

# Report on the Shanghai Silver-Lead Property

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Report On  
THE SHANGHAI SILVER-LEAD PROPERTY  
Mayo Mining District, Y.T.

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Report revised to date for owners'  
files from report on property  
Aug.1/60 for C.D. Poli.

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INTRODUCTION

The Mayo mining district has produced about \$150 million worth of high grade silver-lead-zinc-cadmium ore from Keno and Galena Hills, mostly from Galena Hill, since 1947.

The writer has studied the district from time to time for a few years. It now appears that the fracturing which localized the mineralization is related to a N 70°E-trending anticline up McQuesten valley; and since the mines occur in vein-faults on the south limb of the anticline, similar mineralized vein-faults on the Shanghai property on the north limb of the anticline may prove to contain similar ore.

GENERAL CONDITIONS

Location and Access

The Shanghai silver-lead property is situated on the north side of McQuesten valley across from the United Keno Hill operations about 30 miles NNW of Mayo in the Mayo mining district of Yukon. It lies 4 miles NW of the Silver King mine and can be reached by walking across the valley from the main Mayo-Elsa road, crossing McQuesten river, then climbing an old trail up the slope. A good road could be built cheaply to McQuesten

river, then a ferry or bridge and an additional three-quarter mile of trail or road would be needed.

### Topography and Overburden

The silver-lead showings occur at about 2800 feet elevation, about 600 feet above the valley floor, along a moderately steep south-facing slope. The showings occur in and near gullies or topographic breaks 20 to 50 feet deep which angle northeast up the slope. Bedrock is exposed over much of the hillside and, due to the southern exposure, only the gullies contain permafrost. Overburden rarely reaches more than a few feet to 20 feet in depth.

### Timber, Water

The entire hillside has been burned over so only sparse spruce remains in the area, but cut mine timber can be obtained from Proctor's Sawmill 5 miles across the valley.

Small streams occupying the gullies dry up in late summer but McQuesten river, some 1500 feet away at the base of the slope, provides an adequate source of good water.

### Power, Facilities

Limited power is available from the Northern Power transmission line of the Mayo-Elsa road which services United Keno Hill Mines, Mayo and Keno.

Mayo has twice-weekly plane service, direct telephone communications and year-round road connection with the "outside". Elsa has a supermarket.

### Climate

Climate, typical of central Yukon, is cool in summer and cold in winter with moderate precipitation, but presents no unusual difficulty to year-round mining. Due to its southern exposure the Shanghai property experiences an earlier breakup and less frost than the United Keno Hill operations.

### Costs

Being relatively remote and about 1850 miles from smelters, this district faces higher than average costs of

operation. Mining and milling cost about \$30 per ton of ore, and transportation to smelters costs about \$45-\$50 per ton of concentrates. However, these costs are offset by the rich silver content of the ores which give United Keno Hill a silver-lead concentrate valued at over \$400 per ton. Zinc concentrates, containing less silver, barely pay for themselves depending on conditions. For the last decade or more United Keno Hill have made handsome profits from their operations (see Canadian Mines Handbook and Financial Post Survey of Mines).

### History

From the first mining in 1913 to 1942 the district produced about \$25 million in silver-lead ore and concentrates. Since 1947, mostly under United Keno Hill, the district has produced about 125 million in silver, lead, zinc, and cadmium with net profits ranging from \$500,000 to \$2 million annually. Further exploration is proving up more ore in the district and it can be expected that production will continue for many years to come since much of the district is yet to be explored in detail.

The Shanghai property was first discovered in 1929 by Arthur Chambers and was prospected in 1929 and 1930. Several pits and trenches were dug and a shallow adit was driven, but due to drop in price of silver to 26¢ per ounce the work was abandoned. Nothing was done until 1948 when Cecil Poli restaked the property and subsequently sunk a few new pits.

Wm. Smitheringale visited the property in 1945 but without guidance and, faced with caved workings, could see very little. Powelson visited the property about 1950, optioned it, but did no work. Prior to the present report, apparently no one has spent more than a couple of hours examining the property.

### Property (see claim map)

The claims, Shanghai 1-8 inclusive, were owned outright by Cecil D. Poli of Mayo, Yukon, and in 1961 an undivided <sup>half</sup> interest was transferred to the writer, Aaro E. Aho of 4219 Lions Avenue, North Vancouver, B.C. The original 8 claims are in good standing until September 30, 1961, and in September 1961 24 new claims were staked mainly to cover additional old vein showings to the west.

## GEOLOGY AND MINERALIZATION IN THE DISTRICT

The productive mines of the district occur mainly in northeast-trending southeast-dipping tensional vein-fault systems in competent quartzites or greenstones of the south dipping Central Quartzite formation, overlain and underlain mainly by schists, on the south limb of the McQuesten anticline. The ore tends to be localized in the more massive members of this formation, particularly where vein-faults intersect or branch, where they pass upward into less competent schist or thin-bedded quartzites, and often near N-NW cross-faults.

The pattern of veins and faults in the district appears to be caused by tensional fracturing related to rise of the N 70°E-trending McQuesten anticline. (For similar fracture patterns see "Relation of Ore Deposition to Doming" by E.H. Wisser, Geol.Soc. America memoir 77, 1960).

## GEOLOGY AND MINERALIZATION ON THE SHANGHAI PROPERTY

The Shanghai property contains similar mineralized northeast breaks in similar north-dipping quartzites suggesting the same structural pattern and mineralization on the north limb of the anticline.

### Rock Formations

Rock formations exposed around the Shanghai silver-lead showings can be summarized as follows:

Top

200' or more -- massive to slabby grey quartzite with thin layers of schist (Upper Quartzite).

About 400' -- graphitic and sericitic quartz-mica schist with thin interbeds of quartzite.

200-400' -- massive to slabby quartzite with lenses of schistose greenstone and some quartz-mica and chlorite schist (Middle Quartzite). Contains one lens of schist about 200 feet thick around the showings.

About 200' -- quartz-chlorite schist and quartz-mica schist.

250' or more -- massive to slabby quartzite with layers of schist (Lower Quartzite).

Structure (see geologic plan)

The quartzites and schists have been intruded by sill-like lenses of greenstone and have been very strongly sheared with pervasive bedding-plane movement, resulting in development of schistosity, flat isoclinal drag-folds overturned to the north, and east-west wrinkle lineation parallel to the axes of the drag folds. This structural fabric is also characteristic of the productive south limb of the district and was formed under considerable depth of cover with accompanying low grade regional metamorphism of the greenschist facies.

After much of the cover had been eroded away, perhaps around Laramide time, rise of the McQuesten anticline was accompanied by longitudinal faulting (mineralized mostly by arsenopyrite veins on Keno and Galena Hills), by northeast tensional faulting (mineralized by silver-lead ore), and by north-west cross-faulting.

On the north limb of the anticline, characteristic north-east breaks and probable northwest cross-faults occur on the Shanghai property, and the known silver-lead showings occur chiefly along a zone of longitudinal fracturing between the two breaks.

The upper break is a slightly sinuous gully 20 to 50 feet deep, 20 to 100 feet wide, about 2000 feet long, striking N 45°E, and filled with quartzite rubble and muskeg through which a small stream drains out underground. On the northwest side the middle quartzite slices into the break at an acute angle and reappears on the other (southeast) side about 500 feet farther up. This indicates an apparent offset northeast on the southeast side, or southeast side up, suggesting that the structure is a normal fault related to doming of the McQuesten anticline in the same sense that vein-faults on the south limb can be related to rise of the anticline. The dip of the structure is unknown but is probably fairly steep to the northwest. Mineralization occurs in the quartzite on the northwest side but no prospect holes have been dug on this break itself. Poli reports a high lead content in water samples tested by R.Boyle of the Geological Survey of Canada, from the small seasonal stream near the lower end of the gully.

The lower break is a similar but sharper, straighter gully 20 to 100 feet deep, 20 to 100 feet wide, and about 1500 feet long, striking about N 33°E, also filled with rubble and muskeg, and lying about 1000 feet southeast of the upper break. Across the gully the base of the middle quartzite shows an offset similar in type and magnitude to that in the upper break. No mineralization was noted along the walls of the gully, nor have any prospect pits been dug in it.

The longitudinal zone of fracturing extends for about 1500 feet as a low swale 20 to 100 feet wide, striking N 60°E parallel to the trend of formations between the two breaks and

marked by several occurrences of narrow manganiferous siderite stringers with local galena and minor pyrite in places in either wall. The more prominent stringers strike N 45-50°E and dip steeply, suggesting a steeply-dipping fracture zone cutting across the formations. Several prospect pits have been dug in this swale, mainly near a prominent gap which extends over to the upper break. The dumps of most of these are overgrown but some show siderite, brecciated quartzite, and some galena. A shallow adit started by Chambers across the central part of the swale toward a mineralized section of the northwest wall was abandoned before crossing the swale. This break may possibly extend southwest down the hill through an area of moderate overburden rather than joining the upper break.

Three cross-faults are inferred from exposed fracture faces and apparent offset or discontinuity of quartzite beds.

Presence of one cross-fault is suggested by a N 45°W slickensided face which dips 60°NE on the west side of the gap, by possible offset of the quartzite to the south, and by presence of the gap. The slickensides on the south wall of the gap pitch about 55 degrees to the southeast.

Presence of a second N 35°W cross-fault to the east is strongly suggested by broken-up schist at the adit, by discontinuity of the quartzite on the north wall of the longitudinal swale, by a topographic break to the north, and by about 100 feet of apparent left lateral offset of the upper quartzite.

A third N 40°W cross-fault is suggested by topographic breaks extending across the three main breaks about a thousand feet to the northeast.

More detailed work will be necessary to establish the exact nature of faulting and relationship of the faults to one another and to the mineralization, and more mapping of other parts of the property will be required to establish the significance of other breaks, particularly around veins that occur to the west.

### Mineralization

The known mineralization consists of fracture fillings of manganiferous siderite with local concentrations of argentiferous galena and minor pyrite and chalcopyrite. Assays of the galena range from 30 oz/ton to 130 oz/ton silver with a reported high of 200 oz/ton obtained by Chambers in 1930. Picked samples of galena collected by the writer gave the following assays (note the localities in Figure 1):

LOCALITY NO.	Sample	Pb %	Ag oz/ton	Au oz/ton
1	59-8 Galena, pit near N wall .....	66.8	115.0	0.005
2	59-9 Cut near adit .....	74.4	125.7	0.005
3	59-10 22' shaft W of above .....	77.6	137.2	0.005
4	59-7 Sorted ore in old cabin, probably from adit .....	76.8	130.4	0.005

Average  $\frac{\text{oz/ton Ag}}{\% \text{ Pb}} = 1.7$

About 100 lb of galena lies sorted at the cabin, about 100 lb lie on the dumps, about a ton is reported stored inside the caved portal of the adit, and it is believed that several hundred pounds may have been shipped. All the workings are caved or inaccessible so only small stringers of galena can be seen in place, but there is no indication of any great width having been encountered other than stringers or lenses a couple of inches wide. The galena stored in the adit is said to be mainly float picked from the ground sluice above the adit and Poli reports that some of this assayed 46 oz/ton silver.

A few pieces of galena with higher than average silver content occur on the dump of a pit near the mineralized north wall of the swale in line with the adit (locality 1). A high of 165 oz/ton silver was reported by Murray Watts from a specimen of this material selected by Poli. Native silver has been reported in this galena. Presumably Chambers reported his 200 oz/ton from this locality.

Small stringers and pods of galena occur in altered schistose greenstone in an open cut on the south wall of the swale just above the adit (locality 2).

In the 22-foot shaft (locality 3), a stringer of galena was reportedly encountered part way down, the bottom was in brecciated quartzite, and a 16-foot crosscut to the northwest is reported by Poli to have struck a lens of 3 feet of barren siderite.

A shaft at the lower end of the upper gully is down 14 feet, not yet in bedrock, but pods and stringers of galena up to 2 inches wide occur in an open cut just northwest of the shaft. Poli reports an assay of 50 oz/ton silver from pieces of this material which contained 30-40% galena, which would indicate about 130-150 oz/ton silver in the pure galena.

## CONCLUSIONS

1. The Shanghai property contains competent quartzite and apparently strong breaks with characteristics similar to those of Galena Hill, and of a similar pattern.
2. The known galena assays about 120 oz/ton silver, which is lower than that mined on Galena Hill, but the variability in silver content suggests that richer sections may well occur. Some of the galena on Keno and Galena Hills themselves is also low in silver.
3. While the known mineralization is in stringers and pods, these have been encountered mainly in the walls of structures and little or nothing is known of mineralization which can be expected to occur in the structures themselves.
4. The longitudinal fracture zone has been explored only in a few pits and neither of the northeast breaks have been explored.
5. At depth the mineralized longitudinal structure should cross out of the lens of schist into the lower part of the middle quartzite.
6. The potential of the property therefore remains untested and due to favourable structural conditions commercial ore shoots may well occur.

## RECOMMENDATIONS

1. \$25,000 should be allotted to preliminary exploration of the property, to consist of:

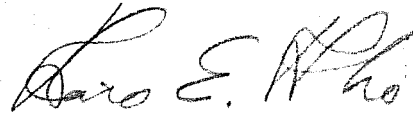
- (a) Geologic mapping, supervision, and labour (\$10,000)
- (b) Bulldozer trenching with D-8 cat with ripping tooth, and shallow shaft sinking (\$15,000).

This work should determine if the structural breaks contain mineralized sections that could prove to be ore shoots. Any encouraging vein should be sunk on for about 20 feet to determine its attitude, then decision could be made on where an exploratory adit may be justified, the extent of drifting, and the probable cost.

2. It would appear that about \$150,000 may be required for the next stage of work as follows:

Road across valley	-\$ 5,000
Say 1500' drifting @ \$60 and camp costs	- 110,000
Equipment	- 25,000
Geology & supervision	- 10,000
	<u>\$150,000</u>

A good road location can be selected to join with the Proctor road down McQuesten valley, and if equipment and supplies are taken over on the ice before breakup, say in March, a boat crossing with a packhorse up to the property should suffice for the rest of the season until underground work is begun.



Dr. A.E. Aho.

Vancouver, B.C.  
October, 1961.

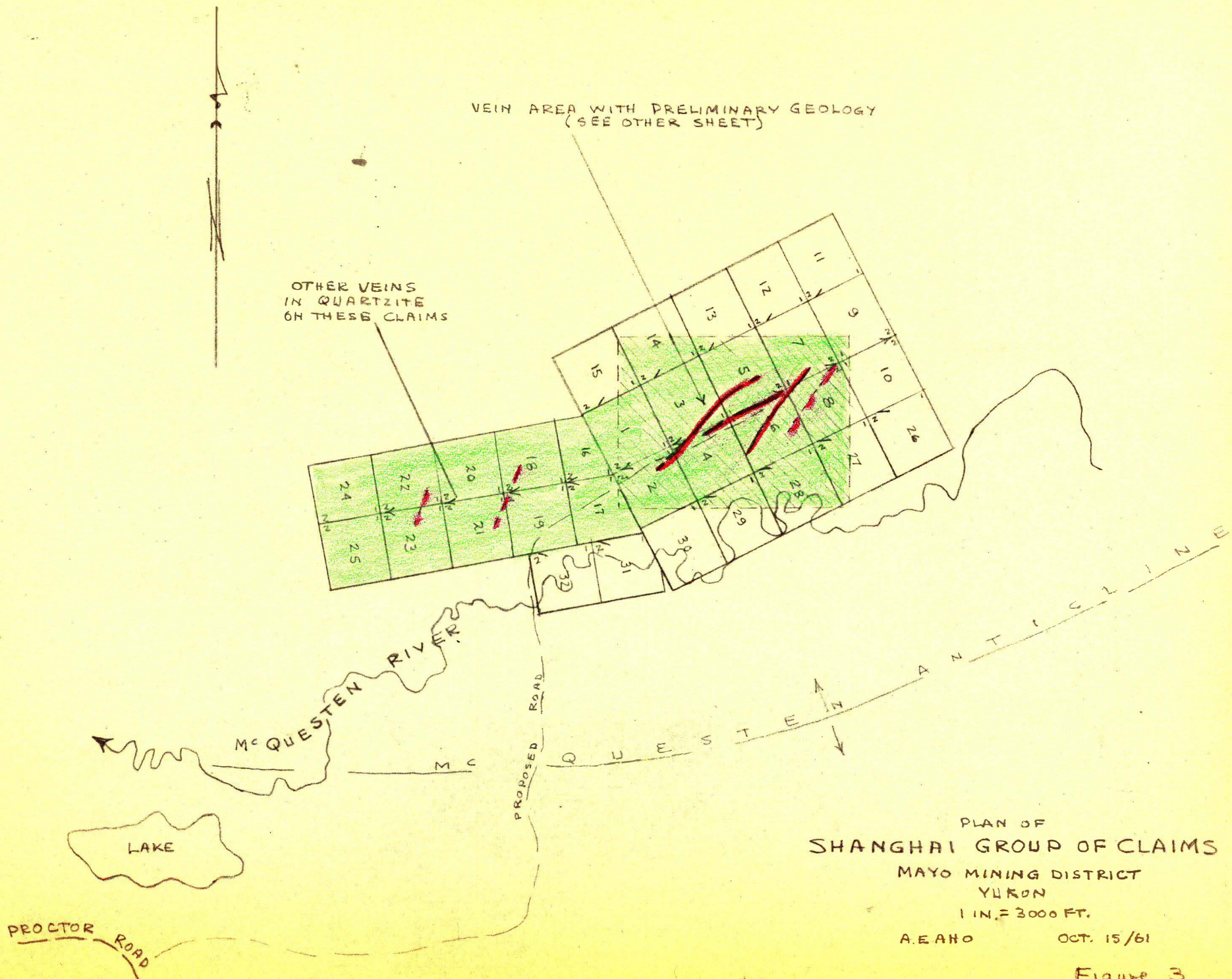
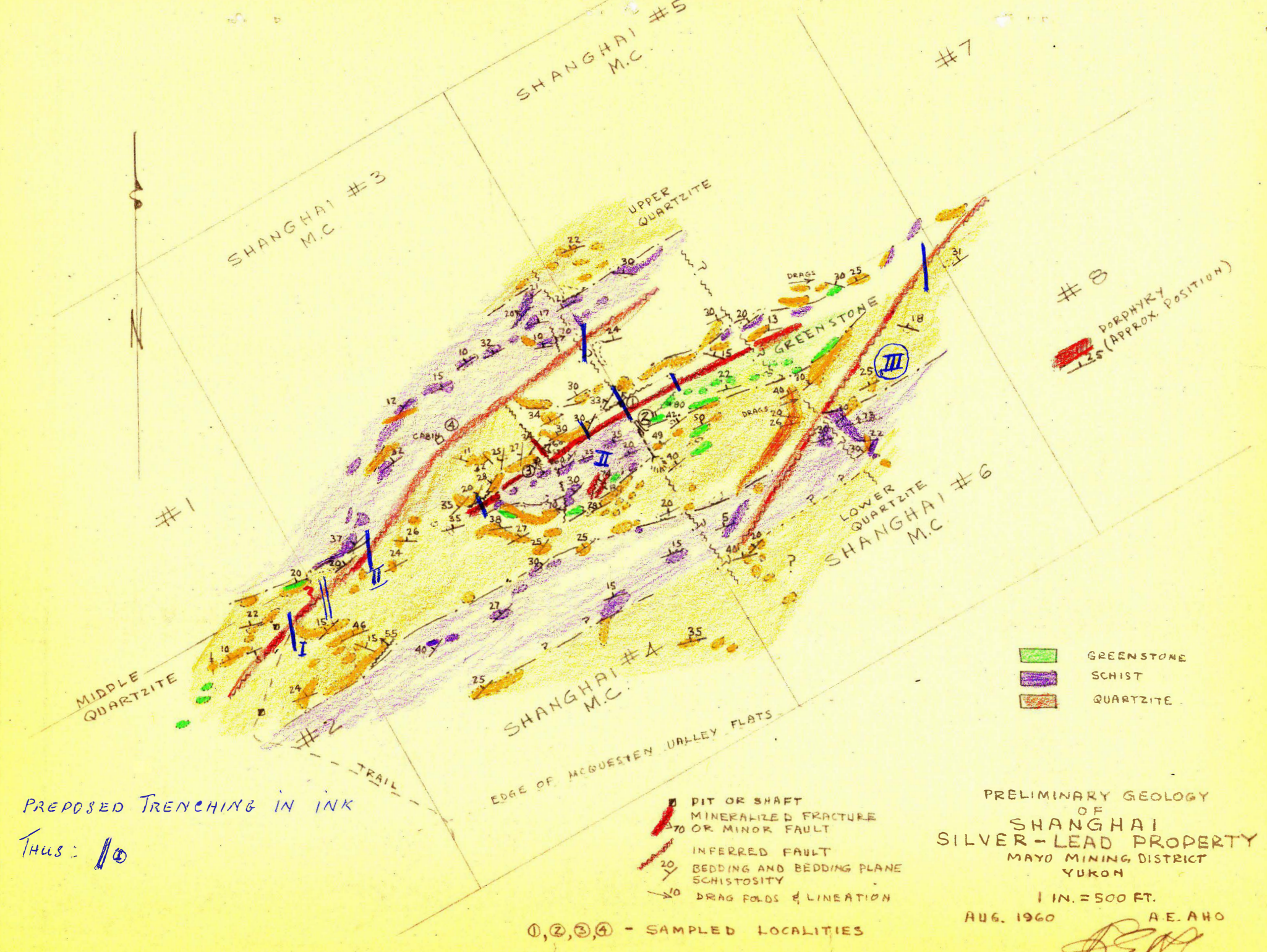


Figure 3



SHANGHAI #3  
M.C.

SHANGHAI #5  
M.C.

#7

#8  
PORPHYRY  
135 (APPROX. POSITION)

MIDDLE  
QUARTZITE

UPPER  
QUARTZITE

GREENSTONE

LOWER  
QUARTZITE  
SHANGHAI #6  
M.C.

SHANGHAI #4  
M.C.

EDGE OF MCGUISTEN VALLEY FLATS

PROPOSED TRENCHING IN INK

THUS: 10

- GREENSTONE
- SCHIST
- QUARTZITE

- PIT OR SHAFT
- MINERALIZED FRACTURE OR MINOR FAULT
- INFERRED FAULT
- BEDDING AND BEDDING PLANE SCHISTOSITY
- DRAG FOLDS & LINEATION

①, ②, ③, ④ - SAMPLED LOCALITIES

PRELIMINARY GEOLOGY  
OF  
SHANGHAI  
SILVER-LEAD PROPERTY  
MAYO MINING DISTRICT  
YUKON

1 IN. = 500 FT.  
AUG. 1960 A.E. AHO

*A.E. AHO*