ENVIRONMENTAL SAMPLE DATA

4th Quarter 1982

PETROTOMICS COMPANY
Shirley Basin, Wy.

1. STACK SAMPLES

Date collected: November 22, 1982
Location: Yellowcake Dryer Stack
Stack flow rate (m^3/sec): 1.285

Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	Release Rate (Ci/qr)	Error Estimate (Ci/qr)	LLD (uCi/ml)	Restricted %MPC
U-nat	3.42×10^{-9}		2.12×10^{-3}		3×10^{-13}	3420
Th-230	2.41×10^{-12}	$\pm 4.46 \times 10^{-13}$	2.16×10^{-6}	$\pm 0.40 \times 10^{-6}$	8×10^{-15}	4.0
Ra-226	1.05×10^{-12}	$\pm 1.44 \times 10^{-12}$	0.94×10^{-6}	$\pm 1.30 \times 10^{-6}$	3×10^{-13}	3.5
Pb-210	5.35×10^{-12}	$\pm 2.68 \times 10^{-12}$	4.80×10^{-6}	$\pm 2.40 \times 10^{-6}$	4×10^{-12}	5.3
Rn-222	0.43×10^{-9}	$\pm 0.07 \times 10^{-9}$	4.71×10^{-4}	$\pm 0.76 \times 10^{-4}$	3×10^{-11}	1.4

Date collected: November 22, 1982
Location: Packaging Room Stack
Stack flow rate (m^3/sec): 0.539

Radionuclide						
U-nat	1.03×10^{-9}		3.39×10^{-4}		3×10^{-13}	1030
Th-230	3.44×10^{-12}	$\pm 1.19 \times 10^{-13}$	1.27×10^{-6}	$\pm 0.04 \times 10^{-6}$	8×10^{-15}	5.7
Ra-226	4.57×10^{-13}	$\pm 2.85 \times 10^{-13}$	0.17×10^{-6}	$\pm 0.11 \times 10^{-6}$	3×10^{-13}	1.5
Pb-210	0×10^{-12}	$\pm 1.78 \times 10^{-12}$	0.0×10^{-6}	$\pm 0.66 \times 10^{-6}$	4×10^{-12}	0.0
Rn-222	1.54×10^{-9}	$\pm 0.11 \times 10^{-9}$	7.07×10^{-4}	$\pm 0.51 \times 10^{-4}$	2×10^{-11}	5.1

1. STACK SAMPLES continued:

Date collected: November 22, 1982
Location: Cooler Exhaust Stack
Stack flow rate (m^3/sec): 0.433

Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	Release Rate (Ci/qr)	Error Estimate (Ci/qr)	LLD (uCi/ml	Restricted %MPC
U-nat	2.76×10^{-11}		5.54×10^{-6}		3×10^{-13}	27.6
Th-230	2.65×10^{-13}	$\pm 4.42 \times 10^{-13}$	0.76×10^{-6}	$\pm 1.27 \times 10^{-6}$	8×10^{-13}	.4
Ra-226	1.34×10^{-12}	$\pm 5.31 \times 10^{-13}$	3.84×10^{-6}	$\pm 1.53 \times 10^{-6}$	3×10^{-13}	4.5
Pb-210	8.85×10^{-13}	$\pm 2.65 \times 10^{-12}$	2.54×10^{-6}	$\pm 7.63 \times 10^{-6}$	4×10^{-12}	0.8
Rn-222	0.08×10^{-9}	$\pm 0.03 \times 10^{-9}$	0.30×10^{-4}	$\pm 0.11 \times 10^{-4}$	2×10^{-11}	0.3

2. AIR SAMPLES

Locations:
Site 1 - 7800' WNW of yellow cake dryer stack.
Site 2 - 500' S of yellow cake dryer stack.
Site 3 - 3200' NE of yellow cake dryer stack.
Site 4 -11800' NNE of yellow cake dryer stack.
Site 5 - 3000' ENE of yellow cake dryer stack.
Site 6 -11700' S of yellow cake dryer stack.

Date collected: 4th Quarter 1982 Location: Site 1	Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)	%MPC
	U-Nat			1×10^{-16}	<0.1
	Th-230	6.51×10^{-16}	$\pm 0.49 \times 10^{-16}$	5×10^{-16}	0.1
	Ra-226	1.32×10^{-17}	$\pm 0.91 \times 10^{-17}$	1×10^{-17}	<0.1
	Pb-210	7.63×10^{-15}	$\pm 0.55 \times 10^{-15}$	5×10^{-16}	<0.1
	Rn-222	1.73×10^{-9}	$\pm 0.21 \times 10^{-9}$	0.5×10^{-9}	57.7

Date collected: 4th Quarter 1982 Location: Site 2	Radionuclide				
	U-nat	7.63×10^{-15}		1×10^{-16}	0.2
	Th-230	1.72×10^{-14}	$\pm 0.09 \times 10^{-14}$	1×10^{-16}	21.5
	Ra-226	3.14×10^{-16}	$\pm 0.28 \times 10^{-16}$	1×10^{-17}	<0.1
	Pb-210	1.97×10^{-14}	$\pm 0.08 \times 10^{-14}$	3×10^{-16}	0.5
	Rn-222	2.42×10^{-9}	$\pm 0.25 \times 10^{-9}$	0.5×10^{-9}	80.6

2. AIR SAMPLES continued:

Date collected: 4th Quarter 1982 Location: Site 3	Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)	%MPC
	U-nat	1.07×10^{-15}		1×10^{-16}	<0.1
	Th-230	1.42×10^{-14}	$\pm 0.08 \times 10^{-14}$	2×10^{-16}	17.8
	Ra-226	1.54×10^{-15}	$\pm 0.06 \times 10^{-15}$	1×10^{-17}	0.1
	Pb-210	2.60×10^{-14}	$\pm 0.11 \times 10^{-14}$	5×10^{-16}	0.7
	Rn-222	1.61×10^{-9}	$\pm 0.20 \times 10^{-9}$	0.5×10^{-9}	53.6
Date collected: 4th Quarter 1982 Location: Site 4	Radionuclide				
	U-nat	6.79×10^{-16}		1×10^{-16}	<0.1
	Th-230	4.63×10^{-15}	$\pm 0.75 \times 10^{-15}$	2×10^{-16}	5.8
	Ra-226	2.85×10^{-16}	$\pm 0.27 \times 10^{-16}$	1×10^{-17}	<0.1
	Pb-210	2.10×10^{-14}	$\pm 0.09 \times 10^{-14}$	4×10^{-16}	0.5
	Rn-222	1.94×10^{-9}	$\pm 0.22 \times 10^{-9}$	0.5×10^{-9}	64.8
Date collected: 4th Quarter 1982 Location: Site 5	Radionuclide				
	U-nat	9.04×10^{-15}		1×10^{-16}	0.2
	Th-230	2.25×10^{-14}	$\pm 0.17 \times 10^{-14}$	2×10^{-16}	28.2
	Ra-226	2.24×10^{-15}	$\pm 0.07 \times 10^{-15}$	1×10^{-17}	0.5
	Pb-210	2.15×10^{-14}	$\pm 0.11 \times 10^{-14}$	7×10^{-16}	0.5
	Rn-222	2.02×10^{-9}	$\pm 0.22 \times 10^{-9}$	0.5×10^{-9}	67.2

2. AIR SAMPLES continued:

Date collected: 4th Quarter 1982 Location: Site 6	Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)	%MPC
	U-nat	4.92×10^{-16}		1×10^{-16}	<0.1
	Th-230	2.99×10^{-17}	$\pm 0.15 \times 10^{-16}$	2×10^{-16}	<0.1
	Ra-226	1.71×10^{-17}	$\pm 0.88 \times 10^{-17}$	1×10^{-17}	<0.1
	Pb-210	7.21×10^{-14}	$\pm 0.56 \times 10^{-14}$	5×10^{-16}	0.5
	Rn-222	0.92×10^{-9}	$\pm 0.16 \times 10^{-9}$	0.5×10^{-9}	30.6

3. LIQUID SAMPLES continued:

Date collected: October 5, 1982
Location: RTH #1
Type of sample: Groundwater - Bailed

Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat	6.5×10^{-9}		1×10^{-10}
Th-230	2.03×10^{-9}	$\pm 0.31 \times 10^{-9}$	2×10^{-10}
Ra-226	2.59×10^{-9}	$\pm 0.25 \times 10^{-9}$	9.7×10^{-11}
Pb-210	0.02×10^{-9}	$\pm 0.01 \times 10^{-9}$	3.1×10^{-11}
Po-210	6.4×10^{-9}	$\pm 8.0 \times 10^{-9}$	3.0×10^{-10}

Date collected: October 5, 1982
Location: RTH #2
Type of sample: Dry Well

Radionuclide
U-nat
Th-230
Ra-226
Pb-210
Po-210

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Ath-1

SAMPLE NO.: 11899

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	.02
Ammonia		Lead	.09
Arsenic	ND(0.002)	Magnesium	191
Barium		Manganese	.146
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	2.0
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	516	Sodium	
Chromium		Sulfate	1000
Copper	.04	Total Dissolved Solids	2543
Fluoride		Total Suspended Solids	
Hardness	1780	Zinc	
		pH (units)	8.51

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

3. LIQUID SAMPLES continued:

Date collected: October 5, 1982
Location: RTH #3
Type of sample: Dry Well

Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat			
Th-230			
Ra-226			
Pb-210			
Po-210			

Date collected: October 5, 1982
Location: RTH #4
Type of sample: Groundwater - Bailed

Radionuclide			
U-nat	1.28×10^{-8}		1×10^{-10}
Th-230	3.42×10^{-10}	$\pm 2.64 \times 10^{-10}$	2×10^{-10}
Ra-226	1.52×10^{-9}	$\pm 0.23 \times 10^{-9}$	2×10^{-10}
Pb-210	0.04×10^{-9}	$\pm 0.05 \times 10^{-9}$	1×10^{-10}
Po-210	5.85×10^{-9}	$\pm 6.63 \times 10^{-9}$	3×10^{-10}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Rth-4

SAMPLE NO.: 11929

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	ND(0.05)
Arsenic	ND(0.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	.44
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	40	Sodium	
Chromium		Sulfate	690
Copper		Total Dissolved Solids	1012
Fluoride		Total Suspended Solids	
Hardness	750	Zinc	
		pH (units)	5,8

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

3. LIQUID SAMPLES continued:

Date collected: October 5, 1982
Location: RTH #5
Type of sample: Groundwater - Bailed

Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat	6.70×10^{-9}		1×10^{-10}
Th-230	6.37×10^{-9}	$\pm 0.52 \times 10^{-9}$	2×10^{-10}
Ra-226	1.12×10^{-9}	$\pm 0.16 \times 10^{-9}$	9×10^{-11}
Pb-210	0.04×10^{-10}	$\pm 0.02 \times 10^{-9}$	6×10^{-11}
Po-210	-2.84×10^{-9}	$\pm 4.02 \times 10^{-9}$	3×10^{-10}

Date collected: October 5, 1982
Location: Townsite
Type of sample: Groundwater - Pumped

Radionuclide			
U-nat	1.63×10^{-11}		1×10^{-10}
Th-230	2.28×10^{-10}	$\pm 1.53 \times 10^{-10}$	9×10^{-11}
Ra-226	0.43×10^{-9}	$\pm 0.27 \times 10^{-9}$	5×10^{-10}
Pb-210	0.04×10^{-10}	$\pm 0.02 \times 10^{-9}$	6×10^{-11}
Po-210	-0.69×10^{-9}	$\pm 5.59 \times 10^{-9}$	3×10^{-10}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Atk-5

SAMPLE NO.: 11930

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	ND(.05)
Arsenic	ND(0.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	2.9
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	10	Sodium	
Chromium		Sulfate	260
Copper		Total Dissolved Solids	1012
Fluoride		Total Suspended Solids	
Hardness	350	Zinc	
		pH (units)	6.4

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Townsite

SAMPLE NO.: 11931

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	BD(.05)
Arsenic	BD(0.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	.46
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	20	Sodium	
Chromium		Sulfate	200
Copper		Total Dissolved Solids	371
Fluoride		Total Suspended Solids	
Hardness	280	Zinc	
		pH (units)	6.8

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

3. LIQUID SAMPLES

Date collected: October 6, 1982
Location: Mill Feed Pond
Type of sample: Surface - Grab

Radionulide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat (dissolved)	2.18×10^{-8}		1×10^{-10}
U-nat (suspended)	1.91×10^{-11}		1×10^{-10}
Th-230 (dissolved)	6.69×10^{-10}	$\pm 2.28 \times 10^{-10}$	9×10^{-11}
Th-230 (suspended)	1.56×10^{-9}	$\pm 0.19 \times 10^{-9}$	8×10^{-11}
Ra-226 (dissolved)	4.39×10^{-9}	$\pm 0.37 \times 10^{-9}$	1.8×10^{-10}
Ra-226 (suspended)	0.43×10^{-9}	$\pm 0.50 \times 10^{-9}$	1.0×10^{-9}
Pb-210 (dissolved)	0.42×10^{-9}	$\pm 0.10 \times 10^{-9}$	2.0×10^{-10}
Pb-210 (suspended)	0.30×10^{-9}	$\pm 0.07 \times 10^{-9}$	1.4×10^{-10}
Po-210 (dissolved)	1.98×10^{-9}	$\pm 5.92 \times 10^{-9}$	5.0×10^{-10}
Po-210 (suspended)	1.05×10^{-9}	$\pm 2.42 \times 10^{-9}$	1.0×10^{-9}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Mill Feed Pond

SAMPLE NO.: 11910

DATE: 10-6-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	ND (.05)
Arsenic	ND (.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	.51
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	20	Sodium	
Chromium		Sulfate	276
Copper		Total Dissolved Solids	450
Fluoride		Total Suspended Solids	
Hardness	100	Zinc	
		pH (units)	9.4

COMMENTS:

NR = Analysis Not Required

ND = Not detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

3. LIQUID SAMPLES

Date collected: October 5, 1982
Location: Sand Draw - North
Type of sample: Surface - Grab

Radionulide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat (dissolved)	3.88×10^{-8}		1×10^{-10}
U-nat (suspended)	1.44×10^{-9}		1×10^{-10}
Th-230 (dissolved)			
Th-230 (suspended)			
Ra-226 (dissolved)	1.50×10^{-9}	$\pm 0.22 \times 10^{-9}$	2.0×10^{-10}
Ra-226 (suspended)	1.24×10^{-9}	$\pm 0.26 \times 10^{-9}$	2.8×10^{-10}
Pb-210 (dissolved)	0.24×10^{-9}	$\pm 0.04 \times 10^{-9}$	8.6×10^{-10}
Pb-210 (suspended)	0.76×10^{-9}	$\pm 0.35 \times 10^{-9}$	8.2×10^{-10}
Po-210 (dissolved)	3.71×10^{-9}	$\pm 16.34 \times 10^{-9}$	3.0×10^{-10}
Po-210 (suspended)	4.51×10^{-9}	$\pm 3.57 \times 10^{-9}$	9.0×10^{-10}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Sand Draw North

SAMPLE NO.: 11934

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	.06
Arsenic	N.D.(.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	.19
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	40	Sodium	
Chromium		Sulfate	995
Copper		Total Dissolved Solids	1470
Fluoride		Total Suspended Solids	
Hardness	960	Zinc	
		pH (units)	8.1

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

3. LIQUID SAMPLES

Date collected: October 5, 1982
Location: Little Medicine Bow River
Type of sample: Surface - Grab

Radionulide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat (dissolved)	7.04×10^{-8}		1×10^{-10}
U-nat (suspended)	4.77×10^{-10}		1×10^{-10}
Th-230 (dissolved)	-0.05×10^{-10}	$\pm 1.95 \times 10^{-10}$	4×10^{-10}
Th-230 (suspended)	7.74×10^{-10}	$\pm 0.91 \times 10^{-10}$	1×10^{-10}
Ra-226 (dissolved)	1.27×10^{-9}	$\pm 0.22 \times 10^{-9}$	2.4×10^{-10}
Ra-226 (suspended)	0.39×10^{-9}	$\pm 0.16 \times 10^{-9}$	2.6×10^{-10}
Pb-210 (dissolved)	0.49×10^{-9}	$\pm 0.09 \times 10^{-9}$	1.8×10^{-10}
Pb-210 (suspended)	0.19×10^{-9}	$\pm 0.17 \times 10^{-9}$	4.1×10^{-10}
Po-210 (dissolved)	-8.92×10^{-9}	$\pm 16.34 \times 10^{-9}$	2.0×10^{-10}
Po-210 (suspended)	3.81×10^{-9}	$\pm 3.66 \times 10^{-9}$	8.0×10^{-10}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Little Medicine Bow River

SAMPLE NO.: 11935

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	ND (.05)
Arsenic	ND (0.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	6.0
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	20	Sodium	
Chromium		Sulfate	115
Copper		Total Dissolved Solids	325
Fluoride		Total Suspended Solids	
Hardness	170	Zinc	
		pH (units)	8.3

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by: _____ Date: _____

ps:12/3/81

3. LIQUID SAMPLES

Date collected: October 5, 1982
Location: Little Medicine Bow River (Above Mill)
Type of sample: Surface - Grab

Radionulide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat (dissolved)	9.24×10^{-9}		1×10^{-10}
U-nat (suspended)	2.15×10^{-9}		1×10^{-10}
Th-230 (dissolved)	1.80×10^{-10}	$\pm 3.52 \times 10^{-10}$	8×10^{-10}
Th-230 (suspended)	1.01×10^{-9}	$\pm 0.11 \times 10^{-9}$	1×10^{-10}
Ra-226 (dissolved)	0.31×10^{-9}	$\pm 0.12 \times 10^{-9}$	1.9×10^{-10}
Ra-226 (suspended)	0.96×10^{-9}	$\pm 0.26 \times 10^{-9}$	1.9×10^{-10}
Pb-210 (dissolved)	2.71×10^{-9}	$\pm 0.65 \times 10^{-9}$	1.3×10^{-9}
Pb-210 (suspended)			
Po-210 (dissolved)	3.0×10^{-9}	$\pm 3.74 \times 10^{-9}$	3.0×10^{-10}
Po-210 (suspended)	1.24×10^{-9}	$\pm 2.84 \times 10^{-9}$	9.0×10^{-10}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Little Medicine Bow River (above)

SAMPLE NO.: 11936

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	ND(.05)
Arsenic	ND(0.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	.33
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	20	Sodium	
Chromium		Sulfate	25
Copper		Total Dissolved Solids	224
Fluoride		Total Suspended Solids	
Hardness	150	Zinc	
		pH (units)	8.4

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

3. LIQUID SAMPLES

Date collected: October 5, 1982
Location: Little Medicine Bow River (Below Mill)
Type of sample: Surface - Grab

Radionuclide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat (dissolved)	6.16×10^{-8}		1×10^{-10}
U-nat (suspended)	3.34×10^{-8}		1×10^{-10}
Th-230 (dissolved)	1.39×10^{-10}	$\pm 4.81 \times 10^{-10}$	7×10^{-10}
Th-230 (suspended)	1.42×10^{-9}	$\pm 0.40 \times 10^{-9}$	3×10^{-10}
Ra-226 (dissolved)	1.19×10^{-9}	$\pm 0.19 \times 10^{-9}$	1.9×10^{-10}
Ra-226 (suspended)	0.60×10^{-9}	$\pm 0.31 \times 10^{-9}$	5.5×10^{-10}
Pb-210 (dissolved)	2.71×10^{-9}	$\pm 0.65 \times 10^{-9}$	1.3×10^{-10}
Pb-210 (suspended)	0.20×10^{-9}	$\pm 0.17 \times 10^{-9}$	3.9×10^{-10}
Po-210 (dissolved)	-0.88×10^{-9}	$\pm 3.46 \times 10^{-9}$	3.0×10^{-10}
Po-210 (suspended)	0.0×10^{-9}	$\pm 3.13 \times 10^{-9}$	8.0×10^{-10}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Little Medicine Bow River (Below)

SAMPLE NO.: 11937

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	
Ammonia		Lead	.04
Arsenic	ND(.002)	Magnesium	
Barium		Manganese	
Bicarbonate		Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium		Nitrate	.40
Carbon (organic)		Potassium	
Carbonate		Selenium	
Chloride	20	Sodium	
Chromium		Sulfate	222
Copper		Total Dissolved Solids	477
Fluoride		Total Suspended Solids	
Hardness	250	Zinc	
		pH (units)	8.2

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

3. LIQUID SAMPLES

Date collected: October 5, 1982
Location: Mine Shop Well
Type of sample: Groundwater - Pumped

Radionulide	Concentration (uCi/ml)	Error Estimate (uCi/ml)	LLD (uCi/ml)
U-nat (dissolved)	2.34×10^{-9}		1×10^{-10}
U-nat (suspended)	1.44×10^{-9}		1×10^{-10}
Th-230 (dissolved)	1.33×10^{-9}	$\pm 1.28 \times 10^{-9}$	2×10^{-9}
Th-230 (suspended)	4.62×10^{-10}	$\pm 1.45 \times 10^{-10}$	1×10^{-10}
Ra-226 (dissolved)	2.36×10^{-9}	$\pm 0.28 \times 10^{-9}$	2.2×10^{-10}
Ra-226 (suspended)	0.29×10^{-9}	$\pm 0.22 \times 10^{-9}$	4.2×10^{-10}
Pb-210 (dissolved)	0.23×10^{-9}	$\pm 0.03 \times 10^{-9}$	5.9×10^{-11}
Pb-210 (suspended)	0.58×10^{-9}	$\pm 0.13 \times 10^{-9}$	2.6×10^{-10}
Po-210 (dissolved)	1.0×10^{-9}	$\pm 2.3 \times 10^{-9}$	1.0×10^{-9}
Po-210 (suspended)	0.97×10^{-9}	$\pm 2.90 \times 10^{-9}$	9.0×10^{-10}

PETROTOMICS ENVIRONMENTAL LABORATORY

ANALYTICAL REPORT
WATER

SAMPLE SITE: Mine Well

SAMPLE NO.: 11900

DATE: 10-5-82

	mg/l		mg/l
Aluminium		Iron	.01
Ammonia		Lead	ND(.02)
Arsenic	ND(0.002)	Magnesium	7.6
Barium		Manganese	.02
Bicarbonate	190	Mercury	
Boron		Molybdenum	
Cadmium		Nickel	
Calcium	14	Nitrate	.78
Carbon (organic)		Potassium	
Carbonate	0	Selenium	
Chloride	20	Sodium	
Chromium		Sulfate	370
Copper	.03	Total Dissolved Solids	568
Fluoride		Total Suspended Solids	ND
Hardness	160	Zinc	
		pH (units)	7.7

COMMENTS:

NR = Analysis Not Required

ND = Not Detected at level given in parenthesis.

Reviewed by:

Date:

ps:12/3/81

4. VEGETATION

No samples taken this quarter.

5. SOIL AND SEDIMENT SAMPLES

Date collected: October 14, 1982
Location: Upper Sand Draw
Type of sample: Sediment

Radionuclide	Concentration (uCi/g)	Error Estimate (uCi/g)	LLD (uCi/g)
U-nat	1.42×10^{-6}		
Th-230	2.12×10^{-6}	$\pm 0.20 \times 10^{-6}$	3×10^{-11}
Ra-226	1.32×10^{-6}	$\pm 0.13 \times 10^{-6}$	6×10^{-8}
Pb-210	2×10^{-6}	$\pm 1 \times 10^{-6}$	1×10^{-6}

Date Collected: October 14, 1982
Location: Lower Sand Draw
Type of sample: Sediment

Radionuclide			
U-nat	1.69×10^{-6}		
Th-230	11.2×10^{-6}	$\pm 0.4 \times 10^{-6}$	5×10^{-11}
Ra-226	0.51×10^{-6}	$\pm 0.08 \times 10^{-6}$	4×10^{-11}
Pb-210	6×10^{-6}	$\pm 1 \times 10^{-6}$	2×10^{-6}

5. SOIL AND SEDIMENT SAMPLES

Soil sites are the same as the Air Sample Sites.

Date collected: October 13, 1982
Location: Site #1
Type of sample: Soil

Radionuclide	Concentration (uCi/g)	Error Estimate (uCi/g)	LLD (uCi/g)
U-nat	1.22×10^{-6}		
Th-230			
Ra-226	1.05×10^{-6}	$\pm 0.14 \times 10^{-6}$	1×10^{-7}
Pb-210	2×10^{-6}	$\pm 1 \times 10^{-6}$	2×10^{-6}

Date Collected: October 13, 1982
Location: Site #2
Type of sample: Soil

Radionuclide			
U-nat	23.09×10^{-6}		
Th-230			
Ra-226	19.6×10^{-6}	$\pm 0.5 \times 10^{-6}$	1×10^{-7}
Pb-210	25×10^{-6}	$\pm 2 \times 10^{-6}$	2×10^{-6}

5. SOIL AND SEDIMENT SAMPLES

Date collected: October 13, 1982
Location: Site #3
Type of sample: Soil

Radionuclide	Concentration (uCi/g)	Error Estimate (uCi/g)	LLD (uCi/g)
U-nat	3.79×10^{-6}		
Th-230			
Ra-226	4.85×10^{-6}	$\pm 0.24 \times 10^{-6}$	5×10^{-8}
Pb-210	7×10^{-6}	$\pm 1 \times 10^{-6}$	2×10^{-6}

Date Collected: October 13, 1982
Location: Site #4
Type of sample: Soil

Radionuclide			
U-nat	1.02×10^{-6}		
Th-230			
Ra-226	1.06×10^{-6}	$\pm 0.12 \times 10^{-6}$	6×10^{-8}
Pb-210	3×10^{-6}	$\pm 1 \times 10^{-6}$	1×10^{-6}

5. SOIL AND SEDIMENT SAMPLES

Date collected: October 13, 1982
Location: Site #5
Type of sample: Soil

Radionuclide	Concentration (uCi/g)	Error Estimate (uCi/g)	LLD (uCi/g)
U-nat	12.86×10^{-6}		
Th-230			
Ra-226	1.84×10^{-6}	$\pm 0.16 \times 10^{-6}$	8×10^{-8}
Pb-210	5×10^{-6}	$\pm 1 \times 10^{-6}$	1×10^{-6}

Date Collected:
Location:
Type of sample:

Radionuclide			
U-nat			
Th-230			
Ra-226			
Pb-210			

6. DIRECT RADIATION MEASUREMENTS

Location	Exposire Rate (mr/qr)	Error Estimate (mr/qr)
Site 1	44.3	±7.9
Site 2	66.9	±7.9
Site 3	57.6	±7.4
Site 4	46.2	±7.1
Site 5	55.6	±8.3
Site 6	42.3	±5.2

Locations:
Site 1 - 7800' WNW of yellow cake dryer stack.
Site 2 - 500' S of yellow cake dryer stack.
Site 3 - 3200' NE of yellow cake dryer stack.
Site 4 -11800' NNE of yellow cake dryer stack.
Site 5 - 3000' ENE of yellow cake dryer stack.
Site 6 -11700' S of yellow cake dryer stack.