6000 0167 (3640)

Mining Properties - Nevada Operations
July 1, 1953

It has been the company's policy to acquire and develop mines and prospects in areas tributary to its metallurgical plants to assure control of basic ore supplies. The selective flotation mills at Bauer and Caselton; the newly completed plants of Pioche Manganese Company at Caselton and Henderson; and the proposed flotation unit for tungsten ores, hydrometallurgical plant for oxidized lead-zinc-silver-manganese ores, and zinc reduction plant are all designed to receive custom ores, but rely on company controlled ore sources for their basic tonnage requirements. The company's property holdings are now such that its basic ore supplies are assured for over 15 years with very substantital areas of mineral bearing ground subject to future development.

With its basic ore supplies now assured, company policy will be primarily directed to prospecting and developing properties it now controls and to diverting most of its expansion capital to the construction of the proposed metallurgical plants referred to above.

The success of the company in the development of selective flotation for the economical treatment of its own complex lead-zinc sulphide ores has given it a strong competitive basis for purchase of custom ores not only from Rocky Mountain areas, but also from foreign sources.

The development of the metallurgy for the treatment of company owned complex silver-lead-zinc-manganese ores in plants recently completed will also make it possible to buy custom ores to advantage.

Plans are being prepared for the construction of a tungsten mill at Minerva for the treatment of tungsten ores from four tungsten mines controlled by the company and custom ores from over twenty tungsten properties tributary to that area.

The attached tabulation gives a condensed summary of the pertinent information on mining properties owned or controlled by the company that are under my management.

Very truly yours,

S. S. Arentz

S. S. Arentz, Manager
Nevada Operations

SSA:sp

MINING PROPERTY - NEVADA OPERATIONS

Name Property	Location	Property Holding	Years Acquired	Controlled By	Past Production	Present Status	Contained Metals
Caselton and #1 Mines	On Ely Range north and west of Pioche,Nev.	134 patented, 207 unpatented lode claims or approx.7000 acres.	From 1923 through 1951.	Ownership, lease and joint venture agreements.	Over 2-1/2 million tons of silver,lead,zinc & manganese ores.	Major operating unit, presently curtailed to 10,000 tons per month.	Silver-lead zinc and manganese.
Prince Mine	Joins the Caselton mine on south.	11 patented, 32 unpatented lode claims or approx.900 acres.	From 1930 through 1951.	Lease agreement and stock ownership.	Over 1-1/4 million tons of silver, lead, zinc and manganese ores	Well equipped operating unit on standby basis.	Manganese, silver,lead and zinc.
Black Prince	Joins the Caselton mine on west.	35 unpatented lode claims approx. 730 acres.	1947	Lease and option to purchase.	Small tonnage of high grade silver.	Not equipped for operation standby basis.	Manganese, lead,silver and zinc.
Manhattan Properties	Joins Caselton on northwest.	11 patented, 163 unpatented claims, approx. 3,500 acres.	1944 through 1950.	Ownership and lease and option to purchase.	Small tonnage of high grade silver,lead, gold.	No equipment or development waiting exploration.	Silver,lead zinc, manganese.
Acme Property	Joins #1 Mine on east.	75 unpatented lode claims or approx. 1,500 acres.	1952	Lease and option to purchase.	No past production.	No equipment or development waiting exploration.	Silver,lead zinc, manganese.
Comet Mines,Inc.	15 miles west of Pioche,Nev. on Highland Range.	17 unpatented lode claims or 320 acres	1950	100% stock ownership.	About 20,000 tons lead, silver zinc and tungsten.	DMEA Exploration underway on property.	Tunsten, silver,lead and zinc.
Comet Coalition	15 miles west of Pioche,Nev.	43 patented, 200 unpatented lode claims Approx. ,4800 acres.	1947	Lease and stock ownership.	About 20,000 tons lead, zinc manganese ore and high grade silver ore.	Large developed ore reserves. On standby basis.	Manganese, lead, zinc and silver.
Black Metal	14 miles north of Pioche,Nev. in Jackrabbit District.	15 patented, 6 unpatented lode claims, approx. 370 acres.	1952	Joint venture agreement.	About 250,000 tons silver, lead, manganese ore.	Equipped and operating.About 100 tons Class IV Mn ore per day.	Manganese, silver, lead.

Name Property	Location	Property Holding	Years Acquired	Controlled By	Past Production	Present Status	Contained Metals
Idamic	15 miles north of Pioche, Nev.	12 patented, 45 unpatented claims, approx. 800 acres.	1947	Stock Ownership.	About 10,000 tons of silver-lead ore.	In production and development, 20 tons of manganese ore per day.	Manganese, lead, silver.
South Paw Mine	20 miles NW of Hiko, Nevada.	12 unpatented, lode claims 240 acres.	1950	Joint venture agreement.	About 2,000 tons manganese ore.	In limited production of high grade manganese.	Manganese and silver.
Lucky Deposit	60 miles NE of Ely, Nevada.	35 unpatented, lode claims approx. 675 acres.	1950	Ownership and lease and Option.	About 2,000 tons high grade copper-silver ore.	On standby basis.	Copper, silver.
Cinch Tunsten	50 miles north of Pioche, Nevada	25 unpatented lode claims or approx. 500 acres.	1947	Ownership	1,000 tons of tungsten ore.	On standby basis.	Tungsten.
Mt. Wheeler	80 miles north of Pioche, Nev.	11 patented, 70 unpatented lode claims, 1,500 acres.	1947	Stock ownership.	None	Major development and exploration in progress.	Tungsten.
Minerva Tungsten	70 miles NE Pioche, Nev.	8 patented, 49 unpatented lode claims, 1,100 acres	1952	Lease	127,000 tons of tungsten ore.	Major development and exploration in progress.	Tungsten.
Deertrail Tungsten	60 miles north of Pioche, Nev.	6 unpatented claims 120 acres.	1951	Lease and option to purchase	None	Standby basis, waiting on milling plant.	Tungsten.
Colorado Oxide Zinc	8 miles SW of Panamint Springs, California.	5 unpatented lode claims approx. 100 acres.	1943	Lease and option to purchase	About 10,000 tons high grade zinc silver-lead ore.	Standby basis.	Zinc, silver, lead.
Lone Mountain Oxide Zn	20 miles west of Eureka, Nev.	45 unpatented lode claims approx. 930 acres.	1950	Ownership and lease and option.	3,000 tons of high zinc-lead ore.	Standby basis.	Zinc, lead silver.
Spruce Mountain Oxide Zn	40 miles south of Wells, Nev.	1 patented and 54 unpatented lode claims approx. 1,000 acres.	1950	Ownership and lease and option.	30,000 tons of high grade silver zinc and lead ore.	Standby basis.	Zinc-silver and lead.

Name Property	Location	Property Holding	Years Acquired	Controlled By	Past Production	Present Status	Contained Metals
Andalusite Mine	12 miles SW of Mesquite, Nevada.	4 unpatented lode claims 80 acres.	1950	Ownership and lease and option.	None	Standby basis.	Rare earths thorium.
Perlite Mines	16 miles NE of Pioche, Nev. 6 miles NE Caliente, Nevada.	18 unpatented placer claims 360 acres.	1949 and 1950	Ownership.	220,000 tons of perlite ore.	Open pit operation 7,000 tons per month.	Perlite Ore.
Bentonite Clay Mine	20 miles NW of Pioche, Nevada.	2 unpatented placer claims 40 acres.	1948	Ownership.	1,000 tons of Bentonite clay	Standby basis.	Bentonite Clay.

6000 0167 (3640)

COMBINED METALS REDUCTION COMPANY

SUMMARY OF COMBINED METALS REDUCTION COMPANY'S OPERATIONS

December 5, 1955

Mr. E. H. Snyder

Mr. M. J. Kennard

Dear Mr. Snyder:

In answer to your request to summarize and briefly outline the present position of the Company, the following has been prepared:

Summary of potential earnings within the next six to eight months -

Operation	Estimated Expenditures	Production Per Month	Estimated Monthly Earnings
Utah:			
Calumet	$ 150,000 (Net)	4,000 Tons	$ 30,000
Bauer Mill.	--	12,000 Tons	32,000
Resin Plant	(250,000) (Insurance Fund)	100 Tons	10,000
Nevada:			
Pan American . . . . . (1/2 of Net Profit Plus 12¢ for Amortization)	$ 264,000	35,000 Tons	$ 27,000
Pioche Mill - Pan American 1/2 of Total Profit) . .	32,000	35,000 Tons	23,000
Sulphide Ores.	--	5,000	8,000
Tungsten	--	---	Break Even
Caselton Mine	--	5,000	Break Even
Total	$ 446,000		$ 134,500

Earnings for 2 Years (before Taxes) Life of Projected Developed Ore at Calumet and Pan American $3,228,000

FORM 25

6000 0167 (3040)

A

Summary - Properties

Attached are tabulations showing the mining properties comprising the Utah and Nevada operations of the company. These properties are briefly described in the operating sections of the report. Other property holdings and the relationship between Combined Metals Reduction Company and associated companies are outlined as follows:

1. Combined Metals Reduction Company

The company owns and operates plants at Bauer, Utah, and Caselton, Nevada, and owns and operates mining properties at Bauer and Butterfield, Utah and Caselton, Nevada. It owns or directly controls other mining properties as described in the operating sections of the report. The plants include the Bauer and Caselton selective flotation mills, the resin refinery, the Bauer Panacalite plant and the Caselton perlite crushing plant with their related auxiliary facilities.

2. Pioche Manganese Company

This company owns and operates a calcining plant at Caselton, Nevada, and two 7500 KVA electric furnaces at Henderson, Nevada, for processing manganese ores and concentrates into ferromanganese and silicomanganese. Combined Metals Reduction Company owns approximately 38% of the stock of Pioche Manganese Company and holds a collateral agreement under which Pioche Manganese Company is obligated to pay Combined Metals Reduction Company a total of $900,000 at $50,000 per year covering the transfer of facilities at Henderson. E. H. Snyder, president of Combined Metals Reduction Company, is also president of Pioche Manganese Company.

3. Uranium Reduction Company

This company holds milling contracts covering large ore reserves in the Moab, Utah, area and is now completing a milling contract with the Atomic Energy Commission. It has completed pilot plant test work and is currently completing engineering on plant design. Combined Metals Reduction Company holds a 25% interest in Uranium Reduction Company and has a management contract covering operations.

4. M.I.A. Mines Company

This is a 50-50 joint venture between Combined Metals Reduction Company and American Zinc Company of Illinois covering the Minerva Tungsten Mine 70 miles northeast of Pioche, Nevada; the Lone Mountain zinc mine 20 miles west of Eureka, Nevada; the Jean zinc stockpile at Jean, Nevada; and controlling interest in a large group of uranium claims southwest of Delta, Colorado.

5. Black Metals Reduction Company

This is a 50-50 joint venture between Combined Metals Reduction Company and Bristol Silver Mines Company covering operation of the Black Metal and Gusset Patch mines at Jackrabbit, 14 miles north of Pioche, Nevada.

6. South Paw Mines

This is a 50-50 joint venture between Combined Metals Reduction Company and Press W. Duffin covering operation of the South Paw manganese mine at Irish Mountain, 20 miles northwest of Hiko, Nevada.

7. Prince Consolidated Mining Company

This company has extensive property holdings adjoining the Combined Metals Reduction Company property at Pioche, Nevada. It has large reserves of complex lead-zinc-manganese ore, a well equipped surface plant and auxiliary facilities. Combined Metals Reduction Company owns approximately 33% of the stock and has a twenty year lease and operating agreement covering the property.

8. Comet Mines, Inc.

This company has property in the Comet district, 10 miles west of Caselton, Nevada. The property has been productive in the past and is currently being developed under a DMEA exploration project. The company is a wholly owned subsidiary of Combined Metals Reduction Company.

9. Comet Coalition Mines Company

This company has extensive property holdings in the Comet district, 10 miles west of Caselton, Nevada. It has large developed reserves of lower grade lead-zinc ore with manganese at the Pan American, Log Cabin and Forlorn Hope properties. The company is controlled by the Anaconda Copper Mining Company and the W. F. Snyder and Sons Company. Combined Metals Reduction Company has a minor stock interest and a twenty year lease and operating agreement.

10. Raymond-Combined Mines Company

This is a 50-50 joint venture between Combined Metals Reduction Company and the Raymond Ely West Mining Company covering development and mining in property adjoining the Caselton-No. 1 Mines. The property is currently under development by a DMEA exploration project.

11. Idamic Mines Company

This company has large property holdings 15 miles north of Pioche, Nevada. Mines include the Ida May, Hurley and North Star groups. Past production includes lead, zinc, silver, copper and manganese ores. The North Star mine is currently being developed by a DMEA exploration project. The company is controlled by Combined Metals Reduction Company through stock ownership.

12. Mt. Wheeler Mines Company

This company has large property holdings 80 miles north of Pioche, Nevada. The property is currently producing tungsten ore and has excellent prospects for major lead-zinc development. It has a well equipped mine and surface plant. Stock control is held between Combined Metals Reduction Company and American Zinc Company of Tennessee.

13. Panacalite Pacific Company

This company owns a highly profitable perlite expanding plant in Los Angeles, California. Combined Metals Reduction Company owns approximately 67% of the stock of Panacalite Pacific Company.

14. Crested Butte Mining and Milling Company

This company owns 10 patented claims and 43 unpatented claims in the Ruby Mining district, Gunnison County, Colorado. The property was just discovered in 1885 and has been in sporadic operation since. The early day miners were primarily interested in high grade lead-silver ores and the relatively high grade zinc content of the ore was a serious detriment. Current operations were started in 1951 and included reopening the mine and road construction. The mine operated on a small scale in 1952 and was shut down in the fall of that year due to the drop in metal prices. Stock control of the company is held by Combined Metals Reduction Company and Universal Die Casting Company of Saline, Michigan, a major zinc customer.

15. Utah Rock Asphalt

This property consists of 600 acres of mineral land in Carbon County, Utah, a few miles northeast of Sunnyside, Utah, covering a very large deposit of natural rock asphalt. The property has been operated in the past as an open pit mine supplying road and street surfacing material of a superior quality. Transportation costs made the operation unprofitable. The property has great potential value for the contained hydro-carbons. Combined Metals Reduction Company and the Van Evera family of Salt Lake City each own a 50% interest.

16. Mercur Gold Mines

The property covers an area of approximately 1900 acres at the Camp of Mercur, at the south end of the Oquirrh Range, 60 road miles southeast of Salt Lake City. The property consists of 52 patented lode mining claims, some unpatented fractions and mill sites. The ore was discovered in 1870 and has a past production of over $25,000,000 in gold. There are over 3,000,000 tons of tailings on the property which contain commercial amounts of gold and thallium under the right economic conditions. The property was reopened in 1934 by the Lewiston Peak Mining Company, later Snyder Mines Company, and was operated continuously until the gold mines closing order of September, 1942. In addition to its future value for gold, the property has good prospects for lead-zinc development in lower horizon which have been very productive at the Camps of Ophir, Utah to the north and Eureka, Utah to the south of Mercur. The property is held by Combined Metals Reduction Company under a lease and option agreement with Snyder Mines Company.

MINING PROPERTY, UTAH OPERATIONS

Name Property	Location	Property Holding	Year Acq.	Controlled by	Past Production	Present Status
Honerine	Stockton, Ut. Honerine Tunnel, Bauer Plant	117 Patent. Claims 896 A 83 Unpat. Claims 1135 A, Mill & camp 640 Acres, Farm 1761.5 Acres	1923 thru 1950	Ownership	1,000,000 T (?)	Limited lease operation
Calumet	Stockton, Ut. Honerine Tunnel, Bauer Plant	30 Pat. Claims 182 Acres, 1 Unpat. Claim 8 Acres	1929	Lease with option to purchase	775,000 T	Mining on 2300 level
Bluestone	Stockton, Ut. Honerine Tun. Bauer Plant	12 Patented Lode Claims	1938	Lease	281,000 T	No work. Mining Facilities intact on 1200 level. Slightly caved.
Ben Harrison	Stockton, Ut.	21 Pat. Claims 293 A., 2 Unpat. Claims 40 A., Mill site 33 acres.	1948	Lease with option to purchase	19,000 T	Surface closed. 1200 level, some leasing.
Silver Coin	Stockton, Ut.	8 Pat. Claims 86.5 A.	1948	Lease with option	1,000 T	Not working. Opened only on surface.
Muirbrook-Larsen	Stockton, Ut.	9 Pat. Claims 49 Acres	1948	Lease with option	2,500 T (?)	Surface, no work. 1200 lvl being driven under mine.
Dugway	Dugway Mt., west Tooele,Ut	8 Unpat. claims 160 A.	1937	Ownership	1,000 T (?)	Assessment work only
Butterfield	Lark, Ut. in Butterfield Canyon	109 Pat. Claims 1383 A. Land 780 Acres, 103 Unpat. Claims 1463 Acres	1932	Ownership on Lavagnino Gp; Lease & option Park Bingham	500,000 T	Lease operation and Company driving DMA drift on 1200 level

All the above mines contain ores of gold, silver, lead, and zinc, except the Bluestone, Silver Coin, and Muirbrook-Larsen which were principally gold, silver, and lead.

Mining Properties - Nevada Operations
July 1, 1954

It has been the company's policy to acquire and develop mines and prospects in areas tributary to its metallurgical plants to assure control of basic ore supplies. The selective flotation mills at Bauer and Caselton; the newly completed plants of Pioche Manganese Company at Caselton and Henderson; and the proposed flotation unit for tungsten ores, hydrometallurgical plant for oxidized lead-zinc-silver-manganese ores, and zinc reduction plant are all designed to receive custom ores, but rely on company controlled ore sources for their basic tonnage requirements. The company's property holdings are now such that its basic ore supplies are assured for over 15 years with very substantial areas of mineral bearing ground subject to future development.

With its basic ore supplies now assured, company policy will be primarily directed toward prospecting and developing properties it now controls and to diverting most of its expansion capital to the construction of the proposed metallurgical plants referred to above.

The success of the company in the development of selective flotation for the economical treatment of its own complex lead-zinc sulphide ores has given it a strong competitive basis for purchase of custom ores not only from Rocky Mountain areas, but also from foreign sources.

The development of the metallurgy for the treatment of company owned complex silver-lead-zinc-manganese ores in plants recently completed will also make it possible to buy custom ores to advantage.

The attached tabulation gives a condensed summary of the pertinent information on mining properties owned or controlled by the company that are under my management.

Very truly yours,

S. S. Arentz

S. S. Arentz, Manager
Nevada Operations

SSA:sp

MINING PROPERTY - NEVADA OPERATIONS

Name Property	Location	Property Holding	Years Acquired	Controlled By	Past Production	Present Status	Contained Metals
Caselton and #1 Mines	On Ely Range north and west of Pioche, Nev.	134 patented, 207 unpatented lode claims or approx. 7000 acres.	From 1923 through 1951.	Ownership, lease and joint venture agreements.	Over 2-1/2 million tons of silver, lead, zinc & manganese ores.	Major operating unit, presently curtailed to 7,000 tons per month.	Silver-Lead zinc and manganese.
Prince Mine	Joins the Caselton mine on south.	11 patented, 32 unpatented lode claims or approx. 900 acres.	From 1930 through 1951.	Lease agreement and stock ownership.	Over 1-1/4 million tons of silver, lead, zinc and manganese ores	Well equipped operating unit on standby basis.	Manganese, silver, lead and zinc.
Black Prince	Joins the Caselton mine on west.	35 unpatented lode claims approx. 730 acres.	1947	Lease and option to purchase.	Small tonnage of high grade silver.	Not equipped for operation standby basis.	Manganese, lead, silver and zinc.
Manhattan Properties	Joins Caselton on northwest.	11 patented, 163 unpatented claims, approx. 3,500 acres.	1944 through 1950.	Ownership and lease and option to purchase.	Small tonnage of high grade silver, lead, gold.	No equipment or development waiting exploration.	Silver, lead zinc, manganese.
Acme Property	Joins #1 Mine on east.	75 unpatented lode claims or approx. 1,500 acres.	1952	Lease and option to purchase.	No past production.	No equipment or development waiting exploration.	Silver, lead zinc, manganese.
Comet Mines, Inc.	15 miles west of Pioche, Nev. on Highland Range.	17 unpatented lode claims or 320 acres	1950	100% stock ownership.	About 20,000 tons, lead, silver zinc and tungsten	DMEA Exploration underway on property, Some Lead-zinc Production.	Tungsten, silver, lead and zinc.
Comet Coalition	15 miles west of Pioche, Nev.	43 patented, 200 unpatented lode claims Approx. 4,800 acres.	1947	Lease and stock ownership.	About 20,000 tons, lead, zinc manganese ore and high grade silver ore.	Large developed ore reserves. On standby basis.	Manganese, lead, zinc and silver.
Black Metal	14 miles north of Pioche, Nev. in Jackrabbit District.	15 patented 6 unpatented lode claims, approx. 370 acres.	1952	Joint venture agreement.	About 250,000 tons silver, lead, manganese ore.	Equipped and operating. About 700 tons Class IV Mn ore per month.	Manganese, silver, lead.

Name Property	Location	Property Holding	Years Acquired	Controlled By	Past Production	Present Status	Contained Metals
Idamic	15 miles north of Pioche, Nev.	12 patented, 45 unpatented claims, approx. 800 acres.	1947	Stock Ownership.	About 10,000 tons of silver-lead ore.	Exploration and development	Manganese, lead, silver.
South Paw Mine	20 miles NW of Hiko, Nevada	12 unpatented, load claims 240 acres	1950	Joint venture agreement.	About 2,000 tons manganese ore.	In limited production of high grade manganese.	Manganese and silver.
Lucky Deposit	60 miles NE of Ely, Nevada.	35 unpatented, lode claims approx. 675 acres.	1950	Ownership and lease and Option	About 2,000 tons high grade copper-silver ore.	On standby basis.	Copper, silver.
C[illegible]h Tungsten	50 miles north of Pioche, Nevada	25 unpatented lode claims or approx. 500 acres.	1947	Ownership	1,000 tons of tungsten ore.	On standby basis.	Tungsten.
Mt. Wheeler	80 miles north of Pioche, Nev.	11 patented, 70 unpatented lode claims, 1,500 acres.	1947	Stock ownership.	None	Major development and exploration in progress. Small production.	Tungsten.
Minerva Tungsten	70 miles NE Pioche, Nev.	8 patented, 49 unpatented lode claims, 1,100 acres	1952	Lease	127,000 tons of tungsten ore.	Producing 60 tons tungsten ore per day. Development continuing	Tungsten.
Deertrail Tungsten	60 miles north of Pioche, Nev.	6 unpatented claims 120 acres.	1951	Lease and option to purchase	None	Standby basis, waiting on milling plant.	Tungsten.
Colorado Oxide [illegible]	8 miles SW of Panamint Springs California.	5 unpatented lode claims approx. 100 acres.	1943	Lease and option to purchase	About 10,000 tons high grade zinc silver-lead ore.	Standby basis.	Zinc, silver, lead.
Lone Mountain Oxide Zn	20 miles west of Eureka, Nev.	45 unpatented lode claims approx. 930 acres.	1950	Ownership and lease and option.	3,000 tons of high zinc-lead ore.	Standby basis.	Zinc, lead silver.
Spruce Mountain Oxide Zn	40 miles south of Wells, Nev.	1 patented and 54 unpatented lode claims approx. 1,000 acres.	1950	Ownership and lease and option	30,000 tons of high grade silver zinc and lead ore.	Standby basis.	Zinc-silver and lead.

Name Property	Location	Property Holding	Years Acquired	Controlled By	Past Production	Present Status	Contained Metals
Andalusite Mine	12 miles SW of Mesquite, Nevada	4 unpatented lode claims 80 acres.	1950	Ownership and lease and option.	None	Standby basis.	Rare earths thorium.
Perlite Mines	16 miles NE of Pioche, Nev. 6 miles NE Caliente, Nevada.	18 unpatented placer claims 360 acres.	1949 and 1950	Ownership.	220,000 tons of perlite ore.	Open pit operation 7,000 tons per month.	Perlite Ore.
Bentonite Clay Mine	20 miles of Pioche, Nevada.	2 unpatented placer claims 40 acres.	1948	Ownership.	1,000 tons of Bentonite clay	Standby basis.	Bentonite Clay.

B

Estimated Ore Reserves - Nevada Operations

July 1, 1954

An accompanying report has identified the several mining properties comprising the mining division of the Nevada Operations. Any discussion of ore reserves requires some basic definitions and an understanding of company policy with respect to exploration, mine development, metallurgical research and plant construction.

Ore is defined as mineralized rock which can be mined at a profit. Ore deposits commonly have all gradations of mineralization between barren waste and relatively pure ore mineral. Ore reserves depend upon the market price and the cost of production as well as upon the size of the ore bodies and the extent to which they are developed. Ore reserves are estimated with varying degrees of accuracy. Developed Ore can be measured and sampled and can be accurately estimated. Probable Ore is exposed on two or more sides by mine workings or drill holes and can be estimated with reasonable accuracy. Inferred Ore is partially defined by mine workings or drill holes but estimates are primarily based on geologic inference based on known conditions governing ore deposition and upon the habits of ore deposits in a particular district. The accuracy of the estimates of inferred ore is dependent upon the judgement and character of the geologist and engineer.

The ultimate production that may be obtained from a metal mine is rarely, if ever, determined. Even a "worked out" mine is subject to new geologic interpretation that will discover adjoining ore bodies and to technological improvements or to better markets that will make ore out of material formerly too low grade to mine.

The complex ores of the Pioche district are excellent examples of how mineralized rock can become ore through improved technology. The lead-zinc sulphide ores of the district were valueless to the early day miners and only became ore through the development of the selective flotation process and the construction of the Bauer and Caselton flotation mills. In the course of mining over 2-1/2 million tons of sulphide ore during thirty years of operation the company's mine workings opened up large areas of lower grade lead-zinc mineralization containing appreciable quantities of manganese. By carrying out an aggressive program of metallurgical research the Company developed the processes embodied in the new additions to the Caselton mill and in the newly completed plants of Pioche Manganese and converted this heretofore worthless rock into our Class I - II and IV manganese ore reserves. The proposed hydrometallurgical and zinc reduction plants will serve a similar purpose for our Class III manganese ore and our oxidized zinc-lead ore reserves as well as greatly enhance the value of other ore reserves.

It is company policy to limit developed reserves to only a year or two in advance of mining because the cost of maintaining mine entries can become a major item of expense, and in the case of sulphide ore, prolonged exposure to air reduces metallurgical recoveries of the valuable minerals. Exploration drilling is used as a guide to mine development, but drill holes alone do not necessarily block out ore reserves. Exploration projects have been prepared to locate extensions of the main Caselton - #1 mine ore bodies and an extension of the Prince mine ore body. Other exploration projects are now in progress at the #1 mine and the Comet mine.

Our currently large reserves of the various classes of complex manganese ores were developed in the course of mining sulphide ore. There has been no planned program of exploration and mine development for the purpose of increasing these ore reserves although during the past two years mine development has been confined to the preparatory work required to place these ores in production. These ore reserves can be substantially increased whenever conditions warrant the exploration of hitherto undeveloped sections of the company's holdings in the Pioche area.

Exploration programs at the Comet, Minerva and Mt. Wheeler properties are designed to increase our reserves of tungsten ore.

It should also be noted that the areas tributary to the Caselton mill contain a good many prospects and small mines in addition to those owned or controlled by the company. The manganese and tungsten ores produced by these properties have no readily available market save the Caselton plant.

The following is a summary of our estimated reserves of the several classes of ore as of July 1, 1954. The distribution of tonnages to the several properties is shown in the attached tabulations. Detailed maps and assay records upon which the estimates are based are on file at the Caselton office.

Type of Ore	Estimated Short Dry Tons	Gold	Silver	Lead	Zinc	Mn	WO_3
Sulphide Ore	779,000	.028	3.93	3.13	8.36	--	--
Class I Manganese	4,498,700	.010	1.93	1.25	2.60	10.26	--
Class II Manganese	2,564,500	.024	2.52	1.77	1.72	13.58	--
Class III Manganese	4,757,000	.01	2.30	2.5	2.5	11.2	--
Class IV Manganese	185,000	.02	2.70	1.5	1.8	20.8	--
Oxidized Zinc-Lead	58,000	.05	3.45	1.8	20.6	--	--
Tungsten Ores	157,500	--	--	--	--	--	0.74
Perlite Ore	41,000,000	--	--	--	--	--	--
Bentonite Filter Clay	120,000	--	--	--	--	--	--

It may be of interest to note that the Caselton mill was constructed on the basis of sulphide ore reserves of 800,000 tons in 1940. Since that date we have mined over 1,500,000 tons of sulphide ore and still have reserves in excess of 750,000 tons. There is no present indication that future development in the district will not have similarly successful results.

Very truly yours,

S. S. Arentz, Manager

SSA:sp

C

UTAH OPERATIONS
COMBINED METALS REDUCTION COMPANY

The Utah Operations consist of mining and milling ores containing gold, silver, lead, zinc and copper; custom milling lead, zinc and tungsten ores, expanding crude perlite and marketing light weight aggregates; and of refining fossil resin from Utah coals and marketing refined resin. The operations are centered at the Bauer plant, 40 miles southwest of Salt Lake City, Utah and 6 miles south of Tooele, the County Seat of Tooele County. The Butterfield camp is 30 miles southwest of Salt Lake City, Utah and adjoins the U. S. Smelting and Refining Company and Utah Copper mines at Bingham, Utah.

The Utah Operations normally employ 320 men, including supervisors and technicians. Employment averages 170 during the present period of low metal prices and curtailed lead-zinc production.

General Facilities

The Bauer operation is a major industrial installation. General Facilities are described as follows:

1. Power

The plant is served by the Utah Power and Light Company, which supplies electric power at 44,000 volts to the Bauer substation. Average power cost is 0.88¢ per kilowatt hour. The Utah Power and Light Company also serves the Butterfield operation on a similar basis.

Bauer also has a 750 H.P. steam plant to provide heat and steam power to the plant facilities.

2. Transportation

The main line of the Union Pacific Railroad crosses the Bauer property and switch trackage is installed to serve the several operating units. The railroad provides daily freight service to the plant. Most of the ore milled is received in railroad cars and all of the concentrates produced are shipped by rail to smelters at Tooele, Utah and Great Falls and Anaconda, Montana.

The Bauer plant is served by a paved entrance road from highway U-36 and has excellent trucking connections.

The Butterfield camp is 5 miles from the loading facilities on the Denver and Rio Grande Railroad at Lark, Utah. The camp has excellent road connections into Salt Lake City.

3. Housing and Community Facilities

Most of the Company's employees at the Bauer plant and the service population of the area, live in the established town of Tooele, Utah. The town also serves the operations of International Smelting Company and the large government Tooele Ordinance Depot, as well as the surrounding farming communities. Key personnel live in 16 modern dwellings in the Bauer camp.

Employees at the Butterfield operation live in Salt Lake valley communities and in Salt Lake City. Key personnel live in 6 company homes in the Butterfield camp.

The areas adjacent to both camps are well populated, settled areas with well developed community facilities and adequate housing. Employees drive to work or provide their own bus service.

4. General Plant Facilities

To service the various operating units, the company maintains general plant facilities including accounting and payroll offices, warehouse, machine shop and electrical repair shop, laboratories, engineering office, railroad and truck scales, research facilities, boarding house and heavy equipment including bulldozer, drag line, crane, trucks and autos.

CALUMET MINE

The Calumet Mine is one of the group of mines owned or controlled by the company adjacent to the Bauer plant. The group is operated as a unit and for the purpose of discussion will be referred to as the Calumet Mine.

The property covers an area of approximately 5,000 acres on the west flank of the Oquirrh Range north of Stockton, Utah and west of the Bauer plant. The property consists of 185 patented and 83 unpatented mining claims, the Bauer plant site and adjoining farm land.

Surface outcrops were first mined in the late 1860's and mining has continued almost without interruption from that early date. Several ore shoots have been mined from the surface for 2,000 feet down the dip of the beds. The company first acquired property in the area with the purchase of the Honerine Mine and the Bauer mill site in 1923 and has since extended its holdings in the area. Total mine development probably exceeds 35 miles of underground workings.

The operating records of the old companies are not available. During its 30 years of operation, the company has mined 800,000 tons of ore having a mine value of nearly twelve million dollars and returning an operating profit before taxes, depletion and depreciation of nearly nine hundred thousand dollars.

The principal ore bodies occur as replacement deposits in favorable limestone beds at their intersection with mineralizing fissures. Limestone beds from 3' to 40' thick are interbedded with 135' to 400' thick quartzite beds. The most productive limestone beds are locally referred to as the Calumet, Muscatine and Iroquois limestone. The sedimentary rocks strike generally east-west and dip to the north. Porphyry dikes and mineralized faults strike north-south, cutting across the bedded formation. The best mineralizers make ore in several limestone beds.

The Honerine adit and the Calumet shaft provide access to the mine workings although old stopes and shafts provide additional openings to the surface. The Honerine adit is several miles long and serves as a main haulage level in addition to draining mine workings above the adit level. The portal is at the Bauer plant. The adit enters the mountain to the east of the plant and intersects the Calumet workings two miles from the portal and 1200 feet down the dip of the ore bodies from the surface. In the area of the mine workings, the ore above the adit level has been mined out, but there are several undeveloped areas that warrant exploration.

The Calumet shaft serves the mine workings below the adit level. The shaft goes from the 1200 level to the 2100 level and from that level a second shaft has been sunk several hundred feet on ore in the Muscatine limestone.

Production from the Calumet Mine has averaged between two and three thousand tons of ore per month. In 1953 the average grade of ore mined was .058 Au, 9.60 Ag, 13.44 Pb, 2.66 Zn. These assays are representative of current production. The single compartment Calumet shaft limits production from the lower levels of the mine. The workings are wet and hot and mining costs are high, but the ore is high grade and combined mine and mill earnings have generally returned a profit on the operation. The mine pumps an average of 350 gallons of water per minute from the lower workings.

The mine has never had large reserves of developed ore. Regular mine development has averaged 13.5 tons of ore per foot of development work which favorably compares with an average of 15.0 tons of sulphide ore per foot of development at the Caselton mine. On a long range basis the mine needs a major development program to block out sufficient ore to warrant sinking a new, larger capacity shaft to serve the mine workings below the adit level. The increased production and decreased costs resulting from such a program would return the estimated $500,000 cost in four to five years.

The operation of the Calumet mine is important to the Bauer plant and flotation mill. In addition to supplying an appreciable tonnage of high grade ore, the mine absorbs 50% of the camp expense and a share of plant and general office general expense.

CALUMET MINE
PRODUCTION AND EARNINGS

Year	Dry Tons	Au	Ag	Pb	Zn	Production	Operating P & L	Develop Footage
1925 to 1940	367,973	.066	5.86	12.58	6.31	$ 3,584,331	$139,454	17,059
1941	42,105	.067	7.20	10.22	6.83	441,952	78,066	5,261
1942	37,996	.072	7.12	9.37	7.41	442,088	58,983	4,200
1943	41,583	.062	6.41	8.02	6.83	664,795	133,567	4,772
1944	43,991	.061	5.80	7.51	7.11	630,180	92,187	2,820
1945	32,447	.057	7.19	9.46	7.18	651,815	178,102	2,151
1946	32,094	.055	6.97	9.45	5.88	641,973	131,088	3,316
1947	32,010	.058	7.37	9.74	6.57	716,959	100,171	3,615
1948	40,154	.069	7.83	10.13	5.01	1,061,580	265,677	3,591
1949	33,873	.063	7.12	9.07	4.53	633,869	(122,722)	3,386
1950	14,630	.075	7.91	10.44	7.35	318,415	(191,312)	465
1951	25,740	.063	8.84	11.77	3.89	724,780	3,649	2,374
1952	20,802	.048	10.15	13.98	2.69	612,743	(49,912)	4,172
1953	24,184	.058	9.60	13.44	2.66	489,211	24,307	1,220
1st half 1954	12,555	.053	9.65	13.90	3.50	273,702	41,747	920
Total	802,137	.064	6.70	11.18	6.04	$11,888,393	$893,052	59,322

The operating loss in 1949 was due to the drastic drop in metal prices that year. In 1950 the mine still suffered from the 1949 metal price drops and work was largely confined to mine development rather than production for the first six months. In 1952 a mine fire in the upper workings of the Calumet mine stopped production for a time and resulted in considerable expense for repairs.

In addition to mine earnings from the Calumet mine, the company has realized a substantial mill profit from the ore. While the mine is currently suffering from lack of developed ore, the long range outlook for the property is good. The ore is relatively high grade and the ore bodies are continuous over a considerable length.

MILLING OPERATIONS

The Caselton mill is a modern, well constructed, fully equipped plant, designed to concentrate several types of complex ore to produce marketable lead, zinc, iron and manganese concentrates. The first unit of the mill was completed on September 1, 1941. A second unit was constructed in 1943, and a third unit was completed early in 1953. The mill treats both company and custom ores by heavy media separation and selective flotation processes. To January 1, 1953 the mill had treated 2,294,461 tons of ore, and had sold concentrates having a net mill value of $33,007,550.00, on which it returned an operating profit of $6,460,177.00 before depreciation and taxes.

The mill receives ore by truck or rail delivery to its stockpile area and receiving hopper. Conveyor belts carry the mine run ore into a well designed crushing and sampling plant, which crushes the ore to pass 1/2 - 5/8" screens at rates up to 200 tons per hour. The crushed ore passes over belt conveyors to fine ore storage bins of 4500 tons capacity. The eight fine ore bins have belt conveyors discharging into the heavy media separation plant or into any of three grinding circuits. The heavy media plant has a rate of capacity of 50 tons per hour and serves to remove waste rock from coarsely crushed ore.

Two of the mill grinding circuits are rated at 600 tons of ore per day and a third grinding circuit is rated at 800 tons per day for a total mill capacity of 2,000 tons of ore per day. Any of the grinding circuits can discharge to any of three flotation circuits, each having a maximum capacity of 1,000 tons per day. One complete circuit is for the selective flotation of sulphide ores containing lead and zinc. A second circuit is designed for recovering lead and silver from oxide ores and for recovering sulphide lead and zinc from manganese ores. The third circuit is designed to selectively recover iron and manganese. All three circuits are designed for maximum flexibility, with pumps so arranged that the circuits can be readily changed to meet a large variety. of flowsheets.

Mill concentrates go to the thickening and filtering plant adjacent to the mill. The filtered concentrates drop into railroad cars for shipment to smelters and refineries.

Auxiliary facilities include a chemical plant for preparing mill reagents; a fully equipped analytical laboratory; a flotation research laboratory; sampling facilities, a water supply system and tailing retention ponds. All mill equipment is housed in modern steel and concrete, fireproof, insulated buildings.

From 1941 through 1952, the Caselton mill earned an average operating profit (before depreciation and taxes) of $2.81 per ton of ore milled. During the past year the mill has absorbed large inventory losses on zinc metal produced under higher prices, and heavy expense incident to placing the manganese section in operation. Most of these extra costs are behind us. Mill crews have been trained in handling manganese reagents, flow sheets have been stabilized and metallurgical efficiencies are approaching those forecast by our laboratory research. Under present metal prices, mill earnings will average an estimated $1.00 per ton before depreciation and taxes.

CASELTON FLOTATION PLANT
PRODUCTION AND EARNINGS

Year	Tons Milled	Production	Cost of Ore	Milling Cost	Operating P & L
1941	45,904	$ 544,222	$ 370,198	$ 82,525	$ 91,499
1942	126,223	1,083,605	695,668	203,010	184,927
1943	144,929	1,465,376	787,600	262,225	415,551
1944	210,582	2,199,283	1,279,395	363,205	556,683
1945	183,169	1,803,168	1,093,208	320,630	389,330
1946	189,209	1,921,206	1,223,719	351,465	346,022
1947	200,653	2,657,765	1,625,951	386,541	645,273
1948	227,741	4,861,569	3,020,013	478,873	1,362,683
1949	250,729	3,652,237	2,892,755	545,335	214,147
1950	263,662	4,830,865	3,146,799	577,531	1,106,535
1951	224,247	4,301,433	2,853,753	671,876	775,804
1952	227,413	3,686,821	2,621,690	693,408	371,723
1953	200,799	1,663,996	1,511,430	878,786	(726,219)
1st Half 1954	25,958	250,001	256,885	189,893	(196,776)
Total	2,521,218	$34,921,547	$23,379,064	$6,005,303	$5,536,782

The Caselton mill started operations on September 1, 1941, treating company ores from the Caselton, No. 1 and Pan American mines and custom ores from the Prince, Ely Valley, Comet and several smaller mines. Mill capacity was increased in 1943 and again in 1952-1953.

In 1952 the mill treated 39,000 tons of complex lead-zinc manganese ore for recovery of lead-zinc only and impounded the tailing for later recovery of manganese. In 1953 the mill treated 85,785 tons of the complex manganese ore and retreated an additional 17,932 tons of tailing for recovery of manganese. The heavy loss in 1953 was largely due to breaking in the new manganese circuit and included the cost of many mechanical changes required by the manganese circuits. Part of the loss was due to inventory losses on slab zinc due to the continued low price of metals.

In the first half of 1954 the mill treated oxidized lead-silver ore and manganese ore, but due to curtailed mine production the mill was idle for over two months. Proposed mine operations and ore now stockpiled will keep the mill in operation during the last half of the year.

The present mill has a capacity of approximately 1500 tons of ore per day and includes a crushing and sampling plant, a sink-float plant, two complete lead-zinc selective flotation circuits and flotation circuits for making iron and manganese recovery. The mill also includes a filtering plant, research and assay laboratories, stockpile areas, railroad trackage and auxiliary facilities.

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NEVADA OPERATIONS
COMBINED METALS REDUCTION COMPANY

June 1, 1954

The Nevada operations consist of mining and milling ores containing gold, silver, lead, zinc and manganese; mining, crushing and sizing crude perlite aggregate; and mining tungsten ores. The operations are centered at the Caselton plant, 2-1/2 miles west of the town of Pioche, County Seat of Lincoln County, Nevada, but include mining properties 200 miles distant in eastern and southern Nevada areas.

The operations normally employ 450 men, including supervisors and technical staff. Employment averages 150 during the present period of low metal prices and curtailed lead-zinc production.

GENERAL FACILITIES

During the past forty years the Nevada Operations have grown from a small, isolated mining operation to a major industrial unit. This growth has depended as much on low cost electric power, improved highway and railroad transportation and employee housing as it has on mine development and equipment or on metallurgical research and plant construction. These important general services are discussed as follows:

1. Power

Prior to 1937, all operations in the Pioche area were necessarily based on high cost steam or diesel plant power. In the period 1935-37, the company took the lead in organizing Lincoln County Power District No. 1, a quasi-municipal organization, for constructing and operating over 150 miles of transmission line to bring low cost power from Hoover Dam generators to the Pioche area. The district has been allotted sufficient Hoover Dam energy to supply present needs and to allow for considerable expansion of operations. Power rates average six mills per kilowatt hour at Caselton.

Lincoln County Power District No. 1 serves all the operations in the Pioche area, in addition to the communities of Pioche, Panaca and Caliente. White Pine Power District No. 9 has been organized to construct and operate a transmission line running north from Pioche and will serve the Minerva, Cinch, Mt. Wheeler and Deertrail properties, as well as other mines and farming communities.

2. Transportation

The Union Pacific Railroad extended its Pioche branch to Caselton and Prince in 1940. The Caselton plant and the new kiln plant of Pioche Manganese Company receive daily train service to the spur tracks serving the operations.

In 1942 the government constructed an oiled highway from main U. S. Highway 93 north of Pioche to serve the Caselton and Prince camps. In 1951 this highway was extended seven miles south to connect with U. S. Highway 93 south of Pioche and provide access between the plant and the communities of Panaca and Caliente. Also during 1951, a 17 mile highway was constructed between Caselton and the company's properties in the Comet district. U. S. Highway 93 provides excellent highway connections to the mining properties north of Pioche and to the Henderson and Las Vegas area to the south. Common carrier and contract truck lines provide regular highway freight service to the plant.

3. Housing and Community Facilities

Most of the company's employees and the service population of the area live in the established communities of Pioche, Panaca and Caliente, which are respectively 9, 10 and 20 miles by oiled highway from the Caselton plant. These communities have a combined population somewhat in excess of 3,000 and have stores, garages, school, churches and amusement centers. There was a shortage of good housing in the area which was partially remedied when the Federal Public Housing Authority constructed forty apartment units, a 70 man dormitory and a commissary at Caselton in 1942, and 112 apartment units at Pioche in 1943. The company has constructed 20 modern residences for housing key personnel at the Caselton camp and has an additional ten homes at the Prince camp. A subdivision of 100 high quality homes has been constructed at Panaca, Nevada for purchase by company employees on very attractive terms.

4. Medical & Hospital

In 1947 the company, in association with the other mine operators in the area and the local miner's union, organized the Pioche Mutual Benefit Association, to provide hospital and surgical insurance for employees and their families. Benefits and premiums were based on the Blue Cross system. The association is run by a board of directors elected by the employee membership and has been most successful in its operations. In 1951 the association used part of its surplus and borrowed funds to purchase the Pioche hospital, a modern, 20 bed, fully equipped, hospital and clinic. A staff physician and surgeon is employed at the hospital, as well as a qualified staff of nurses and technicians. The operating companies contract with the hospital to carry their industrial medical coverage, as provided by State law. A second, well equipped and staffed hospital is maintained by the County at Caliente, Nevada.

5. General Plant Facilities

To service the various operating units, the company maintains general plant facilities, including an accounting and payroll office; a well stocked warehouse; an engineering office; a fully equipped machine shop; analytical, flotation research and microscopic laboratories; first aid and mine rescue equipment; railroad and truck scales; heavy equipment, including bull dozers, power shovel, drag line, crane, road grader, trucks and autos; and camp housing and commissary previously mentioned.

MINING OPERATIONS

The Nevada mining operations are designed to develop and supply ore for the Caselton mill and related facilities of Pioche Manganese Company and to assure basic ore supplies for proposed metallurgical plants. A list of mining properties owned or controlled by the company and the summary of estimated ore reserves are included with this report, following a brief description of each of the more important properties.

1. Caselton and No. 1 Mine

The No. 1 Mine was the first property acquired by the company and, with the Bauer mill, was the basis for the company's early growth and development. In recent years the Caselton mine, on the west extension of the No. 1 Mine ore bodies, has been the principal producer. The Caselton and No. 1 Mines are actually a unit and for the purpose of discussion will hereafter be referred to as the Caselton Mine.

The property covers an area of approximately 7,000 acres immediately west and north of Pioche, Nevada, along the Ely range. The property consists of 134 patented and 207 unpatented lode mining claims and 206 mill site locations owned by the company, and an additional 23 patented claims held under lease and joint venture agreements. Parts of 9 patented claims owned by the Amalgamated Pioche Mines and Smelter Corporation are held under a lease dated December 17, 1942, for a term of twenty years. Six patented claims owned by Manhattan Copper and Gold Mining Company are held under a lease dated December 9, 1942, for a term of 20 years. Eight patented claims owned by Raymond Ely West Company are held under a joint venture agreement dated March 1, 1952, for a term of ten years. All agreements are in good standing.

Principal workings are the Caselton, Susan Duster, Golden Eagle, Demijohn Half Moon, Abe Lincoln and the Lost Treasure mines. Company production and development has been confined to the Caselton, Susan Duster and Golden Eagle workings. Total development includes approximately 125,000 feet of underground workings, 150,000 feet of churn drill holes and 40,000 feet of diamond drill holes.

The Caselton is a fully equipped, operating unit, designed to produce up to 1,500 tons of ore per day. It is one of the larger domestic mining operations, based on its production of gold, silver, lead and zinc and it is becoming an important domestic source of manganese. U. S. Bureau of Mines publication "Mineral Yearbook" has ranked the Caselton mine thirteenth to fifteenth in production of lead and silver and eighth to tenth in production of zinc, among the twenty-five leading mines producing these metals in the United States. The Caselton operation regularly produces 60 to 70% of Nevada's lead-silver production, and 80-90% of Nevada's zinc production. For several years it has ranked as the largest underground mining operation in Nevada. Past production totals approximately two and a half million tons of ore, having an average assay of .044 oz. gold; 4.86 oz. silver; 4.48% lead; 11.96% zinc; having a total mine value of approximately thirty-one million dollars.

Until the drop in the price of lead and zinc, the operation was producing twenty thousand tons of ore per month. Estimated ore reserves are detailed in accompanying Exhibit C. They are summarized as follows:

Glass of Ore	Tons Developed and Probable	Tons Inferred Ore
Sulfide Lead-Zinc	546,800	108,200
Manganese Class I	725,100	867,800
Manganese Class II	867,500	856,000
Manganese Class III	1,113,000	438,000
Manganese Class IV	-----	130,000
Total Estimated Reserves	3,252,400	2,400,000

The principal ore bodies occur as replacement deposits in the Combined Metals horizon of the Pioche shale formation. The Combined Metals horizon is thin bedded, carbonaceous limestone, averaging fifty feet thick and situated about 200 feet above the Prospect Mountain quartzite. Other ore bodies occur as replacement deposits in upper limestone members of the Pioche shale formation, and in the overlying Prince limestone formation. The early production of the district came from high grade fissure deposits in the Prospect Mountain quartzite and, quite probably much future production will come from similar deposits. The area is badly faulted, which adds to development and mining problems. Displacement on the faults ranges from a few inches to over 1,000 feet. Mineralization is widespread in the favorable horizons, but there is little, if any, indication of mineralization on the surface. Exploration is by surface mapping, to determine the limits of individual blocks as defined by major faults, and then churn drilling to the relatively flat, (5-10 degree) ore horizon. The main Caselton-No. 1 Mine ore channel has been developed by mine workings and drill holes for an east-west length of 12,000 feet, a north-south width of 100 to 800 feet and a mineable thickness of 4 to over 40 feet. A northwest trending Caselton-Prince channel has been similarly developed for a length of 6,000 feet. There are good prospects of extending both of these ore channels and for discovering others.

Access to the Caselton Mine is provided by the 1400 foot vertical No. 1 shaft at the east end of the property and by the 1500 foot vertical Caselton shaft over the mountain and two and a half miles west from No. 1. A main haulage level connects the two shafts underground and supplies ventilation to all mine workings. A short extention of present development headings will connect Caselton with the 835 foot vertical Prince shaft, about 1-1/2 miles to the southeast. Mine production has been hoisted through the Caselton shaft since completion of the Caselton mill in 1941.

Mine development is usually limited to blocking out ore a year or two in advance of mining. In the course of mining over two million tons of lead-zinc ore, mine workings have developed large areas of lower grade lead-zinc-manganese mineralization on the flanks of the main ore bodies. Recent additions to the Caselton mill and the facilities of the affiliated Pioche Manganese Company are designed to recover and process manganese from this lower grade material. During the period of low metal prices for lead and zinc, mining operations will be concentrated on the manganese type ores. An estimate covering the proposed operation is attached hereto.

Monthly production from the Caselton mine has exceeded 20,000 tons of ore and has averaged about 16,000 tons per month during the past three years. With recent improvements it appears that a production rate of 30,000 tons per month can be sustained when warranted. Mine equipment and service facilities include rock and service hoists with steel hoist house and headframe at the Caselton shaft; rock hoist and steel hoist house and headframe at the No. 1 shaft; ore bins; 7200 cfm compressor plant; 6,000 gpm pumping plant; blacksmith shop; drill repair shop; timber framing shop; change rooms and office. The underground workings are equipped with battery locomotives, ventilation fans, modern drills, scraper hoists and related equipment. Auxiliary equipment includes churn drills, diamond drills, trucks and bulldozers. As the mine operations have expanded, larger capacity equipment has replaced earlier equipment used during the various stages of the mine's growth, releasing the earlier equipment for use at other properties.

During the past ten years the Caselton mine has earned four million dollars, before taxes, depreciation or depletion. During this period the Caselton mill has earned an equivalent operating profit milling Caselton mine ore plus additional earnings derived from milling custom ores. With drastic reductions in metal prices and the delays incident to getting the new manganese plants and processes into normal operation, the Caselton mine has operated at a substantial loss during the past year. On a long range basis, assuming a combined price for lead and zinc of 26-28¢ and present wage and supply costs the combined mine-mill operating profit on our ore reserves should average approximately four dollars per ton.

The chances are excellent that continued exploration will prove east and west extensions of our main ore channel and will locate other ore channels on the Caselton property. Our present substantial ore reserves assure a long lived, profitable operation under normal price-cost relationships.

2. Prince Consolidated Mining Company Property

The property of the Prince Company consists of eleven patented and twenty-three unpatented mining claims, together with optioned Calneva Mining Company property consisting of one patented claim and ten unpatented claims; in all approximately 900 acres.

The Prince Company is capitalized at 3,000,000 shares, all of which is outstanding. The three largest share holders are Combined Metals Reduction Company, International Smelting and Refining Company (a subsidiary of Anaconda Copper Mining Company) and David Gemmill and Sons. Combined Metals owns 820,000 shares of Prince Company stock.

In May, 1951 Combined Metals secured a lease agreement on the property of the Prince Company. This agreement contains provision for extensions to May, 1976 with nominal work requirements. Property rental consists of 1/3 of the operating profit.

The lease agreement includes the Prince Company's lease and option on the adjoining Virginia Louise mine of the Calneva Mining Company. The latter agreement is kept in good standing by nominal work requirements or, in lieu thereof, by payment of $100 per month. All past and future payments, including royalties, apply on the $200,000 purchase price of which approximately $185,000 remains to be paid. The agreement runs to August, 1962.

The Prince and Virginia Louise mines produced heavily during the First World War when the upper level oxidized ores were valuable as fluxing material for the lead smelters in Utah. This period of operation closed with small production in about 1927. By the close of 1927, the Prince mine had produced 876,467 dry tons of ore with the following average analysis.

Oz. Gold	Oz. Silver	% Lead	% Zinc	% Manganese	% Iron
.009	2.69	2.99	3.46	12.22	31.4

During the same period the Louise mine had produced 141,205 dry tons of ore with average analysis as follows:

Oz. Gold	Oz. Silver	% Lead	% Zinc	% Manganese	% Iron
.014	2.83	3.09	4.00	12.85	31.6

Records are not available on the early (1907-1911) production of silver-lead fissure ore from the Prince mine. The profits from fissure ore production were used to develop and equip the mine for production of the fluxing type ores.

Although the operating margin was low and freight was a large item, the Prince Company paid $575,000 in dividends between July, 1915 and November, 1917.

Production was gradually curtailed and finally discontinued due to Salt Lake smelters having a lower cost source of fluxing material in roasted pyrite concentrates from mills built to treat sulphide ores at or near the smelters.

The Prince shaft was deepened and sulphide ore was developed on the 835 foot level during the 1920's. Thereafter the mine was idle except for desultory lease shipments until the Caselton mill was completed in 1941, making it profitable to produce the sulphide ore.

During the period September, 1941 to June, 1949 the Prince mine produced 197,922 dry tons of sulphide ore with the following average analysis:

Oz. Gold	Oz. Silver	% Lead	% Zinc
.032	2.93	1.24	9.66

In addition, two types of oxidized ores were produced. Manganese-lead-silver ore production totaled 8,667 dry tons which assayed as follows:

Oz. Gold	Oz. Silver	% Lead	% Zinc	% Manganese	% Iron
.017	18.4	3.0	3.0	14.5	12.6

Oxidized lead ore production totaled 1,783 tons which assayed as follows:

Oz. Gold	Oz. Silver	% Lead
.029	11.3	7.3

Exploration work was in progress to locate and develop fissure ore in the underlying quartzite when the 1949 metal market slump occurred and the mine was shut down.

Estimated ore reserve tonnages and assays for the Prince and Virginia Louise mines are summarized as follows:

	Estimated Tons	Oz. Gold	Oz. Silver	% Lead	% Zinc	% Manganese	% Iron
Sulphide Ore:							
Inferred	79,000	.042	4.29	1.08	8.67		
Manganese Class II Ore:							
Developed							
Plus Probable	34,000	.012	9.95	2.35	2.35	15.0	13.0
Inferred	279,500	.006	1.72	1.30	3.06	15.1	13.0
Total Class II	313,500	.006	2.62	1.42	2.98	15.1	13.0
Manganese Class III Ore:							
Developed							
Plus Probable	1,813,000		See footnote*				
Inferred	1,393,000		See footnote*				
Total Class III	3,206,000	(.007	2.8	3.0	3.4	11.5	31.0)*

* Overall average of ore blocks is not shown because some of the individual ore blocks would not be mixed in mining or processing. The assay shown is for the largest single block and is fairly representative of the largest ore blocks.

While the above shown "Inferred" sulphide ore is all that can justifiably be included on the basis of drill hole information and direct fissure projections, we consider exploration for fissure ore and exploration for sulphide bedded ore on the south extension of the Prince ore channel to be among the most attractive possibilities in the district.

Ore blocks of both Class II and Class III types are large and well adapted to low cost mining methods such as open pit or caving of ore in beds where mechanized methods can be easily applied.

3. Black Prince Property

The Black Prince property adjoins the Caselton property two miles west of Caselton on the westward projection of the main Combined Metals ore channel. The property consists of 35 claims covering approximately 730 acres and is held by lease and option agreement running to August, 1967. The agreement provides for a 10% royalty which applies on the $150,000 purchase price. A side agreement with lessees who held the property at the time of its acquisition provides for a 50-50 split of the net earnings from a block of ground adjacent to the Black Prince shaft and to a depth of 500 feet. The latter agreement automatically terminates July, 1957.

Records of past production from the Black Prince are not available, but it is known that a number of shipments were made of high grade silver-manganese ore.

The manganese-silver bearing fissure can be traced for a length of over 8,000 feet on the surface. We believe that this fissure is a surface expression of the westward continuation of the main Caselton mine ore channel. This channel formed bedded replacement ore in the Ely range, where it has been mined from zone 200 to 500 feet wide for a length of over 2 miles.

The structure in the Black Prince area is complicated by thrust faulting. Exploration drilling will be necessary to determine the depth of the Combined Metals limestone, our most favorable ore horizon.

In addition to the attractive possibilities at depth, it is evident that a large tonnage of manganese "protore" exists in the fissure, at or near the surface.

Since taking over the property, Combined Metals has spent $41,000 in development work through the Black Prince shaft and in churn drilling. Work in the Black Prince shaft resulted in blocking out 20,000 tons with an average assay of .06 oz. gold, 7.2 oz. silver, 0.4% lead, 1.6% zinc and 9.3% manganese. The one churn drill hole reached what is believed to be the thrust fault at about 900 feet. The favorable ore horizon may lie just below the fault, but the hole caved and was lost in the fault zone.

About 2,500 feet westerly from the Black Prince shaft, a surface pit was opened on the fissure and a trial run of 376 tons, assaying 14% manganese, was hauled to the Caselton mill for metallurgical tests. If the ore can be successfully treated, there are many locations along the fissure that can be opened for production.

It is emphasized that if exploration drilling succeeds in locating the Combined Metals bed at a reasonable depth, the chances are very good for discovery of ore bodies equivalent in tonnage and grade to the entire past production of the Caselton - No. 1 mines.

4. Manhattan Properties

These properties adjoin the Caselton mine holdings and extend three and a half to seven miles northwest from the Caselton plant. The properties consist of 11 patented and 163 unpatented lode mining claims, covering approximately 3,500 acres. Of this total, 106 unpatented mining claims have been acquired by location or purchase and 11 patented and 57 unpatented mining claims are held by lease and option agreements running to 1964. Expenditures to date total $43,326.00.

Numerous small mines and prospects within the area have been worked intermittently since the early 1870's. There are no reliable production records, but many small shipments of high grade gold, silver and lead ore have been made from widely scattered locations on the property.

A geologic study of the area in 1946 indicated favorable geologic conditions. An area of 1 square mile was mapped in detail and two locations were churn drilled. The area offers attractive exploration possibilities and warrants further geologic mapping and drill hole development.

5. Acme Property

The Acme property consists of 75 unpatented lode mining claims, covering approximately 1,500 acres, situated four miles southeast of Pioche, Nevada, and 13 miles by paved highway from the Caselton plant. The property is held by a lease and option agreement dated May, 1952, for twenty years. Royalty is 5% of the net mine value, with a minimum royalty of $300.00 per month. All royalty payments apply on purchase price of $225,000.00

The Acme property covers the eastward projection of the main east-west ore channel, but surface exposures indicated that faulting had placed the horizon too deep for economic mining. A geologic study of the area developed the possibility that major thrust faulting masked the surface and that the productive ore horizon could lie at a relatively shallow depth. In 1952 the company drilled a wild cat hole to check on this possibility and the hole cut through the thrust faulting at 500 feet from the surface and proved a large, undisturbed block of Combined Metals limestone at 1200 feet. There are very favorable chances that exploration will develop a continuation of the Caselton ore channel, with the possibility of large tonnages of ore in this area.

6. Comet Mines, Inc.

Combined Metals Reduction Company acquired Comet Mines, Inc. as a wholly owned subsidiary in 1951. The property consists of 17 unpatented lode mining claims, approximately 320 acres, adjoining the Comet Coalition Mines Company property on the west side of the range, about 16 miles from the Caselton plant. The mine is on a nearly vertical quartz vein and is developed by a 465 foot vertical shaft and over 2,000 feet of drifts and cross cuts.

The property is completely equipped for development and operation. It is serviced by the Lincoln County Power District distribution system, and by the new Comet highway. Facilities include a boarding house and bunk houses in addition to the hoist house and mine surface plant.

The mine has been worked intermittently since 1910. No records are available covering early shipments of tungsten and high grade oxidized lead-silver ore, but existing records do show a production of 15,000 tons. Over 13,000 tons of sulphide ore shipped to the Caselton mill average .06 gold, 7.0 silver, 2.0 lead, 9.9 zinc and 0.5 tungsten. Some oxide lead-silver ore and some tungsten ore was milled at the property.

In June, 1952, work was started on an exploration project under D.M.E.A. with the government advancing 50% of the cost. The project is designed to open up lower levels of the mine to put the mine in shape for a sustained production of 50 to 75 tons of ore per day. The project includes 535 feet of vertical shaft and 3,220 feet of drifting for a total estimated cost of $190,000.00. As of June 1st, 1954, the Company had completed 400 feet of shaft and 1,070 feet of drifting on the 465 level. Most of the drifting has been through barren fissure between ore shoots, but the last 60 has been in ore and gives every indication that an ore shoot is being developed.

On the basis of past production, we estimate that the complete project will develop 40,000 tons of ore and place the property in position to sustain a production rate of fifty to seventy-five tons of ore per day. At a combined price for lead and zinc of 27¢ per pound, the property can be operated at a profit.

7. Comet Coalition Mines Property

The property consists of 43 patented and 200 unpatented lode mining claims containing about 4,800 acres and covering an area about 6 miles north and south and 1-1/2 miles east and west along the outcrop of the Combined Metals limestone formation on the west side of the Highland Range. The property is in the Comet mining district about 15 miles west of Pioche, Nevada. Comet Coalition Mines Company, owner, is a Nevada Corporation organized in 1935 as a consolidation of Pan American Mining Company and Forlorn Hope Mining Company. Control is held by International Smelting and Refining Co., a subsidiary of Anaconda Copper Company. The property is held by Combined Metals Reduction Company under an agreement and lease dated January 10, 1947 for a term, including renewal options, of twenty years. Royalty is 1/3 of any operating profit after lessee has recovered all expenditures made for the benefit of the property. As of July 1, 1953, Combined Metals expenditures totaled $204,216.41. The lease is in good standing.

Principal workings are the 2,300' Pan American incline shaft, the 800' Long Cabin incline shaft and the 600' Forlorn Hope vertical shaft. Considerable drifting and raising has been advanced through the ore horizon from both the Pan American and Forlorn Hope shafts and earlier operators advanced headings through upper formation at the Schodde and Stella mines. Total development includes approximately 1200 feet of underground workings, 3500 feet of diamond drill hole, and 5500 feet of churn drill hole.

Past production includes a reported $125,000.00 from the Schodde and $50,000.00 from the Stella of high grade silver-lead ore. Combined Metals produced 9,401 tons of lower grade silver-lead-zinc-manganese ore from development headings for a test run at the Caselton mill. Average assays were as follows: .005 gold; 1.53 silver; 1.25 lead; 2.83 zinc and 9.25 manganese.

Combined Metals operations have been confined to unwatering and developing the Pan American mine. Other outcrops and mine workings on the property show extensive mineralization but as no comprehensive information is available, estimates covering ore reserves are confined to the Pan American ore bodies. These reserves are estimated as follows:

		Estimated Assays				
	Estimated Tons	Gold	Silver	Lead	Zinc	Manganese
Developed	1,386,310	.005	1.74	1.25	2.50	9.30
Probable	416,700	.005	2.50	0.83	2.56	9.30
Possible	1,102,800	.005	2.46	1.08	2.94	9.20
Total Sulphide Ore	2,905,810	.005	2.12	1.14	2.67	9.25
Oxide and Semi Oxide Probable Ore	528,000	.010	1.50	1.40	1.70	11.00

The Pan American ore body has been developed by underground workings and by drill holes. The 2,300' incline shaft is driven along the footwall of the ore horizon down the average 10 degree dip of the formation. Drifts and raises have been advanced through the ore body and show a width of 300 to 500 feet and an ore thickness of up to 50' in the center of the ore body grading down to 7' at the edges of the mineable area. The Pan American shaft has been widened to permit transporting mechanized mining equipment as the ore body appears to be well adapted to modern low cost-high production methods. The mine is only equipped for development or low capacity production at the present. Equipment and facilities include an electric hoist, compressor, headframe, loading bin, bunk houses and boarding house. The property is served with Hoover Dam power by Lincoln County Power District over a 22,000 volt transmission line from the main substation which traverses the length of the property and serves all the mine workings. The federal and state governments have expended about $300,000 on the construction of 17 miles of modern highway connecting the Comet Mines with the Caselton Mill.

The widespread mineralization at the Pan American mine and the other Comet workings offers an excellent opportunity for a profitable, low cost, high capacity operation when a balance is restored between metal prices and wage and supply costs. The very likely possibility of developing higher grade ore bodies adds to the attractiveness of the property.

8. Black Metal Joint Venture

The property consists of 15 patented and 6 unpatented lode mining claims containing about 370 acres in the Jackrabbit mining district about 14 miles northwest of Pioche, Nevada. Black Metals Mines, Inc. is a subsidiary of Bristol Silver Mines Company, owner and operator of the adjoining Bristol Silver Mine. Five of the patented claims and the 6 unpatented claims are owned by Black Metal Mines, Inc. The remaining ten patented claims are owned by the Lagoon Company and are held by Black Metal under an amended lease and option agreement dated December 13, 1952. The lease agreement has a term of 10 years with a royalty of 10 to 15% of the net mine value after freight and treatment, depending upon the value of the ore, and a minimum royalty of $1250 per quarter until the option price of $44,666.67 is paid. Combined Metals Reduction Company holds the property under a joint venture agreement with Black Metal Mines, Inc. and a collateral agreement with Bristol Silver Mines Company under the terms of which Combined

Metals agreed to advance $20,000.00 of working capital to place the property into production and to divide any operating profit after the return to Combined Metals Company of its expenditures on the property. The agreement is for twenty years and provides for a lease to Combined Metals at 2-1/2% royalty should Black Metals desire to withdraw from the joint venture and the option to Combined Metals to convert its unreimbursed expenditures into Black Metals stock should the operation be stopped before returning a profit. All agreements are in good standing.

Principal workings are the Black Metal Mine, the Gusset Patch Mine and the Black Jack prospect. The Black Metal mine consists of large open stopes extending on fissure intersections from the surface to the 900 level and as bedded replacements up to 600 feet along the dip of favorable limestone horizon. The mine is opened by the main Black Metal incline shaft on a 20 degree slope from the surface to the 900 level and by the 300 level adit and the Day Winze on the 400, 500, 600, 700 and 800 levels. The Gusset Patch mine consists of a fifty foot inclined shaft and open surface stope. The Black Jack prospect has a fifty foot incline shaft on the dip of a mineralized fissure. Total workings on the Black Metal property exceed 10,000 feet.

Past production probably exceeds 250,000 tons with a net mine value in excess of $2,750,000.00. Production records are incomplete for the period 1878 to 1919, but is reported in excess of 200,000 tons and $2,500,000.00. From 1919 to 1927 the Black Metal mine produced 23,680 tons of silver ore and 24,997 tons of manganese ore having a combined value of $250,000.00. There were high grade shipments from both the Black Metal and Gusset Patch mines. One 54 ton shipment returned $17,500.00 on ore assaying 0.10 gold; 329.0 silver; 36.0 lead; 6.5 copper. Average assays on shipments for the period 1919 to 1927 are reported as follows:

		Gold	Silver	Lead	Iron	Manganese
Silver Ore	23,680 tons	.01	12.0	0.6	3.5	8.6
Manganese Ore	24,897	.01	3.5		1.5	21.7

The mine was shut down in May, 1927 and remained idle until operations were resumed by Combined Metals in October, 1952. Work to date included rehabilitating the Black Metal shaft and Day Winze to the 900 level; repairing the 300, 800 and 900 level haulage drifts; constructing and equipping power lines and substations from the Lincoln County Power District transmission line to Bristol; installing compressors and air lines; installing hoists on both the shaft and winze and constructing headframes and bins; and constructing a hoist house and changeroom. Total cost to Combined Metals to June 1, 1954 is $106,557.00. Total production to June 1st is 8,780 tons of manganese ore having a net mine value of $51,020.00. Costs included opening up Gusset Patch workings and sinking 50' Black Jack prospect shaft.

The Black Metals mine is now in shape to produce 75 to 100 tons per day of Class IV manganese ore averaging 12 to 15% manganese. Mining costs are low as the stopes are large and the ground needs no support. Operating profit before taxes, depletion or depreciation is estimated at $1.75 per ton on 13% ore. Geological conditions warrant reopening the Day Winze to the 1200 level and developing the favorable Bristol limestone horizon. The possibilities are good for developing a large tonnage of both manganese and silver-lead type ores.

Exploration drilling is planned at the Gusset Patch and Black Jack workings which are on the same general fissure system as the Black Metal. The outlook is favorable for developing tonnage at both of these properties. There are many faces of ore in the Black Metal stopes and our recent experience has shown that many of these faces continue in ore when mined. While there are no calculated ore reserves at Black Metal, on the basis of our experience working stope faces an estimated reserve of 25,000 tons seems conservative.

9. Idamic Mines, Inc. Property

Idamic Mines, Inc. holds approximately 800 acres at the north end of the Bristol Range, adjoining the Bristol Silver Mines property, about 15 miles north of Pioche, Nevada. The company owns 33 unpatented lode mining claims and has a lease and option agreement covering twelve patented claims owned by the Ida May Mines Company, which agreement runs until April 30, 1961, and provides for a ten percent royalty to apply on the purchase price of $100,000.00. Another lease and option agreement covers the Lucky Star Mine, consisting of 12 unpatented lode mining claims. This agreement provides for a minimum monthly payment of $250.00 which together with royalties, apply on the purchase price of $30,000. Royalties from recent production have reduced this price to $17,058.70.

Combined Metals Reduction Company holds a 19% stock interest in Idamic Mines, Inc., and the balance of the stock is held by individuals closely associated with Combined Metals.

No records are available of production prior to the formation of the Idamic Mines Company, but the Ida May mine had a substantial production of copper-silver ore, and several thousand feet of development work had been performed on the property. The Lucky Star property has produced a number of shipments of lead-silver ore, and the Last Dollar group has produced silver ore.

Idamic Mines, Inc. was formed in 1946 to explore the area after geological study indicated that the Combined Metals bed underlies a large block of ground with strong surface exposures of mineralization. Properties were acquired and additional claims were located. The company drilled 6,555 feet of churn drill hole, which confirmed the geology and located some manganese ore. The properties were idle until recently when the Combined Metals milling facilities offered a market for manganese ore. To October 1st, production from the Lucky Star and Last Dollar manganese exposures totaled 1,700 tons of 26.2% manganese ore with a net mill value of $45,000.

Both the Lucky Star and Last Dollar properties show promise of leading to extensive ore bodies in the underlying Combined Metals bed and work is now in progress that will increase production for the Last Dollar manganese ore body.

As with many irregular limestone replacement ore bodies, the manganese exposures at the Idamic properties are of a form that precludes blocking out ore. There is every indication that production will continue to increase and that mining the manganese ore may result in the discovery of large ore bodies in the lower horizons.

10. South Paw Property

The South Paw manganese property consists of 12 unpatented lode mining claims, approximately 240 acres, situated 20 miles north-west of Hiko, Nevada, and about 65 miles from the railroad at Caliente, Nevada. The property is operated by Combined Metals under a joint venture agreement with P. W. Duffin. The joint venture holds the property under a lease agreement extending to August, 1975.

One or two shipments of silver ore had been produced from the property prior to a discovery of ore in 1950 when Combined Metals acquired its interest. The property has been worked in a small way since that date with production through May, 1954 totaling 2,356 tons of direct shipping ore averaging 34% manganese. The production has been shipped to government ore purchase depots at Deming, New Mexico and Wendon, Arizona. Gross mine value totals $85,178 with an operating profit to Combined Metals of $13,528 before depreciation, depletion and taxes.

There are no developed ore reserves. The operations have shown a small profit and there is always a chance that continued mining will lead to the discovery of an important ore body.

11. Lucky Deposit Property

The Lucky Deposit property consists of 35 unpatented lode mining claims covering approximately 675 acres situated in the Silver Canyon mining district, about 60 road miles northeast of Ely, Nevada. The company owns 22 claims by location and holds 13 claims under a lease and option agreement dated December 14, 1950, for a term of 20 years.

Silver-lead ore was discovered in the area during the early 1880's and substantial production was obtained from extensive workings in the Aurum mines. Development of copper ore was started in 1913. Production records are incomplete, but in 1917 there were 19 railroad cars, approximately 1,000 tons of ore, produced which assayed 7.0% copper; 5.0 oz. silver and 0.02 oz. gold.

There are three mineralized areas on the property. The upper copper workings are in shale and limestone above the basal quartzite at a horizon roughly conforming to the Combined Metals horizon at Pioche. Development includes surface trenching and stoping and two tunnels totaling 750'. Ore reserves estimated by L. G. Thomas in 1951 are as follows:

Oxide Ore	2,500 tons	3.0 silver - 4.0 copper
Sulphide Ore	25,000 tons	1.5 silver - 2.2 copper

The above estimate does not include possible additional tonnage exposed by recent surface trenching.

A second copper deposit is indicated along the east front of the range. A churn drill hole drilled through 68 feet of mineralized limestone and porphyry assaying 0.68% copper. Further drilling is warranted to develop this exposure.

The silver-lead area has been developed by extensive shallow workings in the massive limestone on the hangingwall of a major fault. There are no developed ore reserves but samples of some of the ore faces assay up to 90.0 oz. silver, 3.4% lead and 1.1% zinc.

The property requires further development before a mining operation can be layed out. The best development would be further drilling of the area along the front of the range to develop what may possibly be a large low grade copper deposit of the type being mined at Ely, Nevada.

Recently New Jersey Zinc Company has acquired a large property holding adjoining this property to the east and development by that company may greatly improve the value of this property.

Other mining properties comprising the Nevada Operations are described under discussion of the Tungsten and Oxide Zinc Programs.

CASELTON AND NO. 1 MINES
PRODUCTION AND EARNINGS

Year	Dry Tons	Au	Ag	Pb	Zn	Mn	Production*	P & L**	Develop Footage
1924-1942	1,130,325	.035	6.24	5.97	15.22		$12,824,405	$ (163,745)	79,203
1943	71,564	.044	3.37	3.63	11.19		778,267	(47,243)	5,387
1944	105,988	.056	3.50	4.03	10.88		1,308,981	426,783	2,960
1945	80,790	.053	3.53	3.92	12.17		1,023,716	212,974	3,792
1946	80,653	.066	4.34	4.49	11.82		1,328,079	297,945	4,057
1947	112,289	.067	3.78	3.57	9.18		1,438,705	212,244	3,840
1948	133,896	.061	4.15	4.29	9.86		2,204,735	618,804	4,262
1949	178,763	.058	4.19	4.09	9.14		2,423,532	750,920	4,722
Lead-zinc ores 1950	187,212	.052	4.01	3.95	9.31		2,645,850	- - -	- - -
Manganese ores 1950	1,900	.024	1.54	1.43	2.42	8.00	9,292	- - -	- - -
Total ore 1950	189,112	.052	3.99	3.92	9.24	0.80	2,655,142	896,639	4,434
Lead-zinc ores 1951	142,264	.046	3.42	3.63	8.00		2,301,349	- - -	- - -
Manganese ores 1951	49,648	.023	1.31	1.34	2.82	8.26	259,140	- - -	- - -
Total ore 1951	191,912	.040	3.03	3.05	6.65	2.14	2,561,389	477,973	4,042
Lead-zinc ores 1952	146,905	.046	3.62	3.86	8.11		2,083,893	- - -	- - -
Manganese ores 1952	36,241	.017	1.50	1.41	2.64	9.66	203,518	- - -	- - -
Total Ore 1952	183,146	.040	3.20	3.38	7.03	1.91	2,287,411	117,818	6,759
Lead-zinc ores 1953	94,575	.056	4.54	4.79	6.45		829,059	- - -	- - -
Manganese ores 1953	82,952	.029	1.77	1.38	2.11	11.44	555,101	- - -	- - -
Total ore 1953	177,527	.043	3.25	3.19	4.42	5.34	1,384,160	(312,497)	1,560
Lead-zinc 6 months 1954	13,935	.085	6.63	7.50	2.54		141,974	- - -	- - -
Manganese 6 months 1954	21,310	.012	1.23	1.52	1.62	13.20	135,652	- - -	- - -
Total Ore 6 months 1954	34,245	.041	3.36	3.89	1.98	7.98	277,626	(22,686)	1,272
Total Lead-zinc	2,479,166	.045	4.97	4.62	12.00	- -	31,391,698	- - -	- - -
Total Manganese	192,051	.023	1.54	1.39	2.34	10.43	1,162,703	- - -	- - -
Total Ore	2,671,217	.043	4.73	4.39	11.28	0.75	$32,554,401	$3,466,929	126,290
							$12.18	1.30	

*Production for the period 1924 through 1942 includes gross value of the ore. After 1942 production includes only the net mill payments to the mine.

**Operating P & L for period 1924 through 1942 does not include plant or company general expense. After 1942 the operating P & L includes mine proportion of Pioche and Salt Lake general expense.

The Caselton and No. 1 Mines together form a well equipped operating unit with substantial ore reserves and a history of over 30 years of continuous operation.

MILLING OPERATIONS

The Caselton mill is a modern, well constructed, fully equipped plant, designed to concentrate several types of complex ore to produce marketable lead, zinc, iron and manganese concentrates. The first unit of the mill was completed on September 1, 1941. A second unit was constructed in 1943, and a third unit was completed early in 1953. The mill treats both company and custom ores by heavy media separation and selective flotation processes. To January 1, 1953 the mill had treated 2,294,461 tons of ore, and had sold concentrates having a net mill value of $33,007,550.00, on which it returned an operating profit of $6,460,177.00 before depreciation and taxes.

The mill receives ore by truck or rail delivery to its stockpile area and receiving hopper. Conveyor belts carry the mine run ore into a well designed crushing and sampling plant, which crushes the ore to pass 1/2 - 5/8" screens at rates up to 200 tons per hour. The crushed ore passes over belt conveyors to fine ore storage bins of 4500 tons capacity. The eight fine ore bins have belt conveyors discharging into the heavy media separation plant or into any of three grinding circuits. The heavy media plant has a rate of capacity of 50 tons per hour and serves to remove waste rock from coarsely crushed ore.

Two of the mill grinding circuits are rated at 600 tons of ore per day and a third grinding circuit is rated at 800 tons per day for a total mill capacity of 2,000 tons of ore per day. Any of the grinding circuits can discharge to any of three flotation circuits, each having a maximum capacity of 1,000 tons per day. One complete circuit is for the selective flotation of sulphide ores containing lead and zinc. A second circuit is designed for recovering lead and silver from oxide ores and for recovering sulphide lead and zinc from manganese ores. The third circuit is designed to selectively recover iron and manganese. All three circuits are designed for maximum flexibility, with pumps so arranged that the circuits can be readily changed to meet a large variety of flowsheets.

Mill concentrates go to the thickening and filtering plant adjacent to the mill. The filtered concentrates drop into railroad cars for shipment to smelters and refineries.

Auxiliary facilities include a chemical plant for preparing mill reagents; a fully equipped analytical laboratory; a flotation research laboratory; sampling facilities, a water supply system and tailing retention ponds. All mill equipment is housed in modern steel and concrete, fireproof, insulated buildings.

From 1941 through 1952, the Caselton mill earned an average operating profit (before depreciation and taxes) of $2.81 per ton of ore milled. During the past year the mill has absorbed large inventory losses on zinc metal produced under higher prices, and heavy expense incident to placing the manganese section in operation. Most of these extra costs are behind us. Mill crews have been trained in handling manganese reagents, flow sheets have been stabilized and metallurgical efficiencies are approaching those forecast by our laboratory research. Under present metal prices, mill earnings will average an estimated $1.00 per ton before depreciation and taxes.

CASELTON FLOTATION PLANT
PRODUCTION AND EARNINGS

Year	Tons Milled	Production	Cost of Ore	Milling Cost	Operating P & L
1941	45,904	$ 544,222	$ 370,198	$ 82,525	$ 91,499
1942	126,223	1,083,605	695,668	203,010	184,927
1943	144,929	1,465,376	787,600	262,225	415,551
1944	210,582	2,199,283	1,279,395	363,205	556,683
1945	183,169	1,803,168	1,093,208	320,630	389,330
1946	189,209	1,921,206	1,223,719	351,465	346,022
1947	200,653	2,657,765	1,625,951	386,541	645,273
1948	227,741	4,861,569	3,020,013	478,873	1,362,683
1949	250,729	3,652,237	2,892,755	545,335	214,147
1950	263,662	4,830,865	3,146,799	577,531	1,106,535
1951	224,247	4,301,433	2,853,753	671,876	775,804
1952	227,413	3,686,821	2,621,690	693,408	371,723
1953	200,799	1,663,996	1,511,430	878,786	(726,219)
1st Half 1954	25,958	250,001	256,885	189,893	(196,776)
Total	2,521,218	$34,921,547	$23,379,064	$6,005,303	$5,536,782

The Caselton mill started operations on September 1, 1941, treating company ores from the Caselton, No. 1 and Pan American mines and custom ores from the Prince, Ely Valley, Comet and several smaller mines. Mill capacity was increased in 1943 and again in 1952-1953.

In 1952 the mill treated 39,000 tons of complex lead-zinc manganese ore for recovery of lead-zinc only and impounded the tailing for later recovery of manganese. In 1953 the mill treated 85,785 tons of the complex manganese ore and retreated an additional 17,932 tons of tailing for recovery of manganese. The heavy loss in 1953 was largely due to breaking in the new manganese circuit and included the cost of many mechanical changes required by the manganese circuits. Part of the loss was due to inventory losses on slab zinc due to the continued low price of metals.

In the first half of 1954 the mill treated oxidized lead-silver ore and manganese ore, but due to curtailed mine production the mill was idle for over two months. Proposed mine operations and ore now stockpiled will keep the mill in operation during the last half of the year.

The present mill has a capacity of approximately 1500 tons of ore per day and includes a crushing and sampling plant, a sink-float plant, two complete lead-zinc selective flotation circuits and flotation circuits for making iron and manganese recovery. The mill also includes a filtering plant, research and assay laboratories, stockpile areas, railroad trackage and auxiliary facilities.

OXIDE ZINC

Zinc mining is currently unattractive due to a flood of foreign metal being dumped on our markets, but the long range outlook for zinc mining is good. The company has done extensive research in developing a metallurgical process for treating oxidized ores and has acquired several mining properties to provide basic ore supplies to proposed plants. No work is now in progress, but plans are complete covering proposed operations when conditions warrant.

MINING PROPERTIES

1. Colorado Zinc - Utacala Mine

The property consists of 5 unpatented lode mining claims covering approximately 100 acres situated on the west edge of Death Valley, between Panamint Springs and Darwin, California. The nearest railroad station is at Keeler, California, 37 road miles from the property of which 33 miles is paved highway. The property is held under a lease and option agreement dated 11/30/43 running to 2/4/55. The total purchase price is $30,000.00 of which $17,543.00 had been paid to July 1, 1954.

There are no records of early production from the property but it is known that there were several shipments of high grade silver ore and one or two shipments of high grade zinc ore. We have records showing production of 3,000 tons of oxide ore assaying 44.2% zinc and 1,750 tons of sulphide ore shipped to the Bauer mill assayed 2.0 oz. silver - 1.0% lead - 22.2% zinc. Most of the work has been done in irregular stopes a few feet from the surface.

Combined Metals has completed one mile of road over very rough terrain to reach a position favorable for future mining and development. Present ore reserves are estimated at 3,000 tons of oxide ore averaging 36.0% zinc. Geologic study indicates that an additional 10,000 tons can be developed by driving an adit below the old stopes and long range exploration possibilities are particularly attractive because the geologic setting closely resembles that of the highly productive Darwin mine of Anaconda Copper Mining Company situated 6 miles west of this property.

2. Lone Mountain Zinc - Mountain View Mine

The property consists of 45 unpatented mining claims covering approximately 930 acres situated on the north slope of Lone Mountain about 20 miles west of Eureka, Nevada. Three of the claims are held by a lease and option agreement for a total price of $50,000.00 of which $35,000.00 had been paid by July 1, 1954. Nine more claims are held under lease agreement and thirty-two claims are held by location. The property is held by M.I.A. Mines Company, a joint venture of Combined Metals Reduction Company and American Zinc Company of Tennessee. During World War II the property produced 2,685 tons of ore assaying 4.1% lead and 29.3% zinc. In the course of development, M.I.A. Mines Company produced 826 tons assaying 4.6% lead and 18.8% zinc.

Development includes over 4,000 feet of diamond drill hole, an old 80' shaft and approximately 500' of drift. During 1952 M.I.A. Mines Company installed a surface plant, sunk a new 120' vertical shaft and drove over 700' of drifts and crosscuts. Development was proceeding with most encouraging results when work was stopped early in 1953 due to the drop in metal prices. Estimated ore reserves total 20,000 tons of ore averaging 30% combined lead and zinc.

3. Spruce Mountain Property

The property consists of one patented and 54 unpatented lode mining claims. Twenty-six of the patented claims are held by location and one patented and 28 unpatented claims are held by a lease and option agreement dated October 30, 1950 for a term of twenty years. The property is in the Spruce Mountain mining district, Elko County, Nevada, 47 road miles south of Wells, Nevada. The mine is 10 miles east of U. S. Highway 93.

The mine was discovered in 1868 and early production is reported to have grossed $700,000.00. The Nevada Lead and Zinc Company acquired the property in 1926 and operated it intermittently until 1950 when it was leased to Combined Metals. Production during this period totaled 18,300 tons assaying 5.01 silver - 15.83% lead - 12.58% zinc and 0.9% copper. The principal workings are the 300' vertical Kille shaft and Latham tunnel. Total underground development, most of which is caved, was probably 2,000 feet. Estimated ore reserves are 30,000 tons.

Proposed development to place the property in operation consists of driving a new adit 2,100 feet from the surface northeasterly past the Kille shaft. The adit will be at an elevation 100' below the 300 level. Regular assessment work during recent years has been concentrated on starting the proposed adit and work completed to date includes a road to the site, a portal excavation and 300' of tunnel.

There is no equipment on the property and no work other than annual assessment work is contemplated until the proposed metallurgical plants are completed. The property has had substantial production and geological conditions are favorable for development of large relatively high grade ore bodies.

METALLURGICAL PLANTS

As previously stated, the company has completed extensive research into the development of metallurgical processes for treating complex oxidized ores containing gold-silver-lead-zinc and manganese. The research resulted in a hydrometallurgical process for producing finished metal and metallic salts from oxide ores. Preliminary plans are completed for construction of a commercial unit when conditions warrant.

The typical oxidized zinc-lead ore from the Colorado, Lone Mountain and Spruce Mountain properties is ideally suited for processing in the Sterling furnace developed by New Jersey Zinc Company. Serious consideration has been given to the construction of a Sterling furnace to operate on low cost Hoover Dam power at either Caselton or Henderson. When the outlook for domestic zinc production becomes reasonably stable, a plant of this type may be warranted to serve the rapidly expanding Pacific Coast market for slab zinc.