Mining districts of Hidalgo County, New Mexico

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INTRODUCTION

Hidalgo County stands second in production of non-radioactive metals among the counties of New Mexico, although far behind Grant County and probably destined to be surpassed by Taos County. Total mineral production is now well over $50 million (Table 1). Of this, nonmetals account for only about $1 1/2 million. Metal production is continuing at a rate between $1 million and $2 million per year.

Although the county has 11 mining districts, over 90 percent of production has come from three underground mines in the Lordsburg district. Copper accounts for nearly 75 percent of the output; gold and silver, largely by-products of copper mining, for 10 percent each. In most years, Hidalgo County has ranked first in gold and silver production in New Mexico and second in copper.

This article is a summary of a bulletin being prepared for publication by the New Mexico Bureau of Mines and Mineral Resources.

HISTORY OF MINING

Prospecting in Hidalgo County began in 1870 but no serious mining could be attempted until the arrival of the Southern Pacific Railroad in 1880. From 1880 to 1893 the emphasis was on precious metals, especially silver. Base metals did not attract much attention until after the price of silver dropped disastrously in 1893. Proximity to smelters at El Paso, Texas and Douglas, Arizona, has favored development of mining in Hidalgo County, especially since much of the copper-silver-gold ore from the Lordsburg district can be shipped directly to smelters as siliceous flux.

TYPES OF ORE DEPOSITS

Three periods of mineralization can be recognized in Hidalgo County (Table 2): (1) Late Cretaceous to early Tertiary (Laramide), (2) Middle Tertiary, and (3) Late Tertiary to Quaternary. Of greatest commercial importance are high-temperature base-metal veins and contact metasomatic deposits formed during the first period in and around porphyritic intrusive bodies. Next in importance are low-temperature gold-, silver-, and lead-bearing veins formed during the sec-

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TABLE 1. SUMMARY OF VALUE OF PRODUCTION OF MINING DISTRICTS IN HIDALGO COUNTY 1870 TO 1961.

<table>
<thead>
<tr>
<th>DISTRICT</th>
<th>Value of production, in dollars</th>
<th>Commodities, in order of importance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1870-1920</td>
<td>1920-31</td>
</tr>
<tr>
<td>Lordsburg</td>
<td>10,000,000</td>
<td>10,000,000</td>
</tr>
<tr>
<td>San Simon</td>
<td>1,300,000</td>
<td>300,000</td>
</tr>
<tr>
<td>Animas</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Caprock Mountain</td>
<td>165,000*</td>
<td>300,000*</td>
</tr>
<tr>
<td>Sylvanite</td>
<td>55,000*</td>
<td>113,000</td>
</tr>
<tr>
<td>Apache No. 2</td>
<td>35,000*</td>
<td>48,000</td>
</tr>
<tr>
<td>Gillespie</td>
<td>40,000*</td>
<td>22,000</td>
</tr>
<tr>
<td>Gold Hill</td>
<td>90,000*</td>
<td>10,000</td>
</tr>
<tr>
<td>Fremont</td>
<td>13,000*</td>
<td>2,000</td>
</tr>
<tr>
<td>Big Hatchet</td>
<td>2,000*</td>
<td>2,000</td>
</tr>
<tr>
<td>Antelope Wells</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>11,643,000</strong></td>
<td><strong>10,374,000</strong></td>
</tr>
</tbody>
</table>

1. all figures rounded off  
2. mainly after 1904  
3. estimate  
4. Mainly before 1904  
5. mainly from Grant county  
6. includes some production from Grant County  
7. Hidalgo County only

Sources of data: U.S. Department of the Interior; State Inspector of Mines; Lindgren, Graton, and Gordon (1910); Lasky and Wootton (1933); and Northrop (1959).
FIGURE 1

Hidalgo County has many features of unusual geologic interest, among them (1) the Lordsburg district, the most important example of the copper-tourmaline class of ore deposits in the United States, (2) several examples of hypogene zoning, especially in the Lordsburg and San Simon districts, (3) the association of contact metasomatic deposits with small bodies of felsite differentiated from larger porphyry bodies rather than with the porphyry bodies themselves, in the San Simon, Apache No. 2, and Fremont districts and (4) the gradation of Plio-Pleistocene managanese and fluorite veins into travertine deposits in the Animas and Caprock Mountain districts.

MINING DISTRICTS

Animas District

The Animas district includes mines on both sides of the Animas Valley in the Pyramid, Animas, and Peloncillo Mountains. Table 3 summarizes the types of deposits in the district.

Antelope Wells District

Antelope Wells is in the southern tip of Hidalgo County. The area has not been organized into a mining district and has no history of production, but small deposits of manganese (psilomelane veins in volcanic rocks) and uranium (uraniferous opal veins in volcanic rocks) have been reported.

Apache No. 2 District

The Apache mine, in sec. 30, T. 28 S., R. 14 W., has accounted for virtually all of the production of the Apache No. 2 district. Between 1880 and 1929 it shipped thousands of tons of low-grade malachite-calcite ore as calcareous flux to the El Paso and Douglas smelters. Total production probably exceeded $100,000. Since 1929, there has been sporadic exploration but only small-scale production. The deposit was formed by contact metasomatic replacement of limestone beds in the Cretaceous U-Bar Formation near a rhyolitic phase of the Apache Hills composite stock. In addition to about 2 percent copper and 3 ounces of silver per ton, the ore locally contains lead, zinc, bis-muth, and tungsten (Strongin, 1957).

None of the other mines in the district have produced as much as $10,000 worth of ore.

Big Hatchet Mountains District

Small limestone-replacement deposits of oxidized lead-zinc-silver ores are present in the Big Hatchet Mountains, but production, if any, has been small. Gypsum occurs in the Epitaph Formation (Permian) and the Hell-to-Finish Formation (Cretaceous) (Weber and Kottlowski, 1959).

Caprock Mountain District

The Caprock Mountain manganese district straddles the Hidalgo-Grant County line. North northwest-trending psilomelane-calcite-opal veins cut late Terti-
TABLE 2. CLASSIFICATION OF MINING DISTRICTS OF HIDALGO COUNTY BY TYPE OF MINERALIZATION

<table>
<thead>
<tr>
<th>District or Subdistrict</th>
<th>Age</th>
<th>Type of Deposits</th>
<th>Metals Non-Metallic Mineral Mined</th>
<th>Production, (in Dollars), through 1958</th>
<th>Production, percent of Total Hidalgo County</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lordsburg</td>
<td>Laramide</td>
<td>Hypothermal to epithermal veins</td>
<td>Cu, Pb, Zn, Ag, Au, fluorite</td>
<td>42,400,000</td>
<td>94.1</td>
</tr>
<tr>
<td>San Simon</td>
<td>Laramide</td>
<td>Contact metasomatic deposits, mesothermal (?) veins &amp; limestone replacement deposits</td>
<td>Pb, Cu, Zn, Ag, W</td>
<td>1,440,000</td>
<td>3.2</td>
</tr>
<tr>
<td>Sylvanite</td>
<td>Laramide</td>
<td>Hypothermal veins, contact metasomatic deposits</td>
<td>Au, Cu, Pb, Ag</td>
<td>270,000</td>
<td>0.6</td>
</tr>
<tr>
<td>Apache No. 2</td>
<td>Tertiary</td>
<td>Contact metasomatic deposits</td>
<td>Cu, Pb, Ag, Bi, W</td>
<td>100,000</td>
<td>0.2</td>
</tr>
<tr>
<td>Fremont</td>
<td>Tertiary</td>
<td>Contact metasomatic, vein, and limestone-replacement deposits</td>
<td>Cu, Pb, Zn, Ag</td>
<td>17,000*</td>
<td>0.0</td>
</tr>
<tr>
<td>Kimball</td>
<td>Tertiary</td>
<td>Epithermal veins</td>
<td>Ag, Au</td>
<td>500,000</td>
<td>1.1</td>
</tr>
<tr>
<td>Animas, Gillespie &amp; Big Hatchet Mountains (?)</td>
<td>Tertiary</td>
<td>Epithermal veins, limestone-replacement deposits</td>
<td>Fire clay, Pb, Ag, fluorite</td>
<td>100,000</td>
<td>0.2</td>
</tr>
<tr>
<td>Gold Hill</td>
<td>Tertiary</td>
<td>Mesothermal to epithermal veins</td>
<td>Au</td>
<td>100,000**</td>
<td>0.2</td>
</tr>
<tr>
<td>Animas</td>
<td>Tertiary</td>
<td>Epithermal veins</td>
<td>Fluorite, Mn</td>
<td>130,000***</td>
<td>0.3</td>
</tr>
<tr>
<td>Caprock Mountains</td>
<td>Tertiary</td>
<td>Epithermal veins</td>
<td>Mn</td>
<td>None **</td>
<td></td>
</tr>
<tr>
<td>Antelope Wells</td>
<td>Tertiary</td>
<td>Epithermal veins</td>
<td>Mn, U</td>
<td>None</td>
<td></td>
</tr>
</tbody>
</table>

* Exclusive of production from Luna County
** Exclusive of several hundred thousand dollars worth of production from Grant County
*** Exclusive of fire clay worth about $150,000 to $200,000
The most important product in each district is underlined

TABLE 3. MINERAL DEPOSITS OF THE ANIMAS DISTRICT

<table>
<thead>
<tr>
<th>Commodity Mined</th>
<th>Name and Location of Deposit(s)</th>
<th>Geologic Type</th>
<th>Years in which Active</th>
<th>Approximate Value of Production, in Dollars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire clay</td>
<td>Phelps Dodge Corp. 1 1/2 miles S. of Pratt</td>
<td>Hydrothermal (?) alteration of andesite along NE-trending fault</td>
<td>Early 1900's to present</td>
<td>150,000 to 200,000</td>
</tr>
<tr>
<td>Manganese</td>
<td>Ridge (Hoggett), secs. 31 and 32, T. 29 S., R. 18 W., Lucky, sec. 30, T. 29 S., R. 18 W.</td>
<td>Psilomelane veins in Tertiary quartz latite ash-flow tuff</td>
<td>WW II, 1953-59</td>
<td>60,000</td>
</tr>
<tr>
<td>Fluorspar</td>
<td>Doubtful, sec. 15, T. 25 S., R. 19 W.</td>
<td>Vein grading into travertine in area of hot ground water</td>
<td>WW II, 1952</td>
<td>40,000 to 60,000</td>
</tr>
<tr>
<td>Silver, lead, zinc</td>
<td>Rincon, sec. 29, T. 28 S., R. 18., many other prospects in Animas Mts.</td>
<td>Limestone replacement</td>
<td>Early 1900's, 1940 to 1949</td>
<td>20,000</td>
</tr>
</tbody>
</table>

Fremont District

The Fremont district covers the Sierra Rica, which is partly in Hidalgo County, partly in Luna County, and partly in the Mexican state of Chihuahua. Production in Hidalgo County has probably amounted to less than $20,000. Most of it has come from a group of lead-silver, lead-zinc, copper-silver, and minor uranium-lead veins and limestone replacement deposits in sec. 25, T. 29 S., R. 14 W. Signs of thermal metamorphism are widespread even though no coarse-grained igneous...
rocks crop out. There are, however, exposures of several bodies of intrusive rhyolite, of the type that occurs in association with porphyry bodies in the Apache No. 2 and San Simon districts.

**GILLESPIE (RED HILL) DISTRICT**

Virtually all production of the Gillespie district has come from the Red Hill lead-silver mine in sec. 30, T. 30 S., R. 17 W., which was sporadically active from the turn of the century to 1950. The deposit is a north-west-trending vein that cuts Tertiary quartz latite ash-flow tuff. The ore is thoroughly oxidized and consists mainly of cerussite, some anglesite, and a little residual galena. Records are incomplete, but 3,746 tons shipped between 1908 and 1950 yielded 1,019,500 pounds of lead and 14,249 ounces of silver, valued at $82,414. Total production must be around $100,000.

In secs. 3 and 4, T. 31 S., R. 18 W., there are a number of silver and fluor spar prospects in silicified limestone.

**GOLD HILL DISTRICT**

The Gold Hill district straddles the Hidalgo-Grant County line. The bedrock is a Precambrian migmatic complex cut by a diabase dike swarm of unknown age and by a few felsic dikes. All rocks are cut by gold-bearing quartz veins from a few inches to 4 feet wide, traceable for a few hundred feet on the surface. The veins have a strong affinity for mafic rocks, especially contacts between granite and a mafic rock such as biotite schist or diabase.

The district reached its peak in the 1890's, when three stamp mills treated oxidized free-milling ore from many shallow mines. The last period of activity in the Hidalgo County part of the district was between 1934 and 1940, when 355 tons of hand-picked ore yielded 224 ounces of gold and 402 ounces of silver. Prospecting of Precambrian pegmatites in 1950 resulted in the discovery of some radioactive minerals but no commercial deposits.

**LORDSBURG DISTRICT**

The Lordsburg district has dominated mining in Hidalgo County since the early years of this century. Between 1904 and 1961 alone it produced over 4,000,000 tons of siliceous fluxing ore and milling-grade ore, which yielded about 156,000,000 pounds of copper, 4,400,000 pounds of lead, 500,000 pounds of zinc, 157,000 ounces of gold and 6,700,000 ounces of silver. Almost all of this has come from three mines in the Virginia subdistrict, the Eighty-five in secs. 1 and 2, T. 24 S., R. 19 W., has veins of complex mineralogy, formerly worked in the Nellie Bly, Robert E. Lee, Venus, Last Chance, and Susie mines for copper and silver or for silver alone. Total production was between $550,000 and $600,000. The subdistrict either represents the outer zone of the Lordsburg district or a secondary center of mineralization (Clark, 1962). It is separated from the Virginia subdistrict by a zone, about 1½ miles wide, mineralized only by fluorite veins. These possibly belong to a younger period of mineralization than the metal veins. The mineralogy of the entire Lordsburg district has been further complicated by the presence of six stages of mineralization (Lasky, 1938).

In an age in which underground mining is facing increasing economic difficulties, the longevity of the larger mines of the Lordsburg district is remarkable. The Eighty-five mine was active from 1908 to 1932, and is presently undergoing renewed development. Banner Mining Company has operated the Bonney-Miser's Chest mine continuously since 1935. The Henry Clay-Atwood property was worked by numerous lessees from 1942 to 1964.

**SAN SIMON DISTRICT**

The San Simon district can be divided into four subdistricts: Kimball, McGhee Peak, Cienega Peak, and Granite Gap. Gillerman (1958) described the geology of the district, exclusive of the Kimball subdistrict.

The mines of the Kimball subdistrict worked north or cast-trending epithermal quartz veins in Late Creta-

The McGhee Peak subdistrict has produced base-metal sulfides mainly from contact metasomatic deposits in limestones next to felsite and monzonite bodies. The ores are associated with tactite minerals, especially garnet and wollastonite. The Silver Hill mine in sec. 3, T. 25 S., R. 21 W. and Carbonate Hill mine in sec. 34, T. 24 S., R. 21 W. each produced over $200,000 in lead, zinc, and silver between 1924 and 1952. The Johnny Bull mine in sec. 3, T. 25 S., R. 21 W. produced an unknown amount of copper, mostly before 1905. There are many smaller mines and prospects.

The Cienega Peak subdistrict has small contact metasomatic tungsten deposits and fluorite veins. A little tungsten was shipped in the early 1950's.

In the Granite Gap subdistrict pockets of thoroughly oxidized lead-silver ores replace Paleozoic limestone next to northeast-trending felsite dikes. No tactite minerals are present (Cargo, 1959). Lindgren, Graton, and Gordon (1910) estimated production prior to 1905 to have been at least $600,000. Output since then has been less. Most of the ore has come from the Bob Montgomery and World's Fair groups of claims in sec. 35, T. 25 S., R. 21 W.

SYLVANITE DISTRICT

The Sylvanite district has many different kinds of mineral deposits (Lasky, 1947), but four types have accounted for virtually all past production. They are (1) contact metasomatic copper deposits, (2) high-temperature gold-copper-tourmaline-quartz veins, (3) gold placers, and (4) contact metasomatic tungsten deposits. Total production has been about $300,000.

The largest contact metasomatic copper deposit known in the district was worked in the Copper Dick mine in sec. 22, T. 28 S., R. 16 W., from which about 4,000 tons of ore was shipped between 1890 and 1954, worth $80,000 to $100,000 (net smelter return). Although the Buckhorn gold mine in sec. 27, T. 28 S., R. 16 W., was discovered in 1880, the discovery of additional gold veins and placers in 1909 touched off the last old-fashioned gold boom in New Mexico. It was short-lived and led to the recovery of less than 1,000 ounces of gold. An additional $70,000 worth of gold was mined during the 1930's, mostly in the Buckhorn mine.

Most of the tungsten has come from the Granite Pass area at the southern end of the district. About 650 tons of scheelite-garnet ore containing 0.44 percent WO₃ were shipped from the Eagle Point claims in S½ sec. 22, T. 29 S., R. 16 W., in 1943, and lesser amounts came from other claims (Dale and McKinney, 1959).

REFERENCES

State (of New Mexico) Inspector of Mines, 1912 to 1964, Annual Reports.