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Land Use Department

Most of us, I imagine including our commissioners, are homeowners. As such, I imagine you have at some point, had work or renovations done on your homes and have experienced the annoying side-effect of dust. I know when I had my kitchen redone, my wonderfully obsessive contractor spent much time sealing off the doorways with plastic and tape. He was meticulous in doing so. Despite his efforts, dust somehow made its way into every other room in my home. Even months after the project was completed I found my furniture covered with a layer of dust. My point in bringing this up, is to give you an example of how insidious dust can be. You can try to trap it, you can clean it, you can try to control it, but dust goes where dust wants to.

~~Now, the type of dust that we should be concerned about, and that quarrying produces is referred to as particulate matter—or PM. The PM that would be produced by operation of a quarry at Mt Decatur is PM10 and 2.5 micrometers. This type of dust cannot be seen by the naked eye and to give you a reference point, PM10 is about 1/20 the width of a human hair. PM10 can be carried by the wind for up to 30 miles and PM2.5 can travel HUNDREDS of miles (8). (remember when we could see the smoke from the CA wildfires?) Quarrying is a well-documented source of airborne particulate matter and is considered to be a pollution by both the World Health Organization (WHO) and the Environmental Protection Agency (EPA) because exposure to it is associated with serious respiratory health effects. PM from quarrying is typically comprised of silica from the rock processing as well as the hydrocarbon and soot from the diesel machinery. While we are assured by GFI that the use of diesel machinery will be minimal, we heard from GFI's own geologist Mr. Slade that core samples that he took were comprised of 72.8% silica, resulting in 33% free silica that would be available from the quartz being mined. Short term exposure to PM causes coughing, shortness of breath, and irritation to eyes, however long term exposure (and a reminder, this will be a project lasting up to 10 years) can cause respiratory disease such as asthma, copd, lung cancer, pulmonary fibrosis, and silicosis. In addition epidemiological studies (3) have documented a significant association between PM exposure and mortality. Children, the elderly, and individuals with pre-existing lung conditions are at highest risk, however no one is immune from~~

the effects of PM.

Now I do not expect you to take any of this information by my word. We heard Attn Heller state that a google search is not sufficient, however, all of what I am presenting here today has been thoroughly researched and documented by organizations such as the WHO, EPA, American Lung Association (ALA), as well as by experts such as Dr. Keith Randolph, who holds a Phd In Experimental Pathology and whose paper on the health risks associated with quarrying I will ask be admitted to the record. The worldwide epidemiologic research provides substantial documentation of the deleterious health effects of PM exposure, particularly on respiratory health (3,4,5).

GFI's expert Suzanna Pisano's model has assured us that no dust will leave the quarry property, but unfortunately, it is in direct conflict with the available scientific research which examines real life quarries. If you look at the research, there have been numerous studies which have shown high concentrations of PM_{2.5} and 10 in neighborhoods surrounding quarries (9,10). The scientific research has shown that quarrying directly impacts the health of individuals living in the surrounding residential areas and studies exist that specifically compare the health of individuals living close to versus farther away from quarries(2, 11). Notably was a cross-sectional comparative study (2) which looked at health and lung functioning of individuals living within .3 miles of quarries as compared to outside this range. Those living within the closer range experienced higher eye and nasal allergy (22% vs 3%), eye soreness (18% vs 1%), chest tightness (9% vs 1%) and chronic cough (11% vs 0%). Lung function parameters were significantly lower among the exposed group compared to the control group and higher levels of airway restriction were found among the exposed group. The mean values of lung function parameters for the closed group were lower than those for the other group, after adjusting for sex, age, height, weight, and smoking (using a linear regression model). Normal spirometry was found in only 43/76 of those individuals close to the quarry versus 71/79 of those living farther away. Restrictive impairment (indicating interstitial lung problem like fibrosis) was found in 31 of the 76 versus 8/79. Lung function parameters were worsened with increasing closeness of the home to the quarry site.

Locally, Westerly RI has battled what we are currently facing. In their article from several years ago, a 47-year old lifelong resident was interviewed (7). His property abuts one of the

town's active quarries and he was diagnosed with silicosis. He is a non smoker and had never worked in a high-risk industry. According to 2016 Westerly Hospital patient data about half the patients who were treated at the hospital had chronic asthma and copd. Quarries were one mile from 2 elementary schools and less than 3 miles from the high school. The percentage of westerly children ages 2-17 who had asthma-related ER visits from 2010-2012 (corresponding which the quarry operation time) was among the highest in RI. How far are your children's or grandchildren's playgrounds and sports fields from Mt Decatur? Quarrying is an industry that should not take place close to and downwind from our homes, our schools, and our playgrounds.

In addition to providing you with a copy of Dr. Randolph's expert opinion summarized in his 2018 article "Health Risks associated with exposure to airborne pollutants arising from quarrying and aggregate processing" (1), I have also provided a full list of my references and note that the sources are from more than a "google search" and include articles from distinguished peer-reviewed journals.

I also have here a letter from the ALA of CT addressed directly to the Members of the Ledyard Planning and Zoning Commission citing their concerns for our town's health should this proposal be approved.

1. Randolph, K. Health Risks associated with exposure to airborne pollutants arising from quarrying and aggregate processing, 2018, www.stop3009vulcanquarry.com
2. Nemer, M, Giacaman, R., Hussein, A. Lung Function and Respiratory Health of Populations Living Close to Quarry Sites in Palestine: A Cross-Sectional Study: Int. J Environ. Res. Public Health 2020, 17(17), 6068.
3. Pope III, CA, Coleman, N, Pond, ZA, Burnett, RT, Fine Particulate air pollution and human mortality: 25+ years of cohort studies. Environmental Research Volume 183, April 2020, 108924
4. Oxman, AD, et al., Occupational Dust exposure and chronic obstructive pulmonary disease. A systematic overview of the evidence. American Review of Respiratory Diseases,(imp fac 24.7) 1993, 148, 38-48.
5. Nishida C., Yatera K., The impact of Ambient Environmental and Occupational Pollution on Respiratory Diseases. International J of Environmental Research and Public Health , 2022, 19(5), 2788.
6. Mkpuma, R.O. Estimation of Air Quality Status due to Quarrying activities and its Impact on the Environment and

7. Carcini, F. Quarry Dust Covers Westerly in Concern, Homes sharing space with mining operations created predictable concerns. ECORI, 2017.
8. EPA website “What is particulate matter”
<https://www.epa.gov/pm-pollution/particulate-matter-pmbasics#:~:text=Particulate%20matter%20contains%20microscopic%20solids,even%20get%20into%20your%20bloodstream.>
9. Chang C. Assessment of influential range and characteristics of fugitive dust in limestone extraction processes. Journal of Air and Waste Management Assoc. 54 (141-148), 2004.
10. Garcia-Martinez, N. The environmental; and health impact due to the rock extraction in the Hector Colon Quarry. San Juan, Puerto Rico, 1984.
11. Calo, W.A, et al. Clinical Conditions Associated with Environmental Exposures: an epidemiologic study in two communities in Juana Diaz Puerto Rico. P R Health and Sciences Journal, 28(2), 126-134, 2009.