APPENDIX V

PRELIMINARY DISEQUILIBRIUM STUDY FOR THE ANDERSON MINE

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INTRODUCTION

The coring program at the Anderson Mine was initiated to resolve the relationship between the recorded subsurface gamma ray mineralization (eU_3O_8) and the actual chemical uranium content (cU_3O_8). Core hole locations were chosen from pre-existing drill holes which exhibited favorable gamma mineralization. These drill holes were offset approximately five feet and the anomalous zones were cored. To date, 15 core holes have been completed, with 14 core holes containing significant equivalent (eU_3O_8) and chemical (cU_3O_8) uranium mineralization.

Two Reid Drilling Company and one Universal Drilling Company rotary rigs were contracted to pull 925 feet of core, of which 94-95% was recovered. Various size core bits and core barrels were tried with the best recovery attained by Russel Sharpe of Reid Drilling Company using a three inch diameter core barrel set up. The core from each core run (usually ten feet) was carefully measured, labeled and boxed. The core was next described by a geologist using a 10X to 45X binocular scope, and finally shipped to the Casper office.

Upon receipt of the cores in Casper, they were split longitudinally and half of the core was dried and pulverized. Pulverized core, representing one-half or one foot intervals, was analyzed on the Blake Beta-Gamma scaler. Each interval was analyzed three times and an average was taken. Initially all samples with an average indicated analysis greater than .02% eU_3O_8 were sent to Chemical and Geological Laboratories in Casper for chemical and

closed-can analyses. Subsequently, selected samples with an average beta-gamma analysis less than .02% U_3O_8 were sent out for chemical and closed-can analyses to fill in gaps in the assay intervals and to better delineate the ore zones (Table 1). A total of 448 core samples have been analyzed to date. In addition, 21 previously analyzed core samples, representing various grades of the mineralized lithologic units, were sent to Skyline Labs, Inc. in Wheat Ridge, Colorado for fluorimetric and closed-can uranium, chemical vanadium and spectrographic analyses (Table 4). Spectographic analyses were run to ascertain the presence of any element other than uranium which might constitute ore, or at least require consideration for secondary recovery during milling of the uranium ore (see Summary of Emission Spec. Results). Periodic cross check analyses were run on random samples throughout this study to verify the reproducibility of all the analyses.

DISEQUILIBRIUM AND CHEMICAL ASSAY RESULTS

Before a summary of the chemical analyses could be made and a subsequent disequilibrium factor computed, adjustments had to be made between the core assay footages and the digitized gamma log footage for each core hole. This adjustment was accomplished for each core hole by determining the best correlation between the closed-can gamma uranium assays and the digitized gamma log data. Plates 19 thru 33 graphically depict the relationship between eU_3O_8 and cU_3O_8. Only cored intervals with at least 2 feet of .03% eU_3O_8 from the gamma log, were considered in this disequilibrium study. The intervals in each core hole which met or exceeded

this cutoff have been summarized in Table 2 along with all other analyses of the respective interval. A weighted average for each core was computed for eU_3O_8, cU_3O_8, V_2O_5, CO_2, and total sulfur by dividing the total thickness of all the intervals into the respective total grade thickness (Table 2). Disequilibrium was then computed for each hole by dividing the weighted average cU_3O_8 by the weighted average eU_3O_8.

Two methods were used to determine the uranium disequilibrium for the Anderson Mine property. The first method involved totaling the weighted eU_3O_8 and cU_3O_8 (Table 3), and then dividing the total cU_3O_8 by the total eU_3O_8:

$$\frac{\text{Total wt. } cU_3O_8}{\text{Total wt. } eU_3O_8} = \text{disequilibrium factor} \quad \frac{12.75\ cU_3O_8\ \text{ft.}}{14.12\ eU_3O_8\ \text{ft.}} \doteq .89$$

The first method yielded a disequilibrium factor of .89. The second method simply entailed dividing the total mineralized thickness into the total weighted disequilibrium for all of the core holes:

$$\frac{\text{Total wt. disequilibrium}}{\text{Total thickness}} \doteq \text{diseq. factor} \quad \frac{177.76\ \text{disequilibrium ft.}}{201\ \text{ft.}} = .88$$

This second method produced a disequilibrium factor of 0.88. The vanadium-uranium ratio (V_2O_5:cU_3O_8) of 1.39 was obtained by ratioing the appropriate weighted grade averages (Table 3). Average total CO_2 and sulfur were determined by dividing the total thickness (160 ft.) into the total weighted analyses of each. The average weighted grades for CO_2 and total sulfur were 6.38 wt. % and 0.57 wt. % respectively (Table 3).

SUMMARY OF EMISSION SPECTROGRAPH RESULTS

A rapid spectrographic scan of 21 uraniferous core samples was completed by Skyline Labs, Inc., Wheat Ridge, Colorado. The samples were selected to represent a cross section of the ore grades and mineralized lithologic units, recognized at the Anderson Mine. The spectrographic scan was run primarily for three reasons:

1. Identify elements other than uranium that might warrant consideration for secondary recovery during milling (i.e. V_2O_5).
2. Evaluate the concentration of those elements which might create milling problems (i.e. Mo).
3. Aid in geochemical exploration for similar uranium deposits in the Basin and Range area.

Before detailed evaluation of the data is made it should be pointed out that there were not enough samples analyzed to determine reasonable background values for all lithologic units. Therefore, average background values as tabulated by Turikian and Wedipohl (1961) were used when applicable.

The emission spectrographic scan provided semi-quantitative analysis of 31 elements. Elements which displayed the most interesting anomalies in at least one lithologic unit were: V, Mo, As, Co, Mn, and Sc (Table 4). Vanadium was the most pervasive anomally, present in all the mineralized units. Quantitative analyses (Table 1) indicate a high enough concentration of vanadium to at least warrant consideration for secondary recovery. The next most important anomalous element is molybdenum. Molybdenum was anomalous in seven

samples, with significant concentration (50 ppm to 300 ppm) in three samples (Table 4). The molybdenum appears to represent rare isolated accumulations within the carbonaceous marls. However, because molybdenum can adversely affect milling of the uranium if an acid leach is used, further molybdenum analyses should be initiated to determine the actual concentration and distribution. The remaining elements; As, Cr, Mn, and Sc are of only minor importance as anomalous trace elements. None of these elements are concentrated enough to warrant secondary recovery or pervasive enough to be used as a pathfinder for uranium mineralization in other areas. However, the overall effects of these trace element concentrations with respect to milling is presently unknown. The lithologic unit with the most trace element anomalies is the sandstone (Table 4).

RECOMMENDATIONS

The disequilibrium factor and the weighted grade averages computed from the 14 mineralized cores are good first approximations. However, the rather complex lithology requires a greater detailed and more comprehensive coring program so that a better statistical evaluation for each mineralized unit can be made. Several units were not cored as frequently as they probably should be in the future. Disequilibrium for each mineralized lithologic unit has also not been computed due to the unequal distribution of the lithologic units cored. Our past experience in other areas indicates that the disequilibrium factor will probably improve as more coring is completed. More coring should provide a better statistical

sampling of the area. Presently the disequilibrium factor neglects values with eU_3O_8 below the cutoff which also has correspondingly high cU_3O_8 (Example: Am-17c; 201 ft. - 202 ft., .076% cU_3O_8 vs. .011% eU_3O_8). Ranges of concentration for various elements via emission spectrograph should be determined for each lithologic unit. This may prove to be vital information for mill recovery. More quantitative work should be undertaken to better understand the concentration of at least U_3O_8, V_2O_5, CO_2, and Mo with respect to specific lithologies and areal distribution.

REFERENCES CITED:

Turekian, K. K. and Wedepohl, K. H., 1961, Distribution of the elements in some major units of the Earth's crust: G.S.A. Bull., v. 72, no. 2, pp. 175-191.

AM - 1C
Cored Interval
60'-140'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
60.5-61	0.056	0.071	0.076	-	-	sltstn.
63-64	0.003	0.010	0.034	-	-	"
64.0-64.5	0.008	0.023	0.021	-	-	"
64.5-65	0.021	0.015	0.036	-	-	"
65-65.5	0.029	0.037	0.044	-	-	calc.ls. & sltstns.
65.5-66	0.017	0.013	0.043	-	-	"
66-66.5	0.019	0.024	0.025	-	-	"
66.5-67	0.102	0.109	0.061	-	-	"
67-67.5	0.021	0.018	0.020	-	-	"
67.5-68	0.051	0.043	0.030	-	-	"
68-68.5	0.012	0.021	0.009	-	-	"
68.5-69	0.020	0.025	0.014	-	-	"
94.5-95	0.004	0.002	0.029	-	-	sltstn.
95-95.5	0.084	0.084	0.025	-	-	lignite
95.5-96	0.031	0.118	0.037	-	-	"
96-96.5	0.054	0.077	0.068	-	-	"
96.5-97	0.043	0.022	0.008	-	-	"
97-97.5	0.005	0.011	0.005	-	-	sltstn.
97.5-98	0.015	0.056	0.021	-	-	sltstn & mdstn.
98-98.5	0.004	0.011	0.005	-	-	"
98.5-99	0.007	0.014	0.020	-	-	"
99-99.5	0.013	0.054	0.021	-	-	"
99.5-100	0.021	0.075	0.036	-	-	"
100-100.5	0.214	0.170	0.133	-	-	sltstn.
100.5-101	0.121	0.121	0.110	-	-	"
101-101.5	0.012	0.038	0.050	-	-	"
101.5-102	0.009	0.015	0.049	-	-	"
103.5-104	0.016	0.030	0.125	-	-	"
104-104.5	0.098	0.096	0.168	-	-	lignit
104.5-105	0.040	0.028	0.023	-	-	"

*Closed can gamma only assay for eU_3O_8.

Table 1. Summary of core analyses from the Anderson Mine Property, September, 1976.

AM - 1C (con't.)

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
105-105.5	0.028	0.041	0.062	-	-	lignite
105.5-106	0.051	0.049	0.169	-	-	mdstn & slts
106-106.5	0.015	0.020	0.026	-	-	" "
106.5-107	0.013	0.021	0.020	-	-	" "
109-109.5	0.008	0.025	0.009	-	-	" "
109.5-110	0.037	0.021	0.026	-	-	" "
110-110.5	0.023	0.033	0.025	-	-	" "
110.5-111	0.028	0.026	0.026	-	-	" "
111-111.5	0.048	0.044	0.071	-	-	" "
111.5-112	0.029	0.036	0.039	-	-	lignite
112-112.5	0.106	0.113	0.035	-	-	"
112.5-113	0.048	0.110	0.041	-	-	"
113-113.5	0.016	0.021	0.034	-	-	"
113.5-114	0.017	0.021	0.088	-	-	sltstn
114-114.5	0.008	0.067	0.053	-	-	"
114.5-115	0.152	0.100	0.110	-	-	"
115-115.5	0.129	0.117	0.028	-	-	"
115.5-116	0.060	0.078	0.020	-	-	"
116-117	0.002	0.020	0.020	-	-	"

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 7C
Cored Intervals
15'-25'; 95'-118'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
17-18	0.009	0.018	0.128	0.32	0.25	mdstn
18-19	0.179	0.198	0.198	0.06	0.26	"
19-20	0.316	0.321	0.162	0	0.33	mdstn-sltstn
20-21	0.045	0.049	0.111	0	0.30	"
21-22	0.003	0.010	0.052	0.01	0.29	"
95-96	0.017	0.023	0.012	0	0.29	mdstn
96-97	0.001	0.024	0.018	-	-	"
97-98	0.009	0.020	0.018	0	0.31	"
98-99	0.016	0.034	0.015	0	0.30	"
99-100	0.011	0.029	0.012	0	0.26	sltstn
100-101	0.007	0.026	0.011	0	0.19	"
102-103	0.001	0.017	0.030	-	-	"
103-104	0.001	0.015	0.024	-	-	"
104-105	0.005	0.019	0.027	0	0.03	sltstn
105-106	0.010	0.017	0.055	-	-	"
106-107	0.005	0.019	0.037	-	-	"

*Closed can gamma only assay for eU_3O_8

Table 1. (Continued)

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
115-116	0.013	0.021	0.012	24.67	0.01	silty ls
116-117	0.006	0.008	0.008	-	-	ss
117-118	0.005	0.006	0.005	-	-	"
118-119	0.004	0.007	0.010	-	-	"
119-120	0.003	0.024	0.017	1.62	0.01	"
120-21	0.004	0.008	0.018	6.87	0.01	"
121-122	0.007	0.014	0.019	6.20	0.01	"
122-123	0.012	0.018	0.020	10.49	0.01	silty ls, che
123-124	0.008	0.023	0.021	8.20	0.01	"
124-125	0.012	0.019	0.023	15.95	0.02	silty ls
125-126	0.008	0.019	0.026	14.84	0.01	" "
126-127	0.047	0.053	0.083	9.23	0.01	" "
127-128	0.018	0.025	0.029	11.45	0.01	" "
128-129	0.022	0.027	0.056	9.08	0.01	" "
129-130	0.001	0.007	0.004	16.62	0.01	ls & chert
130-131	0.007	0.012	0.006	26.22	0.01	" "
131-132	0.030	0.038	0.071	7.16	0.02	ls & mdstn
132-133	0.022	0.033	0.062	3.18	0.01	ss & mdstn
133-134	0.005	0.010	0.038	13.44	0.01	ls & mdstn
134-135	0.017	0.030	0.077	14.11	0.01	silty ls
135-136	0.024	0.031	0.059	14.77	0.01	" "
136-137	0.011	0.016	0.042	2.14	0.15	ss
137-138	0.024	0.028	0.062	9.67	0.01	"
138-139	0.023	0.031	0.107	0.30	0.02	silicified l
139-140	0.005	0.006	0.014	26.44	0.01	ls
140-141	0.013	0.015	0.014	18.31	0.01	ls & sltstn

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 16C
Cored Interval
240'-335'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
246.5-247	0.003	0.014	0.067	-	-	ss & mdstn
247-247.5	0.007	0.078	0.168	-		mdstn
247.5-248	0.014	0.058	0.048	-	-	"
248-248.5	0.055	0.051	0.107	-	-	"
248.5-249	0.078	0.103	0.099	-	-	"
249-249.5	0.425	0.444	0.257	-	-	mdstn & lignite
249.5-250	0.476	0.285	0.169	-	-	mdstn
250-250.5	0.447	0.416	0.159	-	-	"
250.5-251	0.181	0.122	0.278	-	-	mdstn & lignite
251-251.5	0.015	0.028	0.098	-	-	" "
251.5-252	0.003	0.008	0.115	-	-	sltstn
267.5-268	0.001	0.012	0.062	-	-	mdstn
268-268.5	0.004	0.014	0.030	-	-	"
268.5-269	0.141	0.150	0.109	-	-	lignite
269-269.5	0.125	0.102	0.071	-	-	mdstn
269.5-270	0.046	0.061	0.070	-	-	"
270-270.5	0.009	0.022	0.064	-	-	"
270.5-271	0.005	0.021	0.089	-	-	"
287.5-288	0.017	0.022	0.033	-	-	"
288-288.5	0.062	0.048	0.015	-	-	mdstn
288.5-289	0.033	0.053	0.031	-	-	"
289-289.5	0.005	0.020	0.050	-	-	"

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 16C (Con't)

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
292.5-293	0.007	0.015	0.164	-	-	sltstn
293-293.5	0.009	0.015	0.112	-	-	"
293.5-294	0.004	0.014	0.082	-	-	calc. mdstn
294-294.5	0.060	0.045	0.102	-	-	mdstn
294.5-295	0.074	0.066	0.151	-	-	lignite & mdstr
295-295.5	0.079	0.081	0.045	-	-	lignite
295.5-296	0.027	0.075	0.023	-	-	"
296-296.5	0.060	0.090	0.179	-	-	"
296.5-297	0.067	0.095	0.049	-	-	"
297-297.5	0.045	0.077	0.265	-	-	"
297.5-298	0.021	0.028	0.045	-	-	mdstn
298-298.5	0.027	0.035	0.023	-	-	sltstn
298.5-299	0.045	0.050	0.034	-	-	"
299-299.5	0.059	0.050	0.052	-	-	lignite & mdstr
299.5-300	0.042	0.051	0.102	-	-	" "
300-300.5	0.034	0.037	0.062	-	-	lignitic sltstn
300.5-301	0.025	0.025	0.031	-	-	lignitic sltstr
301-301.5	0.233	0.218	0.218	-	-	lignite
301.5-302	0.125	0.141	0.134	-	-	lignite & mdstr
302-302.5	0.022	0.025	0.023	-	-	calc mdstn
302.5-303	0.012	0.013	0.018	-	-	" "
303-303.5	0.013	0.014	0.015	-	-	" "
303.5-304	0.018	0.022	0.012	-	-	" "
304.5-305	0.019	0.040	0.071	-	-	lignite
305-305.5	0.071	0.054	0.054	-	-	"
305.5-306	0.027	0.035	0.015	-	-	mdstn
306-306.5	0.038	0.038	0.018	-	-	"
306.6-307	0.043	0.044	0.018	-	-	lignite
307-307.5	0.044	0.051	0.024	-	-	"
307.5-308	0.035	0.050	0.036	-	-	"
308-308.5	0.052	0.065	0.095	-	-	"
308.5-309	0.013	0.011	0.018	-	-	mdstn
309-309.5	0.015	0.020	0.035	-	-	"
309.5-310	0.016	0.014	0.033	-	-	"
310-310.5	0.050	0.036	0.045	-	-	"
310.5-311	0.039	0.045	0.033	-	-	"
311-311.5	0.039	0.037	0.030	-	-	"
311.5-312	0.038	0.031	0.042	-	-	"
312-312.5	0.012	0.011	0.052	-	-	"

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 17C
Cored Interval
100'-215'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
104-105	0.009	0.017	0.021	11.52	0.07	sltstn & Rs
105-106	0.004	0.014	0.070	0.40	0.02	sltstn
106-107	0.006	0.010	0.034	0.35	0.02	"
107-108	0.010	0.017	0.040	0.01	0.01	"
130-131	0.008	0.011	0.039	-	-	mdstn
131-132	0.040	0.037	0.046	0	0.02	"
132-133	0.012	0.007	0.034	0.07	0.02	"
133-134	0.030	0.026	0.035	11.49	0.02	"
134-135	0.008	0.013	0.016	-	-	"
135-136	0.007	0.010	0.008	-	-	"
136-137	0.028	0.037	0.018	0.07	0.01	"
137-138	0.006	0.008	0.008	-	-	"
138-139	0.017	0.025	0.015	0	0.01	"
139-140	0.010	0.020	0.021	0	0.02	"
140-141	0.009	0.013	0.061	0	0.02	sltstn
141-142	0.009	0.012	0.124	0	0.03	"
143-144	0.003	0.010	0.098	0	0.02	"
144-145	0.010	0.021	0.077	0	0.02	sltstn & mdst
146-147	0.011	0.024	0.249	0	0.01	sltstn
147-148	0.023	0.022	0.159	0	0.02	"
148-149	0.024	0.028	0.068	0	0.01	mdstn
149-150	0.039	0.039	0.092	0	0.01	mdstn
150-151	0.004	0.013	0.080	0	0.02	"
154-155	0.009	0.013	0.102	0	0.01	"
162-163	0.004	0.002	0.205	-	-	"
163-164	0.022	0.036	0.065	0	0.01	mdstn
164-165	0.004	0.011	0.031	-	-	"
165-166	0.024	0.023	0.146	0	0.01	"
166-167	0.005	0.005	0.026	-	-	"
192-193	0.012	0.011	0.039	-	-	"
193-194	0.017	0.020	0.130	0	0.04	mdstn
199-200	0.076	0.090	0.133	0	0.21	"
200-201	0.012	0.021	0.156	0	0.03	sltstn
202-203	0.003	0.008	0.049	0	0.01	mdstn
203-204	0.059	0.064	0.159	0.15	0.04	"
204-205	0.059	0.068	0.127	0	0.01	"
205-206	0.001	0.011	0.076	0	0.02	mdstn & sltst
198-199	0.003	0.007	0.079	-	-	mdstn

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 18C
Cored Interval
270'-320'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
278-279	0.007	0.011	0.021	- -	--	silty ls
279-280	0.055	0.063	0.181	23.12	0.56	" "
280-281	0.007	0.005	0.003	-	-	" "
281-282	0.095	0.115	0.205	22.82	0.73	" "
282-283	0.250	0.161	0.051	16.62	1.00	" "
283-284	0.042	0.035	0.015	22.23	0.88	" "
284-285	0.042	0.032	0.015	22.08	0.84	" "
285-286	0.019	0.025	0.009	21.56	0.77	" "
286-287	0.019	0.030	0.241	8.64	0.75	lignite
288-289	0.062	0.077	0.135	0.74	0.50	"
289-290	0.120	0.148	0.303	3.77	0.62	lignite & sltstn
290-291	0.038	0.040	0.083	6.94	0.75	sltstn & mdstn
291-292	0.005	0.005	0.024	-	-	" "
293-294	0.007	0.001	0.018	-	-	" "
294-295	0.059	0.058	0.036	13.07	0.89	" "
295-296	0.031	0.030	0.062	11.67	0.86	slstn & lignite
296-297	0.103	0.147	0.161	3.03	0.52	" "
297-298	0.058	0.059	0.003	12.48	0.44	" "
298-299	0.023	0.022	0.003	15.43	0.87	marl & lignite
299-300	0.012	0.008	0.025	-	-	" "
312-313	0.014	0.022	0.042	0.22	0.70	sltstn
313-314	0.029	0.017	0.074	0.15	0.63	"
314-315	0.007	0.006	0.049	-	-	"

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 26C
Cored Intervals
595'-649';705'-755'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
601-602	0.008	0.011	0.005			
602-603	0.024	0.029	0.302	8.24	0.67	mdstn & sltst
603-604	0.032	0.027	0.072	3.72	0.62	slstn & lignite
604-605	0.024	0.025	0.226	0.03	0.57	" "
605-606	0.020	0.016	0.058	0.01	0.55	lignite
606-607	0.047	0.061	0.311	0.01	0.45	"
607-608	0.011	0.014	0.021	8.68	0.58	"
619-620	0.002	0.003	0.007	-	-	lignite & sltst
620-621	0.011	0.021	0.013	-	-	" "
621-622	0.019	0.019	0.051	0.06	0.25	" "
622-623	0.012	0.018	0.076	0.72	0.41	lignite, sltstn & mdstn
623-624	0.009	0.010	0.045	4.95	1.57	lignitic sltstn
624-625	0.007	0.019	0.009	9.90	1.07	" "
625-626	0.043	0.048	0.003	15.88	0.27	sltstn
626-627	0.020	0.033	0.007	15.36	0.32	silty ls
627-628	0.010	0.010	0.008	-	-	"
628-629	0.006	0.010	0.010	-	-	lignitic sltst
629-630	0.014	0.026	0.016	9.16	0.70	" "
630-631	0.034	0.040	0.017	6.79	0.53	" "
631-632	0.034	0.070	0.009	22.01	0.18	" "
632-633	0.008	0.006	0.026	-	-	silty, lignitic ls
633-634	0.004	0.014	0.008	-	-	" "
634-635	0.106	0.108	0.008	36.93	0.25	" "
635-636	0.121	0.170	0.003	27.99	0.12	" "
636-637	0.248	0.175	0.015	26.00	0.62	" "
637-638	0.017	0.057	0.001	29.91	0.27	ls & sltstn
638-639	0.012	0.018	0.010	27.32	0.09	" "
639-640	0.052	0.048	0.010	18.09	0.50	ls
640-641	0.008	0.015	0.010	-	-	"
718-719	0.004	0.005	0.012	-	-	ls & sltstn
						sltstn & mdstn

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 26C (Con't)

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
719-720	0.008	0.019	0.015	-	-	mdstn
720-721	0.345	0.292	0.026	0.07	0.67	ss
721-721.3	0.067	0.081	0.071	0.71	0.08	"
722.5-723	0.007	0.009	0.071	-	-	"
723-724	0.022	0.038	0.054	0.68	0	ss & mdstn
725-726	0.006	0.012	0.013	-	-	sltstn
726-727	0.003	0.002	0.010	-	-	ss
733-734	0.003	0.003	0.010	-	-	sltstn
734-735	0.007	0.016	0.018	-	-	"
735-736	0.008	0.008	0.016	-	-	lignitic mdstn
736-737	0.007	0.011	0.016	-	-	" "
738-739	0.004	0.009	0.015	-	-	sltstn
740-741	0.003	0.002	0.008	-	-	marl
741-742	0.001	0.003	0.008	-	-	"
743-744	0.003	0.007	0.029	-	-	mdstn
737-738	0.034	0.037	0.086	0.09	1.74	"
739-740	0.045	0.029	0.089	30.06	0.19	slstn & marl
742-743	0.030	0.022	0.201	8.35	0.90	mdstn & ligni

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 49 C
Cored Interval
606'-650'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
609-610	0.007	0.013	0.063	-	-	mdstn
610-611	0.020	0.019	0.076	-	-	"
611-612	0.010	0.017	0.079	-	-	"
612-613	0.034	0.034	0.120	0.01	0.32	chert
613-614	0.008	0.027	0.155	1.99	0.36	mdstn&cherty l
614-615	0.033	0.054	0.005	30.72	0.05	ls
615-616	0.058	0.051	0.039	26.51	0.01	"
616-617	0.061	0.058	0.026	25.33	0.04	"
617-618	0.077	0.091	0.026	25.63	0.01	"
618-619	0.040	0.051	0.048	6.65	0.55	ls&lignitic mds
619-620	0.037	0.030	0.042	5.98	0.48	lignite & mdst
620-621	0.032	0.036	0.196	0.22	0.63	mdstn
621-622	0.022	0.026	0.014	11.89	0.35	mdstn & ls
622-623	0.020	0.020	0.007	33.60	0.23	ls
624-625	0.024	0.024	0.015	2.73	0.98	mdstn
625-626	0.019	0.025	0.014	-	-	"
629-630	0.004	0.008	0.021	-	-	lignitic mdst
630-631	0.019	0.027	0.053	0.06	0.63	lignite
631-632	0.114	0.089	0.336	0.09	0.73	"
632-633	0.016	0.054	0.039	0.22	1.38	"
633-634	0.020	0.027	0.049	0.65	0.94	mdstn
634-635	0.013	0.019	0.046	0.99	1.19	"
635-636	0.011	0.024	0.146	9.01	1.51	lignite ls & sltstn
636-637	0.078	0.046	0.089	2.29	2.07	mdstn
637-638	0.012	0.024	0.064	2.51	1.40	lignite & mdst

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 51C
Cored Interval
377'-418';430-475'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
394-395	0.001	0.017	0.035	0	0.063	sltstn
395-396	0.004	0.016	0.038	0	0.037	"
396-397	0.040	0.036	0.064	0	0.429	sltstn & ss
397-398	0.013	0.020	0.016	0	0.386	" "
398-299	0.021	0.024	0.013	0.02	0.063	" "
399-400	0.008	0.023	0.013	0.01	0.316	mdstn
400-401	0.008	0.036	0.012	0.02	0.409	sltstn & ss
401-402	0.009	0.034	0.014	0.04	0.326	slstn
402-403	0.005	0.025	0.012	0.02	0.374	sltstn & mdst
403-404	0.012	0.025	0.025	0.04	0.506	lignitic slts
404-405	0.023	0.027	0.020	0	1.012	" "
405-406	0.011	0.031	0.0 0	0	0.848	sandy sltstn
406-407	0.011	0.030	0.017	0	1.386	mdstn
407-408	0.152	0.062	0.254	0.01	2.046	lignitic mdst
408-409	0.001	0.036	0.035	0	0.905	mdstn
409-410	0.005	0.017	0.020	0.10	0.848	"
410-411	0.010	0.032	0.045	0	1.402	"
411-412	0.007	0.026	0.067	0	0.094	"
412-413	0.001	0.007	0.057	0	0.334	"
438-439	0.001	0.011	0.121	3.63	0.027	sltstn
439-440	0.044	0.044	0.064	14.24	0.362	ls & mdstn
440-441	0.227	0.190	0.025	30.84	0.444	ls
441-442	0.063	0.116	0.018	23.25	0.516	"
442-443	0.020	0.028	0.029	14.02	0.227	ls & mdstn
443-444	0.011	0.823	0.089	7.81	0.721	mdstn
444-445	0.024	0.004	0.105	0.68	0.053	lignitic mds
445-446	0.075	0.096	0.199	0.17	0.053	" "
446-447	0.111	0.019	0.140	0.19	0.017	" "
447-448	0.001	0.005	0.200	0.11	0.651	" "
461-462	0.008	0.013	0.488	0.01	0.067	sltstn
462-463	0.007	0.017	0.281	0.02	0.035	"
463-464	0.011	0.018	0.303	0.01	0.060	lignitic slts
464-465	0.259	0.280	0.312	0.01	0.569	" "
465-466	0.263	0.222	0.385	0.13	0.585	" "
466-467	0.845	0.567	0.382	0.02	0.711	sltstn
467-468	0.063	0.088	0.215	0.01	0.551	"
468-469	0.010	0.023	0.156	0.02	0.080	"
469-470	0.008	0.023	0.159	0.07	0.032	"
470-471	0.002	0.004	0.134	0.02	0.025	"

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 79C
Cored Interval
25'-70'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
40-41	0.001	0.007	0.008	-	-	mdstn
41-42	0.024	0.011	0.010	6.42	0.31	"
42-43	0.005	0.008	0.038	9.17	0.33	"
43-44	0.009	0.013	0.030	12.10	0.32	"
44-45	0.001	0.021	0.008	-	-	" "
45-46	0.022	0.026	0.044	12.36	0.11	"
46-47	0.035	0.037	0.012	32.35	0.32	mdstn & ls
47-48	0.021	0.024	0.008	31.68	0.08	" "
48-49	0.001	0.021	0.005	-	-	" "
49-50	0.001	0.006	0.003	-	-	" "
50-51	0.001	0.002	0.003	-	-	" "
58-59	0.010	0.010	0.018	30.28	0.13	silty ls
59-60	0.001	0.013	0.034	-	-	" "
60-61	0.020	0.021	0.060	23.48	0.07	"
61-62	0.004	0.009	0.018	-	-	sltstn
62-63	0.011	0.018	0.145	1.02	0.13	"
63-64	0.021	0.030	0.074	3.84	0.15	"
57-58	0.015	0.014	0.021	-	-	sltstn
64-65	0.008	0.014	0.011	-	-	ls
65-66	0.010	0.013	0.011	-	-	ls & sltstn

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 113C
Cored Interval
270'-345'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
272-273	0.013	0.012	0.036	7.75	1.75	lignite
273-274	0.028	0.022	0.030	0.44	2.17	"
274-275	0.005	0.015	0.026	-	-	"
275-276	0.007	0.010	0.029	-	-	mdstn
276-277	0.013	0.013	0.026	-	-	lignite
277-278	0.007	0.011	0.030	-	-	"
278-279	0.020	0.024	0.030	11.15	1.44	lignite, mdstn ls
279-280	0.016	0.016	0.014	14.84	1.92	lignite,mdstn &l
280-281	0.016	0.025	0.014	7.39	2.13	" "
285-286	0.015	0.022	0.077	0	0.90	lignite
295-296	0.014	0.018	0.065	0	0.63	lignitic sltst
296-297	0.004	0.012	0.132	0	0.47	" "
297-298	0.005	0.009	0.138	0	0.49	"
298-299	0.008	0.016	0.150	0	0.69	"
299-300	0.022	0.045	0.223	0	0.71	"
300-301	0.054	0.062	0.148	0	1.05	"
301-302	0.030	0.055	0.195	0	1.15	"
302-303	0.032	0.040	0.095	0	0.85	sltstn
303-304	0.004	0.016	0.024	-	-	"
316-317	0.004	0.011	0.029	-	-	"
317-318	0.070	0.036	0.036	0	1.69	lignitic sltstn
318-319	0.020	0.019	0.016	0	1.45	" "
319-320	0.012	0.017	0.021	0	1.36	" "
339-340	0.007	0.035	0.022	0	2.78	" "
340-341	0.156	0.117	0.036	0	0.47	" "
341-342	0.006	0.016	0.017	0	0.11	ss
342-343	0.008	0.022	0.021	0	0.13	"
343-344	0.057	0.076	0.028	0	1.42	lignitic mdstn
344-345	0.001	0.004	0.032	-	-	ss

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 119C
Cored Interval
26'-41';105'-135'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
30-31	0.001	0.005	0.055	-	-	mdstn
31-32	0.076	0.076	0.102	0	0.17	"
34-35	0.007	0.022	0.036	0	0.18	"
113.5-114	0.044	0.135	0.101	10.63	0.52	calc mdstn
114-115	0.017	0.029	0.011	20.86	0.99	ls & lignite
116-117	0.014	0.015	0.006	35.45	0.58	marl
118-119	0.016	0.017	0.012	26.81	0.45	"
119-120	0.090	0.083	0.030	27.03	0.93	"
120-121	0.045	0.040	0.065	31.24	0.63	marl & lignit
121-122	0.007	0.008	0.021	-	-	ls
122-123	0.007	0.008	0.024	-	-	ls & lignite
123-124	0.071	0.058	0.083	12.26	1.53	silicified ls &
124-125	0.011	0.019	0.026	-	-	lignite
130-131	0.007	0.012	0.029	-	-	marl
131-132	0.288	0.251	0.170	24.52	1.75	marl & lignite
132-133	0.194	0.118	0.077	0.37	1.85	lignite
133-134	0.011	0.020	0.027	0	2.13	lignite & sltst
117-118	0.015	0.018	0.017	-	-	marl

*Closed can gamma only assay for eU_3O_8.

Table 1. (Continued)

AM - 135C
Cored Interval
373'-399';452'-484'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
377-378	0.008	0.008	0.065	-	-	mdstn
378-379	0.027	0.027	0.095	0	0.47	"
382-383	0.020	0.017	0.077	0	0.96	"
383-384	0.024	0.025	0.030	0.34	1.00	"
384-385	0.028	0.038	0.027	0	1.10	lignitic mdstn
385-386	0.043	0.065	0.092	0	0.21	" "
386-387	0.135	0.085	0.123	0	2.22	" "
387-388	0.025	0.061	0.030	0.01	0.56	" "
388-389	0.033	0.038	0.062	0	0.67	" "
389-390	0.006	0.012	0.047	-	-	sltstn
457-458	0.011	0.033	0.344	0	0.21	lignitic sltstn
458-459	0.010	0.054	0.264	0.01	0.16	" "
459-460	0.033	0.051	0.456	0.01	0.33	" "
460-461	0.171	0.159	0.906	0.10	1.57	" "
461-462	0.176	0.183	0.373	1.09	0.51	" "
462-463	0.106	0.106	0.272	1.43	0.75	" "
463-464	0.090	0.122	0.064	4.61	2.42	" "
464-465	0.008	0.027	0.024	0.16	2.24	" "
465-466	0.006	0.010	0.018	-	-	" "
466-467	0.053	0.048	0.047	8.85	2.09	" "
467-468	0.138	0.125	0.117	6.99	2.24	" "
468-469	0.084	0.144	0.086	0.37	2.24	marl & lignite
469-470	0.045	0.052	0.056	28.06	0.21	marl
470-471	0.058	0.054	0.014	22.01	0.33	"
471-472	0.052	0.128	0.014	16.84	0.33	marl & lignite
472-473	0.361	0.370	0.067	15.58	0.21	" "
473-474	0.273	0.626	0.051	4.71	0.83	lignite sltstn
474-475	0.149	0.145	0.314	0.22	1.10	" "
475-476	0.059	0.051	0.071	0.01	2.09	" "
476-472	0.011	0.018	0.071	0.06	1.70	mdstn & sltstn
381-382	0.012	0.011	0.105	-	-	mdstn

*Closed can gamma only assay for eU_3O_8

Table 1. (Continued)

AM - 149C
Cored Interval(s)
340'-355';380-420'

Core Depth ft.	U_3O_8 % by wt.	eU_3O_8* % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur(s) % by wt.	Lithology
350-351	0.008	0.015	0.015	3.07	0.017	sltstn
351-352	0.005	0.013	0.022	3.38	0.133	"
352-353	0.001	0.004	0.076	0.17	0.007	"
380-381	0.008	0.008	0.064	0.07	0.498	"
381-382	0.014	0.022	0.016	0.20	0.534	"
382-383	0.061	0.076	0.012	0.14	0.658	"
383-384	0.072	0.081	0.014	0.13	0.215	"
384-385	0.032	0.048	0.011	0.38	0.075	"
385-386	0.022	0.028	0.013	0.26	0.316	"
386-387	0.012	0.027	0.015	0.06	0.848	"
387-388	0.003	0.015	0.017	0.04	1.216	"
388-389	0.011	0.013	0.021	0.04	1.009	"
389-390	0.012	0.012	0.024	0.01	0.852	"
390-391	0.009	0.011	0.041	0.01	0.892	"
391-392	0.003	0.013	0.070	0	1.169	"
392-393	0.016	0.045	0.099	0	1.921	"
393-394	0.050	0.050	0.209	0	0.159	lignite sltstn
394-395	0.039	0.028	0.143	0.02	0.077	" "
395-396	0.001	0.008	0.153	3.45	0.317	sltstn
396-397	0.001	0.016	0.163	0.10	0.094	"
397-398	0.039	0.033	0.571	0	0.939	"
398-399	0.009	0.018	0.153	0	0.885	"
399-400	0.011	0.016	0.115	0.01	1.216	"
400-401	0.005	0.021	0.131	0	0.721	"
401-402	0.014	0.017	0.184	0	0.631	sltstn & lignit
402-403	0.012	0.017	0.099	0	0.374	" "
403-404	0.005	0.007	0.077	0	0.090	mdstn
404-405	0.003	0.009	0.105	0	0.050	"
405-406	0.004	0.008	0.191	0.01	0.280	"
406-407	0.005	0.012	0.203	0.01	0.109	"
407-408	0.012	0.024	0.169	0	0.159	"
408-409	0.039	0.034	0.166	0	0.093	"
409-410	0.139	0.150	0.278	0	1.216	mdstn & lignite
410-411	0.032	0.036	0.080	0	1.979	sltstn & lignite
411-412	0.008	0.013	0.020	-	-	sltstn

*Closed can gamma only assay for eU_3O_8.

AM - 1c

Table 2. Core hole interval summary of assays from the Anderson Mine.

Log depth ft.	Thickness ft.	eU_3O_8 % by wt.	cU_3O_8 % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur % by wt.
95.5-98.0	3.0	.061	.037	.029	-	-
100.0-102.5	3.0	.057	.065	.067	-	-
104.5-107.5	3.5	.042	.037	.085	-	-
111.5-116.5	5.5	.055	.058	.050	-	-
Total	15.0					
Weighted average		.054	.050	.057	-	-

cU_3O_8: eU_3O_8 = .926

AM - 7c

18.5-23.0	5.0	.095	.110	.130	.08	.34
98.0-99.5	2.0	.033	.014	.014	0	.28
Total	7.0					
Weighted average		.077	.083	.097	.06	.32

cU_3O_8: eU_3O_8 = 1.072

AM - 13c

125.5-138.5	13.5	.040	.019	.054	10.57	.02
Total	13.5					
Weighted average		.040	.019	.054	10.57	.02

cU_3O_8: eU_3O_8 = .475

AM - 16c

249.0-254.0	5.5	.135	.155	.142	-	-
273.5-276.0	3.0	.080	.055	.072	-	-
298.5-315.5	17.5	.052	.045	.060	-	-
Total	26.0					
Weighted average		.073	.069	.079		

cU_3O_8: eU_3O_8 = .945

AM - 17c

Table 2. (Continued)

Log depth ft.	Thickness ft.	eU_3O_8 % by wt.	cU_3O_8 % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur % by wt.
149.0-150.5	2.0	.033	.032	.080	0	.01
204.5-207.0	3.0	.040	.040	.112	.03	.02
Total	5.0					
Weighted average		.038	.037	.099	.02	.02

cU_3O_8: eU_3O_8 = .974

AM - 18c

281.5-285.5	4.5	.051	.090	.059	21.06	0.84
289.5-293.0	4.0	.081	.060	.191	5.02	0.66
295.5-301.5	6.5	.065	.048	.048	11.14	0.72
Total	15.0					
Weighted average		.065	.063	.089	12.48	0.74

cU_3O_8: eU_3O_8: .938

AM - 26c

627.5-629.0	2.0	.042	.031	.005	15.62	0.30
631.5-640.0	9.0	.082	.064	.011	24.38	0.27
722.5-725.0	3.0	.111	.139	.037	0.39	0.38
Total	14.0					
Weighted average		.083	.075	.016	17.99	0.30

cU_3O_8: eU_3O_8 = .969

AM - 49c

615.0-622.5	8.0	.055	.045	.069	16.87	0.31
632.5-639.5	7.5	.038	.039	.108	1.90	1.21
Total	15.5					
Weighted average		.047	.042	.088	9.63	0.75

cU_3O_8: eU_3O_8 = .894

AM - 51c

Table 2. (Continued)

Log depth ft.	Thickness ft.	eU_3O_8 % by wt.	cU_3O_8 % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur % by wt.
396.0-401.0	5.5	.033	.018	.024	.01	0.32
403.0-411.5	9.0	.038	.026	.055	.02	1.01
442.5-450.0	8.0	.087	.072	.084	11.40	0.30
466.0-471.0	5.5	.205	.288	.319	0.04	0.50
Total	28.0					
Weighted average		.084	.089	.109	3.27	0.52

cU_3O_8: eU_3O_8 = 1.060

AM - 79c

45.5-47.5	2.5	.037	.029	.028	22.36	0.22
Total	2.5					
Weighted average		.037	.029	.028	22.36	0.22

cU_3O_8: eU_3O_8 = .784

AM - 113c

301.5-306.0	5.0	.049	.029	.150	0	0.89
342.5-347.5	5.5	.061	.047	.026	0	0.43
Total	10.5					
Weighted average		.055	.039	.085	0	0.65

cU_3O_8: eU_3O_8 = .709

AM - 119c

122.0-127.0	5.5	.045	.044	.045	23.51	1.03
132.0-134.5	3.0	.123	.163	.092	12.28	1.80
Total	8.5					
Weighted average		.073	.086	.062	19.55	1.30

cU_3O_8: eU_3O_8 = 1.178

Table 2. (Continued)

AM - 135c

Log depth ft.	Thickness ft.	eU_3O_8 % by wt.	cU_3O_8 % by wt.	V_2O_5 % by wt.	CO_2 % by wt.	Total sulfur % by wt.
386.0-391.0	5.5	.053	.053	.067	0.002	0.95
458.0-465.0	7.5	.115	.085	.337	1.06	1.14
468.0-477.5	10.0	.175	.127	.084	10.36	1.17
Total	23.0					
Weighted average		.126	.096	.162	4.85	1.11

cU_3O_8: eU_3O_8 = .762

AM - 149c

382.5-388.0	6.0	.050	.036	.014	0.19	0.44
393.5-396.0	3.0	.044	.035	.150	0.01	0.72
398.0-399.5	2.0	.034	.024	.362	0	0.91
407.0-413.0	6.5	.061	.039	.066	0.002	0.59
Total	17.5					
Weighted average		.051	.036	.096	0.07	0.60

cU_3O_8: eU_3O_8 = .706

Table 3. Calculation summary sheet for Anderson Mine disequilibrium study.

Hole No..	Thickness (ft.)	Average eU_3O_8 (wt.%)	Weighted Average eU_3O_8 (wt.% ft.)	Average cU_3O_8 (wt.%)	Weighted Average cU_3O_8 (wt.% ft.)	Diseq.
AM-1c	15.0	.054	0.810	.050	0.750	0.926
AM-7c	7.0	.077	0.539	.083	0.581	1.078
AM-13c	13.5	.040	0.540	.019	0.257	0.475
AM-16c	26.0	.073	1.898	.069	1.794	0.945
AM-17c	5.0	.038	0.190	.037	0.185	0.974
AM-18c	15.0	.065	0.975	.063	0.945	0.938
AM-26c	14.0	.083	1.162	.075	1.050	0.969
AM-49c	15.5	.047	0.729	.042	0.651	0.894
AM-51c	28.0	.084	2.352	.089	2.492	1.060
AM-79c	2.5	.037	0.093	.029	0.073	0.784
AM-113c	10.5	.055	0.578	.039	0.410	0.709
AM-119c	8.5	.073	0.621	.086	0.731	1.178
AM-135c	23.0	.126	2.898	.096	2.208	0.762
AM-149c	17.5	.051	0.893	.036	0.630	0.706
Total	201.0					
Weighted Totals			14.278		12.757	
Weighted Grade Average			.071		.063	

Disequilibrium Method #1

$$\frac{\text{total wt. } eU_3O_8}{\text{total wt. } eU_3O_8} \text{ or } \frac{12.757}{14.127} = .893$$

Disequilibrium Method #2

$$\frac{\text{total wt. disequilibrium}}{\text{total thickness}} \text{ or } \frac{177.761}{201}$$

study.

Diseq.	Weighted Diseq.	Average V_2O_5 (wt.%)	Weighted Average V_2O_5 (wt.% ft.)	Average CO_2 (wt.%)	Weighted Average CO_2 (wt.% ft.)	Average total sulfur (wt.%ft)	Weighted Average total sulfur (wt.% ft.)
0.926	13.890	.057	0.855	-	-	-	-
1.078	7.546	.097	0.679	0.06	0.42	0.32	2.24
0.475	6.413	.054	0.729	10.57	142.70	0.02	0.27
0.945	24.570	.079	2.054	-	-	-	-
0.974	4.870	.099	0.495	0.02	0.10	0.02	0.10
0.938	14.070	.089	1.335	12.48	187.20	0.74	11.10
0.969	13.566	.016	0.224	17.99	251.86	0.30	4.20
0.894	13.857	.088	1.364	9.63	11.30	0.75	11.63
1.060	29.680	.108	3.052	3.27	91.56	0.52	14.56
0.784	1.960	.028	0.070	22.36	55.90	0.22	0.55
0.709	7.445	.085	0.893	0	0	0.65	0
1.178	10.013	.062	0.527	19.55	166.18	1.30	11.05
0.762	17.526	.162	3.726	4.85	111.55	1.11	25.53
0.706	12.355	.096	1.680	0.07	1.23	0.60	10.50
	177.761		17.683		1020.00		91.73
			.088		6.38		.057

= .893

$\frac{77.761}{201}$ = .884

Table 4. Summary of Emission Spectrographic Analyses, Anderson Mine, September, 1976.

Hole #	AM-135c	AM-135c	AM-135c	AM-119c	AM-119c	AM-113c	AM-7c	AM-17c
Core Depth	460-461	469-470	472-473	119-120	132-133	300-301	18-19	131-132
Lithology	lignite & sltstn	marl	marl & lignite	marl	lignite	lignite & sltstn	mdstn	mdstn
Fe	1.5%	.2%	1.5%	.5%	2%	2%	2%	3%
Ca	.5%	15%	10%	20%	.7%	.2%	.3%	.2%
Mg	.5%	.2%	.2%	1%	1%	.3%	1.5%	2%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	500	<500	<500	<500	<500	<500
B	20	10	15	15	20	20	20	30
Ba	200	10	7	150	300	200	200	100
e	<2	<2	<2	<2	<2	<2	<2	2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	10	5	7	10
Cr	20	10	70	10	30	50	70	50
Cu	10	2	15	2	20	20	20	30
Ga	<10	<10	<10	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
La	20	20	20	20	50	30	50	70
Mn	50	150	150	200	100	150	150	200
Mo	5	70●	300●	2	50●	30●	<2	<2
Nb	<20	<20	<20	<20	<20	<20	<20	20
Ni	15	<5	30	5	20	30	20	20
Pb	10	<10	10	10	20	15	20	10
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	10	<10	10	15
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	150	700	300	2,000	200	100	150	150
Ti	500	200	200	500	1,000	700	1,500	1,500
V	5,000●	200	500●	150	500●	700●	1,000●	200
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	10	<10	<10	<10	15	10	20	20
Zn	<200	<200	<200	<200	<200	<200	<200	<200
:	50	30	<20	30	50	50	50	50

● Anomalous value

Table 4. Summary of Emission Spectrographic Analyses, Anderson Mine, September, 1976.

Hole #	AM-149c	AM-51c	AM-51c	AM-51c	AM-51c
Core Depth	408-409	445-446	446-447	464-465	446-467
Lithology	mdstn	lignite & mdstn	lignite & mdstn	lignite & sltstn	sltstn
Fe	1%	1%	1%	2%	1.5%
Ca	.3%	.5%	.2%	.2%	.2%
Mg	.3%	.5%	.5%	.2%	.5%
Ag	<1	<1	<1	<1	<1
As	<500	<500	<500	<500	700 ●
B	20	10	15	15	15
Ba	150	100	150	200	100
Be	<2	<2	<2	<2	<2
Bi	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50
Co	<5	<5	<5	<5	5
Cr	70	30	50	50	30
Cu	20	10	7	20	15
Ga	<10	<10	<10	<10	<10
Ge	<20	<20	<20	<20	<20
La	30	30	20	20	20
Mn	70	50	50	50	100
Mo	15 ●	<2	<2	10 ●	<2
Nb	<20	20	<20	<20	<20
Ni	15	5	5	10	5
Pb	10	<10	<10	<10	10
Sb	<100	<100	<100	<100	<100
Sc	<10	<10	<10	<10	<10
Sn	<10	<10	<10	<10	<10
Sr	150	100	150	200	150
Ti	500	500	500	300	300
V	700 ●	500 ●	700 ●	1,000 ●	1,500 ●
W	<50	<50	<50	<50	<50
Y	15	10	<10	10	10
Zn	<200	<200	<200	<200	<200
Zr	30	70	20	20	20

● Anomalous value

Table 4. Summary of Emission Spectrographic Analyses, Anderson Mine, September, 1976.

Hole #	AM-18c	AM-26c	AM-26c	AM-26c	AM-26c	AM-49c	AM-49c	AM-149c
Core Depth	297-298	636-637	720-721	721-721.25	723-724	612-613	615-616	393-394
Lithology	lignite	ls & slstn	ss	ss	ss	chert	cherty ls	lignite& s
Fe	1.5%	.5%	3%	2%	5%	2%	.2%	1%
Ca	10%	15%	1%	1%	1.5%	.5%	10%	.2%
Mg	.5%	.2%	1.5%	1%	1.5%	.5%	.3%	.2%
Ag	<1	<1	<1	<1	<1	<1	<1	<1
As	<500	<500	500	<500	<500	<500	<500	<500
B	15	<10	20	30	15	15	<10	50
Ba	100	20	700	700	700	100	10	50
Be	<2	<2	2	2	2	<2	<2	<2
Bi	<10	<10	<10	<10	<10	<10	<10	<10
Cd	<50	<50	<50	<50	<50	<50	<50	<50
Co	<5	<5	15	5	15	<5	<5	<5
Cr	50	15	100 ●	50	100 ●	70	<10	150
Cu	20	5	50	30	30	20	2	10
Ga	<10	<10	10	<10	10	<10	<10	<10
Ge	<20	<20	<20	<20	<20	<20	<20	<20
a	20	20	50	50	50	30	20	30
n	500	300	200 ●	200 ●	200 ●	70	500	20
Mo	15 ●	<2	<2	<2	2	<2	<2	20
Nb	<20	<20	20	<20	20	<20	<20	<20
Ni	15	5	50	20	70	15	5	10
Pb	10	<10	30	20	20	10	<10	<10
Sb	<100	<100	<100	<100	<100	<100	<100	<100
Sc	<10	<10	15 ●	10 ●	20 ●	<10	<10	<10
Sn	<10	<10	<10	<10	<10	<10	<10	<10
Sr	1,000	200	1,000	1,000	1,000	70	500	100
Ti	500	100	2,000	1,000	3,000	500	100	500
V	50	30	200 ●	300 ●	300 ●	1,000 ●	100	700 ●
W	<50	<50	<50	<50	<50	<50	<50	<50
Y	<10	<10	30	10	20	20	<10	10
Zn	<200	<200	<200	<200	< 200	<200	<200	<200
Zr	20	20	50	30	50	30	20	50

● Anomalous value

URANGESELLSCHAFT
U.S.A., Inc.

6000 East Evans Avenue
Building 3, Suite 200
Denver, Colo. 80222
Telephone (303) 753-0411
Telex 45-951 UGD DVR

Mr. Dean Soderstrom
Minerals Exploration Co.
Box 50324
Tucson, Az 85705

July 7, 1978

SUBJECT:

Dear Dean:

For your information and files, I am forwarding the latest Hazen report concerning the Date Creek Project cores. Included are analytical data from the five core intervals taken during our Spring, 1978 drilling program. These cores are a bit complex with respect to the carbon and carbonate values. At this time we are considering separate tests for each of the five core intervals and/or selected composites. Both acid and alkaline leaching should be done. Intervals with both high carbon and high carbonate values are particularly troublesome.

Any suggestions would be appreciated.

Sincerely,

David C. Hertzke
Project Manager

DCH:slk

Enclosure

Memorandum
Union Oil Company of California

UNION

MEMO TO: J. A. Abramo

DATE: May 3, 1978

FROM: D. J. Soderstrom

SUBJECT: UG Metallurgical Test Data

From information received from UG the Tonto 5 drill hole is the only hole which should be used for predicting metallurgical performance of their ore in our circuit. From data received Tonto 5 went into the test sample marked "Composite 1". There were a total of 4 composities prepared from various drill holes. The calculated composite assays are compared below with the actual reported assays.

	CALCULATED ASSAYS			ACTUAL ASSAYS		
Composite	U_3O_8	CO_2	Corg	U_3O_8	CO_2	Corg
1	.0896	0.75	4.21	.044	21.80	-
2	.0483	7.90	.095	.036	7.11	-
3	.0439	17.55	.1275	.030	0.70	3.5
4	.0396	24.03	4.49	.056	14.50	1.7

From the data presented in some of the report, Tonto 5 is identified as a high organic carbon low carbonate interval. Obviously the interval could not have gone into composite 1. When pressed for further information it was stated that it was felt that Tonto 5 had actually been put into Composite 3 but that it could not be verified.

Acid additions to the 4 composites varied from 147 to 1180 lbs/ton of ore. An oxidant addition of 4 lbs/ton was adequate in all cases. Hazen was requested to give acid and oxidant requirements to use for estimated processing costs. The following figures were supplied and they are the basis for the costs on the attached memo.

Sulphuric Acid 600 to 900 lbs/ton

Sodium Chlorate 4 lbs/ton

DJS/m

Memorandum

Union Oil Company of California

UNION 76

MEMO TO: J. A. Abramo

DATE: April 24, 2978

FROM: D. J. Soderstrom

SUBJECT: Milling of UG Ore

Based on reagent consumptions received from John Litz this date, direct milling cost of the ore through the Anderson Mill circuit will range from $17.17/ton minimum to $21.67/ton maximum. This cost is based upon the assumption that no major change will be made in the tailings disposal system in order to handle the toll ore.

DJS/m

HAZEN RESEARCH, INC.

4601 INDIANA STREET
GOLDEN, COLORADO • 80401
TELEPHONE 303/279-4501

June 28, 1978

Mr. David Hertzke
Urangesellschaft, U.S.A., Inc.
Building 3, Suite 200
6000 East Evans Avenue
Denver, Colorado 80222

RECEIVED
JUN 30 1978

Re: HRI Project 4441
Uranium Extraction from Date Creek Ore

Dear David:

The percolation leach on the Date Creek composite has been terminated. The results are listed in Table 1. The ore was leached using a recirculating solution of 5 g/l sulfuric acid. It appears from the data that up to 70% of the uranium was solubilized during the first few volumes of solution. This probably was due to the formation of carbonic acid, which solubilized and held the uranium in solution as the carbonate complex. During this period, the flow through the column was fairly good, 0.2 gal/day/ft^2. The flow then dropped to less than 0.1 gal/day/ft^2 and the uranium content of the effluents decreased to about 5 ppm.

No increase in the uranium content of the effluent was achieved for about 45 days during which time the acid addition had increased from about 300 lb/ton to almost 700 lb/ton of ore. At this point the effluent pH had dropped to almost 2.0 and the soluble uranium had increased to 111 ppm U_3O_8. The test was terminated with this sample, so I do not know if additional volumes would have increased the solubilization further. The column residue contained 0.03% U_3O_8, indicating an overall solubilization of 79%.

It would appear that heap leaching would be a method of salvaging some return from ores too low for conventional processing. However, the low recovery (70%) probably would not provide sufficient cash flow to support the mining and other costs. Some other techniques to enhance the flow rate were tested, but showed negative results.

Also enclosed are the analyses for the five drill core intervals received May 12. Included are fluorimetric U_3O_8 and CO_2 analyses for each interval, organic carbons for the ore zone intervals, plus some others, and radiometric uranium, core moisture, core specific gravity, and core density for each ore zone plus some intervals above and below the ore zones.

The results from the seven ore zones which indicate widely varying ore types.

DC 28C, 488-499	6.6% $CaCO_3$, 1% C. Light density, high limestone at the top and a lignite interval at the bottom.
DC 28C, 516-520	0.1% $CaCO_3$, 3.8% C. Light density, lignitic with very low limestone.
DC 60C, 896-902	2.3% $CaCO_3$. Carbon analysis in progress. Low in both limestone and lignite.
DC 77C, 584-590	48% $CaCO_3$, 4.4% C. Moderately heavy, high limestone at the top and very light, high U_3O_8 lignite at the bottom.
DC 81C, 754-760	21% $CaCO_3$, 5% C. Light density with adjacent limestone and lignite intervals at center of the zone.
DC 81C, 764-770	13% $CaCO_3$, 3.7% C. Very light density, high grade, high lignite with a moderate limestone content.
DC 102C, 1029-1041	45% $CaCO_3$, 0.5% C. Moderately dense limestone with very low carbon content.

The generally high limestone content of all intervals indicates that acid leaching would probably not be economical. The average for the zones is 19% $CaCO_3$ indicating a minimum acid addition to neutralize the limestone of 400 lb H_2SO_4 per ton of ore. The high lignite content, 2.6% C, would present significant soluble organic problems with any alkaline leach. Therefore, I

would recommend that any metallurgical evaluation of these core intervals include both acid leaching and roasting followed by alkaline leaching.

Since the seven intervals are quite different, all of them should be evaluated by each method of processing. We have treated similar samples by both processes on previous projects, so the conditions for the tests can be standardized as follows:

Acid Leach	28-mesh, 50% solids, 60°C, 6 hours, 0.8-1.0 pH with 1-2 lb/ton $NaClO_3$.
Alkaline Leach	350°C roast for 2 hours on 4-mesh ore, 80°C 40% solids, 16-hour leach on 35-mesh calcines using oxygen and 50 g/l Na_2CO_3-$NaHCO_3$ lixiviant.

The estimated charges for the acid leaches are $1,750 and the estimated charges for the roast-alkaline leaches are $2,450. Preparation of the composites for leaching and roasting would bear about $400 in charges. The total for the tests, plus reporting, should be less than $5,000.

The above program could be completed within about four weeks of authorization and would give a fairly good indication of the most economical process to pursue for the treatment of the Date Creek ores. If you have any questions, or desire a more formal proposal, please do not hestitate to call.

Yours truly,

HAZEN RESEARCH, INC.

John E. Litz

John E. Litz
Project Manager

JEL:mgp
Enclosures

Attachment to Letter
Mr. David Hertzke

June 28, 1978

Table 1

Acid Percolation Leach of Date Creek Ore

Lixiviant: 5 g/l H_2SO_4; Feed: 1200 g, 0.082% U_3O_8

Date	Sample	Volume ml	Fluid Conduct. gal/day ft2	Volume Cum ml	Gal per Ton	Addition lb/ton H_2SO_4	pH	emf	U_3O_8 g/l	U_3O_8 Extraction %
4-11	0					33.33				
12	1	1885	0.27	1885	377	176.76	6.29	-	0.110	≤25
13	2	1810	0.26	3695	739	285.00	6.48	+110	0.042	≤34
14	3	1000	0.14	4695	939	318.33	6.74	+125	0.104	≤47
17	4	1600	0.23	6295	1259	351.67	6.42	-25	0.120	≤70
20	5	1020	0.08	7315	1463	378.33	6.65	-40	0.0059	
24	7	1130	0.04	8445	1689	408.33	6.82	-70	0.0056	
27	8	860	0.04	9305	1861	428.33	6.50	-60	0.0044	
5-1	9	1440	0.04	10745	2149	477.33	6.47	-55	0.0033	
4	10	1220	0.06	11965	2393	486.33	6.54	-55	0.0048	
10	11	2360	0.06	14325	2865	536.00	6.35	-30	0.0051	
12		1570	0.11	15895	3179	568.83	6.23	-5		
15		1570	0.08	17465	3493	576.17	6.02	+5		
18		1840	0.09	19305	3861	611.83	4.74	-		
22		1480	0.05	20785	4157	641.00	4.93	+130		
24	12	1640	0.12	22425	4485		2.53	+360	0.013	
26	14	1320	0.10	23745	4749	659.33	2.28	-	0.007	
30	16	1200	0.04	24945	4989	684.67	2.38	+335	0.0055	
6-6	19	2200	0.05	27145	5429		2.08	+380	0.111	79
		1112 g							0.03%	

hri

Uranium Analyses of Core Number: DC-28-C
HRI No. 13455-1 through 25

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
1	470-471	0.002						19.2	0.20			
2	471-472	0.001						0.25	0.10			
3	472-473	0.001						24.9	0.03			
4	473-474	0.002						12.6	0.58			
5	474-475	<0.001						5.89	0.12			
6	475-476	<0.001						0.30	0.08			
7	476-477	<0.001						0.05	0.04			
8	477-478	0.002						3.82	0.03			
9	478-479	0.001						1.52	0			
10	479-480	0.006						0.36	0			
11	480-481	<0.001						0.09	0.05			
12	481-482	<0.001						0.30	0.04			
13	482-483	<0.001						0.50	0.06			
14	483-484	<0.001						1.09	0.23			
15	484-485	<0.001						3.53	0.02			
16	485-486	0.001						8.80	0.28			
17	486-487	0.004	<0.01	0.008	0.009	0.009	0	10.7	0.03	6.0	1.87	17.1
18	487-488	0.003						6.09	0.03			
19	488-489	0.004	<0.01	0.005	0.005	0.013	62	5.39	0.06	8.6	1.89	16.9
20	489-490	0.007	<0.01	0.013	0.019	0.027	30	7.30	0.06	13.5	1.87	17.1
21	490-491	0.138	0.17	0.133	0.114	0.122	7	12.1	0.13	4.2	2.16	14.8
22	491-492	0.380	0.52	0.330	0.226	0.240	6	6.19	0.23	15.6	1.82	17.5
23	492-493	0.024	0.05	0.042	0.038	0.049	22	0.13	0.06	7.1	1.76	18.1
24	493-494	0.014	0.02	0.013	0.010	0.018	44	0.08	0.16	14.5	1.67	19.1
25	494-495	0.014	0.02	0.009	0.006	0.013	54	0.05	0.35	10.1	1.71	18.8

hri

Uranium Analyses of Core Number: DC-28-C
HRI No. 13455-26 through 50

HRI Sub No.	Interval ft	% U_3O_8 Fluorimetric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
26	495-496	0.009	0.01	0.007	0.004	0.011	64	0.05	0.39	13.0	1.68	19.1
27	496-497	0.012	0.01	0.011	0.012	0.018	33	0.06	0.70	6.8	1.65	19.4
28	497-498	0.045	0.05	0.039	0.032	0.036	11	0.06	9.01	14.6	1.55	20.7
29	498-499	0.005	<0.01	0.005	0.005	0.009	44	0.05	0.64	6.7	1.97	16.2
30	499-500	0.007							0.39			
31	500-501	0.005	<0.01	0.005	0.009	0.009	0	4.29	0.39			
32	501-502	0.004						1.01	0.31			
33	502-503	0.012						0.08	0.14			
34	503-504	0.016						5.91	0.22			
35	504-505	0.012						4.10	0.54			
36	505-506	0.013						2.15	0.47			
37	506-507	0.010						1.65	0.26			
38	507-508	0.019						6.01	0.27			
39	508-509	0.047						28.1	1.02			
40	509-510	0.011						2.71	1.83			
41	510-511	0.010						1.49	0.73			
42	511-512	0.010						1.24	0.62			
43	512-513	0.008						11.9	0.72			
44	513-514	0.008						0.11	0.38			
45	514-515	0.008	<0.01	0.009	0.009	0.009	0	0.09	0.19			
46	515-516	0.012						0.10	0.39			
47	516-516.4	0.012	<0.01	0.011	0.012	0.018	33	0.07	2.70	8.2	1.75	18.3
48	516.4-517.4	0.014	0.02	0.012	0.009	0.013	31	0.05	0.43	6.2	1.87	17.1
49	517.4-518.4	0.023	0.02	0.018	0.018	0.024	25	0.03	3.12	9.0	1.73	18.5
50	518.4-519.4	0.082	0.07	0.047	0.033	0.037	11	0.03	12.09	9.7	1.64	19.5

hri

Uranium Analyses of Core Number: DC-28-C
HRI No. 13455-51 through 63

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
51	519.4-520.4	0.013						0.06	0.75	15.5	1.72	18.7
52	520.4-521.4	0.008						0.02	0.21			
53	521.4-522.4	0.005	<0.01	0.009	0.012	0.012	0	0.74	0.11			
54	522.4-523.4	0.006						0.75	0.22			
55	523.4-524.4	0.006						0.75	0.10			
56	524.4-525.4	0.006						0.73	0.07			
57	525.4-526.4	0.008						1.35	0.37			
58	526.4-527.4	0.007						1.52	0			
59	527.4-528.4	0.012						5.40	0.14			
60	528.4-529.4	0.011						9.65	0.13			
61	529.4-530.4	0.013						14.3	0.13			
62	530.4-531.4	0.007						12.1	0.18			
63	531.4-532.4	0.005						0.40	0.49			

Uranium Analyses of Core Number: DC-60-C
HRI No. 13455-64 through 88

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
64	880-881	0.008						4.15	5.17			
65	881-882	0.004						0.38	1.03			
66	882-883	0.002						0.06	2.81			
67	883-884	0.004						0.10	5.03			
68	884-885	0.002						0.16	1.90			
69	885-886	<0.001						0.21	0.39			
70	886-887	<0.001						0.12	0.23			
71	887-888	<0.001						0.92	0.47			
72	888-889	<0.001						1.20	0.10			
73	889-890	<0.001						0.06	-			
74	890-891	0.004						0.12	-			
75	891-892	0.004						0.02	-			
76	892-893	0.022						0.02	-			
77	893-894	0.018						0.06	-			
78	894-895	0.003	<0.01	0.009	0.013	0.013	0	0.01	0.07	12.3	1.98	16.2
79	895-896	0.003						0.02	-			
80	896-897	0.005	<0.01	0.005	0.010	0.017	41	<0.01	-	1.4	2.02	15.8
81	897-898	0.009	<0.01	0.014	0.018	0.025	28	0.03	-	1.6	1.82	17.6
82	898-899	0.144	0.16	0.121	0.103	0.111	7	0.72	-	5.0	1.83	17.5
83	899-900	0.123	0.13	0.119	0.113	0.124	9	2.46	-	10.2	1.87	17.1
84	900-901 1/	0.053	0.05	0.046	0.042	0.050	16	2.43	-	1.3	2.07	15.5
85	901-902	0.005	<0.01	0.011	0.022	0.026	15	0.27	-	3.6	1.87	17.1
86	902-903	0.003						0.93	-			
87	903-904	<0.001	<0.01	0.006	0.008	0.008	0	3.87	0.14	1.3	1.92	16.7
88	904-905	0.001						9.25	0.12			

1/ Some core loss between 900-905 feet. Intervals listed ignore any loss of core.

hri

Uranium Analyses of Core Number: DC-60-C
HRI No. p3455078 through 91

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
89	905-906	0.002						8.42	0.11			
90	906-907	0.003						0.61	0.16			
91	907-908	0.002						1.29	0			

hri

Uranium Analyses of Core Number: DC-77-C
HRI No. 13455-92 through 116

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
92	560-561	<0.001						2.17	0.33			
93	561-562	<0.001						18.7	0.03			
94	562-563	<0.001						4.60	0.05			
95	563-564	<0.001						1.67	0			
96	564-565	0.001						10.2	0.06			
97	565-566	0.001						20.5	2.10			
98	566-567	0.001						10.8	0.35			
99	567-567.6	0.003						23.0	2.01			
100	567.6-568.6	<0.001						17.0	0.36			
101	568.6-569.6	<0.001						1.75	0.50			
102	569.6-570.6	0.004						2.92	0.02			
103	570.6-571.6	<0.001						10.2	0.28			
104	571.6-572.6	<0.001						14.7	0.28			
105	572.6-573.6	<0.001						55.5	3.89			
106	573.6-574.6	0.002						28.8	3.27			
107	574.6-574.10	<0.001						25.2	4.58			
108	574.10-575.10	<0.001						27.8	2.92			
109	575.10-576.10	<0.001						25.2	3.61			
110	576.10-577.10	<0.001						28.5	-			
111	577.10-578.10	0.001						23.7	-			
112	578.10-579.10	0.001						1.55	-			
113	579.10-580.10	0.003						18.3	-			
114	580.10-581.10	0.002						33.2	-			
115	581.10-582	0.002						24.0	-			
116	582-583	0.004	<0.01	0.007	0.008	0.008		35.9	-	0.3	2.44	13.1

hri

Uranium Analyses of Core Number: DC-77-C
HRI No. 13455-117 through 123

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
117	583-584	0.004						32.3				
118	584-585	0.005	<0.01	0.002	0.004	0.006	60	35.7	2.20	2.2	2.27	14.1
119	585-586	0.007	<0.01	0.006	0.006	0.014	57	38.0	0.0	16.8	1.70	18.8
120	586-587	0.010	0.01	0.024	0.030	0.036	17	30.2	1.32	3.8	1.93	16.6
121	587-588	0.630	0.88	0.587	0.424	0.452	6	3.78	10.27	16.4	1.59	20.2
122	588-589	0.454	0.55	0.342	0.212	0.212	0	1.66	12.65	22.9	1.19	27.0
123	589-590	0.007	<0.01	0.015	0.020	0.026	23	17.3	0.23	11.3	1.77	18.0

Uranium Analyses of Core Number: DC-81-C
HRI No. 13455-124 through 148

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
124	750-751	0.002						0.44				
125	751-752	0.002						0.16				
126	752-753	0.006	<0.01	0.008	0.009	0.009	0	13.9		7.7	1.62	19.7
127	753-754	0.010						21.5				
128	754-755	0.003	<0.01	0.003	0.004	0.010	60	7.89	0.08	9.5	1.77	18.1
129	755-756	0.006	<0.01	0.008	0.008	0.008	0	2.67	0.13	5.9	1.94	16.5
130	756-757	0.025	0.02	0.014	0.012	0.016	25	31.6	0.64	5.9	1.99	16.1
131	757-758	0.047	0.07	0.064	0.060	0.060	0	0.45	18.68	16.1	1.66	19.2
132	758-759	0.025	0.03	0.022	0.019	0.019	0	1.13	2.99	4.8	1.81	17.7
133	759-760	0.015	0.02	0.023	0.024	0.032	25	13.1	7.39	17.2	1.48	21.6
134	760-761	0.013						29.3				
135	761-762	0.004	<0.01	0.004	0.007	0.007	0	10.9		2.4	1.66	19.3
136	762-763	0.005	<0.01	0.005	0.008	0.008	0	20.5		3.7	2.07	15.5
137	763-764	0.001						23.3				
138	764-765	0.006	<0.01	0.021	0.028	0.035	20	6.19	≈0.03	5.3	1.99	16.1
139	765-765.6	0.565	0.62	0.346	0.195	0.201	3	10.5	2.63	12.3	1.89	16.9
140	765.6-766.6	0.230	0.30	0.194	0.137	0.152	10	11.5	1.93	3.2	1.76	18.2
141	766.6-767.6	0.264	0.34	0.220	0.157	0.167	6	4.86	10.21	22.3	1.25	25.6
142	767.6-768.6	0.116	0.13	0.097	0.078	0.078	0	0.17	7.18	22.5	1.44	22.2
143	768.6-769.6	0.013	0.02	0.024	0.031	0.031	0	0.56	0.20	3.3	1.77	18.1
144	769.6-770.6	0.012						0.95				
145	770.6-771.6	0.008	<0.01	0.012	0.016	0.016	0	1.35		2.4	1.81	17.7
146	771.6-772.6	0.008						1.52				
147	772.6-77.3	0.010						7.97				
148	773-774	0.014						2.21				

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Uranium Analyses of Core Number: DC-81-C
HRI No. 13455-149 through 154

HRI Sub No.	Interval ft	% U_3O_8 Fluori-metric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
149	774-775	0.004						2.26				
150	775-776	0.007						4.60				
151	776-777	0.001						2.84				
152	777-778	<0.001						4.47				
153	778-779	<0.001						46.4				
154	779-780	0.004						17.7				

Uranium Analyses of Core Number: DC-102-C
HRI No. 13455-155 through 179

HRI Sub No.	Interval ft	% U_3O_8 Fluorimetric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
155	1010-1011	0.002						6.45				
156	1011-1012	0.014						39.6				
157	1012-1013	0.008						21.3				
158	1013-1014	0.003						1.91				
159	1014-1015	0.002						19.4				
160	1015-1016	0.003						6.62				
161	1016-1017	0.003						8.01				
162	1017-1017.6	0.002						0.24				
163	1017.6-1018.6	0.011						13.2				
164	1018.6-1019.6	0.012						9.63				
165	1019.6-1020.6	0.001						5.51				
166	1020.6-1021.6	0.001						1.30				
167	1021.6-1022.6	0.002						0.18				
168	1022.6-1023.6	0.011						0.26				
169	1023.6-1024.6	0.001						1.02				
170	1024.6-1025.6	0.004						2.32				
171	1025.6-1026.6	0.011						8.63				
172	1026.6-1027.6	0.001	<0.01	0.007	0.008	0.008	0	0.17		9.5	1.82	17.6
173	1027.6-1028.6	0.006						7.81				
174	1028.6-1029.6	0.017	0.01	0.019	0.021	0.032	34	25.9	1.16	5.5	1.84	17.4
175	1029.6-1030.6	0.044	0.06	0.047	0.037	0.050	26	28.7	0.90	2.8	2.12	15.1
176	1030.6-1031.3	0.138	0.16	0.150	0.143	0.158	9	26.3	0.39	2.6	2.09	15.3
177	1031.3-1032.3	0.338	0.43	0.303	0.231	0.235	2	13.5	0.47	5.6	1.92	16.7
178	1032.3-1033.3	0.191	0.23	0.194	0.169	0.169	0	18.6	0.0	13.8	1.81	17.6
179	1033.3-1034.3	0.046	0.05	0.063	0.073	0.073	0	10.5	0.12	10.8	1.80	17.8

hri

Uranium Analyses of Core Number: DC-102-C
HRI No. 13455-180 through 197

HRI Sub No.	Interval ft	% U_3O_8 Fluorimetric	Beta-Gamma	Beta-Equiv.	Gamma Equiv.	Sealed Gamma Equiv.	% Radon Loss	% CO_2	% Organic	% Moisture	Specific Gravity	Density ft^3/ton
180	1034.3-1035.3	0.048	0.04	0.049	0.051	0.051	0	23.3	1.85	12.3	1.82	17.6
181	1035.3-1036.3	0.059	0.05	0.060	0.065	0.065	0	29.1	0.0	5.3	1.91	16.8
182	1036.3-1037.3	0.051	0.03	0.066	0.092	0.092	0	26.0	1.44	10.4	1.83	17.5
183	1037.3-1038.3	0.017	<0.01	0.037	0.099	0.099	0	10.4	0.24	10.1	1.76	18.2
184	1038.3-1038.11	0.026	<0.01	0.037	0.097	0.097	0	9.70	0.15	9.4	1.74	18.4
185	1038.3-1039.11	0.031	<0.01	0.044	0.100	0.100	0	17.5	0.24	5.5	1.78	18.0
186	1040.11-1041.11	0.017	<0.01	0.037	0.105	0.105	0	18.4	0.34	6.2	2.08	15.4
187	1041.11-1041.11	0.027	<0.01	0.032	0.093	0.093	0	20.1	0.28	10.8	1.74	18.4
188	1041.11-1042.11	0.016						12.4				
189	1042.11-1043.11	0.006	0.01	0.010	0.012	0.012	0	5.86		7.1	1.92	16.6
190	1043.11-1044.11	0.004						12.5				
191	1044.11-1045.11	0.012						15.3				
192	1045.11-1046.11	0.010						19.9				
193	1046.9-1047.9	0.012						23.2				
194	1047.9-1048.9	0.010						18.2				
195	1048.9-1049.9	0.008						16.5				
196	1049.9-1050.9	0.008						20.8				
197	1050.9-1051.10	0.008						22.5				

hri

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May 4, 1978

Mr. David Hertzke
Urangesellschaft, U.S.A., Inc.
Building 3, Suite 200
6000 East Evans Avenue
Denver, CO 80222

Re: HRI Project 4441
Uranium Extraction from Date Creek Ore

Dear David:

Pieces of core from 26 intervals were measured to determine the ore density. The results are shown in Table 1. The mean density was 17.0 cu ft/ton with a standard deviation of 1.7 cu ft/ton. The densities ranged from 14.1 to 20.9 cu ft/ton. Most of the higher uranium grade intervals had pieces which were high density.

A linear, least-squares fit was made of the uranium grade versus the density. The curve had a coefficient of determination (r^2) of 0.28, which is not too good a fit, but shows some correlation. The formula for the curve is:

$$\% \ U_3O_8 = 0.79 - 0.04 \ (\text{cu ft/ton}).$$

Solutions of the formula at 14 and 20 cu ft/ton show uranium grades of minus 0.001 and 0.24% U_3O_8 respectively.

The density values indicate that calculation of the ore reserves will be very complicated. It might be beneficial to obtain uranium values for the specific pieces of core used for the densities, to either simplify or further complicate the ore reserve calculations.

Leaching studies on a composite of the four cores have begun. The composite consists of one-half the reject pulp from each interval supplied. The analysis of the ore composite is shown in Table 2. The high carbon dioxide value indicates 33.5% $CaCO_3$ equivalent.

Four acid and three alkaline agitation leaches have been completed. The tests are summarized in Table 3, and data sheets are attached. The results indicate uranium solubilizations of >90% with acid additions of >850 lb/ton. The alkaline leach solubilizations are only 81-82%.

Two heap leach tests have been started. The first is a conventional test using a 10-15 g/l H_2SO_4 solution. At this point, about 480 lb/t acid has been added to the ore. The effluent pH is 6.5. The first few volumes of the ore contained up to 120 ppm U_3O_8. Although no balance was attempted, the indication is that 60% of the uranium solubilized due to carbonate ions being formed during the leach. The 60% value was achieved with an acid addition of less than 250 lb/ton. The last few volumes have contained only 3-6 ppm U_3O_8 and I do not anticipate any improvement until the acid addition approaches 700-800 lb/ton.

The second leach was started May 3 and is using an acid pug of the ore with 600 lb/ton H_2SO_4 prior to starting the heap leach. Considerable CO_2 evolution was evident when percolation of solution through the heap started, so it may be that a longer cure of the pugged material would be necessary.

At this point, I see little value in continuing agitation leaches as the results are quite predictable. If additional leaches were performed, there would be some value in using the pulps as feed for thickening tests. However, unless you are confident that the cores are "representative," the data from such tests may not be of significant value.

The poor settling and filtering characteristics of the ore indicate that Resin-in-Pulp recovery of the solubilized uranium may be the most feasible in terms of capital and operating costs. Hazen recently has performed some cost analyses which show economic advantage to Resin-in-Pulp systems. Study of Resin-in-Pulp recovery from the Date Creek ore may be premature at this point; however, we feel at some point it should be considered.

The results of the heap leaches will be transmitted as soon as available. Unfortunately, heap leaching is a time consuming process, but it is inexpensive.

Yours truly,

HAZEN RESEARCH, INC.

John E. Litz

John E. Litz
Project Manager

JEL/skb
cc: Dean Soderstrom
Minerals Exploration Company
Box 50324
Tucson, AZ 85705

Table 1

Core Moisture and Density

Hole No.	Footage	% Moisture	Specific Gravity	Density ft^3/ton	% U_3O_8
DC-62-C	787-788	1.84	1.93	16.6	0.035
	788-789	1.34	2.28	14.1	0.210
	789-790	1.59	2.10	15.2	0.064
	799-800	4.98	1.54	20.8	0.024
	800-801	2.65	2.00	16.0	0.200
DC-56-C	861-862	4.43	1.79	17.9	0.094
	862-863	4.34	1.82	17.6	0.037
	865-866	2.19	1.76	18.2	0.118
	866-867	1.59	1.97	16.2	0.109
	869-870	1.37	1.93	16.6	0.041
	870-871	2.11	1.82	17.6	0.106
	871-872	1.27	2.00	16.0	0.057
DC-49-C	766-767	2.06	1.80	17.8	0.057
	767-768	3.39	1.81	17.7	0.218
	768-769	1.46	1.96	16.3	0.015
	771-772	1.10	1.75	18.3	0.020
	772-773	0.38	2.21	14.5	0.251
	773-774	0.89	1.76	18.2	0.034
DC-33-OC	652-653	1.37	1.72	18.6	0.042
	653-654	1.26	2.08	15.4	0.250
	654-655	0.61	2.15	14.9	0.450
	655-656	0.92	1.80	17.8	0.064
	659-660	0.88	1.98	16.2	0.019
	661-662	0.52	2.04	15.7	0.059
	662-663	0.45	1.76	18.2	0.125
	663-664	0.49	1.53	20.9	0.046

Table 2

Date Creek Composite
(1053-14-0)

Chemical	
U_3O_8	0.028
V_2O_5	0.02
CO_2	14.7
X-ray Fluorescence	
Cu	0.004
Zn	0.006
Pb	0.003
As	0.005
Fe	0.87
Ni	0.003
Rb	0.010
Ba	0.062
Sr	0.13
Zr	0.035
Mo	0.005
Mn	0.024
Yt	0.005

hri

Table 3

Summary of Acid and Alkaline Leaches
(0.082% U_3O_8, 40% Solids, 28-mesh Grind)

No.	Temp °C	Time hrs	H_2SO_4 Added	lb/ton Consumed	$NaClO_3$ lb/ton Added	H_2SO_4 g/l Residual	Residue % U_3O_8	Uranium Extraction, %
16	60	4	1040	910	3	28	0.006	94.1
17	75	24	1210	920	5	65	0.005	95.3
21	75	6	900	860	2	9.2	0.007	92.3
22	75	6	850	830	2	4.6	0.008	91.8

No.	Temp °C	Time hrs	Leach Concn, g/l		Na_2CO_3 lb/ton Consumed	Residue % U_3O_8	Uranium Extraction, %
			Na_2CO_3	$NaHCO_3$			
18	80	24	50	10	1	0.032	58.1
19	80	24	50	10 1/	49	0.016	82.0
20	80	24	50	10 2/	53	0.017	81.1

1/ With 20-40 cc/min oxygen bubbling.
2/ With 20-40 cc/min oxygen bubbling and $Cu(NH_3)_6SO_4$ catalyst.

URANIUM ACID LEACH AMENABILITY

No. 1053-16

Sample No. 1053-14-0 (28-mesh) — 0.082 % U_3O_8, 0.02 % V_2O_5, ____ %

Conditions: 60 °C, 4 hr, 40 % solids

Data

Elapsed Time, min	Temp °C	pH Read	pH Adjusted	emf mv	H_2SO_4 Cum lb/ton	$NaClO_3$ Cum lb/ton
0	60	7.62	0.55	330	1,000	
5	60	0.58	0.55	330	1,040	
10	60			490		3
60	60	0.99		510		
120	60	0.60		495		
180	60	0.60		485		
240	60	0.61		485		

Metallurgical Balance

	Weight/ Volume	Uranium U_3O_8	H_2SO_4	V_2O_5		
Leach head						
%		0.082		0.02		
Grams	200	0.164		0.04		
Filtrate						
g/l		0.386	28.20	0.059		
Grams	205	0.079	5.8	0.012		
Wash						
g/l		0.154				
Grams	630	0.097	7.1	0.015		
Residue						
4 hour, %		0.006		0.01		
___ hour, %						
___ hour, %						
___ hour, %						
Grams	183.6	0.011		0.018		
Percent solubilized						
4 hour		94.1		59.5		
___ hour						
___ hour						
___ hour						
Calculated head, %		0.094		0.023		

Acid consumption, 910 lb/ton

hri

URANIUM ACID LEACH AMENABILITY

No. 1053-17

Sample No. 1053-14-0 — 0.082 % U_3O_8 — ____ %

____ — 0.02 % V_2O_5 — ____ %

____ — ____ % — ____ %

Conditions: 75 °C, 24 hr, 40 % solids

Data

Elapsed Time, hr	Temp °C	pH Read	pH Adjusted	emf mv	H_2SO_4 Cum lb/ton	$NaClO_3$ Cum lb/ton
0	60	7.62	0.50	370	1,210	5
1	60	0.15		585		
2	60	0.13		540		
3	65	0.43		520		
4	77	0.36		520		
5	80	0.87		515		
24	75	0.58		455		

Metallurgical Balance

	Weight/ Volume	Uranium U_3O_8	H_2SO_4	V_2O_5		
Leach head						
%		0.082		0.02		
Grams	200	0.164		0.04		
Filtrate						
g/l		0.411	64.73	0.091		
Grams	235	0.097	15.2	0.021		
Wash						
g/l		0.149				
Grams	605	0.090	14.1	0.020		
Residue						
24 hour, %		0.005		<0.001		
____ hour, %						
____ hour, %						
____ hour, %						
Grams	180.6	0.009		0.002		
Percent solubilized						
24 hour		95.3		95.8		
____ hour						
____ hour						
____ hour						
Calculated head, %		0.098		0.021		

Acid consumption, 920 lb/ton

hri

URANIUM ACID LEACH AMENABILITY
No. 1053-21

Sample No. 1053-14-0 (28-mesh) — 0.082 %U_3O_8, 0.02 %V_2O_5, ____ % — ____ %, ____ %, ____ %

Conditions: 75 °C, 6 hr, ≈40 % solids

Data

Elapsed Time, hr	Temp °C	pH Read/Adjusted	emf mv	H_2SO_4 Cum lb/ton	$NaClO_3$ Cum lb/ton
0				900	2
1	70	1.11	440		
2	73	1.32	420		
3	73	1.40	405		
4	80	1.88	400		
6	80	1.95	380		

Metallurgical Balance

	Weight/ Volume	Uranium U_3O_8	H_2SO_4	V_2O_5		
Leach head						
%		0.082				
Grams	200	0.164				
Filtrate						
g/l		0.402	9.24	0.039		
Grams	155	0.062	1.4			
Wash						
g/l		0.167				
Grams	595	0.099	2.3			
Residue						
6 hour, %		0.007				
___ hour, %						
___ hour, %						
___ hour, %						
Grams	193.2	0.014				
Percent solubilized						
6 hour		92.3				
___ hour						
___ hour						
___ hour						
Calculated head, %		0.088				

Acid consumption, 860 lb/ton

hri

URANIUM ACID LEACH AMENABILITY
No. 1053-22

Sample No. 1053-14-0 (28-mesh)

0.082 % U_3O_8
0.02 % V_2O_5
%

%
%
%

Conditions: 75 °C, 6 hr, ≈40 % solids

Data

Elapsed Time, hr	Temp °C	pH Read/Adjusted	emf mv	H_2SO_4 Cum lb/ton	$NaClO_3$ Cum lb/ton
0				850	2
1	70	1.35	430		
2	73	1.40	410		
3	73	1.58	390		
4	80	2.10	370		
6	80	2.20	350		

Metallurgical Balance

	Weight/ Volume	Uranium U_3O_8	H_2SO_4	V_2O_5		
Leach head						
%		0.082				
Grams	200	0.164				
Filtrate						
g/l		0.460	4.56	0.030		
Grams	183	0.084	0.8			
Wash						
g/l		0.149				
Grams	600	0.089	0.9			
Residue						
6 hour, %		0.008				
___ hour, %						
___ hour, %						
___ hour, %						
Grams	195.1	0.016				
Percent solubilized						
6 hour		91.8				
___ hour						
___ hour						
___ hour						
Calculated head, %		0.095				

Acid consumption, 830 lb/ton

hri

URANIUM ALKALINE LEACH AMENABILITY
No. 1053-18

Sample No. 1053-14-0 0.082 % U_3O_8 _____ %

_____ 0.02 % V_2O_5 _____ %

_____ _____ % _____ %

Conditions: 80 °C _____ psi _____, 24 hr

40 % solids 50 g/l Na_2CO_3 10 g/l $NaHCO_3$

Filtrate: 10.08 pH -100 mv

Metallurgical Balance

	Weight/ Volume	Uranium U_3O_8	Na_2CO_3	$NaHCO_3$	V_2O_5	
Leach head						
%		0.082			0.02	
Grams	200	0.164			0.04	
Filtrate						
g/l		0.226	33.07	19.07	0.004	
Grams	200	0.045	6.6	3.8	0.0008	
Wash						
g/l		0.090				
Grams	430	0.039	5.7	3.3	0.0007	
Residue						
24 hour, %		0.032			0.02	
___ hour, %						
___ hour, %						
___ hour, %						
Grams	189.0	0.060			0.038	
Percent solubilized						
24 hour		58.1			3.8	
___ hour						
___ hour						
___ hour						
Calculated head, %		0.072			0.020	

Calculated soda ash consumption, 1 lb/ton Na_2CO_3

hri

URANIUM ALKALINE LEACH AMENABILITY
No. 1053-19

Sample No. 1053-14-0 0.082 % U_3O_8 _____ %

_____ _____ % _____ %

_____ _____ % _____ %

Conditions: 80 °C 20-40 cc/min O_2, 24 hr

40 % solids 50 g/l Na_2CO_3 10 g/l $NaHCO_3$

Filtrate: 10.06 pH -100 mv

Metallurgical Balance

	Weight/ Volume	Uranium U_3O_8	Na_2CO_3	$NaHCO_3$		
Leach head						
%		0.082				
Grams	200	0.164				
Filtrate						
g/l		0.462	29.15	15.02		
Grams	195	0.090	5.7	2.9		
Wash						
g/l		0.151				
Grams	350	0.053	3.3	1.7		
Residue						
24 hour, %		0.016				
___ hour, %						
___ hour, %						
___ hour, %						
Grams	195.7	0.031				
Percent solubilized						
24 hour		82.0				
___ hour						
___ hour						
___ hour						
Calculated head, %		0.087				

Calculated soda ash consumption, 49 lb/ton Na_2CO_3

hri

URANIUM ALKALINE LEACH AMENABILITY
No. 1053-20

Sample No. 1053-20-0 0.082 % U_3O_8 _____ %
(65-mesh) _____ % _____ %
_____ % _____ %

Conditions: 80 °C 20-40 cc/min O_2 1/, 24 hr
40 % solids 50 g/l Na_2CO_3 10 g/l $NaHCO_3$

Filtrate: 10.08 pH -110 mv

Metallurgical Balance

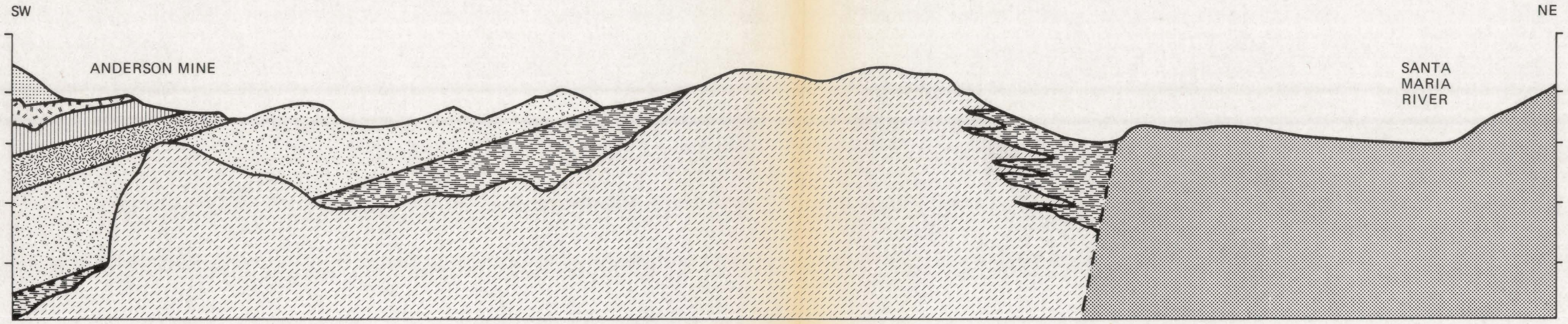
	Weight/ Volume	Uranium U_3O_8	Na_2CO_3	$NaHCO_3$		
Leach head						
%		0.082				
Grams	200	0.164				
Filtrate						
g/l		0.462	29.04	13.61		
Grams	185	0.085	5.4	2.5		
Wash						
g/l		0.151				
Grams	380	0.057	3.6	1.7		
Residue						
24 hour, %		0.017				
___ hour, %						
___ hour, %						
___ hour, %						
Grams	195.8	0.033				
Percent solubilized						
24 hour		81.1				
___ hour						
___ hour						
___ hour						
Calculated head, %		0.088				

Calculated soda ash consumption, 53 lb/ton Na_2CO_3

1/ With $Cu(NH_3)_6SO_4$ catalyst.

hri

R10W
T11N
LEGEND
QUATERNARY
Qal Alluvium
QUATERNARY TERTIARY
QTcgl Capping Conglomerate
TERTIARY
Tmb Miocene Basalt
Tmc Miocene Conglomerate
Tml Miocene Lacustrine Sediments
Tva Andesitic Volcanics
Tvs Volcaniclastic Sediments
Tvf Felsic Volcanics
Contact, (Dashed where approximate)
Contact, Projected Beneath Mapped Units
Fault Showing Dip (Dashed where approximate)
Fault, Projected Beneath Mapped Units
Attitude (Strike & Dip of Beds)
0 1000 Ft.
Scale Bar
EARTH WORK
TONTO 8
TONTO 5
TONTO 23
TONTO 25
TONTO 22
TONTO 2
TONTO 24
TONTO 10
TONTO 15
TONTO 1
TONTO 17
TONTO 7
TONTO 14
TONTO 5
TONTO 18
TONTO 3
YUCCA 13
DC-22
DC-17
DC-20
DC-16
DC-14
DC-26
DC-13
DC-24
N
Union MINERALS EXPLORATION CO.
ANDERSON MINE PROJECT
YAVAPAI COUNTY, ARIZONA
GEOLOGY MAP
SCALE
H.
V.
DATE JUNE, 1977
DRAWN BY L.RM
CHECKED LZH
DESIGN LZH
APPROVED
REVISIONS
FILE



LEGEND

- Quaternery-Tertiary conglomerate, 0-400', tan to white, sandy to very coarse, locally calcite cemented, granitic metamorphic felsic and basalitic clasts
- Tertiary Miocene basalt, black, fine-grained to aphanitic, calcite-filled amygdules, commonly parallel to flow surface, 0-120'
- Tertiary miocene conglomerate, tan to brown siltstone grades upward into arkosic sandstone and then into conglomerate with granitic and felsic clasts, 200-450'
- Tertiary Miocene lacustrine sediments, basal arkosic sandstone, carbonaceous siltstone and lignite, silty limestone, limy siltstone, green siltstones and mudstones, tuffaceous material throughout, 0-400'
- Tertiary volcanic andesite, gray, gray-brown, red-brown, fine-grained, vesicular augite, andesite, locally containing calcite-filled amygdules
- Tertiary volcaniclastic sediments, gray to white, felsic to intermediate tuffs, ash flows, lahar breccias, upper section yellow-tan to tan, sandy
- Tertiary felsic to intermediate volcanics, white to gray, pink-gray, necks, flows and tuffs
- Jurassic granite, brown, purple-gray, biotite granite

0 ½ 1
mile

GENERALIZED CROSS SECTION
OF THE ANDERSON PROPERTY

Memorandum
Union Oil Company of California
union 76

MEMO TO: File

DATE: January 26, 1978

FROM: G. C. Dohm, Jr.

SUBJECT: Anderson Mine Feasibility Study Outline

I. Introduction

1) History
2) Location
3) Work to Date
4) Purpose of Study

II. Abstract

1) Scope
2) Cost Estimate
3) Summary

a) Mine
b) Mill
c) Tailings
d) Ancillary
e) Environmental

III. Financial

1) Cost Estimates

a) Capital
b) Operating

2) Cash Flows, ROR, Payback Period, NPV, etc.

IV. Schedules and Manpower Requirements

1) Project Schedule
2) Project Manpower
3) Construction Manpower
4) Manpower Buildup

V. Geology & Mineral Inventory

1) Geological Report

a) Regional
b) Site Specific

2) Ore Reserves, Waste, Ratios, etc.
3) Geotechnical Study

4) Bulk Density Report
5) Equilibrium Determination
6) Hydrological Evaluation

   a) Groundwater
   b) Surface
   c) Pump Testing

VI. Mining

1) Preproduction Stripping and Mining
2) Ore and Waste Materials Handling
3) Equipment
4) Working Schedules and Constraints
5) Manpower Required for Each Phase
6) Operating and Maintenance Costs
7) Maintenance

   a) Field
   b) Shops

8) Ore Control
9) Phases
10) Stockpiles

VII. As per Abramo thru Ross & Hazen Research.

VIII. Tailings

1) Milling Constraints
2) Mining Constraints
3) Layout
4) Design
5) Management
6) Abandonment

} Dames & Moore

IX. Ancillary Considerations

1) Access Road - Western Engineers
2) Water Supply and Pipeline - Water Development Corporation
3) Power - Arizona Public Services

X. Environmental

As per Woodward-Clyde.

XI. Conclusions and Recommendations

1) Alternatives Comparisons
2) Recommendations for Continued Work
3) Overall Evaluation

The above outline is to serve as a guide only. Circumstances may dictate some structural modification and should so be done after notifying all contributors to the study.

GCD/p

c: FHB, DTA, JCR, JAB, RFL

REVISED: June 2, 1978

6. MINING

6.1 Primary Stripping

6.1.1 Preproduction Stripping

6.1.2 Production Stripping

6.2 Ore and Waste Materials Handling

6.2.1 Secondary Stripping

6.2.2 Interior Waste Removal

6.2.3 Ore Mining

6.3 Ore Grade Control

6.4 Stockpiling Procedure

6.5 Mining Sequence

6.6 Schedules and Constraints

6.7 Equipment List

6.8 Capital Costs

6.9 Operating and Maintenance Costs

6.9.1 Field Maintenance

6.9.2 Shop Maintenance

JR:mm
6/2/78

REVISED: June 2, 1978

6. MINING

6.1 Overburden Removal

6.1.1 Preproduction Stripping

6.1.2 Production Stripping

6.2 Ore and Waste Materials Handling

6.2.1 Secondary Stripping

6.2.2 Interior Waste Removal

6.2.3 Ore Mining

6.3 Ore Grade Control

6.4 Stockpiling Procedure

6.5 Mining Sequence

6.6 Schedules and Constraints

6.7 Equipment List

6.8 Capital Costs

6.9 Operating and Maintenance Costs

6.9.1 Field Maintenance

6.9.2 Shop Maintenance

JR:mm
6/2/78

2.3.1 GEOLOGY and RESERVES

The Anderson Mine Property is located along the northeast margin of the Date Creek Basin which lies near the northeast margin of the Basin and Range Physiographic Province. The basin is part of the Bill Williams Drainage. Basin and Range type structure is dominant in the area; consisting of northwest-southeast oriented hinge faults and fault blocks. Rock types in the area include a granitic basement complex, felsic to intermediate volcanics, lacustrian sediments, basalts and conglomerates.

At the Anderson Mine, Uranium mineralization occurs exclusively in lacustrian sediments. The highest grade and most extensive mineralization is associated with the carbonaceous siltstone and limestone facies of these sediments. The site of deposition for these sediments was a small restricted lake or swamp. Reworked volcanic tuffs contributed a large portion of the sediments. Mineralization is sheet-like and mineral zones have been cut by faulting.

The computer estimated reserves for the open pit Anderson Mine as determined by Digitgraph Computer Systems Corporation, Tucson, Arizona, on May 22, 1978 are: 7,181,962 tons ore, containing 10,299,189 pounds U_3O_8 at .072% U_3O_8 average grade.

2 corrections ok MM 6-5-78

5.1 GEOLOGICAL REPORT

5.1.1 Regional Geology

The Anderson Mine Property is located along the northeast margin of the Date Creek Basin in west-central Arizona. The basin is bordered by the Black Mountains on the north and northeast, by the Rawhide, Buckskin, and McCracken Mountains on the west, and by the Harcuvar Mountains on the south. To the east and southeast it is bordered by a low drainage divide governed in part by the Harcuvar Mountains and/or the Black Mountains. The basin has a gently sloping topography to the west and northwest.

Surface Flow across the basin is accomplished by three drainages; the Santa Maria River, Date Creek and Bullard Wash. The south-flowing Big Sandy River joins the Santa Maria River in the northwest portion of the basin just west of the confluence of Date Creek and the Santa Maria. This combined drainage flows southward into Alamo River Reservoir becoming the Bill Williams River.

The area has been on the margin of several regional deformations. It was on the northwestern margin of Mazatzal Land, the southeastern margin of the Cordillarian Geosyncline, deformed by the Laramide Orogeny, and is presently on the margin of the Basin and Range Physiographic Province.

The area around Anderson Mine exhibits structures typical of the Basin and Range and it is the Basin and Range deformation which is evident in the area today. The structural trends of this deformation are a dominant northwest-southeast trend of parallel to subparallel hinged block

faults and a less dominant westnorthwest-eastsoutheast fault system. Many of these faults exhibit recurrent movements.

The regional stratigraphy may be briefly summarized by 1) a Precombrian or Jurassic granitic basement complex, 2) the lacustrian, clastic and volcanic members of the Paleocene-Eocene Artillery Peak Formation, 3) the Arrastra Volcanic Complex including dacitic intrusions, andesitic flows and volcaniclastic members of early to mid Tertiary age, 4) the Chapin Wash Formation - Anderson Mine Lacustrian sediments of miocene age, 5) a conglomeritic-sandstone unit possibly equivelent to upper Chapin Wash, 6) a Miocene basalt, 7) a Plio-Pleistocene Conglomerate, and 8) Quaternary Alluvium.

5.1.2 Geology of Mine Area

All the drainage on the Anderson Mine Property is to the north and northwest into the Santa Maria River. The headward erosion of these tributaries southward into the Date Creek Basin surface has resulted in a series of subparallel gullies and ridges trending north to northwest. Maximum topographic relief at Anderson Mine is 700 feet.

Faulting in the area trends northwest-southeast and many of the tributaries are developed partially along fault traces. The southerly dip and resistance to erosion of the stratigraphic section have tended to inhibit the headward migration of the tributaries.

Three major faults, the East Boundary Fault System, Fault 1878, and the West Boundary Fault System are present in the area. In addition to these are many parallel faults which have less displacement than the major faults. All of these faults trend between N30°W and N55°W. Another set of faults trending more westerly (N65°W) are present at least in the south-central portion of the property. A set trending northeast has been conjectured by Urangesellschaft and others but has not been observed in the field.

Within the boundaries of the Anderson Mine claims nine (9) informal stratigraphic units have been recognized by Minerals Exploration Company. From oldest to youngest these are: 1) Crystalline Intrusive Rocks, 2) Felsic to Intermediate Intrusions and Flows, 3) Felsic to Intermediate Volcaniclastic Sediments, 4) Andesitic Volcanic Flows, 5) Lacustrian Sediments, 6) Lower Conglomerate, 7) Basaltic Volcanic Flows and Dikes, 8) Upper Conglomerate, and 9) Alluvium.

As the Lacustrian Sediments are the only mineralized unit on the property only they are described in detail. The lacustrian sediments unconformably overlie the andesitic volcanics over most of the Anderson Mine Property. However, to the east-central they overlie the volcaniclastic sediments and further to the east they onlap the felsic to intermediate volcanics. Several drill holes in the center of the mine area have encountered the felsic to intermediate volcanics or the tuffaceous part of the volcaniclastic sediments immediately below the lacustrine sediments.

Evidence now suggests that deposition of the lacustrine sediments occurred in a restricted basin. Therefore, these sediments represent time-transgressive facies deposited within a narrow, probably shallow, basinal feature. This type of depositional environment exhibits complex relationships between individual facies; lensing out, vertical and horizontal gradation, interfingering, etc.

The lake sediments include green silstones and mudstones, white calcareous siltstones, and silty limestone or calcareous tuffaceous material. Much of this material is silicified to varying extents and was derived in part, from volcanic ashes and tuffs common throughout the lake beds. Also present in the lacustrine sequence are zones of carbonaceous siltstone and lignitic material. Along the southern boundary with Urangesellschaft, drill holes encounter the basal arkosic sandstone. To the south and southwest the "typical" lake beds interfinger with and eventually are replaced by a thick, medium to coarse-grained, arkosic sandstone unit.

In addition to the organic material in the carbonaceous zones, abundant plant remains (including twigs, reeds, and small roots) are present in the lacustrine sediments. Reyner et al (1956) recognized abundant silicified palm type wood. Fresh water mollusks, up to 1½ inches in length, are locally common. Thin laminated calcareous siltstone near the top of the lake beds contain small fresh water fish

fossils. A jaw of a rhinoceros reportedly found at Anderson Mine is on display at the Wickenburg Museum. The leg bone of a duck found in the unit has been dated as Miocene by the Los Angeles County Museum. William Breed (1977) of the Museum of Northern Arizona and his associates collected fossils at Anderson Mine in April of 1977. Included in their finds were fresh water fish (Eocene to Recent), a camel bone, and a rhinoceros tooth (Miocene).

All of the lake beds facies may exhibit some uranium mineralization. However, the highest grade and most consistent mineralization is located in the ~~baronaeous~~ CARBONACEOUS siltstones and lignitic materials.

Occasional mineralization has also been noted in the basal sandstone of the lacustrine sediments and in the lower conglomerate. Carbonaceous material is known to interfinger with the basal sandstone and carbon has been noted in the lower conglomerate. Remobilization of the uranium has resulted in the deposition of mineral as fracture fillings around and below the main mineralized zones.

The mineralization is syngenetic as evidenced by the continuation and offset of mineralization across faults. Carbon tends to immediately fix uranium when soluble uranium comes in contact with it. Much of the mineralization is at the top or bottom of the carbonaceous facies, however, mineralization does occur in the middle of some carbonaceous zones. This later relationship implies that mineralization occurred during the deposition of the carbonaceous material.

Silicification of various parts of the Anderson Lake sediments probably occurred soon after deposition. Devitrification of the tuffaceous and ashy lake bed sediments and/or the felsic volcanics were probably the primary sources of silica. This silicification would tend to lock the uranium mineralization and protect it from remobilization.

The following origins have been suggested for the uranium mineralization at Anderson Mine.

1) Leaching of volcanic tuffs
2) Solution, mobilization and deposition from granites in the area
3) Combination of 1 and 2
4) Hypogene
5) Hot springs

Whatever the origin, it was the reducing environment of the lake or swamp that provided the structural and stratigraphic trap necessary for the retension of the uranium.

5.2 Ore Reserves

Anderson Mine reserves are based on radiometric and chemical data taken from a total of 553 drill holes, of which 72 holes were cored through the ore zone and sampled for chemical analysis. Radiometric data was submitted to Digitgraph Computer Systems for interpretation and ore reserve evaluation. Ore reserves were estimated through perpendicular bisector areas of influence (polygons) constructed for each drill hole. Holes are evaluated on arbitary vertical 2.00 ft increments through the ore zone. Increments are catagorized as ore or waste by using a minimum intercept grade of 0.028% U_3O_8 by weight for ore material, all material less than 0.028% U_3O_8 is classified as waste. A cutoff grade of 0.04% U_3O_8 (based on estimated costs & recoveries) was used to determine the economic pit limits.

Subsequent to defining the pit limits, a marginal cutoff grade of 0.028% U_3O_8 was used to define the reserves existing within the pit limits. Based on the above restraints and procedures a final feasibility study reserve estimate for the Anderson Mine was received from Digitgraph Computer Systems on May 22. Reserves are as follows:

Tons of Ore	7,181,962
Contained Pounds U_3O_8	10,299,189
Average Grade (%)	0.0717

~~If~~ The first two years of mill production ~~are~~ will be run at an average feed grade of 0.080% U_3O_8 AND the remaining years will be run at an average grade of 0.0696% U_3O_8.

The reserves are sufficient to maintain a mill throughput of 730,000 tons per year for 9.84 years.

5.4 Bulk Density

Bulk Density values for primary stripping, secondary stripping, interior waste, and ore, were determined from core specimens taken from the Anderson Mine. Samples of primary stripping material were taken from the geotechnical holes which drilled for slope stability determinations. Secondary stripping, interior waste and ore samples were taken during a later core drilling program. Precautionary measures were taken during the latter program to insure that material used for testing accurately represented the inplace materials. Actual values represent averages of a total sample population in excess of 250.

Tabulated below are the bulk density values used in this feasibility study:

	Dry	Wet ($10\%\ H_2O$)
Primary Stripping	15.6 ft^3/ton	14.95
Secondary stripping	17.0 ft^3/ton	15.45
Interior waste	17.0 ft^3/ton	15.45
Ore	20.46 ft^3/ton	20.46

Ore densities do not reflect any moisture content. ~~due to problems encountered in calculating ore reserves using the denser wet material density~~. All remaining tonnages for fleet section selection and costing were developed using wet densities.

5.5 EQUILIBRIUM

~~During 1976 and 1977 MEC~~ Minerals has drilled a total of 72 core holes on the Anderson Property. These core holes represent 14% of all holes and they are located on an approximate 400' grid. 3125 assays were done on core and cuttings by colorimetric and fluorimetric techniques.

The first 14 holes were assayed by Chemical-Geological Laboratory of Casper, Wyoming using the colorimetric assay. The next 19 holes were fluorimetrically assayed by Hazen Research of Golden, Colorado. The remaining 39 holes were done by Skyline Laboratory of Tucson using the fluorimetric technique. All assays were checked by either re-assaying selected samples or submitting known pulps with the samples. Values may be considered accurate to ±5%.

An equilibrium factor was calculated as a ratio between chemical uranium and the gamma log. This ratio was determined both from a hole by hole total of values and by constructing a polygon map and calculating pounds U_3O_8 for both chemical and gamma log. No values were included for either method unless both chemical and log data was available for the given interval. If either value was above the cutoff grade, both values were included. The average equilibrium factor for the entire property with pounds U_3O_8 weighted equally is .999. The average factor within the open pit (toe) is 1.05.

The equilibrium factor has been shown to vary depending on the proximity to the nearest fault. Core holes near faults are depleted in chemical uranium vs radiometrics while holes isolated from faults are not depleted. Because of this effect, each hole on the property has been assigned a unique equilibrium number. These values were interpolated on figure .

Equilibrium has also been shown to vary with grade. Very high grades ($>.090\%$ U_3O_8) are 6% higher in equilibrium than average, while low grades ($<.015\%$ U_3O_8) are 1% lower than average. This grade relationship was determined from the first 33 core holes using chemical vs closed can radiometrics. No closed can assays were run on the ~~remaining~~ subsequent 39 holes.

5.3 Geotechnical Study

Dames and Moore submitted a slope stability report to MEC in April, 1977. This report makes recommendations which have been used in the pit design and resulting economic analyses.

A field investigation program was undertaken to evaluate the geotechnical problems posed by open pit mining in the formations at the Anderson property. The main component of the field program was the coring of two holes from surface to below the pit toe. This core was logged and point load tests were run on 2' intervals to estimate compressive strength. Log information included rock type, core run and percent recovery, rock defects, rock quality designation, fractures per foot and core condition.

A laboratory testing program was performed on representative core samples to determine the engineering properties which influence slope stability. Uniaxial compressive strength tests were performed to ensure proper correlation with point load test results. Moisture and density determinations were made on selected core samples used for direct shear testing.

Material properties for slope design such as bulk density, friction angle and cohesion were based on the above field and laboratory testing, and on the results of previous slope designs and back analyses of slope failures performed by Dames and Moore in comparable materials. Results of the testing program are:

Material	Bulk Density (lbs/cu.ft.)	Friction Angle (degrees)	Cohesion (lbs/sq.ft.)
Capping Conglomerate	140	40	4,000
Well Cemented Sandstone Conglomerate	130	32	4,000
Poorly Cemented Sandstone Conglomerate	130	32	2,000
Lacustrine Sediments	130	28	3,000

Limited surface mapping of structure orientation of the various lithologic units was supplemented by the study of existing geologic maps and sections. The orientation of major faults and other potential failure planes with respect to the major pit slopes was examined to determine the potential of failure planes daylighting into the pit.

Faulting in the site area generally strikes within 10° of northwest and dips steeply, generally to the southwest. Locations and orientations of faults within the area are such as to not cause failure of the pit slopes.

Adequate control of water from all sources is important for slope stability. Control and diversion of surface runoff during rainstorms will be accomplished with dams and ditches. The limited information available on groundwater within the pit indicates that an average of 200 gpm will inflow from the lower conglomerate unit and also from the barren sand unit. Pump tests will be conducted to precisely determine ways to obtain a fully drained slope. All calculated slopes require a fully drained condition.

Results of the slope design analyses indicate that for a slope 800' high, a recommended stable design would be a fully drained slope

mined at 40° through the lacustrine sediments and approximately the lower half of the Tertiary sandstone conglomerate unit, and at 50° over its remaining height with a 100' wide bench separating the two portions of the slope. The 100' bench both increases the stability of the slope and acts as a useful catch bench. Slopes of less than 400' are designed at higher angles as shown on the Table below. The present mine design requires only a short time of highwall exposure before backfilling begins. Slopes are designed with factors of safety of 1.1 to 1.2.

The above design recommendations for the main southern slope should also be valid for any significant side slopes encountered during mining. Serious footwall stability is not anticipated because of the low angle of footwall bedding. Slope design conclusions are based on the assumption that the ultimate pit slope will not have marked horizontal curvature. As mining progresses, the actual performance of the mine slopes will provide important additional information, especially through backslope analyses procedures.

Safe operating slopes at varying heights obtained from interpolation between the recommended design slopes are represented below.

Slope Height (ft)	Operating Slope	Angle
100	.36:1	70°
200	.36:1	70°
300	.68:1	56°
400	.84:1	50°
500	.94:1	47°
600	1.00:1	45°
700	1.04:1	44°
800	1.06:1	43°

5.6 HYDROLOGY

Information regarding water at Anderson Mine has been provided by Water Development Corporation (WDC) reports and by Dames and Moore Studies on slope stabilities and tailings impoundment. In general the Anderson Mine property is drained by the Santa Maria River which is a portion of the Bill Williams drainage which in turn is part of the Colorado River drainage. Groundwater is present in several clastic units and appears to be moving northwestward. The dominant northwest-southeast structural pattern appears to influence groundwater occurrance and movement.

5.6.1 Groundwater

The following units contain groundwater in the Date Creek Basin near Anderson Mine: Recent Alluvium, Upper Conglomerate, Lower Conglomerate, and the Barren Sand.

While some inflow into the Recent Alluvium may occur from groundwater systems, the major amount of the water is subflow of the surface drainage system. Wells at the Palmarita Ranch which are planned as an alternate source of mill water are developed in the Alluvium. One of these wells yielded 2,198 GPM with 17.49 feet of drawdown in 24 hours. There are 5 large diameter wells at the Palmerita Ranch which could be used for mill water supply.

In the immediate vicinity of the mine the upper Conglomerate is above the water table.

The lower Conglomerate in the mine area appears to carry the largest and most consistent amounts of groundwater. WDC states that four wells in section 16 will supply 1000 gpm for 15 years, although wider spacing would be desirable. This is the primary source of water for the mill operation. Water in the lower Conglomerate appears to be compartmentalized and strongly influenced by faulting. It was concluded by WDC that water movement in this unit is toward the northwest and that recharge to the unit is minimal. Data from one pump test indicates that the transmissivity value in Section 16 is 1000 gpd per foot of aquifer width, at a pumping rate of 301 gallons per minute. They further conlude that drawing 1000 gpm for 15 years from section 16 would affect only the Grapevine Springs.

The small amount of data available for the Barren Sand Unit indicates that it is a confined groundwater system having an artesian head of approximately 500 feet. Urangesellschaft's water supply well, DC-5, produces approximately 50 gallons/minute from the Barren Sand. WDC concludes: "The limited thickness, areal extent, and numerous offsets caused by faulting severely reduce the ability of this unit to provide a dependable, long-term large water supply from within the claim area."

Observations during drilling indicates that faults within the pit area may carry sufficient water to require pit dewatering. A well field has been constructed consisting of 6 wells and

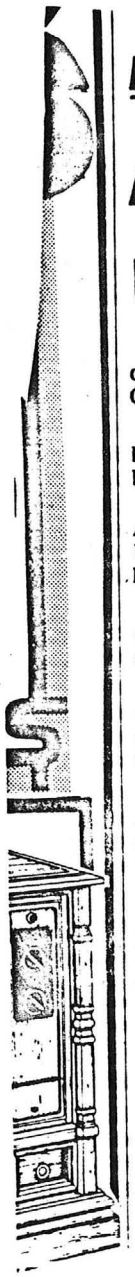
12 observation holes but pump testing has not yet been carried out. Results from this pumping will indicate how much water will be expected in the pit.

5.6.2 Surface Water

Three generally west-flowing ephemeral streams drain the Date Creek Basin; Santa Maria River, Date Creek, and Bullard Wash. The Big Sandy River joins the Santa Maria on the northwest side of the basin and this combined drainage is the Bill Williams River. The Alamo Dam and Reservoir are located on the Bill Williams at the western margin of the basin.

At the Anderson Mine all drainage is northwestward into the Santa Maria River. All of these drainages are ephemeral. Plans for diverting these drainages around mining operations have been made.

TUCSON STAR 6-2-78



Decision in mill

Arizona may get uranium project

A $60 million uranium mine and mill probably will be operating near Wickenburg in two years, a Union Oil Co. of California spokesman said yesterday.

A final decision based on costs and income factors will be made next month, said the spokesman, who asked not to be identified.

Another determining factor will be whether the Arizona Atomic Energy Commission approves the plan, he said. The Union Oil subsidiary involved, the Minerals Exploration Co., has already asked for permission.

The spokesman said the company would not have invested substantial sums in the project had it not looked favorable.

Union Oil and Wickenburg officials plan to meet next week to discuss the impact of 200 to 300 new jobs there. The 4,500-acre site is 43 miles northwest of the town, the spokesman said.

The company has already received clearances from the Arizona Public Service Co. for power lines to the remote site, and from state and county officals for road rights-of-way, he said.

Other companies also are interested in the area, the spokesman noted, adding that a processing mill there would encourage others to move ahead with mining plans.

A German-owned company is considering processing uranium it may mine nearby at the proposed mill, the oil company spokesman said.

The German firm's subsidiary, Urangesellschaft, USA Inc., also has rights to extensive acreage in the area.

The two companies collaborated on environmental studies, the spokesman said. There appear to be no major problems in conserving air and water quality standards, the spokesman said.

Bob Lucht

ANDERSON MINE - REPORTS COMPLETED - May, 1978

ORE RESERVES

1. Anderson Mine Geology Report, MX, Aug. '77

2. Ore Control Techniques at the Anderson Mine, MX, Sept. '77

3. A Review of Estimated Mineable Uranium Reserves, Anderson Mine Project, Chapman, Wood & Griswold, Sept. '77

4. Anderson Mine Bulk Density Study, MX, Jan. '78

5. Development Report on Equilibrium at the Anderson Mine Project, MX, April '78

TECHNICAL STUDIES

1. Slope Stability Studies - Proposed Anderson Mine Property - Open Pit Uranium Mine, Dames & Moore, April '77

2. Preliminary Geotechnical Investigation Report - Mill and Tailings Disposal Sites, Sergent, Hausins and Beckwith, Aug. '77

3. Preliminary Feasibility Study, Morrison-Knudsen, Dec. '77

4. Design Report - Proposed Tailings Impoundment, Anderson Uranium Project, Dames & Moore, May '78

HYDROLOGICAL

1. Progress Report - Exploration for Water Supply, Anderson Mine, Arizona, Water Dev. Corp., June '77

2. Anderson Mine Surface Water, Water Dev. Corp, July, '77

3. Ground-water Hydrology of Anderson Mine Area, Arizona, Water Dev. Corp, Feb. '78

4. Legal Evaluation of Alternative Sources of Water for the Anderson Mine Project, Yavapai Co., Arizona, D.P. Keards & J.C. Lacy, Mar. '78

5. Surface Water Hydrology of Bill Williams River System, Arizona, Water Dev. Corp., Mar '78

ENVIRONMENTAL

1. Socio-Economic Evalution - Anderson Project, MX, April '77

2. Wildlife and Vegetation Baseline Study - Anderson Uranium Project Area, Dames & Moore, Jan. '78

3. Wildlife and Vegetation Baseline Inventory - Proposed Water Pipeline Palmerita Ranch to Anderson Mine Project, Dames & Moore, Jan. '78

4. Preliminary Report of Field Paleontological Resources, Museum of No. Arizona, June '77

5. An Archaeological Survey of the Anderson Mine Area of West-Central Arizona, Museum of Northern Ariz., Feb. '78

6. Application for Certificate of Environmental Compatiblity - Bagdad to Black Mountain 115 kv Line, Arizona Public Service, Jan. '78

7. Anderson Uranium Project Environmental Report, Woodward - Clyde Consultants, Draft copies only - not completed

METALLURGICAL

1. Alkaline Leaching of Anderson Mine Samples, Hazen Research, Aug. '77

2. Acid Leaching of Anderson Mine Samples, Hazen Research, Aug. '77

3. Metallurgical Summary and Preliminary Design Data, A.H. Ross & Associates, Sept. '77

4. Uranium Recovery from Anderson Mine Ore, Hazen Research, March '78

5. Metallurgical Summary and Mill Design Criteria for the Anderson Uranium Deposit, A.H. Ross & Assoc., May '78

U.G. OPTION

7-10-78

Dave Hertzke -

B horizon ore only with a 0.04% cutoff
10,900,000 lb reserve @ an average grade of 0.089% U_3O_8

The other horizons with an .04 cutoff will give 4-6 x 10^6 additional lbs.

These are preliminary figures

BACKSLOPE CALCULATIONS
(ALL NUMBERS CLOCKWISE)

PANEL #	CU FT	TONS (15 CU FT / TON)
A	19,826,640	
	33,275,000	
	35,300,760	
	32,130,780	
	34,427,250	
	42,837,000	
	46,728,000	
	244,525,430	16,301695
B	50,304,000	
	55,717,200	
	55,320,600	
	48,080,000	
	210,049,800	14,003,320
C	45,720,000	
	34,617,550	
	32,672,750	
	28,875,000	
	23,857,600	
	20,930,000	
	19,125,000	
	205,797,900	13,719,860

PANEL #	CU FT	TONS
D	1,826,000	
	22,080,000	
	21,160,000	
	27,775,000	
	11,400,000	
	19,297,500	
	22,535,040	
	26,386,250	
	168,893,790	
E	30,142,750	
	32,065,000	
	43,053,000	
	35,070,750	
	32,604,000	
	17,430,000	
	17,640,000	
	208,005,500	13,867,033
EXTENDED E	208,005,500	
	10,804,000	
	22,535,040	
	26,386,250	
	267,730,790	17,848,719

BENCH ELEV	SQ IN	SQ FT	CU FT
1600	2.98	119,200	11,920,000
1700	6.27	250800	25,080,000
1800	10.09	403600	40 360,000
1900	14.80	592 000	59,20 0,000
2000	19.75	790,000	79,000,000
2100	4.09	163,600	16,360,000
			231,920,000
			244,525,430

ANSWER FROM BEFORE

5% DIFFERENCE

PANEL A

19026640.00	***
35275000.00	***
35300760.00	***
32130780.00	***
34427250.00	***
42837000.00	***
46720000.00	***
244525430.0	***

RT

PANEL B

50304000.00	***
55717200.00	***
55320600.00	***
48709000.00	***
210049800.0	***

RT

C

45720000.00	***
34617550.00	***
32672750.00	***
26675000.00	***
23857600.00	***
20930000.00	***
19125000.00	***
205797900.0	***

D

18260000.00	***
22080000.00	***
21160000.00	***
27775000.00	***
11400000.00	***
19297500.00	***
22535040.00	***
26386250.00	***
168893790.0	***

E

29142750.00	***
32065000.00	***
43053000.00	***
35070750.00	***
32604000.00	***
17430000.00	***
17640000.00	***
208005500.0	***

F

10304000.00	***
5830820.00	***
4199500.00	***
1575000.00	***
500000.00	***
22292320.00	***

EXTENDED E

208005500.0	***
10804000.00	***
22535040.00	***
26386250.00	***
267730790.0	***

G

19722400.00	***
20430900.00	***
25492500.00	***
30723140.00	***
26562000.00	***
8442000.00	***
155084940.0	***

H

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6525000.00	***
30272040.00	***

I

6264000.00	***
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4212000.00	***
3456000.00	***
2580000.00	***
2280000.00	***
2243160.00	***
2114640.00	***
34417800.00	***

J

1890000.00	***
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433500.00	***
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6000.00	***
0.00	***
86640.00	***
602640.00	***
384000.00	***
363540.00	***
4546320.00	***

K

150000.00	***
135000.00	***
150000.00	***
191160.00	***
360000.00	***
739260.00	***
253500.00	***
144060.00	***
2122980.00	***

L

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13440.00	***
43740.00	***
37500.00	***
0.00	***
120000.00	***
180000.00	***
2400000.00	***
2800680.00	***

M

2210000.00	***
1104040.00	***
3019000.00	***
12070000.00	***
11004000.00	***
19712500.00	***
22562500.00	***
[illegible]	***
19530000.00	***
[illegible]	***
? [illegible]	***

123,551,920

U/D — FAULTS – FROM GEOLOGY MAP

····· — INFERRED FAULTS FROM EQUILIBRIUM DATA

— RESERVE EQUILIBRIUM FACTOR CONTOURS

AM49C — HOLE NUMBER

2013.0 — COLLAR ELEVATION

.967 — RESERVE EQUILIBRIUM FACTOR

union MINERALS EXPLORATION CO.

ANDERSON MINE PROJECT
YAVAPAI COUNTY, ARIZONA

EQUILIBRIUM CONTOUR MAP

.02% U_3O_8 CUTOFF

SCALE	DATE: 5/78	APPROVED	REVISIONS
H: 1" = 600'	DRAWN BY: AMG, LRR		
V:	CHECKED: RFL		
	DESIGN: RFL		FILE:

ANDERSON MINE CORE and PULP SAMPLES in CASPER, WYOMING

Hole #	Beta Gamma Pulps	Footages
AM 1C		70-78'9", 78'9"-89, 98-107'5", 107'5"-117'4", 117'4"-126'5", 126'5"-135, 135-140
AM 7C	1 bx Pwdr Samples	15-25, 95-105, 105-10, 110-18
AM 13C	1 box	100-11, 111-21, 121-31, 131-40, 140'3"-149'9"
AM 16C		240-249'8", 249'8"-262'6", 262'5"-72'5", 272'5"-86'5", 286'5"-296, 296-306, 306-16, 316-27, 327-35
AM 17C	2 boxes	100-110, 110-20, 120-30, 130-140, 140-150, 153-162'5", 162'5"-72, 172-190 (lost 7'), 190-200, 200-08, 208-215
AM 18C	1 box	270-80, 280-90, 290-98'10", 298'10"-310'9", 310'9"-320'4", 476-84
AM 26C	4 boxes	595-603, 603-11, 611-19, 619-27, 627-35, 635-43, 643-?, 705-13, 713-21, 721-29, 729-37, 737-45, 745-53, 753-55
AM 49C	1 box	606-14, 614-22, 622-30, 630-38, 638-42, 642-50
AM 51C	2 boxes	338-46, 377-85, 385-93, 393-401, 401-09, 409-17, 417-18, 430-38, 446-54, 454-62, 462-70, 470-75
AM 79C	1 box	25-34, 34-44, 44-54, 54-64, 64-70
AM 113C	1 box	270-80, 280-90, 290-300, 300-10, 310-20, 320-35, 335-50
AM 119C	1 box	26-36, 36-41, 105-15, 115-25, 125-35
AM 127C	1 box	40-50
AM 135C	1 box	373-83, 383-91, 391-99, 452-60, 460-68, 468-78, 676-84
AM 149C	1 box	340-48, 348-55, 380-88, 388-96, 396-404, 404-12, 412-422

HAZEN RESEARCH, INC.

4601 INDIANA STREET
GOLDEN, COLORADO • 80401
TELEPHONE 303/279-4501

REPORT OF ANALYSIS

Mr. Bob Lucht
Minerals Exploration Company
P. O. Box 50324
Tucson, Arizona 85703

Date: June 24, 1977

HRI Project No. 4107
HRI Series No. 11608
Samples Rec'd 5/25/77

Analysis No.	Sample Designation		% CO_2
11608-431	A.M.-382	355	1.76
-434	A.M.-382	370	1.26
-440	A.M.-383	445	0.83
-443	A.M.-383	460	0.64
-444	A.M.-383	465	2.52
-446	A.M.-383	475	4.15
-454	A.M.-384	400	0.37
-455	A.M.-384	405	0.14
-458	A.M.-384	425	0.75
-461	A.M.-384	455	7.91
-468	A.M.-398	340	7.72
-471	A.M.-412	135	0.56
-472	A.M.-412	140	5.86
-476	A.M.-426	470	10.5
-489	A.M.-430	500	15.5
-490	A.M.-430	505	9.31
-491	A.M.-430	510	12.1
-492	A.M.-430	515	17.3
-498	A.M.-430	545	5.52
-516	A.M.-435	100	1.14
-517	A.M.-435	105	1.64
-524	A.M.-437	370	3.91
-525	A.M.-437	375	3.35
-526	A.M.-437	380	2.37
-533	A.M.-438	385	2.08

Mr. Bob Lucht
Minerals Exploration Company

June 24, 1977
HRI Project No. 4107
HRI Series No. 11608

Analysis No.	Sample Designation		% CO_2
11608-534	A.M.-438	390	0.60
-535	A.M.-438	420	4.72
-555	A.M.-440	360	3.13
-556	A.M.-440	365	2.45
-557	A.M.-440	370	1.25
-558	A.M.-440	375	1.20
-559	A.M.-440	380	1.64
-575	A.M.-447	385	0.94
-578	A.M.-447	400	0.48
-585	A.M.-448	450	5.77
-598	A.M.-460	190	0.72
-609	A.M.-463	225	0.31
-610	A.M.-463	230	0.26
-613	A.M.-486	450	5.93
-617	A.M.-486	505	8.56

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

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HAZEN RESEARCH, INC.

4601 INDIANA STREET
GOLDEN, COLORADO • 80401
TELEPHONE 303/279-4501

Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-212	A.M.-346	365	0.023	0.03	0.028	0.026	0.026	0
-213	A.M.-346	370	0.120	0.14	0.111	0.091	0.091	0
-214	A.M.-346	375	0.084	0.09	0.074	0.065	0.065	0
-215	A.M.-348	225	0.003	<0.01	0.004	0.005	0.006	17
-216	A.M.-348	230	0.003	INSUFFICIENT SAMPLE FOR ANALYSIS				
-217	A.M.-348	235	0.022	INSUFFICIENT SAMPLE FOR ANALYSIS				
-218	A.M.-348	240	0.019	INSUFFICIENT SAMPLE FOR ANALYSIS				
-219	A.M.-348	245	0.017	0.02	0.017	0.017	0.017	0
-220	A.M.-348	300	0.003	INSUFFICIENT SAMPLE FOR ANALYSIS				
-221	A.M.-348	305	0.041	INSUFFICIENT SAMPLE FOR ANALYSIS				
-222	A.M.-348	310	0.027	INSUFFICIENT SAMPLE FOR ANALYSIS				
-223	A.M.-348	315	0.010	INSUFFICIENT SAMPLE FOR ANALYSIS				
-224	A.M.-349	420	0.001	<0.01	0.002	0.006	0.006	0
-225	A.M.-349	425	0.001	<0.01	<0.002	0.006	0.006	0
-226	A.M.-349	430	0.005	<0.01	0.007	0.007	0.007	0
-227	A.M.-349	435	0.017	0.03	0.020	0.016	0.016	0
-228	A.M.-349	440	0.026	0.04	0.030	0.021	0.021	0

Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

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4601 INDIANA STREET
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TELEPHONE 303/279-4501

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-229	A.M.-349	445	0.015	0.02	0.016	0.014	0.015	7
-230	A.M.-349	450	0.018	0.02	0.019	0.016	0.016	0
-231	A.M.-349	465	0.008	0.02	0.010	0.005	0.010	50
-232	A.M.-349	470	0.009	0.01	0.010	0.007	0.012	42
-233	A.M.-351	390	<0.001	<0.01	<0.002	<0.002	<0.002	0
-234	A.M.-351	395	<0.001	<0.01	<0.002	<0.002	<0.002	0
-235	A.M.-351	400	<0.001	<0.01	<0.002	<0.002	<0.002	0
-236	A.M.-351	405	<0.001	<0.01	0.002	<0.002	<0.002	0
-237	A.M.-351	410	0.003	0.01	0.006	<0.002	<0.002	0
-238	A.M.-351	415	<0.001	<0.01	<0.002	<0.002	<0.002	0
-239	A.M.-351	455	<0.001	<0.01	<0.002	<0.002	<0.002	0
-240	A.M.-351	460	<0.001	<0.01	<0.002	<0.002	<0.002	0
-241	A.M.-351	465	<0.001	<0.01	<0.002	<0.002	<0.002	0
-242	A.M.-352	320	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-243	A.M.-352	325	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-244	A.M.-352	330	0.025	0.03	0.021	0.013	0.017	24
-245	A.M.-352	370	0.002	<0.01	0.004	<0.002	<0.002	0

HAZEN RESEARCH, INC.

4601 INDIANA STREET
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Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-246	A.M.-352	375	0.010	0.02	0.010	0.004	0.008	50
-247	A.M.-352	380	0.082	0.10	0.078	0.061	0.061	0
-248	A.M.-352	385	0.023	INSUFFICIENT SAMPLE FOR ANALYSIS				
-249	A.M.-352	390	0.038	INSUFFICIENT SAMPLE FOR ANALYSIS				
-250	A.M.-352	395	0.058	INSUFFICIENT SAMPLE FOR ANALYSIS				
-251	A.M.-352	400	0.013	0.02	0.016	0.012	0.016	25
-252	A.M.-352	420	0.062	INSUFFICIENT SAMPLE FOR ANALYSIS				
-253	A.M.-352	425	0.113	0.02	0.014	0.010	0.012	17
-254	A.M.-352	430	0.033	INSUFFICIENT SAMPLE FOR ANALYSIS				
-255	A.M.-354	390	<0.001	<0.01	<0.002	<0.002	<0.002	0
-256	A.M.-354	395	0.004	0.01	0.006	0.002	0.007	71
-257	A.M.-354	400	0.003	<0.01	0.003	<0.002	<0.002	0
-258	A.M.-354	435	0.002	<0.01	<0.002	<0.002	<0.002	0
-259	A.M.-354	440	0.002	<0.01	<0.002	<0.002	<0.002	0
-260	A.M.-354	445	0.019	0.03	0.018	0.012	0.016	25
-261	A.M.-354	450	0.011	0.02	<0.002	0.010	0.012	17
-262	A.M.-354	455	0.013	0.01	0.010	0.008	0.013	38

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Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-263	A.M.-354	460	0.011	0.01	0.009	0.009	0.013	31
-264	A.M.-354	465	0.011	0.02	0.014	0.011	0.015	27
-265	A.M.-354	470	0.024	0.03	0.026	0.023	0.025	8
-266	A.M.-354	475	0.022	0.03	0.020	0.014	0.020	30
-267	A.M.-354	480	0.015	0.02	0.015	0.013	0.013	0
-268	A.M.-354	575	0.006	0.01	0.009	0.006	0.007	14
-269	A.M.-354	580	0.011	0.01	0.009	0.007	0.010	30
-270	A.M.-354	635	0.004	INSUFFICIENT SAMPLE FOR ANALYSIS				
-271	A.M.-354	640	0.027	0.04	0.024	0.014	0.014	0
-272	A.M.-354	645	0.010	0.02	0.013	0.009	0.009	0
-273	A.M.-354	650	0.012	0.02	0.014	0.010	0.011	9
-274	A.M.-357	620	0.021	0.03	0.023	0.015	0.015	0
-275	A.M.-357	625	0.014	0.02	0.016	0.011	0.011	0
-276	A.M.-357	630	0.016	0.02	0.014	0.012	0.012	0
-277	A.M.-357	675	0.008	0.01	0.007	0.005	0.006	17
-278	A.M.-357	680	0.004	0.01	0.005	0.003	0.006	50
-279	A.M.-357	685	0.003	<0.01	0.003	0.003	0.004	25

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Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-280	A.M.-357	730	0.009	0.01	0.012	0.010	0.010	0
-281	A.M.-357	735	0.011	0.02	0.013	0.011	0.011	0
-282	A.M.-358	435	0.002	0.01	0.005	0.005	0.005	0
-283	A.M.-358	440	0.013	0.02	0.015	0.012	0.012	0
-284	A.M.-358	445	0.012	INSUFFICIENT SAMPLE FOR ANALYSIS				
-285	A.M.-358	450	0.014	0.01	0.011	0.011	0.011	0
-286	A.M.-358	535	0.007	0.01	0.006	0.005	0.005	0
-287	A.M.-358	540	0.010	0.02	0.011	0.008	0.008	0
-288	A.M.-358	545	0.013	0.02	0.014	0.010	0.010	0
-289	A.M.-358	550	0.031	0.03	0.027	0.022	0.022	0
-290	A.M.-358	610	0.002	0.01	0.006	0.003	0.003	0
-291	A.M.-358	615	0.004	0.01	0.005	0.005	0.005	0
-292	A.M.-358	620	0.004	0.01	0.006	0.005	0.005	0
-293	A.M.-358	625	0.012	0.01	0.011	0.008	0.008	0
-294	A.M.-358	650	0.023	0.04	0.029	0.021	0.021	0
-295	A.M.-358	655	0.004	<0.01	0.004	0.005	0.005	0
-296	A.M.-358	660	0.003	<0.01	0.005	0.004	0.004	0

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Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-297	A.M.-359	480	0.001	<0.01	<0.002	0.002	0.002	0
-298	A.M.-359	485	0.006	<0.01	0.008	0.008	0.008	0
-299	A.M.-359	490	0.013	0.02	0.015	0.012	0.013	8
-300	A.M.-359	495	0.036	0.04	0.034	0.029	0.029	0
-301	A.M.-359	500	0.037	0.04	0.031	0.027	0.027	0
-302	A.M.-359	525	0.015	0.02	0.015	0.011	0.011	0
-303	A.M.-359	530	0.039	0.05	0.034	0.026	0.029	10
-304	A.M.-359	535	0.047	0.06	0.041	0.029	0.032	9
-305	A.M.-359	540	0.094	0.10	0.066	0.048	0.048	0
-306	A.M.-359	575	0.008	<0.01	0.006	0.006	0.006	0
-307	A.M.-359	580	0.046	0.06	0.045	0.038	0.041	7
-308	A.M.-359	585	0.046	0.05	0.033	0.025	0.028	11
-309	A.M.-359	620	0.013	0.02	0.012	0.009	0.009	0
-310	A.M.-359	625	0.013	0.02	0.015	0.012	0.012	0
-311	A.M.-360	585	0.014	0.02	0.014	0.012	0.012	0
-312	A.M.-360	590	0.025	0.03	0.026	0.021	0.022	5
-313	A.M.-360	595	0.024	0.04	0.026	0.020	0.021	5

Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

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REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 (Radiometric) β-γ	β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-314	A.M.-360	675	0.005	INSUFFICIENT SAMPLE FOR ANALYSIS				
-315	A.M.-360	680	0.006	0.01	0.011	0.008	0.008	0
-316	A.M.-360	685	0.004	<0.01	0.005	0.005	0.005	0
-317	A.M.-360	690	0.005	0.01	0.008	0.006	0.006	0
-318	A.M.-360	695	0.024	INSUFFICIENT SAMPLE FOR ANALYSIS				
-319	A.M.-362	575	0.001	<0.01	0.003	0.002	0.003	33
-320	A.M.-362	580	0.003	<0.01	0.005	0.004	0.004	0
-321	A.M.-362	585	0.011	0.02	0.011	0.008	0.008	0
-322	A.M.-362	595	0.005	0.01	0.008	0.006	0.006	0
-323	A.M.-362	600	0.013	INSUFFICIENT SAMPLE FOR ANALYSIS				
-324	A.M.-362	615	0.007	0.01	0.005	<0.002	<0.002	0
-325	A.M.-362	620	0.020	0.03	0.017	0.008	0.017	53
-326	A.M.-362	625	0.017	0.03	0.017	0.007	0.019	63
-327	A.M.-362	640	0.006	0.01	0.005	<0.002	<0.002	0
-328	A.M.-362	645	0.005	<0.01	0.003	<0.002	<0.002	0
-329	A.M.-362	650	0.013	0.02	0.009	0.004	0.012	67
-330	A.M.-362	655	0.020	0.03	0.020	0.032	0.032	0

Date: June 21, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

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Mr. Bob Lucht
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REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-331	A.M.-363	535	0.019	0.03	0.018	0.011	0.020	45
-332	A.M.-363	540	0.019	0.03	0.017	0.011	0.020	45
-333	A.M.-363	545	0.027	0.04	0.021	0.014	0.023	39
-334	A.M.-363	550	0.036	0.06	0.029	0.009	0.021	57
-335	A.M.-363	555	0.026	0.04	0.021	0.009	0.018	50
-336	A.M.-363	560	0.015	0.02	0.012	0.007	0.016	56
-337	A.M.-363	565	0.020	0.03	0.018	0.009	0.019	53
-338	A.M.-363	580	0.015	INSUFFICIENT SAMPLE FOR ANALYSIS				
-339	A.M.-363	585	0.013	0.02	0.010	0.005	0.014	64
-340	A.M.-363	720	<0.001	<0.01	<0.002	<0.002	<0.002	0
-341	A.M.-363	725	0.001	<0.01	<0.002	<0.002	<0.002	0
-342	A.M.-363	730	<0.001	<0.01	<0.002	<0.002	<0.002	0
-343	A.M.-364	450	0.002	<0.01	0.002	<0.002	<0.002	0
-344	A.M.-364	455	0.002	<0.01	0.002	<0.002	<0.002	0
-345	A.M.-364	460	0.003	<0.01	<0.002	<0.002	<0.002	0
-346	A.M.-364	500	0.002	<0.01	<0.002	<0.002	<0.002	0
-347	A.M.-364	505	0.001	<0.01	<0.002	<0.002	<0.002	0

HAZEN RESEARCH, INC.

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TELEPHONE 303/279-4501

Date: June 22, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-348	A.M.-364	510	0.007	0.01	0.007	0.002	0.012	83
-349	A.M.-364	515	0.014	0.03	0.013	0.006	0.015	60
-350	A.M.-364	520	0.012	0.03	0.012	0.004	0.013	69
-351	A.M.-364	720	<0.001	<0.01	<0.002	<0.002	<0.002	0
-352	A.M.-364	725	0.001	<0.01	<0.002	<0.002	<0.002	0
-353	A.M.-364	730	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-354	A.M.-364	735	0.037	0.05	0.030	0.021	0.034	38
-355	A.M.-365	390	<0.001	<0.01	<0.002	<0.002	<0.002	0
-356	A.M.-365	395	<0.001	<0.01	<0.002	<0.002	<0.002	0
-357	A.M.-365	400	<0.001	<0.01	<0.002	<0.002	<0.002	0
-358	A.M.-365	435	0.006	0.02	0.008	<0.002	<0.002	0
-359	A.M.-365	440	0.004	0.01	0.005	<0.002	<0.002	0
-360	A.M.-365	445	0.004	0.01	0.004	<0.002	<0.002	0
-361	A.M.-365	590	<0.001	<0.01	<0.002	<0.002	<0.002	0
-362	A.M.-365	595	0.002	<0.01	<0.002	<0.002	<0.002	0
-363	A.M.-365	600	0.004	0.01	0.004	<0.002	<0.002	0
-364	A.M.-366	385	<0.001	<0.01	<0.002	<0.002	<0.002	0

Date: June 22, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

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Mr. Bob Lucht
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REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-365	A.M.-366	390	<0.001	<0.01	<0.002	<0.002	<0.002	0
-366	A.M.-366	395	0.004	0.01	0.011	0.011	0.021	48
-367	A.M.-366	440	0.009	0.02	0.008	0.002	0.013	85
-368	A.M.-366	445	0.017	0.03	0.016	0.007	0.017	59
-369	A.M.-366	450	0.041	0.06	0.040	0.028	0.043	35
-370	A.M.-366	455	0.016	0.02	0.014	0.009	0.019	53
-371	A.M.-366	460	0.014	0.03	0.016	0.010	0.022	55
-372	A.M.-366	465	0.015	0.03	0.018	0.013	0.024	46
-373	A.M.-366	585	<0.001	<0.01	<0.002	<0.002	<0.002	0
-374	A.M.-366	590	<0.001	<0.01	<0.002	<0.002	<0.002	0
-375	A.M.-367	280	0.002	0.01	0.005	<0.002	<0.002	0
-376	A.M.-367	285	0.006	0.02	0.012	0.009	0.012	25
-377	A.M.-367	335	0.007	0.01	0.011	0.010	0.014	29
-378	A.M.-367	340	0.013	0.02	0.017	0.016	0.020	20
-379	A.M.-367	345	0.015	0.02	0.016	0.015	0.019	21
-380	A.M.-367	350	0.008	0.01	0.010	0.010	0.010	0
-381	A.M.-368	360	0.002	<0.01	0.004	0.005	0.005	0

Date: June 22, 1977
HRI Project: 4107
HRI Series: 11608
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HAZEN RESEARCH, INC.

4601 INDIANA STREET
GOLDEN, COLORADO • 80401
TELEPHONE 303/279-4501

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-382	A.M.-368	365	0.032	0.04	0.029	0.022	0.023	4
-383	A.M.-368	370	0.089	0.12	0.082	0.058	0.065	11
-384	A.M.-368	395	0.020	0.03	0.022	0.018	0.018	0
-385	A.M.-368	400	0.018	0.02	0.019	0.018	0.018	0
-386	A.M.-368	410	0.033	0.04	0.036	0.033	0.034	3
-387	A.M.-368	415	0.015	INSUFFICIENT SAMPLE FOR ANALYSIS				
-388	A.M.-369	440	0.002	<0.01	0.005	0.005	0.005	0
-389	A.M.-369	445	0.003	0.01	0.008	0.005	0.005	0
-390	A.M.-369	450	0.032	0.04	0.027	0.020	0.023	13
-391	A.M.-369	455	0.026	0.03	0.022	0.017	0.017	0
-392	A.M.-369	460	0.023	0.03	0.027	0.023	0.026	12
-393	A.M.-370	275	0.003	<0.01	0.007	0.006	0.006	0
-394	A.M.-370	280	0.004	<0.01	0.006	0.007	0.007	0
-395	A.M.-370	285	0.006	0.01	0.010	0.008	0.008	0
-396	A.M.-370	290	0.025	0.03	0.026	0.025	0.026	4
-397	A.M.-370	340	0.003	<0.01	0.005	0.006	0.006	0
-398	A.M.-370	345	0.007	0.01	0.010	0.009	0.009	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-399	A.M.-370	350	0.025	0.03	0.022	0.019	0.019	0
-400	A.M.-372	390	0.002	0.01	0.007	0.005	0.005	0
-401	A.M.-372	395	0.001	INSUFFICIENT SAMPLE FOR ANALYSIS				
-402	A.M.-372	400	0.006	<0.01	0.008	0.008	0.008	0
-403	A.M.-372	445	0.007	0.02	0.013	0.010	0.010	0
-404	A.M.-372	450	0.006	0.02	0.011	0.009	0.009	0
-405	A.M.-372	455	0.007	<0.01	0.008	0.009	0.009	0
-406	A.M.-372	460	0.044	0.05	0.038	0.029	0.029	0
-407	A.M.-372	465	0.022	0.02	0.021	0.022	0.022	0
-408	A.M.-372	470	0.024	0.03	0.024	0.023	0.023	0
-409	A.M.-372	475	0.013	0.02	0.016	0.015	0.015	0
-410	A.M.-380	370	0.003	<0.01	0.007	0.006	0.006	0
-411	A.M.-380	375	0.007	INSUFFICIENT SAMPLE FOR ANALYSIS				
-412	A.M.-380	380	0.003	<0.01	0.004	0.006	0.006	0
-413	A.M.-380	405	0.008	0.02	0.012	0.010	0.010	0
-414	A.M.-380	410	0.028	0.04	0.029	0.024	0.024	0
-415	A.M.-380	415	0.056	0.08	0.061	0.049	0.050	2
-416	A.M.-380	430	0.020	0.04	0.026	0.021	0.021	0

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Samples received: 5/25/77

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-417	A.M.-380	435	0.013	0.02	0.018	0.015	0.015	0
-418	A.M.-380	440	0.026	0.03	0.025	0.021	0.021	0
-419	A.M.-380	445	0.038	0.05	0.038	0.032	0.032	0
-420	A.M.-381	415	0.005	<0.01	0.007	0.007	0.007	0
-421	A.M.-381	420	0.006	0.02	0.011	0.008	0.008	0
-422	A.M.-381	425	0.037	0.04	0.033	0.026	0.026	0
-423	A.M.-381	430	0.026	0.03	0.027	0.022	0.022	0
-424	A.M.-381	435	0.020	0.03	0.026	0.023	0.023	0
-425	A.M.-381	440	0.089	0.10	0.078	0.063	0.066	5
-426	A.M.-381	525	0.003	<0.01	0.006	0.006	0.006	0
-427	A.M.-381	530	0.006	0.01	0.010	0.007	0.007	0
-428	A.M.-381	545	0.006	<0.01	0.008	0.008	0.008	0
-429	A.M.-381	550	0.004	0.01	0.007	0.006	0.006	0
-430	A.M.-382	345	0.007	0.02	0.014	0.010	0.010	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-431	A.M.-382	355	0.019	0.03	0.022	0.016	0.017	6
-432	A.M.-382	360	0.014	0.02	0.017	0.015	0.016	6
-433	A.M.-382	365	0.017	0.02	0.022	0.020	0.021	5
-434	A.M.-382	370	0.029	0.04	0.032	0.028	0.031	10
-435	A.M.-382	525	0.001	<0.01	0.003	0.003	0.003	0
-436	A.M.-382	530	0.002	0.01	0.006	0.004	0.004	0
-437	A.M.-383	430	0.006	0.01	0.008	0.007	0.007	0
-438	A.M.-383	435	0.005	0.02	0.013	0.006	0.006	0
-439	A.M.-383	440	0.009	0.02	0.011	0.009	0.009	0
-440	A.M.-383	445	0.030	0.03	0.024	0.022	0.022	0
-441	A.M.-383	450	0.016	0.02	0.015	0.015	0.015	0
-442	A.M.-383	455	0.017	0.02	0.020	0.018	0.018	0
-443	A.M.-383	460	0.025	0.04	0.030	0.026	0.026	0
-444	A.M.-383	465	0.025	0.05	0.033	0.026	0.026	0
-445	A.M.-383	470	0.012	0.02	0.016	0.013	0.023	0
-446	A.M.-383	475	0.020	0.03	0.022	0.016	0.016	0
-447	A.M.-383	480	0.012	0.02	0.015	0.011	0.011	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-448	A.M.-383	485	0.010	0.01	0.011	0.011	0.011	0
-449	A.M.-384	360	0.001	0.01	0.006	0.003	0.003	0
-450	A.M.-384	365	<0.001	<0.01	0.002	0.003	0.003	0
-451	A.M.-384	370	0.002	<0.01	0.005	0.004	0.005	20
-452	A.M.-384	390	<0.001	0.01	0.006	0.004	0.004	0
-453	A.M.-384	395	0.001	<0.01	0.006	0.006	0.006	0
-454	A.M.-384	400	0.012	0.03	0.020	0.017	0.018	6
-455	A.M.-384	405	0.025	0.04	0.025	0.019	0.019	0
-456	A.M.-384	415	0.008	0.01	0.011	0.008	0.008	0
-457	A.M.-384	420	0.005	0.01	0.009	0.007	0.007	0
-458	A.M.-384	425	0.036	0.04	0.037	0.035	0.035	0
-459	A.M.-384	445	0.006	0.01	0.008	0.006	0.006	0
-460	A.M.-384	450	0.013	0.02	0.014	0.012	0.012	0
-461	A.M.-384	455	0.023	0.03	0.025	0.021	0.022	5
-462	A.M.-398	265	<0.001	<0.01	0.002	0.004	0.004	0
-463	A.M.-398	270	0.003	0.01	0.009	0.008	0.008	0
-464	A.M.-398	275	0.007	0.01	0.012	0.011	0.011	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-465	A.M.-398	325	0.003	<0.01	0.005	0.005	0.005	0
-466	A.M.-398	330	0.004	0.01	0.008	0.006	0.006	0
-467	A.M.-398	335	0.005	<0.01	0.007	0.009	0.009	0
-468	A.M.-398	340	0.067	0.10	0.088	0.083	0.088	6
-469	A.M.-412	125	<0.001	<0.01	0.005	0.003	0.003	0
-470	A.M.-412	130	<0.001	<0.01	0.004	0.002	0.002	0
-471	A.M.-412	135	0.046	0.07	0.047	0.035	0.036	3
-472	A.M.-412	140	0.049	INSUFFICIENT SAMPLE FOR ANALYSIS				
-473	A.M.-426	455	0.003	<0.01	0.005	0.006	0.006	0
-474	A.M.-426	460	0.006	<0.01	0.009	0.011	0.011	0
-475	A.M.-426	465	0.007	<0.01	0.010	0.012	0.012	0
-476	A.M.-426	470	0.077	0.11	0.091	0.078	0.085	8
-477	A.M.-426	530	0.006	0.01	0.010	0.007	0.007	0
-478	A.M.-426	535	0.004	<0.01	0.005	0.007	0.007	0
-479	A.M.-426	540	0.018	0.02	0.018	0.015	0.015	0
-480	A.M.-428	545	<0.001	INSUFFICIENT SAMPLE FOR ANALYSIS				
-481	A.M.-428	550	0.019	INSUFFICIENT SAMPLE FOR ANALYSIS				

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 (Radiometric) β-γ	β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-482	A.M.-428	555	0.005	INSUFFICIENT SAMPLE FOR ANALYSIS				
-483	A.M.-428	560	<0.001	<0.01	0.005	0.004	0.004	0
-484	A.M.-428	565	<0.001	INSUFFICIENT SAMPLE FOR ANALYSIS				
-485	A.M.-428	570	<0.001	INSUFFICIENT SAMPLE FOR ANALYSIS				
-486	A.M.-428	575	<0.001	INSUFFICIENT SAMPLE FOR ANALYSIS				
-487	A.M.-428	580	0.002	<0.01	0.003	0.003	0.003	0
-488	A.M.-430	495	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-489	A.M.-430	500	0.010	0.02	0.013	0.022	0.026	15
-490	A.M.-430	505	0.047	0.06	0.037	0.020	0.023	13
-491	A.M.-430	510	0.055	0.07	0.049	0.035	0.041	15
-492	A.M.-430	515	0.035	0.05	0.039	0.033	0.039	15
-493	A.M.-430	520	0.009	0.02	0.010	0.007	0.008	13
-494	A.M.-430	525	0.006	0.02	0.009	0.004	0.007	43
-495	A.M.-430	530	0.004	<0.01	0.006	0.005	0.005	0
-496	A.M.-430	535	0.018	0.02	0.018	0.015	0.016	6
-497	A.M.-430	540	0.012	INSUFFICIENT SAMPLE FOR ANALYSIS				
-498	A.M.-430	545	0.024	0.04	0.029	0.024	0.027	11

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11608-499	A.M.-430	615	0.015	0.02	0.011	0.007	0.007	0
-500	A.M.-430	620	0.010	0.01	0.011	0.009	0.010	10
-501	A.M.-432	380	0.004	0.01	0.007	0.006	0.007	14
-502	A.M.-432	385	0.002	<0.01	0.003	0.004	0.004	0
-503	A.M.-432	390	0.002	<0.01	0.005	0.003	0.004	25
-504	A.M.-432	400	0.001	<0.01	0.005	0.003	0.003	0
-505	A.M.-432	405	0.009	0.01	0.011	0.009	0.010	10
-506	A.M.-432	410	0.006	0.01	0.010	0.007	0.008	13
-507	A.M.-432	420	0.008	0.01	0.009	0.009	0,009	0
-508	A.M.-432	425	0.002	<0.01	0.005	0.003	0.003	0
-509	A.M.-432	430	0.003	<0.01	0.003	0.004	0.004	0
-510	A.M.-432	435	0.007	0.01	0.010	0.007	0.010	30
-511	A.M.-432	440	0.005	0.01	0.008	0.006	0.009	33
-512	A.M.-432	445	0.002	<0.01	0.003	0.003	0.003	0
-513	A.M.-433	360	<0.001	<0.01	<0.002	<0.002	<0.002	0
-514	A.M.-433	365	<0.001	<0.01	0.004	<0.002	<0.002	0
-515	A.M.-433	370	<0.001	<0.01	<0.002	<0.002	<0.002	0
-516	A.M.-435	100	0.034	0.05	0.035	0.029	0.030	3

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-517	A.M.-435	105	0.037	0.05	0.039	0.029	0.036	19
-518	A.M.-435	110	0.016	0.01	0.011	0.011	0.012	8
-519	A.M.-435	175	0.009	<0.01	0.008	0.007	0.008	13
-520	A.M.-435	180	0.011	0.02	0.013	0.011	0.014	21
-521	A.M.-435	185	0.004	<0.01	0.005	0.003	0.003	0
-522	A.M.-437	360	0.001	<0.01	0.004	0.003	0.003	0
-523	A.M.-437	365	0.017	0.02	0.015	0.013	0.014	7
-524	A.M.-437	370	0.026	0.04	0.028	0.022	0.026	15
-525	A.M.-437	375	0.021	0.03	0.022	0.017	0.021	19
-526	A.M.-436	380	0.032	0.05	0.031	0.020	0.021	5
-527	A.M.-437	385	0.016	0.02	0.014	0.012	0.015	20
-528	A.M.-437	390	0.013	0.02	0.014	0.010	0.013	23
-529	A.M.-437	395	0.019	0.02	0.018	0.016	0.016	0
-530	A.M.-437	400	0.005	0.02	0.014	0.010	0.010	0
-531	A.M.-438	375	<0.001	<0.01	<0.002	<0.002	<0.002	0
-532	A.M.-438	380	0.003	<0.01	0.007	0.005	0.006	17
-533	A.M.-438	385	0.036	0.04	0.034	0.027	0.031	13
-534	A.M.-438	390	0.032	0.04	0.027	0.019	0.019	0

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11608-535	A.M.-438	420	0.019	0.03	0.024	0.018	0.019	5
-536	A.M.-438	425	0.007	<0.01	0.007	0.007	0.007	0
-537	A.M.-438	430	0.009	<0.01	0.009	0.010	0.010	0
-538	A.M.-438	465	0.005	<0.01	0.003	0.007	0.007	0
-539	A.M.-438	470	0.005	<0.01	0.002	0.006	0.006	0
-540	A.M.-438	475	0.005	<0.01	0.003	0.005	0.006	17
-541	A.M.-438	480	0.014	0.02	0.017	0.014	0.015	7
-542	A.M.-438	485	0.015	0.01	0.015	0.015	0.015	0
-543	A.M.-439	345	0.001	<0.01	<0.002	0.003	0.003	0
-544	A.M.-439	350	0.002	<0.01	<0.002	0.004	0.004	0
-545	A.M.-439	355	0.014	0.02	0.018	0.018	0.018	0
-546	A.M.-439	360	0.019	0.02	0.019	0.016	0.019	16
-547	A.M.-439	370	0.014	0.01	0.014	0.014	0.014	0
-548	A.M.-439	375	0.013	0.01	0.012	0.012	0.012	0
-549	A.M.-439	380	0.015	0.01	0.015	0.017	0.017	0
-550	A.M.-439	580	0.014	<0.01	0.004	0.006	0.006	0
-551	A.M.-439	585	0.003	<0.01	0.003	0.005	0.005	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-552	A.M.-439	590	0.004	<0.01	0.004	0.006	0.006	0
-553	A.M.-440	350	SAMPLE MISSING					
-554	A.M.-440	355	0.002	<0.01	0.003	0.003	0.003	0
-555	A.M.-440	360	0.096	0.11	0.080	0.061	0.064	5
-556	A.M.-440	365	0.043	0.03	0.029	0.028	0.028	0
-557	A.M.-440	370	0.031	0.04	0.031	0.024	0.027	11
-558	A.M.-440	375	0.037	0.05	0.038	0.031	0.031	0
-559	A.M.-440	380	0.039	0.05	0.034	0.025	0.028	11
-560	A.M.-444	340	<0.001	<0.01	<0.002	0.003	0.003	0
-561	A.M.-444	345	<0.001	<0.01	<0.002	0.002	0.003	33
-562	A.M.-444	350	0.009	<0.01	0.008	0.007	0.007	0
-563	A.M.-444	560	0.001	<0.01	<0.002	0.003	0.003	0
-564	A.M.-444	565	0.009	<0.01	<0.002	<0.002	<0.002	0
-565	A.M.-444	570	0.019	0.02	0.020	0.021	0.022	5
-566	A.M.-444	575	0.004	<0.01	0.004	0.007	0.007	0
-567	A.M.-446	525	<0.001	<0.01	<0.002	0.002	0.003	33
-568	A.M.-446	530	<0.001	<0.01	<0.002	<0.002	<0.002	0

Date: June 24, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

HAZEN RESEARCH, INC.

4601 INDIANA STREET
GOLDEN, COLORADO • 80401
TELEPHONE 303/279-4501

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-569	A.M.-446	535	<0.001	<0.01	<0.002	0.003	0.003	0
-570	A.M.-447	325	0.001	<0.01	<0.002	0.004	0.004	0
-571	A.M.-447	330	0.001	<0.01	<0.002	0.003	0.003	0
-572	A.M.-447	370	0.016	<0.01	0.010	0.013	0.013	0
-573	A.M.-447	375	0.011	<0.01	0.011	0.013	0.013	0
-574	A.M.-447	380	0.011	INSUFFICIENT SAMPLE FOR ANALYSIS				
-575	A.M.-447	385	0.031	0.03	0.029	0.026	0.027	4
-576	A.M.-447	390	0.017	INSUFFICIENT SAMPLE FOR ANALYSIS				
-577	A.M.-447	395	0.015	0.02	0.015	0.011	0.031	55
-578	A.M.-447	400	0.096	0.11	0.078	0.061	0.065	6
-579	A.M.-447	575	0.004	<0.01	0.003	0.005	0.005	0
-580	A.M.-447	580	<0.001	<0.01	<0.002	0.002	0.002	0
-581	A.M.-448	430	0.010	<0.01	0.010	0.012	0.012	0
-582	A.M.-448	435	0.007	<0.01	0.008	0.009	0.009	0
-583	A.M.-448	440	0.009	<0.01	0.008	0.009	0.009	0
-584	A.M.-448	445	0.020	0.02	0.017	0.015	0.015	0
-585	A.M.-448	450	0.030	0.03	0.025	0.023	0.023	0
-586	A.M.-448	455	0.012	0.01	0.011	0.009	0.009	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-587	A.M.-448	460	0.012	<0.01	0.009	0.010	0.010	0
-588	A.M.-458	525	0.002	<0.01	<0.002	0.005	0.005	0
-589	A.M.-458	530	0.002	<0.01	<0.002	0.004	0.004	0
-590	A.M.-458	535	0.002	<0.01	<0.002	0.003	0.003	0
-591	A.M.-458	545	0.010	0.01	0.035	0.011	0.011	0
-592	A.M.-458	550	0.009	0.02	0.011	0.008	0.008	0
-593	A.M.-458	555	0.009	0.02	0.012	0.009	0.009	0
-594	A.M.-459	650	0.008	0.02	0.012	0.009	0.009	0
-595	A.M.-459	655	0.007	0.01	0.009	0.008	0.008	0
-596	A.M.-459	660	0.005	0.02	0.011	0.008	0.008	0
-597	A.M.-459	665	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-598	A.M.-460	190	0.019	0.03	0.023	0.016	0.016	0
-599	A.M.-460	620	0.016	INSUFFICIENT SAMPLE FOR ANALYSIS				
-600	A.M.-460	625	0.003	<0.01	0.006	0.006	0.006	0
-601	A.M.-460	630	0.003	0.02	0.009	0.005	0.005	0
-602	A.M.-460	635	0.002	<0.01	0.005	0.004	0.004	0
-603	A.M.-461	640	<0.001	<0.01	0.003	<0.002	<0.002	0

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REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-604	A.M.-461	645	0.003	<0.01	0.004	0.005	0.005	0
-605	A.M.-461	650	0.003	<0.01	0.005	0.004	0.004	0
-606	A.M.-463	180	<0.001	<0.01	0.003	0.002	0.002	0
-607	A.M.-463	185	0.001	<0.01	0.004	0.003	0.003	0
-608	A.M.-463	220	0.009	0.02	0.014	0.009	0.009	0
-609	A.M.-463	225	0.026	0.04	0.027	0.020	0.020	0
-610	A.M.-463	230	0.027	0.04	0.028	0.021	0.021	0
-611	A.M.-486	440	0.001	<0.01	0.002	0.003	0.003	0
-612	A.M.-486	445	0.002	<0.01	0.004	0.004	0.004	0
-613	A.M.-486	450	0.003	<0.01	0.004	<0.002	<0.002	0
-614	A.M.-486	490	0.007	0.02	0.011	0.007	0.007	0
-615	A.M.-486	495	0.007	0.02	0.012	0.009	0.009	0
-616	A.M.-486	500	0.010	0.01	0.011	0.009	0.009	0
-617	A.M.-486	505	0.011	0.02	0.017	0.011	0.011	0
-618	A.M.-486	510	0.010	0.01	0.011	0.010	0.010	0
-619	A.M.-486	515	0.009	0.01	0.010	0.009	0.009	0
-620	A.M.-486	690	0.001	<0.01	0.004	0.003	0.003	0
-621	A.M.-486	695	0.015	0.02	0.012	0.009	0.009	0

By: John C. Jarvis
John C. Jarvis
Manager, Analytical Laboratory

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Date: June 14, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

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Mr. Bob Lucht
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Tucson, Arizona 85703

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-1	A.M.-213	140	0.034	0.05	0.038	0.032	0.032	0
-2	A.M.-213	145	0.011	0.02	0.013	0.009	0.010	10
-3	A.M.-213	150	0.004	<0.01	0.006	0.006	0.006	0
-4	A.M.-213	155	0.003	<0.01	0.003	0.002	0.005	60
-5	A.M.-215	70	0.001	<0.01	0.002	0.002	0.002	0
-6	A.M.-215	75	0.001	0.01	0.004	0.001	0.004	75
-7	A.M.-215	80	0.018	0.02	0.017	0.017	0.017	0
-8	A.M.-215	85	0.003	0.01	0.004	0.004	0.005	20
-9	A.M.-216	5	0.020	0.03	0.023	0.022	0.022	0
-10	A.M.-216	10	0.019	0.02	0.019	0.019	0.019	0
-11	A.M.-223	80	0.013	0.01	0.012	0.011	0.012	8
-12	A.M.-223	85	0.026	0.03	0.030	0.029	0.029	0
-13	A.M.-223	90	0.028	0.03	0.027	0.023	0.023	0
-14	A.M.-223	95	0.014	0.01	0.015	0.017	0.017	0
-15	A.M.-223	100	0.020	0.03	0.024	0.023	0.023	0
-16	A.M.-223	105	0.005	0.01	0.009	0.007	0.007	0
-17	A.M.-229	65	0.016	0.03	0.020	0.016	0.016	0

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REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-18	A.M.-229	70	0.011	0.01	0.012	0.011	0.011	0
-19	A.M.-229	75	0.004	<0.01	0.006	0.007	0.007	0
-20	A.M.-229	120	0.002	<0.01	<0.002	0.002	0.003	33
-21	A.M.-229	125	0.009	0.01	0.011	0.011	0.011	0
-22	A.M.-229	140	0.003	<0.01	0.005	0.005	0.005	0
-23	A.M.-229	145	0.014	0.01	0.013	0.016	0.016	0
-24	A.M.-229	150	0.016	0.01	0.018	0.021	0.021	0
-25	A.M.-229	155	0.006	<0.01	0.007	0.008	0.008	0
-26	A.M.-230	110	0.002	<0.01	0.004	0.004	0.005	20
-27	A.M.-230	115	0.003	<0.01	0.003	0.004	0.004	0
-28	A.M.-230	120	0.028	0.03	0.029	0.029	0.029	0
-29	A.M.-230	185	0.005	<0.01	0.002	0.008	0.008	0
-30	A.M.-230	190	0.004	<0.01	0.004	0.005	0.005	0
-31	A.M.-230	195	0.018	0.02	0.024	0.025	0.025	0
-32	A.M.-230	200	0.015	0.01	0.017	0.019	0.019	0
-33	A.M.-231	95	0.002	<0.01	0.002	0.006	0.006	0
-34	A.M.-231	100	0.002	0.01	0.005	0.003	0.004	25

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-35	A.M.-232	210	0.001	<0.01	0.002	0.002	0.002	0
-36	A.M.-232	215	0.003	<0.01	0.004	0.006	0.006	0
-37	A.M.-232	220	0.017	0.01	0.018	0.020	0.020	0
-38	A.M.-232	225	0.003	<0.01	0.003	0.005	0.005	0
-39	A.M.-233	270	0.002	<0.01	0.003	0.003	0.003	0
-40	A.M.-233	275	0.016	0.02	0.021	0.022	0.022	0
-41	A.M.-233	280	0.007	INSUFFICIENT SAMPLE FOR ANALYSIS				
-42	A.M.-234	430	0.002	<0.01	0.003	0.004	0.005	20
-43	A.M.-234	435	0.002	<0.01	0.003	0.002	0.005	60
-44	A.M.-234	440	0.002	0.01	0.005	0.004	0.004	0
-45	A.M.-238	55	0.008	<0.01	0.006	0.009	0.010	10
-46	A.M.-238	60	0.022	0.05	0.040	0.037	0.037	0
-47	A.M.-244	80	0.008	0.01	0.010	0.009	0.009	0
-48	A.M.-244	85	0.002	<0.01	0.003	0.003	0.004	25
-49	A.M.-245	210	0.003	0.01	0.006	0.005	0.005	0
-50	A.M.-245	215	0.007	0.01	0.009	0.010	0.010	0
-51	A.M.-245	220	0.006	<0.01	0.005	0.008	0.010	20

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-52	A.M.-224	10	0.009	0.01	0.010	0.012	0.012	0
-53	A.M.-224	15	0.013	0.02	0.020	0.019	0.019	0
-54	A.M.-224	20	0.005	<0.01	0.005	0.006	0.008	25
-55	A.M.-224	75	0.002	<0.01	0.005	0.005	0.005	0
-56	A.M.-224	80	0.010	0.01	0.012	0.012	0.012	0
-57	A.M.-224	85	0.034	0.03	0.034	0.034	0.034	0
-58	A.M.-224	90	0.017	0.01	0.017	0.020	0.020	0
-59	A.M.-224	95	0.009	<0.01	0.008	0.011	0.011	0
-60	A.M.-224	100	0.014	0.01	0.014	0.016	0.016	0
-61	A.M.-249	40	0.003	<0.01	0.003	0.004	0.004	0
-62	A.M.-249	45	0.053	0.05	0.045	0.041	0.041	0
-63	A.M.-249	50	0.004	0.01	0.009	0.010	0.010	0
-64	A.M.-252	5	0.039	0.04	0.032	0.028	0.028	0
-65	A.M.-252	55	0.012	0.01	0.012	0.011	0.013	15
-66	A.M.-252	60	0.025	0.03	0.031	0.034	0.034	0
-67	A.M.-252	65	0.022	0.02	0.025	0.024	0.024	0
-68	A.M.-252	70	0.027	0.02	0.023	0.028	0.030	7

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11608-69	A.M.-252	75	0.021	0.02	0.025	0.025	0.025	0
-70	A.M.-253	20	0.058	0.06	0.052	0.046	0.046	0
-71	A.M.-253	25	0.003	<0.01	<0.002	0.006	0.006	0
-72	A.M.-254	120	0.004	<0.01	0.003	0.005	0.007	29
-73	A.M.-254	125	0.005	<0.01	0.006	0.008	0.008	0
-74	A.M.-254	130	0.003	<0.01	0.005	0.006	0.006	0
-75	A.M.-258	20	0.012	0.01	0.011	0.012	0.012	0
-76	A.M.-258	25	0.034	0.04	0.029	0.024	0.024	0
-77	A.M.-258	75	0.003	<0.01	<0.002	0.003	0.005	40
-78	A.M.-258	80	0.005	<0.01	0.003	0.006	0.006	0
-79	A.M.-278	60	0.002	<0.01	0.004	0.007	0.008	13
-80	A.M.-278	65	0.012	0.01	0.013	0.013	0.013	0
-81	A.M.-278	70	0.018	0.03	0.024	0.023	0.024	4
-82	A.M.-278	75	0.028	0.03	0.034	0.034	0.034	0
-83	A.M.-278	80	0.006	0.02	0.015	0.014	0.014	0
-84	A.M.-278	95	0.003	<0.01	0.004	0.004	0.007	43
-85	A.M.-278	100	0.003	<0.01	<0.002	0.002	0.006	67

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11608-86	A.M.-280	45	0.008	0.01	0.013	0.012	0.012	0
-87	A.M.-280	50	0.027	0.03	0.032	0.031	0.031	0
-88	A.M.-280	55	0.015	0.02	0.019	0.016	0.016	0
-89	A.M.-282	135	0.001	<0.01	<0.002	0.004	0.004	0
-90	A.M.-282	140	0.005	INSUFFICIENT SAMPLE FOR ANALYSIS				
-91	A.M.-282	141	0.015	0.02	0.017	0.016	0.016	0
-92	A.M.-287	135	0.005	<0.01	0.006	0.006	0.006	0
-93	A.M.-287	140	0.008	0.01	0.008	0.007	0.007	0
-94	A.M.-287	145	0.013	0.01	0.011	0.012	0.013	8
-95	A.M.-287	175	0.011	0.02	0.014	0.012	0.012	0
-96	A.M.-287	180	0.020	0.02	0.023	0.024	0.024	0
-97	A.M.-289	80	0.005	0.01	0.009	0.006	0.007	14
-98	A.M.-289	85	0.003	<0.01	0.005	0.006	0.006	0
-99	A.M.-289	90	0.036	0.05	0.040	0.038	0.038	0
-100	A.M.-289	135	0.002	<0.01	<0.002	0.004	0.004	0
-101	A.M.-289	140	0.002	<0.01	0.003	0.004	0.007	43
-102	A.M.-289	145	0.020	0.03	0.024	0.022	0.022	0

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11608-103	A.M.-289	150	0.027	0.03	0.029	0.027	0.027	0
-104	A.M.-289	160	0.023	0.03	0.024	0.022	0.022	0
-105	A.M.-289	165	0.005	0.01	0.011	0.009	0.009	0
-106	A.M.-289	170	0.010	<0.01	0.003	0.003	0.013	77
-107	A.M.-294	55	0.002	<0.01	0.012	0.014	0.014	0
-108	A.M.-294	60	0.010	<0.01	0.003	0.004	0.005	20
-109	A.M.-294	65	0.040	0.04	0.040	0.039	0.039	0
-110	A.M.-294	70	0.049	0.05	0.049	0.050	0.050	0
-111	A.M.-294	90	0.004	<0.01	0.005	0.004	0.007	43
-112	A.M.-294	95	0.003	<0.01	0.004	0.003	0.004	25
-113	A.M.-294	100	0.012	<0.01	0.010	0.011	0.011	0
-114	A.M.-323	140	0.005	INSUFFICIENT SAMPLE FOR ANALYSIS				
-115	A.M.-323	145	0.116	0.12	0.078	0.049	0.049	0
-116	A.M.-323	150	0.114	0.12	0.109	0.102	0.102	0
-117	A.M.-323	155	0.053	0.06	0.044	0.032	0.032	0
-118	A.M.-324	135	0.007	<0.01	0.009	0.008	0.009	11
-119	A.M.-324	140	0.011	INSUFFICIENT SAMPLE FOR ANALYSIS				

Date: June 14, 1977
HRI Project: 4107
HRI Series: 11608
Samples received: 5/25/77

HAZEN RESEARCH, INC.
4601 INDIANA STREET
GOLDEN, COLORADO • 80401
TELEPHONE 303/279-4501

Mr. Bob Lucht
Minerals Exploration Company

REPORT OF ANALYSIS

HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-120	A.M.-324	145	0.012	0.01	0.012	0.012	0.012	0
-121	A.M.-324	150	0.015	0.01	0.014	0.014	0.014	0
-122	A.M.-324	155	0.062	0.07	0.056	0.050	0.050	0
-123	A.M.-325	110	0.004	<0.01	0.004	0.007	0.008	13
-124	A.M.-325	115	0.005	<0.01	0.006	0.007	0.008	13
-125	A.M.-325	120	0.028	0.03	0.028	0.028	0.028	0
-126	A.M.-325	135	0.004	INSUFFICIENT SAMPLE FOR ANALYSIS				
-127	A.M.-325	140	0.007	<0.01	0.007	0.008	0.011	27
-128	A.M.-325	145	0.031	0.04	0.031	0.028	0.028	0
-129	A.M.-330	145	0.006	<0.01	0.004	0.008	0.008	0
-130	A.M.-330	150	0.005	<0.01	0.002	0.007	0.008	13
-131	A.M.-330	155	0.007	<0.01	0.008	0.009	0.009	0
-132	A.M.-330	160	0.008	<0.01	0.010	0.011	0.011	0
-133	A.M.-330	165	0.012	0.01	0.014	0.015	0.015	0
-134	A.M.-331	140	0.003	<0.01	<0.002	0.004	0.004	0
-135	A.M.-331	145	0.013	<0.01	0.011	0.016	0.017	6
-136	A.M.-331	150	0.016	0.02	0.018	0.019	0.019	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-137	A.M.-332	185	0.004	<0.01	0.004	0.005	0.005	0
-138	A.M.-332	190	0.020	0.01	0.021	0.028	0.028	0
-139	A.M.-332	195	0.193	0.23	0.200	0.181	0.181	0
-140	A.M.-332	200	0.038	0.05	0.040	0.036	0.036	0
-141	A.M.-333	170	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-142	A.M.-333	175	0.018	0.02	0.021	0.021	0.021	0
-143	A.M.-333	180	0.011	<0.01	0.010	0.011	0.012	8
-144	A.M.-333	205	0.004	<0.01	0.005	0.005	0.005	0
-145	A.M.-333	210	0.006	INSUFFICIENT SAMPLE FOR ANALYSIS				
-146	A.M.-333	215	0.039	0.04	0.035	0.029	0.029	0
-147	A.M.-336	210	0.002	<0.01	<0.002	0.003	0.004	25
-148	A.M.-336	215	0.023	0.03	0.022	0.019	0.019	0
-149	A.M.-336	220	0.141	0.16	0.149	0.144	0.144	0
-150	A.M.-336	245	0.006	<0.01	0.007	0.007	0.008	13
-151	A.M.-336	250	0.005	<0.01	0.005	0.006	0.007	14
-152	A.M.-336	255	0.026	0.03	0.025	0.025	0.025	0
-153	A.M.-337	420	<0.001	<0.01	0.002	0.002	0.003	33

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-154	A.M.-337	425	<0.001	<0.01	0.002	0.002	0.002	0
-155	A.M.-337	430	0.003	<0.01	0.002	0.004	0.005	20
-156	A.M.-337	435	0.001	<0.01	<0.002	0.002	0.003	33
-157	A.M.-338	335	<0.001	<0.01	<0.002	<0.002	<0.002	0
-158	A.M.-338	340	0.001	<0.01	0.002	0.002	0.002	0
-159	A.M.-338	345	0.008	<0.01	0.005	0.008	0.008	0
-160	A.M.-338	350	0.007	<0.01	0.008	0.008	0.009	11
-161	A.M.-338	355	0.031	0.04	0.035	0.034	0.034	0
-162	A.M.-338	360	0.029	0.03	0.031	0.031	0.031	0
-163	A.M.-338	365	0.018	0.02	0.021	0.022	0.022	0
-164	A.M.-339	260	0.006	0.01	0.007	0.005	0.006	17
-165	A.M.-339	265	0.017	0.02	0.022	0.024	0.024	0
-166	A.M.-339	270	0.008	<0.01	0.007	0.008	0.009	11
-167	A.M.-339	275	0.008	<0.01	0.007	0.010	0.011	9
-168	A.M.-340	245	0.004	<0.01	0.002	0.004	0.005	20
-169	A.M.-340	250	0.009	<0.01	0.007	0.010	0.010	0
-170	A.M.-340	255	0.015	0.02	0.016	0.013	0.014	7

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-171	A.M.-340	295	0.077	INSUFFICIENT SAMPLE FOR ANALYSIS				
-172	A.M.-340	300	0.039	0.05	0.065	0.076	0.076	0
-173	A.M.-340	305	0.020	0.02	0.023	0.025	0.025	0
-174	A.M.-340	310	0.054	0.07	0.058	0.047	0.047	0
-175	A.M.-340	315	0.025	0.03	0.024	0.022	0.022	0
-176	A.M.-341	185	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-177	A.M.-341	190	0.003	INSUFFICIENT SAMPLE FOR ANALYSIS				
-178	A.M.-341	195	0.004	INSUFFICIENT SAMPLE FOR ANALYSIS				
-179	A.M.-341	245	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-180	A.M.-341	250	0.001	<0.01	0.003	0.002	0.003	33
-181	A.M.-341	255	0.001	<0.01	<0.002	0.002	0.005	60
-182	A.M.-341	260	0.002	INSUFFICIENT SAMPLE FOR ANALYSIS				
-183	A.M.-341	285	0.018	INSUFFICIENT SAMPLE FOR ANALYSIS				
-184	A.M.-341	290	0.008	INSUFFICIENT SAMPLE FOR ANALYSIS				
-185	A.M.-341	295	0.004	INSUFFICIENT SAMPLE FOR ANALYSIS				
-186	A.M.-341	300	0.006	INSUFFICIENT SAMPLE FOR ANALYSIS				
-187	A.M.-341	360	0.003	INSUFFICIENT SAMPLE FOR ANALYSIS				
-188	A.M.-341	365	0.001	INSUFFICIENT SAMPLE FOR ANALYSIS				
-189	A.M.-341	370	0.001	INSUFFICIENT SAMPLE FOR ANALYSIS				
-190	A.M.-343	165	0.006	0.01	0.007	0.006	0.006	0

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HRI Sample Designation	Sponsor Designation		% U_3O_8 (fluo)	% U_3O_8 β-γ	(Radiometric) β-Eq.	γ-Eq.	Sealed %eU_3O_8	% Radon Loss
11608-191	A.M.-343	170	0.018	0.03	0.024	0.019	0.019	0
-192	A.M.-343	175	0.011	0.02	0.014	0.010	0.010	0
-193	A.M.-343	270	0.002	<0.01	0.002	0.002	0.003	33
-194	A.M.-343	275	0.002	<0.01	0.004	0.004	0.004	0
-195	A.M.-343	280	0.019	0.03	0.032	0.033	0.033	0
-196	A.M.-345	375	0.010	0.02	0.017	0.016	0.016	0
-197	A.M.-345	380	0.025	0.03	0.022	0.018	0.018	0
-198	A.M.-345	385	0.009	<0.01	0.006	0.007	0.007	0
-199	A.M.-345	390	0.006	0.02	0.010	0.007	0.008	13
-200	A.M.-345	420	0.007	0.02	0.010	0.006	0.006	0
-201	A.M.-345	425	0.018	0.02	0.022	0.021	0.021	0
-202	A.M.-345	430	0.018	0.02	0.019	0.017	0.017	0
-203	A.M.-345	435	0.010	0.01	0.009	0.010	0.010	0
-204	A.M.-345	440	0.011	0.01	0.011	0.009	0.010	10
-205	A.M.-345	445	0.004	0.01	0.005	0.004	0.004	0
-206	A.M.-345	455	0.004	<0.01	0.003	0.005	0.005	0
-207	A.M.-345	460	0.003	<0.01	0.002	0.004	0.004	0
-208	A.M.-345	465	0.006	0.01	0.006	0.006	0.006	0
-209	A.M.-346	350	0.003	0.01	0.006	0.004	0.004	0
-210	A.M.-346	355	0.005	0.01	0.006	0.007	0.007	0
-211	A.M.-346	360	0.034	0.05	0.037	0.032	0.032	0