

Shannon Anderson

From: Jerry Marino <gmarino@meacorporation.com> on behalf of Jerry Marino
Sent: Thursday, July 30, 2020 11:23 AM
To: Shannon Anderson (sanderson@powderriverbasin.org)
Cc: Jill Morrison
Subject: Review of EAI Memo Dated June 9, 2020

Engineering Analytics, Inc. (EAI) reviewed permit documents that were submitted for public comment only "related to potential mine subsidence in the highwall mining area". Also, the review was limited to "5 year period and includes the surface mine and panel TR-1 only" (however, TR-1 was not part of the 5-year plan, as I understand it). Furthermore, there are no written responses by DEQ of other points of concern provided in our report dated April 15, 2020.

In their memo, EAI states the geotechnical data was insufficient in TR-1 area and recommended "that a geostatistical analysis be performed to determine the adequate number of borings, and that the minimum of two additional core holes be drilled and sampled in the proposed TR-1 highwall mining area."

With regards to geotechnical testing of the rock core, EAI recommended that "The suite of testing should be similar to that performed by AAI for core hole 2017-4 (including tensile strength, uniaxial compressive strength, axial and diametral point load testing) and any other testing deemed necessary by AAI for a thorough analysis." They also recommended "that the testing include Atterberg Limit testing to evaluate the plasticity of the roof and floor units, as well as consolidated-drained triaxial testing to better evaluate the long-term strength of the roof and floor."

EAI states AAI mine stability analyses "does not apply to proposed mining areas other than TR-1. In our opinion, the Subsidence Control Plan should be revised to apply only to the open pit and TR-1 area that is being permitted at this time."

Consequently, EAI is stating the **AAI Design is not valid** as insufficient core drilling, core testing and analyses were performed for the TR-1 Panel and furthermore, does not apply to greater reserve areas especially in multi-seam highwall mining areas which were not even examined.

DEQ conditions to the permit appear to follow the associated recommendations by EAI regarding the core drilling and testing. However DEQ did not follow EAI's above recommendation that the permit only apply to the proposed surface mining and the TR-1 area. There is no DEQ statement that I am aware of that explains why DEQ rejected their own consultant's recommendation. This would be a good question to ask.

Although some of our concerns were implemented, EAI or DEQ did not address many other issues proffered in our April 15, report namely:

- There is insufficient definition of the amount of each type of testing outlined.
- There is no definition in their manner in which this testing data is supposed to be used in determining mine stability. EAI leaves this up to the consultant, AIA, whose previous analyses were inadequate when addressing roof and floor stability.
- No discussion of the numerous severe subsidence events predicted by AIA method over entire permitted highwall mine area.
- Stability of reclaimed slope of mined areas was not addressed.

It is concerning that it appears that any further subsidence engineering at the Brook Mine will fall under a non-significant which allows for no public review and scrutiny. As noted by EAI, there is a significant amount of core drilling, core testing, and analyses and highwall mine design to be performed. Also, proposed subsidence engineering

methodology has not been well developed and reviewed. This will establish how future highwall mine areas are will be designed. Moreover, EAI did not recommend that a qualified consultant assist DEQ with subsequent reviews. Who will do this? DEQ admittedly does not have this expertise.

In the EAI memo it states that I said “the Abandoned Mined Lands standards don’t appear to be being applied in the Brook Mine permitting process”. This statement was misinterpreted by EAI. It has nothing to do subsidence potential evaluation as claimed. This statement actually refers to how subsidence events should be remediated. Subsidence remediation proposed by Ramaco was “tighten up” in one of the conditions of the permit.

Shannon, I am working as an expert reviewer of a proposed surface mine in Indiana where the Indiana Department of Natural Resources, INDNR, (DEQ equivalent) had deemed proposed changes to the mine permit as non-significant. The non-significant status applied to the permit by INDNR was appealed by my client and won. I don’t know if what was done in this case would be helpful here with the Brook Mine, but if so, I can give you the contact information for the lawyer we are working with and/or the case information so you can look online for it.

I hope the above is helpful.

Jerry

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