

BEFORE THE ENVIRONMENTAL QUALITY COUNCIL
STATE OF WYOMING

In re Brook Mining Co., LLC coal mine)	
Permit – PT0841)	
)	EQC Docket No. 20-4802
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)	
)	

AFFIDAVIT OF DANIEL D. OVERTON, P.E., D.GE

I, Daniel D. Overton, P.E., D.GE, being of lawful age and first duly sworn upon oath, depose and state as follows:

1. I am over eighteen years of age and am competent to provide this affidavit. The information contained in this affidavit is based on my personal knowledge.
2. I am the President and Principal Geotechnical Engineer at Engineering Analytics, Inc., (“EA”) of Fort Collins, CO.
3. I obtained my Bachelor of Science in Civil Engineering from Colorado State University in 1985 and my Masters of Science in Civil Engineering from the University of California in 1988.
4. I am a registered Professional Engineer in the States of Arizona, Arkansas, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, North Dakota, Oregon, Oklahoma, South Dakota, Texas, Utah, Washington, and Wyoming. Additionally, I am a Registered Civil and Geotechnical Engineer in California. I am a Diplomate of Geotechnical Engineering with the Academy of Geo-Professionals. I am a Fellow with the American Society of Civil Engineers and a Faculty Affiliate at Colorado State University.



5. I have over 35 years of experience as a professional engineer, with an emphasis in the areas of geotechnical design and mine reclamation. My technical specialties include cover design, tailings consolidation analysis, seepage and groundwater analysis, stability analysis, infiltration modeling, and grading plans.
6. I have written over fifty technical papers on various aspects of geotechnical engineering and am the co-author of a text book titled "Foundation Engineering for Expansive Soils."
7. I have previously provided mining-related technical reviews for state and federal agencies including the Wyoming Department of Environmental Quality, the Colorado Division of Reclamation, Mining and Safety, the Virginia Department of Environmental Quality, and the United States Environmental Protection Agency.
8. My previous work with the Wyoming Department of Environmental Quality ("WDEQ") includes settlement modeling, burn and subsidence modeling, and burn cavity predictions for an underground coal gasification project.
9. Starting in June 2018, I have contracted with the WDEQ Land Quality Division ("LQD") to provide expert review of subsidence-related submittals from Brook Mining Company, LLC ("Brook") and review of written and oral public comments submitted to WDEQ/LQD for the proposed Brook Mine near Sheridan, Wyoming. I have prepared four technical memoranda for WDEQ/LQD, which are attached to this affidavit as Exhibits 1 through 4 and incorporated herein as if fully set forth.
10. My initial work on the Brook Mine involved reviewing Brook's February 3, 2018 subsidence sampling and analysis plan. I prepared a technical memorandum dated June 29, 2018 summarizing my review, *See Ex. 1*. Brook's February 2018 subsidence sampling and analysis plan proposed conducting two core samples to test the strength of

materials in the roof, coal, and under-burden in the first highwall panels proposed for years 6 through 10. I noted in my Technical Memorandum dated June 29, 2018 that this plan was deficient. The plan provided no discussion “justifying testing rock from only two borehole locations, and not a larger geological area.” Ex. 1 at 3. I also noted that details for data collection, rock strength testing and analysis were not presented in the plan. I presented some possible alternatives which would, in my opinion, better address the requirements of the WDEQ/LQD.

11. I later reviewed the subsidence-related portions of Brook’s Round 7 permit application submittal, which included Attachment MP-6, the July 2015 Subsidence Control Plan, and Attachment MP-6-A, the September 13, 2018 document, “Geotechnical Design and Operational Considerations for Highwall Mining – Brook Mine,” prepared by Agapito Associates, Inc. (Agapito). I prepared a technical memorandum dated January 14, 2019 summarizing my review, *See* Ex. 2. The Agapito report presented a substantial improvement in the subsidence evaluation of the proposed mining activities. I noted in my Technical Memorandum dated January 14, 2019 that the “Agapito Report furthers the approach for a geotechnical sound design and stability analysis for the Brook Mine plan and it follows the standard approach for geotechnical design of a highwall mine as confirmed by the literature...” Ex. 2 at 6. I commented to WDEQ/LQD that the Agapito report tested only one core sample in the TR-1 area, which was identified as 2017-4. I recommended that Brook “should indicate whether there are plans for an additional borehole analysis for this panel and how will physical characterization be performed for the additional panels in the mine plan and for potential subsidence.” Ex. 2 at 7. I also noted: “The applicant should indicate the plan, or best practices implemented to perform

subsidence evaluations in the event of unexpected subsidence.” Ex. 2 at 7. I also noted: “The applicant should make a specific recommendation for the thickness of coal to be left on the roof and the floor.” Ex. 2 at 7.

12. I reviewed the subsidence-related portions of Brook’s Round 8 permit application submittal. In the Round 8 submittal, Agapito provided clarification regarding the issues I had previously raised. I prepared a technical memorandum dated March 15, 2019 summarizing my review, *See* Ex. 3.
13. In May 2020, EA was tasked by WDEQ/LQD to provide an evaluation of subsidence-related public comments submitted in regard to the published version of Brook’s permit application, as well as oral comments provided during the May 13, 2020, informal conference held by WDEQ/LQD. For this task, I reviewed public comments from fifteen parties, including the written objections of the Powder River Basin Resource Council and the written reports and oral comments of Dr. Gennaro G. Marino of Marino Engineering Associates, Inc., of St. Louis, Missouri, and the oral comments of Tim Ross of Agapito Associates, Inc. My review and response to these comments is documented in my June 9, 2020 Technical Memorandum to WDEQ/LQD. *See* Ex. 4.
14. In my June 9, 2020 Technical Memorandum, I noted Brook’s continued reliance on geotechnical analysis from a single core hole, despite committing to the sampling additional core holes at earlier phases of the permitting process. I commented that the “single core hole (2017-4) does not adequately characterize the stratigraphy or the geotechnical properties of the rock in the immediate area of the proposed TR-1 highwall mining area.” Ex. 4 at 2. I also noted how Dr. Marino, in his written comments, expressed similar concerns regarding Brook’s reliance on analysis from a single core

hole. Ex. 4 at 3. I recommended that a minimum of two additional core holes be drilled and sampled in the proposed TR-1 highwall mining panel. I also provided recommendations for additional geotechnical testing and analysis.

15. Between June 9, 2020, and the WDEQ's issuance of Brook's mining permit, I worked with WDEQ/LQD staff to address my own concerns about Brook's subsidence analysis and the subsidence-related objections from the public, including the comments presented by Dr. Marino.
16. In late June 2020, I consulted with WDEQ/LQD on the requirements within Conditions 9 and 10, which are incorporated into Brook's permit dated July 7, 2020. These permit conditions directly address the concerns I expressed in my Technical Memorandum dated June 9, 2020. These permit conditions were designed to address the written and oral comments from the public, including Dr. Marino.
17. I have reviewed the Petition filed by the PRBRC with the EQC on August 6, 2020. The comments attributed to me in that Petition fail to address the consultation work that I did with the WDEQ between June 9, 2020 and the issuance of the mine permit by the WDEQ on July 7, 2020.
18. The comments included in the Petition which have been attributed to me are included in a Technical Memorandum that I issued to the WDEQ on June 9, 2020. The comments accurately represent my professional opinion at that time. These comments do not represent my opinion as to Brook's current overall Subsidence Control Plan, as supplemented by the mine permit conditions adopted on July 7, 2020.
19. The WDEQ imposed two very important permit conditions in that mine permit related to mine subsidence. Conditions 9 and 10 of the mining permit require Brook to complete

geotechnical testing and analysis (including Atterberg limits and consolidated-drained triaxial testing) from a minimum of three core holes to assess the strength of the roof, coal, and floor layers in each future highwall mining panel. The permit conditions require that the results of the core laboratory testing be reviewed and analyzed by a Wyoming registered Professional Geologist or Engineer, and that the Mine Plan and Subsidence Control Plan be revised, if necessary, based on the data and analyses. The results from these tests must be submitted to WDEQ/LQD and approved before Brook proceeds with operations in any highwall mining panel. These conditions address the concerns I expressed in my Technical Memorandum dated June 9, 2020, as well as similar concerns expressed by Dr. Marino in his written and oral comments.

20. In September of 2020, I reviewed a submittal from WWC Engineering dated August 31, 2020. The submittal included a revised Addendum MP-6 (Subsidence Control Plan) which incorporates the language from the aforementioned Permit Conditions 9 and 10.
21. Brook's current permitted Subsidence Control Plan, which includes adherence to Conditions 9 and 10, is designed so as to prevent subsidence from causing material damage to the land surface. Even before the issuance of the permit conditions, Brook's Subsidence Control Plan included specific measures intended to reduce the risk of trough and sinkhole subsidence. These are discussed in the Agapito report and include the use of a minimum 1.6 stability factor for pillars, a minimum 1:1 width-to-height pillar ratio, and maximum highwall mining widths of 11 to 11.5 feet. These measures result in a lower coal extraction ratio of 39 percent.
22. Conditions 9 and 10 in the approved permit establish a mechanism by which sufficient geotechnical data must be collected and analyzed with respect to mine subsidence. The

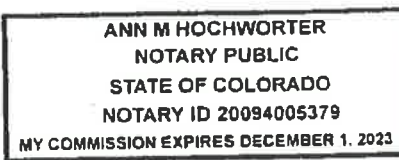
permit conditions require the data and analyses to be submitted to the WDEQ/LQD and approved before mining can take place in each highwall mining panel. It is my professional opinion, to a reasonable degree of scientific certainty, that by supporting future highwall mine design with geotechnical testing and analysis from a minimum of three core samples per highwall mining panel, Brook will have taken reasonable steps to ensure its highwall mining will be conducted in a manner that prevents subsidence from causing material damage to the land surface in all of the highwall mining areas identified in Brook's mine plan.

FURTHER YOUR AFFIANT SAYETH NAUGHT.

DATED this 9TH day of October, 2020

Daniel D. Overton

STATE OF COLORADO)
) SS
COUNTY OF LARIMER)



Subscribed and sworn to before me by Daniel D. Overton this 9TH day of October, 2020.

Witness my hand and official seal.

SEAL

Notary Public

My commission expires: 12/1/2023