UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF MINES

Mineral resources of the Emmett Wash Wilderness Study Area, Coconino County, Arizona

U.S. Bureau of Mines Mineral Land Assessment
MLA 30-82
1982

By
Lane, M.E.

This open file report summarizes the results of a Bureau of Mines wilderness study and will be incorporated in a joint report with the U.S. Geological Survey. The report is preliminary and has not been edited or reviewed for conformity with the U.S. Bureau of Mines editorial standards. Work on this study was conduced by personnel from Intermountain Field Operations Center, Building 20, Denver Federal Center, Denver, CO 80225.

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MINERAL RESOURCES OF THE EMMETT WASH WILDERNESS STUDY AREA, COCONINO COUNTY, ARIZONA

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Michael E. Lane

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STUDIES RELATED TO WILDERNESS
Bureau of Land Management Wilderness Study Area

The Federal Land Policy and Management Act (Public Law 94-579, October 21, 1976) requires the U.S. Geological Survey and the U.S. Bureau of Mines to conduct mineral surveys on certain areas to determine their mineral resource potential. Results must be made available to the public and be submitted to the President and the Congress. This report presents the results of a mineral survey of the Emmett Wash Wilderness Study Area, Coconino County, Arizona.

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MINERAL RESOURCES OF THE EMMETT WASH WILDERNESS STUDY AREA, COCONINO COUNTY, ARIZONA

By Michael E. Lane, U.S. Bureau of Mines

INTRODUCTION

Comprising 12,913 acres in Coconino County, Arizona, the Emmett Wash study area is contiguous with the Paria Canyon-Vermilion Cliffs study area (Bush and Lane, 1980).

The study area, about 14 air miles southwest of Page, Arizona, lies between Marble Canyon and U.S. Highway 89A; Marble Canyon is the extreme eastern portion of the Grand Canyon.

Two dominant topographic features are in the area, Vermilion Cliffs and Marble Canyon. Forming a picturesque escarpment to the north, Vermilion Cliffs is of Navajo Sandstone with shear walls several hundred feet high. Grand Canyon National Park abuts the study area on the south along Marble Canyon, a shear-walled gorge with the walls dropping several hundred feet to the Colorado River.

No mining has been conducted within the study area. However, several locations north of Highway U.S. 89A have been mined, and a small prospect (Universal) lies about 2.5 miles west of the study area (Bush and Lane, 1980).

MINING DISTRICTS AND MINERALIZED AREAS

No mining districts are in the study area. In the 1950's intense prospecting for uranium occurred along Vermilion Cliffs; several mines are located within a few miles of the study area. The mineralized areas are in the Shinarump and Petrified Forest members of the Chinle Formation, mostly in the Shinarump. Because these units are not within the study area, preliminary indications are that uranium is absent.

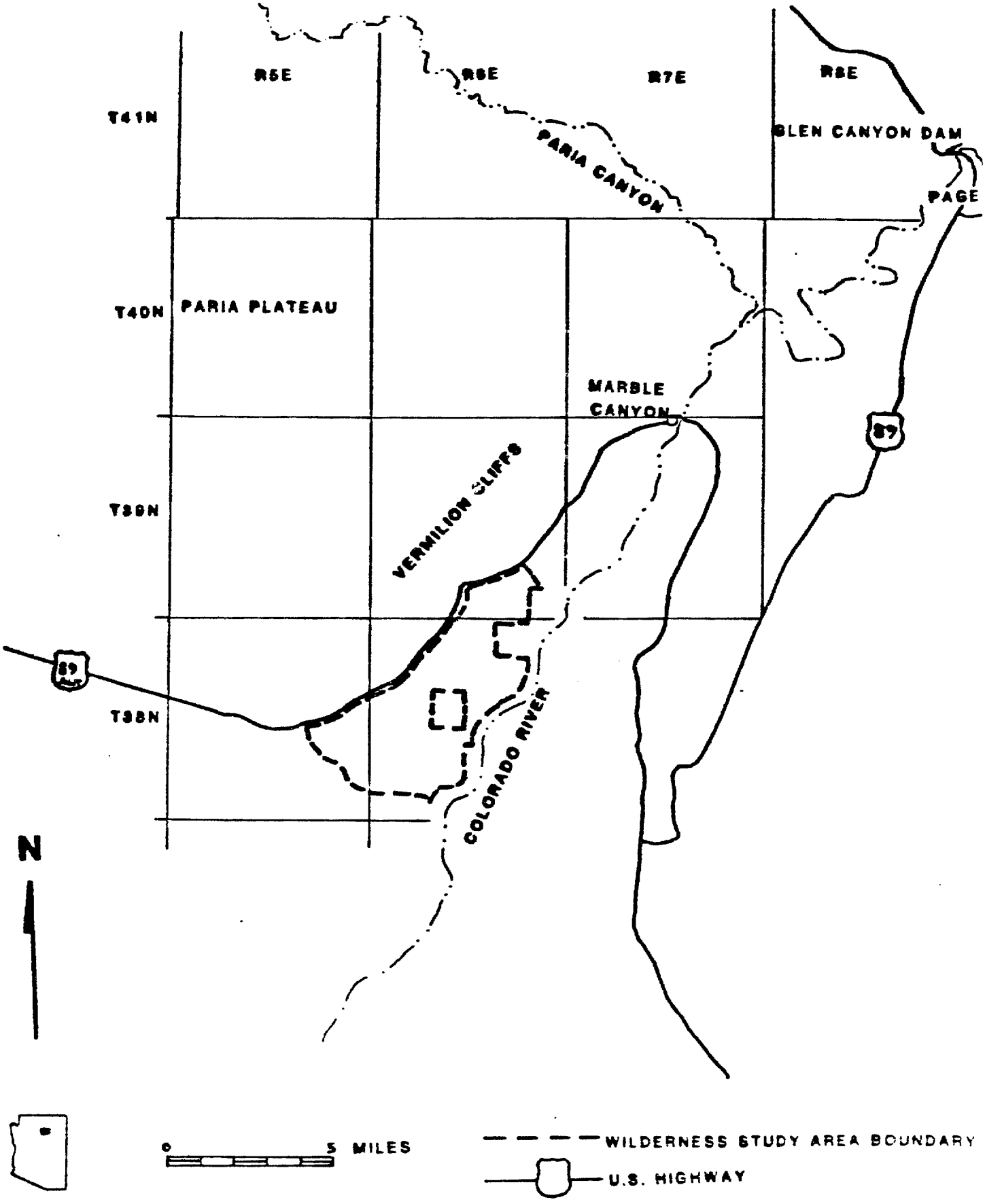

Figure 1--Emmett Wash Wilderness Study Area

The Jasper mine consists of a 40-foot (12.2-m) adit in the SW 1/4 sec. 27, T. 39 N., R. 6 E., (pl. 1) (samples 13-17) about 300 feet (91 m) north of U.S. 89A and about 1/4 mile (0.4 km) east of Cliff Dwellers Lodge.

The adit was driven N. 6° E. in poorly sorted Shinarump conglomerate of rounded quartzite pebbles and quartz sand. On the walls near the floor, siltstone is interbedded with mudstone (Moenkopi). The Moenkopi contains minor copper staining. The mudstone and siltstone comprise the lower 29 inches (74 cm) of the wall, and conglomerate comprises the upper 36 inches (91 cm). Sample 13 (pl. 1), taken in the mudstone and siltstone, contains 0.018 percent U_3O_8, and sample 14 taken directly above in the conglomerate contains no U_3O_8. Sample 15, taken above the siltstone in the lower portion of the wall in indurated conglomerate, contained 0.019 percent U_3O_8. Sample 16, taken above sample 15 in poorly consolidated conglomerate, contained 0.135 percent U_3O_8. Here, the conglomerate was composed of poorly sorted quartz and quartzite pebbles, small siltstone lenses, and some copper staining. Sample 17 taken outside the adit adjacent to the portal in the Moenkopi just below the contact, assayed 0.085 percent U_3O_8.

ASSESSMENT OF MINERAL-RESOURCE POTENTIAL

Mineral-resource potential for the Emmett Wash study area is extremely low because of lack of mineral-bearing horizons such as the Shinarump and Petrified Forest Member of the Chinle Formation.

West of the Kaibab Plateau are several breccia-pipe collapse-type structures; some containing copper and uranium. Stratigraphically, these structures are found below the Kaibab Limestone. Perhaps these structures could be found at depth in the Emmett Wash study area since the study area is primarily Kaibab Limestone. However, there is no evidence at this time that any such features exist in the study area.

REFERENCES

Bush, A. L., and Lane, M. E., 1980, Preliminary report on the mineral-resource potential of the Vermillion Cliffs-Paria Canyon Instant Study Area, Coconino County, Arizona, and Kane County, Utah: U.S. Geological Survey Open-File Report 80-1056, 27 p.

BIBLIOGRAPHY

Bush, A. L., and Lane, M. E., 1981, Analyses of rock, stream-sediment, and water samples from the Vermilion Cliffs-Paria Canyon Instant Study Area, Coconino County, Arizona, and Kane County, Utah: U.S. Geological Survey Open-File Report 81-391, 35 p.

Haynes, D. D., and Hackman, R. J., 1978, Geology, structure and uranium deposits of the Marble Canyon 1° x 2° quadrangle, Arizona: U.S. Geological Survey Miscellaneous Investigations Map I-1003.

Petersen, R. G., 1959, Preliminary geologic map of the Emmett Wash NE quadrangle, Coconino County, Arizona: U.S. Geological Survey Mineral Investigations Field Studies Map MF-215.

____1960, Detrital-appearing uraninite grains in the Shinarump Member of the Chinle Formation in northern Arizona: Economic Geology, v. 55, no. 1, p. 138-149.

Peterson, R. G., and Wells, J. D., 1961, Preliminary geologic map of the Emmett Wash NW quadrangle, Coconino County, Arizona: U.S. Geological Survey Mineral Investigations Field Studies Map MF-197.

Phoenix, D. A., 1963, Geology of the Lees Ferry area, Coconino County, Arizona: U.S. Geological Survey Bulletin 1137, 86 p.

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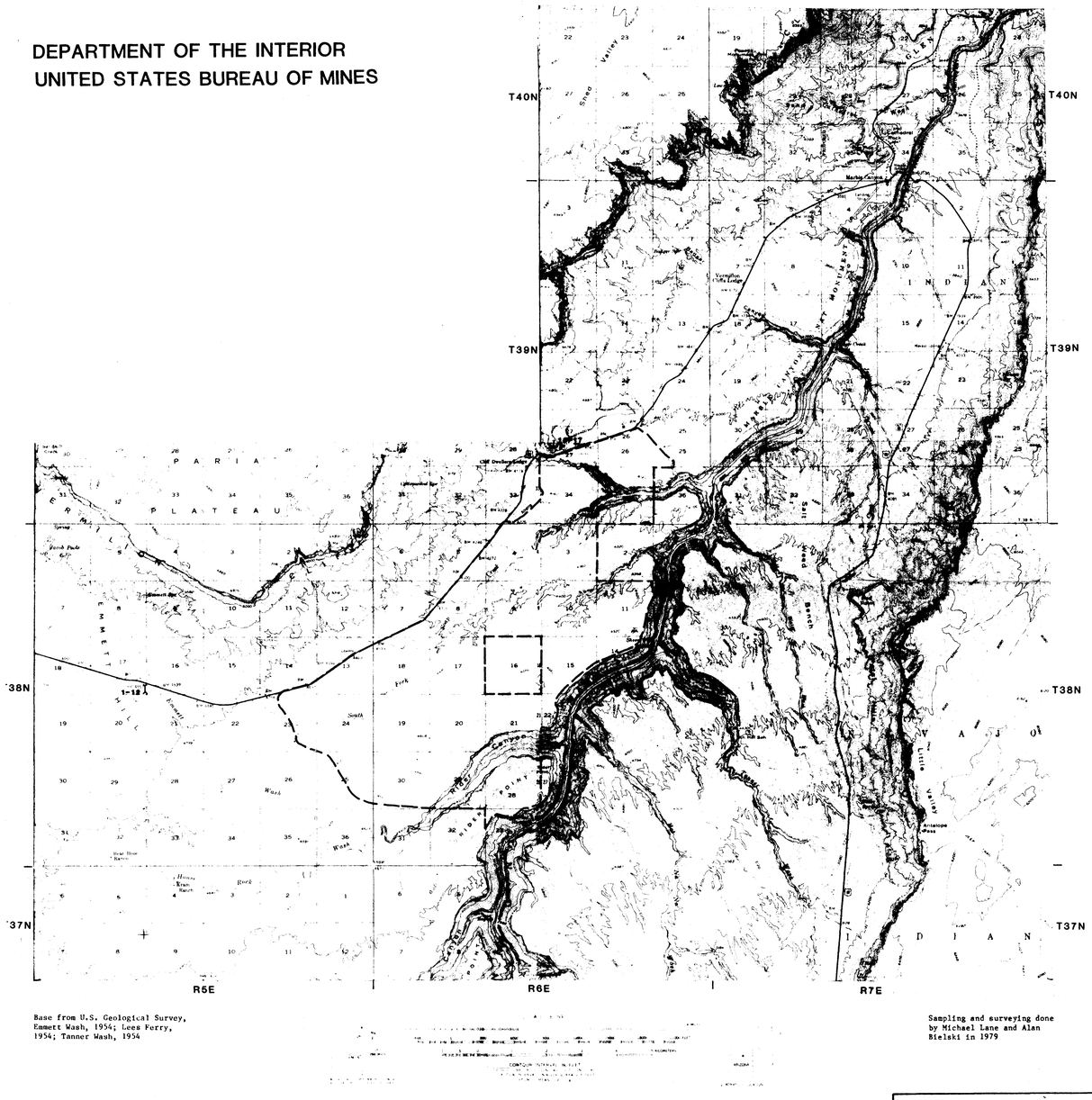
OPEN FILE REPORT
30-82
PLATE 1

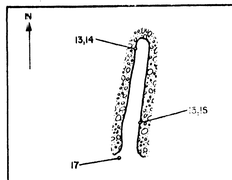


Base from U.S. Geological Survey,
Emmett Wash, 1954; Lees Ferry,
1954; Tanner Wash, 1954

Sampling and surveying done
by Michael Lane and Alan
Bielski in 1979

EXPLANATION

- Adit
- Trench
- 1-12 Sample number
- Study area boundary
- Shinarump conglomerate



Sample No.	Type	Length	Assay data (in percent) U_3O_8	Assay data (in percent) Cu	Remarks
13	Chip---	29 in. (74 cm)	0.018	1.98	Conglomerate, siltstone and mudstone, minor copper staining, Moenkopi-Shinarump contact.
14	---do---	36 in. (91 cm)	n.d.	0.065	Conglomerate, mostly quartzite pebbles with coarse sand matrix, poorly sorted, lower Shinarump.
15	---do---	24 in. (61 cm)	0.019	0.425	Conglomerate, poorly sorted, copper staining, Shinarump.
16	---do---	48 in. (122 cm)	0.135	0.053	Unconsolidated conglomerate, poorly sorted, copper staining, Shinarump.
17	---do---	16 in. (41 cm)	0.085	0.425	Moenkopi-Shinarump contact, sample taken in Moenkopi, buff siltstone.

n.d.-not detected.

Table 1.-- Mineral Deposits of the Emmett Wash Study Area

Sample No.	Prospect Name	Location	Resource(s)	Type of deposit	Development category	Brief description	References
1-12	Universal	SE 1/4 sec. 17, T. 38 N., R. 5 E.	U	Stream channel.	Prospect, inactive.	Shinarump stream channel, poorly sorted, mixed sandstone and carbonaceous material, along Tcs-Tm contact.	None.
13-17	Jasper Mine.	SW 1/4 sec. 27, T. 39 N., R. 6 E.	U, Cu	Stream channel.	Mine, inactive.	Low uranium concentration in conglomerate and altering conglomerate and siltstone in the lower shinarump.	Phoenix, 1963.

Table 2.-- Information and analysis of samples taken at the Universal prospect.

Sample No.	Type	Length	Assay data* Au	Ag	U_3O_8	V_2O_5	Remarks
1	Chip---	54 in. (137 cm)	<0.005	0.2	0.002	0.03	Shinarump (Tcs) - Moenkopi (Tm) contact, Tcs is medium to coarse-grained sandstone with lens of rounded quartzite pebble conglomerate, Tm is shale.
2	Chip---	43 in. (109 cm)	<0.005	<0.2	<0.001	0.01	Poorly sorted Tcs stream channel with siltstone fragments and sandstone lenses.
3	Chip---	32 in. (81 cm)	<0.005	<0.2	0.008	0.02	Gray, bleached Tm, varied bedding thicknesses, some carbonaceous material.
4	Chip---	26 in. (66 cm)	<0.005	<0.2	0.004	0.01	Tcs stream channel, poorly sorted, limonite and gypsum.
5	Chip---	29 in. (74 cm)	<0.005	<0.2	0.015	0.02	Tm, bleached siltstone, some gypsum crystals.
6	Chip---	33 in. (84 cm)	<0.005	0.2	0.058	0.02	Tm, siltstone, bleached, small amounts copper staining.
7	Grab---	Random	<0.005	0.2	0.024	0.01	Bottom of trench, hard, well consolidated, orange color, poorly sorted.
8	Chip---	46 in. (117 cm)	<0.005	<0.2	<0.001	0.01	Tcs, alternating conglomerate and sandstone, lower conglomerate unit contains siltstone fragments.
9	Chip---	31 in. (79 cm)	Trace	<0.2	0.002	0.01	Tcs, weathered, poorly consolidated stream channel, iron staining, quartz pebbles up to 1 in diameter.
10	Grab---	Random	<0.005	<0.2	0.007	0.01	Dump material, stream channel compose of quartzite pebbles and cobbles in sandy matrix.
11	Grab---	Random	<0.005	<0.2	0.077	0.03	Rock in bottom of trench, mostly Tm.
12	Grab---	Random	<0.005	<0.2	0.006	<0.01	Dump material, Tcs, stream channel material, quartzite pebbles and cobbles in sandy matrix.

*Au and Ag in oz/ton; U_3O_8 and V_2O_5 in percent.

MINES AND PROSPECTS MAP OF THE EMMETT WASH WILDERNESS STUDY AREA , COCONINO COUNTY, ARIZONA

By MICHAEL E. LANE

1981