TA-54

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HAZARDOUS WASTE SECTION

Department of Energy
Los Alamos National Laboratory
February 13, 1987

QUARTERLY REPORT: SEPTEMBER 1986 OBSERVATION WELL DATA FROM CANYONS ADJACENT TO MESITA DEL BUEY WASTE DISPOSAL AREAS

Quarterly water levels for the observation wells, located as shown in Figure 1, are given in table I. Observation well water samples for radiochemical, chemical and volatile organic analyses were taken September 18, 1986. Radiochemical and Chemical quality of water from the observation wells in Table II. All chemical and radiochemical constituents were at concentrations below primary and secondary maximum contaminant levels specified for drinking water (US EPA, 1976; US EPA, 1979), with the exception of the manganese measurements at all well locations. The perched water is not a source of municipal or individual water supply. Radionuclides present in the observation well water are naturally occurring and do not indicate radionuclide contamination.

None of the routinely quantitated organic compounds listed in Table III were detected in observation well water samples. The conservative limit of detection for a mixture of analytes in the water is 5 ppb with the exception of the purgeable gases which have a detection limit of 10 ppb. The individual compounds detection limits and observation well water sample results are detailed in Attachment I.

Refer to previous submittals (Devaurs, 1985; Devaurs and Bell, 1986) for further detail on sampling methodology, analytical methodology, and quality assurance/quality control for both inorganic and organic samples. Analytical procedures are being incorporated into a document entitled "Health and Environmental Chemistry Analytical Techniques, Data Management and Quality Assurance Procedures Manual"(LA 10813-MS), scheduled for publication in early 1987.

REFERENCES CITED

US EPA, 1976: U.S. Environmental Protection Agency "National Interim Primary Water Regulations," US EPA report EPA-570/9-76-003 (1976).

US EPA, 1979: U.S. Environmental Protection Agency "National Secondary Drinking Water Regulations," Federal Register 44 (140) (1979).

Devaurs, 1985: Devaurs, M., "Core Analyses and Observation Well Data from Mesita Del Buey Waste Disposal Areas and Adjacent Canyons," Los Alamos National Laboratory report LA-UR-85-4003 (1985).

Devaurs and Bell, 1986: Devaurs, M. and S. Bell, "Results of initial pore gas sampling conducted at Technical Area 54 waste disposal Areas L and G," Los Alamos National Laboratory report LA-UR-86-2370 (1986).

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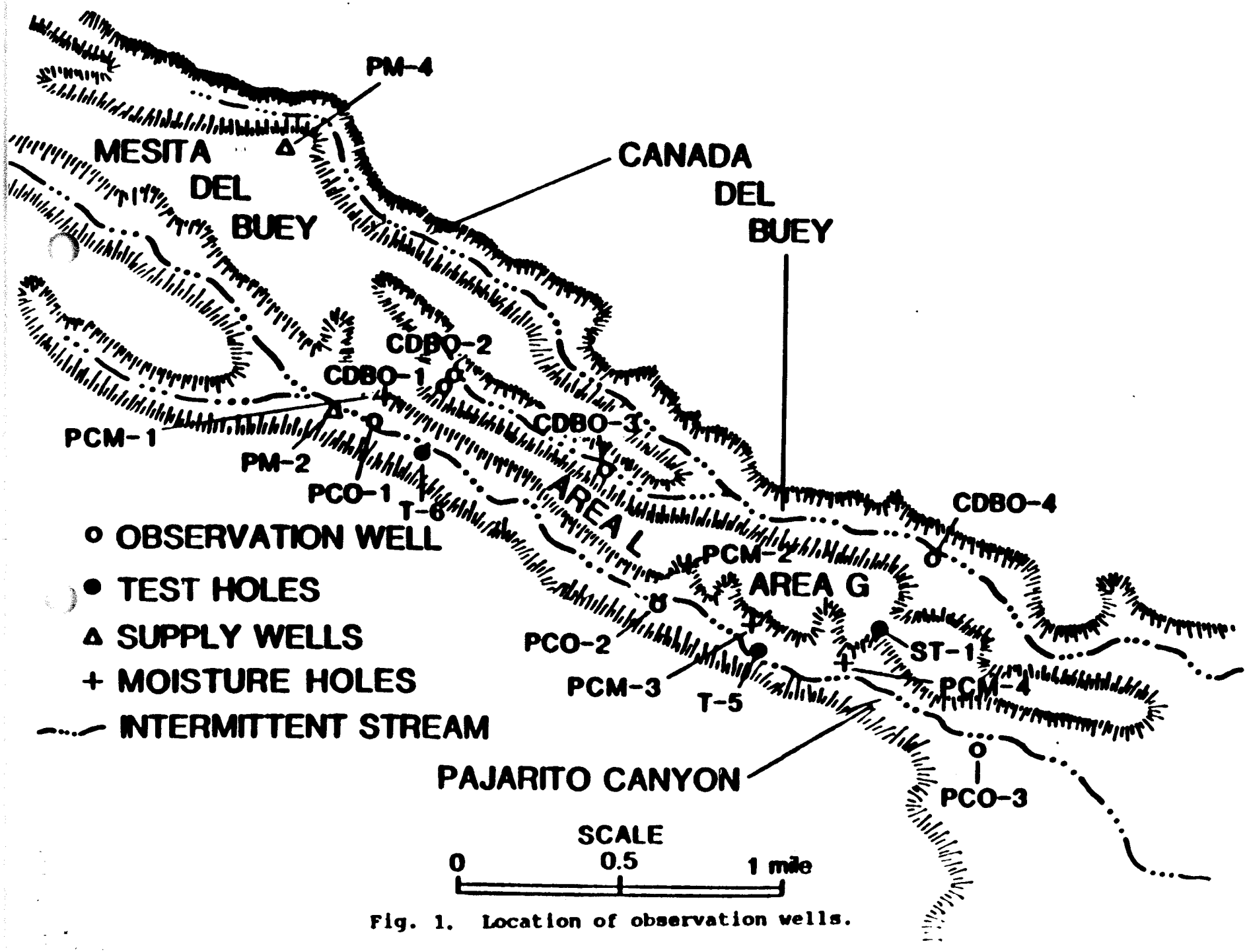

Fig. 1. Location of observation wells.

TABLE I

QUARTERLY WATER LEVELS FOR OBSERVATION WELLS

Date	Water Levels Measured from Land Surface Datum (ft)						
	PCO-1	PCO-2	PCO-3	CDBO-1	CDBO-2	CDBO-1	CDBO-4
1985							
5-28	-	-	-	Dry	Dry	Dry	Dry
6-11	1.25	3.63	2.98	-	-	-	-
9-4	-	-	-	Dry	Dry	Dry	Dry
9-12	1.29	5.05	3.30	-	-	-	-
12-2	-	-	-	Dry	Dry	Dry	Dry
12-13	1.28	6.26	3.01	-	-	-	-
1986							
3-6	1.28	6.26	3.01	Dry	Dry	Dry	Dry
3-12	1.62	6.97	3.11	-	-	-	-
6-10	0.78	3.88	3.29	Dry	Dry	Dry	Dry
6-18	0.72	3.83	3.18	-	-	-	-
7-3	0.54	3.86	2.71	Dry	Dry	Dry	Dry
7-16	0.52	3.99	2.94	-	-	-	-
8-8	0.69	4.94	3.03	Dry	Dry	Dry	Dry
8-27	0.84	5.48	3.19	-	-	-	-
9-3	0.86	5.78	3.13	Dry	Dry	Dry	Dry
9-18	0.85	5.61	3.00	-	-	-	-

Table II

Primary Chemical Quality (concentrations in mg/l)

Well #	Ag	As	Ba	Cd	Cr	F	Hg	N	Pb	Se
PCO-1	<0.001	<0.001	0.07	<0.001	<0.001	0.4	<0.002	<0.2	0.003	<0.001
PCO-2	<0.001	<0.001	0.18	<0.001	<0.001	0.4	<0.002	<0.2	<0.001	<0.001
PCO-3	<0.001	0.002	0.04	0.0013	0.002	0.3	<0.002	<0.2	<0.001	<0.001
Primary maximum contaminant level[a]	0.05	0.05	1.0	0.01	0.05	2.0	0.002	10	0.05	0.01

Table II. (cont)
Secondary Chemical Quality (contentrations mg/l)

Well #	Cl	Cu	Fe	Mn	SO_4	Zn	TDS	pH
PCO-1	11	0.004	<0.003	0.115	6	<0.01	160	7.0
PCO-2	14	0.001	<0.003	0.291	5	<0.01	152	7.1
CO-3	43	0.025	0.003	0.395	1	<0.01	408	7.1
Secondary maximum contaminant level[d]	250	1.0	0.3	0.05	250	5.0	500	6.5 - 8.5

Table II (cont).

Radiochemical and Chemical Quality of Water From Observation Wells

Well #	137 Cs (10^{-9} μCi/ml)	238 Pu (10^{-9} μCi/ml)	239,240 Pu (10^{-9} μCi/ml)	Gross Alpha (10^{-9} μCi/ml)	Gross Beta (10^{-9} μCi/ml)	3H (10^{-6} μCi/ml)	Total U (mg/l)	Gross Gamma (counts/min/l)
PCO-1	74 ± 41	0.000 ± 0.01	0.008 ± 0.01	11.0 ± 3.0	10.0 ± 1.0	4.1 ± 0.6	--	-150 ± 100
PCO-2	40 ± 38	-0.018 ± 0.02	0.012 ± 0.02	14.0 ± 3.0	15.0 ± 2.0	3.6 ± 0.6	--	-150 ± 100
PCO-3	31 ± 43	0.000 ± 0.01	0.005 ± 0.01	9.0 ± 3.0	12.0 ± 1.0	1.9 ± 0.5	--	-220 ± 100
Maximum contaminant level [a]	200	15	15	15[b]	--	20	1800[c]	--

Table II. (cont)
Miscellaneous Chemical Analyses

Well #	SiO_2	Ca	Mg	K	Na	CO_3	HCO_3	P	Total Hard	Conduct mS/m
PCO-1	26	16	5	4.2	22	0.0	88	<0.2	55	225
PCO-2	23	19	5	3.4	19	0.0	88	<0.2	61	225
PCO-3	32	80	16	2.9	18	0.0	281	<0.2	229	650

[a]Reference (US EPA, 1976).

[b]The Environmental Protection Agency's MCL for gross alpha is 15×10^{-9} µCi/ml. However, gross alpha results from the distribution system that exceed EPA's screening limit of 5×10^{-9} µCi/ml require isotopic analysis to determine radium content.

[c]Level recommended by International Commission on Radiological Protection.

[d]Reference (US EPA, 1979).

Note: The value represents twice the uncertainty term for the anlaysis.

TABLE III

ROUTINELY QUANTITATED ORGANIC COMPOUNDS

Chloromethane
Bromomethane
Vinyl chloride
Chloroethane
Methylene chloride
Acetone
1,1 Dichloroethane
1,1 Dichloroethene
trans-1,2 Dichloroethene
Chloroform
1,2 Dichloroethane
2-Butanone
1,1,1 Trichloroethane
Carbon tetrachloride
Vinyl acetate
Bromodichloromethane
1,1,2,2 Tetrachloroethane
1,2 Dichloropropane
trans-1,3 Dichloropropene
Trichloroethene
Dibromochloromethane
1,1,2 Trichloroethane
Benzene
cis-1,3 Dichloropropene

Bromoform
2-Hexanone
4-Methyl-2-Pentanone
Tetrachloroethene
Toluene
Chlorobenzene
Ethyl benzene
Styrene
Total xylenes
Trichlorofluoromethane
Tetrohydrofuran

Attachment 1.

Volatiles Determined by Purge and Trap

COMPOUND	Representative Detection Limits ug/L
Methylene chloride	1.0
1,1-Dichloroethane	1.0
1,1-Dichloroethene	1.0
cis-1,2-Dichloroethene	1.0
1,2-Dichloroethane	1.0
Chloroform	1.0
Bromoform	1.0
Carbon tetrachloride	1.0
Bromodichloromethane	1.0
Dibromochloromethane	1.0
Dibromomethane	1.0
4-Methyl-2-pentanone	1.0
1,1,1-Trichloroethane	1.0
1,1,2-Trichloroethane	1.0
1,2-Dichloropropane	1.0
cis-1,3-Dichloropropene	5.0
trans-1,3-Dichloropropene	5.0
1,2-Dibromo-3-chloropropane	1.0
Trichlorethene	1.0
2-chloroethylvinyl ether	5.0
1,1,2,2-Tetrachloroethane	1.0
Tetrachloroethene	1.0

Chlorobenzene	1.0
1,2-Dichlorobenzene	1.0
1,3-Dichlorobenzene	1.0
1,4-Dichlorobenzene	1.0
Benzene	1.0
Acetone	5.0
Carbon disulfide	5.0
Toluene	1.0
Ethyl benzene	1.0
Styrene	5.0
o-Xylene	1.0
m-Xylene/p-Xylene	1.0
Purgeable gases**	10.0

** The purgeable gases include chloromethane, chloroethane, bromomethane, and vinyl chloride. This detection limit represents an estimate based on responses of similar compounds.

Column: Supelco SPB-5 60m X .25mm X 1.0 um.
Limits of detction estimated by minimum signal required to yield identifiable mass spectral scan.

3.0

Column: Supelco SPB-5 60m X 0.25mm X 1.0 um.
Method: Carbon disulfide desorbtion of charcoal tubes followed by GC/MS analysis.

Attachment 1.

(cont.)

TO: Dave McInroy HSE-8

FROM: Suzanne Bell HSE-9

SUBJECT: RCRA quarterly water samples

On September 18, 1986 you delivered 3 water samples to me at my laboratory in room 115 of OHL-1. The samples had small amounts of sediment in them and were packaged in bottles with teflon coated septa and zero headspace. The samples were immediately placed in the refrigerator and were kept there until analysis began on September 24, 1986. The analysis was conducted using standard HSE-9 purge and trap/gas chromatography/mass spectrometry. 3 blind quality control samples were analyzed along with the samples as were the appropriate standards and blanks. The analysis revealed the presence of no volatile organics above the detection limits (see attached). The results of the quality control samples are summarized in the report of analytical results issued. The low percent recoveries of some of the analytes are attributable to QC sample preparation. These problems have since been corrected. The average percent recovery of 6 volatile organics spiked into water was 94.2% with a relative standard deviation of 6.5% The samples were consumed in testing, and appropriate chain of custody procedures were followed while the samples were in the laboratory.

Suzanne C Bell
2-11-87

#5476

ANALYSIS DATA SHEET

Post Sampling Conference Completed With _____ and Samples Submitted On _____ Time _____

Due _____ Project # _____ Estimate of Time Involved _____ Actual Time _____

Analytical Results and Remarks GC/MS/PT analysis. ~~Spikes used~~:

Average % recovery of spiked samples made up: (6 analytes) 94.2% (σ - 5.9, rel. std dev - 6.3%)

All samples contained no detectable level of volatiles

If Chain of Custody, Seal(s) Intact: Yes___ No___ Seal(s) Broken By: _____ Date _____

Printed Data Output Attached: Yes___ No___ Other Sheets Attached: Yes___ No___ (DE=Date Extracted, DA=Date Analyzed)

Sample Number	DE/DA	Compound	CAS #	Analytical Result (Units)	Analytical Uncertainty	MDL	Comments
86-10548		VOA	19A	< 0.0	MDL	5.0ppb	
86.10549		VOA	19A	"	"	5.0ppb	
86.10550		VOA	19A	"	"	5.0ppb	
86.10551		VOA	19A	"	"	5.0ppb	

Approved By: Analyst [signature] Notebook A003926 Page p 19 Date 10/21/86 QC Coordinator [illegible]

Section Leader [illegible] Date 10/27/86 Computer Entry _____ Date _____

0112S (002S)

REQUESTOR DATA SHEET # 5476

Log Book WELLS Page 19

Sampled by DAVE McINROY Collection Date 9-18 Time 1000 Weather Clear Witness TONY GRIEGGS

Presampling Conference Completed With SUZANNE On 9-17 Send Report To DAVE McINROY MS K-490

Phone 7-0819 Source of Sample: RCRA WELLS Reason for Sampling RCRA

Group HSE 8 Site 59 Building 043 Room No. 224

Priority Assigned: 1. Emergency; 2. Recognized Danger; 3. Imminent Deadline; 4. Special Survey; 5. Routine;

(Circle One) Priority Approval:_____ (1. GL or DGL; 2. or 3. AGL; 4. or 5. SL)

Method of Analysis Complies With:_____

Background Information Useful to Analyst (Contamination Levels, Hazards, Etc.)_____

Chain of Custody: Yes____(See Attached Form) No_____ Other Information_____

All Samples Submitted to HSE-9 Must Be Screened For Radioactivity. Samples Containing Greater Than 20 dpm Total Alpha or 100 dpm Combined Gamma/Beta Contamination Cannot Be Handled At TA-59.

Sample Number	Other I.D.	Sampling Location	Analysis Requested	Sampling Method	Sample Type	Preservative Utilized	Radioactivity Scan (dpm) Alpha	Radioactivity Scan (dpm) Beta/Gamma	Remarks
RE 10548	W Jones	Par. Cany	19A	Grab	W				
10549	PC01	↓							
50	PC02								
51	PC03								

Sampling Method: 24FC=24 Hour Flow-Weighted Composite; 24TC=24 Hour Time-Weighted Composite; G=Grab; B=Bail; D=Drill; C=Core; P=Pump; O=Other (Please Specify)

Sample Type: E=Effluent; SL=Sludge: SO=Soil; SC-Soil Core; WW-Well Water; SW=Surface Water; O=Other

Preservative: F=Filtered; NF=Non-Filtered; NA=Non Acidified; A-H_2SO_4(2 ml/l); A-HNO_3(5 ml/l); A-HNO_3(5 ml/l); A-H_3PO_4 & $CuSO_4$; A-Other; I=Iced; P-NaOH.

QC

SUPPLEMENTAL ANALYSIS REQUEST SHEET # 5476

#A003926 p. 101

ug/l or ppb for all

Sample Number	DE / DA	Compound	CAS #	Analytical Result (Units)		Analytical Uncertainty	MDL	Comments
00.96787		$CHCl_3$		72.0	98	±10%	5.0ppb	73.5 %
		111TCE		79.5	103.6			76.8 %
		Ethylbenz		53.1	68.4			77.6 %
00.96788		CCl_4		87.7	82.3			106.6
		BDCM		65.8	74.0			89.0
		Chloro Φ		37.5	50.8			73.8
00.96789		$CHCl_3$		29.4	36.8			79.8
		111TCE		23.7	38.8			61.1
		CCl_4		9.5	59.2			16.0
		BDCM		38.4	53.3			72.0
		Chloro Φ		16.0	36.5			43.8
		Ethyl Φ		17.4	25.6			68.0

Calculated

amt added

% recovery

Φ = benzene

DE = Date Extracted

DA = Date Analyzed

Approved By:

Analyst [signature] Notebook A003926 Page 97 Date 10.21.86

QC Coordinator _____ Date _____

Section Leader [signature] Date _____

Computer Entry _____ Date _____