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SENT VIA E-MAIL AND FIRST CLASS MAIL

July 6, 2021

Richard Tallman, P.E.

Pottsville District Mining Office
Pennsylvania Department of Environmental Protection
5 West Laurel Boulevard
Pottsville, PA 17901

Re: Elevated Review Technical Deficiencies Application No. 7974SM1C10
Rock Hill Quarry
East Rockhill Township, Bucks County
Response to PADEP April 12, 2021 Technical Deficiency Letter

Dear Mr. Tallman:

Hanson Aggregates PA LLC ("Hanson") is providing this response to your letter dated, April 12, 2021, requesting additional information in connection with Hanson's Rock Hill Quarry ("Quarry").

By letter dated June 21, 2021, PADEP granted Hanson an extension through October 29, 2021 for Items 10.e. through 12.c. of the Technical Deficiency Letter in recognition of the fact that these items require additional sampling and analysis. Accordingly, this response addresses Items 1 through 10.d. of the Technical Deficiency Letter. Hanson will update its permit modules, as necessary, pending PADEP's review and acceptance of the responses provided herein.

Further, Hanson has recently collected additional background samples at the Quarry from overburden, perimeter air, and water to assess the presence of natural occurring asbestos ("NOA"). That data and corresponding maps of the sampling locations are incorporated hereto as Appendix A.

1. **Module 8.3: Groundwater Information §77.532, §77.522, §77.403**

   a. ***In the previously submitted Module 8.3, dewatering of the quarry pit was proposed at therate of 0.23 Million Gallons per Day (MGD). Please explain your intentions regarding dewatering of the pit and how it may relate to the planned removal of the 500 tons per year.***

RESPONSE: The planned removal of 500 tons of aggregate material per year will not require or involve any dewatering of the quarry pit. Approximately 15,000 tons of aggregate are currently stockpiled onsite to meet required minimum removal rates until full operations are recommenced at the Quarry. In addition, there are more than 10 million tons of material present above the water table that could be mined without dewatering the pit. Future mining below the water table will require dewatering of the pit. This will require pumping in excess of 0.23 MGD to achieve dewatering in a reasonable timeframe. At that time, Hanson will request a temporary or permanent increase in NPDES discharge rate to accommodate such dewatering operations.

2. **Module 8.4: Surface Water Information §77.406, §77.532, §77.521**

    a. **Please address any potential for degradation of Bog Run due to dewatering of the quarry pit or from the release of stormwater from the Rock Hill Quarry site considering the Naturally Occurring Asbestos (NOA) content in the water emanating from the Rock Hill Quarry Site.**

RESPONSE: The United States Environmental Protection Agency (USEPA) recommends an ambient surface water quality criterion of 7 million fibers per liter (MFL) for protection of human health[1]. This criterion is based on the established federal drinking water maximum contaminant level (MCL) of 7 MFL for asbestos fibers that exceed 10 microns in length[2]. Pennsylvania does not have a surface water quality standard for asbestos. As part of its investigation of NOA at the site[3], Hanson collected water samples from the quarry pit, NPDES Outfall, and sediment basins and traps in the spring of 2019. None of those samples were close to or exceeded EPA's recommended limit. Recent water samples collected on June 22, 2021 continue to demonstrate the absence of NOA, as all samples were below the method detection limit (MDL). Based upon these results there is no indication that water emanating from the Site has resulted in degradation of Bog Run.

In addition, as part of the mining permit, Hanson has designed and implemented an Erosion and Sediment Control plan to control and treat stormwater runoff and quarry discharge water. Full implementation and maintenance of this system during mining will mitigate the potential for degradation of streams and surface water features downgradient from the quarry. Under Chapter 93 of the PADEP regulations, Tohickon Creek (also known as Bog Run), is currently designated Trout Stocking (TSF) and Migratory Fishes (MF). Neither dewatering of the quarry or stormwater from the area will impact either of these designated uses.

3. ***Module 10.1: Equipment and Operation Plan: §77.452***

    a. ***Please provide the number hours each day and the number of days and each month that there will be any form of activity at the Rock Hill Quarry. NPDES***

[1] https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table
[2] https://www.epa.gov/sites/production/files/2018-12/documents/hh-criteria-calculation-matrix-2002.pdf
[3] EARTHRES, Qualitative Geologic Survey Report Rock Hill Quarry, 11/15/2019; RJ LEE Group, Sample Analysis Report, 8/14/2020.

sample collection will be at least twice per month as opposed to the cited "monthly" collection.

RESPONSE: The number of hours and days of quarry activities will vary depending upon whether Hanson is undertaking full quarry operations or limited operations at 500 tons per year. Full quarry activities will occur on Monday through Saturday, generally between the hours of 6:00 am and 6:00 pm. 500-ton removal activities will occur on a much more limited basis, and Hanson will notify PADEP in advance of that planned activity. Prior to site work or equipment delivery for the initial 500-ton removal operation, Hanson will perform and provide to PADEP five (5) separate sets of eight (8) perimeter ambient air samples in order to determine contemporary background air conditions. 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. Please see Section 1 of Hanson's Asbestos Monitoring and Mitigation Plan in further response to this item.

b. Please provide a detailed security proposal for the Rock Hill Quarry including the frequency of routine site inspections and security visits and please describe the activityand duration associated with these security visits.

RESPONSE: Access to the Quarry is limited to two main gated entrances at Rockhill Road and Rich Hill Road. Access to the Quarry is limited to only authorized personnel during normal operational hours, though security personnel may access the site outside of normal operational hours. Hanson has contracted with a private security company for the Quarry, which is scheduled to work 40 hours per week on a random schedule focusing on high activity time periods for trespassers, including weekends and holidays. Off season hours are adjusted accordingly.

In particular, Hanson's security contractor is under agreement to:

- Patrol and confront trespassers.
- Amicably and non-confrontationally advise and direct persons off the property (involve Pennridge Regional Police Department as necessary).
- Photo persons trespassing to document and determine repeat offenders.
- Assist with identifying routes of entry.
- Assist with installing and maintaining proper signage/security features about the property.

In addition, the security contractor will assist Hanson in maintaining signage at the Quarry in the event of removal, vandalism, and or other damage that may occur.

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, AdditionalSample 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 countingrules. Considering the limited data provided by the sample set, please explain:

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. 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.

a. ***Why Hanson believes these aggregate piles may be safely disturbed under any conditions.***

RESPONSE: Hanson's Asbestos Monitoring and Mitigation Plan and Mineral Identification and Management Guide set forth comprehensive plans to safely identify, monitor, report to PADEP, and mitigate (if necessary) NOA encountered during quarry operations. As detailed in the plans, water will be applied to aggregate stockpiles as necessary to suppress fugitive dust. Dust suppression will be provided by sprays from a water truck, sprinklers, and/or other stationary water sprayers (e.g., Rainbird). Hanson will monitor any personnel exposure to confirm that airborne particulate levels stay below applicable MSHA exposure limits.

b. Where and how this aggregate will be used, if at all.

RESPONSE: Aggregate will generally be used by end-users for unpaved surface applications and other similar uses subject to appropriate disclosures by Hanson.

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.

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.

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

a. The narrative in 10.1 under Non-Scheduled Site Maintenance contains the following passages (italics):

"At such time authorized by the Department, mining of the Rock Hill Quarry will commence in a single phase. Bulldozers or track loaders, excavators, and haul trucks willbe used to remove and stockpile topsoil and overburden from the mining area. Overburden will be hauled to and stored in the designated overburden material stockpile.The underlying rock will then be drilled and blasted to facilitate its removal. The shot rock will be excavated by front-end loader, track loader, or excavator.

The excavated material will then be loaded into a haul truck and transported to either a portable processing plant or a stationary processing plant that will be located within theSurface Mine Permit boundary. The processed material will be staged for sale in stockpiles. Support area in the northwest corner of the permitted area will likely be used to stockpile material. "

Please explain how the mining activities described in the above passages factor into Non-Scheduled Site Maintenance activities or in the proposed minimum 500 tons per year of stockpile crushed aggregate. It appears the described mining activities are for full site mining development, are included with Non-Scheduled Site Maintenance, and conflict with the proposed activities described for the immediate future at the Rock Hill Quarry.

RESPONSE: As stated in Hanson's June 14, 2021 letter to PADEP, Hanson previously communicated its intent, in the short term, to limit mining operations at Rock Hill Quarry to the removal of 500 tons to maintain its active mining license. However, given the extent of the information requested, Hanson now intends to provide information for "full" quarry operations, subject to any additional permitting actions or approvals required by PADEP for future activities prior to their commencement. To reflect this, Hanson has developed its Asbestos Monitoring and Mitigation Plan to address both full quarry and more limited 500-ton removal scenarios.

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

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.

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.***

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.

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.

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.

7. Module 10.8: Special Handling of Toxic Material §77.452, §77.404

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

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 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.

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.

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.

8. Module 10.15: Bonding Calculations: See Attachment 3(c)(i) Conceptual ReclamationPlan: §77.456, §77.453, §77.455, §77.457, §77.462, §77.404

a. ***The Conceptual Reclamation Plan includes the blasting of 52,000 cubic yards of rock to reclaim the affected highwall. Please provide a comprehensive dust monitoring and dust suppression plan for reclamation blasting activity.***

RESPONSE: Hanson's dust monitoring and dust suppression plan covers all operations at the Rock Hill Quarry, including blasting related to 500-ton, full quarry, and closure related activities. Thus, the blasting of 52,000 cubic yards of rock to reclaim the affected highwall is addressed in Hanson's dust monitoring and dust suppression plan. Hanson also addresses blasting in Section 6.2 of its Asbestos Monitoring and Mitigation Plan.

b. The Conceptual Reclamation Plan states that 8,700 cubic yards of existing overburden material would be moved from its present location to the disturbed area for reclamation. Please provide a comprehensive dust monitoring and dust suppression plan for this overburden transport activity.

RESPONSE: Hanson's dust monitoring and dust suppression plan included in module 10 is intended to cover all operations at the Rock Hill Quarry including moving and handling of overburden during 500-ton, full quarry, and closure related activities. Thus, the 8,700 cubic yards of existing overburden material to be moved from its present location to the disturbed area for reclamation is addressed in Hanson's dust monitoring and dust suppression plans. Hanson also addresses blasting in Section 6.2 of its Asbestos Monitoring and Mitigation Plan.

c. ***Please provide an analysis of the overburden material to assess its potential of containing NOA***.

RESPONSE: As provided in Appendix A, Hanson collected eight (8) discrete soil samples to evaluate the potential for NOA in soil and overburden at the Rock Hill Quarry site:

- Four (4) samples (S-1, S-2, S-3, S-4) were taken from the stockpiled overburden pile;
- Two (2) samples were taken from undisturbed soils (S-5, S-6); and,
- Two (2) samples (S-7, S-8) were taken from an area where overburden was removed in preparation for mining.

Samples were collected from 0 to 6 inches below the ground surface utilizing a 3-inch diameter stainless steel soil auger. Surficial organic material, if present, (S-5, S-6, and S-7) was excluded in order to sample a single uniform soil horizon. To evaluate the potential for NOA, samples were analyzed with polarized light microscopy (PLM) using EPA/R-93/600/116 and also by transmission electron microscopy (TEM) in accordance with ISO 22262-2. A single NOA fiber was observed by PLM in two (2) out of the eight (8) samples (S-1 & S-2) and reported as a trace concentration (< 0.1%) as the fibers were outside of the crosshairs. Analysis by TEM detected NOA in one sample (S-3) at a concentration of 0.0024%. The analyses also indicate the presence of amphibole cleavage fragments and other non-asbestos material that met counting requirements for length and aspect ratio. Based on these results, there is potential for NOA to be present at trace concentrations within the soils/overburden at the Site.

9. Module 17.2: Air Pollution Control Plan: §77.455, §77.452, §77.458, §77.631

a. ***Attachment 4(6)(ii) Draft Air Monitoring Plan - Annual removal of 500 tons of***

crushed aggregate from existing stockpiles:

i. Please include a provision committing to provide notice to DEP no less than five (5) working days prior to the beginning any activity that may disturb material on-site, including 500 ton removal events.

RESPONSE: Hanson has incorporated this requirement into section 3.3 of its Asbestos Monitoring and Mitigation Plan.

ii. Please include provisions to ensure that water and/or other dust suppression methods/devices are on-site and in usable condition, prior to undertaking any activity at the site.

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

iii. DEP requests that you commit to cleaning the public road if any material is dragged onto the public road by Hanson or any of their contractors, no later than the end of each work shift. Please provide a detailed plan for cleaning the public road.

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

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.

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

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.

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

vi. Please ensure there is a water truck and/or other dust suppression methods/devices on- site and useable prior to beginning any activities during a 500 ton removal event.

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

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, priorto disturbing said material and during times when no activity is occurring on-site.

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

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.

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

ix. Please elaborate on the protocol of adjusting air sampling locations depending on wind speed and direction during the annual removal of 500 tons of crushed aggregate. Please detail the decision process that will be used to determine the need for an adjustment of air sampling locations specifying action levels of wind speed or changes in direction.

RESPONSE: Per Section 3.1 of Hanson's Asbestos Monitoring and Mitigation Plan:

> if it is determined that the wind direction has changed, creating a situation where the designated downwind samples are no longer downwind of the active operational areas, this fact will be noted on the sample data forms and the appropriate "new" downwind samples will be identified.

In general, sampling locations will be established with the intention of collecting samples from pre-determined locations around the perimeter of the property in a systematic way over time. There are a number of locations along the perimeter of the property at which samplers can be located. These locations will encompass both upwind and downwind locations without the need to relocate due to possible shifting winds. The general locations of the samplers have been selected based on a number of factors including planned equipment operating locations, historic prevailing winds at the Quarry, site specific activities connected with planned quarrying and processing of aggregate products, and locations of potential offsite receptors.

During 500-ton removal events, Hanson will use the same sampling locations and will use a hand-held weather meter such as a Kestra 4500, or equivalent, along with data from the nearby Pennridge Airport Weather Station to evaluate wind direction and wind speed. The wind direction and speed will be recorded approximately every hour.

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.

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 is possible

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.

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.

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

RESPONSE: This requirement has been incorporated into Section 3.5 of Hanson's Asbestos Monitoring and Mitigation Plan. Samples will be analyzed on an expedited timeline after receipt. All efforts will be made to produce results to DEP within 24 hours of receipt by Hanson from the laboratory.

xiii. Please include a provision committing to not conduct a 500 ton removal event at thesite until at least 5 ambient air monitoring events are conducted during idle or low activity conditions at the site and all results are less than the action level.

RESPONSE: Hanson's Asbestos Monitoring and Mitigation Plan has been updated to provide that Hanson will collect five sets of eight perimeter air samples on five separate days during idle or low activity at the site prior to the initial 500-ton removal event following DEP's recission of the current cessation order. See Section 3.3 of Hanson's Asbestos Monitoring and Mitigation Plan.

xiv. Please detail or specify methods, standards and action levels that will be used to initiate corrective actions, such as the use of water to suppress dust, in the following operations:

a) Loading of aggregate onto trucks
b) Adding moisture to the stockpiled aggregate.
c) Overburden loading and transportation.
d) Drilling and blasting.
e) Loading of shot rock.
f) Crushing and stockpiling.
g) Haulage on the Rock Hill Quarry site

h) Haulage off the Rock Hill Quarry site on public highways.

RESPONSE: Hanson's Asbestos Monitoring and Mitigation Plan has been developed to include dust mitigation measures associated with these activities to limit the generation of NOA during quarry activities. See section 6.2 of Hanson's plan. With respect to ambient levels of asbestos at the perimeter of the quarry, Hanson will monitor such concentrations during quarry activities in accordance with its plan and will take appropriate corrective measures if it detects NOA in exceedance of the defined action level. See Sections 3.3 and 3.6 of Hanson's Plan.

Further, these specific activities fall under the purview of the Mine Safety and Health Administration ("MSHA") program, which require that Hanson control exposure to employees of airborne contaminants. With respect to asbestos, MSHA requires that employees' exposure to asbestos not exceed an 8-hour time weighted average full-shift airborne concentration of 0.1 f/cc of air, and that no employee be exposed at any time to airborne concentrations of asbestos in excess of 1 f/cc of air as averaged over a sampling period of 30 minutes. Please see Section 4 of Hanson's Asbestos Monitoring and Mitigation Plan for more information on activity based monitoring.

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

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.

At such time a fixed aggregate processing plant would be constructed, Hanson will likely employ a dust suppression system, such as Nesco Dust Pro, Dustboy or equivalent as appropriate. Information on the Nesco systems are on the Nesco Website. In general, Hanson would incorporate high pressure, wet, dust suppression systems to service the primary and secondary crushing circuits. The systems are to be designed to adequately control dust emissions from the proposed circuits. Generally, high pressure spray nozzles are used, and the system will be capable of creating a minimum pressure of 200 psi measured at the discharge of the pump. Valves will be installed before each spray nozzle such that each nozzle can be adjusted for flow. A drain valve will be installed such that the entire system can be drained to prevent freezing. A surge tank is to be provided to supply the system with a supply of freshwater. Hanson will provide PADEP specific engineering details for the dust suppression system prior to initiating full operations at the quarry.

In the event that Hanson's quarrying activities advance beyond the limited 500-ton removal operation, Hanson will install more permanent equipment. Hanson will coordinate with PADEP in advance and will prepare and submit any permit application(s) necessary prior to the operation of permanent dust suppression equipment.

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

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 Measurementand Identification detailed in "OSWER Directive #9200.0-68, September 2008, Framework for Investigating Asbestos-Contaminated Superfund Sites"

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

[4] Occupational Safety and Health Administration (OSHA). 1986. "Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite." Fed. Reg. 51: 22612 – 22790. June 20; Occupational Safety and Health Administration (OSHA). 1994. "Occupational Exposure to Asbestos." Fed. Reg. 59: 40964 – 41162. August 10.

[5] Mine Safety and Health Administration (MSHA). 2008. "Asbestos Exposure Limit; Final Rule." Fed. Reg. 73(41):11283-11304. 30 CFR 56, 57, 71, February 29.

[6] National Institute for Occupational Safety and Health (NIOSH). 2019. "Asbestos and Other Fibers by PCM. NIOSH Method 7400: Issue 3." In NIOSH Manual of Analytical Methods (Fifth Edition). National Institute for Occupational Safety and Health (NIOSH), Cincinnati, OH. 40p., June 14; National Institute for Occupational Safety and Health (NIOSH). 1994. "Asbestos by TEM. NIOSH Method 7402: Issue 2." In NIOSH Manual of Analytical Methods (Fourth Edition). National Institute for Occupational Safety and Health (NIOSH), Cincinnati, OH. 7p., August 15.

[7] U.S. EPA. 1988. "Integrated Risk Information System for Asbestos."

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

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[8] U.S. EPA. 2008. "Framework for Investigating Asbestos-Contaminated Superfund Sites – OSWER Directive #9200.0-68." September.

[9] J. Hodgson and A. Darnton (2000). "The Quantitative Risks of Mesothelioma and Lung Cancer in Relation to Asbestos Exposure", Annals of Occupational Hygiene, 44, p 565-601; Eastern Research Group (2003). "Report on the Expert Panel on Health Effects of Asbestos and Synthetic Vitreous Fibers: The Influence of Fiber Length", prepared for Agency for Toxic Substances and Disease Registry; USA EPA (2003). Report on the Peer Consultation Workshop to Discuss a Proposed Protocol to Assess Asbestos-Related Risk, May 30, 2003; R. Doll (1989). Mineral fibres in the non-occupational environment: concluding remarks. In Non-Occupational Exposure to Mineral Fibres, Eds. J. Bignon, J. Peto, and R. Saracci. WHO/IARC Scientific Publications No. 90, Lyon p. 511-518; J.M.G. Davis, J. Addison, R.E. Bolton, K. Donaldson, A.D. Jones, and T. Smith (1986). The pathogenicity of long versus short fiber samples of amosite asbestos administered to rats by inhalation and intraperitoneal injection, British Journal of Experimental Pathology. Vol 63(3), p. 415-430; P.A. Moalli, J.L. McDonald, L.A. Goodglick and A.B. Kane (1987). Acute injury and regeneration of the mesothelium in response to asbestos fibres. American Journal of Pathology. Vol. 128(3) p. 426-445; C.A. Barlow, J.M. Grespin, E.A. Best (2018). Asbestos fiber length and its relation to disease risk. Inhalation Toxicology Vol. 29 p. 541-554; Occupational Safety and Health Administration (1992). Occupational Exposure to Asbestos, Tremolite, Anthophyllite, and Actinolite. Federal Register 75 p. 24310.

[10] Lee, R.J., Van Orden, D.R., (2008). Airborne Asbestos in Buildings. Regulatory Toxicology and Pharmacology. Vol. 50 pp 218-225.

[11] Agency for Toxic Substances and Disease Registry (ATSDR). 2001. "Toxicological Profile for Asbestos." 441p., September.

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).

ii. Please indicate that 0.45 micrometer pore size filters will be used unless 0.8 poresize is approved by DEP in a particular instance (i.e. clogging).

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

iii. Please include procedures to ensure that sample durations are adequate to achievea reporting limit of 0.005 f/cc or lower.

RESPONSE: This requirement has been incorporated into Section 3.2 of Hanson's Asbestos Monitoring and Mitigation Plan. Using a minimum sampling time of 4 hours for any sample collection event, as well as a flow rate of 1-4 L/min will ensure that the reporting limit of 0.005 f/cc can be efficiently achieved.

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

[12] Craighead, JE. 2008. "Benign pleural and parenchymal diseases associated with asbestos exposure." In Asbestos and Its Diseases. (Eds.: Craighead, JE; Gibbs, AR), Oxford University Press, Oxford, UK. p139-171; Bernstein, DM; Hoskins, JA. 2006. "The health effects of chrysotile: Current perspective based upon recent data." Regul. Toxicol. Pharmacol. 45:252-264; Coin, PG; Roggli, VL; Brody, AR. 1992. "Deposition, clearance, and translocation of chrysotile asbestos from peripheral and central regions of the rat lung." Environ. Res. 58(1):97-116; Bernstein, DM; Pavlisko, EN. 2017. "Differential pathological response and pleural transport of mineral fibres." In Mineral Fibres: Crystal Chemistry, Chemical-Physical Properties, Biological Interaction and Toxicity. (Ed.: Gualtieri, AF), European Mineralogical Union and the Mineralogical Society of Great Britain and Ireland. p417-434.

[13] Bernstein, DM; Pavlisko, EN. 2017. "Differential pathological response and pleural transport of mineral fibres." In Mineral Fibres: Crystal Chemistry, Chemical-Physical Properties, Biological Interaction and Toxicity. (Ed.: Gualtieri, AF), European Mineralogical Union and the Mineralogical Society of Great Britain and Ireland. p417-434.

[14] National Institute for Occupational Safety and Health (NIOSH). 2011. "Asbestos Fibers and Other Elongate Mineral Particles: State of the Science and Roadmap for Research (Revised Edition)." DHHS (NIOSH) Publication No. 2011-159; NIOSH Current Intelligence Bulletin 62. 174p., April.

[15] V. Roggli (2015). "The So-called Short-Fiber Controversy, Literature Review and Critical Analysis", Archives of Pathology & Laboratory Medicine, 139, p. 1052-1057.

[16] B.T. Mossman (2018). Mechanistic in vitro studies: What they have told us about carcinogenic properties of elongated mineral particles (EMPs). Toxicology and Applied Pharmacology, Vol. 361 p. 62-67; E. Chatfield (2018). Measurement of elongate mineral particles: What we should measure and how do we do it? Toxicology and Applied Pharmacology, Vol. 361, p. 36-46; D. Weill (2018). Proceedings of The Monticello Conference on Elongate Mineral Particles (EMP), Toxicology and Applied Pharmacology, Vol. 361 p. 1-2.

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.

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

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

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.

c. Attachment 4(b)(ii) Draft Air Monitoring Plan General DEP Comments on SamplingMethodology. §77.455, §77.401.

RESPONSE (9(c)(i through xvii)): 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. These plans include details on how Hanson will select upwind and downwind sampling locations, the number of sampling locations, Hanson's monitoring of asbestos levels during idle or low activity periods, and steps Hanson will take to prevent NOA from migrating from the site.

i. Please provide a plan to determine background offsite NOA levels in surrounding communities and vulnerable populations.

RESPONSE: In order to assess background offsite NOA levels in surrounding communities and vulnerable populations, Hanson will collect perimeter data at the quarry and extrapolate from that data any risk of exposure. Perimeter data provides the most accurate data as it relates to NOA from the Rock Hill Quarry, offers the most conservative background assessment scenario as it relates to offsite receptors, and provides readily comparable data against which Hanson can assess any incremental risk posed by future detections of NOA. As indicated in Appendix A, preliminary background perimeter air samples do not demonstrate the presence of ambient NOA at the perimeter of the Quarry. Any offsite NOA could not be associated with any Quarry activities.

As detailed in Hanson's Asbestos Monitoring and Mitigation Plan, in order to implement this analysis, Hanson or authorized representatives will deploy eight (8) monitoring locations along the perimeter of the Quarry to examine the ambient air during periods of no or low activity. The monitoring locations were determined using site plans and expected weather patterns. The coordinates of each monitor were determined using Google Earth. The location of each sampler is at or near the predetermined coordinates based on site features and anticipated wind direction. The monitors were spaced relatively evenly around the Quarry to account for any potential change

in wind direction. Therefore, there would be an upwind and downwind monitor(s) for each possible wind direction. The monitors were set up per the ISO 10312-2019-10 method. The monitors are run at a flow rate and length of time to obtain 1,000 Liters of air. Please see Section 3.1 of Hanson's Asbestos Monitoring and Mitigation Plan for a further discussion on perimeter air sampling locations and wind monitoring.

Hanson's use of perimeter monitoring is supported by several studies of airborne asbestos migration from potential sources, which indicate that airborne migration significantly decreases after only a short distance from the original source. These studies illustrate that the most meaningful data is that which is collected nearest the source. As is the case with most airborne substances, NOA concentrations emitted from a specific source (*e.g.*, a particular occupational activity, a mine, or manufacturing operations) will decrease the farther away from that source because of the mixing of fibers with ambient or outdoor air (*i.e.*, dilution ventilation) (see, *e.g.*, Ilgren *et al*., 2015; Sahmel *et al*., 2015; Kuryvial *et al*., 1974; Donovan *et al*., 2011).[17] [18] [19] [20]

- Kurvivial *et al.* (1974) found "persons living in the vicinity of two large mining operations working asbestos-containing ore were not exposed to asbestos concentrations above those frequently encountered in ambient air. The maximum concentration determined was 0.009 $\mu g/m^3$ (based on 24-hour sample), whereas concentrations of 0.001 to 0.01 have been encountered… in other ambient sampling programs."

- Donovan *et al.* (2011) conducted a literature review and modeled exposure to asbestos in occupational settings. The authors "propose[d] the following approach as a rule of thumb: for persons 1-5 feet from the source, airborne asbestos concentrations can be roughly approximated at 50% of the source concentration; 35% at >5-10 feet, 10% for >10-30 feet, and less than 1% at distances greater than 30 feet. This approach should be helpful for bracketing the range of likely exposures to bystanders being evaluated in asbestos-related dose-reconstruction analyses."

- Ilgren *et al*. (2015) evaluated fiber drift of Bolivian crocidolite downwind of a plant in Cochabamba. They specifically evaluated crocidolite "downwind of the fiberizing unit when the fibre was being milled, shoveled and sieved. The point source readings for these operations were measured on personal samplers worn by the siever and the shoveler. All were exceedingly high. The upper boundary PCME counts for each operation ranged from 729 to 826 f/ml. Remarkably, the concentrations 10 meters outside the plant ranged from 2.7 to 3.7 f/ml, more than a 200 fold decrease. By 100 meters, these fell more than a 1000 fold (0.002 – 0.006 f/ml). At 500 meters, virtually no crocidolite fibres were detected.

[17] Ilgren, EB; Van Orden, DR; Lee, RJ; Kamiya, YM; Hoskins, JA. 2015. "Further studies of Bolivian crocidolite - Part IV: Fibre width, fibre drift and their relation to mesothelioma induction: Preliminary findings." *Epidemiol. Biostat. Public Health* 12(2):e-11167-1-e-1167-11. doi: 10.2427/11167.

[18] Sahmel, J; Avens, HJ; Scott, PK; Unice, K; Burns, A; Barlow, CA; Madl, AK; Henshaw, J; Paustenbach, DJ. 2015. "Measured removal rates of chrysotile asbestos fibers from air and comparison with theoretical estimates based on gravitational settling and dilution ventilation." *Inhal. Toxicol.* 27(14):787-801. doi: 10.3109/08958378.2015.1110216.

[19] Kuryvial, RJ; Wood, RA; Barrett, RE. 1974. "Identification and Assessment of Asbestos Emissions from Incidental Sources of Asbestos." Report to US EPA, Office of Research and Development. EPA-650/2-74-087; NTIS PB-241999, 344p., September.

[20] Donovan, EP; Donovan, BL; Sahmel, J; Scott, PK; Paustenbach, DJ. 2011. "Evaluation of bystander exposures to asbestos in occupational settings: A review of the literature and application of a simple eddy diffusion model." *Crit. Rev. Toxicol*. 41:50-72.

Indeed, the one fibre found at 500 meters could have come from re-entrainment of accumulated ground dust." In this same study, thin fibers of crocidolite (<0.25 microns) were found to be 146 to 195 f/ml at the sieving and shoveling stations respectively, yet the downwind concentrations at 100 meters were reduced to a level of 0.001 f/ml to undetectable at 500 meters downwind.

- At the Libby, Montana asbestos superfund site, the Agency for Toxic Substances and Disease Registry ("ATSDR") assessed community exposure from residual asbestos from facility emissions.[21] ATSDR concluded:

> MDH and the Minnesota Pollution Control Agency used site-specific facility and meteorological data to model past asbestos emissions for the former exfoliation site in Minneapolis, Minnesota [ATSDR 2003a]. Model results indicated a maximum long-term ambient air concentration of 0.0264 f/cc and a maximum short-term (1-hour) ambient air concentration of 0.868 f/cc around the site. Model simulations suggested that long-term airborne asbestos levels diminished rapidly to less than 0.01 f/cc within 1 to 2 blocks (approximately 50–60 yards) of the facility. These results represent a worst case scenario for facility emissions during 1936–1972, before stack emission controls were implemented.

As noted generally in Naturally Occurring Asbestos: A Resource Document for the Pennsylvania Mine-Permitting Process Where NOA May be Present[22], "[q]uarries and mines are typically isolated from adjacent communities by operator-owned undeveloped buffer zones, berms, tree lines, and other natural or constructed barriers. These features reduce airborne dust in remote areas by increasing the distance that dust must travel to reach those areas, and by interfering with any natural wind patterns that could carry dust beyond site boundaries." This is the case with the Rock Hill Quarry, which is generally surrounded by forest and inaccessible terrain, and where excavation is typically within the quarry pit, below the surrounding land.

As such, perimeter monitoring is the most likely to yield the highest (if any) concentrations of airborne NOA. Thus, perimeter monitoring will provide the best and most conservative data for assessing risks in surrounding communities and vulnerable populations, as they will likely reflect highest potential air concentrations.

ii. Please explain how the proposed one-time background air monitoring event lasting two days at the Rock Hill Quarry is sufficient to characterize background air conditions.

RESPONSE: Additional background samples at the Quarry will be collected in accordance with Sections 3.2 and 3.3 of Hanson's Asbestos Monitoring and Mitigation Plan. As explained therein, Hanson will on five (5) separate occasions, collect samples from the eight identified sampling locations along the perimeter of the property (40 samples). As explained in the Asbestos

[21] Agency for Toxic Substances and Disease Registry. October 29, 2008. "Summary Report, Exposure to Asbestos-Containing Vermiculite from Libby, Montana, at 28 Processing Sites in the United States."
[22] Goodman, J.; Wylie, A.; Chatfield, E.; Gibbs, G; Weill, D. *Naturally Occurring Asbestos: A Resource Document for the Pennsylvania Mine-Permitting Process Where NOA May Be Present* (February 5, 2021).

Monitoring and Mitigation Plan, the proposed sampling is more than sufficient to characterize background air conditions.

iii. ***Please explain in detail the methodology that will be used to locate the upwind and downwind sampling locations for air monitoring specific to the Rock Hill Quarry. Previous submissions (R.J. Pierson, December 2018) cited wind data from the Allentown Bethlehem Airport which is approximately 20 miles away with significant topographical features between the airport and the Rock Hill Quarry.***

RESPONSE: Hanson will locate upwind and downwind sampling locations as detailed in Section 3.1 of its Asbestos Monitoring and Mitigation Plan. In general, wind roses from the Quakertown Airport, which is several miles away, have been used to determine monitoring locations in addition to the onsite monitor. The Quakertown wind rose diagrams show the wind directions to be similar to that of the Lehigh Valley International Airport.

iv. ***Please include provisions and specifications for installation of a permanent weather station measuring wind direction and speed at the site for more accurate determination of those parameters.***

RESPONSE: For full quarry operations, Hanson has incorporated this requirement into Section 3.1 of Hanson's Asbestos Monitoring and Mitigation Plan. During 500-ton removal events, Hanson will use handheld monitors to measure wind direction and wind speed.

v. ***Please specify that data from the on-site weather station will be used to assess the proper sampling locations.***

RESPONSE: Hanson has incorporated this requirement into Section 3.1 of Hanson's Asbestos Monitoring and Mitigation Plan. During 500-ton removal events, Hanson will use handheld monitors to measure wind direction and wind speed.

vi. ***Please specify that at least 5 locations will be sampled during each event.***

RESPONSE: Hanson has incorporated this sampling requirement into Section 3.1 of Hanson's Asbestos Monitoring and Mitigation Plan.

vii. ***Please include procedures for collecting data if the weather station is inoperable and unable to monitor wind speed or direction for greater than 12 hours.***

RESPONSE: Hanson has incorporated this requirement into Section 3.1 of Hanson's Asbestos Monitoring and Mitigation Plan. During 500-ton removal events or when the station is inoperable and unable to monitor windspeed and direction, Hanson will use handheld monitors to measure wind direction and wind speed.

viii. ***Please provide procedures and timeframes for multiple sampling events during idle or low activity conditions to take place on a regular basis over an extended time to address concerns about differing weather and seasonal conditions. For example,***

sampling every 6 days for 5 consecutive events over 30 days, once each quarter.

RESPONSE: Hanson has incorporated this sampling requirement into Section 3.2 of Hanson's Asbestos Monitoring and Mitigation Plan.

ix. Please include a planned protocol for adjusting sampling locations depending on wind speed and direction during the sampling event and sufficient detail on the parameters used to determine the sampling locations and the general condition of the sampling site including - local obstructions, distance to the driplines of surrounding trees, type of tree (evergreen or deciduous) height of the sampler, etc.

RESPONSE: Hanson has incorporated this requirement into Section 3.1 of Hanson's Asbestos Monitoring and Mitigation Plan.

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).

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.

xi. Please provide a detailed plan for what actions will be taken when sample results are above the action level. Please include maximum timeframes to take those actions.

RESPONSE: Hanson has incorporated this requirement into Section 3.6 of Hanson's Asbestos Monitoring and Mitigation Plan.

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

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

xiii. Please include provisions indicating that DEP will be notified within 24 hours of receipt of a sample result from the laboratory over the action level.

RESPONSE: This requirement has been incorporated into Section 3.5 of Hanson's Asbestos Monitoring and Mitigation Plan. Samples will be analyzed on an expedited timeline after receipt. All efforts will be made to produce results to the Department within 24 hours or receipt by Hanson from the laboratory.

xiv. 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.

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.

xv. Please include provisions to ensure that water emitting devices or other appropriate dust control equipment is on-site and useable prior to beginning activity where material, soil or rock on site may be disturbed, regardless of the planned length of the activity.

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

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

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.

At such time a fixed aggregate processing plant would be constructed, Hanson will likely employ a dust suppression system, such as Nesco Dust Pro, Dustboy or equivalent as appropriate. Information on the Nesco systems are on the Nesco Website. In general, Hanson would incorporate high pressure, wet, dust suppression systems to service the primary and secondary crushing circuits. The systems are to be designed to adequately control dust emissions from the

proposed circuits. Generally, high pressure spray nozzles are used. Valves will be installed before each spray nozzle such that each nozzle can be adjusted for flow. Hanson will provide PADEP specific engineering details prior to initiating full operations at the Quarry.

When Hanson's quarrying activities increase beyond the limited 500-ton removal operation, Hanson will need to install more permanent aggregate processing equipment. Hanson will coordinate with PADEP in advance and will prepare and submit any permit application(s) necessary prior to the operation of permanent dust suppression equipment.

xvii. ***Please include provisions in the air monitoring plan to sample and monitor ambient air levels of asbestos during any activity where material, soil or rock on site will be disturbed, regardless of the planned length of the activity.***

RESPONSE: Hanson has incorporated this requirement into sections 3.2 and 3.3. of its Asbestos Monitoring and Mitigation Plan.

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.

a. Please detail all methods, protocols and compliance standards that will be employed to assess the background exposure of NOA in the communities surrounding the Rock Hill Quarry.

RESPONSE: Hanson incorporates its Response to Item 9(c)(i). 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's experts have determined that sampling at the boundary of the quarry property is the most effective way to assess risks to the general population. As noted above, preliminary background perimeter air samples did not demonstrate the presence of ambient NOA. Any offsite NOA could not be associated with Quarry activities.

As discussed above, sampling at the property boundary will provide a conservative value to assess exposure to the most sensitive receptors.

b. Please detail all methods, protocols and compliance standards that will be employed to identify and quantify the NOA content in the rock or overburden at the Rock Hill Quarry.

RESPONSE: Please see Hanson's Response 8(c) on Hanson's analysis of overburden.

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.

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:

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.

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.

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:

  1. NPDES Outfall;
  2. Sediment Trap 1
  3. Sediment Trap 2
  4. Sediment Trap 3
  5. Sediment Basin 1
  6. Sediment Basin 2
  7. 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. In particular, Hanson will employ the following measures:

  - utilize a dedicated street sweeper, with water sprays, to clean paved roads and public road ways 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 wind sock 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.

Hanson intends to reply to Paragraphs 10(e) through 12 of PADEP's Deficiency Letter on or before October 29, 2021.

Hanson and its experts are continuing their work and analyses in providing a comprehensive response to the remaining items in PADEP's April 12, 2021 letter. In addition, Hanson anticipates providing PADEP with additional background Quarry perimeter air, overburden, and water sampling results as those results are generated in the near term. Hanson looks forward to PADEP's comments on Hanson's initial response and sampling results. Hanson asks that PADEP let Hanson know when it can expect PADEP's comments on Hanson's initial response and sampling results so Hanson can incorporate any PADEP comments into Hanson's subsequent response due by October 29, 2021.

Hanson is committed to continuing to work with PADEP to allow the removal of the Cessation Order so that quarrying activities can resume at the Rock Hill Quarry.

Regards,

Andrew J. Gutshall, P.G.
Area Environmental Manager

Catherine Stehlin
Associate General Counsel – Northeast Region

encl:

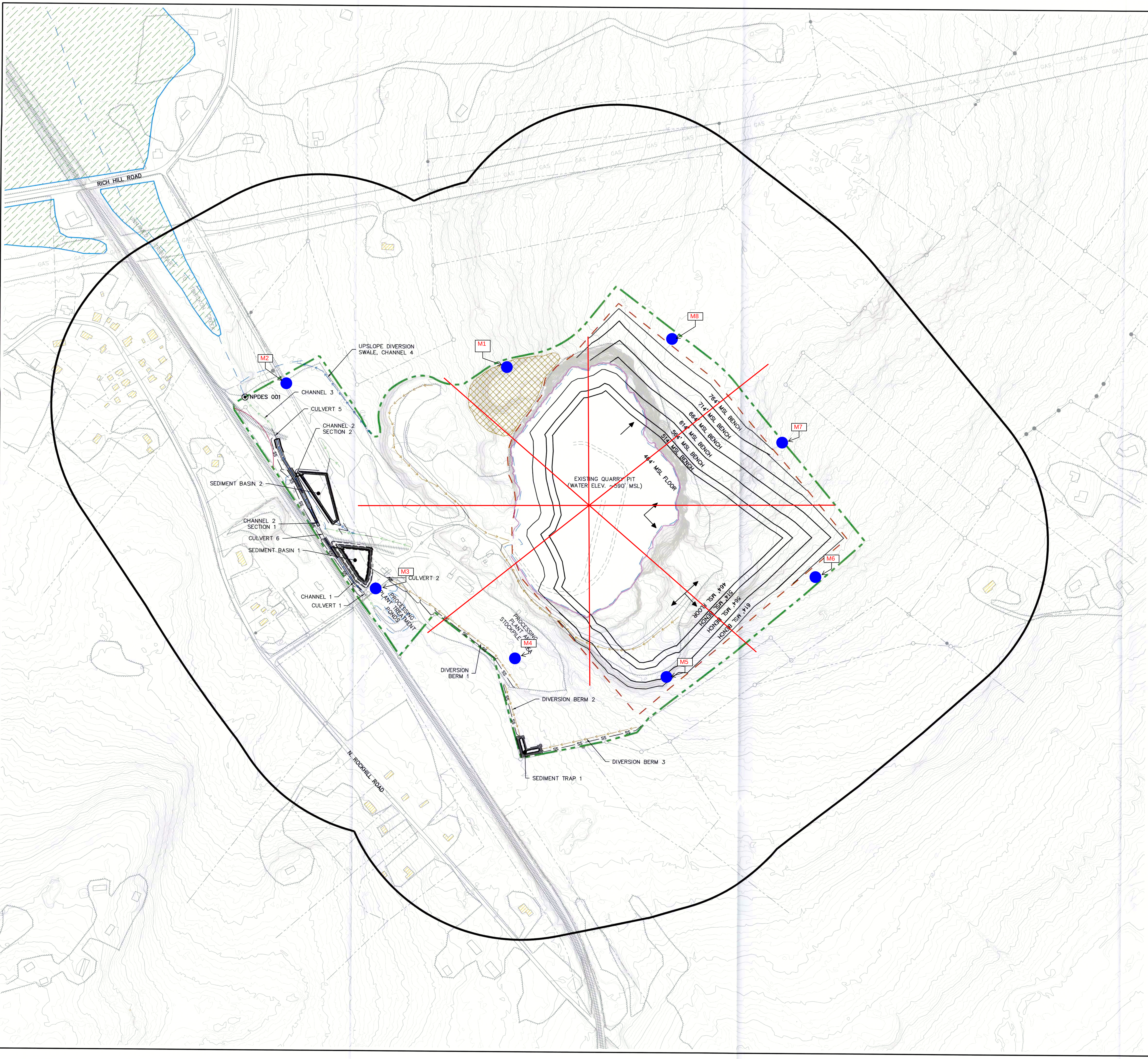
cc: John Stefanko, PADEP (e-mail only)
Daniel Sammarco, P.E., PADEP (e-mail only)
Gary Latsha, PADEP (e-mail only)
Michael P. Kutney, P.G., PADEP (e-mail only)
Randy Shustack, PADEP (e-mail only)

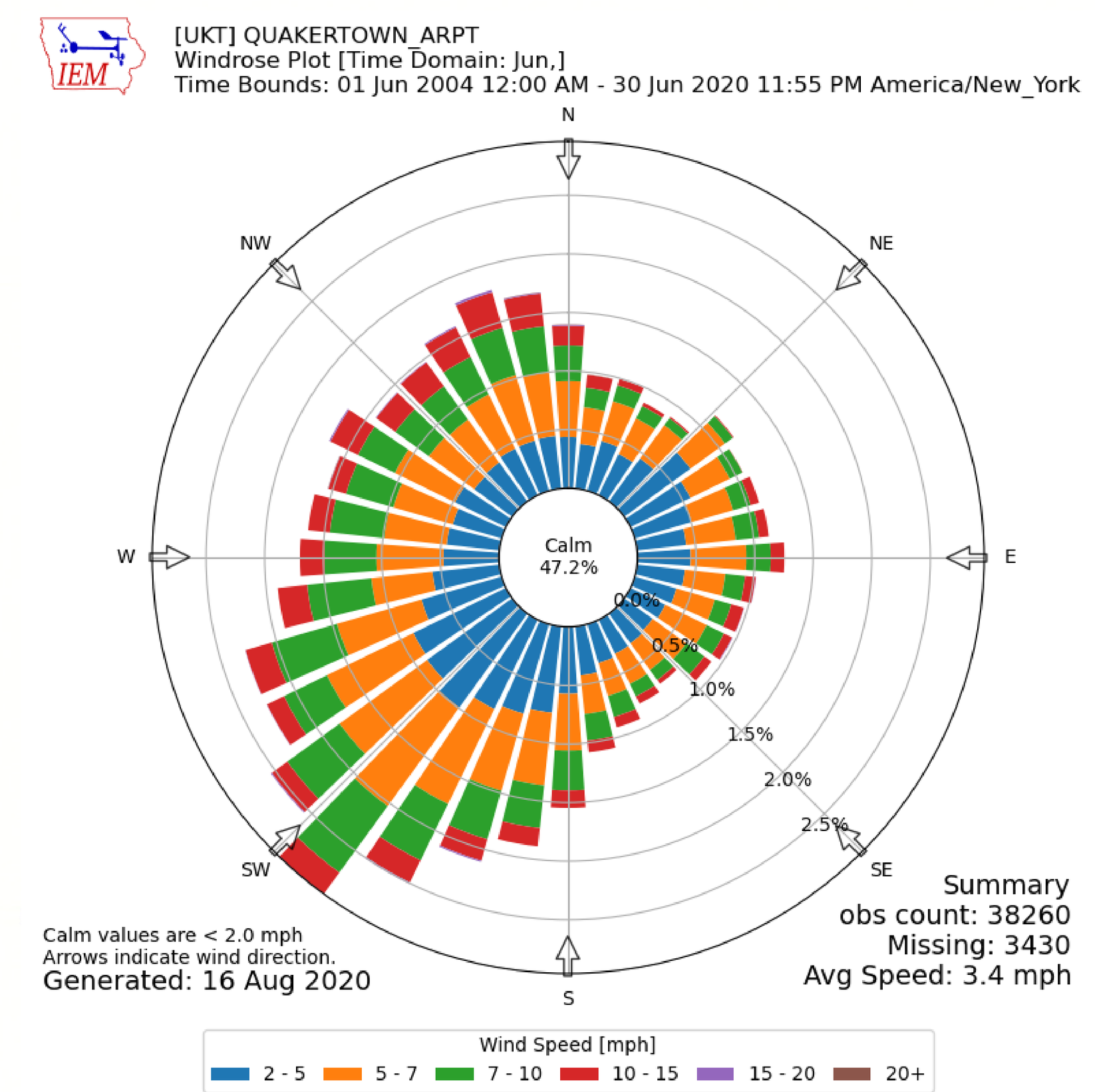
Amiee Bollinger, PADEP (e-mail only)
Thomas Boretski, PADEP (e-mail only)
James Rebarchak, PADEP (e-mail only)
Sachin Shankar, P.E., PADEP (e-mail only)
Jillian Gallagher, PADEP (e-mail only)
Robert Fogel, PADEP (e-mail only)
Neil Shader, PADEP (e-mail only)
Virginia Cain, PADEP (e-mail only)
Craig Lambeth, Esq., PADEP (e-mail only)
Marianne Morano, East Rockhill Township (e-mail only)
County of Bucks (e-mail only)
Rockhill Environmental Preservation Alliance (e-mail only)
Julie Goodman, PhD, Gradient Corp. (e-mail only)
Kelly Bailey, CIH, KBC LLC (e-mail only)
Bryan Bandli, PhD, RJ Lee Group (e-mail only)
Matthew Weikel, P.G., EARTHRES (e-mail only)
Joe Kim, P.E., EARTHRES (e-mail only)
Kristian Witt, CMI (e-mail only)
Mark E. Kendrick, Hanson (e-mail only)
Michael C. Lewis, CHMM, Hanson (e-mail only)
Timothy J. Poppenberg, Hanson (e-mail only)
Robert, J. Schena, Esq., Fox Rothschild LLP
Environmental File

APPENDIX A

HANSON AGGREGATES PA, LLC

PRELIMINARY SAMPLING RESULTS COLLECTED FROM PERIMETER AIR, WATER, AND OVERBURDEN LOCATIONS AT THE ROCK HILL QUARRY JUNE 2020





LEGEND

- EXISTING GRADE CONTOUR (2' INTERVAL)
- EXISTING SMP BOUNDARY
- LIMIT OF MINING
- 1,000' SMP OFFSET
- PRE-ACT HIGHWALL
- 300' BUILDING SETBACK
- PROPERTY BOUNDARY
- EXISTING SURFACE WATER
- EXISTING RAILROAD
- EXISTING TREELINE
- EXISTING GAS PIPELINE
- EXISTING DRAINAGE CHANNEL
- PROPOSED DRAINAGE CHANNEL
- PROPOSED DIVERSION BERM
- PROPOSED COMPOST FILTER SOCK
- EXISTING BUILDING - RESIDENTIAL
- NPDES 001 NPDES DISCHARGE POINT
- OVERBURDEN/TOPSOIL STORAGE
- NWI WETLANDS
- DIRECTION OF MINING

NOTES:

1. EXISTING GRADE TOPOGRAPHY COMPILED BY PAMAP PROGRAM, PA DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES, BUREAU OF TOPOGRAPHIC AND GEOLOGIC SURVEY, DATED JUNE 2010.
2. TOPOGRAPHY AND SITE FEATURES IN WESTERN PERMIT AREA WERE SURVEYED BY EARTHRES GROUP, INC. PERSONNEL, JANUARY 2017.
3. BASEMAP FEATURES INCLUDING BUILDINGS, ROADS, UTILITIES, WATER FEATURES, AND TREELINES RETRACED FROM AERIAL PHOTOGRAPHY DATED 2015, PUBLISHED BY THE DELAWARE VALLEY REGIONAL PLANNING COMMISSION.
4. EXISTING PERMIT INFORMATION INCLUDING PERMIT BOUNDARY, MINING LIMIT, DEPTH OF MINING, AND PRE-ACT HIGHWALLS ARE REFERENCED TO THE PERMIT DRAWING "MINING PLAN, SHEET 3 OF 6" PREPARED BY SKELLY AND LOY, DATED MARCH 18, 1980.
5. HANSON PROPERTY BOUNDARY PROVIDED BY MAP TITLED "PLAT OF SURVEY OF LANDS OF GENERAL CRUSHED STONE", PREPARED BY ORANGEVILLE SURVEYING CONSULTANTS, INC., DATED MAY 7, 2001.
6. ADJACENT PARCEL BOUNDARIES ARE REFERENCED TO THE BUCKS COUNTY GIS RECORDS.
7. WETLANDS REFLECT THOSE DEPICTED IN THE NATIONAL WETLANDS INVENTORY FWS WETLANDS MAPPER.
8. PROPERTY OWNERSHIP INFORMATION IS REFERENCED TO MODULE 5 OF THE PERMIT APPLICATION.
9. STREAM INFORMATION IS REFERENCED TO THE PA DEP eMAPPA ONLINE RECORDS.
9. REFER TO THE E&S PLAN DRAWINGS FOR LOCATION OF ALL EROSION AND SEDIMENTATION CONTROL STRUCTURES.

GRAPHIC SCALE

200 0 100 200 400 800

(IN FEET)
1 inch = 200 ft.

NO.	DATE	BY	REVISIONS

MICHAEL D. FLING, P.E.
LICENSE NO. PE080620

PROJECT SITE:
HANSON AGGREGATES PENNSYLVANIA LLC
SMP NO. 7974SM1
EAST ROCKHILL TOWNSHIP, BUCKS COUNTY
PENNSYLVANIA

PREPARED FOR:
Hanson HEIDELBERGCEMENTGroup

PREPARED BY:
EarthRes ENGINEERING AND SCIENCE
6912 Old Easton Road Pipersville, PA 18947 USA
8000 Combs Farm Drive Morgantown, WV 26508
www.earthres.com
PA office 215.766.1211
WV office 304.212.6866
toll free 800.264.4553

EXHIBIT 9
OPERATIONS MAP

HANSON AGGREGATES PENNSYLVANIA LLC
ROCK HILL QUARRY

DRAWN BY: JTK	CHECKED BY: MDF
DATE: 02/20/18	PROJECT NO: 061003.052
DRAWING NUMBER: R-001	
SHEET 1 OF 1	

F:\PROJECTS\Hanson\061003.XXX Rock Hill Quarry Permit Update\CAD\Drawings\Rev 0\Exhibit 9.dwg Layout: Exhibit 9 User: JKim 02/20/2018 13:26

RJ Lee Group, Inc
350 Hochberg Road
Monroeville, PA 15146
Tel: (724) 325-1776 | Fax (724) 733-1799

Final Laboratory Report

TEM ISO Analysis

Ms. Clair Wischusen
Fox Rothschild LLP
2700 Kelly Road
Suite 300
Warrington, PA 18976
US

Report Date: 06/28/2021
Sample Receipt Date: 06/24/2021
RJ Lee Group Job No.: LLH901997-29
Authorization/P.O. No.:
Samples Received: 10
Client Job No.:

Method: ISO 10312, 1st Edition 1995-05-01

TABLE 1 -- Total Asbestos Structures Concentration

Client Sample Number	RJLG Sample Number	Sample Description	Filter Area (mm^2)	Dilution Factor	Volume (liter)	Area Analyzed (mm^2)	Total Asbestos Chry	Total Asbestos Amph	95% Confidence Interval Chry	95% Confidence Interval Amph	Analytical Sensitivity (S/cc)	Total Asbestos Concentration (S/cc) Chry	Total Asbestos Concentration (S/cc) Amph
0623-1	3174413.HT	M7	385	1	1120	0.07061	0	0	0 - 3	0 - 3	0.0049	< 0.0049	< 0.0049
0623-2	3174414.HT	M8	385	1	965	0.08826	0	0	0 - 3	0 - 3	0.0045	< 0.0045	< 0.0045
0623-3	3174415.HT	M1	385	1	887	0.08826	0	0	0 - 3	0 - 3	0.0049	< 0.0049	< 0.0049
0623-4	3174416.HT	M2	385	1	1045	0.07944	0	0	0 - 3	0 - 3	0.0046	< 0.0046	< 0.0046

NOTES
1. Volumes provided by the client listed above were used to calculate analytical results and sensitivities.
2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
4. Abbreviations: N/A-Not Applicable, O/L-Overloaded, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, NAS-Non-Asbestos Structures, f-Asbestos Fibers, F-Total Fibers.
5. Samples will be held for 90 days and then disposed of per Federal regulations.
6. Sample(s) for this project were analyzed at our Monroeville, PA (NVLAP Lab Code 101208-0, NY ELAP #10884) facility.
7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

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0623-5	3174417.HT	M3	385	1	1040	0.07944	0	0	0 - 3	0 - 3	0.0047	< 0.0047	< 0.0047
0623-6	3174418.HT	M4	385	1	1050	0.07944	0	0	0 - 3	0 - 3	0.0046	< 0.0046	< 0.0046
0623-7	3174419.HT	M5	385	1	1000	0.07944	0	0	0 - 3	0 - 3	0.0048	< 0.0048	< 0.0048
0623-8	3174420.HT	M6	385	1	970	0.07944	0	0	0 - 3	0 - 3	0.0050	< 0.0050	< 0.0050
0623-9	3174421.HT	field blank	385	1	0	0.08826	0	0	0 - 3	0 - 3	N/A	N/A	N/A
0623-10	3174422.HT	field blank	385	1	0	0.08826	0	0	0 - 3	0 - 3	N/A	N/A	N/A

NOTES

1. Volumes provided by the client listed above were used to calculate analytical results and sensitivities.
2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
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5. Samples will be held for 90 days and then disposed of per Federal regulations.
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TABLE 2 -- Asbestos Structures >= 5 µm Length

Client Sample Number	RJLG Sample Number	Sample Description	Filter Area (mm^2)	Dilution Factor	Volume (liter)	Area Analyzed (mm^2)	Total Asbestos Chry	Total Asbestos Amph	95% Confidence Interval Chry	95% Confidence Interval Amph	Analytical Sensitivity (S/cc)	Total Asbestos Concentration (S/cc) Chry	Total Asbestos Concentration (S/cc) Amph
0623-1	3174413.HT	M7	385	1	1120	0.07061	0	0	0 - 3	0 - 3	0.0049	< 0.0049	< 0.0049
0623-2	3174414.HT	M8	385	1	965	0.08826	0	0	0 - 3	0 - 3	0.0045	< 0.0045	< 0.0045
0623-3	3174415.HT	M1	385	1	887	0.08826	0	0	0 - 3	0 - 3	0.0049	< 0.0049	< 0.0049
0623-4	3174416.HT	M2	385	1	1045	0.07944	0	0	0 - 3	0 - 3	0.0046	< 0.0046	< 0.0046
0623-5	3174417.HT	M3	385	1	1040	0.07944	0	0	0 - 3	0 - 3	0.0047	< 0.0047	< 0.0047
0623-6	3174418.HT	M4	385	1	1050	0.07944	0	0	0 - 3	0 - 3	0.0046	< 0.0046	< 0.0046
0623-7	3174419.HT	M5	385	1	1000	0.07944	0	0	0 - 3	0 - 3	0.0048	< 0.0048	< 0.0048
0623-8	3174420.HT	M6	385	1	970	0.07944	0	0	0 - 3	0 - 3	0.0050	< 0.0050	< 0.0050

NOTES

1. Volumes provided by the client listed above were used to calculate analytical results and sensitivities.
2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
4. Abbreviations: N/A-Not Applicable, O/L-Overloaded, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, NAS-Non-Asbestos Structures, f-Asbestos Fibers, F-Total Fibers.
5. Samples will be held for 90 days and then disposed of per Federal regulations.
6. Sample(s) for this project were analyzed at our Monroeville, PA (NVLAP Lab Code 101208-0, NY ELAP #10884) facility.
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TABLE 2 -- Asbestos Structures >= 5 µm Length

Client Sample Number	RJLG Sample Number	Sample Description	Filter Area (mm^2)	Dilution Factor	Volume (liter)	Area Analyzed (mm^2)	Total Asbestos Chry	Total Asbestos Amph	95% Confidence Interval Chry	95% Confidence Interval Amph	Analytical Sensitivity (S/cc)	Total Asbestos Concentration (S/cc) Chry	Total Asbestos Concentration (S/cc) Amph
0623-9	3174421.HT	field blank	385	1	0	0.08826	0	0	0 - 3	0 - 3	N/A	N/A	N/A
0623-10	3174422.HT	field blank	385	1	0	0.08826	0	0	0 - 3	0 - 3	N/A	N/A	N/A

Authorized Signature:

Ashleigh Sload, Scientist

NOTES

1. Volumes provided by the client listed above were used to calculate analytical results and sensitivities.
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4. Abbreviations: N/A-Not Applicable, O/L-Overloaded, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, NAS-Non-Asbestos Structures, f-Asbestos Fibers, F-Total Fibers.
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Rock Hill Quarry
Figure 1
Surface Water Sampling Locations
Legend
Surface water Sample Location
Sediment Trap 2
NPDES Outfall
Sediment Basin 2
Sediment Basin 1
Quarry Pit
Sediment Trap 3
Sediment Trap 1
Google Earth
© 2018 Google
N
1000 ft

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

RJ Lee Group, Inc
350 Hochberg Road
Monroeville, PA 15146
Tel: (724) 325-1776 | Fax (724) 733-1799

Final Laboratory Report

TEM Non Potable Water Analysis

Ms. Clair Wischusen
Fox Rothschild LLP
2700 Kelly Road
Suite 300
Warrington, PA 18976
US

Report Date: 06/28/2021
Sample Receipt Date: 06/23/2021
RJ Lee Group Job No.: LLH901997-28
Authorization/P.O. No.:
Samples Received: 7
Client Job No.:

Method: EPA 100.1 600/4-03-043

Client Sample Number	RJLG Sample Number	Date Prepped	Date Analyzed	Filter Area (mm^2)	Volume (ml)	Area Analyzed (mm^2)	Confidence Interval >0.50 µm	Asbestos Structures >0.50 µm Chry	Asbestos Structures >0.50 µm Amph	Analytical Sensitivity (MFL) >0.50 µm	Concentration (MFL) >0.50 µm
1 - NPDES Outfall	3174398.HTW1	06/24/2021	06/25/2021	1220	10.0	0.17652	0-4	0	0	0.7	< 0.7
2 - Sed. Trap 2	3174399.HTW1	06/24/2021	06/25/2021	1220	10.0	0.17652	0-4	0	0	0.7	< 0.7
3. Sed. Basin 2	3174400.HTW1	06/24/2021	06/28/2021	1220	10.0	0.17652	0-4	0	0	0.7	< 0.7
4. Sed Basin 1	3174401.HTW1	06/24/2021	06/28/2021	1220	10.0	0.17652	0-4	0	0	0.7	< 0.7
5. Quarry Pit	3174402.HTW1	06/24/2021	06/28/2021	1220	10.0	0.17652	0-4	0	0	0.7	< 0.7
6. Sed. Trap 1	3174403.HTW1	06/24/2021	06/28/2021	1220	10.0	0.17652	0-4	0	0	0.7	< 0.7
7. Sed Trap 3	3174404.HTW1	06/24/2021	06/28/2021	1220	10.0	0.17652	0-4	0	0	0.7	< 0.7

NOTES
1. Water samples collected more than 24 hours before receipt may be out of compliance. Drinking water samples are filtered within 24 hours of receipt.
2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
3. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC #100364, NVLAP #101208-0, NY ELAP #10884) facility.
4. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, MFL-million fibers per liter.
6. Samples will be held for 30 days and then disposed of per Federal regulations.
7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

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RJ Lee Group, Inc.

Final Laboratory Report (cont'd)

RJ Lee Group Job No: LLH901997-28
Client Job No/Name:

Client: Fox Rothschild LLP
Report Date: 06\28\2021

Authorized Signature: 

Ashleigh Sload, Scientist

NOTES

1. Water samples collected more than 24 hours before receipt may be out of compliance. Drinking water samples are filtered within 24 hours of receipt.
2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
3. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC #100364, NVLAP #101208-0, NY ELAP #10884) facility.
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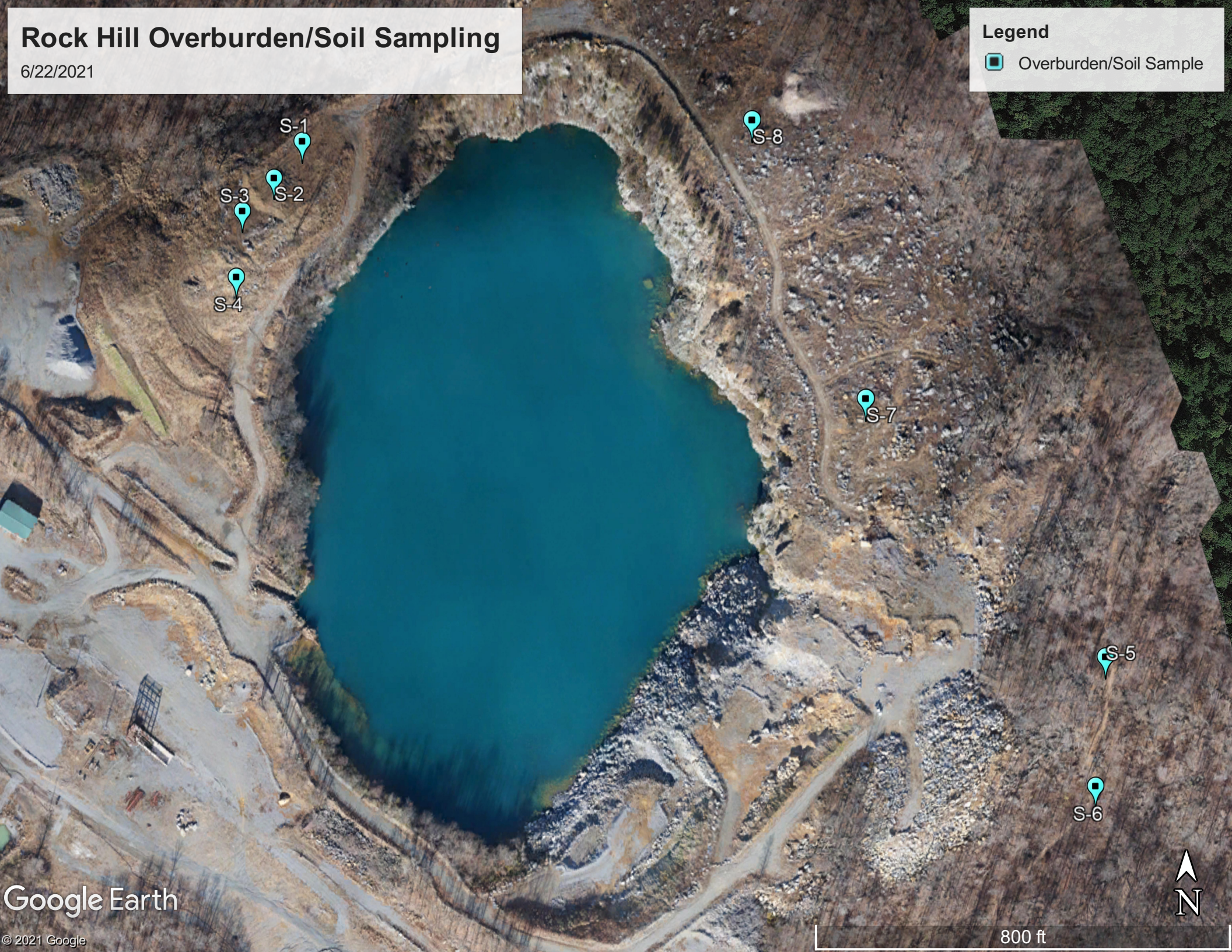
Rock Hill Overburden/Soil Sampling
6/22/2021
Legend
Overburden/Soil Sample
S-1
S-2
S-3
S-4
S-5
S-6
S-7
S-8
Google Earth
© 2021 Google
N
800 ft

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

July 1, 2021

Ms. Clair Wischusen
Fox Rothschild LLP
2700 Kelly Road, Suite 300
Warrington, PA 18976

RE: Sample Analyses
RJ Lee Group Project Number: LLH901997

Ms. Wischusen,

RJ Lee Group, Inc. (RJLG) received eight (8) bulk samples of overburden material collected at the Rockhill Quarry. The samples were analyzed for asbestos by both polarized light microscopy (PLM) in accordance with EPA/R-93/600/116 "Method for the Determination of Asbestos in Bulk Building Materials" and by transmission electron microscopy (TEM) in accordance with ISO 22262-2 "Quantitative determination of asbestos by gravimetric and microscopical methods." Upon receipt, each as-received sample was photographed and assigned unique RJLG sample numbers.

PLM

Each sample was initially examined using a stereo binocular microscope to look for fibrous material. As none was observed, the samples were then prepared for PLM analysis by pulverization using a Bico laboratory jaw crusher and a Bico Type US disc pulverizer. The intent of the pulverization is to reduce the particle size enough such that light could pass through any possible asbestos minerals without over-pulverizing the samples (which could damage any asbestos fibers thus preventing their identification[1,2]). This method of reducing the size of the particles is consistent with the procedure described in CARB 435 (*Determination of Asbestos Content of Serpentine Aggregate*).[3]

Quantitation of the asbestos content of the samples was performed by PLM using the point counting technique. One thousand randomly selected, non-empty points were counted, classifying each counted particle as asbestos or non-asbestos. Elongated non-asbestos amphibole particles were also separately counted. If an asbestos fiber was observed in the PLM field of view but did not fall below the cross hairs, the optical properties of the fiber were determined and recorded and the result (absent any other counted asbestos points) reported as "< 0.1%". The results of the PLM analyses are summarized in the laboratory report provided in Appendix A.

[1] D. Van Orden, J. Wilmoth, and M. Sanchez (2012). "Effect of Size Reduction Processes on the Apparent Fiber Content of Rock Samples", *The Microscope*, 60, p. 3-9.
[2] O. Baietto, M. Diano, G. Zanetti, and P. Marini (2019). "Grinding Test on Tremolite with Fibrous and Prismatic Habit", *Fibers*, 7, 52, doi:10.3390/fib7060052.
[3] Additional information on CARB 435 can be found in "*Implementation Guidance Document: Field Sampling and Laboratory Practices*", California Environmental Protection Agency, Air Resources Board, April 2017. https://ww3.arb.ca.gov/toxics/asbestos/tm435/tm435.htm.

An example is shown in Figure 1 of actinolite and tremolite asbestos observed in samples S-1 and S-2 (RJLG# 3174405 &3174406). An example is shown in Figure 2 of actinolite cleavage observed in samples S-1 and S-4 (RJLG# 3174405 & 3174408).

TEM

The TEM analyses were conducted in accordance with ISO 22262-2 to determine the mass percentage of asbestos using the specified fiber counting parameters requested by PADEP (fibers ≥0.5 μm and ≥3:1 aspect ratio). Portions of the pulverized samples were prepared and analyzed for TEM analysis by suspending a known mass into filtered deionized water and briefly sonicating the sample in an ultrasonic bath. An aliquot of the suspension was filtered through a pre-weighed 0.2 μm polycarbonate membrane filter. After drying, the filter was weighed to determine the mass deposited. A portion of the filter was prepared for TEM analysis by following the procedure in Chatfield[4] using calibrated 200 mesh copper TEM support grids.

The prepared grids were analyzed by TEM in accordance with ISO 22262 to determine the weight percent of asbestiform and non-asbestiform amphibole present in each sample. All particles with lengths ≥ 0.5 μm and aspect ratios (length:width) ≥ 3:1 were counted and the mineral identity of each counted particle was determined using a combination of energy dispersive x-ray spectroscopy (EDS) to determine the chemical composition and selected area electron diffraction (SAED) to determine the crystal structure. The morphology of each counted amphibole particle was characterized as asbestiform or non-asbestiform (i.e. cleavage) using the asbestiform definitions provided in ISO 22262-1. The results of the TEM analyses are summarized in the laboratory report provided in Appendix A.

An example is shown in Figure 3 of actinolite asbestos observed in sample S-3 (RJLG# 3174407). An example is shown in Figure 4 of actinolite cleavage particles observed in samples S-1 and S-3 (RJLG# 3174405 & 3174407).

If you have any questions regarding this report, please do not hesitate to contact me directly.

Sincerely,

Bryan Bandli, Ph.D.
Principal Investigator

Att. Appendix A

cc. Robert Schena

[4] Chatfield E.J. (2000): A rapid procedure for preparation of transmission electron microscopy specimens from polycarbonate filters. *ASTM STP 1342, Advances in Environmental Measurement Methods for Asbestos*, Michael E. Beard and Harry L. Rook, Eds.,242-249

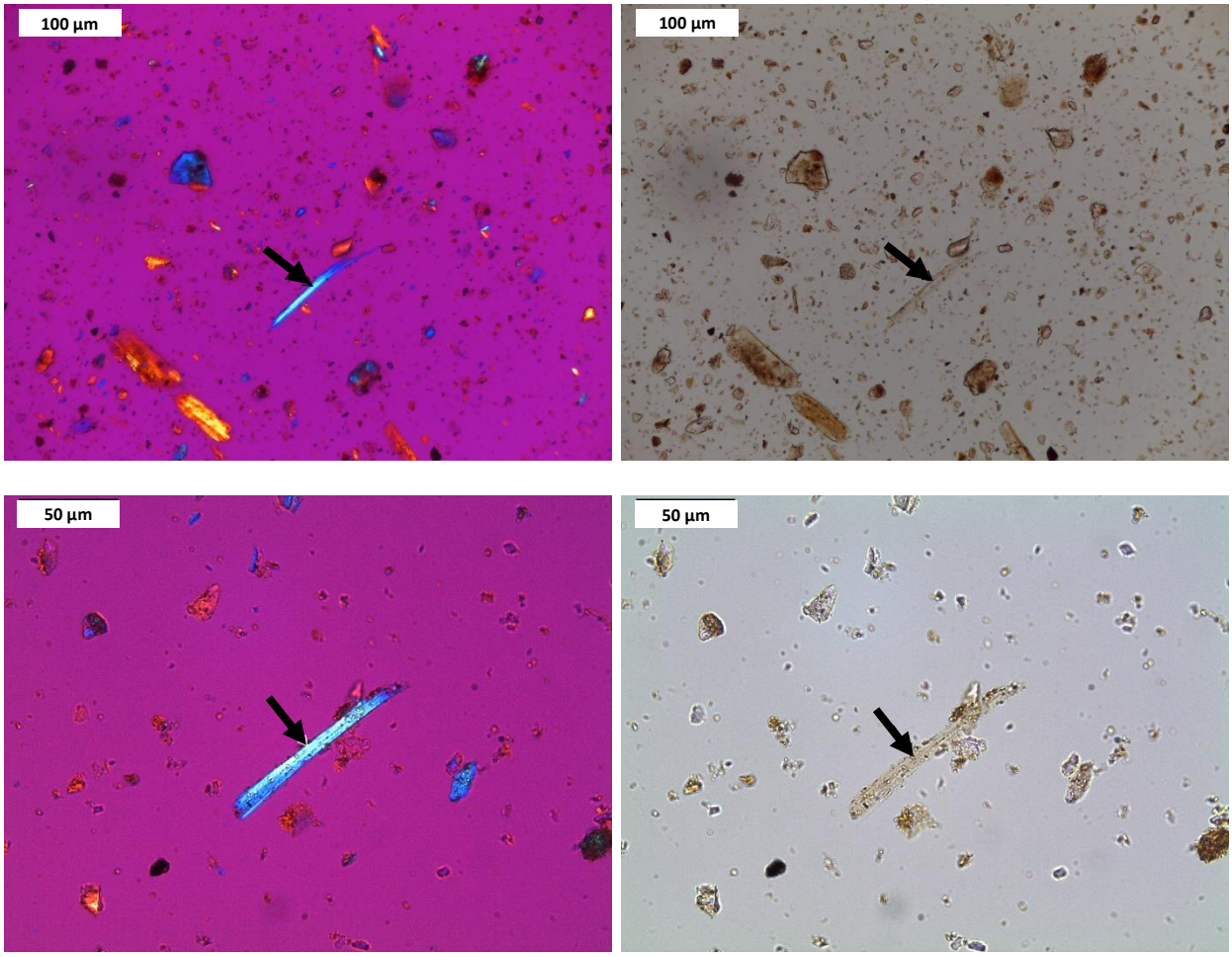

Figure 1. Photomicrographs of an actinolite asbestos bundle observed in sample S-1 (RJLG# 3174405) (top) and tremolite asbestos bundle observed in sample S-2 (RJLG# 3174406) (bottom). A small arrow points to the asbestos in each image. The images were taken with cross polarized light with gypsum plate inserted (left images), in plane polarized light (right images). The particles are immersed in a 1.640 (top) or 1.630 (bottom) refractive index liquid.

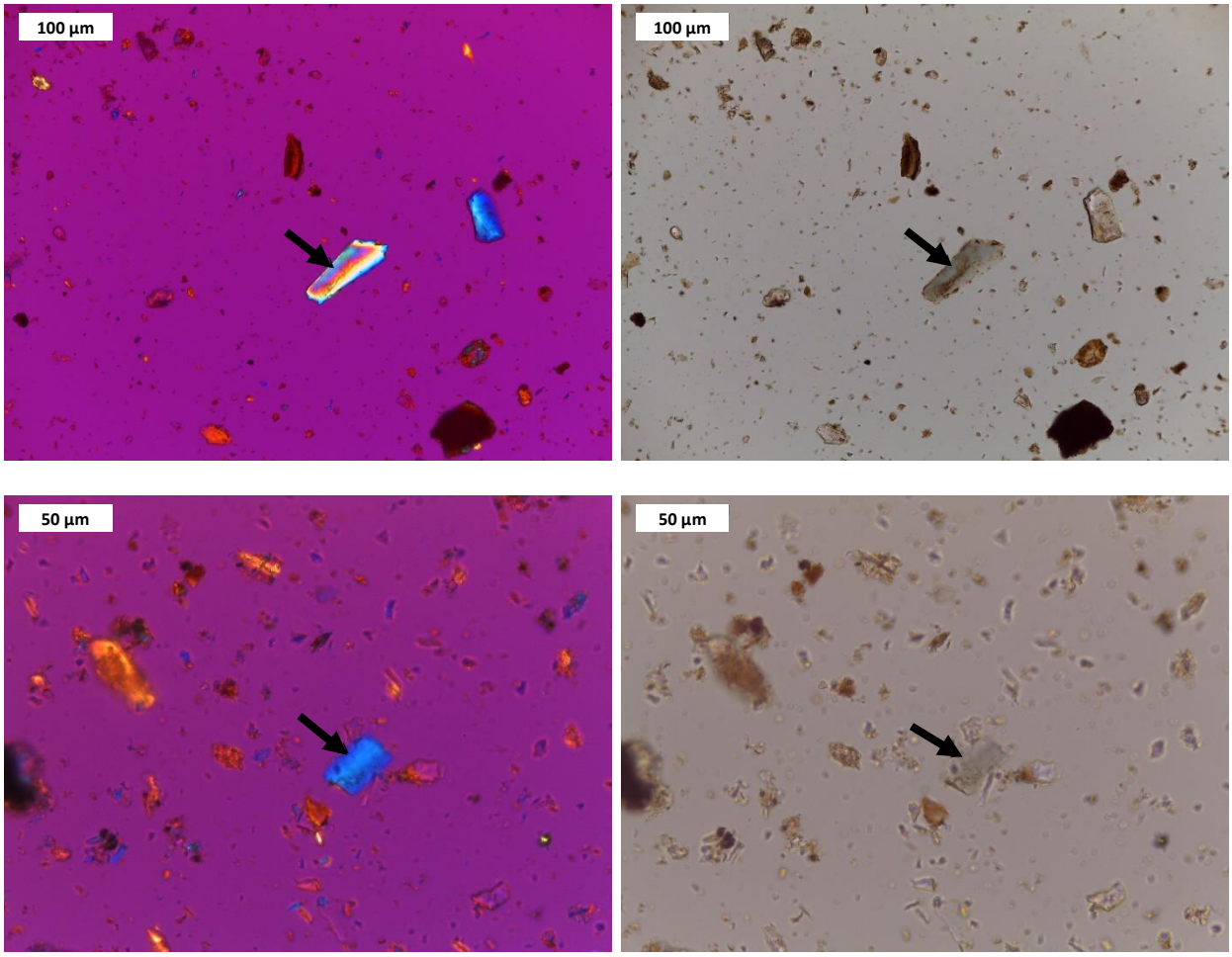

Figure 2. Photomicrographs of an actinolite cleavage particles observed in sample S-1 (RJLG# 3174405) (top) and sample S-4 (RJLG# 3174408) (bottom). A small arrow points to the cleavage particle in each image. The images were taken with cross polarized light with gypsum plate inserted (left images), in plane polarized light (right images). The particles are immersed in a 1.640 refractive index liquid.

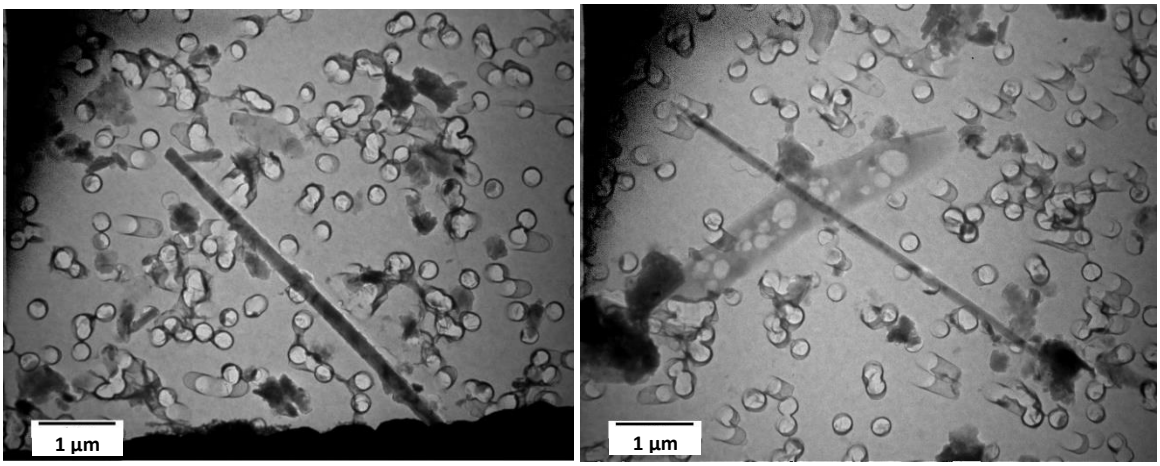

Figure 3. Electron micrographs of representative amphibole asbestos fibers observed in sample S-3 (RJLG# 3174407).

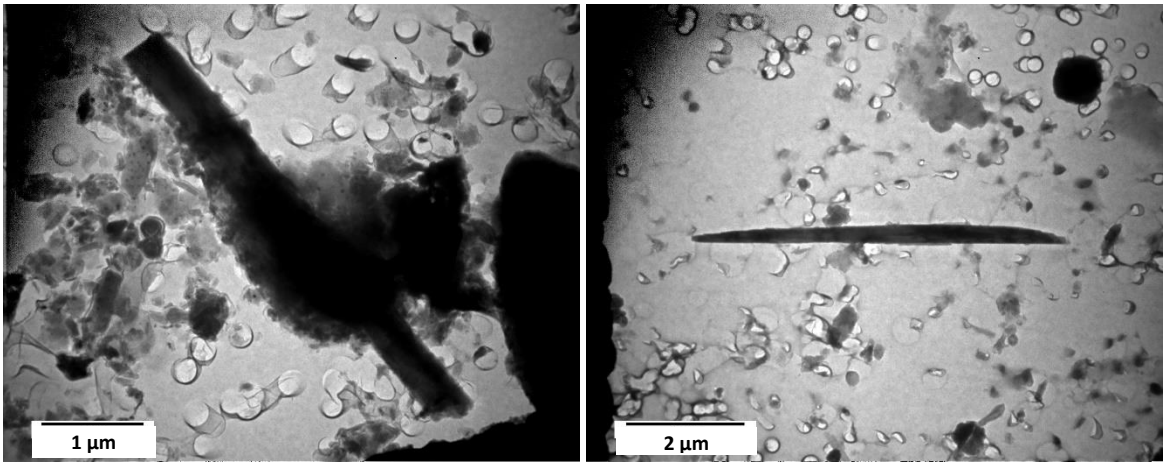

Figure 4. Electron micrographs of representative amphibole cleavage particles observed in sample S-1 (RJLG# 3174405) (left) and S-3 (RJLG# 3174407) (right).

Appendix A:

Laboratory Reports

RJ Lee Group, Inc.
350 Hochberg Road, Monroeville, PA 15146
Tel: 724-325-1776 | Fax: 724-733-1799

Laboratory Report

Fox Rothschild LLP
2700 Kelly Road
Suite 300
Warrington, PA 18976
United States
Attention: Ms. Clair Wischusen
Telephone: 215-918-3559

Report Date	06/29/2021
Sample Receipt Date	06/28/2021
RJ Lee Group Job No.	LLH901997-30
Authorization/P.O. No.	
Client Job No./Name	

Analysis: Asbestos in Bulk Samples by Point Count
Method: EPA/600/R-93/116

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3174405.HPL	S-1	Yes	1	<0.1 AC	0.10 OF	99.90	Q, CA, OP, MI, M	EAF-06/29/2021
Description:	Grey Powder 1000 Point Count. Detection Limit of 0.1%. 0.1% OF= 0.1% Actinolite Cleavage.							
Weight Loss: 0.0%								
3174406.HPL	S-2	Yes	1	<0.1 TR		100.00	Q, F, OR, OP, G, MI, M	AC-06/29/2021
Description:	Brownish Yellow Powder 1000 Point Count. Detection Limit of 0.1%.							
Weight Loss: 0.0%								
3174407.HPL	S-3	Yes	1	ND	0.10 OF	99.90	Q, CA, F, OP, MI, M	EAF-06/29/2021
Description:	Brown Powder 1000 Point Count. Detection Limit of 0.1% 0.1% OF= 0.1% Actinolite Cleavage.							
Weight Loss: 0.0%								

Client Job No./Name:

RJ Lee Group Job No: LLH901997-30

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3174408.HPL	S-4	Yes	1	ND	<0.1 OF	100.00	Q, CA, F, OP, MI, M	EAF-06/29/2021
Description:	Brown Powder 1000 Point Count. Detection Limit of 0.1%. <0.1% OF= <0.1% Actinolite Cleavage.							
Weight Loss: 0.0%								
3174409.HPL	S-5	Yes	1	ND	0.10 OF	99.90	Q, F, OR, OP, MI, M	AC-06/29/2021
Description:	Brownish Yellow Powder 1000 Point Count. Detection Limit of 0.1%. 0.1% OF= 0.1% Actinolite Cleavage.							
Weight Loss: 0.0%								
3174410.HPL	S-6	Yes	1	ND	0.10 OF	99.90	Q, F, OR, OP, MI, M	AC-06/29/2021
Description:	Dark Yellowish Brown Powder 1000 Point Count. Detection Limit of 0.1%. 0.1% OF= 0.1% Actinolite Cleavage.							
Weight Loss: 0.0%								
3174411.HPL	S-7	Yes	1	ND	<0.1 OF	100.00	Q, F, OP, MI, M	EAF-06/29/2021
Description:	Brown Powder 1000 Point Count. Detection Limit of 0.1%. <0.10% OF= <0.10% Actinolite Cleavage.							
Weight Loss: 0.0%								
3174412.HPL	S-8	Yes	1	ND	0.20 OF	99.80	Q, CA, F, OR, OP, MI, M	AC-06/29/2021
Description:	Brown Powder 1000 Point Count. Detection Limit of 0.1%. 0.2% OF= 0.2% Actinolite Cleavage.							
Weight Loss: 0.0%								

RJ Lee Group, Inc
350 Hochberg Road
Monroeville, PA 15146
Tel: (724) 325-1776 | Fax (724) 733-1799

Final Laboratory Report

TEM Bulk Protocol

Ms. Clair Wischusen
Fox Rothschild LLP
2700 Kelly Road
Suite 300
Warrington, PA 18976
US

Report Date: 07/01/2021
Sample Receipt Date: 06/28/2021
RJ Lee Group Job No.: LLH901997-31
Authorization/P.O. No.:
Samples Received: 8
Client Job No.:

Method: ISO 22262-2

TABLE 1 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos

		Total Structures				----------Weight Percent---------- Total Structures Analytical Sensitivity			
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non Asbestos	Chry	Amph Asb	Amph Cleavage Fragment	Non Asbestos
S-1	3174405	0	0	4	2	**< 1.4E-6** 1.4E-6	**< 1.1E-6** 1.1E-6	**3.1E-2** 1.1E-6	**1.2E-3** 1.1E-6
S-2	3174406	0	0	2	2	**< 1.2E-6** 1.2E-6	**< 9.9E-7** 9.9E-7	**6.3E-3** 9.9E-7	**1.1E-2** 9.3E-7

NOTES
1. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
2. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC #100364, NVLAP #101208-0, NY ELAP #10884) facility.
3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
4. Density of amphibole: 3.2 * 10^{-3} ng/μm^3, density of chrysotile: 2.55 * 10^{-3} ng/μm^3, density of non-asbestos: 3.00 * 10^{-3} ng/μm^3.
5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
6. Samples will be held for 90 days and then disposed of per Federal regulations.
7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

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TABLE 1 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos

		Total Structures				----------Weight Percent---------- Total Structures Analytical Sensitivity			
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non Asbestos	Chry	Amph Asb	Amph Cleavage Fragment	Non Asbestos
S-3	3174407	0	3	3	5	**< 1.1E-6** 1.1E-6	**2.4E-3** 8.8E-7	**2.4E-2** 8.8E-7	**8.0E-2** 8.2E-7
S-4	3174408	0	0	0	1	**< 2.0E-6** 2.0E-6	**< 1.6E-6** 1.6E-6	**< 1.6E-6** 1.6E-6	**3.9E-4** 1.5E-6
S-5	3174409	0	0	0	1	**< 1.1E-6** 1.1E-6	**< 8.8E-7** 8.8E-7	**< 8.8E-7** 8.8E-7	**9.7E-5** 8.2E-7
S-6	3174410	0	0	0	1	**< 9.0E-7** 9.0E-7	**< 7.2E-7** 7.2E-7	**< 7.2E-7** 7.2E-7	**2.6E-5** 6.7E-7
S-7	3174411	0	0	0	1	**< 1.4E-6** 1.4E-6	**< 1.1E-6** 1.1E-6	**< 1.1E-6** 1.1E-6	**2.2E-4** 1.1E-6
S-8	3174412	0	0	0	2	**< 1.6E-6** 1.6E-6	**< 1.3E-6** 1.3E-6	**< 1.3E-6** 1.3E-6	**1.5E-3** 1.2E-6

NOTES

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4. Density of amphibole: 3.2 * 10^{-3} ng/μm^3, density of chrysotile: 2.55 * 10^{-3} ng/μm^3, density of non-asbestos: 3.00 * 10^{-3} ng/μm^3.
5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
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TABLE 2 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos ≥5 µm

		--------Structures ≥5 µm--------				----------Weight Percent---------- Structures ≥5 µm Analytical Sensitivity			
						Amphibole			
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non-Asbestos	Chry	Asb	Cleavage Fragment	Non-Asbestos
S-1	3174405	0	0	3	0	**< 1.4E-5** 1.4E-5	**< 1.1E-5** 1.1E-5	**3.1E-2** 1.1E-5	**< 1.1E-5** 1.1E-5
S-2	3174406	0	0	1	1	**< 1.2E-5** 1.2E-5	**< 9.9E-6** 9.9E-6	**4.4E-4** 9.9E-6	**1.0E-2** 9.3E-6
S-3	3174407	0	3	2	4	**< 1.1E-5** 1.1E-5	**2.4E-3** 8.8E-6	**2.4E-2** 8.8E-6	**8.0E-2** 8.2E-6
S-4	3174408	0	0	0	0	**< 2.0E-5** 2.0E-5	**< 1.6E-5** 1.6E-5	**< 1.6E-5** 1.6E-5	**< 1.5E-5** 1.5E-5
S-5	3174409	0	0	0	0	**< 1.1E-5** 1.1E-5	**< 8.8E-6** 8.8E-6	**< 8.8E-6** 8.8E-6	**< 8.2E-6** 8.2E-6
S-6	3174410	0	0	0	0	**< 9.0E-6** 9.0E-6	**< 7.2E-6** 7.2E-6	**< 7.2E-6** 7.2E-6	**< 6.7E-6** 6.7E-6
S-7	3174411	0	0	0	0	**< 1.4E-5** 1.4E-5	**< 1.1E-5** 1.1E-5	**< 1.1E-5** 1.1E-5	**< 1.1E-5** 1.1E-5
S-8	3174412	0	0	0	0	**< 1.6E-5** 1.6E-5	**< 1.3E-5** 1.3E-5	**< 1.3E-5** 1.3E-5	**< 1.2E-5** 1.2E-5

NOTES

1. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
2. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC #100364, NVLAP #101208-0, NY ELAP #10884) facility.
3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
4. Density of amphibole: $3.2 * 10^{-3}$ ng/µm³, density of chrysotile: $2.55 * 10^{-3}$ ng/µm³, density of non-asbestos: $3.00 * 10^{-3}$ ng/µm³.
5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
6. Samples will be held for 90 days and then disposed of per Federal regulations.
7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

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Client Sample Number	RJLG Sample Number	Material Used (gm)	Area Analyzed Total (mm^2)	Area Analyzed $\geq 5 \mu m$ (mm^2)	Effective Filter Area (mm^2)	Dilution Factor
S-1	3174405	0.0007	0.30892	0.30892	1220	1.0
S-2	3174406	0.0008	0.30892	0.30892	1220	1.0
S-3	3174407	0.0009	0.30892	0.30892	1220	1.0
S-4	3174408	0.0005	0.30892	0.30892	1220	1.0
S-5	3174409	0.0009	0.30892	0.30892	1220	1.0
S-6	3174410	0.0011	0.30892	0.30892	1220	1.0
S-7	3174411	0.0007	0.30892	0.30892	1220	1.0
S-8	3174412	0.0006	0.30892	0.30892	1220	1.0

Authorized Signature: 

Ashleigh Sload, Scientist

NOTES

1. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
2. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC #100364, NVLAP #101208-0, NY ELAP #10884) facility.
3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
4. Density of amphibole: $3.2 * 10^{-3}$ ng/μm^3, density of chrysotile: $2.55 * 10^{-3}$ ng/μm^3, density of non-asbestos: $3.00 * 10^{-3}$ ng/μm^3.
5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
6. Samples will be held for 90 days and then disposed of per Federal regulations.
7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

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RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

Laboratory Report (Cont)

Client Job No./Name:

RJ Lee Group Job No: LLH901997-30

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date

Authorized Signature: _____

Alexandra Cheek, Microscopist

ASBESTOS

AM = Amosite
AC = Actinolite
AN = Anthophyllite
CH = Chrysotile
CR = Crocidolite
TR = Tremolite

NON-ASBESTOS

CE = Cellulose
MW = Mineral Wool
FG = Fibrous Glass
SF = Synthetic Fibers
H = Hair
W = Wollastonite
OF = Other Fibers

NON-FIBROUS MATERIALS

AM = Amphibole
B = Binder
CA = Carbonates
CL = Clay
F = Feldspar
G = Gypsum
HY = Hydromagnesite
M = Miscellaneous
MI = Mica
OP = Opaque
OR = Organic
P = Perlite
Q = Quartz
T = Tar
V = Vermiculite

DISCLAIMER NOTES

· "ND" indicates no asbestos was detected; the method detection limit is 0.1%.
· "Trace" or "<" indicates asbestos was identified in the sample, but the concentration is less than the method quantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.25% to 0.32 at high fiber concentrations.
· Samples are archived for three months following analysis and are then properly discarded.
· These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.
· This test report relates to the items tested.
· This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory.
· Any reproduction of this document must be in full in order for the report to be valid.
· This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency.
· Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing."
· Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC. #100364, NY ELAP #10884) facility.
· If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratorys results are limited to the reported values.

Asbestos Monitoring and Mitigation Plan at Hanson Aggregates Rock Hill Quarry Site

Project No: LLH901997

Date: July 6, 2021

Prepared for:

Hanson Aggregates

RJ LEE GROUP
DELIVERING SCIENTIFIC RESOLUTION

1. Introduction

This Asbestos Monitoring and Mitigation Plan ("Plan") has been prepared on behalf of Hanson Aggregates Pennsylvania LLC (Hanson) to establish asbestos monitoring and mitigation protocols for Hanson's non-metallic mineral quarry and processing plant at the existing site located near 2055 North Rockhill Road, Sellersville, PA 18960 in Bucks County. The primary business of the site is to quarry a diabase rock that is then crushed and sold as construction aggregate.

This Monitoring and Mitigation Plan is intended to address all operations at the Rock Hill Quarry. Hanson's current intention to operate at the quarry is limited to loading and hauling out 500 tons of aggregate material once per calendar year. Where appropriate, this Plan addresses any differences between full quarry operations and the currently planned limited operations, including any 500-ton aggregate removal (hereinafter referred to as "500 Ton Removal Operations") and the five (5) background monitoring days that are to be conducted. In general, Hanson will provide the Pennsylvania Department of Environmental Protection (PADEP) Pottsville District Mining Office notice prior to initiating aggregate processing activities at least five (5) days before commencement of sampling activities and quarry operations. Prior to operation in its initial year following DEP approval, Hanson will not conduct 500 Ton Removal Operations until first collecting ambient air samples on 5 separate occasions as described in this plan. In subsequent years, Hanson will collect one round of perimeter ambient air samples prior to and one round during 500 ton removal operations. When Hanson intends to increase the frequency or extent of its quarry operations, Hanson will notify PADEP in advance. Hanson requests that the PADEP provides a specific contact and method for submitting the notice.

2. Description of Facility

The Rock Hill Site is located in East Rockhill Township, Bucks County, PA. The site includes 109.8 acres authorized under Large Noncoal Surface Mine Permit Number 7974SM1. Currently, the Rock Hill Site generally consists of a water-filled quarry pit, stockpile storage areas, and related erosion and sediment/stormwater control features (e.g., sediment ponds and traps, collection ditches, and other best management practice features). Hanson plans to extract diabase at the Rock Hill Site to produce multiple crushed aggregate products for Hanson customers. If at some point in the future, Hanson plans to operate a portable crushing plant to size the diabase for a salable product or to use a contractor with an existing portable plant, Hanson, or a subcontractor, will obtain the necessary air permits prior to operation of any crushing equipment as required by 25 PA Code 127.621.

3. Perimeter Air Monitoring

To monitor for potential airborne asbestos exposures at or near the Site property lines, Hanson will conduct perimeter air monitoring in accordance with the protocols set forth in this Section 3.

3.1 Perimeter Air Sampling Locations and Wind Monitoring

There are a number of locations along the perimeter of the property at which air samplers can be located. These locations will encompass both upwind and downwind locations without the need to relocate due to possible shifting winds. The same locations will be utilized during mining activity on site.

The general locations of the samplers have been selected based on a number of factors including existing equipment operating locations, historic prevailing winds at the Quarry, site-specific activities connected with quarrying and processing of aggregate products, and locations of potential offsite receptors. Based on the historic Wind Rose plots from nearby NOAA station at the Quakertown Airport (climate data can be obtained from: https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=UKT&network=PA_ASOS), the wind generally blows from the west (Figure 1).

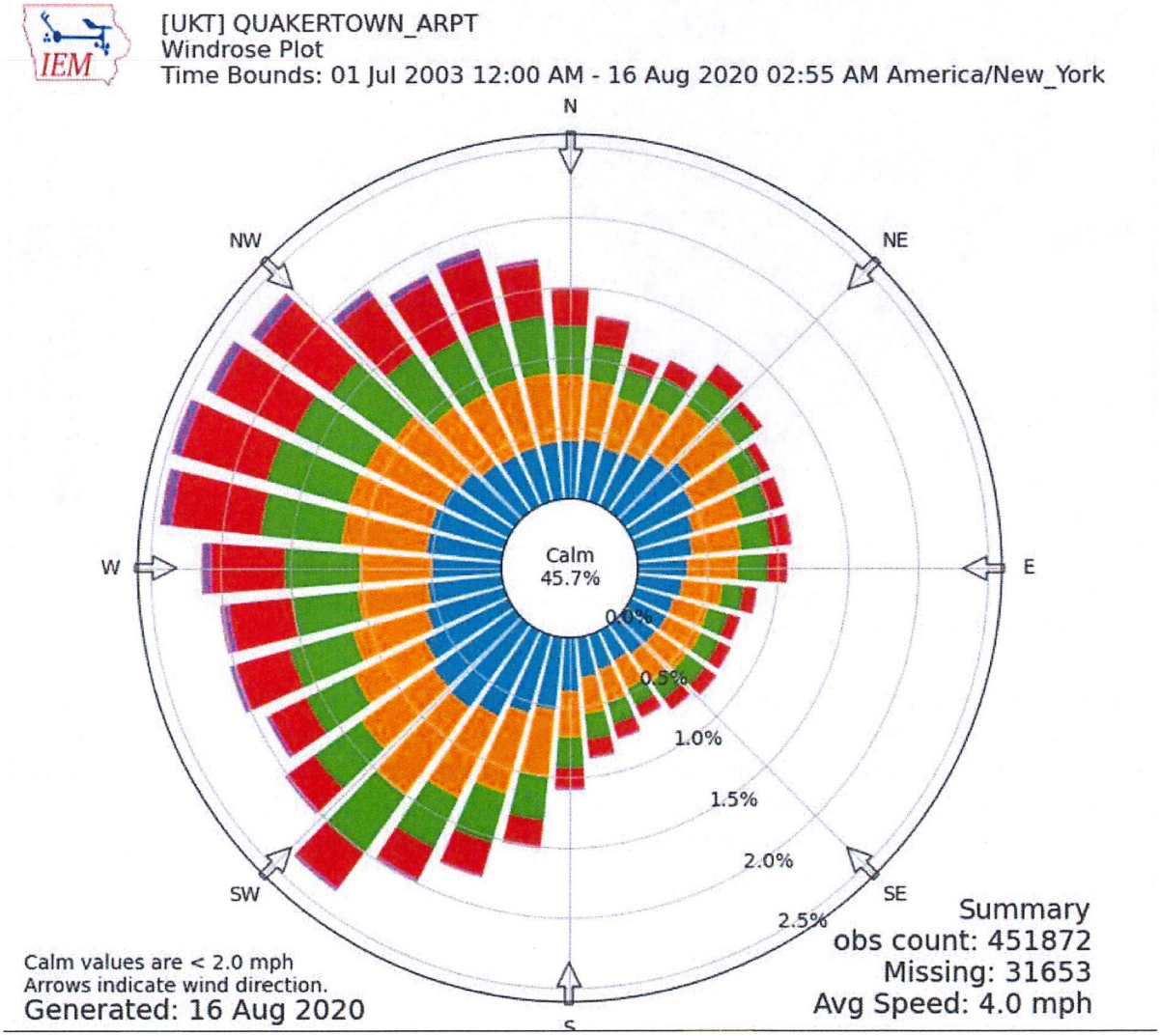

Figure 1. Wind rose diagram displaying wind direction and speed data from the Quakertown Airport (Data source: https://mesonet.agron.iastate.edu/sites/windrose.phtml?station=UKT&network=PA_ASOS)

Based on this, eight (8) proposed sampling locations are shown in Figure 2. The sampling locations are intended to be fixed, however, the selected locations may change over time based on changes in operations.

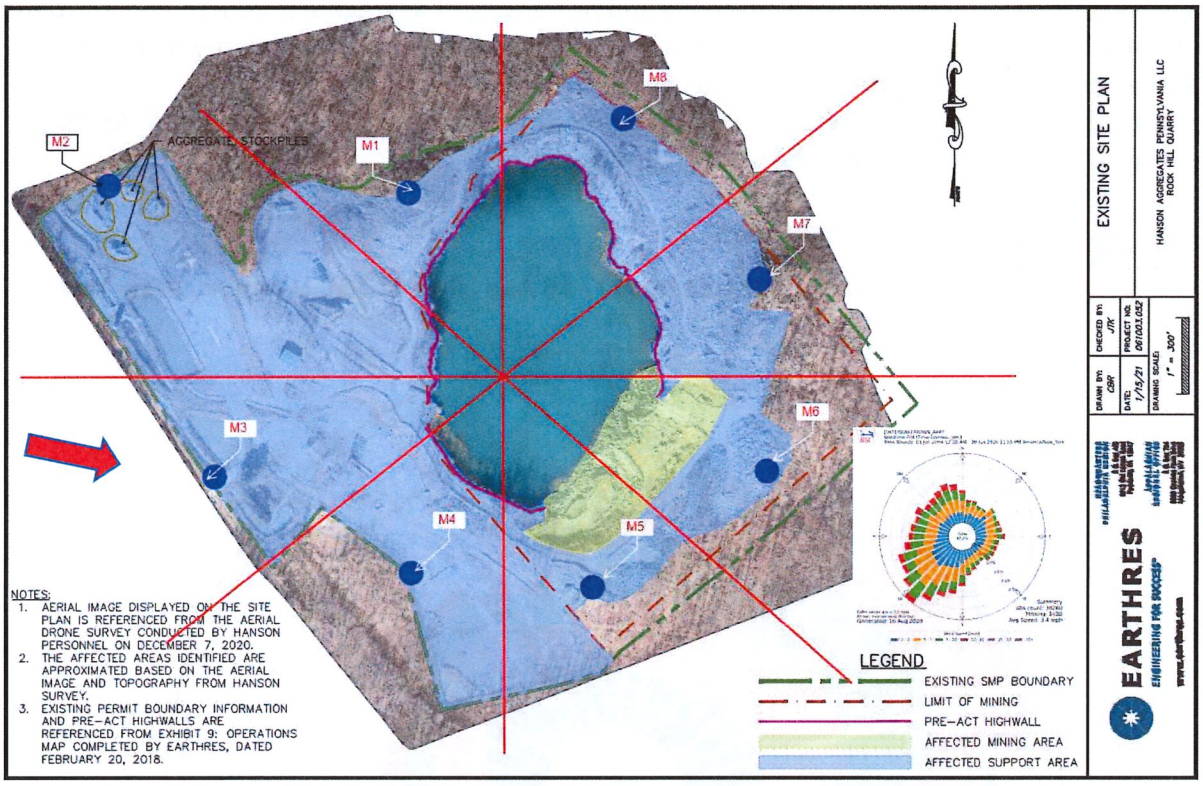

Figure 2. Proposed locations of up to 8 samplers along the general perimeter of the Hanson Aggregates property at Rockhill, PA. The red arrow indicates the approximate direction in which the wind typically blows.

Unless otherwise approved by the PADEP, wind direction and wind speed will be monitored and recorded continuously at the Site each operating day using an automated weather station (Tempest Weather System, or similar) permanently installed at the Hanson facility. The recorded monitoring data will be maintained for a minimum of one (1) year. Note, as explained in Section 3.2, below, during 500 Ton Removal Operations, Hanson will perform handheld measurements to monitor wind direction and wind speed.

If at any time the automated weather station does not monitor either wind speed or wind direction for a period of greater than 12 hours, then monitoring of wind speed and/or wind direction shall be performed manually and recorded at least twice each operating day until the weather station has been repaired or replaced and has resumed monitoring the wind speed and wind direction.

If the automated weather station stops monitoring or recording the wind speed or wind direction as a result of a malfunction, within one (1) business day of discovery of the malfunction, Hanson will take steps to have the automated weather station repaired or replaced. The weather station shall resume operation within one (1) month unless otherwise approved in writing by the Department.

If significant wind direction changes during a sampling event in any one sampling phase, the time and change in direction will be documented to reflect the change and provide data for review of analytical data. If it is determined that the wind direction has changed, creating a situation where the designated downwind samples are no longer downwind of the active operational areas, this fact will be noted on the sample data forms and the appropriate "new" downwind samples will be identified.

In the unlikely event that, based on professional judgment and knowledge of offsite concerns, sampling areas may be adjusted between perimeter sampling events to provide more representative data and consideration of spatial conditions. All adjustments will be documented properly to show the change and the reason for the change.

3.2 Field Sample Collection Methodology

The perimeter air samples will be collected at the selected locations as indicated in Section 3.1 above and will be collected using low flow air sampling pumps. The perimeter air sampling pumps used for the sample collection will be the Escort Elf air pumps by Zefon International (or equivalent).

Consistent with the analytical methods discussed in Section 3.4, each perimeter pump will be affixed with a cassette (and cowl) that contains either a 25 millimeter (mm) diameter Mixed Cellulose Ester (MCE) filter with a maximum pore size of 0.45 micrometer (µm) or a 25 mm diameter capillary pore polycarbonate filter of maximum pore size 0.4 µm. The cassette and cowl shall be fully conductive to reduce fiber loss to the sides of the cassette due to electrostatic attraction. All samples will be collected at an elevation above ground that is typically referred to as the "breathing zone." This is an area approximately 4-6 ft. above the ground surface. The sampling cassette and filter will be affixed to a sampling post station or tripod that will be used to set the sampling height. At least two (2) field blanks (or 10% of the total samples, whichever is greater) will be collected for each sampling event.

Each perimeter air sampling pump will be operated at approximately 1 to 4 liters per minute (lpm). Sampling times will vary, however, all sample durations will be established to assure an adequate sample volume to achieve a reporting limit of 0.005 f/cc or lower. Pump calibration is to be performed at the beginning and end of a sampling event with a rotameter (DRI-CAL or Digical primary calibrator or equivalent) using the cassette on which the sample is collected. Samples will be collected during the routine operations to provide a representative sample.

The sample collector will record the pump serial number, sample number, initial flow rate, sample start/end times, sample locations, and final flow rate on the Field Data Sheets (see Attachment 1 – Field Sampling Documents). Sampling Field Data Sheets will be used to record sample collection information, field measurement and field observations obtained during each sampling event. Information in the datasheets will include, at a minimum, the following:

- Location of the sample, site activities being conducted during sample collection;
- Date and time of collection;
- Sampling flow rate and volume;
- Description of temperature, wind direction, wind speed and general weather conditions; and
- The unique sample identification number for each air sample.

Field notes will also be maintained during all sampling events. The notes will include general information, weather conditions, wind direction, etc. (see Attachment 1 – Field Sampling Documents for examples of both the Field Data Sheets and the Field Notes). Field notes will include a site map with the sample locations for each sampling event clearly marked on the map, and references to photographs as needed to document site sampling activities. Any non-routine site activities will also be noted in the field notes (e.g., lawn mowing, grading, etc.).

Data sheets and field notes will be completed, signed, and dated by the field technician.

Photographs of Air Sampling Activities

Photographs will be taken during selected air sampling activities. The photographs will be used to provide backup documentation of sampling activities. A log of the photographs will be recorded and will include the sampling activity and approximate location for each photograph.

Chain of Custody Records

Chain of custody procedures will be used to maintain and document sample collection and possession. During the sampling process, a laboratory Asbestos Chain-of-Custody form provided by the Laboratory will be completed (see Attachment 1 – Field Sampling Documents). The completed Chain-of-Custody Record will accompany all samples and be signed as required as each sample package recipient receives and relinquishes possession of the sample package.

Sample Packaging and Shipment

The air sample filter cassettes will be carefully packaged and delivered to the analytical laboratory using standard practices. Plastic bags and other acceptable packaging containers will be used for sample shipment and convenience. Shipment tracking information will be provided for each sample shipment.

Weather and Wind Direction Data

During full quarrying operations, all field monitoring events, wind speed and wind direction will be monitored from the onsite permanent weather station. The data will be collected as referenced in Section 3.1 and will be reviewed prior to and following each sampling event. The weather station data will be provided as part of the final report at the completion of the project.

500-Ton Removal Operations and Background Monitoring:

- Field Sampling Collection Methodology: Prior to the initial 500 ton removal event, samples will be collected on five (5) separate occasions (5 rounds from 8 locations – 40 total samples) in advance of the 500 ton removal event. Sampling duration during 500 ton removal activities will be at least four hours in duration or for the entire duration of material handling during a 500 ton removal event to ensure adequate volume of air is collected to allow for efficient analysis to meet the required 0.005 f/cc reporting limit.
- Photography of Air Samples: All photography of air sampling activities in the field will occur during 500 ton removal operations as described for full quarry operations.
- Chain of Custody Records: All chain of custody records will be maintained during 500 ton removal operations as described for full quarry operations.
- Sample Packaging and Shipment: All sample packaging and shipment practices will be maintained during 500 ton removal operations as described for full quarry operations.
- Weather and Wind Direction Data: The sampling locations will remain as described in Section 3.1 to 500 Ton Removal Operations. During the 500-ton removal event and Background Monitoring, a hand-held weather meter such as a Kestra 4500 or equivalent along with data from the nearby air Pennridge Airport Weather Station will be used to evaluate wind direction and wind speed. The wind direction and speed will be recorded approximate every hour.

3.3 Sampling Frequency

During periods of full quarry operation, perimeter monitoring samples will be collected on a bi-monthly basis. Bi-monthly 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. Hanson or its designated contractor will facilitate PADEP's sample collection efforts by providing access to sampling locations and sufficient time and space to sample. Once regular monitoring is underway, the Department will be notified of any unusual changes in the sampling via electronic mail. In addition, PADEP will be notified as soon as possible if any sampling event has been cancelled along with the reason for the cancellation.

In the event that background samples collected herein exceed the established action threshold, Hanson will perform corrective actions as described in Section 3.6, as necessary.

3.4 Analytical Methods

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.

Analytical Laboratory

All samples will be analyzed by an analytical laboratory selected from the list of asbestos analytical laboratories that are part of the National Voluntary Laboratory Approval Program

(NVLAP) and are accredited by the American Industrial Hygiene Association (AIHA) and by the Department of Environmental Protection – Bureau of Laboratories. Any accredited laboratory that meets the requirements listed above may be used for sample analysis.

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.

Quality Control

A quality control (QC) program will be implemented to assure data quality. The field program includes the use of blanks and duplicate samples. Should any sample fail at a particular location, that sample at that location will be resampled within two weeks.

Field Blanks

At least 2 field blanks (or 10% of the total number of samples collected, whichever is greater) will be submitted with each set of samples. A field blank is a new sampling cassette that is opened on site during the sampling period, kept uncovered for at least 30 seconds, and then is closed and sealed for transport to the laboratory. The purpose of the field blank is to document the possible contamination of the filter media that could occur as a result of handling the samples in the field.

Duplicate Samples

Duplicate samples may be collected if directed by Hanson or DEP to evaluate the reproducibility of sampling and analysis. Duplicate samples will be collected, stored and transported in the same manner as the actual samples. A separate number will be assigned to each duplicate, and all duplicates will be submitted blind to the laboratory. For this monitoring program, duplicate sampling will be conducted through the collection of co-located samples collected during the same sampling interval.

Field Equipment

The following equipment will be utilized for this sampling:

- Air sampling pumps (personal or low volume pumps).
- Asbestos sample filter cassettes with filters (25 mm, 0.45 µm pore, MCE).
- Air pump calibration equipment.
- Quart and gallon size resealable bags.
- Sample transport containers and packing material.
- Additional supplies as needed including health and safety equipment.
- Hanson Permanent Weather Station.

500 Ton Removal Operations:

- Analytical Methods: the analytical methods for full quarry operations will be applied as described to any 500 ton removal.
- Analytical Laboratory: the analytical laboratory provisions for full quarry operations will be applied as described to any 500 ton removal.
- Quality Control: the quality control provisions for full quarry operations will be applied as described to any 500 ton removal.
- Field Blanks: the field blank provisions for full quarry operations will applied as described to any 500 ton removal.
- Duplicate Samples: the duplicate sample provisions for full quarry operations will be applied as described to any 500 ton removal.
- Field Equipment: the field sample provisions for full quarry operations will be applied as described to any 500 ton removal, except that Hanson will perform handheld measurements to monitor wind and weather instead of with a permanent weather station. A permanent weather station will be installed prior to commencing full quarry operations.

3.5 Recordkeeping and Reporting

All records and documents related to the airborne asbestos monitoring program will be maintained by Hanson for at least five (5) years and will be made readily available to PADEP upon request. Field Data Sheets and Field Notes will be completed, signed, and dated by the recorder. All logs will be written with waterproof ink. Corrections to data entered will be made by crossing out the error with a single horizontal line, initialing and dating the correction, and entering the correct information. Crossed-out information shall be readable. Photographs will be taken during selected air sampling activities. The photographs will be used to provide documentation of sample locations, site activities, etc. that are pertinent to the asbestos monitoring task. A log of the photographs will be recorded and will include the sampling activity and approximate location for each photograph.

All laboratory reports and associated data sheets, as well as progress reports and other documentation related to perimeter air sampling, will be properly maintained for five (5) years. Copies of the reports will be submitted to DEP quarterly, ninety (90) days after the end of each quarter. All samples analyzed will be retained by the laboratory for at least one (1) year from the date of analysis to allow for follow-up testing should the need arise.

Perimeter air monitoring reports submitted to PADEP will include a summary of the analytical results for all samples collected and analyzed during the reporting period; copies of applicable chain of custody sheets and applicable field sampling logs; and a written report detailing any investigative actions or corrective measures that may have been taken during the reporting

period in response to a result exceeding 0.01 asbestos fibers/cc (counting only asbestos fibers that exceed 5 micrometers in length).

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.

500 Ton Removal Operations: the recordkeeping and removal provisions for full quarry operations will be applied as described to any 500-ton Removal operations.

3.6 Corrective Actions

For the purposes of determining whether corrective action is necessary, Hanson will only count asbestos fibers that exceed 5 micrometers in length. If TEM analysis confirms asbestos fiber concentrations in excess of 0.01 fiber/cc in any sample, Hanson will undertake the following corrective measures to abate any potential harmful migration of asbestos fibers:

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. This written report should also include the results of the most recent EPA Method 100.1 water sampling described in Section 5.

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

500 Ton Removal Operations: the corrective action provisions for full quarry operations will be applied as described to any 500-ton Removal operations, except for 3.6(2). In the event that the perimeter background samples collected during a removal event exceed the established action level, Hanson will perform an additional round of perimeter sampling (1 round of 8 samples) and will perform necessary corrective actions as prescribed by Section 3.6.

4. Activity-Based Air Monitoring

On a quarterly basis, unless otherwise approved in writing by PADEP, Hanson will collect and analyze air samples during each of the following operations using the same collection and analysis methods described above in Sections 3.2 and 3.4:

- Immediately downwind vicinity of blasting, if blasting is conducted during the quarter.
- Near drilling machinery during operations, if drilling is conducted during the quarter.
- Next to internal quarry roads on which haul trucks travel.
- Near crushing/processing machinery during operations.

If TEM analysis confirms asbestos fiber concentrations in excess of MSHA asbestos standard (0.1 f/cc) in any sample, Hanson will (1) notify PADEP within 24 hours of receipt of the TEM analysis results, and (2) within three calendar days, conduct perimeter air monitoring in accordance with Section 3 above.

Hanson will maintain records associated with quarterly activity-based monitoring in accordance with Section 3.5.

Hanson may petition DEP after 3 years of operation to discontinue activity-based monitoring required under this section.

500 Ton Removal Operations: In the event that the perimeter background samples collected during a removal event exceed the established action level, Hanson will perform an additional round of perimeter sampling (1 round of 8 samples) and will perform necessary corrective actions as prescribed by Section 3.6.

5. Dust Suppression Water Source Monitoring

On an annual basis, unless otherwise approved in writing by PADEP, Hanson will collect a sample from dust suppression water source for asbestos analysis. This sample 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.

500 Ton Removal Operations: the dust suppression water source monitoring provisions for full quarry operations will be applied as described to any 500-ton Removal operations.

6. Asbestos Avoidance Measures

6.1 Mineral Identification and Management

Hanson has established and implemented a Mineral Identification and Management Guide. This guide defines the company's procedures to properly identify and manage any materials that meet the guide's definition of "Protocol Mineral Fibers." The Guide covers a number of topics, including the following:

- Identification and mapping of suspect zones and structures of interest.
- Geologic field inspections by a trained geologist.
- Shot rock (muck) pile inspections for suspect minerals.
- Training requirements for key site personnel.
- Proper management and disposal of suspect materials if identified.
- Recordkeeping requirements.

In addition to implementation of the Protocol Mineral Fibers protocols set forth in the Guide, Hanson will also conduct asbestos sampling and analysis of settled dust samples in accordance with the following procedures:

1. Hanson will collect a minimum of one composite sample per month of material deemed non-suspect under the Guide.
2. Samples will be analyzed by Polarized Light Microscopy (PLM) using EPA Method 600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials. All visible elongate mineral particles (EMPs) (those identified as asbestos fibers and cleavage fragments) with aspect ratios greater than 3:1 must be counted.
3. If PLM analysis does not detect asbestos fibers in the sample, the sample will be analyzed by TEM to verify results using EPA Method 600/R-93/116, Method for the Determination of Asbestos in Bulk Building Materials. All visible EMPs (those identified as asbestos fibers and cleavage fragments) with lengths greater than 0.5 µm and aspect ratios greater than 3:1 must be counted.

Hanson will report the results of these analyses to PADEP on a quarterly basis.

500 Ton Removal Operations: the mineral identification and management provisions for full quarry operations will be applied as described to any 500-ton Removal Operations, except that Hanson will only perform settled dust analysis during aggregate removal operations.

6.2 Emissions Mitigation Plan

Hanson implements a number of practices that are consistent with the industry standards and regulatory requirements in order to control emissions at the Rock Hill site. All control strategies will be located at the site prior to any commencing of operations. Below are the largest potential sources of dust emissions at the site, as well as the practices utilized at Rock Hill to control them. Hanson will utilize these practices as described below, and also as necessary in order to maintain compliance with 25 Pa. Code §123.2 and §123.1(c):

Vehicle Traffic:

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

Haul Roads:

Application of water or commercial dust suppressing liquids during extremely dry or windy conditions and in winter months as needed.

Roads are resurfaced/regraded as needed to maintain a clear and safe working surface and thereby reducing dust generation.

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.

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.

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.

Crushing and Sizing Equipment:

Hanson will submit air permit applications prior to installation of aggregated processing equipment. Air Pollution Control devices will be installed and operated according to PADEP Best Available Technology requirements, coupled with work practices, inspection, and source observation.

Shot rock and processed aggregate spillage will be cleaned up as needed to minimize creation of excessive amounts of dust and to maintain general housekeeping in the quarry. The frequency of cleaning up spillage will vary depending upon how much material is running through the plant and how much product is being produced, loaded, and sold on a given day.

Conveyors will have belt scrapers where necessary to keep belts clean and reduce the amount of spillage from the conveyors. As a general practice, conveyors will not be run empty for long time periods. If there are prolonged periods when no material is being conveyed, the belts will be turned off.

Drill Rigs:

On-board dust collection and/or water sprays on drill rigs will be used to limit dust generation. .

A drill shroud is utilized at the ground level to control fugitive emissions from drilling activities.

Blasting:

Prior to blasting, all drill cuttings will be removed from around the drill holes. The use of dust or screenings as stemming for blast holes will not be permitted. Coarse aggregate will be used for stemming.

To minimize the dust offsite migration, the blast area will be pre-wetted to minimize the release of surface dust and fines, scheduling blasts only under favorable meteorological conditions. In addition, smaller blasts can be employed when possible.

Training and Inspections for Visual Emissions:

Key plant personnel will be trained to conduct visual observations of NOA, for fugitive emissions as well as opacity readings on emissions sources to ensure they are operating properly.

Hanson conducts preventative maintenance of operational and dust collection equipment to ensure the timely replacement of worn components.

500 Ton Removal Operations:

- Emissions Mitigation Plan: All equipment to be utilized for dust suppression will be verified to be on site and in usable condition prior to commencement of any full quarry operation or 500 ton removal activity
- Vehicle Traffic: the vehicle traffic plan provisions for full quarry operations will be applied as described to any 500-ton Removal operations, except that a camera to monitor the entrance will not be installed until full quarry operations commence.
- Haul Roads: the haul road provisions for full quarry operations will be applied as described to any 500-ton Removal operations.
- Stockpiling and Material Handling: the stockpiling and material handling provisions for full quarry operations will be applied as described to any 500-ton Removal operations.
- Crushing and Sizing Equipment: the crushing and sizing equipment provisions for full quarry operations will be applied as described to any 500-ton Removal operations.
- Drill Rigs: the drill rig provisions for full quarry operations will be applied as described to any 500-ton Removal operations.
- Blasting: the blasting plan provisions for full quarry operations will be applied as described to any 500-ton Removal operations.
- Training and Inspection for Visual Emissions: the training and inspection for visual emissions provisions for full quarry operations will be applied as described to any 500-ton Removal operations.

Attachment 1

Field Sampling Documents

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Daily Field Notes

Project No. _____ Date _____

Location _____

Sampling Team _____ Other Personnel _____

_____ _____

_____ _____

_____ _____

Field Notes

Prepared by: _____

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AIR SAMPLE DATA SHEET

Date ________	Technician ________________		Page ________	of ________
Project # ________	Calibration # ________________			

Barametric Pressure ________	Temperature ________ Humidity ________ Altitude ________	Start Time (Clock)	Stop Time (Clock)	Elapsed Time HR-MIN	Time Sampled Minutes	Flow Rate L/MIN (Start/Stop)	Volume Sampled Liters
Assigned Sample #	Pump No.						
Location	Height	Observations/Comments				Total Volume	
Filter: ☐ PC ☐ MCE	Sample: ☐ Indoor ☐ Outdoor ☐ Personal SS#						
Assigned Sample #	Pump No.						
Location	Height	Observations/Comments				Total Volume	
Filter: ☐ PC ☐ MCE	Sample: ☐ Indoor ☐ Outdoor ☐ Personal SS#						
Assigned Sample #	Pump No.						
Location	Height	Observations/Comments				Total Volume	
Filter: ☐ PC ☐ MCE	Sample: ☐ Indoor ☐ Outdoor ☐ Personal SS#						
Assigned Sample #	Pump No.						
Location	Height	Observations/Comments				Total Volume	
Filter: ☐ PC ☐ MCE	Sample: ☐ Indoor ☐ Outdoor ☐ Personal SS#						

Request for Environmental and IH Laboratory Analytical Services

ATTENTION TO:		Purchase Order No.:	Client Job No.:
Lab Use Only	Project No.: Client No:	**Date Results Needed**	Rush Charges Authorized ? (check one) ▫ YES ▫ NO
	Date Logged In: Logged In By:		
Report Results To	Name:	**Drinking Water Sample Only**	Sample Purpose: Information ▫ Regulatory ▫ Accreditation (please list below):
	Company:		System ID #:
	Address:		DOH Source #:
	City, State, Zip:		Multiple Sources #s:
	Phone: Fax:		Sample Purpose: A ▫ B ▫ Other ▫
	Email Results To:	**Chemistry Analysis Key**	**Preservation:** Unpres, H_2SO_4, 4°C, HCl, HNO_3, NaOH, Other, Na_2SO_4 — **Matrix:** WW=Wastewater, GW=Groundwater, S=Soil/Sludge, E=Extract, SW=Surface Water, DW=Drinking Water, O=Oil, X=Other — **Container:** P=Plastic, G=Glass, W=Wipe, A=Air (filter or tube)
Invoice To	Name: If a hard copy of invoice is needed, check here ☐		
	Company: Email:		
	Address:		
	City, State, Zip:		
	Phone: Fax:		
Special Instructions			

Client Sample ID	Sample Description	Sample Date	Sample Time Start	Sample Time Stop	Wipe Area / Air Volume	Sample Location (Please specify if NY state)	Analysis Requested						Pres. Upon Receipt (Y/N)	Preservation	Matrix	Container Type	pH	No. Containers

Chain of Custody	Relinquished By (Signature):	Date: Time:	**Chain of Custody**	Received By (Signature): Date: Time:
	Relinquished By (Print Name):	Relinquished To:		Received By (Print Name): Relinquished To:
	Company Name:	Method of Shipment:		Company Name: Method of Shipment:
Chain of Custody	Relinquished By (Signature):	Date: Time:	**Chain of Custody**	Received By (Signature): Date: Time:
	Relinquished By (Print Name):	Relinquished To:		Received By (Print Name): Relinquished To:
	Company Name:	Method of Shipment:		Company Name: Method of Shipment:

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724.325.1776 **Phone**
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DELIVERING SCIENTIFIC RESOLUTION

HANSON AGGREGATES PA, LLC

MINERAL IDENTIFICATION AND MANAGEMENT GUIDE FOR THE ROCK HILL QUARRY

A. Purpose

This Mineral Identification and Management Guide (hereinafter "Guide") memorializes protocols and procedures implemented by Hanson Aggregates PA, LLC (Hanson) to assess whether "protocol minerals" as defined below are present on a quarry site and to minimize the processing of such materials in a manner that may release undesirable mineral fibers.

Some igneous and metamorphic rock materials have the potential to contain, as minor constituents, asbestiform minerals. Six of these asbestiform minerals are currently regulated as asbestos by USEPA, MSHA, and OSHA. The mineralogical properties of asbestos fiber and regulated mineral fibers covered by this Guide are hereinafter referred to as "protocol minerals". Materials suspected of containing protocol minerals are referred to as "suspect material."

This document is solely a guide and is not intended and shall not give rise to new legal obligations or standards. The procedures established in this guide may be varied in light of operational demands or restrictions. This guide shall not alter any applicable environmental, health or safety standards. All such standards shall be followed.

B. Scope

This guide is applicable to and outlines responsibilities of operations at the Rock Hill Quarry. This supplements other mineral identification guides that may be applicable to other quarries operated by Hanson.

C. Protocol Mineral Fibers

1. Asbestos PMFs. "Asbestos" is a commercial term that includes six silicate minerals that belong to the serpentine and amphibole mineral groups—but are "asbestos" only when those minerals *crystallized in nature as asbestiform fibers* (i.e., crystallized with the mineralogical habit of "asbestos").

Table 1 provides information about these six minerals. Note again that the minerals are (a) classified as "asbestos" only when they formed in nature with the asbestiform mineral habit; and (b) not classified as "asbestos" when they formed in nature with the nonasbestiform mineral habit.

Table 1. Asbestos and Nonasbestos Forms of Six Minerals.

Mineral (and crystalline habit)	Commercial or Common Name	CAS No.
Asbestiform serpentine	**Chrysotile Asbestos**	**12001-29-5**
Asbestiform riebeckite	**Crocidolite Asbestos**	**12001-28-4**
Asbestiform cummingtonite-grunerite	**Amosite Asbestos**	**12172-73-5**
Asbestiform anthophyllite	**Anthophyllite Asbestos**	**77536-67-5**
Asbestiform tremolite	**Tremolite Asbestos**	**77536-68-6**
Asbestiform actinolite	**Actinolite Asbestos**	**77536-66-4**
Nonasbestiform serpentine	**Antigorite (see note 4 below)**	**12135-86-3**
Nonasbestiform riebeckite	**Riebeckite**	**17787-87-0**
Nonasbestiform cummingtonite-grunerite	**Cummingtonite-grunerite**	**14567-61-4**
Nonasbestiform anthophyllite	**Anthophyllite**	**17068-78-9**
Nonasbestiform tremolite	**Tremolite**	**14567-73-8**
Nonasbestiform actinolite	**Actinolite**	**13768-00-8**

Notes:

1. "Asbestos" is regulated in the U.S. by numerous state and federal agencies, including EPA, OSHA, and MSHA. A full reference to all regulations is beyond the scope of this Guide. The User is encouraged to become familiar with all mineral fiber regulations for the jurisdictions in which they operate.
2. The term "asbestiform" means the mineralogical habit or form of a mineral in which ultra-fine single crystal fibers (fibrils) occur in bundles that can be separated into increasingly finer fiber bundles that typically display curvature.[1]
3. "Asbestos" possesses (certain) properties such as long fiber length and high tensile strength. Under the light microscope, samples exhibit the asbestiform habit as defined by several of the following characteristics: (a) mean aspect ratios ranging from 20:1 to 100:1 or higher for fibers longer than 5 μm, (b) very thin fibrils, usually less than 0.5 μm in width,

[1] See, for example, EPA, 1993. "Method for the Determination of Asbestos in Bulk Building Materials" (EPA/600/R-93/116).

(c) parallel fibers occurring in bundles, (d) fiber bundles displaying splayed ends, (e) fibers in the form of thin needles, (f) matted masses of individual fibers, and (g) fibers showing curvature.[2]
4. Lizardite (CAS No. 12161-84-1) is another nonasbestiform serpentine mineral. Rarely, asbestiform antigorite may be discovered; for the purposes of this Guide it is considered a PMF

2. Other PMFs (Not Asbestos). It is important to emphasize that Hanson's Guide goes beyond "asbestos" and includes certain asbestiform minerals that Hanson has elected to treat as a potentially equivalent hazard as "asbestos." [3]

These "Other PMFs" include a variety of (a) amphiboles that formed in nature with the asbestiform habit but are not classified as "asbestos" (e.g., asbestiform winchite, asbestiform richterite, asbestiform fluoro-edenite, etc.); and (b) naturally occurring "durable asbestiform zeolites" (e.g., erionite). "Other PMFs" are not "asbestos" and they are not currently regulated by most U.S. authorities in the same manner as "asbestos."

All PMFs exist more commonly in a prismatic crystal growth habit or form (i.e., a nonasbestiform habit or form). These nonasbestiform minerals tend not to grow with parallel alignment, but instead form multi-directional growth patterns. When enough pressure is applied, the crystals fracture easily, fragmenting into prismatic particles called cleavage fragments. While some cleavage fragments are acicular or needle shaped as a result of the tendency to cleave along two dimensions but not along a third, they do not possess the characteristics described above for asbestiform minerals. Furthermore, these cleavage fragments are not associated with asbestos-related diseases, as documented in the published, peer-reviewed scientific literature.

It is not possible to create asbestos from common rock or cleavage fragments by crushing or processing them. Likewise, cleavage fragments cannot be created from "asbestos." When a PMF occurs in nature, the corresponding nonasbestiform habit of that mineral will also always be present. However, the converse is not always true due to the unique set of geologic conditions necessary for minerals to crystallize in the asbestiform habit.

D. Mine Planning

Initial Field Mapping and Description of Primary Structural/alteration features, prior mapping and geologic surveys have established the presence of suspect material. These activities include, but are not limited to:

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[2] (a) National Institute of Standards and Technology (NIST), Certificate of Analysis, Standard Reference Material® 1867a, Uncommon Commercial Asbestos; (b) EPA, 1993.

[3] This Guide includes the "Other PMFs" out of an abundance of caution, based on reports that excess exposures to certain asbestiform fibers (that are not classified as "asbestos") may nonetheless have asbestos-like health effects. However, exposure and health effects data are absent or incomplete for some asbestiform mineral fibers; thus, the inclusion of "Other PMFs" in this Guide does not necessarily mean that they represent an equivalent hazard compared with "asbestos."

1. Qualitative Geologic Survey;
2. Laboratory analysis of aggregate, water, and core samples;
3. Literature review.

The information from the above activities will be used to develop a mine plan to delineate areas where there is a higher probability of suspect material being present.

E. Routine & Periodic Inspection Plan

- Inspection of the quarry should occur annually or at such periods related to mining activity established by the geologist and other professional staff.

- The geologist should visually inspect all active faces on operating levels of the quarry, walls, floors and benches that are safely accessible to determine if PMFs are or may be concentrated. (After the initial field evaluation, future periodic inspections may focus only on the active walls, floors and benches.)

- Shot rock and muck piles will also be visually inspected by knowledgeable site personnel as those materials are produced in the mining process.

- Settled dust samples may be collected and analyzed as a means to monitor fine particulate resulting from the mining process.

- In some cases, PMF identification may be obvious in the field. In other cases, indications for the potential presence of PMFs may include the type of rock mass or, e.g., the relationship to joints, faults/shear zones, or intrusions.

- Training will occur to provide detail on what employees should be aware of in order to readily identify suspect material. Employees working in the quarry will also be informed of the geologic survey results to indicate where suspect material has previously been identified. Employees will receive annual training to visually recognize suspect area where PMFs might be found.

- Hanson further expects all employees who work at production sites to immediately report to the site management the potential discovery of any PMFs, so that an appropriate investigation may ensue.

- Method to identify/confirm suspect material:

    1. If designated site personnel identify suspect material, they will follow the reporting protocol and with the involvement of the geologist, determine by visual inspection and/or laboratory testing that the material does or does not contain protocol mineral fibers.
    2. Suspect material will be identified based on criteria defined by the geologist, including the following: any minerals identified in the rock that appear to be

present in bundles of long, thin, flexible fibers. These minerals may appear in several different forms in the quarry, including bundles of parallel fibers, radiating fibers, matted masses of fibers, or in needle-like formations.

- Action protocol:
    1. If suspect material is found to contain protocol fibers, appropriate personnel will be informed, and additional sampling and testing may be initiated to determine if protocol mineral fibers are present or not.
    2. Based on these results, actions will be undertaken to isolate and dispose of material if the amount is determined to be unacceptable.

- Active mining within a delineated affected area where suspect material has been identified must cease and cannot resume until appropriate personnel have reviewed inspection results and verify that PMF concentration is acceptably low (e.g., <0.1-0.25%) in the area, or appropriate actions have been taken to dispose of suspect material (see below).

- Recording and Reporting:
    1. Location(s) of suspect material identified will be recorded and include coordinates (Northing and easting) and elevation within the quarry.
    2. Results of suspect material inspections, photographs of collected materials, narrative descriptions of suspect materials and laboratory reports will be documented and reported to appropriate knowledgeable mine personnel. Documentation of the results will also be appended to the mine plan.
    3. Reports will also be produced and distributed as described in the Asbestos Monitoring and Mitigation Plan.

- Disposal protocol:
    1. Material identified as suspect material will be delineated by the site geologist.
    2. The material will be wetted prior to any movement or disturbance.
    3. Any personnel involved in the disposal will wear appropriate protective equipment.
    4. Material to be disposed of will be moved using appropriate equipment to a location designated by the geologist within the requirements of the permits. Suspect material will be disposed of within permanently inactive areas within the quarry and covered with non-PMF material overburden.
    5. Locations of any suspect material will be provided to the appropriate personnel for inclusion in the mine plan.
    6. Locations of disposed suspect material areas within the quarry will be provided to the appropriate personnel for inclusion in the mine plan.

F: Additional Steps

Based on the foregoing analysis, on information derived from other sources not included in the Guide, and on the professional judgement of the geologist and other professionals,

Hanson may elect to take additional steps with the goal of avoiding or minimizing PMF contact.

Any additional steps are likely to be site specific and depend on a host of variables that may change from time to time. Accordingly, specific recommendations for any additional steps are beyond the scope of this Guide. However, strictly as suggestions for consideration, additional steps might include but are not limited to:

- Modifying the mining plan
- Modifying the areas of the property where mining and processing occurs
- Implementing personal or area air sampling (i.e. activity based sampling)
- Surface sampling in enclosed spaces (mobile equipment, control booths, etc.)
- Product sampling (stockpiles, conveyors, etc.)
- Creating a visual identification plan
- Special cleaning methods and schedules
- Implementing NSSGA's Occupational Health Program

Many of these additional steps should be directed by the geologist and a competent industrial hygienist who has experience with aggregate production and PMFs.

RESERVATION OF RIGHTS:

Hanson reserves the right to modify, revoke, suspend, terminate or change this guide in whole or in part, at any time, without notice.

Appendix
Identification of Protocol Mineral Fibers

Material to be analyzed for PMFs and/or PPFs will be analyzed by a qualified laboratory. In this Guide, "qualified laboratory" means a laboratory accredited by the American Industrial Hygiene Association and/or the NIST National Voluntary Laboratory Accreditation Program for asbestos analysis. The qualified laboratory must have mineralogical expertise and have the ability and experience to detect PMFs in the natural environment (e.g., rocks, soils, etc.) in accordance with the EPA analytical method and the NIST definition (see the Glossary)..

The analysis should include gross visual examination of the samples provided to inspect for the presence of suspect fibrous mineralization prior to any crushing, grinding, or pulverization of the received material.

Upon receipt, samples should be dried and pulverized using a plate grinder (aka Braun mill) as described in CARB method 435[4]. This should be done with care to avoid over-pulverization of the sample while still producing a sample that is finer than 200 Tyler mesh. Details of the preparation steps are provided in the CARB Method 435 Field Sampling and Laboratory Practices, 2017 document.[5]

Polarized light microscopy (PLM) will be performed following USEPA method 600/R-93/116, with quantification performed by a 1000-point count analysis. All PMFs and PPFs will be reported when observed.

Transmission electron microscopy (TEM) will also be performed if the PLM result is negative for PMF. Samples will be prepared from pulverized sample following USEPA method 600/R-93/116 and fibers counted using ISO 10312 as modified by USEPA OSWER directive #9200.0-68 for PMF and PPF as described above.

Transmission electron microscopy will also be performed on water samples collected from the site. Samples will be prepared and analyzed following USEPA method 100.1.

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[4] California Environmental Protection Agency Air Resources Board, "Method 435--Determination of Asbestos Content of Serpentine Aggregate", pages 1-23, June 6, 1991.

[5] California Environmental Protection Agency Air Resources Board, "Implementation Guidance Document Air Resources Board Test Method 435--Determination of Asbestos Content of Serpentine Aggregate: Field Sampling and Laboratory Practices", pages 1-34, April 2017