



February 18, 2020

Rock Martin, P.G.
Chief, Technical Services Section
Bureau of District Mining Operations
Pennsylvania Department of Environmental Protection
Cambria District Mining Office
286 Industrial Park
Ebensburg, PA 15931-4119

RE: Response to Technical Deficiency Letter
Specialty Granules, LLC, Northern Tract Quarry
Permit No. PA0279617
Hamiltonban Township, Adams County, Pennsylvania

Dear Mr. Martin:

We are writing in response to the Department's letter dated January 24, 2020. The information requests stated in the Department's letter are set out below (in italics), followed by our responses.

1. *Please confirm the fiber lengths and aspect ratios that were counted and reported for the rock core sample TEM analysis. Proposed fiber length and aspect ratios were described in the TEM Asbestos Analytical Procedure for Bulk Samples document. Also confirm whether cleavage fragments meeting these length and aspect ratio parameters were counted and reported.*

RESPONSE:

RJ Lee Group's TEM analysis of the drill core samples is included in the January 10, 2020 Final Laboratory Report for RJ Lee Group Job No. ATH1055868. As noted in this report, the samples were analyzed in accordance with the analytical portion of ASTM D-5756, a method that counts fibers with a minimum length of 0.5 μ m and a minimum aspect ratio of 5:1 (length:width). This report includes count sheets that list the counted particles and also identifies them as to mineral (such as actinolite, "Acti"), as well as whether they occurred in the asbestiform habit (shown as "Asb" in the far-right column) or in a non-asbestiform habit (shown as "Cle" in the far-right column). The summary Table of results tabulates the number of counted asbestiform fibers (under the headings of "Chry" and "Amph") as well as the number of non-asbestiform fragments (under the heading "Cleavage").

The document entitled "TEM Asbestos Analytical Procedure for Bulk Samples" that SGI submitted to the Department on October 15 incorrectly indicated that RJ Lee Group would count and size any particles that have a minimum aspect ratio of 3:1. The inclusion of the 3:1 minimum aspect ratio in this document was an inadvertent error. Use of a 5:1 ratio is required by the applicable analytical method (ASTM D-5756). A 3:1 ratio, in contrast, is typically used when analyzing samples using polarized light microscopy ("PLM"). The 5:1 minimum aspect ratio is consistent

with that shown in other published analytical methods, including the AHERA method (40 CFR Pt. 763, Appendix A to Subpart E) and ISO 10312 and ISO 13794. Furthermore, in a study conducted on amphibole minerals,¹ all of the actinolite asbestos particles had aspect ratios in excess of 5:1, while only 26% of non-asbestos actinolite particles had aspect ratios in excess of 5:1. Thus, the use of the 5:1 accurately captures the asbestiform actinolite particles that may be present in the samples.

2. *Please provide a field map showing locations, dates, and a description of the naturally occurring asbestos (NOA) that has been confirmed through rock core sampling for the proposed Northern Tract Quarry and the existing Pitts Quarry according to the Suspect Mineral Identification and Management Protocol section 1.1 - Initial field mapping and description of primary structural/alteration features.*

RESPONSE:

A field map showing the locations of rock core samples for the proposed Northern Tract quarry is attached as **Exhibit A**. Sheets 2-4 included with this map, which show geologic cross sections for each core hole, identify the locations where RJ Lee Group's recent TEM analysis identified NOA in a sample, along with the amphibole asbestos content of the sample by percent. SGI provided a similar map to the Department on January 6, 2020 showing the locations where RJ Lee Group's 2017 PLM analysis identified NOA.

A map of the entire Charmian site created pursuant to Section 1.1 of SGI's Mineral Identification and Management Guide is included in **Exhibit B**. SGI will update this map to identify suspect zones/structures of interest in the Northern Tract prior to initiation of mining activities in the Northern Tract.

The only identified core sampling for asbestos that SGI has performed for the Pitts Quarry was completed in 2017. The RJ Lee Group laboratory report and chain of custody documentation for that sampling effort are attached as **Exhibit C**. RJ Lee Group's analysis did not detect the presence of asbestos.

3. *Please provide maps of both the Pitts Quarry and the Northern Tract showing sample locations for all sample types (industrial hygiene, perimeter air, processed materials and products).*

RESPONSE:

A map showing SGI's standard processed material and product sampling locations is attached as **Exhibit D**. A map showing industrial hygiene sampling locations is attached as **Exhibit E**.

Maps showing the locations of perimeter air samples are included in RJ Lee Group's November 2018 and October 2019 Perimeter Air Sampling reports, which were previously provided to the Department as Attachment H (Parts 1 and 2) to SGI's December 11, 2019 Technical Deficiency Letter Response.

¹ Van Orden, D. R., Lee, R. J., Hefferan, C. M., Schlaegle, S. and Sanchez, M. (2016), "Determination of the Size Distribution of Amphibole Asbestos and Amphibole Non-Asbestos Mineral Particles", *The Microscope*, 64, p 13 – 25.

4. *Please provide the designated disposition areas for any suspect mineral that may be encountered at the Northern Tract as outlined in the Suspect Mineral Identification and Management Protocol Section 2.4 — Disposition of suspect materials. The disposition location must be clearly shown on the Exhibit 9: Operations Map. In addition, provide the location of any suspect mineral (including NOA) that has been encountered and disposed of for Pitts Quarry.*

RESPONSE:

Exhibit B shows the designated disposition areas for suspect materials that may be encountered at the Northern Tract (the pink areas marked “Suspect Material Primary Burial Location” and “Suspect Material Incidental Occurrence Burial Location”), as well as the locations of suspect material previously encountered and disposed of for the Pitts Quarry. An updated version of the Operations Map showing suspect material disposition locations is attached as **Exhibit F**.

5. *Please explain why SGI is counting cleavage fragments as “non asbestos” in its 1/17/2020 submission to DEP. Page 93 of the 1/17/2020 submission, for example, demonstrates that cleavage fragments are not being reported as asbestos, while materials that appear to have a similar chemical composition are being reported as asbestos fibers. Please explain this difference.*

RESPONSE:

The non-asbestiform particles labeled “cleavage” in the report were observed to have the growth habit that is inconsistent with that of asbestiform amphibole fibers. They do not represent fragments of what were previously larger fibers that would otherwise have qualified as asbestiform. The Department does not (and should not) regulate these non-asbestiform particles as “asbestos,” consistent with pertinent federal regulations administered by the Occupational Safety and Health Administration (“OSHA”), Mine Safety and Health Administration (“MSHA”), and U.S. Environmental Protection Agency (“EPA”).

It is not unusual for amphibole minerals (in this case, actinolite) to exhibit a range of morphological characteristics within a single deposit. It is therefore incumbent on the analytical laboratory to differentiate these characteristics. Amphibole minerals are regulated as “asbestos” when they occur in the asbestiform habit. This growth habit has been shown to produce mineral particles (fibers) which are causative agents for disease (asbestosis, lung cancer, and mesothelioma). Those particles which are in the non-asbestiform growth habit have been shown to be far less of a threat to public health. Numerous studies (either those conducted on differing subjects^{2,3,4} or as

² J. M. G. Davis, et al (1991). “Variations in the Carcinogenicity of Tremolite Dust Samples of Differing Morphology,” *Annals New York Academy of Sciences*, 643, p. 473-489.

³ B. T. Mossman (2008). “Assessment of the pathogenic potential of asbestiform vs. nonasbestiform particulates (cleavage fragments) in in vitro (cell or organ culture) models and bioassays,” *Regulatory Toxicology and Pharmacology*, 52, S200-S203.

⁴ E. E. McConnell (1990). *Toxicology and Carcinogenesis Studies of Tremolite (Cas No. 14567-73-8) in F344/N Rats*, National Institute of Health, NIH publication 90-2531.

reviews of various studies^{5,6,7}) have documented the differences in potency between amphibole asbestos fibers and non-asbestos amphibole particles. Other studies (such as Thompson et al⁸) have documented that amphibole minerals are ubiquitous in our environment, occurring in soils across the United States, yet there is no epidemic of mesothelioma among the general population.

In 1992, OSHA considered whether to regulate non-asbestos amphiboles, including actinolite, and expressly determined based on the extensive record before it that “evidence is lacking to conclude that nonasbestiform ... actinolite present the same magnitude of health effect as asbestos.” 57 Fed. Reg. 24310 (June 8, 1992).⁹ In 2008, MSHA reached a similar conclusion in deciding against regulation of non-asbestiform amphibole minerals. See 73 Fed. Reg. 11284 (Feb. 29, 2008).¹⁰ Similarly, EPA, in its National Emission Standard for Asbestos (40 C.F.R. § 61.140 – 61.156) defines “asbestos” as only the “**asbestiform varieties** of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite, anthophyllite, and actinolite-tremolite.” 40 C.F.R. § 61.141 (emphasis added). The Department’s air quality regulations, at 25 Pa. Code § 124.3, incorporate by reference EPA’s definition of asbestos. Laboratories must differentiate between these growth habits when analyzing samples in order to document compliance with these various regulations.

6. *Please provide a narrative interpretation of the public health implications of the TEM results submitted on 1/17/20, as well as their geographic distribution, and their implications for the proposed mining plan.*

RESPONSE:

The TEM results submitted on January 17, 2020 are not indicative of a public health threat. RJ Lee Group’s TEM analysis indicates that two of the 40 core samples analyzed (SRM No. 9295, associated with corehole NT-13-08, and SRM No. 9240, associated with corehole NT-13-10) contained amphibole asbestos in an amount equal to or greater than 1% asbestos by weight (which is the threshold for regulation as an “asbestos-containing material” by OSHA under 29 C.F.R. § 1910.1001(b)). Both of those coreholes are located on the eastern/southeastern edge of the Northern Tract footprint. Other analysis of samples taken from NT-13-08 and NT-13-10, including the RJ Lee Group’s 2017 PLM analysis (see Attachment C to SGI’s December 11, 2019 Technical Deficiency Letter Response) show significantly lower concentrations of amphibole asbestos. This variability results from the non-homogenous nature of the rock located in the Northern Tract footprint and the small relative sample size utilized for TEM analysis. Further, as

⁵ C. Williams, et al (2013). “State-of-the-science assessment of non-asbestos amphibole exposure: Is there a cancer risk?”, *Environmental Geochemistry and Health*, 35, p. 357-377

⁶ D. H. Garabrant and S.T. Pastula (2018). “A comparison of asbestos fiber potency and elongate mineral particle (EMP) potency for mesothelioma in humans,” *Toxicology and Applied Pharmacology*, 361, p. 127-136.

⁷ J. Addison and E. E. McConnell (2008). “A Review of Carcinogenicity Studies of Asbestos and Non-Asbestos Tremolite and Other Amphiboles”, *Regulatory Toxicology and Pharmacology*, 52, S187-S199.

⁸ B. D. Thompson, et al (2011). “Amphibole Asbestos Soil Contamination in the USA: A Matter of Definition”, *American Mineralogist*, 96, p. 690-693.

⁹ Available at https://www.osha.gov/FedReg_osha_pdf/FED19920608.pdf.

¹⁰ Available at <https://www.govinfo.gov/content/pkg/FR-2008-02-29/pdf/E8-3828.pdf>.

shown in **Exhibit A**, sample 9295 was taken from rock that is below the lowest level of planned mining at the Northern Tract.

To ensure that any asbestiform minerals that may be uncovered during Northern Tract mining operations are managed in a safe and responsible manner, SGI plans to implement (as it already does throughout the Charmian location) a series of protective measures that are designed to identify the presence of potential asbestiform minerals and eliminate any resulting environmental or public health impacts. First, as the Department is aware, SGI has established and implements a Mineral Identification and Management Guide (the "Guide"), an updated version of which is attached as **Exhibit H**. This Guide establishes rigorous procedures for the identification and proper handling of materials suspected of containing asbestos. Pursuant to the Guide, SGI's mine planning department is responsible for generating maps that identify suspect zones/structures of interest based on pre-mine core sampling, historic geologic information, and field observations. Prior to initiation of mining activities, SGI intends to generate such a map for the Northern Tract that takes into account the core sampling results discussed above.

During the mining phase, the Guide calls for inspections to be conducted by trained geologists (on a quarterly basis) and other specially-trained "Designated Site Personnel" (after every blast and once a week thereafter during operations) to look for suspect materials in the active working areas of the quarry. If Designated Site Personnel identify suspect material, they are required to delineate the extent of the material and notify mine management and the Geologist. Active mining in the delineated area must cease while the Guide is followed. The Designated Site Personnel then may either arrange for disposal of the suspect material according to established safety protocols or, with the involvement and oversight of the Geologist, determine by a visual inspection and laboratory testing that the material does not contain protocol minerals. Suspect material is wetted to prevent dust formation and transferred to an onsite disposition point where it is marked and capped to prevent disturbance. Observations are conducted to ensure that the dust control measures are effective throughout this process. Additionally, all employees involved in the handling of the suspect material are required to comply with applicable EHS protocols until the suspect materials are covered at their final location. Active mining within the delineated affected area cannot resume until the suspect material has been removed from the work area and the Geologist or Corporate EHS Manager gives the "all-clear."

In the unlikely event that any asbestiform minerals pass through this initial screening process undetected, SGI routinely collects air samples in the workplace and analyzes them for asbestos (using TEM) for industrial hygiene purposes. SGI provided the results of past industrial hygiene sampling efforts in Attachment G to SGI's December 11, 2019 Technical Deficiency Letter Response. These results show that, in greater than 99.8% of samples analyzed since September 2009 (the earliest month for which SGI maintains records of pertinent laboratory reports), amphibole asbestos was either not detected or detected in concentrations lower than MSHA's "full-shift" permissible exposure limit ("PEL") (0.1 fibers per cubic centimeter (f/cc)).¹¹ MSHA's full-shift PEL assumes that mine workers can be safely exposed, without personal protective equipment, to airborne asbestos at a concentration of just under 0.1 f/cc for a full 8-hour shift each and every work day of their careers. In short, this sampling indicates that SGI's employees are not exposed to airborne asbestos in concentrations that would violate MSHA standards or pose

¹¹ MSHA regulations establish two PELs: (i) a "full shift limit," which provides that a "miner's personal exposure to asbestos shall not exceed an 8-hour time-weighted average full-shift airborne concentration of 0.1 [f/cc]; and (ii) an "excursion limit," which provides that "[n]o miner shall be exposed at any time to airborne concentrations of asbestos in excess of 1 [f/cc] as averaged over a sampling period of 30 minutes." 30 C.F.R. § 56.5001(b)(2).

a threat to their health – and there is no reason to believe mining operations in the Northern Tract would be any different.

Moreover, the indoor air associated with SGI's mineral processing activities passes through a baghouse before being emitted outdoors. To the extent that any asbestiform particles might pass through or otherwise evade the baghouse, dilution in the ambient air prevents any meaningful concentrations of airborne asbestos from reaching off-site receptors. This is supported by the results of the two rounds of perimeter air sampling that SGI conducted in conjunction with this application, which did not detect airborne asbestos in concentrations that are statistically different from those typically present in the ambient air.¹² Moving forward, SGI has committed to implementation of an Asbestos Air Monitoring and Mitigation Plan to assure that SGI's Northern Tract operations do not result in elevated asbestos emissions. In sum, based on all existing data, and in light of SGI's proposed protective measures, there is no reason to believe that SGI's proposed operations in the Northern Tract would pose an asbestos-related public health risk.

7. Core and Air Samples: Please provide lab sheets signed off by the microscopist for all asbestos TEM analyses.

RESPONSE:

With respect to core samples, TEM count sheets were included in SGI's January 17, 2020 submission to the Department, as well as in Attachment C to SGI's December 11, 2019 Technical Deficiency Letter Response. With respect to perimeter air samples, TEM count sheets were included in Attachment H, Part 2 to SGI's December 11, 2019 Technical Deficiency Letter

¹² The general public is exposed to airborne asbestos at levels generally labeled as "background." These airborne fibers result from wind-blown natural occurrences of asbestos as well as from the use or manipulation of commercial products that contain asbestos. There have been various studies of airborne asbestos that describe these "background" concentrations. These studies indicate that the average background concentration in the United States is about 0.00003 f/cc (for fibers 5 μ m and longer), but that this value can vary due to location (such as 0.00038 f/cc in Boulder City, NV) or due to some activity (such as an earthquake, 0.001 f/cc in California following the Loma Prieta earthquake). See, for example, Van Orden, D. R. (2018). "Identification and Analysis of Ambient EMPs", *Toxicology and Applied Pharmacology*, 361, p. 21-26.

It is well understood in industrial hygiene that "dilution ventilation" is one way to reduce airborne concentrations of any pollutant. See S. R. Dinardi (1995), *Calculation Methods for Industrial Hygiene*, John Wiley & Sons, Inc., p 213-260. In an outdoor setting, air originating from the industrial process mixes with background outdoor air. As shown by Ilgren et al (E. B. Ilgren, et al (2015). "Further Studies of Bolivian Crocidolite - Part IV: Fibre Width, Fibre Drift and their relation to Mesothelioma Induction: Preliminary Findings", *Epidemiology Biostatistics and Public Health*, 12), airborne asbestos fibers at an asbestos-cement plant were non-detectable within 100 meters of the plant. Similarly, Kuryvial et al. (Kuryvial R, Wood R, Barrett R. Identification and assessment of asbestos emissions from incidental sources of asbestos. Battelle - EPA Contract No. 68-02-0230, ORD EPA Sept 1974) collected a number of samples up to 2.5 miles downwind of a source and concluded that the "substantial populations surrounding the mine sites where asbestos is present as an accessory mineral" do not appear to be "exposed to significant concentrations in air." Evaluations of worker exposures that were in the vicinity of industrial operations have shown that less than 1% of airborne asbestos concentrations are attributable to the industrial process when collected 30 feet from the source. See E. P. Donovan, et al. (2011), "Evaluation of bystander exposures to asbestos in occupational settings: A review of the literature and application of a simple eddy diffusion model", *Critical Reviews in Toxicology*, 41, p. 50-72. Even greater reductions will occur farther from a source.

Response. RJ Lee Group uses a computer system to record and review the TEM observations. At the bottom of each TEM count sheet, there is a digital signature of the analyst and of a second person reviewing the count sheet which indicates the time and date of their initial and final approval, respectively (see as an example page 39 of Attachment H, Part 2 to SGI's December 11, 2019 Technical Deficiency Letter Response).

8. *Core and Air Samples: Due to the importance of experience and consistency in fiber counting, please provide documentation demonstrating that any microscopists who will be conducting any TEM asbestos analyses have experience or training for that task.*

RESPONSE:

The TEM analyses are conducted by trained personnel in compliance with the requirements of various accrediting agencies, including the U.S. Department of Commerce's National Voluntary Laboratory Accreditation Program ("NVLAP").¹³ A copy of RJ Lee Group's NVLAP Certificate of Accreditation in Asbestos Fiber Analysis, including TEM analytical methods, is included in **Exhibit G**. The NVLAP program requires all analysts to be trained and demonstrate proficiency in asbestos identification and fiber counting, as well as an array of related laboratory skills and techniques.¹⁴ All TEM analyses by RJ Lee Group are directed by Dr. Bryan Bandli, Ms. Monica McGrath-Koerner, and Ms. Ashleigh Sload, all of whom hold advanced degrees in geology. The primary microscopists have been Jon Swope and Ashleigh Sload, whose training and competency has been independently reviewed by the NVLAP assessors.

RJ Lee Group maintains similar accreditations in TEM analysis from the AIHA Laboratory Accreditation Program, LLC ("AIHA-LAP") and American Association for Laboratory Accreditation ("A2LA"). RJ Lee Group's Certificates of Accreditation issued by these organizations are also included in **Exhibit G**.

9. *Air Sampling: Please provide documentation of the following information regarding field blanks to verify contamination has not occurred: (i) Location of field blanks, (ii) Where and when blanks were opened and closed.*

RESPONSE:

The analytical results for all blank filters are included in RJ Lee Group's November 2018 and October 2019 Perimeter Air Sampling reports. Details regarding the time and location of field blanks collected by RJ Lee Group during perimeter sampling are provided in the chain-of-custody documents included within these reports. For the 2018 sampling, a single field blank was collected on August 28, 2018. For the 2019 sampling, two field blanks were collected on September 18 and two field blanks were collected on September 25. These field blanks were collected at the following times and locations:

Date	Time	Location
8/28/2018	1:15pm	Office Parking Lot

¹³ See <https://www.nist.gov/nvlap>.

¹⁴ See NIST Handbook 150-13 Checklist, Airborne Asbestos Analysis, Section 5.2, available at https://www.nist.gov/system/files/documents/nvlap/NIST_HB_150_13_Checklist-2-1.pdf.

9/18/2019	10:03am	West of Pitts Quarry (location #5)
9/18/2019	10:20am	Office Parking Lot
9/25/2019	9:03am	King's Property
9/25/2019	9:06am	King's Property

All field blanks were closed within approximately 30 seconds after they were opened.

10. *Please make revisions to Appendix 7.2—Suspect Minerals Identification and Management Guide, and provide them to DEP as follows:*

- (i) *Section 1.2.1: Revise the definition of “Geologist” to mean: A Pennsylvania Licensed Professional Geologist (P.G.).*

RESPONSE:

SGL does not believe that it is necessary or desirable to require a Pennsylvania Licensed Professional Geologist to fulfill the role of the “Geologist” under SGL’s Minerals Identification and Management Guide. There is no legal or regulatory requirement under the Noncoal Surface Mining Conservation and Reclamation Act or the Department’s Noncoal Mining Rules (25 Pa. Code Ch. 77) that would require an employee geologist to be licensed under the Pennsylvania Engineer, Land Surveyor and Geologist Registration Law.¹⁵ The SGL employees who currently fulfill the role of the Geologist are comprised of a team of three individuals with a combined 60 years of experience, each of whom hold educational degrees in geology and possess relevant experience in meta-volcanic rock formations. The team includes: (1) a chief geologist who holds both bachelor and masters levels degrees in geology and possesses 39 years of geologic experience, including 34 years of experience in hard rock/meta-volcanic formations; (2) a mid-level geologist with a B.S. degree in geology (plus some post-graduate course work), along with 20 years of geologic experience, 14 of which involved meta-volcanic formations; and (3) a junior geologist with a B.S. in geology and one year of experience in hard rock/meta-volcanic formations. This team, with assistance from others, is responsible for ensuring that the individuals completing tasks pursuant to the Guide have received adequate training for their particular role. Additionally, this team conducts the periodic onsite inspections described in section 1.2 of the Guide to ensure that Suspect Zones/Structures identified in core samples and from historical geologic information are accurately depicted on the appropriate maps.

SGL has revised the Guide to reflect the relevant qualifications of its geologic team as well as clarify some of the roles and responsibilities defined in the document (see Exhibit H).

- (ii) *Section 1.4.2: Revise to ‘The “all clear” signal must be determined and given by the Geologist (P.G.).’*

RESPONSE:

See response to 10(i) above.

¹⁵ The Engineer, Land Surveyor and Geologist Registration Law requires a license to engage in the “Practice of Geology,” which is defined as the “the practice or the offer to practice geology **for others for a fee**” 63 P.S. § 149(n). Therefore, persons who perform geologic tasks in their role as an employee, rather than as a third party service provider, do not require licensure.

- (iii) *Section 1.4.3: Please state SGI's rationale for including the carbonaceous material identification step of the Suspect Material Identification/Confirmation, since this does not appear relevant to asbestos.*

RESPONSE:

Because of SGI's broad definition of "suspect material" in the protocol, the morphology of carbonaceous material can sometimes be confused with suspect material. Carbonaceous materials, unlike naturally occurring asbestos, will react when in contact with acid drops. This is a simple and effective test that can be used to differentiate between carbonaceous materials and suspect materials. This distinction, however, has not been used at Charmian, but at other SGI locations where carbonaceous material is far more common.

11. *In regard to Attachment E—Asbestos Air Monitoring and Mitigation Plan at Specialty Granules LLC of the Technical Deficiency Response dated December 11, 2019, please revise this document by adding the following to Section 6.0—Analytical Methods, Duplicate Samples: "Duplicate samples will be provided to DEP", and provide the revised document to DEP.*

RESPONSE:

As discussed by SGI and Department representatives on January 30, 2020, SGI has revised its Asbestos Air Monitoring and Mitigation Plan to provide that SGI will facilitate the Department's collection of its own samples during all sampling events conducted pursuant to the Plan. The Plan requires SGI or its contractor to contact the Department at least two working days in advance of all such sampling events so that Department representatives have an opportunity to collect samples during the same time period. An updated version of the Asbestos Air Monitoring and Mitigation Plan is attached as Exhibit I.

12. *Please confirm that the proposed weather monitoring station will follow EPA Meteorological Monitoring Guidance Document No. 454 R99-005.*

RESPONSE:

In the Department's September 30, 2019 Technical Deficiency Letter, the Department asked SGI to provide a description of how wind speed, relative humidity, and temperature will be monitored during each air sampling event, including whether an automated, site-specific weather monitoring station is feasible and whether wind speed and direction can be monitored at a frequency of no less than one time per hour for each sampling event.

Taking this request into account, SGI established a plan and purchased equipment to accomplish the requirements of the letter. SGI purchased and installed a Lufft WS800-UMB Smart Weather Station, which includes the ability to measure the following parameters: temperature, relative humidity, air pressure, wind direction, wind speed, precipitation intensity, precipitation quantity, radiation, and lightning strikes.

This weather station was chosen because of its accuracy, reliability, and maintenance-free operation. The unit is more reliable than other similar units because it uses no moving parts that are subject to wear and calibration issues. A technical specification sheet for this unit is included as **Exhibit J**.

The Department's January 24, 2020 letter asks SGI to confirm that the proposed monitoring station will follow EPA Meteorological Monitoring Guidance Document No. 454 R99-05. The purpose of the EPA document is to provide guidance on the collection of meteorological data for use in regulatory modeling applications.

After reviewing, SGI notes that the EPA document is over twenty years old and that it was developed for large point source emissions, such as smokestacks at a power plant. The application proposed for SGI's weather station is fundamentally different from an air modeling scenario with a single point source. The purpose of the SGI weather station is to collect data that generally represents ambient conditions at the time of sampling. The air sampling locations and methodology proposed with the Northern Tract have been established to provide sampling at certain points around the entire perimeter of SGI's operations, including the proposed Northern Tract Quarry and the existing Pitts and West Ridge permit areas. Because of this approach, wind data (although collected) are not necessary to determine sample location.

Among other requirements, the EPA document provides some recommended specifications for sensor accuracy. Below is a table that compares some of the Lufft WS800-UMB technical specifications to the recommendations made by EPA.

Meteorological Variable	EPA Recommended Accuracy	WS800-UMB Specification
Wind Speed	± (0.2 m/s + 5% of observed)	±0.3 m/s or ±3 % (0...35 m/s) ±5 % (>35 m/s) RMS
Wind Direction	± 5 degrees	< 3° RMSE > 1.0 m/s
Ambient Temperature	± 0.5 C	±0.2°C (-20...50°C)
Pressure	± 3 mb (0.3 kPa) 0.5 mb	±0.5 hPa (0...40 °C)

With respect to siting, the weather station is located on an existing radio tower near the center of the operations and near the top of the ridge. The station will be mounted approximately 10M up on the pole to avoid ground level interferences. The station will be in proximity to an adjacent forest with less than the EPA specified clearance, however the height of the tower will place the station near the level of the tree canopy. This location was selected because of the height of the existing tower and the proximity to existing power supplies which will make the station more reliable than if a remote solar panel were used for installation.

The Department requested that the weather station collect data hourly during the monitoring periods. The WS800-UMB is pre-programmed to sample the wind speed and direction in one-second intervals, and then average that data over a 2 minute time period. The datalogger then averages the 2 minute data points into hourly averages and sends that information via a cellular connection to an online database where reports can be generated and saved.

The SGI weather station is robust, accurate, reliable, and requires very little maintenance and calibration. The station has been located near the highest point on the site where good communications and power supplies exist. For these reasons, this station is appropriate for the application proposed with the Asbestos Air Monitoring and Mitigation Plan. While the 454 R99-05

guide provides some useful information, it was written for a completely different application than what SGI is proposing for Northern Tract and should not be applied as the only approach to on-site monitoring.

13. *Please explain more clearly why any materials were redacted from any attachments to the Technical Deficiency Response dated December 11, 2019.*

RESPONSE:

With respect to Attachment I (Processed Material and Product Sampling Results) to SGI's December 11, 2019 Technical Deficiency Response Letter, SGI redacted information that did not relate to the Charmian site. Many of the laboratory reports and related documents included in this attachment include analyses of samples taken from other SGI locations, including those in Annapolis, MO, Lone, CA, and Pembine, WI (the "Kremlin" plant). Those locations have different geologic properties and none of the material processed at those locations is processed at the Charmian facility. Therefore, the data relating to those locations have no bearing on conditions at the Charmian location.

With respect to Attachment L (Industrial Hygiene Sampling Results - Respirable Dust) to SGI's December 11, 2019 Technical Deficiency Response Letter, SGI redacted employee names. SGI redacted these names out of respect for the privacy of these individuals and to ensure it does not run afoul of laws prohibiting the disclosure of employees' protected medical or personal identification information.

14. *Please provide the results of the most recent MSHA sampling at the facility, as well as SGI's interpretation of their significance from a public health perspective.*

RESPONSE:

The results of the most recent MSHA asbestos sampling at the Charmian facility are available at <https://www.msha.gov/mine-data-retrieval-system>. This sampling event occurred on July 10, 2019. During this event MSHA sampled two employees, a utility man and a dry screen plant operator, for asbestos. The results of both samples indicate 0 fibers/cc for the sampling period.

Furthermore, as noted above, dating back to 2009 (the earliest year for which SGI maintains records of pertinent laboratory reports), amphibole asbestos was either not detected or detected in concentrations lower than MSHA's "full-shift" PEL in greater than 99.8% of samples analyzed by RJ Lee Group. MSHA's full-shift PEL assumes that mine workers can be safely exposed, without personal protective equipment, to airborne asbestos at a concentration of just under 0.1 f/cc for a full 8-hour shift each and every work day of their careers. In short, this sampling indicates that SGI's employees are not exposed to airborne asbestos in concentrations that would violate MSHA standards or pose a threat to their health – and there is no reason to believe mining operations in the Northern Tract would be any different.

Moreover, the indoor air associated with SGI's mineral processing activities passes through a baghouse before being emitted outdoors. To the extent that any asbestiform particles might pass through or otherwise evade the baghouse, dilution in the ambient air prevents any meaningful concentrations of airborne asbestos from reaching off-site receptors. This is supported by the results of the two rounds of perimeter air sampling that SGI conducted in conjunction with this

application, which did not detect airborne asbestos in concentrations that are statistically different from those typically present in the ambient air. Moving forward, SGI has committed to the implementation of an Asbestos Air Monitoring and Mitigation Plan to assure that SGI's Northern Tract operations do not result in elevated asbestos emissions. In sum, based on all existing data, and in light of SGI's proposed protective measures, there is no reason to believe that SGI's proposed operations in the Northern Tract would pose an asbestos-related public health risk.

15. *Please provide any information/sampling/studies if available that SGI has regarding airborne silica concentrations at or beyond the boundaries of the existing facility.*

RESPONSE:

SGI does not have any information/sampling/studies regarding airborne silica concentrations at or beyond the boundaries of the existing facility. SGI provided all airborne silica data in its possession to the Department in Attachment L to its December 11, 2019 Technical Deficiency Letter Response.

16. *Please provide a demonstration that airborne silica beyond the boundaries of the existing facility will not result in undue risk to public health.*

RESPONSE:

The data provided in Attachment L to SGI's December 11, 2019 Technical Deficiency Letter Response demonstrate that SGI's operations do not and will not generate concentrations of airborne silica that would pose an undue risk to public health beyond the boundaries of the Charmian facility. These data, which result from the analyses of samples collected from predominantly indoor sampling locations, indicate that the vast majority of samples collected by SGI over the past two decades contain silica levels that are below the threshold limit value ("TLV") adopted by MSHA for the protection of workers.¹⁶ The MSHA TLV assumes that mine workers can be safely exposed, without personal protective equipment, to respirable dust at the level of the TLV for a full 8-hour shift each and every work day of their careers.

Furthermore, as noted above, the indoor air associated with SGI's mineral processing activities passes through a baghouse before being emitted outdoors. To the extent that any airborne silica particles might pass through or otherwise evade the baghouse, dilution in the ambient air prevents any meaningful concentrations of airborne silica from reaching off-site receptors, and certainly not at levels that would approach the TLV or otherwise pose a risk to public health.

¹⁶ In 30 C.F.R. § 56.5001(a), MSHA has incorporated by reference the TLVs adopted by the American Conference of Governmental Industrial Hygienists, as set forth and explained in the 1973 edition of the Conference's publication, entitled "TLV's Threshold Limit Values for Chemical Substances in Workroom Air Adopted by ACGIH for 1973," pages 1 through 54. This 1973 publication establishes the following formula for calculating the TLV for respirable dust that contains crystalline silica: $10 \text{ mg/m}^3 / (\text{percentage of quartz plus } 2)$. See 84 Fed. Reg. 45452, 45453 (Aug. 29, 2019). Furthermore, given the variability inherent in the calibration, sampling, and analytical process, MSHA currently applies a sampling and analytical "error factor" (correction factor) of plus 20% to the TLV in evaluating compliance. See MSHA's Practical Guide to an Occupational Health Program for Respirable Crystalline Silica (Jan. 25, 2008) at page 29.

17. *Technical Deficiency Response: Attachment G: Page 2-5: Please provide SGI's assessment of the public health significance of the numbers in the following columns:*

TWA Fibers/cc (PCM)
Peak Fibers/cc (PCM)
Fibers/cc TEM
Tremolite-actinolite fibers/cm³
Respirable Dust (mg/m³)
Crystalline Quartz (respirable) mg/m³

RESPONSE:

The numbers presented in the above-mentioned columns have no public health significance. To the best of SGI's knowledge, these data were derived from industrial hygiene sampling of employees at the Charmian facility from 1976-1994. SGI does not have laboratory reports or other documentation to validate the accuracy of these data, and in any event, conditions at the Charmian facility from 1976-1994 are not representative of current operations. However, even if these data were both accurate and representative, it would not be indicative of a public health threat.

The following table explains, to the best of SGI's knowledge, the meanings of the column headings referenced above:

Column Heading	Explanation
TWA Fibers/cc (PCM)	The measured 8-hour average concentration of all PCM countable fibers in the sample (asbestos as well as non-asbestos fibers that are at least 5 µm long). The MSHA "full shift" PEL is 0.1 asbestos fibers/cc for this 8-hour time weighted average. (Note that the values in this column cannot be compared directly to the full shift PEL because of its inclusion of both asbestos and non-asbestos fibers.)
Peak Fibers/cc (PCM)	The measured PCM concentration for a short-term sample, generally collected for no more than 30-minutes (including both asbestos and non-asbestos fibers that are at least 5 µm long). For asbestos fibers, the comparable MSHA "excursion limit" is 1 asbestos fiber/cc for a 30-minute period. (Note that the values in this column cannot be compared directly to MSHA's excursion limit because of its inclusion of both asbestos and non-asbestos fibers.)
Fibers/cc TEM	The concentration of all fibers counted by the TEM that are at least 5 µm long.
Tremolite-actinolite fibers/cm ³	The concentration of tremolite/actinolite fibers as determined by TEM for fibers 5 µm and longer.
Respirable Dust (mg/m ³)	Respirable dust levels as measured in the sample by passing all airborne dust through a cyclone and collecting the respirable fraction. The current regulatory level for respirable dust is 5 mg/m ³ when

Column Heading	Explanation
	there is no crystalline silica in the airborne dust. When there is crystalline silica, the MSHA TLV is calculated as follows: $10/(\%SiO_2+2)$ mg/m ³ .
Crystalline Quartz (respirable) mg/m ³	The respirable dust fraction is analyzed for crystalline silica. The current MSHA TLV is calculated as follows: $10/(\%SiO_2+2)$ mg/m ³ .

Furthermore, for the reasons explained above, predominantly indoor industrial hygiene sampling results have almost no bearing on potential exposures to outdoor receptors beyond the boundary of the Charmian location. The indoor air associated with SGI's mineral processing activities passes through a baghouse before being emitted outdoors. To the extent that any airborne asbestos or silica particles might pass through or otherwise evade the baghouse, dilution in the ambient air prevents any meaningful concentrations of airborne asbestos or silica from reaching off-site receptors. This is supported by the results of the two rounds of perimeter air sampling that SGI conducted in conjunction with this application, which did not detect airborne asbestos in concentrations that are statistically different from those typically present in the ambient air.

18. *Technical Deficiency Response: Attachment G: Pages 2-5: Does the lack of a number in any of the above columns imply that the parameter was tested and not found, or does it rather imply that that particular sample was not tested for that pollutant?*

RESPONSE:

As noted above in response to question 17, SGI does not possess records of laboratory reports or other documentation to support the raw data provided on pages 2-5 of Attachment G, despite its best efforts to locate such documents. In light of the unavailability of supporting documents for this data (which dates back to the 1970's), SGI cannot provide an informed understanding of the reasons behind the lack of numbers in particular columns.

19. *Technical Deficiency Response: Attachment G: Pages 19-308 showed the actual numeric asbestos fiber counts on certain pages. Please provide SGI's assessment of the public health significance of these numbers, such as Pages 69-74, which list 22.5 fibers of amphibole found.*

RESPONSE:

The data provided on pages 19-308 of Attachment G should be compared to the applicable MSHA PELs for asbestos. As explained above, these results show that, dating back to 2009, amphibole asbestos was either not detected or detected in concentrations lower than MSHA's "full-shift" PEL in greater than 99.8% of samples analyzed. This PEL assumes that mine workers can be safely exposed, without personal protective equipment, to airborne asbestos at a concentration of just under 0.1 f/cc for a full 8-hour shift each and every work day of their careers. In short, this sampling indicates that SGI's employees are not exposed to airborne asbestos in concentrations that would violate MSHA standards or pose a threat to their health.

The data shown on pages 69-74 (RJ Lee Group project AOH1025423-1) are from analyses of samples conducted in general accordance with NIOSH 7402 (see data summary on page 67). The counted fibers are summarized below:

Sample	Asbestos fibers	Non-Asbestos Amphibole Fibers	Other Non-Asbestos Fibers
10226466	0	1	0.5
10226467	0	2	3
10226468	0.5	5	1
10226469	0	14	20.5

Some of the counted amphibole particles were identified as “asbestos” while others were identified as “cleavage” or non-asbestos. This differentiation reflects the observed growth habits of the particles and is required by the analytical method. See NIOSH 7402: “Other amphibole particles that have aspect ratios greater than 3:1 and elemental compositions similar to the asbestos minerals may interfere in the TEM analysis.” Also: “There are, however, several minerals (e.g., pyroxenes, massive amphiboles, and talc fibers) which are chemically similar to asbestos and can be considered interferences.”

20. *Technical Deficiency Response: Attachment G: Please explain why some of the analysis results show “half-fibers” and explain how a “half fiber” would differ from a whole fiber.*

RESPONSE:

The analytical method NIOSH 7402 counts “half fibers” as a way to achieve a statistically representative count of the fibers on the sample. Step 20.c.2 states: “Count fibers which are partially obscured by the grid as half fibers. Note: If a fiber is partially obscured by the grid bar at the edge of the field of view, count it as a half fiber only if more than 2.5 µm of fiber is visible.” The idea is that a very long fiber could be visible in two adjacent grid openings. If it is counted in both grid openings, this would bias the results high. To avoid this, some methods (such as NIOSH 7400 and 7402) count half fibers while other methods (such as EPA 100.1 for drinking water) say to count (as whole fibers) only touching fibers along 2 sides of the grid opening and not along the other two sides.

21. *Technical Deficiency Response: Attachment H: Because the sampling conducted by SGI was limited to what appears to be two grab samples and may not accurately reflect average or normal conditions at the facility, please provide information relating to facility operations during the sampling periods reflected in Attachment H.*

RESPONSE:

SGI collected air samples from 10 locations around the perimeter of the site on two occasions. The first round of sampling used passive monitors that collected particulate over the period of a week (August 28 - September 6, 2018). The second round of sampling used active monitors that collected particulate over a period of 8 hours (September 18 and 25, 2019). The samples collected during both rounds of sampling are reflective of normal operating conditions at the site. From August 28 – September 6, 2018, SGI’s activities included loading and hauling of production rock, rock milling and coloring, shipping, site maintenance, and loading and hauling of fines for disposal in the West Ridge Quarry. The blasting for this period included two blasts in the Pitts Quarry, one for development in the northwest corner of the quarry, and one for production in the southeast corner of the quarry. Four of the eight days during this period had measurable rainfall in what was generally a wet year. During sampling on September 18 and 25, 2019, no blasting was conducted,

but the site was otherwise operating normally. The September 2019 sample events were conducted on days with no rain during an extremely dry period from August through September.

22. *Technical Deficiency Response: Regarding the data reviewed in Attachment H there appears to be insufficient data to make an evaluation that the data presented represents a “normal” day or that particulate matter that may migrate off site may or may not contain asbestos fibers. Please provide more samples across a variety of operational, meteorological and temporal conditions to complete this analysis.*

RESPONSE:

Please see the response to item 21. The conditions during the two rounds of sampling represented normal operating conditions for the facility and are representative of conditions to be expected in the future. Furthermore, SGI will implement the Asbestos Monitoring and Mitigation Plan on an ongoing basis following issuance of the permit.

23. *Technical Deficiency Response: Attachment I - Processed Material and Product Sampling Results: The organization of this 488 page document is unclear. Please provide a detailed list of the contents, plus an executive summary providing SGI’s assessment of the public health significance of the various documents.*

RESPONSE:

Attachment I includes copies of laboratory reports and related chain of custody documents that document the results of SGI's periodic, regular processed material and product sampling efforts dating back to 2011. These documents are arranged in chronological order with the oldest lab reports and chain of custody documents appearing at the beginning of the Attachment. For each sampling event, there is typically (1) a chain-of-custody letter from SGI to RJ Lee Group requesting analysis of specific samples, (2) a table that identifies which of the samples relates to the Charmian facility versus SGI's other facilities, and (3) an RJ Lee Group Laboratory Report that summarizes the results of RJ Lee Group's PLM analysis. As explained in prior submissions to the Department, samples are first analyzed by RJ Lee Group using PLM methodology. If any amount of possible asbestos is reported by this analysis, then SGI requests that RJ Lee Group conduct a TEM analysis for the sample. Therefore, for any instance when PLM sampling identified possible asbestos, there is also additional documentation associated with RJ Lee Group's TEM analysis (see pages 24-34, 220-224, 301-305, and 367-488).

As explained in the December 11, 2019 Technical Deficiency Response Letter, in the vast majority of samples, initial PLM testing identified no potential asbestos. On only four occasions in the last 8+ years did initial PLM testing identify low levels of possible asbestos. Further, on only one of these occasions—sampling for the second quarter of 2019—did follow-up TEM testing identify the presence of any asbestos in any product or processed material samples. Initial TEM testing for the second quarter of 2019 identified the presence of asbestiform amphibole in four samples. See RJ Lee Group Job No. AOH1055599, report dated November 12, 2019. Given the unusual nature of these results, SGI requested that RJ Lee Group conduct TEM testing on the retained material for these samples. This second round of TEM testing identified the presence of amphibole asbestos in only one sample, in an amount well below any level of concern (0.001% by weight). See RJ Lee Group Job No. ATH1056162-0, report dated November 25, 2019. Therefore, the processing material and product sampling results included in Attachment I indicate

that SGI's processed materials and products do not present any threat to public health whatsoever.

24. *Technical Deficiency Response: Attachment K - SGI Respiratory Protection Policy (6-25-2019) USE Active01 304100195 1: Page 8: Please explain what criteria were used by SGI to determine which areas of the facility are Respirator Required Areas.*

RESPONSE:

SGI has collected years of respirable dust samples to help identify the potential exposure to its workforce. This sample data was provided to the Department in Attachment L to its December 11, 2019 Technical Deficiency Response Letter. Utilizing this sampling, SGI has identified specific areas where there may be increased potential for dust exposure. Generally, this occurs in indoor areas where dry rock is crushed and screened. MSHA standards are designed to be protective of workers even if they are not wearing personal protective equipment (respirators in this case). However, SGI still requires its workers to wear respirators in these identified areas while the processing equipment is operational. Workers are further required to wear respirators in situations where dust has the potential of being generated, even if is not in a Respirator Required Area. An example of this would be certain cleanup work or equipment maintenance on certain pieces of equipment.

25. *Technical Deficiency Response: Attachment L - Industrial Hygiene Sampling Results (Respirable Dust)_USE_Active01_304100317_1: Table on Pages 2-5 (2000-2009): Please provide fuller explanations of the meanings of the column headings and the public health significance of the measured results, including whether any of the measured values were exceedances of either OSHA, MSHA, IRIS or any other applicable standards, and why this is or is not a concern.*

RESPONSE:

The data provided on pages 2-5 of Attachment L to SGI's December 11, 2019 Technical Deficiency Letter Response have no public health significance. The meanings of the column headings are as follows:

Column Heading	Explanation
Date	The date of the sample.
Job Title	The job title of the worker subject to sampling.
Total Dust (mg/m3)	The measured value of total dust in the sample (in milligrams per cubic meter).
SiO ₂ (%)	Silicon dioxide (quartz) percentage in the sample.
Respirable Dust TWA (mg/m3)	The measured respirable dust level in the sample, expressed as the concentration of respirable dust for a full shift or an 8-hour equivalent time-weighted average.
Respirable Dust TWA (mg/m3)	This column heading should indicate "(µg/m3)" (micrograms per cubic meter) in the parenthetical. Otherwise the same as the preceding column.

MSHA Respirable Dust TLV (mg/m ³)	The calculated MSHA TLV for respirable dust based on the quartz content of the relevant sample (in milligrams per cubic meter).
Shift Length	The shift length (in hours) of the worker subject sampling.
SiO ₂ Conc. (ug/m ³)	Quartz concentration of the sample (in micrograms per cubic meter).

The data shown on pages 2-5, which result from the analyses of samples collected from predominantly indoor sampling locations, indicate that the vast majority of samples collected by SGI from 2000-2009 contain silica levels that are below the TLV adopted by MSHA for the protection of workers. The MSHA TLV assumes that mine workers can be safely exposed, without personal protective equipment, to respirable dust at the level of the TLV for a full 8-hour shift each and every work day of their careers.

Furthermore, as noted above, the indoor air associated with SGI's mineral processing activities passes through a baghouse before being emitted outdoors. To the extent that any airborne silica particles might pass through or otherwise evade the baghouse, dilution in the ambient air prevents any meaningful concentrations of airborne silica from reaching off-site receptors, and certainly not at levels that would approach the MSHA TLV or otherwise pose a risk to public health.

26. *Technical Deficiency Response: Attachment L: Table on Pages 6-11 (2010-2019): Please provide fuller explanations of the meanings of the column headings and the public health significance of the measured results, including whether any of measured values were exceedances of either OSHA, MSHA, IRIS or any other applicable standards, and why this is or is not a concern.*

RESPONSE:

The data provided on pages 6-11 of Attachment L to SGI's December 11, 2019 Technical Deficiency Letter Response also have no public health significance. The meanings of the column headings are as follows:

Column Heading	Explanation
Date	The date of the sample.
Sample	Sample ID number.
Location	Location of the sample.
Job Title	The job title of the worker subject to sampling.
Time on	Time the worker's shift started.
Time off	Time the worker's shift ended.
Total Time (min.)	Total shift time (in minutes).
Total Dust (mg/m ³)	The measured value of total dust in the sample (in milligrams/cubic meters).
Volume (liters)	Volume of the sample (in liters).
Flow Rate (L/min.)	Flow rate of the sample (in liters/minute).
Volume (m ³)	Volume of the sample (in cubic meters).
Dust Mass (mg)	Total dust mass in the sample (in milligrams).
Respirable Dust TWA (mg/m ³)	Measured respirable dust level in the sample, expressed as the concentration of respirable dust for

	a full shift or an 8-hour equivalent time-weighted average.
Quartz Mass (mg)	Quartz mass in the sample (in milligrams).
Quartz (%)	Quartz percentage of the sample.
Quartz (mg/m ³)	Quartz concentration in the sample (in milligrams per cubic meter).
MSHA Respirable Dust TLV (mg/m ³)	The calculated MSHA TLV for respirable dust based on the quartz content of the relevant sample, measured in milligrams per cubic meter.
MSHA Respirable Dust TLV +20% (mg/m ³)	The calculated MSHA TLV for respirable dust based on the quartz content of the relevant sample, measured in milligrams per cubic meter, plus the 20% error factor that MSHA allows for enforcement purposes.
% MSHA TLV	The value in the column entitled "Respirable Dust TWA (mg/m ³)" divided by the value in the column entitled "MSHA Respirable Dust TLV +20% (mg/m ³)"
OSHA Proposed SiO ₂ PEL (mg/M ³)	This column reflects OSHA's now current PEL for respirable crystalline silica (0.05 mg/m ³) (Note that this PEL does not apply to SGI in light of MSHA jurisdiction over the Charmian plant.)
% OSHA Proposed Quartz PEL	The value in the column entitled "Quartz (mg/m ³)" divided by the value in the column entitled "OSHA Proposed SiO ₂ PEL (mg/M ³)."

The data shown on pages 6-11, which result from the analyses of samples collected from predominantly indoor sampling locations, indicate that the vast majority of samples collected by SGI from 2010-2019 contain silica levels that are below the TLV adopted by MSHA for the protection of workers. The MSHA TLV assumes that mine workers can be safely exposed, without personal protective equipment, to respirable dust at the level of the TLV for a full 8-hour shift each and every work day of their careers.

Furthermore, as noted above, the indoor air associated with SGI's mineral processing activities passes through a baghouse before being emitted outdoors. To the extent that any airborne silica particles might pass through or otherwise evade the baghouse, dilution in the ambient air prevents any meaningful concentrations of airborne silica from reaching off-site receptors, and certainly not at levels that would approach the TLV or otherwise pose a risk to public health.

27. *Technical Deficiency Response: Attachment L: Table on Page 19: Please provide fuller explanations of the meanings of the column headings and the public health significance of the measured results, including whether any of measured values were exceedances of either OSHA, MSHA, IRIS or any other applicable standards, and why this is or is not a concern.*

RESPONSE:

The data provided on page 19 of Attachment L to SGI's December 11, 2019 Technical Deficiency Letter Response likewise are of no public health significance. The meanings of the column headings are as follows:

Column Heading	Explanation
Date	The date of the sample.
Job Title	The job title of the worker subject to sampling.
Shift	Timing of shift.
Location	Location of sampling event.
Respirable Dust 8 hr. TWA (mg/M ³)	Measured respirable dust level in the sample, expressed as the concentration of respirable dust for a full shift or an 8-hour equivalent time-weighted average.
Quartz (mg/M ³)	Quartz concentration in the sample (in milligrams per cubic meter).
Quartz (%)	Quartz percentage of the sample.
MSHA Respirable Dust TLV (mg/M ³)	The calculated MSHA TLV for respirable dust based on the quartz content of the relevant sample, measured in milligrams per cubic meter.
MSHA Compliance Level	The calculated MSHA TLV for respirable dust based on the quartz content of the relevant sample, measured in milligrams per cubic meter, plus the 20% error factor that MSHA allows for enforcement purposes.
% Allowable Exposure	The value in the column entitled "Respirable Dust TWA (mg/M ³)" divided by the value in the column entitled "MSHA Compliance Level"

The data shown on pages 19, which result from the analyses of samples collected from predominantly indoor sampling locations, indicate that 9 of the 11 samples contained silica levels that were below the MSHA Compliance Level (the MSHA TLV plus a 20% error factor). As noted above, the MSHA TLV assumes that mine workers can be safely exposed, without personal protective equipment, to respirable dust at the level of the TLV for a full 8-hour shift each and every work day of their careers.

Furthermore, as noted above, the indoor air associated with SGI's mineral processing activities passes through a baghouse before being emitted outdoors. To the extent that any airborne silica particles might pass through or otherwise evade the baghouse, dilution in the ambient air prevents any meaningful concentrations of airborne silica from reaching off-site receptors, and certainly not at levels that would approach the TLV or otherwise pose a risk to public health.

28. *Attachment M - Product Testing for Properties and Constituents (10-07-2019) _ USE _ Active01 30410029.PDF: This entire document is marked as Company Confidential. Please confirm whether SGI truly intends to claim this as confidential, and if so, please provide the statutory basis for the confidentiality claim, as well as a redacted version of the document suitable for public release, with a cover letter and chart listing each redaction by page number with the statutory justification of each item.*

RESPONSE:

SGL has removed the "Company Confidential" label from this document and provided an updated version in Exhibit K.

29. *Please obtain and analyze split samples for NOA using EPA Method 100.1 from all intakes of water that are used for processing and/or dust suppression. Please include a description of the source and the sampling location that the sample was obtained including but not limited to the "J-stand" and water pumped from Pond #3 of the Lower Mill Ponds to the Charmian Facility.*

RESPONSE:

SGL engaged ARM Group, LLC to conduct the requested sampling in coordination with the Department. Both ARM Group and the Department collected samples on February 11, 2020. The samples collected by ARM Group were sent via FedEx to RJ Lee Group for analysis the same day. Reports prepared by ARM Group and RJ Lee Group are attached as Exhibit L. As indicated in RJ Lee Group's laboratory report, a single amphibole asbestos fiber was detected in the sample collected from the Lower J-Stand, and no asbestos was detected in the sample from the Upper J-Stand.

Based on these results, in combination with the results of the two prior rounds of water sampling conducted by ARM and RJ Lee Group (Attachment F, Parts 1 and 2 to the December 11, 2019 Technical Deficiency Letter Response), there is no reason to believe that SGL's use of on-site water for processing and/or dust suppression poses any health risk. In the only samples that contained any detectable amount of amphibole asbestos—a single fiber each in Pitts Pond and the Lower J-Stand—the asbestos concentration was orders of magnitude lower than EPA's maximum contaminant level ("MCL") under the Safe Drinking Water Act.¹⁷ This MCL is not an effluent limit or water quality standard that applies to SGL—it is a drinking water standard that applies to public water systems that supply drinking water to the public for consumption. Stated differently, potable water provided by any public water supplier or commercial water bottler could permissibly contain significantly higher levels of asbestos than were detected in Pitts Pond and the Lower J-Stand.

30. *Please provide a response for the following written comment from the public:*

The proposed site of this new quarry has to be the poster child of where NOT to put a quarry. Would PADEP even consider this application if it were not for the existing quarry behind it? The tract is surrounded on three sides by HQ tributaries and stream, wetlands exist on both sides, and it is situated within a residential area, across from a State Forest. The only antidegradation option which prevents damage to an iconic stream (Toms Creek is well known and loved because of its trout fishing and its long stretch down through to Lake May and the Carroll Valley Community Park), is the first: moving the site to a different location. I was mistaken in my estimate of how much land SGL

¹⁷ See 40 C.F.R. § 141.62(b) (establishing the MCL for asbestos as "7 Million Fibers/liter (longer than 10 µm)").

currently owns. It is not 1400 acres, but there is plenty of room within its current boundaries, and ISP/SGI has deed recorded options to mine on adjacent properties. SGI even admits that if it were to move some of its infrastructure that it could expand into those areas. And SGI has deed recorded mining rights to an 130 acres parcel owned by Elizabeth Chase, continuous with the Pitts quarry. (See Appendix A.)

RESPONSE:

This comment starts from the false premise that SGI's proposed Northern Tract mining operations would be harmful to Tom's Creek, its tributaries, and the wetlands adjacent to the proposed quarry. For the reasons explained in much greater detail throughout SGI's application materials and prior responses to public comments (see in particular the Application's Anti-Degradation Supplement in Module 24), SGI intends to develop the Northern Tract quarry in a manner that avoids negative impacts to these aquatic features, as well as nearby residences and the Michaux State Forest.

In particular, SGI has and will comply with the Department's stringent antidegradation requirements that apply to activities in the vicinity of High Quality waters like Tom's Creek. SGI's proposed stormwater control facilities are designed to prevent any discharge to Tom's Creek except in extreme storm events generating runoff in excess of the 100-year, 24-hour storm. If such a rare storm event were to occur in the Tom's Creek watershed, the impact on Tom's Creek from any controlled discharge from the Northern Tract pond system would be negligible as compared to the uncontrolled runoff across the entire watershed.

Additionally, as discussed in prior public comment responses, no direct or indirect impacts are anticipated to four of the five wetlands within or adjacent to the Northern Tract permit area. Although the application acknowledges the potential for indirect impacts to Wetland D, Wetland D is an expansive habitat extending well beyond the Northern Tract permit boundary and hydrologic sustenance from other sources of runoff area outside of the Northern Tract permit boundary are expected to ameliorate the potential effects of Northern Tract quarry development. SGI has committed to undertake ongoing monitoring of Wetland D, and if changes in the hydrologic conditions are observed, SGI intends to work with the Department to develop and implement a mitigation strategy if required.

Finally, the fact that SGI holds ownership interests in other nearby parcels, which may or may not be minable, has no bearing on the suitability of mining in the Northern Tract, with its demonstrated reserves of recoverable metabasalt. SGI has demonstrated through its application materials and prior comment responses that it will comply with all regulatory requirements for mining in the Northern Tract, and the hypothetical potential for mining other parcels (whether realistic or not) has no role to play in this permit proceeding.

31. *With regard to items 6, 14, 17, 19, 23, 25, 26, and 27, it might also be helpful in evaluating the public health implications of the data if SGI were to utilize and extrapolate from available data including but not limited to data regarding its efforts to protect its employees.*

RESPONSE:

Please see the responses to the specified items above.

Sincerely,

A handwritten signature in cursive script, reading "Matthew S. McClure".

Matthew S. McClure
Senior Director Operations

cc: Justin P. Dunlap
Kevin Moore
Rachel Engelstein
Celeste Levine
Drew Van Orden
R. Timothy Weston
Craig P. Wilson

Exhibits:

- A. 2019 Core Sampling Map
- B. Suspect Material Map
- C. Pitts Quarry Core Sample Analyses
- D. Processed Material and Product Sampling Map
- E. Industrial Hygiene Sampling Map
- F. Updated Operations Map
- G. RJ Lee Group Certificates of Accreditation
- H. Updated Mineral Identification and Management Guide
- I. Updated Asbestos Air Monitoring and Mitigation Plan
- J. Lufft WS800-UMB Smart Weather Station Technical Data
- K. Updated Product Quality Testing Protocol
- L. Water Sampling Results (Feb. 2020)