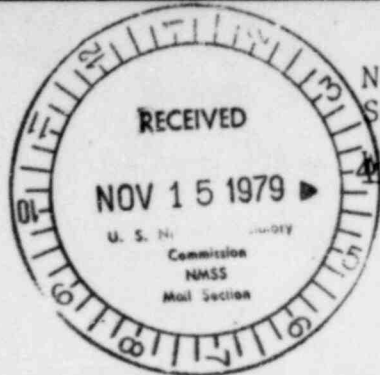


PDR



NRC DOCKET NO. 40-8348
SOURCE MATERIALS LICENSE NO. SUA-1223
WYDEQ LAND QUALITY DIVISION LICENSE TO EXPLORE NO. 17

ADDENDUM TO SYNOPSIS OF RESEARCH INSITU URANIUM LEACHING PROJECT
MINERALS EXPLORATION COMPANY
SWEETWATER COUNTY, WYOMING

RESULTS OF AQUIFER STABILIZATION OBSERVATION AND OTHER SURVEYS

REVIEW

Minerals Exploration, a wholly-owned subsidiary of Union Oil Company of California, conducted a research insitu uranium leaching test project in the Great Divide Basin, Sweetwater County, Wyoming from August 1976 to September 1978. This project was operated under the captioned State and Federal licenses. The results and activities of this test through September 1978 were fully described in a report by W.C. Goth. At the time of shutdown, commitments were made to perform soil and gamma surveys and to observe groundwater quality in the spring and summer of 1979 to demonstrate that the completed groundwater restoration is stable. The report summarizes the results of those commitments.

GROUNDWATER MONITORING

After the shutdown in September 1978, all of the pumps were pulled from the wells, and the wells were not disturbed until spring. On April 25, 1979, Minerals personnel met with

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personnel from LQD's Lander office to sample the wells. Wells were sampled by lowering a pump into the casing to a depth of 100 feet and pumping one casing volume out before sampling. Due to pump problems, part of the sampling had to be delayed until May 10. At this time, the same persons completed the sampling program. The samples were analyzed by Chemical and Geological Labs in Casper, Wyoming except for radiometric analyses, which were performed by Eberline Labs, Albuquerque, New Mexico.

The wells were sampled again on July 11 and 12, 1979. Personnel from LQD's Lander office and from the Water Quality Division in Cheyenne were present and took duplicate samples. Minerals' samples were again analyzed at Chemical and Geological Labs, except for the radiometric analyses, which were performed by Ecology Audits in Casper, Wyoming.

Tables 1 through 23 present the results of these analyses (1 well per table). Each table has five columns with the following information: The limit of detection for constituents which are near or below the limit, The baseline values, The values as of September 1, 1978 when restoration concluded, and The values from the spring and summer samplings. Table 24 lists the relative locations and depths of the wells.

SOIL EVALUATION IN EVAPORATION/RETENTION POND

Map A is a detailed map of the natural depression which was used as a retention area/evaporation pond during the

operation and pumpout. This area was fenced off and had a 2-foot earthen dike around it, but was unlined. The map indicates the locations that were inundated within the fenced area, the locations of the soil sampling locations, and the location of the gamma survey points. The area was completely dry by November 1978. Soil sampling was performed by digging a small pit with a backhoe. After the pit was complete, the sidewalls were sampled through the prescribed intervals, and the lithology was described. Figures 1 through 6 depict the lithologic descriptions.

The soil samples were analyzed for selenium, arsenic, molybdenum, radium-226, uranium, conductivity, and pH by Chemical and Geological Laboratories in Casper except for the radium which was performed by Eberline Labs. Table 25 lists the results of these tests.

The soils appear to be fairly uniform in all respects and suitable as a revegetation substrate. Two locations showed higher than usual uranium values. The soil in location A showed high values of uranium from 2.5 to 10 feet. This location is 700 feet away from and 10 feet higher than the retention area and was previously undisturbed. Therefore, it was concluded that this occurrence is a natural phenomenon. The other high uranium value occurred within the top 6 inches of sample point D, which was near the outfall of the discharge pipe. It is accompanied by a high Ra-226 value.

GAMMA SURVEY

A gamma dose rate survey was performed on a grid of 45 points within the retention area. The grid is illustrated on Map A. Test particulars and results are listed in Table 26.

From the statistical analysis at the bottom of Table 9, it is concluded that the difference between areas inundated at one time or another and areas not inundated is not significant.

PROPOSED RECLAMATION PLANS

1. The individual well houses will be removed. The sand screen in the wells will be removed, if possible. The pattern wells and the monitor wells will be plugged according to LQD guidelines, and the casing will be cut off below grade. Approximately 6 inches of sand were placed inside each well house at the beginning of the project to absorb spills. This sand will be removed and disposed of according to paragraph 6. The entire area will be scarified and revegetated according to the requirements of License to Explore #17. Roads and trails other than the access road will be scarified and revegetated.
2. The fence surrounding the evaporation pond/retention area will be taken down as will the snow fences within. The fence around the discharge pipeline from the plant to the retention area will be taken down, the pipe removed, the ditch refilled, and the area revegetated as per paragraph 1. The top 6 inches of soil downstream from the outfall of the discharge pipe will

be removed as shown on Map A and disposed of as described in paragraph 6. The area will encompass that which was inundated and extend from the outfall to the present location of the first snow fence. This would amount to approximately 2800 square feet, or about 50 cubic yards of soil. The segment of the retention area which had been inundated plus any other segment significantly disturbed will be scarified and revegetated.

3. The two 10' x 30' metal buildings and the quonset type building will be left standing as storage facilities for the Sweetwater Mine. The plant equipment and building interior will be checked and cleansed of removable surface contamination according to NRC Annex C guidelines. The plant equipment will be removed for similar usage elsewhere or disposal as described in paragraph 6. The dirt floor will be removed to a depth of 6 inches and disposed of as described in paragraph 6. The fence around the metal buildings will be left standing. The lab and office trailers, fuel tanks, generators, and the generator buildings have already been removed. At some point in the future, the metal buildings will be removed, the fence taken down, and the area revegetated and re-contoured as per paragraph 1.

4. The freshwater well will be abandoned and its building will be removed.

5. The contents of the lined sump mentioned in Item 13b, p. 51 of the Application for Amendments, Modifications to Source Materials License SUA-1223, NRC Docket No. 40-8348 will be left as it is (covered and fenced in) until Minerals Exploration Company's mill is in operation. At that time, the contents of the sump will be transferred to the Sweetwater Project's mill tailings area. The 6'W x 6'D x 25'L sump will be refilled and revegetated. This is in accordance with Item 17 of the revised license, dated July 14, 1977.

6. All solid waste from the reclamation proceedings will be treated in 1 of 2 ways. Soil (expected volume, 150 cubic yards) and other materials not readily decontaminated will be deposited in the Sweetwater mill tailings area when that facility becomes operational. Items for disposal which can be decontaminated will be cleansed and placed in the mill's solid waste dump. Commitments made in Items 1 through 6 will be completed within 2 years of the time permission is obtained to commence reclamation. Progress of revegetation will be addressed in the annual report for License to Explore #17 until revegetation is complete.

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POOR ORIGINAL

TABLE 1

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-1A 8-2-76	1A 9-1-79	1A 4-26-79	1A 7-11-79
pH		7.7	8.0	8.2	8.8
Na, mg/l		68	74	80	71
K, mg/l		2	1	1	1
Ca, mg/l		1	1	3	2
Mg, mg/l		ND	0	0	1
Cl, mg/l		6	8	10	12
As, mg/l	0.01	0.01	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.16	0.09	0.14
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₃ , mg/l		0	0	12	12
HCO ₃ , mg/l		134	122	110	110
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		33	52	56	57
U ₃ O ₈ , mg/l		0.020	2.150	2.3	1.6
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		176	196	216	220
Eh, Millivolts		+220	+240	+215	+260
226 Ra, pCi/l		---	2.9	1.4±.2	3.5
Gross α, pCi/l		17±3	595±5	610±30	767 ± 62
Gross β, pCi/l		22±7	206±3	260±20	391 ± 34
SP. COND, MICRO- @ 25° F MHOS		295	255	275	295
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.05	0.06	ND
Nas NO ₃ , mg/l	0.01	ND	0.01	0.32	0.13
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.02		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l	0.01		ND		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.11	0.12	0.2
90 Sr, pCi/l					
230 Th, pCi/l					1592
Ba	0.05		ND		156

POOR ORIGINAL

SWEETWATER COUNTY, WYO.

TABLE 2

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-2A 8-2-76	2A 9-1-78.	2A 4-25-79	2A 7-10-79
pH		7.8	7.8	8.2	7.5
Na, mg/l		71	80	80	83
K, mg/l		0	1	1	2
Ca, mg/l		3	14	3	13
Mg, mg/l		0	1	0	2
Cl, mg/l		8	6	8	10
As, mg/l	0.01	0.01	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.15	0.08	0.14
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		0.01		
CO ₂ , mg/l		0	0	12	0
HCO ₃ , mg/l		134	159	110	171
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		39	52		66
U ₃ O ₈ , mg/l		0.030	5.3	2.4	6.65
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		187	222	216	260
Eh, Millivolts		+215	+237	+210	+250
226 Ra, pCi/l			21.5	1.1	20.46
Gross α , pCi/l		15±3	1513±30	700±46	3903±179
Gross β , pCi/l		27±6	522±16	340±20	1625±85
SP. COND. MICRO- @ 88°F MHOS		275	300	275	335
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.05	0.05	ND
Nas NO ₃ , mg/l	0.01	ND	0.03	0.23	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.02		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l	0.01		0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.46	0.10	0.61
90 Sr, pCi/l					
230 Th, pCi/l					
BA			0.05		1592 157

POOR ORIGINAL

SWEETWATER COUNTY, WYO.

TABLE 3

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-3A 8-2-76	3A 9-1-78	3A 5-10-79	3A 7-11-79
pH		8.7	7.7	7.7	7.4
Na, mg/l		69	66	69	65
K, mg/l		1	1	3	1
Ca, mg/l		1	7	8	7
Mg, mg/l		1	0	1	2
Cl, mg/l		8	6	10	14
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.14	0.23	0.14
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₃ , mg/l		24	0	0	0
HCO ₃ , mg/l		85	122	134	134
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		35	52	53	54
U ₃ O ₈ , mg/l		0.008	2.2	2.2	2.4
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		181	210	210	194
Eh, Millivolts		+190	+237	+220	+270
226 Ra, pCi/l			11.7	27.3	7.9
Gross α , pCi/l		29 \pm 4	508 \pm 13	571 \pm 9	1095 \pm 74
Gross β , pCi/l		34 \pm 7	250 \pm 8	176 \pm 4	622 \pm 42
SP. COND. MICRO- @ 25°C Mhos		275	275	290	305
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.06	0.31	ND
Nas NO ₃ , mg/l	0.01	ND	0.04	0.14	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.01		
Dis. Fe mg/l	0.01		0.01		
Mn, mg/l	0.01		ND		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l			0.12	0.24	0.32
90 Sr, pCi/l					
230 Th, pCi/l					1592 158
Ba	0.05		ND		

POOR ORIGINAL SWEETWATER COUNTY, WYO.

TABLE 4

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-4A 8-2-76	4A 9-1-78	4A 5-10-79	4A 7-11-79
pH		8.6	8.9	8.2	8.1
Na, mg/l		71	77	77	69
K, mg/l		1	5	1	1
Ca, mg/l		2	1	3	3
Mg, mg/l		0	0	1	2
Cl, mg/l		8	6	10	12
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.15	0.17	0.13
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₃ , mg/l		12	24	12	0
HCO ₃ , mg/l		110	95	110	134
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		38	56	54	57
U ₃ O ₈ , mg/l		0.016	1.1	4.2	2.7
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		186	211	212	180
Eh, Millivolts		+185	+280	+210	+300
226 Ra, pCi/l			2.1	2.1	2.3
Gross α, pCi/l		38 ± 7	336 ± 7	1211 ± 14	1440 ± 84
Gross β, pCi/l		46 ± 7	78 ± 4	330 ± 5	700 ± 44
SP. COND. MICRO- @ 25° C MHO/S		275	280	280	295
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	ND	0.12	ND
Nas NO ₃ , mg/l	0.01		0.03	0.09	0.13
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.03		
Dis. Fe mg/l	0.01		0.03		
Mn, mg/l	0.01		ND		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.03	0.17	0.21
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		

1592 159

POOR ORIGINAL

TABLE 5

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-5A 8-2-76	5A 9-1-78	5A 4-25-79	5A 7-11-79
pH		8.6	7.8	7.7	7.6
Na, mg/l		67	70	86	87
K, mg/l		1	1	2	1
Ca, mg/l		2	10	9	5
Mg, mg/l		0	0	0	1
Cl, mg/l		6	6	8	14
As, mg/l	0.01	0.01	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.16	0.12	0.14
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₂ , mg/l		12	0	0	0
HCO ₃ , mg/l		110	134	134	171
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		32	57	86	60
U ₃ O ₈ , mg/l		0.006	2.45	7.25	6.75
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		174	210	257	244
Eh, Millivolts		+190	+290	+240	+300
226 Ra, pCi/l			13.4	12	6.1
Gross α , pCi/l		26 \pm 4	634 \pm 12	780 \pm 40	3623 \pm 190
Gross β , pCi/l		38 \pm 7	191 \pm 6	430 \pm 20	2075 \pm 102
SP. COND. MICRO- @ 25°C MHO/S		265	300	290	320
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.11	0.17	ND
Nas NO ₃ , mg/l	0.01	ND	0.04	0.33	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.16		
Dis. Fe mg/l	0.01		0.01		
Mn, mg/l	0.01		0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.76	0.81	1.3
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		1592 160

POOR ORIGINAL

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-6A 6-23-77	6A 9-1-78	6A 5-10-79	6A 7-11-79
pH		7.1	7.8	7.6	6.2
Na, mg/l		221	64	78	77
K, mg/l		6	1	2	2
Ca, mg/l		224	13	19	17
Mg, mg/l		8	1	2	3
Cl, mg/l		44	6	10	14
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	0.03	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.14	0.17	0.17
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₃ , mg/l		0	0	0	0
HCO ₃ , mg/l		1135	134	183	183
NH ₄ , mg/l		0.070			
NO ₂ , mg/l					
NO ₃ , mg/l					
SO ₄ , mg/l		84	56	62	68
U ₃ O ₈ , mg/l		241	3.8	3.85	1.7
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		1146	207	263	280
Eh, Millivolts		+300	+320	+230	+300
226 Ra, pCi/l		290 ± 45	18.2	38.8	26.3
Gross α, pCi/l		51400	1042 ± 8	966 ± 17	912 ± 48
Gross β, pCi/l		39200	202 ± 3	396 ± 8	469 ± 27
SP. COND. MICRO- @ 88°F MHO3		1475	300	365	355
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01		0.06	0.2	ND
Nas NO ₃ , mg/l	0.01		0.03	0.10	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.01		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l	0.01		0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.07	0.07	0.12
90 Sr, pCi/l					
230 Th, pCi/l					1592 61
Ba	0.05		ND		

POOR ORIGINAL

SWEETWATER COUNTY, WYO.

TABLE 7

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-7A 6-23-77	7A 9-1-78	7A 4-25-79	7A 7-10-79
pH		7.9	8.0	8.0	7.5
Na, mg/l		77	83	86	88
K, mg/l		9	1	3	2
Ca, mg/l		8	12	10	9
Mg, mg/l		0	1	1	1
Cl, mg/l		12	8	10	8
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.13	0.07	0.23
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₃ , mg/l		36	0	0	0
HCO ₃ , mg/l		127	171	159	171
NH ₄ , mg/l		0.011			
NO ₂ , mg/l					
NO ₃ , mg/l					
SO ₄ , mg/l		41	63	72	66
U ₃ O ₈ , mg/l		0.078	5.75	4.6	4.5
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		210	252	260	258
Eh, Millivolts		+230	+295	+220	+250
²²⁶ Ra, pCi/l	2.3	2.3	2.1	22	22.5
Gross α, pCi/l	68 ± 6	68 ± 6	46 ± 3	1300 ± 100	2913 ± 119
Gross β, pCi/l	5 ± 10	5 ± 10	72 ± 3	720 ± 20	1335 ± 59
SP. COND. MICRO- @ 86°F MHOS		550	350	310	335
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01		ND	0.16	ND
Nas NO ₃ , mg/l	0.01		0.01	0.18	0.34
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.01		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l	0.01		0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		ND	0.03	ND
⁹⁰ Sr, pCi/l					
²³⁰ Th, pCi/l					
					1592 162

1976-1978 SOLUTION MINING FOR URANIUM,

SWEETWATER COUNTY, WYO.

TABLE 8

POOR ORIGINAL

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L20-8A 6-24-77	8A 9-1-78	8A 4-25-79	8A 7-10-79
pH		7.6	8.2	7.7	7.9
Na, mg/l		184	85	86	93
K, mg/l		7	2	6	2
Ca, mg/l		45	4	11	7
Mg, mg/l		1	0	1	1
Cl, mg/l		28	8	12	12
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.13	0.10	0.23
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₂ , mg/l		0	12	0	0
HCO ₃ , mg/l		537	110	146	159
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		44	72	90	75
U ₃ O ₈ , mg/l		48	0.730	2.00	2.1
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		573	237	280	268
Eh, Millivolts		+270	+280	+230	+250
226 Ra, pCi/l		36 ± 8	4.5	12	5.26
Gross α, pCi/l		10800	244 ± 3	530 ± 30	1223 ± 78
Gross β, pCi/l		8600	68 ± 2	340 ± 20	589 ± 1
SP. COND. MICRO- @ 88°F MHOS		780	335	360	375
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.05	0.17	ND
Nas NO ₃ , mg/l	0.01	ND	0.03	0.18	0.34
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.01		
Dis. Fe mg/l	0.01		0.01		
Mn, mg/l	0.01		ND		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.12	0.34	0.38
90 Sr, pCi/l					
230 Th, pCi/l					
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TABLE 10

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L29-2B 9-29-76	2B 9-1-78	2B 5-10-79	2B 7-11-79
pH		8.7	8.1	7.8	8.1
Na, mg/l		79	61	85	77
K, mg/l		1	1	5	4
Ca, mg/l		0	6	12	9
Mg, mg/l		0	1	2	3
Cl, mg/l		6	6	12	32
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.16	0.16	0.13
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₃ , mg/l		42	0	0	0
HCO ₃ , mg/l		55	116	171	159
NH ₄ , mg/l	0.1	0.10			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		48	48	70	60
U ₃ O ₈ , mg/l		0.021	1.5	6.82	5.7
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		203	180	270	234
Eh, Millivolts		+204	+280	+220	+270
226 Ra, pCi/l			3.8	24.2	5.0
Gross α , pCi/l		72 ± 6	486 ± 10	1904 ± 23	3238 ± 126
Gross β , pCi/l		68 ± 9	181 ± 6	748 ± 12	1608 ± 65
SP. COND., MICRO- @ 88°F MHOS		270	255	355	335
P, mg/l					
Dis NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	0.1	ND	0.08	ND
Nas NO ₃ , mg/l	0.01	ND	0.03	0.20	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		0.01		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l	0.01		ND		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.68	0.75	1.39
90 Sr, pCi/l					
230 Th, pCi/l					

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TABLE 11

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L29-3B 9-29-76	3B 9-1-78	3B 5-10-79	3B 7-11-79
pH		8.7	8.1	8.1	8.4
Na, mg/l		70	59	76	71
K, mg/l		1	11	6	3
Ca, mg/l		1	7	9	7
Mg, mg/l		0	1	1	2
Cl, mg/l		4	4	10	18
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.16	0.21	0.13
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		0.02		
CO ₃ , mg/l		28	0	0	12
HCO ₃ , mg/l		81	122	146	146
NH ₄ , mg/l	0.1	0.08			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	0.27			
SO ₄ , mg/l		35	56	63	5
U ₃ O ₈ , mg/l		0.011	0.750	0.580	0.59
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		180	198	237	208
Eh, Millivolts		+236	+270	+210	+260
226 Ra, pCi/l			8.3	6.7	3.3
Gross α , pCi/l		20 ± 3	230 ± 2	192 ± 6	305 ± 40
Gross β , pCi/l		31 ± 8	183 ± 2	104 ± 3	213 ± 27
<small>SP. COND. MICRO- @ 86°F MHOS</small>		265	290	295	290
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	0.06	0.06	0.10	ND
Nas NO ₃ , mg/l	0.01	0.06	0.24	0.08	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l	0.01		ND		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l	0.01		0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.48	1.11	1.71
90 Sr, pCi/l					
230 Th, pCi/l					
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TEST	WELL NUMBER AND DATE SAMPLED					
	Limit of Detection	L29-4B 9-29-76	4B 9-1-78	4B 4-25-79	4B 7-11-79	
pH		8.2	8.2	7.7	7.7	
Na, mg/l		75	67	71	72	
K, mg/l		0	9	2	2	
Ca, mg/l		1	10	6	8	
Mg, mg/l		0	0	1	2	
Cl, mg/l		4	6	10	18	
As, mg/l	0.01	ND	ND	ND	ND	
Mo, mg/l	0.05	ND	ND	ND	ND	
Se, mg/l	0.01	ND	ND	ND	ND	
Al, mg/l	0.05		ND			
B, mg/l	1.0		ND			
Cd, mg/l	0.002		ND			
Cr, mg/l	0.01		ND			
F, mg/l				0.12	0.13	
Pb, mg/l	0.05		ND			
Hg, mg/l	0.001		ND			
Zn, mg/l	0.01		0.01			
CO ₃ , mg/l		6	12	0	0	
HCO ₃ , mg/l		128	122	134	159	
NH ₄ , mg/l	0.1	0.16				
NO ₂ , mg/l						
NO ₃ , mg/l	0.1	ND				
SO ₄ , mg/l		44	51	50	8	
U ₃ O ₈ , mg/l		0.020	0.480	0.720	0.560	
V ₂ O ₅ , mg/l	ND	0.05	ND			
TDS, mg/l		193	215	206	168	
Eh, Millivolts	+235	+235	+270	+210	+260	
226 Ra, pCi/l			8.1	2.2	4.4	
Gross α , pCi/l		12 \pm 3	260 \pm 4	190 \pm 20	417 \pm 46	
Gross β , pCi/l		23 \pm 8	269 \pm 4	110 \pm 10	279 \pm 30	
SP. COND, MICRO- @ 88°F MHOS		255	285	260	295	
P, mg/l						
Dis. NH ₃ , mg/l						
Nas NH ₃ , mg/l	0.01	0.12	0.06	0.11	ND	
Nas NO ₃ , mg/l	0.01	ND	0.05	0.10	ND	
Cu, mg/l	0.01		ND			
Tot. Fe mg/l	0.01		0.01			
Dis. Fe mg/l	0.01		ND			
Mn, mg/l	0.01		0.01			
Ni, mg/l	0.04		ND			
PO ₄ , mg/l	0.01		0.85	1.32	2.22	
90 Sr, pCi/l						
230 Th, pCi/l						
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TABLE 13

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	L29-5B 9-29-76	5B 9-1-78	5B 4-25-79	5B 7-11-79
pH		8.2	7.7	7.5	7.7
Na, mg/l		81	69	70	72
K, mg/l		0	1	3	3
Ca, mg/l		0	9	13	17
Mg, mg/l		0	1	2	2
Cl, mg/l		6	6	10	18
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.19	0.13	0.13
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		ND		
CO ₂ , mg/l		7	0	0	0
HCO ₃ , mg/l		139	134	146	183
NH ₄ , mg/l	0.08	0.08			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		41	58	60	10
U ₃ O ₈ , mg/l		0.010	0.360	5.62	3.95
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		204	210	230	216
Eh, Millivolts		+238	+268	+200	+260
226 Ra, pCi/l			7.5	23 ± 1	5.3
Gross α, pCi/l		19 ± 3	162 ± 6	1300 ± 100	1892 ± 97
Gross β, pCi/l		26 ± 8	72 ± 4	800 ± 30	1112 ± 55
SP. COND. MICRO- @ 88°F MMS		260	275	300	335
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01		0.06	0.15	ND
Nas NO ₃ , mg/l	0.01		0.05	0.17	ND
Cu, mg/l			ND		
Tot. Fe mg/l			0.01		
Dis. Fe mg/l			ND		
Mn, mg/l			0.01		
Ni, mg/l			ND		
PO ₄ , mg/l			0.67	0.49	0.81
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		592 167

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TABLE 14

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	LS-1 4-17-77	LS-1 9-1-78	LS-1 4-25-79	LS-1 7-12-79
pH		7.5	8.0	7.9	7.9
N ₂ , mg/l		89	93	109	106
K, mg/l			3	3	4
Ca, mg/l		105	46	43	73
Mg, mg/l		12	1	5	10
Cl, mg/l			26	42	56
As, mg/l	0.01	0.01	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	0.64	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0	ND	ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.92	0.80	0.65
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		0.23		
CO ₂ , mg/l		0	0	0	0
HCO ₃ , mg/l		84	220	220	256
NH ₄ , mg/l					
NO ₂ , mg/l					
NO ₃ , mg/l					
SO ₄ , mg/l		245	104	125	140
U ₃ O ₈ , mg/l		0.89	0.40	0.550	1.35
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		663	381	435	480
Eh, Millivolts		-32.3	+265	+210	+280
226 Ra, pCi/l		3.1	1.2	.71	24.1
Gross α , pCi/l		415 \pm 24	130 \pm 7	96 \pm 14	1056 \pm 90
Gross β , pCi/l		103 \pm 4	196 \pm 7	89 \pm 10	711 \pm 47
SP. COND., MICRO- @ 88°F MHOS			550	600	800
P, mg/l		0.1			
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	0.02	0.08	0.07	ND
Nas NO ₃ , mg/l	0.01	4.4	0.40	1.4	1.4
Cu, mg/l	0.01		0.02		
Tot. Fe mg/l	0.01		0.01		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l	0.01		ND		
Ni, mg/l	0.40		ND		
PO ₄ , mg/l	0.01		ND	ND	ND
90 Sr, pCi/l					
230 Th, pCi/l					

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TABLE 15

TEST	WELL NUMBER AND DATE SAMPLED					
	Limit of Detection	LS-2 4-17-77	LS-2 9-1-78	LS-2 4-25-79	LS-2	
pH		7.5	8.1	8.1	7.0*	
Na, mg/l		70	90	105		
K, mg/l			3	3		
Ca, mg/l		3	18	40		
Mg, mg/l		6	3	7		
Cl, mg/l			8	34	33*	
As, mg/l	0.01	0.03	ND	ND		
Mo, mg/l	0.05	ND	ND	ND		
Se, mg/l	0.01	0.66	ND	ND	ND*	
Al, mg/l	0.05		ND			
B, mg/l	1.0	0.2	ND			
Cd, mg/l	0.002		ND			
Cr, mg/l	0.01		ND			
F, mg/l			0.67	0.60		
Pb, mg/l	0.05		ND			
Hg, mg/l	0.001		ND			
Zn, mg/l	0.01		0.39			
CO ₂ , mg/l		0	0	12	0*	
HCO ₃ , mg/l		81	220	207	121*	
NH ₄ , mg/l						
NO ₂ , mg/l						
NO ₃ , mg/l						
SO ₄ , mg/l		213	62	119		
U ₃ O ₈ , mg/l		0.89	0.120	0.760		
V ₂ O ₅ , mg/l	0.05	ND	ND			
TDS, mg/l		529	292	422	442*	
Eh, Millivolts		-29.3	+260	+215		
226 Ra, pCi/l		3.1	0.46	1.3		
Gross α, pCi/l		302 ± 17	47 ± 2	74 ± 13	415*	
Gross β, pCi/l		82 ± 3	11 ± 2	280 ± 20	348*	
SP. COND, MICRO- @ 68°F MHO3			425	575	705*	
P, mg/l		0.1				
Dis. NH ₃ , mg/l			0			
Nas NH ₃ , mg/l	0.01	0.03	0.07	0.05		
Nas NO ₃ , mg/l	0.01	2.1	0.14	1.4		
Cu, mg/l	0.01		0.03			
Tot. Fe mg/l	0.01		0.34			
Dis. Fe mg/l	0.01		0.04			
Mn, mg/l	0.01		ND			
Ni, mg/l	0.04		ND			
PO ₄ , mg/l	0.01		ND	ND		
90 Sr, pCi/l						
230 Th, pCi/l						

*These are DEQ results.

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TABLE 16

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-1 8-2-76	GM-1 9-1-78	GM-1 4-25-79	GM-1 7-10-79
pH		6.9	8.0	7.7	7.8
Na, mg/l		41	94	91	104
K, mg/l		3	2	3	2
Ca, mg/l		47	7	9	9
Mg, mg/l		6	1	1	1
Cl, mg/l		14	14	12	16
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l			0.15		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.17	0.16	0.16
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l			0.20		
CO ₂ , mg/l		0	0	0	0
HCO ₃ , mg/l		134	171	183	207
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		102	66	60	60
U ₃ O ₈ , mg/l		1.7	0.155	0.117	0.080
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		279	268	266	294
Eh, mV		+210	+305	+200	+250
226 Ra, pCi/l			0.39	0.67	0.25
Gross α , pCi/l		1010 \pm 30	32 \pm 2	26 \pm 8	55 \pm 6
Gross β , pCi/l		590 \pm 20	34 \pm 2	21 \pm 7	54 \pm 7
SP. COND. MICRO- @ 88°F MHOS		500	370	360	370
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.29	0.20	0.11
Nas NO ₃ , mg/l	0.01	ND	0.07	1.8	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l			0.30		
Dis. Fe mg/l			0.16		
Mn, mg/l			0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01			0.05	0.2
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		1592 170

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TABLE 17

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-2 8-2-76	GM-2 9-1-78	GM-2 4-25-79	GM-2 7-10-79
pH		7.5	7.8	7.5	7.5
Na, mg/l		63	66	67	68
K, mg/l		5	3	2	3
Ca, mg/l		49	37	33	34
Mg, mg/l		3	3	3	3
Cl, mg/l		18	10	14	14
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	0.06	0.02	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.11	0.07	0.12
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l			0.10		
CO ₃ , mg/l		0	0	0	0
HCO ₃ , mg/l		146	122	122	134
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		128	132	119	115
U ₃ O ₈ , mg/l		0.032	0.490	0.372	0.415
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		338	311	298	303
Eh, Millivolts		+205	+305	+210	+260
226 Ra, pCi/l			0.75	0.32	0.50
Gross α , pCi/l		1390 \pm 30	43 \pm 3	72 \pm 13	208 \pm 13
Gross β , pCi/l		790 \pm 20	23 \pm 3	50 \pm 9	162 \pm 10
SP. COND. MICRO- @ 80°F MHO ₃		590	400	375	415
P, mg/l					
Dis. NH ₃ , mg/l					
N as NH ₃ , mg/l	0.01	ND	0.07	0.06	ND
N as NO ₃ , mg/l	0.01	ND	0.07	1.3	ND
Cu, mg/l					
Tot. Fe mg/l			0.08		
Dis. Fe mg/l			0.04		
Mn, mg/l			0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		ND	ND	ND
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		592

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TABLE 18

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-3 8-2-76	GM-3 9-1-78	GM-3 4-25-79	GM-3 7-10-79
pH		7.7	7.8	7.7	7.7
Na, mg/l		49	61	63	68
K, mg/l		3	3	2	3
Ca, mg/l		33	57	39	47
Mg, mg/l		2	1	5	2
Cl, mg/l		14	16	18	18
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	0.01	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.10	0.07	0.10
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		0.28		
CO ₃ , mg/l		0	0	0	0
HCO ₃ , mg/l		122	110	110	110
NH ₄ , mg/l		ND			
NO ₂ , mg/l					
NO ₃ , mg/l		ND			
SO ₄ , mg/l		78	164	158	155
U ₃ O ₈ , mg/l		0.75	0.340	0.345	0.285
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		239	356	348	347
Eh, Millivolts		+210	+260	+220	+250
226 Ra, pCi/l			0.95	0.26	1.58
Gross α, pCi/l		700 ± 20	62 ± 3	64 ± 12	159 ± 12
Gross β, pCi/l		570 ± 20	32 ± 3	52 ± 8	105 ± 10
SP. COND. MICRO- @ 88°F MHOS		455	490	455	500
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.08	0.02	ND
Nas NO ₃ , mg/l	0.01	ND	0.08	1.1	ND
Cu, mg/l					
Tot. Fe mg/l	0.01		ND		
Dis. Fe mg/l	0.01		ND		
Mn, mg/l			0.01		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		ND	0.02	ND
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		

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TABLE 19

POOR ORIGINAL

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-4 8-2-76	GM-4 9-1-78	GM-4 4-25-79	GM-4 7-10-79
pH		8.0	8.3	8.1	8.1
Na, mg/l		32	77	70	81
K, mg/l		3	1	6	1
Ca, mg/l		49	13	6	7
Mg, mg/l		4	1	1	1
Cl, mg/l		16	14	12	12
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.13	0.08	0.13
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		0.02		
CO ₃ , mg/l		0	12	0	12
HCO ₃ , mg/l		134	110	122	110
NH ₄ , mg/l		ND			
NO ₂ , mg/l					
NO ₃ , mg/l		ND			
SO ₄ , mg/l		78	72	54	70
U ₃ O ₈ , mg/l		0.98	0.260	0.210	0.190
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		248	244	204	238
Eh, Millivolts		+190	+254	+210	+250
226 Ra, pCi/l			1.9	0.19	1.80
Gross α , pCi/l		910 \pm 30	90 \pm 4	45 \pm 10	124 \pm 26
Gross β , pCi/l		770 \pm 20	62 \pm 3	22 \pm 7	106 \pm 22
SP. COND. MICRO- @ 25°C MMOS		500	340	285	310
P, mg/l					
Dis. NH ₃ , mg/l					
N as NH ₃ , mg/l	0.01	ND	0.06	0.05	ND
N as NO ₃ , mg/l	0.01	ND	0.11	1.0	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l			0.02		
Dis. Fe mg/l			0.02		
Mn, mg/l	0.01		ND		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		ND	0.02	ND
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		592 173

POOR ORIGINAL

TABLE 20

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-5 8-2-76	GM-5 9-1-78	GM-5 4-25-79	GM-5 7-10-79
pH		8.5	7.4	7.3	7.3
Na, mg/l		56	79	81	87
K, mg/l		5	5	4	5
Ca, mg/l		49	38	33	33
Mg, mg/l		6	3	3	3
Cl, mg/l		18	16	16	14
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	0.01	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.20	0.16	0.16
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		0.08		
CO ₃ , mg/l		12	0	0	0
HCO ₃ , mg/l		110	159	171	183
NH ₄ , mg/l		ND			
NO ₂ , mg/l					
NO ₃ , mg/l		ND			
SO ₄ , mg/l		134	128	110	117
U ₃ O ₈ , mg/l		1.35	0.220	0.054	0.057
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		334	347	331	349
Eh, Millivolts		+195	+260	+200	+270
226 Ra, pCi/l			1.4 ± 3	0.33	0.78
Gross α, pCi/l		860 ± 30	66 ± 5	7.2 ± 5.7	37 ± 17
Gross β, pCi/l		620 ± 20	310 ± 7	11 ± 6	52 ± 19
SP. COND, MICRO- @ 86°F MHOS		555	490	445	475
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	ND	0.03	ND
Nas NO ₃ , mg/l	0.01	ND	0.07	1.1	ND
Cu, mg/l	0.01		ND		
Tot. Fe mg/l			0.39		
Dis. Fe mg/l			0.03		
Mn, mg/l			0.05		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		ND	0.02	ND
90 Sr, pCi/l					
230 Th, pCi/l					
Ba	0.05		ND		

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TABLE 21

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-6 8-2-76	GM-6 9-1-78	GM-6 4-25-79	GM-6 7-10-79
pH		6.6	7.4	7.3	7.6
Na, mg/l		71	86	76	96
K, mg/l		5	5	3	4
Ca, mg/l		44	31	25	25
Mg, mg/l		3	2	4	3
Cl, mg/l		16	12	14	14
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	0.01	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.29	0.25	0.15
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l	0.01		0.19		
CO ₃ , mg/l		0	0	0	0
HCO ₃ , mg/l		134	183	171	195
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		145	108	85	105
U ₃ O ₈ , mg/l		1.25	0.360	0.260	0.230
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		350	334	291	343
Eh, Millivolts		+190	+255	+200	+260
226 Ra, pCi/l			0.79	2.1 0.1	3.3
Gross α , pCi/l		950 \pm 30	80 \pm 2	62 \pm 12	147 \pm 28
Gross β , pCi/l		720 \pm 20	166 \pm 2	37 \pm 8	153 \pm 24
SP. COND. MICRO- @ 88°F MHOS		525	470	410	435
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	0.06	0.07	ND
Nas NO ₃ , mg/l	0.01	ND	0.04	1.0	1.1
Cu, mg/l	0.01		ND		
Tot. Fe mg/l			0.60		
Dis. Fe mg/l			0.03		
Mn, mg/l			0.07		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		0.12	0.03	ND
90 Sr, pCi/l					
230 Th, pCi/l					1592 175

WATER TEST RESULTS
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SWEETWATER COUNTY, WYO.

POOR ORIGINAL

TABLE 22

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-7 8-2-76	GM-7 10-24-78	GM-7 4-25-79	GM-7 7-10-79
pH		7.2	7.3	7.3	7.3
Na, mg/l		54		101	90
K, mg/l		4		6	6
Ca, mg/l		43		36	31
Mg, mg/l		7		7	9
Cl, mg/l		16		16	26
As, mg/l	0.01	0.02		ND	ND
Mo, mg/l	0.05	ND		ND	ND
Se, mg/l	0.01	ND	ND	ND	ND
Al, mg/l	0.05				
B, mg/l	1.0				
Cd, mg/l	0.002				
Cr, mg/l	0.01				
F, mg/l				0.18	0.23
Pb, mg/l	0.05				
Hg, mg/l	0.001				
Zn, mg/l	0.01				
CO ₃ , mg/l		0	0	0	0
HCO ₃ , mg/l		110	268	305	317
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		142		70	10
U ₃ O ₈ , mg/l		1.98	0.120	0.028	0.024
V ₂ O ₅ , mg/l	0.05	ND			
TDS, mg/l		320	298	386	314
Eh, Millivolts		+205		+220	+250
226 Ra, pCi/l			2.9	0.63	1.1
Gross α, pCi/l	4.6	1500 ± 40	35 ± 4	ND	13 ± 11
Gross β, pCi/l	5.9	650 ± 20	18 ± 3	ND	32 ± 17
SP. COND. MICRO- @ 86°F MHOS		540		490	525
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	4.6	5.1	0.48
Nas NO ₃ , mg/l	0.01	ND	0.09	1.6	0.25
Cu, mg/l					
Tot. Fe mg/l					
Dis. Fe mg/l					
Mn, mg/l					
Ni, mg/l					
PO ₄ , mg/l				0.68	0.92
90 Sr, pCi/l					
230 Th, pCi/l					1592 176

WATER TEST RESULTS
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SWEETWATER COUNTY, WYO.

TABLE 23

POOR ORIGINAL

TEST	WELL NUMBER AND DATE SAMPLED				
	Limit of Detection	GM-8 8-2-76	GM-8 9-1-78	GM-8 4-25-79	GM-8 7-10-79
pH		7.1	7.3	7.3	7.3
Na, mg/l		71	85	89	83
K, mg/l		4	5	4	5
Ca, mg/l		38	35	30	31
Mg, mg/l		8	3	5	4
Cl, mg/l		22	14	16	22
As, mg/l	0.01	ND	ND	ND	ND
Mo, mg/l	0.05	ND	ND	ND	ND
Se, mg/l	0.01	0.01	ND	ND	ND
Al, mg/l	0.05		ND		
B, mg/l	1.0		ND		
Cd, mg/l	0.002		ND		
Cr, mg/l	0.01		ND		
F, mg/l			0.23	0.20	0.23
Pb, mg/l	0.05		ND		
Hg, mg/l	0.001		ND		
Zn, mg/l			0.14		
CO ₃ , mg/l		0	0	0	0
HCO ₃ , mg/l		122	183	183	195
NH ₄ , mg/l	0.1	ND			
NO ₂ , mg/l					
NO ₃ , mg/l	0.1	ND			
SO ₄ , mg/l		150	118	118	81
U ₃ O ₈ , mg/l		0.83	0.270	0.182	0.160
V ₂ O ₅ , mg/l	0.05	ND	ND		
TDS, mg/l		353	350	352	342
Eh, Millivolts		+200	+246	+215	+280
226 Ra, pCi/l			0.20	1.1	0.6
Gross α, pCi/l		880 ± 30	64 ± 3	35 ± 9	83 ± 22
Gross β, pCi/l		520 ± 20	82 ± 3	31 ± 7	108 ± 22
SP. COND. MICRO- @ 88°F MHOS		590	485	445	475
P, mg/l					
Dis. NH ₃ , mg/l					
Nas NH ₃ , mg/l	0.01	ND	ND	0.06	ND
Nas NO ₃ , mg/l	0.01	ND	0.01	1.1	0.18
Cu, mg/l	0.01		ND		
Tot. Fe mg/l			0.07		
Dis. Fe mg/l			0.02		
Mn, mg/l			0.07		
Ni, mg/l	0.04		ND		
PO ₄ , mg/l	0.01		ND	0.02	ND
90 Sr, pCi/l					
230 Th, pCi/l					

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Table 24

<u>Well Nos.</u>	<u>Total Depth (feet)</u>	<u>Relative Location</u>
L20-1A to 8A	365	East Five Spot numbered as shown x 4 x 3 x 1 x 5 x 2 x 8 x 6 x 7
L29-1B to 5B	412	West pattern numbered as shown x 4 x 3 x 1 x 5 x 2
GM-1 to 4	365	Guard monitor wells around east pattern, 250 feet out from L20-1A, starting with GM-1 in the northwest and moving clockwise.
GM-5 to 8	412	Guard monitor wells around west pattern, 250 feet out from L29-1B, starting with GM-5 in the northwest and moving clockwise.
LS-1, 2	70	Monitor wells in retention area to water table. LS-2 is 50 feet from LS-1 in the direction of natural groundwater movement (SW).

PCC/c11
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Table 25

SOIL ANALYSES

<u>Sample</u>	<u>As</u> mg/g	<u>Se</u> mg/g	<u>Mo</u> mg/g	<u>U₃O₈</u> mg/g	<u>pH</u> units	<u>NH₃</u> <u>as³(N) mg/g</u>	<u>COND.</u> mmhos	<u>Ra-226</u> pCi/g
A-1	7	nd	2	4.1	7.7	1.1	0.2	1.2
A-2	7	2	2	4.4	8.1	1.1	0.3	1.5
A-3	6	3	2	4.7	8.2	1.1	0.6	1.2
A-4	5	4	2	18.	8.2	2.1	3.3	4.4
A-5	4	3	3	14.	7.9	2.0	6.6	2.4
A-6	nd	1	2	14.	8.2	1.0	0.2	2.9
B-1	nd	nd	2	1.6	8.0	1.1	0.3	0.9
B-2	4	nd	2	2.6	8.1	1.5	0.2	1.3
B-3	3	nd	2	2.9	8.2	1.5	0.2	1.4
B-4	nd	nd	2	3.7	8.7	1.6	0.8	1.7
B-5	nd	nd	2	3.7	8.7	2.5	0.1	1.3
B-6	nd	nd	2	2.6	8.9	3.0	0.6	1.9
C-1	3	1	2	1.8	8.3	4.0	0.4	1.1
C-2	5	2	3	2.0	8.4	1.1	0.2	1.3
C-3	4	2	3	3.8	8.0	2.7	0.2	1.5
C-4	2	3	2	3.3	8.3	3.0	0.1	1.3
C-5	1	1	2	3.1	8.5	2.0	0.5	1.6
C-6	4	1	2	4.3	8.7	2.3	0.7	1.9
D-1	2	nd	2	25	8.1	1.1	0.5	27.
D-2	3	3	2	4.4	8.1	4.2	0.3	1.2
D-3	4	1	2	2.2	8.2	2.0	0.3	1.5
D-4	3	3	2	3.1	8.1	1.0	0.3	1.3
D-5	2	1	2	2.2	8.3	1.0	0.3	1.1
D-6	2	nd	2	2.7	8.6	1.0	0.2	1.0
E-1	1	1	2	3.7	8.2	3.0	0.6	0.9
E-2	5	1	2	3.2	8.3	3.0	0.3	1.2
E-3	6	1	2	2.8	8.4	1.0	0.4	1.6
E-4	3	1	3	3.3	7.9	4.0	0.4	2.8
E-5	2	1	2	2.7	8.2	5.0	0.3	1.0
E-6	2	2	2	4.1	8.2	6.0	0.2	0.7
F-1	3	1	2	2.0	7.5	4.1	0.4	0.7
F-2	5	nd	2	2.2	8.2	3.2	0.2	1.1
F-3	4	1	3	3.3	8.5	4.1	0.3	1.3
F-4	5	2	2	4.7	8.4	2.1	0.1	1.3
F-5	2	2	2	4.0	8.6	1.1	0.3	0.8
F-6	1	2	2	4.4	8.4	1.2	0.4	1.0

Depths

Sample 1	0.0-0.5 feet
Sample 2	0.5-1.5 feet
Sample 3	1.5-2.5 feet
Sample 4	2.5-4.5 feet
Sample 5	4.5-7.5 feet
Sample 6	7.5-10.0 feet

Detection Limits

Arsenic	1 mg/g
Selenium	1 mg/g

pH was made on a saturation paste

Table 26

GAMMA SURVEY - IN SITU SITE

A Gamma Dose Rate Survey was performed at the in situ leach plant evaporation pond utilizing a Reuter-Stokes environmental monitor, model #RSS-111. Instrument's specs are: sensitivity = 20 $\mu\text{r/hr.}$ /, flux range = 1-500 $\mu\text{r/hr.}$ and accuracy = 5% @ 10 $\mu\text{r/hr.}$ The data that was obtained is summarized below. Raw data is on file in the Rawlins Office, MEC.

<u>Point #</u>	<u>Date of Reading</u>	<u>Reading*</u>	<u>Point #</u>	<u>Date of Reading</u>	<u>Reading*</u>
A1	1-10-79	16.0	E4	12-29-78	7.5
A2	1-10-79	14.5	E5	12-28-78	3.0
A3	1-10-79	16.0	E6	12-29-78	12.5
A4	1-10-79	15.0	E7	12-29-78	17.0
B1	1-10-79	14.5	E8	12-29-78	22.5
B2	1-9-79	13.0	E9	12-29-78	15.0
B3	1-9-79	13.5	F5	12-29-78	6.0
B4	1-10-79	15.0	F6	12-29-78	7.5
C1	1-9-79	14.0	F7	12-29-78	8.0
C2	1-9-79	14.0	F8	12-29-78	10.0
C3	1-9-79	14.0	F9	12-29-78	11.5
C4	12-29-78	15.0	F10	1-10-79	16.5
C5	12-29-78	12.0	G5	12-29-78	15.0
C6	12-29-78	9.0	G6	12-28-78	8.0
C7	12-29-78	5.0	G7	12-29-78	13.5
C8	12-29-78	19.0	G8	12-29-78	10.0
C9	12-29-78	16.0	G9	1-10-79	14.5
D4	12-29-78	13.0	G10	1-10-79	16.5
D5	12-28-78	6.0	H9	1-10-79	17.0
D6	12-29-78	10.5	H10	1-10-79	17.0
D7	12-29-78	3.5	I9	1-10-79	16.5
D8	12-29-78	20.0	I10	1-10-79	17.5
D9	12-29-78	17.0			

* $\mu\text{r/hr.}$

	<u>Range</u>	<u>Mean</u>	<u>S</u>	<u>Points</u>
All Points	3.0 - 22.5 $\mu\text{r/hr}$	13.1 $\mu\text{r/hr}$	4.4	45
Within Area of Inundation	6.0 - 22.5 $\mu\text{r/hr}$	12.8 $\mu\text{r/hr}$	4.1	14
Never Inundate	3.0 - 20.0 $\mu\text{r/hr}$	13.2 $\mu\text{r/hr}$	4.6	31

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TEST PIT 'A'

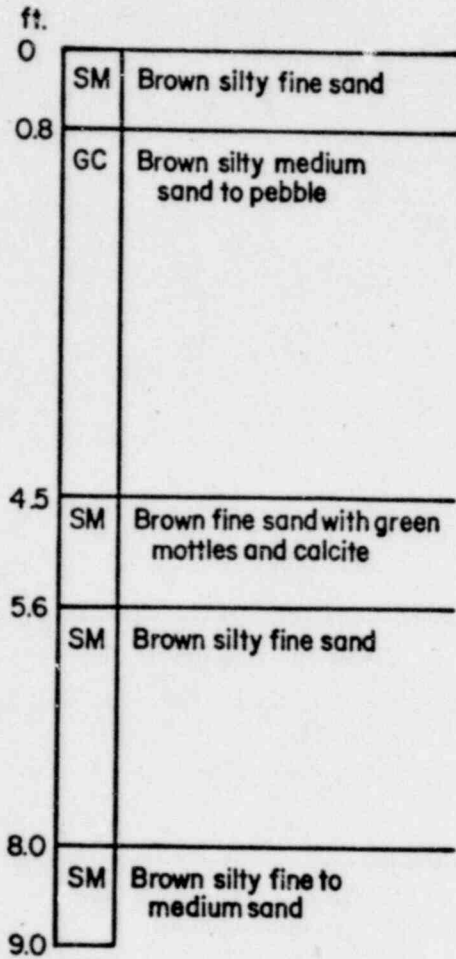


figure 1

TEST PIT 'B'

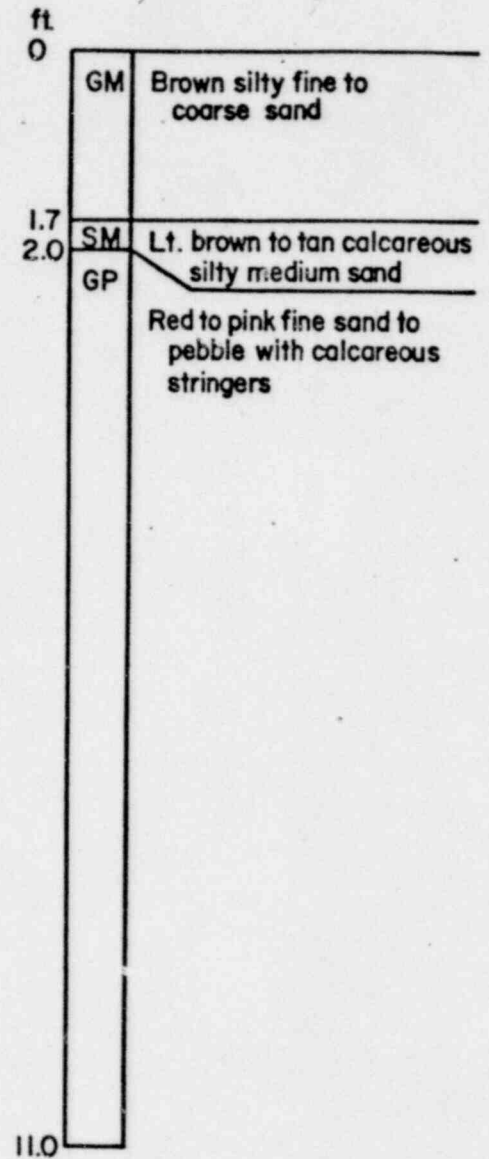


figure 2

TEST PIT 'C'

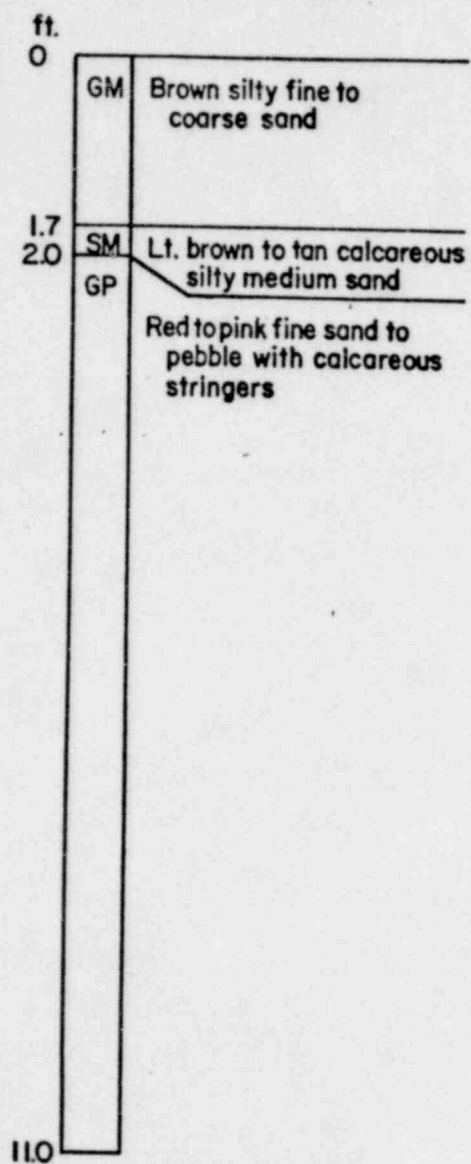


figure 3

TEST PIT 'D'

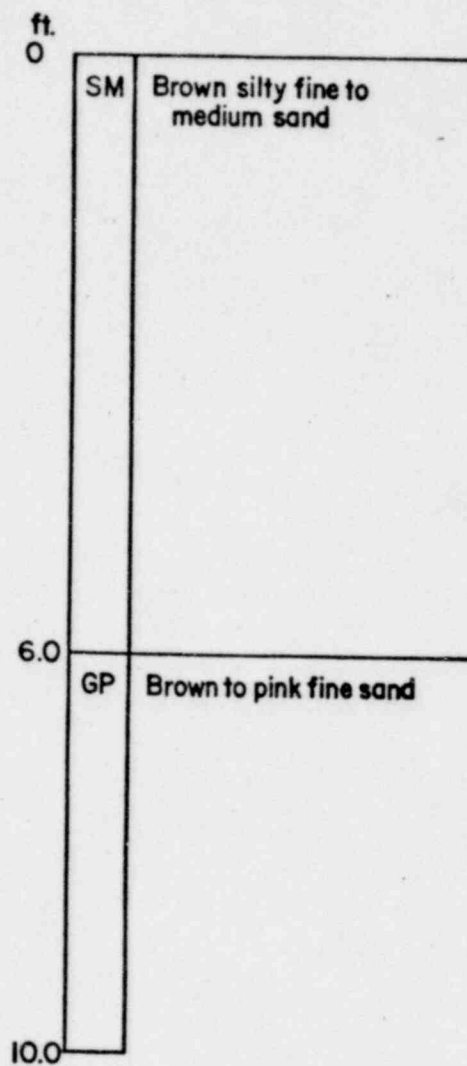


figure 4

TEST PIT 'E'

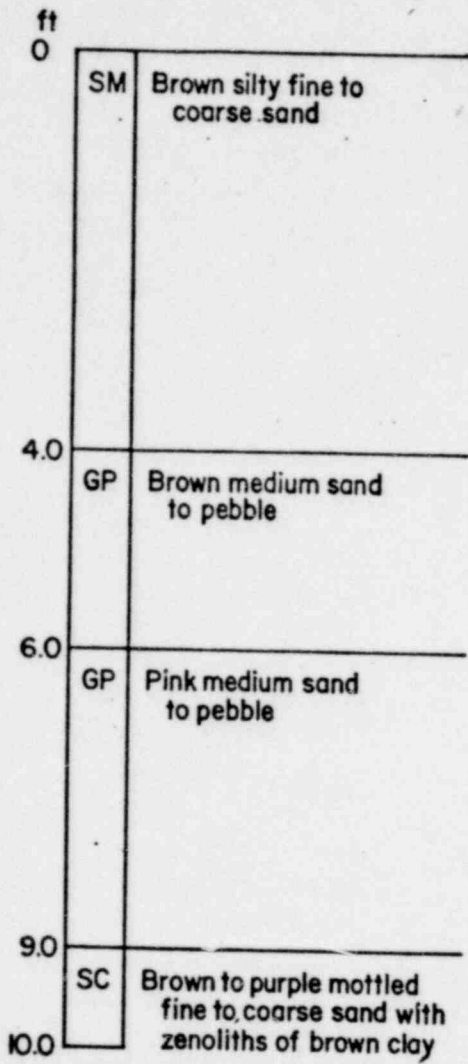


figure 5

TEST PIT 'F'

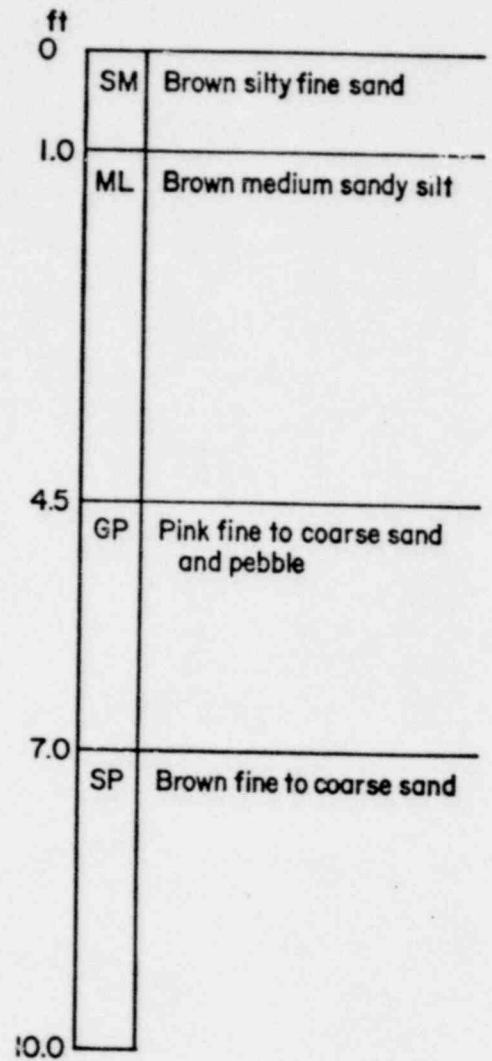


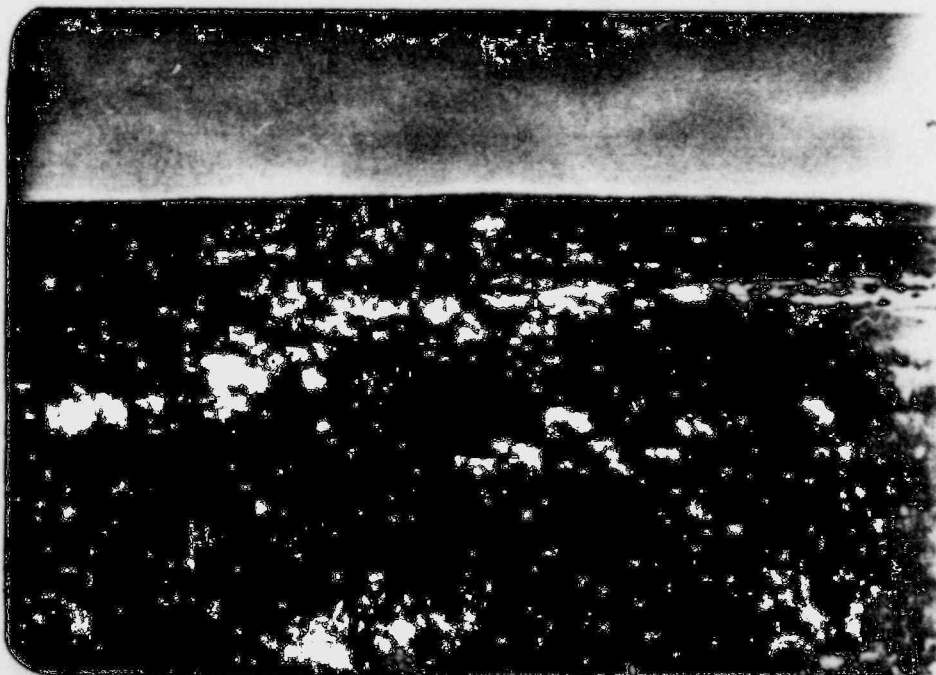
figure 6

Figure 7

PHOTOGRAPHS OF RETENTION AREA - August 1978



Looking northeast toward surface facility from vicinity of sample point E.



Looking southwest from vicinity of sample point E.
LS-1 and LS-2 are in the background.

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Figure 7

PHOTOGRAPHS OF RETENTION AREA - August 1978



Southwest (lowest) corner of retention area in vicinity of sample point F.

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1. 00

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