

# What We Have Learned About the Air We Breathe

By Stop 3009 Vulcan Quarry

In August 2017, the residents of Comal County were hit with a bombshell – three bombshells, actually. One, the beautiful, pristine 1500-acre White Ranch at the corner of SH 46 and FM 3009 had been sold to Blue Pine Holdings. Two, at closing, Blue Pine Holdings made it known that they represented Vulcan Construction Materials, LLC out of Alabama as owners of the site. Three, Vulcan subsequently submitted an air permit application to the Texas Commission on Environmental Quality (TCEQ) for a portable rock crushing plant, aka – a quarry. Alarm signals sounded and from the dust arose a grassroots effort to stop, hinder, set-back or restrict Vulcan from operating at the expense of the more than 12,000 residents encircling the site.

## Science and Tech Group

A group of concerned citizens with experience in metal and non-metal mining, not only in the United States but also worldwide, became concerned because they had a clear understanding of the inherent dangers and impact open-pit surface mining would have on humans, wildlife, natural resources and the environment. This tech team of twelve engineers, geologists, hydrologists, pathologists, and university professionals who hold master's degrees and Ph.D.'s in numerous disciplines, as well as a lifetime of experience, came together to bring light to this problem. With their vast knowledge of the industry, they knew that not only air, but water and several other areas of mining would need to be considered. Each discipline would need the appropriate studies and standards researched in order to predict and present facts that would impact area residents.

Don Everingham stated, "What we knew and clearly understood was the industrial nature of mining and the associated impact on **humans** – particularly health issues, **water** – mining utilizes and requires huge amounts of water for processing materials and controlling fugitive dust, **land** (often taken for granted) – is in fact the reason life is present on this planet, soil is a key factor and most often overlooked, **reclamation** – soils require reclamation that carefully includes many environmental concerns and multiple sciences to assure all interests are preserved, i.e. endangered species, special habitats requirements, slopes, infiltration rates, etc., **traffic** – a tremendous amount of equipment is used to load and haul material as well as the heavy Class 8 trucks that are used to transport product over public roads, and lastly, **noise** and **light** pollution".

Along the Balcones Escarpment of Texas, **caves** create additional concerns – they are part of the "plumbing" of the Edwards aquifer. A quarry can be likened to a man-made "funnel" into the aquifer that will allow pollutants present during flood events (aka "gully washers") to enter the water system with no benefit of natural filtration. TCEQ doesn't have to consider all these other areas of concern in the overall impact of mining to grant a permit. In Texas, the only consideration for issuing the air permit

is the rock crusher itself, none of the other point sources (haul roads, mining, blasting, truck diesel emissions, product transfer, etc.) come into play.

Since TCEQ only requires an air permit for Vulcan to set up shop, the group had no choice but to tackle this issue first. They soon found out, after much investigation, that there is zero science, no research or collection of valid data to confirm questionable elements found in our air. This is particularly true in the Hill Country Region of central Texas. Most data used by TCEQ is old data from as far back as the 1940's – long before most people were concerned with dust or what was contained in the dust. Air quality was born from research that proved and confirmed that many chemicals and elements reduced to microscopic size, too small to be visible to the human eye or even under the standard microscopes used in many laboratories at that time, are inherently dangerous to human health and the environment.

Research today by specialty laboratories, universities, and private industry have found these extremely small particles, ( $PM_{10}$ ,  $PM_{2.5}$  and smaller), in almost all environmental areas of our lives. This said, it is up to all responsible science, industry, and knowledgeable individuals to take every opportunity to not only understand the nature of environmental safety and health, but to accept the responsibility to prevent problems from developing into an uncontrolled problem at any level. Several members of the tech group have experienced environmental problems in their careers and know firsthand what the issues are and how to control these problems. Several individuals have been on the ground floor of developing standards, tests, mitigation, and monitoring requirements to solve and control the mining problem.

## **Air Monitoring Program 2018**

Using this knowledge and a sense of a moral obligation, the group set out an Air Monitoring Program in January 2018. Several short-term air samples were taken and tested for ten elements to see what was actually in the local air or atmosphere. The ten elements were oxygen (O), fluorine (F), sodium (Na), aluminum (Al), silica (Si), sulfur (S), chlorine (Cl), copper (Cu), iron (Fe), and calcium (Ca). They also checked for ozone elements and weren't surprised that the ozone material consisted of carbon (C), nitrates ( $NO_3$ ), and sulphur (S).

Air sample filter data results provided by Galbraith Laboratories, Inc. for the listed elements determined need for further investigation. Silica (Si) material indicated far higher levels than reported by the mining operations or the TCEQ.

As a result, they developed and implemented a field air monitoring trial using 24-hour periods to collect samples from five sites in the quarry row area (the immediate area of active mining in Comal and Bexar counties) and thirty samples (presently being tested) as background samples to check the

atmospheric conditions out of reach of monitors located in Bexar county. There are no monitors located in Comal County to detect or collect PM<sub>10</sub> or PM<sub>2.5</sub> particulate material.

The results (Table 1) of the first five samples taken in the area around quarry row showed higher levels of particulate matter than the EPA National Ambient Air Quality Standard (NAAQS) of 35 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) for a 24-hour test (Table 2).

Sample	Concentration ( $\mu\text{g}$ )	Duration (mins)	Flow Rate (l/min)	$\mu\text{g}/\text{cm}^3$	$\mu\text{g}/\text{m}^3$
7B14009	939.24	1432	4.5	$1.46 \times 10^{-7}$	145.80
7B14011	1619.03	1438	4.5	$2.5 \times 10^{-7}$	250.20
7B14012	1644.98	1435	4.5	$2.55 \times 10^{-7}$	254.74
7B14013	768	1428	4.5	$1.2 \times 10^{-7}$	119.51
7B14014	129.73	1434	4.5	$2.01 \times 10^{-8}$	20.10

Table 1

Pollutant [links to historical tables of NAAQS reviews]		Primary/ Secondary	Averaging Time	Level	Form
<u>Carbon Monoxide (CO)</u>		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
<u>Lead (Pb)</u>		primary and secondary	Rolling 3 month average	0.15 µg/m <sup>3</sup> <sup>(1)</sup>	Not to be exceeded
<u>Nitrogen Dioxide (NO<sub>2</sub>)</u>		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb <sup>(2)</sup>	Annual Mean
<u>Ozone (O<sub>3</sub>)</u>		primary and secondary	8 hours	0.070 ppm <sup>(2)</sup>	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
<u>Particle Pollution (PM)</u>	PM <sub>2.5</sub>	primary	1 year	12.0 µg/m <sup>3</sup>	annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m <sup>3</sup>	annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m <sup>3</sup>	98th percentile, averaged over 3 years
		PM <sub>10</sub>	primary and secondary	24 hours	150 µg/m <sup>3</sup>

Table 2

While the air program for 2018 is limited in scope and depth, it is one data point of information that clearly shows the need for additional air monitoring. This monitoring should actually be done by a third-party entity as the agencies in Texas have shown complete disregard for the citizens right to know and understand what is suspended in the air we breathe.

The 2018 research also found a high percentage of silica material in the various formations. In fact, the percentages in the manufactured material sold by area mines (documented on scale tickets at the various mines along Quarry Row) are much higher than those stated by TCEQ officials in the February 2018 public meeting. When high concentrations of a known carcinogenic material are found in the parent material it will be present in the atmosphere at great distances from the mine by the nature of crushing and processing the materials.

## **Health Effects of Quarry Dust**

Fugitive dust is an inevitable problem for almost all forms of mining. It is one of the most visible, invasive, and potentially irritating impact factors in open pit mining. It is a source of particulate matter (PM). PM is classified into size ranges. The PM of interest in terms of health risks are those that are very small, invisible to the naked eye, and are referred to as PM<sub>2.5</sub> and PM<sub>10</sub>. Generally, PM comprises two kinds of microscopic particles, mineral (silica and other minerals from rock processing), and hydrocarbon and soot from diesel exhaust of industrial equipment and trucks that are heavily utilized in the quarrying industry. PM<sub>2.5</sub> and PM<sub>10</sub> are invisible to the naked eye, and are easily carried in wind currents, can remain airborne for long periods of time, and can be carried up to 30 miles (PM<sub>10</sub>) or hundreds of miles (PM<sub>2.5</sub>) from the source.

[http://itepsrv1.itep.nau.edu/itep\\_course\\_downloads/Intro\\_Resources/INTRO6-15FIN/WhatIsParticMat.pdf](http://itepsrv1.itep.nau.edu/itep_course_downloads/Intro_Resources/INTRO6-15FIN/WhatIsParticMat.pdf).

Clearly dust requires special attention. Dust generation resulting from blasting, handling, processing or transporting mined materials is not the only area of concern. Dust can also be sourced from bare or poorly maintained areas within the mine, such as poor reclamation procedures and practices, lack of stockpile management, air movement, topography, humidity, and other weather factors that impact dust movement. Haul roads and poorly maintained dust control systems throughout the mine can lead to accumulative dust material that can also be reactivated. All these are unregulated source points by TCEQ rules.



Interior quarry construction road (unregulated source point)

Wind Rose data from several area sources, along with other weather data, were carefully studied and discussed with professional air monitoring companies and professionals. None of the work was considered out of line or abnormal considering all source data and known standards. The downside is that work and research along the Balcones Escarpment is not current or complete since little has been done in the past 50–70 years. During this time period, the escarpment has seen extremely rapid growth and development. Comal County is the second fastest growing county in the nation.

Since the EPA standard for both  $PM_{2.5}$  and  $PM_{10}$  is based on three years of data averaged (Table 2 – 98<sup>th</sup> and 99<sup>th</sup> percentiles), and there is no shortage of available rock to be mined, it would make sense to implement a three-year moratorium on aggregate mining air permits while an independent third party entity does a complete research project on the Balcones Escarpment. It should also include a study on water.

The National Oceanic and Atmospheric Administrations (NOAA) and the National Air and Space Administrations (NASA) research and development of the optic density technology used by satellites were also referenced and discussed. Their findings indicate a correlation to the 2018 air data. This was compared by professionals and all agree that more work and research is needed. The fact is, this data pushes this requirement forward.

## Air Monitoring Program 2019

The tech and science group are still hard at work. The Air Monitoring Program for 2019 will commence on July 20, 2019. One of the university tech team members, with the help of graduate students and area residents will be collecting air samples from fifteen different sites in and around Comal County. Each site will collect data for an average of ten days. TSI has built a custom PM Collection Monitor with weather station. This is a world class unit that will collect very accurate samples of airborne PM material for ground concentration and background.

The Air Program results will be correlated with geological data collected along the Balcones Escarpment by member geologists. They will collect ten to twelve parent material samples from the escarpment stretching from Medina County to Hays County. The samples will be tested for several elements including crystalline silica (silicon dioxide –  $\text{SiO}_2$ ), based on the various geology and faults that may be encountered. In addition, purchased material from several area mines will be tested for crystalline silica.

## Texas Government and Agency Response

In our opinion, TCEQ has not given all these factors enough consideration in granting Vulcan's draft permit. The commissioners and the Executive Director should take a drive along Old Nacogdoches Road, FM 482 and Krueger Canyon Roads in Comal County. They need to experience what residents see, hear, feel and breathe every day. From the Cemex plant/quarry in New Braunfels all the way around to the Hansen Aggregates plant/quarry in Garden Ridge. The trees, indeed, everything is covered with limestone dust. The dust (particulate matter) does not magically drop from the air at the fence lines, it affects all life beyond. The permits TCEQ issues with the promise and the obligation that says they will "strive to protect our state's public health and natural resources consistent with sustainable economic development" is not being met. And, little if any enforcement is being done.

Air Quality Emissions is a statewide problem and our elected officials are not in step with constituents. In 2015 the EPA signed a directive ordering Texas and 35 other states to mandate penalties on any industrial facilities that illegally spew dangerous pollutants into the air, but Texas never did. Industries deployment of an "affirmative defense" after illegally emitting dangerous chemicals: claiming that the emissions were a result of a "start-up, shutdown or malfunction at a facility — basically, an unforeseen, unavoidable situation" was the basis for the directive, a way to hold industry accountable. According to the TCEQ, in fiscal year 2017, polluters in Texas invoked the loophole in 97 percent of emissions events. Unfortunately, in 2015, Attorney General Ken Paxton filed suit against Obama's EPA, claiming the order "make[s] it impossible for even the most carefully-regulated facilities to avoid costly penalties due to unplanned events out of their control." The Attorney General, along with Governor Abbott kept this in the courts until President Trump was elected. Now Texas doesn't have to worry about the order because on April 29, 2019, Andrew Wheeler, the president's current EPA chief and a former coal industry lobbyist, filed an order to rescind the directive.

Several letters to the governor's office, TCEQ and EPA remain unanswered. More than 50 bills were presented this year that addressed the aggregate industry, however only one made it to the governor's desk and it was weak. The aggregate industry is one of the largest financial contributors to statewide elected offices in Texas. State officials may be sympathetic to a certain degree, but money still talks in Austin. Normal citizens cannot equal the monies behind the highway lobby, the aggregate and concrete lobby or the real-estate lobby, to name a few. We have eighteen months before the next legislative session kicks off. There is a lot to do.

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Stop 3009 Vulcan Quarry is an all-volunteer grassroots organization opposing plans by Vulcan Construction Materials to set up a 1500-acre open-pit limestone quarry in a residential area between Bulverde and New Braunfels, Texas. Visit [www.stop3009vulcanquarry.com](http://www.stop3009vulcanquarry.com) for more information.