BAXTER-AND CAVE CANYON MINES, CAVE MOUNTAINS, SAN BERNARDINO COUNTY, CALIFORNIA

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Acknowledgement and Disclaimer

The information in this paper is taken largely from published and public sources. I have reproduced this material and present it pretty much as we found it, not trying to harmonize discrepancies in mine or geologic descriptions. I have changed verb tenses for readability and have used some paraphrase. I have expanded abbreviations or special characters with full text (e.g. feet instead of ft., inches instead of ") Italics indicate quotations. Authors of the original information are indicated at the end of each paragraph. Paragraphs without a citation are our own materials. The maps in this report have been compiled and rectified from digital and paper copies of original sources that were made at different scales and in different geographic projections. Therefore, many of the maps had to be adjusted or stretched. They do not fit perfectly. Most are accurate to within 100 feet, but reproduction and projection errors can be as much as 300 feet for some maps. PLSS means Public Land Survey System. That survey data was obtained from the U.S. Bureau of Land Management website.

MRDS, 2011, Mineral Resources Data System, U.S. Geological Survey, https://mrdata.usgs.gov/mrds/. This database relies on records that, in many cases, are inaccurate or imprecise. For example, if a report describes a mine as being in "Section 9", with no other information, MRDS plots the mine location in the center of the section. If a mine is reported in "SW ¼" of a section, MRDS plots the mine in the center of that SW quarter-section. Where I could confidently adjust an MRDS location of a mineral deposit to features identifiable in aerial photographs or topographic maps, I did so.

Help me make this report better. If you have any photographs, memories or reports for this mine that you can share, please send them to yosoygeologo@gmail.com so that I can incorporate that information and material into this paper.

ALTERNATIVE NAMES: Baxter, Basin, Cave Canyon, Baxter and Bellardie, Evening Star, White Marble

LOCATION

NAME	TRS	Latitude	Longitude
Cave Canyon	**11N 6E Sec. 11 SBM**	**35.05251**	**-116.30779**
Cave Canyon Mine	**11N 6E Sec. 12 SBM**	**35.05311**	**-116.30556**
Baxter Mine	**11N 6E Sec. 12 SBM**	**35.05331**	**-116.30556**
Cave Canyon Deposits	**11N 6E Sec. 12 SBM**	**35.04920**	**-116.30166**

OWNERSHIP:

This mine is on private land owned by Cal Portland Cement Company. Get their permission before going on their property.

GEOLOGY

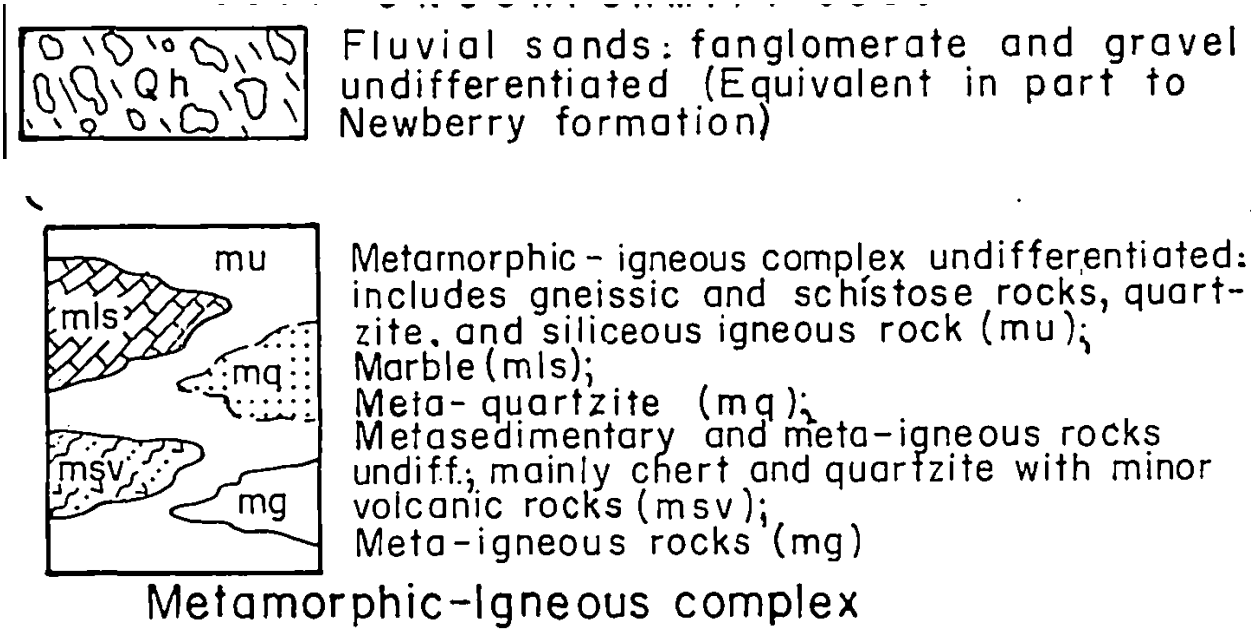
The Baxter Mine area is described by Lamy (1948), Southern Pacific Company (1964) and Brown and Monroe (2000).

Today there is a iron deposit (Baxter) and a limestone deposit (Cave Mountain). The name Cave Canyon used to apply to the iron deposit.

The Cave Canyon (Baxter and Bellardie, Evening Star, White Marble) deposit is described in Cloudman (1919, 872-876), Logan (1947:281), Tucker (1930: 308); Tucker and Sampson (1931:383), Tucker and Sampson (1943: 516), Collier and Danehy, 1958) and Wilkerson (2015)

Rocks exposed in the general area include those of Paleozoic, Mesozoic and Cenozoic age. Paleozoic rocks in the region are inner miogeosynclinal shallow water sediments and include Late Precambrian and Cambrian clastic dominated sequences, Cambrian and Devonian dolomites and Upper Paleozoic limestone-dominated formations. During early and middle Mesozoic time sedimentary and volcanic rocks were deposited, and during middle Mesozoic time. The region underwent intense deformation including folding., thrust faulting , and metamorphism, and was intruded by a variety of plutonic rocks. Uplift. erosion and volcanism were dominant processes during Cenozoic time. The region continues to be seismically active (Brown and Monroe, 2000).

The mine area is dominated by a metamorphic complex with limestone members and a sedimentary equivalent to part of the Newberry Formation (Qh).



The major exposed rock units that are associated with the iron-ore deposits include: (1) a metamorphic group consisting of granitic, gneissic, and somewhat schistose rocks, including some meta-quartzite; (2) acid and basic intrusives, dominantly granite, pegmatite, aplite, and diorite porphyry; (3) crystalline limestone or dolomite; (4) a sandstone-fanglomerate formation; and (5) alluvium. Roughly. with the exception of the intrusives and the alluvium, these units occur in zones trend-ng northeast (Pl. VIII). The limestone forms a conspicuous ridge extending westward for about half a mile along the southern part of

the area. The principal mass of iron ore makes a lov ridge flanked to the north by gneissic rocks and to the south by the sandstone-fanglomerate (Lamey, 1948, p. 74)

*The ore is black to red, and is composed chiefly of magnetite and hematite, with some limonite. Some brecciated ore masses contain large quantities of gypsum and very minor amounts of malachite and chrysocolla. In surface exposures the ore appears to be relatively firm, but in adits, trenches, and pits most of it is seen to be shattered. The orebodies are steeply inclined lenticular masses associated with gneissic and quartzitic rock, and limestone. Estimates indicate that the amount of waste rock occurring as scattered masses throughout the ore zone ranges from 25 to 50 percent or more (*Lamey, 1948, p. 77)

In this area the iron appears to have selectively replaced the metamorphic rocks along zones parallel to the general trend of the. country rock, e.g., N 15° E. There has been post-mineral movement along the major shear zone as the ore is brecciated and faulted (Collier and Danehy, 1958).

Acidic and porphyritic dikes appear to have intruded; along shear zones. The mineralization continues to the southwest along the strike of the shear zone into Southern Pacific Company-owned Section 11 where several small mineralized areas are mined. The mineralization in this area is near the end of the "exposed" mineralized iron outcroppings The shear zone continues on to the northwest and is in part of the Cave Canyon fault system. Farther to the west, along the general trend hydrothermal altered. zones and a few gold prospects were observed (Collier and Danehy, 1958).

Iron mineralization occurs as irregular replacement bodies along shear zones where the physical-chemical environments of the pre-Tertiary host rocks are favorable. The host rock may be igneous. metamorphic or limestone. In the Cave Canyon area the larger deposits are more closely associated with the metamorphic-igneous complex. But this is largely due to structural features (Collier and Danehy, 1958).

The Cave Mountain iron deposits are mined from the Baxter open pit mine which has been intermittently active from the 1930's to the present. The following three main stratigraphic units are identified in the area of the mine: 1) Mesozoic diorite, 2) Miocene fluvial and landslide deposits, and 3) Quaternary alluvial and colluvial cover. Miocene landslide deposits are intercalated with the fluvial units and are classified as rock avalanches. The Miocene fluvial and landslide sequence has been tectonically tilted southward and presently dips southward between 30 and 60 degrees. At least three landslides are present and consist of the following lithologies: Mesozoic intrusive rock, Mesozoic quartzite and metavolcanic rock, and upper Paleozoic limestone. The iron ore mineralization occurs in the stratigraphically lowest of 3 landslides and is hosted by metamorphosed porphyritic volcanic rocks. The geologic setting of the Cave Mountain iron deposits has similarities to iron deposits in the southern Avawatz Mountains 40 km to the north. Of particular note is that the iron deposits at both locations occur within Miocene rock avalanche deposits (Bishop, 2013)..

The salient feature of the Cave Canyon-Baxter iron deposit is that it is a jumbled up mess. A fault runs through the mine area and complicates structural interpretation. This is probably an ancient rock avalanche deposit that was later faulted and to which hydrothermal iron-rich fluids interacted to form the orebody



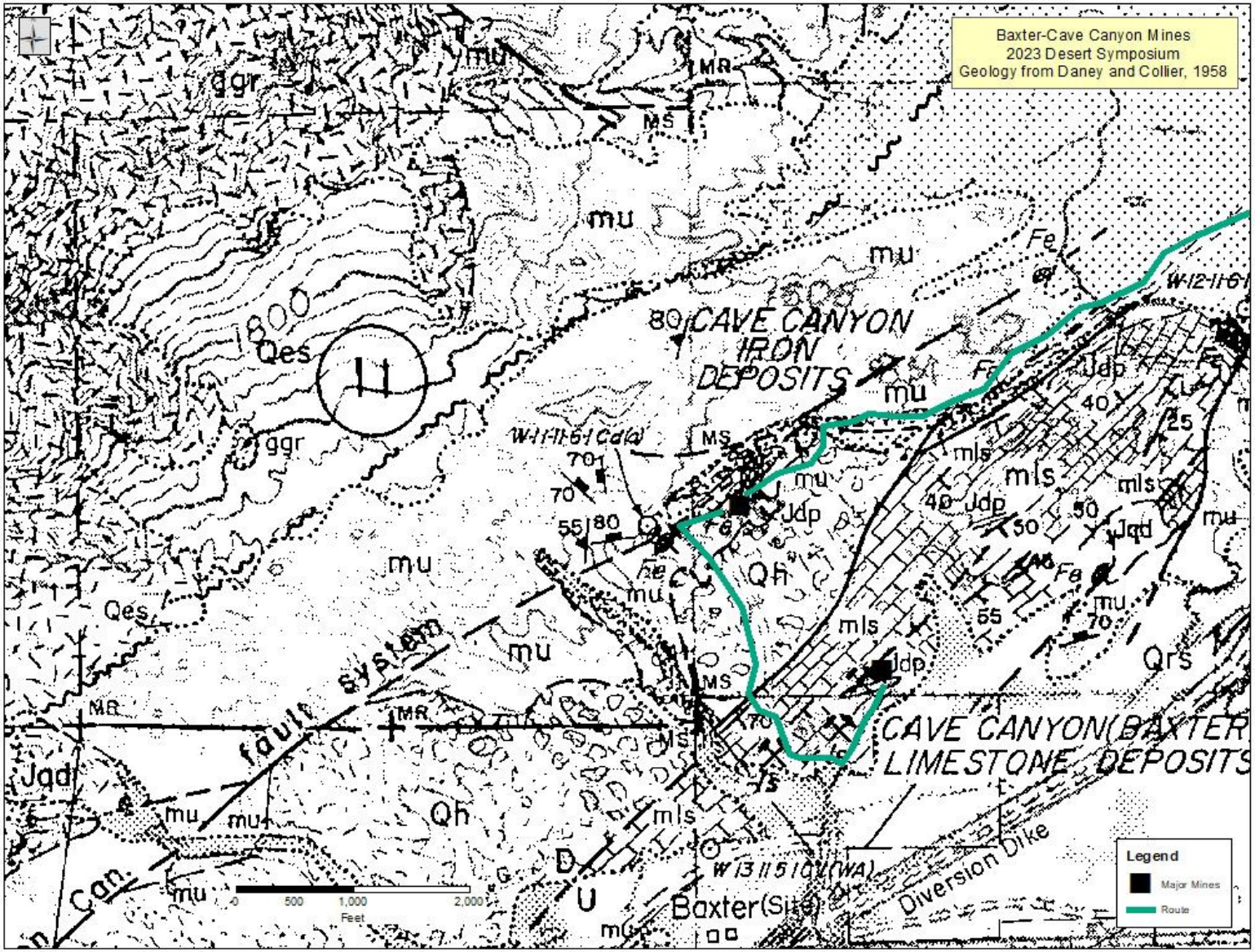
Figure 1. Baxter iron mine, 2009. Photo by Gregg Wilkerson



Figure 2. Baxter Iron mine showing block of ore within carbonate.



Figure 3. Railroad loading shoots, Cave Canyon limestone mine. Photo by Gregg Wilkerson, 2009.


Baxter-Cave Canyon Mines
2023 Desert Symposium
Geology from Daney and Collier, 1958
CAVE CANYON IRON DEPOSITS
CAVE CANYON(BAXTER LIMESTONE DEPOSITS
Baxter(Site)
Diversion Dike
fault system
Qes
Qh
Qrs
mu
mls
Jdp
Jqd
Jad
ggr
MS
MR
Fe
Legend
Major Mines
Route
0
500
1,000
2,000
Feet

Return to the Basin exit overpass at Interstate 1-15