A Composite Report
on
Tonopah Consolidated Mines, Ltd.
by
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A Composite Review of Various Reports on the Properties of the Tonopah Consolidated Mines, Ltd.

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The following is a condensed and composite review of various reports at hand on the properties of the Tonopah Consolidated Mines, Ltd., as herein presented. In this effort, the principle idea is to present the main matter of each report without losing the overall meaning. Where certain qualifying statements are made concerning any of the data presented, they are also included as a necessary part of the whole.

The reports used herein have been made for and are on file with Tonopah Consolidated Mines, Ltd., by Wm. J. Loring, M. E. of Reno, Nevada and San Francisco, California; J. V. McConnell, M. E. of El Paso, Texas and Long Beach, California; Lewis R. Robins, M. E. of Reno, Nevada; John L. Dynan, M. E. of Tonopah, Nevada; and J. G. Gibson, Geologist, of Palo Alto, California, and others. References to these various reports are made by the use of the following letters: Loring "L"; McConnell "M"; Robins "R"; Dynan "D"; and Gibson "G".

Also, credit must be given to a source of information relative to the history and ore conditions which has been used extensively in this report; The University of Nevada Bulletin, (Jan. 1953) Geological and Mining Series #51, "The History of Fifty Years of Mining at Tonopah, 1900-1950," by Jay A. Carpenter, Russell Richard Elliott and Byrd Janita Wall Sawyer.

<u>Pertinent Facts:</u> (G)

Location: This consolidated group is located at Tonopah, Nye

County, Nevada. Tonopah is the County Seat of Nye County, and is connected by excellent highways to Reno, Las Vegas and Ely in Nevada besides points in Southern California. The permanent population of Tonopah is about 5,000 persons.

Topography: The mine is situated in a pass at the Southern end of the San Antonio Range of mountains. These mountains are moderately eroded lava formations and are bare of all vegetation except sagebrush and such kindred plants. The climate being very arid, all timber and lumber must be imported; very few trees can exist.

Power and Water: Although the climate is quite arid, a plentiful supply of water will be available from the mine workings. Power can be secured from the Nevada California Electric Company at a nominal rate but due to the large amount that will be used in mining operations when fully under way, it will be more economical to provide a suitable power plant for the purpose.

Climate: The climate is typical of the Southern Nevada desert - cool to cold dry winters with comparatively little snow and short, hot, dry summers. Mining operations are carried on throughout the year with but little or no interruptions to normal communications.

Labor Conditions: Labor is plentiful and well skilled. Labor prices are standard and there is no apparent outside control over local labor. Most of the miners are local men, either owning their own homes or well satisfied with local living conditions.

Titles: The titles are good; all titles have been checked by competent legal persons.

The Mine: The Tonopah Consolidated Mines, Ltd., holdings consist of mining properties listed below, and other leases and options

comprising approximately 5,000 acres, with total measurable reserves up to 400 million dollars in silver alone. Reference: T. J. Niceley, Wm. J. Loring and others.

Tonopah Belmont and Mizpah Extension:	Owner, T. J. Niceley 25 claims, 500 acres, valued by owner at $500,000. with 80 million in measurable ore available; 8 million in proven ore, ready for mining; 1,600,000 tons tailings value at $3.50 per ton equals $5,600,000. Reference, T. J. Niceley.
Tonopah Extension: . . .	Estate Managers: Al Silver and John Connolly: 167 claims; valued at $750,000; 3,340 acres. John L. Dynan gives value on 2244 acres as $544,649. (1935) and ore reserve (semi-blocked) $1,355,460.00 of which none has been mined.
Steen and Harris Group: . (Alpine)	Owners: Steen and Harris 16 claims valued at $16,000. 320 acres.
Challenger Group:	Owner: Milared Hancock 40 claims valued at $20,000. 800 acres.

On the above, all are owned outright or are under lease or option by the Corporation.

Negotiations are under way for the acquiring of the North Star, the Montana-Tonopah, and the Calumet-Hecla holdings.

The relative positions of these various mine groups are better shown on the accompanying map.

Housing Area: The Corporation will construct and own a housing area completely apart from the old town of Tonopah. This will be operated as a planned city of approximately 10,000 population.

Mill and Treatment Plant: A mill, treatment plant, and/or smelter for the processing of ones will be constructed and owned by the Corporation. These facilities will be designed for the treatment of 1,000 tons daily - built in four 250-ton units.

History of the Area (University of Nevada Bulletin #51)

The Tonopah Mining District was discovered by Jim Butler in 1900 accompanied only by his burros. What happened after that is history, but the facts and figures are still staggering. Here are some of these early figures.

In 1900, the total production of metals in Nevada was 220,000 tons, valued at $2,632,000., or an average of $12.00 per ton. During 1905 this tonnage had risen to 391,000 tons worth $6,412,000., or about $20.00 per ton, due to the richness of the Tonopah ore. At the time the Butlers and Oddie sold the Mizpah to Philadelphia interests for $336,000., nearly a million dollars worth of ore averaging from $50 to $150 per ton was on the road between the mines and the smelters on San Francisco Bay.

Production of the Tonopah Mining District is indicated to be in the neighborhood of $187,000,000.; a figure some statisticians are inclined to rate at least 25 million dollars too low because of the lack of early records. The production record of these mines is third in Nevada, exceeded only by Virginia City and Ely.

Tonopah's five big years were 1910, 1911, 1912, 1913, and 1914. Production these five years fell a little short of the $10 million yearly mark. The bulk of gold and silver production these five

years came from the mines of Tonopah.

No known producing mine in the Tonopah district was closed due to lack of ore; it was due to the low price of silver at that time and a water problem, serious enough at the time, but presenting no present day difficulties.

History of the Component Mines: (University of Nevada Bulletin #51)

The present plan is for constructing a low-level tunnel or drift running under the entire group and connecting with the surface at a convenient place for the location of a mill. The water which once was something of a problem in certain parts of the mines will amply provide for the large milling operation necessary to serve the purposes of the Corporation. All in all, it becomes but one single, large operation. However, in the analysis of this operation, it is well to evaluate the component units.

Tonopah-Belmont Mine: The Belmont Mine is well and favorably known throughout the entire mining world. It was one of the most productive mines of the early-day great producers and for some years was the largest producer of silver in the State of Nevada, with a recorded production of well over $38,000,000.00. 44,000,000 It was owned and operated by the Tonopah Belmont Development Company. A modern mill was erected and the Company operated until 1923, at which time it was closed down and wrecked.

After the closing down of the mill, the Company continued operating the mine until 1929 and the ore was shipped to Miller's Plant for treatment. From 1929 to 1932, the mining was done by leasers until the low price of silver (below 25¢ per ounce) forced the closing of the mine. In November, 1924, the property was leased to H. D. Budelman and Associates, who operated under a lease system

until July 31, 1938, at which time the Company again took over operation of the property under a lease system and continued to work the property until the mine fire of 1939. The fire, of unknown origin, destroyed the main Belmont shaft, together with the surface equipment and many buildings. The mine was then idle until purchased by Tom Niceley and J. W. Handel in 1940. Soon after this purchase, the mine was reopened through the Desert Queen Shaft by Mr. Niceley but production was stopped by war conditions.

The property remained idle until August, 1945, at which time a bond and lease was granted to J. V. Mc Connell and Associates of El Paso, Texas. The Desert Queen Shaft was again reopened and the mine put into a workable condition. A systematic sampling campaign was made to determine the extent and value of the ore bodies. Many hundreds of samples were cut, and this work is even now being continued. On March, 1946, the lease and bond was sold by J. V. Mc Connell to David Anderson and Associates of San Francisco, California. This latter group did nothing more than some sampling and rehabilitation. Since this time, Mr. Niceley has worked towards the present consolidation.

Has 80 ft vein

<u>Tonopah Extension</u>: The Tonopah Extension Mining Company was organized in 1901 to develop three claims. These were Southwest of the Tonopah Mining Company's claims; the Sand Grass, Red Plume and Buckboard. This ground was also adjacent to the Mc Namara claim.

In 1904, shipping ore was discovered and by 1905, Charles E. Schwab placed Donald B. Gillies in charge and the property was brought to a dividend basis. Although the tonnage was high, the value per ton was low compared with other companies. However, because of good management, the Company paid dividends, and the stock reached a high of $15.00 per share.

Due to the persistence of comparatively low-valued ore, the Company built its own reduction plant instead of trying to maintain shipping ore.

Mr. Kirchen, having joined the Tonopah Extension Mining Company was responsible for the building of a thirty-stamp mill which almost immediately was increased to sixty stamps.

The Tonopah Extension, holding, originally, only three claims with a 50-acre area, began its great expansion in property holdings by first purchasing, in 1910 for $54,330., the Red Rock group of 33 acres and the Mc Kane group of 144 acres. This acreage surrounded the West end of the Tonopah Extension ground and extended it over 3,000 feet to the West. Both the Red Rock and the Mc Kane claims in time became heavy ore producers. For the fiscal year ending March 31, 1912, the mine produced 53,500 tons of a gross value of $590,000. and on this lower grade of ore the mill discontinued concentration. In the next year there was mined 54,618 tons, with a mill recovery of $737,616 of $13.50 a ton, with a profit of $236,293 and with dividends paid of $94,339.00.

$15.00 ton =

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The development work at No. 2 shaft at the 750-foot, 850-foot and 950-foot levels on the newly discovered Murray Vein "indicates that it will be the best ore body we have ever opened."

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The Company reported to the State a production in the calendar year of 1922 of 129,571 tons having a value of $1,757,129.00; and in 1923 it reported 141,090 tons of a value of $1,883,065.00. These were prosperous years with a net income of probably over $600,000 and dividends declared of over $275,000 a year. *******

Mr. Kirchen stated that on this level there was an ore shoot on the Victor vein, 700 feet in length with a maximum width of 80 feet.

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In the 1913 report, Mr. M. R. Ward is listed as President, and Mr. Kirchen as General Manager, and both remained so through the final report to the stockholders dated March 31, 1927.

Mr. Kirchen wisely advised the Company to purchase the adjoining Red Rock and Mc Kane groups, but also he joined up with others to secure claim holdings to the North of the Extension and of the Sand Grass claim of the Tonopah Mining. It was Mr. Kirchen's faith in the possibility of deep ore bodies below the barren surface, that enthused Key Pittman to secure the Golden Anchor and Midway Extension groups of claims, totalling 15 in all, lying North of the Sand Grass claim, and to organize in 1910 the Tonopah Merger Company. In March 1912 the Company issued a report on Tonopah Merger Mining Company, in which Mr. Kirchen states: (1) that "Commercial ore has been opened up in your property at a depth of 1,050 feet through a long cross cut from the Tonopah Extension, easily reached by sinking your shaft 175 feet deeper," and (2) "Your property is very favorable to discovering other veins and large ore bodies and developing into a large paying mine."

President Key Pittman in his foreward to the report stated to the Stockholders, "Mr. Kirchen's high standing as a mining engineer, his unparalleled success as General Manager of the Tonopah Extension, his familiarity with surrounding properties, and his recognized conservatism, make the report worthy of full faith and consideration."

This fine tribute to a friend, and his own energetic company promotion was an indication of the fine ability of the future United States Senator of 1913.

New properties were added to Tonopah Extension's already extensive holdings, the Tonopah Merger and Tonopah Victor. The vein system included the Murray vein with a width of 26 feet over a 500-foot long ore shoot, the North Merger vein, the O K and Breccia veins. The Cash Boy property was also purchased which later became a good producer.

Further newly-discovered veins include the Bermuda, The Paymaster and the Merton with good ore shoots.

The mine closed down in 1927 with silver below 60¢ per ounce and a quite heavy flow of water. The mine was handling over 2,000 gallons per minute against a head of 1,800 feet. Electric power failures made the water problem more accute.

Total production records on the Tonopah Extension for the period 1901 through 1939 gives 1,547,124 tons of ore produced with a value of $22,998,069.00.

<u>The Montana Tonopah</u>: The Montana-Tonopah Mining Company was incorporated in 1902 to develop a group of claims lying directly North of the famous Mizpah claims of the Tonopah Mining Company. Senator W. A. Clark, the copper king of Montana, supplied much of the original capital.

The shaft was sunk in a barren formation within but 250 feet of the Mizpah side line. At a depth of 370 feet the shaft encountered the ore bearing formation and a cross cut on the 392 foot level hit the rich Montana Vein; and a cross cut on the 462 foot level, 200 feet North of the Montana Vein, hit the MacDonald

vein, which was exceptionally high in silver sulphides.

There is no record of any considerable body of reserve ore; however, Mr. Knox, the Company's President, points out that the Tonopah Extension, "Adjoining us immediately on the West" now "has on the 1,880-foot level, the largest ore body that has ever been developed in Tonopah with unlimited possibilities of values to an unknown depth, therefore, full justification for the Montana Company to explore its territory to the same depth."

Between the years 1903 and 1925, this company produced 588,757 tons of ore for a total value of $9,284,471.

The Halifax: The Halifax Mining Company held four claims South of the Mizpah Extension and adjoining the Tonopah Belmont to the East. This Company was backed by Thomas Kerns, the wealthy Salt Lake mining man. The shaft was all in "later andesite;" the term Spurr used for the barren formation such as the Montana and the Midway encountered over the ore-bearing formation he termed the "early andesite." A heavy flow of water was encountered at 600 feet and work ceased at 800 feet. Years later, when the Tonopah Belmont found rich veins in their adjoining claims, the West End Consolidated made a good producer out of the Halifax. It is now a part of the Tonopah Consolidated Mines, Ltd., holdings.

Total production of the Halifax mine from 1913 to 1926 has been 45,926 tons valued at $1,069,797.00.

General Geology: (G and others)

Much has been published concerning this Tonopah district in general and the Belmont Mine in particular. While I may differ in some minor particulars, and in some possible conclusions,

drawn therefrom, in general, the geology is well worked out and cannot be improved upon.

Originally this work was started by J. E. Spurr and his report was published by the U. S. Geological Survey in Professional Paper #42, 1905. Additional work by him appeared in the "Report on the geology of the property of the Montana-Tonopah Mining Company.," published in 1910 and "Ore Deposition at Tonopah, Nevada," Economic Geology, Vol. 10 - pp 713-769, 1918. His work has been followed by many other reports, amongst which are:

1. The geology of the producing part of the Tonopah Mining District: Economic Geology, Vol. 4, pp 681-712, 1909. By J. A. Burgess.

2. The geology of the Tonopah Mining District: American Institution Mining Engineers Transactions, Vol. 43. pp. 157-168, 1912. By Augustus Locke.

3. The genesis of the ores at Tonopah, Nevada: U. S. Geological Survey Professional Paper 106, 1918. By E. S. Bastion and F. B. Lancy.

4. The underground geology of the Tonopah Mining District Nevada, University of Nevada Bulletin Vol. XXIX, No. 5 by Thomas B. Nolan, U. S. Geological Survey and the Nevada State Bureau of Mines. 1938.

A quick summary of the geology would entail first an enumeration of the rock formations, all of which are considered as belonging to the Tertiary Period, a listing of the principle faults together with what bearing they would have on the rock formations and ore

conditions, ores and the conditions surrounding their deposition and the general conclusions therefrom.

Seven formations were recognized by the field work done in 1929 and 1930 by the U. S. G. S. under Thomas B. Nolan.

1. The oldest formation is the Tonopah Formation consisting of tuffs, breccias, and flows interbedded. These beds are over 1,000, possibly over 2,000 feet thick and may over lie very old metamorphic (sedimentary) formations as is shown by the presence of quantities of crystalized calcium carbonate in the vicinity of fault planes where heavily charged circulating water flowed. The so-called "Glassy Trachyte" as well as the Sand-Grass Andesite belong to this series of wall rocks.

2. The next oldest formation is the Sand-Grass Andesite consisting of dark lava interbedded with the Tonopah formation.

3. Then is listed the Mizpah Trachyte, classed as a series of surface flows in places brecciated. This formation has been subject to periods of coral erosion but was probably originally over 2,000 feet thick. In the Belmont Mine this formation is the best ore zone.

4. Next is the Extension Breccia Formation, an intrusive tabular mass localized in the Western part of the Tonopah area.

5. Next oldest is the West End Rhyolite. This is also one of the Belmont ore formations. This takes the form of sills up to 600 feet in thickness and is intruded into the older formations.

6. "A fraction breccia member of the Esmeralda formation" is classed next, "a volcanic breccia that unconformably over lies the ore bodies and their wall rocks." (Nolan)

7. The youngest formation is a later Ryolite, forming lenses and dikes intruded into all the older formations.

The first five formations form the wall rocks and may be classed as older than the ore while the last two are definitely post-ore formations.

Faulting:

Most of the faulting, and this district is very extensively faulted, occurred before the deposition of the ores. In fact, the existance of the ore is closely related to the very complex fault systems.

The faulting may be divided into three groups but are generally believed to belong to a "Single epoch or period of earth movement." (Nolan)

The first group consists of Faulting with a:

1. Northerly strike and flat dip to East - "Halifax fault zone," just to the East of the Belmont Mine.

2. Probably slightly younger than the first group in the Tonopah Fault consisting of three major branching faults. This system is unique in that it is a curved fault (not the result of subsequent folding) striking Easterly and having a North or South dip. The strike also shows a curvature allowing for an Easterly and Westerly dip along the course of the strike giving it

a dome shaped appearance. The Stone Cabin Fault is the only major fault of this series to affect the Belmont.

3. The latest groups of faults are a series of faults with Northeast and Northwest strikes dipping Easterly and a few with a North and South strike dipping towards the West.

The mineralization is closely connected with the second group. These related faults occur at comparatively shallow depths with a relatively small throw (a few hundred feet more or less) and usually branch and die out to the upward with a generally steepening dip. The major exception to this latter statement is the Belmont vein which flattens towards its top. One series of these veins strikes East and West dipping steeply towards the North even in places having a steep Southerly dip. In the Belmont this series is represented by the Belmont vein, Lilly Belle vein and others. A second series with low Northerly dips (30 to 40 degrees) is represented by the Rescue, Faborite, and Shaft veins on the Belmont Mine. The Favorite passes into a steeper dipping vein upwards.

The third series of faults is well represented by the Mizpah Fault on the Belmont ground. This is a Northwesterly fault dipping flatly to the East which cuts through from the North Star where it joins with a branch of the Stone Cabin Fault, through Belmont ground into the Rescue-Eula where it approaches the Halifax Fault zone. It is severely complicated with the Northeasterly striking Belmont Fault. The vertical displacement is some 600 feet more or less while the horizontal movement may be as much as 800 or 900 feet.

The Belmont mine has several representatives of the Northeast system, among which are the Favorite Fault with a displacement up to 100 feet, the Tesuro Fault (50 feet or less movement) and the Belmont Fault varying in strike at its Northern end of North and South to Northward to W 40° E and even N 60° (Movement about 600 feet vertically and 600 horizontally.)

The origin of the faulting is probably duo fold. First there was an uplift along the Halifax Fault zone giving a general Westerly dip to all the basic formations, then a small dome pushed up just to the Westward at the crest of the Tonopah Fault. This was followed by general settling or collapse which created the third fault series. This settling movement was greater towards the East and Northeast.

The mineralization follows the East and West fault system with but few exceptions. There is some ore along the Mizpah fault. The size of the ore shoots and value of the contained ores vary greatly. The veins are not well defined but occur rather as a mineralized portion of the rock itself with only assay walls. They are classed as replacement veins following faults and minor fractures. (Nolan)

The minerals present which have been recognized are Electrium (containing Selenium) Argentite, Polybasite, Arsonical Pyargyrite along with other silver and base metal sulphides. The gangue contains Quartz, pinkish and fine grained Carbonate, Barite and altered wall rock. Corargyrite, Iodyrite and Embolite are also found in certain lesser amounts.

The silver mineralization follows a definite pattern or temperature zone which gives it both a top and bottom beyond which the silver enrichments do not occur. This zone follows more or less a dome shape, possibly suggesting the shape of the minor secondary "intrusion." This zone has, so far, yielded practically all the ore

mined in the district. This zone follows in a general way the dome shaped Tonopah Fault and may be closely connected with it. Mineralization is limited mostly to the area West of the Halifax Fault zone.

95 To ratio

A very definite ratio of silver to gold continues throughout the entire district and varies only slightly locally. This ratio in the Belmont is 95 ounces of silver to one ounce of gold. The silver decreases with depth as it approaches the lower limits of the silver zone. Only in one or two places does gold occur locally without a corresponding amount of silver being present. (See Map #2)

Bel

The ore conditions within the mine today can be briefly summarized as follows:

While much ore has been mined there still remains quite a number of faces where mining operations were stopped short of following the ore to the end. These places represent a larger or smaller amount of ore in place but taken on an average will give an immediate and definite quantity of mill grade and better ore sufficient for a reasonable operation. Development work during the whole history of the Belmont Mine was contemporaneous to the mining. With so many veins and ore faces it has been only necessary, and continues to be so, that one follow the ore face as long as it continues to mine profitable ore, then proceed on another. Development work is not the blocking out of defined ore shoots or veins but is the following of the most favorable of the minor ore showings which more often than not open up into definite shoots or lenses of good ore. A considerable number of places where ore bodies remain untouched are indicated in the records of some ten miles of drill holes only a portion of which have been followed out.

While the above study on geology covers primarily the Tonopah Belmont, the same is true that is general for the whole district. The Tonopah Consolidated Mines, Ltd. is primarily concerned in the conditions of the Western part of the camp as well as the above described Belmont.

The geological conditions of the Western end are considerably influenced by the downward curve of the structures in general. This tends to place the ore zone at a greater depth than in the central portion of the camp. The greater depth plus certain major faults have provided water channels through which a very considerable quantity of water interferes somewhat with the mining operation. In the past, this has been a serious problem. With modern equipment and a steady source of power, this excessive water can be turned into an asset rather than being a liability.

There remains a lot of corelation of the vein structure connecting the Eastern and Western area. What seems to be large new veins in the more recently prospected Western area may be a continuation of faulted segments of the very productive veins in the Central and Eastern parts. There has yet been no Western limit of the vein structure indicated.

There seems to be but little information available on the underground vein conditions in the North and Northeastern areas..... that is on the Montana and Mizpah Extension sections. Further study will be necessary to fill in the picture. On the East end of the camp the country beyond the Halifax Fault should be studied more closely in relation to the further extensions of the Belmont vein and others. Some ore was found on the Halifax but not in any quantities such as one might expect. The early occurance of heavy sulphides may indicate a considerable vertical throw has occured along the Halifax Fault. This would naturally cause some variations in continuity of ore bearing structures.

Following Spurr's study on temperature zones in the Belmont Mine, it becomes more apparent that the silver bearing zone has both a top and bottom limit. However, the fact that the major veins continue on in depth undiminished in size, and the fact that these veins are still heavily mineralized can only lead to the conclusion that the limits of mineralization are far from being reached. There are indications in several parts of the mine, notably along the lower levels of the Belmont and in the North Star wherein valuable gold enrichment has occurred, far in excess of the usual 100 to 1 gold-silver ratio that perhaps there may be a considerable increase in gold values at a deeper temperature zone. (One has only to remember the fact that there were five different productive temperature zones carrying gold values on both the Kennedy and Argonaut mines on the mother lode; in each instance the gold values were separated by barren zones although mineralization continued.) There are also certain other minerals in small quantity (Tungsten) in certain veins indicative of much deeper seated and high temperature mineralization.

When one contemplates the extent and concentration of mineralization in only one principle temperature zone and considers what can further exist at a greater depth relative to the minerals that can occur in these relatively higher temperature zones, it is easy to believe that the area has only been a little more than scratched as far as potential is concerned.

Ore Conditions: (D) (L)

The ore conditions in the Company's Tonopah Extension area are well described by John L. Dynan in his report of January 18, 1935. Excerpts from this report read as follows:

In mines of the nature of those at Tonopah, the amount of ore which is definitely blocked out in measurable form at any one time is usually comparatively small. The mines at Tonopah have been producing

for 30 years, and for most of that time, there has not been any large ore reserve blocked out in advance. Hence, in a block of ground where geological conditions are favorable and the presence of mineralized veins is known, the total amount of ore which will be produced is likely to be many times that which can be definitely measured at a given time. In a table which is attached to this report, and has been compiled from annual reports of the Tonopah Extension, mine production from 1912 to date is shown as 1,747,000 tons of ore. The largest tonnage ever claimed as "Ore Reserves" is 150,000 tons, in the report for the year ending March 31, 1913. and in most of these reports no "Ore Reserves" whatever in the sense of definitely measurable tonnage are claimed. This is a point which must be borne in mind in submitting figures on any "Ore Reserves" which may be partly blocked out or indicated.

The past large production of the mine came mostly from the Murray Vein, on which a large shoot of ore extended from above the 950-foot level to about the 2,125 foot level. The year 1925 was the last year of large production from this shoot, and during the years 1926-1929 exploration of newer ore-bearing ground to the West of this shoot was under way. This exploration work opened a series of new veins. At the end of 1930, falling silver prices and heavy expense of pumping mine water caused a complete shut down except for leasing operations above water level.

Water

The water has risen in the lowest mine workings to a point seventy-five feet below the 1200-foot level. For this reason workings to which reference is made in this report are inaccessible, and the information contained herein in regard to them is obtained from Company maps, assay reports and other records. All of these maps and records so consulted were those regularly kept by the operating officers of the Company for their own information and guidance in the conduct of operations.

The principle veins opened by this work are three in number. The Denver Vein, the most Northerly, is in all probability the faulted Westerly extension of the Murray Vein. South of the Denver Vein are two more veins known as the Merton Vein and the Bermuda Vein. Each of the three veins has produced important quantities of ore.

On the Murray Vein, the ore shoot was large and rich on the 1880 and 2000 foot levels, and was still important on the 2125 foot level. It therefore seems to me a reasonable assumption that these shoots under discussion will extend downward from the 1650 foot level sills to the 2125 foot level, a vertical distance of 475 feet. This would make a tonnage of 389,500 tons, of an average assay of 14.05 ounces silver and 0.14 ounce gold per ton, to be classified as probable ore, since it is exposed on one side only.

The ore supply can, therefore, be briefly summed up as follows:

1. A block exposed on one side (bottom of 1650 foot level) and assumed to extend to 2125 foot level, and estimated to contain 389,500 tons of ore.

2. A block of geologically favorable ground extending 1500 to 2000 feet, and possibly much farther, to the West of the present faces, into which the known veins are headed on their respective courses. This is a block which should produce a large amount of ore, but for which it is impossible at present to present any definite figures as to tonnage to be expected.

W. J. Loring has estimated that there is ore to the extent of 696,400 tons as a reserve in the Belmont - value given as $8,567,000.[12] Considering that it never has been the policy at Tonopah to build up ore reserves, this is a very substantial figure.

Belmont Reserve

Loring continues to say: Additional important probable new ore can

Drill hole.

be developed in ground that was drilled and found most encouraging but was not mined because it did not average $19.70 per ton. I have a detailed record of these long prospect holes, some of which I find have been stoped while others have not been touched. There are records of 10.4 miles of these holes. Still, all of the prospective ground has never been touched by drill holes or cross cuts.

Loring continues: The deep levels have only been scratched. My reason for stressing these points is to impress upon those who may be interested, to put this analysis in such form as to be understandable and, answer the natural question, "Why did the Tonopah Development Company leave a mine such as you have endeavored to describe in this practical report?".....No matter what may be said, the fact is that the conditions are just as I have written; the ore is here, that is the main and only question.

Plan of Operations

It is the intent and purpose of the Tonopah Consolidated Mines, Ltd. to consolidate the better properties in the Tonopah Camp that are available into one operation. As a result, the Company has acquired by purchase and/or by lease:

1. The Tonopah Belmont ?
2. The Mizpah Extension ?
3. The Halifax
4. The Tonopah Extension Holdings
5. The Steen and Harris Group (lying North of the Mizpah Extension.)
6. The Callenger Group of Mildred Hancock (lying North of the Tonopah Extension.)
7. The Montana (negotiations complete)

and are negotiating on other properties:

1. The North Star
2. The Calumet and Hecla Properties
3. Umatilla
4. Carrie Group, and others.

These properties as listed comprise most of the better located mines in the Camp. The few remaining pieces may or may not be added to the whole at a later date.

The bulk of the forty or more known veins and most of the unexplored mineralized area lies within the Company's holdings. The names of these veins list like a "Who's Who" of Tonopah Mining history - such veins as:

Delmonte	Mizpah	South Vein
Belmont	Favorite	Silver State
Shaft	I. O. U.	Burro
Shoe String	Lilly Belle	Ohio
Occidental	Seven Eleven	Tesura
Middle	Rhyolite	Gold

and in the Western area:

Mac Donald	Murray	Denver
Sand Grass	Merton	Pay Master
Egyptian	Western	Bermuda

Mr. Niceley aptly states: "The entire district of the Tonopah Mines, a combination of some 30 to 40 different properties, has produced in money, the sum of $189,000,000.00 of record. This was during the time prior to turning over several of the mines to leasers. I am sure that a complete search of the records of all mines will show this district has produced over $200,000,000. This production was from the upper part of the district and very

Not mined deep

little mining was done below the 1000 foot level. However there has been some development through the 2000 foot level; and one shaft, I am told, is 2680 feet deep and still in ore. The mineralized zone extends in width 12,000 feet wide and in length 30,000 feet (six miles East and West.) In my office I have many maps made during the time of operations. Also, I have six reports on the properties in which each engineer is in agreement. There is at the present time, in the Belmont alone, ($80,000,000.00) in measurable ore. What I mean by measurable ore is ore that you can walk along a drift and measure the length, width, and depth and in so doing you will reach in excess of eighty million in this one property.

2 1/4 miles wide
6 miles long

ore in sight

The Tonopah Consolidated Mines, Ltd. have already established a program to put this project into being. They have outlined their plan:

New Co.

1. To pay in cash for optioned mines, consisting of approximately 6000 acres of mineralized land. This consists of approximately 95% of all the mines that have produced ore. The purchase price of these properties is approximately two million dollars.

2. To immediately survey all of these properties and put up identifying corner posts. (Part of which has already been done.)

3. Contact equipment companies and millrights for a "Turn Key Job" that will reduce one thousand tons of ore to money per every 24 hours. This mill will be put up in units of 250 ton units so that in the event one unit is broken down, we are still in production or if we did not have sufficient ore at any time, we could close down one or two which ever is necessary. Estimated daily production is forty thousand dollars. Estimated cost of Proposal #3 is one million dollars.

4. Contract a sinking of a shaft of four compartments 14'x16',

completely equipped for hoising ore, man and supplies, a man way, pumps and electricity, complete with stations, tipples, etc. Estimated cost to be approximately $1,225,000.00.

5. To drive a haulage tunnel for the full length of the mining properties and connect with loading chutes from each property to the hauling tunnels using this also for drainage tunnel for water. Install the proper and adequate pumping equipment, skip loaders, trucks for hauling and drills, stopers, etc. for mining at a cost of approximately seven hundred thousand dollars.

6. Arrange for adequate housing, sewage disposal, electricity, etc. for employees. Estimated cost is $500,000.00.

7. It is also our intention in so far as possible to lease all equipment, housing, machinery of any kind what so ever, so that it may be deducted from the income tax.

They estimate the employment factor as 3500 persons. This means a living for approximately 14,000 people.

The Company proposes to establish their own power plant to take care of not only the mining operations but also the requirements of the Housing Project. There will, also, be an auxilliary power supply to protect the mine pumping operations.

The expected water surplus which may reach an amount of 7000 gallons per minute or more of quite pure water will amply supply the population needs with surpluses available to local agricultural needs. With water, many products can be grown; the soil is good.

The Company plans to dig this tunnel and main shaft and establish production at a cost of about 7.5 million dollars.

Since the ore is known to be present in substantial quantities, and the water, once a serious detriment but as planned, an economic benefit. The success of the project should be assured. There are no metallurgical or ore treatment problems. Metal losses, in the past, have been low.

Other economic factors may even help this project considerably. First, it produced principally silver. This metal, currently selling at $0.90 per ounce, is in short supply with demand increasing rapidly such that Government stocks cannot continue to provide the market demand much longer. This, it is practically certain that the price will increase rapidly in the near future. This fact is generally agreed upon by nearly all economists.

demand on Silver

Then again, another feature peculiar to the area is the fact that approximately 6000 acres of mineral land, including such major producers as the Belmont with a record of $40 million production and the Tonopah Extension and others were available and have been acquired at a low cost.

While the magnitude of the investment is great, it must be remembered that the return is in proportion to the size of the undertaking.

Economic factors:

With the establishment of the project, its scope and history, it follows naturally to study its economic feasibility both as to investment and operating costs as well as expected results.

The total project should represent a primary cost of some seven and one half million dollars. This would be apportioned more or less:

Primary costs.	$ 250,000.00
Land purchases and options . .	$2,000,000.00
Main tunnel	$ 700,000.00
Connecting tunnels	$ 300,000.00
Main Shaft	$1,250,000.00
Mill and Treatment Plant . . .	$1,000,000.00
Power plant and Pumping Equip.	$ 250,000.00
Mining Equip. and Surface needs	$ 250,000.00
Operating Capital	$1,000,000.00
Housing Program	$ 500,000.00

The management has carefully worked out a plan to get the power plant and a first mill unit in as soon as possible. This will allow the project to be operating while the other phases (more or less time consuming) are being done. The 1500 foot 4 compartment shaft (plus sump) will be dug and equipped. Next would be the 18,000 foot haulage and drainage tunnel (at about 4200 foot elevation) and connections to working areas and auxilliary air and escape ways would be made. Following, in turn, would be the rehabilitation of the mining areas and actual mining. The work, of course, will not be done all at once but will proceed as rapidly as feasible. The cost of maintaining such capital amounts available do not allow for any delayed program.

A further economic study in feasibility is relative to operating costs. After all, the real success of any project is in "What will it earn?" Most of the major mines within this consolidation have past histories of successful operations - Profits and Dividends. Largely, it has never been a problem with the Belmont in the past; they had what can be called an "ideal" mine - one that no amount of mismanagement could hurt. The Tonopah Extension however, combined lower grade ore bodies, poorer metal prices and a serious water problem with good management to make a profitable enterprise. (The lowest silver prices in history, still more water

and uncertain electric power supply finally closed the mine, not the lack of ore - the Management actually stopped the mining operation to preserve the ore when prices dropped so low. (Silver even went below 25¢ per ounce.) A table of mining and milling costs on the Tonopah Extension is attached as an exhibit hereto. The Montana and Halifax properties had periods of profits, however, not much data is available on their operations.

Some comparative cost data is given as follows:

(see page #28)

SOURCE OF DATA	DYMAN Tonopah Ex.Ore	LORING Belmont Dumps	LORING Belmont Stope Gobs	LORING Belmont Fills	LORING Belmont Ore
Estimated Tonnage	389,000 T	100,000	200,000	100,000	296,400
Assay A. G.	@ 64.5 - 14.05 oz				
A. U.	@ 35.00 0.14 oz				
Value Reported	13.96	8.50	8.50	15.00	15.24
Recovery	95%				
Cost per Ton	9.50	7.00	5.50	6.00	7.00
Estimated Profit	3.48	1.50	3.00	9.00	8.24
Date	1935	1946	1946	1946	1946

Outside of working over a few lower grade dumps and mine fills, the average ores can be selective mined or upgraded (mechanically) to make $20.00 and better (up to $40.00 or more) heads into the mill. This up grading should not be costly.

Again, referring to costs: It is only too true that labor and material costs have doubled and even trebled in certain phases. However, much of this price increase is offset by mechanical handling, substituting machinery and power for labor. Also, in this instance, the consolidated operation, increases the over-all efficiency and allows for better and better mechanization.

I have arranged an estimated cost statement to correspond on what I believe can be accomplished. On existing ore I have used the above listed figure as to tonnage but with todays values and todays estimated costs.

SOURCE OF DATA	DYMAN, etc. Tonopah Ext.	Loring, etc. Dumps	LORING, etc. Stopes,Gobs	LORING, etc. Fills	LORING Belmont Ore	GIBSON Estimated Ore Potential
Estimated Tonnage	400,000	200,000	300,000	150,000	296,400	30,000,000
Ore Sources	Reserve	Reserve	Reserve	Reserve	Reserve	Undeveloped Ore
Assay	$20.00	$ 8.50	$ 8.50	$15.00	$15.24	$10.00
Value Calculated	$18.00	$ 6.85	$ 6.85	$12.00	$13.72	$ 9.00
Recovery	90%	80%	80%	80%	90%	90%
Cost per ton	$ 9.00	$ 4.40	$ 5.40	$ 7.50	$ 9.00	$ 8.00
Estimated Profit	$11.00	$ 4.10	$ 3.10	$ 7.50	$ 6.24	$ 2.00

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BASED ON ESTIMATED COSTS - 1000 to 2000 TONS PER DAY OPERATION

ITEM	DUMP ORE	FILL ORE	RESERVE DEVELOPED ORE	NEW ORE DEVELOPMENT
Mining	Mine Gob		3.00	3.50
Handling	.50	1.00	1.00	1.00
Crushing and Up-grading 2/1	1.00		.50	1.00
Ore Treatment	1.00	2.00	2.00	1.00
Process Efficiency	1.65 - 80%	3.00 - 80%	2.00 - 90%	1.00 - 90%
Marketing		.25	.25	.25
Overhead	.25	.25	.25	.25
Total Costs	4.40	6.50	9.00	8.00

Another point to try to determine is the estimated ore potential. This is a most difficult problem. Even the best kept records as were kept by the Belmont and the Tonopah Extension cannot give the answers. There are so many faces and areas in the 40 odd veins and mineralized wall rock besides great areas of the mineralized zone yet unexplored, that almost any figure could be too small. The greater the efficiency of the operation, the lower total costs are, the more material that can be classed as ore-material that was passed over in other days. Also operating costs varied greatly in those early days so what was ore one day would be passed by the next - to remain until efficient operations once more made the material "ore." There could easily be 10,000,000 tons of $20.00 average and up; by dropping the average to $10.00, this tonnage could rise to 30,000,000 tons and for each dollar drop in value, further huge quantities of the mineralized zone can be classed as ore. The values need only to be greater than the costs - a profit is pre-supposed; that is ore.

As to what might be expected of this consolidated property - again a good guess. With good management plus large amounts of ore plus mechanization, the answer lies in comparisons as to what others have done and are doing. Allowing for up-grading (possibly sink-float) followed by standard treatment for concentration followed by cyaniding or smelting the concentrate (all standard practice) on a scale of 1000 to 2000 tons daily through the mill (2500 to 5000 tons daily to the up-grading circuit), the operation would show:

	250 T Plant	1000 T Plant	2000 T Plant
Tons through Mill Circuit	250	1,000	2,000
Tons through up-grades	500	2,500	5,000
Ore reserves available	850,000	500,000 plus 30,000,000	30,000,000
Years operation	5-6 & up	4 to 44 years up	20 years up

The 250-ton plant would plan to operate on $15.00 ore or better and would show $5.00 plus profit per ton or $750.00 per day X 350 days or $260,600.00 plus annually.

The 1000 ton plant handling 2500 tons gross would need a $10.00 or better ore and should show $2.00 up of profit per ton or $2000.00 per day X 350 days or $700,000.00 plus annually.

The 2000-ton unit handling 5000 tons gross would pay double this last amount of $1,400,000.00 plus annually.

Conclusions:

It is most difficult to properly evaluate a property of such magnitude as are the properties of the Tonopah Consolidated Mines, Ltd., it is actually several mines grouped into a unit with each unit a great property in itself.

Consider the whole as a body, 2½ miles wide and 6 miles long - perhaps a mile or more deep. Consider that this body is much mineralized with some 40 major veins, some wide and some narrower with numerous branches, off-shoots and stringers, not even with definite walls.

I have given in this report the opinions of others who are well-informed in regards to these properties; opinions as to the past richness and abundance of ore and especially to the fact that while much ore has been profitably mined, it is a long way from being worked out. Some of the easy ore has been taken but the controling factors of mine operations stoppage has been, mainly, low silver prices (in the past) and, in some areas, too much water for the then existing equipment - not the lack of ore.

The only conclusion that can be drawn from the above analysis of this operation is that with good management and sufficient capital is that it can pay a good return on the investment and at the same time maintain a sound operation over the next twenty years or more. It should be able to operate on a favorable comparative basis to such properties as the Homestake Gold Mine in South Dakota and other well-managed properties.

I would sincerely recommend your program to any one as may be interested.

Dated: November 19, 1961

F. G. Gibson

F. G. Gibson, Geologist.
B. S. Stanford University 1923
3878 Magnolia Drive
Palo Alto, California

TABLE SHOWING COSTS PER TON

YEAR ENDED MARCH 31, 1931	TONS MINED AND MILLED	FEET DEVELOPMENT DONE	MINING COST	MILLING COST	MARKETING COST	TOTAL COST PER TON
1912	50,900	10,156	$4.724	$3.247	$0.227	$ 8.199
1913	54,618	11,172	5.331	3.290	0.293	8.854
1914	58,022	16,092	5.784	2.979	0.190	8.953
1915	71,882	12,651	5.191	3.753	0.450	9.394
1916	91,981	13,967	4.614	4.478	0.501	9.593
1917	109,402	12,017	4.900	3.623	0.296	8.819
1918	110,187	10,977	5.260	3.210	0.171	8.541
1919	114,921	10,322	4.804	3.447	0.237	8.484
1920	70,611	5,941	5.512	3.964	0.235	9.711
1921	89,022	9,114	6.440	4.091	0.270	10.801
1922	84,463	10,024	6.071	3.842	0.207	10.120
1923	134,801	8,884	8.568	3.630	0.221	9.319
1924	144,917	12,469	5.737	3.457	0.252	9.446
1925	171,046	13,997	5.890	3.337	0.288	9.515
1926	73,247	13,401	9.214	4.293	0.212	13.719
1927	51,587	8,574	11.764	3.583	(2.443 special (0.164	18.054
1928	66,024					
1929	42,401					
Apr. 1, 1929 to Dec. 1, 1929	49,194					
Calendar Year 1930	98,486		5.071	2.549	0.222	7.842

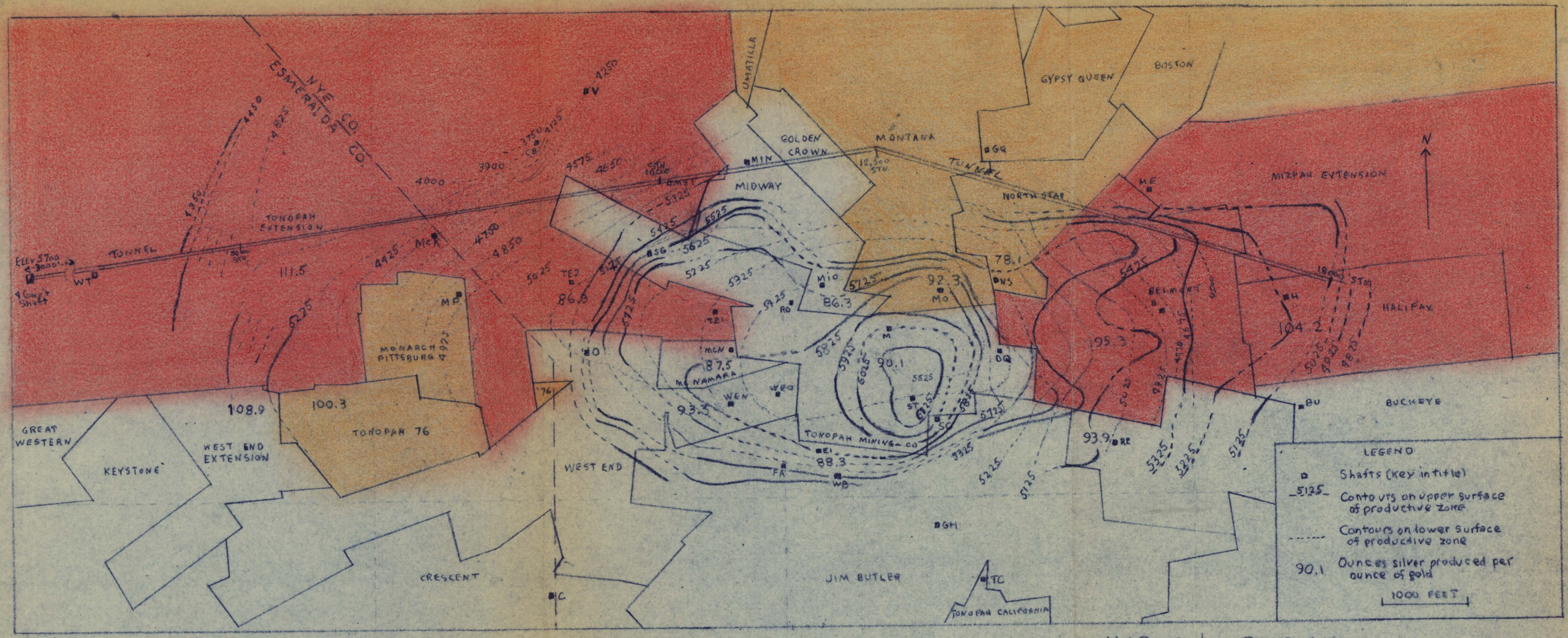
TONOPAH BELMONT DEVELOPMENT COMPANY

ORE PRODUCTION RECORD AFTER MILL CLOSED IN THE YEAR 1923

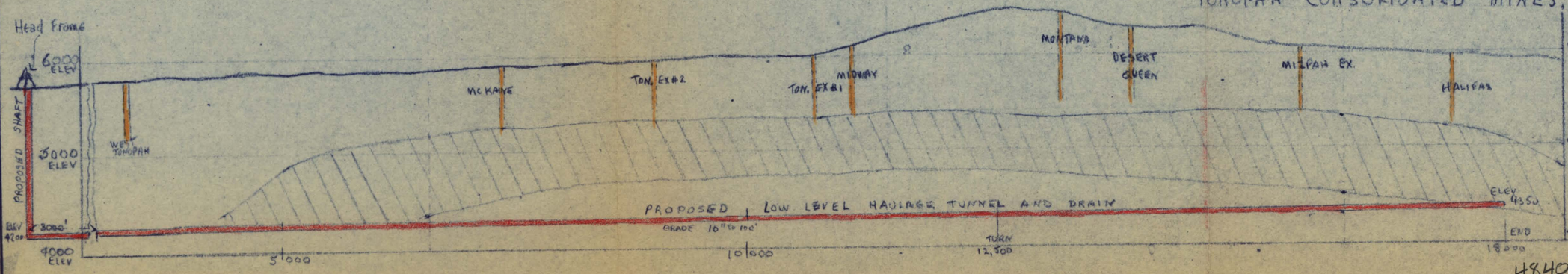
Year	Dry Tons	Ounces Silver	Silver Value	Silver Price	Ounces Gold	Gold Value	Gold Price	Total Gross Value	Shipped to:
1924	36568	838051.13	562580.22	.6713	10388.722	214753.58	20.67	777333.80	Millers
1925	31034	679334.54	467446.05	.6881	7194.733	148728.07	20.67	616174.12	"
1926	27851	657546.30	401148.48	.6101	6958.560	143845.86	20.67	544994.34	"
1927	20133	506978.22	289398.39	.5708	5302.409	109610.34	20.67	399008.73	"
1928	18797	431777.37	252047.46	.5837	4452.480	92040.83	20.67	344088.29	"
1929	17259	480476.46	251299.26	.5230	4932.909	101972.15	20.67	353271.41	"
1930	6802	255388.46	102491.86	.4013	2739.142	56622.93	20.67	159114.79	"
1931	3566	195276.75	56037.22	.2869	2004.669	41440.05	20.67	97477.27	"
1932	2353	118728.03	33421.64	.2815	1244.073	25717.17	20.67	59138.81	See note
1933	No production - Property shut down								
1934	585	21366.70	13781.52	.6450	290.899	10181.46	35.00	23962.28	A.S.& R. Co. See note
1935	4415	171039.13	124409.39	.7274	1839.919	64397.39	35.00	188806.78	"
1936	4461	143061.71	110973.17	.7757	1516.346	53068.58	35.00	164041.75	"
1937	6932	260703.11	202227.37	.7757	2842.411	99484.46	35.00	301711.83	"
1938	7043	231977.52	154380.90	.6655	2582.900	90401.57	35.00	244782.47	" See note
1939	4047	148841.11	98596.51	.6624	1608.732	56305.70	35.00	154902.21	" " "

NOTES:

Company operations were carried on, after closing of mill, until July 31, 1929, when mine was put on leasing basis and operations were carried on by various leasees. Leasing operations were discontinued on September 30, 1932 when the price of silver became too low to operate. Practically all ore up to this period was shipped to the plant of the Tonopah Mining Company at Millers, Nevada. Production figures for 1932 represent 9 months of that year. In November, 1934, property was leased to H. D. Budelman and associates. Production for 1934 represents 2 months of that year. Budelman conducted operations until July 31, 1938, when this company took over the property and operations were then conducted by leasing to miscellaneous lessees. Mine fire of October 31, 1939 destroyed main working shaft and portion of surface plant. Production for 1939 represents 10 months of that year.



MAP and SECTION
TONOPAH CONSOLIDATED MINES.



Key to Shafts
B - BELMONT
DQ - Desert Queen
H - HALIFAX
MCK - McKANE
ME - Mizpah Ex
MIN - New Midway
MO - Montana
NS - North Star
O - Ohio
MP - Monarch-Pittsburg
SG - Sand Grass
TE1 - Ton. Ex. #1
TE2 - Ton. Ex #2
V - VICTOR
CB - CASH BOY
WT - West Tonopah

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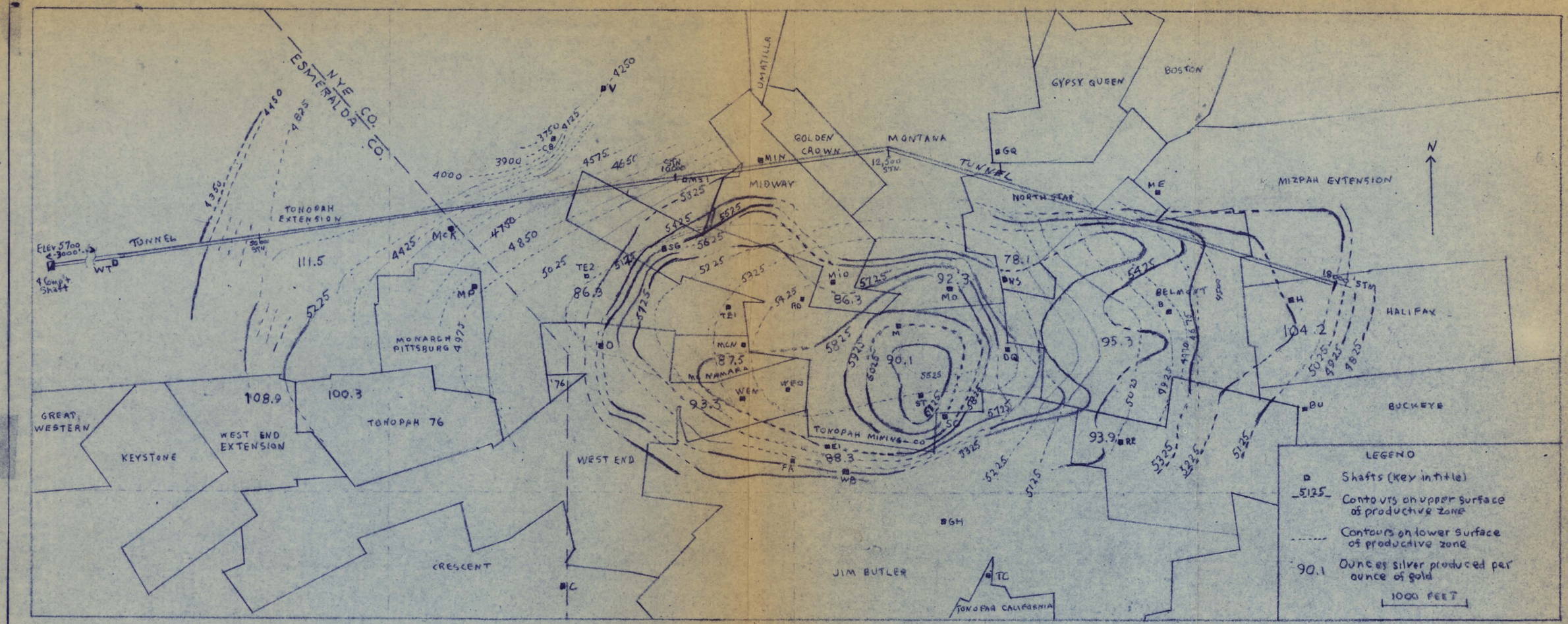
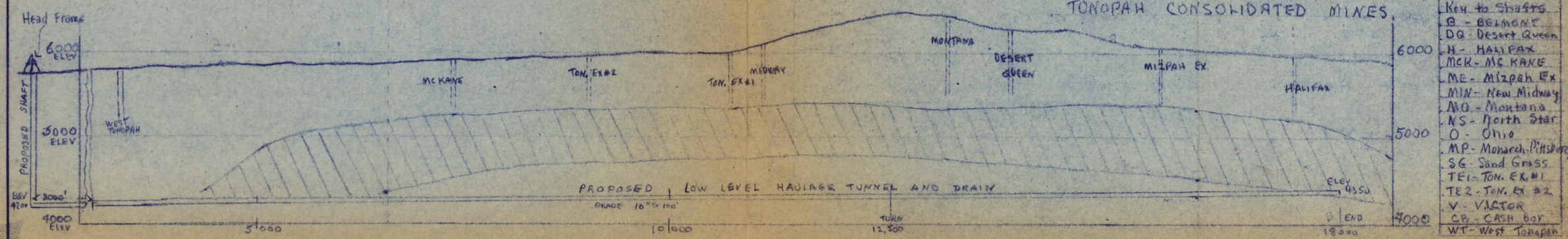


MAP and SECTION
TONOPAH CONSOLIDATED MINES



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