04B00215

BATTLE MOUNTAIN GOLD COMPANY
FORTITUDE GOLD DEPOSIT

INTRODUCTION

Lac geologists visited Battle Mountain Gold Company's Fortitude ore deposit on February 14, 1986. The deposit is located in the Battle Mountain Range, in northeast Lander County, Nevada, 32 miles southwest of the city of Battle Mountain (Figure 1). Rob Benson, mine geologist, conducted the tour.

GENERAL GEOLOGY

The reader is referred to U.S.G.S. Professional Paper 459-A & B for detailed discussions of the geology of the Battle Mountain Range and its ore deposits.

Stratigraphy.

Paleozoic sedimentary rocks underlie the majority of the range. Eugeoclinal cherts and shales of the Cambrian Scott Canyon Formation and quartzites, shales, and calcareous sandstone of the Cambrian Harmony Formation are the oldest rocks in the area. These rocks are part of the Roberts Mountain thrust plate. Autochthonous, overlap sequence limestones and coarse clastics of the Pennsylvanian to Permian Antler Sequence unconformably overlie the Cambrian strata within the same range. The Antler Sequence in the Battle Mountain Range includes three units; middle Pennsylvanian, interbedded conglomerate and sandstone of the Battle Formation; Pennsylvanian-Permian Antler Peak Limestone, and; the Permian, calcareous, conglomeratic Edna Mountain Formation. Cherts and argillites of the Pennslyvanian Pumpernickel Formation are thrust over the Antler Sequence along the Golconda thrust fault. An Eocene (38.5 m.a.), weakly altered, porphyritic granodiorite pluton intrudes the Paleozoic sedimentary rocks.

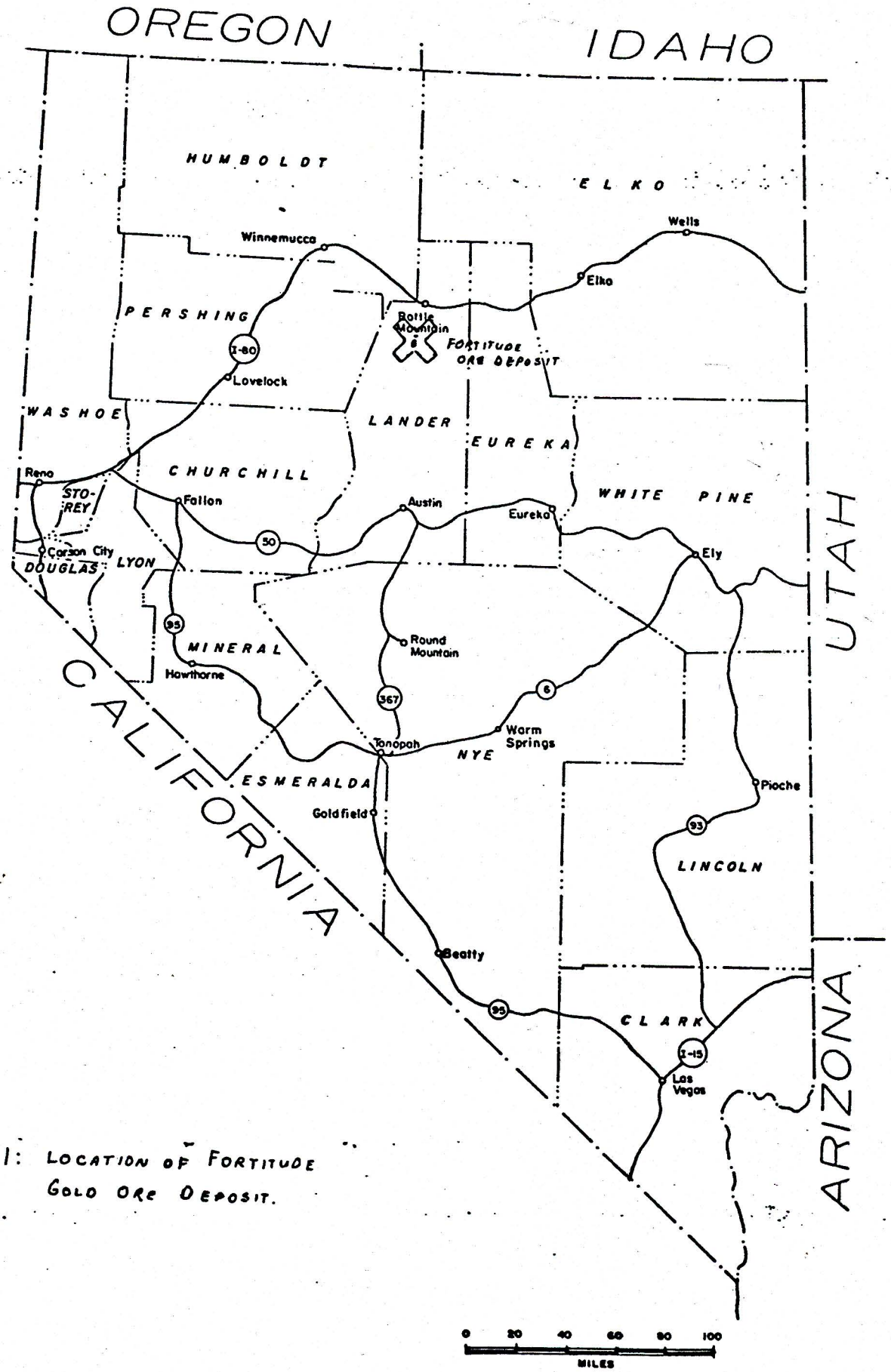

FIGURE 1: LOCATION OF FORTITUDE GOLD ORE DEPOSIT.

Structure.

Structure in the mine area is complex and records evidence of recurring orogeny that began in the Paleozoic. Folding and large-scale, eastward-directed thrusting accompanied the Devonian-Pennslyvania Antler orogeny and the Permian, Sonoman orogeny. These orogenies are responsible for the Roberts Mountains thrust & the Golconda thrust, respectively. Minor westward-directed, thrusting and folding accompanied Juro-Cretaceous orogeny. Finally, middle-Tertiary extension produced high-angle, basin and range style block faulting. Structural complexity in the region increases permeability and porosity of large areas of rocks, necessary for circulation of hydrothermal fluids, as well as provides deep-seated conduits for mineralizing fluids.

The deposit lies along a strong, northwest-directed lineament, the Eureka-Battle Mountain trend. This trend is defined a by northwestward alinement of mineral occurrences, windows on the upper plate of Roberts Mountain Thrust and Oligocene-Eocene stocks.

MINERALIZATION

Base and precious metals deposits in Copper Canyon are genetically related to the 38.5 m.a. altered, porphyritic granodiorite Copper Canyon stock (see Figure 2). Mineralization occurs as disseminated and massive sulfide eplacements of calc-silicated, calcerous rock units. Mineralization also occurs as sulfide veins and fissure fillings within and outside areas of calc-silicate alteration.

Mining History.

Large-scale, open pit mining of copper ores from skarn

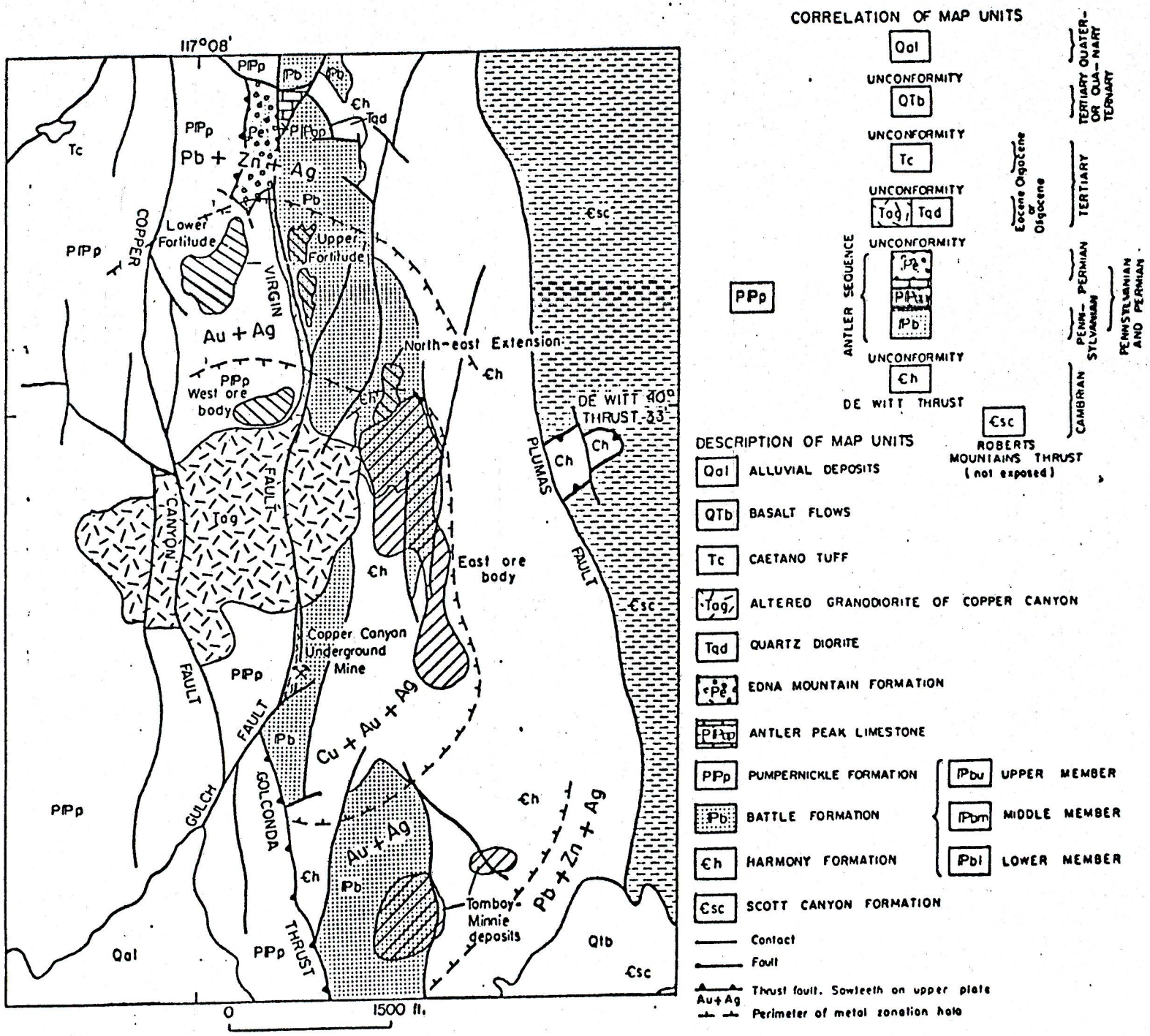

Figure 2. Generalized geologic map of the Copper Canyon area (modified from Blake et al, 1984).

adjacent to the stock was initiated by Duval Corporation in 1967. Total combined production from East and West copper pits was 16.2 st with an average grade of .79% copper, 0.72 oz/ton silver, and 0.025 oz/ton gold.

Mid-1970's gold exploration resulted in the discovery of the Tomboy-Minnie and Northeast Extension gold deposits at Copper Canyon. The Tomboy-Minnie deposits contain 3.9 st of ore grading 0.04 oz/ton gold an 0.28 oz/ton silver. These deposits occur in lenses confined to calc-silicated, oxidized, lower Battle Formation calcareous conglomerates. Mineralizing fluids infiltrated along north-south trending high angle faults and were concentrated near intersections of northeasterly-and northwesterly-trending faults. The deposits are very close to and parallel to the Cambrian Harmony Formation and Battle Formation unconformable contact. Fluid migration may be partly controlled by this structure. A similar geologic environment is responsible for gold mineralization at Battle Mountain Gold Company's unannounced Surprise prospect in the Copper Basin area. Here gold mineralization is in the Harmony Formation just below the Battle contact. Reserves are said to be 2.1 st of 0.11 oz/ton gold.

Fortitude Geology.

The stratabound and stratiform Fortitude ore deposit occurs as massive-sulfide replacement of Antler Peak Limestone. The ore body is approximately 1,600' X 600' X 100' to 175' thick (N.B. - this is about the size of a claim.) The ore zone lies near the hanging wall of the north-south trending, west-dipping, Virgin fault (see Figure 3). The Virgin fault is intruded by an altered porphyritic dike, similiar to the Copper Canyon granodiorite stock. The ore zone is bounded by north-trending faults of minor displacement that dip back into the Virgin Fault. These

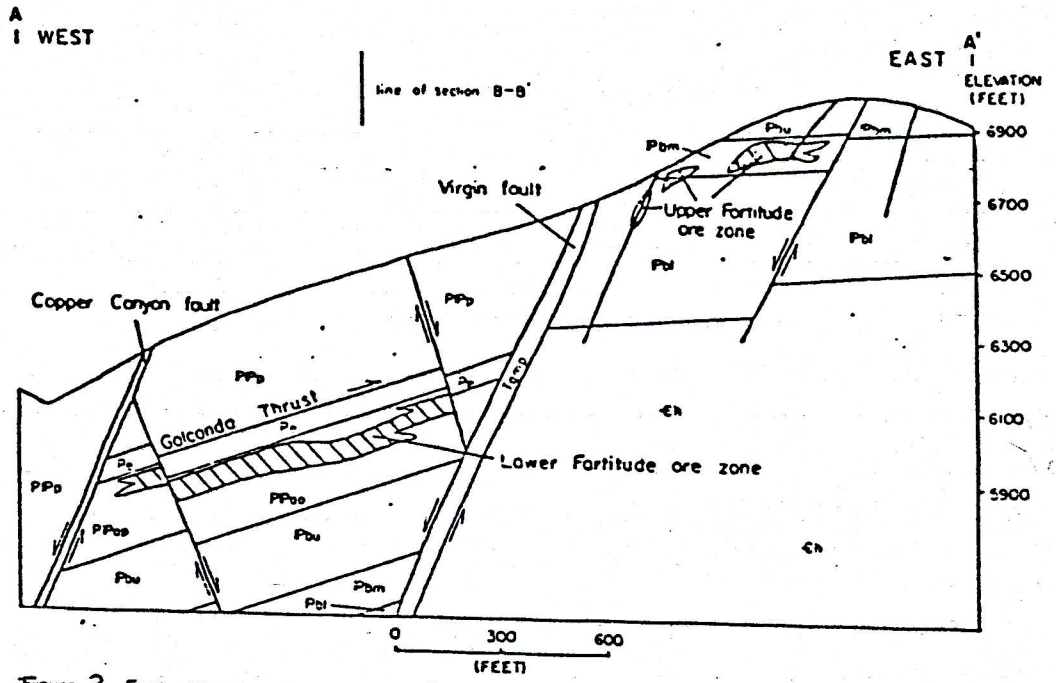

Figure 3 East—West vertical section showing generalized geology of the Fortitude area. View is to the north. Rock units same as Figure 2.

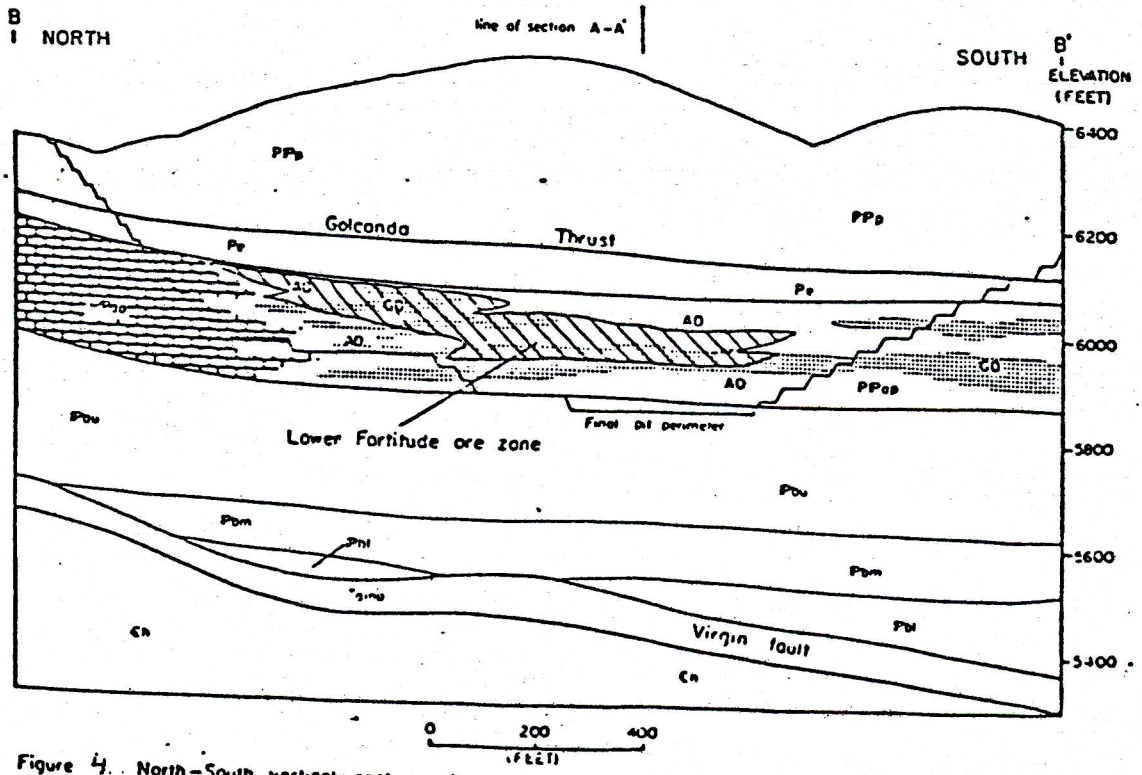

Figure 4. North—South vertical section showing geology and alteration types in the Lower Fortitude ore zone. View is to the east. GD = garnet dominant alteration (stippled pattern), AD = actinolite dominant alteration, block pattern = marbleized/recrystallized limestone. Rock units same as Figure 2.

faults are believed to be antithetic faults to the major Virgin fault. Fluids probably ascended the Virgin fault and were trapped by these smaller faults.

The ore body lies in a distal skarn zone (Figure 4). An early, isochemical, garnet-dominant assemblage is replaced locally by actinolite-dominant hydrothermal alteration assemblage with minor associated pyrrhotite-chalcopyrite-pyrite-sphalerite-galena. A pyrite-marcasite-arsenopyrite-chlorite alteration assemblage along with the majority of gold mineralization replaces the calc-silicate alteration. Fluid inclusion data indicates that hydrothermal fluids responsible for the actinolite-assemblage and chlorite-assemblage alteration events had temperatures near 200°C. The gold in the ore occurs as free particles at intergrain boundaries between sulfides and free gold absorbed onto pyrrhotite. The ore is unusual when compared to Carlin-type deposits in its coarseness. 10% to 15% of the gold is recovered by gravity concentration.

The successive alteration-mineralization assemblages reflect the transformation from magmatic- to meteoric-derived fluid flow as well as cooling of the fluids. Late stage fluids responsible for chloritization, sericitization, and gold mineralization are dominantly meteoric in origin. These plumes are set into broad scale convective circulation by heat from cooling stock along a pervasively fractured zone associated with stock emplacement.

Fortitude Mining & Production - Facts & Figures

The Fortitude ore deposit contains reserves of 7 million tons of ore grading 0.282 oz/ton gold and 0.82 to 1 oz/ton silver. On the average, 92% of the gold and 50% of the silver is recovered by carbon-in-pulp, cyanide-leach methods. Thirty-two hundred to thirty-five hundred tons of ore are

processed daily by the mill. Mining costs are $11 to $12 per ton. Overall production costs are $220 per ounce. This figure is expected to decrease to $200 per ounce with decreased stripping ratio. Stripping ratio will average 7:1 through mine life. The company expects to extract 26,000 ounces of gold yearly. Appendix B is a copy of a recent article from EM & J describing mining, milling and recovery in detail.

EXPLORATION STRATEGY

Geochem.

A suite of 18 samples were taken from altered host sediments, bounding fault zones, ore zones, and distal, weakly altered sediments (see Appendix A for geochem results and sample descriptions). The samples were taken from the 6075' level which is approximately 200' from the surface (Figure 5). In general, base, precious metals, and pathfinder elements concentrations are elevated in zones of intense alteration, increasd sulfide content, and/or structures. The deposit was a blind ore body covered by 300' or more of sediments. A deep-seated, mineralized fault with gold mineralization cutting a favorable stratigraphic package is the best geochemical evidence for a Fortitude-type deposit.

Geophysics.

Rumor has it that the ore body was discovered during a dump condemnation drilling program. The hole was chosen to test a magnetic anomaly. The anomaly was intense but very small. Obviously a variety of geophysical methods pioneered during copper porphyry exploration could help identify

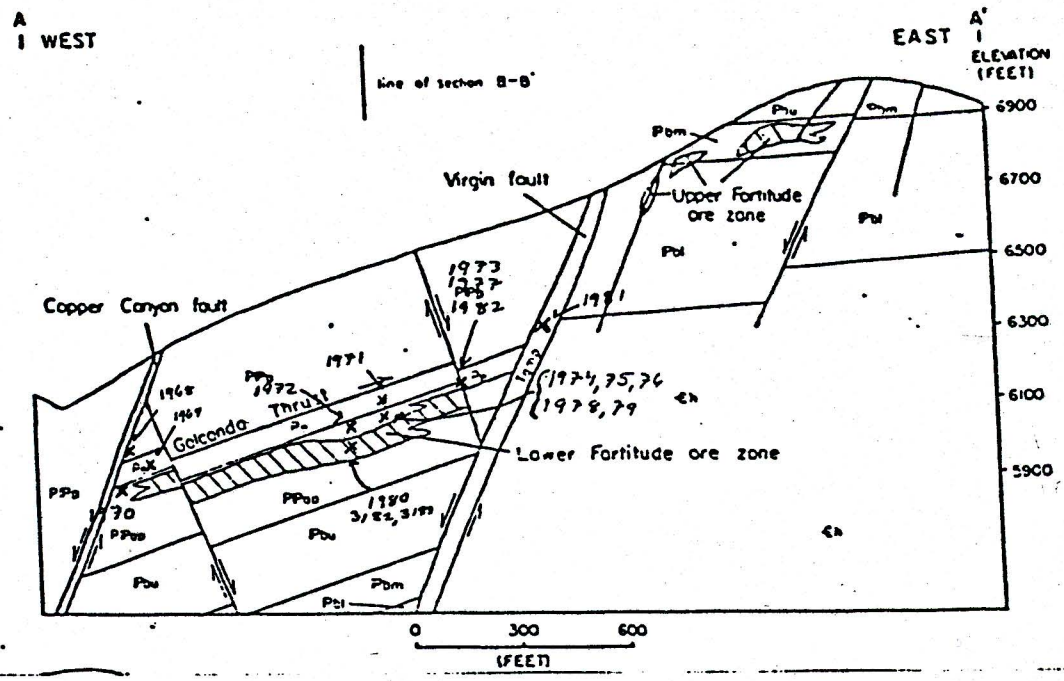

FIGURE 5: APPROXIMATE SAMPLE LOCATIONS.

sulfide-rich replacement bodies, fault structures, alteration zones, and stratigraphy/igneous rock types.

Geologic Model.

The following are important criteria for a Fortitude-style, gold-rich, replacement body.

1. 37-40 m.a. porphyritic granite to granodiorite stocks, that have associated base-metal mineralization and fairly strong, prophyry-style alteration. This time interval is consistent with a strong pulse of igneous activity and gold mineralization in Nevada. The Battle Mountain-Eureka mineralized trend has a number of plutons of this age.

2. Evidence for a strong, widespread, late-stage epithermal alteration event. Alteration assemblages indicative of such an event include, chlorite, sericite, pyrite, quartz ± gold.

3. High and low angle structures which provide fluid pathways and structural traps, respectively.

4. Exploration of the concentric, gold-rich zones peripheral to a copper and base metal-rich zone surrounding an altered stock. This zoning has been recognized surrounding the Copper Canyon stock and possibly the Eureka stock in the Eureka district.

EXPLORATION TARGETS

Eureka District.

Ratto and Windfall occur in a peripheral zone surrounding the Eureka stock. Further examination in the peripheral zone south of Ratto is warranted. Ratto is currently being offered for sale by Amselco. Geologic reserves of 4 to 5 million tons of 0.08 oz/ton have been established, although mining reserves are significantly less. Information about the property has been requested.

Ely District.

An extensive, late-stage quartz-sericite-pyrite alteration assemblage occurs in the Ely copper district. Silver King has mineable reserves in this area.

Iron Point.

Bruce Miller says moly mineralization in a stock was encountered in deep drill holes. The stratigraphy of the area is such that the Antler Peak should occur at depth and could be mineralized adjacent to buried stock. Iron-stained and widespread clay alteration at surface suggest a large-scale hydrothermal system existed in the area.

Bullion District.

NICOR has 1.1 million tons of 0.1 oz/ton gold mineralization in the crest of the Piñon anticline. The mineralization is related to small plugs and dikes, probably offshoots of a shallowly buried intrusive.

Districts Related to Intrusive Rocks in Eastern Assemblage Carbonates:

Ferber
Currant
Spruce Mountain
Dolly Varden
Cedar Mountains
Deep Creeks, Utah

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APPENDIX "A"

Geochemical Analysis Report

TO: Mr. Robert E. Bennett
Long Lac Mineral Exploration
1475 Greg St.
Sparks, NV 89431 tel:702/356-8058

Lot Identity: LOA-60307B
Digest: 5.0 gram

Report Date: 03/07/86

Sample ID	#	Ag ppm	As ppm	Au ppm	Cu ppm	Hg ppm	Mo ppm	Pb ppm	Sb ppm	Tl ppm	Zn ppm
B 3182	1	76.01	18.60	64.88	2168.	<.582	1.016	523.6	2.444	<.948	248.0
B 3183	2	1.492	67.73	.1335	69.08	<.491	3.971	359.9	3.811	<.982	723.5
B 1968	3	1.477	506.2	.0858	62.87	<.481	1.167	709.7	5.629	<.963	1511.
B 1969	4	20.41	61.79	.0399	482.1	<.497	4.765	2192	17.05	<.994	1385.
B 1970	5	75.28	35.37	32.96	3729	<1.22	<.492	2095	4.266	1.330	136.6
B 1971	6	1.058	19.77	.1337	144.3	<.490	2.655	101.7	6.155	<.980	101.5
B 1972	7	.7961	133.7	.0681	28.59	.7756	1.580	49.23	4.831	<.965	50.04
B 1973	8	33.15	768.5	.3874	817.8	<.481	5.571	1894	32.33	<.963	2092.
B 1974	9	.2534	19.98	.0275	10.00	<.486	1.113	24.40	<.972	<.972	29.62
B 1975	10	9.335	1169.	.0365	461.5	<.477	13.77	459.9	71.84	<.954	489.5
B 1976	11	.9603	741.6	.2246	32.43	2.455	12.88	47.32	5.931	<.982	267.3
B 1977	12	.2721	81.59	.0169	9.663	<.488	1.250	13.96	7.398	<.976	2297.
B 1978	13	.1187	6.454	.0299	3.340	<.494	2.312	10.03	.9993	<.988	76.55
B 1979	14	.6666	5.018	.1940	21.09	<.491	14.97	14.25	<.982	2.042	15.06
B 1980	15	64.56	12.96	3.006	1929.	<.607	<.486	803.1	2.168	<.972	88.06
B 1981	16	5.265	962.3	.2218	946.4	1.682	.6156	59.81	5.990	1.206	66.00
B 1982	17	14.28	1983	.0885	227.3	<.999	11.51	823.9	29.38	<.974	6176

Battle Mtn

Red: Indicates data above high standard and may not be quantitatively accurate.

This report has been reviewed and approved by:

W Fo[illegible] Date: 3/7/86

William B. Henderson, Lab Director/Chemist

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Au Field Trip B 01982
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortitude Pit - Battle Mtn Au
Sump level 6050(?) level
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. ____ SIZE 3lbs
REMARKS:
5' channel of highly
Adized + oxidized chip
fault zone from major
east antithetic fault

Field Notes As Filed

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Au Field Trip B 01981
SAMPLER CJN
STATE NV. COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortitude Pit - Battle Mtn Au
6050? Bench above west Pit
CHANNEL PANEL CHIP OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. ____ VERT HORIZ W. ____ SIZE ____
REMARKS: Sampled area of
Tonalite Dike filling
Viewed fault - mod to
strong argillic alteration.

Noted As Filed

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Au Field Trip B 01980
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortitude Pit - Battle Mtn Au
Sump level 6050?
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. ____ SIZE 3lbs
REMARKS: One large sample from
Austin Pink in floor of
sump

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Au Field Trip B 01979
SAMPLER PEM
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortitude Pit - Battle Mtn Au.
6075' Bench
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. ____ SIZE 3lbs
REMARKS: Highly altered Austin Pink
from broken hanging antithetic
fault zone
Low sulfides - heavily
argillized - some limonite

Field Notes As Filed

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Au Field Trip B 01978
SAMPLER PEM
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortitude Pit - Battle Mtn Au
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. ____ SIZE 4lbs
REMARKS: Bleached and oxidized
Austin Pink from western
silicified hanging antithetic
fault zone

Field Notes As Filed

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Au Field Trip B 01977
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION 6075' level Fortitude Pit
Battle Mtn Au
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. ____ SIZE 2½ lbs
REMARKS:
Eastern side antithetic fault
zone in Austin Pink. Lim.
represents 5' chip - silicified
bx w/ lim. and qtz. in open
space filling

Field Notes FB

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip B 01976
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortitude Pit. Battle Mtn Au
6075 Bench
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 2' VERT HORIZ W. 3' SIZE 3lbs
REMARKS:
Chlorite Austin Pink west
above 6050' horizon

Field Notes As Filed

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip B 01975
SAMPLER CJN/PEM
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortitude Pit - Battle Mtn Au
6075 level - East side of pit
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP) HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. ____ VERT HORIZ W. ____ SIZE 3lbs
REMARKS: V. chlorite Austin Pink
completely altered - low sulfid

Notes As Filed

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip B 01974
SAMPLER CJN
STATE NV. COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortuine Pit - Battle Mtn Au
6075' Bench

CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP/HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. 2' SIZE 3lbs
REMARKS:
CHARACTER SAMPLE OF MARBELIZED TAP (ANDER MINE) ABOUT 50-75' BELOW FOUNA MTN CONTACT. ABOUT 12 MARBLIZED TO ORE

FIELD NOTES AS F5

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip B 01973
SAMPLER PEM
STATE NV. COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortuine Pit - Battle Mtn Gold
6075 Bench

CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP/HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 2' VERT HORIZ W. ____ SIZE 2lbs
REMARKS:
DIMONTIC CHIP ACROSS MINERALIZED FAULT FRINGE ZONE - CUTTING ALBITE PORK

FIELD NOTES AS PEM #2

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip B 01972
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortuine Pit - Battle Mtn Au
6075' Level

CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP/HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. 2' SIZE 3lbs
REMARKS: ABOUT 50' STRATIGRAPHICALLY BELOW CONTACT W/ FOUNA MTN IN MARBLIZED / UNDERLIN MARBLIZED UNDERLIN MARBLIZED CARB 2% Py > Po

FIELD NOTES F1

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip B 01971
SAMPLER PEM
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortuine Pit Battle Mtn Au.
6075 Bot level.

CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP/HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 5' VERT HORIZ W. ____ SIZE 2lbs
REMARKS: REPRESENTATIVE CHIP JUST ABOVE TEM / TAP CONTACT

FIELD NOTES AS PEM 1

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip Au B 01970
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortuine Pit Battle Mtn Gold

CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP/HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. ____ VERT HORIZ W. ____ SIZE 3lbs
REMARKS:
HIGH GRADE OF SIL-AS-PO-PY POD OR VEIN REPLACEMENT AT CONTACT OF FOUNA MTN-AUSTINOR PORK
TOTAL SULFIDES = 15%
PO > AS > PY

FIELD SAMPLE F3

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

PROJECT Spring Field Trip B 01969
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortuine Pit - Battle Mtn Gold
6075' Level.

CHANNEL PANEL (CHIP) OUTCROP FLOAT (BANDED) STREAM SOIL
SELECT (REP/HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. ____ VERT HORIZ W. ____ SIZE 2lbs
REMARKS: FOUNA MOUNTAIN CONTACTAGE MINERALIZED AND WEAKLY WITH CAR-AS HOMATITE TO WEAKLY ARGILLIZED)

SAMPLE NOTED AS F2

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W

LONG LAC MINERAL EXPLORATION · U.S.A.

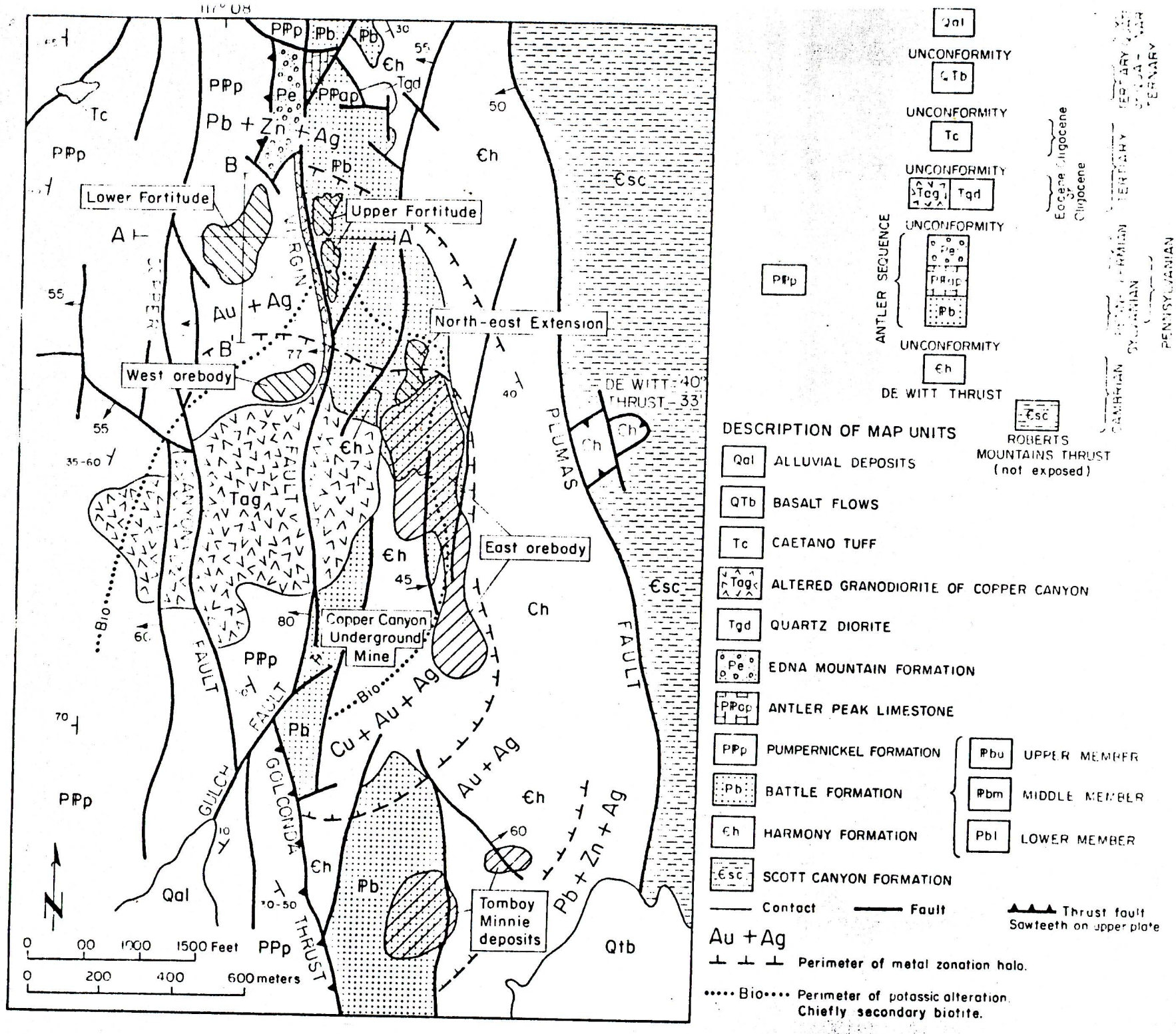
PROJECT Spring Field Trip B 01968
SAMPLER CJN
STATE NV COUNTY Lander DATE 2/14/86
QUAD ____ T. ____ R. ____ S. ____
LOCATION Fortuine Pit - Battle Mtn Gold
6075' Level

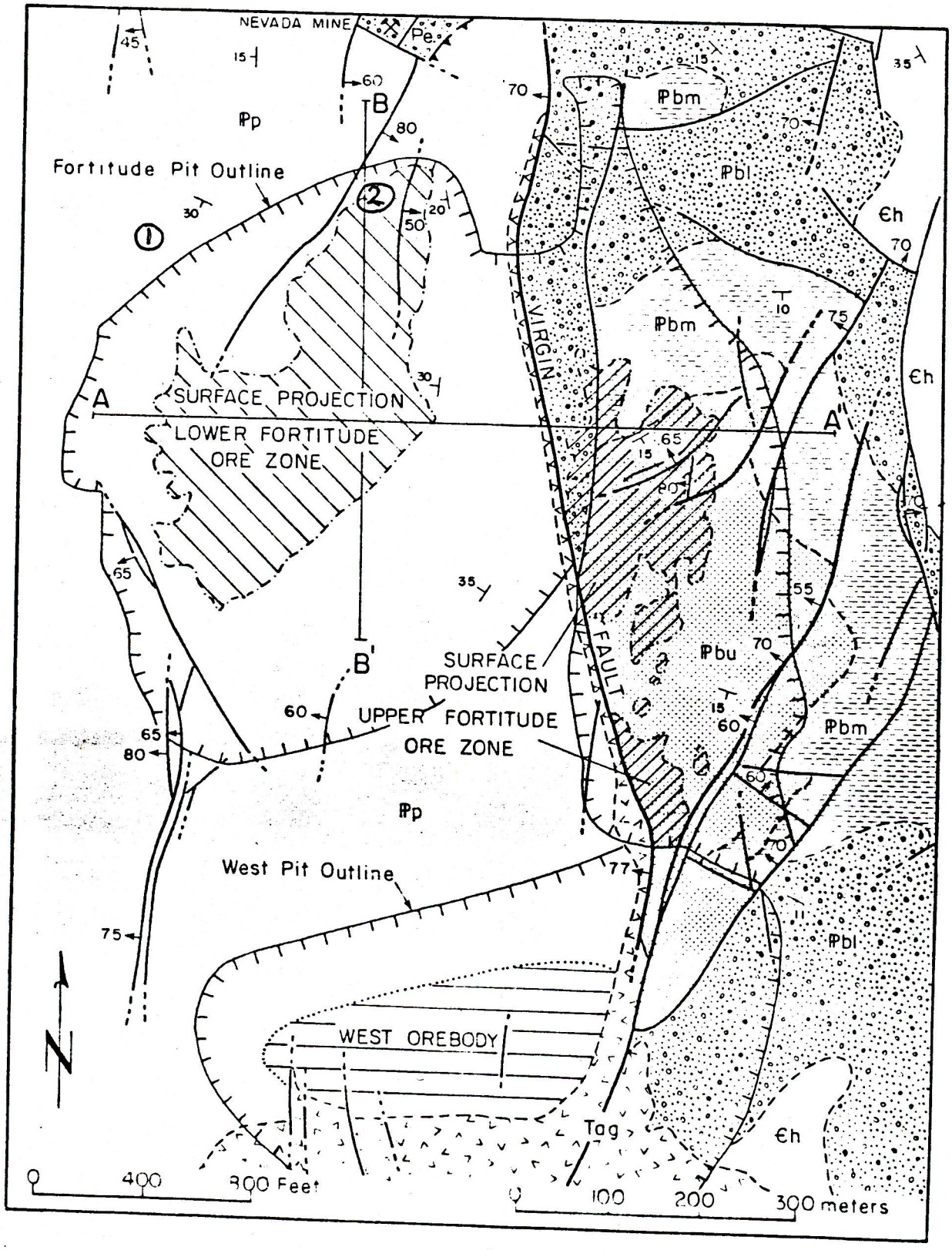
CHANNEL PANEL (CHIP) OUTCROP FLOAT STREAM SOIL
SELECT (REP/HIGH-GRADE) COMPOSITE DUMP WORKING
SAMPLE DIMENSIONS: L. 6" VERT HORIZ W. ____ SIZE 3lbs
REMARKS: CHIP OF THIN VEIN CUTTING UNMINERALIZED FOUNA MTN - RESURGE FEEDER SILLIDRE.

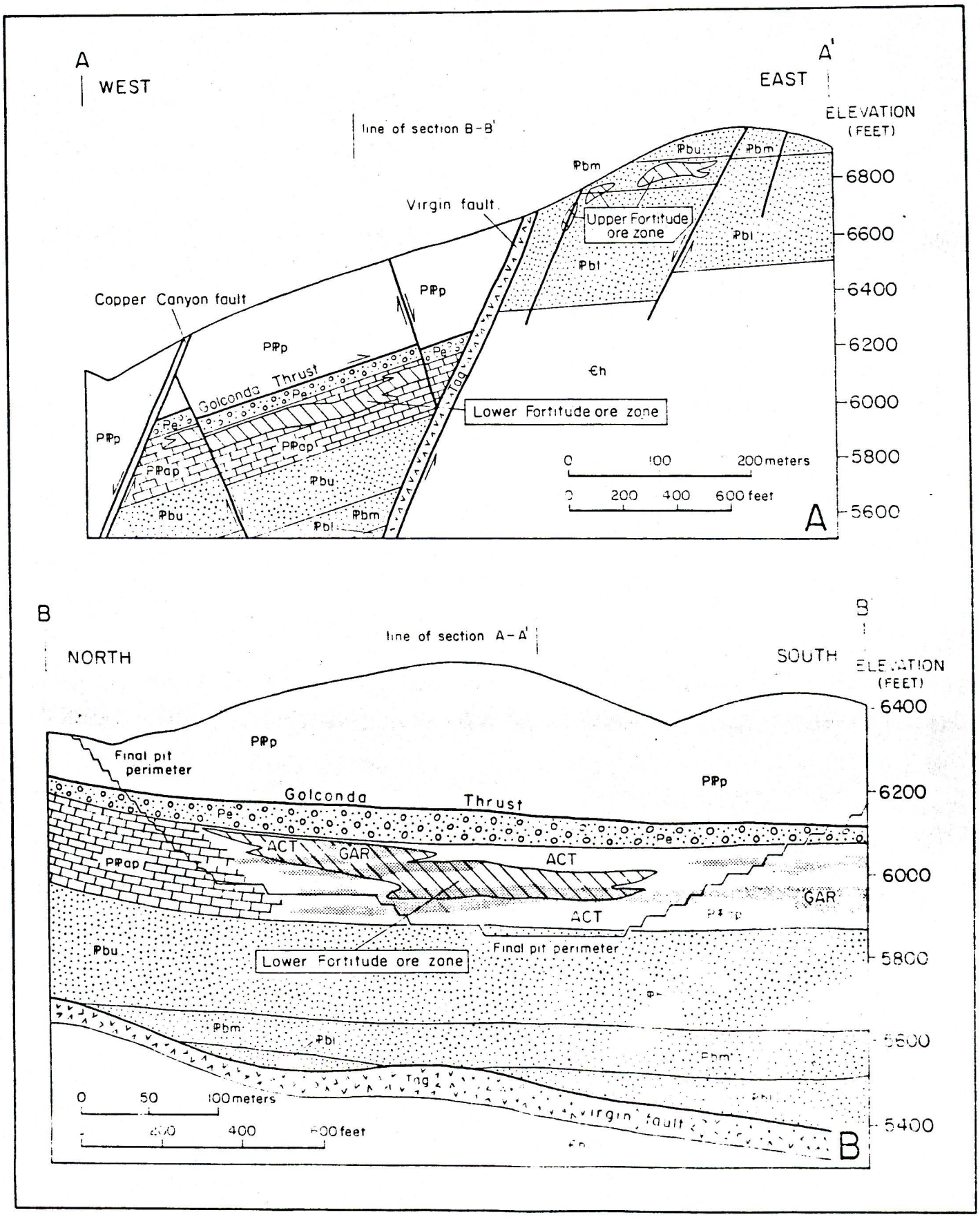
MODERATELY LIMONITIC STAINED MODERATELY ARGILLIZED FAULT ZONE

FIELD NOTES AS F1

Assay For: Au Ag As Sb Hg Tl Cu Mo Pb Zn W


Lower Fortitude
Upper Fortitude
North-east Extension
West orebody
East orebody
Copper Canyon Underground Mine
Tomboy Minnie deposits
Pb + Zn + Ag
Au + Ag
Cu + Au + Ag
Pb + Zn + Ag
Bio
COPPER CANYON FAULT
VIRGIN GULCH FAULT
GOLCONDA THRUST
PLUMAS FAULT
DE WITT THRUST
ROBERTS MOUNTAINS THRUST (not exposed)
UNCONFORMITY
ANTLER SEQUENCE
Eocene Oligocene
PENNSYLVANIAN AND PERMIAN
CAMBRIAN
DESCRIPTION OF MAP UNITS
Qal ALLUVIAL DEPOSITS
QTb BASALT FLOWS
Tc CAETANO TUFF
Tag ALTERED GRANODIORITE OF COPPER CANYON
Tgd QUARTZ DIORITE
Pe EDNA MOUNTAIN FORMATION
PPap ANTLER PEAK LIMESTONE
PPp PUMPERNICKEL FORMATION
Pb BATTLE FORMATION
Ch HARMONY FORMATION
Csc SCOTT CANYON FORMATION
Pbu UPPER MEMBER
Pbm MIDDLE MEMBER
Pbl LOWER MEMBER
Contact
Fault
Thrust fault Sawteeth on upper plate
Au + Ag Perimeter of metal zonation halo.
Bio Perimeter of potassic alteration. Chiefly secondary biotite.
0 00 1000 1500 Feet
0 200 400 600 meters


NEVADA MINE
Pe.
Pp
Fortitude Pit Outline
SURFACE PROJECTION
LOWER FORTITUDE ORE ZONE
A
A'
B
B'
VIRGIN
FAULT
SURFACE PROJECTION
UPPER FORTITUDE ORE ZONE
West Pit Outline
WEST OREBODY
Tag
Pbm
Pbl
Pbu
Eh
0 400 800 Feet
0 100 200 300 meters


A
WEST
A'
EAST
ELEVATION (FEET)
line of section B-B'
Virgin fault
Upper Fortitude ore zone
Copper Canyon fault
Golconda Thrust
Lower Fortitude ore zone
0 100 200 meters
0 200 400 600 feet
6800
6600
6400
6200
6000
5800
5600
B
NORTH
line of section A-A'
SOUTH
B'
ELEVATION (FEET)
Final pit perimeter
Golconda Thrust
ACT
GAR
Lower Fortitude ore zone
Final pit perimeter
Virgin fault
0 50 100 meters
400 600 feet
6400
6200
6000
5800
5600
5400