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James Doyle Sell Mining Collection

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ASARCO

Southwestern Exploration Division

May 4, 1982

TO: J. D. Sell

FROM: F. R. Koutz

Tour: Morenci-Metcalf District
Greenlee County, Arizona

In the afternoon of April 30, H. G. Kreis, G. W. Pickard and myself were given an excellent tour of Morenci-Metcalf by Rick Preece, Staff Geologist. Mr. Preece and F. J. Menzer, Assistant Chief Geologist, were much more open on PD activities than has been normal for them in the past. With the shut-down, Morenci has laid-off 3 geologists--they are down to 9 now, of which 4 work full time on Small Mines Division projects outside the district. The Morenci geologic staff including technicians, etc. was up to 21 at the first of the year. The Geology and Engineering Departments are under "Engineering and Geologic Services" with E. M. Schern, Director. There is no Chief Engineer or Geologist.

Rick Preece is in charge of the mineral inventory of the latest "ultimate" pit(s) which has just been entered into the computer. PD had been mining 0.80 Cu and 0.015 MoS_2 from Morenci (60,000 TPD) and 0.74 Cu and 0.02 MoS_2 from Metcalf (40,000 TPD), but Metcalf has been shut down most of last year with 80,000 TPD taken from Morenci and extra stripping in the Lone Star area by truck (which will force rerouting of U.S. 666 in next 2-4 years). PD for the last several months has been averaging +0.9% Cu from Morenci. Stripping ratio has been erratic lately from 2-3:1. They are increasing the pit slope from 37°-45° in almost all areas as the result of a comprehensive slope-stability study. Cut-off is still 0.4% Cu with 0.2-0.4% Cu ores taken to low grade leach dumps. Twenty-25% of Morenci production has recently come from leaching of this material, high-grade leach (mostly old stope fill and oxides) and the Metcalf tailings leach.

Preece mentions that they will do the final development drilling on the Western Copper property next year--planned to come on line in 10-20 years. Ore has not yet been found or is very deep on the Western Copper Extention property (staked in 1973) S of Western Copper and E of the 4500 level shops (Rockhouse Canyon SE to Clifton).

Preece says the ultimate district pit will be 2 miles wide and 3 miles long (N-S). One pit bottom will be at the 4200 foot elevation, the other will be at the 3200 foot elevation in primary cpy-bn. The present drop-cut is 4200 feet elevation and the island between the two pits at 4250' (now started). Ore reserves (without Western Copper) from the last "ultimate" pit were 1.2 billion tons or enough for 35 years at 10^5 TPD and 350 days operation/year (grade: "0.7-0.8% Cu, 0.4% cut-off").

The Evans Point lime quarry has been shut down. The Morenci smelter has been getting their lime from N. Arizona because of a contract, cheaper rates and Evans Point has a higher CaO content than necessary. Morenci silica flux now comes from a quarry behind the Metcalf concentrator. The Coronado Quartzite is mined containing about 0.1% Cu and several tenths oz. Ag/T.

PD is now operating the Ash Peak silver mine near Duncan for silica flux. They are shipping the tails (1-2 oz. Ag/T) and mining from an open cut between the Shamrock and Commerce shafts. According to Mr. Menzer former Bisbee miners, recently at the Safford Underground, are now doing development work for an ultimate 200 TPD underground capacity of silica flux at Ash Peak. Up to 50 TPD is presently being mined underground with grades around 4 oz. Ag/T. The flux is being shipped to the Hidalgo, N.M smelter or stock-piled. Part of PD's new demand for high-grade silica flux will be the installation of an "oxygen smelting" process at Morenci during shut-down.

The Buckeye Apache was another Small-Mines flux project in the Dos Cabesas. Preece stated that PD's claims had been staked several days before Gold Depository filed on the same ground at the courthouse. GD&L never tried to stake the area until 3 months later (although they were first in the courthouse) and then claimed that PD had torn down GD&L monuments and back-dated the date of PD staking. In the Safford District PD had apparently really neglected to file assessment work with the BLM on some claims which GD&L "repapered" at the courthouse without ever being on the ground. PD has restaked and filed since then.

PD has been doing quite a bit of exploration for precious metal-bearing ores on the margins of the Morenci district. In the diorite porphyry intrusive area in the SW part of the district the magnetite skarns (with good aeromag. expression) have fair Au-Ag, but not high enough to mine. Preece has been mapping in the Garfield Gulch area (NE part of district) and next year PD plans to drill into the monzonite and granite prophyry below sediments. R. T. Moolick had drilled the sediments here in 1960's finding little or no mineralization.

High-grade chalcocite veins have been drilled in the Stevens Mine area and continue under the volcanics. Preece stated that this area had 0.4% hypogene although some feel that the chalcocite is also hypogene.

To the E to NE mineralization dies out in Garfield Gulch with only minor pyrite epidote and chloritic alteration. Drilling east of the San Francisco fault at the head of Garfield Gulch showed no alteration or mineralization. The Coronado Quartzite was at an elevation of 2100' here, considerably down thrown from the 6100 foot elevation 3 miles west at Coronado Mountain.

Preece is also mapping in the Horseshoe and Coronado Mines area-a series of E-W veins in the NW portion of the district which extend west under the volcanics. There are about 80 million tons of oxide and sulfide reserves in this area from 1920's development and drilling. More mineralization will be delineated with future drilling.

Preece showed us skarn alteration on the southside of the Morenci pit, dominated by garnet-diopside (mostly diopside in the shales) and serpentine-chlorite-talc. Most garnet in the Ordovician Longfellow Limestone is grossularite while that in the Mississippian Modoc Limestone is andradite. Very high grade chalcocite veins in the old Joy Mine area have been keeping the grade up in recent months. Although the chalcocite usually replaces pyrite it is orthorhombic and traditionally PD has felt that it might be hypogene. Alunite veins (sometimes intergrown with pyrite) in the Joy and Ryerson mine areas were suggested to be supergene rather than part of a hypogene advanced argillic assemblage. Preece (and Sid Williams) believe that the alunite probably has something to do with the 35 my. volcanics which once covered the area. Preece said that Paul Williams, their district mineralogist, had noted electrum veins at Morenci cutting cuprite and considerable Mo in akaganeite (Beta-FeOOH) from Metcalf. They have considerable interest in Ag in Mn oxides as at Hardshell as the type locality of coronadite-cryptomelane-$(Pb,K,Ag)\ Mn_8O_{16}$ is the Coronado mine and considerable amounts of Ag-Mn ores occur at Bisbee in areas now being explored by the small mines division. Much of the Au-Ag fluxing ores now mined at Bisbee are from the pyritic cores and halos of 10-40,000 ton Cu ore bodies formerly mined. Preece says that several tenths oz./T Au is not uncommon in these ores, but he did not know the average grade.

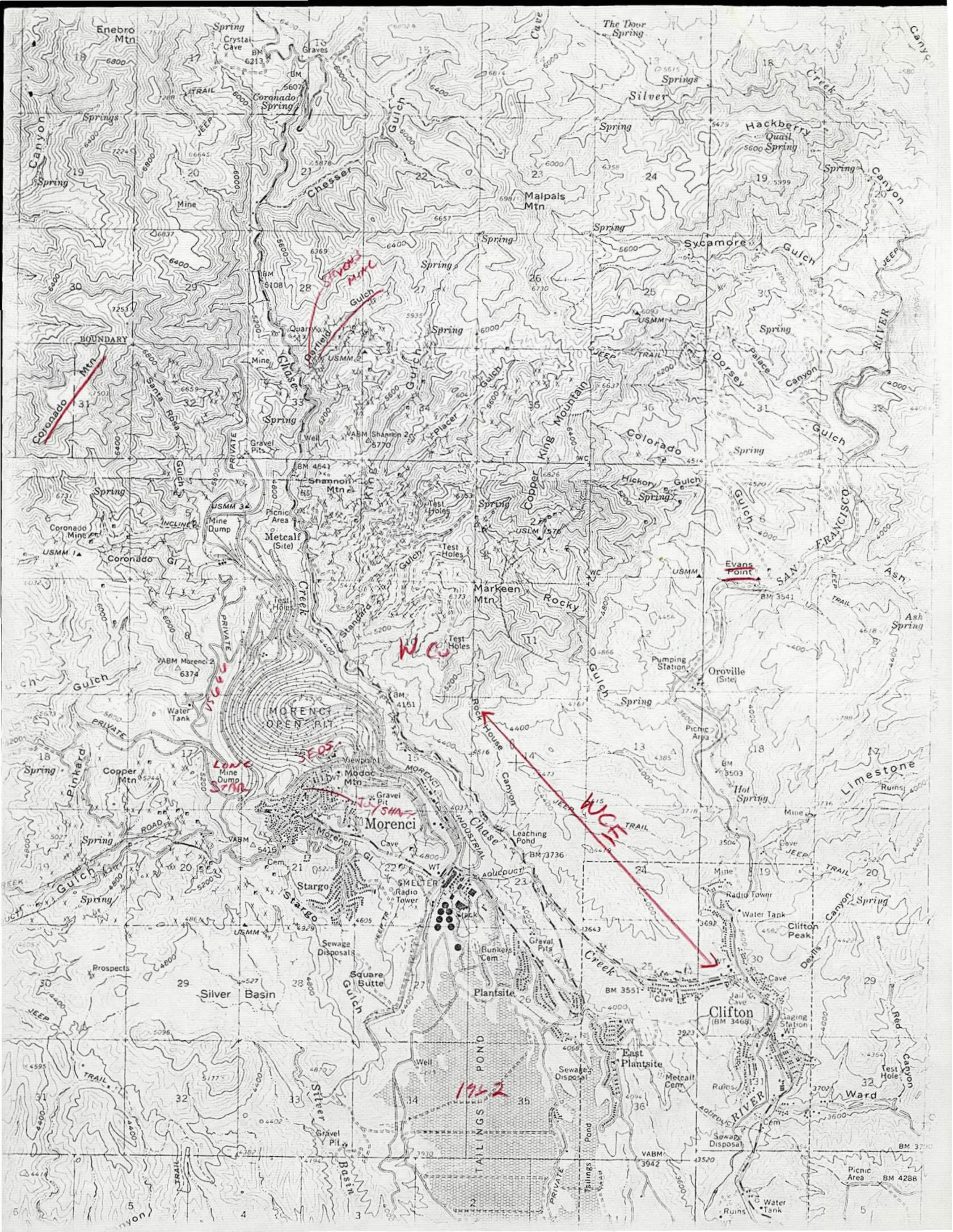
We had some good discussions with Preece on capping developed over cc/py mineralization Morenci and cov/py/cpy mineralization at Metcalf. Relief hematites after covellite are distinctly blacker than hematites after chalcocite, but both have a "seal-brown" powder. Preece says that covellite in some cases replaces chalcocite on the margins of the Morenci blanket, but that the multiple covellite-chalcocite blankets described by Langton in his 1973 paper are not well shown over much of the district. Oxidation and supergene enrichment especially at Metcalf is well controlled by fracturing with higher-grade, well-fractured enriched zones often below poorly-fractured, poorly-enriched zones. Multiple levels of fractured zones do not necessarily represent multiple periods of enrichment. Preece said that no additional evidence had been developed to confirm that the high supergene grades over considerable thickness at Morenci were due to former Cu skarns, leached and eroded before mining, over the porphyries.

The number of productive and non-productive monzonite and granite porphyries broken out have increased considerably since my tenure at Morenci in 1973. It is clear that Bennett and Schern, former Chief Geologists after Langton, were clearly "splitters" rather than "lumpers."

A total of 5 deep holes 2000-4000 feet below the Morenci pit bottom have been drilled from 1972-to date. These show a high-grade cpy-bn zone which extends to about 3000' elevation and 0.1-0.4 mineralization that locally extends to 1000' elevation. Once out of the heavy qtz-ser-py zone, K-spar-biotite-quartz ∓ epidote ∓ chlorite alteration is common and usually veinlet controlled. Green argillic (montmorillonite-chlorite) veinlet selvages are very common.

F. R. Koutz

FRK:mek
Att.
cc: WLK, HGK, GWP, SAA



Enebro Mtn
Spring
Crystal Cave
Graves
The Door Spring
Canyon
Coronado Spring
TRAIL
JEEP
Springs
Silver
Creek
Spring
Hackberry
Quail Spring
Chesser
Gulch
Mine
Malpais Mtn
Sycamore
Gulch
RIVER
Garfield Gulch
Quarry
BOUNDARY
Coronado Mtn
Santa Rosa
Chase
Placer
King Mountain
Dorsey
Palace
Canyon
Colorado
Gulch
Copper
Hickory Gulch
SAN FRANCISCO
Gravel Pits
PRIVATE
Shannon Mtn
Coronado Mine
INCLINE
Mine Dump
Metcalf (Site)
Picnic Area
Test Holes
Evans Point
Ash
Ash Spring
Coronado Gl
Creek
Standard
Markeen Mtn
Rocky
Test Holes
Pumping Station
Oroville (Site)
Gulch
MORENCI OPEN PIT
Water Tank
Rock House Canyon
Picnic Area
Hot Spring
Limestone
Pinkard
Copper Mtn
Viewpoint
Modoc Mtn
Gravel Pit
Mine Dump
Morenci
MORENCI INDUSTRIAL
Chase
Leaching Pond
JEEP TRAIL
Cave
Ruins
Spring
ROAD
Gulch
Cem
Stargo
Stargo
SMELTER
Radio Tower
AQUEDUCT
Mine
Radio Tower
Water Tank
Clifton Peak
Devils Canyon
Sewage Disposal
Bunkers Cem
Gravel Pits
Creek
Prospects
Square Butte
Gulch
Plantsite
Cave
Jail Cave
Clifton
Silver Basin
Gaging Station
Red Canyon
Well
TAILINGS POND
East Plantsite
Sewage Disposal
Metcalf Cem
Ruins
Test Hole
Ward
Silver Basin
Gravel Pit
Tailings Pond
RIVER
Sewage Disposal
Picnic Area
Water Tank
Ruins
W Cu
WCF
1922
Lone Star

Ash Peak Area
Greenlee Co, AZ

JDS

Transient Miner, Dewey Wilkens has 12 lode claims with 7 placer claims, all unpatented between Safford & Duncan.

He says that he has an 8 inch by 40 foot outcrop with selected rocks running between 0.5 and 10 % Tin. These samples have between 3000 & 4000 ppm Indium. The structure has visible specularite.

An outfit called Indium Resources (?) drilled a 500' hole into the structure and found only specularite.

Location T8S, R30E.

Cheops claims.

JDJ

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