

40-3453

RETURN ORIGINAL TO PDR, HQ.

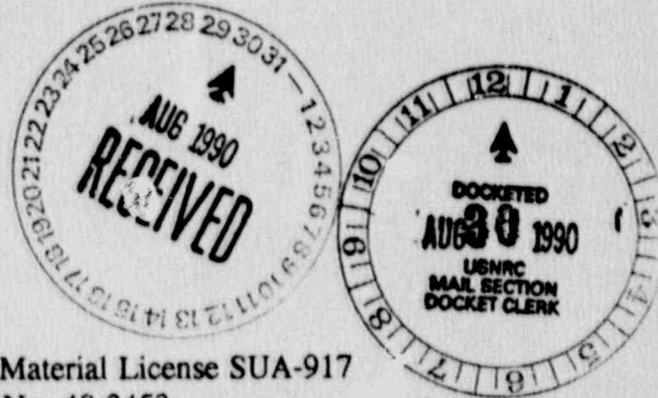
ATLAS CORPORATION

04003453130R

Republic Plaza, 370 Seventeenth Street, Suite 3150
Denver, CO 80202
Telephone: (303) 825-1200 Fax: (303) 892-8808

August 28, 1990

Mr. Ramon E. Hall, Director
Uranium Recovery Field Office
Region IV
U. S. Nuclear Regulatory Commission
Box 25325
Denver, CO 80225



Re: Source Material License SUA-917
Docket No. 40-3453
License Condition No. 48

Dear Mr. Hall:

This transmits five copies of the results of the effluent and monitoring programs as required by 10 CFR 40.65 and license condition 48 of the last revision to Source Material License SUA-917.

The results and information hereby transmitted are for the first half of 1990. If additional information or classification is needed regarding the enclosed information, please contact Mr. Dale Edwards at our Moab, Utah office (801) 259-5131.

Sincerely,

Richard E. Blubaugh
Vice President Regulatory
and Environmental Affairs

REB/DLE/jlb
enclosure

CC: M. S. Davis
D. L. Edwards

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PDR ADOCK 04003453
C PDC

DESIGNATED ORIGINAL

00001
Certified By Mary C. Hard

90-0781

ATLAS MINERALS
SOURCE MATERIAL LICENSE SUA-917
DOCKET NUMBER 40-3453
ENVIRONMENTAL MONITORING PROGRAM
FIRST HALF 1990

CONTINUOUS AIR SAMPLES

FIRST QUARTER 1990

DLC
1/8/90

ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT
CONTINUOUS AIR SAMPLES
 Quarter: 1st Qtr. 1990

Sample Number S1
 Date of Collection Jan. - Mar.
 Location of Sampler Northeast of mill
 Name of Sampler Collector D. L. Edwards

Radionuclide	MPC	Concentration uCi/ml	Error Estimate	LLD uCi/ml	% MPC	Name & Date of Assayer
U-238	5×10^{-12} uCi/ml	6.93×10^{-16}		1×10^{-16} uCi/ml	.014	Barringer
Rn-222	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb-210	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	3.86×10^{-16}	3.28×10^{-16}	1×10^{-16} uCi/ml	.48	Barringer
Ra-226	3×10^{-12} uCi/ml	1.93×10^{-17}	1.16×10^{-16}	1×10^{-16} uCi/ml	.0006	Barringer
Rn-222	30×10^{-10} uCi/ml	2.17×10^{-9}			72.3	Terradex

100
204

ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 1st Qtr. 1990

Sample Number S2
 Date of Collection Jan. - Mar.
 Location of Sampler Mill salvage yard
 Name of Sampler Collector D. L. Edwards

<u>Radionuclide</u>	<u>MPC</u>	<u>Concentration uCi/ml</u>	<u>Estimate Estimate</u>	<u>LLD uCi/ml</u>	<u>% MPC</u>	<u>Name & Date of Assayer</u>
U-Nat	5×10^{-12} uCi/ml	1.31×10^{-15}		1×10^{-16} uCi/ml	.026	Barringer
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	7.14×10^{-16}	4.05×10^{-16}	1×10^{-16} uCi/ml	.024	Barringer
Ra-226	3×10^{-12} uCi/ml	5.79×10^{-17}	1.35×10^{-16}	1×10^{-16} uCi/ml	.002	Barringer
Rn-222	30×10^{-10} uCi/ml	3.96×10^{-9}			132	Terradex

122
149

ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 1st Qtr. 1990

Sample Number 53

Date of Collection Jan. - Mar.

Location of Sampler Northwest of Mill Tailings Pond

Name of Sampler Collector D. L. Edwards

<u>Radionuclide</u>	<u>MPC</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>LLD uCi/ml</u>	<u>% MPC</u>	<u>Name & Date of Assayer</u>
U-Nat	5×10^{-12} uCi/ml	6.66×10^{-15}		1×10^{-16} uCi/ml	.13	Barringer
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter:						
Th-230	8×10^{-14} uCi/ml	1.08×10^{-14}	1.54×10^{-15}	1×10^{-16} uCi/ml	13.5	Barringer
Ra-226	3×10^{-12} uCi/ml	2.32×10^{-15}	5.79×10^{-16}	1×10^{-16} uCi/ml	.077	Barringer
Rn-222	30×10^{-10} uCi/ml	1.53×10^{-9}			51.0	Terradex

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT
CONTINUOUS AIR SAMPLES
Quarter: 1st Qtr. 1990

Sample Number S4
 Date of Collection Jan. - Mar.
 Location of Sampler Arches Headquarters
 Name of Sampler Collector D. L. Edwards

<u>Radionuclide</u>	<u>MPC</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>LLI uCi/ml</u>	<u>% MPC</u>	<u>Name & Date of Assayer</u>
U-Nat	5×10^{-12} uCi/ml	5.09×10^{-16}		1×10^{-16} uCi/ml	.010	Barringer
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	3.09×10^{-16}	3.09×10^{-16}	1×10^{-16} uCi/ml	.39	Barringer
Ra-226	3×10^{-12} uCi/ml	1.35×10^{-16}	1.54×10^{-16}	1×10^{-16} uCi/ml	.005	Barringer
Rn-222	30×10^{-10} uCi/ml	$.93 \times 10^{-9}$			31.0	Terradex

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ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 1st Qtr. 1990

Sample Number S6

Date of Collection Jan. - Mar.

Location of Sampler Approximately Two Miles South of Mill

Name of Sampler Collector D. L. Edwards

<u>Radionuclide</u>	<u>MPC</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>LLD uCi/ml</u>	<u>% MPC</u>	<u>Name & Date of Assayer</u>
U-Nat	5×10^{-12} uCi/ml	3.26×10^{-16}		1×10^{-16} uCi/ml	.006	<u>Barringer</u>
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter:						
Th-230	8×10^{-14} uCi/ml	1.16×10^{-16}	2.51×10^{-16}	1×10^{-16} uCi/ml	.15	<u>Barringer</u>
Ra-226	3×10^{-12} uCi/ml	0	1.35×10^{-16}	1×10^{-16} uCi/ml	0	<u>Barringer</u>
Rn-222	30×10^{-10} uCi/ml	$.50 \times 10^{-9}$			16.6	<u>Terradex</u>

CONTINUOUS AIR SAMPLES

SECOND QUARTER 1990

066
1993

ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 2nd Qtr. 1990

Sample Number S1
Date of Collection April - June
Location of Sampler Northeast of Mill
Name of Sampler Collector D. L. Edwards

Radionuclide	MPC	Concentration uCi/ml	Error Estimate	LLD uCi/ml	% MPC	Name & Date of Assayer
U-Nat	5×10^{-12} uCi/ml	3.24×10^{-15}		1×10^{-16} uCi/ml	.065	Barringer
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	2.11×10^{-15}	5.74×10^{-16}	1×10^{-16} uCi/ml	2.6	Barringer
Ra-226	3×10^{-12} uCi/ml	4.98×10^{-16}	2.49×10^{-16}	1×10^{-16} uCi/ml	.017	Barringer
Rn-222	30×10^{-10} uCi/ml	1.2×10^{-9}			40.0	Terradex

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2/27

ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 2nd Qtr. 1990

Sample Number S2
 Date of Collection April - June
 Location of Sampler Mill Salvage Yard
 Name of Sampler Collector D. L. Edwards

Radionuclide	MPC	Concentration uCi/ml	Error Estimate	LLD uCi/ml	% MPC	Name & Date of Assayer
U-Nat	5×10^{-12} uCi/ml	6.22×10^{-15}		1×10^{-16} uCi/ml	.12	Barringer
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	5.36×10^{-15}	9.57×10^{-16}	1×10^{-16} uCi/ml	6.7	Barringer
Ra-226	3×10^{-12} uCi/ml	3.64×10^{-16}	2.30×10^{-16}	1×10^{-16} uCi/ml	.012	Barringer
Rn-222	30×10^{-10} uCi/ml	2.0×10^{-9}			66.7	Terradex

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ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 2nd Qtr. 1990

Sample Number S3

Date of Collection April - June

Location of Sampler Northwest of Mill Tailings Pond

Name of Sampler Collector D. L. Edwards

<u>Radionuclide</u>	<u>MPC</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>LLD uCi/ml</u>	<u>% MPC</u>	<u>Name & Date of Assayer</u>
U-Nat	5×10^{-12} uCi/ml	9.98×10^{-15}		1×10^{-16} uCi/ml	.20	Barringer
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	1.17×10^{-14}	1.34×10^{-15}	1×10^{-16} uCi/ml	14.6	Barringer
Ra-226	3×10^{-12} uCi/ml	1.63×10^{-15}	4.98×10^{-16}	1×10^{-16} uCi/ml	.05	Barringer
Rn-222	30×10^{-10} uCi/ml	1.0×10^{-9}			33.3	Terradex

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ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 2nd Qtr. 1990

Sample Number S4

Date of Collection April - June

Location of Sampler Arches Headquarters

Name of Sampler Collector D. L. Edwards

Radionuclide	MPC	Concentration uCi/ml	Error Estimate	LLD uCi/ml	% MPC	Name & Date of Assayer
U-Nat	5×10^{-12} uCi/ml	4.41×10^{-16}		1×10^{-16} uCi/ml	.009	Barringer
Rn ²²²	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb ²¹⁰	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	5.36×10^{-16}	4.40×10^{-16}	1×10^{-16} uCi/ml	.67	Barringer
Ra-226	3×10^{-12} uCi/ml	1.15×10^{-16}	1.53×10^{-16}	1×10^{-16} uCi/ml	.004	Barringer
Rn-222	30×10^{-10} uCi/ml	$.5 \times 10^{-9}$			17.7	Terradex

DLE
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ATLAS MINERALS

MOAB MILL

REGULATORY AFFAIRS DEPARTMENT

CONTINUOUS AIR SAMPLES

Quarter: 2nd Qtr. 1990

Sample Number S6

Date of Collection April - June

Location of Sampler Approximately 2 miles south of Mill

Name of Sampler Collector D. L. Edwards

<u>Radionuclide</u>	<u>MPC</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>LLD uCi/ml</u>	<u>% MPC</u>	<u>Name & Date of Assayer</u>
U-238	5×10^{-12} uCi/ml	9.59×10^{-16}		1×10^{-16} uCi/ml	.019	Barringer
Rn-222	30×10^{-10} uCi/ml			2×10^{-10} uCi/ml		
Pb-210	4×10^{-12} uCi/ml			1×10^{-5} uCi/ml		
Quarter: _____						
Th-230	8×10^{-14} uCi/ml	1.72×10^{-16}	2.68×10^{-16}	1×10^{-16} uCi/ml	.22	Barringer
Ra-226	3×10^{-12} uCi/ml	5.74×10^{-17}	1.34×10^{-16}	1×10^{-16} uCi/ml	.002	Barringer
Rn-222	30×10^{-10} uCi/ml	$.2 \times 10^{-9}$			6.7	Terradex

ENVIRONMENTAL TLD BADGE RESULTS

FIRST QUARTER 1990

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ATLAS MINERALS
REGULATORY AFFAIRS DEPARTMENT
DIRECT RADIATION MEASUREMENTS
ENVIRONMENTAL BADGES

1st Quarter 1990

Date: 1-1-90 to 3-31-90

<u>Location</u>	<u>Exposure Rate</u> <u>mr/yr</u>	<u>Error Estimate</u> <u>mr/yr</u>
1. Continuous Air Monitor #1	<u>17</u>	<u>± 2.0</u>
2. Continuous Air Monitor #2	<u>42</u>	<u>± 4.2</u>
3. Continuous Air Monitor #3	<u>58</u>	<u>± 5.8</u>
4. Continuous Air Monitor #4	<u>26</u>	<u>± 2.6</u>
5. Continuous Air Monitor #6	<u>13</u>	<u>± 2.0</u>
6. Guard House	<u>110</u>	<u>± 11.0</u>

ENVIRONMENTAL TLD BADGE RESULTS

SECOND QUARTER 1990

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ATLAS MINERALS
REGULATORY AFFAIRS DEPARTMENT
DIRECT RADIATION MEASUREMENTS
ENVIRONMENTAL BADGES

2nd Quarter 1990

Date: 4-1-90 to 6-30-90

<u>Location</u>	<u>Exposure Rate</u> <u>mr/Or</u>	<u>Error Estimate</u> <u>mr/Or</u>
1. Continuous Air Monitor #1	<u>6</u>	<u>± 2</u>
2. Continuous Air Monitor #2	<u>41</u>	<u>± 4.1</u>
3. Continuous Air Monitor #3	<u>64</u>	<u>± 6.4</u>
4. Continuous Air Monitor #4	<u>23</u>	<u>± 2.3</u>
5. Continuous Air Monitor #6	<u>9</u>	<u>± 2</u>
6. Guard House	<u>110</u>	<u>±11</u>

Revised: 5/87

**SURFACE WATER RESULTS
FOR THE COLORADO RIVER
FIRST QUARTER 1990**

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1990

ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

RIVER WATER REPORTS

1st QUARTER 1990

Location of Sample: Upstream from Mill

Sampling Method Used (Bailed-Pumped): Bailed

Date Sample was Collected: 1/16/90

Name of Sampler: D. L. Edwards

Radionuclide	MPC uCi/ml	Date of Analysis	Concentration uCi/ml	Error Estimate	L.L.D uCi/ml	% MPC	Name of Assaver
(D) U-Nat	3×10^{-8}	1/22-1/25	4.40×10^{-9}		2×10^{-9}	.015	BLI
(S) U-Nat	3×10^{-8}	1/22-1/25	1.29×10^{-9}		2×10^{-9}	.004	BLI
(D) Ra-226	3×10^{-8}	1/26-2/1	0	$.1 \times 10^{-9}$	2×10^{-10}	0	BLI
(S) Ra-226	3×10^{-8}	1/26-2/1	0	$.1 \times 10^{-9}$	2×10^{-10}	0	BLI
(D) Th-230	2×10^{-6}	1/22-1/25	0	$.4 \times 10^{-9}$	2×10^{-10}	0	BLI
(S) Th-230	2×10^{-6}	1/22-1/25	$.1 \times 10^{-9}$	$.5 \times 10^{-9}$	2×10^{-10}	.005	BLI
(D) Pb-210	1×10^{-7}	1/23-2/20	$.5 \times 10^{-9}$	1.5×10^{-9}	1×10^{-9}	.5	BLI
(S) Pb-210	1×10^{-7}	1/23-2/20	1.9×10^{-9}	1.6×10^{-9}	1×10^{-9}	1.9	BLI
(D) Po-210	7×10^{-7}	2/1-2/7	0	$.6 \times 10^{-9}$	1×10^{-9}	0	BLI
(S) Po-210	7×10^{-7}	2/1-2/7	5.0×10^{-9}	1.1×10^{-9}	1×10^{-9}	.71	BLI

Common Ion and Trace Metals

Non-Radionuclide	Date of Analysis	Concentration mg/L	L.L.D.	Name of Assaver
As	2/14	<.001	1 ug/L	BLI
Cl	1/31	191	.2 mg/L	BLI
Cu	2/1	<.01	10 ug/L	BLI
NO ₃	1/30	.7	.1 mg/L	BLI
Se	2/23	.007	2 ug/L	BLI
TDS	1/25	823	10 mg/L	BLI
SO ₄	1/25	338	.1 mg/L	BLI
Conductivity	1/16	1400	10 umhos	DLE
pH	1/16	7.84	.1 units	DLE

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

RIVER WATER REPORTS

1st QUARTER 1990

Location of Sample: Downstream from Mill

Sampling Method Used (Bailed-Pumped): Bailed

Date Sample was Collected: 1/16/90

Name of Sampler: D. L. Edwards

<u>Radionuclide</u>	<u>MPC uCi/ml</u>	<u>Date of Analysis</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>L.L.D uCi/ml</u>	<u>% MPC</u>	<u>Name of Assayer</u>
(D) U-Nat	3×10^{-8}	1/22-1/25	7.45×10^{-9}		2×10^{-9}	.025	BLI
(S) U-Nat	3×10^{-8}	1/22-1/25	1.15×10^{-9}		2×10^{-9}	.004	BLI
(D) Ra-226	3×10^{-8}	1/26-2/1	0	$.1 \times 10^{-9}$	2×10^{-10}	0	BLI
(S) Ra-226	3×10^{-8}	1/26-2/1	0	$.1 \times 10^{-9}$	2×10^{-10}	0	BLI
(D) Th-230	2×10^{-8}	1/22-1/25	0	$.4 \times 10^{-9}$	2×10^{-10}	0	BLI
(S) Th-230	2×10^{-8}	1/22-1/25	$.1 \times 10^{-9}$	$.5 \times 10^{-9}$	2×10^{-10}	.005	BLI
(D) Pb-210	1×10^{-7}	1/23-2/20	$.5 \times 10^{-9}$	1.5×10^{-9}	1×10^{-9}	.5	BLI
(S) Pb-210	1×10^{-7}	1/23-2/20	1.9×10^{-9}	1.6×10^{-9}	1×10^{-9}	1.9	BLI
(D) Po-210	7×10^{-7}	2/1-2/7	$.1 \times 10^{-9}$	$.6 \times 10^{-9}$	1×10^{-9}	.014	BLI
(S) Po-210	7×10^{-7}	2/1-2/7	5.6×10^{-9}	1.2×10^{-9}	1×10^{-9}	.80	BLI

Common Ion and Trace Metals

<u>Non-Radionuclide</u>	<u>Date of Analysis</u>	<u>Concentration mg/L</u>	<u>L.L.D.</u>	<u>Name of Assayer</u>
As	2/14	<.001	1 ug/L	BLI
Cl	1/31	204	.2 mg/L	BLI
Cu	2/1	<.01	10 ug/L	BLI
NO ₃	1/30	.8	.1 mg/L	BLI
Se	2/23	.006	2 ug/L	BLI
TDS	1/25	850	10 mg/L	BLI
SO ₄	1/25	351	.1 mg/L	BLI
Conductivity	1/16	1400	10 umhos	DLE
pH	1/16	7.82	.1 units	DLE

**SURFACE WATER RESULTS
FOR THE COLORADO RIVER
SECOND QUARTER 1990**

ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

143
RECEIVED
JUN 14 1991
Regulatory Affairs

RIVER WATER REPORTS
Month 2nd Qtr. 1990

Name of Sampler Dale L. Edwards
Date and Time Sample was Collected 5-22-90
Location of Sample Upstream from mill
Sampling Method Used (Bailed-Pumped) Bailed

<u>Radionuclide</u>	<u>M.P.C.</u>	<u>Date of Analysis</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>L.L.D.</u>	<u>Name of Assayer</u>	<u>%</u>
U-nat	3×10^{-5} uCi/ml	5-22-90	4.38×10^{-9}	1.10×10^{-9}	8×10^{-10} uCi/ml	DLE	015

Common Ion and Trace Metals

	<u>Date of Analysis</u>	<u>Concentration</u>	<u>L.L.D.</u>	<u>Name of Assayer</u>
Conductivity	5-22-90	900 umhos	10 umhos	DLE

100
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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

RIVER WATER REPORTS
Month 2nd Qtr. 1990

Name of Sampler Dale L. Edwards
Date and Time Sample was Collected 5-22-90
Location of Sample Downstream from mill
Sampling Method Used (Bailed-Pumped) Bailed

<u>Radionuclide</u>	<u>M.P.C.</u>	<u>Date of Analysis</u>	<u>Concentration uCi/ml</u>	<u>Error Estimate</u>	<u>L.L.D.</u>	<u>Name of Assayer</u>	<u>%</u>
U-nat	3×10^{-5} uCi/ml	5-22-90	3.77×10^{-9}	1.14×10^{-9}	8×10^{-10} uCi/ml	DLE	.01%

Common Ion and Trace Metals

	<u>Date of Analysis</u>	<u>Concentration</u>	<u>L.L.D.</u>	<u>Name of Assayer</u>
Conductivity	5-22-90	900 umhos	10 umhos	DLE

GROUND WATER RESULTS

FIRST QUARTER 1990

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

1st QUARTER 1990

Well No. AMM-1
 Date and Time Sample was Collected: 3-23-90
 Location of Sample: Northeast Corner of the Boundary
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 170 gal
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L				1.0		
U-Nat	4 pCi/L				0.2		
Ra-226	5 pCi/L				0.2		
Ra-228	5 pCi/L				0.9		

Common Ion and Tract Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	4-26-90		1940	.01 mg/L		Barringer
Cl	4-02-90		3220	0.2 mg/L		Barringer
SO ₄	4-06-90		1130	0.1 mg/L		Barringer
NO ₃	4-03-90		0.2	0.1 mg/L		Barringer
Cr		0.08 mg/L		.0005 mg/L		
Pb				.002 mg/L		
Mo		0.05 mg/L		.010 mg/L		
Ni		0.06 mg/L		.010 mg/L		
Ag				.010 mg/L		
V		0.04 mg/L				
Se		0.01 mg/L		1 ug/L		
TDS	4-04-90		6700	10 mg/L		Barringer
pH	3-23-90		7.2	0.1 units		DLE

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

1st QUARTER 1990

Well No. AMM-2
 Date and Time Sample was Collected: 3-23-90
 Location of Sample: Between Tailings Pond and River
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 148 gal
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L				1.0		
U-238	4 pCi/L				0.2		
Ra-226	5 pCi/L				0.2		
Ra-228	5 pCi/L				0.9		

Common Ion and Tract Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	4-26-90		4060	.01 mg/L		Barringer
Cl	4-02-90		2240	0.2 mg/L		Barringer
SO ₄	4-06-90		16000	0.1 mg/L		Barringer
NO ₃	4-03-90		49.2	0.1 mg/L		Barringer
Cr		0.08 mg/L		.0005 mg/L		
Pb				.002 mg/L		
Mo		0.05 mg/L		.010 mg/L		
Ni		0.06 mg/L		.010 mg/L		
Ag				.010 mg/L		
V		0.04 mg/L				
Se		0.01 mg/L		1 uc/L		
TDS	4-04-90		23000	10 mg/L		Barringer
pH	3-23-90		7.15	0.1 units		DLE

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

1st QUARTER 1990

Well No. 4/M-3
 Date and Time Sample was Collected: 3-23-90
 Location of Sample: Between Tailings Pond and River
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 153 gal
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L				1.0		
U-Nat	4 pCi/L				0.2		
Ra-226	5 pCi/L				0.2		
Ra-228	5 pCi/L				0.9		

Common Ion and Tract Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	4-26-90		2620	.01 mg/L		Barringer
Cl	4-02-90		2070	0.2 mg/L		Barringer
SO ₄	4-06-90		5590	0.1 mg/L		Barringer
NO ₃	4-03-90		0.1	0.1 mg/L		Barringer
Cr		0.08 mg/L		.0005 mg/L		
Pb				.002 mg/L		
Mo		0.05 mg/L		.010 mg/L		
Ni		0.06 mg/L		.010 mg/L		
Ag				.010 mg/L		
V		0.04 mg/L				
Se		0.01 mg/L		1 ug/L		
TDS	4-04-90		11900	10 mg/L		Barringer
pH	3-23-90		6.92	0.1 units		DLE

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

1st QUARTER 1990

Well No. ATP-25
 Date and Time Sample was Collected: 3-23-90
 Location of Sample: Between Tailings Pond and River
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 35 Gal.
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L				1.0		
U-Nat	4 pCi/L				0.2		
Ra-226	5 pCi/L				0.2		
Ra-228	5 pCi/L				0.9		

Common Ion and Tract Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	4-26-90		4120	.01 mg/L		Barringer
Cl	4-02-90		1010	0.2 mg/L		Barringer
SO ₄	4-06-90		23900	0.1 mg/L		Barringer
NO ₃	4-03-90		73.4	0.1 mg/L		Barringer
Cr		0.08 mg/L		.0005 mg/L		
Pb				.002 mg/L		
Mo		0.05 mg/L		.010 mg/L		
Ni		0.06 mg/L		.010 mg/L		
Ag				.010 mg/L		
V		0.04 mg/L				
Se		0.01 mg/L		1 ug/L		
TDS	4-04-90		31400	10 mg/L		Barringer
pH	3-23-90		7.12	0.1 units		DLE

GROUND WATER RESULTS

SECOND QUARTER 1990

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ATLAS MINERALS
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REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

2nd QUARTER 1990

Well No. AMM-1
 Date and Time Sample was Collected: 5-11-90
 Location of Sample: Northeast Corner of the Boundary
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 170 Gal.
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L	6/5-6/13	95	+ 34	1.0	288	Barringer
U-Nat	4 pCi/L	6/8-6/12	2.2		0.2	55	Barringer
Ra-226	5 pCi/L	6/5-6/6	0	+ .1	0.2	0	Barringer
Ra-228	5 pCi/L	5/30-6/4	.3	+ .7	0.9	6.0	Barringer

Common Ion and Tract Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	6/12		2060	.01 mg/L		Barringer
Cl	6/01		3080	0.2 mg/L		Barringer
SO ₄	6/06		1110	0.1 mg/L		Barringer
NO ₃	6/05		0.2	0.1 mg/L		Barringer
Cr	6/12	0.08 mg/L	< .01	.01 mg/L	125	Barringer
Pb	6/12		< .01	.01 mg/L		Barringer
Mo	6/12	0.05 mg/L	.02	.010 mg/L	40	Barringer
Ni	6/12	0.06 mg/L	.02	.010 mg/L	33	Barringer
Ag	6/12		< .01	.010 mg/L		Barringer
V	6/12	0.04 mg/L	.01	.010 mg/L	25	Barringer
Se	6/11	0.01 mg/L	.002	1 ug/L	20	Barringer
TDS	6/06		6720	10 mg/L		Barringer
pH	6/11		7.20	0.1 units		DLE

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ATLAS MINERALS
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REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

2nd QUARTER 1990

Well No. AMM-2
 Date and Time Sample was Collected: 5/11/90
 Location of Sample: Between Tailings Pond and River
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 148 Gal.
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L	6/05-6/13	2100	+ 200	1.0	6364	Barringer
U-Nat	4 pCi/L	6/08-6/12	3500		0.2	87500	Barringer
Ra-226	5 pCi/L	6/05-6/06	0	+ .1	0.2	0	Barringer
Ra-228	5 pCi/L	5/30-6/04	3.1	+ .9	0.9	62	Barringer

Common Ion and Tract Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	6/12		4230	.01 mg/L		Barringer
Cl	6/01		2230	0.2 mg/L		Barringer
SO ₄	6/06		1120	0.1 mg/L		Barringer
NO ₃	6/05		54.5	0.1 mg/L		Barringer
Cr	6/12	0.08 mg/L	< .01	.01 mg/L	125	Barringer
Pb	6/12		< .01	.01 mg/L		Barringer
Mo	6/12	0.05 mg/L	1.04	.010 mg/L	2080	Barringer
Ni	6/12	0.06 mg/L	.03	.010 mg/L	50	Barringer
Ag	6/12		< .01	.010 mg/L		Barringer
V	6/12	0.04 mg/L	.01	.010 mg/L	25	Barringer
Se	6/11	0.01 mg/L	.047	1 ug/L	25	Barringer
TDS	6/06		22800	10 mg/L		Barringer
pH	6/11		7.15	0.1 units		DLE

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

2nd QUARTER 1990

Well No. AMM-3
 Date and Time Sample was Collected: 5/11/90
 Location of Sample: Between Tailings Pond and River
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 153 Gal.
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L	6/05-6/13	1800	+ 200	1.0	5455	Barringer
U-Nat	4 pCi/L	6/08-6/12	2400		0.2	60000	Barringer
Ra-226	5 pCi/L	6/05-6/06	.1	+ .2	0.2	2	Barringer
Ra-228	5 pCi/L	5/30-6/04	1.0	+ .7	0.5	20	Barringer

Common Ion and Trace Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	6/12		2040	.01 mg/L		Barringer
Cl	6/01		1160	0.2 mg/L		Barringer
SO ₄	6/06		5600	0.1 mg/L		Barringer
NO ₃	6/05		.7	0.1 mg/L		Barringer
Cr	6/12	0.08 mg/L	<.01	.01 mg/L	125	Barringer
Pb	6/12		<.01	.01 mg/L		Barringer
Mo	6/12	0.05 mg/L	1.15	.010 mg/L	2300	Barringer
Ni	6/12	0.06 mg/L	<.01	.010 mg/L	17	Barringer
Ag	6/12		<.01	.010 mg/L		Barringer
V	6/12	0.04 mg/L	<.01	.010 mg/L	25	Barringer
Se	6/11	0.01 mg/L	.080	1 ug/L	800	Barringer
TDS	6/06		12100	10 mg/L		Barringer
pH	5/11		7.11	0.1 units		DLE

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ATLAS MINERALS
MOAB MILL
REGULATORY AFFAIRS DEPARTMENT

MONITOR WELL REPORTS

2nd QUARTER 1990

Well No. ATP-2S
 Date and Time Sample was Collected: 5/11/90
 Location of Sample: Between Tailings Pond and River
 Sampling Method Used (Bailed-Pumped): Pumped
 The Amount of Water to be Removed Prior to Sampling: 35 Gal.
 Name of Sampler: D. L. Edwards

Radionuclide	Standards	Date of Analysis	Concentration pCi/L	Error Estimate	L.L.D.	% Standard	Name of Assayer
Gross Alpha	33 pCi/L	6/05-6/13	4700	+ 400	1.0	14242	Barringer
U-Nat	4 pCi/L	6/08-6/12	5400		0.2	135000	Barringer
Ra-226	5 pCi/L	6/05-6/06	1.6	+ .4	0.2	32	Barringer
Ra-228	5 pCi/L	5/30-6/04	1.6	+ .8	0.9	32	Barringer

Common Ion and Tract Metals

	Date of Analysis	Standards	Concentration mg/L	L.L.D.	% Standard	Name of Assayer
Na	6/12		4220	.01 mg/L		Barringer
Cl	6/01		1150	0.2 mg/L		Barringer
SO ₄	6/06		22800	0.1 mg/L		Barringer
NO ₃	6/05		97.8	0.1 mg/L		Barringer
Cr	6/12	0.08 mg/L	< .01	.01 mg/L	125	Barringer
Pb	6/12		< .01	.01 mg/L		Barringer
Mo	6/12	0.05 mg/L	.91	.010 mg/L	182	Barringer
Ni	6/12	0.06 mg/L	.06	.010 mg/L	100	Barringer
Ag	6/12		<.01	.010 mg/L		Barringer
V	6/12	0.04 mg/L	< .01	.010 mg/L	25	Barringer
Se	6/11	0.01 mg/L	.060	1 ug/L	600	Barringer
TDS	6/06		32100	10 mg/L		Barringer
pH	5/11		7.24	0.1 units		DLE