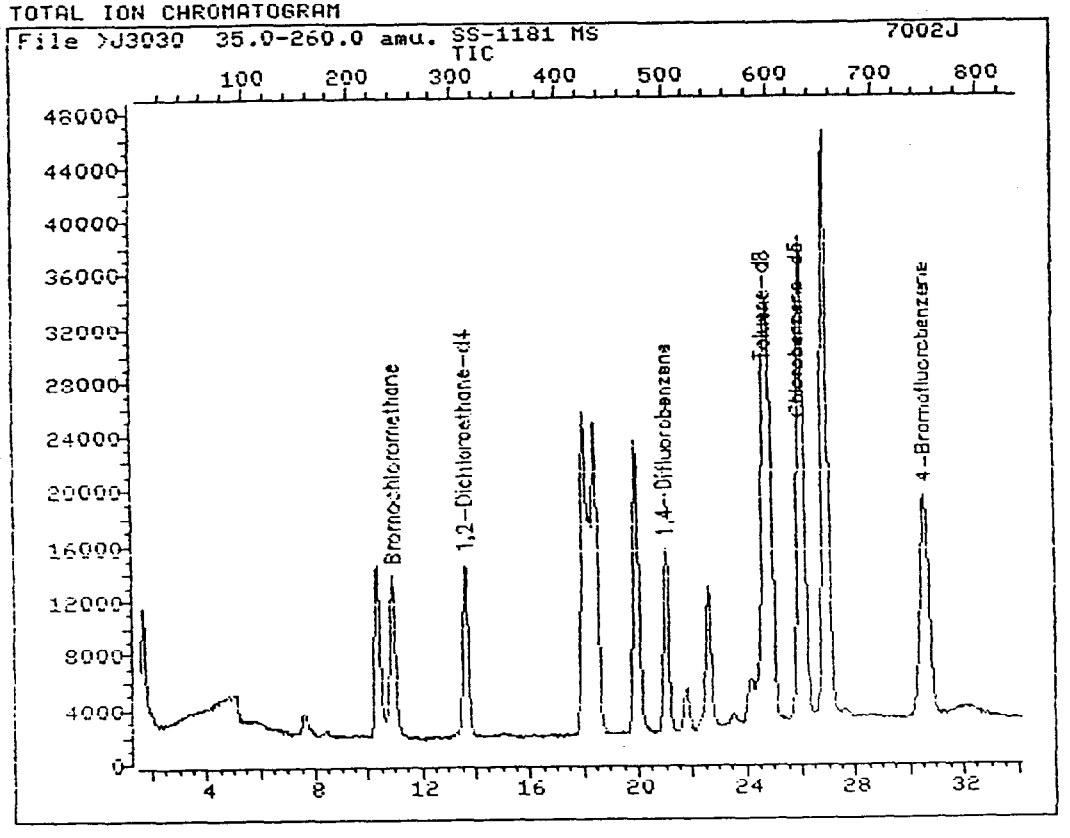
Nanco Sample ID: 89-SS-1181 MS Customer Sample ID: B-1-89 COMPOSITE MS

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	13	5
	67641	ACETONE	16	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	150	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	BMRL	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	BMRL	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	28	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	140	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	31	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	90	5
	108907	CHLOROBENZENE	140	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



00083

Data File: >J3030::F5
Name: SS-1181 MS
Misc: 7002J

Quant Output File: ^J3030::F1

Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890707 23:31
Injected at: 890707 22:57

****

NANCO LABS, INC.

****

GOLDBERG-ZOINO ASSOC., INC.

Date Received: 06/24/89
Date Reported: 07/11/89

00084

TCLP FRACTION
VOLATILE COMPOUNDS BY GC/MS

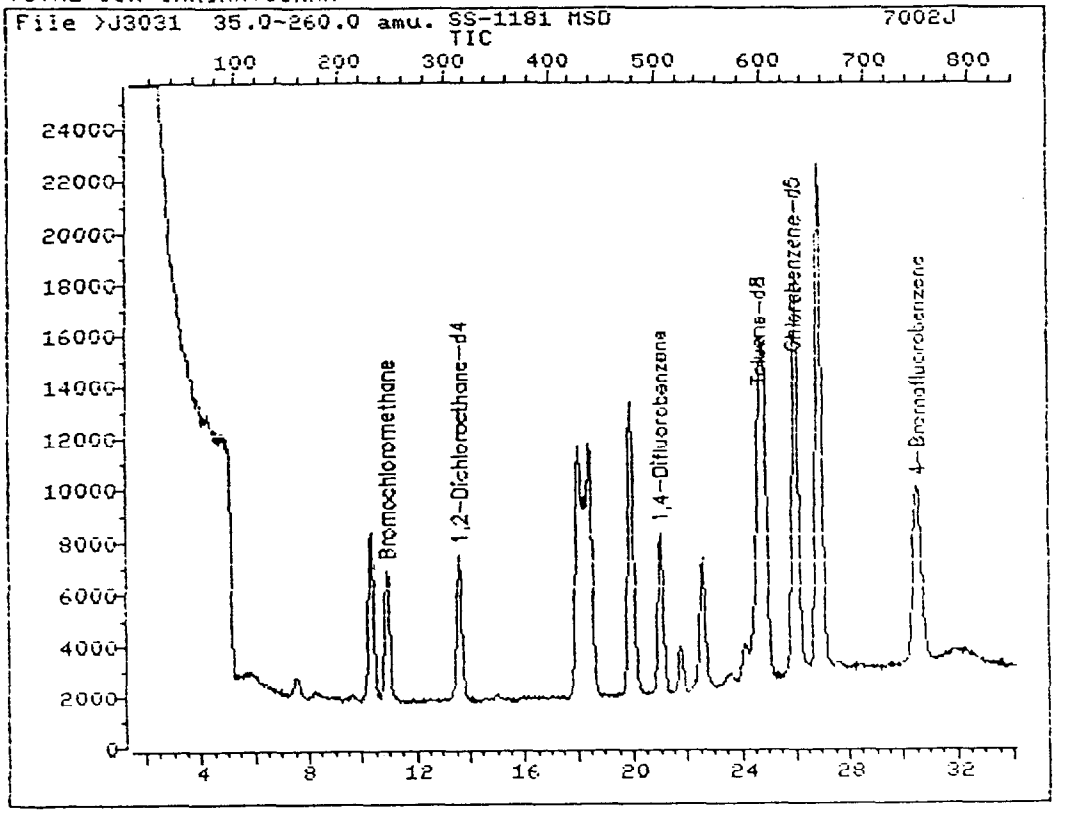
Nanco Sample ID: 89-SS-1181 MSD Customer Sample ID: B-1-89 COMPOSITE MSD

	CAS #	COMPOUNDS	RESULTS SAMPLE CONC. UG/L	MRL UG/L
	75014	VINYL CHLORIDE	N.D.	10
	75092	METHYLENE CHLORIDE	13	5
	67641	ACETONE	20	10
	75694	TRICHLOROFLUOROMETHANE	N.D.	5
	75150	CARBON DISULFIDE	N.D.	5
	107131	ACRYLONITRILE	N.D.	500
	75354	1,1-DICHLOROETHENE	140	5
	60297	ETHYL ETHER	N.D.	5
	67663	CHLOROFORM	N.D.	5
*	76131	1,1,2-C13-1,2,2-FL3 ETHANE	N.D.	5
	107062	1,2-DICHLOROETHANE	N.D.	5
	78831	ISOBUTANOL	N.D.	500
	114786	ETHYL ACETATE	N.D.	5
	78933	2-BUTANONE	N.D.	10
	71556	1,1,1-TICHLOROETHANE	BMRL	5
	56235	CARBON TETRACHLORIDE	N.D.	5
	71363	n-BUTANOL	N.D.	500
	79016	TRICHLOROETHENE	26	5
	79005	1,1,2-TRICHLOROETHANE	N.D.	5
	71432	BENZENE	130	5
	110861	PYRIDINE	N.D.	500
	108101	4-METHYL-2-PENTANONE	41	10
	127184	TETRACHLOROETHENE	N.D.	5
	79345	1,1,2,2-TETRACHLOROETHANE	N.D.	5
	108883	TOLUENE	85	5
	108907	CHLOROBENZENE	130	5
	100414	ETHYLBENZENE	N.D.	5
	1330207	XYLENE (TOTAL)	N.D.	5

*1,1,2-C13-1,2,2-FL3 ETHANE = 1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE

ND=NOT DETECTED BMRL=BELOW MINIMUM REPORTING LEVEL MRL=MINIMUM REPORTING LEVEL

TOTAL ION CHROMATOGRAM



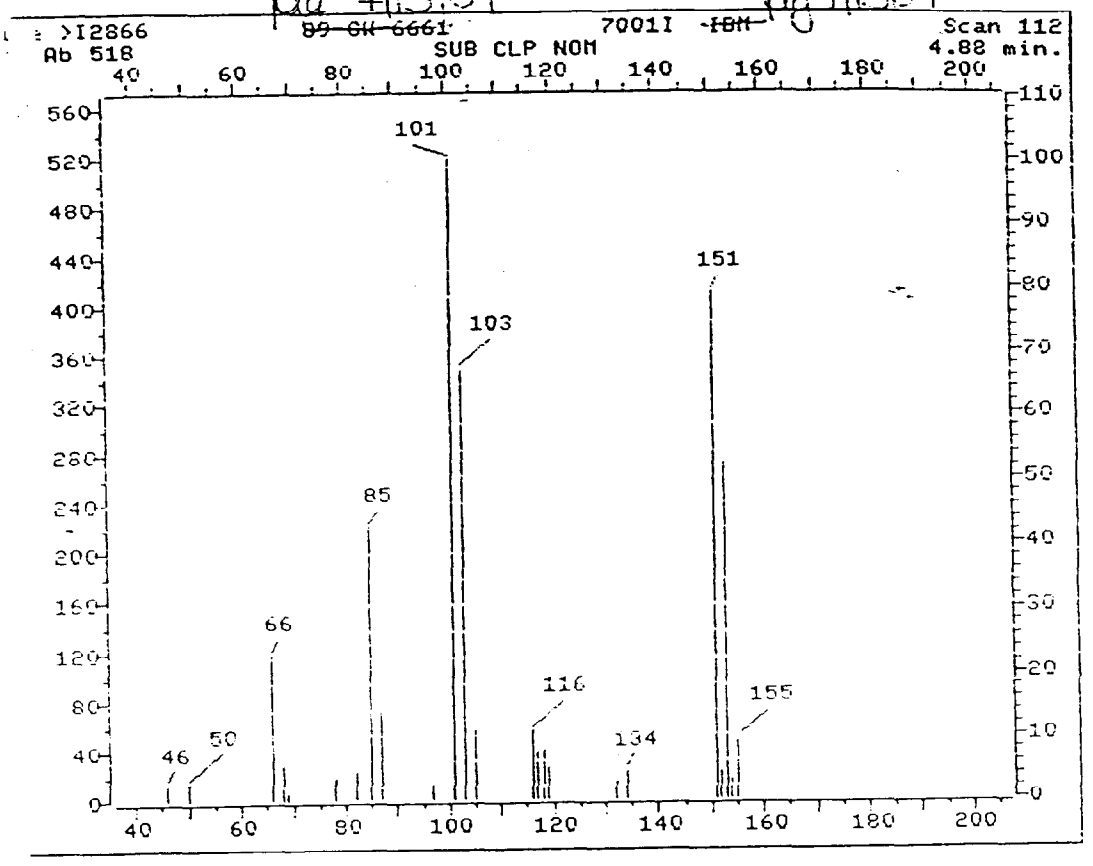
00085

Data File: >J3031::F5 Quant Output File: ^J3031::F1
Name: SS-1181 MSD
Misc: 7002J

Id File: IDTCLP::QT
Title: VOA TCLP ID FILE
Last Calibration: 890707 16:47

Operator ID: CHUCK
Quant Time: 890708 00:10
Injected at: 890707 23:36

pg 7/13/89 pg 7/13/89



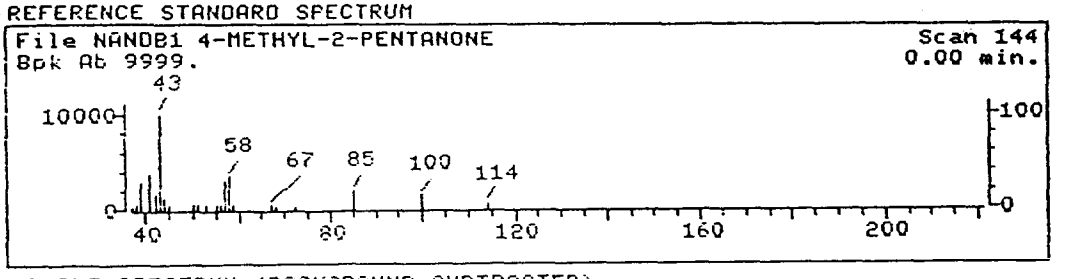
00047

Reference Spectra for

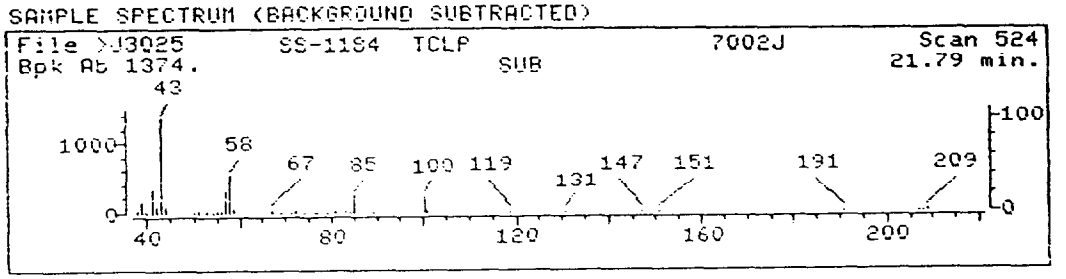
1,1,2-Trichloro-1,2,2-Trifluoroethane

pg 7/13/89

REFERENCE STANDARD SPECTRUM

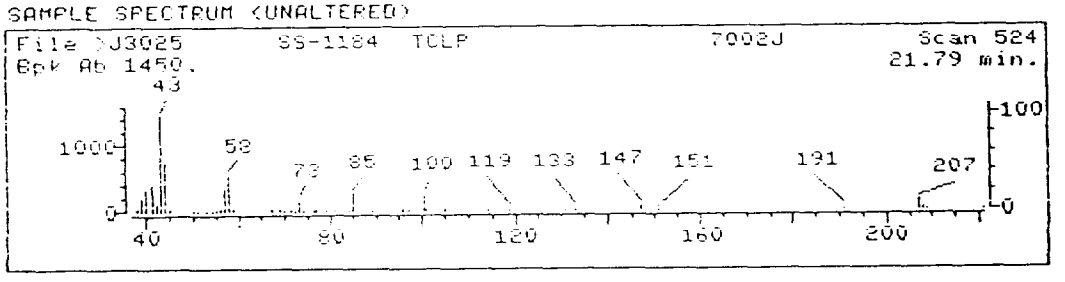


SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



00048

SAMPLE SPECTRUM (UNALTERED)



Data File: >J3025::F5
Name: SS-1184 TCLP
Misc: 7002J
Quant Time: 890707 20:17
Injected at: 890707 19:42

Quant Output File: ^J3025::F1

Quant ID File: IDTCLP::QT
Last Calibration: 890707 16:47

Compound No: 26
Compound Name: 4-Methyl-2-Pentanone
Scan Number: 524
Retention Time: 21.79 min.
Quant Ion: 43.0
Area: 19579
Concentration: 36.45 UG/L
q-value: 34

Nanco Sample ID: 89-SS-1185

Client Sample ID: B-2-89/S-4