

Attachment B
Email to Department Dated October 15, 2019 (Core Sample Analysis Protocol)

Bonafair, Kori L.

From: Matthew McClure <matthew.mcclure@specialtygranules.com>
Sent: Tuesday, October 15, 2019 7:53 PM
To: Paronish, Chadwick
Cc: Sammarco, Daniel; Martin, Rock; Gallaher, Wade; Welte, Daniel; Lambeth, Craig; Duke, Alicia; Weaver, William (DEP); Kevin Moore; Wilson, Craig P.; Weston, R. Timothy; Celeste Levine
Subject: Re: SMP No. 01180301- Northern Tract Quarry- Review Letter
Attachments: LLH808740 TEM Analytical Procedure 101519 (1).pdf

External Sender:

Dear Chad,

In advance of our response to the department's comment letter dated September 30, 2019 we are providing the department with a brief overview and attached lab analytical method for concurrence prior to SGI proceeding with the analysis and incurring the corresponding cost. The department requested that SGI re-analyze the 40 samples from coreholes in the NT footprint previously analyzed via PLM (now utilizing Transmission Electron Microscopy). Of 40 samples, 35 have sufficient retains to run TEM on (including the split samples sent to the department). An insufficient amount of material was retained from 5 coreholes. In those 5 SGI has resampled from stored cores. These samples will be analyzed utilizing both TEM and PLM. All data will be provided to the department. Please reply with your concurrence to the attached analytical method.

Thank you,


Matthew S. McClure

Executive Director Operations

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On Mon, Sep 30, 2019 at 1:45 PM Paronish, Chadwick <chaparonis@pa.gov> wrote:

| Matt,

Please find the attached review letter for the Northern Tract Quarry permit application. The review letter is being sent via email only and will not be followed by a hardcopy.

If you have any questions please contact me at the number below or reply to this email.

Thanks,

Chadwick Paronish, PG | Licensed Professional Geologist
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TEM Asbestos Analytical Procedure for Bulk Samples

Summary:

This analytical method describes a procedure for preparing and analyzing bulk samples (such as rocks or aggregate) for possible asbestos content using transmission electron microscopy (TEM). As there is no single consensus protocol for TEM analysis of this type of material, this procedure is based on the following consensus protocols:

- CARB 435. Determination of Asbestos Content of Serpentine Aggregate (crushing and grinding)
- ASTM D5756. Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Mass Surface Loading (particle suspension and deposition on filters)
- AHERA. Interim Transmission Electron Microscopy Analytical Method (TEM filter preparation and counting)
- EPA 600/R-93/116. Method for the Determination of Asbestos in Bulk Building Materials (definitions of asbestos)
- ISO 22262-2. Air quality — Bulk materials — Part 2: Quantitative determination of asbestos by gravimetric and microscopical methods (TEM counting and mass calculations)

The procedure involves size reduction (as needed), dispersion of the sample into a suspension, filtration of the suspension, followed by preparation and analysis of the deposit filter. The analytical results are reported in terms of weight percent.

Sample Receipt

Upon receipt at the laboratory, each sample is assigned a laboratory sample number and is examined to determine if the sample appears to be moist. If the sample appears to contain residual moisture, the sample is dried for an hour in a warm oven (60 °C) and is then weighed. The sample is returned to the oven for another hour and is re-weighed. This step is repeated until a stable weight is attained.

Sample Comminution

Each sample is visually examined to determine its largest particle size (top size). If the top size is 3/8 to 1/2 inch (nominally 10 mm), then the sample is passed through a laboratory jaw crusher (Bico) to reduce the particle size to 3/8-inch or less.

Each sample, as needed, is then pulverized in a disc grinder (Bico type UA) to a nominal top size of about 150 µm (100 mesh). At this top size, approximately half of the sample is finer than 74 µm (200 mesh) as required by CARB 435.

After pulverization, blend the ground sample using the Turbula mixer (type T2F).

Care is taken to clean the crusher and pulverizer between samples to prevent cross-contamination.

Filter Preparation

Remove and weigh a portion of the pulverized sample. Place this into a beaker containing 100 ml of deionized water.

Prepare a filter funnel. Use a polycarbonate filter (PC) with 0.2 μm pores. Filter an aliquot of the sample suspension. After the filter has dried, prepare at least 3 TEM grids using direct preparation procedures as described in the ASTM D5756 method.

Transmission Electron Microscopy Analysis

Examine the TEM grids at a screen magnification of approximately 10,000X. Examine 25 grid openings looking for elongated particles that are at least 5 μm and longer and that have a minimum aspect ratio of 3:1. Count and size (length and width) any particle meeting these minimum dimensional criteria. Use the elemental composition (EDXA) and diffraction pattern (SAED) for the identification of counted fibers as one of the six regulated asbestos minerals, or other minerals. Record the EDXA and SAED for one of every 10 chrysotile fibers observed, and one of every 5 amphibole fibers observed.

Increase the magnification to approximately 20,000X and examine 10 grid openings for elongated mineral particles that have a minimum length of 0.5 μm and a minimum aspect ratio of 3:1. Count and size (length and width) any particle meeting these minimum dimensional criteria. Use the elemental composition (EDXA) and diffraction pattern (SAED) for the identification of counted fibers as one of the six regulated asbestos minerals, or other minerals. Record the EDXA and SAED for one of every 10 chrysotile fibers observed, and one of every 5 amphibole fibers observed.

At each magnification, use the AHERA criteria for fiber, bundle, cluster, and matrix identification. At each magnification, analyze half of the grid openings on one TEM grid and the remaining grid openings on a second TEM grid.

The mass of each counted particle is calculated as described in ISO 22262-2 (section 14.2.4.6 Calculation of the mass fraction percentage of asbestos).