

ATTACHMENT 2

Utah Department of Environmental Quality

April 11, 1996

Water Quality Sampling Results
in Vicinity of
Atlas Uranium Mill Tailings

Utah State Health Laboratory Report

UTAH STATE HEALTH DEPARTMENT
DIVISION OF LABORATORY SERVICES
Environmental Chemistry Analysis Report

UDEQ - DRC

ATTN:

168 N 1950 W BLDG 2

PO BOX 144850

SLC

UT

84114-4850

536-4250

Description: COLORADO R AT US191 XING NEAR MOAB

Site ID: 495700 Source: 03

Inorganic Review: 06/19/96

Cost Code: 342

Organic Review:

Lab Number: 9602314 Type: 04

Radiochemistry Review: 07/30/96

Sample Date: 04/11/96 Time: 07:56

Microbiology Review:

Tot. Cations: 128 mg/l Cations: 6.6 me/l

Tot. Anions: 266 mg/l Anions: 6.7 me/l

Grand Total: 394 mg/l

Laboratory Analyses

L-pH *	7.96		T.Sus.Sol	320.0 mg/l	
NO2+NO3, N	0.3 mg/l		T.K.N.	NO mg/l	
Ammonia N	0.132 mg/l		D-Arsenic	<5.0 ug/l	
D-Barium	62.5 ug/l		D-Cadmium	<1.0 ug/l	
D-Calcium	56.9 mg/l		D-Chromium	<5.0 ug/l	
D-Copper	<12.0 ug/l		D-Iron	101.0 ug/l	
D-Lead	9.0 ug/l		D-Magnesium	17.2 mg/l	
D-Mangan	7.7 ug/l		D-Nickel	<10.0 ug/l	
D-Potassium	3.3 mg/l		D-Selenium	2.0 ug/l	
D-Silver	<2.0 ug/l		D-Sodium	50.9 mg/l	
D-Zinc	<30.0 ug/l		Bicarbonate	134 mg/l	
Carb. Diox	2 mg/l		Carbonate	0 mg/l	
Chloride	49.5 mg/l		Fluoride	0.312 mg/l	
Hydroxide	0 mg/l		Sulfate	150.3 mg/l	
T. Phos.	0.34 mg/l		Tot. Alk.	110 mg/l	
T. Hardns.	212.7 mg/l		Turbidity	100.0 NTU	
L-Sp. Cond	638 umhos		TDS @ 180C	424 mg/l	
Alpha, grs	12 pCi/l	+/-1.3	Beta gross	<10 pCi/l	+/-5.6
Radium 226	3 pCi/l	+/-0.3	Radium 228	2.8 pCi/l	+/-2.2
D-Aluminum	87.0 ug/l		D-Beryllium	<1.0 ug/l	
D-Molybdenum	8.0 ug/l		D-Vanadium	<40.0 ug/l	
T-Aluminum	5650 ug/l		T-Arsenic	<5.0 ug/l	
T-Barium	0.141 mg/l		T-Beryllium	<1 ug/l	
T-Cadmium	1 ug/l		T-Chromium	7.0 ug/l	
T-Copper	<12.0 ug/l		T-Iron	6.44 mg/l	
T-Lead	9.0 ug/l		T-Mangan	247.0 ug/l	
T-Mercury	<0.2 ug/l		T-Molybdenum	8 ug/l	
T-Nickel	<10.0 ug/l		T-Selenium	2.0 ug/l	
T-Silver	<2.0 ug/l		T-Uranium	3.2 pCi/l	+/-1.0
T-Zinc	79.3 ug/l		T-Vanadium	<40 ug/l	
T-Antimony	<3.0 ug/l		T-Thallium	<2.0 ug/l	
D-Thallium	<1.0 ug/l		D-Antimony	<3.0 ug/l	
D-Mercury	<0.2 ug/l		CO3 Solids	66 mg/l	

Comments on test results:

L-pH.....pH should be performed as a field test.

END OF REPORT

UTAH STATE HEALTH DEPARTMENT
DIVISION OF LABORATORY SERVICES
Environmental Chemistry Analysis Report

UDEQ - DRC

ATTN:

168 N 1950 W BLDG 2

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536-4250

Description: COLORADO R @ SEEPS FROM ATLAS MILL TAILINGS
Site ID: Source: 03 Inorganic Review: 06/19/96
Cost Code: 342 Organic Review:
Lab Number: 9602316 Type: 04 Radiochemistry Review: 07/30/96
Sample Date: 04/11/96 Time: 08:17 Microbiology Review:
Tot. Cations: 138 mg/l Cations: 6.8 me/l
Tot. Anions: 283 mg/l Anions: 7.1 me/l
Grand Total: 421 mg/l

Laboratory Analyses

L-pH *	7.96		T.Sus.Sol	844.0 mg/l	
NO2+NO3, N	0.14 mg/l		T.K.N.	N0 mg/l	
Ammonia N	3.57 mg/l		D-Arsenic	<5.0 ug/l	
D-Barium	72.9 ug/l		D-Cadmium	1.0 ug/l	
D-Calcium	56.4 mg/l		D-Chromium	<5.0 ug/l	
D-Copper	<12.0 ug/l		D-Iron	163.0 ug/l	
D-Lead	<3.0 ug/l		D-Magnesium	16.7 mg/l	
D-Mangan	14.5 ug/l		D-Nickel	<10.0 ug/l	
D-Potassium	3.2 mg/l		D-Selenium	1.0 ug/l	
D-Silver	<2.0 ug/l		D-Sodium	58.4 mg/l	
D-Zinc	42.9 ug/l		Bicarbonate	137 mg/l	
Carb. Diox	2 mg/l		Carbonate	0 mg/l	
Chloride	50 mg/l		Fluoride	0.37 mg/l	
Hydroxide	0 mg/l		Sulfate	166.3 mg/l	
T. Phos.	0.6 mg/l		Tot. Alk.	112 mg/l	
T. Hardns.	211.8 mg/l		Turbidity	230.0 NTU	
L-Sp. Cond	685 umhos		TDS @ 180C	438 mg/l	
Alpha, grs	50 pCi/l	+/-2.0	Beta gross	12.7 pCi/l	+/-6.4
Radium 226	1.4 pCi/l	+/-0.6	Radium 228	4.2 pCi/l	+/-2.5
D-Aluminum	103.0 ug/l		D-Beryllium	<1.0 ug/l	
D-Molybdum	10.0 ug/l		D-Vanadium	<40.0 ug/l	
T-Aluminum	9730 ug/l		T-Arsenic	<5.0 ug/l	
T-Barium	0.228 mg/l		T-Beryllium	<1 ug/l	
T-Cadmium	<1 ug/l		T-Chromium	9.0 ug/l	
T-Copper	14.8 ug/l		T-Iron	9.51 mg/l	
T-Lead	13.0 ug/l		T-Mangan	473.0 ug/l	
T-Mercury	<0.2 ug/l		T-Molybdum	11 ug/l	
T-Nickel	12.0 ug/l		T-Selenium	2.0 ug/l	
T-Silver	<2.0 ug/l		T-Uranium	5.5 pCi/l	+/-1.0
T-Zinc	75.7 ug/l		T-Vanadium	<40 ug/l	
T-Antimony	<3.0 ug/l		T-Thallium	<2.0 ug/l	
D-Thallium	<1.0 ug/l		D-Antimony	<3.0 ug/l	
D-Mercury	<0.2 ug/l		CO3 Solids	67 mg/l	

Comments on test results:

L-pH.....pH should be performed as a field test.

END OF REPORT

UTAH STATE HEALTH DEPARTMENT
DIVISION OF LABORATORY SERVICES
Environmental Chemistry Analysis Report

UDEQ - DRC

ATTN:

168 N 1950 W BLDG 2

PO BOX 144850

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UT

84114-4850

536-4250

Description: ATLAS MILL TAILINGS PILE SEEP

Site ID: 495657 Source: 03

Cost Code: 342

Lab Number: 9602315 Type: 04

Sample Date: 04/11/96 Time: 08:30

Tot. Cations: 787 mg/l Cations: 27.1 me/l

Tot. Anions: 4784 mg/l Anions: 104.9 me/l

Grand Total: 5571 mg/l

Inorganic Review: 06/20/96

Organic Review:

Radiochemistry Review: 07/30/96

Microbiology Review:

Laboratory Analyses

L-pH *	7.97		T.Sus.Sol	37950.0 mg/l	
NO2+NO3, N	96.93 mg/l		T.K.N.	NO mg/l	
Ammonia N	219.0 mg/l		D-Arsenic	<5.0 ug/l	
D-Barium	72.8 ug/l		D-Cadmium	<1.0 ug/l	
D-Calcium	340 mg/l		D-Chromium	<5.0 ug/l	
D-Copper	28.0 ug/l		D-Iron	87.8 ug/l	
D-Lead	<3.0 ug/l		D-Magnesium	29 mg/l	
D-Mangan	3470.0 ug/l		D-Nickel	<10.0 ug/l	
D-Potassium	53.4 mg/l		D-Selenium	<1.0 ug/l	
D-Silver	<2.0 ug/l		D-Sodium	146.0 mg/l	
D-Zinc	96.8 ug/l		Bicarbonate	137 mg/l	
Carb. Diox	2 mg/l		Carbonate	0 mg/l	
Chloride	610 mg/l		Fluoride	1.74 mg/l	
Hydroxide	0 mg/l		Sulfate	4106.4 mg/l	
T. Phos.	20.52 mg/l		Tot. Alk.	113 mg/l	
T. Hardns.	967.6 mg/l		Turbidity	440.0 NTU	
L-Sp. Cond	1043 umhos		TDS @ 180C	8068 mg/l	
Alpha, grs	720 pCi/l	+/-5.0	Beta gross	890 pCi/l	+/-74.3
Radium 226	6.5 pCi/l	+/-0.8	Radium 228	5.4 pCi/l	+/-2.3
D-Aluminum	70.0 ug/l		D-Beryllium	<1.0 ug/l	
D-Molybdum	1550.0 ug/l		D-Vanadium	96.1 ug/l	
T-Aluminum	172000 ug/l		T-Arsenic	170.0 ug/l	
T-Barium	1.96 mg/l		T-Beryllium	13 ug/l	
T-Cadmium	14 ug/l		T-Chromium	700.0 ug/l	
T-Copper	458.0 ug/l		T-Iron	379.0 mg/l	
T-Lead	305.0 ug/l		T-Mangan	16000.0 ug/l	
T-Mercury	1.2 ug/l		T-Molybdum	980 ug/l	
T-Nickel	525.0 ug/l		T-Selenium	<1.0 ug/l	
T-Silver	3.0 ug/l		T-Uranium	825.0 pCi/l	+/-15.4
T-Zinc	1800.0 ug/l		T-Vanadium	1100 ug/l	
T-Antimony	<3.0 ug/l		T-Thallium	<2.0 ug/l	
D-Thallium	<1.0 ug/l		D-Antimony	<3.0 ug/l	
D-Mercury	<0.2 ug/l		CO3 Solids	68 mg/l	

Comments on test results:

L-pH.....pH should be performed as a field test.

END OF REPORT

UTAH STATE HEALTH DEPARTMENT
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Environmental Chemistry Analysis Report

UDEQ - DRC

ATTN:

168 N 1950 W BLDG 2

PO BOX 144850

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UT

84114-4850

536-4250

Description: COLORADO R 1/4 MI BL SEEPS @ POINT OF ISLAND

Site ID: Source: 03

Inorganic Review: 06/19/96

Cost Code: 342

Organic Review:

Lab Number: 9602317 Type: 04

Radiochemistry Review: 07/30/96

Sample Date: 04/11/96 Time: 08:38

Microbiology Review:

Tot. Cations: 4 mg/l

Cations: 0.2 me/l

Tot. Anions: 271 mg/l

Anions: 6.8 me/l

Grand Total: 275 mg/l

Laboratory Analyses

L-pH *	7.97		T.Sus.Sol	724.0 mg/l	
NO2+NO3, N	0.37 mg/l		T.K.N.	N0 mg/l	
Ammonia N	<0.05 mg/l		D-Arsenic	<5.0 ug/l	
D-Barium	9.5 ug/l		D-Cadmium	<1.0 ug/l	
D-Calcium	<1 mg/l		D-Chromium	<5.0 ug/l	
D-Copper	<12.0 ug/l		D-Iron	<20.0 ug/l	
D-Lead	10.0 ug/l		D-Magnesium	<1 mg/l	
D-Mangan	<5.0 ug/l		D-Nickel	<10.0 ug/l	
D-Potassium	1.1 mg/l		D-Selenium	2.0 ug/l	
D-Silver	<2.0 ug/l		D-Sodium	<1.0 mg/l	
D-Zinc	<30.0 ug/l		Bicarbonate	135 mg/l	
Carb. Diox	2 mg/l		Carbonate	0 mg/l	
Chloride	48 mg/l		Fluoride	0.356 mg/l	
Hydroxide	0 mg/l		Sulfate	155.9 mg/l	
T. Phos.	0.58 mg/l		Tot. Alk.	111 mg/l	
T. Hardns.	6.6 mg/l		Turbidity	210.0 NTU	
L-Sp. Cond	649 umhos		TDS @ 180C	402 mg/l	
Alpha, grs	20 pCi/l	+/-1.0	Beta gross	10.7 pCi/l	+/-6.3
Radium 226	1.1 pCi/l	+/-0.6	Radium 228	2.3 pCi/l	+/-2.1
D-Aluminum *	3200.0 ug/l		D-Beryllium	<1.0 ug/l	
D-Molybdum	3.0 ug/l		D-Vanadium	<40.0 ug/l	
T-Aluminum	9100 ug/l		T-Arsenic	<5.0 ug/l	
T-Barium	0.196 mg/l		T-Beryllium	<1 ug/l	
T-Cadmium	<1 ug/l		T-Chromium	8.0 ug/l	
T-Copper	<12.0 ug/l		T-Iron	7.58 mg/l	
T-Lead	10.0 ug/l		T-Mangan	388.0 ug/l	
T-Mercury	<0.2 ug/l		T-Molybdum	7 ug/l	
T-Nickel	10.0 ug/l		T-Selenium	2.0 ug/l	
T-Silver	<2.0 ug/l		T-Uranium	4.7 pCi/l	+/-1.4
T-Zinc	60.7 ug/l		T-Vanadium	<40 ug/l	
T-Antimony	<3.0 ug/l		T-Thallium	<2.0 ug/l	
D-Thallium	<1.0 ug/l		D-Antimony	<3.0 ug/l	
D-Mercury	<0.2 ug/l		CO3 Solids	67 mg/l	

Comments on test results:

CO3 Solids...Due to matrix interference this sample result is not reliable
D-Aluminum...Due to matrix interference this sample result is not reliable
L-pH.....pH should be performed as a field test.

END OF REPORT

UTAH STATE HEALTH DEPARTMENT
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UDEQ - DRC

ATTN:

168 N 1950 W BLDG 2

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84114-4850

536-4250

Description: COLORADO R 1/2 MILE BL SEEPS FROM ATLAS MILL TAILINGS
Site ID: Source: 03 Inorganic Review: 06/19/96
Cost Code: 342 Organic Review:
Lab Number: 9602318 Type: 04 Radiochemistry Review: 07/30/96
Sample Date: 04/11/96 Time: 08:42 Microbiology Review:
Tot. Cations: 204 mg/l Cations: 9.9 me/l
Tot. Anions: 264 mg/l Anions: 6.7 me/l
Grand Total: 468 mg/l

Laboratory Analyses

L-pH *	8.01		T.Sus.Sol	932.0 mg/l	
NO2+NO3, N	0.33 mg/l		T.K.N.	NO mg/l	
Ammonia N	0.14 mg/l		D-Arsenic	<5.0 ug/l	
D-Barium	350.0 ug/l		D-Cadmium	<1.0 ug/l	
D-Calcium	56.7 mg/l		D-Chromium	<5.0 ug/l	
D-Copper	<12.0 ug/l		D-Iron	37.3 ug/l	
D-Lead	<3.0 ug/l		D-Magnesium	19.2 mg/l	
D-Mangan	9.4 ug/l		D-Nickel	<10.0 ug/l	
D-Potassium	4 mg/l		D-Selenium	2.0 ug/l	
D-Silver	<2.0 ug/l		D-Sodium	124.0 mg/l	
D-Zinc	<30.0 ug/l		Bicarbonate	134 mg/l	
Carb. Diox	2 mg/l		Carbonate	0 mg/l	
Chloride	48.5 mg/l		Fluoride	0.344 mg/l	
Hydroxide	0 mg/l		Sulfate	149.1 mg/l	
T. Phos.	0.5 mg/l		Tot. Alk.	110 mg/l	
T. Hardns.	220.5 mg/l		Turbidity	240.0 NTU	
L-Sp. Cond	638 umhos		TDS @ 180C	392 mg/l	
Alpha, grs	19 pCi/l	+/-1.0	Beta gross	11.7 pCi/l	+/-6.3
Radium 226	0.5 pCi/l	+/-0.5	Radium 228	<1 pCi/l	+/-0.8
D-Aluminum	50.0 ug/l		D-Beryllium	<1.0 ug/l	
D-Molybdum	7.0 ug/l		D-Vanadium	<40.0 ug/l	
T-Aluminum	3800 ug/l		T-Arsenic	<5.0 ug/l	
T-Barium	0.0791 mg/l		T-Beryllium	<1 ug/l	
T-Cadmium	<1 ug/l		T-Chromium	<5.0 ug/l	
T-Copper	<12.0 ug/l		T-Iron	1.53 mg/l	
T-Lead	<3.0 ug/l		T-Mangan	39.4 ug/l	
T-Mercury	<0.2 ug/l		T-Molybdum	8 ug/l	
T-Nickel	<10.0 ug/l		T-Selenium	2.0 ug/l	
T-Silver	<2.0 ug/l		T-Uranium	3.2 pCi/l	+/-1.2
T-Zinc	<30.0 ug/l		T-Vanadium	<40 ug/l	
T-Antimony	<3.0 ug/l		T-Thallium	<2.0 ug/l	
D-Thallium	<1.0 ug/l		D-Antimony	<3.0 ug/l	
D-Mercury	<0.2 ug/l		CO3 Solids	66 mg/l	

Comments on test results:

L-pH.....pH should be performed as a field test.

END OF REPORT

UTAH STATE HEALTH DEPARTMENT
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UDEQ - DRC

ATTN:

168 N 1950 W BLDG 2

PO BOX 144850

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84114-4850

536-4250

Description: COLORADO R BL ATLAS MILL TAILINGS PILE
Site ID: 495656 Source: 03 Inorganic Review: 06/25/96
Cost Code: 342 Organic Review:
Lab Number: 9602319 Type: 04 Radiochemistry Review: 07/30/96
Sample Date: 04/11/96 Time: 08:45 Microbiology Review:
Tot. Cations: 816 mg/l Cations: 37.6 me/l
Tot. Anions: 263 mg/l Anions: 6.7 me/l
Grand Total: 1079 mg/l

Laboratory Analyses

L-pH *	8.04		T.Sus.Sol	612.0 mg/l	
NO2+NO3, N	0.33 mg/l		T.K.N.	NO mg/l	
Ammonia N	0.127 mg/l		D-Arsenic	<5.0 ug/l	
D-Barium	137.0 ug/l		D-Cadmium	<1.0 ug/l	
D-Calcium	84 mg/l		D-Chromium	<5.0 ug/l	
D-Copper	<12.0 ug/l		D-Iron	71.2 ug/l	
D-Lead	<3.0 ug/l		D-Magnesium	46.7 mg/l	
D-Mangan	49.9 ug/l		D-Nickel	<10.0 ug/l	
D-Potassium	11.8 mg/l		D-Selenium	1.0 ug/l	
D-Silver	<2.0 ug/l		D-Sodium	673.0 mg/l	
D-Zinc	46.4 ug/l		Bicarbonate	134 mg/l	
Carb. Diox	2 mg/l		Carbonate	0 mg/l	
Chloride	47 mg/l		Fluoride	0.341 mg/l	
Hydroxide	0 mg/l		Sulfate	150.4 mg/l	
T. Phos.	0.45 mg/l		Tot. Alk.	110 mg/l	
T. Hardns.	401.7 mg/l		Turbidity	160.0 NTU	
L-Sp. Cond	638 umhos		TDS @ 180C	394 mg/l	
Alpha, grs	19 pCi/l	+/-1.0	Beta gross	11.5 pCi/l	+/-6.3
Radium 226	1 pCi/l	+/-0.6	Radium 228	<1 pCi/l	+/-2.5
D-Aluminum	35.0 ug/l		D-Beryllium	<1.0 ug/l	
D-Molybdenum	3.0 ug/l		D-Vanadium	<40.0 ug/l	
T-Aluminum	7350 ug/l		T-Arsenic	<5.0 ug/l	
T-Barium	0.831 mg/l		T-Beryllium	<1 ug/l	
T-Cadmium	<1 ug/l		T-Chromium	6.0 ug/l	
T-Copper	<12.0 ug/l		T-Iron	6.83 mg/l	
T-Lead	10.0 ug/l		T-Mangan	357.0 ug/l	
T-Mercury	<0.2 ug/l		T-Molybdenum	7 ug/l	
T-Nickel	<10.0 ug/l		T-Selenium	2.0 ug/l	
T-Silver	<2.0 ug/l		T-Uranium	4.6 pCi/l	+/-1.4
T-Zinc	59.2 ug/l		T-Vanadium	<40 ug/l	
T-Antimony	<3.0 ug/l		T-Thallium	<2.0 ug/l	
D-Thallium	<1.0 ug/l		D-Antimony	<3.0 ug/l	
D-Mercury	<0.2 ug/l		CO3 Solids	66 mg/l	

Comments on test results:

CO3 Solids...Due to matrix interference this sample result is not reliable

L-pH.....pH should be performed as a field test.

END OF REPORT