pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

October 21, 2021

Mr. Andrew Gutshall P.G.
Hanson Aggregates PA, LLC
7600 Imperial Way
Allentown, PA 18195

Re: DEP Comments on Elevated Review Technical Deficiencies
SMP Application No. 7974SM1C10
Rock Hill Quarry Operation
East Rock Hill Township, Bucks County

Dear Mr. Gutshall:

The Department of Environmental Protection (DEP) has received your July 6, 2021 response to the April 12, 2021 technical deficiency letter and has the following comments on the responses and submissions therein.

In preparation of this comment letter, we have restated the original technical deficiency questions, Hanson's response along with pertinent excerpts from referenced documents and DEP's comments on Hanson's response.

Technical Deficiency 4:

4. Module 10.1: Equipment and Operation Plan: "Annual Removal of 500 tons.": §77.452, §77.455, §77.404(5)

According to sampling results provided by Hanson in their August 14, 2020, Additional Sample Analysis report, seven (7) of the sixteen (16) aggregate samples showed results ranging from 0.11% to 0.52% by weight using ISO10312, 2019-10, Annex C counting rules. Considering the limited data provided by the sample set, please explain:

Hanson Response: As an initial matter, we note that PADEP's reference to results ranging from 0.11% to 0.52% is misleading in that it combines results from the RJLG August 14, 2020, report Tables 4 and 5, and therefore overstates the quantity of asbestos. PADEP appears to be referring to all amphibole particles observed during the analyses, not just asbestos. Two of the samples had no amphibole detected (less than 2.7x10-6 %) and five of the samples had concentrations less than 0.11%.

If only asbestiform fibers are included in the quantification, the results range from none detected in seven samples to 0.23% (Table 4) or 0.14% (Table 5). To infer that the total asbestos content is 0.11% to 0.52% is not an accurate reflection of the materials analyzed or the information provided in the report. ***ISO 10312 states explicitly that it cannot differentiate asbestiform from non-asbestiform morphologies of the amphiboles in fibers collected from an air sample.*** *(Emphasis added)*

Therefore, to use this method to quantify asbestos in a bulk material and ignore the asbestiform morphology required in the definition of asbestos will result in an overestimate of the asbestos content.

DEP Response: Please provide the "explicit" statement in ISO 10312 that you refer to in the above italicized and bolded passage in your response.

Technical Deficiency 4.c.

4 c.: ***Explain how receivers of the aggregate will be advised of the asbestos content of the aggregate and precautions they will be required to take concerning the use of the aggregate.***

Hanson Response: The OSHA and MSHA Hazard Communication Standards require product warnings that meet their specifications. This is normally conveyed in safety data sheets and weigh ticket warnings. The Quarry will comply with all OSHA and MSHA warning regulations.

DEP Response: Please provide the material safety data sheet that you intend to use to comply with the OSHA and MSHA Hazard Communication Standards.

Technical Deficiency 5.b.

5. Module 10.1: Equipment and Operation Plan: "Non-Scheduled Site Maintenance" §77.452, §77.455

b. Please explain why air monitoring is excluded for dry aggregate or earthen material disturbance activities lasting less than 4 hours.

Hanson Response: Hanson has updated its approach to air monitoring for disturbance activities. As discussed in Section 1 of Hanson's Asbestos Monitoring and Mitigation Plan, prior to the initial 500-ton removal operation, five sets of eight perimeter air samples will be collected on five separate days during idle or low activity to establish the ambient baseline concentrations. Air samples will be collected during the entirety of any 500-ton removal event regardless of whether it lasts less than 4 hours. In subsequent years, Hanson will perform two (2) sampling events (2 separate sets of 8 samples) in conjunction with 500-ton removal operations – one prior to removal and one during.

DEP Response: Please include the following sampling in your air monitoring for disturbance activities:

1. Please develop, submit to DEP for approval and execute an activity-based sampling program to gain an understanding asbestos exposure at low levels of activity (driving vehicles onsite, moving piles, etc.) in order to demonstrate that removal should not cause NOA fiber migration.

2. DEP requires a 24-hour lab analysis turnaround for samples taken during active operations at the Rock Hill Quarry.

6. Module 10.7: Identification of Toxic Materials §77.452, §77.404

a. ***Please explain the response of N/A to this module, particularly since NOA, a toxic substance, has been found to exist in the rock at the Rock Hill Quarry.***

Hanson Response: Hanson will identify and handle NOA encountered during its quarry operations in accordance with Hanson's Asbestos Monitoring and Mitigation Plan and Mineral Identification and Management Guide. Hanson will update Module 10 accordingly once agreement is reached with PADEP on the information to be included herein. Hanson previously responded with "N/A" because it will be treating all aggregate at Rock Hill Quarry as if it contains NOA and so there will be no "special" handling procedures other than what is set forth in Hanson's Asbestos Monitoring and Mitigation Plan and Mineral Identification and Management Guide.

DEP Response: Hanson states above that "it will be treating all aggregate (and by extension, the diabase from which the aggregate is produced) at the Rock Hill Quarry as if it contains NOA".

Please explain why the corrective action level described in the AMMP for improving or modifying dust controlling best management practices can be determined by excluding a portion of the "counted" elongate mineral particles based on selected asbestiform properties.

Technical Deficiency 6.b.

6.b. Please describe in detail the procedures that will be employed in identification of NOA. The asbestos fiber structure counting criteria should be in concert with the structure counting criteria expressed in ISO 10312, 2019-10, Annex C.

Hanson Response: Hanson will identify and handle NOA encountered during its quarry operations in accordance with Hanson's Asbestos Monitoring and Mitigation Plan and Mineral Identification and Management Guide.

The procedures employed to identify NOA or EMP collected from air samples will follow the relevant portions of ISO 10312 that relate to fiber identification using energy dispersive x-ray spectroscopy and selected area electron diffraction. If further analysis of bulk materials is to be performed, the analysis will be conducted in a manner similar to prior analysis of bulk materials performed by RJLG in 2019 and 2020. This will include a combination of PLM and TEM analyses to identify and quantify any NOA or EMP present in the materials. PLM methodology will follow USEPA method 600/R-93/116 or ISO 22262-1. TEM methodology will follow ISO 10312, as modified by EPA OSWER directive modified to determine the mass percentage of asbestos in the analyzed samples. The modification will incorporate relevant portions for the mass determination outlined in ISO 22262-2. Where this data is not consistent with the six regulated asbestos minerals, the fibers will be identified to the best of the laboratory's ability and reported as "Other EMP." Optionally, powder x-ray diffraction (XRD) could be implemented to assist in the determination of the presence of amphibole minerals as well as other minerals in bulk samples submitted for analysis according to USEPA method 600/R-93/116 or ISO 22262-3.

DEP Response: Title 25, § 77.455. Air pollution control plan states:

"The description shall include an air pollution control plan which includes the following:

(1) A plan for fugitive dust control practices, as required under § 77.575 (relating to air resources protection), and if applicable, how the requirements of Chapters 123 and 127 (relating to standards for contaminants; and construction, modification, reactivation and operation of sources) will be met.

(2) If requested by the Department, an air quality control monitoring program to provide sufficient data to evaluate the effectiveness of the air pollution control plan."

In the Asbestos Monitoring and Mitigation Plan (AMMP), Section 3.4, Analytical Methods is this passage: "If any TEM method of asbestos analysis confirms asbestos fiber concentrations in excess of 0.01 fiber/cc in any sample, then the reporting and corrective action requirements set forth in Section 3.6 are triggered. For the purposes of determining whether corrective action is necessary, this analysis will only count asbestos fibers that exceed 5 micrometers in length."

DEP directs that the method of counting fibers that shall be employed is expressed as the first scheme underlined below counting U.S. regulatory asbestos minerals and their non-asbestos mineral analog EMPs with the intent that this is the standard that shall be used when determining if corrective actions are needed to improve dust controlling Best Management Practices.

> *Fiber Measurement and Identification:*
>
> *Under the ISO method, two specific counting schemes are detailed. The first scheme is more general and allows for the counting of fibers that are 0.5 µm in length or greater and have aspect ratios of 5:1 or greater. In routine practice, TEM is able to resolve fibers down to approximately 0.1 µm in width, as compared to the resolution for routine PCM (0.25 µm). Therefore, short thin fibers that would not be detected using PCM will be detected using TEM under the general counting scheme. EPA recommends modification of the aspect ratio to 3:1 for this counting scheme.*
>
> *The other counting scheme allows for the counting of PCM equivalent fibers, or PCMe. Under this scheme, the analyst is to count fibers that are longer than 5 µm in length with aspect ratios of 3:1 or greater. PCMe fibers and structures under the ISO method also have a defined width range of between 0.2 µm and 3.0 µm. (Note that EPA recommends a width range between 0.25 µm and 3.00 µm, as recommended by World Health Organization [WHO, 1986].) The purpose of counting fibers as PCMe fibers is that the method is attempting to mimic the size fraction of fibers that would be detected if the sample were being run under PCM.*

Technical Deficiency 7.b.

7. b. Please describe in detail the procedures that will be employed in the handling of NOA including NOA containing rock and/or soil. The asbestos fiber structure counting criteria should be in concert with the structure counting criteria expressed in ISO 10312, 2019- 10, Annex C.

Hanson Response: Hanson will identify and handle NOA encountered during its quarry operations in accordance with Hanson's Asbestos Monitoring and Mitigation Plan and Mineral Identification and Management Guide.

Trace quantities of asbestiform actinolite-tremolite have been found at the Rock Hill Quarry. For the purposes of developing Hanson's plans, Hanson assumes that all rock and soil at the quarry will have trace levels of these asbestiform minerals present unless tested and shown not to contain detectable asbestos. With this assumption, all handling of rock and soil at the quarry, will be performed with:

- Dust suppression using water trucks, sprinklers, and/or stationary water sprays.
- Water sprays will be located at transfer points so the rock being processed will be continually wet.
- Loads being adequately wetted or otherwise controlled before and during truck loading operations.
- Unpaved roads being sprayed with a water truck.
- Posted speed limits within the Quarry being limited.
- Daily inspection for material tracked onto public roads and, regular cleaning of the roadway but, no later than the end of each workday, if necessary.
- Trucks transporting product off-site being covered with tarps or other devices.
- Paving of quarry entrance/exit to the public roadway.
- A state-of-the-art street sweeper with a broom system and water sprays used for paved traffic surfaces.
- Roads resurfaced/regraded as needed to maintain a safe working surface and thereby reduce dust generation.
- Air pollution control equipment being operated according to PADEP performance standards coupled with work practices, inspection, and source monitoring.
- Ensuring that material being excavated, crushed, screened, loaded, transferred, or conveyed does not result in visible dust emissions exceeding 40 CFR Part 60, Subpart OOO limits for applicable sources.
- Drill rigs with on-board dust collection and/or sprays to limit dust generation.
- Drill shrouds utilized at the ground level to control fugitive emissions from drilling activities.
- Responsible employees trained to conduct visual observations for fugitive emissions as well as opacity readings on emission sources to ensure they are operating properly.
- Preventative maintenance of dust control equipment to ensure timely replacement or repair of defective components.

DEP Response: Please provide the destination and use of the 500 tons per year and if it will be crushed upon arrival at its destination. If the ultimate use of the 500 tons includes further crushing in its use, monitoring of that site for asbestos will be required.

Technical Deficiency 9.a.iv.

9.a. iv. Please include provisions ensuring that street sweepers are only operated with sufficient water and dust suppression controls to prevent them from being a source of dust emissions.

Hanson Response: Hanson has incorporated this requirement into section 6.2 of its Asbestos Monitoring and Mitigation Plan.

> **Hanson referenced, Section 6.2, AMMP, Vehicle Traffic: Cited for Clarity**
>
> Hanson will utilize a dedicated street sweeper to clean paved plant roads and public roadways near site entrances as needed. Hanson's street sweeper is a state-of-the-art sweeper utilizing a broom system and water sprays to collect debris while minimizing dust generation. Hanson will maintain a log of the time and day when the street sweeper is used.
>
> Site entrance is paved to reduce tracking and improve sweeping efficiency.
>
> When operating, Hanson will conduct a daily visual inspection for material tracked onto public roads. If material has accumulated on a public road, Hanson will clean the road promptly or, at minimum, by the end of the workday. During full quarry operations, one camera will be installed to monitor the entrance of the quarry to allow the operator to observe any accumulated material.
>
> Hanson will install a truck wash utilizing spray nozzles and pressurized water to remove loose or dusty material from loaded trucks leaving the site through the main gate.
>
> All trucks transporting materials off-site will be covered with tarps or other devices.
>
> Hanson operates and maintains a minimum of one truck equipped with water sprays to control dust from roadways.
>
> A water truck will be equipped with a water cannon to spray hard-to-reach areas of stockpiles during times of need.
>
> Posted vehicle speed limits on haul roads in quarry and stockpile areas to no more than 15 miles per hour

DEP Response: Please add provisions that the street sweeper will only operate with sufficient water and dust controls to prevent the street sweeper from becoming a source of dust emissions.

Please add provisions that the street sweeper will follow a schedule such as once per hour, four times per day.

Technical Deficiency 9.a.v

9.a.v. DEP requests that a commercial wash station be installed at a sufficient distance from the exit so that vehicles can be cleaned to prevent deposition of material off-site. This should be used by all vehicles leaving the site.

Hanson Response: Hanson has incorporated this requirement into section 6.2 of its Asbestos Monitoring and Mitigation Plan.

DEP Response: Please add the provision that the use of the truck wash <u>will</u> be required for all vehicles leaving the site.

Technical Deficiency 9.a.vii:

9.a.vii. Existing moisture level of aggregate piles and roads may not always be sufficient to control emissions. Please include provisions indicating that you will add moisture to roads, product stockpiles, soil, or other on-site material, as needed to control dust, prior to disturbing said material and during times when no activity is occurring on-site.

Hanson Response: Hanson has incorporated this requirement into section 6.2 of its Asbestos Monitoring and Mitigation Plan.

Hanson Referenced: Section 6.2, AMMP: Stockpiles and material handling:

Limit the size and disturbance of stockpiles to the minimums necessary.

Storage piles will be wetted using water sprays as necessary to control emissions. Stock and working piles will be adequately wetted or controlled using dust palliatives or suppressants, wind berms, or breaks during the addition and removal of material.

Hanson *may* occasionally apply surface binders to stockpiles of fines in order to control particulate emissions from areas that will be temporarily inactive and may be subject to wind erosion. *(Emphasis added)*

Hanson *may* wet materials to be handled prior to loading tucks. The drop height will be minimized as safety permits. Trucks will be loaded on the leeward side of the storage pile. The facility will install a wind-sock to easily identify wind direction. *(Emphasis added)*

Dust will be controlled with wet sprays and/or dust collection systems in accordance with best available technology requirements on all conveyors/transfer points.

Hanson will ensure that material being excavated, crushed, screened, loaded, transferred, or conveyed does not result in visible dust emissions exceeding 40 CFR Part 60, Subpart OOO limits for applicable sources.

Overburden will be wetted (if necessary) prior to movement or handling to minimize dust generation.

Wooded buffers and/or vegetated earthen berms surround the quarry. These buffers and berms within Hanson's control will remain in place for the life of the mining operation.

All efforts are to be made to limit stripping of overburden to the spring and winter months, and/or timed to be during or soon after precipitation events, when soil conditions are not conducive for the generation of large amounts of dust.

Mining activities are primarily within a pit surrounded by mining faces with the majority of rock disturbance occurring at the bottom of the faces. The overlying benches and perimeter faces help screen the quarrying activity from wind, thereby reducing wind velocity and associated dust generation. The pit design also helps to confine dust within the quarry.

The stone has a natural moisture content that helps bind finer particles together and minimizes the generation of dust.

DEP Response: Please include provisions that Hanson will add moisture to roads, product stockpiles, soil, or other on-site material, as needed to control dust, prior to disturbing said material and during times when no activity is occurring on-site.

Technical Deficiency 9.a.viii:

9.a.viii.: Please include additional provisions for dust control measures during loading of trucks, such as water sprays during loading, use of directed fog cannons, etc.

Hanson Response: Hanson has incorporated this requirement into section 6.2 of its Asbestos Monitoring and Mitigation Plan. (see above)

DEP Response: Please include provisions that Hanson will add surface binders to stockpiles of fines as needed.

Please include provisions that Hanson will add moisture to materials prior to loading on trucks as needed.

Technical Deficiency 9.a.x.:

9.a.x.: During any 500 ton removal activities, ensure that the air samples are delivered to the laboratory for analysis after each workday and the sample results have a 24-hour turnaround time from the laboratory.

Hanson Response: See Sections 3.4 and 3.5 of Hanson's Asbestos Monitoring and Mitigation Plan. Hanson will have samples analyzed on an expedited basis during removal activities. Samples collected during full quarry operations will be analyzed based on a standard 10-business day turnaround time. For samples collected during 500-ton removal activities, Hanson will request that the laboratory be analyzed on an expedited basis. When possible, results will be provided from the laboratory to Hanson within five business days of sample receipt. When expedited turnaround of results is not possible, results will be provided from the laboratory to Hanson as quickly as possible.

> **Hanson Reference: Excerpt Section 3.4, AMMP addressing turnaround.**
>
> Samples collected during full quarry operations will be analyzed based on standard 10 business day turnaround time. Samples collected during 500-ton removal activities will be requested to be analyzed on an expedited basis. When possible, results will be provided from the laboratory to Hanson within five business days of sample receipt. When expedited turnaround of results is not possible, results should be provided from the laboratory to Hanson as quickly as is possible.
>
> **Excerpt Section 3.5, AMMP addressing reporting:**
>
> Analytical reports provided to Hanson by the analytical laboratory will be sent to PADEP via email within 24 hours of receipt, whenever possible, but no later than 48 hours of receipt.

DEP Response: DEP has stated previously the requirement is a 24-hour turnaround time on analysis of samples.

Technical Deficiency 9.a.xi.:

9.a.xi.: Please clearly indicate that sampling during 500 ton removal events will take place while material is being handled and moved regardless of any 4-hour time constraint.

Hanson Response: Hanson has updated its Asbestos Monitoring and Mitigation Plan to provide that Hanson will conduct sampling in advance of and during the entirety of any 500-ton removal event. See Section 3.2 of Hanson's Asbestos Monitoring and Mitigation Plan.

Hanson Reference: Excerpt Section 3.3 cited below

Section 3.3 Sampling Frequency, AMMP

During periods of full quarry operation, perimeter monitoring samples will be collected on a bimonthly basis. Bimonthly Samples will be collected for an initial 6-month period of full quarry operations. Although daily hours of operation may vary, sampling events will coincide with times the aggregate processing equipment is operating and will not be conducted on closed days except to perform ambient or low activity sampling as described below. Samples will also be collected during blasting activities.

After the initial six-month period of full quarry operations, Hanson may request permission from PADEP to decrease the frequency of sampling or to cease asbestos air monitoring, provided that airborne asbestos fiber levels are consistently less than the corrective action threshold of 0.01 f/cc as determined pursuant to Section 3.4. Hanson shall keep a log of quarry activities that occur during each sampling event.

500 Ton Removal Operations

Due to the infrequent nature of any 500-ton removal events planned for the site, samples will be collected during the following instances:

1. During the entirety of the 500-ton removal activity; and

2. In the initial year of operation, five (5) separate events during idle or low activity conditions prior to the planned activity and that will be used to establish that the ambient asbestos concentrations are less than the action level (0.01 f/cc).

3. Following the initial year, one (1) sampling event during idle or low activity conditions prior to planned activity and that will be used to establish that the ambient asbestos concentrations are less than that action level (0.01 f/cc).

The actual day on which the samples are collected can vary to minimize the possibility of precipitation, which could affect the overall airborne particulates.

Background sampling will be conducted prior to the initial year of operation on five (5) separate occasions. The sampling will be conducted every two weeks, unless weather dictates otherwise, and shall avoid precipitation events that could adversely impact data collection. In subsequent years, Hanson will perform one (1) round of sampling prior to operation. Hanson or its designated contractor will notify PADEP at least five (5) working days prior to initiating each air sampling

event conducted pursuant to this Plan so that PADEP representatives have an opportunity to collect samples at the same locations during the same time period.

DEP Response: The proposed sampling program frequency is inadequate, please commit to the following:

a. Develop, submit to DEP for approval and execute an activity-based sampling program to gain an understanding asbestos exposure at low levels of activity and demonstrate that removal should not cause U.S. regulatory asbestos minerals and their non-asbestos mineral analog EMP migration. This must be done before 500-ton removal can be approved.

b. Develop, submit to DEP for approval, and commit to execute a daily sampling program to be implemented in a stepped-up basis as each quarry activity begins should full quarrying activity be approved.

c. Commit to daily sampling for at least the first month of quarry operation during full quarry operations.

Commit to twice weekly sampling for six months after the daily sampling shows no migration of U.S. regulatory asbestos minerals and their non-asbestos mineral analog EMPs from the Rock Hill Quarry site.

Technical Deficiency 9.a.xiv.:

9.a.xiv.: ***Please provide specific engineering detail(s) on all devices planned to be used for dust suppression specific to each operational application including rates of application.***

Hanson Response: In accordance with Hanson's Asbestos Monitoring and Mitigation Plan, all dust suppression equipment will be verified to be on-site and in usable condition prior to commencement of any quarrying activity. Under the limited 500-ton operation, Hanson will use portable equipment to mitigate and suppress any dust potentially generated during quarry activities.

DEP Response: Please provide specific engineering details of all dust suppression equipment including:

- Mobile, stationary or both
- Wheel washing facilities
- Scheduling and/or sequence of operations

Technical Deficiency 9.b.i.:

9.b.: Attachment 4(b)(ii) Draft Air Monitoring Plan - General DEP Comments on Analytical Procedures: §77.455, §77.130

9.b.i.: Please explain the reference to the 5 micrometers in length in the definition of asbestos fiber. The definition of an asbestos fiber should be consistent with the counting methodology

as found in ISO 10312-2019-10 "Ambient Air - Determination of Asbestos Fibers - Direct Transfer Transmission Electron Microscopy Method", as modified in Appendix C, Page C-3: Fiber Measurement and Identification detailed in "OSWER Directive #9200.0-68, September 2008, Framework for Investigating Asbestos-Contaminated Superfund Sites"

Hanson Response: Hanson will identify and handle NOA encountered during its quarry operations in accordance with Hanson's Asbestos Monitoring and Mitigation Plan and Mineral Identification and Management Guide. Using fibers >5.0 μm long is consistent with OSHA and MSHA permissible exposure limit measurements and provides a comparison to known exposure and risk assessment studies. Additionally, fibers >5.0 μm are used by EPA IRIS to determine acceptable risk levels based on asbestos exposure. While 0.5 μm minimum fiber lengths will be included in data collection, action levels should be based on sound risk assessment science, which rely on fibers longer than >5.0 μm to determine asbestos disease risk. In 1986, OSHA promulgated an occupational airborne asbestos standard after conducting a quantitative risk assessment using a number of epidemiological studies of workers exposed to asbestos in a variety of work environments (OSHA, 1986).4 This risk standard was based on asbestos fibers measured by phase contrast microscopy (PCM) that were longer than 5 micrometers (μm), had length to width aspect ratios of 3:1 or greater, and were wider than 0.25 μm. The standard permissible exposure limit (PEL) was set at 0.2 fibers per cubic centimeter of air (f/cc). This was reduced to 0.1 f/cc in 1994 and is the current PEL (OSHA, 1994). MSHA later adopted this PEL in 2008 (MSHA, 2008).5 The National Institute for Occupational Safety and Health (NIOSH) uses this fiber dimension for its asbestos fiber analytical methods both PCM and Transmission Electron Microscopy (TEM) (NIOSH, 2019; NIOSH, 1994).6 EPA, through its Integrated Risk Information System (IRIS) also uses the same PCM fiber dimensions to determine risk (EPA, 1988).7 Even the EPA's OSWER Directive #9200.0-68, September 2008, Framework for Investigating Asbestos-Contaminated Superfund Sites recognizes that asbestos fibers longer than 5 μm with aspect ratios of 3:1 and greater, are the fibers that need to be assessed to determine asbestos risk (EPA, 2008)[8]:

> "For risk calculations, the inhalation unit risk for asbestos was derived for PCM measurements, and IRIS includes a statement that it should not be applied directly to any other analytical techniques. However, the IRIS summary also acknowledges that use of PCM alone in environments which may contain other fibers may not be adequate (EPA 1988). Therefore, methods for counting PCM-equivalent (PCMe) structures have been designed so that fiber counts made with the two techniques (PCM and TEM) would be approximately equal. EPA recognizes there is some uncertainty associated with using PCMe fiber counts to calculate risk with the inhalation unit risk, but the amount of uncertainty is thought to be relatively small compared to other sources. Alternatively, the use of PCM in environments where other mineral or organic fibers are present is likely to contribute a much larger source of uncertainty. Thus, TEM is preferred to PCM for characterization of environmental exposures."

The use of TEM for analysis of environmental particulate, that could include shorter and/or thinner fibers in the collected data, does not change the fact that the risk assessment data are based on PCM fibers. There is considerable scientific consensus that fibers less than 5 μm in length are of insignificant importance as it pertains to being a cancer health hazard (Hodgson and

Darnton, 2000; Eastern Research Group, 2003; EPA, 2003; Doll, 1989; Davis et al, 1986; Moalli, 1987; Barlow et al, 2018; OSHA, 1992).[9] Most background ambient asbestos fibers are less than 5 μm in length (Lee and Van Orden, 2008).[10] These asbestos fibers have been in the environment since the beginning of time and people everywhere are exposed to these fibers every day, with every breath.

An elongate mineral particle's (EMP) length affects its ability to be deposited in the lungs and biopersist (ATSDR, 2001).[11] Longer EMPs that are sufficiently narrow are more likely to be deposited in the lower airways after being inhaled, from which they are not readily cleared by the lungs' natural processes (Craighead, 2008; ATSDR, 2001; Bernstein and Hoskins, 2006; Coin et al., 1992; Bernstein and Pavlisko, 2017).[12] In contrast, shorter EMPs are less likely to be deposited in the lower airways and more readily engulfed and digested by large white blood cells called macrophages during the phagocytosis process, thus allowing them to be cleared from the lungs more easily (Bernstein and Pavlisko, 2017).[13] NIOSH (2011) indicated that EMPs < 5 μm in length did not contribute to lung cancer risk.[14] Based on existing animal and human studies, Roggli (2015) concluded that "there is no convincing evidence for a pathogenic effect for [asbestos] fibers that are 5 μm or less in length."[15] The scientific consensus following the Monticello Conference on EMPs also supported the conclusion that asbestos fibers ≤ 5 μm pose insignificant risk for asbestos-related cancer (Mossman, 2018; Chatfield, 2018; Weill, 2018)[16]. Occupational epidemiology studies of cancer and mesothelioma risk, and subsequent regulatory exposure limits derived using these studies, are all based on measurements of asbestos fibers that are longer than 5 μm (Chatfield, 2018).

DEP Response: One purpose of the air monitoring program is to assure that the Best Management Practices employed in controlling and preventing the migration of elongate mineral particles that may contain asbestos fibers are effective by using the information gained from that air monitoring program to initiate corrective action.

Please explain how dust controlling Best Management Practices can be judged effective if one is judging that efficacy based on the appearance of specifically defined asbestiform fibers which may only be a part of the entire spectrum of U.S. regulatory asbestos minerals and their non-asbestos mineral analog EMPs.

Technical Deficiency 9.b.iv:

9.b.iv.: DEP believes that the appropriate methodology for analyzing samples in this situation is ISO 10312-2019-10 "Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Electron Microscopy Method", as modified in Appendix C, Page C-3: Fiber Measurement and Identification detailed in EPA's "OSWER Directive #9200.0-68, September 2008, Framework For Investigating Asbestos-Contaminated Superfund Sites". If Hanson wishes to do concurrent sampling to demonstrate the efficacy of other analysis methods for this site, then that may be proposed.

Hanson Response: This requirement has been incorporated into Section 3.4 of Hanson's Asbestos Monitoring and Mitigation Plan.

Hanson Reference: Section 3.4 Analytical Methods, AMMP

The analytical methods and laboratory analysis for asbestos in air analysis to be utilized as part of this plan shall be those described in ISO 10312-2019-10 "Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Electron Microscopy Method", as modified by Page C-3 of EPA's "OSWER Directive #9200.0-68, September 2008, Framework for Investigating
Asbestos-Contaminated Superfund Sites", which states that "*Under the ISO method, two specific counting schemes are detailed. The first scheme is more general and allows for the counting of fibers that are 0.5 μm in length or greater and have aspect ratios of 5:1 or greater. In routine practice, TEM is able to resolve fibers down to approximately 0.1 μm in width, as compared to the*
resolution for routine PCM (0.25 μm). Therefore, short thin fibers that would not be detected using
PCM will be detected using TEM under the general counting scheme. EPA recommends modification of the aspect ratio to 3:1 for this counting scheme."

Although the above methods must be used for all air samples, Hanson may, at its discretion, concurrently analyze air samples using alternative methods as follows, in order to compare the results of the methods. The allowable alternative methods which may be used for comparison shall include PCM in accordance with either the Occupational Safety & Health Administration (OSHA) Method ID-160 (see 29 C.F.R. 1910.1001, Appendix B) or the National Institute for Occupational Safety and Health (NIOSH) Manual for Analytical Methods (NMAM), Method 7400,
Asbestos and other Fibers by PCM. These PCM methods are used to count all visible fibers, including non-asbestos fibers, that are longer than 5 μm with a 3:1 aspect ratio or greater.

If PCM analysis detects potential fiber concentrations in excess of 0.01 fiber/cc, then NIOSH Method 7402, Asbestos by TEM, shall be employed to ascertain the mineralogy of the fibers in the sample. TEM analysis is used to identify and differentiate asbestos fibers from non-asbestos fibers.

If Hanson chooses to do comparative analyses with PCM/TEM NIOSH 7402, and if Hanson after a
period of three years of such analyses, concludes that the results of these analyses do not significantly differ from the results of the required ISO 10312 sampling, Hanson may petition DEP
to discontinue the ISO 10312 analyses in favor of PCM/TEM NIOSH 7402 analyses.

During the analysis of air samples by TEM, sufficient filter area will be analyzed to achieve a reporting limit (i.e., analytical sensitivity) of 0.005 f/cc or lower.

If any TEM method of asbestos analysis confirms asbestos fiber concentrations in excess of 0.01 fiber/cc in any sample, then the reporting and corrective action requirements set forth in Section 3.6 are triggered. For the purposes of determining whether corrective action is necessary, this analysis will only count asbestos fibers that exceed 5 micrometers in length.

In the unlikely event that any air sampling filters are determined to be overloaded with particulate and cannot be read by ISO 10312, Hanson shall report this to DEP within 7 days of the determination, and shall propose corrective action of re-analyzing the filters using ISO 13794 (as

modified by Page C-3 of EPA's OSWER Directive #9200.0-68, described above). During full quarry
operations, resampling may be possible. Due to the infrequent nature of 500 ton removal activity resampling may not be feasible. Hanson will coordinate with DEP in the event that air sampling filters are determined to be overloaded with particulate following 500 Ton Removal Operations

DEP Response: DEP disagrees with the above underlined and italicized statement. Please explain how dust controlling Best Management Practices can be judged effective if one is judging that efficacy based on the appearance of specifically defined asbestiform fibers which may only be a part of the entire spectrum of U.S. regulatory asbestos minerals and their non-asbestos mineral analog EMPs.

Technical Deficiency 9.b.v.

9.b.v.: Please provide detailed laboratory standard operating procedures (SOPs) that will be used to prepare samples, analyze samples, and calculate results.

Hanson Response: All SOPs are based on published methods that are publicly available. Laboratory standard operating procedures are considered confidential and proprietary. However, Hanson will make accommodations for PADEP to review these procedure documents with any laboratory, to the extent possible, upon request by PADEP.

DEP Response: Please make the accommodations for the DEP to review these procedural documents.

Technical Deficiency 9.c.x.:

Item 9 c. x. Please define an action level for asbestos sample results. Based on previous discussions it is suggested that this be 0.01 fibers/cubic centimeter (f/cc).

Hanson Response: Hanson has incorporated this requirement into Section 3.6 of Hanson's Asbestos Monitoring and Mitigation Plan. Hanson has incorporated an action level of 0.01 f/cc, as requested by PADEP, but for the purposes of determining whether corrective action is necessary, Hanson will only consider and count asbestos fibers that exceed 5 micrometers in length. Hanson reserves the right to petition PADEP to modify this action level pending the generation and review of additional site data. When analyzing a sample by TEM for ambient asbestos concentration, the analyst will either count 100 fibers or 100 grid openings, whichever comes first. Since there are many more short fibers than long fibers, there is a significant possibility that 100 short fibers would be counted, and the analysis stopped before a significant number of long fibers (>5 μm) would be counted. By reducing the area analyzed based on the numerical concentration of the shorter fibers, the sensitivity of the analysis for the longer fibers is decreased. The result would be an analysis that is biased toward fibers that are not associated with health risk at the expense of fibers that are known to be related to risk (Chatfield, 2018). The results are then unusable for comparison to studies performed using PCM that are the foundation of the risk assessment science and unnecessarily confound the interpretation of the findings. Performing the analysis in this way additionally has the effect of diluting the calculated concentration of those fibers (>5 μm) that pose the greatest risk to human health.

DEP Response: As a general observation, the samplings and analyses of the Rock Hill Quarry site using numerous testing methods and protocols has shown that asbestos fibers and amphibole cleavage fragments can be found at the Rock Hill Quarry site in varying concentrations. These concentrations vary depending on the location, material sampled, thickness and quantity of the actinolite veining and the diabase rock itself within the diabase on the quarry property.

The limited petrographic analysis of a few samples has shown the presence of asbestos fibers within the diabase matrix itself. The limited sampling of the prepared aggregate shows both asbestos fibers and amphibole cleavage fragments. The limited sampling of the overburden has shown both the presence of asbestos fibers and amphibole cleavage fragments and the limited background sampling of the air to date has shown the presence of amphibole cleavage fragments.

Hanson has committed to "counting" both asbestiform fibers and actinolite cleavage fragments in their sampling and analysis but introduces a caveat eliminating fibers greater than 5μm when considering corrective actions to the dust suppression Best Management Practices as follows: *"Hanson has incorporated this requirement into Section 3.6 of Hanson's Asbestos Monitoring and Mitigation Plan. Hanson has incorporated an action level of 0.01 f/cc, as requested by PADEP,* but *for the purposes of determining whether corrective action is necessary, Hanson will only consider and count asbestos fibers that exceed 5 micrometers in length. Hanson reserves the right to petition PADEP to modify this action level pending the generation and review of additional site data. but has limited any corrective action to the presence of a specific quantity of asbestos fibers".*

Please explain in specific detail how a corrective action level determined from and/or limited by a threshold quantity counting only asbestos fibers that exceed 5 micrometers in length can effectively be used to determine if the Best Management Practice's (BMP's) employed to control dust containing elongate mineral particles that may contain asbestos fibers are effective and if corrective action is needed if the source and by default, the quantity and presence of those specifically defined asbestos fibers are varying as is at the Rock Hill site.

Technical Deficiency 9.c.xii.:

9.c. xii. Please include provisions indicating that all sample results will be forwarded to DEP via email within 24 hours of receipt from the laboratory.

Hanson Response: Samples collected during full quarry operations will be analyzed based on standard 10 business day turnaround time. Samples collected during 500-ton removal activities will be requested to be analyzed on an expedited basis. When possible, results will be provided from the laboratory to Hanson within five business days of sample receipt. When expedited turnaround of results is not possible, results will be provided from the laboratory to Hanson as quickly as is possible

DEP Response: DEP has stated previously the requirement is a 24-hour turnaround time on analysis of samples.

Technical Deficiency 9.c.xiv:

9.1.viv.: Please propose procedures indicating how Hanson will conduct initial asbestos air monitoring during low activity conditions and the use of on-site roads (i.e.: water sample collection, site inspections, security, etc.) demonstrating that ambient levels of asbestos do not exceed the action level.

Hanson Response: During initial air sampling, only one to two vehicles are on site in order to minimize any fugitive dust generation by vehicle traffic that might affect ambient air evaluation. Further, to mitigate generating emissions, trucks will not exceed the posted vehicle speed limits of 15 mph.

DEP Response: Please develop, submit to DEP for approval and execute an activity- based sampling program to gain an understanding asbestos exposure at low levels of activity and demonstrate that removal should not cause NOA fiber migration.

Technical Deficiency 9.c.xvi.:

9..c. xvi. Please provide engineering detail(s) on water emitting devices planned to be used for controlling dust specific to the operational application.

Hanson Response: In accordance with Hanson's Asbestos Monitoring and Mitigation Plan, all dust suppression equipment will be verified to be on-site and in usable condition prior to commencement of any quarrying activity. Under the limited 500-ton operation, Hanson will use portable equipment to mitigate and suppress any dust potentially generated during quarry activities.

DEP Response: Please provide specific engineering detail of the "portable equipment" that will be used to mitigate and suppress any dust generated during quarry activities.

Technical Deficiency 10.c.

10. Please provide an up to date comprehensive NOA Monitoring and Risk Mitigation Plan for the Rock Hill Quarry.: §77.451, §77.105, §77.130.

10. c. Please detail all methods, protocols and compliance standards that will be employed to monitor the migration of NOA from the Rock Hill Quarry Site.

Hanson Response: Hanson will monitor ambient levels of NOA at the perimeter of the quarry in accordance with its Asbestos Monitoring and Mitigation Plan. In the event that NOA is detected above the defined action level, Hanson will employ the following corrective measures outlined in Section 3.6 of the Plan:

Hanson Reference: Excerpt Section 3.6, AMMP, Corrective Actions

1. Report the results immediately to the Hanson site manager and Senior Director of Operations. Hanson will also notify the PADEP within 24 hours of receipt of the TEM analysis results.

2. Daily air sampling of that location will commence for 7 days.

3. Investigate the potential cause of the results. The investigation will include at least the following elements:

    a. Review of operational activities that were occurring during sampling

    b. Confirmation that dust suppression systems are fully operational, and

    c. Quality Assurance and Quality Control review of all sampling and laboratory equipment and procedures.

4. Hanson will take immediate corrective measures. These corrective measures may vary based on the location of the sample, and findings of the investigation. The investigation will begin as soon as the result is confirmed and will be completed in an expedited manner. The corrective actions may include investigation of the source of any airborne asbestos, extra dust suppression measures, cleanup, repairs or modifications to systems and controls, or temporary cessation of operations.

5. Within seven calendar days of receipt of the TEM analysis results from the 7-day daily air sampling in 2) above, submit to PADEP a written report of the sampling results, and a plan and schedule of steps that have been or will be taken to identify and mitigate the source of the airborne asbestos, and to re-monitor ambient air at the facility perimeter.

6. Hanson will record the results and all corrective measures taken at the site in a permanent written log.

7. During a 500-ton removal event, if an exceedance of the established action level occurs, Hanson will conduct an additional sampling event (1 round of 8 perimeter air samples) and will conduct corrective actions, as necessary.[1]

[1] ***Note added by DEP: Bullet No. 7 is in Hanson's 7/6/2021 response to the April 12, 2021 Deficiency Letter but is <u>not</u> in the AMMP.***

DEP Response: It is DEP's intent that the "defined action level" for implementing corrective actions be determined utilizing ISO10312-2019-10 "Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Electron Microscopy Method", as modified by Page C-3 of EPA's "OSWER Directive #9200.0-68, September 2008, Framework for Investigating Asbestos-Contaminated Superfund Sites", which states that "Under the ISO method, two specific counting schemes are detailed. The first scheme is more general and allows for the counting of fibers that are 0.5 μm in length or greater and have aspect ratios of 5:1 or greater. In routine practice, TEM can resolve fibers down to approximately 0.1 μm in width, as compared to the resolution for routine PCM (0.25 μm). Therefore, short thin fibers that would not be detected

using PCM will be detected using TEM under the general counting scheme. EPA recommends modification of the aspect ratio to 3:1 for this counting scheme."

DEP directs the "defined action level" for implementing corrective action shall be determined utilizing the counting method cited above counting U.S. regulatory asbestos minerals and their non-asbestos mineral analog EMPs without modification for fibers shorter than 5μm.

Technical Deficiency 10.d.

10.d.: All methods, protocols and compliance standards that will be employed to control migration of NOA from the Rock Hill Quarry site whether they be in air, water, overburden, waste, or products produced by the Rock Hill Quarry.

Hanson Response: Hanson will address migration of NOA from the site through the following pathways:

- Air: as discussed Hanson's Asbestos Monitoring and Mitigation Plan, Hanson has identified eight (8) locations where it will monitor NOA at the perimeter of the Quarry (see Section 3.1), Hanson will sample NOA during both full quarry operation and 500-ton operations (See Section 3.3), and Hanson will perform corrective actions as necessary if NOA is detected above the established action level (see Section 3.6).

- Water: On an annual basis, unless otherwise approved in writing by PADEP, Hanson will collect a water sample from a dust suppression water source for asbestos analysis. This samples will be collected and analyzed in accordance with EPA Method 100.1, Analytical Method for Determination of Asbestos Fibers in Water. Hanson will maintain records of annual EPA Method 100.1 water analyses for at least five (5) years and will make these records available to PADEP upon request. Furthermore, if perimeter air sampling triggers corrective action requirements in accordance with Section 3.6, then Hanson will submit the results of the most recent EPA method 100.1 analyses to PADEP in accordance with Section 3.6.

  As indicated on Appendix A, Hanson has collected preliminary water samples from the following locations:

  a. NPDES Outfall.
  b. Sediment Trap 1
  c. Sediment Trap 2
  d. Sediment Trap 3
  e. Sediment Basin 1
  f. Sediment Basin 2
  g. Quarry Pitt

  The results of the preliminary sampling demonstrate concentrations at or below the Method Detection Limit with no structures identified.

- Traffic: In accordance with Sections 4 and 6.2 and Hanson's Asbestos Monitoring and Mitigation Plan, NOA potentially generated by truck traffic and mitigated as necessary. Hanson will employ the following measures:

    - utilize a dedicated street sweeper, with water sprays, to clean paved roads and public roadways near site entrances as needed,
    - perform daily visual inspections for material tracked on public roads and will promptly clean any accumulated material.
    - will install a truck wash utilizing spray nozzles and pressurized water to remove loose or dusty material from loading trucks leaving the site.
    - require that all trucks transporting materials off-site be covered with tarps or other devices.
    - post vehicle speed limits on haul roads in quarry and stockpile areas of 15 miles per hour.
    - apply water or commercial dust suppression liquids during extremely dry or winter conditions, as needed.
    - wet materials to be handled prior to loading and limit drop height as safety permits. Trucks will be loaded on the leeward side of the storage pile. The facility will install a windsock to easily identify wind direction.

- Product: Customers are provided Safety Data Sheets as necessary. The OSHA and MSHA Hazard Communication Standards require product warnings that meet their specifications. This is normally conveyed in Safety Data Sheets and weigh ticket warnings. The Quarry will comply with all OSHA and MSHA warning regulations. So long as the asbestos content does not exceed the 1.0% limit from TSCA, or 0.1% from OSHA, measured using an appropriate method for bulk materials, there is no regulatory requirement to label this material as asbestos containing.

- Waste: In general, sediment and/or pieces of aggregate generated during quarrying activities are managed on-site for future use, such as reclamation. This material includes fines and/or overburden that may result from quarry and blasting activity. Materials such as filters and filter systems that may accumulate asbestos fibers will be managed and disposed of in accordance with PADEP regulations and only to properly licensed waste disposal facilities.

DEP Response: It is DEP's intent that the "defined action level" for implementing corrective actions be determined utilizing ISO10312-2019-10 "Ambient Air – Determination of Asbestos Fibers – Direct Transfer Transmission Electron Microscopy Method", as modified by Page C-3 of EPA's "OSWER Directive #9200.0-68, September 2008, Framework For Investigating Asbestos-Contaminated Superfund Sites", which states that "Under the ISO method, two specific counting schemes are detailed. The first scheme is more general and allows for the counting of fibers that are 0.5 μm in length or greater and have aspect ratios of 5:1 or greater. In routine practice, TEM can resolve fibers down to approximately 0.1 μm in width, as compared to the resolution for routine PCM (0.25 μm). Therefore, short thin fibers that would not be detected using PCM will be detected using TEM under the general counting scheme. EPA recommends modification of the aspect ratio to 3:1 for this counting scheme."

DEP directs the "defined action level" for implementing corrective action shall be determined utilizing the counting method cited above counting U.S. regulatory asbestos minerals and their non-asbestos mineral analog EMPs without modification for fibers shorter than 5μm.

These comments are in response to Hanson's responses to DEP's April 12, 2021 deficiency letter. They are intended to clarify and define DEP's position on significant points raised in the deficiency letter. Please respond to the comments listed above by December 6, 2021. Should you have any questions regarding the comments herein, please contact me to discuss your concerns or to schedule a meeting.

Sincerely,

Richard E. Tallman, P.E.
Environmental Engineer
Bureau of District Mining Operations

cc: John J. Stefanko, Deputy Secretary
Daniel Sammarco, P.E., Director DMO
Michael Kutney, P.G., EGM
Craig Lambeth, Office of Chief Council
Gary Latsha, District Mining Manager, Pottsville DMO
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Thomas Boretski, SMCIS
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