Rockwell ER Program
Rocky Flats Plant

(06/09/89)

ER PROGRAM DATA ASSESSMENT SUMMARY REPORT FORM

Batch No. E88-3369/4th Quarter 1988 **Site** Area 2 - 881 Hillside

Laboratory RFP 881 General Labs **No. of Samples/Matrix** 16/Water

SOW # 7/87 **Reviewer Org.** TechLaw

Sample Numbers 43-87, 52-87, 45-87, 70-86, 55-86, 55-86D, 69-86, 4-87, 9-74, 10-74, 3-81, 8-87, 1-87, 2-87, 62-86, 5-87.

Data Assessment Summary

		VOA	Comments
1.	Holding Times	V	Within 40 CFR 136 holding times.
2.	GC/MS Tune/Instr. Perf.	V	Some GC/MS tune data does not match summaries.
3.	Calibrations	A	Initial (2 TCL out 10/24, 4 TCL out 11/20) Continuing (2CCC out, %D 25 TCL out Total, 2-butanone<.05+J/-R).
4.	Blanks	A	Chloroform contamination, methylene chloride and toluene in 11/22/88 blank.
5.	Surrogates	A	43-87 (+(J)/non-detect (R)) 9-74 and 10-74X50 Dil (+J/non-detect UJ)
6.	Matrix Spike/Dup.	V	
7.	Other QC	A	Methylene chloride, acetone, 2-butanone, trichloroethene contamination in trip and field blank.
8.	Internal Standards	V	
9.	Compound Identification	V	
10.	System Performance	A	1) Chloroform, Methylene chloride, Toluene blank contamination. 2) Surr. out (43-87, 9-74, 10-74X50). 3) Calib. %D, 25 TCL out.
11.	Overall Assessment	A	Date acceptable, with qualifications.

V = Data had no problems.
A = Data acceptable but qualified due to problems.
R = Data rejected.
X = Problems, but do not affect data.

Data Quality: Data contained in this batch were reviewed and found to be acceptable with qualifications. Acceptable, qualified data may be used provided that individual values impacted by the "Action Items'" listed below are appropriately flagged. (Refer to attached Results Summary Table).

ADMIN RECORD

"REVIEWED FOR CLASSIFICATION
By R. B. Hoffman
Date 7-11-90

REVIEWED FOR CLASSIFICATION/UCNI
By George H. Sotlock
Date @ 6/27/90

Action Items: 1) Initial Calibration: Chloromethane values for 55-86, 55-86D, 69-86, 4-87, 9-74, 9-74X50 Dilution, 10-74, 10-74X50 Dilution, 3-87, 8-87, 1-87, and associated Trip and Field Blanks are estimated and undetected (UJ) because the percent relative standard deviation values (RSD) were excessively high. Chloromethane and Chloroethane non-detect values for 2-87, 62-86, 5-87, and associated Trip and Field Blanks are rejected because the percent RSD was >50%.

2) Continuing Calibration: Chloromethane and Chloroethane non-detect values for 43-87, 43-87X100 Dilution, 52-87, 45-87, 70-86, and associated Trip and Field Blanks are rejected (R) because the % difference between the initial and continuing calibration was >50%. Chloroethane non-detect values for samples 55-86, 55-86D, 69-86, 4-87, 9-74, 10-74, 3-87, 8-87, 2-87, 62-86, 5-87, and associated Trip and Field Blanks are rejected (R) because the % difference between the initial and continuing calibrations was >50%. Non-detect values for Bromomethane, 4-Methyl-2-Pentanone, and Ethylbenzene are estimated and undetected (UJ) for samples 2-87, 62-86, 5-87 and associated Trip and Field Blanks (all run on 11/22/88), because the % difference between initial and continuing calibration was >25%. The positive Tetrachloroethene value for sample 62-86 is estimated because the % difference between the initial and continuing calibration was >25%. CCC (Vinyl Chloride) % difference value was >25% for the continuing calibration run on 10/25/88. CCC (Ethylbenzene) % difference value was >25% for the continuing calibration run on 11/22/88.

3) Blanks: Chloroform was found in all reagent blanks. As a result, all positive values were estimated and undetected (UJ). Methylene Chloride and Toluene was found in the reagent blank run on 11/22/88. All positive values for methylene chloride and toluene are estimated and undetected (UJ).

4) Surrogates: Surrogate recovery was >10% but less than the lower recovery criteria for samples 9-74 and 10-74X50 Dilution. All positive values are estimated (J) and all non-detects are estimated and undetected (UJ). Surrogate recovery was <10% for sample 43-87. All positive values are estimated (J) and all non-detects are rejected (R).

5) Other QC: Trichloroethene contamination at 4ug/l found in the Field Blank for samples collected 10/24/88. Positive Trichloroethane value for sample 3-87 is estimated (J) because of possible cross-contamination or analytical carry-over from previous samples. Subsequent reanalysis of 3-87 showed the Trichloroethene value is a non-detect.

Comments: All values below method detection limits will be estimated (J) and quantified as acceptable until the quantitation limits are supplied. Samples that do not meet surrogate recovery criteria must be reanalyzed. Chloroform contamination was found in the Reagent Blanks.

Note: Data Summary Tables are attached.

Robert J. Thiel Jr.
Reviewer Signature

06/09/89
Date

TABLE #: 1-E88-3369 **Page** 1 **of** 5

SITE NAME: Area 2 4th Quarter - 881 Hillside

SAMPLING DATE: 10/17/88, 10/19/88, 10/24/88, 11/14/88

CLP VOLATILE ORGANIC ANALYSIS: Low Water **ANALYTICAL RESULTS (ppb)**

Sample Location		Rgnt B	Trip Blank		Field Blank		43-87		43-87		45-87		70-86		52-87	
Sample Number									X100							
Sampling Date			10/17/88		10/17/88		10/17/88		10/17/88		10/17/88		10/17/88		10/17/88	
Remarks																
Volatile Organic Compound	Detection Limit (ppb)	(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)
Chloromethane	10		10 U	R	10 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R
Bromomethane	10		10 U	V	10 U	V	10 U	R	1000 U	V	10 U	V	10 U	V	10 U	V
Vinyl Chloride	10		10 U	V	10 U	V	10 U	R	1000 U	V	10 U	V	10 U	V	10 U	V
Chloroethane	10		10 U	R	10 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R
Methylene Chloride	5		3 J	A	2 J	A	31 J	A	500 U	V	5 U	V	5 U	V	5 U	V
Acetone	10		3 J	A	2 J	A	10 U	R	1000 U	V	10 U	V	10 U	V	10 U	V
Carbon Disulfide	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
1,1-Dichloroethene	5		5 U	V	5 U	V	17000 E	A	11000	V	5 U	V	5 U	V	5 U	V
1,1-Dichloroethane	5		5 U	V	5 U	V	350 E	A	500 U	V	5 U	V	5 U	V	5 U	V
1,2-Dichloroethene (Total)	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Chloroform	5	9 ppb	5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
1,2-Dichloroethane	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
2-Butanone	10		3 J	A	2 J	A	10 U	R	1000 U	V	10 U	V	10 U	V	10 U	V
1,1,1-Trichloroethane	5		5 U	V	5 U	V	5800 E	A	25000 E	A	5 U	V	5 U	V	5 U	V
Carbon Tetrachloride	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Vinyl Acetate	10		10 U	V	10 U	V	10 U	R	1000 U	V	10 U	V	10 U	V	10 U	V
Bromodichloromethane	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
1,2-Dichloropropane	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
cis-1,3 Dichloropropene	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Trichloroethene	5		5 U	V	5 U	V	5300 E	A	17000	V	5 U	V	5 U	V	2 J	A
Dibromochloromethane	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
1,1,2-Trichloroethane	5		5 U	V	5 U	V	83 J	A	500 U	V	5 U	V	5 U	V	5 U	V
Benzene	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Trans-1,3-Dichloropropene	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Bromoform	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
4-Methyl-2-pentanone	10		10 U	V	10 U	V	10 U	R	1000 U	V	10 U	V	10 U	V	10 U	V
2-Hexanone	10		10 U	V	10 U	V	10 U	R	1000 U	V	10 U	V	10 U	V	10 U	V
Tetrachloroethene	5		5 U	V	5 U	V	2500 E	A	8100	V	5 U	V	5 U	V	2 J	A
1,1,2,2-Tetrachloroethane	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Toluene	5		5 U	V	5 U	V	180 J	A	500 U	V	5 U	V	5 U	V	5 U	V
Chlorobenzene	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Ethylbenzene	5		5 U	V	5 U	V	4 J	A	500 U	V	5 U	V	5 U	V	5 U	V
Styrene	5		5 U	V	5 U	V	5 U	R	500 U	V	5 U	V	5 U	V	5 U	V
Xylene (Total)	5		5 U	V	5 U	V	5 U	R.	500 U	V	5 U	V	5 U	V	5 U	V
Total volatile organic concentration (ppb)		9	9		6		31248		61100		0		0		4	

U Indicates the compound was not detected above the Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review (data validation).
* Value is rejected due to other contractual criteria examined during the quality control review (data validation).
** Value is rejected due to blank contamination identified during the quality control review (data validation).
ppb Parts per billion.

DQ Data Qualifier
V Valid
A Acceptable with qualifications
R Rejected, data unusable
E Exceeds calib. range; diluted & reanalyzed

Form V-1

TABLE #: 1-E88-3369 Page 2 of 5

SITE NAME: Area 2 4th Quarter - 881 Hillside

SAMPLING DATE: 10/17/88, 10/19/88, 10/24/88, 11/14/88

CLP VOLATILE ORGANIC ANALYSIS: Low Water ANALYTICAL RESULTS (ppb)

Sample Location		Rgnt B	Trip Blank		Field Blank		55-86		55-86D		69-86		4-87		Rgnt B
Sample Number															
Sampling Date			10/19/88		10/19/88		10/19/88		10/19/88		10/19/88		10/19/88		
Remarks															
Volatile Organic Compound	Detection Limit (ppb)			(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)	
Chloromethane	10		10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A	
Bromomethane	10		10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	
Vinyl Chloride	10		10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	
Chloroethane	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	
Methylene Chloride	5		3 J	A	3 J	A	5 U	V	5 U	V	5 U	V	5 U	V	
Acetone	10		10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	
Carbon Disulfide	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
1,1-Dichloroethene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
1,1-Dichloroethane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
1,2-Dichloroethene (Total)	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Chloroform	5	11ppb	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	9 ppb
1,2-Dichloroethane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
2-Butanone	10		10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	
1,1,1-Trichloroethane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Carbon Tetrachloride	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Vinyl Acetate	10		10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	
Bromodichloromethane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
1,2-Dichloropropane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
cis-1,3 Dichloropropene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Trichloroethene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	56	V	
Dibromochloromethane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
1,1,2-Trichloroethane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Benzene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Trans-1,3-Dichloropropene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Bromoform	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
4-Methyl-2-pentanone	10		10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	
2-Hexanone	10		10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V	
Tetrachloroethene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	3 J	A	
1,1,2,2-Tetrachloroethane	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Toluene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Chlorobenzene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Ethylbenzene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Styrene	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Xylene (Total)	5		5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V	
Total volatile organic concentration (ppb)		11	3		3		0		0		0		59		9

U Indicates the compound was not detected above the Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review (data validation).
* Value is rejected due to other contractual criteria examined during the quality control review (data validation).
** Value is rejected due to blank contamination identified during the quality control review (data validation).
ppb Parts per billion.

DQ Data Qualifier
V Valid
A Acceptable with qualifications
R Rejected, data unusable
E Exceeds calib. range; diluted & reanalyzed

Form V-1

TABLE #: 1-E88-3369 Page 3 of 5
SITE NAME: Area 2 4th Quarter - 881 Hillside
SAMPLING DATE: 10/17/88, 10/19/88, 10/24/88, 11/14/88
CLP VOLATILE ORGANIC ANALYSIS: Low Water ANALYTICAL RESULTS (ppb)

Sample Location		Trip Blank		Field Blank		9-74		10-74		3-87		8-87		Trip Blank		Field Blank	
Sample Number																	
Sampling Date		10/24/88		10/24/88		10/24/88		10/24/88		10/24/88		10/24/88		10/24/88		10/24/88	
Remarks																	
Volatile Organic Compound	Detection Limit (ppb)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)
Chloromethane	10	10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A	10 UJ	A
Bromomethane	10	10 U	V	10 U	V	10 UJ	A	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V
Vinyl Chloride	10	10 U	V	10 U	V	10 UJ	A	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V
Chloroethane	10	10 U	R	10 U	R	10 UJ	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Methylene Chloride	5	23	V	4 J	A	13 J	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Acetone	10	10 U	V	10 U	V	10 UJ	A	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V
Carbon Disulfide	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
1,1-Dichloroethene	5	5 U	V	5 U	V	4600 E	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
1,1-Dichloroethane	5	5 U	V	5 U	V	23 J	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
1,2-Dichloroethene (Total)	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Chloroform	5	5 U	V	5 U	V	5 UJ	A	30 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V
1,2-Dichloroethane	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
2-Butanone	10	10	V	10 U	V	10 UJ	A	10 U	V	10 U	V	10 U	V	10 U	V	4 J	A
1,1,1-Trichloroethane	5	5 U	V	5 U	V	6900 E	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Carbon Tetrachloride	5	5 U	V	5 U	V	5 UJ	A	2500 E	A	5 U	V	5 U	V	5 U	V	5 U	V
Vinyl Acetate	10	10 U	V	10 U	V	10 UJ	A	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V
Bromodichloromethane	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
1,2-Dichloropropane	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
cis-1,3 Dichloropropene	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Trichloroethene	5	5 U	V	5 U	V	5500 E	A	1300 E	A	6	V	5 U	V	5 U	V	4 J	A
Dibromochloromethane	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
1,1,2-Trichloroethane	5	5 U	V	5 U	V	73 J	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Benzene	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Trans-1,3-Dichloropropene	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Bromoform	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
4-Methyl-2-pentanone	10	10 U	V	10 U	V	10 UJ	A	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V
2-Hexanone	10	10 U	V	10 U	V	10 UJ	A	10 U	V	10 U	V	10 U	V	10 U	V	10 U	V
Tetrachloroethene	5	5 U	V	5 U	V	3800 E	A	5 U	V	5 J	A	5 U	V	5 U	V	5 U	V
1,1,2,2-Tetrachloroethane	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Toluene	5	5 U	V	5 U	V	2 J	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Chlorobenzene	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Ethylbenzene	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Styrene	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Xylene (Total)	5	5 U	V	5 U	V	5 UJ	A	5 U	V	5 U	V	5 U	V	5 U	V	5 U	V
Total volatile organic concentration (ppb)		33		4		20911		3800		11		0		0		8	

U Indicates the compound was not detected above the Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review (data validation).
* Value is rejected due to other contractual criteria examined during the quality control review (data validation).
** Value is rejected due to blank contamination identified during the quality control review (data validation).
ppb Parts per billion.

DQ Data Qualifier
V Valid
A Acceptable with qualifications
R Rejected, data unusable
E Exceeds calib. range; diluted & reanalyzed

Form V-1

TABLE #: 1-E88-3369 Page 4 of 5
SITE NAME: Area 2 4th Quarter - 881 Hillside
SAMPLING DATE: 10/17/88, 10/19/88, 10/24/88, 11/14/88
CLP VOLATILE ORGANIC ANALYSIS: Low Water ANALYTICAL RESULTS (ppb)

Sample Location		1-87		Rgnt B	9-74		10-74		3-87		Rgnt B	2-87		62-86	
Sample Number					X50		X50		Rerun						
Sampling Date		10/24/88			10/24/88		10/24/88		10/24/88			11/14/88		11/14/88	
Remarks															
Volatile Organic Compound	Detection Limit (ppb)		(DQ)			(DQ)		(DQ)		(DQ)			(DQ)		(DQ)
Chloromethane	10	10 UJ	A		500 UJ	A	500 UJ	A	10 UJ	A		10 U	R	10 U	R
Bromomethane	10	10 U	V		500 U	V	500 UJ	A	10 U	V		10 UJ	A	10 UJ	A
Vinyl Chloride	10	10 U	V		500 U	V	500 UJ	A	10 U	V		10 U	V	10 U	V
Chloroethane	10	10 U	R		500 UJ	A	500 UJ	A	10 UJ	A		10 U	R	10 U	R
Methylene Chloride	5	5 U	V		250 U	V	250 UJ	A	5 U	V	5 ppb	5 UJ	A	5 UJ	A
Acetone	10	10 U	V		500 U	V	500 UJ	A	10 U	V		10 U	V	10 U	V
Carbon Disulfide	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
1,1-Dichloroethene	5	5 U	V		4800	V	250 UJ	A	5 U	V		5 U	V	5 U	V
1,1-Dichloroethane	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
1,2-Dichloroethene (Total)	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Chloroform	5	5 U	V	12 ppb	460 UJ	A	250 UJ	A	5 U	V	11 ppb	5 UJ	A	5 UJ	A
1,2-Dichloroethane	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
2-Butanone	10	10 U	V		500 U	V	500 UJ	A	10 U	V		10 U	R	10 U	R
1,1,1-Trichloroethane	5	5 U	V		8200	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Carbon Tetrachloride	5	5 U	V		250 U	V	1600 J	A	5 U	V		5 U	V	5 U	V
Vinyl Acetate	10	10 U	V		500 U	V	500 UJ	A	10 U	V		10 U	V	10 U	V
Bromodichloromethane	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
1,2-Dichloropropane	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
cis-1,3 Dichloropropene	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Trichloroethene	5	5 U	V		9500	V	600 J	A	5 U	V		5 U	V	5 U	V
Dibromochloromethane	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
1,1,2-Trichloroethane	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Benzene	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Trans-1,3-Dichloropropene	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Bromoform	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
4-Methyl-2-pentanone	10	10 U	V		500 U	V	500 UJ	A	10 U	V		10 UJ	A	10 UJ	A
2-Hexanone	10	10 U	V		500 U	V	500 UJ	A	10 U	V		10 U	V	10 U	V
Tetrachloroethene	5	5 U	V		2500	V	250 UJ	A	5 U	V		5 U	V	29 J	A
1,1,2,2-Tetrachloroethane	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Toluene	5	5 U	V		250 U	V	250 UJ	A	5 U	V	6 ppb	5 UJ	A	5 UJ	A
Chlorobenzene	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Ethylbenzene	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 UJ	A	5 UJ	A
Styrene	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Xylene (Total)	5	5 U	V		250 U	V	250 UJ	A	5 U	V		5 U	V	5 U	V
Total volatile organic concentration (ppb)		0		12	25000		2200		0		22	0		29	

U Indicates the compound was not detected above the Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review (data validation).
* Value is rejected due to other contractual criteria examined during the quality control review (data validation).
** Value is rejected due to blank contamination identified during the quality control review (data validation).
ppb Parts per billion.

DQ Data Qualifier
V Valid
A Acceptable with qualifications
R Rejected, data unusable
E Exceeds calib. range; diluted & reanalyzed

Form V-1

TABLE #: 1-E88-3369 Page 5 of 5
SITE NAME: Area 2 4th Quarter - 881 Hillside
SAMPLING DATE: 10/17/88, 10/19/88, 10/24/88, 11/14/88
CLP VOLATILE ORGANIC ANALYSIS: Low Water ANALYTICAL RESULTS (ppb)

Sample Location		5-87		Trip Blank		Field Blank							
Sample Number													
Sampling Date		11/14/88		11/14/88		11/14/88							
Remarks													
Volatile Organic Compound	Detection Limit (ppb)		(DQ)		(DQ)		(DQ)						
Chloromethane	10	10 U	R	10 U	R	10 U	R						
Bromomethane	10	10 UJ	A	10 UJ	A	10 UJ	A						
Vinyl Chloride	10	10 U	V	10 U	V	10 U	V						
Chloroethane	10	10 U	R	10 U	R	10 U	R						
Methylene Chloride	5	5 UJ	A	9 UJ	A	7 UJ	A						
Acetone	10	10 U	V	10 U	V	10 U	V						
Carbon Disulfide	5	5 U	V	5 U	V	5 U	V						
1,1-Dichloroethene	5	5 U	V	5 U	V	5 U	V						
1,1-Dichloroethane	5	5 U	V	5 U	V	5 U	V						
1,2-Dichloroethene (Total)	5	5 U	V	5 U	V	5 U	V						
Chloroform	5	5 UJ	A	5 UJ	A	5 UJ	A						
1,2-Dichloroethane	5	5 U	V	5 U	V	5 U	V						
2-Butanone	10	10 U	R	13 J	A	10 U	R						
1,1,1-Trichloroethane	5	5 U	V	5 U	V	5 U	V						
Carbon Tetrachloride	5	5 U	V	5 U	V	5 U	V						
Vinyl Acetate	10	10 U	V	10 U	V	10 U	V						
Bromodichloromethane	5	5 U	V	5 U	V	5 U	V						
1,2-Dichloropropane	5	5 U	V	5 U	V	5 U	V						
cis-1,3 Dichloropropene	5	5 U	V	5 U	V	5 U	V						
Trichloroethene	5	5 U	V	5 U	V	5 U	V						
Dibromochloromethane	5	5 U	V	5 U	V	5 U	V						
1,1,2-Trichloroethane	5	5 U	V	5 U	V	5 U	V						
Benzene	5	5 U	V	5 U	V	5 U	V						
Trans-1,3-Dichloropropene	5	5 U	V	5 U	V	5 U	V						
Bromoform	5	5 U	V	5 U	V	5 U	V						
4-Methyl-2-pentanone	10	10 UJ	A	10 UJ	A	10 UJ	A						
2-Hexanone	10	10 U	V	10 U	V	10 U	V						
Tetrachloroethene	5	5 U	V	5 U	V	5 U	V						
1,1,2,2-Tetrachloroethane	5	5 U	V	5 U	V	5 U	V						
Toluene	5	6 UJ	A	5 U	V	5 U	V						
Chlorobenzene	5	5 U	V	5 U	V	5 U	V						
Ethylbenzene	5	5 UJ	A	5 UJ	A	5 UJ	A						
Styrene	5	5 U	V	5 U	V	5 U	V						
Xylene (Total)	5	5 U	V	5 U	V	5 U	V						
Total volatile organic concentration (ppb)		0		13		0		0	0	0	0	0	0

U Indicates the compound was not detected above the Required Quantitation Limit.
J Quantitation is approximate due to limitations identified during the quality control review (data validation).
* Value is rejected due to other contractual criteria examined during the quality control review (data validation).
** Value is rejected due to blank contamination identified during the quality control review (data validation).
ppb Parts per billion.

DQ Data Qualifier
V Valid
A Acceptable with qualifications
R Rejected, data unusable
E Exceeds calib. range; diluted & reanalyzed

Form V-1

SOP WORK SHEETS FOR VOLATILES

HOLDING TIMES

SAMPLE NO. *	PRESERVED YES	PRESERVED NO	CONC. LEVEL / MATRIX	DATE SAMPLED	DATE RECEIVED	DATE ANALYZED	TIME ANALYZED	INSTRUMENT I.D.	CONTRACT HOLDING TIME MET YES	CONTRACT HOLDING TIME MET NO	40 CFR 136 HOLDING TIME MET YES	40 CFR 136 HOLDING TIME MET NO	ACTION
Trip Bl		X	low	10/17/88	10/17/88	10/25/88	13:55	EXTR 1		X		X	+5 (-5) none
Field Bl							14:30						~~+8~~
43-87							15:17						-5
52-87							15:33						
45-87							16:28						
70-86							17:05						
70-86							17:39						
70-86 MS							18:14						
70-86 MSD							18:51						
43-87						10/26/88	1300						
Trip Blank				10/19/88	10/19/88		13:46		X		X		none
Field Blank							14:13						
55-86							14:49						
55-86 D							15:24						
69-86							16:00						
4-87							16:34						
4-87							17:09						
4-87 MS							17:45						
4-87 MSD							18:20						
~~Trip Blank~~													
~~Field Blank~~													
~~9-74~~													
10-74													

1 day over within CFR 10day Time

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

SOP WORK SHEETS FOR VOLATILES

HOLDING TIMES

SAMPLE NO. *	PRESERVED YES	PRESERVED NO	CONC. LEVEL / MATRIX	DATE SAMPLED	DATE RECEIVED	DATE ANALYZED	TIME ANALYZED	INSTRUMENT I.D.	CONTRACT HOLDING TIME MET YES	CONTRACT HOLDING TIME MET NO	40 CFR.136 HOLDING TIME MET YES	40 CFR.136 HOLDING TIME MET NO	ACTION
Trip Bl		X	Low	10/24/88	10/24/89	10/3/88	19:24	ExTR1	X		X		none
Field Bl		↓	↓	↓	↓	↓	19:50	↓	↓		↓		↓
9-74		↓	↓	↓	↓	↓	19:58	↓	↓		↓		↓
10-74		↓	↓	↓	↓	↓	20:33	↓	↓		↓		↓
3-87		↓	↓	↓	↓	↓	21:08	↓	↓		↓		↓
8-87		↓	↓	↓	↓	↓	21:42	↓	↓		↓		↓
Trip Bl		↓	↓	↓	↓	↓	22:16	↓	↓		↓		↓
Field Bl		↓	↓	↓	↓	↓	22:50	↓	↓		↓		↓
1-87		↓	↓	↓	↓	↓	23:24	↓	↓		↓		↓
2-87		↓	↓	11/14/88	11/22/88	11/22/88	17:22	↓	↓	X	↓	X	~~none~~ - 1 Day over +5
62-86		↓	↓	↓	↓	↓	17:57	↓	↓	↓	↓	↓	↓
5-87		↓	↓	↓	↓	↓	18:32	↓	↓	↓	↓	↓	↓
Trip Bl		↓	↓	↓	↓	↓	19:07	↓	↓	↓	↓	↓	↓
Field Bl		↓	↓	↓	↓	↓	19:42	↓	↓	↓	↓	↓	↓
9-74		X	X	10/24/88	10/24/88	11/2/88	~~14:57~~ 13:49	ExTR1		X		X	~~none~~ *
10-74		↓	↓	↓	↓	↓	~~15:48~~ 14:19	↓		↓		↓	
3-87		↓	↓	↓	↓	↓	14:57	↓		↓		↓	

* sample was high level Reform.

* hand dilut

Positive J

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

TRIP BLA

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT25A01

Level: (low/med) LOW Date Received: 10/17/88

% Moisture: not dec. 100. Date Analyzed: 10/25/88

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

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

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

FIELD BL

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT25A02

Level: (low/med) LOW Date Received: 10/17/88

% Moisture: not dec. 100. Date Analyzed: 10/25/88

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10.	U ~~J~~ ~~OSR~~ R
74-83-9	Bromomethane	10.	U ~~J~~ V
75-01-4	Vinyl Chloride	10.	U ~~J~~ ~~OSR~~ V
75-00-3	Chloroethane	10.	U ~~J~~ R R
75-09-2	Methylene Chloride	2.	J A
67-64-1	Acetone	~~10~~ 2 NS	~~U~~ J A
75-15-0	Carbon Disulfide	5.	U ~~J~~ V
75-35-4	1,1-Dichloroethene	5.	U ~~J~~ V
75-34-3	1,1-Dichloroethane	5.	U ~~J~~ V
540-59-0	1,2-Dichloroethene (total)	5.	U ~~J~~ V
67-66-3	Chloroform	5.	U ~~J~~ V
107-06-2	1,2-Dichloroethane	5.	U ~~J~~ V
78-93-3	2-Butanone	~~10~~ 2 NS	~~U~~ J A
71-55-6	1,1,1-Trichloroethane	5.	U ~~J~~ V
56-23-5	Carbon Tetrachloride	5.	U ~~J~~ V
108-05-4	Vinyl Acetate	10.	U ~~J~~ V
75-27-4	Bromodichloromethane	5.	U ~~J~~ V
78-87-5	1,2-Dichloropropane	5.	U ~~J~~ V
10061-01-5	cis-1,3-Dichloropropene	5.	U ~~J~~ V
79-01-6	Trichloroethene	5.	U ~~J~~ V
124-48-1	Dibromochloromethane	5.	U ~~J~~ V
79-00-5	1,1,2-Trichloroethane	5.	U ~~J~~ V
71-43-2	Benzene	5.	U ~~J~~ V
10061-02-6	trans-1,3-Dichloropropene	5.	U ~~J~~ V
75-25-2	Bromoform	5.	U ~~J~~ V
108-10-1	4-Methyl-2-Pentanone	10.	U ~~J~~ V
591-78-6	2-Hexanone	10.	U V
127-18-4	Tetrachloroethene	5.	U V
79-34-5	1,1,2,2-Tetrachloroethane	5.	U V
108-88-3	Toluene	~~0.85~~	~~B~~ ~~J~~ U V
108-90-7	Chlorobenzene	5.	U V
100-41-4	Ethylbenzene	5.	U V
100-42-5	Styrene	5.	U V
1330-20-7	Xylenes (total)	5.	U V

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

43-S7

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT25A03

Level: (low/med) LOW Date Received: 10/17/88

% Moisture: not dec. 100. Date Analyzed: 10/25/88 Surrogate <10%

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10.	U ~~UJ~~ R	R
74-83-9	Bromomethane	10.	U R	R
75-01-4	Vinyl Chloride	10.	U ~~UJ~~ R	R
75-00-3	Chloroethane	10.	U R	R
75-09-2	Methylene Chloride	31.	J	A
67-64-1	Acetone	5.	~~UJ~~ ~~UJ~~	R
75-15-0	Carbon Disulfide	5.	U R	R
75-35-4	1,1-Dichloroethene	17000.	EJ	J
75-34-3	1,1-Dichloroethane	350.	EJ	J
540-59-0	1,2-Dichloroethene (total)	~~830.~~ 5 NS	U ~~E~~ R	R — carryover
67-66-3	Chloroform	~~3.~~ 5	BJ ~~UJ~~ R	R
107-06-2	1,2-Dichloroethane	5.	U R	R
78-93-3	2-Butanone	10.	U R	R
71-55-6	1,1,1-Trichloroethane	5800.	EJ	A
56-23-5	Carbon Tetrachloride	~~310.~~ 5 NS	U ~~EJ~~ R	R
108-05-4	Vinyl Acetate	10.	U R	R
75-27-4	Bromodichloromethane	5.	U R	R
78-87-5	1,2-Dichloropropane	5.	U R	R
10061-01-5	cis-1,3-Dichloropropene	5.	U R	R
79-01-6	Trichloroethene	5300.	EJ	A
124-48-1	Dibromochloromethane	5.	U R	R
79-00-5	1,1,2-Trichloroethane	83.	J	A
71-43-2	Benzene	5.	U R	R
10061-02-6	trans-1,3-Dichloropropene	5.	U R	R
75-25-2	Bromoform	5.	U R	R
108-10-1	4-Methyl-2-Pentanone	10.	U R	R
591-78-6	2-Hexanone	10.	U R	R
127-18-4	Tetrachloroethene	2500.	EJ	A
79-34-5	1,1,2,2-Tetrachloroethane	5.	U R	R
108-88-3	Toluene	180.	BJ	A
108-90-7	Chlorobenzene	5.	U R	R
100-41-4	Ethylbenzene	4.	UJ	A
100-42-5	Styrene	5.	U R	R
1330-20-7	Xylenes (total)	5.	U R	R

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

52-37

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT25A04

Level: (low/med) LOW Date Received: 10/17/88

% Moisture: not dec. 100. Date Analyzed: 10/25/88

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10.	U ~~UJ~~ R	R
74-83-9	Bromomethane	10.	U	V
75-01-4	Vinyl Chloride	10.	U ~~UJ~~ R	V
75-00-3	Chloroethane	10.	U R	R
75-09-2	Methylene Chloride	5.	U	V
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	V
79-01-6	Trichloroethene	2.	J	A
124-48-1	Dibromochloromethane	5.	U	V
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	V
127-18-4	Tetrachloroethene	2.	J	A
79-34-5	1,1,2,2-Tetrachloroethane	5.	U	V
108-88-3	Toluene	~~0.9~~	~~BJ~~ 5 U	
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
[illegible]-42-5	Styrene	5.	U	
1330-20-7	Xylenes (total)	5.	U	V

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

45-37

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT25A05

Level: (low/med) LOW Date Received: 10/17/88

% Moisture: not dec. 100. Date Analyzed: 10/25/88

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10.	U~~J~~R	R
74-83-9	Bromomethane	10.	U	✓
75-01-4	Vinyl Chloride	10.	U~~J~~R	✓
75-00-3	Chloroethane	10.	UR	R
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	~~0.7~~	~~BJ~~ 5 U	
108-90-7	Chlorobenzene	5.	U	
100-41-4	Ethylbenzene	5.	U	
100-42-5	Styrene	5.	U	
1330-20-7	Xylenes (total)	5.	U	✓

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

70-86

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT25A06

Level: (low/med) LOW Date Received: 10/17/88

% Moisture: not dec. 100. Date Analyzed: 10/25/88

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10.	U UJR	R
74-83-9	Bromomethane	10.	U	V
75-01-4	Vinyl Chloride	10.	U UJR	V
75-00-3	Chloroethane	10.	UR	R
75-09-2	Methylene Chloride	5.	U	V
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	Xylenes (total)	5.	U	

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

43-87

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT26

Level: (low/med) LOW Date Received: 10/17/88

% Moisture: not dec. 100. Date Analyzed: 10/26/88

Column: (pack/cap) CAP Dilution Factor: 100.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	1000.	U OSR	R
74-83-9	Bromomethane	1000.	U	
75-01-4	Vinyl Chloride	1000.	U OSR	
75-00-3	Chloroethane	1000.	UR	R
75-09-2	Methylene Chloride	500.	U	
67-64-1	Acetone	1000.	U	
75-15-0	Carbon Disulfide	500.	U	
75-35-4	1,1-Dichloroethene	11000.		
75-34-3	1,1-Dichloroethane	500.	U	
540-59-0	1,2-Dichloroethene (total)	500.	U	
67-66-3	Chloroform	500.	U	
107-06-2	1,2-Dichloroethane	500.	U	
78-93-3	2-Butanone	1000.	U	
71-55-6	1,1,1-Trichloroethane	25000.	E	A
56-23-5	Carbon Tetrachloride	500.	U	
108-05-4	Vinyl Acetate	1000.	U	
75-27-4	Bromodichloromethane	500.	U	
78-87-5	1,2-Dichloropropane	500.	U	
10061-01-5	cis-1,3-Dichloropropene	500.	U	
79-01-6	Trichloroethene	17000.		
124-48-1	Dibromochloromethane	500.	U	
79-00-5	1,1,2-Trichloroethane	500.	U	
71-43-2	Benzene	500.	U	
10061-02-6	trans-1,3-Dichloropropene	500.	U	
75-25-2	Bromoform	500.	U	
108-10-1	4-Methyl-2-Pentanone	1000.	U	
591-78-6	2-Hexanone	1000.	U	
127-18-4	Tetrachloroethene	8100.		
79-34-5	1,1,2,2-Tetrachloroethane	500.	U	
108-88-3	Toluene	500.	U	
108-90-7	Chlorobenzene	500.	U	
100-41-4	Ethylbenzene	500.	U	
100-42-5	Styrene	500.	U	
1330-20-7	Xylenes (total)	500.	U	

Lab Name: GLAS Contract: FIELD BL

Lab Code: GLAB Case No.: E88-3369SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: NOV2210

Level: (low/med) LOW Date Received: 11/14/88

% Moisture: not dec. 100. Date Analyzed: 11/22/88

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

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	10.	UR	R
74-83-9	Bromomethane	10.	U US	A
75-01-4	Vinyl Chloride	10.	U R	V
75-00-3	Chloroethane	10.	UR	R
75-09-2	Methylene Chloride	7.	B US	A
67-64-1	Acetone	10.	U	V
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	~~2~~ 5	~~B~~ U US	A
107-06-2	1,2-Dichloroethane	5.	U	V
78-93-3	2-Butanone	10.	UR	R
71-55-6	1,1,1-Trichloroethane	5.	U	V
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 US	A
591-78-6	2-Hexanone	10.	U	V
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 US	A
100-42-5	Styrene	5.	U	V
1330-20-7	Xylenes (total)	5.	U	V

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

9-74

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: NOV0201

Level: (low/med) LOW Date Received: 10/24/88

% Moisture: not dec. 100. Date Analyzed: 11/ 2/88

Column: (pack/cap) CAP Dilution Factor: 50.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q	
74-87-3	Chloromethane	500.	U	A
74-83-9	Bromomethane	500.	U	V
75-01-4	Vinyl Chloride	500.	U	V
75-00-3	Chloroethane	500.	U	A
75-09-2	Methylene Chloride	250.	U	V
67-64-1	Acetone	500.	U	
75-15-0	Carbon Disulfide	250.	U	
75-35-4	1,1-Dichloroethene	4800.		
75-34-3	1,1-Dichloroethane	250.	U	
540-59-0	1,2-Dichloroethene (total)	250.	U	
67-66-3	Chloroform	460.	B	A
107-06-2	1,2-Dichloroethane	250.	U	V
78-93-3	2-Butanone	500.	U	
71-55-6	1,1,1-Trichloroethane	8200.		
56-23-5	Carbon Tetrachloride	250.	U	
108-05-4	Vinyl Acetate	500.	U	
75-27-4	Bromodichloromethane	250.	U	
78-87-5	1,2-Dichloropropane	250.	U	
10061-01-5	cis-1,3-Dichloropropene	250.	U	
79-01-6	Trichloroethene	9500.		
124-48-1	Dibromochloromethane	250.	U	
79-00-5	1,1,2-Trichloroethane	250.	U	
71-43-2	Benzene	250.	U	
10061-02-6	trans-1,3-Dichloropropene	250.	U	
75-25-2	Bromoform	250.	U	
108-10-1	4-Methyl-2-Pentanone	500.	U	
591-78-6	2-Hexanone	500.	U	
127-18-4	Tetrachloroethene	2500.		
79-34-5	1,1,2,2-Tetrachloroethane	250.	U	
108-88-3	Toluene	250.	U	
108-90-7	Chlorobenzene	250.	U	
100-41-4	Ethylbenzene	250.	U	
100-42-5	Styrene	250.	U	
1330-20-7	Xylenes (total)	250.	U	

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

10-74

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: NOV0202

Level: (low/med) LOW Date Received: 10/24/88

% Moisture: not dec. 100. Date Analyzed: 11/ 2/88

Column: (pack/cap) CAP Dilution Factor: 50.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q.	
74-87-3	Chloromethane	500.	U UJ	A
74-83-9	Bromomethane	500.	U UJ	
75-01-4	Vinyl Chloride	500.	U ~~UJ~~ UJ	
75-00-3	Chloroethane	500.	U UJ	
75-09-2	Methylene Chloride	250.	U UJ	
67-64-1	Acetone	500.	U UJ	
75-15-0	Carbon Disulfide	250.	U UJ	
75-35-4	1,1-Dichloroethene	250.	U UJ	
75-34-3	1,1-Dichloroethane	250.	U UJ	
540-59-0	1,2-Dichloroethene (total)	250.	U UJ	
67-66-3	Chloroform	250.	U UJ	
107-06-2	1,2-Dichloroethane	250.	U UJ	
78-93-3	2-Butanone	500.	U UJ	
71-55-6	1,1,1-Trichloroethane	250.	U UJ	
56-23-5	Carbon Tetrachloride	1600.	J	
108-05-4	Vinyl Acetate	500.	U UJ	
75-27-4	Bromodichloromethane	250.	U UJ	
78-87-5	1,2-Dichloropropane	250.	U UJ	
10061-01-5	cis-1,3-Dichloropropene	250.	U UJ	
79-01-6	Trichloroethene	600.	J	
124-48-1	Dibromochloromethane	250.	U UJ	
79-00-5	1,1,2-Trichloroethane	250.	U UJ	
71-43-2	Benzene	250.	U UJ	
10061-02-6	trans-1,3-Dichloropropene	250.	U UJ	
75-25-2	Bromoform	250.	U UJ	
108-10-1	4-Methyl-2-Pentanone	500.	U UJ	
591-78-6	2-Hexanone	500.	U UJ	
127-18-4	Tetrachloroethene	250.	U UJ	
79-34-5	1,1,2,2-Tetrachloroethane	250.	U UJ	
108-88-3	Toluene	250.	U UJ	
108-90-7	Chlorobenzene	250.	U UJ	
100-41-4	Ethylbenzene	250.	U UJ	
100-42-5	Styrene	250.	U UJ	
[illegible]	Xylenes (total)	250.	U UJ	

SOP WORK SHEETS FOR VOLATILES

GC / MS TUNING AND PERFORMANCE

SAMPLE NO.*	DATE TUNED	TIME TUNED	BFB ION ABUNDANCE CRITERIA MET		ION ABUNDANCE CRITERIA NOT MET	SKEWED OR DISTORTED SPECTRA		FREQUENCY OF TUNE > 12 HRS.		ACTION
			YES	NO		YES	NO	YES	NO	
Trip Bl	10/25/88	7:51	X				X		X	None
Field Bl										
43-87										
52-87										
45-87										
70-86										
70-86										
70-86 MS										
70-86 MSD										
43-87	10/26/88	12:30								Summary Does not match Raw Data
Trip Blank										
Field Blank										
55-86										
55-86 D										
69-86										
4-87										
4-87										
4-87 MS										
4-87 MSD										

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

SOP WORK SHEETS FOR VOLATILES

GC / MS TUNING AND PERFORMANCE

SAMPLE NO.*	DATE TUNED	TIME TUNED	BFB ION ABUNDANCE CRITERIA MET		ION ABUNDANCE CRITERIA NOT MET	SKEWED OR DISTORTED SPECTRA		FREQUENCY OF TUNE > 12 HRS.		ACTION
			YES	NO		YES	NO	YES	NO	
Trip Bl	10/31/88	12:30	X				X		X	none
Field Bl	↓	↓	↓				↓		↓	↓
9-74										
10-74										
3-87										
8-87										
Trip Bl										
Field Bl										
1-87	↓	↓	↓				↓		↓	
2-87	11/22/88	7:59	X				X		X	
62-86	↓	↓	↓				↓		↓	
5-87										
Trip Bl										
Field Bl	↓	↓	↓				↓		↓	↓
9-74	11/2/88	10:09	•				X		X	Data Does not
10-74	↓	↓					↓		↓	match
3-87										Summary

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

BFB TUNE - BROMOFLUOROBENZENE (BFB)

Lab Name: [illegible] Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Lab File ID: OCT25BF3 BFB Injection Date: 10/25/88

Instrument ID.: EXTR1 BFB Injection Time: 7:51

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

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.7
75	30.0 - 60.0% of mass 95	51.1
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.9
173	Less than 2.0% of mass 174	0.4 (0.5)1
174	Greater than 50.0% of mass 95	66.7
175	5.0 - 9.0% of mass 174	4.0 (5.9)1
176	Greater than 95.0%, but less than 101.0% of mass 174	66.5 (99.7)1
177	5.0 - 9.0% of mass 176	3.6 (5.5)2

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

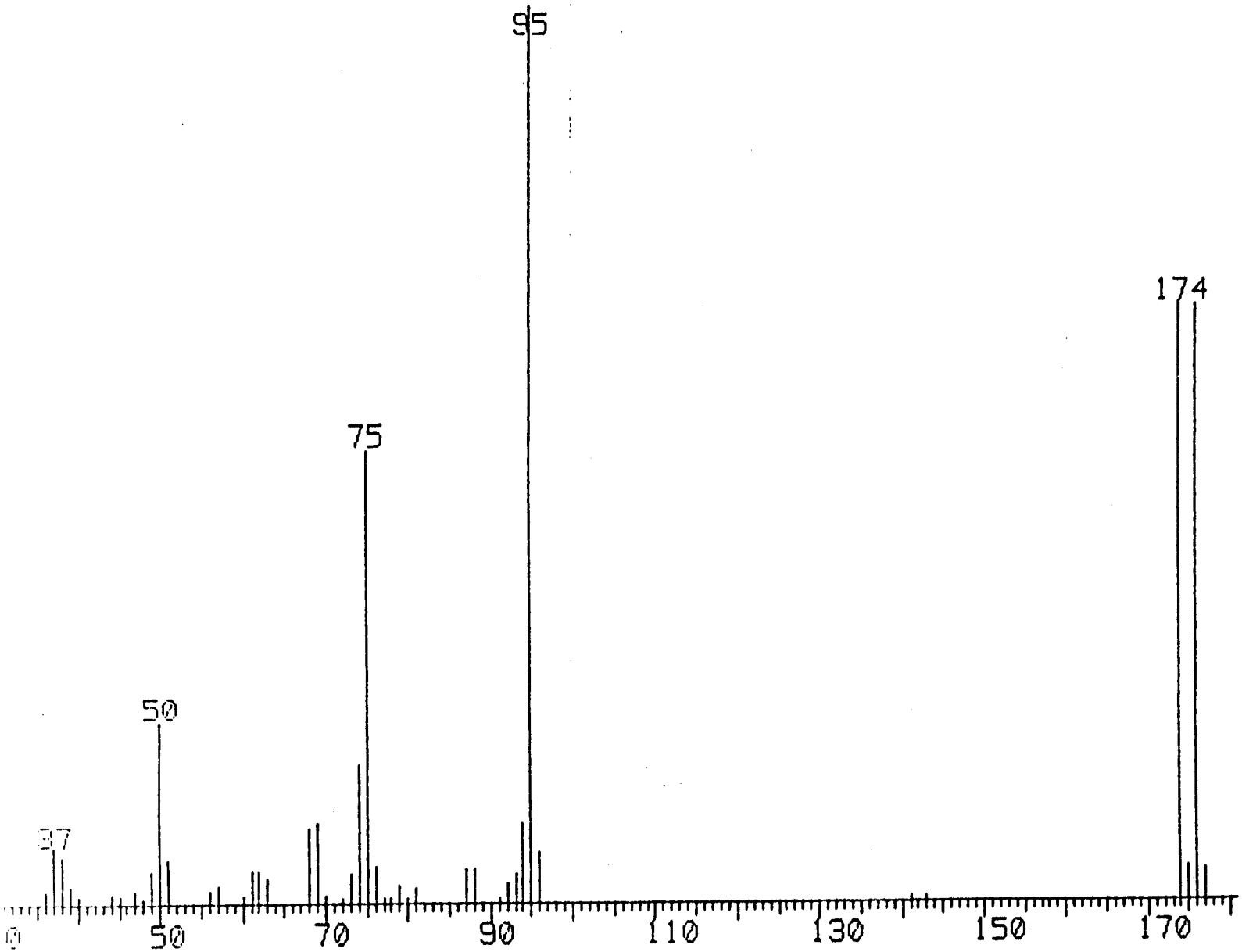
THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1	OCT25CC		OCT25CC	10/25/88	8:49
2	REAGEN		OCT25LB	10/25/88	10:29
3	TRIP BLA		OCT25A01	10/25/88	13:55
4	FIELD BL		OCT25A02	10/25/88	14:30
5	43-87		OCT25A03	10/25/88	15:17
6	52-87		OCT25A04	10/25/88	15:53
7	45-87		OCT25A05	10/25/88	16:28
8	70-86		OCT25A06	10/25/88	17:05
9	70-86		OCT25A07	10/25/88	17:39
10	70-86MS		OCT25A08	10/25/88	18:14
11	70-86MSD		OCT25A09	10/25/88	18:51
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA 1/87 Rev.

125BFB
-OCT-88 07:51:28 Scan 1163 Time 16.67 Min.
100 % = 8832

Total Scale
38642 1*



25-OCT-88 07:51:22 SCAN 1163 TIME 16.67 MIN.
100 % = 8832

36	1.29	56	1.31	74	15.58	92	2.19
37	6.41	57	2.04	75	51.09	93	3.20
38	5.26	60	0.79	76	4.12	94	9.13
39	2.07	61	3.70	77	0.57	95	100.00
40	1.09	62	3.66	78	0.54	96	5.88
44	1.18	63	2.77	79	1.87	141	0.65
45	0.93	68	8.57	80	0.65	143	0.61
47	1.42	69	8.99	81	1.75	174	66.67
48	0.58	70	0.80	87	3.97	175	3.95
49	3.52	72	0.60	88	4.01	176	66.49
50	20.65	73	3.40	91	0.53	177	3.63
51	5.06						

5A

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

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Lab File ID: OCT26BFB BFB Injection Date: 10/26/88

Instrument ID.: EXTR1 BFB Injection Time: 8:39

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

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.6
75	30.0 - 60.0% of mass 95	50.1
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	6.0
173	Less than 2.0% of mass 174	0.3 (0.5)1
174	Greater than 50.0% of mass 95	73.3
175	5.0 - 9.0% of mass 174	4.7 (6.4)1
176	Greater than 95.0%, but less than 101.0% of mass 174	73.1 (99.8)1
177	5.0 - 9.0% of mass 176	4.3 (5.8)2

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

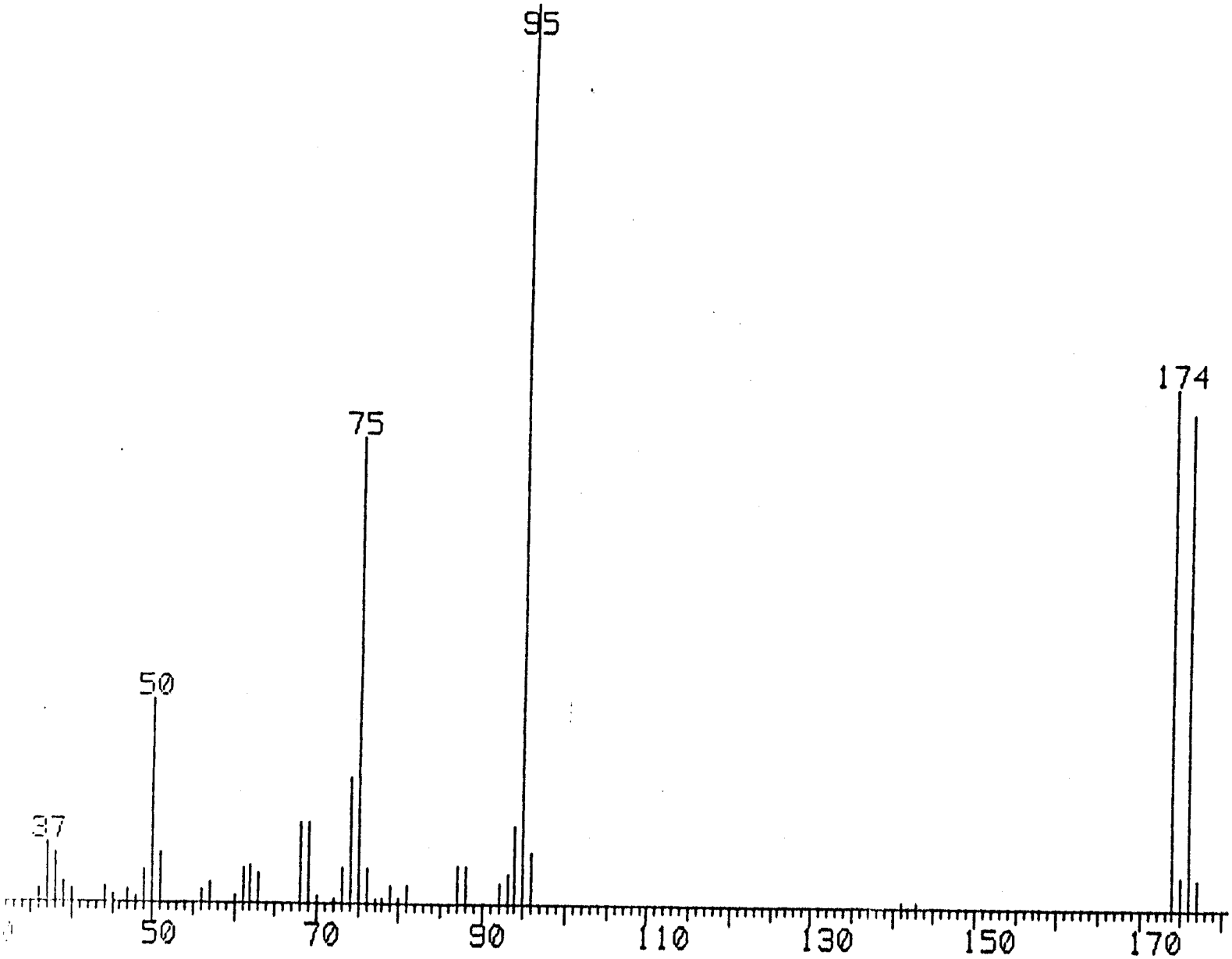
THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1			OCT26CC	10/26/88	10:14
2	REAGEN		OCT26LB	10/26/88	11:00
3	43-87		OCT26	10/26/88	13:00
4	TRIP BLA		OCT26A01	10/26/88	13:46
5	FIELD BL		OCT26A02	10/26/88	14:13
6	55-86		OCT26A03	10/26/88	14:49
7	55-86D		OCT26A04	10/26/88	15:24
8	69-86		OCT26A05	10/26/88	16:00
9	4-87		OCT26A06	10/26/88	16:34
10	4-87		OCT26A07	10/26/88	17:09
11	4-87 MS		OCT26A08	10/26/88	17:45
12	4-87 MSD		OCT26A09	10/26/88	18:20
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA 1/87 Rev.

126BFB
-OCT-88 08:39:29 Scan 1166 Time 16.72 Min.
100 % = 7824

Total Scale
33421 1*



26-OCT-88 08:39:29 SCAN 1166 TIME 16.72 MIN.
100 % = 7824

36	1.39	51	5.50	73	3.96	92	2.25	
37	6.68	56	1.39	74	14.31	93	3.17	
38	5.70	57	2.48	75	52.15	94	3.90	
39	2.38	60	0.95	76	3.86	95	100.00	
40	1.56	61	3.94	77	0.77	96	5.74	
44	1.65	62	4.10	78	0.60	141	0.72	
45	1.02	63	3.17	79	2.01	143	0.63	
47	1.51	68	9.19	80	0.75	174	58.49	
48	0.72	69	9.16	81	1.87	175	3.55	
49	3.74	70	0.78	87	4.19	176	55.62	95%
50	23.11	72	0.61	88	4.03	177	3.17	

5A

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

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Lab File ID: OCT31BFB BFB Injection Date: 10/31/88

Instrument ID.: EXTR1 BFB Injection Time: 12:30

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

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	18.7
75	30.0 - 60.0% of mass 95	50.3
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.5
173	Less than 2.0% of mass 174	0.0 (0.0)1
174	Greater than 50.0% of mass 95	73.3
175	5.0 - 9.0% of mass 174	4.8 (6.5)1
176	Greater than 95.0%, but less than 101.0% of mass 174	72.8 (99.4)1
177	5.0 - 9.0% of mass 176	4.1 (5.7)2

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

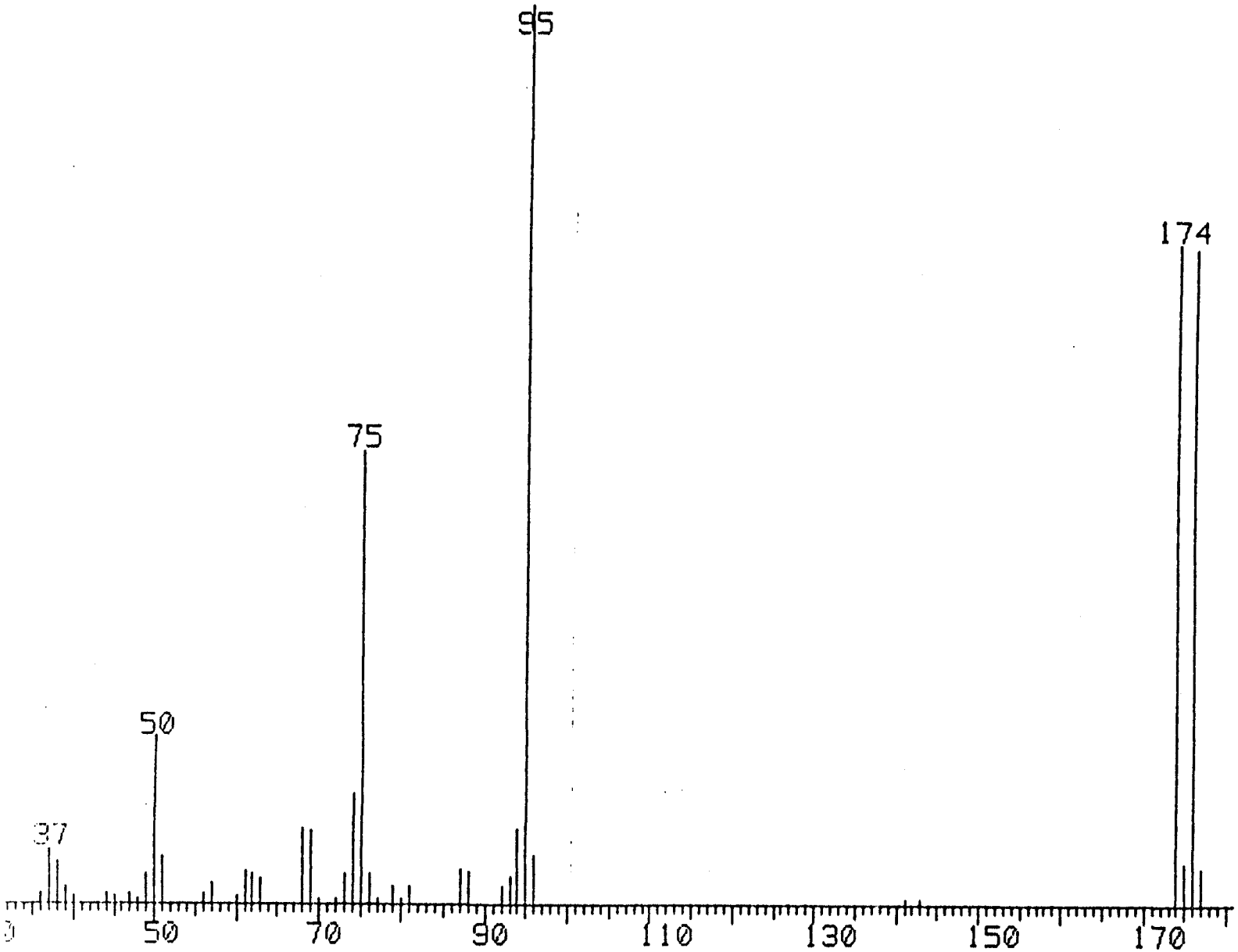
THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1			OCT31CC	10/31/88	13:53
2	REAGEN		OCT31LB	10/31/88	14:40
3	FIELD BL		OCT3107	10/31/88	18:50
4	TRIP BLA		OCT3108	10/31/88	19:24
5	9-74		OCT3109	10/31/88	19:58
6	10-74		OCT3110	10/31/88	20:33
7	3-87		OCT3111	10/31/88	21:08
8	3-87		OCT3112	10/31/88	21:42
9	TRIP BLA		OCT3113	10/31/88	22:16
10	FIELD BL		OCT3114	10/31/88	22:50
11	1-87		OCT3115	10/31/88	23:24
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA 1/87 Rev.

131BFB
-OCT-88 12:30:56 Scan 1162 Time 16.67 Min.
100 % = 7184

Total Scale
31591 1*



OCT31BFB
31-OCT-88 12:20:56 SCAN 1162 TIME 16.67 MIN.
100 % = 7184

36	1.25	51	5.26	73	3.34	93	3.01
37	6.10	56	1.17	74	12.25	94	8.49
38	4.79	57	2.34	75	50.33	95	100.00
39	1.93	60	0.82	76	3.37	96	5.50
40	0.82	61	3.77	77	0.70	141	0.63
44	1.14	62	3.48	79	1.88	143	0.75
45	0.96	63	2.70	80	0.54	174	73.27
47	1.24	68	8.49	81	1.85	175	4.76
48	0.56	69	8.20	87	3.93	176	72.83
49	3.40	70	0.72	88	3.79	177	4.13
50	18.71	72	0.52	92	1.98		

5A

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

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Lab File ID: NOV02BFB BFB Injection Date: 11/ 2/88

Instrument ID.: EXTR1 BFB Injection Time: 10:08

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

m/e	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	20.6
75	30.0 - 60.0% of mass 95	50.5
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.5
173	Less than 2.0% of mass 174	0.3 (0.5)1
174	Greater than 50.0% of mass 95	68.7
175	5.0 - 9.0% of mass 174	4.0 (5.8)1
176	Greater than 95.0%, but less than 101.0% of mass 174	67.8 (98.6)1
177	5.0 - 9.0% of mass 176	3.4 (5.0)2

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

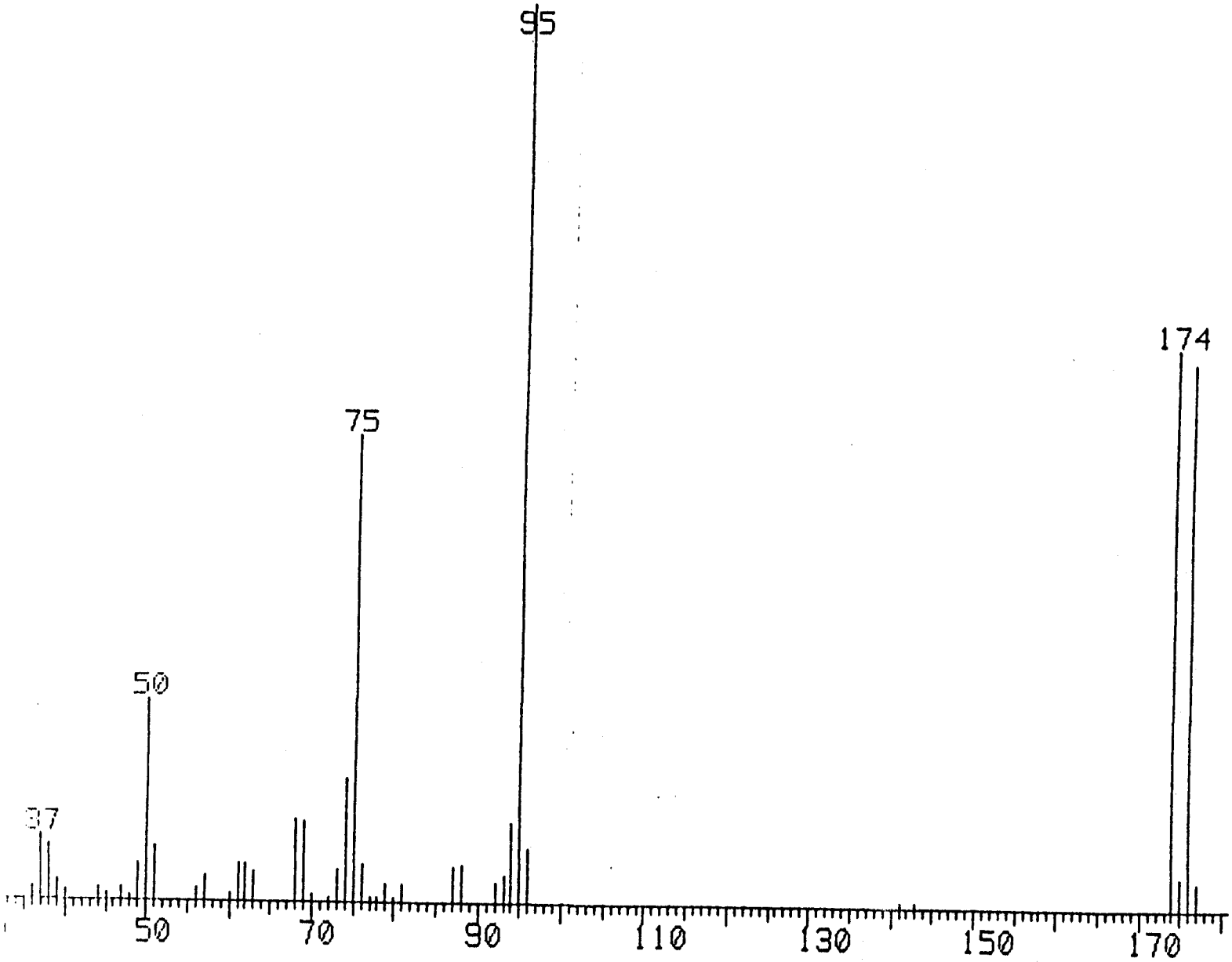
THIS TUNE APPLIES TO THE FOLLOWING SAMPLES, MS, MSD, BLANKS, AND STANDARDS:

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	DATE ANALYZED	TIME ANALYZED
1			NOV02CC	11/ 2/88	11:19
2	REAGEN		NOV02LB	11/ 2/88	12:53
3	9-74		NOV0201	11/ 2/88	13:48
4	10-74		NOV0202	11/ 2/88	14:18
5	3-87		NOV0203	11/ 2/88	14:57
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA 1/87 Rev.

M2BFB
-NOV-88 10:08:55 Scan 1164 Time 16.68 Min.
100 % = 7056

Total Scale
31044 1*



02-NOV-88 10:08:55 SCAN 1164 TIME 16.68 MIN
100 % = 7056

36	1.50	51	6.11	73	3.73	92	2.28
37	7.21	56	1.47	74	13.99	93	3.16
38	6.12	57	2.72	75	52.15	94	9.07
39	2.40	60	0.89	76	4.08	95	100.00
40	1.25	61	4.28	77	0.61	96	6.02
44	1.37	62	4.27	78	0.61	141	0.62
45	0.92	63	3.37	79	1.98	143	0.65
47	1.57	68	9.40	80	0.67	174	63.27
48	0.62	69	9.06	81	1.88	175	3.56
49	4.08	70	0.84	87	3.94	176	61.45
50	22.90	72	0.60	88	4.18	177	3.10

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

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: E8G-3475SAS No.: SDG No.:

Lab File ID: NOV22BFB BFB Injection Date: 11/22/88

Instrument ID.: EXTR1 BFB Injection Time: 7:59

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

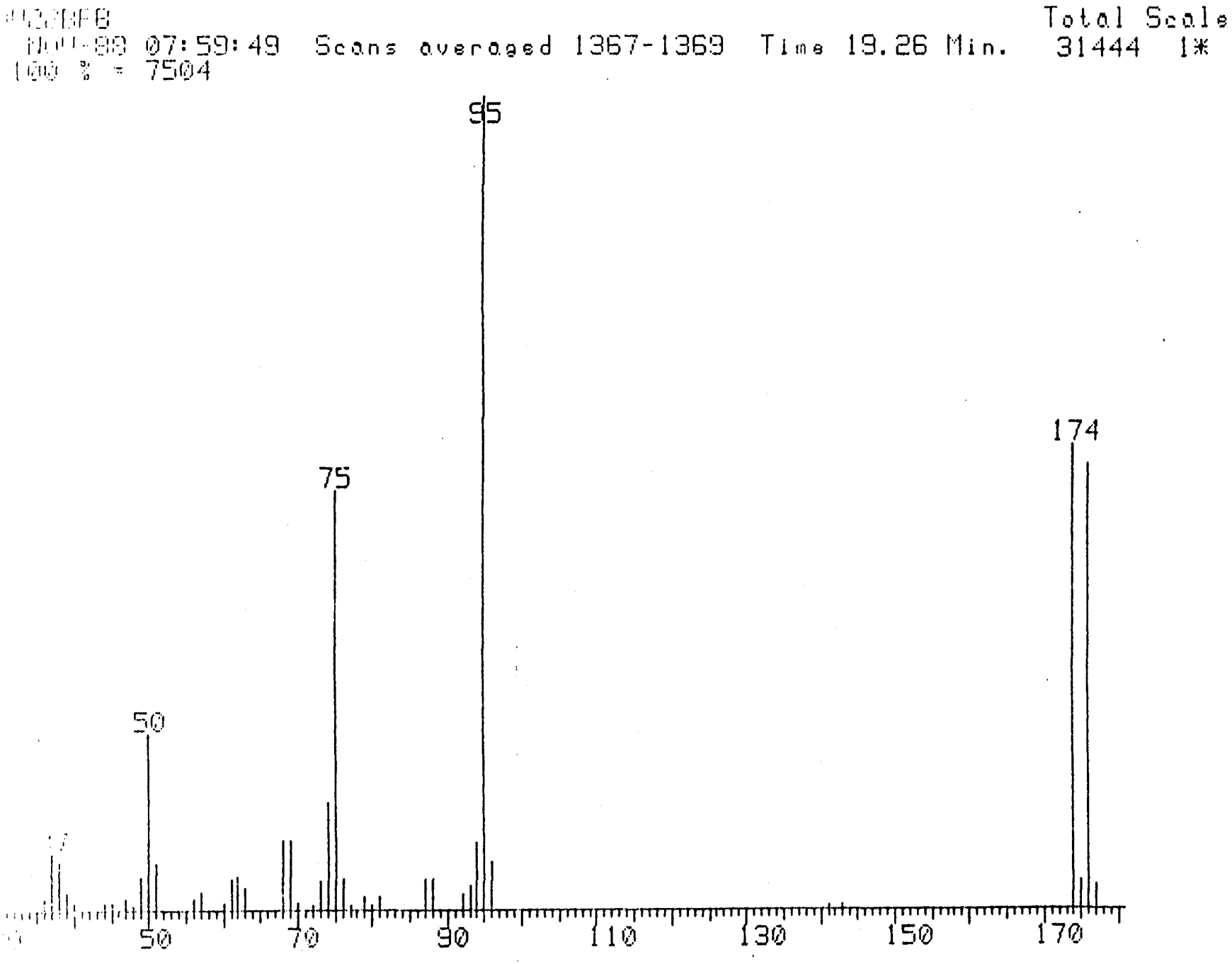
m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE
50	15.0 - 40.0% of mass 95	22.2
75	30.0 - 60.0% of mass 95	51.8
95	Base peak, 100% relative abundance	100.0
96	5.0 - 9.0% of mass 95	5.9
173	Less than 2.0% of mass 174	0.3 (0.5)1
174	Greater than 50.0% of mass 95	57.2
175	5.0 - 9.0% of mass 174	3.6 (6.3)1
176	Greater than 95.0%, but less than 101.0% of mass 174	54.8 (95.7)1
177	5.0 - 9.0% of mass 176	3.1 (5.6)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	NOV22CC		NOV22CC	11/22/88	9:09
2	RGNT B		NOV22LB	11/22/88	11:38
3	2-87		NOV2206	11/22/88	17:22
4	62-86		NOV2207	11/22/88	17:57
5	5-87		NOV2208	11/22/88	18:32
6	TRIP BL		NOV2209	11/22/88	19:07
7	FIELD BL		NOV2210	11/22/88	19:42
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					

FORM V VOA 1/87 Rev.


Total Scale
31444 1*
07:59:49 Scans averaged 1367-1369 Time 19.26 Min.
100 % = 7504
95
174
75
50
50
70
90
110
130
150
170

SOP WORK SHEETS FOR VOLATILES

COMPOUND IDENTIFICATION

SAMPLE NO	HSL COMPOUNDS WITHIN ±0.06 RRT UNITS OF STANDARD		SAMPLE vs. STANDARD SPECTRAL CRITERIA MET		ACTION ON HSL COMPOUNDS	NON-HSL COMPOUND IDENTIFICATION CRITERIA MET		ALL SPECTRA PRESENT		ACTION ON NON-HSL COMPOUNDS
	YES	NO	YES	NO		YES	NO	YES	NO	
Trip Bl	X		X							
Field Bl	X		X	*	~~Acetone~~ I)					10DL ~~Spike~~ ~~too~~ close to detection
43-87	X		X	X	Acetone (b), 12DCE (b) J. *(b)					→
52-87	X		X	*	no PCE spectrum <2					
45-87	X		X							
70-86	X		X							
70-86	X		X							
70-86 MS										
70-86 MSD										
43-87	X		X	*	No PCE ~~spectrum~~ *1					
Trip Blank	X		X	*	(No TCE, PCE ~~spect~~)					
Field Blank	X		X	*						
55-86	X		X							
55-86 D	X		X							
69-86	X		X							
4-87	X		X							
4-87										
4-87 MS										
4-87 MSD										

*2 ~~2-Butanone (b)~~ ✓
carbon tet (b)

*1 ~~xtra Toluene, chloroform spectra not it~~

~~Acetone looks like 11DCE~~

~~2-Butanone looks like 111TCE~~
carbon tet " " " "

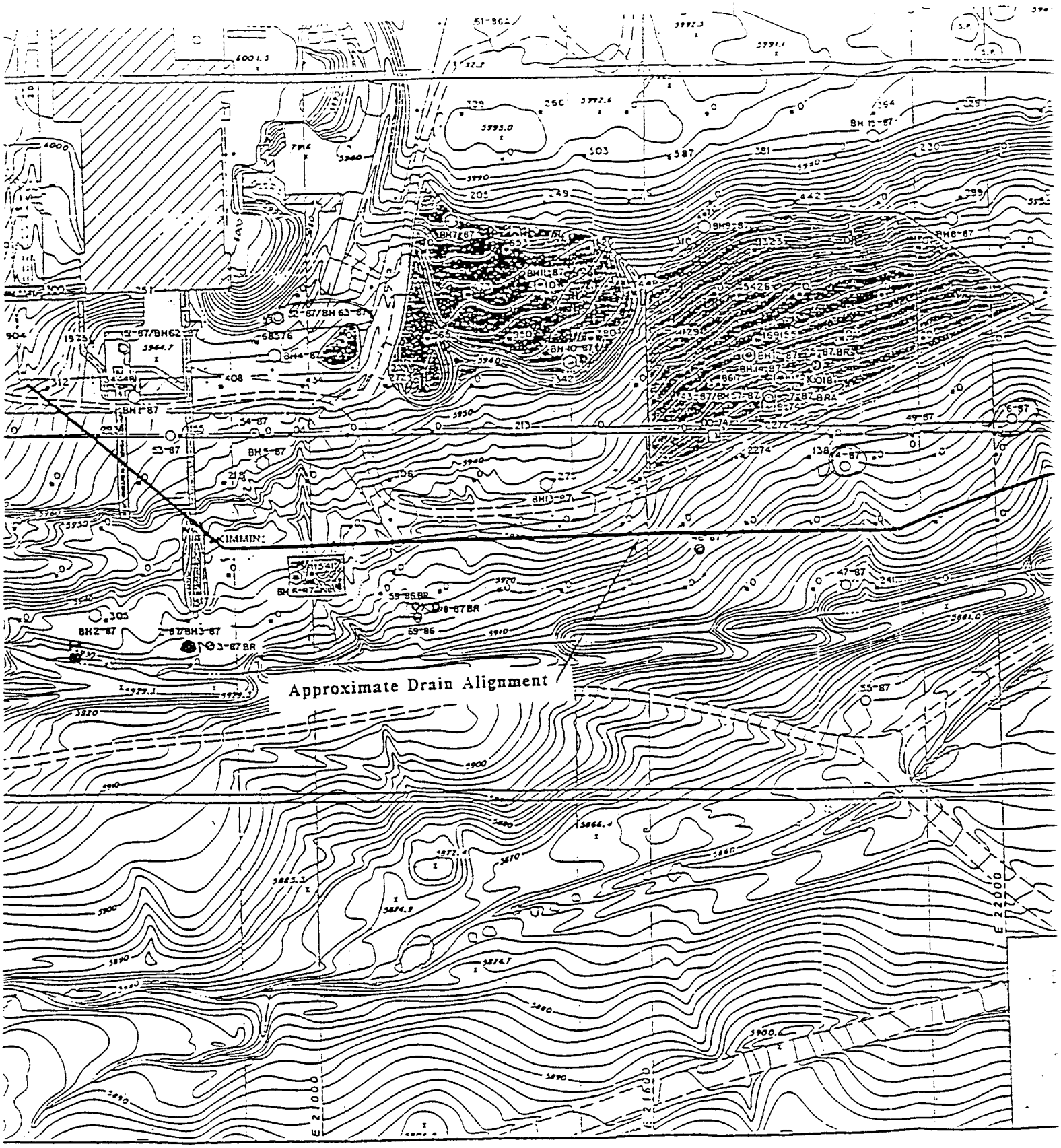
SOP WORK SHEETS FOR VOLATILES

COMPOUND IDENTIFICATION

SAMPLE NO	HSL COMPOUNDS WITHIN ±0.06 RRT UNITS OF STANDARD		SAMPLE vs. STANDARD SPECTRAL CRITERIA MET		ACTION ON HSL COMPOUNDS	NON-HSL COMPOUND IDENTIFICATION CRITERIA MET		ALL SPECTRA PRESENT		ACTION ON NON-HSL COMPOUNDS
	YES	NO	YES	NO		YES	NO	YES	NO	
Trip Bl	X		X	*	~~(no 2-butanone spectra)~~					
Field Bl	X		X	*	*					
9-74	X		X	*	*					
10-74	X		X							
3-87	X		X	*	~~NO PCE spectra~~					
8-87	X		X							
Trip Bl	X		X							
Field Bl	X		X	*	~~NO PCE spectra~~					
1-87	X		X							
2-87	X		X							
62-86	X		X	*	*					
5-87	X		X							
Trip Bl	X		X	*	~~No 2-butanone spectra~~					
Field Bl										
9-74	X		X	*	~~NO PCE spectra~~					
10-74	X		X							
3-87	X		X							

* 111 ~~Trichloroethane~~
~~PCE~~
~~Chloroform (missing)~~

*1 2-butanone, tetrachloroethene - not detect. but spectra given
2 Tetra chloroethane detected - no spectra
Carbon tet not detected - Reported


Approximate Drain Alignment
KIMMIN
E 21000
E 22000

[illegible] SCANS AVERAGED [illegible] TIME [illegible] MIN.
100 % = [illegible]

26	1.46	51	5.79	73	3.58	93	3.11
27	7.24	56	1.32	74	13.59	94	8.60
38	6.18	57	2.34	75	51.74	95	100.00
39	2.38	60	0.88	76	3.86	96	5.94
40	0.88	61	3.90	77	0.60	141	0.52
44	0.97	62	4.04	79	1.63	143	0.60
45	0.99	63	2.83	80	0.55	174	57.21
47	1.57	68	8.90	81	1.65	175	3.58
48	0.63	69	8.71	87	3.96	176	54.80
49	4.07	70	0.78	88	3.93	177	3.05
50	22.17	72	0.55	92	2.03		

SOP WORK SHEETS FOR VOLATILES

INITIAL CALIBRATION

SAMPLE NO.*	DATE	TIME	DESCRIBE CHROMATOGRAPHIC PROBLEMS	SPCC CRITERIA MET		CCC CRITERIA MET		ALL COMPOUNDS RF>0		ANY HSL COMPOUND RF<0.05		ANY HSL COMPOUND RSD>30%		ACTION
				YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	
Trip Bl	10/24/88 TJF	13:50	RRF missing for	X		X		X			X	X		chloromethane +; chloroethane +
Field Bl			1T, 2T, 3T											
9-74														
10-74														
3-87														
8-87														
Trip Bl														
Field Bl														
1-87														
2-87	11/20/88	13:44	none	X		X		X			X	X		chloromethane +; Bromomethane + Chloroethane + Xylenes +J
62-86														
5-87														
Trip Bl														
Field Bl														
9-74	10/24/88	13:50	RRF missing for	X		X		X			X	X		X chloromethane +J/ chloroethane +;
10-74			1T, 2T, 3T											
3-87														

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

VOLATILE ORGANICS INITIAL CALIBRATION DATA

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: E88-33 SAS No.: SDG No.:

Instrument ID: EXTR1 Calibration Date(s): 10/24/88 10/24/88

Matrix: (soil/water) SOIL Level: (low/med): ED Column: (pack/cap) CAP

Min RRF for SPCC(#) = 0.300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF20 = VOA05 RRF50 = VOA04
RRF100= VOA03 RRF150= VOA02 RRF200= VOA01

COMPOUND	RRF20	RRF50	RRF100	RRF150	RRF200	RRF	% RSD
Chloromethane	# 0.341	0.203	0.381	0.576	0.726	0.445	46.2#
Bromomethane	0.753	0.599	0.380	0.533	0.597	0.572	23.5
Vinyl Chloride	* 0.590	0.543	0.453	0.673	0.782	0.608	20.6*
Chloroethane	0.204	0.262	0.155	0.280	0.438	0.268	40.0
Methylene Chloride	1.618	1.633	1.425	1.758	1.787	1.644	8.7
Acetone	0.899	0.874	0.929	1.114	1.177	0.999	13.7
Carbon Disulfide	9.297	9.096	5.933	10.119	10.214	8.932	19.6
1,1-Dichloroethene	* 1.400	1.332	1.111	1.433	1.440	1.343	10.2*
1,1-Dichloroethane	# 3.094	3.006	2.894	3.286	3.397	3.135	6.5#
1,2-Dichloroethene (total)	1.589	1.621	1.565	1.811	1.878	1.693	8.4
Chloroform	* 5.612	3.883	3.368	3.632	3.643	4.028	22.4*
1,2-Dichloroethane	2.091	2.048	1.956	2.196	2.264	2.111	5.8
2-Butanone	0.061	0.059	0.071	0.079	0.071	0.068	12.0
1,1,1-Trichloroethane	0.452	0.444	0.501	0.518	0.468	0.477	6.7
Carbon Tetrachloride	0.397	0.389	0.463	0.475	0.447	0.434	9.0
Vinyl Acetate	0.670	0.461	0.834	0.800	0.847	0.723	22.4
Bromodichloromethane	0.584	0.563	0.636	0.658	0.693	0.627	8.5
1,2-Dichloropropane	* 0.335	0.363	0.411	0.432	0.450	0.398	12.1*
cis-1,3-Dichloropropene	0.259	0.276	0.328	0.327	0.331	0.304	11.3
Trichloroethene	0.326	0.333	0.349	0.379	0.392	0.356	8.1
Dibromochloromethane	0.377	0.379	0.469	0.479	0.500	0.441	13.2
1,1,2-Trichloroethane	0.245	0.244	0.303	0.300	0.312	0.281	11.9
Benzene	1.160	1.091	1.213	1.335	1.332	1.226	8.7
trans-1,3-Dichloropropene	0.613	0.613	0.709	0.738	0.782	0.691	11.0
Bromoform	# 0.237	0.256	0.315	0.334	0.325	0.293	14.9#
4-Methyl-2-Pentanone	0.381	0.481	0.562	0.540	0.589	0.511	16.2
2-Hexanone	0.482	0.546	0.626	0.602	0.639	0.579	11.2
Tetrachloroethene	0.380	0.414	0.476	0.496	0.569	0.467	15.8
1,1,2,2-Tetrachloroethane	# 0.502	0.469	0.555	0.565	0.563	0.531	8.1#
Toluene	* 0.895	0.836	0.876	0.951	1.057	0.923	9.3*
Chlorobenzene	# 0.997	0.916	0.974	1.056	1.081	1.005	6.6#
Ethylbenzene	* 0.446	0.451	0.486	0.515	0.532	0.486	7.8*
Styrene	1.937	1.889	2.321	2.561	2.684	2.278	15.7
Xylenes (total)	1.173	1.148	1.366	1.507	1.526	1.344	13.3
Toluene-d8	1.148	1.084	1.188	1.229	1.370	1.204	8.9
Bromofluorobenzene	0.651	0.638	0.675	0.720	0.756	0.688	7.1
1,2-Dichloroethane-d4	1.575	1.651	1.576	1.704	1.719	1.645	4.2

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Instrument ID: EXTR1 Calibration Date(s): 10/24/88 10/24/88

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

Min RRF for SPCC(#) = 0.300 (0.250 for Bromoform) Max %RSD for CCC(*) = 30.0%

LAB FILE ID: RRF = VOA05 RRF = VOA04
RRF = VOA03 RRF = VOA02 RRF = VOA01

COMPOUND		RRF	RRF	RRF	RRF	RRF	RRF	% RSD
Chloromethane	#		0.203	0.381	0.576	0.726	0.471	48.4#
Bromomethane			0.599	0.380	0.533	0.597	0.527	19.5
Vinyl Chloride	*		0.543	0.453	0.673	0.782	0.613	23.6*
Chloroethane		0.204	0.262	0.155	0.280	0.438	0.268	40.0
Methylene Chloride		1.618	1.633	1.425	1.758	1.787	1.644	8.7
Acetone		0.899	0.874	0.929	1.114	1.177	0.999	13.7
Carbon Disulfide		9.297	9.096	5.933	10.119	10.214	8.932	19.6
1,1-Dichloroethene	*	1.400	1.332	1.111	1.433	1.440	1.343	10.2*
1,1-Dichloroethane	#	3.094	3.006	2.894	3.286	3.397	3.135	6.5#
1,2-Dichloroethene (total)		1.589	1.621	1.565	1.811	1.878	1.693	8.4
Chloroform	*	5.612	3.883	3.368	3.632	3.643	4.028	22.4*
1,2-Dichloroethane		2.091	2.048	1.956	2.196	2.264	2.111	5.8
2-Butanone		0.061	0.059	0.071	0.079	0.071	0.068	12.0
1,1,1-Trichloroethane		0.452	0.444	0.501	0.518	0.468	0.477	6.7
Carbon Tetrachloride		0.397	0.389	0.463	0.475	0.447	0.434	9.0
Vinyl Acetate		0.670	0.461	0.834	0.800	0.847	0.723	22.4
Bromodichloromethane		0.584	0.563	0.636	0.658	0.693	0.627	8.5
1,2-Dichloropropane	*	0.335	0.363	0.411	0.432	0.450	0.398	12.1*
cis-1,3-Dichloropropene		0.259	0.276	0.328	0.327	0.331	0.304	11.3
Trichloroethene		0.326	0.333	0.349	0.379	0.392	0.356	8.1
Dibromochloromethane		0.377	0.379	0.469	0.479	0.500	0.441	13.2
1,1,2-Trichloroethane		0.245	0.244	0.303	0.300	0.312	0.281	11.9
Benzene		1.160	1.091	1.213	1.335	1.332	1.226	8.7
trans-1,3-Dichloropropene		0.613	0.613	0.709	0.738	0.782	0.691	11.0
Bromoform	#	0.237	0.256	0.315	0.334	0.325	0.293	14.9#
4-Methyl-2-Pentanone		0.381	0.481	0.562	0.540	0.589	0.511	16.2
2-Hexanone		0.482	0.546	0.626	0.602	0.639	0.579	11.2
Tetrachloroethene		0.380	0.414	0.476	0.496	0.569	0.467	15.8
1,1,2,2-Tetrachloroethane	#	0.502	0.469	0.555	0.565	0.563	0.531	8.1#
Toluene	*	0.895	0.836	0.876	0.951	1.057	0.923	9.3*
Chlorobenzene	#	0.997	0.916	0.974	1.056	1.081	1.005	6.6#
Ethylbenzene	*	0.446	0.451	0.486	0.515	0.532	0.486	7.8*
Styrene		1.937	1.889	2.321	2.561	2.684	2.278	15.7
Xylenes (total)		1.173	1.148	1.366	1.507	1.526	1.344	13.3
Toluene-d8		1.148	1.084	1.188	1.229	1.370	1.204	8.9
Bromofluorobenzene		0.651	0.638	0.675	0.720	0.756	0.688	7.1
1,2-Dichloroethane-d4		1.575	1.651	1.576	1.704	1.719	1.645	4.2

FORM VI VOA 1/87 Rev.

	RRF	%RSD
Meth chloride	1.644	8.7%
2-Butanone	.068	12.0%

1.644

SOP WORK SHEETS FOR VOLATILES

CONTINUING CALIBRATION

SAMPLE NO.*	DATE	TIME	SPCC CRITERIA MET		CCC CRITERIA MET		ALL COMPOUNDS RF>0		CALIBRATION WITHIN 12 HRS. OF SAMPLE ANALYSIS		ANY HSL COMPOUND RF<0.05		ANY HSL COMPOUND %D>25		ACTION
			YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	
Trip Bl	10/25/88	8:49	X			X	X		X			X	X		Bromomethane (+J) vinyl chloride. chloromethane +J (R) chloroethane %D >100%
Field Bl															
43-87															
52-87															
45-87															
70-86															
70-86															
70-86 MS															
70-86 MSD															
43-87	10/26/88	18:14	X		X		X		X			X	X		chloroethane +J/R %D > 73 chloromethane +J carbon disulfide +J 4-methyl-2-pentanone
Trip Blank															
Field Blank															
55-86															
55-86D															
69-86															
4-87															
4-87															
4-87 MS															
4-87 MSD															

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

SOP WORK SHEETS FOR VOLATILES

CONTINUING CALIBRATION

SAMPLE NO.*	DATE	TIME	SPCC CRITERIA MET		CCC CRITERIA MET		ALL COMPOUNDS RF>0		CALIBRATION WITHIN 12 HRS. OF SAMPLE ANALYSIS		ANY HSL COMPOUND RF<0.05		ANY HSL COMPOUND %D>25		ACTION
			YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO	
Trip Bl	10/31/88	13:53	X		X		X		X			X	X		Chloroethane J/R %D > 63
Field Bl	↓	↓	↓		↓		↓		↓			↓	↓		↓
9-74	↓	↓	↓		↓		↓		↓			↓	↓		↓
10-74	↓	↓	↓		↓		↓		↓			↓	↓		↓
3-87	↓	↓	↓		↓		↓		↓			↓	↓		↓
8-87	↓	↓	↓		↓		↓		↓			↓	↓		↓
Trip Bl	↓	↓	↓		↓		↓		↓			↓	↓		↓
Field Bl	↓	↓	↓		↓		↓		↓			↓	↓		↓
1-77	↓	↓	↓		↓		↓		↓			↓	↓		↓
2-87	11/2/88	9:09	X			X			X		X		X		* See below
62-86	↓	↓	↓			↓			↓		↓		↓		↓
5-87	↓	↓	↓			↓			↓		↓		↓		↓
Trip Bl	↓	↓	↓			↓			↓		↓		↓		↓
Field Bl	↓	↓	↓			↓			↓		↓		↓		↓
9-74	11/2/88	11:19	X		X		X		X			X	X		Vinyl Acetate J
10-74	↓	↓	↓		↓		↓		↓			↓	↓		↓
3-87	↓	↓	↓		↓		↓		↓			↓	↓		↓

Acetone, 1,1 Dichloroethane, 1,2-Dichloroethene, 1,2,dichloroethane, Vinyl Acetate, 4-methyl-2-Pentanone, 2 Hexanone, 1,1,1,2,2 Tetrachloroethane J

RRFL.05

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

* 2-Butanone +J/-R; Chloroethane J/R; Chloromethane +J/-RUJ; Bromomethane +J/-RUJ; 4-methyl-2-pentanone +J/-RUJ; Ethylbenzene +J/-RUJ; Xylenes +J; Styrene +J; 1122 PCE +J; PCE +J; 2-Hexanone +J; Di Bromodichloromethane +J; TCE +J; 1,2 Dichloroethane +J

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Instrument ID: EXTR1 Calibration Date: 10/25/88 Time: 8:49

Lab File ID: OCT25CC Init. Calib. Date(s): 10/24/88 10/24/88

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

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) is 25.0%

COMPOUND	RRF	RRF50	%D
Chloromethane	# 0.471	0.996	111.2 #
Bromomethane	~~0.527~~ .572	0.384	27.3
Vinyl Chloride	* 0.613	0.436	28.8 *
Chloroethane	0.268 .608	0.946	253.0
Methylene Chloride	1.644	1.959	19.1
Acetone	0.999	0.976	2.3
Carbon Disulfide	8.932	11.160	24.9
1,1-Dichloroethene	* 1.343	1.591	18.5 *
1,1-Dichloroethane	# 3.135	3.241	3.4 #
1,2-Dichloroethene (total)	1.693	1.906	12.6
Chloroform	* 4.028	4.378	8.7 *
1,2-Dichloroethane	2.111	2.532	19.9
2-Butanone	0.068	0.062	9.0
1,1,1-Trichloroethane	0.477	0.449	5.9
Carbon Tetrachloride	0.434	0.453	4.4
Vinyl Acetate	0.723	0.763	5.6
Bromodichloromethane	0.627	0.648	3.4
1,2-Dichloropropane	* 0.398	0.372	6.5 *
cis-1,3-Dichloropropene	0.304	0.299	1.6
Trichloroethene	0.356	0.367	3.1
Dibromochloromethane	0.441	0.399	9.5
1,1,2-Trichloroethane	0.281	0.301	7.3
Benzene	1.226	1.312	7.0
trans-1,3-Dichloropropene	0.691	0.707	2.3
Bromoform	# 0.293	0.329	12.4 #
4-Methyl-2-Pentanone	0.511	0.610	19.4
2-Hexanone	0.579	0.672	16.0
Tetrachloroethene	0.467	0.513	9.9
1,1,2,2-Tetrachloroethane	# 0.531	0.573	8.0 #
Toluene	* 0.923	1.027	11.3 *
Chlorobenzene	# 1.005	1.103	9.8 #
Ethylbenzene	* 0.486	0.558	14.8 *
Styrene	2.278	2.435	6.9
Xylenes (total)	1.344	1.400	4.2
Toluene-d8	1.204	1.335	10.9
Bromofluorobenzene	0.688	0.726	5.5
1,2-Dichloroethane-d4	1.645	1.932	17.5

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Instrument ID: EXTR1 Calibration Date: 10/26/88 Time: 10:14

Lab File ID: OCT26CC Init. Calib. Date(s): 10/24/88 10/24/88

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

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) is 25.0%

COMPOUND	RRF	RRF50	%D
Chloromethane	# 0.471	0.301	36.3 #
Bromomethane	0.527	0.477	9.5
Vinyl Chloride	* 0.613	0.597	2.5 *
Chloroethane	0.268	0.465	73.6
Methylene Chloride	1.644	1.647	0.2
Acetone	0.999	1.243	24.4
Carbon Disulfide	8.932	5.089	43.0
1,1-Dichloroethene	* 1.343	1.126	16.2 *
1,1-Dichloroethane	# 3.135	2.898	7.6 #
1,2-Dichloroethene (total)	1.693	1.797	6.2
Chloroform	* 4.028	3.749	6.9 *
1,2-Dichloroethane	2.111	2.256	6.9
2-Butanone	0.068	0.075	10.5
1,1,1-Trichloroethane	0.477	0.461	3.2
Carbon Tetrachloride	0.434	0.455	4.8
Vinyl Acetate	0.723	0.890	23.2
Bromodichloromethane	0.627	0.666	6.2
1,2-Dichloropropane	* 0.398	0.397	0.3 *
cis-1,3-Dichloropropene	0.304	0.332	9.1
Trichloroethene	0.356	0.367	3.2
Dibromochloromethane	0.441	0.459	4.2
1,1,2-Trichloroethane	0.281	0.274	2.5
Benzene	1.226	1.333	8.7
trans-1,3-Dichloropropene	0.691	0.742	7.4
Bromoform	# 0.293	0.303	3.5 #
4-Methyl-2-Pentanone	0.511	0.662	29.7
2-Hexanone	0.579	0.717	23.7
Tetrachloroethene	0.467	0.505	8.1
1,1,2,2-Tetrachloroethane	# 0.531	0.615	15.9 #
Toluene	* 0.923	0.961	4.1 *
Chlorobenzene	# 1.005	1.095	8.9 #
Ethylbenzene	* 0.486	0.539	10.8 *
Styrene	2.278	2.460	8.0
Xylenes (total)	1.344	1.300	3.3
Toluene-d8	1.204	1.225	1.8
Bromofluorobenzene	0.688	0.759	10.3
1,2-Dichloroethane-d4	1.645	1.895	15.2

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Instrument ID: EXTR1 Calibration Date: 10/31/88 Time: 13:53

Lab File ID: OCT31CC Init. Calib. Date(s): 10/24/88 10/24/88

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

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) is 25.0%

COMPOUND	RRF	RRF50	%D
Chloromethane	# 0.471	0.464	1.7 #
Bromomethane	0.527	0.464	12.0
Vinyl Chloride	* 0.613	0.508	17.2 *
Chloroethane	0.268	0.439	63.8
Methylene Chloride	1.644	2.012	22.3
Acetone	0.999	1.481	48.3
Carbon Disulfide	8.932	8.855	0.9
1,1-Dichloroethene	* 1.343	1.571	17.0 *
1,1-Dichloroethane	# 3.135	3.948	25.9 #
1,2-Dichloroethene (total)	1.693	2.340	38.3
Chloroform	* 4.028	4.318	7.2 *
1,2-Dichloroethane	2.111	2.919	38.3
2-Butanone	0.068	0.082	19.5
1,1,1-Trichloroethane	0.477	0.527	10.5
Carbon Tetrachloride	0.434	0.516	18.9
Vinyl Acetate	0.723	0.940	30.1
Bromodichloromethane	0.627	0.708	13.0
1,2-Dichloropropane	* 0.398	0.431	8.2 *
cis-1,3-Dichloropropene	0.304	0.378	24.4
Trichloroethene	0.356	0.407	14.4
Dibromochloromethane	0.441	0.525	19.1
1,1,2-Trichloroethane	0.281	0.330	17.5
Benzene	1.226	1.405	14.6
trans-1,3-Dichloropropene	0.691	0.804	16.4
Bromoform	# 0.293	0.363	23.9 #
4-Methyl-2-Pentanone	0.511	0.735	43.9
2-Hexanone	0.579	0.778	34.3
Tetrachloroethene	0.467	0.557	19.3
1,1,2,2-Tetrachloroethane	# 0.531	0.665	25.3 #
Toluene	* 0.923	1.009	9.3 *
Chlorobenzene	# 1.005	1.167	16.2 #
Ethylbenzene	* 0.486	0.594	22.3 *
Styrene	2.278	2.550	12.0
Xylenes (total)	1.344	1.468	9.2
Toluene-d8	1.204	1.346	11.8
Bromofluorobenzene	0.688	0.696	1.1
1,2-Dichloroethane-d4	1.645	2.146	30.5

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Instrument ID: EXTR1 Calibration Date: 11/ 2/88 Time: 11:19

Lab File ID: NOV02CC Init. Calib. Date(s): 10/24/88 10/24/88

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

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) is 25.0%

COMPOUND	RRF	RRF50	%D
Chloromethane	# 0.471	0.474	0.5 #
Bromomethane	0.527	0.531	0.6
Vinyl Chloride	* 0.613	0.572	6.7 *
Chloroethane	0.268	0.288	7.6
Methylene Chloride	1.644	1.758	6.9
Acetone	0.999	1.155	15.7
Carbon Disulfide	8.932	8.673	2.9
1,1-Dichloroethene	* 1.343	1.387	3.3 *
1,1-Dichloroethane	# 3.135	3.289	4.9 #
1,2-Dichloroethene (total)	1.693	1.815	7.2
Chloroform	* 4.028	4.143	2.9 *
1,2-Dichloroethane	2.111	2.202	4.3
2-Butanone	0.068	0.081	19.1
1,1,1-Trichloroethane	0.477	0.587	23.1
Carbon Tetrachloride	0.434	0.528	21.5
Vinyl Acetate	0.723	1.004	38.9
Bromodichloromethane	0.627	0.701	11.9
1,2-Dichloropropane	* 0.398	0.441	10.8 *
cis-1,3-Dichloropropene	0.304	0.351	15.5
Trichloroethene	0.356	0.399	12.2
Dibromochloromethane	0.441	0.470	6.6
1,1,2-Trichloroethane	0.281	0.311	10.9
Benzene	1.226	1.312	7.0
trans-1,3-Dichloropropene	0.691	0.761	10.1
Bromoform	# 0.293	0.312	6.5 #
4-Methyl-2-Pentanone	0.511	0.606	18.8
2-Hexanone	0.579	0.650	12.3
Tetrachloroethene	0.467	0.526	12.8
1,1,2,2-Tetrachloroethane	# 0.531	0.556	4.7 #
Toluene	* 0.923	0.946	2.5 *
Chlorobenzene	# 1.005	1.059	5.4 #
Ethylbenzene	* 0.486	0.521	7.2 *
Styrene	2.278	2.370	4.0
Xylenes (total)	1.344	1.341	0.2
Toluene-d8	1.204	1.283	6.6
Bromofluorobenzene	0.688	0.719	4.6
1,2-Dichloroethane-d4	1.645	1.757	6.8

VOLATILE CONTINUING CALIBRATION CHECK

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: E82-3475SAS No.: SDG No.:

Instrument ID: EXTR1 Calibration Date: 11/22/88 Time: 9:09

Lab File ID: NOV22CC Init. Calib. Date(s): 11/20/88 11/20/88

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

Min RRF50 for SPCC(#) = 0.300 (0.250 for Bromoform) Max %D for CCC(*) is 25.0%

COMPOUND	RRF	RRF50	%D
Chloromethane	# 0.725	0.415	42.7 #
Bromomethane	0.907	0.464	48.9
Vinyl Chloride	* 0.527	0.575	9.1 *
Chloroethane	0.315	0.587	86.3
Methylene Chloride	1.636	1.547	5.4
Acetone	0.626	0.529	15.5
Carbon Disulfide	5.262	5.100	3.1
1,1-Dichloroethene	* 1.057	1.028	2.8 *
1,1-Dichloroethane	# 3.218	2.603	19.1 #
1,2-Dichloroethene (total)	1.937	1.370	29.2
Chloroform	* 4.671	4.031	13.7 *
1,2-Dichloroethane	2.858	2.284	20.1
2-Butanone	0.068	0.049	28.3
1,1,1-Trichloroethane	0.506	0.527	4.3
Carbon Tetrachloride	0.489	0.391	20.1
Vinyl Acetate	1.763	2.086	18.3
Bromodichloromethane	0.767	0.785	2.4
1,2-Dichloropropane	* 0.535	0.513	4.2 *
cis-1,3-Dichloropropene	0.447	0.340	23.9
Trichloroethene	0.422	0.396	6.1
Dibromochloromethane	0.588	0.429	27.1
1,1,2-Trichloroethane	0.388	0.380	2.2
Benzene	1.448	1.385	4.4
trans-1,3-Dichloropropene	0.947	0.824	13.0
Bromoform	# 0.398	0.367	7.7 #
4-Methyl-2-Pentanone	0.607	0.354	41.6
2-Hexanone	0.860	0.582	32.3
Tetrachloroethene	0.527	0.345	34.6
1,1,2,2-Tetrachloroethane	# 0.715	0.513	28.3 #
Toluene	* 1.157	0.921	20.4 * ok
Chlorobenzene	# 1.308	1.317	0.7 #
Ethylbenzene	* 0.614	0.342	44.3 *
Styrene	3.075	1.893	38.4
Xylenes (total)	1.616	0.989	38.8
Toluene-d8	1.508	1.265	16.1
Bromofluorobenzene	0.961	0.755	21.4
1,2-Dichloroethane-d4	2.324	1.973	15.1

SOP WORK SHEETS FOR VOLATILES

BLANKS

SAMPLE NO	DATE ANALYZED	TIME ANALYZED	APPROPRIATE METHOD BLANK FOR EACH GC/MS SYSTEM		BLANK ANALYSIS EVERY 12 HOURS OR EVERY 20 SAMPLES		CRITERIA OF <5XCRDL FOR MELTHYLENE CHLORIDE, ACETONE AND TOLUENE MET		CRITERIA OF < CRDL FOR ALL OTHER HSL COMPOUNDS MET		ACTION
			YES	NO	YES	NO	YES	NO	YES	NO	
RGNTB	10/25/88	10:29	X		X		X			X	1, ~~X~~
RGNTB	10/26/88	11:00	X		X		X			X	3
RGNTB	10/31/88	14:40	X		X		X			X	4
RGNTB	11/2/88	12:53	X		X		X			X	5
RGNTB	11/22/88	11:38	X		X		X			X	6, 7, 8,

1. chloroform (9ug/l) → 45ug/l
~~2. Toluene (1.8ug/l) → 8ug/l~~
3. chloroform (11ug/l) → 55ug/l
4. chloroform (9ug/l) → 45ug/l
5. Chloroform (12ug/l) 60 ug/l
6. Methylene Chloride (5ug/l) → 50ug/l
7. Chloroform (11ug/l) → 55ug/l
8. Toluene (6ug/l) 60ug/l

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Lab File ID: OCT25LB Lab Sample ID:

Date Analyzed: 10/25/88 Time Analyzed: 10:29

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

Instrument ID: EXTR1

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

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	TRIP BLA		OCT25A01	13:55
2	FIELD BL		OCT25A02	14:30
3	43-87		OCT25A03	15:17
4	52-87		OCT25A04	15:53
5	45-87		OCT25A05	16:28
6	70-86		OCT25A06	17:05
7	70-86		OCT25A07	17:39
8	70-86MS		OCT25A08	18:14
9	70-86MSD		OCT25A09	18:51
10				
11				
12				
13				
14				
15				
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30				

COMMENTS:

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

REAGEN

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT25LB

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

% Moisture: not dec. 100. Date Analyzed: 10/25/88

Column: (pack/cap) CAP 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	9.	
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	~~0.8~~ 5	~~J~~ U
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylenes (total)	5.	U

4A

VOLATILE METHOD BLANK SUMMARY

Name: GLAB Contract:

Code: GLAB Case No.: SAS No.: SDG No.:

File ID: OCT26LB Lab Sample ID:

Analyzed: 10/26/88 Time Analyzed: 11:00

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

rument ID: EXTR1

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

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	43-87		OCT26	13:00
2	TRIP BLA		OCT26A01	13:46
3	FIELD BL		OCT26A02	14:13
4	55-86		OCT26A03	14:49
5	55-86D		OCT26A04	15:24
6	69-86		OCT26A05	16:00
7	4-87		OCT26A06	16:34
8	4-87		OCT26A07	17:09
9	4-87 MS		OCT26A08	17:45
10	4-87 MSD		OCT26A09	18:20
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ENTS:

VOLATILE METHOD BLANK SUMMARY

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Lab File ID: OCT31LB Lab Sample ID:

Date Analyzed: 10/31/88 Time Analyzed: 14:40

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

Instrument ID: EXTR1

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

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	FIELD BL		OCT3107	18:50
2	TRIP BLA		OCT3108	19:24
3	9-74		OCT3109	19:58
4	10-74		OCT3110	20:33
5	3-87		OCT3111	21:08
6	8-87		OCT3112	21:42
7	TRIP BLA		OCT3113	22:16
8	FIELD BL		OCT3114	22:50
9	1-87		OCT3115	23:24
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COMMENTS:

1A

EPA SAMPLE NO.

VOLATILE ORGANICS ANALYSIS DATA SHEET

REAGEN

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: OCT31LB

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

% Moisture: not dec. 100. Date Analyzed: 10/31/88

Column: (pack/cap) CAP 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	9.	
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	Xylenes (total)	5.	U

4A

VOLATILE METHOD BLANK SUMMARY

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

Lab File ID: NOV02LB Lab Sample ID:

Date Analyzed: 11/ 2/88 Time Analyzed: 12:53

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

Instrument ID: EXTR1

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

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	9-74		NOV0201	13:48
2	10-74		NOV0202	14:18
3	3-87		NOV0203	14:57
4				
5				
6				
7				
8				
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COMMENTS:

1A

VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

REAGEN

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: SAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: NOV02LB

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

% Moisture: not dec. 100. Date Analyzed: 11/ 2/88

Column: (pack/cap) CAP 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	12.	
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	Xylenes (total)	5.	U

VOLATILE METHOD BLANK SUMMARY

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: E88-3475SAS No.: SDG No.:

Lab File ID: NOV22LB Lab Sample ID:

Date Analyzed: 11/22/88 Time Analyzed: 11:38

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

Instrument ID: EXTR1

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

	EPA SAMPLE NO.	LAB SAMPLE ID	LAB FILE ID	TIME ANALYZED
1	2-87		NOV2206	17:22
2	62-86		NOV2207	17:57
3	5-87		NOV2208	18:32
4	TRIP BL		NOV2209	19:07
5	FIELD BL		NOV2210	19:42
6				
7				
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9				
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COMMENTS:

RGNT B

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: E3G-3475GAS No.: SDG No.:

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

Sample wt/vol: 5. (g/mL) ML Lab File ID: NOV22LB

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

% Moisture: not dec. 100. Date Analyzed: 11/22/88

Column: (pack/cap) CAP 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.	
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	11.	
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	6.	
108-90-7	Chlorobenzene	5.	U
100-41-4	Ethylbenzene	5.	U
100-42-5	Styrene	5.	U
1330-20-7	Xylenes (total)	5.	U

SOP WORK SHEETS FOR VOLATILES

SURROGATES

SAMPLE NO.*	BLANK SURROGATES CRITERIA MET		IF "NO" WERE ALL ASSOCIATED SAMPLES RE-PURGED		SAMPLE SURROGATE RECOVERIES MET CRITERIA		IF "NO" WAS SAMPLE RE-PURGED		RE-PURGED SAMPLE MET CRITERIA		SURROGATES OUTSIDE CRITERIA	ACTION
	YES	NO	YES	NO	YES	NO	YES	NO	YES	NO		
BI	X											
BI	X											
87						X	X	Dil	X		Tol, BFB	~~Reject all data except~~ reject all non detects R
87					X							
87					X							
86					X							
86					X							
86 MS					X							
86 MSD					X							
87					X							
Blank	X											
Blank	X											
86					X							
86D					X							
86					X							
87					X							
87					X							
87 MS					X							
87 MSD						X		X			Tol	
TB 10/25	X											
TB 10/26	X											

all + values J all non detects R 87, 147, 207, 287 (Rerun, Diluted)

estimate reject MSD Data for 4-87

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

WATER VOLATILE SURROGATE RECOVERY

Lab Name: GLAB Contract:

Lab Code: GLAB Case No.: E88-3475 SAS No.: SDG No.:

	EPA SAMPLE NO.	S1 (TOL)#	S2 (BFB)#	S3 (DCE)#	OTHER	TOT OUT
1	RGNT B	108	96	97		0
2	2-87	95	103	88		0
3	62-86	98	91	86		0
4	5-87	104	93	89		0
5	TRIP BL	91	99	94		0
6	FIELD BL	93	101	93		0
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	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 Rev.

THIRD QUARTER 1988 GROUNDWATER MONITORING WELL REPORT

This enclosure contains the Radiochemisrty laboratory data for Tritium, Gross Alpha, and Gross Beta for Area 2, 881 Hillside, of third quarter 1988 groundwater monitoring wells. Thirty-four wells were checked for this area in the third quarter. A total of seventeen wells were actually sampled with sixteen wells coming up dry. Well 59-86 could not be sampled due to a broken casing. Table 1 contains a listing of the wells sampled as well as the dry wells. Wells with an * next to them were only sampled for volatile organics due to the lack of water volume in the well.

Trip and field blanks were picked up in this area of sampling. No field duplicate well was sampled for this area. An equipment blank was sampled for all analytes except the volatile organics.

This report summarizes the analytical results with no attempt to assess the levels of the analytes found.

Each analyte is analyzed by a documented laboratory procedure (L-procedure) that is controlled by the Quality Laboratory. The L-procedure gives a technical and comprehensive description of the Quality Assurance (QA) involved including standards, spikes, duplicates, and data handling. Some QA will be reported in each section as it pertains to the particular analysis. The QA data is retained with the raw data in the General Laboratory main report file system.

The sampling for groundwater monitoring wells is performed by the General Laboratory personnel. The sampling outline is contained in the Sampling Procedure for the Groundwater Monitoring Program L-procedure. The sample logging and tracking system is outlined in the Sample Administration-General Laboratory L-procedure.

Three different types of blanks for QA are picked up in the field and submitted as actual samples. These include a trip blank (TB) which consists of sample bottles filled with deionized water in the lab, sealed and transported into and out of the field during sampling. A field blank (FB) consists of a set of sample bottles filled with deionized water in the field at a well location that was sampled that day. An equipment blank (EB) consists of a deionized water rinse of the sample equipment after it has been cleaned and rinsed. A duplicate well is a second full set of sample bottles that are filled at a well after the original sampling. This field duplicate well is referred to as the well number followed by a "D".

TABLE 1

WELLS SAMPLED FOR AREA 2 OF 3RD QUARTER 1988

Sampled	Dry
9-74	16-74
10-74	57-86
56-86	58-86
61-86*	63-86
62-86	64-86
69-86	65-86
70-86	68-86
1-87*	44-87
2-87	47-87
3-87	48-87
4-87	49-87
5-87	50-87
6-87*	51-87
8-87	53-87
43-87	54-87
45-87	55-87
52-87	
	59-86**

* VOAS ONLY COLLECTED
** CASING BROKE

RADIOCHEMICAL ANALYSES

Gross Alpha/Gross Beta Analyses

Gross alpha and gross beta activities are measured by evaporating an aliquot of the sample onto a planchet and counting the alpha and beta activities in a gas flow proportional counter. Couting efficiencies for both alpha and beta particles are determined from a counting efficiency vs solids weight curve. These curves were determined using plutonium-239 for the alpha efficiency curve and a solution of strontium-90, yttrium-90 for the beta efficiency curve.

The theoretical minimum detectable activity (MDA) for the analysis method is based on the detector background, detector efficiency, count time and volume of sample analyzed. The solids concentration in the sample is generally the limiting factor because the aliquot size analyzed must be chosen so that the residue weight on the planchet will not exceed 100 mg. The MDA for each analysis is calculated and if the observed result is less than the MDA, the MDA is also reported.

Quality assurance and quality control for gross alpha and gross beta analyses are provided by the following methods:

1) Two planchets are prepared for each sample. The two counts must agree within the uncertainty associated with counting statistics or the sample is reanalyzed.

2) Ten percent of the samples are analyzed in duplicate and both results are reported. Such duplicate analyses are designated as Lab Duplicates.

3) A control sample is analyzed with each batch of samples. The batch in which a sample was analyzed in denoted by the "Batch #" and the corresponding control sample data for each batch is given in the "QA/QC Data" section of the report.

3) Additional measurement control samples, submitted by an independent lab, are analyzed periodically. The data for these analyses are available in the archives.

The lower MDAs and uncertainties for this quarter's gross alpha and gross beta data as compared to previous quarter's analyses can be attributed to the new analysis method, in which the alpha and beta activity were determined simultaneously. This enabled the count time to be twice as long as that used in previous analyses.

Tritium Analyses

Tritium, as tritiated water, is separated from the sample matrix by distillation and is quantified by liquid scintillation counting. The theoretical minimum detectable activity (MDA) for this analysis method is a function of the detector background, detector efficiency, count time and the volume of sample analyzed. The MDA is calculated for each analysis and if the observed result is less than the MDA, the activity is reported as less than the MDA.

Quality assurance and quality control for tritium analyses are provided by the following methods:

1) Each sample vial is counted twice and the average is used to calculate the reported activity. The two counts must agree within counting statistics or the sample is reanalyzed.

2) A control sample is analyzed with each batch of samples. The batch in which a sample was analyzed is denoted by the "Batch #" and the corresponding control sample data for each batch is given in the "QA/QC Data" section of the report.

3) Ten percent of the samples are analyzed in duplicate and both results are reported. The duplicate analyses are designated as a Lab Duplicate.

4) Additional control samples, submitted by an independent lab (IMECS and EPA-EMSL-LV), are analyzed periodically. Data from these analyses are available in the archives.

Isotopic Analyses

Plutonium, uranium and americium isotopes are analyzed using ion-exchange and solvent extraction to isolate the isotopes of interest, followed by electrodeposition onto counting planchets, and analysis by alpha spectroscopy. A reagent blank is analyzed with each sample batch and the sample activity is corrected for reagent blank activity based on historical reagent blank analyses. A control sample is also analyzed with each sample batch. The sample batch in which a sample was analyzed is denoted by the "Batch #" and the corresponding control sample data is given in the "QA/QC Data" section of the report.

The MDA for this analysis method is dependent on detector background, uncertainty of the reagent blank activity, chemical recovery and volume of sample analyzed. The MDA for each analysis is calculated, and if the sample activity is less than the MDA, the MDA is also reported.

The uncertainties, denoted as +/- in this report, were calculated by propagation of the errors due to counting statistics and are stated at the two sigma level.

3rd Quarter Groundwater Report

E88-2939

Well Number		56-86			70-86		
Sample Date		7-14-88		Batch #	7-14-88		Batch #
Gross Alpha	(pCi/l)	2 +/- 1	(MDA 4)	AB-1	1 +/- 1	(MDA 2)	AB-1
Gross Beta	(pCi/l)	4 +/- 3	(MDA 8)	AB-1	6 +/- 2		AB-1
Pu-239,240	(pCi/l)	0.00 +/- 0.04	(MDA 0.10)	ISO-71	0.00 +/- 0.04	(MDA 0.11)	ISO-71
Am-241	(pCi/l)	0.02 +/- 0.09	(MDA 0.51)	ISO-83	0.00 +/- 0.09	(MDA 0.56)	ISO-83
U-233,234	(pCi/l)	0.04 +/- 0.10	(MDA 0.28)	ISO-71	0.27 +/- 0.12		ISO-71
U-235	(pCi/l)	0.00 +/- 0.03	(MDA 0.08)	ISO-71	0.01 +/- 0.04	(MDA 0.07)	ISO-71
U-238	(pCi/l)	0.00 +/- 0.14	(MDA 0.44)	ISO-71	0.19 +/- 0.16	(MDA 0.41)	ISO-71
Tritium	(pCi/l)	<2.0 * E2	(MDA)	H3-04	<2.0 * E2	(MDA)	H3-04

Well Number		2-87			62-86		
Sample Date		7-14-88		Batch #	7-15-88		Batch #
Gross Alpha	(pCi/l)	11 +/- 3		AB-5	5 +/- 1		AB-2
Gross Beta	(pCi/l)	6 +/- 2		AB-5	6 +/- 1		AB-2
Pu-239,240	(pCi/l)	0.00 +/- 0.04	(MDA 0.10)	ISO-71	0.00 +/- 0.11	(MDA 0.20)	ISO-99
Am-241	(pCi/l)	0.00 +/- 0.08	(MDA 0.29)	ISO-97	0.00 +/- 0.17	(MDA 0.59)	ISO-74
U-233,234	(pCi/l)	9.2 +/- 0.9		ISO-71	3.9 +/- 0.4		ISO-74
U-235	(pCi/l)	0.13 +/- 0.05		ISO-71	0.10 +/- 0.04	(MDA 0.19)	ISO-74
U-238	(pCi/l)	4.2 +/- 0.5		ISO-71	3.3 +/- 0.4		ISO-74
Tritium	(pCi/l)	(2.3 +/- 0.9)*E2		H3-04	<2.2 * E2	(MDA)	H3-05

Well Number		4-87			TB		
Sample Date		7-15-88		Batch #	7-19-88		Batch #
Gross Alpha	(pCi/l)	37 +/- 6		AB-4	9 +/- 1 **		AB-4
Lab Duplicate					0 +/- 1		AB-16
Gross Beta	(pCi/l)	30 +/- 4		AB-4	13 +/- 2 **		AB-4
Lab Duplicate					-1 +/- 1		AB-16
Pu-239,240	(pCi/l)	0.00 +/- 0.04	(MDA 0.09)	ISO-99	0.00 +/- 0.04	(MDA 0.10)	ISO-99
Am-241	(pCi/l)	0.00 +/- 0.17	(MDA 0.65)	ISO-74	0.00 +/- 0.17	(MDA 0.85)	ISO-74
U-233,234	(pCi/l)	19 +/- 2		ISO-74	0.00 +/- 0.10	(MDA 0.25)	ISO-74
U-235	(pCi/l)	0.55 +/- 0.10		ISO-74	0.00 +/- 0.03	(MDA 0.07)	ISO-74
U-238	(pCi/l)	14 +/- 1		ISO-74	0.00 +/- 0.14	(MDA 0.39)	ISO-74
Tritium	(pCi/l)	<2.1 * E2	(MDA)	H3-07	<2.1 * E2	(MDA)	H3-07

** Sample may have been contaminated during the analysis. Note the rerun.

3rd Quarter Groundwater Report

E88-2939

Well Number	FB			69-86		
Sample Date	7-19-88		Batch #	7-19-88		Batch #
Gross Alpha (pCi/l)	0 +/- 1	(MDA 2)	AB-2	8 +/- 3		AB-5
Gross Beta (pCi/l)	-1 +/- 2	(MDA 4)	AB-2	9 +/- 3		AB-5
Pu-239,240 (pCi/l)	0.00 +/- 0.04	(MDA 0.09)	ISO-99	0.00 +/- 0.06	(MDA 0.13)	ISO-99
Am-241 (pCi/l)	0.05 +/- 0.17	(MDA 0.54)	ISO-74	0.00 +/- 0.17	(MDA 0.62)	ISO-74
U-233,234 (pCi/l)	0.02 +/- 0.10	(MDA 0.29)	ISO-74	10 +/- 1		ISO-74
U-235 (pCi/l)	0.00 +/- 0.03	(MDA 0.08)	ISO-74	0.19 +/- 0.06		ISO-74
U-238 (pCi/l)	0.04 +/- 0.15	(MDA 0.45)	ISO-74	7.1 +/- 0.7		ISO-74
Tritium (pCi/l)	<2.1 * E2	(MDA)	H3-07	<2.0 * E2	(MDA)	H3-04

Well Number	52-87			10-74		
Sample Date	7-19-88		Batch #	7-20-88		Batch #
Gross Alpha (pCi/l)	39 +/- 5		AB-2	3 +/- 4	(MDA 8)	AB-2
Gross Beta (pCi/l)	23 +/- 4		AB-2	1 +/- 3	(MDA 8)	AB-2
Pu-239,240 (pCi/l)	0.01 +/- 0.08	(MDA 0.27)	ISO-75	0.00 +/- 0.07	(MDA 0.30)	ISO-75
Am-241 (pCi/l)	0.01 +/- 0.17	(MDA 0.99)	ISO-75	0.00 +/- 0.08	(MDA 0.44)	ISO-100B
U-233,234 (pCi/l)	28 +/- 3		ISO-100	6.2 +/- 0.6		ISO-75
U-235 (pCi/l)	0.53 +/- 0.22		ISO-100	0.21 +/- 0.06		ISO-75
U-238 (pCi/l)	19 +/- 2		ISO-100	4.5 +/- 0.5		ISO-75
Tritium (pCi/l)	<2.0 * E2	(MDA)	H3-03	<2.1 * E2	(MDA)	H3-07

Well Number	5-87			9-74		
Sample Date	7-20-88		Batch #	7-21-88		Batch #
Gross Alpha (pCi/l)	13 +/- 5		AB-2	15 +/- 4		AB-6
Lab Duplicate	12 +/- 5		AB-7	18 +/- 5		AB-6
Lab Duplicate	18 +/- 5		AB-16			
Gross Beta (pCi/l)	17 +/- 6		AB-2	11 +/- 3		AB-6
Lab Duplicate	18 +/- 5		AB-7	9 +/- 3		AB-6
Lab Duplicate	18 +/- 5		AB-16			
Pu-239,240 (pCi/l)	0.00 +/- 0.07	(MDA 0.23)	ISO-75	0.00 +/- 0.04	(MDA 0.12)	ISO-80
Am-241 (pCi/l)	0.11 +/- 0.17	(MDA 1.2)	ISO-75	0.00 +/- 0.10	(MDA 0.44)	ISO-108
U-233,234 (pCi/l)	14 +/- 1		ISO-100	12 +/- 1		ISO-80
U-235 (pCi/l)	0.29 +/- 0.07		ISO-100	0.28 +/- 0.07		ISO-80
U-238 (pCi/l)	8.2 +/- 0.9		ISO-100	8.6 +/- 0.9		ISO-80
Tritium (pCi/l)	<2.1 * E2	(MDA)	H3-07	<2.3 * E2	(MDA)	H3-24

3rd Quarter Groundwater Report

E88-2939

Well Number		43-87			3-87		
Sample Date		7-21-88		Batch #	7-22-88		Batch #
Gross Alpha	(pCi/l)	21 +/- 4		AB-5	2 +/- 1	(MDA 3)	AB-5
Gross Beta	(pCi/l)	21 +/- 4		AB-5	6 +/- 2		AB-5
Pu-239,240	(pCi/l)	0.00 +/- 0.04	(MDA 0.12)	ISO-80	0.00 +/- 0.04	(MDA 0.14)	ISO-80
Am-241	(pCi/l)	0.00 +/- 0.09	(MDA 0.47)	ISO-108	0.00 +/- 0.11	(MDA 0.60)	ISO-108
U-233,234	(pCi/l)	18 +/- 2		ISO-80	1.2 +/- 0.2		ISO-80
U-235	(pCi/l)	0.57 +/- 0.11		ISO-80	0.00 +/- 0.03	(MDA 0.07)	ISO-80
U-238	(pCi/l)	16 +/- 2		ISO-80	0.42 +/- 0.17		ISO-80
Tritium	(pCi/l)	<2.2 * E2	(MDA)	H3-23	<2.1 * E2	(MDA)	H3-07

Well Number		8-87			45-87		
Sample Date		7-22-88		Batch #	7-22-88		Batch #
Gross Alpha	(pCi/l)	8 +/- 3		AB-7	2 +/- 1	(MDA 3)	AB-5
Gross Beta	(pCi/l)	10 +/- 3		AB-7	14 +/- 2		AB-5
Pu-239,240	(pCi/l)	0.00 +/- 0.04	(MDA 0.12)	ISO-80	0.00 +/- 0.04	(MDA 0.13)	ISO-80
Am-241	(pCi/l)	0.01 +/- 0.09	(MDA 0.39)	ISO-80	0.00 +/- 0.12	(MDA 0.84)	ISO-108
U-233,234	(pCi/l)	1.6 +/- 0.2		ISO-80	1.3 +/- 0.2		ISO-80
U-235	(pCi/l)	0.04 +/- 0.04	(MDA 0.10)	ISO-80	0.02 +/- 0.04	(MDA 0.08)	ISO-80
U-238	(pCi/l)	0.45 +/- 0.17	(MDA 0.53)	ISO-80	0.79 +/- 0.20		ISO-80
Tritium	(pCi/l)	<2.2 * E2	(MDA)	H3-05	<2.1 * E2	(MDA)	H3-07

Well Number		EB		
Sample Date		7-22-88		Batch #
Gross Alpha	(pCi/l)	0 +/- 1	(MDA 2)	AB-5
Gross Beta	(pCi/l)	0 +/- 2	(MDA 4)	AB-5
Pu-239,240	(pCi/l)	0.02 +/- 0.04	(MDA 0.12)	ISO-80
Am-241	(pCi/l)	0.01 +/- 0.09	(MDA 0.96)	ISO-80 *
U-233,234	(pCi/l)	0.02 +/- 0.10	(MDA 0.21)	ISO-80
U-235	(pCi/l)	0.00 +/- 0.03	(MDA 0.06)	ISO-80
U-238	(pCi/l)	0.30 +/- 0.17	(MDA 0.33)	ISO-80
Tritium	(pCi/l)	<2.2 * E2	(MDA)	H3-06

* Chemical recovery < 30%

3rd Quarter Groundwater Report

Quality Assurance/Quality Control Data

E88-2939

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GROSS ALPHA/GROSS BETA CONTROL SAMPLE RESULTS

		Gross Alpha (pCi/l)		Gross Beta (pCi/l)	
Batch #	Control ID	Observed	Actual	Observed	Actual
AB-1	EPA 7/22/88	13 +/- 1	15	4 +/- 1	4
AB-2	EPA 7/22/88	12 +/- 1	15	4 +/- 1	4
AB-4	EPA 7/22/88	13 +/- 1 *	15	5 +/- 1	4
AB-5	EPA 7/22/88	13 +/- 1	15	7 +/- 1 *	4
AB-6	EPA 7/22/88	12 +/- 1	15	5 +/- 1	4
AB-7	EPA 9/23/88	9 +/- 1	8	10 +/- 1	10
AB-16	EPA 9/23/88	8 +/- 1	8	10 +/- 1	10

* Analysis failed QA tests.

Note: Participant average of EPA X-check 7/22/88 Alpha = 12 pCi/l
Beta = 6 pCi/l
9/23/88 Alpha = 8 pCi/l
Beta = 11 pCi/l

PLUTONIUM CONTROL SAMPLE RESULTS

		Plutonium-239 (d/m/ml)	
Batch #	Control ID	Observed	Actual
ISO-71	CSL 630135	4.38 +/- 0.56	5.0 +/- 0.2
		4.06 +/- 0.51	5.0 +/- 0.2
ISO-75	CSL 630135	5.15 +/- 0.56	5.0 +/- 0.2
		5.77 +/- 0.61	5.0 +/- 0.2
ISO-80	CSL 630135	4.32 +/- 0.56	5.0 +/- 0.2
		5.88 +/- 0.70	5.0 +/- 0.2
ISO-99	CSL 602479	6.11 +/- 0.74	6.2 +/- 0.1
	(0.25 ml)	6.21 +/- 0.76	6.2 +/- 0.1

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Quality Assurance/Quality Control Data

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AMERICIUM CONTROL SAMPLE RESULTS

Batch #	Control ID	Americium-241 (d/m/ml) Observed	Actual
ISO-74	CSL 630113	5.07 +/- 0.68	5.0 +/- 0.1
		5.09 +/- 0.69	5.0 +/- 0.1
ISO-75	CSL 630113	5.96 +/- 0.87	5.0 +/- 0.1
		5.36 +/- 0.90	5.0 +/- 0.1
ISO-80	CSL 630113	5.41 +/- 1.05	5.0 +/- 0.1
		5.71 +/- 1.02	5.0 +/- 0.1
ISO-83	CSL 630113	5.21 +/- 1.00	5.0 +/- 0.1
		5.29 +/- 1.06	5.0 +/- 0.1
ISO-97	CSL 630113	5.11 +/- 0.76	5.0 +/- 0.1
		4.76 +/- 1.05*	5.0 +/- 0.1
ISO-100B	CSL 630113	5.79 +/- 0.84	5.0 +/- 0.1
ISO-108	CSL 630113	5.13 +/- 0.79	5.0 +/- 0.1
		5.95 +/- 0.84	5.0 +/- 0.1

* Chemical recovery <30%

URANIUM CONTROL SAMPLE RESULTS

Batch #	Control ID	Uranium-234 (d/m/ml) Observed	Actual	Uranium-235 (d/m/ml) Observed	Actual	Uranium-238 (d/m/ml) Observed	Actual
ISO-71	CSL 620209	4.31 +/- 0.48	4.94 +/- 0.10	0.12 +/- 0.05	0.22 +/- 0.01	4.66 +/- 0.53	4.89 +/- 0.10
		5.13 +/- 0.55	4.94 +/- 0.10	0.12 +/- 0.05	0.22 +/- 0.01	5.35 +/- 0.58	4.89 +/- 0.10
ISO-74	CSL 620209	4.55 +/- 0.52	4.94 +/- 0.10	0.12 +/- 0.05	0.22 +/- 0.01	4.78 +/- 0.56	4.89 +/- 0.10
		4.89 +/- 0.53	4.94 +/- 0.10	0.25 +/- 0.06	0.22 +/- 0.01	4.70 +/- 0.53	4.89 +/- 0.10
ISO-75	CSL 620209	4.70 +/- 0.52	4.94 +/- 0.10	0.12 +/- 0.05	0.22 +/- 0.01	5.21 +/- 0.58	4.89 +/- 0.10
		5.32 +/- 0.57	4.94 +/- 0.10	0.19 +/- 0.06	0.22 +/- 0.01	5.29 +/- 0.58	4.89 +/- 0.10
ISO-80	CSL 620209	4.66 +/- 0.55	4.94 +/- 0.10	0.17 +/- 0.07	0.22 +/- 0.01	5.12 +/- 0.60	4.89 +/- 0.10
		4.77 +/- 0.52	4.94 +/- 0.10	0.22 +/- 0.07	0.22 +/- 0.01	4.98 +/- 0.56	4.89 +/- 0.10
ISO-100	CSL 620209	5.58 +/- 0.59	4.94 +/- 0.10	0.13 +/- 0.06	0.22 +/- 0.01	4.81 +/- 0.54	4.89 +/- 0.10
		5.25 +/- 0.55	4.94 +/- 0.10	0.22 +/- 0.06	0.22 +/- 0.01	5.56 +/- 0.60	4.89 +/- 0.10

3rd Quarter Groundwater Report

Quality Assurance/Quality Control Data

E88-2939

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TRITIUM CONTROL SAMPLE RESULTS

Control sample ID - CSL 630132

Batch #	Observed (pCi/l)	Standard (pCi/l)
H3-03	(1.1 +/- 0.1) * E3	1001 +/- 44
H3-04	(9.5 +/- 1.1) * E2	1000 +/- 44
H3-05	No control sample run.	
H3-06	(7.9 +/- 1.1) * E2	1000 +/- 44
H3-07	(9.3 +/- 1.1) * E2	999 +/- 44
H3-23	(1.0 +/- 0.1) * E3	974 +/- 43
H3-24	(9.5 +/- 1.2) * E2	974 +/- 43

Enclosure (4) to Rockwell
letter WL-5 dated 6/21/89,
page 1 of 9.

GENERAL LABORATORY

Laboratory Data

AREA 2 - 881 HILLSIDE

Fourth Quarter 1988 (E88-3369)

ROCKWELL INTERNATIONAL
AEROSPACE OPERATIONS
ROCKY FLATS PLANT
P.O. BOX 464
GOLDEN, COLORADO 80402-0464

APPROVED BY: _____
D. A. Blair
Sr. Analytical
Chemist

APPROVED BY: _____
M. W. Hume
QC/QA
Administrator

APPROVED BY: _____
T. H. Elmont
Manager,
General Chemistry

DISTRIBUTION:
K. Wegner (2)
C. L. Sundblad
File

FOURTH QUARTER 1988 GROUNDWATER MONITORING WELL REPORT

This enclosure contains the Atomic Absorption laboratory data for Area 2, 881 Hillside, of fourth quarter 1988 groundwater monitoring wells. Thirty-four wells were checked for this area in the fourth quarter. A total of fifteen wells were actually sampled with eighteen wells coming up dry. Well 59-86 had a cracked casing and was not sampled. Table 1 contains a listing of the wells sampled as well as the dry wells. Wells with an * next to them were only sampled for volatile organics due to the lack of water volume in the well.

Four sets of trip and field blanks were picked up in this area of sampling. A field duplicate well, labeled 56-86D, was also sampled for this area.

This report summarizes the analytical results with no attempt to assess the levels of the analytes found.

Each analyte is analyzed by a documented laboratory procedure (L-procedure) that is controlled by the Quality Laboratory. The L-procedure gives a technical and comprehensive description of the Quality Assurance (QA) involved including standards, spikes, duplicates, and data handling. Some QA will be reported in each section as it pertains to the particular analysis. The QA data is retained with the raw data in the General Laboratory main report file system.

The sampling for groundwater monitoring wells is performed by the General Laboratory personnel. The sampling outline is contained in the Sampling Procedure for the Groundwater Monitoring Program L-procedure. The sample logging and tracking system is outlined in the Sample Administration-General Laboratory L-procedure.

Two different types of blanks for QA are picked up in the field and submitted as actual samples. These include a trip blank (TB) which consists of sample bottles filled with deionized water in the lab, sealed and transported into and out of the field during sampling. A field blank (FB) consists of deionized water rinse of the sample equipment after it has been cleaned and rinsed in the field at a well location that was sampled that day. This was previously referred to as an Equipment Blank. A duplicate well is a second full set of sample bottles that are filled at a well after the original sampling. This field duplicate well is referred to as a well number followed by a "D".

TABLE 1

WELLS SAMPLED FOR AREA 2 OF 4TH QUARTER 1988

Sampled	Dry
9-74	16-74
10-74	57-86
56-86	58-86
62-86	61-86
69-86	63-86
70-86	64-86
1-87*	65-86
2-87	68-86
3-87	6-87
4-87	44-87
5-87	47-87
8-87	48-87
43-87*	49-87
45-87	50-87
52-87	51-87
	53-87
	54-87
	55-87
	59-86**

* VOAS ONLY COLLECTED
** CASING CRACKED

METALS BY ATOMIC ABSORPTION SPECTROSCOPY

LAB NUMBER: E88-3369
DATE: 05-15-89

Attached is the Fourth Quarter 1988 Well Report for Metals by Atomic Absorption (AA) Spectroscopy, containing analytical results for Lab Number E88-3369. Results were determined on filtered samples preserved to a pH of less than 2 with nitric acid. Analytical results are reported down to the Quantification Limit (QL), an estimate of the lowest detectable concentration having an acceptable degree of accuracy and precision. The Quantification Limit is always less than or equal to the Required Detection Limit (RDL). EPA SW-846 Digestion and Analytical Methods were used for each requested analyte, except for cesium (cesium is not on the Hazardous Substance List; therefore, no EPA methodology exists and routine furnace AA protocols are used). The table below summarizes this information.

ELEMENT	DIGESTION METHOD	ANALYTICAL METHOD	RDL mg/l	QL mg/l
Arsenic	7060	Furnace AA; 7060	0.010	0.005
Cesium	3020	Furnace AA	0.20	0.02
Lead	3020	Furnace AA; 7421	0.005	0.005
Mercury	7470	Cold Vapor AA; 7470	0.0002	0.0002
Potassium	3005	Flame AA; 7610	5.0	0.5
Selenium	7740	Furnace AA; 7740	0.005	0.005
Thallium	3020	Furnace AA; 7840	0.010	0.010

Results for all elements (except potassium) are given as Total Dissolved Metals. Potassium results are given as Dissolved Metal; all sample results are in milligrams per liter (mg/l). The "batch date" referred to is the date the sample was digested by the method used for a particular analyte.

All results are reported using significant figures in milligrams per liter (mg/l) using the following modifiers:

U: A sample result followed by a "U" indicates that no detectable amount of analyte was found in that sample.

J: A sample result followed by a "J" indicates that an estimated, detectable amount of analyte was found in the sample, but the concentration is less than or equal to the Quantification Limit for that analyte.

C: Note different batch date or use of Method of Standard Additions (MSA).

If a sample result is not followed by any letter modifier, then the concentration is above the Quantification Limit.

Samples are usually digested in groups of 15 to 20. Each digestion "batch" includes at least one laboratory duplicate of a sample and at least one (pre-digestion) spike of a sample. Results of laboratory duplicate samples with more than +/- 20% relative percent deviation are considered for re-analysis. Spiked sample recoveries outside of 75% to 125% are also considered for re-analysis. Spike recoveries and results for laboratory duplicates are included in the Well Report. Since four different digestions are performed on each sample, a sample spike is usually not performed for all seven analytes.

Spiking levels are given in the table below. Only percent recoveries are given in the Well Report table.

Analyte	mg/l
As	0.010
Cs	0.04
Hg	0.0010
K	5.0
Pb	0.010
Se	0.010
Tl	0.010

Each digestion batch also contains at least one Method Blank (an aliquot of mQ water that is carried through the digestion process) and at least one Method Spike (an aliquot of mQ water spiked with a known amount of analyte). Analytical results and recoveries for these two samples are monitored to ensure that the digestion was performed correctly. Sample results are corrected for any detectable amount of analyte found in the Method Blank. Data for Method Blanks and Method Spikes may be found on batch sheets and run sheets, but is not reported due to lack of an efficient reporting system.

All analytical data is quantitated directly against a calibration line with a correlation coefficient of 0.996 or greater. To determine the calibration line, at least three standards and a blank are used, with at least three readings of each. The calibration line is validated against an independent reference standard (an EPA standard for all analytes except cesium) periodically throughout the run. If the observed value of the reference standard is not within +/- 25% of its true value, the preceeding data is not considered acceptable and is re-run. Calibration and validation data may be found in the raw data, but is not reported due to lack of an efficient reporting system.

COMMENTS

General Comments

The Zeeman AA spectrometer, commonly used for the analysis of arsenic, lead, selenium, and thallium in well samples, experienced catastrophic failure over the weekend of 2-17-89 and was out of service until the end of March. This problem prevented us from completing the analysis of Fourth Quarter 1988 well samples by the end of March. At that time we switched the analysis of lead and thallium over to another AA spectrometer which uses continuum background correction. We delayed using this spectrometer for arsenic or selenium analyses since Zeeman background correction is often recommended for these analytes; however, we did perform some selenium analyses using the continuum background correction system without incident.

During this same time period, AA laboratory personnel were investigating problems in the determination of beryllium in stack gas filter samples, and supporting the chromic acid spill investigation. We were also audited by Argonne National Laboratory during February and March. All of these activities interrupted our routine work and also encouraged some procedural changes.

During March, several controlled experiments were performed to determine the source of an apparent "lead contamination problem" pointed by the Argonne audit team. No definitive source of the "contamination" could be found. During April, we started performing analytical spikes on each sample to investigate possible matrix effects. We found a surprising number of well samples that had low recoveries for lead, and we re-analyzed these samples according to Full Method of Standard Additions, as described in EPA CLP SOW 7/87. All of these samples showed measurable concentrations of lead when this technique was used. We have also investigated the use of a variety of different matrix modifiers for lead analysis to compensate for these matrix effects, but with little success.

Anecdotal Record

Individual problems encountered in the analysis of Fourth Quarter 1988 well samples are discussed below. The letter in parenthese refers to a notation made in the Well Report Table.

(a) 9-74 (10-25-88) This well sample was analyzed for selenium several different times, yielding variable results as reported below.

Result mg/l	Batch Date	Analysis Date	Comments
0.61	1-16-89	1-17-89	1:10 dilution of digested sample
0.66	1-16-89	1-18-89	1:20 dilution of digested sample
0.92	1-16-89	1-27-89	1:50 dilution of digested sample
0.005U	1-30-89	2-01-89	1:50 pre-digestion dilution
0.90	2-15-89	3-14-89	1:50 dilution of digested sample;
0.95	2-15-89	3-14-89	not analyzed promptly due to catastrophic instrument failure

(b) 10-74 (10-25-88) This well sample was initially digested immediately prior to a catastrophic instrument failure. When the initial digestate was analyzed about six weeks after its preparation, it exhibited erratic spike recoveries. The sample was redigested on 4-10-89 and yielded the following results:

Analyte	mg/l	Comments
Pb	0.007	Full Method of Standard Additions result.
Tl	0.010U	
Cs	0.02U	

FOURTH QUARTER 1988 WELL REPORT
METALS BY ATOMIC ABSORPTION SPECTROSCOPY

LAB NUMBER: E88-3369
DATE: 05-15-89

SAMPLE ID:	TB	FB	45-87	45-87-S	45-87-LD	45-87LDS	52-87	70-86	70-86-S
SAMPLE DATE:	10-18-88	10-18-88	10-18-88	10-18-88	10-18-88	10-18-88	10-18-88	10-18-88	10-18-88
UNITS:	mg/l	mg/l	mg/l	% REC	mg/l	% REC	mg/l	mg/l	% REC
ELEMENT:									
Arsenic	0.005U	0.005U	0.005U				0.005U	0.005U	99
Selenium	0.005U	0.005U	0.005U				0.005U	0.005U	77
Batch Date:	01-05-89	01-05-89	01-05-89				01-05-89	01-05-89	01-05-89
Mercury	0.0002U	0.0002U	0.0002U				0.0002U	0.0002U	102
Batch Date:	10-31-88	10-31-88	10-31-88				10-31-88	10-31-88	10-31-88
Lead	0.005U	0.005U	0.005U		0.005U		0.005U	0.005U	90
Thallium	0.01U	0.01U	0.01U		0.01U		0.01U	0.01U	87
Cesium	0.02U	0.02U	0.02U		0.02U		0.02U	0.02U	113
Batch Date:	01-19-89	01-19-89	01-19-89		01-19-89		01-19-89	01-19-89	01-19-89
Potassium	0.5U	0.5U	11.4	82	11.6	82	1.6	4.6	
Batch Date:	10-27-88	10-27-88	10-27-88	10-27-88	10-27-88	10-27-88	10-27-88	10-27-88	

SAMPLE ID:	TB	FB	2-87	2-87-LD	56-86	56-86-S	56-86D	69-86	69-86-S
SAMPLE DATE:	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88
UNITS:	mg/l	mg/l	mg/l	mg/l	mg/l	% REC	mg/l	mg/l	% REC
ELEMENT:									
Arsenic	0.005U	0.005U	0.005U	0.005U	0.005U		0.005U	0.005U	
Selenium	0.005U	0.005U	0.005U	0.005U	0.005U		0.005U	0.077	
Batch Date:	01-05-89	01-05-89	01-05-89	01-05-89	01-16-89		01-16-89	01-16-89	
Mercury	0.0002U	0.0002U	0.0002U	0.0002U	0.0002U		0.0002U	0.0002U	108
Batch Date:	10-31-88	10-31-88	10-31-88	10-31-88	11-02-88		11-02-88	11-11-88	11-11-88
Lead	0.005U	0.005U	0.005U	0.005U	0.005U	120	0.005U	0.005U	
Thallium	0.01U	0.01U	0.01U	0.01U	0.01U	92	0.01U	0.01U	
Cesium	0.02U	0.02U	0.02U	0.02U	0.02U	113	0.02U	0.02U	
Batch Date:	01-19-89	01-19-89	01-19-89	01-19-89	01-19-89	01-19-89	01-19-89	01-19-89	
Potassium	0.5U	0.5U	1.9		1.8		1.9	2.0	
Batch Date:	10-27-88	10-27-88	10-27-88		10-27-88		10-27-88	10-27-88	

FOURTH QUARTER 1988 WELL REPORT
METALS BY ATOMIC ABSORPTION SPECTROSCOPY

LAB NUMBER: E88-3369
DATE: 05-15-89

SAMPLE ID:	62-86	62-86-S	62-86-LD	4-87	4-87-S	4-87-LD	4-87LD-S	5-87	5-87-LD
SAMPLE DATE:	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88	10-20-88
UNITS:	mg/l	% REC	mg/l	mg/l	% REC	mg/l	% REC	mg/l	mg/l
ELEMENT:									
Arsenic	0.005U		0.005U	0.005U				0.005U	
Selenium	0.044		0.044	0.058				0.028	
Batch Date:	01-16-89		01-16-89	01-16-89				01-16-89	
Mercury	0.0002U	100		0.0002U				0.0002U	0.0002U
Batch Date:	11-02-88	11-02-88		11-02-88				11-11-88	11-11-88
Lead	0.005U		0.005U	0.005U				0.005U	
Thallium	0.01U		0.01U	0.01U				0.01U	
Cesium	0.02U		0.02U	0.02U				0.02U	
Batch Date:	01-19-89		01-19-89	01-19-89				01-19-89	
Potassium	4.8			1.8	82	1.8	77	11	
Batch Date:	10-27-88			10-27-88	10-27-88	10-27-88	10-27-88	11-01-88	

SAMPLE ID:	TB	FB	FB-S	9-74	9-74-S	10-74	10-74-LD	8-87	3-87
SAMPLE DATE:	10-25-88	10-25-88	10-25-88	10-25-88	10-25-88	10-25-88	10-25-88	10-25-88	10-25-88
UNITS:	mg/l	mg/l	% REC	mg/l	% REC	mg/l	mg/l	mg/l	mg/l
ELEMENT:									
Arsenic	0.005U	0.005U	87	0.003J		0.005U		0.005U	0.005U
Selenium	0.005U	0.005U	100	(a)		3.2C	2.7	0.005U	0.005U
Batch Date:	01-16-89	01-16-89	01-16-89	01-16-89		01-16-89 C1-30-89	01-30-89	01-16-89	01-16-89
Mercury	0.0002U	0.0002U		0.0002U	95	0.0002U		0.0002U	0.0002U
Batch Date:	11-02-88	11-02-88		11-02-88	11-02-88	11-02-88		11-02-88	11-02-88
Lead	0.005U	0.005U		0.005U		(b)		0.005U	0.007
Thallium	0.01U	0.01U		0.01U		(b)		0.01U	0.01U
Cesium	0.02U	0.02U		0.02U		(b)		0.02U	0.02U
Batch Date:	02-01-89	02-01-89		02-01-89		04-10-89		02-01-89	02-01-89
Potassium	0.5U	0.5U		1.7		1.2		9.6	5.2
Batch Date:	11-01-88	11-01-88		11-01-88		11-01-88		11-01-88	10-27-88

FOURTH QUARTER 1988 WELL REPORT
METALS BY ATOMIC ABSORPTION SPECTROSCOPY

LAB NUMBER: E88-3369
DATE: 05-15-89

SAMPLE ID:	TB	FB	FB-S	FB-LD	FB-LD-S
SAMPLE DATE:	10-27-88	10-27-88	10-27-88	10-27-88	10-27-88
UNITS:	mg/l	mg/l	% REC	mg/l	% REC
ELEMENT:					
Arsenic	0.005U	0.005U	97		
Selenium	0.005U	0.005U	93		
Batch Date:	01-16-89	01-16-89	01-16-89		
Mercury	0.0002U	0.0002U			
Batch Date:	11-02-88	11-02-88			
Lead	0.005U	0.005U			
Thallium	0.01U	0.01U			
Cesium	0.02U	0.02U			
Batch Date:	02-01-89	02-01-89			
Potassium	0.5U	0.5U	96	0.5U	104
Batch Date:	11-01-88	11-01-88	11-01-88	11-01-88	11-01-88