



February 15, 2008

Mr. Dan Schulse
Universal Minerals
6319 Brookhill Dr.
Houston, Texas 77087

**Re: Site Specific Industrial Hygiene Services
Universal Minerals
Sharp Jet Garnet Abrasive Demonstration Project
LaPorte, Texas
Envirotest Project Number: HOU 08 0173**

Dear Mr. Schulse:

Enclosed is the laboratory report for Site Specific Industrial Hygiene Services performed at Mobley Industrial Services located at 1220 Miller Cut-off Road in LaPorte, Texas. This report provides a summary of the analytical results and conclusions of air monitoring conducted on February 1, 2008.

A total of twelve (12) samples (six personnel and six areas), were collected to determine the concentration of respirable dust, crystalline silica and specific trace metals. Six of the results were collected during confined space blasting and six were collected during open air blasting. The results of this air monitoring indicated that all samples were below the OSHA PEL in addition to being below the standard limit of detection for all samples with the exception of one, which indicates a detection below the OSHA PEL. If you should have any questions, please do not hesitate to contact us. Envirotest, Ltd. appreciates this opportunity to be of continued service to you.

Sincerely,

Jason A. Binford
Vice President of Operations
Envirotest, Ltd.

By: ETI Management, L.L.C.

Brent Mattox, Ph.D, CIH
Certified Industrial Hygienist
Envirotest, Ltd.



I. Executive Summary

Envirotest, Ltd. (Envirotest) is pleased to have provide Site Specific Industrial Hygiene (SSIH) Services to Universal Minerals, Inc. for work performed at the Mobley Blast Yard located in LaPorte, Texas.

During blasting activities Envirotest collected representative samples of both confined and unconfined blasting utilizing current federal regulations and in accordance with state-of-the-art monitoring programs which included:

- 1) Collection of silica samples for Quartz, Cristobalite and Tridymite using the NIOSH 7500 protocol.
- 2) Analysis of air monitoring samples for total and respirable dust using NIOSH 0500 and 0600 protocol.
- 3) Analysis of air monitoring samples for trace heavy metals (arsenic, beryllium, cadmium, chromium, lead, and vanadium) using the NIOSH 7300 protocol.

II. Health Effects of Crystalline Silica

Silica refers to the chemical compound silicon dioxide (SiO_2), which occurs in a crystalline or noncrystalline (amorphous) form. Crystalline silica can be found in more than one form, some of the listed forms are: alpha quartz, beta quartz, and Cristobalite. The abundance of alpha quartz is so great that the term quartz is often used in place of the general term crystalline silica. Quartz is a common component of soil and rocks; consequently, workers are potentially exposed to quartz dust in many occupations and industries.

In 1974, NIOSH reviewed the available health effects data on occupational exposure to Respirable crystalline dust and determined that the principal health effect was silicosis. It was also determined that occupational exposure to respirable crystalline silica was concentration equivalent to a time-weighted average no greater than 50 micrograms per cubic meter of air ($50 \mu\text{g}/\text{m}^3$ – or $0.05 \text{mg}/\text{m}^3$), determined for a 10-hr workday during a 40-hr workweek. Besides silicosis, occupational exposures to respirable silica are associated with the development of lung cancer, pulmonary tuberculosis, and airways diseases.

III. Regulations and Exposure Limits

When proper practices are not followed or controls are not maintained, respirable crystalline silica exposures can exceed the NIOSH Recommended Exposure Limit (REL), the OSHA Permissible Exposure Limit (PEL), or the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Value (TLV) [NIOSH 2002, ACGIH 2001]. NIOSH recommends an exposure limit of $0.05 \text{mg}/\text{m}^3$ to reduce the risk of developing silicosis, lung cancer and other adverse health effects.



If respirable dust contains more than 1% silica, the OSHA PEL for respirable dust exposures in general industry can be calculated as shown in the equation below:

$$\text{Respirable PEL (mg/m}^3\text{)} = \frac{10 \text{ mg/m}^3}{\% \text{ Silica} + 2}$$

Where % silica refers to the percentage of silica by mass contained in an 8-hour sample [29 CFR 1910.1000]. By this equation, the respirable dust PEL is dependent upon the percentage of silica contained in the dust. The PEL ranges from 5 mg/m³ if the dust contains no silica, to 0.1 mg/m³ if the dust is 100% silica.

The current OSHA permissible exposure limit (PEL) for respirable dust containing crystalline silica (quartz) for the construction industry is expressed in millions of particles per cubic foot (mppcf) and is calculated using the following formula [29CFR 1926.55]:

$$\text{Respirable PEL} = \frac{250 \text{ mppcf}}{\% \text{ Silica} + 5}$$

IV.1. Sampling Methods

- NIOSH Method 7500 for Crystalline Silica (Quartz, Cristobalite, and Tridymite) or a modified version as noted in the data sheets.
- NIOSH method 0500 and 0600 for analysis of Total and Respirable Dust when applicable.
- NIOSH Method 7300 for the analysis of trace heavy metals (arsenic, beryllium, cadmium, chromium, lead, and vanadium).



IV.2. Analytical Laboratory and Sampling

Envirotest submitted the collected samples to Galson Laboratories, Inc. for analytical analysis. Galson Laboratories, Inc. is an American Industrial Hygiene Association (AIHA) accredited laboratory (#100324).

Unless noted, samples were collected and submitted following both laboratory and method specific parameters. The sampling campaign was conducted by trained and experienced air monitoring technicians employed by Envirotest, Ltd. Personal Sampling Pumps that were used during the sampling regiment were calibrated before and after each use with a calibrated rotameter. Samples were labeled, recorded on a chain of custody, and shipped to the laboratory.

IV.3. Sampling Results

The air monitoring campaign involved the collection of twelve (12) samples performed during both confined space blasting and open air blasting. A summarized list of the samples collected during the air monitoring campaign are described in the Table as follows:

Personal Sampling Results

Analyte	Sample Number	Sample Volume (L)	Analytical Results mg/m ³	Comments
Arsenic Beryllium Cadmium Chromium Lead Vanadium	A2-1TM-1 UP	480	<0.00063 <0.00031 <0.00031 <0.0063 <0.00078 <0.00094	Satisfactory
Total Dust	A2-1TD-2- UP	480	<0.21	Satisfactory
Dust Quartz Cristobalite Tridymite	A2-1-S-3 UP	528	<0.19 <0.019 <0.019 <0.038	Satisfactory
Arsenic Beryllium Cadmium Chromium Lead Vanadium	A2-1-TM-4 DW	480	<0.00063 <0.00031 <0.00031 <0.0063 <0.00078 <0.00094	Satisfactory
Total Dust	A2-1TD-5 DW	480	<0.21	Satisfactory



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Personal Sampling Results

Analyte	Sample Number	Sample Volume (L)	Analytical Results mg/m ³	Comments
Dust Quartz Cristobalite Tridymite	A2-1-S-6-DW	528	<0.19 <0.019 <0.019 <0.038	Satisfactory
Respirable Dust	P2-1-R-1	528	0.35	Satisfactory
Dust Quartz Cristobalite Tridymite	P2-1-S-2	528	<0.19 <0.019 <0.019 <0.038	Satisfactory
Arsenic Beryllium Cadmium Chromium Lead Vanadium	P2-1-TM-3	480	<0.00063 <0.00031 <0.00031 <0.0063 <0.00078 <0.00094	Satisfactory
Respirable Dust	P2-1-R-4	528	<0.19	Satisfactory
Dust Quartz Cristobalite Tridymite	P2-1-S-5	528	<0.19 <0.019 <0.019 <0.038	Satisfactory
Arsenic Beryllium Cadmium Chromium Lead Vanadium	P2-1-TM-6	480	<0.00063 <0.00031 <0.00031 <0.0063 <0.00078 <0.00094	Satisfactory

V. Conclusions

The results of this air monitoring indicated that all samples were below the OSHA PEL in addition to being below the standard limit of detection for all samples with the exception of one, which indicates a detection below the OSHA PEL.

VI. Closing Remarks

Envirotest appreciates the opportunity to be of continued service to Universal Minerals, Inc. If you have any questions or should any portion of this document require clarification or discussion, please do not hesitate to contact us.

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