

URANIUM REDUCTION COMPANY

INTER-OFFICE CORRESPONDENCE

To: L. A. Paister

From: B. B. Winn

Date: March 8, 1960

Subject: RADIATION REPORT FOR NOVEMBER, 1959

The following report covers the work completed or "in progress" on the radiation control program during the month of November.

EXTERNAL RADIATION PROGRAM

1. The AEC film badges for use during the month November were received and distributed. The AEC badges exposed during the month of October were returned to the Idaho Falls operation office.

AIR SAMPLING

1. The fourth quarter, 1959 general air and breathing zone air sampling program was completed. This survey was conducted by Mr. T. R. Downard of our staff. The survey began on October 9, 1959 and terminated on November 23, 1959. A total of 201 general air samples and 70 breathing zone air samples were collected. These samples were collected by the methods described in our radiation control policy until October 30, 1959. As outlined in my October report, the volume of air collected for a sample was increased subsequent to this date. The increase in sample volume enables us to report accurately radioactivity in the air to a minimum figure of 1.24×10^{-11} uc/ml.

Of the 201 general air samples taken, 183 samples resulted in air concentrations below the maximum allowable concentration of 5.0×10^{-11} uc/ml.

Eighteen samples were above the maximum allowable concentration. The following table is a resume of these 18 samples.

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Area Sampled	Count Rate	Count M.A.S.	Count M.A.S.	Ave. of all Samples
Grizzly Pit Below hopper	3	9.81×10^{-11}	1.24×10^{-11} 1.60×10^{-11}	4.22×10^{-11}
Crusher MCC deck	3	7.68×10^{-11}	1.24×10^{-11} 1.55×10^{-11}	3.49×10^{-11}
Crusher - Area around secondary screens	3	10.55×10^{-11}	1.24×10^{-11} 4.17×10^{-11}	5.35×10^{-11}
Crusher - #3 Head Pulley area	3	5.59×10^{-11}	1.86×10^{-11} 1.24×10^{-11}	2.89×10^{-11}
Crusher - Bottom floor transfer tower	3	7.68×10^{-11} 13.9×10^{-11}	1.24×10^{-11}	7.61×10^{-11}
Crusher - transfer tower - top floor	3	5.95×10^{-11}	1.54×10^{-11} 1.65×10^{-11}	3.05×10^{-11}
Crusher - #3 Conveyor ramp	3	7.56×10^{-11} 18.1×10^{-11}	1.24×10^{-11}	8.97×10^{-11}
Crusher - #4 Conveyor ramp	3	5.52×10^{-11}	1.24×10^{-11} 1.24×10^{-11}	2.66×10^{-11}
Sample Tower - South side - 3rd floor	3	8.93×10^{-11}	1.24×10^{-11} 1.24×10^{-11}	3.81×10^{-11}
Fine Ore Bins - Top	3	19.5×10^{-11}	3.07×10^{-11} 1.24×10^{-11}	7.93×10^{-11}
Yellow Cake Control Room	3	8.03×10^{-11} 14.6×10^{-11}	1.33×10^{-11}	7.99×10^{-11}
Hearth Dryer - #1 Deck Top Deck	3	9.76×10^{-11} 98.2×10^{-11}	3.96×10^{-11}	37.3×10^{-11}
Hearth Dryer - #5 Deck	3	8.39×10^{-11}	4.82×10^{-11} 2.89×10^{-11}	5.33×10^{-11}
Packaging Area	3	7.68×10^{-11}	4.17×10^{-11} 3.86×10^{-11}	5.23×10^{-11}

The results of this survey indicate that several areas still need immediate attention. On the basis of the high airborne dust concentration found on the #1 deck of the hearth dryer, a work order was submitted to install an umbrella type vacuum hood over the top of the roaster. This installation, with a feasible method of disposal of the dry filter press papers should correct the situation.

Attention is also called to the fact that constant inspection and immediate repair of all dust producing leaks in the crushing plant and product packaging area is necessary to keep the airborne dust concentration below the maximum allowable concentration.

Of the 70 breathing zone samples collected, 69 were below the maximum allowable concentration and one sample was above the maximum allowable concentration. The one sample that resulted in a concentration of 7.68×10^{-11} uc/ml was one of three collected on the Dryer-Packager operators. The other two samples collected gave results below 1.24×10^{-11} uc/ml. The average of the three samples taken was 3.14×10^{-11} uc/ml. The two remedial steps described in the preceding paragraph should lower this job classification exposure.

Generally the results of the general air sampling survey are not as good as those reported in the third quarter report. However, I would like to point out that while more areas are over the maximum allowable concentration, the extent to which they are over is less in those areas that were also found to be over the maximum allowable concentration in the third quarter survey.

In my opinion, the general increase in airborne concentration in the crushing plant is due to a decrease in the number of man hours spent on maintenance. This decrease in time spent has, of course, been necessitated by the conversion to the alkaline circuit.

EMPLOYEE EDUCATION AND INSTRUCTION

Following the installation of the Ohmart density detectors on the grinding circuit and reagent recovery thickener, Mr. James Owen of the Ohmart Corporation conducted a meeting for all foremen and Maintenance Department personnel who might have occasion to supervise and/or work on these units. The basic hazards of external radiation were covered along with the proper precautions to exercise in working on these units. A memo to Mr. Dan Poppe was written by E. B. Winn requesting that the Metallurgical Department be advised whenever maintenance work on the Ohmart detecting units was scheduled. This memo stated that an external radiation survey of the units would be made prior to the actual work in order to provide safe working conditions. Mr. Owen submitted a field report of his radiation survey made after installation of the units was completed. This report is on file in the Personnel Department.

PRE-PLANNED HOUSEKEEPING PROGRAM

1. A contract for the installation of the ducts for the Spencer vacuum producer in the crushing plant was given to a contractor and this work is still in process.

CRASH CLEAN-UP PROGRAM

1. In a telephone conversation with a representative of the Sprout-Waldron Company, we were informed that the investigation of the disposal of wet filter press papers by means of their digester had proved unsuccessful.

Mr. Robert L. Smith, of the Colorado State Health Department, was requested to investigate the use of a commercial type incinerator for this purpose. On his recommendation, a purchase order was placed with the Killam Company, Denver, Colorado, for an incinerator.

2. Work was completed on the No. 2 Syntro vibrator dust balancing duct.

EFFLUENT TREATMENT

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1. ~~Radio~~ additions experiments have not been conducted as yet on the tailings effluent due to the inclement weather. The surface of the tailings pond has been frozen, thus making it impossible to remove the effluent from the north drainage line which is where our experimental unit is set up.

COLORADO RIVER SAMPLING SCHEDULE

1. Our regular monthly sampling program of effluent and Colorado River sampling was completed. The URC Radiation laboratory is making the necessary analysis on these samples.

2. During the inspection trip of Mr. Kant and Mr. Johnson on October 29 and 30, they discussed with members of our staff an investigation that is currently being carried on by the AEC analytical laboratory staff of the various analytical methods for the determination of Radium²²⁶. They stated that preliminary results of this investigation have shown that in the Modified Harwell procedure for the determination of Ra²²⁶, co-precipitation of thorium and Radium takes place, thus resulting in high Ra²²⁶ results. An AEC method eliminating this co-precipitation error has been developed but as of this date is not ready for distribution. On November 6, 1959, Mr. Hollis wrote to Mr. Donald Walker of the AEC requesting permission for one of our staff to visit the AEC laboratory,

on the formation of a meeting for members of the analytical group of all the mills for the purpose of learning about this new method.

SPECIAL SURVEYS

1. Paragraph 7.4(1) of the "American Standard for Uranium Mines and Concentrators" states as follows:

"7.4.1 Urinalyses for Uranium Content. Urinalyses for uranium content shall be made annually prior to return to work from vacation to estimate the body burden of uranium. Additional samples from exposed workers may be useful in checking the effectiveness of control measures.

"7.4.1 Interpretation of Urinary Uranium Analyses. If a urine sample taken after a minimum of one week's absence from exposure shows a uranium content greater than 100 $\mu\text{g/l}$, a repeat sample shall be taken. If this repeat sample confirms the first result, the workers shall be removed from exposure until the urinary uranium level falls below 100 $\mu\text{g/l}$."

In line with this recommendation, a program of urine sampling and analysis was started on employees returning from a minimum of one week's absence from work. The Personnel Department advises the Metallurgical Department which employees are on vacation and their work return date. A urine sample is collected from these individuals prior to their first working date. To date, 10 urine specimens have been collected. None of these individuals had urinary uranium levels over 100 $\mu\text{g/l}$. Results of this survey are on file in the Personnel Department radiation file.

2. The installation of the Ohmart density detectors on the carbonate plant grinding and reagent recovery thickener necessitates a "wipe" test of these units every six months to meet AEC regulations for the use of "sealed sources". These units contain a Cesium 137 source. A monthly survey of these units will be made by the Metallurgical Department. A report on the survey made on 11-13-59 is on file in the Personnel Department.

B. B. Winn
Plant Metallurgist