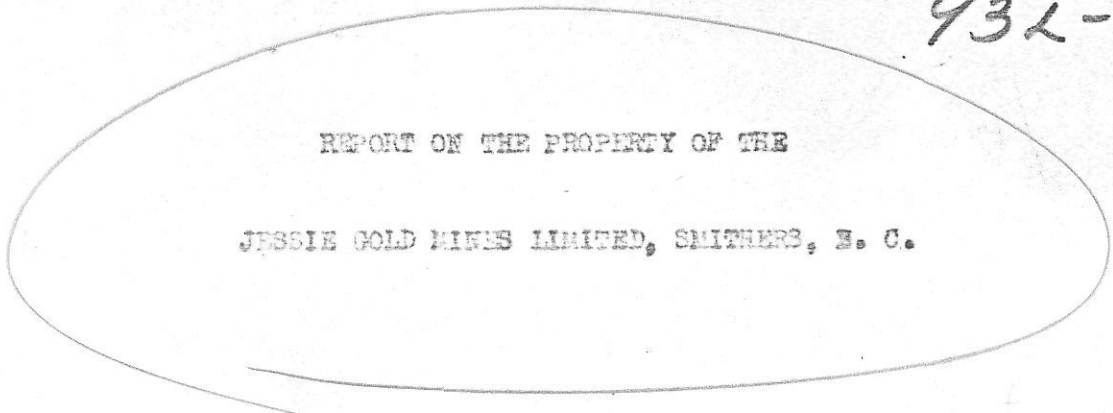


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REPORT ON THE PROPERTY OF THE

JESSIE GOLD MINES LIMITED, SMITHERS, B. C.

By W. G. Norris-Loewenthal,
Mining Engineer,
Vancouver, B. C.

September, 1932.

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PROPERTY

The property consists of six adjoining claims and fractional claims, comprising 244.37 acres, all of which have been surveyed, and are now in process of crown-granting. Ownership of the property is vested in the Jessie Gold Mines Limited (Non-Personal Liability), a company incorporated in the year 1929, with a capitalisation of \$1,000,000.00.

ACCESSIBILITY

The claims are situated on the Easterly slope of Hudson's Bay Mountain, between the North and South Forks of Simpson Creek, almost due West, and overlooking the town of Smithers, B. C. The latter town is the commercial centre of the Bulkley Valley and an important divisional point on the Canadian National Railways, 226 miles from tide-water at Prince Rupert, B. C.

The elevation of Smithers is 1625 feet above sea level, and the elevation of the Jessie camp is 4150 feet, the present tunnel being 100 feet higher.

A good auto road, one mile long, connects the town of Smithers with the base of Hudson's Bay Mountain, from which point a good pack trail, about $5\frac{1}{2}$ miles long, extends along the mountain side to the mine camp. Branch trails also extend to all the other adjoining properties, which include the Empire Group, the Wade Group, the Yukon Group, the Snowshoe Group and the Cassiar Group. All of these properties were examined in a preliminary way by the writer.

In a straight line the workings are about $2\frac{1}{2}$ miles from the Canadian National Railways, which skirts the foot of the mountain, and this would be the approximate length of an aerial tram to connect the mine with the railway.

It would be quite feasible to convert portions of the present trail into a motor road and by lengthening this out somewhat, in order to overcome some of the heavy grades, the total length of such a road, between the mine and Smithers, should not exceed $5\frac{1}{2}$ miles.

At the present time all supplies are taken to the mine by pack horses.

GENERAL CONDITIONS

Timber for all mining purposes is plentiful. The opportunities for driving lower tunnels and attaining considerable depth are ideal; the present camp and any future camp or tunnels are well below timber line. There is an ample water supply available from either the North or South Fork of Simpson Creek and it would be possible to develop sufficient power for ordinary mining work, below the confluence of these two creeks, there being ample fall, and probably sufficient water for at least nine months in the year for such a development.

The climatic conditions are good, the property faces towards the South and East, which ensures an earlier Spring and a later Fall, and there seems to be no reason whenever the property is suitably equipped why operations should not be conducted the year round.

There are several excellent millsites, either close to the mine, on the hillside, or at the foot of the mountain, close to the railway.

Generally speaking the situation of the property is such that future operations could be conducted at a minimum cost.

DEVELOPMENT AND EQUIPMENT

Equipment consists of a bunkhouse and cockhouse, several tents and a blacksmith shop. The bunkhouse, constructed this year, is well built and commodious, and should hold eight men comfortably.

The veins have been exposed on the surface and underground, by open cuts, stripping and tunnel work. In all, about 150 feet of tunneling and raising has been performed this year. The veins have been completely stripped over a triangular area, approximately 500 feet in length, in addition to which a series of open cuts exposes one of the veins for a further length of 850 feet beyond the stripping.

The work this year included the building of a branch trail, one half mile long, connecting the main trail with the camp and workings.

The present manager, Mr. L. S. McGill, has been in charge of the operation since its inception and has carried out the work in a most able and economical manner. The amount of work performed for the comparatively small amount of capital is an outstanding achievement.

GEOLOGY AND SURFACE EXPOSURES

The deposits are replacement fissure veins, that is, fissure veins in which a variable amount of the wall rock has been replaced by ore minerals. They occur in a band of Volcanic rocks consisting of Andesite and Tuffs, referred to as of Middle Jurassic age by the Geological Survey of Canada.

The veins are well defined and have strong and persistent hanging walls, the mineralization consists of Galena, Sphalerite and Arsenopyrite. Iron Pyrite also occurs in some sections. There are three intersecting veins on the property, Nos. 1, 2, and 3, the Nos. 1 and 2 cross each other, and the extensions of each continue beyond the points of intersection. The No. 3 vein intersects both the Nos. 1 and 2 veins, but its continuation beyond the points of intersection is not well defined on the surface, so that it has been assumed that this vein is of limited extent, and ends at the two points where it intersects the other veins. Later developments in the tunnel, however, point to the possibility of an extension of this vein, at least beyond the No. 2, in a South-Easterly direction, and if this supposition is correct, it will be a matter of some importance for the future of the property, inasmuch as the direction of this vein is across the hill, and future operations to attain depth might be conducted by drifting on this vein, instead of running rock crosscuts. Some further surface prospecting should be conducted with a view of establishing this point definitely. The same applies to the downward extension of No. 1 vein, the bottom exposure of which is only a short distance below the No. 2 vein. There is no reason to suppose that this is the end of the vein, and some further surface work should be done to establish its downward continuity.

An examination of the veins on the two adjoining properties towards the North and South of the Jessie Group, namely the Yukon and the Snowshoe Groups, discloses the fact that the veins exposed on these properties are similar in strike, dip and mineralization to the No. 2 vein of the Jessie Group. Their positions on the map indicate that all of these three exposures may be on one and the same vein; however, the three exposures are so far apart that no positive statement can be made at this time concerning this, but it constitutes a very strong probability, and is well worth bearing in mind. If such a condition could be definitely established, either by surface exploration or underground work, there is a very good chance of a considerable tonnage being developed from this one vein, as the present exposures are shown over a length of nearly two miles.

An outcrop of Intrusive rock, probably diorite, was observed on the Yukon Group, near the vein outcrop, and a similar exposure, but of smaller extent was noted close to the intersection of the Nos. 3 and 1 veins on the Jessie Group. It is quite possible that these outcrops are the surface expressions of an underlying body of Intrusive rocks, which is most probably the source of the mineralization. It is significant that, as these intrusions are approached, the Arsenopyrite content of the vein becomes greater, and the Galena and Sphalerite seems to disappear. This would indicate that, as depth was attained on the veins, assuming that there is an underlying body of intrusive rocks, the arsenopyrite would increase and the base metal content decrease. Inasmuch as the Gold content seems to vary with the amount of Arsenopyrite in the ore, the Gold values will probably increase with depth, and the base metal content become less.

A description of the three intersecting veins exposed on the surface follows:

No. 1 vein:

This vein has been traced for a distance of about 1000 feet along the strike, the vertical range being 405 feet, between elevations, 4247 feet and 4650 feet. The strike, projected on to a horizontal plane, is almost due West, but the outcrop runs in a North-Westerly direction. The dip of the vein varies from 35 degrees at the upper end to 52 degrees at the lower end, the direction of dip is towards the South.

This vein has been stripped from its lowest point, slightly below the No. 2 vein intersection, up the hill, to the point of intersection with No. 3 vein and a short distance beyond, the total length of stripping being about 150 feet. Beyond this point a series of open cuts exposes the vein for the balance of its known length.

The vein varies in width from 4 inches up to 24 inches, this being the width of solid mineral exposed against the hanging wall. Below this solid material, there is generally two or three feet of lower grade material, which gradually fades into the country rock. The footwall is not well defined. The mineralization is mainly Arsenopyrite.

No. 2 vein:

This vein has been exposed by stripping for a distance of 200 feet, and by outcrops and open cuts for a further length of 100 feet, the latter distance

being towards the South-West. At both ends of the outcropping the vein is covered with wash, rendering further surface stripping difficult.

The width of the vein varies from 8" at the upper end to 30" near the lower end, which is close to the present tunnel. The vein strikes N. 10 degrees E., and more or less parallels the side hill. The dip is fairly flat and averages about 24 degrees towards the West, or into the hill.

The mineralization of the vein on the lower end consists of Galena, Sphalerite and Pyrite, but beyond the intersection of No. 1 vein, the mineralization is essentially Arsenopyrite; this may be accounted for by the proximity of the vein to the intrusive rock outcrop previously referred to.

This vein intersects No. 1 vein at a point 115 feet from the present tunnel, in a North-Easterly direction, and is exposed by stripping for a distance of about 75 feet beyond this point. It is the most important vein from the standpoint of width and mineralization of the three veins so far uncovered at the mine.

No. 3 vein:

This has been regarded as a branch vein having its two extremities at the points of intersection with No. 1 vein on the North-West and No. 2 vein on the South-East. It has been stripped over a length of 110 feet and over a vertical range of 80 feet. There is every reason to assume that the vein does not terminate at the points of intersection, but continues beyond, certainly towards the South-East (see page 2).

The strike of the vein is North-Westerly, and the dip averages 35 degrees towards the South-West. The vein is narrow, the width being about 6" on the average, mineralization is mainly Arsenopyrite.

UNDERGROUND WORKINGS

The underground workings consist of a tunnel, driven by hand, which was started near the lower end of the stripping on No. 2 vein, and was intended as a crosscut to No. 2 vein. Close to the portal, however, of this tunnel, a small vein was encountered (see sample 14) and followed till it intersected the No. 2 vein, at a point 25 feet from the portal of the tunnel. The latter vein was crosscut obliquely by the tunnel and exposed a good body of ore, the width on the left side being 18" and on the right side 12". The ore, as exposed in the tunnel, consists of a mixture of Galena, Sphalerite and Iron Pyrite, and both foot and hanging wall are well defined. Samples Nos. 12 and 13 were taken across this exposure and they average \$4.00 in Gold; 4½ ozs. Silver; 5% Lead and 16% Zinc; this is a very fair grade of milling ore under normal metal prices. The dip of the walls in this exposure is 35 degrees towards the West, which explains why the vein was struck somewhat sooner than expected, the dip on the surface above the tunnel being much flatter than this.

The tunnel was continued as a crosscut a further distance of 15 feet beyond the No. 2 vein, and a short crosscut raise extended from the face, with the object of making sure that there was no further mineralization in the hanging wall. On the completion of this work, drifting was started on the main exposure of ore towards the North-East, the object being to run to the intersection of

No. 3 vein, and then deflect the drift, following the latter. This intersection was cut at a distance of 20 feet from the main tunnel, and after some preliminary crosscutting to determine the width of No. 3 vein, the latter was followed for a distance of 40 feet, the face of the drift being that distance from the point of intersection at the time of the writer's last visit to the property. This latter drift has followed ore along its entire length, but the widest and best looking ore was cut just beyond the point where the two veins intersect, at this point the ore is over five feet in width (see sample No. J. G. 2).

The position of this vein, in the tunnel, as determined by Brunton survey, coincides very closely with its projected position, assuming a dip of 35 degrees, as determined by the writer before the drift was extended. The characteristics of the vein are about the same as exposed on the surface, except that a greater width of ore is exposed underground than was shown on the surface.

As the position of the No. 3 vein appears to be more or less definitely established on the tunnel level, and as this vein coincides in respect to both dip and strike with that shown in the first, or outer portion of the tunnel, it is fair to assume that the latter is an extension of the No. 3 vein towards the South-East, although its position would indicate that there has been a slight displacement of the vein, towards the left or South-West. Such displacement could well occur, if the No. 2 vein was a later fracturing than the No. 3, and had faulted the latter.

The face of the present drift on No. 3 vein is some 60 feet distant from the intersection with No. 1 vein, when this position is reached there will be a vertical depth of 77 feet, or 120 feet on the dip of the vein, from the surface. The present drift should be extended this 60 feet by hand, and if the intersection referred to is sufficiently interesting, preparations will have to be made to follow No. 1 vein.

SAMPLING AND ORE VALUES

Sampling was confined to the massive ore exposures in the different veins, and the bulk of the samples were taken on the surface. Owing to the hardness of the material, it was necessary to cut most of the samples with moils. It was not possible to sample all of the open cuts on No. 1 vein, owing to most of them being filled with debris. What samples were taken on the cuts at the extreme North-Westerly end of the vein were just grabs. The two samples taken by the writer in the last two cuts assayed respectively, \$2.44 and \$6.80 in Gold and Silver. Three samples, one by the Resident Government Engineer, and two by the management, from these same cuts, assayed as follows: (a) Au .56; Ag 2.1; Pb trace; Zn 4.0%; (b) Au .12; Ag 1.7; Pb 1.1%; Zn 6.8%; Cu 0.30%; (c) Au .45; Pb 0.1%; Ag 2.1; Zn 1.2%; Cu 0.2%. These samples give an average of \$8.16 in Gold and Silver, and are probably more nearly representative of the average grade than the writer's sampl

In addition to the above samples, and those taken by the Resident Engineer and by the management, numerous other samples have been taken on the different veins. A sample of Arsenopyrite, taken from No. 2 vein by the Resident Engineer in the year 1927 assayed \$14.80 in Gold and 1.06 oss. Silver; a sample of Galena-Zinc ore taken from the same vein, by the same authority, assayed \$2.60 in Gold; 8.0 oss. Silver; 5% Lead and 12% Zinc. In the following year, Mr. Lay, the Resid-

ent Engineer, obtained an assay from a sample taken across 1.5 ft. of ore on No. 2 vein: Au \$6.00; Ag 29.5 oss; Pb 24%; Zn 5.0%; and a sample taken across 2 feet of Arsenopyrite at the same time, and on the same vein, assayed Au \$7.60; Ag 4.1 oss; Pb trace; Zn 7.5%. A sample taken by the Resident Engineer across 10" of ore on No. 3 vein, at the same time as the two noted above, assayed: Au \$5.60; Ag 7.6 oss.; Pb 0.8%; Zn 11.3%.

It would appear from these samples that the Gold undoubtedly occurs in the Arsenopyrite, and that the Silver is proportional to the Lead content, also that most of the Arsenopyrite contains Zinc, which appears in the assays, but which is hard to distinguish with the naked eye. The clean Arsenopyrite, apparently carries about \$15.00 in Gold, and only a negligible amount of Silver.

A sixty pound sample, taken from the veins in the year 1928 was shipped to Trail for a mill test, and this assayed: Gold \$3.20; Ag 12.9 oss; Pb 18.4%; Zn 10.2%. This is somewhat higher in grade than the average of the writer's samples taken in the tunnel, viz; Nos. 13 and 14, and Nos. J. G. 1 and 2 which were taken by the management. Nevertheless, this sample is a fair representative of the average Lead-Zinc ores.

On the whole the ore should be amenable to selective flotation, but it is obvious from a study of the assays that all of the different elements in the ore will have to be saved and marketed, before a profitable operation can be ensured. The gold by itself, in view of the narrow widths, could hardly be made to pay, but under normal conditions, with a fair price obtainable for the Lead, Zinc and Silver, the operation would undoubtedly be profitable.

A list of samples taken by the writer is appended to this report; this includes two samples taken by the management and sent to the writer for assay, also several samples taken on adjoining properties.

RECOMMENDATIONS

The work now being carried out, namely the drifting on No. 3 Vein, should be continued by hand until the intersection with No. 1 vein is reached, this means an extension of the present drift for a further distance of approximately 60 feet. At this point the face of the working will be some 150 feet from the portal, and it may be necessary to provide ventilation. It will also be essential that a mine car and track be installed for further drifting on No. 1 vein. For the present, however, the work can be carried on in the same manner as it has been for the past season.

It is probably too late in the season to start any surface exploration, but next year some of this should be done, the particular objectives recommended being as follows:-

- (1) Exploration for the extension of the No. 3 vein towards the North-West and South-East, but more particularly the latter.
- (2) Exploration for the downward extension of No. 1 vein.
- (3) If either or both of these veins can be traced downwards to a reasonable depth, say 100 feet below the present tunnel, and the values and widths appear to be promising, then a new lower tunnel should be started on whichever vein appears

to be the most promising. This proposed tunnel will have as its objectives, the exploration of the particular vein being followed by the tunnel, either No. 1 or No. 3 as the case may be, and the development of No. 2 vein at depth. Such development of the latter vein is not possible with the present tunnel, as it is at too shallow a depth below the outcrop.

(4) An effort should be made to trace the No. 2 vein further on the surface, both towards the North-East and South-West, the object of this work would be to test the possibility of linking up this vein with the outcrops shown on the Yukon property to the North-East, and the Snowline property on the South-West.

CONCLUSION

The work performed to date on the property has shown up three promising veins, which give every indication of extension, both as regards length and depth.

The ore so far uncovered is of a fair milling grade, and under the exceptionally favorable conditions obtaining, could be mined at a profit with normal metal prices, and providing the work recommended results in the development of a sufficient tonnage of ore to justify the installation of a power plant and mill.

The results obtained at the property to date, have fully justified the moderate expenditure incurred, and the able and efficient manner in which the operation has been conducted reflects great credit on the management.

Respectfully Submitted,

"W. G. Horrie-Loewenthal"

Mining Engineer.

ASSAYS OF SAMPLES

No.	Width	Location & Description (see also assay plan & map)	Assays			
			Gold oss. per ton	Silver	Lead %	Zinc %
1	30"	Near #5 Hub-No. 2 vein Arsenopyrite and Pyrite	.16	2.1	-	-
2	20"	6 feet North of No. 1 do	.26	2.2	-	-
3	20"	6 feet North of No. 2 do	.16	2.3	-	-
4	24"	Intersection of Nos. 2 & 3 Veins, Arsenopyrite	.12	4.6	-	-
5	18"	Face of Big Cut No. 2 vein Galena, Arsenopyrite	.01	1.2	-	-
6	8"	49 ft. South of No. 3A hub No. 2 vein, Galena, Zinc and Arsenopyrite	.25	3.9	4.8	-
7	10"	Near End of Stripping, North side No. 2 vein, arsenopyrite	.66	1.1	-	-
8	7"	Along No. 3 vein, length 42' Arsenopyrite	.40	5.6	-	-
9	12 1/2"	27 1/2' below Hub-4b, oxidised Galena and Arsenopyrite, Zinc	.29	5.5	-	-
10	12"	12 1/2' from Hub-4b "	.15	2.3	-	-
11	24"	Intersection Nos. 1 & 3 veins	.36	1.2	-	-
12	12"	In tunnel, 29' from portal	.34	3.3	2.5	16.4
13	16"	In tunnel, 32' from portal	.08	5.7	6.8	-
14	4"	In tunnel, 18 to 22' from portal.	.05	2.3	-	-
<u>Jessie Group</u>						
1	30"	In tunnel 65' from portal	.03	7.5	6.5	13.0
2	62"	In tunnel 60' from portal	.03	2.1	3.0	6.0
15	4"	Lowest cut No. 1 vein	.42	4.3	-	-
16	-	Speciment from No. 2 vein in tunnel	.16	21.6	23.4	-
Cut No. 5		No. 1 vein, Arsenopyrite, grab	.10	1.7	-	-
Cut No. 7		No. 1 vein, Arsenopyrite, grab	.30	1.8	-	-
<u>Wade Group</u>		Grab from vein do (Elevation 5300 ft.)	.40	7.4	-	-
<u>Snowshoe Group</u>		Grab from vein, Elev. 4375 ft.	.36	0.8	-	-

Note: Dashes under headings Lead and Zinc indicate that samples were not assayed for these metals.

All samples except Jessie Group Nos. 1 and 2 were taken by W. G. Norrie-Loewenthal. Samples Jessie Group Nos. 1 and 2 were taken by the mine superintendent.

Assays by G. S. Eldridge and Company, Vancouver.

JESSIE GOLD MINES, LIMITED

NON-PERSONAL LIABILITY

Manager and Secretary-Treasurer

L. S. MCGILL

HEAD OFFICE AND MINE:

SMITHERS

CENTRAL BRITISH COLUMBIA

September 30th, 1932.

Mr. Douglas Lay,

HAZELTON, B. C.

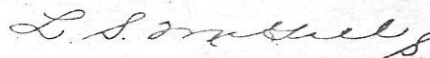
SIR:

Enclosed please find report of

Mr. W. G. Norrie-Loewenthal, our Consulting Engineer.

Yours truly,

JESSIE GOLD MINES LIMITED (N.P.L.)



Secretary.

ENCL.

JESSIE GOLD MINES, LIMITED

NON-PERSONAL LIABILITY

Manager and Secretary-Treasurer

L. S. MCGILL

HEAD OFFICE AND MINE:

SMITHERS

CENTRAL BRITISH COLUMBIA

October 24th, 1932.

Mr. Douglas Lay,
Government Mining Engineer,
HAZELTON, B. C.

Dear Mr. Lay:

I beg to enclose herewith a copy of the plan of the workings of Jessie Mine as made by Mr. W. G. Norrie-Loewenthal, also a copy of a map showing mining properties on Hudson Bay Mtn. These are to go with the copy of the report by W. G. Norrie-Loewenthal on the Jessie Mine which was sent to you recently.

On Saturday, October 22nd, I inspected the recent work at the mine and found that during October the last ten feet of the tunnel has opened up what is probably the best showing of ore on the property either surface or underground. It shows up to six feet wide of ore on the right hand side of the tunnel and right across the face of the tunnel there is a solid band of ore, 30" wide. This new ore is chiefly arsenopyrite in quartz, with a little zinc and practically no galena in it. It seems to be bearing out the anticipations of both yourself and Mr. Norrie-Loewenthal that, as we are getting further in, there will be more arsenopyrite and less galena and also higher gold values.

I am still very much in doubt as to whether the tunnel is following No. 3 vein or No. 2 vein. As I mentioned to you at Quesnel, Mr. Norrie-Loewenthal is quite convinced that it is following the No. 3 vein and has made his plan and report accordingly.

We are preparing to let a contract for the driving of this tunnel throughout the winter months and if the financial arrangements made by me in Vancouver are carried out by the parties there, that will be done.

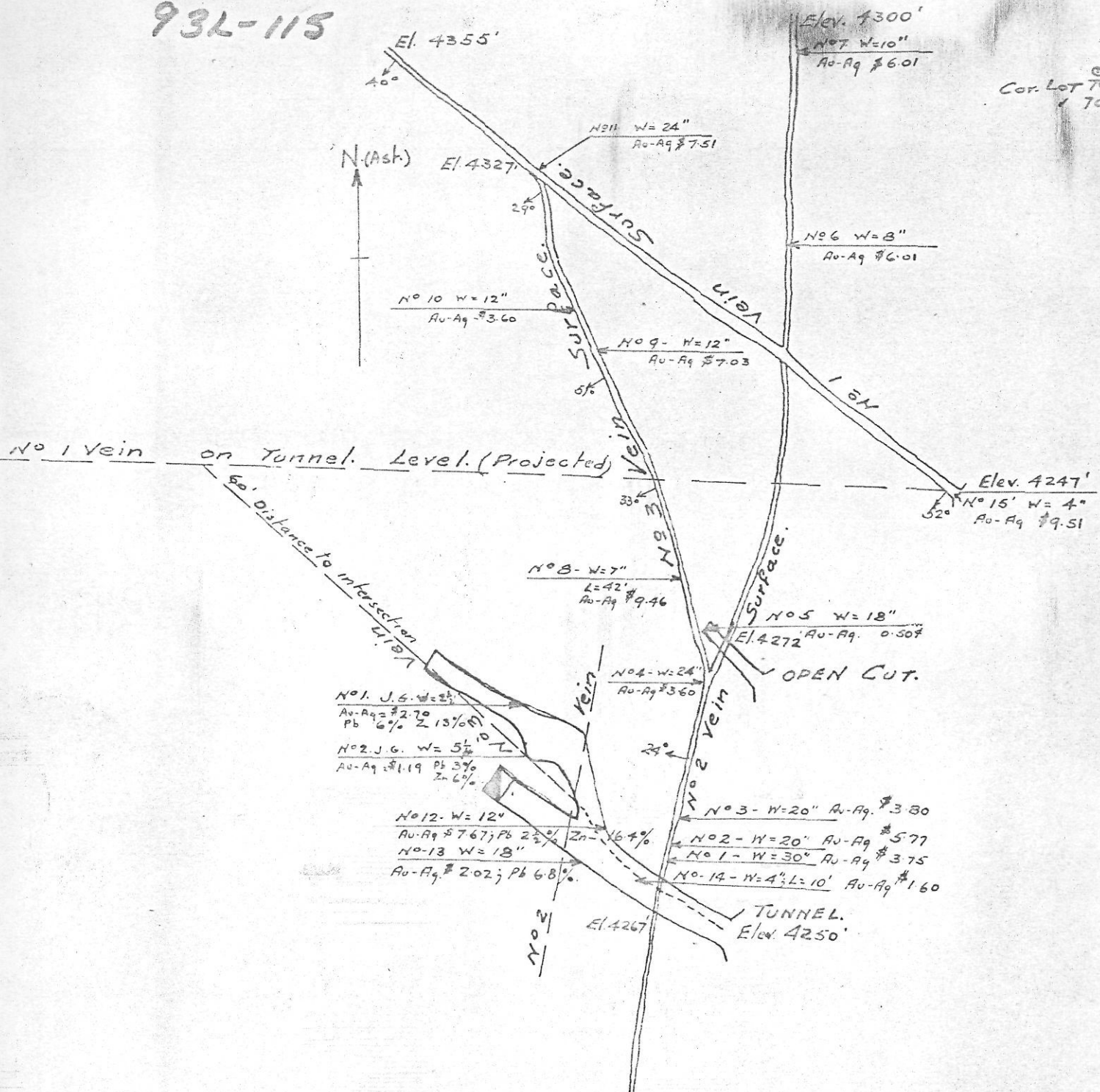
Yours truly,

L. S. McGill

LSM/MS
ENCLS.

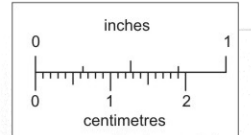
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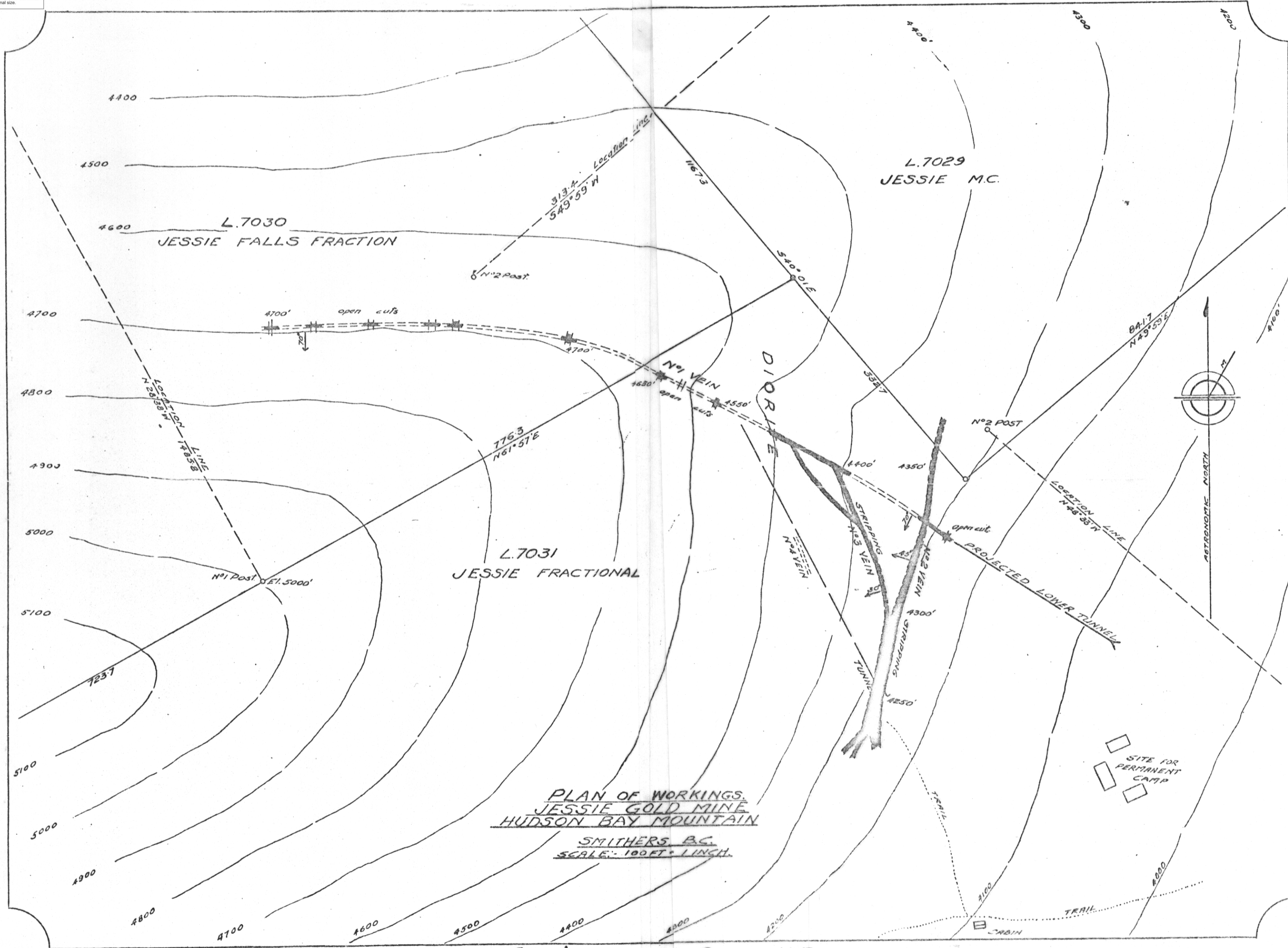


PLAN
OF
THE JESSIE MINE
SHOWING SURFACE & UNDERGROUND WORKINGS.
Scale 30'=1 inch.

Made From Brunton Traverse.
by H.G. Morrie-Loewenthal M.E.



This reference scale bar has been added to the original image. It will scale at the same rate as the image, therefore it can be used as a reference for the original size.



PLAN OF WORKINGS,
 JESSIE GOLD MINE
 HUDSON BAY MOUNTAIN
 SMITHERS B.C.
 SCALE: 100 FT. = 1 INCH.

93L/14W 93L-115