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ABSTRACT

Geology and ore deposits of the Taylor Mining District, White Pine County, Nevada.

The Taylor Mining District is located on the west flank of the Schell Creek Range, 15 miles south of Ely, Nevada. Rocks in the range consist of easterly-dipping Paleozoic limestone, dolomite, and shale, which have been intruded by dikes and sills of mid-Tertiary rhyolite. Silver bearing formations in the district consist of the Devonian Guilmette Limestone and its transition with the overlying Pilot Shale; and the Mississippian Joana Limestone. Known commercial deposits in the district are restricted to the upper 400 feet of the Guilmette.

The most prominent structural feature in the district is a north-northwest trending assymetrical anticline, having a vertical west limb and a gently dipping east limb. Two prominent fracture systems are associated with this anticline, one striking north-northwesterly and the other north-easterly. Some of the north-northwesterly fractures have fault offset, down on the west; original movement was pre-ore, but re-activation occurred during Basin and Range tectonics.

The ore consists of argentite, native silver, and perhaps carargyrite in jasperized Guilmette Limestone. The silica and silver appear to be contemporaneous, and are slightly older than the mid-Tertiary intrusive rhyolite. The solutions entered along the fracture systems and deposited the minerals in crackle breccia on and near the axis of the anticline, at or near the Guilmette-Pilot contact. A period of calcite deposition followed the ore-forming period. The source of the silver may have been a deep-seated intrusive body, though evidence for such a body is lacking; other possible sources were the Chainman Shale and the mid-Tertiary intermediate flow rocks. Some supergene redistribution has occurred, giving the deposit its present uniform, blanket-like form. The deposit occupies about 40 acres; averages 50 feet thick; and lies near the surface (average overburden is 30 feet, and the deposit crops out in many places). The deposit contains seven million tons averaging three ounces silver per ton, and is haloed by a like tonnage of lower grade material.

Ore was discovered in the district in 1868, and about 60,000 tons averaging 20 ounces silver per ton were mined before 1885. An additional 100,000 tons averaging 10 ounces silver per ton was produced from 1920 through 1960. Silver King Mines explored and developed the district in the 1960's and 1970's. A 1200 tpd, CCD cyanide plant became operational on April 1, 1981.

STUART R. HAVENSTRITE

from SEG Fieldtrip, "Sediment Hosted Precious Metal Deposits" held during GSA Annual Mtg. in Reno, NV (Oct. 31 - Nov 3, 1984)

GEOLOGY AND ORE DEPOSITS OF THE TAYLOR SILVER DISTRICT

By: STUART R. HAVENSTRITE

LOCATION

The Taylor Silver District is located near the eastern border of Nevada, in White Pine County (Fig. 1). The district is 14 miles south of Ely, and four miles east of Highway 6, 50 and 93.

Silver King Mines, Inc., and Agnew Enterprises are joint-venture partners in the property, with Silver King as operator. The companies own four patented mining claims in the district; eight claims for which patent proceedings are underway; and 108 unpatented claims, all in Humboldt National Forest.

GEOLOGY

General

The district lies on the western slope of the Schell Creek Range, at elevation 7500 feet. Rocks in the range consist of Paleozoic sediments, mainly limestone, dolomite, and shale. The sedimentary rocks were intruded by a few small bodies of mid-Tertiary rhyolite. Remnants of mid-to late-Tertiary intermediate flows and pyroclastic rocks occupy the western foothills of the range.

Stratigraphy

The oldest formation exposed in the central Taylor district is the Guilmette Limestone, Devonian in age (Fig. 2). The Guilmette is about 2,000 feet thick. It consists of massive, fine-grained limestone in the upper few hundred feet, grading downward into sandy limestone and sandy dolomite. The lower contract is gradational into the Devonian Simonson Dolomite. The Guilmette is resistant to erosion, especially in its upper part, and forms massive cliffs.

The Guilmette is overlain by a 100 foot thick section of thin-bedded limestone and siliceous shale. This section represents a transition between the Guilmette and the overlying Pilot Shale.

The Pilot Shale is Devonian and Mississippian in age, and consists of 300 feet of banded, siliceous shale. The Pilot forms distinctive tan-weathering talus slopes.

The Joana Limestone disconformably overlies the Pilot Shale. The Joana is about 300 feet thick. It is a typical Mississippian limestone, consisting primarily of thick-bedded to massive coarse-grained limestone which is composed mainly of crinoid fragments and other fossil remnants. The upper one-third and lower one-third of the Joana forms massive, monument-like cliffs in eastern Nevada. The central one-third is the thinner-bedded, less resistant, and forms talus slopes.

The Mississippian Chainman Shale disconformably overlies the Joana Limestone. The Chainman consists of incompetent, black, euxinic shale; the formation typically forms strike valleys which exhibit chaotic, landslide topography where younger rocks have slid over the Chainman. Numerous sandstone and quartzite beds, mainly in the upper part of the formation, form small ridges.

The depositional thickness of the Chainman is difficult to determine, because of poor exposures and because of the tendency of the Chainman to fold or flow under stress, thus causing missing or repeating sections. Sadlick measured 23 sections in Eastern Nevada and Western Utah, and estimates the Chainman was about 1,000 feet thick. In the Taylor district, the maximum observed thickness is about 1,000 feet. Ten miles to the west, in the Ward Mining District, the average thickness in 80 core holes is 600 feet.

The Pennsylvanian Ely Limestone overlies the Chainman Shale. The Ely consists of more than 2,000 feet of cyclicly deposited thin-bedded limestone, shaly limestone, and calcareous shale. The limestone beds are predominantly fine-grained, though a few beds are composed of crinoid and brachiopod fragments.

It is interesting to note the number of places in which this section of the stratigraphic column (uppermost Guilmette to basal Ely) is the locus for mineral deposits in Eastern Nevada.

The top of the Guilmette contains silver ore at Taylor, Hamilton (Treasure Hill bonanza mined in the 1870's), and several other smaller occurrances; these beds are also the host for the very extensive copper-zinc-silver deposits in the Ward District.

The transition beds above the Guilmette are the host for the gold deposits at Alligator Ridge; these beds and the overlying Pilot Shale are under intensive exploration in eastern Nevada at present.

The Joana limestone is the host for silver mineralization at Taylor and Hamilton; silver-gold ore in deposits which are satelite to the Ruth copper porphyry deposits; and extensive zinc-silver-copper deposits at Ward.

The Chainman Shale and Ely Limestone are the host rock for about 20% of the copper ore mined at Ruth (the remainder of the ore is in quartz monzonite porphyry). The Ely is the host for lead-silver-zinc deposits at Ward.

IGNEOUS ROCK

Intrusive activity was confined to the mid-tertiary (35 M.Y.±), when a few rhyolite dikes, sills and irregular bodies intruded the sedimentary rocks. The rhyolite bodies contain xenoliths of silver-bearing jasper, but are themselves intensely hydrothermally altered to clay minerals. We infer that the rhyolite was implaced only slightly later than the silver and silica.

Structure

The Schell Creek Range is a north-trending, eastward tilted horst typical of the Basin and Range geomorphic province. Rocks in the range have been subjected to three distinct periods of diastrophism.

1) Mid-Mesozoic compressional phase ("antler" or related movement) which resulted in north trending tight folding and decollement thrust faulting, and extensive deformation of incompetent units such as the Chainman Shale. These stresses in the Taylor District formed a north-trending, assymetrical anticline (Fig. 3 & 4); the competent Guilmette Limestone fractured to crackle breccia on the crest and flanks of the anticline; and this breccia became the host for the Taylor ore deposits.

2) "Laramide" uplift and intrusive phase, which extended intermittently from 120 to 35 million years ago. Numerous north to north-northwest trending, high-angle, predominantly normal faults with small displacement were first activated in the Taylor District during this phase. A complementary east-northeast set also developed at this time. These faults were the conduits for the hydrothermal silver-bearing fluids which deposited the silver ore in the Guilmette crackle breccia. Notably few igneous bodies were intruded into rocks of the Schell Creek Range during this phase. They are limited to a few rhyolite plugs and dikes in the vicinity of the Taylor District. Near the close of this diastrophic phase, the intermediate flows and pyroclastics which now occupy the foothills of the range were extruded.

3) Late Tertiary to recent "Basin and Range" phase. This continuing orogeny has formed the present geomorphology of Eastern Nevada. Total structural relief from range to valley is typically several thousand feet. Many of the north-trending faults in the Taylor District were re-activated during this period.

ORE DEPOSITS

Mineralogy

The ore in the Taylor District consists of finely disseminated crystals of argentite and clots of native silver in a gangue of silicified limestone which Lovering has described as jasperoid. Much of the jasperoid consists of breccia fragments. Accessory minerals include limonite pseudomorphing pyrite; calcite and quartz as late-stage veins and as the matrix cementing the jasperoid breccia; and rare purple fluorite.

Lovering has identified other sulfide minerals such as stibnite, sphalerite, tetrahedrite, chalcopyrite, galena, and pyrargyrite (?), but these are rare and are of no economic importance.

Form

The ore deposits consist of large tabular masses of argentian jasperoid which occur at the top of the Guilmette Limestone. The ore occupies the crest and flanks of the north-trending assymetrical anticline which is the dominant structure in the district (Fig. 4). The ore is flay-lying on the crest of the anticline; dips vertically on the west flank of the anticline; and dips gently to the east on the east flank. The form of the ore bodies has been modified by late movement of small magnitude along the north and east-northeast trending normal faults. The ore body averages about 50 feet in thickness, based on a grade cutoff of two ounces silver per ton; occupies about 40 acres; and contains about seven million tons of ore averaging 3 ounces silver per ton with a like amount of waste which averages about .75 ounces silver per ton.

Paragenesis

The ore solutions were introduced along the normal faults, entered the crackle breccia zone at the top of the Guilmette Limestone, were impeded by the capping shale of the Guilmette transition zone, and replaced the limestone, depositing the silver as argentite and also depositing pyrite and silica. Drewes, Lovering and the Silver King staff believe that the silica which formed the jasperoid was deposited contemporaneously with the argentite, because of their ubiquitous association.

Rhyolitic dikes and sills were intruded along the same channelways as the ore solutions, at a later time; fragments of argentian jasper occur commonly within the rhyolite bodies.

This ore-forming period probably occurred during late stages of the mid-Mesozoic orogenic phase and/or during the "Laramide" orogenic phase. Later movement re-brecciated the jasperoid; this breccia was then re-cemented with quartz and calcite. Some further modification of the ore deposits occurred during the recent Basin and Range orogenic activity.

Source of Silver

Both Drewes and Lovering relate the argentian hydrothermal solutions to a deep-seated igneous body which they believe was emplaced under the Taylor District during Cretaceous or Tertiary time.

The existence of such a stock is open to question in my mind. The Schell Creek Range is distinctive for its paucity of intrusive bodies or thermal effects related to such bodies, and aeromagnetic surveys flown at various elevations over the District reveal no anomalous magnetism which might reflect a deeply buried intrusion.

Another possible source for the silver (and the silica) is the Chainman Shale. Robert Boyle and others who have sampled black euxinic shales such as the Chainman report silver content of one to ten ppm. If the Chainman Shale overlying the Taylor District contained one ppm silver, then each square mile of Chainman would have, upon deposition, contained as much silver as is presently contained in the Taylor deposit.

The Chainman was subjected to intense diastrophic forces during the mid-Mesozoic compressional orogeny; because it was much less competent than the overlying and underlying strata it was folded, deformed, and in many areas has been thinned to a fraction of its original thickness. Much heat must have been generated during this period, and the connate water in the Chainman would have dissolved increasing amounts of silver (which is very soluble in water even at standard temperatures - Shcherbine, p. 1136). Much of this water would have been squeezed from the formation during the mid-Mesozoic and the "Laramide" diastrophism, and would have found its way as a hydrothermal solution into the favorable loci of the jasperoid breccia.

Another possible source of the silver was the mid-Tertiary intermediate flows and pyroclastic rocks which covered the District at one time; the flows may, however, be younger than the silver, as are the intrusive rhyolite bodies.

Supergene Enrichment

Several lines of evidence suggest that the present form of the Taylor deposit has been at least partially determined by supergene redistribution and enrichment of the silver values.

1) The deposit is unique in its uniformity; within the ore outline as shown on Figure 5, the occurrence of either high grade zones or barren zones is rare, and silver content feathers out both vertically and horizontally.

2) A composite of the 130 ore holes in the deposit (Fig. 6) shows a distinct, gradual increase in silver values from the surface downward to a maximum at a depth of about 60 feet, followed by a gradual decline to a depth of 180 feet; at this point, the jasperization of the limestone rapidly decreases as does the silver content.

3) The jasperoid near the surface has a leached appearance, being lighter in color and somewhat more "spongy" than the typical jasperoid below a depth of 20 feet.

4) A sequential analysis, as follows:

   A) The rhyolite is younger than the argentian jasper, because fragments of the jasper are common within the rhyolite bodies, having been plucked from the channel walls during emplacement.

   B) Silver values are typically higher just above rhyolite sills.

   This paragenesis suggests that silver was remobilized after the rhyolite was intruded.

   There are several ways by which the primary silver, in the form of argentite and perhaps also as the native metal, could have been dissolved in the zone of oxidation, and re-precipitated at the redox interface. Boyle and Shcherbina, as well as many others, have studied and reported on this process. Their findings are briefly summarized as follows:

1) Dissolution of silver minerals in the zone of oxidation

   a) Oxygenated water will dissolve argentite, forming soluble silver sulfate.

   b) If pyrite is present, the process is enhanced; the pyrite is oxidized first, forming sulfuric acid as well as ferrous sulfate which further oxidizes to form ferric sulfate. The sulfuric acid and ferric sulfate then attack the argentite and/or native silver accelerating its decomposition to silver sulfate.

   c) In a carbonate environment, sulfuric acid may react with the carbonate to form bicarbonate ion, which will react with argentite to form a soluble silver bicarbonate complex ion.

2) Transportation of dissolved silver downward in the surface waters probably as silver sulfate at Taylor.

3) Precipitation of silver as native metal or as secondary argentite, caused by the following agents:

   a) A reduction of the acidity of the solution, because of contact with carbonate wall rocks, will cause the silver to precipitate as an unstable oxide which rapidly breaks down to form native silver.

   b) A reduction in the oxidation potential of the solution because of proximity to the water table, will reduce ferric ion to ferrous ion. The ferrous ion will precipitate native silver, re-oxidizing ferrous ion to ferric ion.

c) Sulfides in the zone of reduction (e.g. pyrite) will cause silver in solution to precipitate, probably as secondary argentite, according to Schurmann's reaction series.

d) The reducing action of hydrogen sulfide, generated by decaying organic matter, will cause silver in solution to precipitate, probably as argentite.

HISTORY

The Taylor District was discovered in 1868; during the following 20 years, about 60,000 tons of ore averaging 20 ounces silver per ton was mined, primarily from the Argus shear zone. This is one of the north-trending normal fault zones which acted as feeders for the mineralizing solutions. Formations are displaced downward on the east, bringing un-mineralized Pilot Shale in contact with the ore-bearing Guilmette; the fault zone marks the eastern limit of surface silver mineralization. In this area a six foot thick bed at the top of the Guilmette, or perhaps a solution breccia zone parallel to bedding, was stoped preferentially. Ore was also stoped from fault zones and from irregular bodies.

The ore from this mining phase was taken by wagon to Steptoe Valley where two smelters treated it. Because of the long haul and the primitive ore processing facilities, the ore cutoff grade was high, about 10 ounces per ton. The district became idle about 1892.

Around 1920, a cyanide treatment plant was built at Taylor, but there is no recorded production from it.

During the 1930's, the District was revived; additional ore was mined underground in the Argus area and the Monitor area to the west. Also, some ore was mined by open cut methods in the Argus and Monitor areas and on Bishop Hill, and most of the old dumps from the 19th century mining, which averaged about eight ounces silver per ton, were also processed. Much of the ore during this period was sold as siliceous flux to the Kennecott smelter at McGill. Total production during this period was about 100,000 tons which averaged 10 ounces silver per ton.

About 1960, K. L. Stoker acquired the existing claims in the Taylor District from several individuals and companies, and when Silver King Mines, Inc., was formed in 1961, the claims became Silver King property. Additional claims were staked, to form the present property holding of 120 mining claims totaling about three square miles. Four of the claims are patented, and patent has been applied for on eight others.

Silver King in 1962 began a program of deep percussion drilling along the Argus shear zone in an attempt to locate deep ore below the old mine workings. A small pod of high grade ore was discovered, and in 1964 the Taylor shaft was sunk to a depth of 400 feet (Fig. 5). The pod produced 4,000 tons in 1965 averaging 30 ounces silver per ton. Further exploration drifting and underground drilling failed to discover significant additional reserves and the mine was closed.

Many of the percussion holes drilled in the early 1960's penetrated substantial thicknesses of low grade silver mineralization at or near the surface. The mineralization was too low grade to constitute ore at prevailing silver prices; however, when silver prices began to escalate in 1973, Silver King resumed its exploration and development drilling program. Several core holes were drilled 10 to 20 feet from existing hammer-drill holes, to check the validity of the chip samples. The core data confirmed the chip data (core samples assayed, an average, 5% higher than comparable chip samples). This check drilling also demonstrated the unique uniformity of the Taylor ore deposit; mineralization within the exterior ore boundaries is ubiquitous, and there exist few barren or high grade areas (Fig. 5).

The percussion drilling program resumed in 1974, and has continued intermittently to the present. In all, about 450 holes have been drilled in the District since 1962, of which 22 are core holes. The drilling has outlined an area of about 40 acres underlain by ore grade mineralization, which is defined as at least a 30 foot thickness containing at least two ounces silver per ton. Using this cutoff, the ore averages 50 feet in thickness (up to 200 feet thick in a few places), with average overburden of 50 feet (waste to ore ratio is 2.0:1).

Measured diluted reserves using the two ounce cutoff are presently five million tons averaging 3.3 ounces silver per ton. Much of the overburden is low grade mineralized rock; if all overburden which exceeds one ounce silver per ton is "stripped to the mill", diluted reserves become seven million tons averaging 3.0 ounces silver per ton. Inferred reserves based on reasonable geologic projection will add at least three million tons of ore to the reserve.

Financing to develop the project was secured in 1979; open-pit development, and construction of a 1200 ton-per-day counter-current decantation cyanide leach plant, began immediately, and was completed in early 1981 (Fig. 8). Total expenditure in the District, including drilling, mine development, and mill construction, was about $10 million.

The open pit mine was developed and is being mined using an Ingersoll-Rand DM 25 hammer drill; an Ingersoll-Rand crawlair drill powered by a 850 cfm diesel compressor; a Komatsu D155A dozer; two Clark-Michigan 7 yard loaders; three Wabco 35 ton haulpack dump trucks. The mine is presently producing 35,000 tons of ore and 75,000 tons of waste per month, at a cost of $1.30 per ton rock.

The crushing plant consists of a 30" x 42" jaw crusher; 4¼ foot standard cone crusher; 4¼ foot shorthead cone crusher in closed circuit with a 6' x 20' double-deck vibrating screen (slotted, 3/8" x 1½"); and an open-air live storage area.

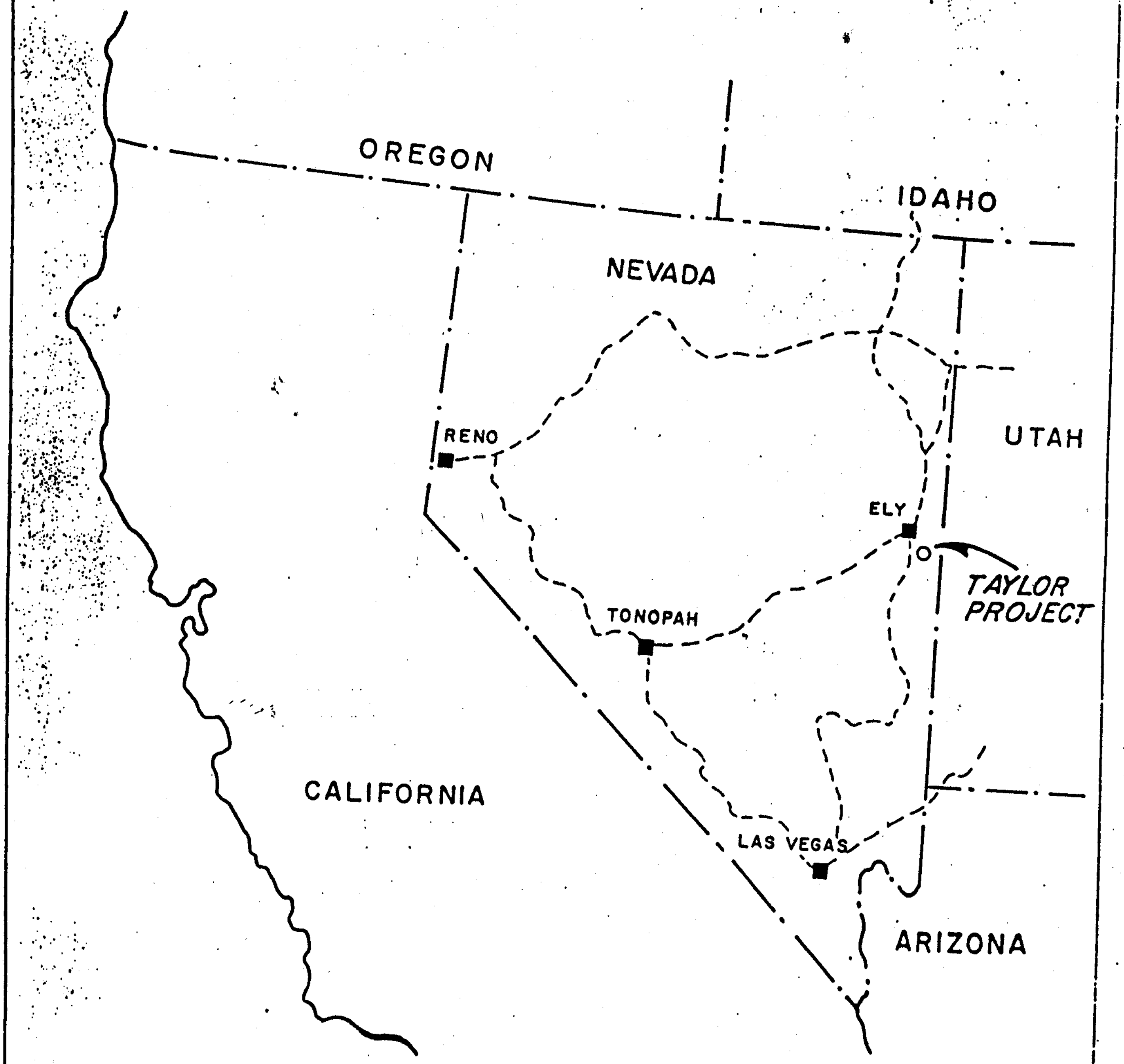
The grinding section consists of four primary and four secondary 8 foot x 72 inch Hardinge ball mills. Two stage classification using Krebs cyclones allows a grind which consistently exceeds 90% passing a 325 mesh screen.

Sodium cyanide, concentration four pounds per ton, is introduced in the ball mills. Leaching begins here and is completed in three agitation tanks arranged in series; extraction ranges from 70 to 85% depending on which area of the ore deposit is being mined.

The pulp is washed in four stages using Enviroclear high-rate thickeners, before reporting to the tailings pond. Pregnant solution, averaging 1½ ounces silver per ton, is clarified in two U.S. drum-type filters; de-aerated; precipitated by zinc (Merrill-Crowe process); and the metallic silver separated from the now barren solution in three filter presses. The silver precipitate, averaging 80% silver, is dried and shipped for refining.

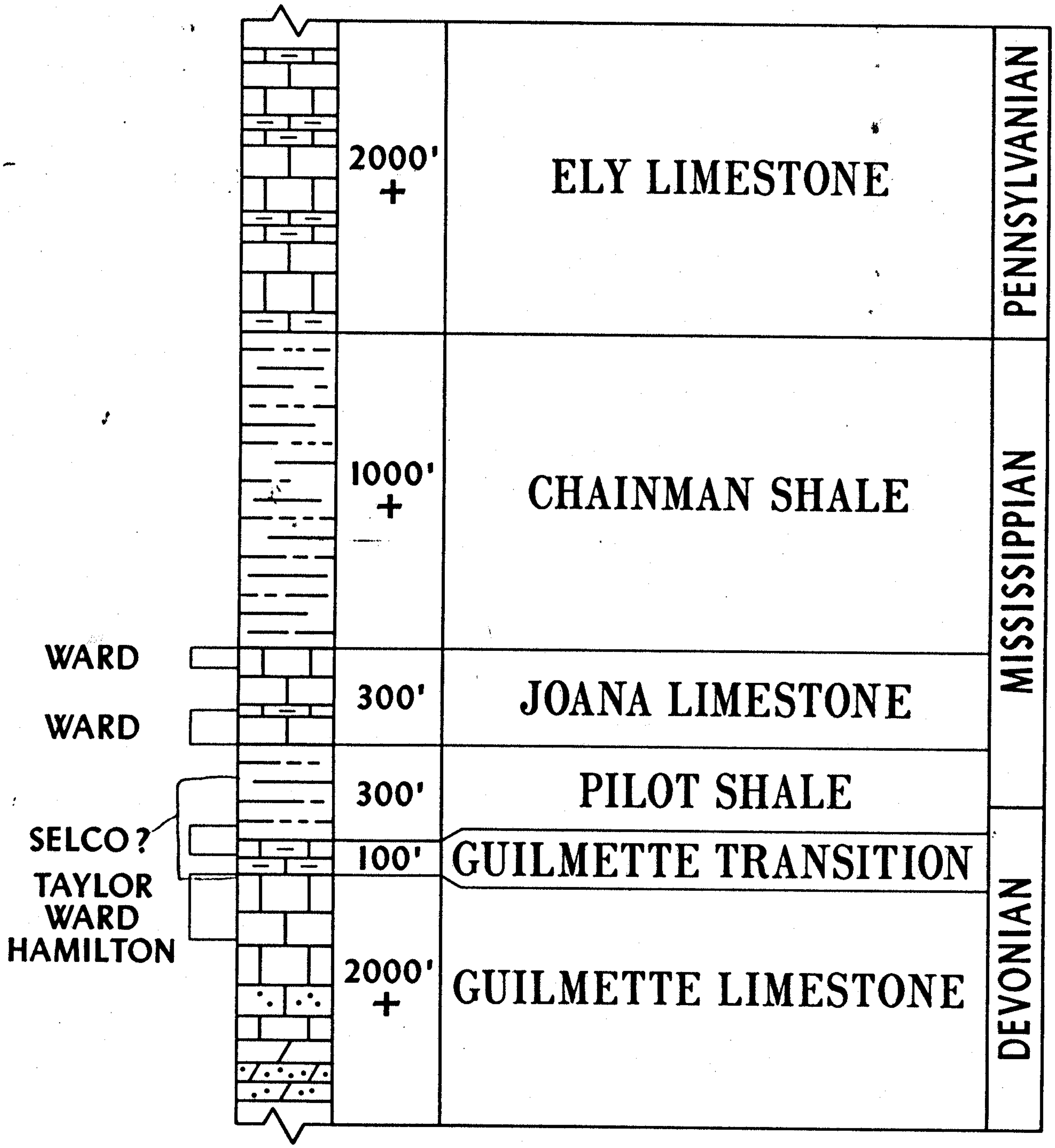
Milling cost averages $8.50 per ton. Overall project cost is about $6.05 per ounce silver produced plus amortization cost of $1.20 per ounce.

Production to date is 1 million ounces from 400,000 tons of ore.



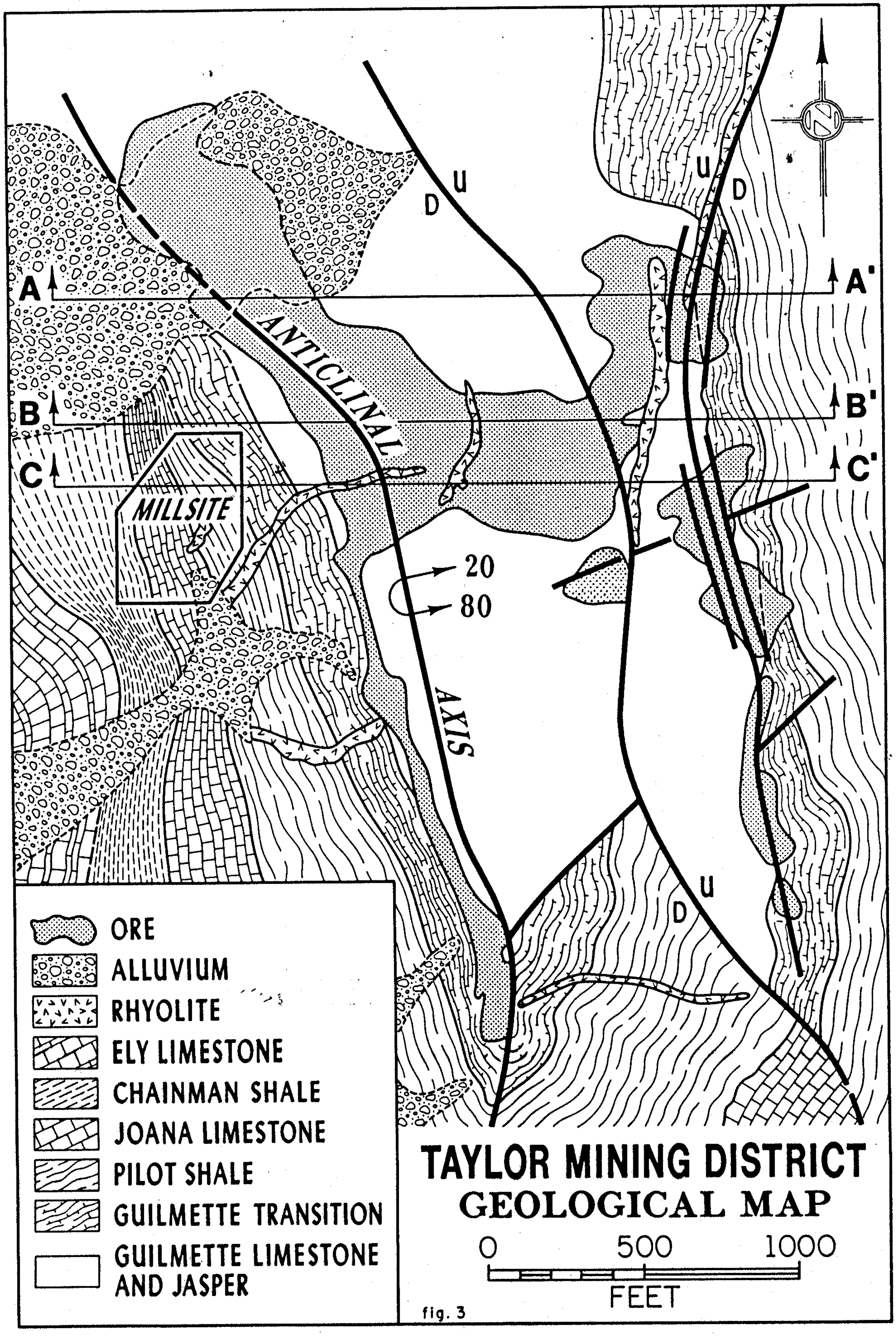
INDEX MAP
TAYLOR MINING DISTRICT

fig. 1



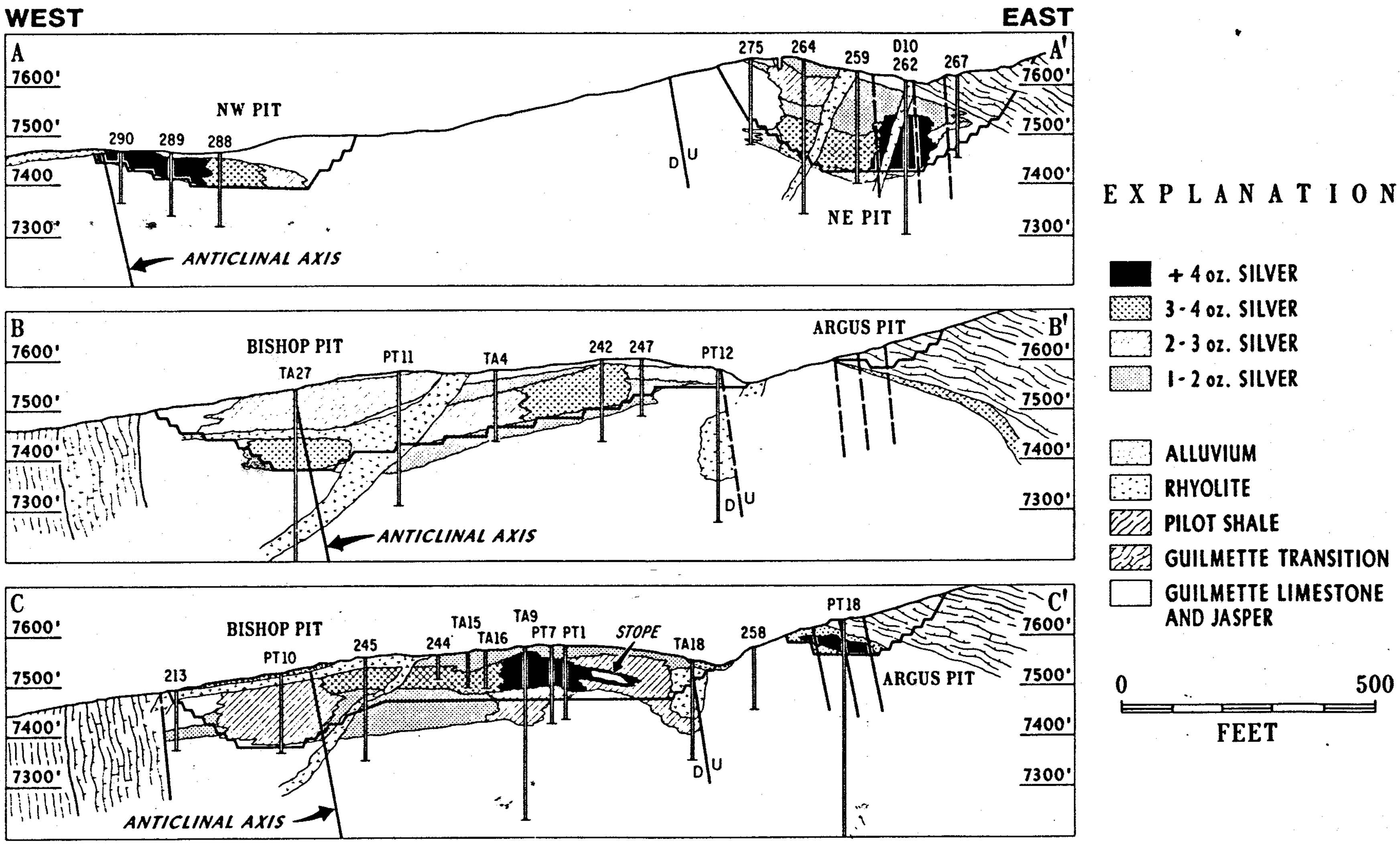
TAYLOR MINING DISTRICT
STRATIGRAPHIC SECTION

fig. 2



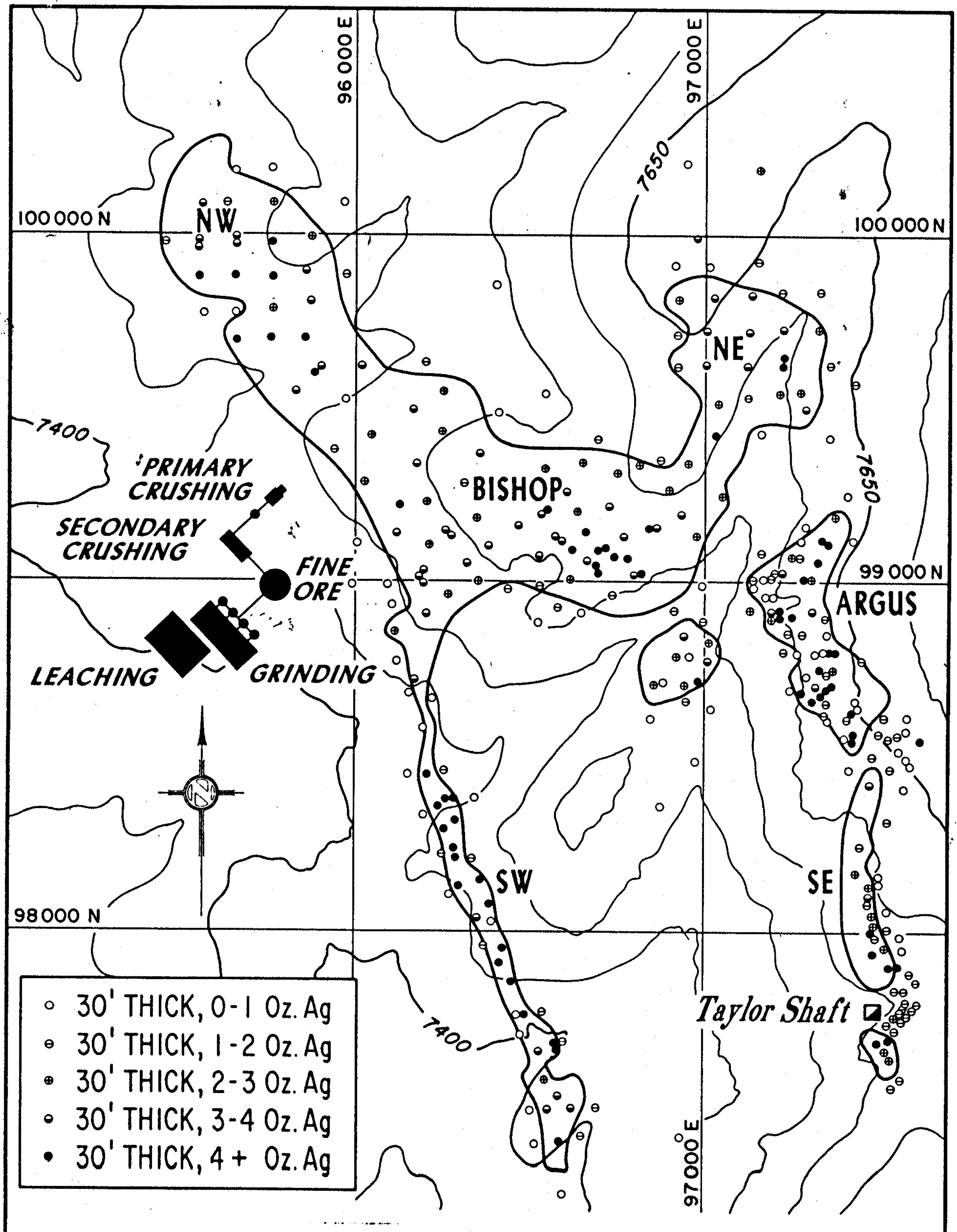
TAYLOR MINING DISTRICT
GEOLOGICAL MAP

fig. 3



TAYLOR MINING DISTRICT
REPRESENTATIVE CROSS SECTIONS

fig. 4

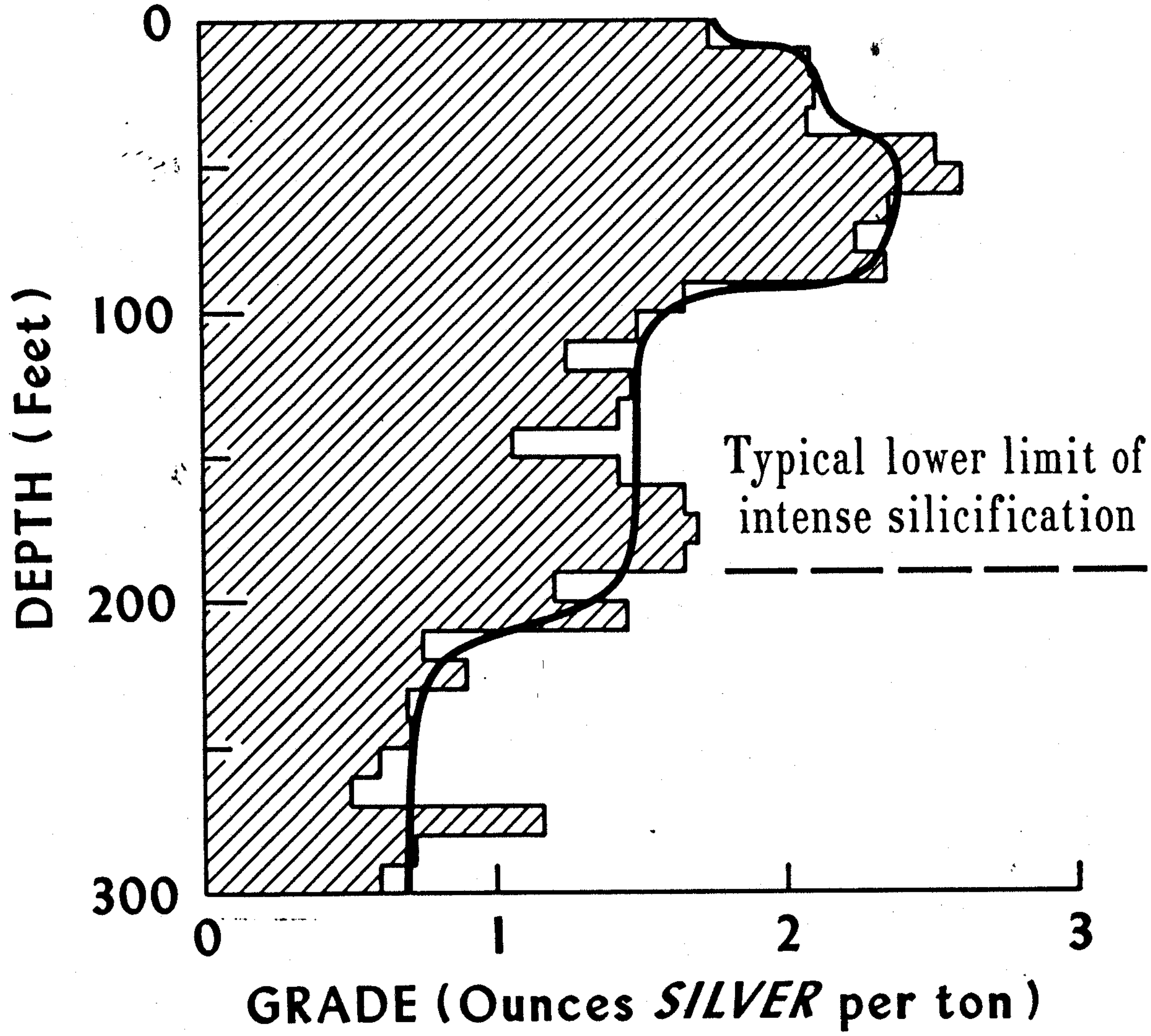


TAYLOR MINING DISTRICT
ORE BODY

0 500 1000 FT.

fig. 5

4 328 400N ± 200'
700000 E

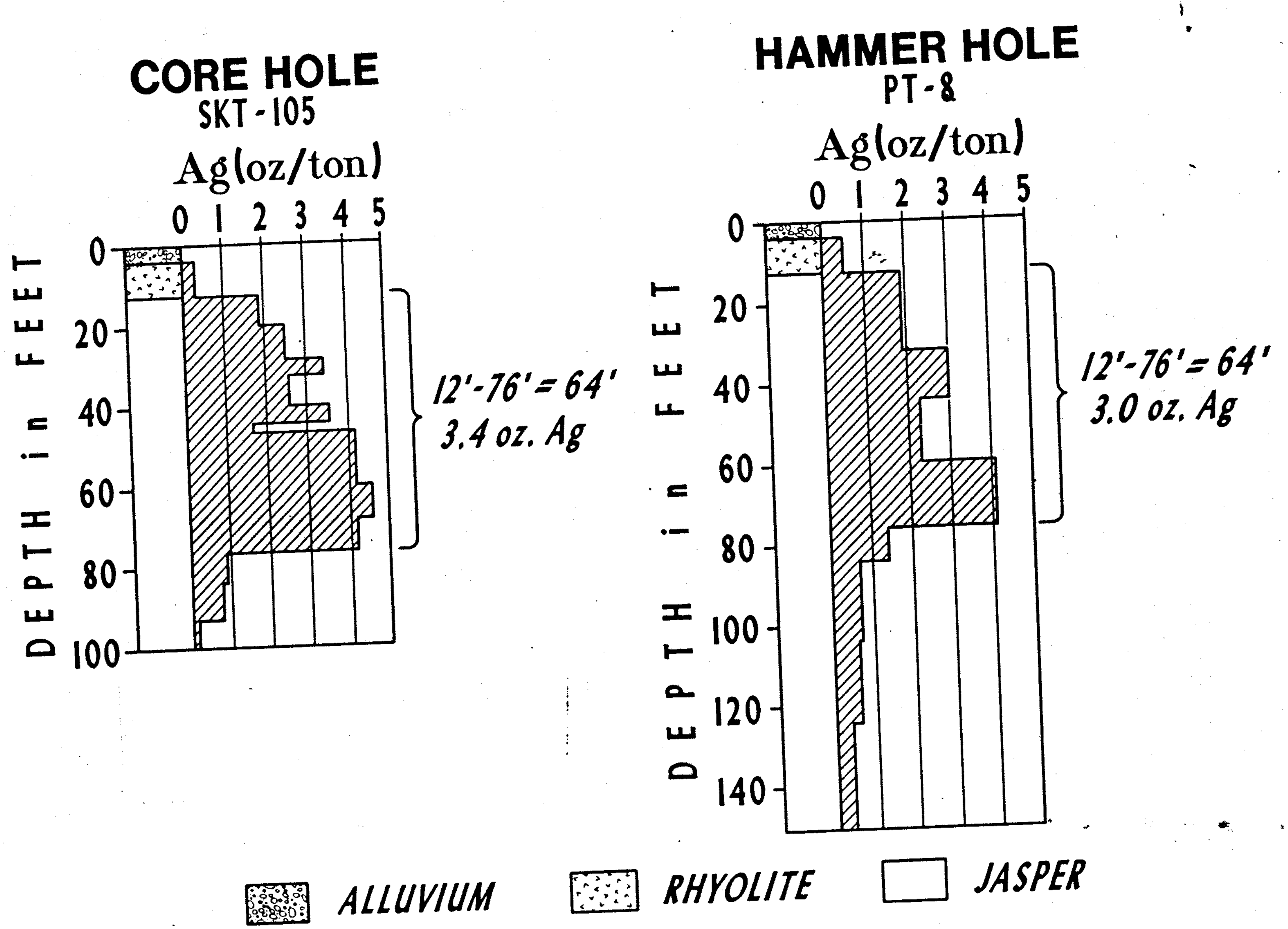


TAYLOR DISTRICT

HISTOGRAM

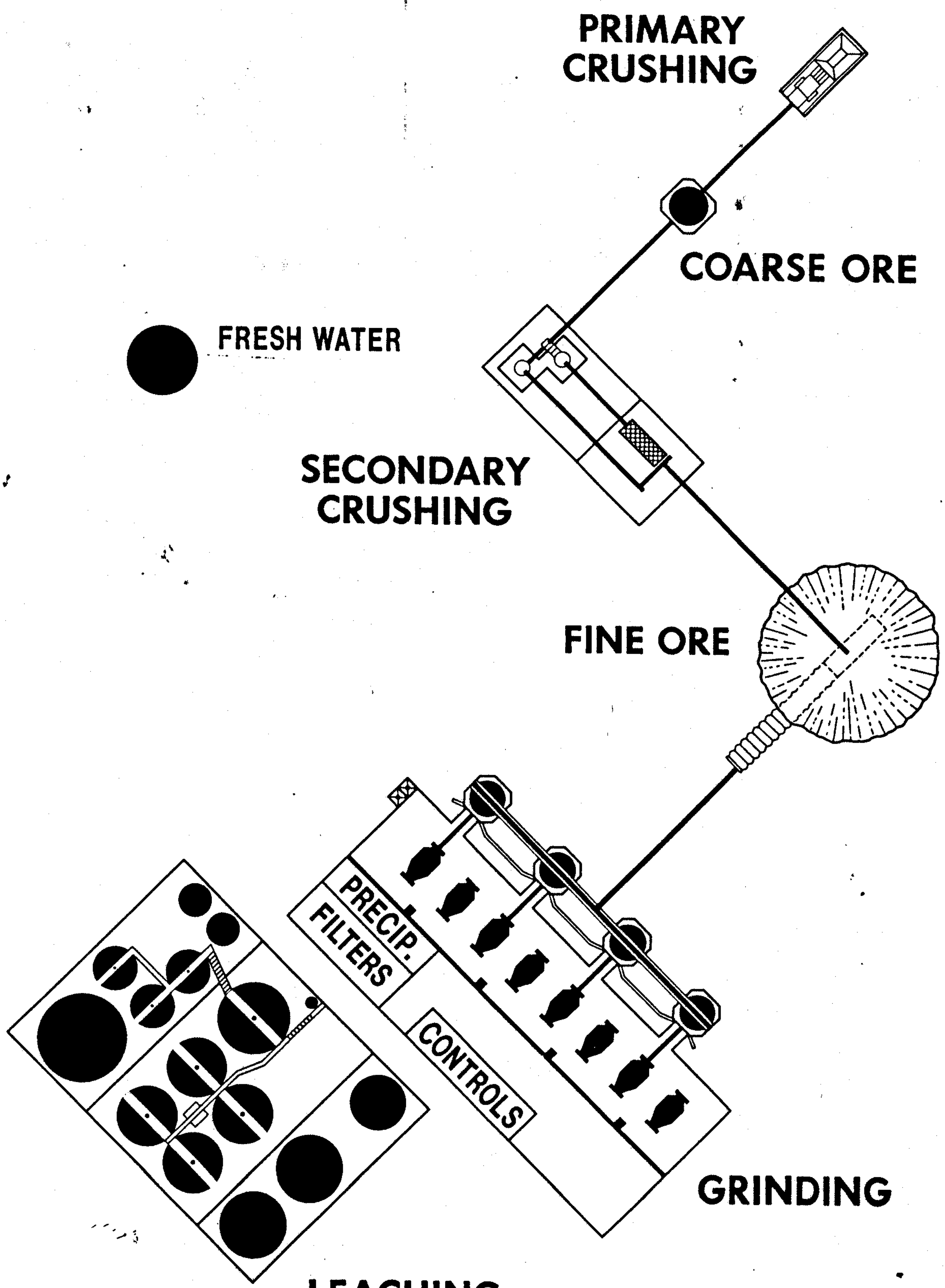
AVERAGE GRADE vs DEPTH
of 130 drill holes within the *TAYLOR OREBODY*

fig. 6



SAMPLE COMPARISON-CORE vs. HAMMERDRILL

fig. 7



TAYLOR MILL · GENERAL ARRANGEMENT

fig. 8

BIBLIOGRAPHY

Boyles, R.W.
1970: The geochemistry of silver and its deposits; Geological Survey of Canada, Bull. 160.

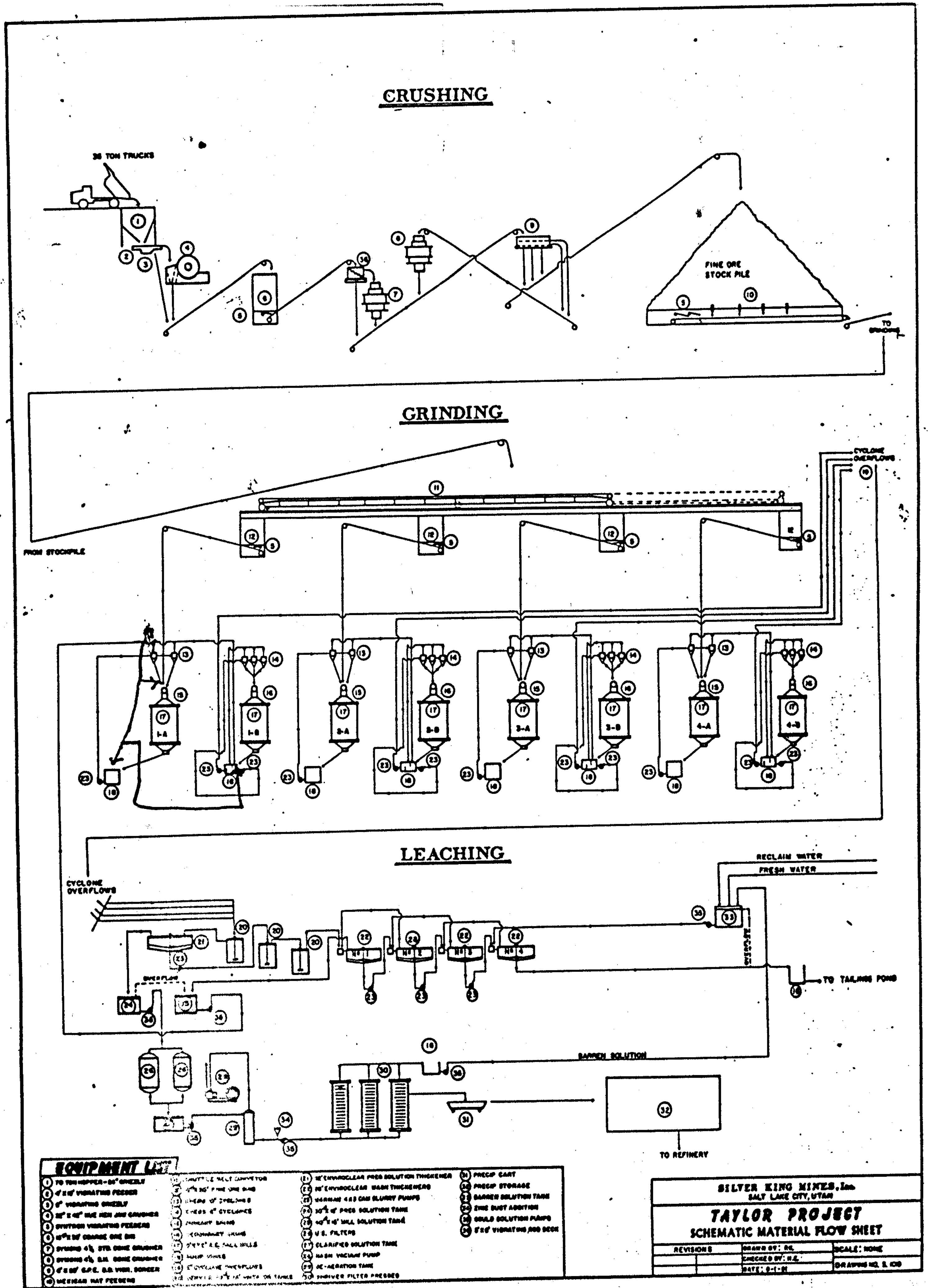
Drewes, Harold
1967: Geology of the Connors Pass Quadrangle, Schell Creek Range, East Central Nevada; USGS Prof. Paper no. 557

Heidrick, Thomas
1963: Geology of the Ward mining district; Unpub. Master's thesis, University of Arizona.

Lovering, Thomas
1974: Jasperoid as a guide to mineralization in the Taylor mining district and vicinity near Ely, Nevada; Econ. Geology, vol 69.

Sadlick, Walter
1958: Some preliminary aspects of Chainman stratigraphy; Guidebook to the geology of East-Central Nevada, Utah Geological Society.

Scherbina, V.V.
1970: Geochemistry of silver in oxidized zone of sulfidic deposits; International Geology Review, vol. 14, no. 10.



CRUSHING
35 TON TRUCKS
FINE ORE STOCK PILE
TO GRINDING
GRINDING
FROM STOCKPILE
CYCLONE OVERFLOWS
LEACHING
CYCLONE OVERFLOWS
RECLAIM WATER
FRESH WATER
OVERFLOW
TO TAILINGS POND
BARREN SOLUTION
TO REFINERY
EQUIPMENT LIST
PRECIP CART
PRECIP STORAGE
BARREN SOLUTION TANK
ZINC DUST ADDITION
U.S. FILTERS
CLARIFIED SOLUTION TANK
DE-AERATION TANK
SILVER KING MINES, Inc.
SALT LAKE CITY, UTAH
TAYLOR PROJECT
SCHEMATIC MATERIAL FLOW SHEET
REVISIONS
SCALE: NONE

CAPITAL INVESTMENT

OPEN PIT GOLD - SILVER MINES

NEVADA & IDAHO

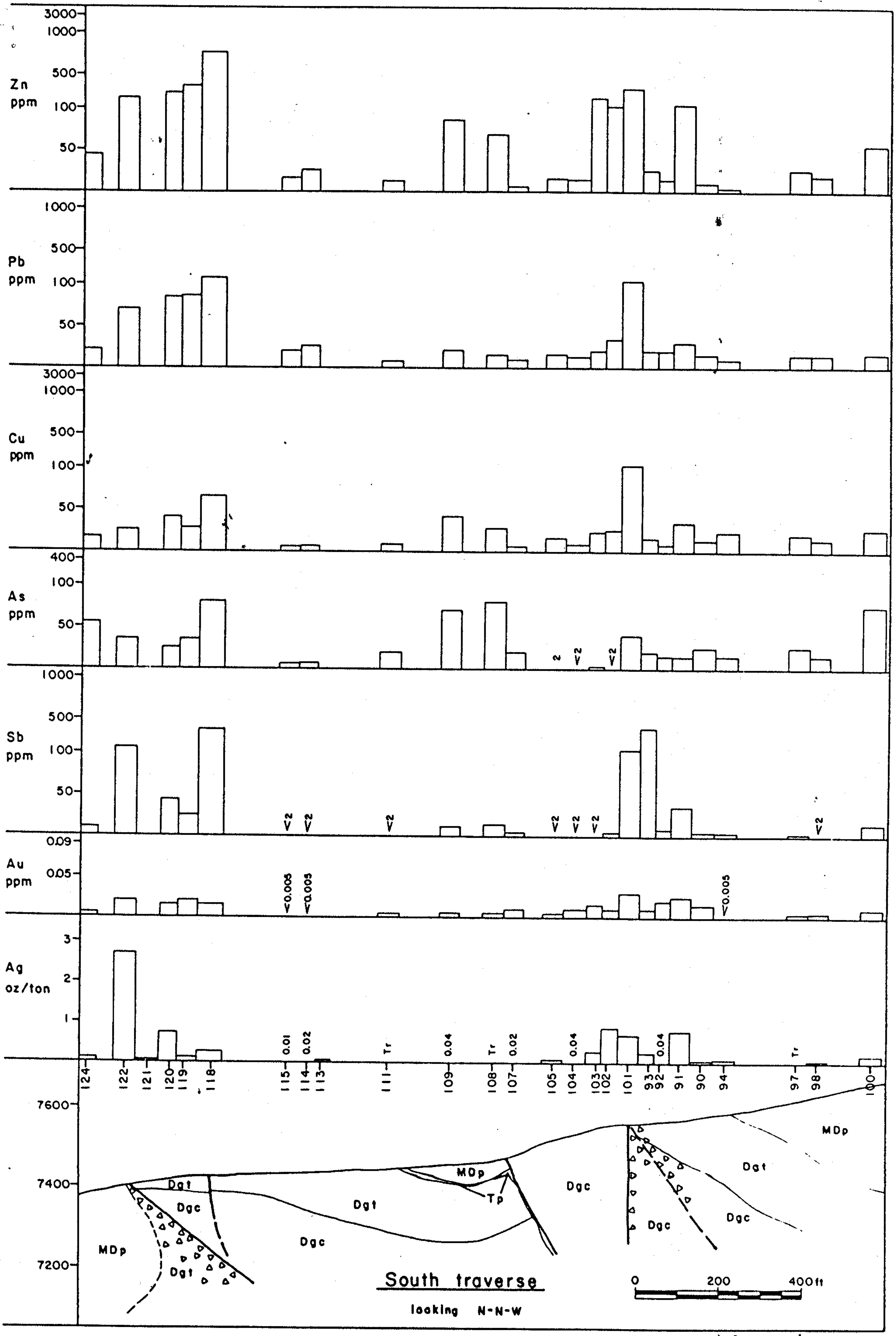
Year Commissioned	Throughput		Capital Cost		Capital Cost Per Ton Per Day
1981 Taylor	1200 TPD	for	$11,000,000	=	$ 9,167
1978 Delamar	1700 TPD	"	$22,000,000	=	$12,940
1981 Escalante	800 TPD	"	$16,500,000	=	$20,625
1981 Pinson	1000 TPD	"	$18,000,000	=	$18,000
1981 Jerritt Canyon	3000 TPD		$95,000,000		$31,670
1975 Taylor (Mt. States Study done in 1975 up-dated to 1981 dollars)	2000 TPD	"	$24,000,000		$12,000

LABOR REQUIREMENT COMPARISON

WESTERN OPEN PIT SILVER AND GOLD MINES

1981 - 1982

DUVAL (Gold)	AMSELCO (Gold)	HOUSTON OIL (Silver)	DELAMAR (Silver)	CARLIN (Gold)	PINSON (Gold)	TAYLOR (Silver)
4000 TPD	1500 TPD (Heap Leach)	1000 TPD	2000 TPD	3000 TPD	1000 TPD	1200 TPD
450 Men Total	220 Men Total (70 Salaried, 150 Hourly)	106 Men Total (43 Salaried, 63 Hourly)	190 Men Total (27 Salaried, 163 Hourly)	250 Men Total (60 Salaried, 190 Hourly)	117 Men Total	85 Men Total (10 Salaried, 75 Hourly)
---	16 Office	6 Office	---	9 Office	---	2 Office
---	18 Lab	---	8-1/2 Lab	17 Lab	---	4 Lab
---	6 Security	6 Security	1 Security?	1 Security	---	1 Security
---	1-1/4 Safety	---	---	9 Warehousemen	---	1 Warehouseman
8.9 Tons Per Man Shift	6.8 Tons Per Man Shift	9.4 Tons Per Man Shift	10.5 Tons Per Man Shift	12.0 Tons Per Man Shift	8.5 Tons Per Man Shift	14.1 Tons Per Man Shift
		Closed Down	Operating at a loss 9/23/82			



J.M. EDWARDS
C.S.U. 1982

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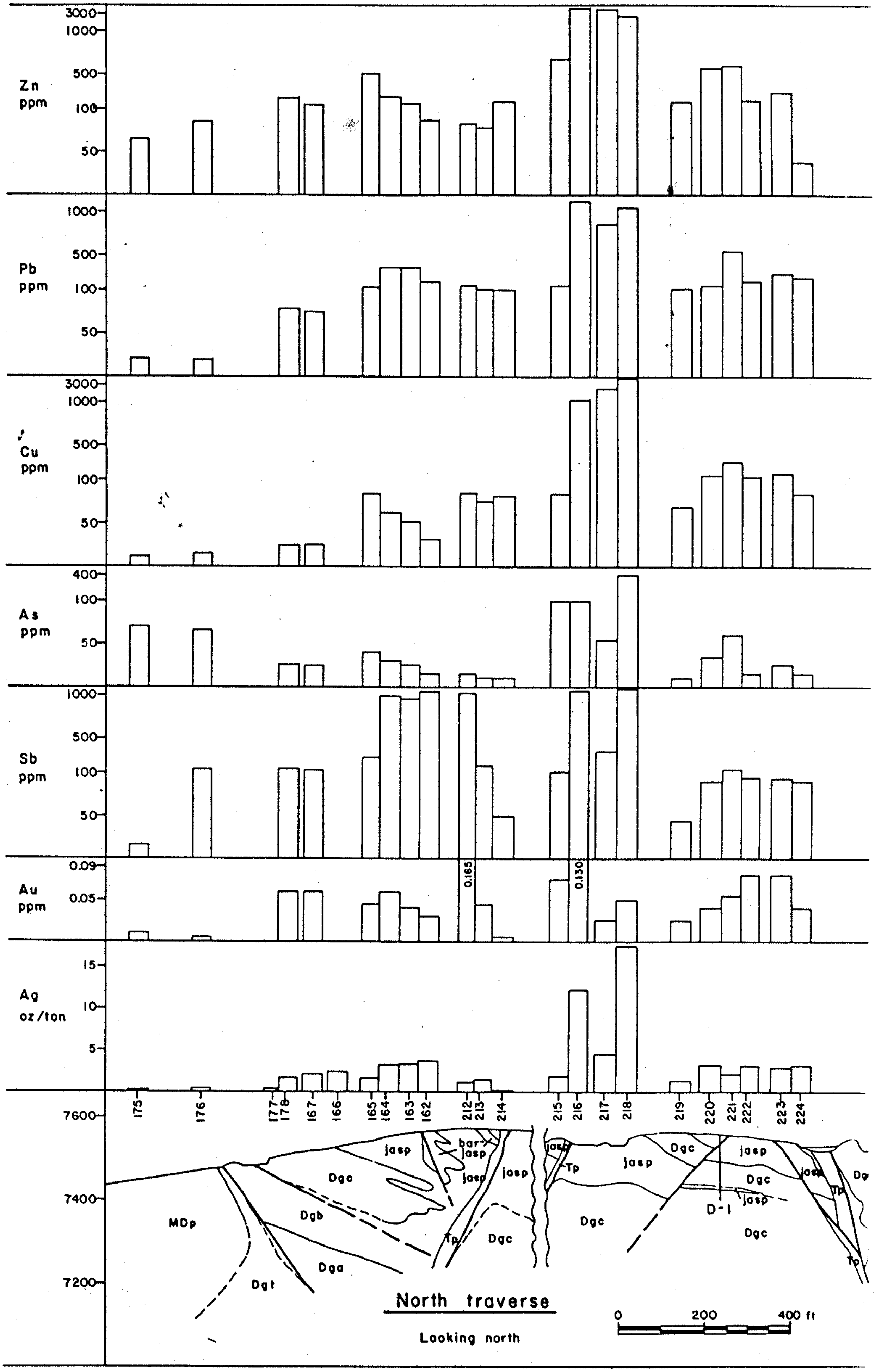
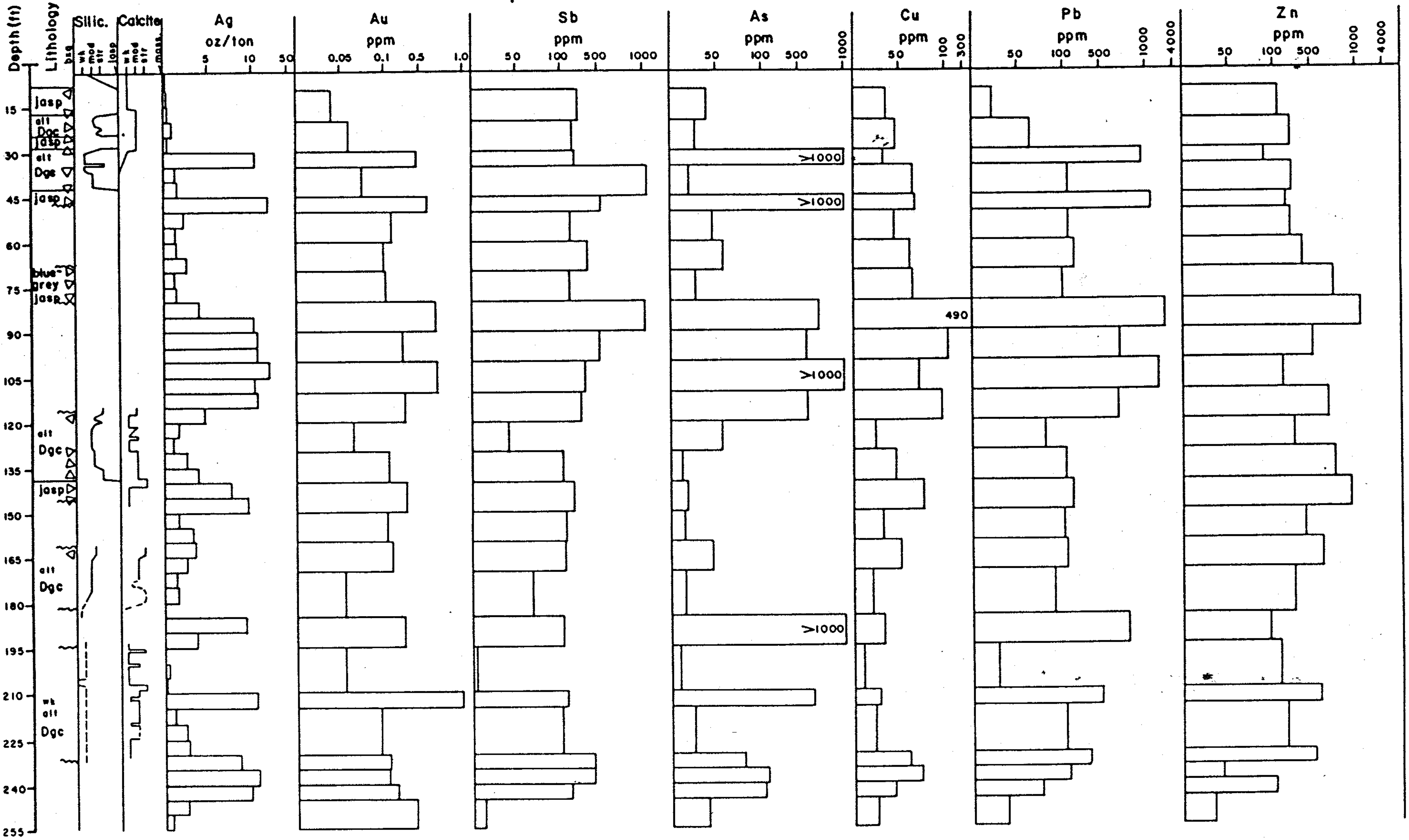


J.M. EDWARDS

Drill hole: D-10 99,656 N, 97,230 E
Total depth: 262 ft Collar elev.: 7600



J.M. EDWARDS
C.S.U. 1982