COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF HEALTH

February 7, 2020

Rockhill Environmental Preservation Alliance, Inc
703 W. Market St.
Perkasie, PA 18944

Rockhill Environmental Preservation Alliance, Inc.,

Thank you very much for contacting the DOH and sharing REPA's concerns regarding the presence of asbestos at the Rockhill Quarry in East Rockhill Township, Bucks County, Pa, where mining operations are under a temporary cessation due to the asbestos.
Please see our response below:

Naturally occurring asbestos (NOA) is present in specific geological formations found in Pennsylvania. These rock formations, such as ultramafic rock, and serpentine rock, can be either found deep in the ground or in rocks at the surface. The amount of asbestos typically present in this rock can range from less than 1% up to about 25%. Naturally occurring asbestos can be released into the environment from its bound form if the rock is broken, crushed, or frayed either by human activity or via natural weathering processes.

In outdoor rural areas nonadjacent to known asbestos sources, background levels of asbestos in the air are about 10 (fibers/m^3) or 0.00001 fibers/mL. Due to the wearing down or disturbance of manufactured products, including insulation, automotive brakes and clutches, ceiling and floor tiles, drywall, roof shingles, and cement, typically found in more urban settings, levels found in cities can be as much as 10-fold higher.

There are several published studies and reports that discuss non-occupational asbestos exposure and describe health issues associated with NOA, manufactured asbestos production facilities, and community health. The most well-known studies concerning asbestos exposure and human health are associated with asbestos mining in Libby, Montana. The most extensive studies of occupationally exposed asbestos lung injury come from this town and surrounding communities.

A regionally relevant historical study is the Ambler, Pennsylvania Ambient Air Study published in March 1977, showed that asbestos fibers from an asbestos waste pile could be distributed by the wind to a neighboring community, but fiber concentrations in the air diminish rapidly as distance from source increases. A follow-up study was conducted in the same community between 2008 and 2011, and although mesothelioma levels were higher in the affected community, only samples collected on the national priority list site exceeded EPA screening values.

Several asbestos-related lung disease cases were observed to be higher in communities surrounding a large defunct asbestos mining operation near Belveder Mountain Vermont, as compared to control communities. However, as published in the document *A Cross-Sectional Study of Asbestos-Related Morbidity and Mortality in Vermonters Residing Near an Asbestos Mine,* VDOH 2008, and the follow-up report published in 2009, upon further investigation many of the previously reported asbestos-associated illnesses were determined to be occupationally related. In western states, NOA exposure risks have been gaining public interest and concern. Two case studies titled: *The presence of asbestos in the natural environment is likely related to mesothelioma in young individuals and women from Southern Nevada,* Bauman et al. 2015, and the El Dorado Hills, California Asbestos EPA documents present a different hazard to a non-traditional population of citizens. These studies document that environmental exposure to NOA can occur in communities near specific geological formations and may increase risk of asbestos-related lung diseases, but the risk is highly dependent on climate (dry), weather patterns and activity, e.g., dust storms, type of regional geology, and type of human activities conducted in high NOA areas. As with the defunct, inactive Ambler, Pa, and Belevedere mountain sites, activity at these sites was prohibited. Recreational activities such as off-road vehicle sports and mountain bicycle riding in areas with high levels of NOA can lead to increased levels of airborne dust, which results in higher rates of inhaled asbestos fibers.

However, there are no current federal standards that limit the concentration of asbestos in ambient air in the US. Rather, federal regulations set forth restrictions on (1) emission levels from known point sources, (2) the manufacture, importation, processing, and distribution of certain asbestos-containing products and ''new uses'' of asbestos, and (3) the use and handling of asbestos-containing material during construction, demolition and renovation. **Although state or federal regulations for asbestos in ambient air are rare, due to a historical relationship with asbestos mining, the state of Vermont has set a Stationary Source Hazardous Air Impact Standard for asbestos fibers (Annual Average) at 0.00012 ug/m^3.**

The Pennsylvania Department of Health (PADOH) was consulted by the Pennsylvania Department of Environmental Protection (PADEP) in the fall of 2019 to provide feedback to a series of questions concerning naturally occurring asbestos (NOA) at the Rockhill Quarry site.

As it pertains to the health of citizens who live near the Rockhill Quarry, NOA is best to be avoided and left alone. Natural weathering and erosion may increase the risk of exposure to neighboring communities in drier months. Any mechanized activity or kinetic energy that makes physical contact with geological formations that contain asbestos, asbestos-like material, or elongated mineral fibers will accelerate the natural weathering process. Although there are varying levels of agreement between the PADEP, Rockhill Environmental Preservation Alliance (REPA) and Pierson Materials/Hanson Aggregates concerning the amount or type of respiratory elongated mineral fibers (EMF) present, environmental, geological sampling conducted over the last 18 months commissioned by the aforementioned entities, have agreed that actinolite, a type of asbestos fiber, is present in the rock material at the Rockhill Quarry site. Analytical reports also agree that "non-asbestos" mineral material

in exceedance of 3:1 length to width ratio is also present in the geological materials sampled and analyzed from the site. Both of these observations justify pause for further evaluation. Free asbestos fibers of a length greater than 5μM, with an aspect ratio greater than 3:1, are the most hazardous due to increased lung penetration and deposition. These fibers can cross blood vessels and, if consumed, gastrointestinal walls. Asbestos mineral fibers of these dimensions are difficult for the body to remove and, depending on the site of deposition, can cause scarring and oxidative stress. Fibers with a diameter greater than 3μM have not been observed to be respirable and have been observed to be less hazardous. Some types of asbestos fibers, such as chrysotile, can split into fibrils and undergo partial dissolution within the lungs. This breakdown into smaller pieces can lead to increased pulmonary clearance. Amphibole asbestos such as actinolite do not subdivide into fibrils of smaller diameter or break up by length. They are much less soluble in lung fluids, and they have long residence times in the lungs.

Although the presence of these types of minerals have been associated with illness and injury in medical reports, and environmental investigations, the PADOH does not have the data to support the assessment that communities or children who attend schools in close proximity to the Rockhill Quarry are in immediate risk of asbestos or EMF-related illness. There is also a paucity of data available to evaluate whether current or proposed activities on the Rockhill Quarry site are protective of the health of workers on site, adults and children who live near the Rockhill Quarry, and children who attend school near the site.
To address these gaps in knowledge, additional environmental sampling should be conducted.

Comprehensive health-based environmental sampling should at least include air and soil sampling for onsite, source, property/fence line, and offsite locations. To produce sample data most applicable to human health, stationary breathing zone and on-person sampling methods should be employed over several weeks, including summer and winter seasons covering various weather conditions. Also, various activity-based personal sampling should be considered. To determine the risk of exposure to vulnerable populations, a thorough environmental asbestos sampling plan should also include schools, daycares, and hospitals, etc. If evidence of substantial water runoff has been detected, waterbody sampling should be included (river, lake, pond) in the sampling plan, especially if the runoff leaves the site. As an example, the EPA has executed several comprehensive NOA environmental sampling studies involving nearly 400 air samples and 180 soil samples in a Californian community and neighborhood school. The methods and results are presented in the EPA document titled: *El Dorado Hills Naturally Occurring Asbestos Multimedia Exposure Assessment El Dorado Hills, California.*

Until data are available to determine the level of onsite and offsite asbestos or hazardous EMF exposure occurs during various activities over more than one season, the risk of asbestos-related illness in the stakeholder population will not be fully understood. As environmental investigations continue at the Rockhill Quarry site, material containing NOA should be addressed with concern. Generally, there are three concepts to consider when NOA has been identified at a location.

If possible, NOA should be avoided and left alone: If rock containing naturally occurring asbestos is intact and undisturbed, your risk of exposure is low. Avoid blasting it, crushing it, or grinding it up. If possible, prohibit access or limit activities in the area. Especially avoid digging transporting and or gardening in areas in which NOA has been detected or suspected to be present. Avoid riding bicycles on unpaved surfaces. Avoid riding off-road vehicles such as four-wheelers and dirt bikes in areas with NOA. Also, limit running, hiking, or driving on unpaved surfaces in these areas. If activities in the area determined to have NOA cannot be avoided, then risk minimization procedures should be considered.

1)Have a plan. Before you disturb rock or soil that is likely to contain asbestos, make sure you have an adequate protocol in place to control and contain the dust. If the enterprise is large and it is anticipated that a large amount of dust may be generated, consider notifying surrounding communities to avoid being outside or downwind of the site of concern prior to the event. Also, partnering with local and state air monitoring teams to determine the NOA fiber levels offsite would be appropriate.

2) Keep it wet and cap it: If the rock or dirt contains NOA, keep it wet while you're working, and seal it under a layer of clean soil and a layer of pavement, turf, or clean gravel. Also, the risk of lung disease associated with environmentally exposed asbestos depends on several factors. The most important of these are 1) how long you were exposed, 2) how long it has been since your exposure started, and (3) whether you smoked cigarettes. Cigarette smoking synergistically interacts with asbestos exposure and will increase your chances of developing lung cancer.

If you have any questions about NOA and the potential health risks associated with NOA exposure, feel free to contact the Department of Health at 717-787-3350 or env.health.concern@pa.gov.

Sincerely,

Raphael M. Barishansky
Deputy Secretary
Health Preparedness and Community Protection

cc: Honorable Senator Santarsiero, 10th Senatorial District

Resources:

Toxic Substances Portal - Asbestos

United States Commerce and Trade Asbestos Definition-title15-chap53-subchapII.pdf
EPA Restrictions on Discontinued Uses of Asbestos; Significant New Use Rule

State of Vermont Agency of Natural Resources Air Pollution Control Regulations

ATSDR Toxicological Profile for Asbestos

ATSDR Public Health Assessment BoRit Asbestos Ambler PA 2013

Vermont Department of Health: A Cross-Sectional Study of AsbestosRelated Morbidity and Mortality in Vermonters Residing Near an Asbestos Mine 2008

Environmental Monitoring for Asbestos:Sumas Mountain Asbestos Site Selected Residential Properties

EPA Naturally Occurring Asbestos El Dorado Hills
Comparison of soil sampling and analytical methods for asbestos at the Sumas Mountain Asbestos Site—Working towards a toolbox for better assessment

EPA Naturally Occurring Asbestos Approaches for Reducing Exposure