BEN BOLT CAMP.

103 P

Ben Bolt mine. Stewart BC
by Dr. A. C Skerl

Nov 3 1955

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1758 WESTERN PARKWAY
VANCOUVER 8. B.C.

REPORT ON THE BEN BOLT MINE
STEWART, B. C.

INTRODUCTION.

The writer conducted a detailed mapping and sampling campaign of the five adits of this property during the week 26th September to 1st October, 1955 with the help of three samplers.

The accompanying map (scale 1 inch to 20 feet) shows the geology of the underground workings with average assay values and the surface topography. The results for the 215 samples are given on the assay plans.

SITUATION.

The property is situated on the west side of Albany Creek, a north flowing tributary of Glacier Creek, that enters the Bear River 4 miles above Stewart, B.C.

At present it is reached by a pack horse trail about 5 miles long from the Highway.

Owing to several steep sections this is not suitable for converting a truck road but a better route is available that could be easily constructed on a 5% grade for most of the way.

HISTORY.

The 1,600 feet of underground workings was all hand driven in the very hard rock between 1910 and 1912.

No further underground work has been done since but a little prospecting activity in the claims was recorded for the years 1929 and 1930.

GEOLOGY.

The whole of the workings are within a large quartz vein that is at least 200 feet thick. The footwall is not exposed on account of scree material and the hanging wall is asumed to be the dip slope on the hillside above the workings.

Owing to the flat dip of 30° W. the tunnels have explored only a quarter of the width of the vein on its footwall side.

In several of the crosscuts the last few feet are in argillaceous rock that is partially silicified. It was presumably replaces garded as the hanging wall of the vein or at least of the possible ore-bearing section.

The part of the vein that has been explored so far is mostly quartz although zones of partially replaced argillite breccia and of partly silicified argillite bands are present. Sulphides are found throughout the vein both scattered and in layers parallel to the general dip.

These sulphides are in order of abundance; pyrite, sphalerite, galena, chalcopyrite and friebergite (?).

Where the layers are 1 to 3 feet thick and sufficiently frequent the content of valuable metal is enough to make ore. Outside the ore zones the vein usually averages about Au 0.01 oz. Ag 0.50 oz. Pb Trace Zn 0.25%.

On each level there is a section of the vein with considerably higher mineral content then the remainder. These sections
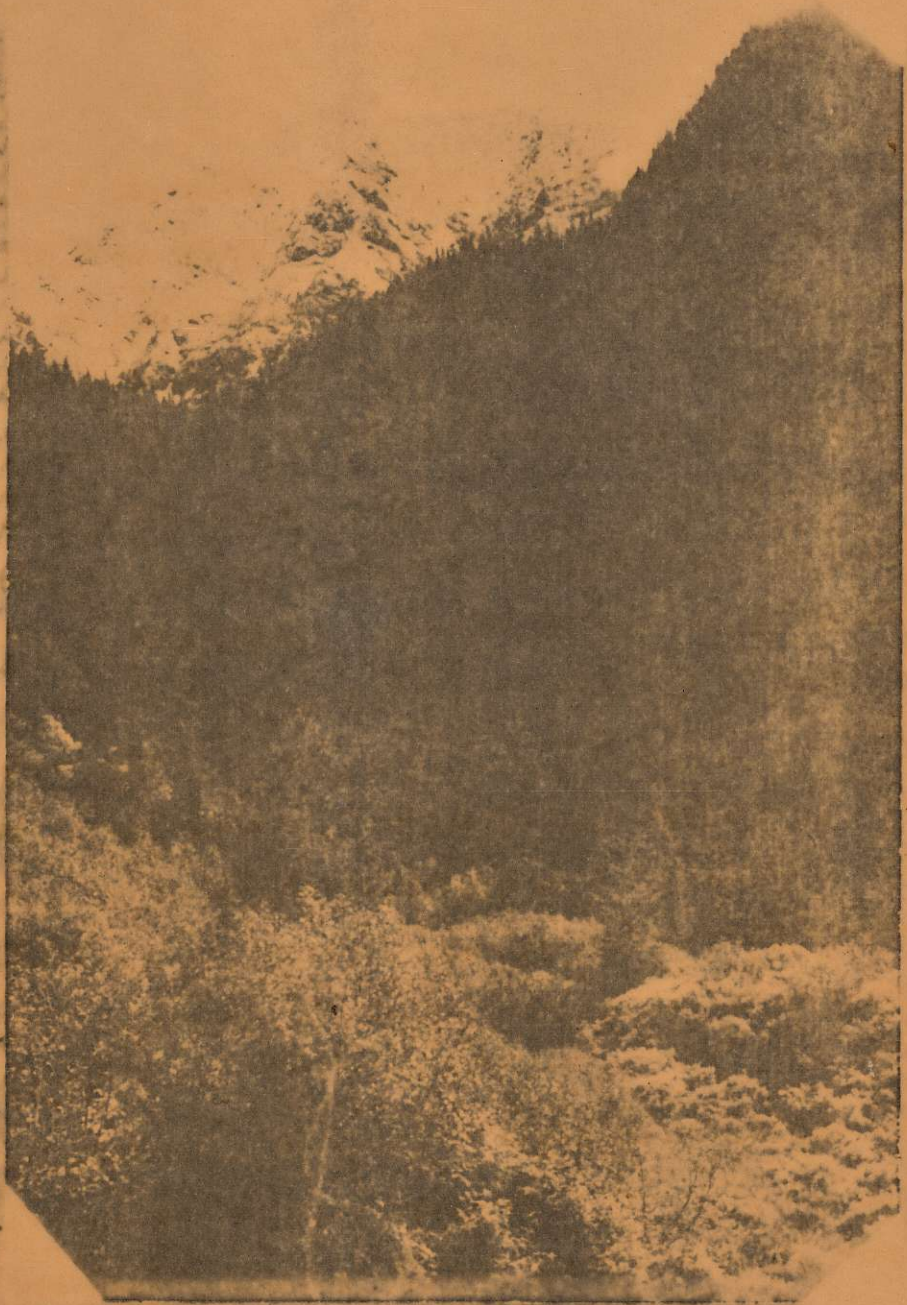
BEN BOLT MINE.

Looking south from camp site.

all appear to be in the same zone within the large quartz vein
but the width and grade varies. From one to three bleached dykes
of andesitic composition up to 20 feet wide follow this zone.

At least one other zone is present as indicated by a rusty
outcrop seen in the inaccessible cliff about 90 feet above the top-
most portal.

Although the true strike of the vein is due north the edge of
the outcrop is a steep cliff about 100 feet high that trends down
to the north-west. It is not known whether this is due to a major
fault or whether it is the work of the glacier that recently oc-
cupied the valley. The hanging wall has been stripped clean of the
argillaceous country rock by the ice over a large area.

The ore-bodies are probably lenticular in shape but there is
a good chance that they extend much further down the dip then their
strike length as was the case at the Dunwell and Portland Canal Mines.

There is a possibility that the ore has a southerly rake.

SAMPLING.

Since the vein and the streaks of sulphides within it have a
flat dip averaging 30° it was decided to take all samples verti-
cally. In cross-cuts the top of one cut was made equivalent to the
bottom of the next sample whil_st in drifts 5 feet from the floor
up on the footwall side and 5 feet from the back down on the hang-
ing wall side together give the equivalent of 10 feet of a vertical
section through the vein. A total of 215 samples were taken in the
five adits as shown in the accompanying assay plans. In addition
8 assays of samples taken by Mr. C.Rutherford in 1953 were used.

INTERPRETATION OF ASSAY RESULTS.

Most of the cross-cuts and drifts are oblique to the strike of the vein so that the assays have to be interpreted according to the geology.

The dykes associated with the mineralization have branches that are not necessarily parallel to the ore. They do contain some mineral but no as much as the adjacent vein. In all cases they were sampled except in the drift on the 2704 level where the dyke was assumed to carry no values in calculating the grade.

On the 2475 level the north drift appears to cross successive strands of mineral between branches of the main dyke so that possibily a 30 feet width horizontally has been explored in the 100 feet giving an average of Au 0.02oz. Ag 0.62oz. Pb 0.36% Zn 1.48%. which would gross $6.20 per ton and net $3.90.

The south drift also crosses the strike obliquely to give similar but lower grade values.

The 2575 level is mainly an oblique cross-cut with a limited amount of drifting. The equivalent of 80 feet of true cross-cut averages only Au 0.01oz. Ag 0.57oz. Pb 0.05% Zn 0.52%. The drifting has indicated an ore zone 7 feet wide for 70 feet long that averages Au 0.04oz. Ag 0.65oz. Pb 0.77% Zn 1.04% with a gross value of $6.85 and net of $5.00.

The 2668 level exposes mineralized vein over a horizontal width of 65 feet by means of a 200 feet oblique drift and 3 cross-cuts. The north half has developed the best section known in the

mine.

There appears to be a length of 110 feet with a horizontal
width of 40 feet that averages Au 0.02oz. Ag 4.24oz. Pb 2.35%
Zn 2.65% with a gross value of $18.50 and net of $13.80.

The south half has indicated a further 25 feet width in the
footwall of the above ore that for 140 feet averages Au 0.012oz.
Ag 1.03oz. Pb 0.34% Zn 0.13%.

The 2704 adit was started on an outcrop of high grade ore that
was followed for 90 feet. The average value for the length is Au
0.07oz. Ag 2.65oz. Pb 2.00% Zn 1.25% for a horizontal width of
12 feet of which one quarter is dyke. This has a gross value of
$14.10 and net of $10.50.

The last 12 feet of the cross-cut from the portal is concealed
by a backfill of ore and it is suspected that more ore occurs there.

The cross-cutting at 80 feet south of the portal gives an aver-
age of Au 0.01oz. Ag 3.2oz. Pb 0.18% Zn 0.32% while about 20 feet
further south where the drift turns into the footwall the sampling
gives Au 0.008oz. Ag 1.12oz. Pb 0.23%. Zn 1.53%. over an additional
width of 25 feet.

The 2814 level has an indicated zone for 40 feet that averages
Au 0.004oz. Ag 4.68oz. Pb 0.40%. Zn 0.03%. over a width of 12 feet.

MILLING.

It is expected that a sulphide concentrate could readily be
made from this ore using a sink-float plant.
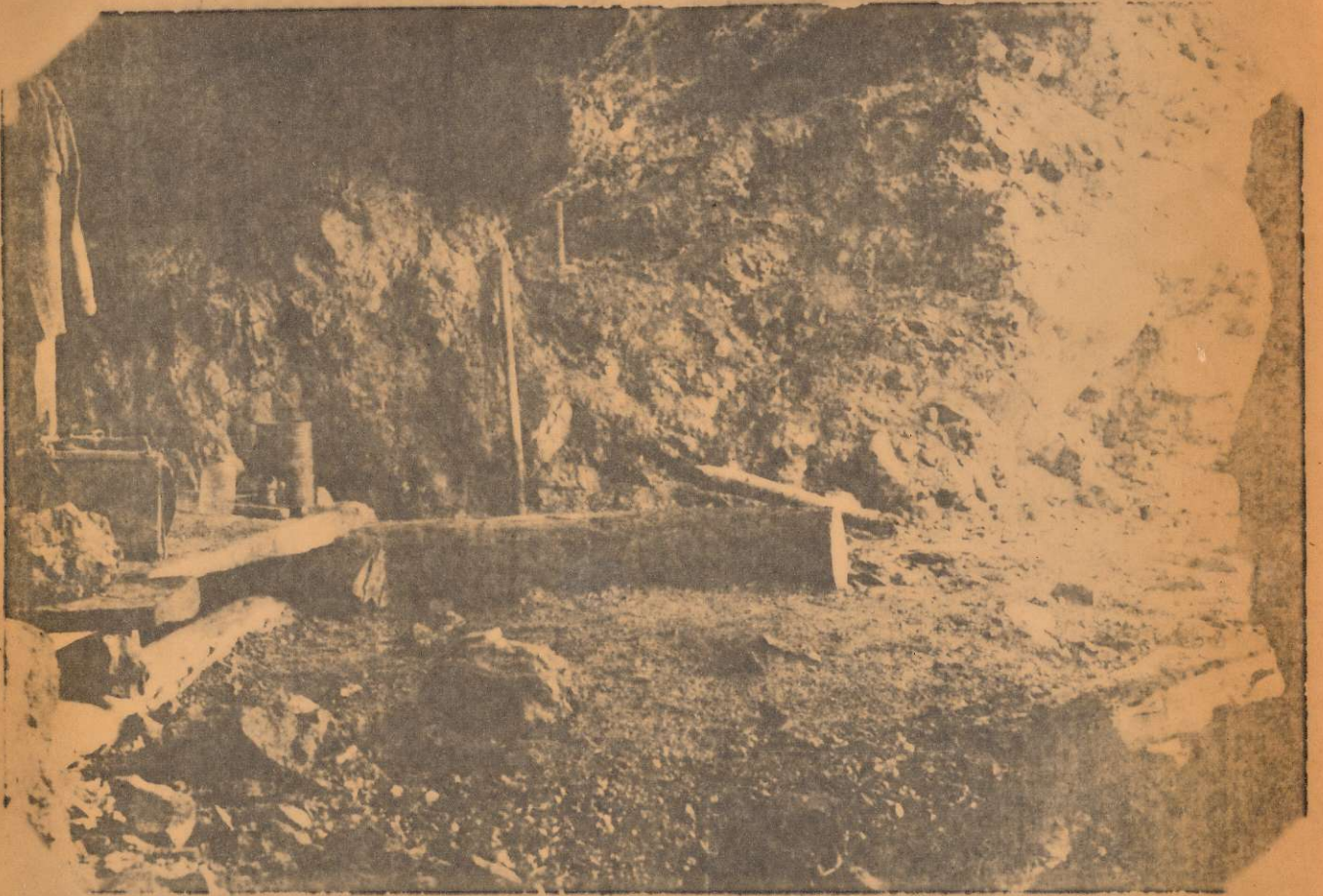
BEN BOLT MINE.

Inside 2704 portal looking north.

The product could then be treated at a central mill that made lead and zinc concentrates from other properties in the area.

All the coarse sample rejects have been saved so that a fair sample can be assembled for test purposes.

If a smelter is erected near Stewart then this ore may have an enhanced value as a flux; alternatively the pure quartz parts of the vein could be mined by open pit for flux and so expose the ore layers.

ORE RESERVES.

In the following figures net value refers to the value per ton after allowing for mill loses and smelter charges. The net values for Au, Ag, Pb, and Zn are taken as 80%, 80%, 90%, % 50% respectively of the gros values and assuming prices of $35.00, 90 cents 15 cents and 13 cents respectively.

It was hoped that the zone of mineralization would prove on sampling to be one continuous and wide ore-body but the true width of only 7 feet on the 2575 level at present disproves this although it may be very localised condition.

On the 2475 level the irregularities of the dyke and the obliqueness of the sulphide streaks to the drift makes an evaluation difficult.

There a zone of better mineralization following both sides of the dyke for a horizontal width of 60 feet and a length of at least 200ft. An average net grade between $3.00 and $5.00 per ton is indicated at present but detailed drilling or cross-cutting could improve this value considerably. Between the level and the surface there would be an estimated 60,000 tons and another 50,000 tons for 50 feet below the level.

On the 2668 level in the north drift a block 110 feet long and 40 feet wide has a net average value of $13.80 per ton. It is partially exposed on the 2704 level above.

There would be 20,000 tons from the level to the surface for the block and another 20,000 tons down to the 50 feet below the level.

There is a good possibility that this block extends for 100 feet farther to the south in which case there would be another 40,000 tons above the level at 20,000 below.

The 2814 level is of limited extent and so far indicates only a 12 feet width of low grade ore.

The ore reserves indicated above amount to 100,000 tons that would have a net value of $13.80 per ton. 110,000 tons that would have a net value between $3.00 and $5.00 per ton.

Since there are no raises on the ore or other openings this ore can only be classified as probable.

If the 2475 level was extended south for 300 feet and the 2575 level for 200 feet and both found the high grade ore just as good as on the 2668 level then another 100,000 tons would be added between the levels.

RECCOMMENDATIONS.

To test both the downward extension of the main ore-body and the possibility of an upper ore-body a set of nine vertical holes should be drilled from the surface at 50 feet intervals along the survey line on the east side of the creek above the workings and starting at station 1.

BEN BOLT MINE.

View from 2704 portal looking north along the vein on
the west side of the valley of Albany Creek.

The holes would be about 250 feet long to penetrate the foot-wall of the veins

The results obtained from these holes would decide whether the deposit warranted a large scale open-pit operation or a medium size underground operation.

It is estimated that with two shifts on one machine the drilling could be completed in 2 months at a cost of $15,000 including trail repair, assaying and engineering.

SUMMARY.

A vein 200 feet thick and dipping at $30°$ W. has been explored by 1,600 feet of tunnels in five adits that have penetrated only the first 50 feet on the footwall side.

A mineralized zone with values in gold, silver, lead and zinc and varying from 5 to 25 feet in true thickness has been partially exposed by the irregular workings.

It is estimated that there is present in one block 40,000 tons of probable ore that after milling and smelting would yield $13.00 per ton at the smelter. The cost of mining and milling would have to be subtracted from this amount to give the working profit. There are indications however that this block is much larger and would amount to 200,000 tons down to the bottom level. An expenditure of $15,000 on surface diamond drilling would check this possibility and at the same time explore the overlying vein material for parallel ore-bodies. The lower lower tunnel can then be extended 300 feet south to explore the ore underground.

The present lower tunnel indicates an ore-body of marginal grade that for 110,000 tons averages a net between $3.00 and $5.00

which could be more. If this tunnel is put into operation then a pattern of regular test holes can be drilled that will determine the average grade.

The results of this investigation have been very encouraging and justify preliminary diamond drilling to determine the scale on which mining could be conducted.

BEN BOLT.

A. C. SKERL

ASSAY PLAN   2475   LEVEL.

SCALE :   1 in. to 20 ft.

Width ft.	No.	Gold oz.	Silver oz.	Lead %	Zinc %
o	1801	Tr.	0.80	Tr.	0.10
6	02	Tr.	0.55	Tr.	0.20
6	03	Tr.	0.15	Tr.	0.15
6	04	0.005	0.15	Tr.	0.07
6	05	Tr.	0.30	Tr.	0.10
6	06	0.01	0.95	Tr.	0.15
6	07	0.01	0.45	Tr.	0.25
6	08	0.02	0.70	0.32	0.80
6	09	0.02	0.45	0.21	0.25
6	10	0.01	0.25	0.21	0.25
6	11	0.02	0.85	Tr.	0.15
6.3	12	0.02	1.00	0.32	0.20
6	13	0.01	0.55	Tr.	0.25
6	14	0.01	0.40	Tr.	0.07
5	15	0.01	0.45	Tr.	0.35
5	16	0.03	0.15	0.81	0.80
5	17	0.02	0.15	0.32	1.20
5	18	0.03	1.15	Tr.	0.08
5	19	0.02	1.10	Tr.	8.20
5	20	0.02	0.80	Tr.	2.75
5	21	0.02	1.00	Tr.	1.50
5	22	0.04	0.60	Tr.	2.30
5	23	0.03	0.70	Tr.	2.65
5	24	0.01	0.40	Tr.	Tr.
5	25	0.02	0.20	Tr.	0.35
5	26	0.01	0.40	Tr.	0.15
5	27	0.06	0.70	0.76	0.20
5	28	0.01	0.55	0.43	0.25
6	29	0.06	0.80	2.35	3.20
5	30	0.02	0.55	0.49	1.00
5	31	0.01	1.05	1.96	0.60
5	32	0.01	0.70	0.49	0.15
5	33	0.01	0.45	Tr.	0.60
5	34	Tr.	0.30	0.60	0.95
5	35	Tr.	0.15	Tr.	0.10
6	36	0.01	0.95	0.10	4.90
5	37	0.01	1.05	Tr.	1.90

BEN BOLT.

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ASSAY PLAN 2475 LEVEL SOUTH DRIFT.

SCALE : 1 in. to 20 ft.
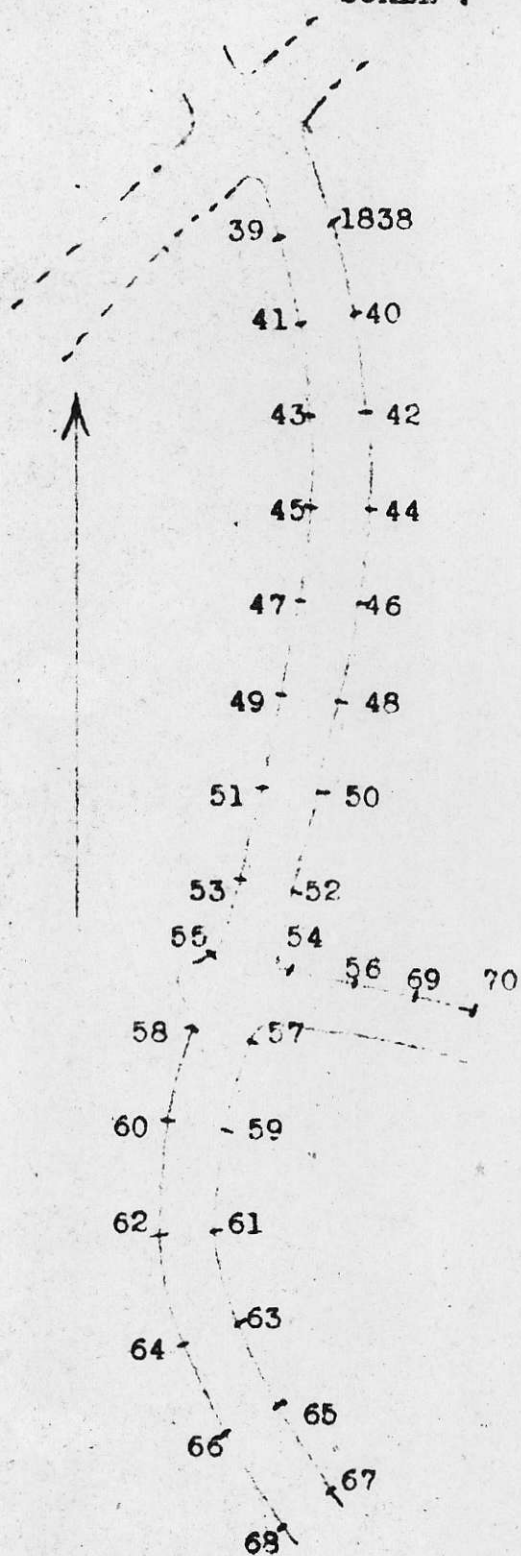
No.	Gold oz.	Silver oz.	Lead %	Zinc %	Width ft.
1838	0.01	1.25	Tr.	0.07	5
39	0.01	0.85	0.21	Tr.	5
40	0.01	1.10	0.54	0.10	5
41	0.02	1.20	0.32	0.20	5
42	0.02	0.70	0.60	0.50	5
43	0.02	0.95	1.47	0.25	5
44	Tr.	0.70	2.12	0.20	5
45	0.01	0.65	Tr.	0.05	5
46	0.01	0.80	0.27	Tr.	5
47	0.01	0.80	Tr.	0.15	5
48	0.01	1.05	Tr.	0.06	5
49	0.01	0.70	0.04	0.80	5
50	0.02	0.85	0.10	1.40	5
51	0.02	0.95	Tr.	0.60	5
52	0.01	0.85	0.04	2.50	5
53	0.02	1.25	1.30	0.80	5
54	0.02	0.70	0.54	0.20	5
55	0.01	0.70	0.38	0.15	6
56	0.01	0.65	Tr.	0.10	5
57	0.01	0.70	0.05	0.20	5
58	0.02	0.95	Tr.	0.30	5
59	0.005	Tr.	Tr.	0.85	5
60	0.005	Tr.	Tr.	0.70	5
61	0.01	1.25	Tr.	1.75	5
62	Tr.	0.50	Tr.	0.60	5
63	0.02	1.20	Tr.	3.00	5
64	0.01	0.70	Tr.	0.45	5
65	0.02	1.95	Tr.	2.30	5
66	0.01	0.55	Tr.	0.35	5
67	0.02	1.00	0.54	4.30	5
68	0.01	0.80	Tr.	0.70	5
69	0.02	0.95	Tr.	0.30	5
70	Tr.	0.55	Tr.	0.20	5

BEN BOLT.

ASSAY PLAN 2575 LEVEL
SCALE : 1 in. to 20 ft.

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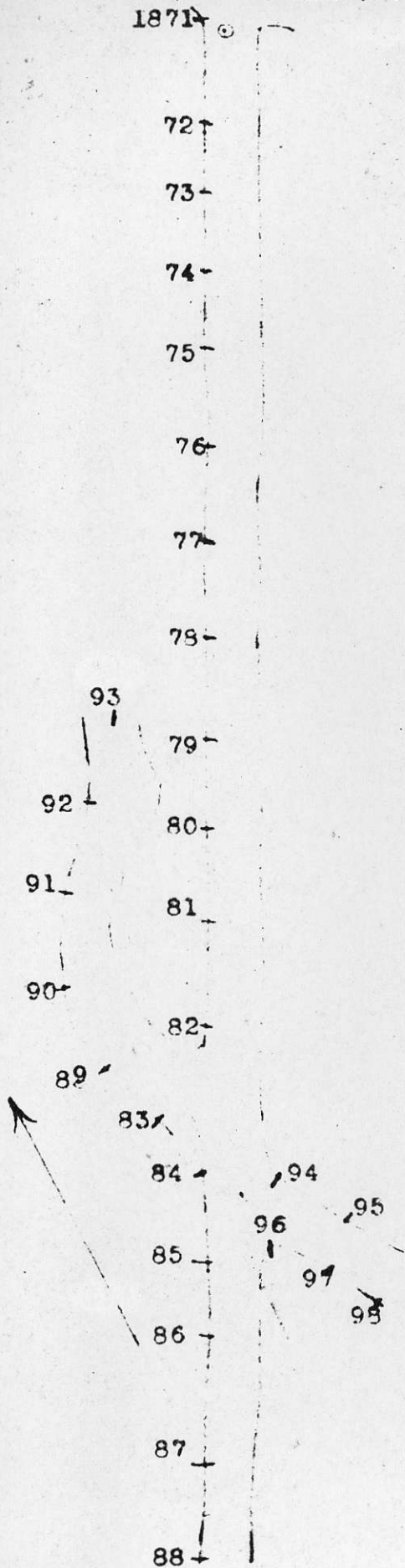
No.	Gold oz.	Silver oz.	Lead %	Zinc %	Width Ft.
1871	0.005	0.50	Tr.	0.25	6
72	0.01	0.45	Tr.	0.20	6
73	0.005	0.65	Tr.	0.25	6
74	0.005	0.80	Tr.	0.35	6
75	0.005	0.70	Tr.	0.30	6
76	Tr.	0.50	Tr.	0.35	6
77	0.01	0.80	Tr.	0.15	6.5
78	0.01	0.90	Tr.	0.25	5
79	0.01	0.65	Tr.	0.35	6
80	Tr.	0.50	Tr.	0.20	7
81	Tr.	0.50	Tr.	0.30	7
82	Tr.	0.55	Tr.	0.20	6.5
83	Tr.	0.50	Tr.	0.25	5
84	0.06	0.60	0.65	3.90	6
85	0.01	0.30	Tr.	Tr.	7
86	0.005	0.30	Tr.	Tr.	7
87	0.02	0.40	Tr.	Tr.	7
88	Tr.	0.25	Tr.	Tr.	6
89	0.02	0.80	Tr.	Tr.	4
90	0.01	0.15	Tr.	0.05	6
91	0.01	0.30	Tr.	Tr.	5
92	0.06	0.60	0.35	0.15	6
93	0.06	0.75	0.45	Tr.	5
94	0.02	0.80	0.05	Tr.	5
95	0.01	0.90	Tr.	Tr.	5
96	0.005	0.50	1.65	0.10	5
97	0.005	0.35	Tr.	0.08	6.5
98	0.005	0.25	Tr.	0.08	6.5

BEN BOLT.

ASSAY PLAN 2668 LEVEL
SCALE: 1 in. to 20 ft.

A. C. SKERL
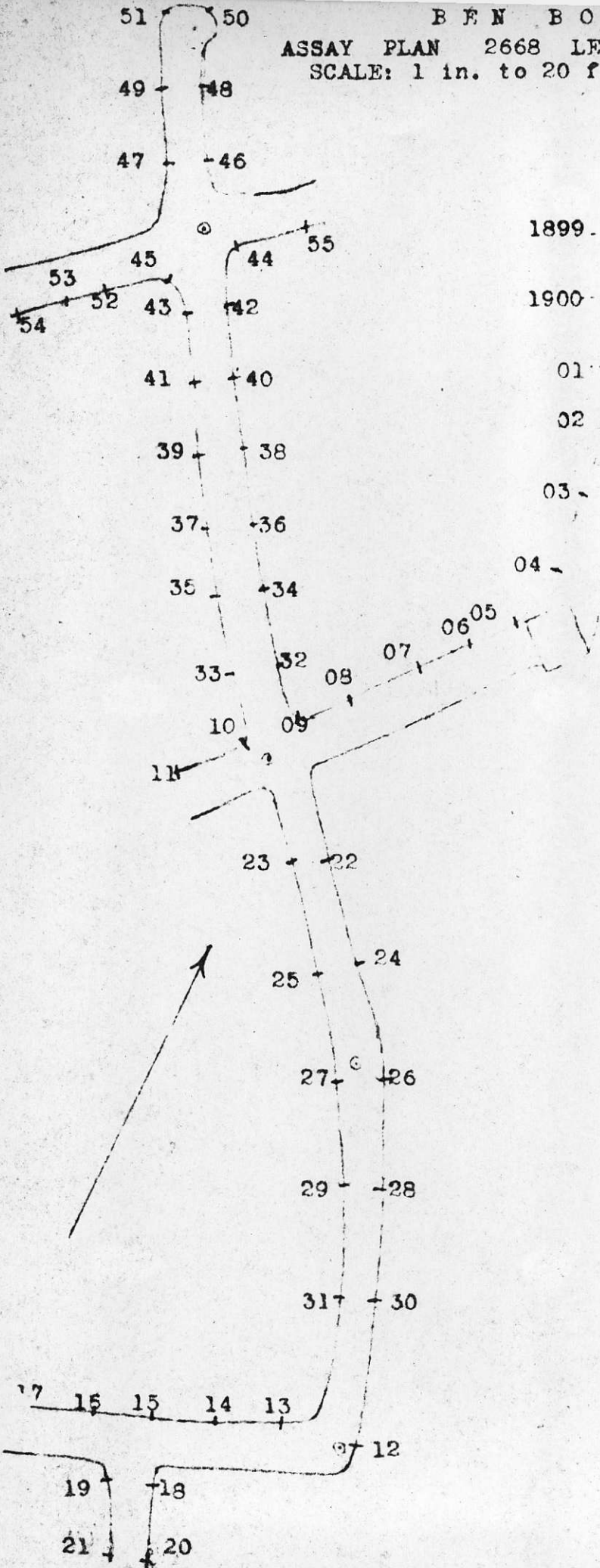
No.	Gold oz.	Silver oz.	Lead %	Zinc %	Width Ft.
1899	0.01	0.65	Tr.	Tr.	6.5
1900	0.005	0.15	Tr.	0.12	7
01	0.005	0.30	Tr.	0.15	6
02	0.005	0.30	Tr.	0.08	6
03	0.005	0.10	Tr.	Tr.	7
04	0.01	1.00	Tr	0.05	7
05	0.01	0.70	Tr.	0.05	5
06	0.005	0.30	0.15	Tr.	6
07	0.02	2.25	1.92	Tr.	6.5
08	0.005	0.80	0.42	0.05	6
09	0.005	0.40	0.05	Tr.	6.5
10	0.03	0.20	1.00	3.30	6
11	0.02	0.20	Tr.	0.25	6
12	0.01	0.65	0.04	0.10	5
13	0.01	1.10	0.05	0.10	6
14	0.01	1.10	Tr.	Tr.	6
15	0.03	1.40	1.00	0.35	6
16	0.02	0.80	1.50	3.35	6.5
17	0.01	0.50	0.30	Tr.	7
18	0.02	0.65	Tr.	0.18	4.5
19	0.005	0.40	Tr.	2.70	4.5
20	0.02	0.85	Tr.	0.80	4.5
21	0.02	0.95	Tr.	0.40	5
22	0.03	0.70	0.30	Tr.	5
23	0.01	1.30	0.35	0.30	5
24	0.005	1.10	Tr.	0.15	5
25	0.005	0.95	Tr.	0.40	5
26	Tr.	Tr.	Tr.	0.30	5
27	Tr.	Tr.	Tr.	0.10	5
28	Tr.	Tr.	0.25	0.12	5
29	Tr.	Tr.	Tr.	0.05	5
30	Tr.	Tr.	Tr.	0.30	5
31	Tr.	Tr.	Tr.	0.95	5
32	Tr.	Tr.	Tr.	0.10	5
33	0.01	0.25	0.30	0.25	5
34	0.01	0.80	0.75	0.55	5
35	0.005	0.25	0.10	0.20	5
36	0.04	4.15	7.05	2.95	5
37	0.01	0.25	0.70	2.20	5
38	0.02	0.65	1.23	0.20	5
39	0.02	0.95	2.25	11.65	5
40	0.01	0.50	1.17	0.15	5
41	0.03	0.30	1.28	8.50	5
42	0.03	0.65	1.17	1.20	5
43	0.01	0.25	0.53	1.20	5
44	0.03	2.85	6.20	5.35	6
45	0.04	2.90	7.27	7.40	7
46	0.02	1.40	4.81	3.40	5
47	Tr.	0.30	0.70	0.25	5
48	0.07	108.90	1.23	0.30	5
49	0.01	17.10	0.12	0.30	5
50	0.01	10.00	1.07	9.95	5
51	0.005	2.40	Tr.	0.15	5
52	0.005	5.50	0.65	Tr.	7
53	0.005	8.90	Tr.	Tr.	6
54	Tr.	1.30	Tr.	0.15	6
55	0.02	7.20	0.32	0.20	6

B E N B O L T .
ASSAY PLAN 2814 LEVEL
SCALE : 1 in. to 20 ft.

A. C. SKERL
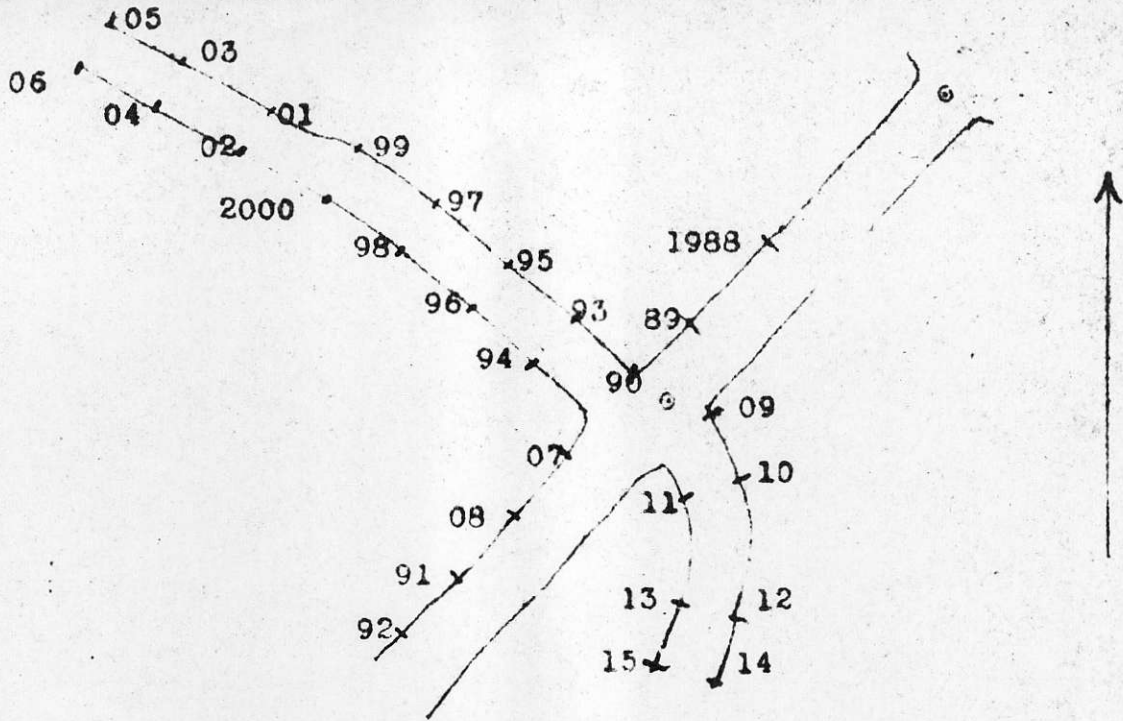
No.	Gold oz.	Silver oz.	Lead %	Zinc %	Width Ft.
1988	Tr.	1.05	Tr.	Tr.	6
89	Tr.	0.80	TR.	Tr.	7
90	0.005	0.65	Tr.	Tr.	7
91	0.005	0.70	Tr.	Tr.	7
92	0.01	1.85	Tr.	Tr.	7
93	0.005	12.65	Tr.	0.05	5
94	0.005	2.90	1.12	Tr.	5
95	0.01	2.10	0.20	0.05	5
96	0.01	1.35	Tr.	Tr.	5
97	0.005	0.45	Tr.	Tr.	5
98	0.005	1.15	Tr.	Tr.	5
99	0.005	0.45	Tr.	Tr.	5
2000	Tr.	0.25	Tr.	0.05	5
01	0.01	7.65	Tr.	Tr.	5
02	0.005	0.50	Tr.	Tr.	5
03	0.01	0.40	Tr.	Tr.	5
04	0.005	0.95	Tr.	0.10	5
05	0.005	6.35	Tr.	Tr.	5
06	Tr.	3.10	0.05	Tr.	5
07	Tr.	2.55	0.48	0.05	6
08	Tr.	3.20	0.20	Tr.	6
09	Tr.	1.10	Tr.	Tr.	6
10	Tr.	Tr.	Tr.	0.10	5
11	Tr.	TR.	Tr.	0.10	5
12	0.005	Tr.	Tr.	0.05	5
13	0.01	4.70	Tr.	Tr.	5
14	Tr.	2.10	Tr.	Tr.	5
15	Tr.	TR.	Tr.	0.70	5
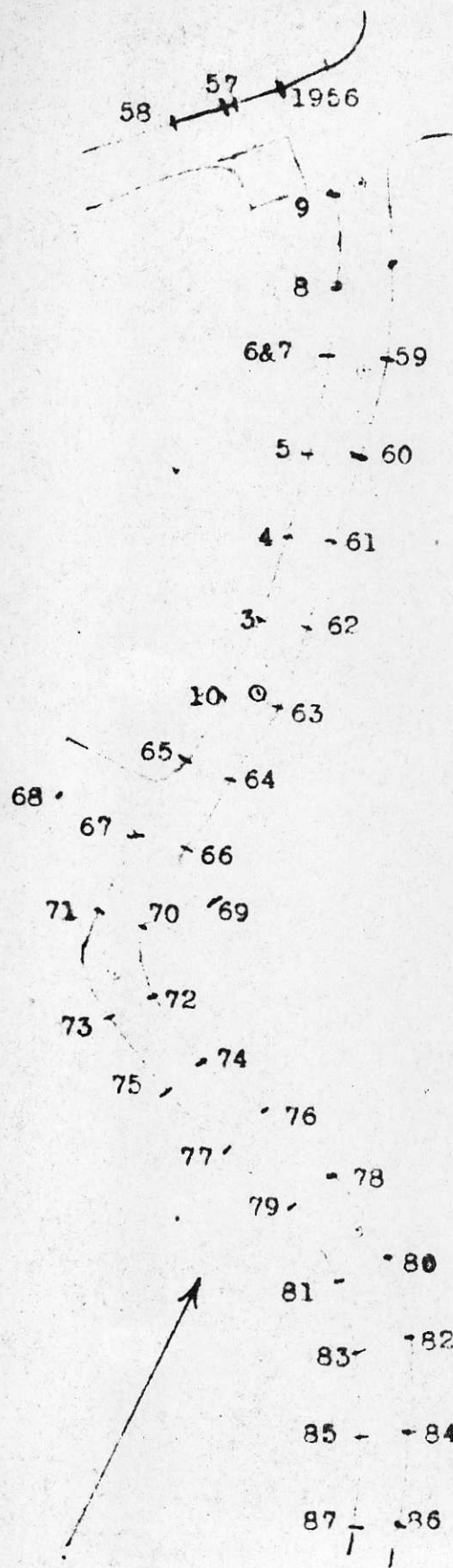
No.	Gold oz.	Silver oz.	Lead %	Zinc %	Width Ft.
1956	0.16	6.25	4.55	8.15	4.2
57	0.005	3.35	Tr.	0.30	5.5
58	0.01	1.40	Tr.	0.50	4.0
59	0.01	1.40	0.90	0.40	3.3
60	0.12	2.45	1.44	0.50	2.7
61	0.10	2.45	1.87	0.45	3.1
62	0.12	5.90	0.64	1.50	6.0
63	0.08	2.40	1.55	1.95	6.0
64	0.02	6.40	2.30	3.20	4.2
65	0.01	0.80	Tr.	0.20	4.0
66	0.02	3.35	0.53	0.50	6.0
67	0.005	4.15	Tr.	0.20	4.0
68	0.005	2.10	Tr.	0.25	6.0
69	0.02	2.20	Tr.	0.15	3.0
70	0.01	0.95	Tr.	0.05	5.0
71	0.01	1.45	Tr.	Tr.	4.5
72	0.005	0.30	0.53	0.10	5.0
73	0.01	1.60	Tr.	Tr.	4.5
74	0.005	0.90	Tr.	0.15	5.0
75	0.02	2.30	0.64	6.35	5.0
76	0.01	0.90	Tr.	Tr.	5.0
77	0.005	1.45	Tr.	0.10	3.5
78	Tr.	0.15	Tr.	0.55	5
79	0.005	0.90	0.20	2.50	5
80	0.01	5.20	Tr.	Tr.	5
81	0.005	0.90	Tr.	0.09	5
82	0.03	1.50	0.30	0.05	5
83	0.02	1.35	0.10	0.12	5
84	0.01	1.20	Tr.	0.04	5
85	Tr.	0.70	Tr.	Tr.	5
86	Tr.	1.30	Tr.	0.05	5
87	0.005	1.45	Tr.	Tr.	5

Samples by C. Rutherford :

No.	Gold	Silver	Lead		Width
3	0.08	2.30	3.10		5
4	0.14	6.25	9.10		3
5	0.06	1.30	4.40		4
6	0.10	2.15	7.90		3
7	0.08	1.20	2.60		4
8	0.10	2.15	4.20		4.5
9	0.11	3.15	0.15		5
10	0.08	0.90	0.90		2.5