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MINING ENFORCEMENT AND SAFETY ADMINISTRATION

4800 FORBES AVENUE

PITTSBURGH, PENNSYLVANIA 15213

Metal and Nonmetal Mine
Health and Safety

APR 16 1976

Ms. Frances E. Mett, President
Powhatan Mining Company
6721 Windsor Mill Road
Baltimore, Maryland 21207

Dear Ms. Mett:

Enclosed are the results of the asbestos and respirable dust surveys conducted on your property on February 18-20, 1976, by Raymond H. Hoffman, Mining Engineer, Mining Enforcement and Safety Administration.

Measurement of the airborne asbestos fiber concentration consists of drawing a sample of dust-laden air through a filter, counting the fibers on the filter using a microscope, and calculating the airborne fiber concentration. The results are fibers per milliliter of air.

Samples are collected to represent personal breathing zone measurements of fibrous dusts. The filter media is 37 mm Millipore type AA mounted in an open face filter holder. The sampling air flow rate is 1.7 lpm, using a battery-powered personal pump. The sampling time is a function of concentration so that the filter contains a quantity that is satisfactory for counting with a microscope. Full working shift time weighted average exposures are calculated by relating appropriate sample results to estimated exposure times on the day of the evaluation.

Counting is performed by the phase contrast illumination method (the membrane filter method) described by NIOSH in their criteria document "Occupational Exposure to Asbestos", U.S. Department of HEW, HSM 72-10267, G. P. O., Washington, DC, 1972. This method requires phase contrast illumination, 400-450 magnification and a 4 mm objective. Fibers greater than 5 microns in length and with an aspect ratio greater than 3 to 1 are counted.

MESA Mandatory Standard 55, 56, 57.5-1 (b) states, in part, the following:

> 55, 56, 57.5-1 Mandatory. (b) " The 8-hour time weighted average airborne concentration of asbestos dust to which employees are exposed shall not exceed 5 fibers per milliliter greater than 5 microns in length. No employee shall be exposed, at any time, to

AMERICAN REVOLUTION BICENTENNIAL 1776-1976

airborne concentrations of asbestos fibers in excess of 10 fibers longer than 5 micrometers, per milliliter of air, as determined by the membrane filter method over a minimum sampling time of 15 minutes....."

The dust concentration results included in this report were obtained by the gravimetric dust sampling method. Results are milligrams of respirable dust per cubic meter of air (mg/m^3).

The dust sampling equipment used consisted of an air pump, 37 mm diameter, 5 micron pore size filter, and a 10 mm cyclone dust classifier in series with the filter. All components were interconnected by tubing and/or fittings to maintain a negative pressure at the cyclone inlet. Sampling equipment was of the "personal" type and the cyclone and accompanying filter assembly were located in the breathing zone of each person sampled.

As air was drawn through the sampling device, the respirable dust was deposited on the filter, with the coarser dust being dropped into the grit pot of the cyclone.

The equipment used met the requirements of the American Conference of Governmental Industrial Hygienists for "respirable" dust sampling and was operated at an air flow rate of 1.7 liters per minute. The flow rate of the apparatus was checked prior to use and was periodically checked during sampling to ensure that the flow rate was maintained.

Each filter was weighed prior to and after sampling, with the difference in weight being the amount of dust collected on the filter.

Free Silica (SiO_2)

Free silica (alpha quartz) analyses were made from the respirable fraction of dust deposited on the filter. The sample location and the results obtained are shown in the appended table(s).

Threshold Limit Value (TLV)

The 1973 edition of "Threshold Limit Values of Airborne Contaminants and Physical Agents," as published by the American Conference of Governmental Industrial Hygienists, was the source of the applicable Threshold Limit Values. The TLV, in mg/m^3, is the limiting value for exposure to silica-bearing dust for a 7- to 8-hour workday.

The TLV's were calculated for each sample from the following equation:

$$\text{TLV (in mg/m}^3\text{)} = \frac{10}{\% \, SiO_2 + 2}$$

The Time Weighted Average (TWA) concentrations were calculated from the following equation:

$$\text{TWA Conc. } (mg/m^3) = \frac{\text{Dust weight (mg)}}{\text{flow rate (lit./min.) x time (min.) x .001 } m^3/\text{lit.}}$$

Twa concentrations exceeding the TLV indicate overexposure.

All employees sampled for both asbestos fiber and respirable dust were below the TLV values.

We wish to thank you and your employees for your cooperation with the inspector during this survey.

Sincerely,

Frank J. Delimba/tjc

Frank J. Delimba
Subdistrict Manager
Northeastern District

Enclosure

cc: Dr. A. Goodwin, Chief, Health Division - MESA (1)
R. H. Hoffman, Mining Engineer - MESA (1)
Pittsburgh Subdistrict Files (1)