

THE FORUM ON THE GEOLOGY OF INDUSTRIAL MINERALS

56th Annual Meeting, Georgia, VIRTUAL

Wednesday, September 30th, 2020 Presentations:

Noon -12:05 Welcome

12:05 - 12:35 PM, Mason Graham, KaMin Solutions, Review of Georgia Surface Mine Permitting

12:40 – 1:10 PM, Rich Kyle, PhD, Texas Bureau of Economic Geology, Adaptive Reuse of Central Texas Industrial Mineral Production Sites: Long-lived Developments whose Time has Come

1:15 – 1:45 PM, Eric Parrish, KaMin Solutions, Kaolin Industry Mine Planning

1:45 – 2:00 PM, Questions and Answers

Abstracts:

Review of Georgia Surface Mine Permitting

Mason Graham

Project Geologist, KaMin Solutions

mason.graham@kaminsolutions.com

(478) 233-2692

The Georgia Surface Mining Act of 1968 implemented new laws regarding environmental protection and surface mining in Georgia that are still used today. The laws set forth in this Act are regulated and enforced by the Surface Mining Unit of Georgia's Environmental Protection Division. Once a mining company is prepared to begin mining a new property, a permit must be acquired by submitting a Surface Mining Land Use Plan (SMLUP) to the Surface Mining Unit.

The process of acquiring a surface mining permit is preceded by land owner negotiations, exploration, and calculation of probable mineral reserves. The permit application must contain all pertinent information of the mining company, the mine's intended location and an estimated lifetime. An SMLUP is to be submitted with the permit application. After the submittal, the mining company must use a third-party surveyor to establish the proposed permit boundary. Then, an official from the Surface Mining Unit will visit and inspect the proposed permit area. After the inspection, the submittal will undergo final evaluation that will either lead to a request for revisions or to approval. The SMLUP consists of four maps and a cross section. A location map shows the mine's location relative to nearby land or water features. The boundary map shows the proposed surface mine's boundary and neighboring property boundaries. The mine plan map shows how the mine will be used and maintained during its lifespan. The final reclamation map is used to show an estimation of how the mine will be reclaimed. The cross section shows a comparison between reclaimed topography and original topography.

Even with extensive preparation surrounding property evaluation and the amount of detail that goes into permit submittals the system is still not perfect. Common issues prevalent in the current surface mine

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permitting climate surround overlapping mine permits and the management of inactive mines. Improvements are currently being made to further mitigate these issues and make mine permitting in Georgia more streamlined.

Adaptive Reuse of Central Texas Industrial Mineral Production Sites: Long-lived Developments Whose Time Has Come

J. Richard Kyle

Bureau of Economic Geology

Jackson School of Geosciences, University of Texas at Austin

rkyle@jsg.utexas.edu

(512) 471-4351

Texas has long been a major producer of industrial minerals and currently is the largest producing state with 2018 production value exceeding \$6 billion. The state industrial mineral production is diverse, but the largest tonnage contributor is the crushed stone industry with production from more than 200 quarries. Although spread throughout the state, crushed stone production, with attendant cement manufacture, is concentrated in central Texas serving the booming Austin-San Antonio region.

The Alamo Portland and Roman Cement Works in San Antonio became the first cement plant west of the Mississippi in 1880. The operations provided cement for late 19th century regional construction including the state capitol in Austin. The plant operated until 1907, when operations were relocated, and by 1919 the original site had been developed as a Japanese Tea Garden, now part of Brackenridge Park. The new Cementville plant and quarry operated until the early 1980s when it moved to its current location away from rapidly expanding San Antonio. The Cementville plant, clinker shed, and smokestacks were incorporated into and redeveloped as the Quarry Market lifestyle center; the adjacent rock quarry now houses the Quarry Golf Course. Another San Antonio adaptive reuse example involves the former Redlands quarry that produced crushed stone from 1934 to 1988. The quarry property was redeveloped and opened in 1992 as the Six Flags theme park, utilizing the limestone high walls to create landscape features and additional relief for rides.

Former quarries in carbonate settings on the periphery of populated areas have advantages for adaptive reuse. The removal of near surface weathered and karst features typically results in more stable substrate for development purposes than the natural surface. Future challenges to resource production include land use planning to help facilitate social license aspects, for which adaptive reuse may be a key component.

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Kaolin Industry Mine Planning

Eric Parrish

Mining Engineer, KaMin Solutions

Eric.parrish@kaminsolutions.com

(478) 957-8339

Begin with the end in mind best encompasses mine planning on a grand scale. Mine planning should first be done on-site on the ground that is going to be disturbed. There is no substitute for setting eyes on the terrain that is going to be affected. This allows the mine planners to properly allocate space for spoil piles, sediment basins, haul roads, ramps, etc. The first cut on a new property typically requires more initial planning due to several factors including: no preexisting dump space, cutting four highwalls, less room to control water, and various other factors. Properties that span years or decades also face planning challenges as well. These older active pits are often regularly mined in, and therefore, better maintained to provide ease of access. The more active a pit remains the better. This allows for more regular road maintenance, highwall care, pipe installation, etc. Pits that are left to the elements with no plans of further development are destined to decline quickly unless they are fully reclaimed. Each mine pit or mine property is faced with short term and long-term goals. The long-term goals need to be laid out very early on in the mine planning process, but reviewed on an annual basis. These long-term goals can include mining progression, drilling plans for testing, and a final reclamation plan. Short term goals will often follow the budget outlined for the upcoming year including: yards of overburden per pit, expected tons of crude, spoil placement, and reclamation of new spoils. Each property presents its own unique challenges, but proper planning can lead to a successful lifespan of the mine.