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REPORT ON THE STORM CLOUD MINE - BY FRANK A. KENNEDY

JUNE 25, 1928

LOCATION:

The Storm Cloud Mine is situated in the Hassayampa Mining District, Yavapai County, Arizona, approximately by automobile road, fifteen miles south of Prescott.

The Cash Mine adjoins the Storm Cloud on the South and is developed by two shafts 300 feet and 400 feet respectively, connected by levels and underground workings.

The Senator property, now controlled by Bluford H. J. Balter, present operator of the Storm Cloud, lies adjacent to the northeast and was formerly operated by the Phelps Dodge Mining Company. This property is developed by one long crosscut tunnel 3100 feet long and is further developed by considerable drifting along the different veins crossed by the long tunnel. The Cash and the Senator have both produced a large tonnage.

DESCRIPTION

The following patented claims are embraced in the Storm Cloud group:

NAME	ACRES	NAME	ACRES
1. St. Cloud	19.37	9. Bugle	01.85
2. Parintha	18.87	10. Storm Cloud	20.66
3. Ginger	14.87	11. Trapezoid	14.90
4. Hoot Owl	17.62	12. Palmetto	07.75
5. Johnnie	18.57	13. Betsy Ann	13.16
6. Paw Paw	15.49	14. Dakota	20.00
7. Lion	11.69	15. Cracker	20.00
8. Traction	01.63		

Also two unpatented mining lode claims, McCleur and Ranger Chief.

ACCESSIBILITY

The Storm Cloud Mine is on a good automobile road but fifteen miles from Prescott, Arizona, with a hauling charge of approximately $2.50 per ton down on concentrates and $4.00 per ton from Prescott to the Mines. It is approximately 200 miles by rail to either the Hayden or Magma smelters.

HISTORY AND OLD DEVELOPMENT

The Storm Cloud is one of the oldest known properties in this district, having been located in 1875. Its old workings and dumps show that it has produced considerable shipping ore.

The Gold Vein was mined from near the surface to the 200' level, and the ore milled at mills situated on nearby properties. The gold occurred in a free state and was amalgamated. How much was lost in sulphides, I do not know but believe the ore was of a very good grade.

The Storm Cloud gold-silver-copper vein lies parallel and approximately 75 feet to the west of the gold vein and strikes approximately north and south. The copper vein was worked in the past entirely for direct shipping ore, I was not able to get any data on old production but was furnished by G. M. Colvocoresses, mining engineer, who looked after the property for the owner, such data as he had which covered shipments for the years 1925, 1926 and 1927.

Year	Dry Tons	Oz. Gold	Oz. Silver	% Copper
1925	819	.054	3.86	8.65
1926	776	.076	4.93	8.05
1927	235	.060	5.00	9.80

FOOT UNITS

For Computing Average Assay

	Gold	Silver	Copper
1925	44.186	3135.34	7084.35
1926	59.076	3825.68	6246.80
1927	14.100	1175.00	2303.00
	117.362	8152.02	15634.15

Average assay - .064 oz. Au., 4.88 oz. Ag., 8.54% Cu.

The Ten Spot Shaft located on the McCleur claim of the Storm Cloud group, is reported to be down 267 feet. The maps show a level 80 feet from the collar of the shaft, with two crosscuts. The one to the southeast cuts a small vein 20 feet from the shaft. The crosscut to the northwest is a little over 100 feet long and crosscuts the Ten Spot vein reported to be 40 feet in width at that elevation. Another level was made at approximately 235 feet in depth and crosscuts driven to both the northwest and southeast. The one to the Southeast

is reported to have crossed two veins and the other crosscut cut the Ten Spot Vein. Mr. Rosenberg reports that three feet of this vein averaged $9.40 in gold and silver, and 4.4% copper. This shaft is being dewatered at the present time.

There are several short tunnels on different claims, all driven to intersect veins, and all look promising and warrant further prospecting.

GEOLOGY

The country rock series of the Storm Cloud and adjacent area is made up of Yavapai schist rhyolite and grandodiorite, and some very fine grained rock porphyritic in character carrying some lime. The Storm Cloud vein occurs in conjunction with the rhyolite on the foot wall with a schist hanging wall. There are at least twenty veins crossing the property and evidently all carry values of either gold, silver, copper lead or zinc.

There are only four veins that I will mention in particular in this report, namely: The Storm Cloud gold-silver-copper vein. The Storm Cloud Gold Vein, the Ten Spot vein, and one paralleling the Ten Spot which I shall call the Galena.

The vein filling of nearly all veins is quartz carrying gold, silver, copper, lead and zinc. They vary in width from a few inches to forty feet or more and the surface indications show very good mineralization.

ORE DEPOSITS

The Storm Cloud vein varies in width from two feet to twelve feet and the vein is continuous. It appears to carry copper values its entire length but of varying grades. The richer grades form in lenticular masses. How far these masses of high grade ore extend downward below the main level of the storm Cloud, I do not know, but I am convinced that one need not fear that the ore on the copper vein will play out on account of the vein itself not extending down to a very great depth.

The ore in this vein occurs in the form of chalcopyrite carrying both gold and silver, and in some places chalcocite. The

average value of the ore can best be ascertained by the assay of the crude ore into the mill for a period of time together with the assays on the assay map. The character of the ore is such as to be classified as a soft ore and is easily drilled and easily reduced by fine grinding in the mill. The dip of the Storm Cloud is approximately 80 degrees to the East and strikes north and south. It is easily traced on surface from cuts and pits for thousands of feet, and is, indeed, a very strong persistent vein. There are approximately 3000 feet of this vein on the property.

Following is a table showing average mill feed and results obtained from the Storm Cloud copper vein:

DATE May	TONS	MILL HEAD % Cu.	CONC % Cu	TAILS % Cu.	COPPER REC.	CONCENTRATES TONS
1	25.0	6.07	20.4	0.30	96.5	7.1
2	24.0	2.04	16.3	0.13	94.4	2.7
3	24.0	2.51	18.6	0.21	92.7	3.4
4	25.0	2.90	16.9	0.32	96.2	4.0
5	8.8	2.01	18.4	0.18	91.9	0.8
6	25.0	2.27	18.1	0.10	96.1	2.8
7	2.88	2.39	18.0	0.17	93.7	0.35
8		No Operation				
9	28.0	2.86	17.2	0.15	95.6	4.5
10	22.7	3.93	18.5	0.18	96.3	4.6
11	14.0	4.07	26.6	0.19	96.1	2.0
12	13.8	3.58	22.5	0.21	95.0	2.0
13	14.8	3.76	23.0	0.28	88.5	2.1
14	20.4	3.68	25.8	0.43	89.8	2.6
15	13.0	4.01	23.9	0.30	93.7	2.0
16		No Operation				
17		No Operation				
18	12.8	4.33	21.2	0.36	93.2	2.4
19	10.3	3.63	22.2	0.37	91.3	1.5
20	10.5	3.89	21.84	0.50	89.1	1.6
21		No Operation				
22	14.8	3.64	21.00	0.49	88.6	2.2
23		No Operation				
25	22.7	2.78	15.8	0.65	82.3	3.3
26	28.0	2.39	18.7	0.55	78.9	2.3
27	37.9	4.28	18.7	0.54	89.9	7.7
28	25.5	2.66	15.2	0.26	91.5	4.4
29	9.0	4.74	22.6	0.59	89.8	2.5
30		No Operation				
31		No Operation				
JUNE						
1	19.8	2.41	17.24	0.92	60.8	1.7
2	34.4	2.79	16.12	0.47	85.6	5.0
3		No Operation				
4	32.0	1.66	17.0	0.34	78.7	3.77
5	28.0	2.66	22.5	0.49	79.7	3.0
6	27.5	2.90	20.4	0.38	88.5	3.40
7	31.9	3.24	20.6	0.50	92.8	4.60
8	31.5	3.21	24.2	0.82	77.0	3.17
9	30.0	3.34	28.7	0.36	82.8	2.88

June cont'd	TONS	MILL HEAD % Cu.	CONC % Cu	TAILS % Cu.	COPPER REC.	CONCENTRATES TONS
10	29.0	3.34	25.7	0.50	86.6	3.26
11	22.9	3.79	29.5	0.79	81.3	5.20
12	34.5	3.95	28.8	1.16	73.6	3.48
13	17.0	4.52	28.6	0.45	91.5	3.92
14	29.0	4.06	27.6	0.38	91.9	3.92
15	14.0	4.58	24.7	0.35	93.7	2.43
16	27.8	4.68	27.2	0.18	96.8	4.63
17	30.0	4.37	28.4	0.24	95.3	4.40
18	29.5	3.68	25.7	0.20	95.3	4.02
19	31.3	3.97	26.87	0.21	95.5	4.42
20	28.5	3.62	26.7	0.19	95.4	3.69
21	30.4	4.05	25.9	0.27	94.3	4.48
22	29.1	3.52	17.4	0.21	95.2	5.60
23	30.1	4.01	24.1	0.26	94.6	4.75
	1076.9	156.77	995.3	17.13	4038.0	157.7

AVERAGE RESULTS

23.90	Tons average tonnage
3.48	Average percent copper mill feed
22.10	Average assay of concentrates, % copper
0.38	Average assay of tailings, % copper
89.70	Average percent copper recovered
3.50	Average number tons concentrate
6.80	Average ratio of concentration

Note: The mill was run only part time which accounts for low tonnage.

The above assay analysis of 3.48% copper is a fair criterion of the grade of ore encountered in this vein.

The gold vein already referred to has been mined down to approximately 30 feet below the present main level. It is officially reported to have produced $40,000.00 in gold. More work should be done on this vein in order to determine its extent and value.

The Ten Spot Vein, together with the Storm Cloud, appear to be the two strongest veins on the entire property. The Ten Spot surface indications show it to be a wider and stronger vein, apparently, than the Storm Cloud Vein. It has been developed, according to the survey map of the underground workings on the Senator Mine, for some 750 feet in length. The nearest breest of this vein toward the Ten Spot shaft is some 900 feet from the boundary line of the Storm Cloud group. It is reported that the Ten Spot vein is from 40 to 60 feet in width on the Senator property. This appears to be true, for the surface shows the vein to be a very wide highly mineralized vein. Con-

siderable work has been done recently by leasors on this vein, and direct shipping gold ore has been mined and shipped this season. Five surface samples on the Ten Spot Vein were taken just south of the Bugle Claim line. The following results show very good gold and silver content on three of the samples taken:

NO.	WIDTH	LOCATION	OZ. AU.	OZ. AG.	VALUE
1	4 ft.	Near South tunnel	0.08	1.50	$ 2.50
2	3 ft.	200 ft. No. of #1	0.50	16.67	20.02
3	2 ft.	100 ft. No. of #2	0.17	17.90	14.14
4		200 ft. No. of #3	0.37	01.40	8.24
5	7 ft.	General N. of #4	0.16	00.60	3.25

The Galena Vein runs parallel to the Ten Spot and as stated before, has been crosscut by a level at the eighty foot station in the shaft, also by a shallow tunnel and the vein followed some distance. Further development on this lead vein may develop sufficient tonnage to warrant milling.

PRESENT DEVELOPMENT

The maps of the Storm Cloud show how much work has been done on the gold vein and on the Storm Cloud copper vein. The shaft has been sunk to 150 feet below the present vein or second level. A new level has been started 100 feet below and is called the third level.

Drifting along the vein has been started both to the North and South on this level, and stoping of ore between the two levels will commence as soon as the development and drifts are driven in a little distance from the shaft. There is without doubt, a very large prospective tonnage between this second level and surface to the South. There is the area between the second and third levels, or 100 feet in vertical height, and from the portal of the tunnel inward 700 feet in length that will produce a large tonnage of milling ore. Some diamond drilling has been done. The following attached sheets show the classification and results. The small amount of drilling done is no criterion as to the value of the ore body and too much credence should not be placed on the results obtained.

CLASSIFICATION

DRILL HOLE NO. ONE

Dip 30 Degrees

FEET From	To	Oz.Au.	Oz.Ag.	% Cu.	REMARKS
3	23				Albite Diorite
23	32.5				Lime Vein
32.5	34.5	.0	Tr.	.04	Porphyritic
34.5	37	.0	.0	.16	Iron Porphyry
37	38				Vein Casing
38	39				Pyritic Schist
39	39.5	Tr.	.2	.45	Pyritic Schist
39.5	41				Pyritic Schist
41	42	Tr.	.2	.12	Pyritic Schist
42	47				Fe Porphyry
47	50	Tr.	.8	1.64	Ore
50	51				Pyritic Schist
51	51.5				Fe Porphyry
51.5	52.5				Pyritic Schist
52.5	54	.01	.4	1.00	Ore
54	59	.01	1.0	1.89	Ore
59	61	.01	1.8	3.08	Ore
61	65	Tr.	.2	.41	Mineralized porphyry
65	68				Altered Schist
68	75				Porphyry
75-	91				Porphyry
81	94				Lime Vein
94	95	Tr.	.3	.28	Altered Schist
95	99				Altered Schist
99	100	.0	Tr.	.06	Altered Schist
100	104				Glossy Porphyry
104	110	.02	.1		Conglomerate
110	121				Pyritic Schist
121	127				Pyritic Schist
127	128	.03	.1		Small Vein
128	129				Schist
129	130	.02	.9		Schist
130	140				Schist
140	142	.02	.1		Schist
142	145				Silicified Schist
145	146				Ore Stringer
146	147				Schist
147	155				Silicified Schist
155	156	.02	.9		Mineralized Schist
156	164				Mineralized Schist
164	166	.01	.1		Mineralized Schist
166	178				Diorite
178	213				Schist

DRILL HOLE NO. TWO

Dip 60 Degrees

0	88				Porphyry
88	89	.06	.6	1.18	Vein Matter
89	90				Vein Matter
90	91	Tr.	.2	.20	Vein Matter
991	97	.06	5.8	1.28	Vein Matter

DRILL HOLE NO. TWO, cont'd.

FEET From	To	Oz.Au.	Oz.Ag.	%Cu.	REMARKS
97	102	Tr.	Tr.	.06	Vein Matter
102	103				Porphyry
103	107.5	Tr.	.1	.32	Vein Matter
107.5	109				Mineralized schist.
109	111				Porphyry
111	114	Tr.	.2	.45	Vein Matter
114	117	.01	.6	.28	Vein Matter
117	127				Porphyry

CLASSIFICATION

DRILL HOLES NO. FOUR

Dip 50 Degrees

FEET From	To	Oz. Au.	Oz.Ag.	%Cu.	REMARKS
0	69				Rhyolite (Limey)
69	72				Mixed
72	78				Porphyry
78	82	.01	.4	.61	Vein Matter
82	96				Schist
96	97	Tr.	.4	2.05	Vein Matter
97	101				Min. Schist
101	104	.01	.1	.12	Vein Matter
104	107	Tr.	.1	.28	Vein Matter
107	111	Tr.	.1	.49	Vein Matter
111	115				Min. Schist
115	116	Tr.	.1	.12	Schist & Popphyry
116	127				Rhyolite.

WATER

The quantity of water is always a serious question in most places in Arizona. At the present time the mine and mill are being operated sixteen hours per day without any trouble. I believe ample water can be developed to supply the mine and mill through any dry season, whereas during the wet season there is plenty of water.

POWER

There is at present one Holt engine and one W.S.M. gas eliminator engine, each connected to a compressor to furnish air for mining and pumping. The mill is operated by a Western type full deisel engine. The deep shaft pump on the Ten Spot Shaft is run by a gasoline engine.

Electric power can be delivered here on the property for a total cost of $4750.00 and this amount will be refunded by the power company at the rate of fifteen percent of the cost of the power consumed on that line.

EQUIPMENT

The mine is fairly well equipped for exploration and also for milling up to fifty tons daily capacity. Enough electricity is generated for both surface and underground use. The compressors furnish approximately 500 cubic feet free air per minute. The underground hoist used for hoisting between the second and third levels is large enough for prospecting. The drilling equipment together with track and cars, etc. is ample for the capacity of the mill.

CONCENTRATION:

A fifty ton flotation mill has been erected and is in steady operation. The mill results show that the ores are readily concentrated. The preceding data on the mill feed and concentration shows that copper concentrate of 22.1 percent was averaged during that period from a 3.48 percent copper feed, with a concentration ratio of 6.8 of crude ore to one ton of concentrate. The average recovery was 89.7 percent which would have been higher but the water used came from one of the shafts which had not been pumped out for years, and was very detrimental to the action of the flotation reagents. It was highly acidic which has considerable bearing on the results obtained. Without question, better than 92 percent recovery can be maintained.

It is planned, if electric power is put in, to move the present mill up to the portal of the tunnel which will be highly advantageous, as it will cut out the cost of hauling crude ore from the tunnel to the mill, and thereby make a saving of fifty cents per ton crude ore.

SMELTING:

At the present writing the Storm Cloud concentrates are sold under the usual smelter rates, namely: 2.5 cents is deducted from the daily current price of copper for that date and is supposed to be to cover cost of refining, marketing, and shipping of bullion, and 85% of the copper in the concentrates is paid for under that price. However, this is unusual & it is probable that a little better rate could be obtained by entering into a yearly contract with the smelter. Following is a table showing the results of the last smelter returns:

DATE 1928	%Cu.	Oz.Au.	Oz.Ag.	TONS	VALUE PER TON	TOTAL VALUE LESS FREIGHT
Mar.						
4	25.48	0.17	12.60	26.47	$ 61.80	$ 1275.01
21	23.90	0.15	12.80	28.25	28.52	1284.05
Apr.						
10	24.64	0.20	37.20	30.82	73.95	1786.99
20	20.90	0.16	21.00	34.62	56.81	1520.07
May						
2	18.20	0.14	14.20	37.39	46.68	1338.24
7	17.10	0.15	11.80	20.91	43.40	1031.79
18	15.10	0.11	11.50	35.05	38.27	1013.96
June						
6	17.10	0.14	13.50	36.88	45.93	1294.95
	162.42	1.22	134.60	260.39	425.36	10545.06
Averages	20.30	0.15	16.82	32.55	53.17	1318.13

COSTS

In making out a cost statement I have conservatively estimated what the mine and mill should be able to do on a basis of 100 tons per day. In doing this, however, I have in mind that the mine will be further advanced on development and eletric power installed.

Mine Supplies complete	.95	
Mill Supplies complete	.50	
Cost per ton		1.45
Mine labor charge	120.30	
Mill Labor charge	57.50	
Cost per 100 tons	177.80	
Cost per ton		1.78
Smelting 4% copper per ton		2.75

TOTAL ESTIMATED COSTS

MINE

Supplies	.95	
Labor	1.20	
Total per ton	2.15	
Daily cost per 100 tons		215.00

MILL

Supplies	.50	
Labor	.58	
Total per ton	1.08	
Daily cost per 100 tons		107.50

TOTAL COSTS

Mine - per ton	2.15
Mill - Per ton	1.08
Smelting per ton	2.75
Cost per ton crude ore	5.98

I believe that under an average management the above cost of $5.98 per ton crude ore for mining, milling and smelting can be approximated very closely.

PROPOSED DEVELOPMENT

It would be well to drive the new level to the North and South. There may be barren places but raises put in should strike ore directly above this level. The raises should be put in and stopes started. I suggest, however, it is best to drive the second level or main level drift on the South as fast as possible. This drift can still be driven approximately 700 feet before coming to the end line of the property, and there should be enough tonnage between there and surface to operate a 100 ton mill along period of time.

There is an unexplored area of 1600 feet on the Storm Cloud vein to the North and should be just as productive as the rest of the vein. A series of short diamond drill holes approximately 75 feet apart, drilled along the strike, crosscutting the vein about 100 feet in kepth, will conclusively prove up the vein. With the idea of mining to the North it might be advisable to clean out the old shaft located near the compressor house, and sink down to the 100 foot level and drift to the North and South from that point.

It would also be well to complete the diamond drilling for the first eight holes as was planned to explore below the present main level. If any deep drilling seems advisable, I would suggest this be confined to the crosscut from the bottom of the shaft, and two holes put down, one cutting 150 feet below, that level and one cutting the vein 250 feet below that level. This would prove whether the pyritic gangue of the vein had been replaced by copper and whether a second ore horizon existed. Diamond drilling can be done in this vicinity for approximately $3.10 per foot plus the cost of producing compressed air, and is really the cheapest and quickest way to prospect ahead of any tunnel or mining work. A study of all successful mining companies will show that they are either using the diamond drill or the long hole method for all of their preliminary prospecting.

CONCLUSION

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In making this report on the Storm Cloud Mine, I have had in mind the possible future of the property, and I feel it is an inopportune time to make a report. In fact, I am certain with drilling confined to the Storm Cloud vein alone, between surface and 200 feet in depth for its entire length, that the property will appear far more attractive to a mining investor than it does now. In other words, it needs more development laid out in advance and carried out in a systematic manner.

The copper vein is without question the best productive vein on the entire property, although the Ten Spot vein looks very attractive due to its width and continuance. The stopes in the copper vein show up a beautiful body of copper ore. It requires further exploration to prove the tonnage and the grade of copper ore in this vein, and believe it can be made to average as high as the average mill run mentioned previously in this report. The Storm Cloud vein looks very promising and will show a development of ore for its entire length, varying in grade, and I strongly recommend again that exploration for the time being be confined entirely to this vein. I believe the most economical and commercial ore will be derived from the Storm Cloud vein above the horizon 225 feet in depth below surface for its entire length of 3200 feet. It is highly probable that the ore found below that horizon will be very pyritic. The property is very nicely situated to carry on mining at a low cost and within a short distance of some of the biggest producers in the United States.

Respectfully submitted,

(Signed) Frank A. Kennedy.

Mining Engineer,
Boise, Idaho.

June 25, 1928.

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1925	819	.054	3.86	8.65
1926	776	.076	4.93	8.05
1927	235	.060	5.00	9.80

FOOT UNITS

For Computing Average Assay

	Gold	Silver	Copper
1925	44.186	3135.34	7084.35
1926	59.076	3825.68	6246.80
1927	14.100	1175.00	2303.00
	117.362	8152.02	15634.15

Average assay - .064 oz. Au., 4.88 oz. Ag., 8.54% Cu.

The Ten Spot Shaft located on the McCleur claim of the Storm Cloud group, is reported to be down 267 feet. The maps show a level 80 feet from the collar of the shaft, with two crosscuts. The one to the southeast cuts a small vein 20 feet from the shaft. The crosscut to the northwest is a little over 100 feet long and crosscuts the Ten Spot vein reported to be 40 feet in width at that elevation. Another level was made at approximately 235 feet in depth and crosscuts driven to both the northwest and southeast. The one to the Southeast

is reported to have crossed two veins and the other crosscut cut the Ten Spot Vein. Mr. Rosenberg reports that three feet of this vein averaged $9.40 in gold and silver, and 4.4% copper. This shaft is being dewatered at the present time.

There are several short tunnels on different claims, all driven to intersect veins, and all look promising and warrant further prospecting.

GEOLOGY

The country rock series of the Storm Cloud and adjacent area is made up of Yavapai schist rhyolite and grandodiorite, and some very fine grained rock porphyritic in character carrying some lime. The Storm Cloud vein occurs in conjunction with the rhyolite on the foot wall with a schist hanging wall. There are at least twenty veins crossing the property and evidently all carry values of either gold, silver, copper lead or zinc.

There are only four veins that I will mention in particular in this report, namely: The Storm Cloud gold-silver-copper vein. The Storm Cloud Gold Vein, the Ten Spot vein, and one paralleling the Ten Spot which I shall call the Galena.

The vein filling of nearly all veins is quartz carrying gold, silver, copper, lead and zinc. They vary in width from a few inches to forty feet or more and the surface indications show very good mineralization.

ORE DEPOSITS

The Storm Cloud vein varies in width from two feet to twelve feet and the vein is continuous. It appears to carry copper values its entire length but of varying grades. The richer grades form in lenticular masses. How far these masses of high grade ore extend downward below the main level of the storm Cloud, I do not know, but I am convinced that one need not fear that the ore on the copper vein will play out on account of the vein itself not extending down to a very great depth.

The ore in this vein occurs in the form of chalcopyrite carrying both gold and silver, and in some places chalcocite. The

average value of the ore can best be ascertained by the assay of the crude ore into the mill for a period of time together with the assays on the assay map. The character of the ore is such as to be classified as a soft ore and is easily drilled and easily reduced by fine grinding in the mill. The dip of the Storm Cloud is approximately 80 degrees to the East and strikes north and south. It is easily traced on surface from cuts and pits for thousands of feet, and is, indeed, a very strong persistent vein. There are approximately 3000 feet of this vein on the property.

Following is a table showing average mill feed and results obtained from the Storm Cloud copper vein:

DATE May	TONS	MILL HEAD % Cu.	CONC % Cu	TAILS % Cu.	COPPER REC.	CONCENTRATES TONS
1	25.0	6.07	20.4	0.30	96.5	7.1
2	24.0	2.04	16.3	0.13	94.4	2.7
3	24.0	2.51	18.6	0.21	92.7	3.4
4	25.0	2.90	16.9	0.32	96.2	4.0
5	8.8	2.01	18.4	0.18	91.9	0.8
6	25.0	2.27	18.1	0.10	96.1	2.8
7	2.88	2.39	18.0	0.17	93.7	0.35
8		No Operation				
9	28.0	2.86	17.2	0.15	95.6	4.5
10	22.7	3.93	18.5	0.18	96.3	4.6
11	14.0	4.07	26.6	0.19	96.1	2.0
12	13.8	3.58	22.5	0.21	95.0	2.0
13	14.8	3.76	23.0	0.28	88.5	2.1
14	20.4	3.68	25.8	0.43	89.8	2.6
15	13.0	4.01	23.9	0.30	93.7	2.0
16		No Operation				
17		No Operation				
18	12.8	4.33	21.2	0.36	93.2	2.4
19	10.3	3.63	22.2	0.37	91.3	1.5
20	10.5	3.89	21.84	0.50	89.1	1.6
21		No Operation				
22	14.8	3.64	21.00	0.49	88.6	2.2
23		No Operation				
25	22.7	2.78	15.8	0.65	82.3	3.3
26	28.0	2.39	18.7	0.55	78.9	2.3
27	37.9	4.28	18.7	0.54	89.9	7.7
28	25.5	2.66	15.2	0.26	91.5	4.4
29	9.0	4.74	22.6	0.59	89.8	2.5
30		No Operation				
31		No Operation				
JUNE						
1	19.8	2.41	17.24	0.92	60.8	1.7
2	34.4	2.79	16.12	0.47	85.6	5.0
3		No Operation				
4	32.0	1.66	17.0	0.34	78.7	3.77
5	28.0	2.66	22.5	0.49	79.7	3.0
6	27.5	2.90	20.4	0.38	88.5	3.40
7	31.9	3.24	20.6	0.50	92.8	4.60
8	31.5	3.21	24.2	0.82	77.0	3.17
9	30.0	3.34	28.7	0.36	82.8	2.88

June cont'd	TONS	MILL HEAD % Cu.	CONC % Cu	TAILS % Cu.	COPPER REC.	CONCENTRATES TONS
10	29.0	3.34	25.7	0.50	86.6	3.26
11	22.9	3.79	29.5	0.79	81.3	5.20
12	34.5	3.95	28.8	1.16	73.6	3.48
13	17.0	4.52	28.6	0.45	91.5	3.92
14	29.0	4.06	27.6	0.38	91.9	3.92
15	14.0	4.58	24.7	0.35	93.7	2.43
16	27.8	4.68	27.2	0.18	96.8	4.63
17	30.0	4.37	28.4	0.24	95.3	4.40
18	29.5	3.68	25.7	0.20	95.3	4.02
19	31.3	3.97	26.87	0.21	95.5	4.42
20	28.5	3.62	26.7	0.19	95.4	3.69
21	30.4	4.05	25.9	0.27	94.3	4.48
22	29.1	3.52	17.4	0.21	95.2	5.60
23	30.1	4.01	24.1	0.26	94.6	4.75
	1076.9	156.77	995.3	17.13	4038.0	157.7

AVERAGE RESULTS

23.90	Tons average tonnage
3.48	Average percent copper mill feed
22.10	Average assay of concentrates, % copper
0.38	Average assay of tailings, % copper
89.70	Average percent copper recovered
3.50	Average number tons concentrate
6.80	Average ratio of concentration

Note: The mill was run only part time which accounts for low tonnage.

The above assay analysis of 3.48% copper is a fair criterion of the grade of ore encountered in this vein.

The gold vein already referred to has been mined down to approximately 30 feet below the present main level. It is officially reported to have produced $40,000.00 in gold. More work should be done on this vein in order to determine its extent and value.

The Ten Spot Vein, together with the Storm Cloud, appear to be the two strongest veins on the entire property. The Ten Spot surface indications show it to be a wider and stronger vein, apparently, than the Storm Cloud Vein. It has been developed, according to the survey map of the underground workings on the Senator Mine, for some 750 feet in length. The nearest breast of this vein toward the Ten Spot shaft is some 900 feet from the boundary line of the Storm Cloud group. It is reported that the Ten Spot vein is from 40 to 60 feet in width on the Senator property. This appears to be true, for the surface shows the vein to be a very wide highly mineralized vein. Con-

siderable work has been done recently by leasors on this vein, and direct shipping gold ore has been mined and shipped this season. Five surface samples on the Ten Spot Vein were taken just south of the Bugle Claim line. The following results show very good gold and silver content on three of the samples taken:

NO.	WIDTH	LOCATION	OZ. AU.	OZ. AG.	VALUE
1	4 ft.	Near South tunnel	0.08	1.50	$ 2.50
2	3 ft.	200 ft. No. of #1	0.50	16.67	20.02
3	2 ft.	100 ft. No. of #2	0.17	17.90	14.14
4		200 ft. No. of #3	0.37	01.40	8.24
5	7 ft.	General N. of #4	0.16	00.60	3.25

The Galena Vein runs parallel to the Ten Spot and as stated before, has been crosscut by a level at the eighty foot station in the shaft, also by a shallow tunnel and the vein followed some distance. Further development on this lead vein may develop sufficient tonnage to warrant milling.

PRESENT DEVELOPMENT

The maps of the Storm Cloud show how much work has been done on the gold vein and on the Storm Cloud copper vein. The shaft has been sunk to 150 feet below the present vein or second level. A new level has been started 100 feet below and is called the third level.

Drifting along the vein has been started both to the North and South on this level, and stoping of ore between the two levels will commence as soon as the development and drifts are driven in a little distance from the shaft. There is without doubt, a very large prospective tonnage between this second level and surface to the South. There is the area between the second and third levels, or 100 feet in vertical height, and from the portal of the tunnel inward 700 feet in length that will produce a large tonnage of milling ore. Some diamond drilling has been done. The following attached sheets show the classification and results. The small amount of drilling done is no criterion as to the value of the ore body and too much credence should not be placed on the results obtained.

CLASSIFICATION

DRILL HOLE NO. ONE

Dip 30 Degrees

FEET From	To	Oz.Au.	Oz.Ag.	% Cu.	REMARKS
3	23				Albite Diorite
23	32.5				Lime Vein
32.5	34.5	.0	Tr.	.04	Porphyritic
34.5	37	.0	.0	.16	Iron Porphyry
37	38				Vein Casing
38	39				Pyritic Schist
39	39.5	Tr.	.2	.45	Pyritic Schist
39.5	41				Pyritic Schist
41	42	Tr.	.2	.12	Pyritic Schist
42	47				Fe Porphyry
47	50	Tr.	.8	1.64	Ore
50	51				Pyritic Schist
51	51.5				Fe Porphyry
51.5	52.5				Pyritic Schist
52.5	54	.01	.4	1.00	Ore
54	59	.01	1.0	1.89	Ore
59	61	.01	1.8	3.08	Ore
61	65	Tr.	.2	.41	Mineralized porphyry
65	68				Altered Schist
68	75				Porphyry
75-	91				Porphyry
81	94				Lime Vein
94	95	Tr.	.3	.28	Altered Schist
95	99				Altered Schist
99	100	.0	Tr.	.06	Altered Schist
100	104				Glossy Porphyry
104	110	.02	.1		Conglomerate
110	121				Pyritic Schist
121	127				Pyritic Schist
127	128	.03	.1		Small Vein
128	129				Schist
129	130	.02	.9		Schist
130	140				Schist
140	142	.02	.1		Schist
142	145				Silicified Schist
145	146				Ore Stringer
146	147				Schist
147	155				Silicified Schist
155	156	.02	.9		Mineralized Schist
156	164				Mineralized Schist
164	166	.01	.1		Mineralized Schist
166	178				Diorite
178	213				Schist

DRILL HOLE NO. TWO

Dip 60 Degrees

0	88				Porphyry
88	89	.06	.6	1.18	Vein Matter
89	90				Vein Matter
90	91	Tr.	.2	.20	Vein Matter
991	97	.06	5.8	1.28	Vein Matter

DRILL HOLE NO. TWO, cont'd.

FEET From	To	Oz.Au.	Oz.Ag.	%Cu.	REMARKS
97	102	Tr.	Tr.	.06	Vein Matter
102	103				Porphyry
103	107.5	Tr.	.1	.32	Vein Matter
107.5	109				Mineralized schist.
109	111				Porphyry
111	114	Tr.	.2	.45	Vein Matter
114	117	.01	.6	.28	Vein Matter
117	127				Porphyry

CLASSIFICATION

DRILL HOLES NO. FOUR

Dip 50 Degrees

FEET From	To	Oz. Au.	Oz.Ag.	%Cu.	REMARKS
0	69				Rhyolite (Limey)
69	72				Mixed
72	78				Porphyry
78	82	.01	.4	.61	Vein Matter
82	96				Schist
96	97	Tr.	.4	2.05	Vein Matter
97	101				Min. Schist
101	104	.01	.1	.12	Vein Matter
104	107	Tr.	.1	.28	Vein Matter
107	111	Tr.	.1	.49	Vein Matter
111	115				Min. Schist
115	116	Tr.	.1	.12	Schist & Popphyry
116	127				Rhyolite.

WATER

The quantity of water is always a serious question in most places in Arizona. At the present time the mine and mill are being operated sixteen hours per day without any trouble. I believe ample water can be developed to supply the mine and mill through any dry season, whereas during the wet season there is plenty of water.

POWER

There is at present one Holt engine and one W.S.M. gas eliminator engine, each connected to a compressor to furnish air for mining and pumping. The mill is operated by a Western type full deisel engine. The deep shaft pump on the Ten Spot Shaft is run by a gasoline engine.

Electric power can be delivered here on the property for a total cost of $4750.00 and this amount will be refunded by the power company at the rate of fifteen percent of the cost of the power consumed on that line.

EQUIPMENT

The mine is fairly well equipped for exploration and also for milling up to fifty tons daily capacity. Enough electricity is generated for both surface and underground use. The compressors furnish approximately 500 cubic feet free air per minute. The underground hoist used for hoisting between the second and third levels is large enough for prospecting. The drilling equipment together with track and cars, etc. is ample for the capacity of the mill.

CONCENTRATION:

A fifty ton flotation mill has been erected and is in steady operation. The mill results show that the ores are readily concentrated. The preceding data on the mill feed and concentration shows that copper concentrate of 22.1 percent was averaged during that period from a 3.48 percent copper feed, with a concentration ratio of 6.8 of crude ore to one ton of concentrate. The average recovery was 89.7 percent which would have been higher but the water used came from one of the shafts which had not been pumped out for years, and was very detrimental to the action of the flotation reagents. It was highly acidic which has considerable bearing on the results obtained. Without question, better than 92 percent recovery can be maintained.

It is planned, if electric power is put in, to move the present mill up to the portal of the tunnel which will be highly advantageous, as it will cut out the cost of hauling crude ore from the tunnel to the mill, and thereby make a saving of fifty cents per ton crude ore.

SMELTING:

At the present writing the Storm Cloud concentrates are sold under the usual smelter rates, namely: 2.5 cents is deducted from the daily current price of copper for that date and is supposed to be to cover cost of refining, marketing, and shipping of bullion, and 85% of the copper in the concentrates is paid for under that price. However, this is unusual & it is probable that a little better rate could be obtained by entering into a yearly contract with the smelter. Following is a table showing the results of the last smelter returns:

DATE 1928	%Cu.	Oz.Au.	Oz.Ag.	TONS	VALUE PER TON	TOTAL VALUE LESS FREIGHT
Mar.						
4	25.48	0.17	12.60	26.47	$ 61.80	$ 1275.01
21	23.90	0.15	12.80	28.25	28.52	1284.05
Apr.						
10	24.64	0.20	37.20	30.82	73.95	1786.99
20	20.90	0.16	21.00	34.62	56.81	1520.07
May						
2	18.20	0.14	14.20	37.39	46.68	1338.24
7	17.10	0.15	11.80	20.91	43.40	1031.79
18	15.10	0.11	11.50	35.05	38.27	1013.96
June						
6	17.10	0.14	13.50	36.88	45.93	1294.95
	162.42	1.22	134.60	260.39	425.36	10545.06
Aver-ages	20.30	0.15	16.82	32.55	53.17	1318.13

COSTS

In making out a cost statement I have conservatively estimated what the mine and mill should be able to do on a basis of 100 tons per day. In doing this, however, I have in mind that the mine will be further advanced on development and eletric power installed.

Mine Supplies complete	.95	
Mill Supplies complete	.50	
Cost per ton		1.45
Mine labor charge	120.30	
Mill Labor charge	57.50	
Cost per 100 tons	177.80	
Cost per ton		1.78
Smelting 4% copper per ton		2.75

TOTAL ESTIMATED COSTS

MINE

Supplies	.95	
Labor	1.20	
Total per ton	2.15	
Daily cost per 100 tons		215.00

MILL

Supplies	.50	
Labor	.58	
Total per ton	1.08	
Daily cost per 100 tons		107.50

TOTAL COSTS

Mine - per ton	2.15
Mill - Per ton	1.08
Smelting per ton	2.75
Cost per ton crude ore	5.98

I believe that under an average management the above cost of $5.98 per ton crude ore for mining, milling and smelting can be approximated very closely.

PROPOSED DEVELOPMENT

It would be well to drive the new level to the North and South. There may be barren places but raises put in should strike ore directly above this level. The raises should be put in and stopes started. I suggest, however, it is best to drive the second level or main level drift on the South as fast as possible. This drift can still be driven approximately 700 feet before coming to the end line of the property, and there should be enough tonnage between there and surface to operate a 100 ton mill along period of time.

There is an unexplored area of 1600 feet on the Storm Cloud vein to the North and should be just as productive as the rest of the vein. A series of short diamond drill holes approximately 75 feet apart, drilled along the strike, crosscutting the vein about 100 feet in kepth, will conclusively prove up the vein. With the idea of mining to the North it might be advisable to clean out the old shaft located near the compressor house, and sink down to the 100 foot level and drift to the North and South from that point.

It would also be well to complete the diamond drilling for the first eight holes as was planned to explore below the present main level. If any deep drilling seems advisable, I would suggest this be confined to the crosscut from the bottom of the shaft, and two holes put down, one cutting 150 feet below, that level and one cutting the vein 250 feet below that level. This would prove whether the pyritic gangue of the vein had been replaced by copper and whether a second ore horizon existed. Diamond drilling can be done in this vicinity for approximately $3.10 per foot plus the cost of producing compressed air, and is really the cheapest and quickest way to prospect ahead of any tunnel or mining work. A study of all successful mining companies will show that they are either using the diamond drill or the long hole method for all of their preliminary prospecting.

CONCLUSION

CONCLUSION

In making this report on the Storm Cloud Mine, I have had in mind the possible future of the property, and I feel it is an inopportune time to make a report. In fact, I am certain with drilling confined to the Storm Cloud vein alone, between surface and 200 feet in depth for its entire length, that the property will appear far more attractive to a mining investor than it does now. In other words, it needs more development laid out in advance and carried out in a systematic manner.

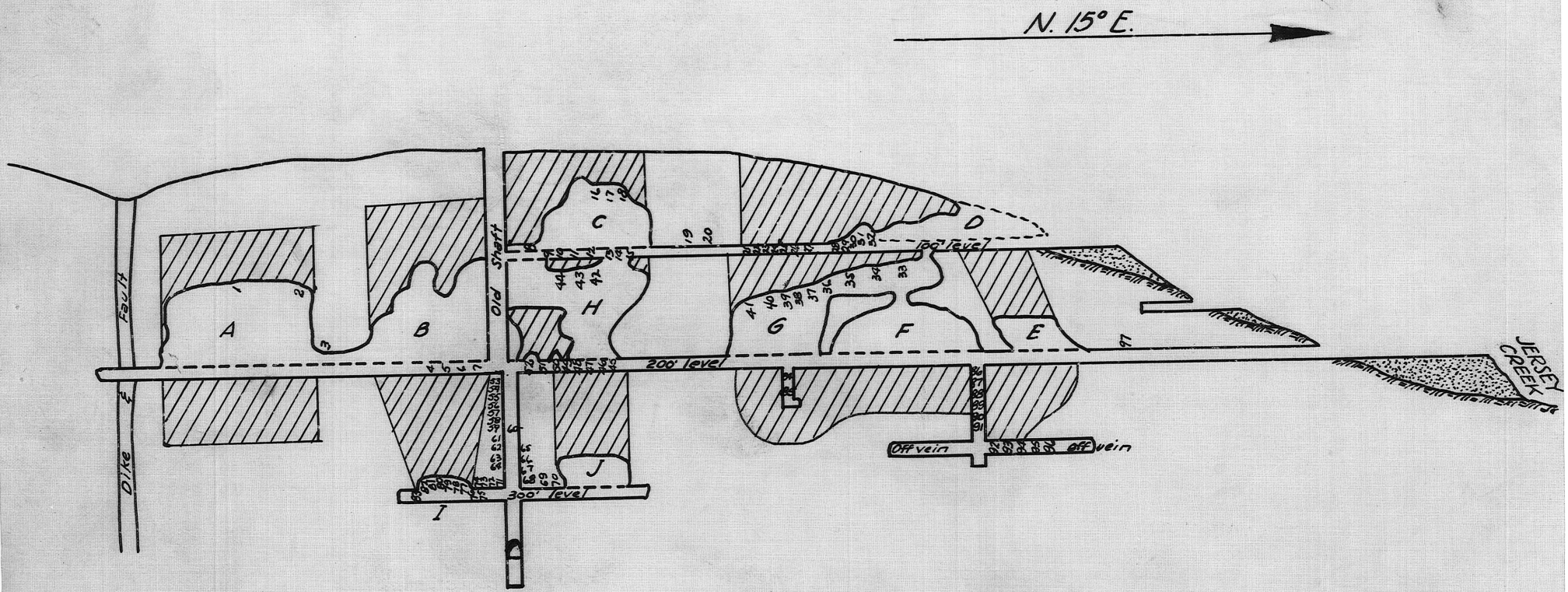
The copper vein is without question the best productive vein on the entire property, although the Ten Spot vein looks very attractive due to its width and continuance. The stopes in the copper vein show up a beautiful body of copper ore. It requires further exploration to prove the tonnage and the grade of copper ore in this vein, and believe it can be made to average as high as the average mill run mentioned previously in this report. The Storm Cloud vein looks very promising and will show a development of ore for its entire length, varying in grade, and I strongly recommend again that exploration for the time being be confined entirely to this vein. I believe the most economical and commercial ore will be derived from the Storm Cloud vein above the horizon 225 feet in depth below surface for its entire length of 3200 feet. It is highly probable that the ore found below that horizon will be very pyritic. The property is very nicely situated to carry on mining at a low cost and within a short distance of some of the biggest producers in the United States.

Respectfully submitted,

(Signed) Frank A. Kennedy.

Mining Engineer,
Boise, Idaho.

June 25, 1928.



LONGITUDINAL SECTION OF STORM CLOUD MINE SHOWING SAMPLE LOCATIONS

0 20' 60' 120' 240'

14092

Yavapai County

8

May 27, 1957

STORM CLOUD MINE YAVAPAI COUNTY

This property inactive.

MARK GEMMILL

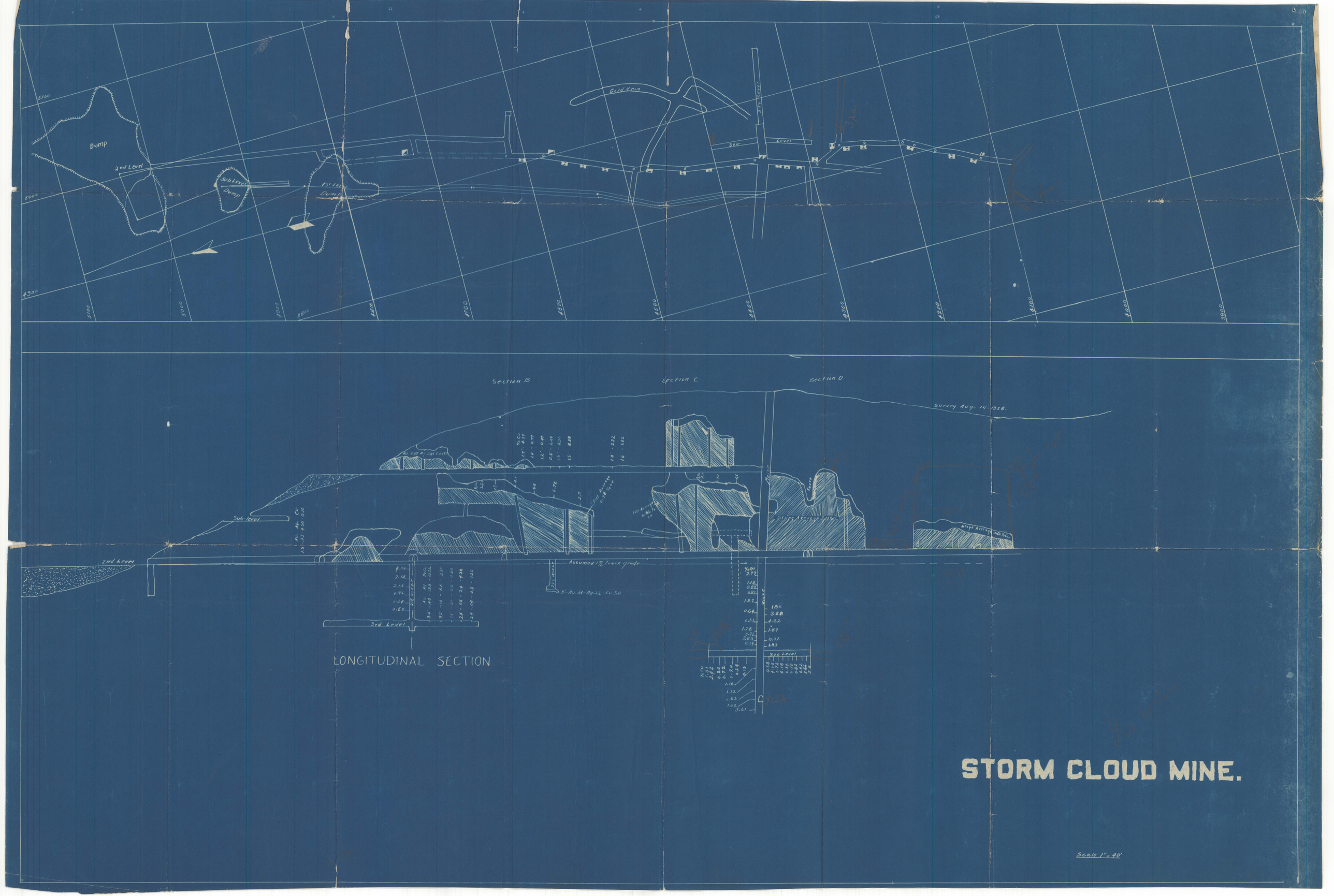
See; U.S.G.S. Bulletin #782 pp 122/123, 46,48

See: Production Possibilities of the Marginal Copper Mines in Arizona, 1941, p. 87, 88, 89.

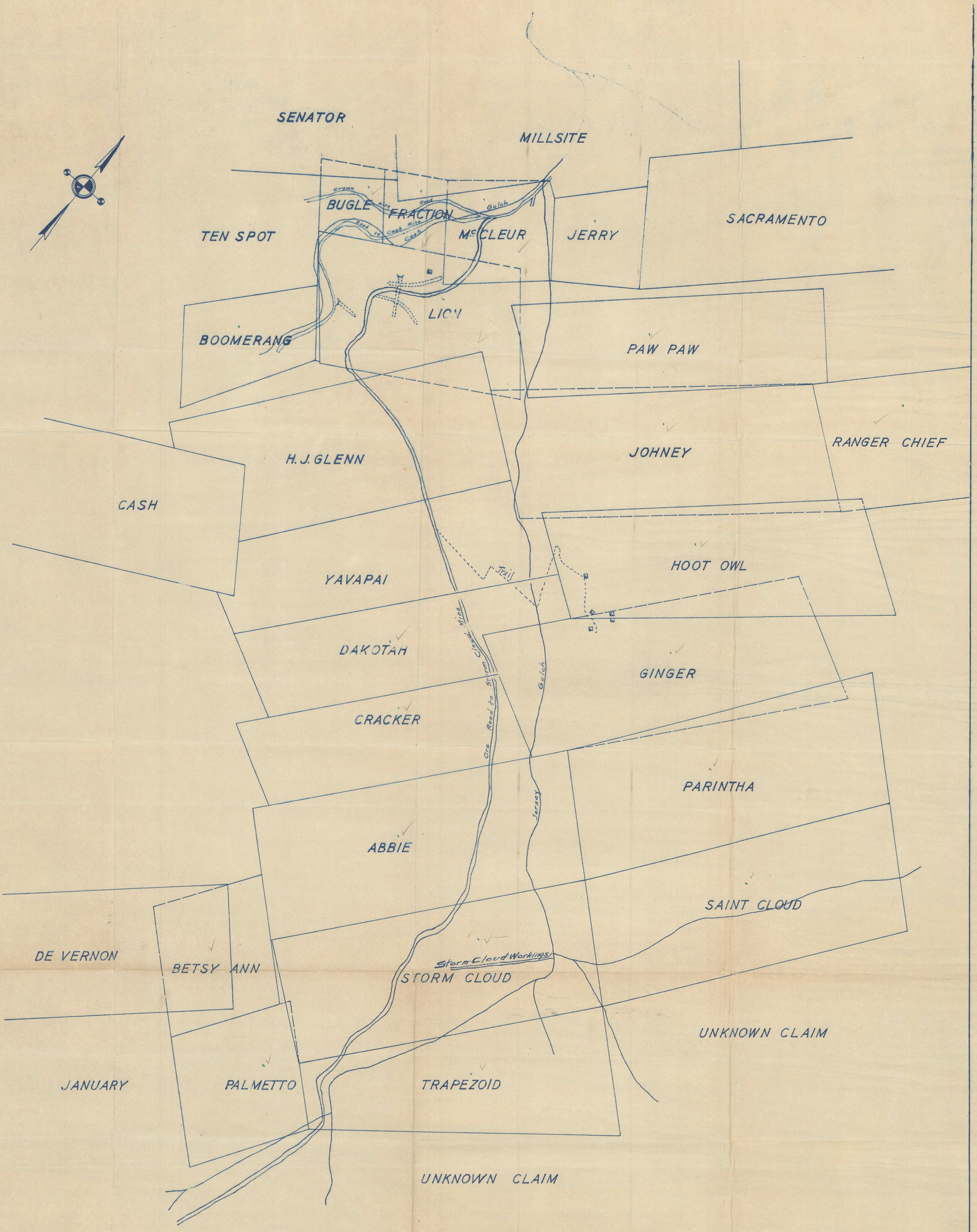
See: A.B.M. BULL. #140 p. 101

Ariz. Mng. Journal, June, 1918, p. 44

See Lost Oro claim (file)
11/25/64



STORM CLOUD MINE.



PLAT
OF
STORM CLOUD GROUP OF CLAIMS
YAVAPAI COUNTY ARIZONA

Scale: 1 inch = 200 Feet