R E P O R T

ON THE LEASE OF THE GOLDFIELD OPERATORS, LTD.

O N

THE JUMBO EXTENSION MINE

GOLDFIELD, NEVADA

INTRODUCTION

At the request of Mr. H. P. Kervin, President, Goldfield Operators, Ltd., the writer left Pasadena with Mr. Kervin the morning of July 2, 1940; drove to Goldfield, Nevada; spent four and one half working days on the property and returned to Pasadena July 7. Three days were spent underground cutting samples and mapping the new workings with the assistance of two men, and one and a half days were spent in compiling maps and information from the files of other companies in the district.

LOCATION OF LEASE

The lease holdings are situated in the central part of the Goldfield Mining District, Goldfield, Nevada. The property leased includes the Velvet, Paloverde and Dick Bland Mining Claims, U.S. Patents No. 3626-3843, comprising 30.72 acres of the Jumbo Extension Company together with the Jumbo Jr. claim of approximately 5 acres adjoining the above ground to the north, or a total of approximately 36 acres.

HISTORY OF THE JUMBO EXTENSION COMPANY

The Velvet, Paloverde and Dick Bland claims were located during the early staking in Goldfield in 1903-4. In April 1904, the Jumbo Extension Mining Company was incorporated as successor to the Jumbo and Vernal Extension Mining Company. This company met with indifferent success until the discovery in October, 1914, of a rich orebody extending from about the 800 level to below the 1000 level in the latite and along the latite-shale contact.

In February, 1915, the Reorganized Booth Mining Company filed an apex suit against the Jumbo Extension to recover damages on the grounds that the new orebody was apexed in the Booth ground. The suit

was settled by the payment of substantial stock and cash to the Reorganized Booth Mining Company which in turn entered into side-line agreements with the Jumbo Extension. Subsequently similar side-line agreements were made with the Goldfield Consolidated and Goldfield Merger Mines Companies so that the property is protected from similar future litigation.

The mine was developed by two shafts. The original shaft, known as the Jumbo Ex, is on the Paloverde claim. It attained a depth of 1017 feet and from it all of the ore mined by the Jumbo Extension Company from this area was hoisted. It is now partly caved and cannot be used. The second shaft, known as the Velvet, but also called the Original Velvet or No. 2 shaft, is on the Velvet claim. It originally was only 400 feet deep, but in May 1915 work was started to enlarge it from a 2 to a 3 compartment shaft and to deepen it to 1017 feet and connect with the workings from the Jumbo Ex shaft. However, the main orebody was practically exhausted before this work was completed. This shaft is now open and in good condition to the 900 level, although at the present time the mine water stands in the shaft slightly above the 900 level. Connections were made between the two shafts on the 790 and 830 levels.

The mine produced through 1915 and most of 1916. The recorded production for fiscal years ending June 30, follows:

	Ore Tons	Gross Value	Loss in Treatment	Value Total	Value Per Ton
1915					
To Smelter	10,873	$669,560	$51,161	$618,399	$56.87
To Cons.Mill (3 months)	5,547	81,850	49,302	32,548	5.87
1916					
To Smelter	35,541	$1,124,487	$153,703	$970,785	$27.32

The total output in 1915 was 22,562 tons for a net of $403,827 from ore containing 1,259,388 lbs. copper; 30,480 oz. gold and 99,459 oz. silver. In August, 1916, the management reported "No new commercial ore has been opened in the mine for the past six months and the production has come

entirely from the one ore-shoot first opened 18 months ago. The drain on this one ore-shoot has been very heavy and the end of the productive life of the mine is not remote, unless further development discloses new ore-bodies." Further development in the vicinity of the known orebody were not successful and consequently the mine closed.

The mine is accredited with a total production of $2,800,000. The following production record is taken from a report of Edwin S. Giles, Mining Engineer.

Year	Tons	Gross Value	Average Value
1913	11,210.26	$88,636.03	$7.91
1914	8,000.99	144,269.54	18.03
1915	16,420.00	650,947.55	39.64
1916	35,541.00	970,784.00	27.32
1917	8,143.66	192,714.14	23.66
	79,315.91	$2,047,352.06	Average 23.62

To the total shown in this table must be added an unknown amount for production during seven months in 1914 for which the records are missing and also the production made by leasers. It is assumed that the total of $2,800,000 was reached by adding an estimated amount for this production to that recorded above.

During the life of the mine two attempts, both unsuccessful, were made to mill the ore. The company first leased a mill at Bonnie Clare, Nevada, and hauled the ore there, but a satisfactory recovery could not be made and the mill was closed in June, 1914. From June to September, 1914, ore was shipped to the Goldfield Consolidated Milling and Transportation Company, with the results recorded above, which show a recovery of only about 39.8 percent. The copper content of the ore prohibited satisfactory cyanidation; the ore is not amenable to gravity concentration, and flotation at that time could not be used on the ore. Consequently the only

ore which could be economically mined was of shipping grade. The operating costs against shipping ore were as follows:

Mining	$2.91
Development	2.49
Freight & Treatment	9.26
General Expense	1.17
	$15.83

At the close of the fiscal year June 30, 1915, the ore reserves were given as follows:

Mill ore on dump	1,500 tons
Shipping ore	49,500 tons
Milling ore	35,750 tons
Total	86,750 tons

If we subtract the 43,685 tons of ore mined and shipped during 1916 and 1917, the last years of operations, there should remain 37,250 tons of mill ore in the mine and on the dumps and about 5,800 tons of shipping ore in the mine, a total of 43,050 tons, providing the original ore estimates were reasonably accurate. This probably is scattered from the 830 level down, throughout the formerly productive area of the mine. The average grade of this ore would probably lie between $8.00 and $15.00 a ton, at $20.67 gold.

In November, 1931, a lease on the above mentioned Jumbo Extension claims was obtained by Mr. H. P. Kervin, who later transferred it to the Goldfield Operators, Ltd. During 1932, the mine was partly reopened for this company by leasers who were given financial and engineering assistance by the company. Since then, intermittent work has resulted in the rehabilitation of the Velvet shaft to the 900 level, reopening the connection between the Velvet and Jumbo Ex shafts on the 790 level, making connection between the 830 and 790 levels at two points, various pieces of new development as listed below, and a number of small shipments to the smelter, which have netted about $3,200.00.

GEOLOGY

The general geology of the region and the surface geology in the vicinity of the mines has been described in considerable detail by F. L. Ransome in U.S.G.S. Prof. Paper 66, 1909. Subsequent work has added little to his general description, but has substantially modified and extended concepts presented in that report concerning the details of the mineralization with depth.

In the vicinity of the Jumbo Ex mine the basement rock is believed to be alaskite and granite on which rests about 200 feet of shale overlain by about 200 feet of latite and 700 feet of dacite. The volcanics and shale dip gently eastward, although interrupted by normal faulting as they approach the easterly side of the district.

The rocks are moderately altered away from mineralization, but in the vicinity of the veins, silicification and locally alunitization has been intense. In many places the original character of the rock can be determined only with great difficulty.

MINERALIZATION

The metalization was accompanied by the deposition of widespread quartz localized in part by the veins, but replacing the wallrocks for considerable distances on both sides of veins and fractures. Much of this quartz is barren and outcrops on the surface as craggy ledges characteristic of the district. Quartz is accompanied in many places by fine-grained pyrite, likewise often carrying little or no values in gold.

The gold, most of which occurs as native gold, is accompanied by minerals containing copper, silver, bismuth, tellurium, antimony, arsenic, tin and other elements. The commoner minerals include pyrite, marcasite, bismuthinite, famatinite, and goldfieldite. In some areas, famatinite

may be abundant, but may or may not be accompanied by good gold values. Bismuthinite is a better indicator of gold values. Goldfieldite is usually found only in the immediate vicinity of high grade ores. Pyrite is not an indicator of values.

STRUCTURE

In the vicinity of the Jumbo Ex mine the larger structural features of the mineralization are fairly simple. As already mentioned the rocks which form a host for the ore have a relatively gentle eastward to northeast dip. The Columbia Mountain fault, with a strike somewhat west of north and eastward dip outcrops along the east flank of Columbia mountain. South of the mountain the fault appears to horsetail out. At about the same place, the northerly limits of the main or Consolidated vein appear as a zone of more or less parallel, small, irregular quartz stringers and veins. Going southward, this zone becomes united to form the Consolidated vein which swings eastward to form the Mohawk nose and continues in a southeasterly direction beyond the Florence mine. Along this vein have been found the orebodies which yielded a major part of the rich ores of the district. This vein, depending on its strike, dips easterly to northeasterly to north, at low angles ranging in general between 30 and 50 degrees.

A second vein system, the Clermont, lies to the north of the Consolidated vein. In the area southwest of the Jumbo Ex shaft, the Clermont vein has a general strike of N 35° W and outcrops about 550 feet west-southwest of the western boundary of the Paloverde claim. This vein, like the Consolidated, has a variable strike, and swings in a gradual but irregular curve from a northerly to an easterly bearing. Its dip is easterly and in general steeper than that of the Consolidated vein. Lack of extensive underground development on this vein, in the area west and northwest of the Jumbo Ex property, prohibits a satisfactory knowledge of

the dip of the Clermont vein, but the available evidence strongly suggests that the Clermont joins the Consolidated in the area west of the Jumbo Ex shaft on the 790 level, and that the northeasterly trending vein system northeast from the Jumbo Ex shaft on the 790 and lower levels is in reality a zone formed by the intersection of the Clermont and Consolidated veins.

When sinking the Jumbo Ex shaft, a vein then presumed to be the Consolidated, was cut at about 730 feet and the shaft continued in mineralized ground to below the 790 level. It seems more probable that this upper vein was the Clermont, close to its junction with the Consolidated which makes some ore on the 790 level close to and in the footwall of the Jumbo Ex shaft.

A third vein system, of relatively minor importance, with a strike of about N 20 W crosses the Jumbo Ex property. This vein lies about 100 feet northeast of the Velvet shaft. As far as is known, it dips steeply to the northeast. It has not been economically mineralized except where intersected by small northeasterly striking fissures.

Traversing the main producing area of the Goldfield district are a number of northeasterly fissures which appear of small importance on the surface, but which probably have played a major part in the localization of ore-shoots along the Consolidated and Clermont veins. These fissures in general strike around N 45 E and dip southwest at variable angles, but usually steeper than 40°.

The surface outcrop of these fissures is usually obscure or poorly marked by small barren quartz veins. A number of the major oreshoots of the district, however, appear to be located on the intersection of these fissures and the Consolidated or, to a lesser extent, the Clermont veins.

STRUCTURAL LOCALIZATION OF THE JUMBO EX OREBODY

The main orebody developed and mined on the Jumbo Ex property was the so-called Bonanza orebody. It lay in the Consolidated vein, started at about 790 level and pitched east or slightly south of east down to about the 1000 level. The localization of this orebody must have been due to a different structural control than that of most of the other orebodies of the district which lie clustered around the Mohawk nose which trends northeast.

A study of the accompanying composite map readily shows the probable structural cause of the localization of the Bonanza orebody. It lies along the plane or intersection of the Consolidated vein and "A" fissure. The recognition and development of "A" fissure in this part of the district is due to the work of the Eastern Exploration Company since 1935. They recognized its significance and developed it rather extensively on the 200 and 300 levels in the vicinity of its intersection with the Clermont vein where it made a small amount of ore. Also, they followed it to the southeast to locate its intersection with the Consolidated vein only to find when they reached the intersection that the area had been stoped out by earlier work.

On the 300 level, the intersection of the Clermont vein and "A" fissure lies within 250 feet of the Jumbo Ex property line, and in direct dipward line with the rake of corresponding structures localizing the hanging wall ore of the Jumbo Ex 900 level. The Eastern Exploration Company attempted to obtain a lease from Goldfield Operators, Ltd. of the area lying south of a line 100 feet north of the 0000 cordinate, but satisfactory terms could not be reached. This lease would have included the intersection of the Clermont vein and "A" fissure from somewhat about the 600 level down to or beyond the 900 level.

ORE POSSIBILITIES ALONG INTERSECTION OF "A" FISSURE AND CLERMONT VEIN

The intersection of "A" fissure and the Clermont vein is structurally a favorable zone for ore. It has already been pointed out that the

Bonanza orebody was located in part at least along the intersection of the Consolidated vein and "A" fissure. Likewise, in the vicinity of the 790 level where the Clermont and the Consolidated veins join there was ore of sufficient grade to be mined and shipped. Easterly and southeasterly from this area the two veins diverge because of differences in strike and dip, consequently there is a wedge shaped area, bounded on the top by the Clermont vein, on the bottom by the Consolidated vein, on the south by "A" fissure, and on the north by the intersection of the Consolidated and Clermont veins, lying in the hanging wall of the Consolidated vein, which has received virtually no development. Within this area, the most favorable structural zone is that of the intersection of "A" fissure and the Clermont vein. Here an orebody might be found, extending upward along the axis of intersection to form a hangingwall branch from the Bonanza orebody. Unlike many sections of the Goldfield district, there is room in this area for a substantial orebody which would not have been found by any known development work done to date.

The fact that fissure intersections on the Clermont vein may be economically mineralized is demonstrated by the experience of the Eastern Exploration Company which in 1936 located an orebody at the intersection of "F" fissure and the Clermont from which they mined ore with a gross value in excess of $700,000. This orebody started about the 400 level and extended to within a few feet of the surface.

OTHER FAVORABLE AREAS

Another area which merits more investigation is partly opened on the 900 level north of the Velvet shaft. This area is now flooded and so is inaccessible, but the records show ore close to the Kewana No. 2 line. This also is essentially virgin ground and there is the possibility of another orebody there with a pitch parallel to the main Jumbo Ex orebody. If such an orebody exists, however, only part of it would be on Jumbo Ex ground.

There are several areas on and below the 790 level where small orebodies may exist as continuations or branches of the main orebody; one of these is now being worked by leasers.

SAMPLING

Fifty eight samples were cut on the 790 and 830 levels under the writer's supervision. These samples were assayed by Downer Bros. in Goldfield. In addition two samples were recut and the assaying done by the same firm, and five check samples were cut by the writer and submitted to Smith-Emery Company in Los Angeles. Two pulps, assayed by Downer Bros. were also submitted to Smith-Emery for check assays.

The location of the samples, the sample widths and the values are shown on the accompanying sample maps and table and the assayer's certificates are appended to the original copy of this report. The values posted on the sample maps are combined gold and silver, but as the assays show, practically all of the values are in gold.

In practically no place in the area sampled did the vein have sharp limits. The entire area is intensely silicified, and the only boundaries are fissures, faults, or the limits of the workings. In some places, samples were taken across several feet, in an attempt to establish whether or not the ore was of milling grade. In practically all places, the samples were cut to a mining width or greater, rather than narrow samples across obviously high grade streaks.

Assay values for the 830 level are substantially better than those on 790 level. This might well be expected since the area sampled represents the margin of the main orebody both vertically and latterly and it is known that the best ore lay below the 830 level.

SAMPLES AND ASSAYS

Sample	Width	Oz. Gold	Oz. Silver	Value per Ton		Marks
1	22 in	0.38	tr	$13.30	830 L.	- fractured quartz
2	54 "	0.18	tr	6.30	"	- Quartz, pyrite
3	22 "	1.88	3.04	67.95	"	- near cross fracture
4	43 "	0.12	tr	4.20	"	- fractured quartz
5	49 "	0.04	tr	1.40	"	- massive quartz
6	58 "	0.12	tr	4.20	"	- vein quartz
7	54 "	0.04	tr	1.40	"	- qtz.strks.Sulphs.
8	33 "	0.20	tr	7.00	"	- qtz.strks.Sulphs.
9	31 "	0.24	tr	8.40	"	- qtz.small sulph.str.
10	40 "	0.74	tr	25.90	"	- vein qtz.diss.sulph.
11	44 "	0.22	tr	7.70	"	- vein qtz.
12	42 "	0.46	tr	16.10	"	- vein qtz.
13	38 "	0.12	tr	4.20	"	- mass.qtz.sulph.str.
14	60 "	0.10	tr	3.50	"	- vein qtz.
15	50 "	0.12	tr	4.20	"	- mass qtz.
16	43 "	0.42	tr	14.70	"	- mass.qtz.sulph.str.
17	56 "	0.02	tr	.70	"	- mass.qtz.
18	61 "	tr	tr	.00	"	- mass.qtz.
19	40 "	tr	tr	.00	"	- mass.qtz.sulph.str.
20	30 ft.	0.02	tr	.70	"	- mass.qtz.
21	27 ft.	0.06	tr	2.10	"	- mass.qtz.
22	32 in.	0tr.	tr	.00	"	- fw.vein in stope
23	46 "	0.12	o.70	4.76	"	- hw vein in stope
24	53 "	0.08	tr	2.80	"	- hw vein in stope
25	46 "	0.24	1.60	9.53	"	- hw vein in stope
26	51 "	0.04	tr	1.40	"	- hw vein in stope
27	Grab	tr	tr	.00	"	- systematic grab
28	73 in.	0.06	tr	2.10	790 L	- vein,sulph str.
29	60 "	0.16	1.00	6.31	"	- fractured vein qtz.
30	15 ft.	tr	tr	.00	"	- mass qtz.
31	60 in.	tr	tr	.00	"	- vein qtz.
32	65 "	0.06	tr	2.10	"	- veinqtz.
33	52 "	tr	tr	.00	"	- vein qtz.
34	65 "	0.02	tr	.70	"	- mass qtz.
35	20 ft.	0.02	tr	.70	"	- mass vein qtz.
36	20 ft.	tr	tr	.00	"	- mass vein qtz.
37	72 in.	0.02	tr	.70	"	- fractured vein qtz.
38	75 "	0.02	0.34	.70	"	- fractured vein qtz.
39	12.5 ft	0.06	0.44	1.00	"	- mass vein qtz.
40	49 in				"	- vein under flat shear
41	41 "				"	- vein below no.40
42	43 "	0.14	0.80	5.47	"	- fr.vein in stope
43	28 "	0.12	1.20	5.05	"	- fr.vein in stope
44	26 "	0.18	2.70	8.22	"	- fr. vein in stope
45	57 "	0.08	1.20	3.65	"	- fr.vein in stope
46	39 "	0.04	tr	1.40	"	- vein face Kervin rse.
47	59 "	0.28	3.20	12.70	"	- fr.vein qtz.
48	52 "	0.02	tr	.70	"	- vein qtz.
49	54 "	0.02	tr	.70	"	-brec.sil.latite
50	65 "	tr	tr	.00	"	-brec.sil.latite

Samples and Assays (continued)

Sample	Width	Oz. Gold	Oz. Silver	Value per Ton	Remarks
51	60 in	tr	tr	$ .00	790 L. - brecciated sil.lat.
52	79 in	0.06	tr	2.10	" - " " "
53	56 in	tr	tr	.00	" - mass qtz.
54	61 in	0.02	tr	.70	" - qtz.& sulph. strks.
55	54 in	0.04	tr	1.40	" - vein quartz
56	35 in	0.12	2.00	5.62	" - fract. qtz.
57	38 in	0.06	tr	2.10	" - vein qtz.
58	45 in	0.06	tr	2.10	" - vein qtz.
59	50 in	0.04	tr	1.40	" - vein qtz.
60	19.9 ft.	tr	tr	.00	" - mass vein qtz.
200	30 ft	0.10	0.44	3.80	Recut of Sample 20
210	27 ft	0.02	tr	.70	Recut of Sample 21
300	14 ft	0.30	2.40	12.20	790 L. Fw shear & vein qtz.
4 HJF	43 in	0.02	0.14	.80	830 L, Recut check on Samp 4
23HJF	46 in	0.28	1.57	10.92	830 L, " " " 23
27HJF	Grab	0.04	0.36	1.66	830 L, Check Samp on StGrb 27
29HJF	60 in	0.04	0.36	1.66	790 L, Recut check Samp 29
57HJF	38 in	0.03	0.25	1.23	790 L, Recut check Samp 57
10 SE		0.82	2.88	30.75	Check assay pulp samp 10
11 SE		0.23	0.72	8.61	Check assay pulp samp 11

Samples 1 to 300 inclusive, assayed by Donner Bros. Goldfield, Nevada.
Samples 4 HJF to 11 SE inclusive, assayed by Smith-Emery Co., Los Angeles.

The sampling also indicates that if the tonnage of milling ore given in the old reports on ore reserves exists, it probably is to be found either on parts of the 830 level not accessible at present or in deeper workings.

No ore of shipping grade is indicated by the samples on or above the 790 level. On the 830 level, there are three samples of ore of shipping grade, ite., above $15. but they represent small areas that cannot be accurately estimated and can best be mined by leasers.

SURVEYING

All new workings were surveyed with a Brunton (declination 17°) and tape and are posted on the sample maps. The outline of old workings, stopes, etc., and the cordinates are taken from older maps. In compiling the large map accompanying this report, the coordinate lines of the old maps were used, although in places they obviously were not true to scale. Since no reference points were available to the writer, the new map was adjusted to the old

coordinates by sections.

NEW DEVELOPMENT

On the 790 level, a total of 365 feet of drifting and crosscutting has been done since the beginning of the lease. In addition there has been about 115 feet of raising and 50 feet of winzing in addition to some stoping. On the 830 level there has been no new development, but three raises have been partly cleaned out.

In addition to this development work, the shaft has been put in workable condition down to the 900 level, including considerable retimbering and relagging, parts of the 790 and 830 levels cleaned out and connections with the Jumbo Ex shaft cleaned out so that the air circulation is satisfactory.

CONCLUSIONS

1. That a crosscut be driven from the 790 level to reach the area of intersection of "A" fissure and the Clermont vein and that this area be explored by drifting, crosscutting and drilling. It will require about 250 feet of crosscutting to reach the area.

2. That the Anderson winze now started from the 790 level be continued to the 830 level to open up that section of the mine for investigation. This involves about an additional 50 feet of sinking.

3. That a connection be established between the raise at coordinates N 315, E 2170, and the 780 level so that area can be tested. This should not involve more than a few feet of work providing the old map is correct.

4. That the present system of partly financing leasers to do development work is economical for the company and should be continued.

Respectfully submitted,

(Signed) Horace J. Fraser

Horace J. Fraser
1201 E. California St.,
Pasadena, California