UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

June 11, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration
Attention: Code 210

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2465, (Manganese) L. E. Shoup Managnese Claims, Coconino County, Arizona

Enclosed are four copies of the final report on DMEA-2465, a copy of the letter of denial to the applicant, and two copies of Form 3b.

W. H. King

W. H. King

A. H. Koschmann

A. H. Koschmann

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

June 11, 1952

Dr. L. E. Shoup
Bank of Arizona Bldg.
Prescott, Arizona

Dear Dr. Shoup:

Reference is made to your application for Government aid on the Shoup Manganese Property.

Projects approved by the Defense Minerals Exploration Administration must, in its judgement, show definite promise of yielding material of acceptable grade, and in quantities that will significantly improve the mineral supply position for the National Defense Program.

A careful study of your property and data available to this agency, reveals that the probability of disclosing mineable reserves by your proposed exploration program is not considered sufficiently promising to justify Government participation. Under these circumstances, we regret to advise you that your application for exploration aid is denied.

Very truly yours,

W. H. King
Executive Officer
Field Team, Region IV

cc: Acting Administrator, DMEA

Mining Division
Region IV

June 11, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2465 (Manganese) Dr. L. E. Shoup Manganese Claims, Coconino County, Arizona

Enclosed are nine copies of the final engineering report on DMEA-2465 by J. H. Soule' of the Bureau of Mines.

Drilling as proposed by the applicant, and to the amount he is willing and able to participate, would have little chance of making a discovery, and any discovery made proabably would not be significant.

The field examiners recommend that the application for aid be denied and we concur in this recommendation.

W. H. King

W. H. King

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 16 1952

Reviewed by
DMEA OPERATING COMMITTEE
6-20-52
(date)

MINING DIVISION
REGION IV

June 4, 1952

Memorandum

To : W. H. King, Acting Chief, Mining Div., Region IV

From : Chief, Arizona-New Mexico Br., Mining Div., Region IV

Subject : Final Report, DMEA Docket 2465, Shoup's Manganese Property, Long Valley Mining District, Coconino County, Ariz.

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by C. S. Bromfield of the Geological Survey and J. H. Soule' of the Bureau of Mines, and the section on Engineering by Soule' for the above report. A separate section on Geology will be submitted by the Geological Survey.

I concur with the examining team's recommendations that an exploration loan be denied.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms, Chief
Arizona-New Mexico Branch

CC W. H. King (8)
C. A. Anderson
DMEA-2465
DF

WRStorms:frj

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

200 New Customhouse
Denver 2, Colo.

June 9, 1952

Memorandum

To : DMEA Field Team, Region IV

From : A. H. Koschmann

Subject: DMEA Docket 2465, Geologic Report, L. E. Shoup Manganese Claims, Coconino County, Arizona

Enclosed are the original and 8 copies of the geologic report by C. S. Bromfield of the Geological Survey.

It has been recommended that the loan be denied.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

P. O. Box 1126, University Station
Tucson, Arizona

June 6, 1952

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: A. F. Shride, Tucson, Arizona

Subject: Geologic Report, IM A 2465, L. E. Stump Manganese Claims, Coconino County, Arizona

Enclosed are the original and 8 copies of the above report by C. S. Brinfield of the Geological Survey.

This report, which recommends denial of an exploration loan because of the probable small size of the deposits available for potential discovery, and the lack of a feasible method of exploration for the small scattered ore bodies, has my approval.

A. F. Shride
Acting District Supervisor
Arizona-New Mexico

Enclosures 9

SUPERVISOR'S OFFICE
JUN 1952

RECEIVED
JUN 1952
U.S. Geological Survey
Mineral Deposits Branch
Denver

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2465, Shoup's Manganese Property

Long Valley Mining District

Coconino County, Ariz.

C. S. Bromfield, Geologist
U. S. Geological Survey

John H. Soule', Mining Engineer
U. S. Bureau of Mines

May 1952

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By C. S. Bromfield[1] and John H. Soule[2]

The existence of manganese ores has been known for a long time in the Long Valley Mining District, southern Coconino County, Ariz. The total production may have exceeded 4,000 tons of ore, the grade ranging from 35 to 50 percent.

L. E. Shoup of Prescott, Ariz. owns some of the claims in the district and applied for Government assistance under the Defense Production Act to explore part of his property. The application, Docket DMEA 2465, was for $5,000, the work to consist of diamond core drilling.

Manganese oxides occur in flat-lying Kaibab limestone as more or less bedded deposits commonly associated with solution cavities. No commercial deposits of the bedded type have been found on the applicant's claims, but two shallow shafts have penetrated a 6-foot low-grade manganiferous zone. At its surface outcrop this type of deposit was mined, where it locally contained nodules and irregular masses of psilomelane which could be sorted to a shipping product. These deposits, though the most important in the district, have been small and scattered and consequently it is felt that drilling, as proposed by the applicant, would have little chance of making a discovery. Any discovery made probably would not be significant.

1/ Geologist, U. S. Geological Survey
2/ Mining Engineer, U. S. Bureau of Mines

It is estimated that ore reserves on the Shoup property total from 500 to 1,500 tons containing about 34 percent manganese based on a 25 percent grade cutoff. These reserves will be reduced considerably by the use of higher grade cutoff.

There is no mining in the district at present and mining costs would be high. It is estimated that it would cost nearly $42.00 per ton to mine and deliver the ore to the stockpile at Deming, N. Mex. A small profit is indicated by mining the existing reserves but is insufficient to pay for needed equipment, depreciation, taxes, and overhead, in addition to the repayment of the Government's share in any exploration work.

Perhaps, the best method of exploration would be the method employed in the past where the ore was followed in mining. A possible project for the district would consist of the use of geophysical methods, followed by testpitting of selected anomalies. However, the Shoup area is too limited in potentialities to warrant a separate project.

It is concluded that: (1) although 4,000 tons of manganese ores have been mined from the Long Valley district, only a small part was derived from the Shoup claims; (2) the ore reserves on the Shoup claims are small and the expectation of increasing these reserves is not good; (3) the economic features are not attractive; (4) the applicant's proposal is technically unfeasible as a better method of

exploration would be the one followed in the past where outcrops and known ore was followed; (5) a district geophysical survey, followed by testpitting, might be feasible but the Shoup property alone does not warrant separate work.

Based upon the foregoing conclusions, it is recommended that the application for Government assistance in exploring the Shoup property be denied.

L. E. SHOUP MANGANESE CLAIMS
LONG VALLEY MANGANESE DISTRICT
COCONINO COUNTY, ARIZONA

IMEA 2465

Geology

By Calvin S. Bromfield
Geologist, U. S. Geological Survey

L. E. SHOUP MANGANESE CLAIMS
LONG VALLEY MANGANESE DISTRICT
COCONINO COUNTY, ARIZONA

DMEA 2465

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INTRODUCTION

The Shoup Manganese Claims, near Long Valley, Coconino County, Arizona, are situated near the southern edge of the Colorado Plateau, a few miles north of the Mogollon Rim. In this area the plateau has an altitude of 6800 to 7000 feet. Its surface is generally flat with a north to northeast trending drainage system separated by broad low divides. The plateau in this region is covered by pine forests and rock outcrops are few and small. Manganese oxides are found in the Long Valley District as (1) bedded deposits in limestone containing nodules and masses of psilomelane, (2) nodules and irregular masses in the soil near the surface, and (3) irregular replacement in conglomerate. The latter type is relatively unimportant. At present no production is being made from the district.

GENERAL GEOLOGIC SETTING

The surface of the plateau in the Long Valley area is underlain largely by the Permian Kaibab limestone. The underlying Permian Coconino sandstone is exposed here and there where streams have eroded through the Kaibab limestone. The formations dip gently to the northeast and essentially control the plateau surface. Scattered remnants of once more extensive Tertiary basalt flows overlie the Kaibab limestone south of the Long Valley manganese district. The Kaibab limestone in the area of the manganese claims consist of alternating beds of limestone, sandstone, and calcareous sandstones. This formation has a thickness of about 250-300 feet in the Long Valley region. A northeast trending elongate body of conglomerate crosses the Long Valley manganese area. As shown in a sketch by C. B. Hunt[1/] this body is

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1/ Hunt, C. B., Manganese deposits near Long Valley, Arizona: U. S. Geological Survey Memorandum Report, 1940 (Confidential).

approximately 1000 feet wide and terminates at its southwest end against Kaibab limestone. Its northeast end is not determined. Two previous observers, Jones[2] and Hunt[3], interpreted this conglomerate zone as a tectonic breccia and inferred it might have some bearing on the manganese occurrence in the district. Duncan and Byers[4] who made a detailed examination August 4 - 15, 1941, interpreted this "breccia" as a sedimentary deposit, and suggested it may be Triassic in age. The present writer concurs in their interpretation of this feature as a sedimentary deposit. Highway department gravel pits in the formation show a rude but definite stratification. It is probable that this conglomerate occupies a valley or depression on an old erosion surface in the Kaibab limestone.

MANGANESE DEPOSITS

Manganese oxides occur in three general settings in the Long Valley district. These are (1) nodules and irregular masses of psilomelane in soil or clay filled pockets overlying the Kaibab limestone, (2) more or less bedded deposits in Kaibab limestone containing nodules and irregular masses of psilomelane associated with solution caverns, and (3) irregular coatings, nodules, and replacements in conglomerate. The first and second types have yielded nearly the entire production of the district; the last type enumerated is relatively unimportant, and has yielded little ore.

2/ Jones, E. L., Jr., Deposits of manganese ore in Arizona: U. S. Geological Survey Bull. 710, p. 127, 1920.

3/ Op. cit.

4/ Duncan, D. C. and Byers, F. M., Manganese deposits near Long Valley, Coconino County, Ariz.: U. S. Geological Survey Memorandum Report, p. 7 - 8, 1942 (Confidential).

At the time of the field examination the pits, shallow workings, and shafts which could afford observation of some of the critical features of the manganese occurrence were largely caved or in dangerous condition. The best information on the nature of the deposits is found in a detailed confidential report by Duncan and Byers[5] who spent two weeks in the area during August, 1941 when the district was being exploited.

The area that contains the numerous small scattered workings from which the production of the district has come lies north of the elongate northeast-southwest belt of conglomerate in the nearly flat lying Kaibab limestone. Here the limestone is cut by irregular joints of both northeast and northwest trend. These joints have evidently exercised some control over the location of the small surface pockets containing high grade manganese which are found at and near the surface. Manganese oxides as lumps and irregular masses of psilomelane are found in these clay filled fissures of northeast or northwest trend. Depressed areas, some elongated in the direction of the particular fissure, commonly mark the location of these pockets. The deposits are commonly only a few feet across and 2 to 10 feet deep. Such superficial deposits produce from a few tons up to several tens of tons.

On the applicant's claims at depths of 20 to 50 feet several shafts have encountered horizontal bedded deposits of decomposed calcareous sandstone and limestone, interlayered with hematitic clay. These beds are replaced in varying degree by soft manganese oxides (wad) of low-grade. Locally nodules and irregular masses of psilomelane are sufficiently concentrated in this zone to compose the ore that has been produced from this type of occurrence. The zone ranges up to 8 feet in

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5/ Op. cit.

thickness. Solution cavities are found associated with the bedded deposit, and Duncan and Byers report that the deposits of bedded manganiferous material in the cavities may terminate abruptly against limestone walls. Brecciated material is found within some cavities. The breccia is commonly cemented by manganese oxides, and is probably a collapse breccia resulting from withdrawal of support through solution and decomposition of the rocks during the formation of cavities. Bodies such as this have yielded from a few tons to several hundred tons. The maximum known size for an ore body of this type was 125 feet long by 6 feet thick. This deposit was found where the flat lying manganiferous zone outcropped along the sides of Iron Mine draw. This deposit is on the Linesba claims, just to the southwest of the Shoup claims (Fig. 3).

About 250 tons of manganese ore has been produced from L. E. Shoup's claims. Most of this has come from small pockets on the surface. Shoup has put down two 50 to 75 foot shafts within 50 feet of each other (Fig. B). In each of these shafts according to the applicant a low-grade manganiferous zone was encountered at a depth of about 50 feet. The zone was 6 feet thick. No significant amount of ore grade material was discovered. These openings were too dangerous to attempt at the time of the examination. Cursory investigation suggests the possibility that this zone may be the same as that on which the largest body on the Linesba claims was developed. The applicant proposes to explore this inferred zone for commercial manganese deposits by diamond drilling.

It is the opinion of the examining team that diamond drilling would not be feasible in exploring this property. The friable material common in the manganese pockets or zones would not core well. In addition

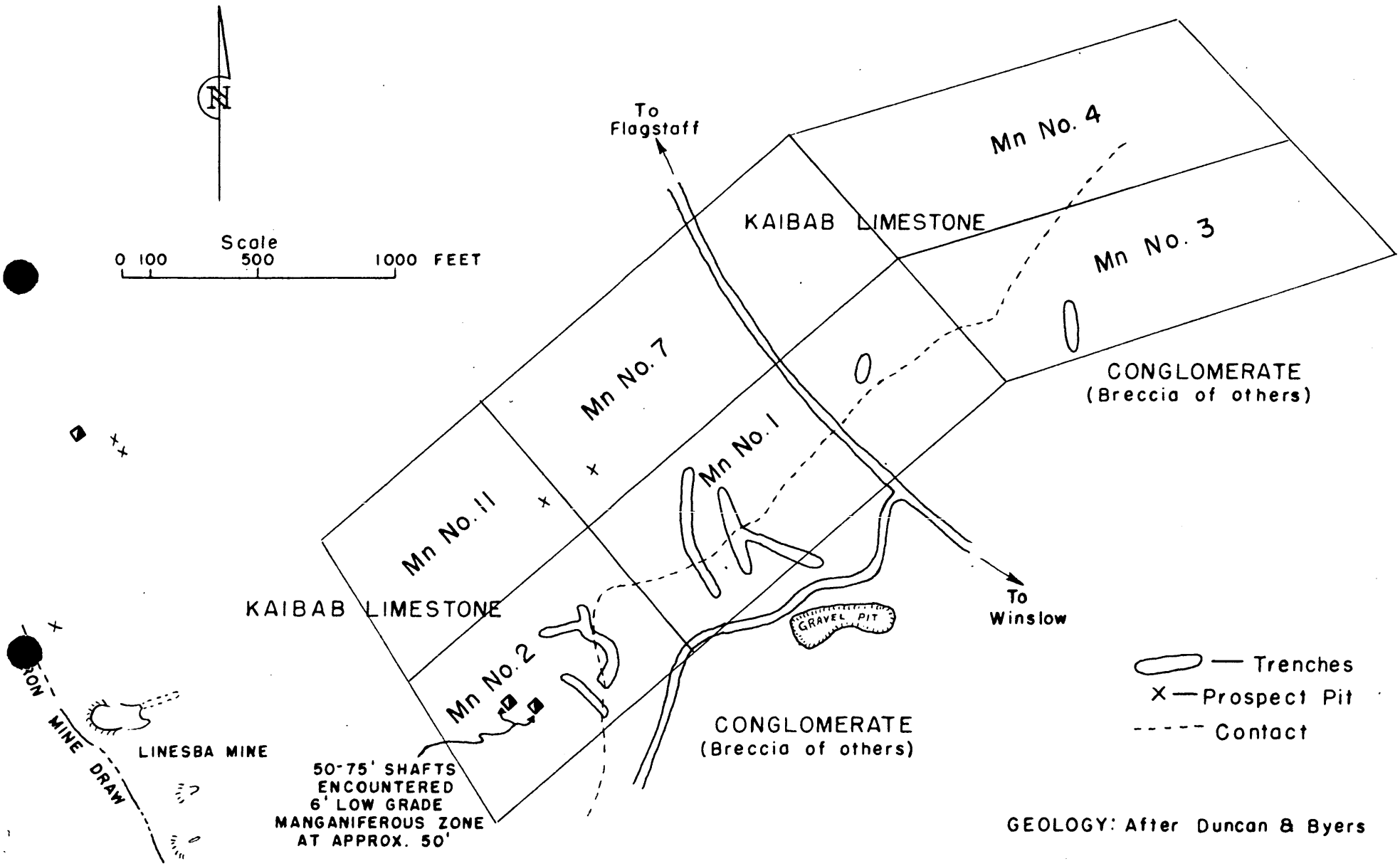

FIG. 3 — GENERALIZED GEOLOGIC MAP, SHOUP MANGANESE CLAIMS
COCONINO CO., ARIZONA DMEA 2465

6-1-52

it is felt that the targets, as indicated by past mining, are too small to be found satisfactorily except by a prohibitive amount of drilling.

ORE RESERVES

Little direct data are available on which to base ore reserve estimates on the Shoup claims. In the general area of Iron Mine Draw numerous pits have yielded from a few tons to several tens of tons, and one deposit on the Linesba claims has produced several hundred tons. Total production from the district to date (May, 1952) has not much exceeded 4000 tons of ore averaging 35-50 percent manganese. Of this small production only 250 tons have come from the Shoup claims.

Duncan and Byers[6/] after a rather thorough investigation of the district made the following estimate (1941):

	Tons 40-48% Mn	Tons 25-35% Mn
Measured	150	300
Indicated	1800	2000
Inferred	2800	2800

Only a small part of these reserves could be attributed to the Shoup claims, the largest portion being attributed to the Linesba claims. Since the time of the examination about 2000 tons of manganese ore have been shipped from the Long Valley area, and most of this has been from the Linesba claims. Reserves have not been increased by this work. It is inferred on the basis of past production from Shoup's claims in comparison with that of the district and from the limited showings that the magnitude of the reserves of 25-50 percent manganese ore on Shoup's claims would approximate 500-1000 tons.

6/ Op. cit., p. 12.

GEOLOGIC CONCLUSIONS

Several factors make discouraging any systematic exploration of the Shoup claims. These are (1) the small size of the potential targets and their scattered nature, (2) the lack of a feasible method of exploration, and (3) the fact that the inferred manganiferous zone in which the high grade "hot spots" are erratically distributed does not outcrop on the applicant's claims but is at an approximate depth of 50 feet making test pitting for the small bodies expensive.

Drilling as proposed by the applicant, and to the amount he is able and willing to participate, would have little chance of making a discovery, and any discovery made probably would not be significant.

It is recommended, therefore, that the loan be denied because of the small size of the deposits, and lack of a practical method of exploration for these small scattered bodies.

DMEA-2465, SHOUP'S MANGANESE PROPERTY
LONG VALLEY MINING DISTRICT
COCONINO COUNTY, ARIZ.

Engineering Report

By John H. Soule'
Mining Engineer
U. S. Bureau of Mines

May 1952

DMEA-2465, SHOUP'S MANGANESE PROPERTY
LONG VALLEY MINING DISTRICT
COCONINO COUNTY, ARIZ.

Engineering report — Page

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INTRODUCTION

Manganese deposits have been known in the Long Valley area of southern Coconino County, Ariz. for many years and interest has been manifest in these deposits at various times. Some production has resulted in times of high manganese prices. In addition to examinations by private engineers and geologists, the area has been examined and reported upon by members of Federal and State agencies.

E. L. Jones, Jr. and F. L. Ransome have described the area in U. S. Geological Survey Bull. 710-D, 1920. E. D. Wilson and G. M. Butler mention the area in University of Arizona Bulletin No. 127, 1930, the material being taken largely from the preceding publication. Since that time visits were made by J. E. Bell, U. S. Bureau of Mines, in March and September 1940; by Charles H. Johnson, U. S. Bureau of Mines, and Charles B. Hunt, U. S. Geological Survey, in October 1940; by Harold B. Ewoldt, U. S. Bureau of Mines, who took metallurgical samples in June 1941; and by D. C. Duncan and F. M. Byers, U. S. Geological Survey, who spent nearly 2 weeks in August 1941 studying and mapping the area. The results of metallurgical testing by the Bureau of Mines is contained in the files at Tucson, Arizona.

Dr. L. E. Shoup of Prescott, Arizona located some claims in the district in 1939 and recently applied for Government assistance under the Defense Production Act in exploring part of his property. The

application, Docket DMEA 2465, proposed diamond drilling a number of holes at a project cost of $5,000. The application was sent to the field for an examination of the property. This examination was made on April 23, 1952 by C. S. Bromfield, U. S. Geological Survey and J. H. Soule', U. S. Bureau of Mines. The engineering aspects of this examination are reported herein.

ACKNOWLEDGMENTS

Acknowledgment is due to Dr. L. E. Shoup, owner of the property and the DMEA applicant, for showing the examining engineers over the property. Acknowledgment also is made of material derived from published and unpublished reports by personnel of the U. S. Geological Survey and the U. S. Bureau of Mines.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Long Valley manganese deposits are situated in the Long Valley Mining District, southern Coconino County, Arizona. Most of the claims located by L. E. Shoup form a contiguous group which centers about the common corner of secs. 19, 20, 29, and 30, T. 14 N., R. 10 E. The group strikes northeasterly and southwesterly. The claims of special interest in the exploration project are located at the southwestern end of the group and are wholly within the NE¼ of sec. 30 of the above township, as shown in figures 1 and 2.

The property is reached by travelling to Long Valley and the Flagstaff, Winslow, Pine road junction, 59 miles southeasterly from Flagstaff, Ariz., 55 miles southwesterly from Winslow, Ariz., or

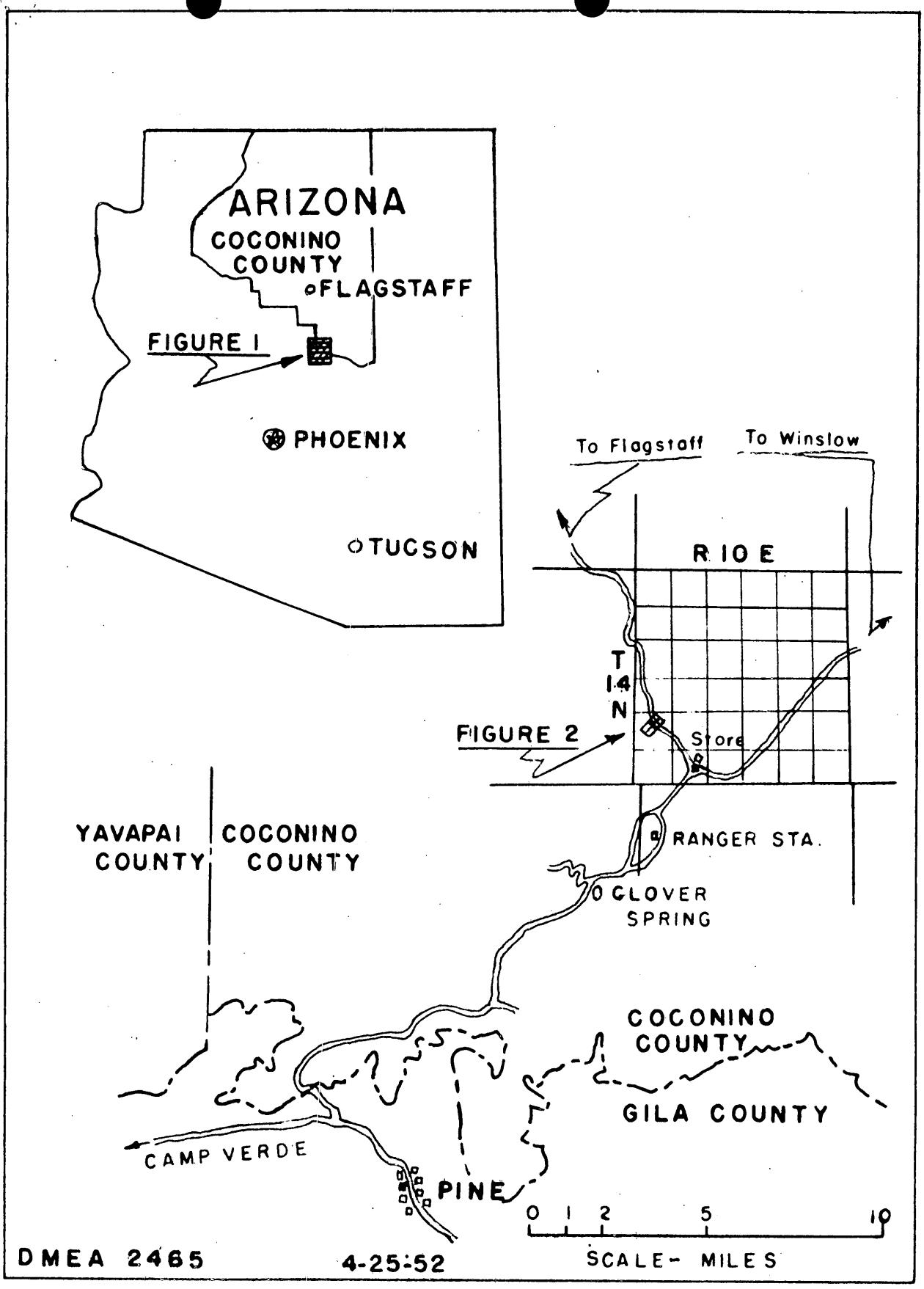

FIGURE 1, LOCATION MAP, L.E. SHOUP MANGANESE

COCONINO COUNTY, ARIZONA

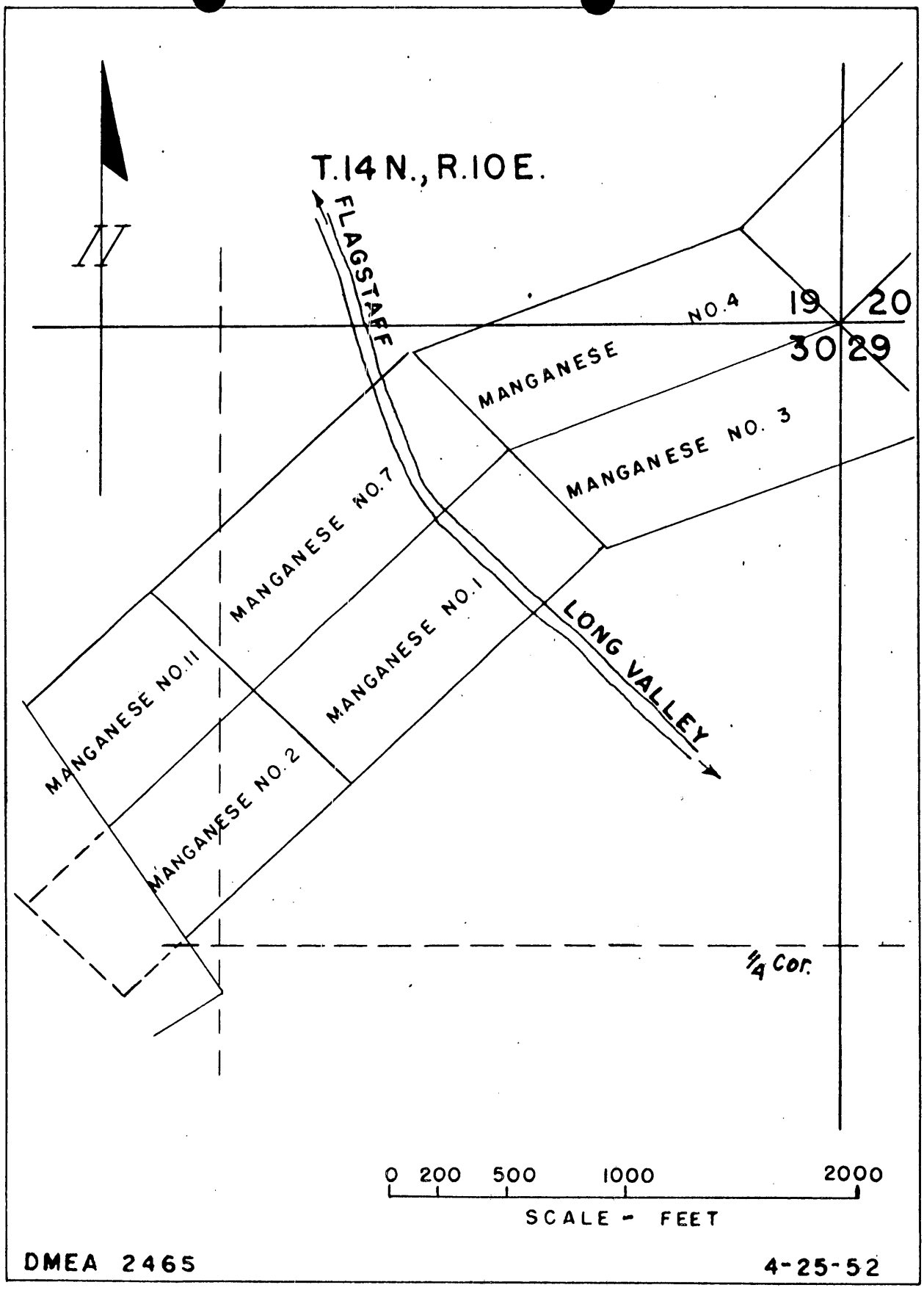

FIGURE 2- PARTIAL CLAIM MAP, SHOUP MANGANESE

25 miles northerly from Pine, Ariz. From this junction, travel northwesterly for 1.75 miles toward Flagstaff (see figure 1). The most interesting deposits lie southwest of this point within a mile or so of the road. Much of the terrain can be traveled by automobile during dry weather. Such travel is not recommended when the ground is wet.

The topography of the area is not rugged but becomes increasingly so to the south and west, where steep cliffs mark the Mogollon Rim. The property is at an elevation of about 7,000 feet. The relief can be measured in a few tens of feet.

Precipitation averages about 24 inches annually, in part as heavy summer thunder showers and in part as heavy winter snows. Both conditions hamper transportation, especially the winter snows if the roads are not maintained. Temperatures are delightful in the summer but become severe with considerable sub-zero weather in the winter.

There are no permanent streams in the immediate area. The depth of the water table is unknown but may be shallow. A small amount of water is available at Clint's Well at the road junction 1.75 miles southeast of the property, and a larger supply is available at Clover Springs about 7 miles south of the property (figure 1).

The country is heavily forested with large stands of Ponderosa pine, and subordinate oak and other forest flora. Much of the timber is suitable for mining purposes.

Living accommodations are primitive and consist of one small shack on the Shoup property, with others in varying states of disrepair nearby. Minor supplies are available at Flagstaff and Winslow, but major mining equipment probably is available no closer than Phoenix, Ariz.

The nearest railroad points are at Winslow and Flagstaff, both on the main line of the Atchison, Topeka, and Santa Fe Railroad. Both cities are about 57 miles from the deposits, but the highway grades favor trucking to Winslow, although some of the road to Flagstaff is paved. Trucking to Winslow also would be advantageous in shipping ores to eastern markets. Trucking to Flagstaff would be advantageous in shipping ores to western markets. Freight, express, telephone, telegraph and postal services are available at both Flagstaff and Winslow.

HISTORY AND PRODUCTION

The early history of the manganese deposits of Long Valley are unknown other than that they have been known for a long time and that some work was done in the past. Some manganese was shipped from the area during World War I and again from 1927 to 1930. Interest was revived in the district in 1939 and sporadic production resulted.

The Humphries Gold Corp. did considerable trenching with power equipment early in 1941 but evidently lost interest in the deposits and withdrew from the area. J. Reed Dennison and associates of Batesville, Ark. became interested in the area from 1940 through 1949, and shipped some ore to various markets.

Although considerable manganese has been mined from the Long Valley deposits, reliable production figures are lacking. The following table contains material derived from various sources, some of which may be of doubtful value. How much of this production was derived from the Sheup group of claims is undeterminable, but from the extent of the mine workings the production must have been small. Sheup claims that 5 cars, or about 250 tons of ore containing 40-50 percent manganese were mined and shipped from his property. This figure seems reasonable.

TABLE I. Production - Long Valley Manganese District.

Year	Source	Long Tons	Grade
Before 1918		?	?
1918	Duncan & Byers, U.S.G.S. Con. Rept.	33	50
1918	" " "	750	35
1927-1930	Wilson & Butler, U. A. Bull. 127	216	45
1939	Hentschel Private Report	600	?
1940	J. Reed Dennison Statement of Facts	200	
1941	" " " "	150	
1942	" " " "	600	
1943	" " " "	600	
1944	" " " "	100-200	
1945	" " " "	100-200	
1946	" " " "	100-200	
1947	" " " "	100-200	
1948	" " Letter	150	
1949	" " "	165	
	Approximate total	4,064	

As nearly 2,500 tons of manganese ore were produced from Long Valley since 1939, the 250-ton production from the Shoup property constitutes about 10 percent of the production since that time.

J. Reed Dennison in a letter states that his company shipped 2,250 tons of manganese ore from the Long Valley and Heber districts for 6 years prior to 1947. Only 75 of these tons were derived from the Heber deposits and the remainder from Long Valley.

From the above table, it seems that the total production of manganese ore from the Long Valley district totals approximately 4,000 tons.

OWNERSHIP AND EXTENT

Dr. L. E. Shoup, Bank of Arizona Bldg., Prescott, Ariz., became interested in the Long Valley manganese deposits and located his first claims in 1939. He now holds 14 unpatented but surveyed claims. At least 10 claims of the group are contiguous and are named the Manganese 1-10. The names and locations of the remaining 4 claims are unknown. Only 4 of these 10 Manganese-named claims, Manganese 1, 2, 7, and 11, were considered in the application for exploration assistance (see figure 2).

DESCRIPTION OF DEPOSITS 1/

The manganese deposits of Long Valley are of three general types. These are (1) nodules and irregular masses of psilomelane in soil or clay-filled pockets on the surface of the flat-lying Kaibab limestone;

1/ Bromfield, C. S., U. S. Geological Survey

(2) More or less bedded deposits in Kaibab limestone, containing nodules and irregular masses of psilomelane; (3) irregular coatings, nodules, and replacements in the conglomerate. The first and second types have yielded nearly the entire production of the district; the last type is relatively unimportant, and has yielded little ore.

The largest deposit in the Long Valley district is of the bedded type and was found where the manganiferous zone outcropped along Iron Mine Draw. This deposit is on the Linesba claims adjoining the Shoup claims on the southwest. It was up to 6 feet thick, 125 feet across, and produced several hundred tons. Two 50- to 75-foot shafts on the Shoup claims have intersected a low-grade bedded manganiferous zone having a thickness of 6 feet at a depth of 50 feet. Cursory examination suggests that the zone may be the same as the zone that outcrops along Iron Mine Draw. The applicant proposes to explore this zone for commercial deposits of manganese.

The bodies discovered to date are small and irregular in distribution, but the grade is good, commonly 40 to 50 percent manganese.

ORE RESERVES

There are little data upon which to compute ore reserves for the Shoup group of claims. The following estimates from confidential sources are based upon the best information available. They pertain to the district.

TABLE II. - Ore Reserves - Long Tons, Estimated 1941.

	Manganese, 40 to 48 percent	Manganese, 25 to 35 percent
Measured	150	300
Indicated	1,800	2,000
Inferred	2,800	2,800
Total	4,750	5,100

Bell of the Bureau of Mines (1940) noted very substantial reserves. Ewoldt of the Bureau of Mines (1941) estimated the district reserves at 400 tons of measured and indicated ore containing more than 40 percent manganese and about 4,000 tons of manganese-bearing material containing less than 40 percent manganese.

Using the reserves shown in the above table and subtracting the production since 1940, about 7,300 tons of reserves remain unmined. Using the approximate 10 percent ratio of production between the Shoup production and the district production, there may be 730 tons of ore reserves of all categories on the Shoup claims. As past production was made largely or wholly from plus 40 percent material, the following table approximates the reserves on the Shoup claims.

TABLE III. - Shoup Ore Reserves - Long Tons.

	Manganese, 40 to 48 percent	Manganese, 25 to 35 percent
Measured	10	30
Indicated	80	200
Inferred	130	280
Total	220	510

The average grade of the 730 tons is estimated to be 34 percent manganese, based on a grade cutoff of 25 percent and assuming an even distribution of the manganese throughout the various grades. By using a 33 percent grade cutoff, the reserves are reduced to a total of 320 tons of ore containing 41 percent manganese.

It seems evident that past operations were confined to mining the known reserves and that no exploration was done other than that done in the process of the mining. In other words, the reserves have not been increased since the above estimates were made.

That the district contains no large near surface deposits of low-grade manganese ore was proven by the trenching done by the Humphries Gold Corp. early in 1941.

PRESENT STATUS

The Shoup manganese property, as well as other properties in the district, is not being worked at the present time. Development on the Shoup claims consists of large trenches, small shallow pits, and 2 shafts about 50 feet deep. The shafts are in poor condition.

The manganese ores occur in small, generally detached bodies and no systematic development seems possible. Mining must be done by "gophering" methods and the ore may be followed to depths up to 50 feet. This necessitates a number of small shallow shafts to adequately develop the ore, which in turn, indicates small relatively primitive surface plants. Elaborate plants are not justified by present knowledge of the deposits. The following short economic study is based

upon early 1952 conditions and prices of manganese being paid at the Deming stockpile. Sorting will be necessary to bring the shipments to a marketable grade.

Costs -- Per Ton of Ore

Truck freight to Winslow	$6.84
Railroad freight to Deming, New Mex.	9.91
Mining, sorting and loading	25.00
Total	$41.75

As $43.15 is being paid at the Deming stockpile for 33 percent manganese ores, this is the minimum grade that can be profitably shipped. If a stockpile is established at Aguila, ARiz. rail freight may be reduced by $5.13, making a total cost of $36.62. Under these conditions, ore of 31 percent grade may be mined and shipped profitably, ignoring equipment and depreciation costs. The following short economic summary will approximate the results that would be obtained in operating the property and shipping the ore to the Deming stockpile:

TABLE IV. Economic Summary.

Mining, sorting, shipping 730 tons @ $41.75	$30,477.50
Value of ore at stockpile, 730 tons @ $46.00	33,580.00
Apparent profit, less depreciation	$3,102.50

An additional $3,744.90 may be realized if a stockpile is established at Aguila, making a total apparent profit of $6,487.40. From this sum must be deducted the equipment costs, overhead, depreciation and taxes. Judging from the above, it seems that the simplest method of exploration would be by mining the existing reserves and by continued mining if the ore bodies should continue beyond the expected limits.

PROPOSED EXPLORATION

The project proposed by L. E. Shoup, the applicant for Government assistance in exploring his Long Valley manganese property, was to consist of core drilling 14 holes averaging 60 feet in depth. The total 840-foot drilling project was to cost $5,000. This proposal cannot be recommended for the following reasons:

1. The known manganese ore bodies are relatively small in size and are generally detached so a large number of holes would be necessary to properly sample the area. The ore bodies present too small a target for drilling.

2. The ground consists of interbedded limestone and sandstone. The limestone should give but little trouble in drilling but the sandstone is friable and no core could be expected. Also the wad ore or manganiferous sandstone will not core satisfactorily. There is no assurance that sludge samples can be taken as water loss could occur in such a formation. However, the main objection to sludge samples would be the salting of the sample by caved material. This salting could be serious when the material caves readily and the zone to be sampled is likely to be small in extent normal to the drill hole.

3. The substitution of churn or wagon drilling for diamond core drilling raises the same objection that pertains to the taking of sludge samples. In addition, neither of these methods is sensitive enough to accurately sample possible thin bodies of manganese ore.

The slight moisture content of the rocks would prevent the use of a wagon drill in dry sampling the deposits.

As the Long Valley deposits may have yielded as much as 4,000 tons of manganese ore, and because drilling results would prove unsatisfactory, a possible method of exploration would consist of geophysical surveying, followed by testpitting on selected anomalies. The best results probably would be obtained by gravitational methods using a gravimeter. Such a survey could be done rapidly and at a relatively low cost. However, the Shoup property constitutes such a small part of the known mineralized portion of the district that to confine such work to the property would be unwarranted.

CONCLUSIONS

The following conclusions are derived from an examination of the L. E. Shoup manganese claims in the Long Valley mining district and from a study of available information pertaining to the district:

1. Although about 4,000 tons of manganese ore have been produced from the district, only a small part was derived from the Shoup claims which contain only small ore reserves.

2. The expectancy of finding ore bodies larger than those already mined is small.

3. The known ore bodies are small and detached. High mining costs are usual in the district and are increased when mining the deeper ore bodies such as exist on the Shoup claims.

4. Probably the best method of exploring the deposits would be, as practiced in the past, by mining outcrops and following the ore to depth.

5. The exploration project proposed by the applicant cannot be approved because the possible ore bodies present small targets necessitating an excessive amount of drilling, and because questionable results would be derived from any drilling.

6. A district geophysical survey, followed by test pitting of selected anomalies, might be warranted but the Shoup claims constitute too small a portion of the productive part of the district to warrant a separate project.

RECOMMENDATIONS

Based on the preceding conclusions, it is recommended that L. E. Shoup's application for Government assistance, Docket DMEA-2465, be denied.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

June 11, 1952

Memorandum

To: Acting Administrator, Defense Minerals Exploration Administration
Attention: Code 210

From: Field Team, Region IV

Subject: Final Report, DMEA Docket 2465, (Manganese) L. E. Shoup Managnese Claims, Coconino County, Arizona

Enclosed are four copies of the final report on DMEA-2465, a copy of the letter of denial to the applicant, and two copies of Form 3b.

W. H. King
W. H. King

A. H. Koschmann
A. H. Koschmann

Mining Division
Region IV

June 11, 1952

Memorandum

To: Field Team, Region IV

From: Acting Chief, Mining Division, Region IV

Subject: Final Report, DMEA Docket 2465 (Manganese) Dr. L. E. Shoup Manganese Claims, Coconino County, Arizona

Enclosed are nine copies of the final engineering report on DMEA-2465 by J. H. Soule' of the Bureau of Mines.

Drilling as proposed by the applicant, and to the amount he is willing and able to participate, would have little chance of making a discovery, and any discovery made proabably would not be significant.

The field examiners recommend that the application for aid be denied and we concur in this recommendation.

W. H. King

W. H. King

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
RECEIVED
JUN 16 1952

Reviewed by
DMEA OPERATING COMMITTEE
6-20-52
(date)

MINING DIVISION
REGION IV

June 4, 1952

Memorandum

To : W. M. King, Acting Chief, Mining Div., Region IV

From : Chief, Arizona-New Mexico Br., Mining Div., Region IV

Subject : Final Report, RMA Docket 2465, Shoup's Manganese Property, Long Valley Mining District, Coconino County, Ariz.

Enclosed are original and 8 copies of the section on Summary, Conclusions and Recommendations by C. S. Bromfield of the Geological Survey and J. M. Soule' of the Bureau of Mines, and the section on Engineering by Soule' for the above report. A separate section on Geology will be submitted by the Geological Survey.

I concur with the examining team's recommendations that an exploration loan be denied.

Brochure is enclosed.

Walter R. Storms

Walter R. Storms, Chief
Arizona-New Mexico Branch

cc W. M. King (8)
C. A. Anderson
RMA-2465
MF

WRStorms:frj

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

200 New Customhouse
Denver 2, Colo.

June 9, 1952

Memorandum

To : DMEA Field Team, Region IV

From : A. H. Koschmann

Subject: DMEA Docket 2465, Geologic Report, L. E. Shoup Manganese Claims, Coconino County, Arizona

Enclosed are the original and 8 copies of the geologic report by C. S. Bromfield of the Geological Survey.

It has been recommended that the loan be denied.

A. H. Koschmann
A. H. Koschmann
Supervising Geologist
Colorado-Wyoming

Enclosures (9)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
P.O.Box 4126, University Station
Tucson, Arizona

June 6, 1952

Memorandum

To: A. H. Koschmann, Denver, Colorado

From: A. F. Shride, Tucson, Arizona

Subject: Geologic Report, DM A 2465, L. K. Shoup Manganese Claims, Coconino County, Arizona

Enclosed are the original and 8 copies of the above report by C. S. Bromfield of the Geological Survey.

This report, which recommends denial of an exploration loan because of the probable small size of the deposits available for potential discovery, and the lack of a feasible method of exploration for the small scattered ore bodies, has my approval.

A. F. Shride
Acting District Supervisor
Arizona-New Mexico

Enclosures 9

JUN 1952
RECEIVED
U.S. Geological Survey
Mineral Deposits Branch
Denver

UNITED STATES
DEPARTMENT OF THE INTERIOR
OSCAR L. CHAPMAN, SECRETARY

DEFENSE MINERALS EXPLORATION ADMINISTRATION

REPORT OF EXAMINATION BY FIELD TEAM
REGION IV

DMEA-2465, Shoup's Manganese Property

Long Valley Mining District

Coconino County, Ariz.

C. S. Bromfield, Geologist
U. S. Geological Survey

John H. Soule', Mining Engineer
U. S. Bureau of Mines

May 1952

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

By C. S. Bromfield[1] and John H. Soule'[2]

The existence of manganese ores has been known for a long time in the Long Valley Mining District, southern Coconino County, Ariz. The total production may have exceeded 4,000 tons of ore, the grade ranging from 35 to 50 percent.

L. E. Shoup of Prescott, Ariz. owns some of the claims in the district and applied for Government assistance under the Defense Production Act to explore part of his property. The application, Docket DMEA 2465, was for $5,000, the work to consist of diamond core drilling.

Manganese oxides occur in flat-lying Kaibab limestone as more or less bedded deposits commonly associated with solution cavities. No commercial deposits of the bedded type have been found on the applicant's claims, but two shallow shafts have penetrated a 6-foot low-grade manganiferous zone. At its surface outcrop this type of deposit was mined, where it locally contained nodules and irregular masses of psilomelane which could be sorted to a shipping product. These deposits, though the most important in the district, have been small and scattered and consequently it is felt that drilling, as proposed by the applicant, would have little chance of making a discovery. Any discovery made probably would not be significant.

1/ Geologist, U. S. Geological Survey
2/ Mining Engineer, U. S. Bureau of Mines

It is estimated that ore reserves on the Shoup property total from 500 to 1,500 tons containing about 34 percent manganese based on a 25 percent grade cutoff. These reserves will be reduced considerably by the use of higher grade cutoff.

There is no mining in the district at present and mining costs would be high. It is estimated that it would cost nearly $42.00 per ton to mine and deliver the ore to the stockpile at Deming, N. Mex. A small profit is indicated by mining the existing reserves but is insufficient to pay for needed equipment, depreciation, taxes, and overhead, in addition to the repayment of the Government's share in any exploration work.

Perhaps, the best method of exploration would be the method employed in the past where the ore was followed in mining. A possible project for the district would consist of the use of geophysical methods, followed by testpitting of selected anomalies. However, the Shoup area is too limited in potentialities to warrant a separate project.

It is concluded that: (1) although 4,000 tons of manganese ores have been mined from the Long Valley district, only a small part was derived from the Shoup claims; (2) the ore reserves on the Shoup claims are small and the expectation of increasing these reserves is not good; (3) the economic features are not attractive; (4) the applicant's proposal is technically unfeasible as a better method of

exploration would be the one followed in the past where outcrops and known ore was followed; (5) a district geophysical survey, followed by testpitting, might be feasible but the Shoup property alone does not warrant separate work.

Based upon the foregoing conclusions, it is recommended that the application for Government assistance in exploring the Shoup property be denied.

L. M. SHOUP MANGANESE CLAIMS
LONG VALLEY MANGANESE DISTRICT
COCONINO COUNTY, ARIZONA

DRSA 2465

Geology

By Calvin S. Brumfield
Geologist, U. S. Geological Survey

L. E. SHOUP MANGANESE CLAIMS
LONG VALLEY MANGANESE DISTRICT
COCONINO COUNTY, ARIZONA

DMEA 2465

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INTRODUCTION

The Sheep Manganese Claims, near Long Valley, Coconino County, Arizona, are situated near the southern edge of the Colorado Plateau, a few miles north of the Mogollon Rim. In this area the plateau has an altitude of 5800 to 7000 feet. Its surface is generally flat with a north to northeast trending drainage system separated by broad low divides. The plateau in this region is covered by pine forests and rock outcrops are few and small. Manganese oxides are found in the Long Valley District as (1) bedded deposits in limestone containing nodules and masses of psilomelane, (2) nodules and irregular masses in the soil near the surface, and (3) irregular replacement in conglomerate. The latter type is relatively unimportant. At present no production is being made from the district.

GENERAL GEOLOGIC SETTING

The surface of the plateau in the Long Valley area is underlain largely by the Permian Kaibab limestone. The underlying Permian Coconino sandstone is exposed here and there where streams have eroded through the Kaibab limestone. The formations dip gently to the northeast and essentially control the plateau surface. Scattered remnants of once more extensive Tertiary basalt flows overlie the Kaibab limestone south of the Long Valley manganese district. The Kaibab limestone in the area of the manganese claims consist of alternating beds of limestone, sandstone, and calcareous sandstones. This formation has a thickness of about 250-300 feet in the Long Valley region. A northeast trending elongate body of conglomerate crosses the Long Valley manganese area. As shown in a sketch by C. B. Hunt[1] this body is

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1/ Hunt, C. B., Manganese deposits near Long Valley, Arizona: U. S. Geological Survey Memorandum Report, 1940 (Confidential).

approximately 1000 feet wide and terminates at its southwest end against Kaibab limestone. Its northeast end is not determined. Two previous observers, Jones[2] and Hunt[3], interpreted this conglomerate zone as a tectonic breccia and inferred it might have some bearing on the manganese occurrence in the district. Duncan and Byers[4] who made a detailed examination August 4 - 15, 1941, interpreted this "breccia" as a sedimentary deposit, and suggested it may be Triassic in age. The present writer concurs in their interpretation of this feature as a sedimentary deposit. Highway department gravel pits in the formation show a crude but definite stratification. It is probable that this conglomerate occupies a valley or depression on an old erosion surface in the Kaibab limestone.

MANGANESE DEPOSITS

Manganese oxides occur in three general settings in the Long Valley district. These are (1) nodules and irregular masses of psilomelane in soil or clay filled pockets overlying the Kaibab limestone, (2) more or less bedded deposits in Kaibab limestone containing nodules and irregular masses of psilomelane associated with solution caverns, and (3) irregular coatings, nodules, and replacements in conglomerate. The first and second types have yielded nearly the entire production of the district; the last type enumerated is relatively unimportant, and has yielded little ore.

2/ Jones, F. L., Jr., Deposits of manganese ore in Arizona: U. S. Geological Survey Bull. 710, p. 127, 1920.

3/ Op. cit.

4/ Duncan, D. C. and Byers, F. M., Manganese deposits near Long Valley, Coconino County, Ariz.: U. S. Geological Survey Memorandum Report, p. 7 - 8, 1942 (Confidential).

At the time of the field examination the pits, shallow workings, and shafts which could afford observation of some of the critical features of the manganese occurrence were largely caved or in dangerous condition. The best information on the nature of the deposits is found in a detailed confidential report by Duncan and Byers[5] who spent two weeks in the area during August, 1941 when the district was being exploited.

The area that contains the numerous small scattered workings from which the production of the district has come lies north of the elongate northeast-southwest belt of conglomerate in the nearly flat lying Kaibab limestone. Here the limestone is cut by irregular joints of both northeast and northwest trend. These joints have evidently exercised some control over the location of the small surface pockets containing high grade manganese which are found at and near the surface. Manganese oxides as lumps and irregular masses of psilomelane are found in these clay filled fissures of northeast or northwest trend. Depressed areas, some elongated in the direction of the particular fissure, commonly mark the location of these pockets. The deposits are commonly only a few feet across and 2 to 10 feet deep. Such superficial deposits produce from a few tons up to several tens of tons.

On the applicant's claims at depths of 20 to 50 feet several shafts have encountered horizontal bedded deposits of decomposed calcareous sandstone and limestone, interlayered with hematitic clay. These beds are replaced in varying degree by soft manganese oxides (wad) of low-grade. Locally nodules and irregular masses of psilomelane are sufficiently concentrated in this zone to compose the ore that has been produced from this type of occurrence. The zone ranges up to 8 feet in

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5/ Op. cit.

thickness. Solution cavities are found associated with the bedded deposit, and Duncan and Byers report that the deposits of bedded manganiferous material in the cavities may terminate abruptly against limestone walls. Brecciated material is found within some cavities. The breccia is commonly cemented by manganese oxides, and is probably a collapse breccia resulting from withdrawal of support through solution and decomposition of the rocks during the formation of cavities. Bodies such as this have yielded from a few tons to several hundred tons. The maximum known size for an ore body of this type was 125 feet long by 6 feet thick. This deposit was found where the flat lying manganiferous zone outcropped along the sides of Iron Mine draw. This deposit is on the Linsebe claims, just to the southeast of the Shoup claims (Fig. 3).

About 250 tons of manganese ore has been produced from L. E. Shoup's claims. Most of this has come from small pockets on the surface. Shoup has put down two 50 to 75 foot shafts within 50 feet of each other (Fig. 8). In each of these shafts according to the applicant a low-grade manganiferous zone was encountered at a depth of about 50 feet. The zone was 6 feet thick. No significant amount of ore grade material was discovered. These openings were too dangerous to attempt at the time of the examination. Cursory investigation suggests the possibility that this zone may be the same as that on which the largest body on the Linsebe claims was developed. The applicant proposes to explore this inferred zone for commercial manganese deposits by diamond drilling.

It is the opinion of the examining team that diamond drilling would not be feasible in exploring this property. The friable material common in the manganese pockets or zones would not core well. In addition

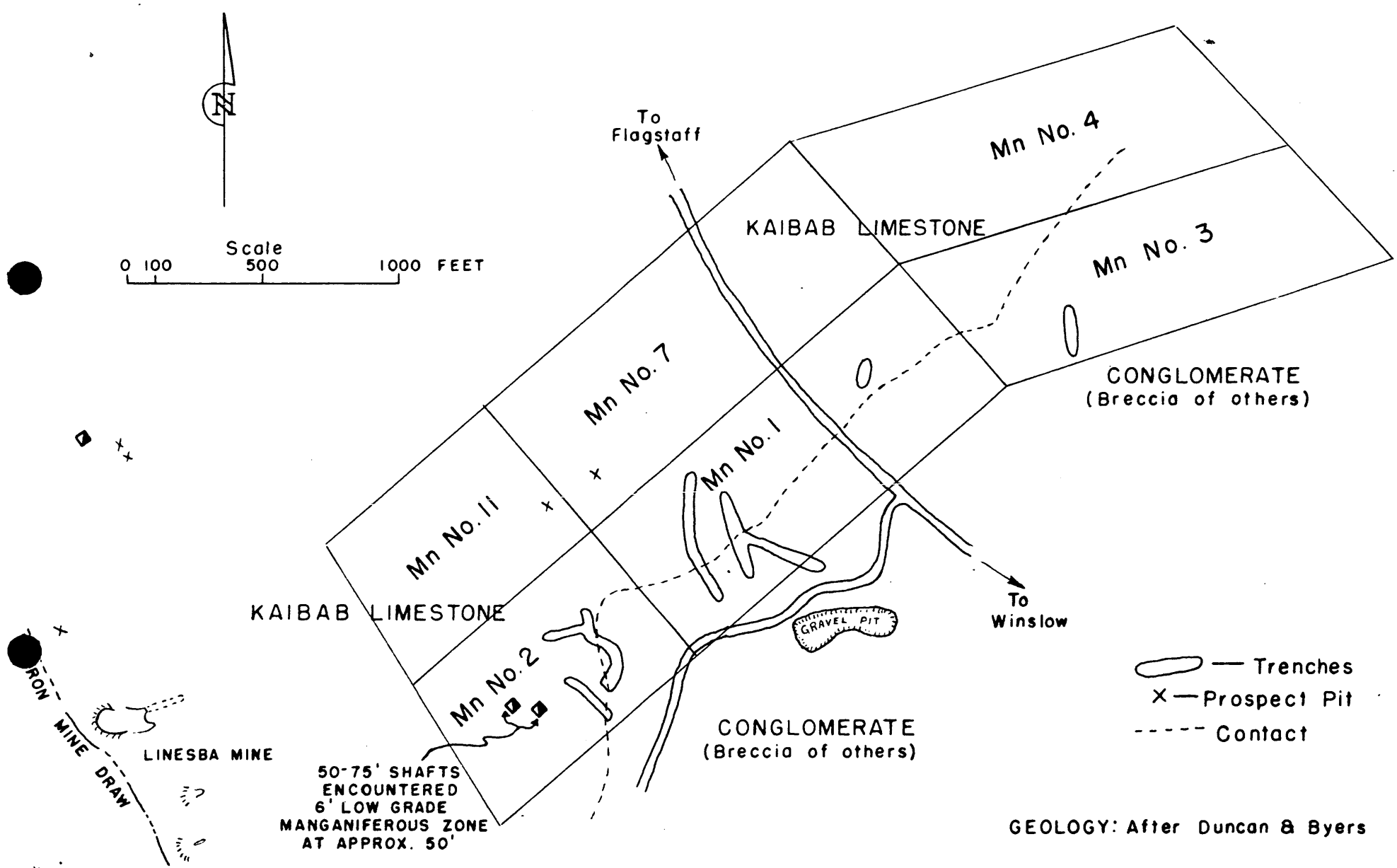

FIG. 3 — GENERALIZED GEOLOGIC MAP, SHOUP MANGANESE CLAIMS
COCONINO CO., ARIZONA DMEA 2465

6-1-52

it is felt that the targets, as indicated by past mining, are too small to be found satisfactorily except by a prohibitive amount of drilling.

ORE RESERVES

Little direct data are available on which to base ore reserve estimates on the Sheup claims. In the general area of Iron Mine Draw numerous pits have yielded from a few tons to several tens of tons, and one deposit on the Linscha claims has produced several hundred tons. Total production from the district to date (May, 1952) has not much exceeded 4000 tons of ore averaging 35-50 percent manganese. Of this small production only 250 tons have come from the Sheup claims.

Duncan and Byers[6] after a rather thorough investigation of the district made the following estimate (1941):

	Tons 40-48% Mn	Tons 25-35% Mn
Measured	150	300
Indicated	1800	2000
Inferred	2000	2000

Only a small part of these reserves could be attributed to the Sheup claims, the largest portion being attributed to the Linscha claims. Since the time of the examination about 2000 tons of manganese ore have been shipped from the Long Valley area, and most of this has been from the Linscha claims. Reserves have not been increased by this work. It is inferred on the basis of past production from Sheup's claims in comparison with that of the district and from the limited showings that the magnitude of the reserves of 25-50 percent manganese ore on Sheup's claims would approximate 500-1000 tons.

6/ Op. cit., p. 12.

GEOLOGIC CONCLUSIONS

Several factors make discouraging any systematic exploration of the Shoup claims. These are (1) the small size of the potential targets and their scattered nature, (2) the lack of a feasible method of exploration, and (3) the fact that the inferred manganiferous zone in which the high grade "hot spots" are erratically distributed does not outcrop on the applicant's claims but is at an approximate depth of 50 feet making test pitting for the small bodies expensive.

Drilling as proposed by the applicant, and to the amount he is able and willing to participate, would have little chance of making a discovery, and any discovery made probably would not be significant.

It is recommended, therefore, that the loan be denied because of the small size of the deposits, and lack of a practical method of exploration for these small scattered bodies.

DMEA-2463, SKOUP'S MANGANESE PROPERTY
LONG VALLEY MINING DISTRICT
COCONINO COUNTY, ARIZ.

Engineering Report

By John H. Soule'
Mining Engineer
U. S. Bureau of Mines

May 1952

DMEA-2465, SHOUP'S MANGANESE PROPERTY
LONG VALLEY MINING DISTRICT
COCONINO COUNTY, ARIZ.

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History and production — 4
Ownership and extent — 6
Description of deposits — 6
Ore reserves — 7
Present status — 9
Proposed exploration — 11
Conclusions — 12
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INTRODUCTION

Manganese deposits have been known in the Long Valley area of southern Coconino County, Ariz. for many years and interest has been manifest in these deposits at various times. Some production has resulted in times of high manganese prices. In addition to examinations by private engineers and geologists, the area has been examined and reported upon by members of Federal and State agencies.

E. L. Jones, Jr. and F. L. Ransome have described the area in U. S. Geological Survey Bull. 710-D, 1920. E. D. Wilson and G. M. Butler mention the area in University of Arizona Bulletin No. 127, 1930, the material being taken largely from the preceding publication. Since that time visits were made by J. E. Bell, U. S. Bureau of Mines, in March and September 1940; by Charles M. Johnson, U. S. Bureau of Mines, and Charles B. Hunt, U. S. Geological Survey, in October 1940; by Harold D. Zwoldt, U. S. Bureau of Mines, who took metallurgical samples in June 1941; and by D. C. Duncan and F. M. Byers, U. S. Geological Survey, who spent nearly 2 weeks in August 1941 studying and mapping the area. The results of metallurgical testing by the Bureau of Mines is contained in the files at Tucson, Arizona.

Dr. L. E. Shoup of Prescott, Arizona located some claims in the district in 1939 and recently applied for Government assistance under the Defense Production Act in exploring part of his property. The

application, Docket DMEA 2465, proposed diamond drilling a number of holes at a project cost of $5,000. The application was sent to the field for an examination of the property. This examination was made on April 23, 1952 by C. S. Bromfield, U. S. Geological Survey and J. M. Soule', U. S. Bureau of Mines. The engineering aspects of this examination are reported herein.

ACKNOWLEDGMENTS

Acknowledgment is due to Dr. L. E. Shoup, owner of the property and the DMEA applicant, for showing the examining engineers over the property. Acknowledgment also is made of material derived from published and unpublished reports by personnel of the U. S. Geological Survey and the U. S. Bureau of Mines.

LOCATION, TOPOGRAPHY AND PHYSICAL FEATURES

The Long Valley manganese deposits are situated in the Long Valley Mining District, southern Coconino County, Arizona. Most of the claims located by L. E. Shoup form a contiguous group which centers about the common corner of secs. 19, 20, 29, and 30, T. 14 N., R. 10 E. The group strikes northeasterly and southwesterly. The claims of special interest in the exploration project are located at the southwestern end of the group and are wholly within the NE¼ of sec. 30 of the above township, as shown in figures 1 and 2.

The property is reached by travelling to Long Valley and the Flagstaff, Winslow, Pine road junction 59 miles southeasterly from Flagstaff, Ariz., 55 miles southwesterly from Winslow, Ariz., or

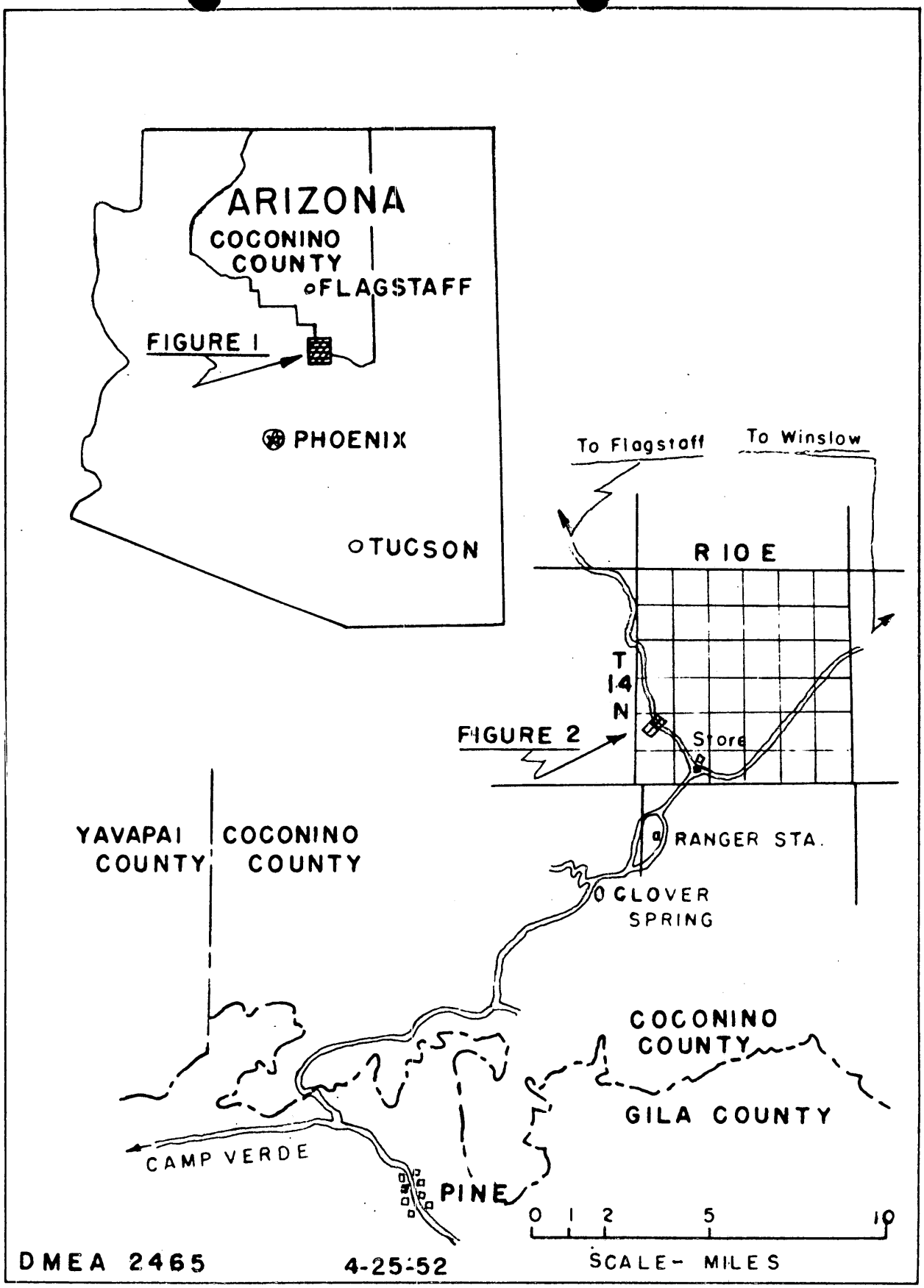

FIGURE 1, LOCATION MAP, L.E. SHOUP MANGANESE

COCONINO COUNTY, ARIZONA

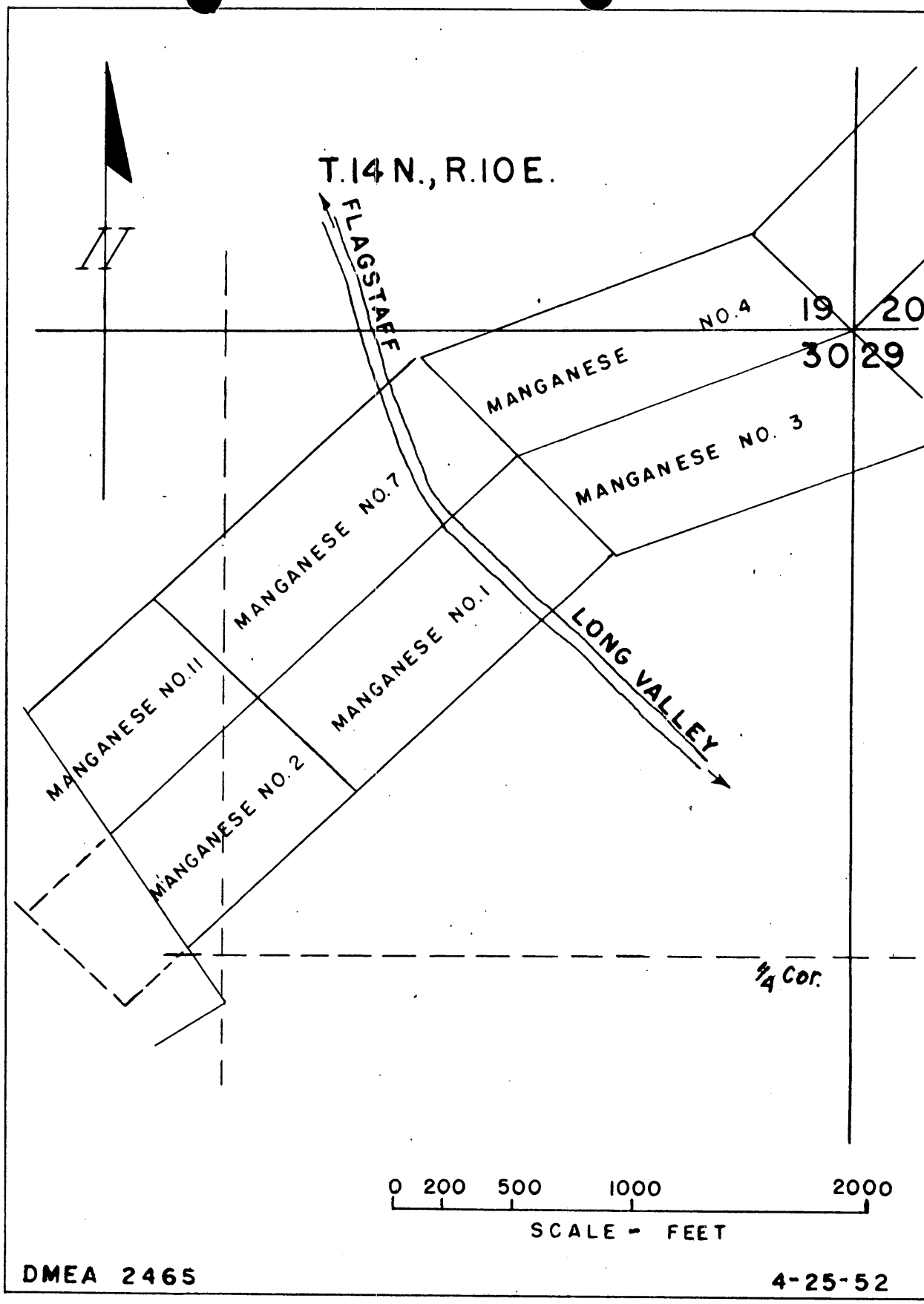

FIGURE 2- PARTIAL CLAIM MAP, SHOUP MANGANESE

25 miles northerly from Pine, Ariz. From this junction, travel northwesterly for 1.75 miles toward Flagstaff (see figure 1). The most interesting deposits lie southwest of this point within a mile or so of the road. Much of the terrain can be traveled by automobile during dry weather. Such travel is not recommended when the ground is wet.

The topography of the area is not rugged but becomes increasingly so to the south and west, where steep cliffs mark the Mogollon Rim. The property is at an elevation of about 7,000 feet. The relief can be measured in a few tens of feet.

Precipitation averages about 24 inches annually, in part as heavy summer thunder showers and in part as heavy winter snows. Both conditions hamper transportation, especially the winter snows if the roads are not maintained. Temperatures are delightful in the summer but become severe with considerable sub-zero weather in the winter.

There are no permanent streams in the immediate area. The depth of the water table is unknown but may be shallow. A small amount of water is available at Flint's Well at the road junction 1.75 miles southeast of the property, and a larger supply is available at Clover Springs about 7 miles south of the property (figure 1).

The country is heavily forested with large stands of Ponderosa pine, and subordinate oak and other forest flora. Much of the timber is suitable for mining purposes.

Living accommodations are primitive and consist of one small shack on the Shoup property, with others in varying states of disrepair nearby. Minor supplies are available at Flagstaff and Winslow, but major mining equipment probably is available no closer than Phoenix, Ariz.

The nearest railroad points are at Winslow and Flagstaff, both on the main line of the Atchison, Topeka, and Santa Fe Railroad. Both cities are about 57 miles from the deposits, but the highway grades favor trucking to Winslow, although some of the road to Flagstaff is paved. Trucking to Winslow also would be advantageous in shipping ores to eastern markets. Trucking to Flagstaff would be advantageous in shipping ores to western markets. Freight, express, telephone, telegraph and postal services are available at both Flagstaff and Winslow.

HISTORY AND PRODUCTION

The early history of the manganese deposits of Long Valley are unknown other than that they have been known for a long time and that some work was done in the past. Some manganese was shipped from the area during World War I and again from 1927 to 1930. Interest was revived in the district in 1939 and sporadic production resulted.

The Humphries Gold Corp. did considerable trenching with power equipment early in 1941 but evidently lost interest in the deposits and withdrew from the area. J. Reed Dennison and associates of Batesville, Ark. became interested in the area from 1940 through 1949, and shipped some ore to various markets.

Although considerable manganese has been mined from the Long Valley deposits, reliable production figures are lacking. The following table contains material derived from various sources, some of which may be of doubtful value. How much of this production was derived from the Shoup group of claims is undeterminable, but from the extent of the mine workings the production must have been small. Shoup claims that 5 cars, or about 250 tons of ore containing 40-50 percent manganese were mined and shipped from his property. This figure seems reasonable.

TABLE I. Production - Long Valley Manganese District.

Year	Source	Long Tons	Grade
Before 1918		?	?
1918	Duncan & Byers, U.S.G.S. Con. Rept.	33	50
1918	" " "	750	35
1927-1930	Wilson & Butler, U. A. Bull. 127	216	+ 45
1939	Mentschel Private Report	600	?
1940	J. Reed Dennison Statement of Facts	200	
1941	" " " "	150	
1942	" " " "	600	
1943	" " " "	600	
1944	" " " "	100-200	
1945	" " " "	100-200	
1946	" " " "	100-200	
1947	" " " "	100-200	
1948	" " Letter	150	
1949	" " "	165	
	Approximate total	4,064	

As nearly 2,500 tons of manganese ore were produced from Long Valley since 1939, the 250-ton production from the Shoup property constitutes about 10 percent of the production since that time.

J. Reed Dennison in a letter states that his company shipped 2,250 tons of manganese ore from the Long Valley and Weber districts for 6 years prior to 1947. Only 75 of these tons were derived from the Weber deposits and the remainder from Long Valley.

From the above table, it seems that the total production of manganese ore from the Long Valley district totals approximately 4,000 tons.

OWNERSHIP AND EXTENT

Dr. L. E. Shoup, Bank of Arizona Bldg., Prescott, Ariz., became interested in the Long Valley manganese deposits and located his first claims in 1939. He now holds 14 unpatented but surveyed claims. At least 10 claims of the group are contiguous and are named the Manganese 1-10. The names and locations of the remaining 4 claims are unknown. Only 4 of these 10 Manganese-named claims, Manganese 1, 2, 7, and 11, were considered in the application for exploration assistance (see figure 2).

DESCRIPTION OF DEPOSITS 1/

The manganese deposits of Long Valley are of three general types. These are (1) nodules and irregular masses of psilomelane in soil or clay-filled pockets on the surface of the flat-lying Kaibab limestone;

1/ Bromfield, C. S., U. S. Geological Survey

(2) More or less bedded deposits in Kaibab limestone, containing nodules and irregular masses of psilomelane; (3) irregular coatings, nodules, and replacements in the conglomerate. The first and second types have yielded nearly the entire production of the district; the last type is relatively unimportant, and has yielded little ore.

The largest deposit in the Long Valley district is of the bedded type and was found where the manganiferous zone outcropped along Iron Mine Draw. This deposit is on the Linesba claims adjoining the Shoup claims on the southwest. It was up to 6 feet thick, 125 feet across, and produced several hundred tons. Two 50- to 75-foot shafts on the Shoup claims have intersected a low-grade bedded manganiferous zone having a thickness of 6 feet at a depth of 50 feet. Cursory examination suggests that the zone may be the same as the zone that outcrops along Iron Mine Draw. The applicant proposes to explore this zone for commercial deposits of manganese.

The bodies discovered to date are small and irregular in distribution, but the grade is good, commonly 40 to 50 percent manganese.

ORE RESERVES

There are little data upon which to compute ore reserves for the Shoup group of claims. The following estimates from confidential sources are based upon the best information available. They pertain to the district.

TABLE II. - Ore Reserves - Long Tons, Estimated 1941.

	Manganese, 40 to 48 percent	Manganese, 25 to 35 percent
Measured	150	300
Indicated	1,800	2,000
Inferred	2,800	2,800
Total	4,750	5,100

Bell of the Bureau of Mines (1940) noted very substantial reserves. Ewoldt of the Bureau of Mines (1941) estimated the district reserves at 400 tons of measured and indicated ore containing more than 40 percent manganese and about 4,000 tons of manganese-bearing material containing less than 40 percent manganese.

Using the reserves shown in the above table and subtracting the production since 1940, about 7,300 tons of reserves remain unmined. Using the approximate 10 percent ratio of production between the Shoup production and the district production, there may be 730 tons of ore reserves of all categories on the Shoup claims. As past production was made largely or wholly from plus 40 percent material, the following table approximates the reserves on the Shoup claims.

TABLE III. - Shoup Ore Reserves - Long Tons.

	Manganese, 40 to 48 percent	Manganese, 25 to 35 percent
Measured	10	30
Indicated	80	200
Inferred	130	280
Total	220	510

The average grade of the 730 tons is estimated to be 34 percent manganese, based on a grade cutoff of 25 percent and assuming an even distribution of the manganese throughout the various grades. By using a 33 percent grade cutoff, the reserves are reduced to a total of 320 tons of ore containing 41 percent manganese.

It seems evident that past operations were confined to mining the known reserves and that no exploration was done other than that done in the process of the mining. In other words, the reserves have not been increased since the above estimates were made.

That the district contains no large near surface deposits of low-grade manganese ore was proven by the trenching done by the Humphries Gold Corp. early in 1941.

PRESENT STATUS

The Shoup manganese property, as well as other properties in the district, is not being worked at the present time. Development on the Shoup claims consists of large trenches, small shallow pits, and 2 shafts about 50 feet deep. The shafts are in poor condition.

The manganese ores occur in small, generally detached bodies and no systematic development seems possible. Mining must be done by "gophering" methods and the ore may be followed to depths up to 50 feet. This necessitates a number of small shallow shafts to adequately develop the ore, which in turn, indicates small relatively primitive surface plants. Elaborate plants are not justified by present knowledge of the deposits. The following short economic study is based

upon early 1952 conditions and prices of manganese being paid at the Deming stockpile. Sorting will be necessary to bring the shipments to a marketable grade.

Costs - Per Ton of Ore

Truck freight to Winslow	$6.84
Railroad freight to Deming, New Mex.	9.91
Mining, sorting and loading	25.00
Total	$41.75

As $43.15 is being paid at the Deming stockpile for 33 percent manganese ores, this is the minimum grade that can be profitably shipped. If a stockpile is established at Aguila, Ariz. rail freight may be reduced by $5.13, making a total cost of $36.62. Under these conditions, ore of 31 percent grade may be mined and shipped profitably, ignoring equipment and depreciation costs. The following short economic summary will approximate the results that would be obtained in operating the property and shipping the ore to the Deming stockpile:

TABLE IV. Economic Summary.

Mining, sorting, shipping 730 tons @ $41.75	$30,477.50
Value of ore at stockpile, 730 tons @ $46.00	33,580.00
Apparent profit, less depreciation	$3,102.50

An additional $3,744.90 may be realized if a stockpile is established at Aguila, making a total apparent profit of $6,487.40. From this sum must be deducted the equipment costs, overhead, depreciation and taxes. Judging from the above, it seems that the simplest method of exploration would be by mining the existing reserves and by continued mining if the ore bodies should continue beyond the expected limits.

PROPOSED EXPLORATION

The project proposed by L. E. Shoup, the applicant for Government assistance in exploring his Long Valley manganese property, was to consist of core drilling 14 holes averaging 60 feet in depth. The total 840-foot drilling project was to cost $8,000. This proposal cannot be recommended for the following reasons:

1. The known manganese ore bodies are relatively small in size and are generally detached so a large number of holes would be necessary to properly sample the area. The ore bodies present too small a target for drilling.

2. The ground consists of interbedded limestone and sandstone. The limestone should give but little trouble in drilling but the sandstone is friable and no core could be expected. Also the wad ore or manganiferous sandstone will not core satisfactorily. There is no assurance that sludge samples can be taken as water loss could occur in such a formation. However, the main objection to sludge samples would be the salting of the sample by caved material. This salting could be serious when the material caves readily and the zone to be sampled is likely to be small in extent normal to the drill hole.

3. The substitution of churn or wagon drilling for diamond core drilling raises the same objection that pertains to the taking of sludge samples. In addition, neither of these methods is sensitive enough to accurately sample possible thin bodies of manganese ore.

The slight moisture content of the rocks would prevent the use of a wagon drill in dry sampling the deposits.

As the Long Valley deposits may have yielded as much as 4,000 tons of manganese ore, and because drilling results would prove unsatisfactory, a possible method of exploration would consist of geophysical surveying, followed by testpitting on selected anomalies. The best results probably would be obtained by gravitational methods using a gravimeter. Such a survey could be done rapidly and at a relatively low cost. However, the Shoup property constitutes such a small part of the known mineralized portion of the district that to confine such work to the property would be unwarranted.

CONCLUSIONS

The following conclusions are derived from an examination of the L. E. Shoup manganese claims in the Long Valley mining district and from a study of available information pertaining to the district:

1. Although about 4,000 tons of manganese ore have been produced from the district, only a small part was derived from the Shoup claims which contain only small ore reserves.

2. The expectancy of finding ore bodies larger than those already mined is small.

3. The known ore bodies are small and detached. High mining costs are usual in the district and are increased when mining the deeper ore bodies such as exist on the Shoup claims.

4. Probably the best method of exploring the deposits would be, as practiced in the past, by mining outcrops and following the ore to depth.

5. The exploration project proposed by the applicant cannot be approved because the possible ore bodies present small targets necessitating an excessive amount of drilling, and because questionable results would be derived from any drilling.

6. A district geophysical survey, followed by test pitting of selected anomalies, might be warranted but the Shoup claims constitute too small a portion of the productive part of the district to warrant a separate project.

RECOMMENDATIONS

Based on the preceding conclusions, it is recommended that L. B. Shoup's application for Government assistance, Docket DMEA-2465, be denied.

UNITED STATES
DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION
WASHINGTON 25, D. C.

224 New Customhouse
Denver 2, Colorado

March 28, 1952

Memorandum

To: Administrator, Defense Minerals Exploration Administration
Attention: Code 210

From: Executive Officer, Field Team, Region IV

Subject: Docketing for Exploration Assistance

Enclosed in duplicate are the applications and Forms 3a pertaining to the following applications for Government assistance in exploration work:

Dr. L. E. Shoup
Bank of Arizona Bldg.
Prescott, Arizona — DMEA-2465

Robert E. Williams
P. O. Box 25
Norwood, Colorado — DMEA-2464

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Arizona Metals Co.
P. O. Box 1266
Kingman, Arizona — DMEA-2463

J. H. East, Jr.

J. H. East, Jr.

Enclosures:

Returned to Field - One copy each MF-103 and 100 with attachments and
DMEA-2463 - exhibits "A", "B" (2 maps), "C", "D", "E", and "F".

DMEA-2464 - One copy MF-103 & 100 with attachments and Agreement, and Mining Lease.

DMEA-2465 - One copy MF-103 & 100 with attachments and one map.

Sd

Form MF-103
(Revised June 1951)

UNITED STATES DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Budget Bureau No. 42-R1035.1.

MF-103 Should Be Filed With General Technical Data Form MF-100

APPLICATION FOR AID FOR AN EXPLORATION PROJECT PURSUANT TO MINERAL ORDER 5, UNDER DEFENSE PRODUCTION ACT OF 1950

Not To Be Filled in by Applicant

Docket No. DMEA-2465
Metal or Mineral
Date Received 3-31-52
Amount $
Participation (Government %)

Name and address of applicant

L. E. Shoup,
Bank of Arizona Bldg,
Prescott, Arizona.

Date Feb 28, 1952.

If you have already filed MF-100, give date filed ....., type of assistance requested .....,

DMA Docket Number (if available) .....

INSTRUCTIONS

Read Mineral Order 5, Regulations Governing Government Aid in Defense Projects, before completing this application. Submit four copies each, of the signed application form, General Technical Data Form MF-100, and answers to questions as specified, to Defense Minerals Administration, Department of the Interior, Washington 25, D. C., or to the nearest field executive office thereof, with your name and address on each sheet of the application and all accompanying papers. If you have previously filed MF-100, it is not necessary to file it again. However, you should indicate in space provided above the type of assistance previously applied for (loans, procurement contracts, etc.) and DMA Docket Number, if available. *When a question is inapplicable it should be so stated in the form.* Additional sheets should be attached in answering any questions or in supplying additional information. IF YOU CANNOT ANSWER A QUESTION, SO STATE.

1. (*a*) Give a description of the real property that will be in any way involved in the exploration project, including any existing mine or operating property.

   (*b*) If you are not the owner of the property, submit a copy of the lease, purchase option, or other agreements under which you are authorized to operate the property with each copy of your application.

   (*c*) Give the legal description of the exact parcel, plot, or area upon which the exploration is to be conducted.

   NOTE: (1) If both areas are the same, so state. The only obligation to repay the Government is from the net earnings from any commercial discovery made in the area specified in (*c*) above in which the exploration is to be conducted, and the expenditure of funds which may be charged as costs of the project must be limited to that area or to work necessary to perform the exploration in that area.

   (2) If applicant is not the owner of the property or if there are any liens or encumbrances against the property, copy of agreements of claimants, lienors, encumbrances, and lessors subordinating their interests in the property to the interest of the Government under the Exploration Project Contract will be required for attachment to the Contract.

2. (*a*) What metals or minerals do you expect to find?

   (*b*) Furnish statement of the geologic features of your property, giving type of ore deposit and reasons for expecting to find commercial ore bodies. Illustrate with maps or sketches. If you have a geologic or engineering report, or assay maps showing width and grade, please send them with application, stating whether or not you wish to have them returned.

DEPARTMENT OF THE INTERIOR
Defense Minerals Administration
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The information requested in questions 3, 4, 5, 6, 7, 8, and 9 below should be answered specifically and in detail, as this information will be attached to and incorporated as part of the Exploration Project Contract, if such contract is entered into with you by the Government.

ANSWER EACH QUESTION ON SEPARATE SHEETS OF PAPER AND SUBMIT A COPY OF EACH ANSWER FOR EACH COPY OF YOUR APPLICATION.

3. (*a*) Describe fully the proposed work and give the total cost of the project.

   (*b*) State the time required to start the project and to complete it.

4. Submit a map or sketch of the property involved showing a plan (and cross section, if needed) of the present mine workings and the *location of the proposed exploration work* as related to geologic features, such as contacts, veins, ore-bearing beds, etc.

5. Furnish an itemized list of existing facilities, buildings, installations, and fixtures with a statement of the cost of any necessary rehabilitation or repairs to put into useful and operable condition.

6. Furnish a detailed list of additional facilities, buildings, and fixtures to be purchased, installed, or erected by you, with the estimated cost of each item.

7. Furnish a detailed list of operating equipment, separated into items to be—

   (*a*) Rented

   (*b*) Purchased

   (*c*) Furnished by you

   with the rental, purchase price, or depreciation of each item, as the case may be, to be charged as a cost of the project.

8. Furnish an itemized schedule of labor, by numbers and classes (miners, muckers, etc.) and of supervisors by numbers and positions, with the maximum wages or salaries to be paid to each.

9. Furnish a detailed list with estimated cost of each item for materials, supplies, engineering, assaying, accounting, power, water, utilities, and any other items not provided for above.

10. (*a*) How much are you prepared to invest in the proposed project?

    (*b*) Is this amount sufficient to pay your part of the cost of the project, in accordance with the regulations on Government participation (Sec. 9 of MO–5)?

11. State any conditions or circumstances regarding the property not sufficiently brought out by the foregoing questions.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

(Name of company)	By L. E. Shaw (Signature of authorized official)
July 28 – 1952 (Date)	Owner (Title)

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

U. S. GOVERNMENT PRINTING OFFICE 16—64067-2

L. E. Shoup,
Bank of Arizona Bldg,
Prescott, Arizona.

Feb 28, 1952.

Attach to Form MF-103.

1. (a) Property is located in the Long Valley Mining District, Coconino County, Arizona. Township 14 North, Range 10 East, Section 30. The actual claims involved will be Mangenese #1, Mangenese #2, Mangenese #11, and Mangenese #7. Survey map of property inclosed.
   (b) I am the owner of the property. There are no leans or encumbrances aginst the property.
   (c) Same as (a) above.

2. (a) Mangenese ore.
   (b) Mangenese has been mined on surface and shallow pits by Mr Denison who had my property leased during war. There is a blanket formation of mangenese deposit at approximately fifty feet depth on my property that has never been developed but which has been proven by me in the last two years by shaft work. A sandstone layer at this depth carries or is peplaced by the deposits of mangenese ore.
   These deposits of ore are not continuous but according to ore mined in side of canyon on property below mine and on the same level as the fifty foot on my property there is some good large deposits. One deposit opened up where it was over seven feet thick and ran 46, 47, 48, and 49% Mn. There was twenty five or more car loads shipped from this one ore body. The Burea of Mines have in the past examined the whole district and made reports on same. These reports are on file in Washington , and I beleive a copy of same is on file at the Bureau in Tucson Arizona. I could never get a copy of the peport. J.E.Bell I beleive made one report. I was also told by Mr Denison that the Bureau intended diamond drilling the whole district, but the Korean war then started and nothing was done. No Bureau of Mines Engineer has been on the ground since I put down shafts and proved there is a blanket layer of mangenese deposit at this depth.
   The Bureau also tooklarge samples of ore from my ground and ajoining properties and tested them at Salt Lake City, then pute out a Report of Investigation R. I. 4140, Concentration of Mangenese Oxid Ores from the Long Valley Mining District, Coconino County, Arizona. I got a copy of same from Pittsburgh. These large samples were surface ore and contained more silica than the ore that comes from depth. The ore that will be developed on this fifty foot level will be a better all around grade of ore.

3. (a) The proposed work will be diamond drilling, assaying, and Engineers report, also accounting. The diamond drilling to be done by contract at $5.00 per foot (this price was given me by a diamond drilling contractor) and each hole will not be over sixty feet depth which will be $300.00 per hole. I estimate fourteen holes and $4.200.00 for same. I also estimate $800.00 for Engineers report, assaying and also the accounting.
   Will have to have several complete analysises of the ore besides several assayes for Mn content alone. The diamond driller is an Engineer and will also make the report. The total cost not to exceed $5.000.00.

L. E. Shoup

L. E. Shoup.
Bank of Arizona Bldg,
Prescott, Arizona.

Feb 28, 1952.

Attach to Form MF-103.

(b) The work can be started within thirty days and will be completed within sixty days from date of starting.

4. Map inclosed, all holes will be done on Mangenese #1, 2, 7, & 11, mostly on #1, and #2 claims. An Arizona State mining Engineer and the Engineer doing the diamond drilling along with a Bureau Engineer will determine the exact location to drill the holes on these claims.

5. Have one 14 by 20 foot cabin on property that can be used by men doing work at no cost.

6. Does not apply.

7. Does not apply. All work done by contract. We furnish nothing.

8. Does not apply.

9. Stated above in 3.

10. $1,250.00
(b) This will pay my part of the project.

11. There has been some fifty cars of ore shipped from the ajoining property and my property by Mr Denison. This ore was taken mostly from surface and shallow workings. My property had never been opened up on the fifty foot level untill I put down two shafts and proved there is ore on this level in blanket formation. This diamond drilling project should definately determine the extent and size of the ore bodies. The property extends on each side of an improved highway so there will be no expense for road work.

L. E. Shoup

Form MF-100
(May 1951)

U. S. DEPARTMENT OF THE INTERIOR
DEFENSE MINERALS ADMINISTRATION

Form approved.
Budget Bureau No. 42-R1026.

GENERAL TECHNICAL DATA FOR USE UNDER THE DEFENSE PRODUCTION ACT OF 1950

NOT TO BE FILLED IN BY APPLICANT

Docket No. DMEA-2465

Date received 3-31-52

L. E. Shoup,
Bank of Arizona Bldg,
Prescott, Arizona.

Name and address of applicant

Date Feb 28, 1952.

INSTRUCTIONS

This form is to be filed with Defense Minerals Administration, Department of the Interior, Washington 25, D. C. It should be accompanied by appropriate application form when a specific type of Government assistance is requested, in the form of (1) loan, (2) purchase contract, (3) Government guarantee of a private loan, (4) priorities or allocation of mining equipment, and maintenance, repair and operating supplies, and (5) other forms of Government assistance that might arise under the Act. Submit four (4) signed copies of the form and accompanying papers. Name and address should be stamped or typed on each sheet of this form and all accompanying papers. *When a question is inapplicable it should be so stated on the form.* Additional sheets may be attached in answering any questions or in supplying additional information. (IF YOU CANNOT ANSWER A QUESTION, SO STATE.) If a question is answered elsewhere indicate where answered. It is not necessary to answer it again.

GENERAL TECHNICAL DATA

Supply the following information on separate sheets, arranged, numbered, and lettered as indicated:

1. Materials produced:
   (*a*) What are the chief mine, mill, or smelter products?
   (*b*) What are the byproducts, if any?
2. Name(s) and type(s) of mine(s), mill(s), smelter(s), refinery(ies), pit(s), quarry (ies), drilling operation(s). Include old names of property, if any. Show extent of workings, including the following:
   (*a*) Linear feet of shafts.
   (*b*) Linear feet of drifts and crosscuts.
   (*c*) Linear feet of tunnels or adits.
   (*d*) Linear feet of other mine openings (explain briefly).

   Indicate whether mine is flooded or not. Describe any pumping problems. Give size or productive capacity.
3. For each operation listed above supply the following:
   (*a*) Distance and direction from nearest town and shipping point.
   (*b*) Mining district.
   (*c*) Township, Section, Range.
   (*d*) County, State.

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4. (*a*) State whether or not property is now in operation, and if in operation, by whom operated.
   (*b*) Are you operating this property as:
   ☐ Owner.
   ☐ Lessee.
   ☐ Contractor.
5. Number of years in production _____

   If not in production or operation, estimated date when production will begin _____
6. Experience of operators:
   Describe the mining and general business experience of (*a*) the applicant, and (*b*) the person or persons who manage the project.
7. History:
   (*a*) Give a statement, as complete as possible, of previous exploration, development, operation, and production of property, with reasons for suspension of operation.
   (*b*) State briefly the known history and production of adjoining and neighboring properties.
   (*c*) Furnish any available (private) reports that may apply to this application, including results of mine examinations, recommended exploration and development, and metallurgical investigations.

8. Names and addresses of Officers, Directors, or Partners, and in addition thereto, the five largest stockholders if applicant is a corporation.

Name and Address (a)	Official Title (If officer is also director indicate by "D") (b)	Total of Annual Salary, Commissions, Bonuses, Etc., Received From Applicant and Affiliates During Last Fiscal Year (c)	Estimated Net Worth Outside of Interest in Applicant (d)	Number of Shares Held in Applicant Corporation		Life Insurance Carried for Benefit of Applicant	
				Common (e)	Preferred (f)	Amount (g)	Net Cash Surrender Value After Loans (h)
	Total		x x x x x			x x x x x	x x x x x

If more lines are needed continue on separate sheet.

9. Capital Stock Issues:

For Corporate Applicants

Item	Authorized (a)	Outstanding (b)	Par Value (c)	Number of Shares Outstanding (d)	Dividend Rate Last Paid* (e)
Common stock	$	$	$		
Preferred stock	$	$	$		

*Indicate period covered.

10. Production:

Item	Kind of Product (a)	1948 Total (b)	1949 Total (c)	1950 Total (d)	Present Average Monthly (e)
1. Quantity of product mined or quarried (Short, long, metric tons; barrels; pounds; etc.)					
2. Quantity of product processed (specify unit of measure and type of process)					
3. Quantity and grade of product sold or shipped (specify units of measure)					

11. Do you contemplate a change in the present average monthly rate of production? If so, state estimated maximum monthly production and basis of change.

12. Ore or Mineral Reserves:

(*a*) Describe the ore or mineral deposit briefly. Accompany the application by any available report on the geology and ore reserves.

L. E. Shoup,
Bank of Arizona Bldg,
Prescott, Arizona.

Feb 28, 1952

Attach to form MF-100

1. Materials produced:
   (a) Manganese ore.
   (b) No byproducts.

2. The property has always been known as the Shoup Mangenese property.
   (a) Approximately 100 feet.
   (b) No drifting or crosscuts.
   (c) None.
   (d) Some pits and shallow openings on surface.
   There is no water problems. All workings are dry and will be dry in all the proposed development work. Do not know what the productive capisity will be.

3. (a) Fifty seven miles to Winslow, which is the shipping point.
   (b) Long Valley Mining District.
   (c) Township 14 North, Section 30, Range 10 East.
   (d) Coconino County, Arizona.

4. (a) Property is not now in operation.
   (b) Will be operating property as owner.

5. Off and on during war but no production since the war. Hope to get into production this summer if loan is granted.

6. Have had considerable mining experiance over a peroid of twenty years, also general business experience by (a) applicant, (b) the persons who will do the contract work if loan is granted are experienced operators.

7. History:
   (a) This information given on Form MF-103, 2,(b).
   (b) On above form question 11.
   (c) All of this is given on above form under question 2,(b).

8. Does not apply, and questions 9,10,11, and 12 do not apply.

13. Located on good improved highway 57 miles from Winslow, which is the supply and shipping point.

14. There is sufficient year around water supply available for all operations one and one half miles from property.

15. Air compressor furnishes all power required.

16. Does not apply.

17. No equipment on property, none owned and none necessary for this operation. One cabin that can be used by men doing contract work.

18. All information given above or on Form MF-103.

L. E. Shoup

(*b*) If deposit is other than pla

(1) Submit assay plans and/or sections showing location and size of proved (measured) and probable (indicated) ore or mineral reserve.

(2) State the tonnage (indicate type of ton) and grade of each class of ore reserve, as above, and show how computed. Tabulated total ore reserve as follows:

TOTAL ORE OR MINERAL RESERVES

Ore or Mineral Reserve	Estimated Tons (a)	Metal or Mineral Content Per Ton (Grade) (b)	Gross Value Per Ton (c)	Recoverable Unit Value Per Ton (d)	Estimated Cost of Production Per Ton (e)
Measured (proved)					
Indicated (probable)					

(*c*) If placer:

(1) Give estimated total yardage and average marketable mineral content of each deposit.

(2) Submit map showing location of placer deposit and surrounding area, with all test holes or pits. Submit logs of each hole and test pit with depth and average value of each.

(3) Describe gravel, stating whether fine, medium or coarse; loose, tight, cemented, or frozen, and whether it contains stumps or boulders more than 1 foot in diameter; if so, how large, and in what proportion.

(4) Describe bedrock, giving type (granite, sandstone, shale, etc.) and state whether it is hard or soft, smooth, uneven or rough.

(5) Describe overburden, stating whether loose, tight, or cemented; fine or coarse textured; furnish estimate of average thickness and total amount.

(6) Tabulate the reserves using the form outlined above for ore or mineral reserves.

13. Access Roads:

Give road distances to shipping, supply and residence points, stating kind and condition of roads.

14. Water Supply:

State source and quantity of water available for operations and whether sufficient for all seasons of year.

15. Power:

State amount of power used, rate per hour, and source thereof.

16. Labor:

State number and classes (miners, muckers, millmen, etc.) of men employed during a recent representative payroll period.

17. Equipment and Facilities:

Describe present equipment on the property, including buildings. (State condition.) List major pieces of equipment now owned or controlled and in serviceable condition available for this operation.

18. Are there any particular conditions or circumstances affecting your operations that are not described above? If so, explain.

CERTIFICATION

The undersigned company, and the official executing this certification on its behalf, hereby certify that the information contained in this form and accompanying papers is correct and complete to the best of their knowledge and belief.

(Name of company)

By L. E. Shoup
(Signature of authorized official)

Sep 28 - 1952
(Date)

Owner
(Title)

Title 18, U. S. Code (Crimes), Section 1001, makes it a criminal offense to make a willfully false statement or representation to any department or agency of the United States as to any matter within its jurisdiction.

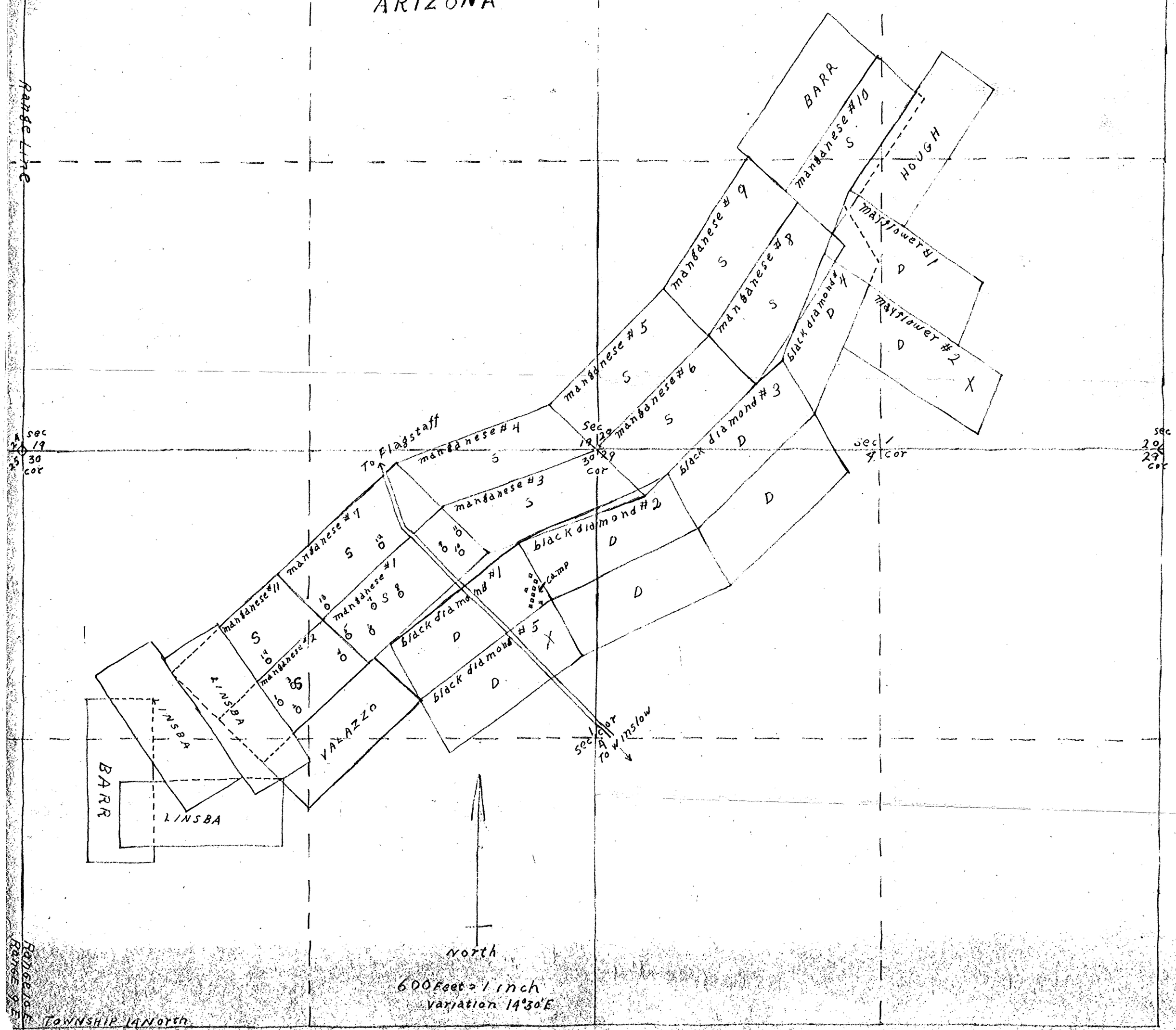
U. S. GOVERNMENT PRINTING OFFICE 16—63792-1

Albany, Oregon

OFFICIAL BUSINESS

C. O. Mittendorf, Administrator
Defense Minerals Exploration Administration
Department of the Interior
Washington 25, D.C.

MAP OF
L. E. SHOUP
LONG VALLEY
MANGANESE CLAIMS,
Coconino National Forest
Coconino County
ARIZONA



The Shoup Claims by the letter S
The Dickerson Claims by the letter D
All others by name of owner.
(J. H. Ratliff) Engineer
30 - Proposed location of diamond drill holes

L. E. Shoup,
Bank of Ariz Bldg.
Prescott,
Arizona.