

M E M O R A N D U M

To: Dr. Daniel N. Miller, Jr.
From: Dr. Forrest K. Root
Subject: Pumice and Scoria Prospects in the Leucite Hills
Sections 4, 10, 12, 14, and 24, T21N, R102W
Sweetwater County, Wyoming
Date: May 12, 1972

The claims of Mr. Robert C. LeFaivre, Western Aggregates Company, were examined on Friday, April 21, in the company of Mr. LeFaivre and Mr. Marion Loomis of the Wyoming State Department of Economic Planning and Development. The best access to the Leucite Hills is through the old coal mining town of Superior, about 17 miles northeast of Rock Springs. At least two adequate unpaved roads lead the 3.5 miles north out of Superior onto Zirkel Mesa upon which most of Mr. LeFaivre's claims are located. Additional claims are located on Emmons Mesa, one mile to the northwest of Zirkel Mesa. These claims were not visited because of difficult access.

Zirkel and Emmons Mesas are capped by Late Tertiary ^{Quaternary} volcanic flow rocks and represent isolated erosional remnants of a once more extensive volcanic field. Upon both of these mesas are found a number of small volcanic cones of the steep-sided, cinder cone type. The cones are composed primarily of broken fragments of pumice and scoria in a wide range of sizes. The fragmental nature of the pumice and scoria indicates that these materials were explosively erupted from the central volcanic vents as solid material and were airborne before settling back to the ground to form the cones of loose material.

Pumice and scoria are both volcanic rocks which have ^{high} degrees of vesiculation or cellular structure. Vesicles or bubbles in rocks of this type are produced by escaping gases while the rocks are still in the molten state. The distinction

between pumice and scoria is one of weight. By definition, pumice is light enough to float on water. Only a small part of the Leucite Hills vesiculated rocks is true pumice. The remainder should rightfully be called scoria.

The fact that the pumice and scoria fragments are in unconsolidated form and generally naturally sorted by size and color makes these deposits extremely attractive to the aggregate producer. Such materials need only be removed and screened to become a marketable product. The light weight, the shock and sound absorbing qualities, and the attractive colors of some of the rocks are all assets which make such materials very desirable as a concrete aggregate.

The materials vary in color and texture from cone to cone and within a single cone. Shades of light buff, tan, brown, and gray are seen. Some of the tan to brown rock contains phenocrysts of bronze-colored phlogopite mica. The mica gives an attractive sparkle to the rocks, and the larger blocks of such material would be a highly marketable facing or decorative stone for construction purposes. The amount of large material which would be suitable for cutting was difficult to ascertain, as Mr. LeFaivre had removed some of the larger blocks from the surface and from the pits on his claims to his shop in Green River. However, large volumes of the materials viewed were in size grades larger than 2". Such materials would be very acceptable as open-faced aggregate in pre-cast decorative panels.

A geologic report prepared by Mr. Chester E. Farrow of Littleton, Colorado, for Western Aggregates Company in October of 1964 placed the pumice and scoria reserves on their claims on both Zirkel and Emmons Mesas at 17,454,800 cubic yards. These estimates seem very reasonable and conservative. Although the Western Aggregates claims on Federal lands constitute the bulk of the Leucite Hills pumice and scoria deposits, additional reserves are on Union Pacific controlled lands in

Sections 11, 13, and 15. Basins Engineering is currently in the process of developing the deposit in Section 15. They will reportedly market a sorted product of large pebble size for use in landscaping. The site of the Basins Engineering operation also underwent production in the early 1950's by the Superior Pumice Company. Over 6000 cubic yards were mined during that early operation.

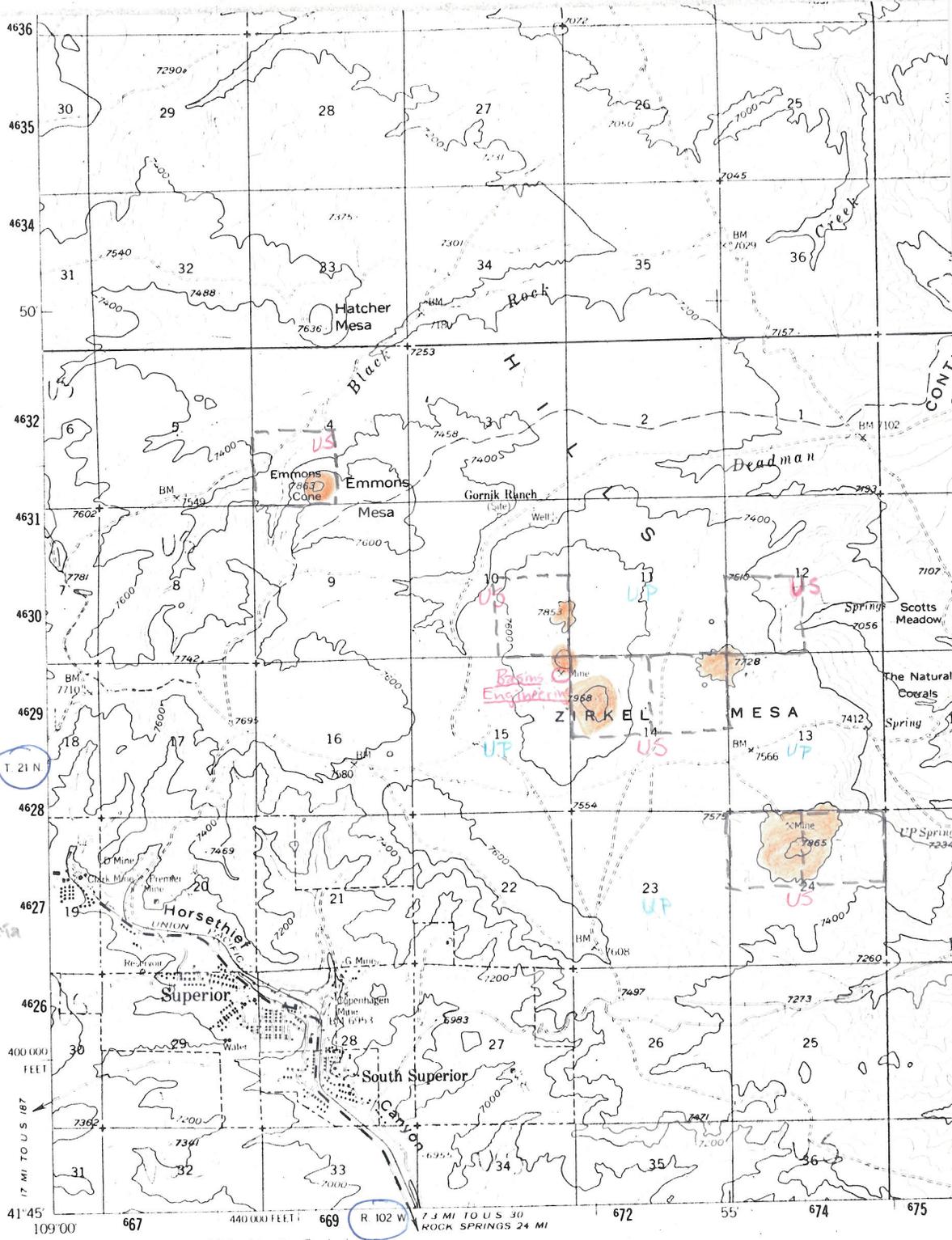
Mr. LeFaivre's potential problems if he decides to attempt to patent his claims stem from the facts that (1) Federal lands in the Leucite Hills have long been regarded as a potash reserve, and (2) pumice, whether it be aggregate or building stone material, comes under the common variety classification of minerals and is, therefore, saleable rather than claimable under federal regulations. However, Mr. LeFaivre's claims predate the "common variety" law of 1955, and assessment work has been continued through the years.

Since the volcanic cones probably represent the most easily developed sites in the event that potash production is once again undertaken, and since applications for potash leases are pending on most of these lands, the Bureau of Land Management seems inclined to regard the rocks as a potash reserve and to give priority to potash development.

Additional large reserves of pumice and scoria are present on UP lands in Sections 11 and 13. Pending the outcome of Basins Engineering's operation in Section 15, development of these deposits might be anticipated.

The pumice and scoria deposits of the Leucite Hills are unique in chemical composition and unusually well suited for use as aggregate and as decorative stone. Under present and projected conditions of potash supply, the closing of the entire Leucite Hills Federal lands to development of minerals other than potash would not seem to be warranted. Whether selective leases would be granted for the mining of

pumice for aggregate and building stone, withholding potassium rights to the unvesiculated flows which lie beneath, remains to be seen.



UP - Union Pacific
 US - Federal Lands,
 withdrawn for Potash

Western Aggregates
 Claims - - - -

Pumice and Scoria

ROCK SPRINGS
 4167 II

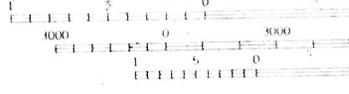
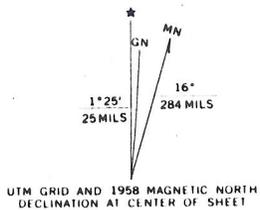
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 as part of the Department of the Interior program
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Topography from aerial photographs by photogrammetric methods
 Aerial photographs taken 1956 Field check 1958

Polyconic projection 1927 North American datum
 10,000 foot grid based on Wyoming coordinate system,
 west central zone
 1000 meter Universal Transverse Mercator grid ticks,
 zone 12, shown in blue

Unchecked elevations are shown in brown



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From Superior, Wyo. 15" Quad. 1958