Rockwell ER Program
Rocky Flats Plant

(06/15/89)

ER PROGRAM DATA ASSESSMENT SUMMARY REPORT FORM

Batch No. E88-2939/3rd Quarter 1988 **Site** Area 2 - 881 Hillside

Laboratory 881 **No. of Samples/Matrix** 21/Low Water

SOW # 10/86 Rev. 8/87 **Reviewer Org.** TechLaw, Inc.

Sample Numbers 56-86, 70-86, 2-87, 62-86, 6-87, 4-87, 4-87MS, 4-87MSD, TB7-18, FB7-18, 69-86, 61-86, 52-87, 10-74, 5-87, 9-74, 43-87, 1-87, 3-87, 8-87, 45-87.

Data Assessment Summary

		VOA	Comments
1.	Holding Times	V	
2.	GC/MS Tune/Instr. Perf.	R	Deviation of Statement of Work, page 2 Action Items
3.	Calibrations	A	See Action Items, page 2.
4.	Blanks	R	See Action Items, page 2.
5.	Surrogates	R	See Action Items discussion of 4-87MSD & MB7-31, page 2.
6.	Matrix Spike/Dup.	A	Surrogates Toluene-d8 and BFB out on 4-87MSD.
7.	Other QC	R	Twelve hour curve not met. See Action Items, page 2.
8.	Internal Standards	V	
9.	Compound Identification	V	
10.	System Performance	V	
11.	Overall Assessment	R	See Comments, page 3.

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: The data contained in this package have been reviewed and found to be rejected. Please refer to the Action Items and Comments sections on the following page(s).

ADMIN RECORD

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

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

A-OU01-000051

Action Items: 1) GC/MS Tune/Instrument Performance: The GC/MS tune criteria was not met because the BFB tune was performed simultaneously to the analysis of the method blank, before the BFB tune could be demonstrated separately. According to the case narrative, the BFB tune was run simultaneously with the first initial calibration standard run on 7/14/88. The Statement of Work for Organic Analysis 10/86 Section E page 10 paragraph 1.1.1 and 1.1.2 stipulates that BFB criteria must be met before any standards, samples or blanks are analyzed. The Statement of Work also stipulates that the tune must not be performed simultaneously with the analysis of any blanks or standards. The data for all standards, samples and blanks are rejected (R) because of these deviations.

2) Blanks: Acetone, chloroform, methylene chloride, and trichloroethene was found in all of the method blanks associated with this batch. The blank contaminants are a potential interference affecting the resolution and sensitivity of instrument tune. As a result, the data associated with these blanks are rejected (R).

3) Surrogates: The sample 4-87MSD had the surrogates toluene-d8 and BFB out of the contract required QC limits for percent recovery. A method blank (MB7-31) had the surrogate toluene-d8 out of the QC limit. Although positive results of samples would be flagged as "J" and negative results as "UJ" normally, neither of these samples were re-purged in order to meet the contract requirements. The Statement of Work (10/86) page E-19 paragraph 4.3.2 requires that surrogate recoveries out of specification be repurged, reinjected or reextracted. The Statement of Work for Organics Analysis page E-19 paragraph 4.3.1.4 requires that all method blank surrogate recoveries meet QC limits. These are additive problems to those Action Items discussed above, and as a result all data are rejected (R).

4) Other QC: The twelve hour frequency requirement for analyses run on 7/28/88 was exceeded for samples 43-87, 1-87, 3-87, 8-87 and 45-87. The Statement of Work for Organic Analysis 10/86 Section E page 10 paragraph 1.1.1 stipulates that the BFB criterion must be demonstrated daily or for each twelve hour time period, which ever is more frequent. As a result the data for the samples mentioned in this item are rejected (R).

5) Calibrations: Compounds with a % relative standard deviation >30% in an initial calibration were the following: SPCCs Chloromethane and Bromoform; CCCs Vinyl Chloride and 1,1-Dichloroethene; target compounds Bromomethane and Chloroethane. Positive values are estimated (J) and non-detects are estimated and undetected (UJ). The Continuing calibration of 7-19-88 has the following compounds with a (%D>25)

% difference: SPCC Chloromethane and target compound 2-Butanone. Samples affected are 56-86, 70-86, 2-87, 62-86, 6-87, 4-87, 4-87 duplicate, 4-87MS, and 4-87MSD. Positive values are estimated (J) and non-detects are estimated and undetected (UJ). Continuing calibration of 7/28/88 has the following compounds with a %D>25: SPCC Chloromethane, CCC 1,1-Dichloroethene, target compounds Bromomethane, Acetone, Vinyl acetate, 2-Hexanone and 1,2-Dichloroethane-d4. Samples affected are TB7-18, FB7-18, 69-86, 61-86, 52-87, 10-74, 5-87, 9-74, 43-87, 1-87, 3-87, 8-87, and 45-87. Positive values are estimated (J) and non-detects are estimated and undetected (UJ). Continuing calibration of 7/31/88 has the following compounds with a %D>25: SPCCs Chloromethane and 1,1,2,2-Tetrachloroethane; target compounds 2-Butanone, Vinyl acetate, Cis-1,3-Dichloropropene, 4-Methyl-2-pentanone, 2-Hexanone, Styrene and Xylenes (total). Samples affected are 10-74DL, 9-74DL and 43-87DL. Positive values are estimated (J) and non-detects are estimated and undetected (UJ).

Comments: Due to major problems with the GC/MS tune, blank contamination, method blank surrogate recovery, and sample surrogate recovery all data are rejected.

Note: Data Summary Tables are attached.

Anthony N. Toth
Reviewer Signature

6-15-89
Date

TABLE #: 1-E88-2939 **Page** 1 **of** 4

SITE NAME: Area 2 - 881 Hillside

SAMPLING DATE: 7/13, 7/14/88

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

Sample Location																
Sample Number		MB7-19	56-86		70-86		2-87		62-86		6-87		4-87		4-87	
Sampling Date			7/13/88		7/13/88		7/13/88		7/14/88		7/14/88		7/14/88		7/14/88	
Remarks		Method Blank													Duplicate	
Volatile Organic Compound	Detection Limit (ppb)			(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)
Chloromethane	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Bromomethane	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Vinyl Chloride	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Chloroethane	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Methylene Chloride	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Acetone	10	2 ppb	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Carbon Disulfide	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
1,1-Dichloroethene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
1,1-Dichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
1,2-Dichloroethene (Total)	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Chloroform	5	10 ppb	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
1,2-Dichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
2-Butanone	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
1,1,1-Trichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	4	R	4	R
Carbon Tetrachloride	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Vinyl Acetate	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Bromodichloromethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
1,2-Dichloropropane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
cis-1,3 Dichloropropene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Trichloroethene	5		5 U	R	5 U	R	5 U	R	5 U	R	15	R	33	R	33	R
Dibromochloromethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
1,1,2-Trichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Benzene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Trans-1,3-Dichloropropene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Bromoform	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
4-Methyl-2-pentanone	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
2-Hexanone	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R
Tetrachloroethene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	2	R	2	R
1,1,2,2-Tetrachloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Toluene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Chlorobenzene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Ethylbenzene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Styrene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Xylene (Total)	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R
Total volatile organic concentration (ppb)		12	0		0		0		0		15		39		39	

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

Form R-1

TABLE #: 1-E88-2939 **Page** 2 **of** 4

SITE NAME: Area 2 - 881 Hillside

SAMPLING DATE: 7/18, 7/19, 7/21/88

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

Sample Location																
Sample Number		MB7-28	TB7-18		FB7-18		69-86		61-86		52-87		10-74		10-74DL	
Sampling Date			7/18/88		7/18/88		7/18/88		7/18/88		7/18/88		7/19/88		7/19/88	
Remarks		Method Blank	Trip Blank		Field Blank										X50	
Volatile Organic Compound	Detection Limit (ppb)			(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)
Chloromethane	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
Bromomethane	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
Vinyl Chloride	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
Chloroethane	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
Methylene Chloride	5	2 ppb	4	R	43	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Acetone	10	4 ppb	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
Carbon Disulfide	5		5 U	R	5 U	R	5 U	R	11	R	5 U	R	5 U	R	250 U	R
1,1-Dichloroethene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
1,1-Dichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
1,2-Dichloroethene (Total)	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Chloroform	5	9 ppb	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	42	R	500	R
1,2-Dichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
2-Butanone	10		10 U	R	46	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
1,1,1-Trichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Carbon Tetrachloride	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	4700 E	R	4100	R
Vinyl Acetate	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
Bromodichloromethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
1,2-Dichloropropane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
cis-1,3 Dichloropropene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Trichloroethene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	1600 E	R	1000 U	R
Dibromochloromethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
1,1,2-Trichloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Benzene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Trans-1,3-Dichloropropene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Bromoform	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
4-Methyl-2-pentanone	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
2-Hexanone	10		10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	10 U	R	500 U	R
Tetrachloroethene	5		5 U	R	5 U	R	5 U	R	5 U	R	1	R	5 U	R	250 U	R
1,1,2,2-Tetrachloroethane	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Toluene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Chlorobenzene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Ethylbenzene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Styrene	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Xylene (Total)	5		5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	5 U	R	250 U	R
Total volatile organic concentration (ppb)		15	0		89		0		0		1		6342		5600	

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

Form R-1

TABLE #: 1-E88-2939 Page 3 of 4

SITE NAME: Area 2 - 881 Hillside

SAMPLING DATE: 7/19, 7/20, 7/21/88

CLP VOLATILE ORGANIC ANALYSIS: Low Water

ANALYTICAL RESULTS (ppb)

Sample Location																		
Sample Number		5-87		9-74		9-74DL		43-87		43-87DL		1-87		3-87		8-87		
Sampling Date		7/19/88		7/20/88		7/20/88		7/20/88		7/20/88		7/20/88		7/21/88		7/21/88		
Remarks						X100				X100								
Volatile Organic Compound	Detection Limit (ppb)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)		(DQ)	
Chloromethane	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
Bromomethane	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
Vinyl Chloride	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
Chloroethane	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
Methylene Chloride	5	2	R	5 U	R	500 U	R	46	R	280 U	R	2	R	5 U	R	4	R	
Acetone	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
Carbon Disulfide	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
1,1-Dichloroethene	5	5 U	R	1600 E	R	4100	R	920 E	R	19000	R	4	R	5 U	R	5 U	R	
1,1-Dichloroethane	5	5 U	R	14	R	500 U	R	370 E	R	390	R	5 U	R	5 U	R	5 U	R	
1,2-Dichloroethene (Total)	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Chloroform	5	5 U	R	2	R	920	R	2	R	920	R	5 U	R	5 U	R	5 U	R	
1,2-Dichloroethane	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
2-Butanone	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
1,1,1-Trichloroethane	5	5 U	R	6000 E	R	7200	R	3900 E	R	32000 E	R	14	R	5 U	R	5 U	R	
Carbon Tetrachloride	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Vinyl Acetate	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
Bromodichloromethane	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
1,2-Dichloropropane	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
cis-1,3 Dichloropropene	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Trichloroethene	5	5 U	R	5500 E	R	5400	R	4100 E	R	19000	R	5	R	2	R	5 U	R	
Dibromochloromethane	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
1,1,2-Trichloroethane	5	5 U	R	50	R	500 U	R	73	R	500 U	R	5 U	R	5 U	R	5 U	R	
Benzene	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Trans-1,3-Dichloropropene	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Bromoform	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
4-Methyl-2-pentanone	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
2-Hexanone	10	10 U	R	10 U	R	1000 U	R	10 U	R	1000 U	R	10 U	R	10 U	R	10 U	R	
Tetrachloroethene	5	5 U	R	2300 E	R	1500	R	4200 E	R	8700	R	4	R	2	R	5 U	R	
1,1,2,2-Tetrachloroethane	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Toluene	5	5 U	R	2	R	500 U	R	210 E	R	250	R	5 U	R	5 U	R	5 U	R	
Chlorobenzene	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Ethylbenzene	5	5 U	R	5 U	R	500 U	R	23	R	500 U	R	5 U	R	5 U	R	5 U	R	
Styrene	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Xylene (Total)	5	5 U	R	5 U	R	500 U	R	5 U	R	500 U	R	5 U	R	5 U	R	5 U	R	
Total volatile organic concentration (ppb)		2		15468		19620		13844		80540		29		4		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
R Valid
A Acceptable with qualifications
R Rejected, data unusable
E Exceeds calib. range; diluted & reanalyzed

Form R-1

TABLE #: 1-E88-2939 Page 4 of 4

SITE NAME: Area 2 - 881 Hillside

SAMPLING DATE: 7/21/88

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

Sample Location									
Sample Number		45-87		MB7-31					
Sampling Date		7/21/88							
Remarks				Method Blank					
Volatile Organic Compound	Detection Limit (ppb)		(DQ)						
Chloromethane	10	10 U	R						
Bromomethane	10	10 U	R						
Vinyl Chloride	10	10 U	R						
Chloroethane	10	10 U	R						
Methylene Chloride	5	2	R	2 ppb					
Acetone	10	10 U	R	8 ppb					
Carbon Disulfide	5	5 U	R						
1,1-Dichloroethene	5	5 U	R						
1,1-Dichloroethane	5	5 U	R						
1,2-Dichloroethene (Total)	5	5 U	R						
Chloroform	5	5 U	R	14 ppb					
1,2-Dichloroethane	5	5 U	R						
2-Butanone	10	10 U	R						
1,1,1-Trichloroethane	5	5 U	R						
Carbon Tetrachloride	5	5 U	R						
Vinyl Acetate	10	10 U	R						
Bromodichloromethane	5	5 U	R						
1,2-Dichloropropane	5	5 U	R						
cis-1,3 Dichloropropene	5	5 U	R						
Trichloroethene	5	5 U	R	1 ppb					
Dibromochloromethane	5	5 U	R						
1,1,2-Trichloroethane	5	5 U	R						
Benzene	5	5 U	R						
Trans-1,3-Dichloropropene	5	5 U	R						
Bromoform	5	5 U	R						
4-Methyl-2-pentanone	10	10 U	R						
2-Hexanone	10	10 U	R						
Tetrachloroethene	5	5 U	R						
1,1,2,2-Tetrachloroethane	5	5 U	R						
Toluene	5	5 U	R						
Chlorobenzene	5	5 U	R						
Ethylbenzene	5	5 U	R						
Styrene	5	5 U	R						
Xylene (Total)	5	5 U	R						
Total volatile organic concentration (ppb)		2		25					

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

Form R-1

SOP WORK SHEETS FOR VOLATILES

Area 2 - 881 Hillside 3rd QTR. 1988 Batch No. F88-2939

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
MB7-19			Low water	—	—	7-19-88	9:01	EXTREL	~~—~~		~~—~~		none
56-86				7-13-88	7-13-88		13:01						
70-86							13:30						
2-87							14:02						
62-86				7-14-88	7-14-88		14:33						
6-87							15:04						
4-87							15:35						
4-87 Dup.							16:07						
4-87 MS							16:38						
4-87 MSD							17:09						
MB7-28				—	—	7-28-88	7:32		—		—		
TB7-18				7-18-88	7-18-88	7-28-88	15:29						
FB7-18							15:58						
69-86							16:30						
61-86							17:02						
52-87							17:34						
10-74				7-19-88	7-19-88		18:05						
5-87							18:37						
9-74				7-20-88	7-20-88		19:09						
43-87							19:40						
1-87							20:12						
3-87				7-21-88	7-21-88		20:45						
8-87							21:17						
45-87							21:49						
MB7-31				—	—	7-31-88	7:29		—		—		

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

SOP WORK SHEETS FOR VOLATILES

HOLDING TIMES

SAMPLE NO *	PRESERVED		CONC. LEVEL / MATRIX	DATE SAMPLED	DATE RECEIVED	DATE ANALYZED	TIME ANALYZED	INSTRUMENT I.D.	CONTRACT HOLDING TIME MET		40 CFR. 136 HOLDING TIME MET		ACTION
	YES	NO							YES	NO	YES	NO	
10-74x50		↓	Low Water	7-19-88	7-19-88	7-31-88	10:35	EXTREL	↓		↓		none
9-74x100			↓	7-20-88	7-20-88	7-31-88	11:04	↓					↓
43-87x100		↓	↓	7-20-88	7-20-88	7-31-88	11:36	↓					

* 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	
MB7-19	7-19-88	9:01								All samples are unacceptable since BFB tune used blank samples for tuning - see comments in data assessment summary
56-86	↓	↓								
70-86										
2-87										
62-86										
6-87										
4-87										
4-87 Dup.										
4-87 MS										
4-87 MSD										
MB7-28	7-28-88	7:32								
TB7-18										
FB7-18										
69-86										
61-86										
52-87										
10-74										
5-87										
9-74										
43-87										Not satisfactory, see comments in data assessment form
1-87										
3-87										
8-87										
45-87										
MB7-31	7-31-88	7:29								

* 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	
10-74X50	↓	↓	↓				↓		↓	
9-74X100										
43-87X100										

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

SOP WORK SHEETS FOR VOLATILES

INITIAL CALIBRATION

SAMPLE NO.*	DATE	TIME	DESCRIBE CHROMATO-GRAPHIC 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	
MB7-19	7-14-88	6:25	None											Acceptable with qualifiers, all samples.
56-86	↓	↓	↓		↓		↓	↓			↓	↓		
70-86														
2-87														
62-86														
6-87														
4-87														
4-87 Dup.														
4-87 MS														
4-87 MSD														
MB7-28														
TB7-18														
FB7-18														
69-86														
61-86														
52-87														
10-74														
5-87														
9-74														
43-87														
1-87														
3-87														
8-87														
45-87														
MB7-31	↓	↓	↓		↓		↓	↓			↓	↓		

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

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	
10-74 x50	7-14-88	6:25			↓		↓	↓			↓	↓		
9-74 x100	↓	↓	↓		↓		↓	↓			↓	↓		
43-87 x100														

* 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	
MB7-19	7-19-88	11:27													
56-86															
70-86															
2-87															
62-86															
6-87															
4-87															
4-87 Dup															
4-87 MS															
4-87 MSD															
MB7-28	7-28-88	9:21													
TB7-18															
FB7-18															
69-86															
61-86															
52-87															
10-74															
5-87															
9-74															
43-87															
1-87															
3-87															
8-87															
45-87															
MB7-31	7-31-88	9:03													

Data for CC lends suspicion to BFB tune and usability.

* 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	
10-74x50	↓	↓		↓	↓		↓		↓			↓	↓		
9-74x100	↓	↓		↓	↓		↓		↓			↓	↓		
43-87x100	↓	↓		↓	↓		↓		↓			↓	↓		

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

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	
MB7-19	7-19-88	9:01	↓		↓		↓			↓	
MB7-28	7-28-88	7:32									
MB7-31	7-31-88	7:29	↓		↓		↓			↓	

Blank contaminants negates usability of BFB tunes.

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		
MB7-19							N/A		N/A			
56-86												
70-86												
2-87												
62-86												
6-87												
4-87												
4-87 Dup												
4-87 MS												
4-87 MSD	✓		N/A			✓		✓	N/A		Toluene-d_8 + BFB	R
MB7-28												
TB7-18												
FB7-18												
69-86												
61-86												
52-87												
10-74												
5-87												
9-74	✓		N/A			✓	✓		✓		All	Sample was diluted from high TCL concentrations.
43-87	✓		N/A			✓	✓		✓		Tol.-d_8, DCE	same as 9-74
1-87							N/A		N/A			
3-87												
8-87												
45-87												
MB7-31		✓		✓	✓		N/A		N/A		Toluene-d_8	R

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

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		
10-74 X50		↓		↓	↓		N/A		N/A			
9-74 X100							↓		↓			
43-87 X100		↓		↓	↓		↓		↓			

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

SOP WORK SHEETS FOR VOLATILES

MATRIX SPIKE / MATRIX SPIKE DUPLICATE

SAMPLE NO.*	MATRIX SPIKES FOR EVERY 20 SAMPLES		ADVISORY LIMITS FOR SPIKE RECOVERY MET		ADVISORY LIMITS FOR SPIKE RPDs MET		ACTION
	YES	NO	YES	NO	YES	NO	
4-87MS	✓		✓		N/A		
4-87MSD	✓		✓			✓	No action on RPD value

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

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	
					All samples results are rejected. See comments in data assessment summary. All TCL compounds were identified					N/A

SOP WORK SHEETS FOR VOLATILES

SYSTEM PERFORMANCE / OVERALL ASSESSMENT

SAMPLE NO.*	IDENTIFY FACTORS THAT INDICATE INSTRUMENT PERFORMANCE PROBLEMS (e.g. BASELINE SHIFTS, I.S. ABSOLUTE AREA CHANGES, ETC.)	OVERALL ASSESSMENT OF DATA FOR THE SAMPLE (e.g. U, J, R, N, QUALIFERS)
	Data for all samples has	
	been rejected due to deviation	
	from the statement of work etc.	
	See comments in the data	
	assessment form.	
	All TCL compounds were identified	
	without apparent instrument	
	problems.	

* INCLUDE MATRIX SPIKES, BLANKS AND RE-RUNS HERE

Enclosure (1) to Rockwell
letter WL-5 dated 6/21/89.
page 1 of 11.

GENERAL LABORATORY

Laboratory Data

AREA 2 - 881 HILLSIDE

Third Quarter 1988 (E88-2939)

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

APPROVED BY: _____
J. 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

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

==========

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

3rd Quarter Groundwater Report

Quality Assurance/Quality Control Data

E88-2939

==========

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

==========

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