N00158.AR.000020
NAS WILLOW GROVE
5090.3a

EA Laboratories

RESULTS OF ANALYSIS OF
TWO WATER SAMPLES
COLLECTED AT WILLOW GROVE
ON 25 AND 26 APRIL 1989

Prepared for:

Northern Division
Naval Facilities Enginering Command

Prepared by:

EA Laboratories

June 1989
Rept. #890281

TABLE OF CONTENTS

WILLOW GROVE

		Page
1.	NARRATIVE	1 000
2.	CHAIN OF CUSTODY	2 000
3.	VOLATILES DATA	3 000
	A. Q.C. Summary	3 001
	1. Surrogate Percent Recovery (Form II)	3 002
	2. Matrix Spike/Matrix Spike Duplicate (Form III)	3 003
	3. Method Blank Summary (Form IV)	3 004
	4. BFB (Form V)	3 005
	B. Sample Data	3 007
	1. Data for Sample Source Water NELW-1 & 2	3 008
	2. Data for Sample Source Water NELW-3	3 014
	3. Data for Trip Blank (4/25/89)	3 019
	C. Standards Data	3 022
	1. Initial Five Point Calibration (Form VI)	3 023
	2. Continuing Calibration Check (Form VII)	3 024
	3. Internal Standard Area Summary (Form VIII)	3 025
	D. Raw QC Data	3 026
	1. Method blank	3 027
	2. Matrix Spike Data	3 033
	3. Matrix Spike Duplicate Data	3 036
	E. Quality Assurance Summary	3 039

1. NARRATIVE

NARRATIVE

On 25 and 26 April 1989, EA Engineering, Science, and Technology, Inc. personnel collected two water samples at Willow Grove. The samples and one trip blank were taken to EA Laboratories in Sparks, Maryland for analysis. Upon receipt at the laboratory the samples were inspected, compared with the chain-of-custody record, logged, assigned laboratory accession numbers and distributed for the determination of volatile organic compounds.

Results are summarized in the appended data package.

In accepting analytical work, EA Laboratories, a division of EA Engineering, Science, and Technology, Inc., warrants the test results to be of precision normal for the sample type and methodology employed for each sample as submitted. The methods indicated were employed as stated to the extent permitted by sample and/or matrix limitation, if any. EA disclaims any other warranties, express or implied, including warranty of fitness for a particular purpose and warranty of merchantability. Also, EA accepts no legal responsibility for the purpose for which the client uses test results. EA cannot accept any terms and conditions or purchase orders, work orders, or requests, and any analytical work performed by EA must be governed by the terms and conditions set forth herein.

2. CHAIN OF CUSTODY

340

Chain f Custody Record

EA Laboratories
15 Loveton Circle
Sparks, MD 21152
301-771-4950

Company Name	Project Manager or Contact
EA Engineering	Chuck Houlik

Project No.	Project Name
10388.03	Willow Grove

Special QA Pr. tocols (Circle)
EPA-CLP TIER I (NJ) OTHER (SPECIFY)
USATHAMA TIER II (NJ) NAVY Level C

Date	Time	Grab	Comp	Sample Identification (I.D. and Matrix)	No. of Containers	VOC	EA Labs Accession Number	Remarks
4/25/89	1550	X		Source WATER (NELW-1 NELW-2)	2	X	2025	
4/26/89	1007	X		Source WATER (NELW-3)	2	X	2026	
4/25/89	1555	X		TRIP BLANK	1	X	2027	

Sampled by: (Signature) Thomas Potts
Title: Geologist II
Date/Time 4/26/89 1115
Relinquished by: (Signature)
Date/Time
Received by: (Signature)

Relinquished by: (Signature)
Date/Time
Recieved by: (Signature)
Relinquished by: (Signature)
Date/Time 4/27/89 1150
Rec'd. by Lab: (Signature) Mary Capu

Sample Custody Notes: 890281 d. 18 May 89

Sample Shipped by: (Circle) Fed. Ex. Puro. UPS
Other (Specify)

Air Bill Number:

EA 0396 6/3/88 White — EA Sample Custody Yellow — EA Lab Manager Pink — Project Manager

2001

3. VOLATILES DATA

A. QC Summary

2A
WATER VOLATILE SURROGATE RECOVERY

Lab Name: EAENG Contract: 68-01-7436

Lab Cod : EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
1	NFFW5	101	99	110		0
2	VBLK2	105	103	106		0
3	NFFW2	106	102	104		0
4	TRIP BL	108	108	112		0
5	NFFW6	99	96	105		0
6	RINSE BL	107	95	108		0
7	TRIP BL	102	97	102		0
8	NFFW7	101	98	106		0
9	NFFW7MS	101	96	98		0
10	NFFW7MSD	99	95	102		0
11	VBLK3	99	101	101		0
12	NELW1+2	97	99	110		0
13	NELW1MS	96	91	112		0
14	NELW1MSD	101	98	111		0
15	NELW3	102	103	104		0
16	TRIP BL	106	108	111		0
17						
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27						
28						
29						
30						

	QC LIMITS
S1 (TOL) = Toluene-d8	(88-110)
S2 (BFB) = Bromofluorobenzene	(86-115)
S3 (DCE) = 1,2-Dichloroethane-d4	(76-114)

Column to be used to flag recovery values

* Values outside of contract required QC limits

D Surrogates diluted out

FORM II VOA-1 1/87 R v.

3A

WATER VOLATILE MATRIX SPIKE/MATRIX SPIKE DUPLICATE RECOVERY

Lab Nam : EAENG Contract: 68-01-7436

Lab Cod : EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix Spike - EPA Sample No.: NELW1+2

COMPOUND	SPIKE ADDED (UG/L)	SAMPLE CONCENTRATION (UG/L)	MS CONCENTRATION (UG/L)	MS % REC #	QC LIMITS REC.
1,1-Dichloroethene	50.	0.	64.	129	61-145
Trichloroethene	50.	0.	53.	107	71-120
B nzene	50.	0.	53.	105	76-127
Toluene	50.	0.	55.	109	76-125
Chlorobenzene	50.	0.	53.	107	75-130

COMPOUND	SPIKE ADDED (UG/L)	MSD CONCENTRATION (UG/L)	MSD % REC #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1-Dichloroethene	50.	63.	125	3	14	61-145
Trichloroethene	50.	55.	111	4	14	71-120
Benzene	50.	53.	106	1	11	76-127
Toluen	50.	56.	111	2	13	76-125
Chlorob nzene	50.	56.	113	6	13	75-130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

RPD: 0 out of 5 outside limits
Spike Recovery: 0 out of 10 outside limits

COMMENTS:

FORM III VOA-1 1/87 Rev.

4A
VOLATILE METHOD BLANK SUMMARY

Lab Name: EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Lab File ID: EF450 Lab Sample ID: METHOD BLANK

Date Analyzed: 5/ 1/89 Time Analyzed: 9:27

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

Instrument ID: 7002E5

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

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	NELW1+2	EA # 2025	EF451	10:28
2	NELW1MS	EA # 2025MS	EF452	11:14
3	NELW1MSD	EA # 2025MSD	EF453	11:59
4	NELW3	EA # 2026	EF454	12:45
5	TRIP BL	EA # 2027	EF455	13:31
6				
7				
8				
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COMMENTS:

5A
VOLATILE ORGANIC GC/MS TUNING AND MASS
CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: EAENG Contract: 68-01-7436

Lab Cod : EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Lab Fil ID: EF374 BFB Injection Date: 4/21/89

Instrument ID.: 7002E5 BFB Injection Time: 12:30

Matrix:(oil/water) WATER Level:(low/med): LOW Column:(pack/cap) PACK

m/	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	23.3
75	30.0 - 60.0% of mass 95	53.2
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	7.7
173	Less than 2.0% of mass 174	.0 (.0)1
174	Greater than 50.0% of mass 95	82.2
175	5.0 - 9.0% of mass 174	6.9 (8.4)1
176	Greater than 95.0%, but less than 101.0% of mass 174	81.8 (99.4)1
177	5.0 - 9.0% of mass 176	6.1 (7.5)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1	VSTD20	20PPB	EF375	4/21/89	13:42
2	VSTD50	50PPB	EF376	4/21/89	14:27
3	VSTD100	100PPB	EF377	4/21/89	15:13
4	VSTD150	150PPB	EF378	4/21/89	15:58
5	VSTD200	200PPB	EF379	4/21/89	16:43
6					
7					
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22					

5A

VOLATILE ORGANIC GC/MS TUNING AND MASS CALIBRATION - BROMOFLUOROBENZENE (BFB)

Lab Name: EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Lab File ID: EF448 BFB Injection Date: 5/ 1/89

Instrument ID.: 7002E5 BFB Injection Time: 7:03

Matrix:(soil/water) WATER Level:(low/med): LOW Column:(pack/cap) PACK

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.3
75	30.0 - 60.0% of mass 95	52.6
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.9
173	Less than 2.0% of mass 174	.0 (.0)1
174	Greater than 50.0% of mass 95	77.3
175	5.0 - 9.0% of mass 174	6.7 (8.7)1
176	Greater than 95.0%, but less than 101.0% of mass 174	75.1 (97.1)1
177	5.0 - 9.0% of mass 176	5.1 (6.8)2

1-Value is % mass 174 2-Value is % mass 176

THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1	VSTD50	50 PPB	EF449	5/ 1/89	8:09
2	VBLK3	METHOD BLANK	EF450	5/ 1/89	9:27
3	NELW1+2	EA # 2025	EF451	5/ 1/89	10:28
4	NELW1MS	EA # 2025 MS	EF452	5/ 1/89	11:14
5	NELW1MSD	EA # 2025 MSD	EF453	5/ 1/89	11:59
6	NELW3	EA # 2026	EF454	5/ 1/89	12:45
7	TRIP BL	EA # 2027	EF455	5/ 1/89	13:31
8					
9					
10					
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12					
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16					
17					
18					
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22					

B. Sample Data

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

NELW1+2

Lab Nam : EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix: (soil/water) WATER Lab Sample ID: EA # 2025

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: EF451

Level: (low/med) LOW Date Received: 4/27/89

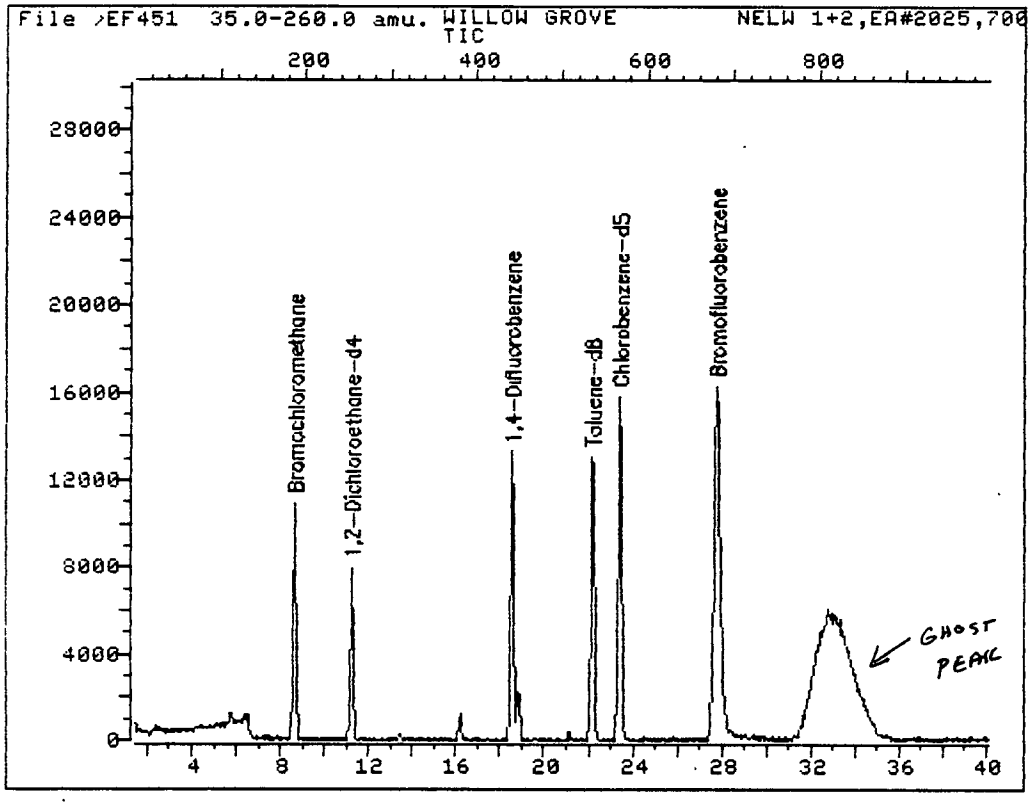
% Moisture: not dec. 100. Date Analyzed: 5/ 1/89

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	1.	J
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	4.	J
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	7.	
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styren	5.	U
1330-20-7	Xylene (total)	5.	U

FORM I VOA 1/87 Rev.

TOTAL ION CHROMATOGRAM



Data File: >EF451::D2 Quant Output File: ^EF451::QT
Name: WILLOW GROVE
Misc: NELW 1+2,EA#2025,7002E5,WATER,5.0ML

Id File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

Operator ID: CARL
Quant Time: 890501 11:09
Injected at: 890501 10:28

QUANT REPORT

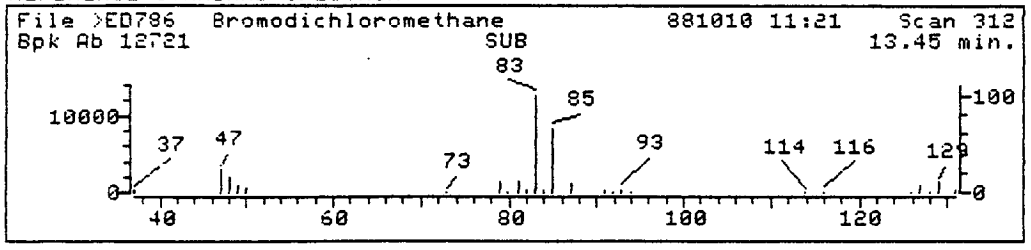
Operator ID: CARL Quant Rev: 6 Quant Time: 890501 11:09
Output File: ^EF451::QT Injected at: 890501 10:28
Data Fil : >EF451::D2 Dilution Factor: 1.00000
Name: WILLOW GROVE
Misc: NELW 1+2,EA#2025,7002E5,WATER,5.0ML

ID File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

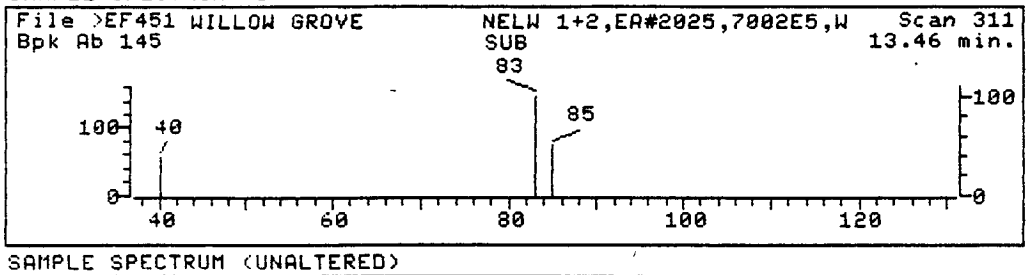
	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	8.65	128.0	14225	50.00	UG/L	92
13)	1,2-Dichloroethane-d4	11.21	65.0	36053	55.16	UG/L	82
15)	*1,4-Difluorobenzene	18.54	114.0	53786	50.00	UG/L	89
20)	Bromodichloromethane	13.46	83.0	1111	1.13	UG/L	76
24)	Dibromochloromethane	16.21	129.0	3921	3.94	UG/L	96
28)	Bromoform	18.85	173.0	6488	6.77	UG/L	99
29)	*Chlorobenzene-d5	23.42	117.0	50155	50.00	UG/L	95
35)	Toluene-d8	22.18	98.0	51735	48.60	UG/L	98
40)	Bromofluorobenzene	27.76	95.0	52409	49.64	UG/L	91

* Compound is ISTD

REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



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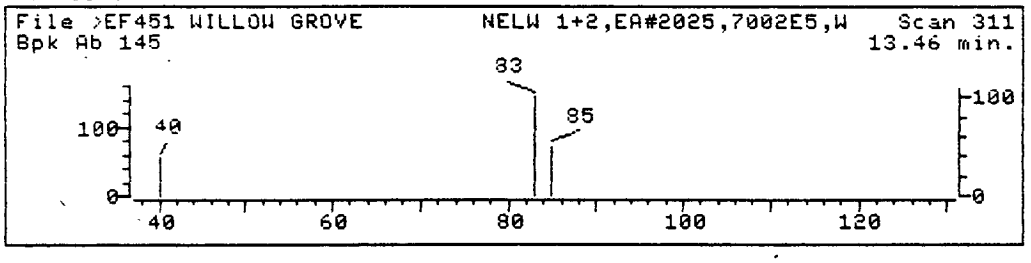

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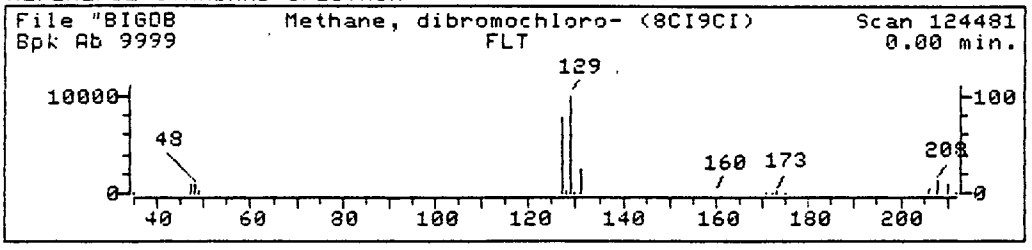
Name: WILLOW GROVE
Misc: NELW 1+2,EA#2025,7002E5,WATER,5.0ML
Quant Time: 890501 11:09 Quant ID File: EVOA::BD
Injected at: 890501 10:28 Last Calibration: 890501 09:24

Compound No: 20
Compound Name: Bromodichloromethane
Scan Number: 311
Retention Time: 13.46 min.
Quant Ion: 83.0
Area: 1111
Concentration: 1.13 UG/L
q-value: 76

REFERENCE STANDARD SPECTRUM



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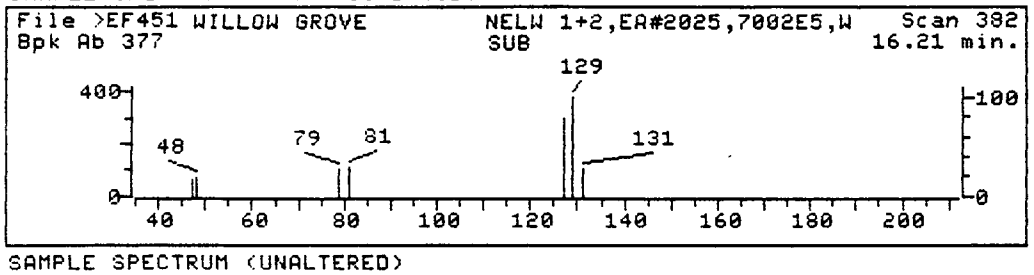

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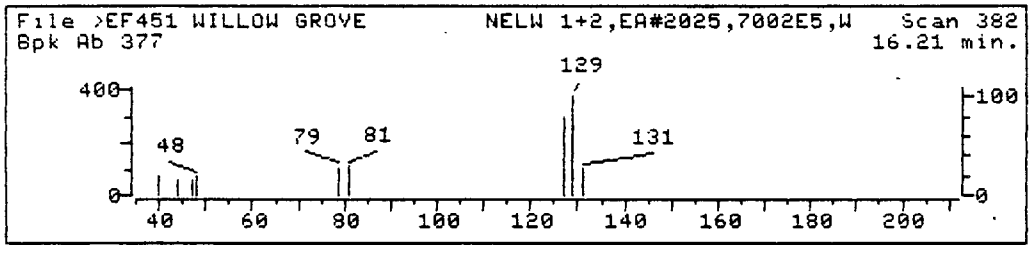

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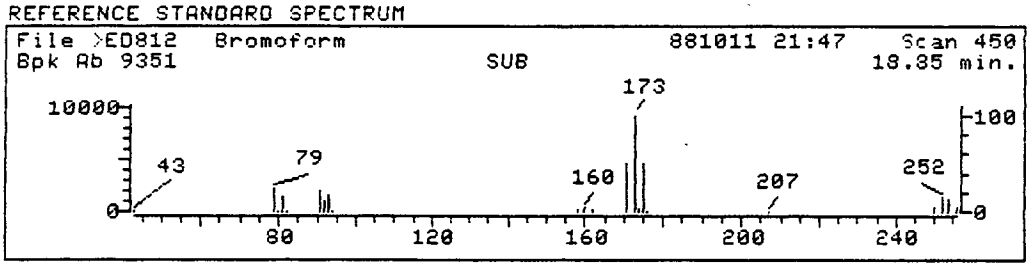
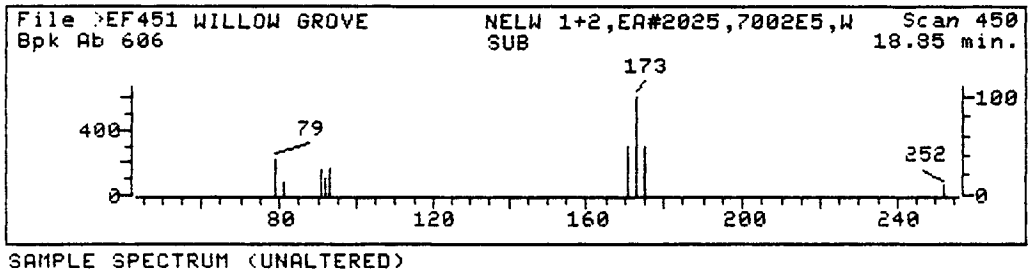
Misc: NELW 1+2,EA#2025,7002E5,WATER,5.0ML
Quant Time: 890501 11:09 Quant ID File: EVOA::BD
Injected at: 890501 10:28 Last Calibration: 890501 09:24

Compound No: 24
Compound Name: Dibromochloromethane
Scan Number: 382
Retention Time: 16.21 min.
Quant Ion: 129.0
Area: 3921
Concentration: 3.94 UG/L
q-value: 96

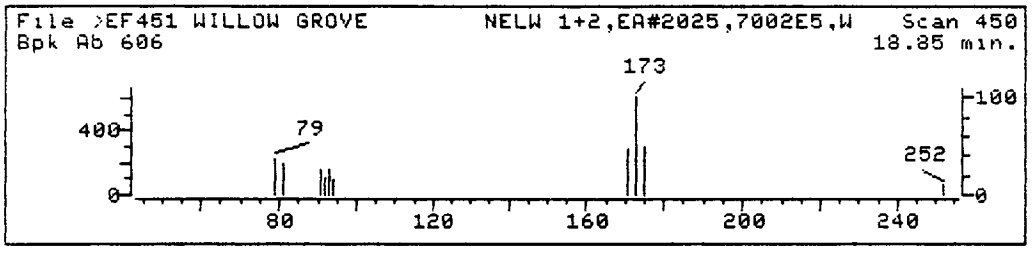
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >EF451::D2 Quant Output File: ^EF451::QT
Name: WILLOW GROVE
Misc: NELW 1+2,EA#2025,7002E5,WATER,5.0ML
Quant Time: 890501 11:09 Quant ID File: EVOA::BD
Injected at: 890501 10:28 Last Calibration: 890501 09:24

Compound No: 28
Compound Name: Bromoform
Scan Number: 450
Retention Time: 18.85 min.
Quant Ion: 173.0
Area: 6488
Concentration: 6.77 UG/L
q-value: 99

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

NELW3

Lab Name: EAENG Contract: 68-01-7436

Lab Cod : EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix: (soil/water) WATER Lab Sample ID: EA # 2026

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: EF454

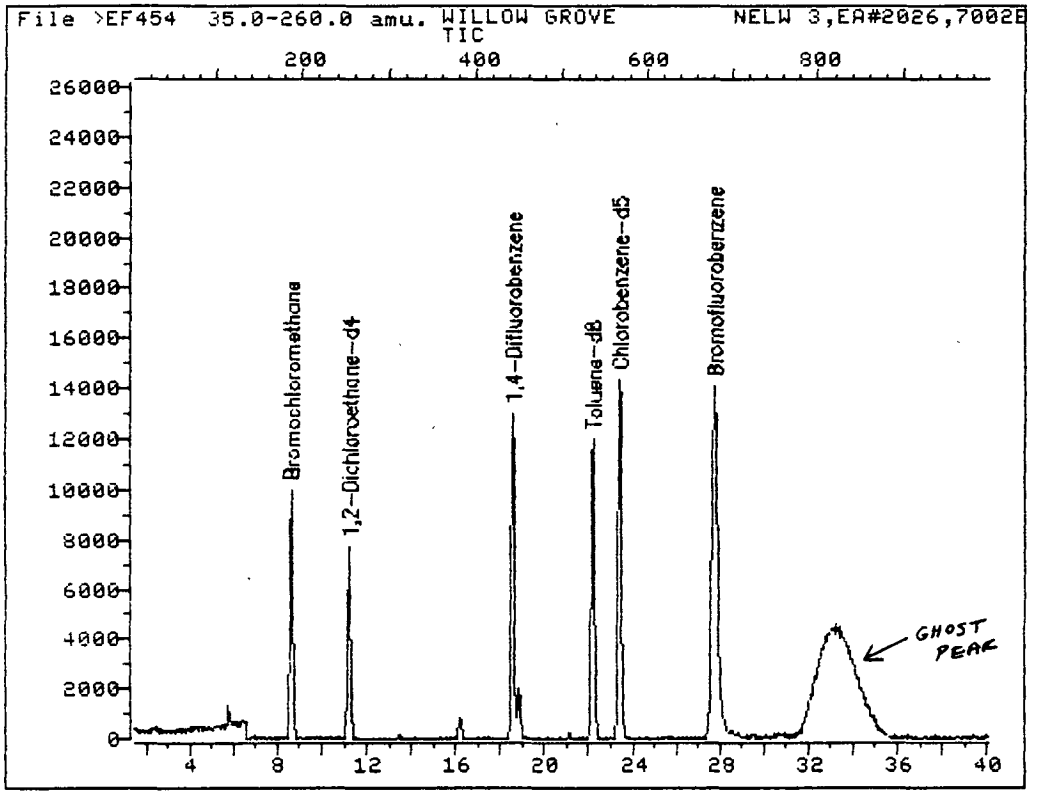
Level: (low/med) LOW Date Received: 4/27/89

% Moisture: not dec. 100. Date Analyzed: 5/ 1/89

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	4.	J
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	7.	
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylene (total)	5.	U

TOTAL ION CHROMATOGRAM



Data File: >EF454::D2 Quant Output File: ^EF454::QT
Name: WILLOW GROVE
Misc: NELW 3,EA#2026,7002E5,WATER,5.0ML

Id File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

Operator ID: CARL
Quant Time: 890501 13:26
Injected at: 890501 12:45

QUANT REPORT

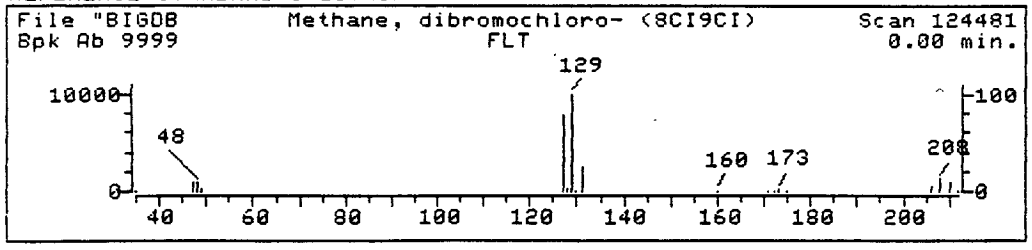
Operator ID: CARL Quant Rev: 6 Quant Time: 890501 13:26
Output File: ^EF454::QT Injected at: 890501 12:45
Data Fil : >EF454::D2 Dilution Factor: 1.00000
Name: WILLOW GROVE
Misc: NELW 3,EA#2026,7002E5,WATER,5.0ML

ID File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

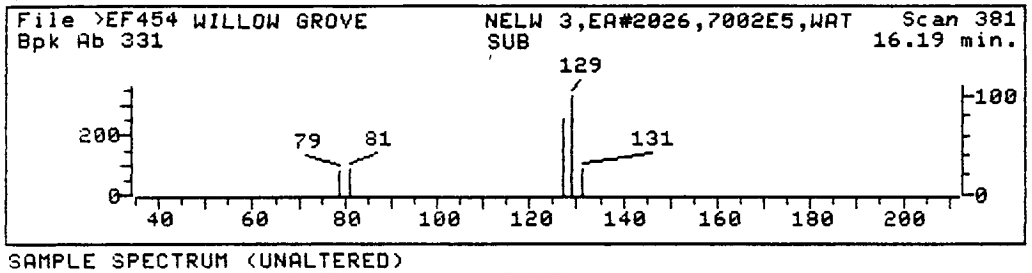
	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	8.64	128.0	13155	50.00	UG/L	97
13)	1,2-Dichloroethane-d4	11.23	65.0	31477M	52.08	UG/L	78
15)	*1,4-Difluorobenzene	18.56	114.0	47324	50.00	UG/L	90
24)	Dibromochloromethane	16.19	129.0	3288	3.76	UG/L	99
28)	Bromoform	18.83	173.0	5793	6.87	UG/L	98
29)	*Chlorobenzene-d5	23.40	117.0	44570	50.00	UG/L	96
35)	Toluene-d8	22.20	98.0	48076	50.82	UG/L	97
40)	Bromofluorobenzene	27.74	95.0	48140	51.31	UG/L	91

* Compound is ISTD

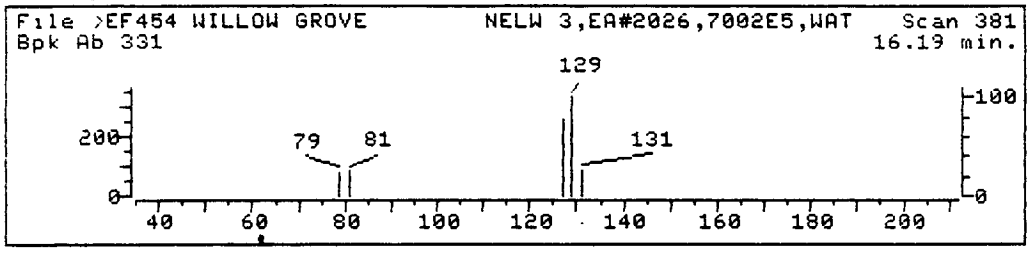
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



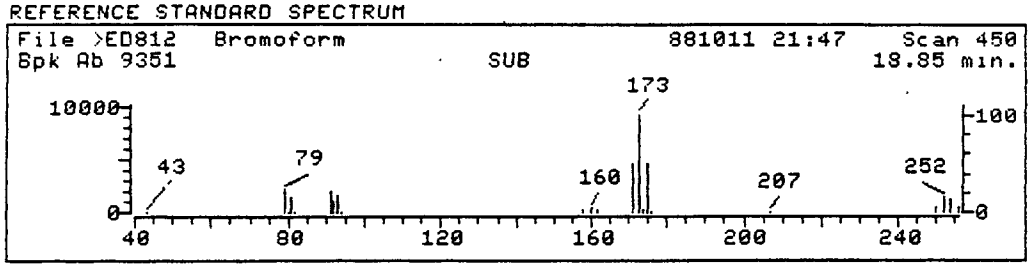
SAMPLE SPECTRUM (UNALTERED)



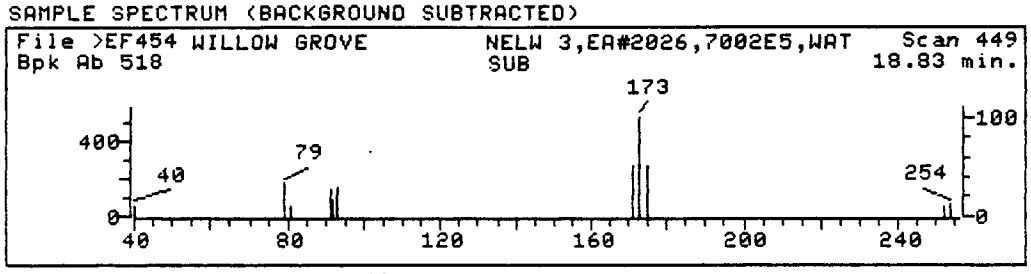
Data File: >EF454::D2 Quant Output File: ^EF454::QT
Name: WILLOW GROVE
Misc: NELW 3,EA#2026,7002E5,WATER,5.0ML
Quant Time: 890501 13:26 Quant ID File: EVOA::BD
Injected at: 890501 12:45 Last Calibration: 890501 09:24

Compound No: 24
Compound Name: Dibromochloromethane
Scan Number: 381
Retention Time: 16.19 min.
Quant Ion: 129.0
Area: 3288
Concentration: 3.76 UG/L
q-value: 99

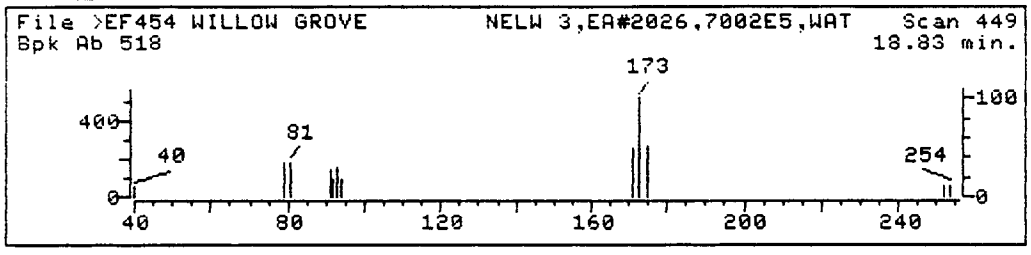
REFERENCE STANDARD SPECTRUM



SAMPLE SPECTRUM (BACKGROUND SUBTRACTED)



SAMPLE SPECTRUM (UNALTERED)



Data File: >EF454::D2 Quant Output File: ^EF454::QT
Name: WILLOW GROVE
Misc: NELW 3,EA#2026,7002E5,WATER,5.0ML
Quant Time: 890501 13:26 Quant ID File: EVOA::BD
Injected at: 890501 12:45 Last Calibration: 890501 09:24

Compound No: 28
Compound Name: Bromoform
Scan Number: 449
Retention Time: 18.83 min.
Quant Ion: 173.0
Area: 5793
Concentration: 6.87 UG/L
q-value: 98

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIP BL

Lab Nam : EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix: (soil/water) WATER Lab Sample ID: EA # 2027

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: EF455

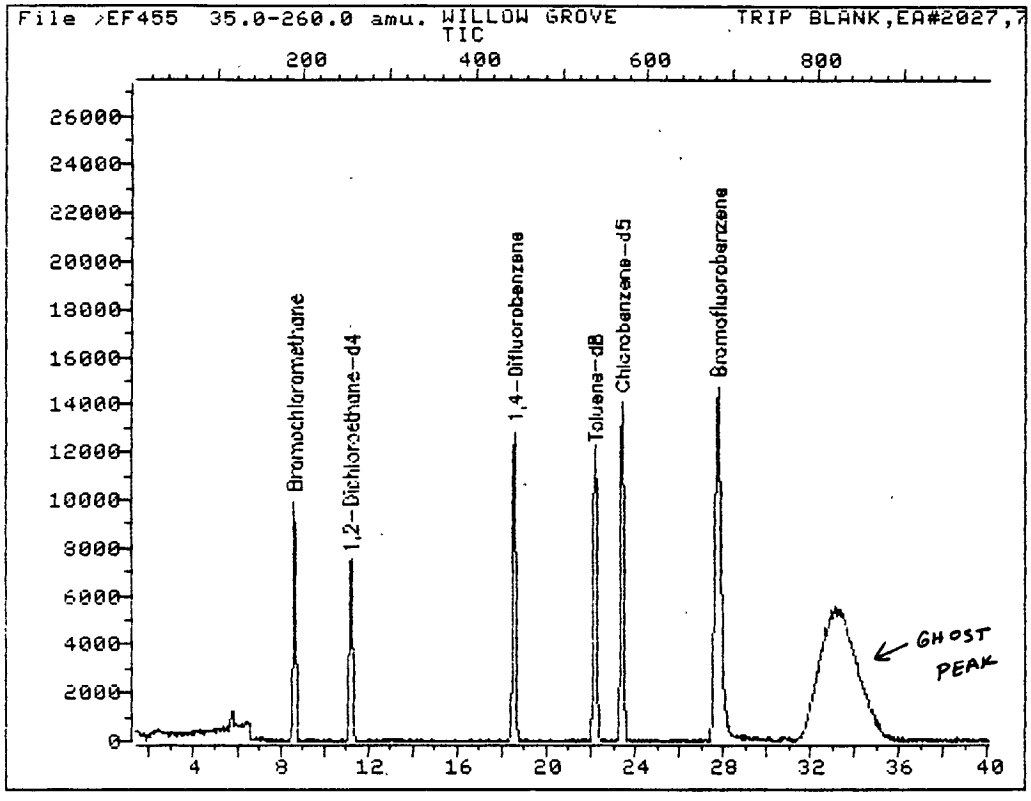
Level: (low/med) LOW Date Received: 4/27/89

% Moisture: not dec. 100. Date Analyzed: 5/ 1/89

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xyl n (total)	5.	U

TOTAL ION CHROMATOGRAM



Data File: >EF455::D2 Quant Output File: ^EF455::QT
Name: WILLOW GROVE
Misc: TRIP BLANK,EA#2027,7002E5,WATER,5.0ML

Id File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

Operator ID: CARL
Quant Time: 890501 14:12
Injected at: 890501 13:31

QUANT REPORT

Operator ID: CARL Quant Rev: 6 Quant Time: 890501 14:12
Output File: ^EF455::QT Injected at: 890501 13:31
Data File: >EF455::D2 Dilution Factor: 1.00000
Name: WILLOW GROVE
Misc: TRIP BLANK,EA#2027,7002E5,WATER,5.0ML

ID File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	8.64	128.0	12766	50.00	UG/L	96
13)	1,2-Dichloroethane-d4	11.20	65.0	32510M	55.43	UG/L	79
15)	*1,4-Difluorobenzene	18.57	114.0	48527	50.00	UG/L	90
29)	*Chlorobenzene-d5	23.41	117.0	43315	50.00	UG/L	94
35)	Toluene-d8	22.17	98.0	48820	53.10	UG/L	98
40)	Bromofluorobenzene	27.75	95.0	49367	54.14	UG/L	91

* Compound is ISTD

C. Standards Data

6A

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Nam : EAENG Contract: 68-01-7436

Lab Cod : EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Instrum nt ID: 7002E5 Calibration Date(s): 4/21/89 4/21/89

Matrix:(oil/water) WATER Level:(low/med): LOW Column:(pack/cap) PACK

Min $\overline{RRF}$ for SPCC(#) = .300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = EF375 RRF50 = EF376
RRF100= EF377 RRF150= EF378 RRF200= EF379

COMPOUND	RRF20	RRF50	RRF100	RRF150	RRF200	$\overline{RRF}$	% RSD
Chlorom thane #	.283	.556	.558	.593	.614	.521	25.9#
Bromomethane	.791	1.045	1.089	.943	.916	.957	12.2
Vinyl Chloride *	.603	.869	.918	.913	.778	.816	16.1*
Chloroethane	.437	.547	.581	.604	.609	.556	12.7
M thylen Chloride	1.262	1.417	1.379	1.240	1.288	1.317	5.9
Acetone	.084	.485	.458	.345	.367	.348	45.7
Carbon Disulfide	2.923	3.178	3.258	3.203	3.351	3.183	5.0
1,1-Dichloroethene *	.996	1.116	1.134	1.075	1.144	1.093	5.5*
1,1-Dichloroethane #	2.072	2.430	2.531	2.345	2.502	2.376	7.8#
1,2-Dichloroethene (total)	.963	1.220	1.289	1.237	1.276	1.197	11.2
Chloroform *	3.381	3.815	3.927	3.515	3.693	3.666	6.0*
1,2-Dichloroethane	2.579	3.335	3.407	3.112	3.158	3.118	10.4
2-Butanone	.045	.027	.031	.026	.027	.031	25.7
1,1,1-Trichloroethane	.792	1.063	1.011	.938	.928	.946	10.8
Carbon Tetrachloride	1.003	1.199	1.112	1.010	.999	1.065	8.3
Vinyl Acetate	.584	.614	.712	.608	.685	.640	8.6
Bromodichloromethane	.914	1.177	1.149	1.063	1.059	1.073	9.6
1,2-Dichloropropane *	.299	.356	.388	.331	.372	.349	10.0*
cis-1,3-Dichloropropene	.529	.704	.734	.650	.688	.661	12.1
Trichloroethene	.468	.504	.537	.457	.498	.493	6.4
Dibromochloromethane	.978	1.105	1.113	.977	1.000	1.035	6.6
1,1,2-Trichloroethane	.392	.417	.448	.373	.405	.407	6.9
B nz n	.640	.815	.844	.748	.796	.769	10.4
trans-1,3-Dichloropropene	.447	.572	.604	.540	.562	.545	10.9
Bromoform #	.842	1.002	1.046	.933	.960	.957	8.0#
4-M thyl-2-Pentanone	.411	.347	.389	.312	.359	.364	10.5
2-H xanone	.277	.239	.276	.211	.240	.249	11.2
T trachloroethene	.513	.576	.575	.498	.540	.541	6.5
1,1,2,2-Tetrachloroethane #	.620	.731	.755	.657	.696	.692	7.9#
Tolu n *	.520	.651	.659	.584	.606	.604	9.3*
Chlorob nzene #	.919	1.015	1.025	.885	.948	.958	6.3#
Ethylbenzene *	.333	.431	.455	.400	.419	.408	11.4*
Styren	.857	.982	1.024	.877	.939	.936	7.5
Xyl n (total)	.542	.625	.643	.553	.588	.590	7.4
Tolu n -d8	1.045	1.061	1.050	1.044	1.045	1.049	.7
Bromofluorobenzene	1.052	1.064	1.075	1.007	1.063	1.052	2.5
1,2-Dichloro thane-d4	2.400	2.632	2.761	2.765	2.879	2.687	6.8

7A
VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: EAENG Contract: 68-01-7436

Lab Cod : EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Instrument ID: 7002E5 Calibration Date: 5/ 1/89 Time: 8:09

Lab File ID: EF449 Init. Calib. Date(s): 4/21/89 4/21/89

Matrix:(soil/water) WATER Level:(low/med): LOW Column:(pack/cap) PACK

Min RRF50 for SPCC(#) = .300 (0.250 for Bromoform) Max %D for CCC(*) = 25.0%

COMPOUND	RRF	RRF50	%D
Chloromethane #	.521	.538	3.4 #
Bromomethane	.957	.783	18.2
Vinyl Chloride *	.816	.744	8.8 *
Chloroethane	.556	.473	14.9
Methylene Chloride	1.317	1.157	12.2
Acetone	.348	.916	163.2
Carbon Disulfide	3.183	2.605	18.2
1,1-Dichloroethene *	1.093	.973	11.0 *
1,1-Dichloroethane #	2.376	2.058	13.4 #
1,2-Dichloroethene (total)	1.197	1.077	10.1
Chloroform *	3.666	3.102	15.4 *
1,2-Dichloroethane	3.118	2.586	17.1
2-Butanone	.031	.060	91.4
1,1,1-Trichloroethane	.946	.765	19.2
Carbon Tetrachloride	1.065	.848	20.3
Vinyl Acetate	.640	.651	1.6
Bromodichloromethane	1.073	.917	14.5
1,2-Dichloropropane *	.349	.338	3.3 *
cis-1,3-Dichloropropene	.661	.619	6.3
Trichloroethene	.493	.466	5.4
Dibromochloromethane	1.035	.924	10.7
1,1,2-Trichloroethane	.407	.395	2.9
Benzene	.769	.723	6.0
trans-1,3-Dichloropropene	.545	.495	9.3
Bromoform #	.957	.890	6.9 #
4-Methyl-2-Pentanone	.364	.437	20.2
2-Hexanone	.249	.306	23.0
Tetrachloroethene	.541	.505	6.5
1,1,2,2-Tetrachloroethane #	.692	.682	1.4 #
Toluene *	.604	.568	5.9 *
Chlorobenzene #	.958	.885	7.7 #
Ethylbenzene *	.408	.364	10.6 *
Styrene	.936	.837	10.6
Xylene (total)	.590	.511	13.4
Toluene-d8	1.049	1.061	1.2
Bromofluorobenzene	1.052	1.053	.1
1,2-Dichloroethane-d4	2.687	2.297	14.5

8A
VOLATILE INTERNAL STANDARD AREA SUMMARY

Lab Name: EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Lab File ID (Standard): EF449 Date Analyzed: 5/ 1/89

Instrument ID: 7002E5 Time Analyzed: 8:09

Matrix:(soil/water) WATER Level:(low/med): LOW Column:(pack/cap) PACK

		IS1(BCM) AREA #	RT	IS2(DFB) AREA #	RT	IS3(CBZ) AREA #	RT
	12 HOUR STD	16545.	8.61	59092.	18.54	53935.	23.38
	UPPER LIMIT	33090.	9.11	118184.	19.04	107870.	23.88
	LOWER LIMIT	8273.	8.11	29546.	18.04	26968.	22.88
	EPA SAMPLE NO.						
1	VBLK3	15651.	8.66	55099.	18.54	52023.	23.42
2	NELW1+2	14225.	8.65	53786.	18.54	50155.	23.42
3	NELW1MS	11565.	8.62	43593.	18.54	42349.	23.38
4	NELW1MSD	12588.	8.62	48137.	18.55	46690.	23.39
5	NELW3	13155.	8.64	47324.	18.56	44570.	23.40
6	TRIP BL	12766.	8.64	48527.	18.57	43315.	23.41
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							
21							
22							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

UPPER LIMIT = + 100%
of internal standard area.
LOWER LIMIT = - 50%
of internal standard area.

Column used to flag internal standard area values with an asterisk

D. Raw QC Data

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

VBLK3

Lab Nam : EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix: (soil/water) WATER Lab Sample ID: METHOD BLANK

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: EF450

Level: (low/med) LOW Date Received: 0/ 0/ 0

% Moistur : not dec. 100. Date Analyzed: 5/ 1/89

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene	5.	U
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene	5.	U
124-48-1	Dibromochloromethane	5.	U
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene	5.	U
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	5.	U
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene	5.	U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylen (total)	5.	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

VBLK3

Lab Nam : EAENG Contract: 68-01-7436

Lab Cod : EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix: (soil/water) WATER Lab Sample ID: METHOD BLANK

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: EF450

Level: (low/med) LOW Date Received: 0/ 0/ 0

% Moisture: not dec. 100. Date Analyzed: 5/ 1/89

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	- -	UNKNOWN	2.42	6.	J
2.	- -	UNKNOWN	6.41	7.	J
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
15.					
16.					
17.					
18.					
19.					
20.					
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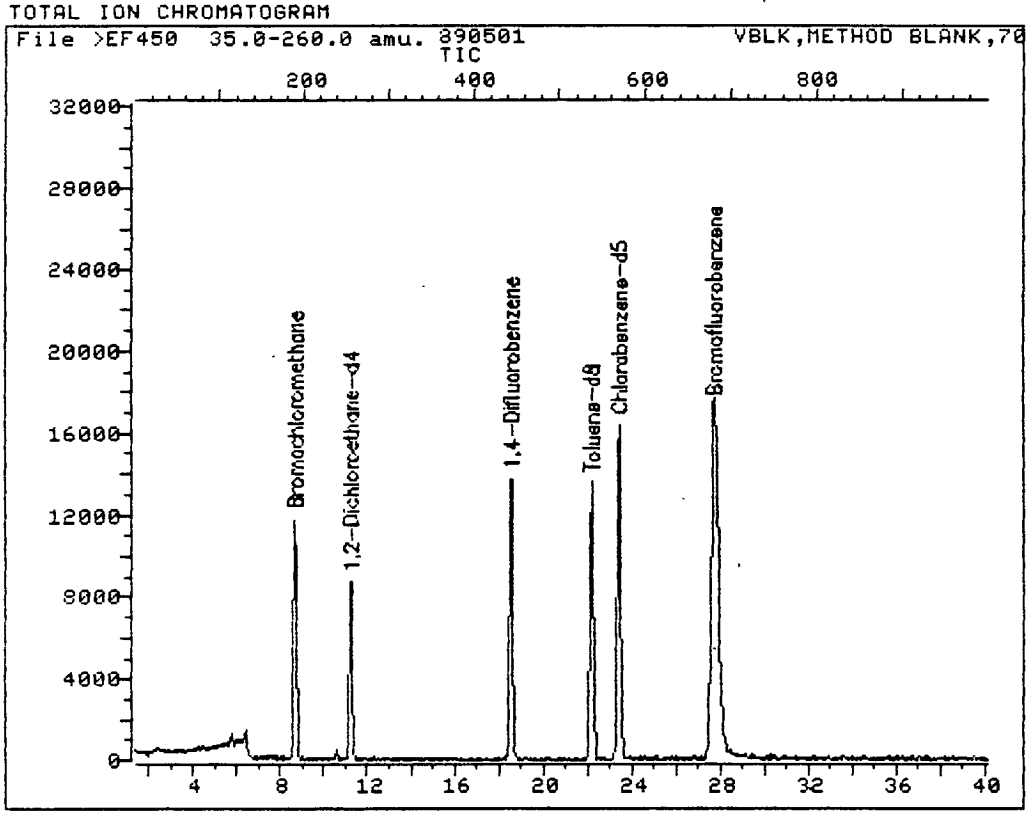
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

FORM I VOA-TIC 1/87 Rev.

TOTAL ION CHROMATOGRAM



Data File: >EF450::D2 Quant Output File: ^EF450::QT
Name: 890501
Misc: VBLK,METHOD BLANK,7002E5

Id File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

Operator ID: CARL
Quant Time: 890501 10:08
Injected at: 890501 09:27

QUANT REPORT

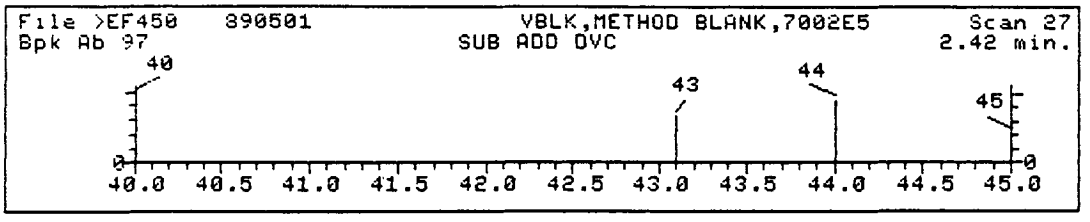
Operator ID: CARL
Output File: ^EF450::QT
Data File: >EF450::D2
Name: 890501
Misc: VBLK,METHOD BLANK,7002E5

Quant Rev: 6
Quant Time: 890501 10:08
Injected at: 890501 09:27
Dilution Factor: 1.00000

ID File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	8.66	128.0	15651	50.00	UG/L	97
13)	1,2-Dichloroethane-d4	11.22	65.0	36482	50.73	UG/L	84
15)	*1,4-Difluorobenzene	18.54	114.0	55099	50.00	UG/L	92
29)	*Chlorobenzene-d5	23.42	117.0	52023	50.00	UG/L	95
35)	Toluene-d8	22.18	98.0	54453	49.32	UG/L	98
40)	Bromofluorobenzene	27.69	95.0	55432	50.62	UG/L	90

* Compound is ISTD

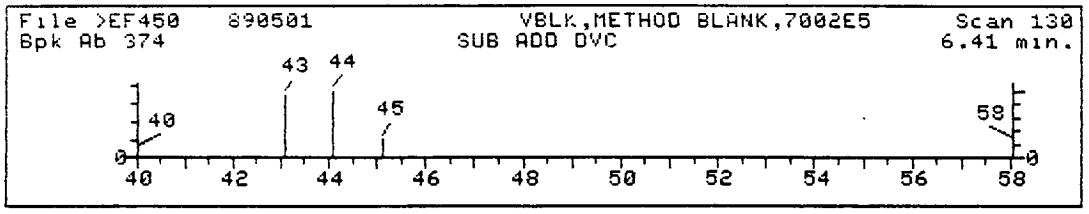


Retention time = 2.42 UNKNOWN

Area = 13083.00 Tentative Concentration is 6.00

Sample file: >EF450 Spectrum #: 27

No data base entries were retrieved.



Retention time = 6.41 UNKNOWN

Area = 14312.00 Tentative Concentration is 7.00

Sample file: >EF450 Spectrum #: 130

No data base entries were retrieved.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

NELW1MS

Lab Name: EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix: (soil/water) WATER Lab Sample ID: EA# 2025

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: EF452

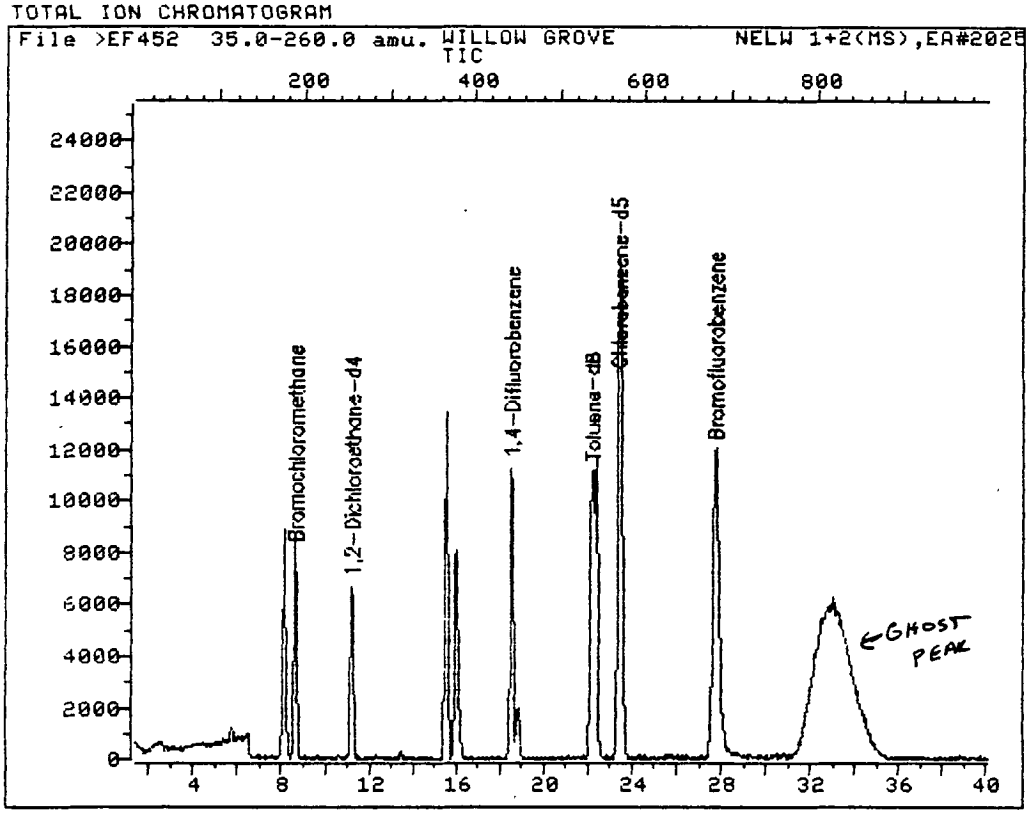
Level: (low/med) LOW Date Received: 4/27/89

% Moisture: not dec. 100. Date Analyzed: 5/ 1/89

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene		
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	5.	U
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene		
124-48-1	Dibromochloromethane	6.	
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene		
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	7.	
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xyl ne (total)	5.	U

TOTAL ION CHROMATOGRAM



Data File: >EF452::D2 Quant Output File: ^EF452::QT
Name: WILLOW GROVE
Misc: NELW 1+2(MS),EA#2025,7002E5,WATER,5.0ML

Id File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

Operator ID: CARL
Quant Time: 890501 11:55
Injected at: 890501 11:14

QUANT REPORT

Operator ID: CARL Quant Rev: 6 Quant Time: 890501 11:55
Output File: ^EF452::QT Injected at: 890501 11:14
Data File: >EF452::D2 Dilution Factor: 1.00000
Name: WILLOW GROVE
Misc: NELW 1+2(MS),EA#2025,7002E5,WATER,5.0ML

ID Fil : EVOA::BD
Titl : CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	8.62	128.0	11565	50.00	UG/L	96
9)	1,1-Dichloroethene	8.15	96.0	14499	64.43	UG/L	89
13)	1,2-Dichloroethane-d4	11.21	65.0	29807	56.09	UG/L	80
15)	*1,4-Difluorobenzene	18.54	114.0	43593	50.00	UG/L	92
23)	Trichloroethene	15.55	130.0	21685	53.35	UG/L	85
24)	Dibromochloromethane	16.17	129.0	4516	5.61	UG/L	94
26)	Benzene	16.02	78.0	33217	52.72	UG/L	89
28)	Bromoform	18.85	173.0	5735	7.39	UG/L	97
29)	*Chlorobenzene-d5	23.38	117.0	42349	50.00	UG/L	97
34)	Toluene	22.38	92.0	26259	54.55	UG/L	96
35)	Toluene-d8	22.18	98.0	43093	47.94	UG/L	98
36)	Chlorobenzene	23.50	112.0	39917	53.26	UG/L	94
40)	Bromofluorobenzene	27.72	95.0	40572	45.51	UG/L	88

* Compound is ISTD

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

NELW1MSD

Lab Nam : EAENG Contract: 68-01-7436

Lab Code: EAENG Case No.: WILLOW SAS No.: SDG No.: NF6S5

Matrix: (soil/water) WATER Lab Sample ID: EA# 2025

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: EF453

Level: (low/med) LOW Date Received: 4/27/89

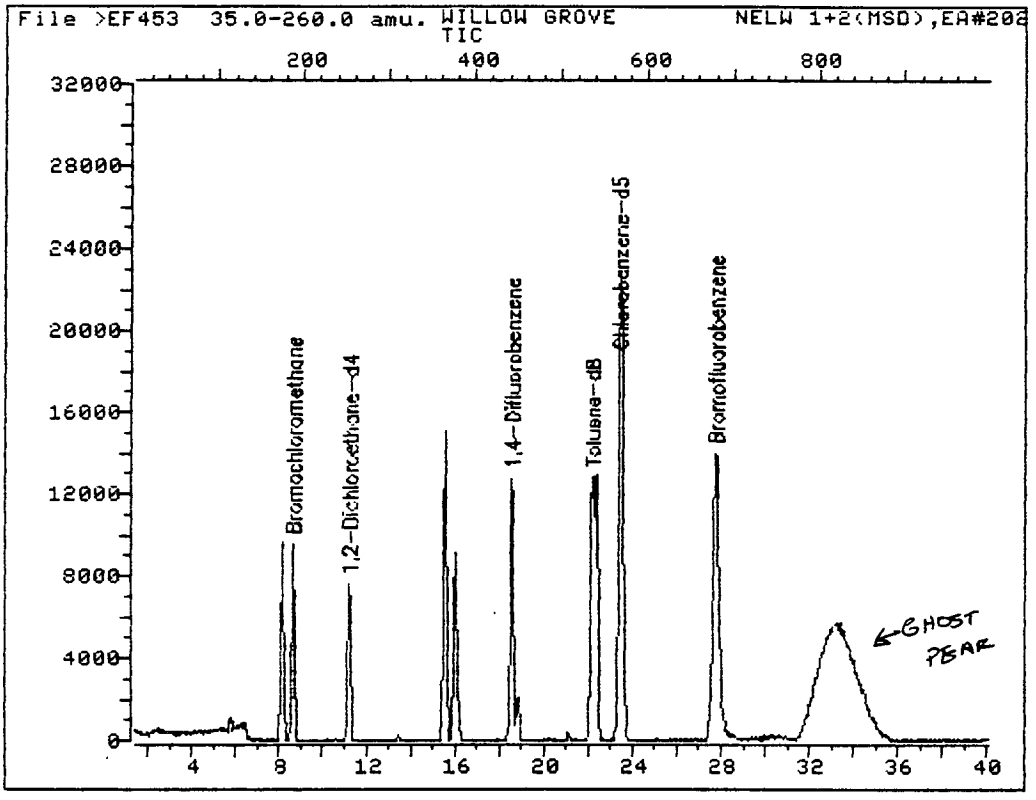
% Moisture: not dec. 100. Date Analyzed: 5/ 1/89

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U
74-83-9	Bromomethane	10.	U
75-01-4	Vinyl Chloride	10.	U
75-00-3	Chloroethane	10.	U
75-09-2	Methylene Chloride	5.	U
67-64-1	Acetone	10.	U
75-15-0	Carbon Disulfide	5.	U
75-35-4	1,1-Dichloroethene		
75-34-3	1,1-Dichloroethane	5.	U
540-59-0	1,2-Dichloroethene (total)	5.	U
67-66-3	Chloroform	5.	U
107-06-2	1,2-Dichloroethane	5.	U
78-93-3	2-Butanone	10.	U
71-55-6	1,1,1-Trichloroethane	5.	U
56-23-5	Carbon Tetrachloride	5.	U
108-05-4	Vinyl Acetate	10.	U
75-27-4	Bromodichloromethane	2.	J
78-87-5	1,2-Dichloropropane	5.	U
10061-01-5	cis-1,3-Dichloropropene	5.	U
79-01-6	Trichloroethene		
124-48-1	Dibromochloromethane	5.	J
79-00-5	1,1,2-Trichloroethane	5.	U
71-43-2	Benzene		
10061-02-6	trans-1,3-Dichloropropene	5.	U
75-25-2	Bromoform	7.	
108-10-1	4-Methyl-2-Pentanone	10.	U
591-78-6	2-Hexanone	10.	U
127-18-4	Tetrachloroethene	5.	U
79-34-5	1,1,2,2-Tetrachloroethane	5.	U
108-88-3	Toluene		
108-90-7	Chlorobenzene		
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xyl n (total)	5.	U

FORM I VOA 1/87 R v.

TOTAL ION CHROMATOGRAM



Data File: >EF453::D2 Quant Output File: ^EF453::QT
Name: WILLOW GROVE
Misc: NELW 1+2(MSD),EA#2025,7002E5,WATER,5.0ML

Id File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

Operator ID: CARL
Quant Time: 890501 12:40
Injected at: 890501 11:59

QUANT REPORT

Operator ID: CARL Quant Rev: 6 Quant Time: 890501 12:40
Output File: ^EF453::QT Injected at: 890501 11:59
Data File: >EF453::D2 Dilution Factor: 1.00000
Name: WILLOW GROVE
Misc: NELW 1+2(MSD),EA#2025,7002E5,WATER,5.0ML

ID File: EVOA::BD
Title: CLP protocol-5pt calibration, 7002E5
Last Calibration: 890501 09:24

	Compound	R.T.	Q ion	Area	Conc	Units	q
1)	*Bromochloromethane	8.62	128.0	12588	50.00	UG/L	97
9)	1,1-Dichloroethene	8.15	96.0	15330	62.58	UG/L	87
13)	1,2-Dichloroethane-d4	11.22	65.0	32012M	55.35	UG/L	78
15)	*1,4-Difluorobenzene	18.55	114.0	48137	50.00	UG/L	91
20)	Bromodichloromethane	13.46	83.0	1419	1.61	UG/L	97
23)	Trichloroethene	15.52	130.0	24862	55.39	UG/L	92
24)	Dibromochloromethane	16.18	129.0	4356	4.90	UG/L	98
26)	Benzene	15.99	78.0	36953	53.11	UG/L	90
28)	Bromoform	18.82	173.0	6154	7.18	UG/L	93
29)	*Chlorobenzene-d5	23.39	117.0	46690	50.00	UG/L	97
34)	Toluene	22.38	92.0	29569	55.72	UG/L	97
35)	Toluene-d8	22.19	98.0	49983	50.44	UG/L	98
36)	Chlorobenzene	23.51	112.0	46649	56.45	UG/L	92
40)	Bromofluorobenzene	27.73	95.0	48340	49.18	UG/L	94

* Compound is ISTD

E. Quality Assurance Summary

EA LABORATORIES

QUALITY ASSURANCE SUMMARY

FOR NAVAL ENERGY AND ENVIRONMENTAL SUPPORT ACTIVITY CONTRACTS

Project: Willow Grove Analysis: TCL volatiles

EA Laboratories Report No. 890281 Method: U.S. EPA-CLP

Reviewed by: [illegible] Date: 5-24-89

1. The 10-day holding time requirement from sample collection to analysis was met for all samples.
   ✓ Yes ____ No

2. The 12-hour tuning period for BFB was met for all samples.
   ✓ Yes ____ No

3. Initial calibration criteria were met for all samples: the RSD is ≤30% for all CCC compounds, and the RRF for SPCC compounds is >0.300 (0.250 for bromoform).
   ✓ Yes ____ No

4. Continuing calibration criteria were met for all samples: the response factor percent deviation from the mean initial calibration response factor for all CCC compounds was ≤25%, and the RRF for SPCC compounds is >0.300 (0.250 for bromoform).
   MMR 2Jun89 ✓ Yes ____ No

5. Surrogate recovery limits were met for all samples.
   ✓ Yes ____ No

6. MS and MSD criteria were met for all samples.
   ✓ Yes ✗ No MMR 2Jun89

7. Method blank criteria were met for all samples: common laboratory contaminants are ≤5X CRQL, all other compounds are <CRQL.
   MMR 2Jun89 ✓ Yes ____ No

(Revised 8 May 1989)