

## SUMMARY OF RADIATION SAFETY SURVEY RESULTS FOR MONTHS OF APRIL & MAY, 1962

### Airborne Radioactivity Surveys

Three surveys were made during the months of April and May; all areas of the plant listed in the license application were included.

Almost all areas were found to be well below any prescribed limits. Only two, the Packaging and Drying rooms, were above. Average concentrations in these areas were  $8.8 \times 10^{-11}$  uc/ml in the Packaging room and  $10.9 \times 10^{-11}$  uc/ml in the Drying room. The high dust readings were caused by mechanical upsets in these rooms. Corrective steps have been taken, and much improvement was seen on the last survey.

Time and concentration studies showed that operators working in these areas were exposed on the average to less than MPC. These figures were: Final Product Packaging Operator, 83% MPC and Precipitation Operator, most often working in the Dryer Room, 41% MPC.

### External Surveys-Radioactivity

A beta-gamma survey of all areas of the mill was taken April 23. It showed that the Grizzly floor in the Primary Crusher building and the Barrel storage area in the Mill building to be the only two where a person could be exposed to as much as 25% MPD. No one, however, is working in these areas for sufficient amounts of time to approach this level.

A film-badge program was begun June 4 to provide additional information about external exposures.

### Water Sampling Results

Potable water supplies are sampled each month, and duplicate samples are sent to two different laboratories to be analyzed for Radium 226, Thorium 230 and Uranium. From three drill holes below the tailings dam, water tables are also sampled monthly and assayed for the same isotopes.

Using the equation shown in part 20, April and May, results from the drill holes showed concentrations totaling 13% the equivalent MPC. Averages of drinking water samples from March, April and May were 141%.

This figure was due almost entirely to high Radium assays, approximately 3.5 MPC in March. Since then, Ra 226 has been of the order  $10^{-10}$  uc/ml, indicating an abnormal sample for the month of March.

# AREA DUST SURVEY RESULTS

Area	Bldg.	Surveys	High uc/ml x 10 <sup>-11</sup>	Low uc/ml x 10 <sup>-11</sup>	Avg. uc/ml x 10 <sup>-11</sup>	X MPC *
Grizzly Floor	Primary	2	.34	.12	.23	.03
Feeder Floor	Primary	2	.40	.32	.36	.05
Crusher Floor		1			.68	.10
Pit		1			.99	.15
Screen Floor	Secondary	2	.12	.01	.06	.01
Impactor Floor		2	.13	.07	.10	.02
Ground Floor		2	.38	.07	.23	.03
Tripper Floor	Fine Ore	1			.08	.01
Feeder Floor		3	.27	Nil	.10	.02
Sample Prep		2	.03	.02	.02	.01
Grind	Mill	3	.83	.05	.31	.05
Leach		3	.30	.05	.14	.02
Precipitation		3	1.25	.03	.70	.11
Precipitation		3	1.02	.03	.48	.07
Packaging		3	13.53	.09	8.80	1.32
Drying		3	25.460	.73	10.86	1.63
Shift Office		3	2.011	.06	.73	.11
Change Room		3	3.846	.01	.14	.02
Supt. Office		3	8.031	.03	2.74	.41
Met. Office		3	.85	.01	.33	.05
Met. Lab		3	3.98	.08	1.40	.21
CCD Deck		3	.01	Nil	.01	<.01
CCD Tunnel		2	Nil	nil	nil	0
Tailing Pump House		1			nil	0
SX Deck		3	.02	Nil	.01	<.01
SX Lab		3	.09	Nil	.03	<.01
Office	Office	2	.04	.01	.02	<.01
Cafeteria		3	.06	Nil	.03	<.01

\*MPC =  $6.67 \times 10^{-11}$  uc/ml (equivalent MPC for normal 42 work week).

# POTABLE WATER SURVEY RESULTS

MONTH	Ra 226 uc/ml	Th 230 uc/ml	U308 ug/ml
March (1)	$4.0 \times 10^{-8}$	$4.4 \times 10^{-7}$	1.91
(2)	$2.9 \times 10^{-8}$	$.003 \times 10^{-7}$	2.58
April (1)	$(0.4) \times 10^{-10}$	$6.7 \times 10^{-9}$	3.1
(2)	$1.22 \times 10^{-9}$	$.50 \times 10^{-9}$	2.73
May (1)	$3.6+.4 \times 10^{-9}$	$<5 \times 10^{-9}$	1.6
(2)	$3.7 \times 10^{-9}$	$1.9 \times 10^{-8}$	1.7

## TEST HOLES BELOW TAILINGS DAM

April (1)			
RTH #1	$1.6+.4 \times 10^{-9}$	$7.2 \times 10^{-9}$	.03
2	$0+.4 \times 10^{-10}$	$7.0 \times 10^{-9}$	.03
3	$0+.4 \times 10^{-10}$	$2.4 \times 10^{-7}$	.02
May (1)			
RTH #1	$8+.3 \times 10^{-10}$	$<5 \times 10^{-9}$	$<.02$
2	$1.9+.4 \times 10^{-10}$	$5 \times 10^{-9}$	$<.02$
3	$4+.2 \times 10^{-10}$	$7.1 \times 10^{-9}$	$<.02$

(1) Tracerlab, Inc., Waltham, Mass.

(2) Radiation Detection Company, Palo Alto, California

# PETROTOMICS COMPANY

## JOB EXPOSURE EVALUATION

Survey Period Apr-May, 1962

BUILDING Mill Building PROCESS AREA Final Product Packaging

OPERATOR Packaging 1 men/shift 1 shift/day 1 men/day

Operation or Operating Area	Time Per Oper.	Oper. Per Shift	Time Per Shift (T)	Sample No.	Concentration $\frac{\mu\text{Ci}}{\text{m}^3}$ uc/ml x $10^{-11}$			TxC
					High	Low	Avg. (C)	
Packaging Room			360	8, 36, 65	13.54	.09	8.80	3168.00
Drying Room			60	10, 37, 66	25.46	.73	10.86	651.60
Precip Area-Mezz.			150	4, 29, 58	1.25	.03	.70	105.00
Reagent Mix			120	9, 30, 59	1.02	.03	.48	57.60
Shift Office			20	14, 41, 69	2.01	.06	.73	14.60
Change Room			10	15, 42, 68	3.85	.01	.14	1.40

$\Sigma(T)$  720

$\Sigma(TxC)$  3998.20

$$\frac{\Sigma(TxC)}{\Sigma(T)} = \frac{5.55}{720} \frac{\text{uc/ml} \times 10^{-11}}{\text{m}^3} = \boxed{.83} \text{ MPC}$$

$\text{MPC} = 6.67 \times 10^{-11} \text{ u}$

40-6659

# PETROTOMICS COMPANY

## JOB EXPOSURE EVALUATION

Survey Period **Apr-May, 1962**

BUILDING Mill Building PROCESS AREA Precipitation

OPERATOR Precip 1 men/shift 2 shift/day 2 men/day

Operation or Operating Area	Time Per Oper.	Oper. Per Shift	Time Per Shift (T)	Sample No.	Concentration <del>u/m</del> uc/ml x 10 <sup>-11</sup>				TXC
					High	Low	Avg.	(C)	
Precip-Mezzanine			360	4, 29, 58	1.25	.03	.70		252.00
Precip-Main Floor			150	9, 30, 59	1.02	.03	.48		72.00
Dryer Room			150	10, 37, 66	25.46	.73	10.86		1629.00
SX Lab			30	7, 35, 60	.09	Nil	.03		.90
Shift Office			20	14, 41, 69	2.01	.06	.73		14.60
Change Room			10	15, 42, 65	3.85	.01	.14		1.40

$\Sigma(T)$  720

$\Sigma(TXC)$  1969.90

$$\frac{\Sigma(TXC)}{\Sigma(T)} = \frac{1969.90}{720} = 2.74 \text{ uc/ml x } 10^{-11}$$

$\frac{2.74}{6.67} = .41$

MPC

MPC =  $6.67 \times 10^{-11}$  uc/ml  
(42 hrs/wk)

40-6659

# PETROTOMICS COMPANY

## JOB EXPOSURE EVALUATION

Survey Period Apr-May, 1962

BUILDING Crushing Bldg. & Fine Ore PROCESS AREA Crushing

Crusher Opr.

OPERATOR & Asst. Crusher 2 men/shift 1 shift/day 2 men/day  
Opr.

Operation or Operating Area	Time Per Oper.	Oper. Per Shift	Time Per Shift (T)	Sample No.	Concentration <del>uc/ml</del> uc/ml x 10 <sup>-11</sup>				TxC
					High	Low	Avg.	(C)	
Primary:									
Grizzly Floor			80	18, 45	.34	.12	.23		18.40
Feeder			35	19, 46	.40	.32	.36		12.60
Crusher			265	47			.69		182.85
Pit			25	20			.99		24.75
Secondary:									
Screen			10	48, 21	.11	.01	.06		.60
Impactor			15	49, 22	.13	.07	.10		1.50
Ground			45	23, 50	.38	.12	.25		11.25
Fine Ore:									
Tripper			125	51			.08		10.00
Cafeteria			30	17, 44	.06	Nil	.03		.90

$\Sigma(T) = 630$

$\Sigma(TxC) = 262.85$

$$\frac{\Sigma(TxC)}{\Sigma(T)} = \frac{262.85}{630} \times 10^{-11} \text{ uc/ml} = \boxed{.07} \text{ MPC}$$

$$= .42 \times 10^{-11} \text{ uc/ml}$$

$$MPC = \frac{6.4}{42} \times 10^{-11} \text{ uc/ml}$$

(42 hrs/wk)

05-6057

# RADIATION SURVEY

April 23, 1962

By B. M. Moulden

Location	Readings	High Mr/hr.	Low Mr/hr	Avg. Mr/hr.	Feb. Avg. Mr/hr.
Primary Crusher					
Grizzly Floor	6	.80	.50	.65	.015
Feeder Floor	6	.10	.05	.07	.01
Crusher Floor	6	.08	.05	.07	.03
Pit	6	.11	.06	.09	.03
Secondary Crusher					
Upper Floor	6	.15	.06	.12	.015
Screen Floor	6	.30	.10	.21	.035
Impactor Floor	6	.30	.10	.21	.01
Ground Floor	6	.20	.10	.17	Nil
Fine Ore Storage					
Upper Floor	6	.40	.10	.23	
Second Floor	6	.18	.11	.15	.03
Ground Floor	6	.10	.06	.08	.03
Mill Building					
Ball Mill	6	.13	.07	.11	Nil
Leach	6	.17	.11	.14	Nil
Precipitation	6	.14	.08	.10	Nil
Packaging	6	.50	.10	.21	Nil
Drying	6	.13	.08	.11	.01
Storage	5	.80	.40	.64	Nil
Office and Lab	6	.12	.06	.09	Nil

Solvent Extraction					
SX	6	.10	.06	.08	.01
Lab	3	.11	.07	.09	.01
Outside		.12	.05	Apx. .07	Nil
Barrel Surfaces		1.50	1.00		



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Casper, Wyoming  
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Ltr. ack. our ltr of 7/10/62 and re:  
the improper routing of the safety survey D. A. Hasshaumer  
also advising that in future they will  
have their Radiologist, B.M. Moulden transmit w/file cy & File

ENCLOSURES: these surveys direct to our office.

1. Sum Rad Safety Survey results for mos. cy for Compl.  
April and May, 1962
2. Area Dust Survey Results
3. Potable Water Survey Results
4. Job Exposure Evaluation
5. Radiation Survey

H armon

7/16

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