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State Mineral Resources Board

OFFICIAL SURVEY

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COLORADO LEAD-ZINC MINES

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4

COLORADO LEAD-ZINC MINES

1954

To His Excellency, The Honorable Dan Thornton, Governor of the State of Colorado, and Members of the Thirty-ninth General Assembly:

I have the honor to transmit herewith a preliminary report, as compiled under the direction of the State Mineral Resources Board by Edward D. Dickerman and others.

It is hoped that this preliminary report will be enlarged and brought up to date from time to time, and that it will serve as a foundation for future work of the State of Colorado in the development of its mineral resources.

In referring to the report, the reader should keep in mind that the State Mineral Resources Board was created primarily for the purpose of aiding and assisting the mining industry in a cooperative way with the federal government, and that the results of the Board's activities will be best realized in times of economic stress and strain rather than during times of comparative prosperity. Forward looking citizens will appreciate the advisability of continuing these studies so that in the future they will be available for the use of future governors, members of the legislature and federal and state agencies.

COLORADO STATE MINERAL RESOURCES BOARD

Robert S. Palmer

Secretary

204 State Office Building
1954.

STATE OF COLORADO

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MINING ENGINEER
Z2BI SOUTH COOK STREET
DENVER 10. COLORADO

April 30, 1954

State Mineral Resources Board
Denver, Colorado

Gentlemen:

On September 1, 1953, the State Mineral Resources Board commissioned me to make a survey of the lead and zinc producing counties of Colorado.

The County Recorders, Treasurers and Assessors of thirty-eight mineral producing counties were visited during September, October and November. From their records lists of owners of both patented and located claims were obtained, together with the last known addresses of the owners. In the cases of Lake and Eagle counties the names of the claims to which the people hold title were also procured. These lists are on file in the office of the Board.

To the 10,515 owners a questionnaire was sent to ascertain their ideas of their own claims. Some 1262 answers were received and the consensus of opinions has been stated within the accompanying report.

To fully bring before the reader the import of mining in Colorado, and the possibilities of future mining, some background history has been given.

The effects of price of lead and zinc range against cost of mining was studied and those results have been given.

The mining industry of Colorado is equipped and has the ore for volume production provided too much time does not elapse before mining of base metals becomes profitable again and the mines become abandoned. The owners of the claims indicate sufficient ore is present for development to a goodly amount of the industrial demand for many years.

Herewith the report is handed to you.

Respectfully submitted,

Edward D. Dickerman

THE EXPANSION OP MINING IN WESTERN UNITED STATES

Aboriginal Indians of the western United States mined and processed various minerals, rocks and clays for their own use and industry. They mined and used the precious metals to such an extent that when the Spaniards occupied Old Mexico, they heard legends of great ore bodies.

In 1540, Coronado went to the Seven Cities of Cibola in search of deposits rich in gold and jewels.1 The legend of Cibola did not prove sufficient metals to be interesting, but here Coronado learned of Quiviras and traveled to that place to investigate the riches to be found there. He returned then to Old Mexico.

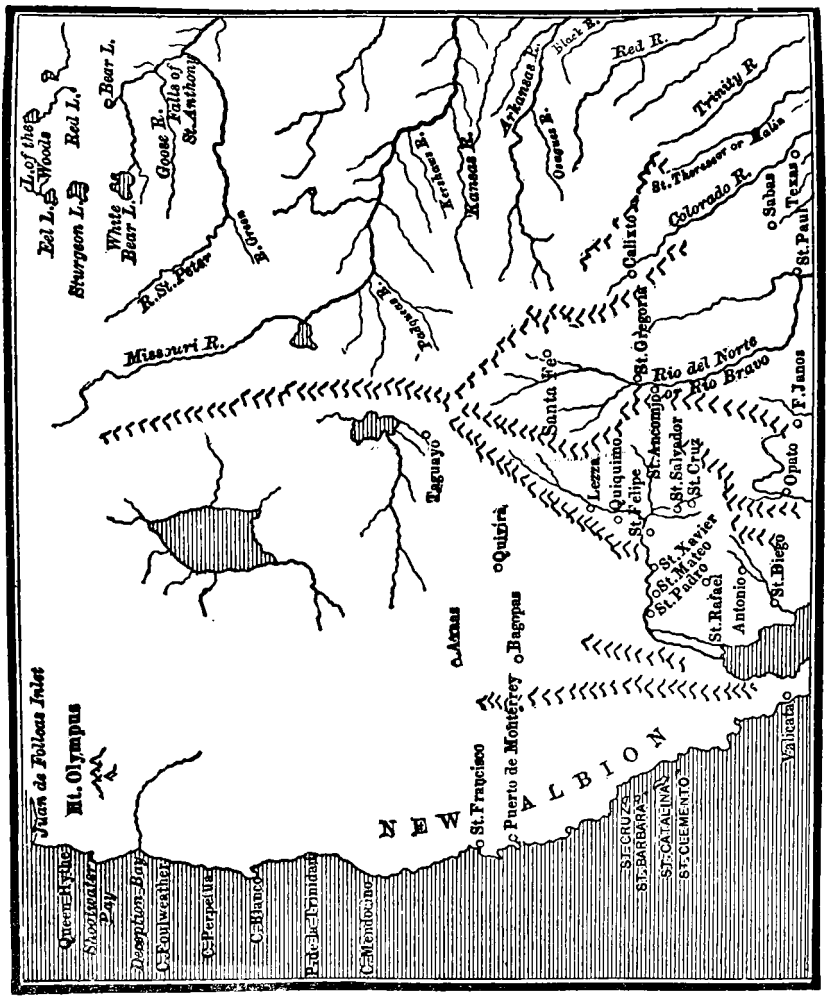
Guajatola, the "breasts of the world," was the legend that led the Spaniards toward the Spanish Buttes of southcentral Colorado. These, it was said, would provide the life blood of the world2. The Spanish Buttes epitomized the "life blood of the world" to be later found throughout the Rocky Mountain region.

Little did the Spanish realize that there would be found, developed and used, the vast array of minerals now being delivered to all industry:

gold	titanium	feldspar
silver	barium	fluorspar
copper	magnesium	mica
lead	uranium	vermiculite
zinc	radium	perlite
iron	bismuth	sillimanite
manganese	sulphur	bentonite
molybdenum	antimony	gillsonite
tungsten	arsenic	cement
vanadium	thorium	coal
nickel	aluminum	oil
cobalt	mercury	oil shale
beryllium	chromium	and all the others

Gold was found in quantities great enough that when the trappers and fur traders reported to communities east of the Mississippi River, the French, then located around the Great Lakes, sent expeditions in 1702, as Iberville reported, "to discover New Mexico, to trade and to see what the mines of which the Indians spoke looked like." Le Page clu Pratz, in his "Histoire de la Louisiane" (published in Paris in 1758), presents a map showing a "Mined' or" (gold mine) on the Arkansas River and tells^of "a rivulet whose waters rolled down gold dust."

1 History of Nevada, Colorado and Wyoming, 1540 to 1888, San Francisco 189,



UTAH AND NEVADA, 1795.

Englishmen, too, became interested in purported mines of the West3. Herman Moll, English geographer, in his map of North America of 1720, wrote across the central region west of the Mississippi a legend saying: '' This country is full of mines.'' English explorers who had pushed westward toward the Rocky Mountains brought back stories of gold4.

Even with all this interest, mining in the territories did not take on much luster until 1849 when the gold deposits of California were exploited and allayed the financial difficulties of the Atlantic seaboard. It took people from the east to really develop the mineral resources of the Rocky Mountain region. The Russell Brothers, who were originally from Georgia, but who gained experience in mining in California, led a party of Georgians, Cherokee Indians and others to Cherry Creek in 1858 in search of gold, in what was then Western Kansasr'.

Parties spread out from this discovery into the neighboring hills until John Hamilton Gregory discovered the lode veins of north Clear Creek near the town of Black Hawk, now known as the Gregory Diggings. From here, in short order, the numerous mining camps of Colorado were started by a host of individuals who sought gold in every nook and cranny; and in doing so discovered all the other minerals now mined.

> "The rush into the mining fields came because the panic of 1857 had caused widespread unemployment and numerous business failures, the public was tuned for reception of favorable news. Many a man, facing the world with empty hands listened eagerly to the stories of Pikes Peak gold. The bearer of glowing news always had a large audience; in fact, some who returned from the mines with unfavorable reports were almost mobbed, and were put down as ignoramuses—so ready were people to hear only what they wanted to believe."8

Again the Rocky Mountain region saved the industrial east, by pouring life blood of hard money into its coffers.
The Civil War interrupted mining to some extent, then as heavy expenditures and the issuance of greenbacks during the Civil War inflated the currency and lifted the price of gold, eastern capatalists grasped at hopeful investments in gold mines of the west.

It was not until the close of the sixties that new chemical processes were devised with which the refractory ores could be made to yield.up their gold. But prior to these discoveries the discouraging condition in the mining camps was reflected in the valley towns7.

3 Colorado and Its People, Hafen, Volume I
4 Ibid
6 U. S. G. S. Professional Paper, 138, Mining In Colorado, Charles W. Henderson.
6 Colorado and Its People, Hafen, Volume I
7 Ibid

One phase of the social and economic implications of gold discoveries has been revealed by T. A. Rickard in his monumental work "Man and Metals" in this way:8

> "One fundamental difference between the winning of gold by the Spaniards under Cortes and Pizarro in the sixteenth century and that of the English-speaking miners of the nineteenth century must be noted; the larger part of the loot from Mexico and Peru fell into the hands of aristocratic adventurers; the gold and silver snatched from the Aztecs and the Incas went as booty to the Spanish chiefs and their military followers; the precious metal did not go into the hands of the plain people. After the treasures of the hapless inhabitants in the conquered countries had been gathered, they were put to work in the mines under as ruthless a system of servitude as the world has ever seen. Altogether different in character were the great adventures in California and Australia. The gold that was won there went to the workers themselves. These later Argonauts were mostly of the laboring class; they were neither courtly freebooters nor minions of a king. The gold of Grass Valley and of Bendigo in the days of the great rush, went to the young men who dug it themselves and from them to those at home."

The activating influence of this invasion of residents from the east was that even a poorly financed man could own a plot of ground and when he found ore could become wealthy. This flood led to the staking of some 50,000 mining claims in the Kansas Territory.

The accompanying Cottom Map of the United States, 1859, (Western History Department, Denver Public Library) portrays the immigration of people from the eastern States. The town and city names are indistinct, but the spread of inhabitants is clearly indicated.

RAILROADS

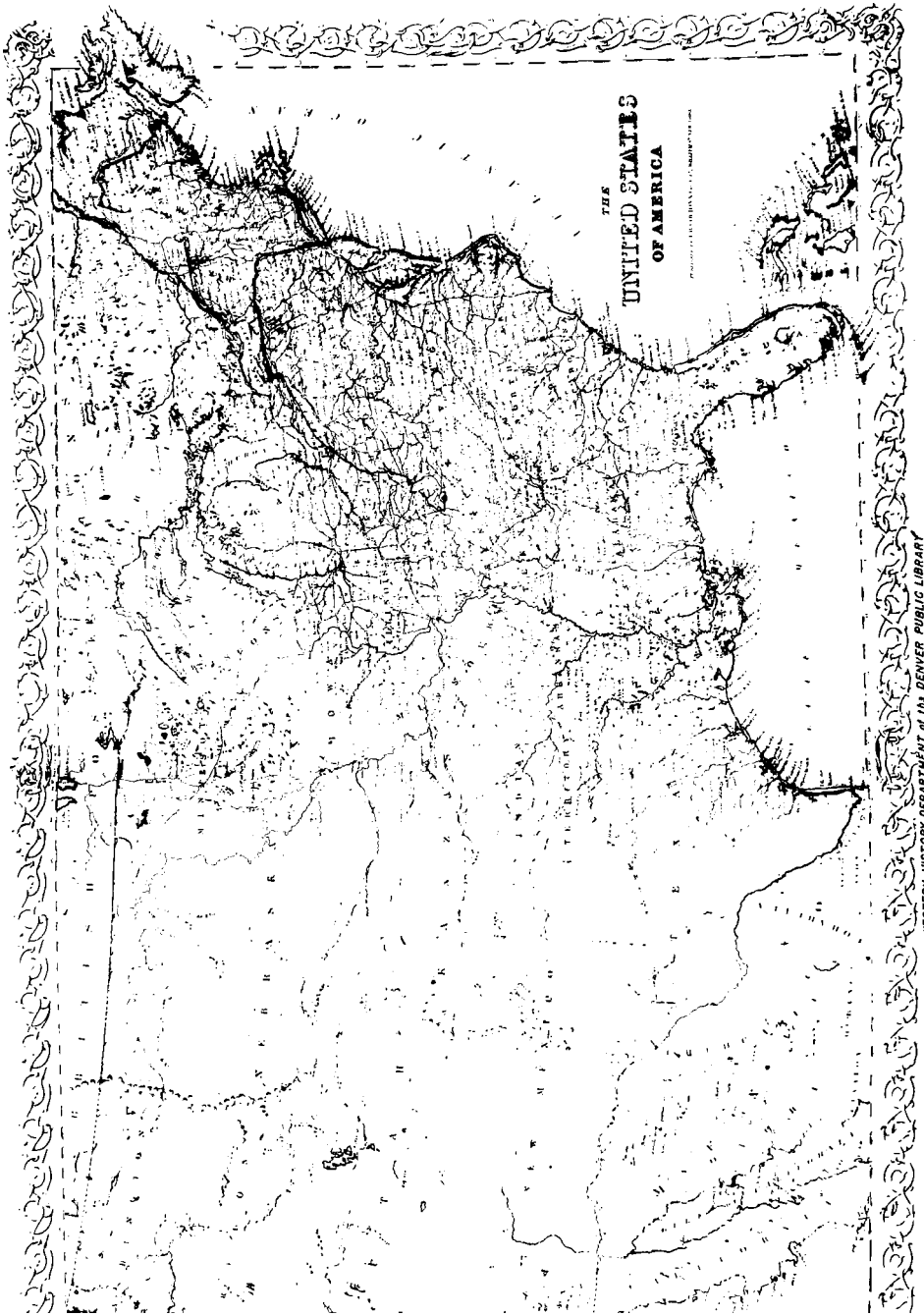
With all these people in these hills, the agriculture in the state received its great impetus in feeding the hard working miners in the vigorous climate.

> "During most of the decade of the sixties, Colorado's development was slow and halting. With Indians on the warpath, the Civil War interrupting immigration, the placer mines played out and the reduction of refractory ores hardly begun, the railroad being built to the north of the Territory, and statehood denied—this was perhaps the gloomiest period of Colorado's history. But the 'darkest hours are just before the dawn', and so it proved to be for Colorado. The decade of the seventies was one of promise and achievement, xxx" 9

As has been the case many times, cost caught up with the price of metals and cheaper methods of transportation had to be found. Under such circumstances, when the railroad prospects for Denver were very dark, her citizens made one of the most heroic efforts in the city's history. With property values falling, with scores of people moving from the city, Denver leaders rose to the emergency. They organized a "Board of Trade" and

8 Metal Magic, Isaac P. Marcosson

0 Colorado and Its People, Hafen, Volume I



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under its leadership launched the Denver Pacific Railroad Company to build their own line from Denver to Cheyenne. The entire city was canvassed for stock subscriptions. "Pay or Perish" was the slogan. The response was remarkable. In a single day the subscriptions amounted to $225,000, and this from a little frontier toAvn of less than four thousand people. Some offered to pay for their stock by working on the roadbed; others agreed to furnish a certain number of ties. In January, 1868, Arapahoe County voted $50,000 in bonds as a stock subscription to the Denver Pacific Company. In May the actual work of grading was begun, with the usual ceremonies before a large and enthusiastic crowd.

"Many difficulties were encountered. All stock subscriptions were not paid up nor could all the county bonds be sold. With insufficient local capital available, help had to be obtained from outside sources. Offers were entertained, and deals were made with the Union Pacific and the Kansas Pacific railroad companies. A land grant of some 900,000 acres, obtained from Congress, was a material help in financing the road. The laying of track was begun in 1869. By December of this year the railroad extended from Cheyenne south to the new town of Evans, named in honor of ex-Governor Evans, leader of the enterprise, by June 24, 1870, the road was completed to Denver. For the ceremony of driving the last spike the city of Georgetown presented a spike of solid silver. (This prized memento is in possession of the State Historical Society of Colorado, a gift of John Evans, grandson of the Territorial Governor.)"10

From this beginning, railways were promoted and constructed into various mining camps and permitted the shipment of the base as well as the precious metals, and the boom was on!

SMELTERS

These ores had to go into the east for refining, and again cost caught up with price, so smelters were then promoted and built. "One of the most important factors in promoting mining development was the perfecting of processes for treatment of refractory ores. Building on the experience of Lyons and the other pioneer metallurgists, Professor Nathaniel P. Hill, of Rhode Islands' Brown University, devised methods of reducing the ores. He organized the Boston and Colorado Smelting Company, which in 1867 built a plant at Black Hawk. The works added to and improved, together with other mills and smelters, promoted mining in the region."11

Smelters were then built throughout the state of Colorado, even into the nearly inaccessible canyons. Mining in the state expanded until 1900, with more and more men being engaged in the industry, even through the silver panic of 1893.

10 Colorado and Its People, Hafen, Volume I
n Colorado and Its People, Hafen, Volume I

In 1872 the General Land Office issued comprehensive regulations providing for uniformity in size of claims and all other matters pertaining to mineral lands and procedure in cases of disputes and conflict of rights. It is estimated about 75,000 or 80,000 claims have been surveyed in 27,914 separate surveys to date. Of the claims surveyed about 50,000 have been patented.12

As industry of the United States rose to meet the needs of an increasing population, the demand for metals gave the mines an ever enlarging market which in turn provided the stimulus for more mines. These operations discovered the vast mineral resources which we now know.

The pressure for metals brought about this great expansion of Colorado's mining industry against all the constraining forces. Activity rose to a crescendo.

In 1900, the period of contraction began with the consolidation of the smelting interests, and as the cost again overtook price, mines became abandoned and consolidation of mining claims into larger groups was occasioned. This, perhaps, brought about a more economical development of ore bodies, but it also drove out a host of the small miners.

ADVANCE OF MINING MACHINERY

Since "necessity is the mother of invention," the air drills, water pumps, electric hoists and other machinery used in mines were originated and developed in the state of Colorado. Now the state is one of the most important distribution centers for mining machinery in the United States and delivers equipment all over the world.

After the oxidized ore had been thoroughly mined, there was left the sulfide ore and the flotation process was introduced, to again place cost and price in a profitable balance. This kept Colorado in the ranks of the great metal producing states, up to the present time.

Colorado is fifth in the production of gold, silver, lead and zinc, and tenth in Copper.

ELECTRICITY

During 1881, two 35 light Brush Swan dynamos were installed in Denver, and as early as 1880 an experimental plant generated lights for an amazed throng. In 1883 Denver adopted electric lights for street illumination. Eight centrally located steel towers, each 150 feet high, beamed light over large areas of the capital city's downtown area and portions of residential streets.

12 Colorado and Its People, Hafen, Volume II

Leadville was the second town in Colorado to have electric service. Arc lighting was installed there about 1883.

The practicability of transmitting electrical energy to points removed from the place of its generation vested the Rocky Mountain streams with added resource value. The Colorado mining boom of the early 1880s added further incentive to development of the state's hydro-electric power. Aspen, after discovery of rich ore in 1884, was the scene of the region's first water power plant. By 1887 capacity had been increased to provide power for the mine hoists, making this the initial application of hydro-electric power for industrial purposes in this territory.

In 1880 one of the earliest alternating current plants in the state was built at Black Hawk, supplying electricity for lighting only, and a pioneer inter-city transmission line was built to Central City. This line was three miles long and operated at 1000 volts, single phase.

The first commercial high voltage transmission system built for industrial purposes was completed at Telluride, Colorado, on June 19, 1891, by L. L. Nunn, aided by his brother, P. N. Nunn. Power for the alternating current transmission plant came from the then nationally famous Ames plant.

This plant generated 3000 volts, single phase, and transmitted power to the Gold King mill more than two and a half miles away.

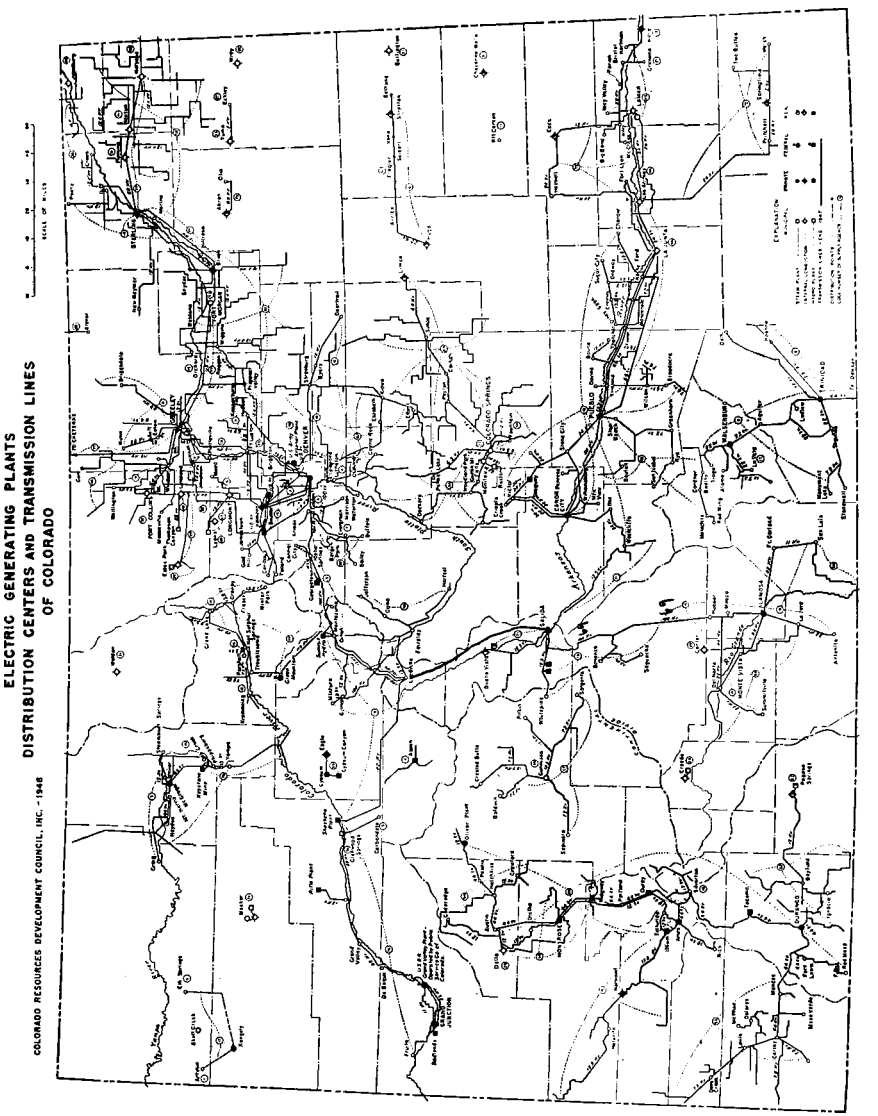
Major electrical equipment manufacturers for years utilized the Ames plant as a field laboratory, particularly in the perfection of heavy duty equipment and the solution of lightning problems in that storm-swept area.

In Colorado from 1888 to 1905 small plants were built in Fort Collins, Greeley, Georgetown, Idaho Springs, Golden, Longmont, Boulder, Colorado Springs, Canon City, Florence, Pueblo, Trinidad, Walsenburg and Alamosa. Englewood and Littleton were served by transmission from Denver.

The decade of 1905-1915 witnessed the extension of electric service to many towns, either by the construction of new plants or extension of service areas surrounding existing plants. The consolidation process was begun and we see the beginning of some of our present day major systems, such as the Mountain States Power Company of Wyoming, the Western Colorado Power Company, the Public Service Company of Colorado, and Southern Colorado Power Company.

In 1906 the consolidation of numerous small plants in north central Colorado took place. A modern steam-electric plant was built near Lafayette, and a 44 kv loop transmission system reaching to Fort Collins and Greeley connected the intervening towns.

The Central Colorado Power Company was formed, which began construction of the state's two largest hydro-electric plants: Shoshone on the Colorado River near Glenwood Springs,


ELECTRIC GENERATING PLANTS
DISTRIBUTION CENTERS AND TRANSMISSION LINES
OF COLORADO
COLORADO RESOURCES DEVELOPMENT COUNCIL, INC. - 1948

and Boulder Canyon plant on Middle Boulder Creek near Boulder, Colorado.

The construction of these two plants and the connecting transmission system again brought this region national attention. The Boulder Canyon plant, with a static head of 1830 feet, was one of the highest head plants in the country. The 100,000 volt Shoshone-Denver line was the first 100 kv line under construction and is one of the highest in elevation, crossing the Continental Divide three times and reaching a maximum elevation of 13,628 feet.

In 1907 steam plants and a transmission system to supply the Trinidad Walsenburg coal mining area in southern Colorado and the northern New Mexico coal mines were built. Also, in 1907, a system was completed extending from Cripple Creek and Canon City through Pueblo and down the Arkansas Valley to La Junta.

Electrical development in Wyoming kept pace with the region. Here in a sparsely settled territory without large industries and with but few towns, progressive businessmen sparked a large increase from the start made by Senator Warren in 1882. By 1917 generating capacity was more than 20,000 kilowatts.

The power demand for the mining industry is as shown (Analysis of Electric power required and available in Colorado and Wyoming—1942-1944, Colorado Water Conservation Board) :

COUNTY		HORSE POWER
Boulder		150
Clear Creek		
	Idaho Springs	900
	Georgetown	1,000
	Silver Plume	1,000
	Empire	500
		2,700
Gilpin		1,125
Summit		
	Montezuma	550
	Ten Mile	1,000
	Breckenridge	250
		1,805
Park		450
Eagle		1,000
Lake		700
Chaffee		300
Saguache		400
Gunnison		300
Hinsdale		600
San Juan		
	Silverton	1,300
	Eureka	1,500
	Animas Porks	750
		3,550
Ouray		
	Red Mountain	1,100
	Ouray	600
		1,700

Private and public power available to the mining areas rose to some half million kw hours which is an ample supply for the mines, even though the complete power demand on the various systems almost equals the full capacity.

Now as shown on the map, a super power circuit is able to provide all the mining camps of the state with ample power.

These records reveal a number of interesting things about the progress of mining in Colorado. The rising and falling curve of production is influenced by many complex factors such as the discovery of a great new ore body, like Leadville or Cripple Creek, improved metallurgical practices, like the smelter or the electrical furnace, passage of a law like a tariff bill, the patent law of 1866, or the order closing the gold mines in World War II, and a host of others.13

Now Colorado can produce nearly all the metals, minerals and nonmetals requested by industry and science; and whenever the cost-price ratio provides a profit, the mines will meet the challenge.

HIGHWAYS

To further reduce the cost of operation, trucks have now superseded the movement of ores and the present state highway map shows the excellent web of highways throughout the mining areas of the state.

Over these highways 20 ton trucks make delivery of ores and concentrates to the smelter or market in hours and even days less than older methods of transportation, and, because of these highways, the development of the uranium regions is made more economically profitable.

PUBLICATIONS

The mining boom brought into Colorado the best of the nation's geologists to study the deposits of the state so that the miner could better understand the geology and thus be led to other lodes.

Since Hayden's first survey a constant stream of scientists have passed through and each left his opinion as to the origins of minerals, which in turn has influenced the geologic thinking for the entire world.

The United States Geological Survey
The United States Bureau of Mines
Colorado Scientific Society
Colorado Geological Survey
Colorado Mining Association
Colorado Mineral Resources Board

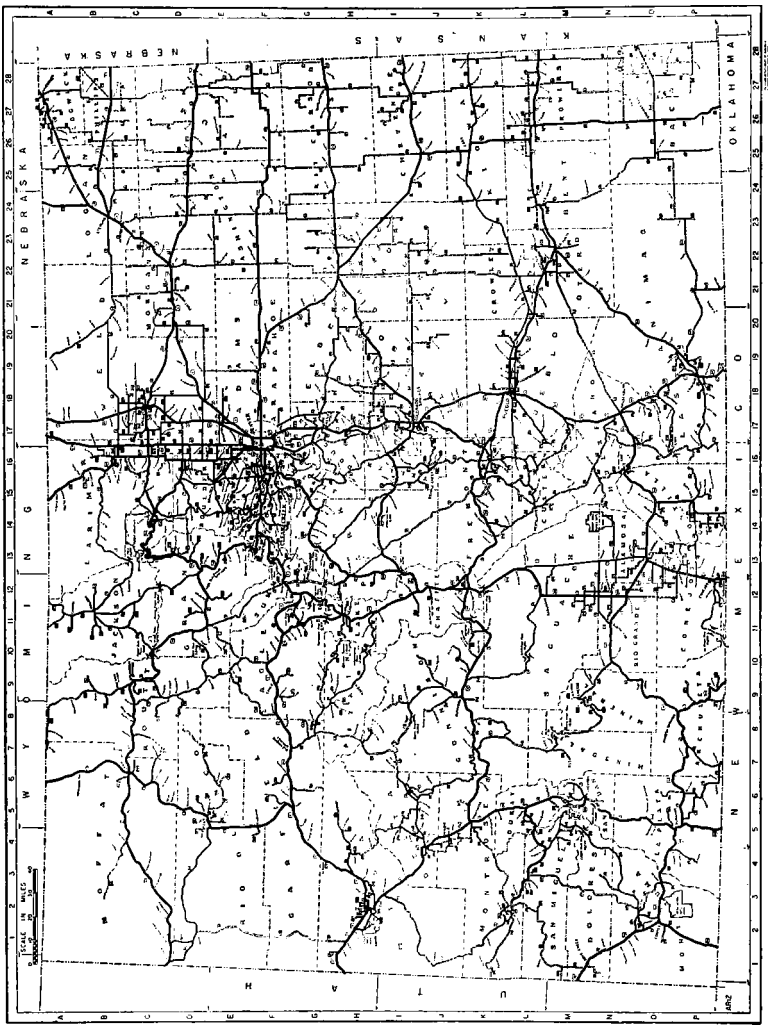
and a multitude of other organizations and individuals have published ample information of the ore deposits of Colorado.

13 Colorado and Its People, Hafen, Volume II

COIiORRDO COnSTRUCTION BULLETIN

Issued by the Colorado Department of Highways

Mark U. Watrous, Chief Engineer



From this information miners can learn something about every mineral region and almost every mine in Colorado.

More detailed work in some areas is needed to complete surveys and to bring some areas up to date under new geologic thinking and hence estimate the reserves of all the valuable deposits, metallic and non-metallic. Except for the coal and molybdenum regions, reserves are only estimates.
Many times mines have been worked out only to have another energetic person come along and produce larger quantities of minerals.

The total amount of mineral produced in Colorado since 1858 has added $4,702,045,000 in new wealth to the economy of the United States.

You will note that the entire contribution of mineral resources into industry, in the long term of view, is ever expanding and important to the health and safety of this country.

But in spite of all these aids, the mining of lead and zinc has fallen into the doldrums. Finances have been poured into foreign countries for the development of their ore deposits to supplement the domestic production, and by doing so, the foreign cost-price ratio is in balance, whereas the domestic cost-price ratio does not provide a profit.

Colorado

Mineral Resources Board Compilation Of

TOTAL MINERAL PRODUCTION

			Value
GOLD	1858-1953	(39,937,129 fine ozs.)	$ 892,936,479
SILVER	1858-1953	(750,098,322 fine ozs.)	585,373,827
COPPER	1868-1953	(640,702,430 lbs.)	75,357,811
LEAD	1869-1953	(5,303,666,583 lbs.)	279,571,199
ZINC	1895-1953	(3,326,405,985 lbs.)	295,642,922
BUILDING STONE	1897-1953		47,894,000
CLAY	To 1953		16,058,000
COAL	1864-1953		1,139,132,000
FELDSPAR	1935-1953		6,332,000
FLUORSPAR	1880-1953		15,765,110
NATURAL GAS	To 1953		12,815,000
PETROLEUM	1862-1953		449,998,652
UNDISTRIBUTED: Tungsten, Molybdenum, Vanadium, Barite, Beryl, Bismuth, Cadmium, Cement, Clay Products, Coke, Iron Ore, Lime, Lithium, Manganese, Mica, Pyrite, Sand and Gravel,	To 1953		
GRAND TOTAL			$4,702,043,000
(December 1953 Estimated)			885,066,000

PRODUCTION ~ ALL MINERALS
PRODUCTION ~ GOLD, SILVER, COPPER, LEAD, ZINC
DOLLARS
60
50
40
30
20
10
0
8J
(J
0
-J
1
-J
8

COLORADO MINING CLAIMS

To learn the present status of the patented and unpatented claims in Colorado, the State Mineral Resources Board obtained a complete list of the owners of metal producing claims from all the thirty-seven mining counties. In many instances the names and legal descriptions of the claims were given.

Questionnaires were sent to all the people and corporations whose names appeared on the books of the Recorders and Assessors of the 37 counties visited.

It was found that there are 10,515 individuals, (including many women) and companies who claim title to 49,689 patented and unpatented claims. The number of persons interested in the various companies and corporations were not determined, but considering some of the large companies the 10,000 could be at least doubled. These owners live in every state in the union and many foreign countries. They declare that their properties contain all manner of metals and minerals.

Many owners have held title for a generation or more, and all indicated they will hold them for better mining conditions. It is surprising how many of the properties in all the Colorado mining counties have been operated since 1930, when the base metal industry was nearly closed by the Depression. It was this Depression that gave a boost to the gold production and again the monetary metals from Colorado alleviated the money shortage of the United States.

NUMBER OF MINING CLAIMS IN COLORADO

From The

OFFICIAL SURVEY OF COLORADO MINERAL INDUSTRIES

Conducted By Colorado Mineral Resources Board

COUNTY	NO. OP CLAIMS	NO. OF OWNERS	NEW LOCATIONS
Alamosa	30	11	2
Archuleta	458	4	445
Boulder	4,267	1,082	
Chaffee	1,572	350	
Clear Creek	6,527	1,388	
Conejos	158	48	
Custer	532	191	
Delta	53	9	
Dolores	1,097	78	327
Eagle	1,118	299	
El Paso	53	21	
Fremont	376	147	41
Garfield	218	42	8
Gilpin	2,829	1,327	__

(Continued on next page)

NUMBER OF MINING CLAIMS IN COLORADO (Continued)

COUNTY	NO OF CLAIMS	NO. OF OWNERS	NEW LOCATIONS
Grand	1,938	478	68
Gunnison	1,099	283	
Hinsdale	182	27	
Jackson	31	20	7
Jefferson	2,285	617	22
Lake	670	168	22
La Plata	27	20	
Larimer	1,192	112	749
Mesa	589	185	11
Mineral	49	17	3
Moffat	298	77	60
Montezuma	1,531	189	283
Montrose	1,805	233	
Ouray	2,182	352	
Park	1,770	183	
Pitkin	186	27	81
Rio Blanco	180	13	
Rio Grande	78	39	
Routt	615	153	106
Saguache	2,271	293	
San Juan	2,087	306	
San Miguel	4,078	572	
Summit	5,267	1,155	
Teller			
TOTALS	49,689	10,515	2,310

Each depression in the mining industry closed many mines until now a relatively few are active. This does not mean that whole territories have been abandoned, but consolidation of areas have permitted exploration and extraction of ores more efficiently through one adit, than through the many shafts and tunnels originally present. The fact that production continues when conditions are favorable, indicates that ore in commercial quantities is present.

In the lead-zinc areas 1,744 men lost employment because of the drop in lead and zinc prices without a corresponding adjustment in mining costs, and a drop in silver price would close the remaining operations or would prevent a reopening of mines.

Except in the gold regions and where gold is an important assist in lead-zinc operations, all say they can not mine gold ore profitably at the present prices.

The lack of mine financing was not as much the cause of the cessation of mining as the cost-price ratio. Most of the owners believe their mines will be financed when conditions warrant.

Many owners did not wish Government loans, preferring to obtain money elsewhere. There were some who did seek and receive Government aid, however.

Even at that, and because of the activity in the uranium field, new fields of minerals are being found each day.

The accompanying table of the recorded total mineral production shows by figures the astounding volume of metals, minerals and non-metals that have been poured from our mountains.

MINE PRODUCTION OF LEAD AND ZINC IN COLORADO
1869 THROUGH 1952-1953

YEAR	LEAD (Pounds)	ZINC (Pounds)
1869	150,000	
1870	250,000	
1871	555,000	
1872	1,150,000	
1873	1,236,400	
1874	1,277,933	
1875	1,636,000	
1876	1,334,020	
1877	4,286,364	
1878	13,722,222	
1879	47,348,000	
1880	71,348,000	
1881	81,094,000	100,000
1882	110,000,000	100,000
1883	141,114,000	300,000
1884	126,330,000	300,000
1885	106,692,000	300,000
1886	118,000,000	119,346,429
1887	126,000,000	96,774,960
1888	128,404,000	104,594,994
1889	133,940,000	134,285,463
1890	109,192,000	120,315,775
1913	87,897,773	89,133,901
1914	74,211,898	37,220,493
1915	68,810,597	48,790,742
1916	70,914,087	2,360,000
1917	67,990,012	23,258,000
1918	65,960,760	54,152,000
1919	37,070,241	56,727,000
1920	46,629,788	61,621,000
1921	19,660,466	65,000,000
1922	23,477,200	71,729,000
1923	45,698,185	71,462,000
1924	47,557,061	58,861,000
1925	62,966,000	72.518,000
1926	68,887,000	32,373,000
1927	66,000,000	218,000

YEAR	LEAD (Pounds)	ZINC (Pounds)
1891	126,256,000	300,000
1892	120,000,000	1,125,000
1893	110,000,000	1,650,000
1894	101,226,000	1,500,000
1895	93,968,000	1,671,000
1896	89,606,000	1,292,000
1897	80,794,286	2,683,989
1898	113,416,138	3,900,656
1899	138,048,446	11,300,656
1900	164,274,762	16,282,055
1901	148,111,020	26,843,731
1902	106,296,827	52,582,510
1903	101,513,414	80,616,000
1904	107,498,854	66,771,590
1905	115,746,777	83,561,396
1906	106,646,506	86,012,903
1907	89,065,232	85,048,564
1908	61,645,671	30,130,002
1909	72,162,326	51,210,260
1910	76,058,775	77,089,643
1911	69,679,289	94,607,456
1912	75,242,267	132,222,812
1933	4,803,000	2,569,000
1934	8,435,000	1,544,000
1935	11,345,000	2,403,000
1936	14,534,000	2,344,000
1937	19,572,000	8,494,000
1938	18,910,000	9,106,000
1939	16,444,000	3,660,000
1940	22,952,000	10,120,000
1941	25,148,000	31,444,000
1942	30,362,000	64,430,000
1943	36,064,000	88,188,000
1944	35,396,000	79,910,000
1945	34,088,000	71,546,000
1946	34,072,000	72,294,000
1947	37,392,000	77,490,000
1948	50,286,000	90,328,000
1949	53,706,000	95,406,000
1950	53,580,000	91,708,000
1951	60,672,000	111,428,000
1952	60,000,000	106,480,000
1953	43,700,000	75,400.000

Since the lead-zinc areas and towns have been so badly crippled by the present prices of lead and zinc, the Colorado Mining Association took the matter to Washington so vigorously that the House of Representatives of the 83rd Congress, sent the Select Committee on Small Business to hold hearings at central points of the mining west. Many mining men, labor representatives and business men testified before this Committee.

Results of this have been somewhat successful, in that the Administration has suggested increasing stock pile quotas for lead and zinc. Some relief is being discussed on increases in tariff and import quotas.

Even with all the expert testimony, it was evident that all pertinent data was not available for a full and complete estimate of the condition of the mines of Colorado and neighboring states.

The cost of mining lead and zinc has outstripped the price which the ores bring in this country, while the lower labor cost countries of the World can still mine profitably by selling in the United States market. The miners do not ask for a subsidy but do ask that by some means the difference in wages be equalized and competition be placed on an equal and fair basis. Many of their tax dollars have been used to promote and bring into being the mines which are their competitors and which mines have a better break in the United States Markets.

"It is most unfortunate that between years of high production there is an era when mines have to be abandoned and plants demolished because of heavy taxation. Then when good mining years return, mines have to be reopened and re-equipped at an exaggerated cost. If these years happen to be during a war, the mining industries have to compete with munitions for machinery.

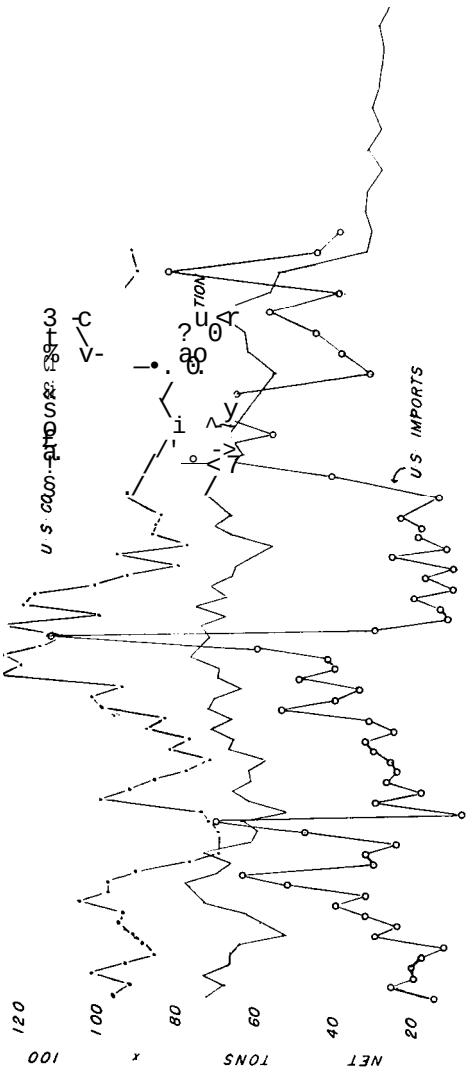
"The dependency of the United States on its mineral deposits was established during World War II. The depredations of the U-boats were so stringent that the country approached a desperate condition. Should another time happen, North America may find itself in worse straits.''

(Above quote by Henry L. Day, President Idaho Mining Association, President, Day Mines, Inc., Hearings before select Committee on Small Business, House of Representatives, 83rd Congress, page 301-303).

U. S. SILVER SUPPLY & DEMAND

from Year Book American Bureau Metal Statistics

Year	Ag Net Imports Over Exports (Fine Ounces)	United States Production (Fine Ounces)	New Ag Available (Fine Ounces)	All Uses in U. S. (Fine Ounces)	Surplus (+) or Deficit (–) (Fine Ounces)
1945	–47,907,000	29,332,000	–18,575,000	207,010,000	–225,585,000
1946	21,888,000	21,377,000	43,265,000	149,122,000	–105,857,000
1947	75,518,000	36,053,000	111,571,000	125,552,000	–13,981,000
1948	83,689,000	36,111,000	119,800,000	136,663,000	–16,863,000
1949	92,785,000	34,559,000	127,344,000	103,492,000	+23,852,000
1950	103,451,000	42,068,000	145,519,000	144,599,000	+920,000
1951	74,697,000	39,967,000	114,664,000	154,440,000	–39,776,000
1952	73,512,000	40,245,000	113,757,000	152,338,000	–38,581,000
1953	80,488,000	34,697,000	85,185,000	147,756,000	–62,571,000


U.S. IMPORTS
NET TONS
120
100
80
60
40
20

The recent drop in lead and zinc prices has closed many operations and the rest are on the ropes. Now the silver users are threatening to take away silver prices. This will finish the lead and zinc mines of this country.

Statistics of the American Bureau of Metal Statistics, 1952, show that since 1945, there were only two years when imports and United States production more than met the total demand for the silver. Silver, for the most part, is produced as a by-product of copper, lead and zinc mines. Should this production cease, on the closing of the mines, where would the manufacturers obtain their supplies? From foreign countries? If the fabricators relied on foreign silver only, it can be assured, from past experiences, that silver would not be 90c per ounce—but many times that cost.

It would seem, therefore, that the manufacturers should not buck—but urge, help and abet the miners of the United States to keep the production coming and their factories operating.

Prom statistics developed by the United States Tariff Commission, for the years 1950, 1951, and 1952, as shown on chart "LEAD" the apparent surplus of unmanufactured lead is not too great.

If the average production of lead ore in the United States be at the average of the three year, 825,755 tons, there would be 400,000 tons available to imports.

With this balance of tonnage, both domestic and foreign mines could operate and the domestic ore deposits remain immediately available.

PRICES

Sharp changes in prices does not lend to the enthusiasm for any business.

In 1952 when imports of lead and zinc were being withheld the prices rose. Then when the imports flooded into the American markets, the prices broke sharply to a point where it was no longer profitable to mine the base metals.

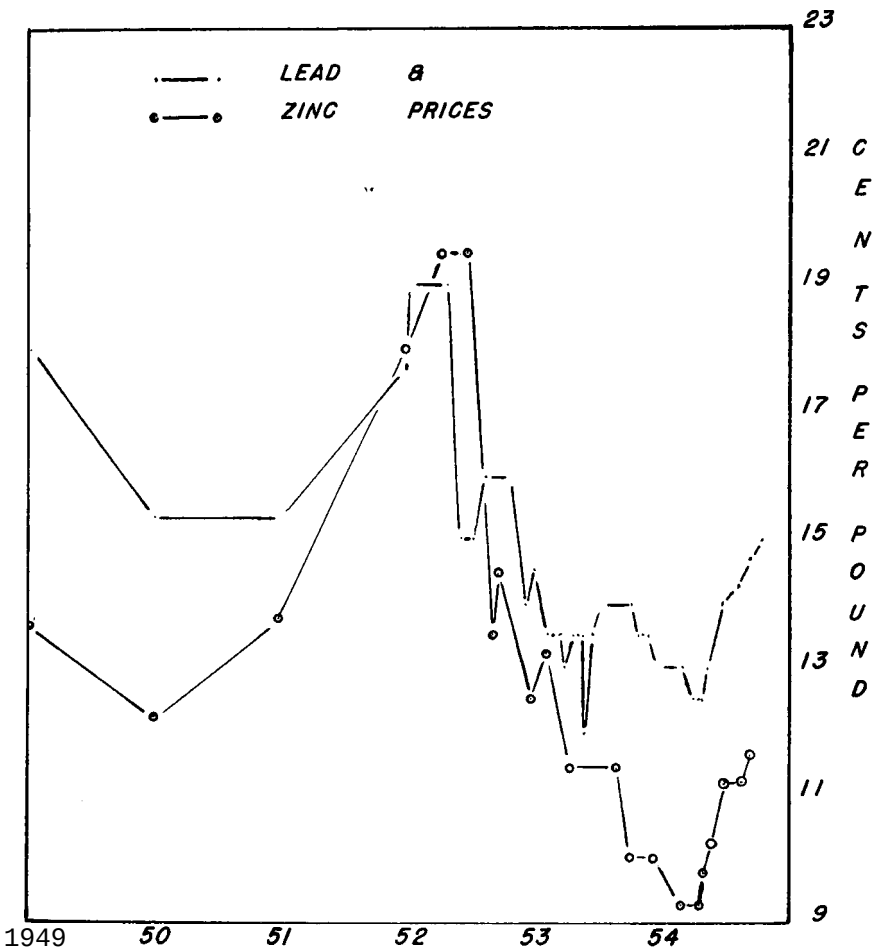
During the latter part of 1954, prices of lead and zinc rose again under the stimulus of the stockpile program, which has been advocated by Colorado mining interests for many years.

LEAD1

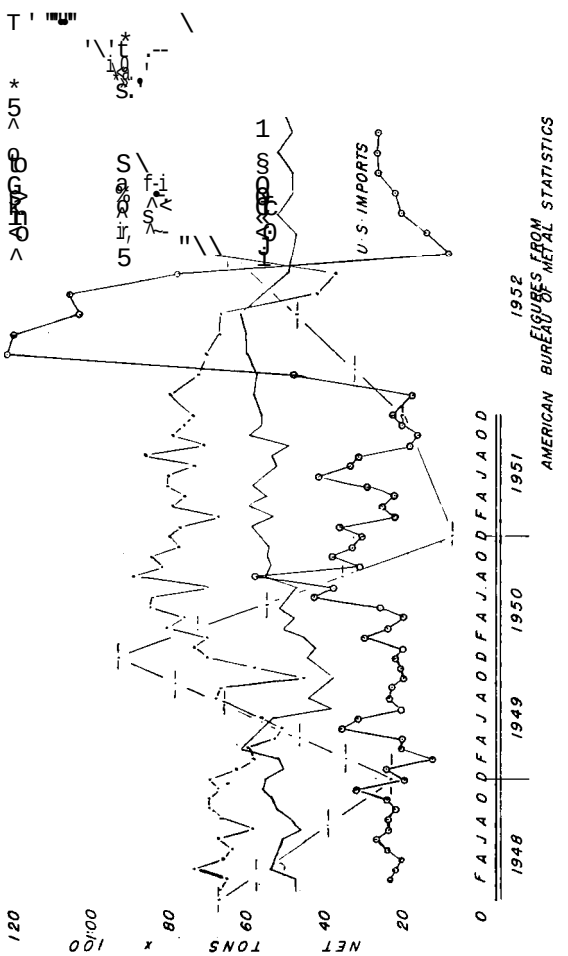
Tons of 2,000 Pounds

Year	Domestic Ore	% Total	Foreign Ore and Bullion	% Total	Total	Secondary Recovery	Total Lead	Total Consumption	Over Supply
1950	418,809	83	85,505	17	504,314	482,276	986,590	1,216,790	35,619
1951	342,644	82	75,049	18	417,693	518,110	935,803	1,151,235	25,339
1952	383,358	81	89,494	19	472,852	471,294	944,146	1,100,585	58,949
1953	351,183	70	155,788	30	506,971			1,150,600	81,152
1954 (thru July)	196.5752	69	87,251	31	283,826			630,000	93,030

1 American Bureau of Metal Statistics, 1954
- Daily Metal Reporter, October 1954



FIGURES from AMERICAN BUREAU of METAL STATISTICS


U.S. IMPORTS
NET TONS
120
100
80
60
40
20
0
F A J A O D F A J A O D F A J A O D F A J A O D
1948
1949
1950
1951
1952
FIGURES FROM AMERICAN BUREAU OF METAL STATISTICS

The accompanying graphs of lead and zinc prices indicate the increase in price occasioned by foreign countries withholding lead and zinc, forcing prices up. Then, when surpluses were dumped on the American market, the prices fell so rapidly that cost adjustments at United States' mines could not be made fast enough and many operations were forced to stop. Now, only the high grade operations or those with amenable costs can function.

The graphs on lead and zinc production imports and consumption depict the effects of the prices on the movement of these metals.

The average use and imports of zinc during the years 1950, 1951 and 1952 in which the apparent surplus of 270,000 tons of zinc was built, indicates that should the domestic production continue at 724,000 tons, the imports could still stand at 400,000 tons to meet all the consumption requirements of the United States.

The surpluses of lead and zinc still are insufficient to cover a gap of a year's shutoff of imports. To be certain that the United States mines can be expanded to fill all domestic needs more deposits should be developed.

(The following quote was taken from an address by Representative W. Sterling Cole at the Convention of The Colorado Mining Association, January 29,1954):

"Here let me express a few thoughts which I hope may be heeded by our friends abroad who are engaged in supplying uranium for our atomic plants. Among a few such friends, I have detected the fear—and it is an honestly held, even if mistaken notion—that our present program for procuring foreign ores is directed at building up a stockpile of raw materials for use in future atomic power plants. Those who entertain such apprehensions fear that by pre-empting existing supplies of uranium ore, our country may achieve an unfair advantage when widespread use of atomic power is a reality. Such fears, I can state very categorically, are completely without foundation, and it is important that this become known. It is a plain fact that our foreign ore purchase program is aimed exclusively at acquiring the materials needed to enlarge our stockpile of atomic and thermonuclear weapons—weapons which protect not only this nation but also our friends abroad. As you in this audience have good cause to know, we are not holding back on the production of domestic ores in order to conserve them for future peacetime uses.

"True though these statements are, we have the responsibility of demonstrating to our friends abroad who provide us with uranium that we are earnestly trying to meet as large a portion o± present uranium requirements as we can from domestic sources. The bestway to make that fact known is for the Atomic Energy Commission, and for the American mining industry, to expand further the magnitude of their programs for searching out new

supplies of domestic ores. There is urgent need, moreover, to intensify every research effort directed at devising more efficient and more economical ways of recovering domestic ores."

This, of course, also applies to lead and zinc mining.

When the potash industry was attempting to make the United States independent of foreign sources, the Government took active steps to aid the mine operators.14

In order to make this country more self-sufficient in lead and zinc it would seem just as essential to give enthusiastic aid to the mine operators of these metal mines.

STANDARD OIL COMPANY (New Jersey)

In a recent treatise "Facts About Oil Imports," April 15, 1953, shows how this country is dependent on imports of certain fuel oils and hence free-trade with the producing countries is essential to procure this oil.

Should this country not be able to obtain this import because of severed sea lanes, a healthy and vigorous domestic oil industry must be in existence for a home ditch stand.

It is economically sound to import metals for similar reasons. But, if by doing so, the domestic mines are crippled so badly that they are abandoned, where will Standard Oil of New Jersey obtain minerals for the Home Ditch Stand? This country must have a healthy going mining industry as well as an oil industry.

Question is—how long does it take to close sea lanes? How long does it take to redevelop mines, equip them and place them into production?

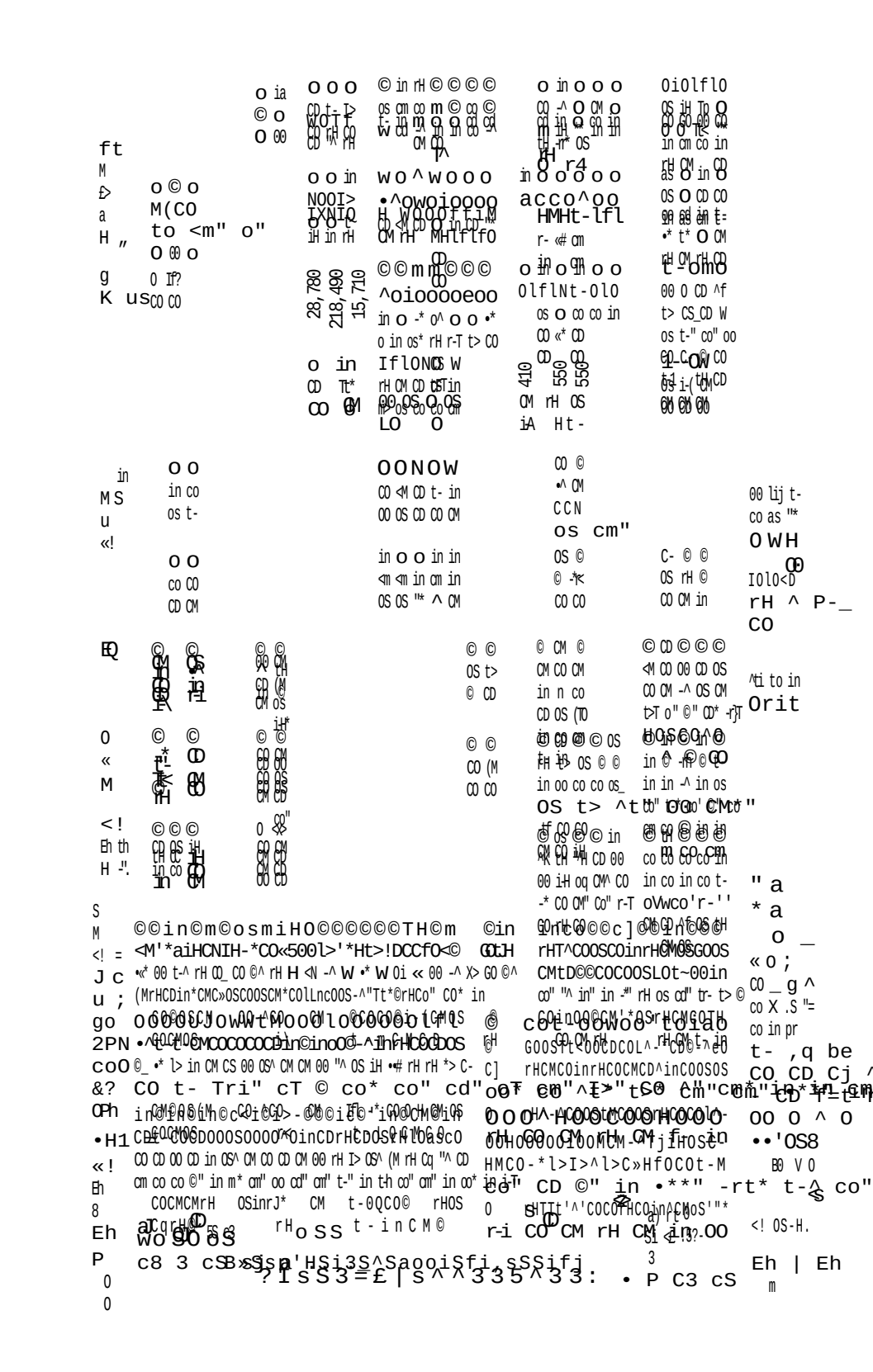
A case in point is the Leadville Drainage Tunnel. Although the idea of draining the Leadville District by gravity was started in 1897, the big urge came after most of the lead-zinc mines closed in 1932 and were flooded. By the constant solicitation of the Colorado Legislature, civic organizations, the Colorado Mining Association, the Colorado Congressional delegations and the need for more lead and zinc in World War II, an appropriation was granted and work commenced December 1943. The tunnel reached its present length, 11,850 feet, February 1952.

Two companies began rehabilitating shafts and drifts preparatory to prospecting and developing the shallower ore bodies drained by the tunnel. Other concerns planned to follow suit in adjacent areas.

Along came the drop in lead and zinc prices and all work and plans ceased July 1953—twenty years after the project was initiated.

This is an indication of the time needed for the development of important ore bodies.

» Leasing of Government Potash Land, H. I. Smith, Mining Engineering, AIME, April 1954



The production of a small mine is taken to indicate the value of metals mined against the cost of mining and the value of gold and silver as aids in meeting the cost.

This mine produced several thousand tons of ore, all sold to custom mills during the years 1946, 1947, 1948, 1949, 1950, 1951, 1952 and 1953. The average weighted content was: Gold—0.122 ozs., silver—2.62 ozs., lead 5.43% and zinc—6.12%. This average content was taken against the prices paid on settlements received nearest to the 15th of July of each year, in an attempt to show the effect of the variations in rmces on the economics of the enterprise.

The chart is an accumulated chart to picture the entire value of the ore against entire cost to produce it at these dates. The difference between the value and cost indicates profit, (only on the dates shown).

The value of the gold plus the value of the silver about paid for the mill charge plus the transportation—$3.50 per ton and 77c per ton respectively.

The graph clearly indicates that the loss in lead and zinc prices pulled the value of this average ore down, while the cost of extraction increased to the point that the costs are approaching the value. The loss of any value would cause this producer to stop.

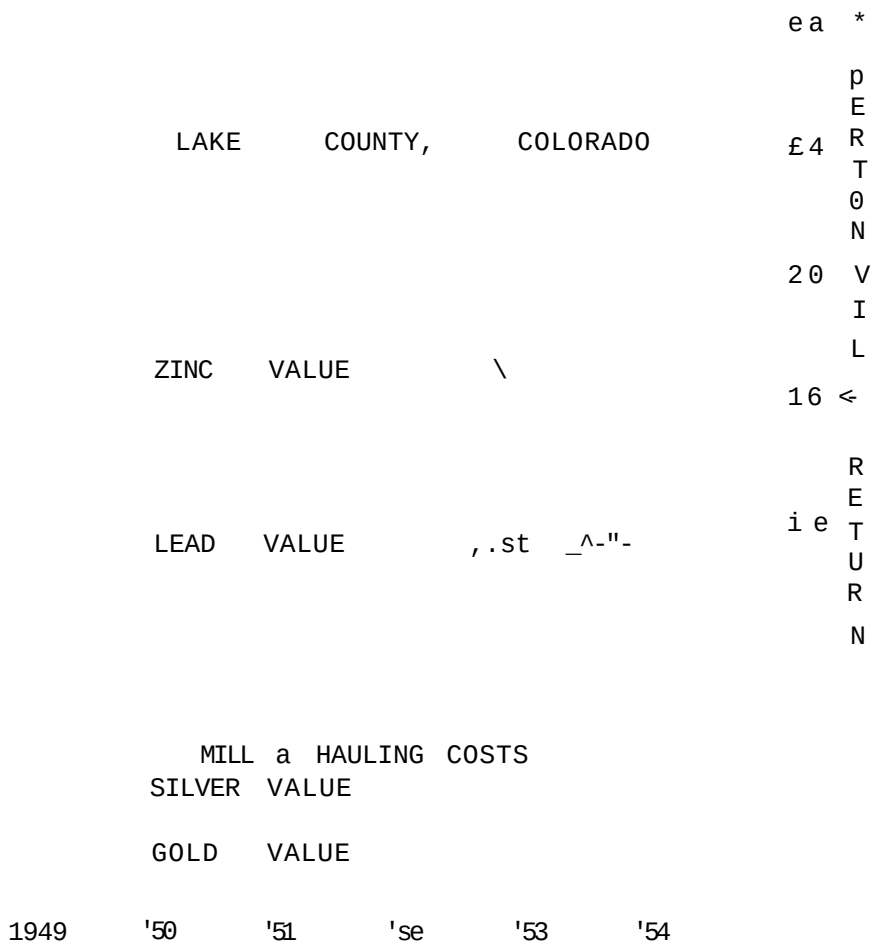
That the miner does not receive the published value of the metals is clearly shown:

Gold—(Government price	—$35.00 per ounce	
Miner received	—$26.1843 per ounce	
or	—75%	
Lead—Price May 1952	— 17.00c per pound	
Miner received	— 9.94c per pound	
or	—58.2%	
Zinc—Trice May 1952	— 19.5c per pound	
Miner received	— 4.8c per pound	
or	—24.6%	
Zinc—Price June 1952	— 11.0c per pound	
Miner received	— 2.68c per pound	
or	—24.2%	

(Figures taken from settlement sheets).

Another operation in the Leadville area is trying to hold on. This operation entails a large pumping cost. If forced to close for six weeks, it is most likely that it will never reopen. There is a known ore reserve of 500,000 tons, containing 4% lead and 4% zinc. This would be a loss to society of 20,000 tons of metallic lead and 20,000 tons of metallic zinc. Under the present costs, should zinc fall below 7.8c per pound the miner will have to pay the freight on all ore sold.

If this is multiplied by the number of mines recently closed, the loss of these metals will be tremendous.



AVERAGE ORE against PRICE FLUCTUATIONS

A cry is elevated that the world in general is becoming deficient in these base metals. So the loss of any possible recoverable metal is a calamity to the nation.

When mines do shut down, and unless the operator is well enough financed to tide over the slack time, costs of taxes and maintenance are so great that the equipment must be sold.

Then, when the demand for metals again is far greater than the supply, the mines are requested to produce. In such times industry in general returns to the machinery market. The competition for machinery becomes confusion and high prices for equipment result. Whereas, if the mines could be kept open much of this cost could be avoided.

Investigation of the sale of ore from the Ouray County area, to learn the difference in distance, produced the "Actual Ore against Actual Expenses Chart."

In this case, actual settlement expense figures were plotted. Although the ore was similar in value to the average ore in the previous case, the expenses were higher and the operation went into the red at an earlier date.

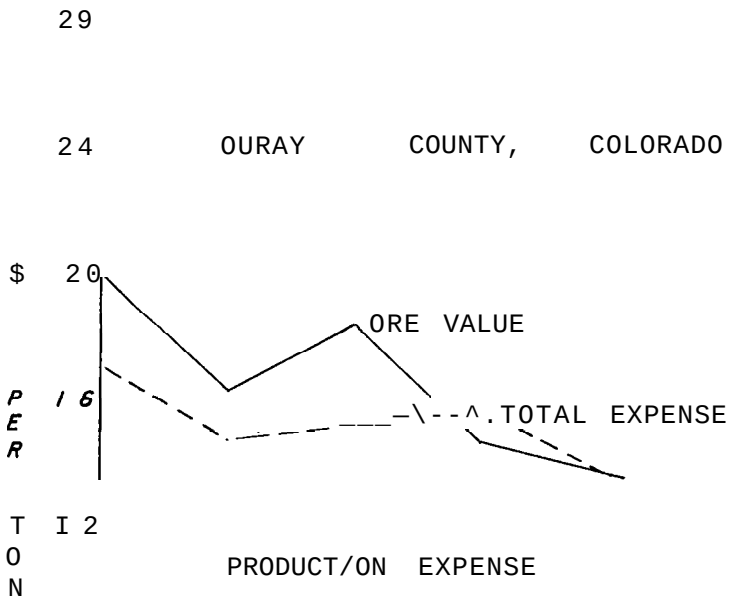
Both charts show the production declined at the same time as the drop in prices for lead and zinc.

THE KING LEASE, INC.,

Ouray, Colorado.

Comparative Operating Per Ton Income, Expense and Profit or Loss Statement on Ores Mined and Milled. January 1, 1946 through December 31, 1953.

	Averages for Years Ending December 31							
	1946 Per Ton	1947 Per Ton	1948 Per Ton	1949 Per Ton	1950 Per Ton	1951 Per Ton	1952 Per Ton	1953 Per Ton
Gross Production less Tails	$20.50	$18.11	$18.48	$17.13	$16.71	$18.42	$15.01	$13.89
Royalties, Shipping & Selling Ex-	5.41	4.53	4.01	5.63	4.22	5.75	4.53	3 80
Net Production	15.09	13.58	14.47	11.50	12.49	12.67	10.48	10.09
Production Expense	11.88	13.03	12.80	11.72	10.88	9.73	11.45	10.09
Profit or Loss before Income	17.29	17.56	16.81	17.35	15.10	15.48	15.98	13.89
Taxes & Deple-	3.21	.55	1.67	(—.22)	1.61	2.94	(—.97)	.00
Average Head Assays Including Tails:								
Gold, oz. Per Ton	.349	.14	.12	.06	.10	.07	.064	.069
Silver, oz. Per Ton	5.34	4.25	5.07	4.70	4.20	2.30	2.14	2.04
Lead, Percent	2.02	2.17	3.17	2.98	3.15	2.56	2.45	2.83
Zinc, Percent	2.29	2.41	3.45	3.20	3.80	2.79	2.36	2.38
Copper, Percent	.42	.43	.42	.50	.46	.55	.49	.60


29
24
OURAY COUNTY, COLORADO
$ 20
ORE VALUE
PER I 6
TOTAL EXPENSE
TON I 2
PRODUCT/ON EXPENSE
8
ROYALTIES, SHIPPING, SELLING EXPENSE
1949 '50 '51 '52 '53 '54
ACTUAL ORE against ACTUAL EXPENSES

MINERAL COUNTY, COLORADO

The ores of Mineral County follow a similar pattern as those of Lake and Ouray Counties. No expense data were given on expenses and so are not shown on the graph.

However the operation is holding on as long as possible so that the deposits will not be lost by shut down and accompanying dilution from caving, or until better market conditions exist.

When general business in the United States fell into the doldrums in the 1930s, the mines were requested to create more jobs; when World War II was going on, the miners were asked to produce metals; when the country was in short supply of metal during the Korean conflict, the mines again were urged to produce. In every case the mining industry met the challenge.

Now the mines are again requested to provide jobs for men. If these mines are closed because of no market, there can be but very few jobs available.

PEOPLE'S STAKE IN EXPLORATION

The people of the United States have a financial interest in the development of the mineral resources of this country.

Through the Defense Minerals Production Program, designed to locate greater ore reserves at a time when lead and zinc were in very short supply. $10,750,060 was spent by the Government to August 1952, while the owners matched with $18,072,807 in 357 projects.

(Compilation showing progress and status of the Defense Minerals Production, October 10, 1952.)

This is beyond the expense of the United States Bureau of Mines with its field men and laboratories striving to find more ore and better methods of recovery.

This is as it should be because in an emergency even the large surpluses of lead and zinc can melt away before adequate production can be assured.

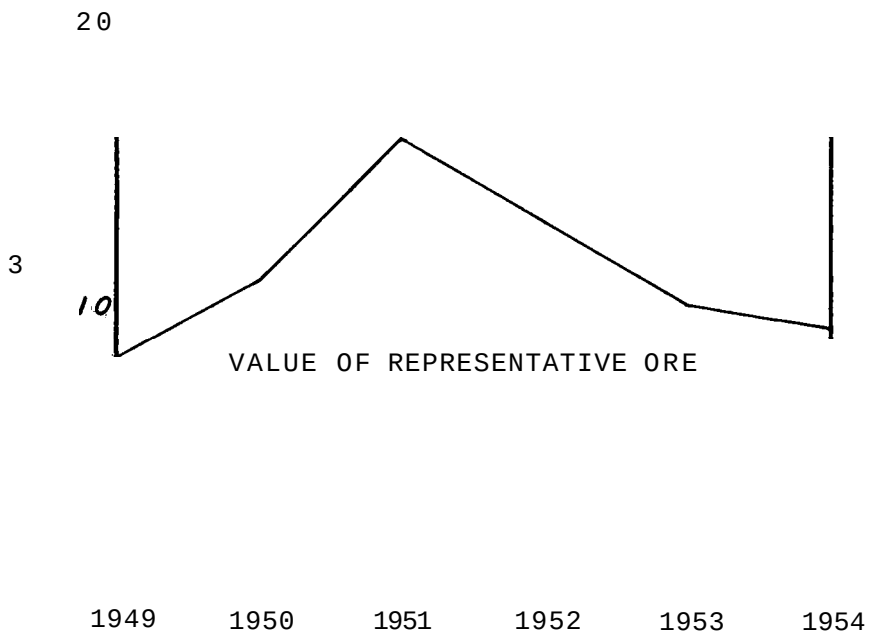
ZINC1

Tons of 2,000 Pounds

Year	Domestic Ore	% rotal	Foreign Ore and Metal	% Total	Total	Secondary Metal	Total	Consumption	Stocks
1950	...623,575	59	434,547	41	1,057,922	66,970	1,124,892	967,134	86,545
1951	...681,189	64	390,918	36	1,072,107	48,657	1.110,764	933,971	86,603
1952	. ..666,001	54	563,750	46	1,229,751	55,111	1,284,862	852,783	185,192
1953	...534,730	42	745,542	58	1,280,272	51,000	1,331,272	977,636	270,806
1954 (thru August)	...316,0012							557,166	193,253

1 American Bureau of Metal Statistics, 1954
- Daily Metal Reporter, October 1954

MINERAL COUNTY COLORADO



TAXES

The direct property taxes assessed against the mining properties located in Colorado are given in the opposite table for the years 1951, 1952 and 1953, to show the value of the mining industry to the economy of the various counties and to Colorado.

In some counties where lead and zinc are important minerals it will be seen that the equipment totals dropped between 1952 and 1953 and indicating abandonment of the mines. The counties in which the machinery assessment increased are those that produce the alloy and photo-electric elements.

Other slight changes occur from variance of valuation and levy from year to year.

Besides this the mines pay all the numerous taxes paid by other industries but nevertheless the total taxes from the mineral industry are most important to the segments of society.

CONCLUSIONS

The immigration of people into the Mountain States in search of work and riches during bad times in the east abeted the search and finding of the minerals now available to the multifarious industry of this country.

The Mountain States have provided the life blood of this land and will do it again when called upon or when better economic conditions exist.

The mining areas of Colorado contain lead and zinc in sufficient quantities to be greatly sought when the supply is short; and when the mines are allowed to deteriorate, the nation loses valuable metal due to dilution from caving and flooding and abandonment.

However, the base metal deposits of Colorado, at this time, are ready, willing and able to produce—if the economy would permit.

# # # # # #

ACKNOWLEDGMENTS

For the excellent and cordial assistance in the preparation of the list of mining property, owners—many thanks are here expressed to the Recorders and Treasurers of the various mining counties of Colorado.

And for the preparation of the data here presented, our thanks and appreciation are extended to :

Denver Public Library, Western Collection
J. R. Irion, Public Service Company of Colorado
Alvin Berry, General Electric Company
Colorado State Highway Department
A. J. Martin, U. S. Bureau of Mines
Robert L. Jones, Jones Lead & Zinc Mines Company
L. D. Barry, The King Lease, Inc.
W. L. Davenport
H. B. Hayden, Bmperius Mining Company
Colorado Tax Commission

METALS INDICATED AS BEING PRESENT BY CLAIM OWNERS

Alamosa	X	X																
Archuleta		X	X	X	X													
Boulder	X	X	X	X	X	X		X	X	X	X		X	X	X			X
	X	X	X	X	X	X	X	X	X		X		X	X	X			
Clear Creek	X	X	X	X	X	X	X	X	X		X			X				
Conejos	X	X	X	X	X													
	X	X	X	X	X													
Delta	X	X		X														
	X	X	X	X	X		X				X							
Douglas	X	X					X											
Eagle	X	X	X	X	X	X	X	X	X	X							X	
El Paso	X	X																
Fremont	X	X	X	X	X				X			X		X	X	X	X	X
Garfield	X		X	X						X	X							
Gilpin	X	X	X	X	X	X	X		X		X							
Gunnison	X	X	X	X	X	X	X	X	X									X
Hinsdale	X	X	X	X	X		X											
Jackson	X	X	X	X	X													
	X	X	X	X	X							X						
	X	X	X	X	X	X	X	X				X					X	
La Plata	X	X	X	X	X		X											
	X		X											X				
Mesa	X		X	X						X	X							
Mineral	x	X	X	X	X													
Moffat	X			X						X	X							
Montezuma	X	X		X	X					X	X							
Montrose	X	X																
	X	X	X	X	X	X	X	X									X	
Park	X	X	X	X	X	X	X	X	X		X							
Pitkin	X	X		X	X	X		X										
Rio Blanco										X	X							
Rio Grande			X	X	X													
Routt	X	X	X	X	X								X					
Saguache	X	X	X	X	X	X	X		X					X				
San Juan	X	X	X	X	X	X	X											
San Miguel	X	X	X	X	X	X	X	X		X	X							
Summit ...	X	X		X	X	X	X	X	X				X					
Teller ...	X		X	X			X											
							1						1					

METALS INDICATED AS BEING PRESENT

	a 3 d M	-t» a 0 c <0 m	tH d a w 2	d 0 5	u d p. w u 0 E	a 3 w a >, 0	0) s 3	o	Ph	a) 3 0 a u >	u 0 u d Ph	a 3 "u o	a o u o	d 5	w o > w u <	a o o p	c 3 <
Archuleta						X											
Boulder	X		X	X	X			X									
Chaffee			X		X		X	X		X							
Clear Creek	X	X			X												
Conejos					X												
Custer	X	X		X			X			X							X
Delta			X				X									X	X
Douglas																	
Dolores																	X
Eagle	X					X										X	
El Paso			X	X	X	X	X	X	X					X		X	
Fremont			X		X		X							X		X	
Garfield							X									X	
Gilpin																	
Grand	X																
Gunnison	X	X			X		X	X		X						X	
Hinsdale	X				X												
Jackson																	
Jefferson				X	X												
Lake	X															X	
La Plata	X				X		X										
Larimer			X														
Mesa	X				X									X			
Moffat	X	X			X												
Montezuma																	
Montrose	X						X										X
Park	X		X		X		X									X	
Pitkin	X						X								X	X	
Rio Blanco	X													X			
Rio Grande	X																
Saguache	X		X		X			X	X			X					X
San Juan	X	X			X		X										X
San Miguel	X				X												
Teller	X															X	

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