pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

March 2, 2020

Hanson Aggregates Pennsylvania, LLC
Attn: Andrew Gutshall, P.G.
7660 Imperial Way
Allentown, PA 18195-1040

Re: Rock Hill Quarry Qualitative Geologic Survey Report
SMP No. 7974SM1
East Rockhill Township, Bucks County

Dear Mr. Gutshall:

The Department offers the following comments on Qualitative Geologic Survey Report (QGSR), dated November 15, 2019, for the Rock Hill Quarry, Surface Mining Permit No., 7974SM1, East Rockhill Township, Bucks County:

1. **Section 2.3 Previous Site Investigations, 4.0 Sample Collection and Analysis: Section 4.1 Surface Water Sampling and 5.0 Investigation Results: 5.1 Surface Water Sampling**

On Page 3 of the QGSR, under Section 2.3 Previous Site Investigations, this paragraph appears:

> Five (5) surface water samples were collected from the Site on December 20, 2018 and were analyzed by EMSL Laboratories via U.S. Environmental Protection Agency (EPA) Method 100.2 (EPA 600/R-94/134) for asbestos fibers greater than or equal to (≥) 0.5 microns (µm), as well as for fibers >10 microns in length. The results indicated non-detectable results for NOA fibers >10 microns in length. The EPA Drinking Water Limit is 7 million fibers per liter (MFL) for fibers >10 microns in length.

This cites EPA Method 100.2 as the testing method and specifying fiber length down to 0.5µm as well as for fibers greater than 10 microns. The 0.5µm length appears to be in accordance with EPA Method 600-4-83-043 (100.1) so the December 20, 2018 sample testing appears to have been done according to EPA Method 100.1.

Then, on Page 10 of the QGSR, under Sample Collection and Analysis: Section 4.1 Surface Water Sampling, the following excerpt appears:

> The samples collected by EARTHRES were placed on ice and transmitted under chain-of-custody to RJ Lee Group, Inc., in Monroeville, Pennsylvania for analysis per EPA Method 100.2 600/R-94-134 for fibers >10µm in length with a minimum aspect ratio of 3:1. The water samples were further analyzed by the RJ Lee Group, Inc., per EPA Method 100.1 600/4-83-043 modified for fibers > 5µm in length with a minimum aspect ratio of 3:1. Sample results are provided on Table 1 in Appendix B. Laboratory sheets are included in Appendix F.

Please explain:

- Why RJ Lee Group, Inc. "modified" EPA Method 100.1 to count the 5µm length fibers as opposed to the protocol of 0.5µm length as specified in EPA Method 100.1.
- Why RJ Lee Group, Inc. did not use the same parameters (length, etc.) as EMSL used in its analysis and the impact that would have on the reported results.
- Why would the subsequent investigation of the surface water (per the QGSSP) begun on April 25, 2019 be performed to apparently less stringent parameters than the Previous Site Investigation?

2. **Section 3.0, Section 3.1, and Section 4.0:**

- How was the diabase determined to be York Haven Type?
- What site-specific observations were made to make the interpretation that the diabase is homogeneous as well as the lithology at the site in general?

3. **Section 4.0 Sample Collection and Analysis: Section 4.2 Aggregate Stockpile Sampling, Section 4.3 Rock Coring and Sampling, Section 4.5 Boulder Field mapping and Sampling, Section 4.6 Hand Sample Collection and Analysis. Also 5.0 Investigation Results: Section 5.2 Aggregate Stockpile Sampling Results, Section 5.3 Rock Coring and Sampling Results, Section 5.4 Boulder Field Sampling, Section 5.5 Hand Sample Results.**

On Page 15 of the QGSR, under Section 5.2 Aggregate Stockpile Sampling, the following passage appears: "The trace and confirmed detections of NOA are much lower than 1.0% federal limit[2] enforced by PADEP…."

The passage refers to a footnote 2 as follows: " [2](a) 40 CFR Part 763.83; (b) 40 CFR Part 61.141; and (c) 15 U.S. Code Chapter 53 Section 2642" which cites the Federal Regulations listing 1.0% as the Federal Limit for "Asbestos Containing Materials"

These regulations are consistent in citing the 1.0% as the Federal Limit for Asbestos Containing Materials. The regulations also cite or describe methods for the analysis of the material to determine the percentage of asbestos and the methods provide parameters (listing but not limited to length, thickness, aspect ratio, and numerous others) for determining an asbestos fiber.

- In the case of 40 CFR, Part 763. it provides two methods:
  - Under Subpart E, Appendix E: Polarized Light Microscopy (PLM)
    - Length > 5.0µm
    - Thickness > 0.25µm
    - Aspect Ratio > 3:1
  - Under Subpart E, Appendix A: Transmission Electron Microscopy (TEM)
    - Length > 0.5µm
    - Thickness > 0.4µm
    - Aspect Ratio > 5:1

- In the case of 40 CFR 61, it refers to the method 40 CFR 763. Subpart E, Appendix E:
  - Under Subpart E Appendix E: Polarized Light Microscopy (PLM)
    - Length > 5.0µm
    - Thickness > 0.25µm
    - Aspect Ratio > 3:1

- In the case of 15 USC, Chapter 53, Section 2642, it directs one to "Guidance for Controlling Asbestos-Containing Material in Buildings" (EPA 560/5-85-024) and the two following methods:
  - Under EPA 560/5-85-024 Appendix M, TEM (EPA provisional method [Yamate 1984])
    - Length > 0.5µm
    - Thickness > 0.02µm
    - Aspect Ratio > 3:1
  - Under EPA 560/5-85-024 Appendix M, PCM (NIOSH 7400)
    - Length > 5.0µm
    - Thickness > 0.25µm
    - Aspect Ratio > 3:1

For the initial analysis of the Aggregate Stockpile Samples, the Rock Coring Samples, the Boulder Field Samples and the Hand Samples, the analysis was conducted using EPA Method 600/R-93/116 which has the following parameters:

- Length > 5.0µm
- Thickness- usually < 0.5µm
- Aspect Ratios ranging from 20:1 to 100:1
- Two or more of the following:
  - Parallel fibers occurring in bundles,
  - Fiber bundles displaying splayed ends,
  - Matted masses of individual fibers, and/or
  - Fibers showing curvature

For the subsequent analysis, samples that showed trace concentrations of NOA asbestos in the initial analysis were analyzed using EPA Method 600/R-93/116 with Transmission Electron Microscopy (TEM) and it appears by inspection of the submitted data that the following parameters were used to identify if the fiber was asbestos:

- Length > 0.5µm
- Thickness < 0.5µm
- Aspect Ratios > 10:1
- Two or more of the following:
  - Parallel fibers occurring in bundles,
  - Fiber bundles displaying splayed ends,
  - Matted masses of individual fibers, and/or
  - Fibers showing curvature

Please Explain or Provide:

- Please verify the permitted acreage. Section 4.0 states the permitted area is 55 acres. Department records shows the permit acreage is 103.2 acres.

- Please explain why the 1.0% limit is the correct standard to use for Naturally Occurring Asbestos.

- Please explain why PLM was chosen as the approach for determining the amount of NOA at the Rock Hill Quarry?

- Regulations have been cited in the QGSR as sources for a definition of Asbestos Containing Material which has been also used to define a material containing Naturally Occurring Asbestos. These regulations also prescribe methods of analysis. Please explain why an analysis method (EPA 600/R-93/116) that counts as asbestos those fibers with an aspect ratio of >20:1 may be preferable to the methods cited in the regulations that count fibers as asbestos that have an aspect ratio of 3:1 or 5:1.

- Why would EPA Method 600/R-93/116 be used for analysis if it was not promulgated by the EPA, particularly if the regulations cited for the definition of Asbestos Containing Materials contain methods of analysis.

- Why EPA Method 600/R-93/116 is appropriate for analyzing for Naturally Occurring Asbestos when Federal Register, Volume 59, Number 146 (Monday, August 1, 1994) which introduced the method states the "approach should be considered" for use in analyzing (1) "Floor tiles..." and (2) "...hard wall and acoustical plaster, stucco or other similar multi-layered materials ...."

- By inspection of the submitted data for aggregate samples in the QGSR, it appears that a 10:1 aspect ratio was the governing parameter in determining if a structure was asbestos or a cleavage fragment as there is only one instance found that shows a 10:1 aspect ratio that was deemed asbestos. All other structures at 10:1 or less aspect ratios were deemed to be cleavage fragments or non-asbestos. Please explain why this is a logical assumption and consistent with the regulatory definitions cited in the QGSR. Secondly, if one was using EPA 600/R-93/116, which states an aspect ratio of 20:1 should be used, why was a 10:1 ratio apparently used?

- Please explain why drilling and sampling for asbestos was not proposed in other locations in the quarry, and explain what consideration is being given to the question of whether avoiding asbestos entirely would be easier and safer than mitigating its effects.

- Please explain the significance, in terms of protecting human health and safety, of the presence of asbestos fibers in water at the site. Citing drinking water standards seems irrelevant since none of the onsite water is proposed for human consumption.

- On what basis is the asbestos detection in DB-1 anomalous? What field observations, beyond visual, were used to make this determination? The literature cited is general in nature and was not addressing NOA. (Core Sampling Results, Section 6.2)

- Please explain how the vein volume assessment is an overestimate when mineralized veins are ubiquitous at the site. Proposed mining would presumably encounter all the veins.

- The Department inquired about the goals of the drilling program prior to its approval. EarthRes replied, "*The goal of the drilling program is to further evaluate the presence or absence of trace amounts of naturally occurring asbestos (NOA) in the rock to be mined. Success will be determined through laboratory analysis for NOA in the mineral vein samples identified in the cores as specified in the work plan.*" Typically drilling results are compared with mapping results and an evaluation is made regarding whether there is a need for more data collection. In this case it appears that drilling data does not match the limited mapping. Estimates of mineralized veins, based on drilling data (Section 4.4), were made about the volume of veins and the NOA within them. However, the drill core logs do not appear to intersect veins that are mapped. As mentioned above, veins at the site are ubiquitous, although comparatively few were logged. It appears that using drill core data, the volume of veins, and therefore the volume of NOA, are underestimated.

- Asbestos concentrations from the samples collected by the Department are in some cases different than those collected by EarthRes. In light of the comments above noting apparent discrepancies between asbestos definitions and laboratory reporting, please re-evaluate the asbestos concentrations as appropriate. (Core Vein Volume Assessment, Section 6.2)

- Please explain, in detail, how EarthRes determined that, "it is indicated that the CB-1 #1 sample is from mineral Vein #7" (Section 5.5). Visually, they appear dissimilar. The drill log describes voids, but the Bench Face Mapping Data does not mention voids. The Bench Face Mapping table states that Vein #7 is approximately 8 inches wide. Intersecting the vein (via drilling) at an angle, with respect to both the vertical and horizontal axes, will result in the vein appearing longer in the drill core. The photos provided do not show a vein of actinolite greater than 8 inches. Based on the Geologic Features and Boring Location Plan, two or three other veins (Nos. 1, 3, and 4) should have been intersected before Vein #7. These veins were not correlated in the drill logs. Looking at the bench face photographs, it would appear that more than 19.9' (the sample depth of CB-1 #1) horizontal feet exists between Vein #7, and vein 1, 3, and 4. Properly orienting the core and surveying the bore hole would reduce uncertainty.

- What is the expected annual production of aggregate from the quarry? What is the total tonnage of aggregate planned for mining at the quarry?

- The noncoal regulations require complete and accurate characterization of the geology and hydrology of the area proposed for mining. Every effort should be made to fully characterize the amount, type and locations of asbestos at the Rock Hill quarry.

In order to comprehensively address comments regarding the analytical testing at the Rock Hill Quarry, Hanson has requested, and the Department granted, additional time to address the additional sampling and analysis requirements detailed in the Department's September 20, 2019 letter. All required sampling, analysis and reporting from both this letter and the September 20, 2019 letter are due April 6, 2020. Samples should be analyzed for NOA in a manner that thoroughly and comprehensively identifies the amount of NOA at the quarry and is congruent with the regulatory definitions of asbestos as described in the QGSR.

If you have any questions, please feel free to contact our office.

Sincerely,

Michael Kutney, P.G.
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