CONTACT INFORMATION
Mining Records Curator
Arizona Geological Survey
3550 N. Central Ave, 2nd floor
Phoenix, AZ, 85012
602-771-1601
http://www.azgs.az.gov
inquiries@azgs.az.gov

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REPORT ON THE GROWLER MINE OWNED BY COLONIAL COPPER COMPANY

FREDERICK E. SMALL, M. E.

THE GROWLER MINE

The Growler Mine consists of 26 patented mining claims,comprising about 500 acres. The property contains rich deposits of copper,gold and silver.

LOCATION

The property is located about 60 mi.a little west of south of Gila Bend,a station on the Southern Pacific R.R.,in the Growler Mining District, Pima Co.,Ariz. Names of claims belonging to this group are as follows,viz.: Thrush,America,Hawk,Munroe,Lincoln,Daisy,Copper Flat,Copper Hill,Palo Verde, Washington,Madison,Tuesday,Maggie,Yellow Hammer,Blue Bird,Gila,Liberty,Butte, Arizona,Boston,Growler,Portland,Advance,Quail,Wednesday,Treasury.(See Plate I.)

TOPOGRAPHY

The country in the main bears a rounded,undulating aspect,with many steep hills,chiefly limestone and dioritic,of great prominence,yet in every instance easy of approach. The property runs in a northerly and southerly direction. The elevation of the property is about 1,450 ft.above the sea level. A good wagon road runs from Gila Bend to and across the property. Its topography insures operating on an economical basis.

GEOLOGY

Briefly,the country rock inclosing the veins,as well as the surrounding region,is composed of limestone,diorite and diabase;in instances in massive dykes;more frequently schistose and highly metamorphosed. In this rock alteration and leaching have proceeded to an enormous extent. Adjacent to the vein system,the transition is very great,in fact so much that the ferro-magnesian minerals have to a great extent disappeared,leaving cellular spongy or gossan masses,containing much iron sesquioxides,as a result of oxidation. In other instances the limestone and diabase schist has been heavily kaolinized,at times stained with chlorite minerals,often containing limestone. Throughout the diabase occur intrusions of diorite and dioritic porphyry,unaltered,save when neighboring the veins.

Dykes of trachyte and diorite traverse the formation, demonstrating the most favorable conditions for the existence of extensive ore bodies. There is one tremendous body of vein matter with an average width of about 3,000 ft., carrying fair values in copper, gold, silver and iron, traversing the entire length of the property, and can be traced for many miles beyond the boundary line of the Growler Mine both north and south, parallel with a lime contact for the west wall, with altered granite and schist for the east wall. In the vein matter various forms of copper ore exists, the ore bodies appearing at and above the surface of the ground. In various shafts on the property the ore body goes down with a dip of about 65 degrees to the west, and the vein matter shows increased value as depth is attained.

NATURE AND OCCURRENCE OF THE ORE

The copper ore occurs at the contact between stratified limestone and an extensive plutonic dyke of porphyritic rock, allied to granite, which, rising below and partly through the limestone, caused its impregnation with copper ore and the formation of garnet rock at and near the contact through which the ore is distributed. Beds of limestone, with some layers of shale, are seen to lie upon the uneven surface of the porphyry dyke, and dip westward into the lime contact, while presenting bluff edges and cliffs to the eastward. The copper ore is developed, not only at the immediate contact of the limestone and the dyke, but irregularly upwards in different beds and layers. This permits of many points of attack in mining, not alone along the face of the cliffs, but in the side ravines and arroyos.

The cliff formation is due primarily to an extensive volcanic force. The length of the croppings of ore along the scarped cliffs is greatly extended by the irregular outline along the arroyos, thus giving opportunities to follow and trace the veins the entire length of the property. Access to the ore is secured all along the croppings, and also by shafts, tunnels, and open cuts on each and every claim in the group.

MINERALOGY AND ORES

The ore in the Growler Mine consists of silicates and lime diorites, carrying copper in carbonates, oxides, native, glance, chrysacolla, malachite,

azurite,chalcopyrite,sulphides,bornite and cuprite. The ore also carries in conjunction with copper,gold,silver,iron,lime and sulphur. Assays show as follows:

Copper	.1 to 45.3%
Gold	0.12 " 2 oz.
Silver	0.6 " 62 "
Iron	16 " 74%
Lime	22 " 84%
Sulphur	8 " 22%

The ores are associated with iron pyrites,and in a gangue or matrix of lime garnet. There are also accompanying pockets and seams of oxidized ores,such as green and blue carbonates of copper,and sulphate of copper. All these are the results of oxidation of the pyrites,and are deposited from the sulphatic solutions,which,trickling down and coming into contact with the soluble limestone,are precipitated. These oxidized ores are valuable, not only for their high percentage of copper,but to add to the sulphide ores to make a good smelting mixture.

GENERAL CHARACTERISTIC OF VEINS

The veins are due to a great fracture along the stratification of the limestone and schist. After the fissuring took place a movement of the mass constituting the hanging wall occurred. The movement was to the south,as shown by the deflection of the strata of the footwall for a few feet beyond its boundary line. In this movement zones of crushed material resulted,which later,through pressure,became banded,yet full of seams and cross-joints. Here was a most favorable seat for the desposition of large ore bodies,and when it is considered that this fissuring,as already stated, was with the stratification,the drainage offered to circulating waters mineral bearing,flowing towards and into the fissue,must have been very great.

The vein filling matter consists of kaolinized materials,containing much iron sesquioxide,particularly as depth is gained,talco substances, quartz,garnet,jasper,copper,gold and silver. In the lower workings large masses of cellular quartz and jasper,containing much spongy iron oxides and particles of copper oxides,carbonates and native copper,tend to illustrate

the assurance that large bodies of copper will result at and below the region of the ebb and flow of waters, sulphides already appearing.

QUANTITY OF ORE

It is certain that the ore exists in large quantity. The workings demonstrate this. There is every reason to believe that it extends the width and length of the entire property, and extends northward into and under the hills as far as the contact of the two classes of rock extends, and the same to the south. This is indefinite, but a great distance. Such intrusive dykes are known to extend for miles. The limestone strata certainly does not so extend in this case, and can be followed the entire length of the Growler Range of Mountains. There is good reason to expect that a great change in the nature of the ores and in their average grade and percentage of copper will occur, as the mine is developed and extended downward into the bowels of the earth. There are doubtless local variations of amount and of quantity, and richer bodies may be encountered at any time. When depth is reached and the workings get beyond the influence of surface waters and the access of air, there will be less decomposition of the sulphides and less oxidized ore, but experiemce shows that oxidation often occurs at great depth from the surface, far beyond the supposed reach of the oxidizing influences. In this case the best evidence of what to expect in the future, is what has been found in the past. It may be added that the position of the contact surfances, by their gradual inclination inwards under the mountains, is favorable to the deposition of ore from solutions which may accumulate in descending the general slope of the mountains.

DEVELOPMENT

The development consists of shafts sunk in the vein matter. Copper Hill shaft is 256 ft. in depth, and cuts ore all the way down. Copper shows in the form of sulphides, chalcopyrite, bornite, malachite and native copper. At the 100 ft. level 3 drifts were driven north, east and south, 40 ft. each, with an average assay value of gold, 0.01 oz., silver 0.20 oz., copper 8.76%. The shaft from the surface down to the 202 ft. level is 4 x 7 ft. in the clear, but is widened at the 202 ft. level to 4 x 7½. The ore in the bottom of the

shaft showed an average value in gold of 0.91 oz.,copper 6.36%. This shaft is equipped with 2 boilers,1 of 60 h.p. and the other 70 h.p.,a 70 h.p. hoist,1 #7 Cameron cump,1 4 x 6 stationary pump,1 small boiler feed pump,a blacksmith's outfit,2 1,000 gallon tanks,1 Ingersoll-Rand air compressor, a 2¼" 2-drill machine,and 1 regular drill Ingersoll-Rand,and 50 drills for the same. Also 2 buckets,1 6 cu.ft.and 1 9 cu.ft.,1 torpedo water bucket of 120 gals. The most of the shaft is well timbered,but in some of the upper working levels the laggings have been taken out,which should be replaced. This shaft should be sunk to the 1,000 ft.level,and from the work already done on it,it shows that between the 600 and 1,000 ft.level a large,heavy body of ore will be opened up. There is also in close proximity to this shaft on the Copper Hill claim,a tunnel,which has been driven into the heavy iron gossan capping for a distance of 135 ft. 75 ft.from the mouth of the tunnel a drift was driven southeast 47 ft. Reference is made to this tunnel on Plat II,appended to the back of this report,which is marked "Copper Hill Shaft."

To get a fair idea of this heavy iron capping,I thoroughly sampled this tunnel,taking samples at every 5 ft.along the entire length of it,and also in the southeast drift. The samples are marked "T" for the main tunnel, and " L D" for the drift,and the figures "L D,1,2,3,4,5,6,7 and 8" refer to the assays on the drift,while those marked "T,1,2,3,4,5,6,7,8,9,10,11,12,13, 14,15,16,17,18,19 and 20" refer to assays on the tunnel itself. I would state right here that all assays made upon this property for myself were made by H.H.Atkins,assayer,Mayer,Ariz.

Class	No.	Au. oz.	Ag. oz.	Cu. %
"T"	1	0.01	0.15	0.35
	2	0.01	0.10	0.25
	3	0.02	0.13	0.20
	4	0.01	-	0.20
	5	tr.	-	0.65
	6	0.02	0.21	1.86
	7	tr.	-	4.20
	8	0.02	0.30	7.35
	9	0.05	0.24	1.50
	10	0.01	0.35	3.48
	11	0.03	0.26	1.90
	12	tr.	-	0.80
	13	0.01	0.10	0.45
	14	0.02	-	1.15

Class	No.	Au. oz	Ag. oz	Cu. %
	15	0.01	0.12	0.90
	16	0.03	0.27	0.90
	17	0.04	0.15	1.10
	18	0.03	0.11	0.90
	19	0.01	-	1.40
	20	-	-	0.40
"L D"	1	tr.	-	0.10
	2	0.03	0.18	0.25
	3	0.02	0.21	1.75
	4	0.01	0.24	0.10
	5	0.04	0.08	2.58
	6	tr.	0.04	0.70
	7	0.02	0.42	3.83
	8	0.02	0.36	4.58

The above assays go to show and to absolutely prove that there are enormous values in copper contained in this property. While the assays place the average at a low value we must also take into consideration the fact that this is nothing but surface,which has been subjected to enormous leaching for ages,and it absolutely demonstrates and proves that the values are there, and by sinking the main shaft to the depth of 1,000 ft.it will prove the Growler Mine to be a big copper producer.

The other heavy workings on the property are upon the Yellow Hammer shaft,which is located on the Yellow Hammer claim,near to the east boundary of the property,the Copper Hill shaft being on the west side of the property, as shown in Plate I. The Yellow Hammer shaft,which is an incline shaft (illustrated on Plate III attached to the back of this report has been sunk to a depth of 330 ft. This has been opened up on the 85 ft.level by a drift north and south,south 85 ft.and north 80ft. Reference is made to the south drift on the plate marked "YH2," which gave an average assay value of 0.09 oz.gold,0.17 oz.silver,and 7.45% copper. The walls of the 80 ft.north drift, marked on plate III "YH1," gave an average assay value of 0.02 oz.gold,0.11 oz.silver,and 0.90% copper,while the main body of ore taken from said drift gave the average assay value of a trace of gold,0.16 oz.silver and 15.42% copper.

The shaft was sunk in ore its entire depth. At the 190 ft.level

another drift had been driven south, which gave an average assay value of 0.65 oz. gold, 0.65 oz. silver, and 3.42% copper. This drift is marked "T B A" on the Plate. At the 280-foot level a drift was driven north 25 feet, marked "T A W" on the Plate, which gave an average assay value of 0. 02 oz. gold, 0.41 oz. silver, and 5.54% copper. At the 300-foot level a drift had been driven 24 feet south and 57 feet north. The average of ore in the bottom of these two drifts, marked "Y H 30a" on the south drift, gave an average assay value of 0.39 oz. gold, 0.58 oz. silver, and 3.65% copper, while the north drift, marked "Y H 30b", gave an average assay value of 1.02 oz. gold, 0.45 oz silver, and 2.47% copper, while the bottom of the shaft at 310 feet, marked on the Plate "Y H 31s," gave the average assay value of 1.51 oz. gold, 0.76 oz. silver, and 4.91% copper.

Referring to Plate III, there are two dumps on this property at the shaft. One is marked "Dump A/X", which gave an average assay value of 0.03 oz. gold, 0.23 oz. silver, and 14.20% copper. "DUMP C/X, which is supposed to contain nothing but waste material or the dirt dump, gave an average assay value of 0.7 oz. gold, 0.31 oz. silver, and 2.36% copper. The above assays are all figured upon 2,000 pounds to the ton, and all of them have a reference, as to the ore containing so much value to each ton of ore.

The Yellow Hammer shaft is equipped with a 50 h.p. boiler and 26 h.p. hoist. The shaft is tracked from the top to the bottom, and has an ore car and a blacksmith's outfit, and a 500 gallon tank. There are also on this claim and the Copper Hill claim, 500 cords of wood.

There is on the Daisy claim a vertical shaft 100 feet deep, which shows sulphide ore in bottom. This shaft is equipped with a 15 h.p. upright boiler and 8 h.p. hoist.

Further equipment on the property: There are six canvas houses, a dining room, kitchen, grain house and a store. There are three wagons, two of 2-3/4 inch and one of 3-3/4 inch, and

six horses. Upon the other claims numerous shallow trenches, ditches and shafts, varying in depth from 10 to 100 feet, have been sunk, all of which have been thoroughly examined, and all go to show that there is a large deposit of copper lying underneath this property. In sampling, I took great care to satisfy myself that the values I obtained are under, rather than above the average values of the ore.

TIMBER AND FUEL

There is no mining timber on the property or in close proximity to it, but in the arroyos, with which this country is well blessed, is sufficient wood for all purposes for many years to come, and which can be delivered on the property at a price not to exceed $5.00 per cord.

TRANSPORTATION.

A railroad has been surveyed from Tuscon to Ajo, passing the old Gunsight Mine about seven miles northeast of the Growler Mine. This railroad is to be built for the Calumet & Arizona, who own the mines at the Ajo and have about 27,000,000 tons of demonstrated ore. The Southern-Pacific Railroad is surveying a branch line from Gila Bend to the Ajo. (The Ajo Mining Camp is only sixteen miles north of the Growler Mine.) The Rock Island survey for a railroad crosses the Growler Mine and terminates at St. George's Bay on the Gulf of California, and from the information obtained it looks as though these roads would be completed within a very short time; in fact, I am of the opinion that by the time the property is fully developed and placed upon a shipping basis, the railroads will be all completed and ready for use, as it is the intention of the railroads to have the lines in operation before the close of the year 1914.

The wagon road from Gila Bend to the property is ideal, there being but very little grade, in fact, a large part of it being almost level and over which teams can haul large loads at

all seasons of the year.

MISCELLANEOUS.

The Growler Mine has many advantages over a great many properties located in the western country, and particularly in Arizona. It has a showing, from the development that has been done, of the making of one of the great producing copper mines in the country. There is an enormous vein body crossing this property its entire length, which lies under a heavy red oxide gossan capping, and carries values that are really remarkable for a surface showing. The Growler Mine is in an advanced state of development, the Copper Hill main shaft being a vertical shaft, and is 256 feet in depth, with crosscuts at the 100-foot level, which open up the ground and show that it contains mineral values of an average that means much towards the future development of the property. In fact, the Growler Mine should be a large producer within eighteen months, with a tonnage sufficient to warrant the earning of fair profits.

CONCLUSION

Deducing evidence from the preceding, and thence reasoning from conditions as above described and as I found them on the property, I have no hesitancy whatever in recommending extensive development. Such development I know will give promising results, and extensive bodies of sulphide ore can be expected. In assembling the materials and data embodies in this report, I have made great effort to be conservative. Every figure and statement made are matters of fact and record. A thorough investigation of the entire property has been carefully made.

In view of the indications on the Growler Mine, I know there is the most solid encouragement for the investment of capital.

FREDERICK E. SMALL

Mining Engineer.

January 9th, 1914.

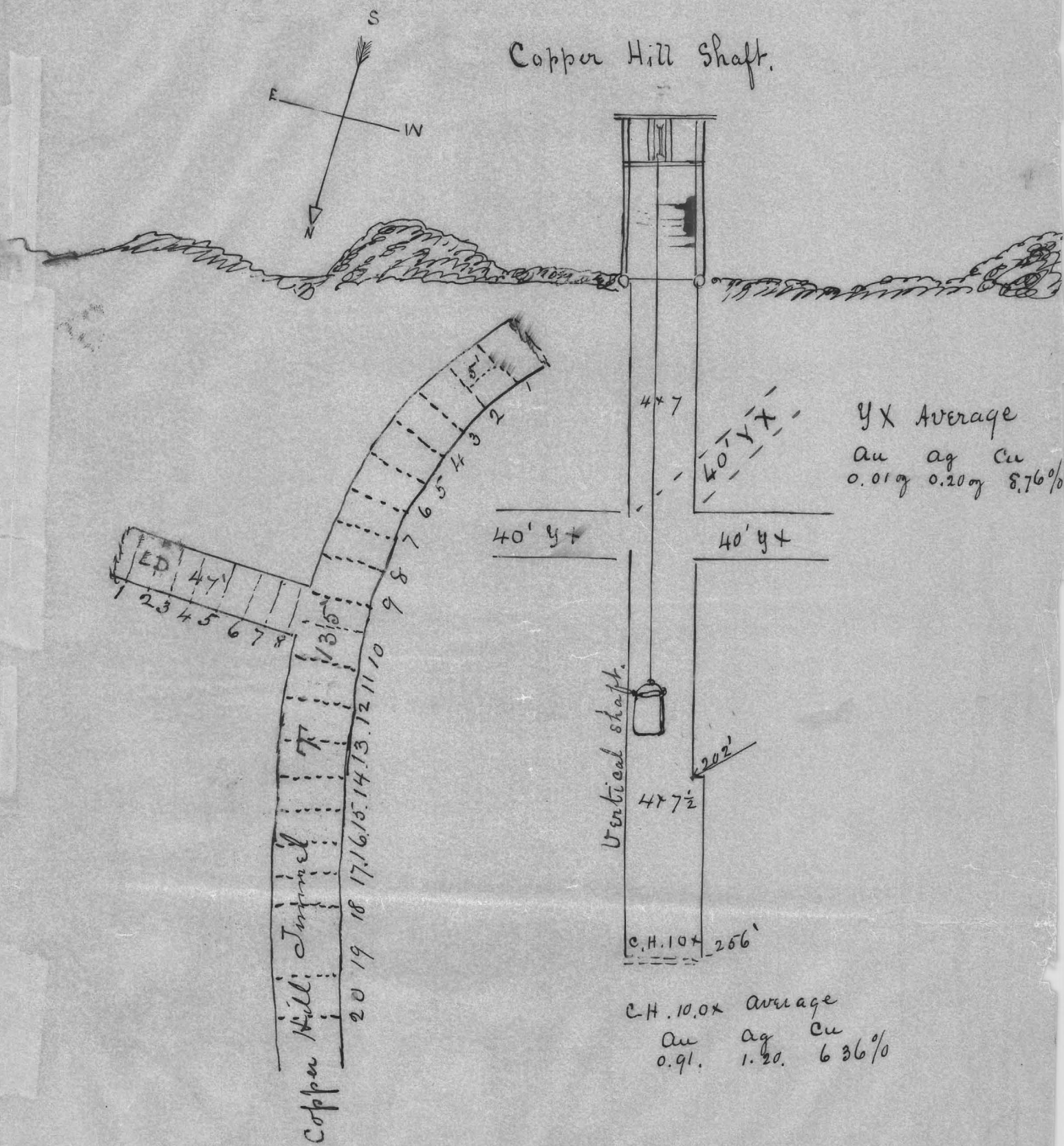
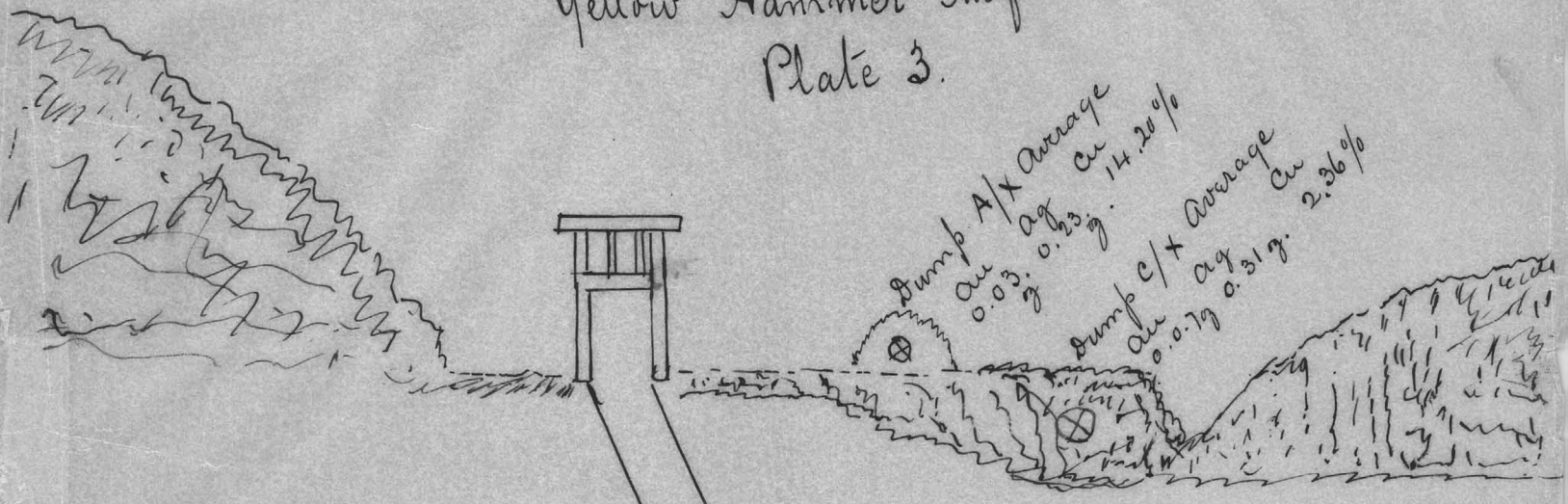

Copper Hill Shaft.
S
E
W
N
4 x 7
40' Y x
40' y +
40' y +
Y X Average
Au Ag Cu
0.01 oz 0.20 oz 8.76%
Vertical shaft.
20'
4 x 7½
C.H. 10 x 266'
C.H. 10.0 x Average
Au Ag Cu
0.91. 1.20. 6.36%
Copper Hill Tunnel
E.P.
47'
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
3½'

PLATE II

Yellow Hammer Shaft

Plate 3.



85'

85'. Y. H. 2 drift.

Average. Au 0.09 g. Ag 0.17 g. Cu 7.45%

80'. Y. H. 1. drift.

Average Walls. Au 0.02 g. Ag 0.11 g. Cu 0.90%

Average Main Body Au Ag Cu 15.42% drift

Incline Shaft.

190'

T.B.A drift 25'

Average Au 0.65 g. Ag 0.65 g. Cu 3.42%

N

E

W

S

280'

Average Au 0.02 g. Ag 0.41. Cu 5.54%

25' T A W drift

300'

Y.H. 30 A. drift 24'

Average Au 0.89 g. Ag 0.68 g. Cu 3.65%

57'. Y. H. 30 B drift

Au 1.02 g. Ag 0.85 g. Cu 2.47%

4.11 Au

310'

Cu 4.91%

Ag 0.76.

330'

Au 1.51 g

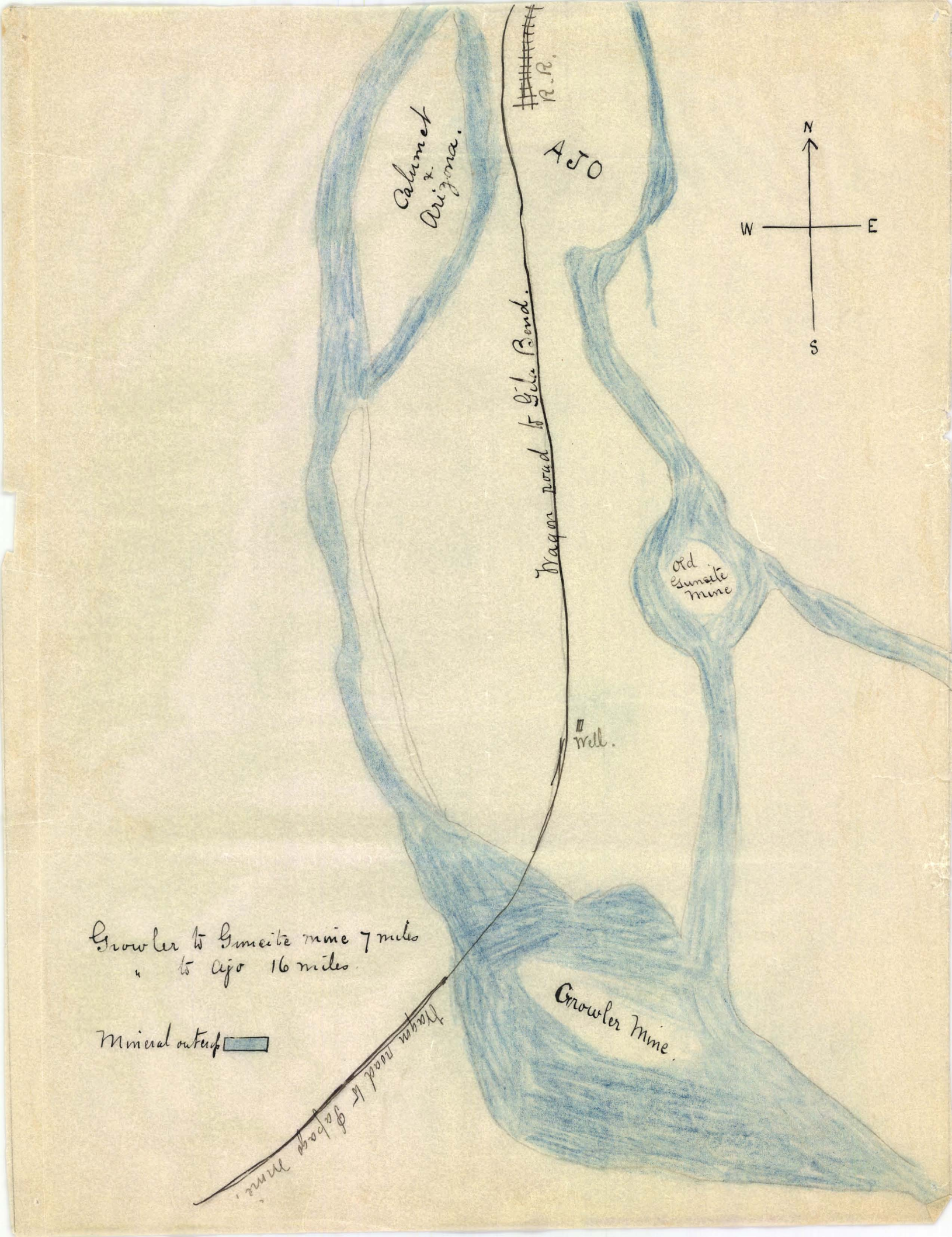
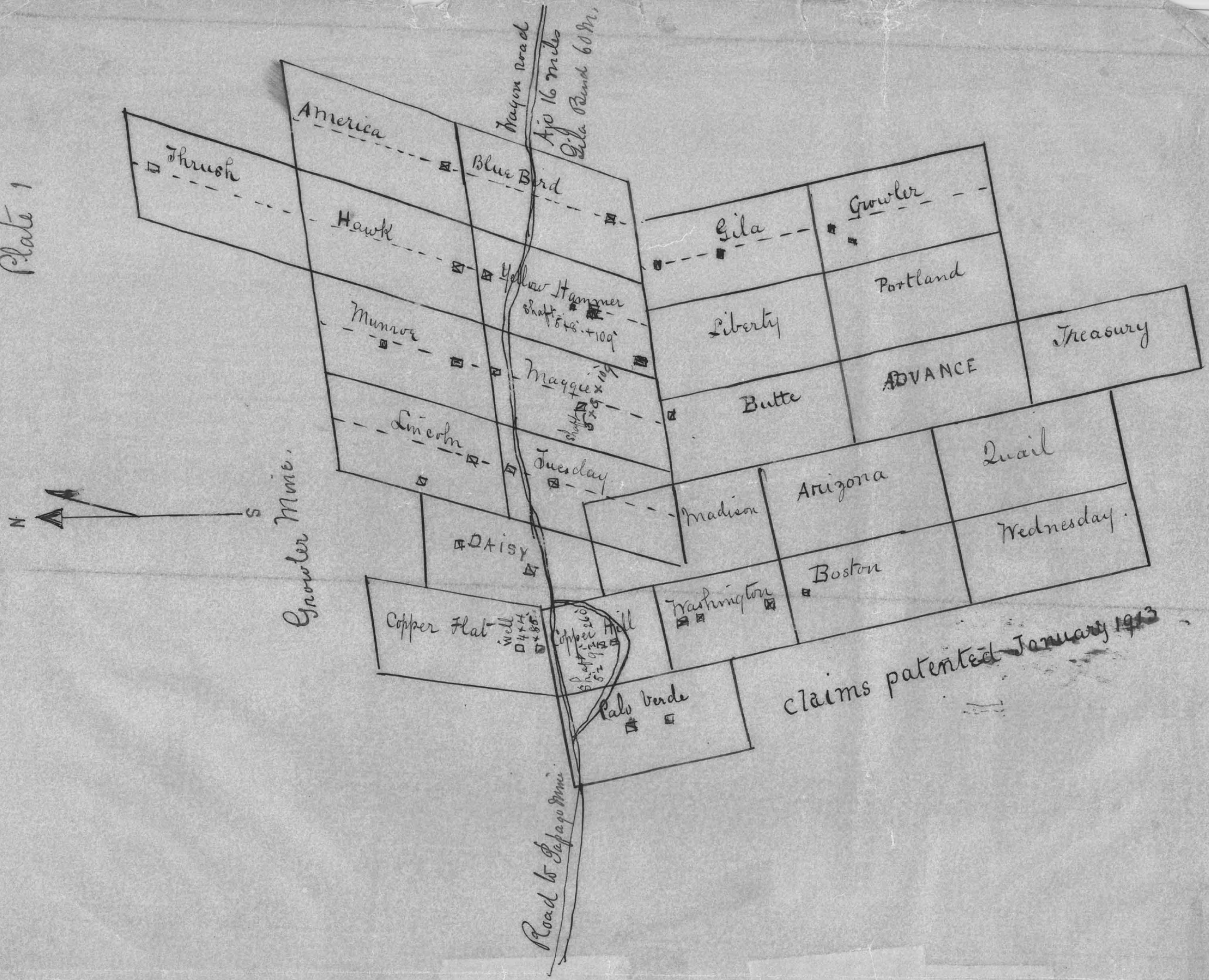

Calumet & Arizona.
A.T.S.F.
R.R.
Wagon road to Gila Bend.
N
W
E
S
Old Gunsite Mine
Well.
Growler to Gunsite mine 7 miles
" to Ajo 16 miles.
Mineral outcrop
Growler Mine.
Wagon road to Ajo

Plate 1


Wagon road
Ajo 16 miles
Gila Bend 60 m.
America
Blue Bird
Thrush
Hawk
Yellow Hammer
Shaft 6x6 +10'
Munroe
Maggie
Shaft 7x9 +10'
Lincoln
Tuesday
Daisy
Copper Flat
Well 4x4 +8'
Copper Hill
Shaft 9x12 +60'
Gila
Gowler
Portland
Liberty
Treasury
ADVANCE
Butte
Madison
Arizona
Quail
Wednesday
Boston
Washington
Palo Verde
N
S
Gowler Mine.
Road to Gila Bend
claims patented January 1913