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November 23, 1954

Mr. Richard Y. Dakin  
400 Montgomery St.  
San Francisco 4, Calif.

To Edward Wisser, Dr.,

To professional services, preparation of report on  
mineral possibilities of Dakin ranch, Mendocino  
Co., California,.....\$350.00

OFFICE REPORT ON POSSIBILITIES FOR COMMERCIAL MINERALS ON DAKIN  
RANCH, MENDOCINO COUNTY, CALIFORNIA

INTRODUCTION

Evaluation of an area in terms of possible commercial minerals can be done only in the field; but field work should be preceded by study of all available information on the area and the region surrounding it. Such a study indicates the rock types to be encountered and the ore minerals to be looked for, thereby saving time in the field, and in some cases eliminating the expense of a field examination because data at hand indicate that chances for ore are too slim to justify the outlay.

No geologic work whatever has been done in the Dakin ranch area; on the Geologic Map of California it lies in a large region marked "unmapped". The area has not been described in any published article. Dr. Olaf Jenkins, head of the California Division of mines, tells me that the general region has been mapped for an oil company, but that the map was not available. The geological departments of the University of California and Stanford University send their students into the field to map particular areas for theses; results of such work are seldom published. Enquiry shows that neither university has had any geologic mapping done in the area in question.

However, several geologists have done enough "car geology" in the Dakin ranch region to furnish a general idea of the geology there; among those questioned are Dr. N. L. Taliaferro of the University of California, an authority on the California Coast Ranges, Mr. Salem Rice of the State Division of Mines, and Mr. <sup>R</sup>Poter Irwin of the U. S. Geological Survey.



The accompanying map shows the known geology of Mendocino County and the territory adjoining it, together with known occurrences of manganese, chromite and quicksilver deposits, the dominant ore deposits of this section of the Coast Ranges.

#### GENERAL GEOLOGY

Manganese, chromium and quicksilver all occur typically or exclusively in what is <sup>o</sup>known as the Franciscan formation; if that formation is lacking at the Dakin ranch, chance for finding any of these metals is practically nil.

Franciscan Formation.- This formation, of Jurassic age, is the typical rock assemblage of the Coast Ranges. The rock type by which it can best be recognized consists of thin-bedded dense chert, varying in color from white to red, brown and green. All manganese deposits of the Coast Ranges are found in chert members of the Franciscan.

The Franciscan contains also dark gray sandstone; igneous rocks, basalt and diabase, dark greenish-gray and commonly called "greenstone"; and finally, irregular masses of serpentine, an altered igneous rock usually green in color and with a soapy or greasy feel. Chromite deposits occur exclusively in serpentine (or in its parent rock, peridotite) and quicksilver deposits are commonly associated with this rock type.

Cretaceous Rocks.- These consist of sandstone and mudstone; no ore minerals, so far as known, exist in these rocks.

Regional Distribution of Franciscan and Cretaceous.- Cretaceous rocks barren of ore, are known to extend at least 10 to 15 miles inland from the Mendocino County coast. All of the manganese, chromite and quicksilver deposits shown on the plan occur in the Franciscan. The area containing these deposits is bounded on the west by a sharp NNW line passing almost through the Dakin ranch. It is thought by Jenkins, Talia-



ferro and Rice that the Franciscan rocks are bounded on the west by a fault, which may coincide with the NNW line mentioned, but which probably lies somewhat west of it, in which case the Dakin ranch would lie within the Franciscan formation. The fault, while as yet speculative, is a likely possibility, for its NNW strike corresponds with that of the San Andreas rift (the "earthquake" fault producing the 1906 earthquake), with the strike of a fault east of Clear Lake, and with that of other faults in the region.

The aerial photo of the ranch strongly suggests the presence of a fault striking NNW and touching the SW corner of the property. The area northeast of the supposed fault, including the ranch, suggests thin-bedded, folded Franciscan, while that southwest of the fault is probably a different rock, either thick-bedded Franciscan sandstone or Cretaceous sandstone.

Thus it is highly likely that the Dakin ranch is underlain by those Franciscan rocks which elsewhere have contained deposits of manganese, chromite and quicksilver.

#### POSSIBLE COMMERCIAL MINERALS ON THE DAKIN RANCH

Quicksilver.— The writer has done considerable work in the Mayacmas quicksilver belt, the northwest end of which is shown on the map. While quicksilver now enjoys the highest price in history (see below), all indications suggest that the productive belt ends to the NW at the Occident and Sulphur Bank mines. Nearly 100 years of prospecting have failed to discover a commercial deposit NW of the present end of the belt; chances for finding quicksilver in the Dakin area appear therefore slim.

Chromite. As shown on the map, important productive chromite mines are lacking in Mendocino County, although many of the deposits shown as prospects have been small shippers. If no serpentine exists on the

ranch, it is a virtual certainty that no chromite exists either.

Manganese.- The chance of finding manganese seems the most favorable of the three. The productive Thomas and South Thomas mines lie only about 10 miles east of the ranch, and the Foster Mountain mine 16 miles northeast of it. Mendocino County has been one of the leading manganese producers of California.

Other Minerals.- Gold and copper in insignificant amounts have been found in the Franciscan formation, as well as some jade in serpentine masses. Chances for finding any of these are negligible.

#### ECONOMICS OF MANGANESE, CHROMITE AND QUICKSILVER

All three are strictly "war babies", mineable at a profit in the United States only in time of war, "hot" or "cold." At present manganese and chromite are being bought and stockpiled by the Federal government; the market for quicksilver is more open, but considerable apparently is being acquired by the government.

Manganese.- All Coast Range manganese deposits are small; the Thomas mine during its major productive period, 1914-1918, produced only 6200 tons of 50% manganese ore. Any manganese ore found would come under the government's small lot program, f.o.b. railroad cars. Under this program ore running 40% manganese or higher is accepted. Price on the basis of 48% manganese ore is \$2.30 per unit. Ore found on the ranch would probably run closer to 40%; assuming a price of \$2.00 per unit for that grade of ore, 40% ore would have a gross value of \$80 per ton (a unit is 1%, or 20 pounds per short ton). Out of this would have to come the cost of mining, sorting and trucking to the Northwestern Pacific Railroad.

Present conditions however cast a cloud over this rosy-looking picture. The present trend toward "peaceful coexistence" with Russia



foretells a slowing down of war preparation expenditures. Further, the deadline for registration in the government purchase programs, June 30, 1954, has passed. Much low-grade manganese ore is being mined, and imports are at a very high rate.

Doubtless if a deposit of good grade manganese ore were found on the Dakin ranch, possibility of marketing it would be thoroughly investigated; but the general present situation of manganese is far from encouraging.

Chromite.- Chromite ore is received by the government at Grant's Pass, Oregon, price paid being \$115 per long ton of lump ore running 48% Cr<sub>2</sub>O<sub>3</sub>; minimum grade received is 42%, but the chromium-iron ratio must be 3 to 1 or better.

Apparently the government is still making contracts for delivery of chromite ore; termination date for this program (end of acceptance of ore) is June 30, 1957.

Quicksilver.- The price of quicksilver is presently the highest in history, nearly \$330 per flask of 76 pounds (\$4.35 per pound). The government guarantees a price of \$225 per flask, over an unknown period but this price is so far below the open market as to be without significance to quicksilver producers. It is rumored that present high prices are due to some newly-discovered hush-hush use for the metal, but the rumor is unconfirmed, and the duration of the extraordinary price cannot be predicted.

#### CONCLUSIONS

The ore mineral most likely to be found on the Dakin ranch is manganese. Unfortunately, it seems rather late in the game to enter the manganese business, even were a promising deposit found. Tightening of the international situation could of course reverse the



trend and restore manganese to its former attractiveness.

I am not optimistic regarding chances for chromite or quicksilver on the Dakin ranch. Since neither metal would be present if serpentine were absent, and since serpentine is easily recognized search for either metal could be eliminated if a brief reconnaissance showed the absence of serpentine. Manganese oxide is also easily recognized; a sizeable body of manganese ore could scarcely escape a rapid reconnaissance either.

The chances for manganese, chromite or quicksilver deposits on the ranch are considered slim; but the matter could be settled by an examination not exceeding two days in length.

Berkeley, Calif.  
November 22, 1954

E. W.  
Edward Wisser



(BRANSCOMB)

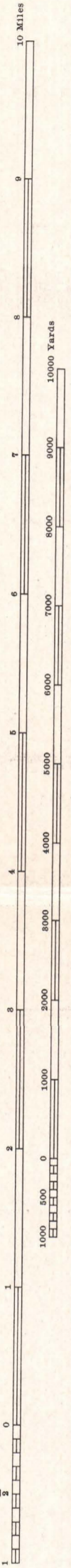
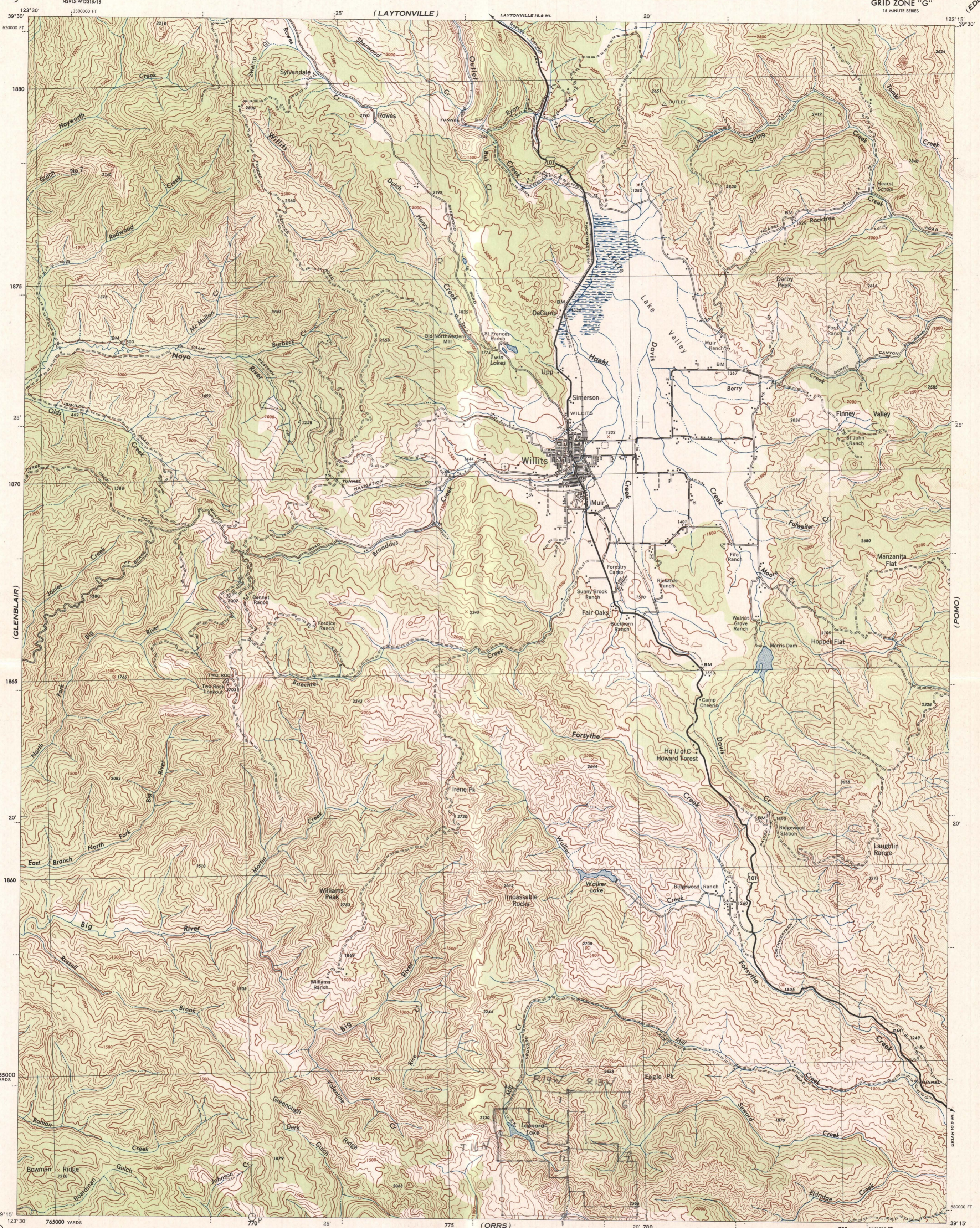
# CALIFORNIA MENDOCINO COUNTY WILLITS QUADRANGLE GRID ZONE "G"

WAR DEPARTMENT  
CORPS OF ENGINEERS, U. S. ARMY

FIRST EDITION - 29E 2

# CALIFORNIA MENDOCINO COUNTY WILLITS QUADRANGLE GRID ZONE "G"

(EDEN VALLEY)

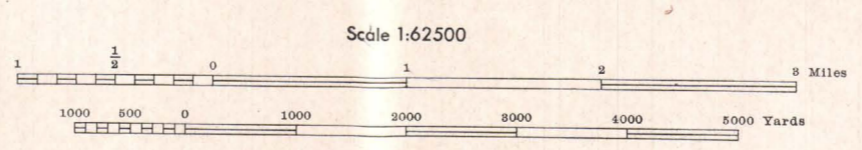


(SADDLE POINT)

Prepared under the direction of the Chief of Engineers, U.S. Army, 1943.  
 Horizontal and vertical control by U.S. Engineer Office, Los Angeles, California, 1942,  
 U.S. Coast and Geodetic Survey, 1942, and U.S. Geological Survey, 1942.  
 Topography by U.S. Engineer Office, Los Angeles, California, 1943,  
 from aerial photographs utilizing photogrammetric plotting equipment.  
 Aerial photography under the direction of U.S. Engineer Office, Los Angeles, California, 1942.  
 This map complies with the national standard map accuracy requirements.  
 Polyconic projection, North American Datum, 1927.

### ROAD CLASSIFICATION 1943

- Dependable hard-surface, heavy-duty road. ————
- Loose-surface graded, dry weather road. ————
- Secondary hard-surface, heavy-duty road. ————
- Secondary hard-surface, dry weather road. ————
- Dirt road. ————
- all-weather road. ————
- U.S. Route. ————
- State Route. ————
- LANE 1 & 2 LANE. ————



Scale 1:62,500

CONTOUR INTERVAL 100 FEET  
 DATUM IS MEAN SEA LEVEL (1929 ADJ.)  
 FIVE THOUSAND YARD GRID COMPUTED FROM "GRID SYSTEM FOR PROGRESSIVE MAPS  
 IN THE U.S." ZONE G, U.S.C. & G.S. SPECIAL PUBLICATION NO. 59  
 (THE LAST THREE DIGITS OF THE GRID NUMBERS ARE OMITTED)  
 CALIFORNIA STATE GRID ZONE 2 IS INDICATED BY DOTTED  
 TICKS OUTSIDE THE NEAT LINE AT 10000 FT INTERVALS  
 NOTE: OFFICERS USING THIS MAP WILL MARK HEREON CORRECTIONS AND ADDITIONS WHICH COME  
 TO THEIR ATTENTION AND MAIL DIRECT TO "THE CHIEF OF ENGINEERS, WASHINGTON, D.C."

APPROXIMATE MEAN DECLINATION 1944  
 FOR CENTER OF SHEET  
 ANNUAL MAGNETIC CHANGE 0.7' DECREASE  
 USE DIAGRAM ONLY TO OBTAIN NUMERICAL VALUES TO DETERMINE MAGNETIC  
 NORTH LINE. CONNECT THE PIVOT POINT "P" ON THE SOUTH EDGE OF THE  
 MAP WITH THE VALUE OF THE ANGLE BETWEEN GRID AND MAGNETIC NORTH,  
 AS PLOTTED ON THE DEGREE SCALE AT THE NORTH EDGE OF THE MAP.

WILLITS, CALIF.  
N3915-W12315 / 15

(UMAH)





MAP OF MENDOCINO COUNTY AND ADJOINING TERRITORY, SHOWING KNOWN DEPOSITS OF MANGANESE, CHROMITE AND QUICKSILVER

0 10 MI.

LEGEND

ROCK FORMATIONS  
 Cretaceous (?) Sandstone, shale etc. KI  
 Serpentine SP  
 Franciscan chert, sandstone etc. Jf

MINERAL DEPOSITS  
 Manganese:  >1000 Tons Shipped  
 <1000 " "  
 Prospect  
 Chromite:  >1000 Tons "  
 Prospect  
 Quicksilver:  Large producer  
 Small "  
 Prospect