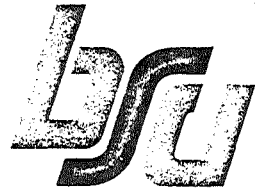


EW2970-2



BOISE STATE UNIVERSITY • 1910 UNIVERSITY DRIVE • BOISE, IDAHO 83725

DEPARTMENT OF GEOLOGY

726-1000


November 29, 1978

Dennis Goldman  
E.G. & G.  
Idaho Operations Office  
550 Second St.  
Idaho Falls, ID 83401

Dear Mr. Goldman:

Enclosed are the tabulated results of the X-ray analysis of the well samples from RRGE-1, RRGE-2, RRGE-3,3A,3B, RRGE-4, RRGP-5, RRG-6. These are wells from Raft River that have been X-rayed since the departure of Clay Nichols. Complete X-ray patterns are on file for these wells along with RRINT-3. Also enclosed is a summary of the analytical procedure for the samples, a tabulation of the B.L.M. well readings for Lynn Nelson, and a proposed budget for 1979 for the X-ray grant E(10-1)-1537.

Sincerely,

  
Jim Saunders  
Research Associate

# X-RAY ANALYSIS

Prepared By	Initials	Date
Approved By		

## RRGE #1

SAMPLE	DEPTH (FT)	COMMENTS	MONTMORILLONITE	ILLITE	KAOLINITE	ZEOLITE	CALCITE	OTHER
1								
2	3120 - 3150							
3								
4	3150 - 3180			✓ <sub>m</sub>	✓ <sub>w</sub>	possible CHABAZITE	✓	chlorite
5								
6	3180 - 3210		✓ <sub>w</sub>	✓ <sub>m</sub>		ANALCIME?	✓	
7								
8	3210 - 3240		✓ <sub>s</sub>	✓ <sub>m</sub>	✓ <sub>m</sub>	ANALCIME?	✓	
9								
10	3240 - 3270		✓ <sub>m</sub>	✓ <sub>m</sub>	✓ <sub>m</sub>		✓	
11								
12	3270 - 3300		✓ <sub>m</sub>	✓ <sub>m</sub>	✓ <sub>m</sub>	ANALCIME?	✓	
13	3300 - 3360							
14	4050 - 4080		✓ <sub>?w</sub>	✓ <sub>m</sub>	✓ <sub>s</sub>		✓ <sub>w</sub>	chlorite
15								
16	4170 - 4200			✓ <sub>w</sub>	✓ <sub>m</sub>	ANALCIME?	✓	chlorite
17								
18	4200 - 4230		✓ <sub>w</sub>	✓ <sub>w</sub>	✓ <sub>m</sub>	ANALCIME?	✓	
19								
20	4320 - 4350		✓ <sub>m</sub>	✓ <sub>m</sub>	✓ <sub>m</sub>	ANALCIME?		
21								
22	4410 - 4440		✓ <sub>m</sub>	✓ <sub>m</sub>	✓ <sub>m</sub>	✓	✓	
23								
24								
25	4470 - 4500			✓ <sub>s</sub>	✓ <sub>s</sub>			chlorite
26								
27								
28								
29								
30								
31								
32								
33								
34								
35								
36								
37								
38								
39								
40								
41								

# RRGE # 2

## Preliminary Results from X-RAY Analysis

	MONT MONT MONT	CHLORITE	TILLITE	OPALITE	MICA	MIXED LAYERING	SED.	HEATED 200°C	SLIGHT DEFORM.	NOTES
922	✓			✓			✓	✓		9.8° (9.0 Å) ZEOLITE
1000	✓						✓		✓	9.8° (9.0 Å) ZEOLITE
1100	✓						✓	✓		9.8° (9.0 Å) ZEOLITE
1200	✓		✓	✓			✓		✓	" "
1300	✓			✓			✓	✓	✓	" "
1400	✓			✓			✓	✓		
1500							✓			8.0° (10.0 Å) ZEOLITE
1600	✓			✓		✓	✓	✓	✓	MIXED LAYERING - STILL EXPANDING WHEN HEATED
1700							✓	✓	✓	MIXED LAYERING - NO LONGBER EXPANDING WHEN HEATED
1800							✓			NO EXP. PATTERNS
1900						✓			✓	VERY LITTLE EXPANSION OF MIXED LAYERING WHEN HEATED
2000							✓			MIXED LAYERING
2100		✓	✓	✓				✓	✓	
2200							✓	✓	✓	
2300		✓					✓			
2400							✓		✓	
2500							✓			
2600							✓			NO EXP. PATTERNS
2700							✓			" "
2800							✓	✓	✓	
2900		✓					✓	✓		
3000							✓		✓	
3100		✓					✓			
3200		✓					✓		✓	
3300		✓					✓			
3400		✓					✓			
3500		✓					✓		✓	
3600		✓					✓		✓	

48  
19

RACE # 2

(2)

	MOHT	CHLORIDE	THIUR	CALITE	MICA	MIXED LAYERING	S.S.	HEATED	E.G.M.	PLUM	NOTES
3700		✓				✓	-		✓		MIXED LAYERING HIGH CONC. OF CLAYS
✓ 3800		✓				✓	-		✓		MIXED LAYERING HIGH CONC. OF CLAYS
3900							-		✓		EMPTY PATTERNS
4100							-		✓		
✓ 4100		✓					-		✓		HIGH CONC. OF CLAYS - MIXED LAYERING
4200							✓		✓		
4300							-				
4400		✓					✓				
1500		✓					-				
4600		✓					✓		✓		
4700					✓		✓		✓		
4800		✓			✓		✓		✓		
4900		✓			✓		✓				
5000		✓			✓		✓				
5100					✓		✓				
5200		✓			✓		✓				
5300					✓		✓				
5400		✓			✓		✓				
5500					✓		✓				

# X-Ray Analysis

Initials	Date
----------	------

Prepared By	
Approved By	

## RRGE #2

Sample	Depth (ft)	Comments	Montmorillonite	Illite	Kaolinite	Zeolite	Calcite	Other
	1							
	2	3290-3330	✓ <sub>s</sub>	✓ <sub>s</sub>	✓ <sub>m</sub>	Chabazite or Analcime	✓	Possibly chlorite
	3							
	4	4470-4480	✓ <sub>m</sub>		✓ <sub>s</sub>		✓	very possibly chlorite
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
	13							
	14							
	15							
	16							
	17							
	18							
	19							
	20							
	21							
	22							
	23							
	24							
	25							
	26							
	27							
	28							
	29							
	30							
	31							
	32							
	33							
	34							
	35							
	36							
	37							
	38							
	39							
	40							
	41							

X-Ray Analysis

RRGE # 3, 3A, 3B

Modified  
8-17-76

APPROVED BY

Sample Depth (ft)	Comments	Montmorillonite	Illite	Kaolinite	Zeolite	Calcite	Other
1 2805	Core #1	Xs	Xm	Xw	possibly Analcite	X	
2 2807-8		Xs	Xw	Xw	Possibly Analcite	X	
5 2809		Xs	Xs	Xw	Analcite	X	
7 2815		Xs	Xvw	Xw	possibly Analcite	X	
9 "Top"	Core #2	Xm	1 Xm	Xs	possibly Analcite	X	Penninite
11 "Bottom"		Xw	1 Xs	Xm	Analcite	X	possibly Penninite
13 No depth	Core #3	Xs	1 Xw			X	
14 3973-4		Xs	1 Xw	Xw	Analcite	X	Penninite, & pyrophyllite
16 3979-80		Xs	1 Xvw		Analcite	X	possibly hydrobiotite Penninite
19 4950-60	Core #3B	Xs	Xm-s	Xm-s		X	
21 4970-80		Xs	Xm-s	Xm-s		X	possibly Penninite
22 4990-5000		Xs	Xs	Xm-s		X	possibly Penninite
25 4259	Core #3A	Xs	Xw	Xm	possibly Analcite	X	possibly Penninite
27 4980-5000		Xs	Xm	Xw		X	possibly pyrophyllite
29 5320-5340		Xs	1 Xw	Xw-m		X	possibly Pyrophyllite & Penninite
31 5420-5440		Xs	1 Xs	Xm-s		X	
33 5620-5630		Xs	Xm-s	Xw-m		X	
35 5760-5770		Xw	1 Xs	2 Xw			
37 5860-5870		possibly	1 Xs	Xm		X	

Notes: 1 Could be part penninite  
2 Mica group; could be muscovite



# X-RAY ANALYSIS

Initials    Date

Prepared By

Approved By

## RRGE # 4

SAMPLE	DEPTH (ft)	COMMENTS	MONTMOR-ILLITE (ILLONITE)	KAOHLINITE	ZEOLITE	CALCITE	OTHER
	1						
	2	1900	✓m	✓m			✓CHLORITE
	3						
	4	2840.8	✓s	✓w	✓w	✓	
	5						
	6	2845.4	✓m			✓	
	7						
	8	2851	✓s	✓w		✓s	✓CHLORITE
	9						
	10	2851.8	✓m	✓m		✓	
	11						
	12						
	13						
	14						
	15						
	16						
	17						
	18						
	19						
	20						
	21						
	22						
	23						
	24						
	25						
	26						
	27						
	28						
	29						
	30						
	31						
	32						
	33						
	34						
	35						
	36						
	37						
	38						
	39						
	40						
	41						





Depth (ft.)	Comments	Montmorillonite	Illite	Kaolinite	Zeolite	Calcite	Others
1							
2000-2020	Powder & Sedimented	vs**	w		vw		analcite? vw chlorite
3							
2260-2280	"	s	w-m		w-m		vw chlorite
5							
2480-2500	"	s**	w		w		chabazite w vw chlorite
6							
2560-2580	"		vw		w-m		clinop-titolite m chlorite
3							
2660-2680	"		vw		w-m		chabazite w chlorite
10							
2860-2880	"	w	w-m		w-m		analcite w chlorite
12							
3000-3020	"	w**	vw		vw		analcite w vw chlorite
15							
3280-3300	"	m**	vw		vw		analcite s w chlorite
17							
3340-3360	"	m**	w		w		analcite m w chlorite
19							
3460-3480	"	vw**	vw		w		analcite w w chlorite
21							
3743-3760	"	vw**	vw		w		analcite vw w chlorite
22							
3800-3820	"		w		w-m		zeolite 9.41 A vw chlorite
23							
3860-3880	"	vw	w		w-m		zeolite 9.41 A vw chlorite
24							
3940-3960	"		w		w-m		chabazite? w chlorite
25							
4340-4360	"	w**	w		w-m		analcite w chlorite
26							
4480-4500	"	w**	w		w-m		vw chlorite muscovite
27							
4500-4540	"	w**	w-m		w		w muscovite
28							
							... more

Depth (ft.)	Comments	Montmorillonite	Illite	Kaolinite	Zeolite	Calcite	Others
2							
3							
4							
5							
6							
7							
8							
9							
10							
11	Powder & Sedimented	vw**	m-s	w			muscovite
12							w chlorite
13							muscovite
14	"	w**	m-s	w			
15							
16							
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							
27							
28							
29							
30							
31							
32							
33							
34							
35							
36							
37							
38							
39							
40							
41							

\*\*Double montmorillonite peak (30.46 A chlorite-montmorillonite; 14.73 A montmorillonite)

360

X-RAY ANALYSIS

RRGI #6

Prepared By	
Approved By	

Depth (ft)	Comments	Montmorillonite	Illite	Kaolinite	Zeolite	Calcite	Other
110 - 140	powder and smear	W (chlorite -Mont.?)					
1170-1200	powder and sedimented	M-S	M		clinoptilolite		
1290 - 1320	"	M-S	M		clinoptilolite or heulandite		
1620 - 1650	"	S	M		clinoptilolite	W	
1830 - 1860	"	M-S	M		clinoptilolite		
2000 - 2020	"	S	S				
2030 - 2060	powder and smear	W-M	W-M				
2090 - 2120	"	W	W				
2240 - 2270	powder and sedimented	M	W-M				
2300 - 2320	"	S	M-S	W-M	W analcite?	WV	W chlorite
2480 - 2500	"	VS	W-M	W			WV chlorite
2680 - 2700	"	M	W-M	W			W-M chlorite
2700-2720	"	M	M	W	analcite?		W chlorite
2820 - 2840	"	W	W-M	WV	analcite	WV	W chlorite
2860-2880	"	M	M	WV	analcite?		W chlorite

1 2 3 4 5 6

Depth (ft)	Comments	Montmorillonite	Illite	Kaolinite	Zeolite	Calcite	Other
3005	powder and sedimented	M-S	M-S	W-M	analcite		M chlorite
3007	"	VS	M	W-M	analcite		W-M chlorite
3013	"	S	S	M			W chlorite
3018	"	W-M <sup>1</sup>	W	VW		W-M	W chlorite
3024A	"	M <sup>1</sup>	M	M		W	M chlorite
3024B	"	M <sup>1</sup>	M	W-VW			Zeolite? 5.6Å
3040 - 3060	"	M <sup>2</sup>	W-M	W	analcite?	W	W chlorite
3100 - 3120	"	VW <sup>2</sup>	W-M	M	analcite?	VW	M chlorite
300 - 3320	"	M <sup>2</sup>	W-M	W			W-M chlorite
3500 - 3520	"	M <sup>2</sup>	M	M	analcite?	W-M	M chlorite
3700 - 3720	"	M <sup>2</sup>	W-M	W-M	analcite?		M chlorite
3820 - 3840	"	M-S <sup>2</sup>	W-M	M	analcite?		M chlorite

NOTES: 1 - no shift in montmorillonite peak with glycolation and incomplete removal of peak with heating

2 - double montmorillonite peaks (6.5° and 8.1° 2θ) (shifted to 6.0° and 6.5° 2θ after glycolation)

KEY: VS = very strong  
 S = strong  
 M = medium  
 W = weak  
 VW = very weak

27