Josephine County

Name: Albright Mine. (copper gold)

Old Name: Mammoth Mine.

Owners: G. H. Grover, Clarence Hunt and E. M. Albright all of Grants Pass, Oregon.

Location: Gossan outcrops on ridge between West Fork of Illinois and Blue Creek in S.E.¼ Sec. 16, T. 41 S., R. 9 W. 2½ miles from Redwood Highway. 45 miles from Grants Pass.

Area: 260 acres of patented ground.

History: Original discoverer unknown. Albright has worked on the property off and on since 1900. The property has been sold on bond and lease several times.

Geology: Covered on page 190 in Bulletin 846-B Geology and Ore Deposits of the Takilma Waldo District. In this report it is called the Turner Mine. Turner had the mining claims. The east line of Sec. 16 which is not shown is very close to the arrow denoting north on the sketch.

Development: Tunnel 5 S. 55° E. 300 ft.
" 6 S. 35° E. 250 ft.
Both tunnels are in iron stained greenstone. There is a 650 ft.? tunnel parallel to and about 50 ft. below Tunnel 6. The portal is caved and the dump does not represent a tunnel of that length.

Miscellaneous Information: Elevation 3200 ft. Plenty of timber. Ideal location for mill site on West Fork of Illinois River, 1200 ft. below the mine. Water power could be developed. Less than one mile of road would have to be constructed to connect with the old Crescent City road.

Informant: J. E. Morrison, 11/14/38.

Confidential: This property may have a low grade possibility. I intend to do some sampling as soon as possible. Harry Messenger told me this property was sampled by Engineer for Queen of Bronze and it ran $2 in gold and over 2% copper. Do you have any information on the property?

State Department of Geology and Mineral Industries

702 Woodlark Building
Portland 5, Oregon

ALBRIGHT MINE — Waldo Mining District — Josephine County

Sample submitted by Oregon Dept. of Geology

Sample received on July 8, 1947

Analysis requested As reported

Analysis by:

L. L. Hoagland
Assayer

Lab. No.	Sample Marked	Results of Analysis: Gold	Results of Analysis: Silver	Remarks
P-6257	Albright Mine	0.07 oz/Ton	0.60 oz/Ton	Grab sample from portal #4 tunnel - sulphide ore.
P-6258	" "	0.05 oz/Ton	Trace	Chip sample across 80 foot outcrop.
P-6259	" "	0.02 oz/Ton	0.60 oz/Ton	Ore stockpile near leach tanks.
P-6260	" "	0.03 oz/Ton	Trace	Just above #4 tunnel 10' chip sample of sil gossan.
P-6261	" "	Trace	Trace	(from dozer cut)
P-6262	" "	0.33 oz/Ton	0.87 oz/Ton	Larger gossan E. wall rock. Larger gossan in place 6' wide.
P-6263	" "	0.20 oz/Ton	Trace	Soft gossan - right of P-6262.

* * * *   * * * * * * * *   * * * * * * * * * * * * *   * * * * * * * * * * * * *

ALBRIGHT MINE   WALDO   JOSEPHINE

August 22, 1947

Sample submitted by R. S. Mason (D.O.G.A.M.I.)

Sample received on July 8, 1947.

Analysis requested As reported

Analysis by:

L. L. Hoagland
Assayer

Lab. No.	Sample Marked	Results of Analysis: Gold	Silver	Remarks
P-6257	Albright Mine	0.07 oz.	0.60 oz.	Grab sample from portal #4 tunnel - sulphide ore
P-6258	" "	0.05 oz.	Trace	Chip sample across 80' outcrop
P-6259	" "	0.02 oz.	0.60 oz.	Ore stockpile near leach tanks
P-6260	" "	0.03 oz.	Trace	Just above #4 tunnel 10' chip sample of sil gossan
P-6261	" "	Trace	Trace	(from dozer cut)
P-6262	" "	0.33 oz.	0.87 oz.	Larger gossan E. wall rock Larger gossan in place 6' wide
P-6263	" "	0.20 oz.	Trace	Soft gossan - right of P-6262

*** ***** *********** ****************

ALBRIGHT (MAMMOTH, TURNER) MINE (copper, gold) Waldo District

Owners: G. H. Grover, Clarence Hunt, and E. M. Albright, all of Grants Pass, Oregon

Location: Gossan outcrops on ridge between west fork of Illinois and Blue Creek in SE¼ sec. 16, T. 41 S., R. 9 W., 2½ miles from Redwood Highway, 45 miles from Grants Pass.

Area: 260 acres of patented ground

History: Original discoverer unknown. Albright has worked on the property off and on since 1900. The property has been sold on bond and lease several times.

Development: Tunnel 5—S. 55°E. 300 feet. Tunnel 6—S. 35° E. 250 feet. Both tunnels are in iron stained greenstone. There is a 650-foot (?) tunnel parallel to and about 50 feet below Tunnel 6. The portal is caved and the dump does not represent a tunnel of that length.

General: Elevation is 3200 feet. Plenty of timber. Ideal location for mill site on West Fork of Illinois River, 1200 feet below the mine. Water power could be developed. Less than one mile of road would have to be constructed to connect with old Crescent City Road.

History

"The Turner or Albright Mine is just north of the California line, 45 miles southwest of Grants Pass, and 2½ miles by trail from the Redwood Highway. Between the highway and the mine the trail gains 1,200 feet in altitude. Waters Creek, the nearest railroad point, is 35 miles to the northeast. The property was located about 35 years ago and now belongs to Edward Turner and James Albright. It includes, according to Mr. Turner, three claims in sec. 15 and 260 acres of patented ground in sec. 16, T. 41 S., R. 8 W. Nine tunnels with numerous crosscuts have been driven which, in all, have a total length of over 3,000 feet. No production has been reported.

"Two large bodies of porous iron-stained rock or 'gossans', enclosed in fine-grained greenstone, crop out at the Turner Mine. One is about 80 feet wide and can be traced on the surface for 900 feet. The other averages about 20 feet in width and is well defined on the surface for over 300 feet. Both gossans crop out prominently, but the narrower one is much more conspicuous because of the fact that it rises 30 to 50 feet above its surroundings. The larger gossan is partly prospected by tunnels 5 and 6. Both tunnels are near the surface and run through soft brown oxidized material and iron-stained greenstone. Some pyrite occurs near the face of tunnel 5, but the oxidation is elsewhere nearly complete. The smaller gossan is composed of porous brown, highly silicified material, which in places contains cores of unoxidized pyrite. In other places, practically all of the iron has been removed, and there remains a cavernous white residuum composed principally of silica ribs. However, because of the abundant silica, a prominent outcrop has been maintained in spite of the thorough leaching. Beautiful specimens of the type of gossan described by Locke as "botryoidal jaspery limonite" have been mined from one of the workings known as the "picture rock" tunnel. Sulphides are exposed in several tunnels beneath the smaller gossan. Of these, pyrite is by far the most abundant, although considerable chalcopyrite is associated with it in tunnels 2 and 3. In spite of the fact that the development work has thus far shown a high proportion of pyrite in the sulphide ore, the presence of considerable chalcopyrite with the pyrite at the face of tunnel 3, and below in tunnel 2, seems to justify more exploration on these levels. Because silicification makes the rock hard to mine by hand methods, work was stopped in the tunnels in the two places appearing most favorable for prospecting.

"An extension of tunnel 3 another 200 or 300 feet would add a great deal of information as to the probable worth of the property."

Informant: J.E. Morrison, 38 Ref.: Shenon p. 192, 1933

Albright Mine (Mammoth Mine)(Turner Mine) Gold Copper
NAME OLD NAMES PRINCIPAL ORE MINOR MINERALS

41 South 9 West SE¼ Sec.16
T R S

Josephine ... COUNTY

Waldo ... AREA

3200 ... ELEVATION

Road constructed in 1941. wood highway.
2½ miles by trail from Red/ ROAD OR HIGHWAY

45 miles from Grants Pass DISTANCE TO SHIPPING POINT

PUBLISHED REFERENCES

Oregon Metal Mines Handbk. 14-C Vol.II Sec.2

Shenon 336:192

MISCELLANEOUS RECORDS

PRESENT LEGAL OWNER (S) G.H. Groover, Clarence Hunt, E.M. Albright

Address Grants Pass, Oregon

OPERATOR ...

Name of claims	Area	Pat.	Unpat.
260 acres of patented ground			

Name of claims	Area	Pat.	Unpat.

EQUIPMENT ON PROPERTY

MI-21

CRIB MINERAL RESOURCES FILE 12

RECORD IDENTIFICATION
RECORD NO............. M060682
RECORD TYPE........... X1M
COUNTRY/ORGANIZATION. USGS
DEPOSIT NO............ DOGMI 100-444
MAP CODE NO. OF REC..

REPORTER
NAME........................... JOHNSON, MAUREEN G.
UPDATED........................ 81 02
BY............................. FERNS, MARK L. (BROOKS, HOWARD C.)

NAME AND LOCATION
DEPOSIT NAME.................. ALBRIGHT
SYNONYM NAME.................. TURNER MINE , GRANDRE, MAMMOTH MINE , GRANDRE, MAMMOTH MINE

MINING DISTRICT/AREA/SUBDIST. ~~WALDO~~

COUNTRY CODE.................. US
COUNTRY NAME: UNITED STATES

STATE CODE................ OR
STATE NAME: OREGON

COUNTY.................... JOSEPHINE
DRAINAGE AREA............. 17100311 PACIFIC NORTHWEST
PHYSIOGRAPHIC PROV........ 13 KLAMATH MOUNTAINS
LAND CLASSIFICATION....... 01

QUAD SCALE	QUAD NO OR NAME
1: 62500	CHETCO PEAK

LATITUDE	LONGITUDE
42-00-07N	123-45-25W

UTM NORTHING	UTM EASTING	UTM ZONE NO
4650048.9	437320.9	+10

TWP...... 41S
RANGE.... 09W
SECTION.. 15 16 16
MERIDIAN. W.M.

ALTITUDE.. 1200

MINOR PRODUCTS.. AJ

OCCURRENCE(S) OR POTENTIAL PRODUCT(S):
POTENTIAL.......
OCCURRENCE...... AG ZN CO

ORE MATERIALS (MINERALS,ROCKS,ETC.):
CHALCOPYRITE, PYRITE, SPHALERITE; ERYTHRITE , SPHALERITE; ERYTHRITE

COMMODITY COMMENTS:
SUSPECT -OTHERS

EXPLORATION AND DEVELOPMENT
STATUS OF EXPLOR. OR DEV. 5
PROPERTY IS INACTIVE
YEAR OF DISCOVERY......... 1898
BY WHOM................... EDWARD TURNER AND JAMES ALBRIGHT
PRESENT/LAST OWNER....... ROUGH AND READY LUMBER CO., CAVE JUNCTION OREGON
PRESENT/LAST OPERATOR.... BARETTA MINING INC. (1981)

EXPLOR. AND DEVELOP. COMMENTS:
DIAMOND DRILLING PROGRAM (1980-1981)

DESCRIPTION OF DEPOSIT

DEPOSIT TYPES:
GOSSAN, MASSIVE SULFIDE
FORM/SHAPE OF DEPOSIT:

SIZE/DIRECTIONAL DATA
SIZE OF DEPOSIT...... SMALL
COMMENTS(DESCRIPTION OF DEPOSIT):
GOSSANS SURFACE OUTCROP 900X80 FT, 300 BY 20 FT.

DESCRIPTION OF WORKINGS
SURFACE AND UNDERGROUND

COMMENTS(DESCRIP. OF WORKINGS):
OVER 3000 FEET OF WORKINGS IN 14 ADITS.

PRODUCTION
YES
SMALL PRODUCTION
23 CU, AU, EST .100+ TONS 1940-1942 CU

GEOLOGY AND MINERALOGY

AGE OF HOST ROCKS............. JUR

IMPORTANT ORE CONTROL/LOCUS.. GOSSAN IN GREENSTONE

GEOLOGY (SUPPLEMENTARY INFORMATION)
REGIONAL GEOLOGY
TECTONIC SETTING........... OPHIOLITE

LOCAL GEOLOGY
NAMES/AGE OF FORMATIONS,UNITS,OR ROCK TYPES
AGE: JUR

SIGNIFICANT ALTERATION:
SILICIFICATION

GEOLOGICAL PROCESSES OF CONCENTRATION OR ENRICHMENT:
EXPOSURE OF GOSSAN WITH BOTRYOIDAL JASPER

COMMENTS (GEOLOGY AND MINERALOGY):
BANDS OF MASSIVE SULFIDES OCCUR WITHIN A GREENSTONE. CHERT SEQUENCE.

GENERAL COMMENTS
RECORD NUMBER (M013215) HAS BEEN MERGED WITH THIS RECORD AND DELETED FROM THE OREGON FILE.

GENERAL REFERENCES
1) RAMP, L. AND PETERSON, N.V., 1979, GEOLOGY AND MINERAL RESOURCES OF JOSEPHINE COUNTY, OREGON; ODGMI BULL. 100 45 P
2) TAYLOR, C.S., 1980, GEOLOGY AND GEOCHEMISTRY OF MASSIVE SULFIDE DEPOSITS AND ASSOCIATED VOLCANIC ROCKS, BLUE CREEK DISTRICT, OREGON; OREGON STATE UNIV. MS THESIS
3) BROOKS, H.C. AND RAMP, L., 1968, GOLD AND SILVER IN OREGON; ODGMI BULL. 61, P. 246
4) OREGON METAL MINES HANDBOOK, 1942, ODGMI BULL. 14-C, VOL. 2, SEC. 1, P. 177

PROJECT NAME: TURNER-ALBRIGHT PROPERTY

ALSO KNOWN AS: MAMMOTH MINE, BAE PARCELS, TURBO AND CLIFF TURNER ALBRIGHT

OWNER(S): RAYROCK RESOURCES LTD (OPTIONEE, OPERATOR-25%)
BARETTA MINING INC (OPTIONOR-75%)

METAL(S): GOLD
COPPER
SILVER
ZINC

EXPL. STATUS: RESERVES DEVELOPMENT
ACTIVITY STATUS: ON HOLD AWAITING FINANCING

OPERATION-TYPE: OPEN PIT

MINESEARCH #: 100279

MOST RECENT SOURCE: APRIL 1985

LOCATION

STATE: OREGON
COUNTY: JOSEPHINE
LOCALE: KLAMATH MOUNTAINS
MINING DISTRICT: MONUMENTAL
TOWN: O'BRIEN
DISTANCE FROM: 21 MI SW OF TAKILMA
LONGITUDE: 123.45.25
LATITUDE: 42.00.15

APPROXIMATELY 340 ACRES OF FEE LANDS CONTAINING THE MAIN DEPOSITS ARE LOCATED WITHIN JOSEPHINE COUNTY, OREGON. NEARLY 300 ADDITIONAL CLAIMS COVERING ABOUT SEVEN SQUARE MILES HAVE BEEN STAKED IN OREGON AND ADJOINING DEL NORTE COUNTY, CALIFORNIA.

ACCESS TO THE PROPERTY IS BY GRAVEL ROAD FROM O'BRIEN, OREGON, WHICH IS ON THE REDWOOD HIGHWAY. (AMERICAN CHROMIUM AR 1983)

GENERAL COMMENTS

DUE TO METALLURGICAL PROBLEMS, RAYROCK FEELS THAT THE PROJECT WILL ONLY BE ECONOMIC IF ADDITIONAL ORE IS DELINEATED. 1984 DRILLING SHOWED MORE FAULTING THAN PREVIOUSLY EXPECTED.

ALTHOUGH THE PROJECT IS GEOLOGICALLY ATTRACTIVE, EXPLORATION IS VERY EXPENSIVE AND DEEP DRILLING IS REQUIRED. RAYROCK IS CURRENTLY NEGOTIATING WITH A POTENTIAL NEW JOINT-VENTURE PARTNER. (PC 4/85)

DESCRIPTION OF CLAIMS

THE DEPOSIT IS COMPRISED OF FOUR CLAIM GROUPS: THE TURNER-ALBRIGHT, THE BAE PARCELS, THE TURBO, AND THE CLIFF GROUPS. THESE TOTAL 312 CLAIMS AND 6,485 ACRES.

WORK HISTORY

1900: SURFACE MINERAL SHOWINGS WERE FIRST NOTED BY GOLD PROSPECTORS AT THE TURN OF THE CENTURY. THE TURNER-ALBRIGHT GOSSAN WAS DISCOVERED BY MR TURNER AND MR ALBRIGHT. THEIR INITIAL PARTNERSHIP SOON DISSOLVED AND NO EVIDENCE OF THEIR EARLY WORK REMAINS.

EARLY 1940'S: A SMALL MINING COMPANY EXPLORED FOR FREE GOLD INTERMITTENTLY.

1954: GRANBY MINING CORP OPTIONED THE PROPERTY.

1960: LLOYD FRIZZEL, GEOLOGIST, DRILLED FOUR CHURN AND TWO DD HOLES.

1974-76: PECHINEY UGINE KUHLMAN DEVELOPMENT AND AMERICAN SELCO CONDUCTED EXPLORATION WHICH SHOWED LOW-GRADE MINERALIZATION.

1976: SAVANNA GROUP FORMED BARETTA MINING CORP LTD TO EXPLORE AND DEVELOP THE PROPERTY.

1979-81: 30 DD HOLES WERE DRILLED, 20 OF WHICH INTERSECTED ORE-GRADE SULFIDES. (BARETTA AR 1981)

1982: NORANDA DID A MAJOR AMOUNT OF DRILLING AND PROVED UP RESERVES, BUT LITTLE METALLURGICAL WORK WAS DONE BEFORE THE OPTION WAS DROPPED. (PC 3/83)

1982: NORANDA COMPLETED GEOLOGICAL MAPPING OF THE SURROUNDING CLAIMS AND ALSO CONDUCTED DOWN-HOLE GEOPHYSICS WHICH IDENTIFIED POSSIBLE EXTENSIONS OF THE DEPOSIT. NORANDA DROPPED ITS OPTION IN DECEMBER WITHOUT EARNING ANY INTEREST IN THE PROPERTY.

1983: A OPTION AGREEMENT WAS REACHED WITH RAYROCK.

RAYROCK STARTED DD ON A SATELLITE PROSPECT IN CALIFORNIA WITH ENCOURAGING GEOLOGIC RESULTS. GEOPHYSICAL WORK ON THE MAIN DEPOSIT INDICATED A POSSIBLE MAJOR EXTENSION TO THE SOUTH. (GCNL 3/16/84)

1984: RAYROCK DRILLED SEVERAL OF THE COINCIDENT GEOPHYSICAL AND GEOCHEMICAL TARGETS. IT FOUND NEW INTERSECTIONS OF RICH MASSIVE SULFIDES EXTENDING THE MAIN ZONE TO THE SOUTHEAST. (AMERICAN CHROMIUM AR 1984)

1984: MOST OF THE DRILL HOLES DID NOT ENCOUNTER SIGNIFICANT MINERALIZATION, BUT DID PROVIDE DATA FOR A NEW GEOLOGICAL INTERPRETATION OF THE DEPOSIT. (PC 4/85)

NATURE OF UNDERGROUND WORKINGS

APPROXIMATELY 3,000 FT OF TUNNELING FROM 14 ADITS DRIVEN INTO OXIDIZED ZONES. (MR 3/17/82)

EXPLORATION AND CAPITAL COSTS

MORE THAN $3 MILLION HAD BEEN SPENT HERE AS OF EARLY 1983: $1 MILLION BY BARETTA AND $2 MILLION BY NORANDA. (PC 3/83)

RAYROCK'S 1983 EXPLORATION PROGRAM WAS BUDGETED AT $2.8 MILLION. (GCNL 9/29/83)

CORE DATA

TURNER-ALBRIGHT PROPERTY DRILLING SUMMARY, AS OF 12/1/83:

HOLE # DIP (DEGREE) TOTAL DEPTH(FT)	INTERVAL	LENGTH (FT)	ASSAYS OZ/ST AU	OZ/ST AG	LB/ST CO	%CU	%ZN
TAB-1	128-159	31	.100	.35	2.49	.23	1.09
	184-202	18	.0400	.03	.97	.24	.22
90	253-313	60	.046	.36	1.65	.12	1.14
	410-445	35	.048	.13	.60	.01	.49
2031	458-598	140	.047	.07	1.01	.05	.50
	601-647	46	.031	.31	----NOT ASSAYED----		
	980-1130	150	.055	.05	.42	.25	.10
TAB-10	278-555	277	.090	---	1.54	.58	1.24
61	670-885	215	.128	.18	1.20	1.90	1.41
	895-920	25	.055	---	1.06	.03	.04
2002	1025-1065	40	.049	---	2.50	.17	.11
TAB-18	380-510	130	.087	.12	.48	.90	2.75
90	727-732	5	.314	---	.48	3.60	1.10
	925-1045	120	.086	.29	.35	1.86	4.50
1592	1060-1080	20	.028	.13	.15	.33	5.65
TAB-23 90 2001	170-750	580	.054	---	1.79	.37	.72
TAB-33 45 350	137 175	38	.479	2.01	----	6.62	1.90
TAB-35 56 423	99-176	77	.094	1.02	----	.88	7.40

TAB-41	168-179	11	.117	2.67	----	1.54	7.63
55							
317							
TAB-43	495-530	35	.100	2.07	----	.87	1.63
70	746-840	94	.071	2.01	----	.73	14.60
1108							
TAB-48	145-159	14	.250	1.77	----	2.05	.22

NOTE: FOR A DETAILED SUMMARY OF DRILL HOLE DATA SEE THE AMERICAN CHROMIUM LIMITED 1983 ANNUAL REPORT. P 6-7.

ORE AMENABILITY

THE METALLURGY IS BELIEVED TO BE COMPLEX.

EXPLORATION COMMENTS

HOLE TAB #23 WAS THE FIRST TO ENCOUNTER MINERALIZATION EAST OF A NORTH-NORTHWEST, SOUTH-SOUTHEAST TRENDING FAULT WHICH HAD PREVIOUSLY BEEN THOUGHT TO BE THE EASTERN LIMIT OF MINERALIZATION.

A PRONOUNCED ANOMALY IS EVIDENT ON FIVE NORTH-SOUTH LINES SPACED 400-FT APART, INDICATING AN EAST-WEST STRIKE LENGTH ON THE ORDER OF 1,600 FT. THE ANOMALY SUGGESTS A CONDUCTOR PLUNGING BELOW 2,000 FT IN DEPTH AT THE WEST END. (BARETTA PR 1/12/82)

HOLE TAB #23 WAS DRILLED ON THE AXIS OF THE ANOMALY NEAR THE SECOND LINE FROM THE EAST. THE HOLE INDICATED MASSIVE SULFIDES FROM 169-749 FT. (BARETTA PR 1/12/82)

HOLE TAB #43, NEAR THE SOUTH END OF THE DRILLING AREA, ENCOUNTERED A 50-FOOT SECTION WHICH ASSAYED 16.8% ZINC. (AMERICAN CHROMIUM AR 1983)

THE DEPOSIT IS PRESENTLY OPEN DOWN DIP TO THE EAST AND ON STRIKE TO THE SOUTH. GEOCHEMICAL AND GEOLOGICAL EVIDENCE SUGGESTS THAT ADDITIONAL DEPOSITS ARE LIKELY TO BE FOUND IN THE GENERAL AREA. (AMERICAN CHROMIUM AR 1983)

RESERVES REPORT 1

ZONE NAME: UPPER HIGH-GRADE POD
CERTAINTY: DRILL INFERRED
RESERVES: 43,000 ST

GRADE:	GOLD	0.42 OZ/ST
	SILVER	1.70 OZ/ST
	COPPER	4.32 %
	ZINC	1.36 %
	COBALT	0.08 %

REFERENCE: AMERICAN CHROMIUM PR 1982

RESERVES GIVEN IN THE NORTHERN MINER 3/31/83 FOR ALL THREE ZONES COMBINED ARE 3.8 MILLION ST AVERAGING 0.10 OZ/ST AU AND 0.44 OZ/ST AG, 1.33% CU, AND 3% ZN. AN ESTIMATED 1.6 MILLION ST OF THIS IS OPEN PITTABLE.

RESERVES REPORT 2

ZONE NAME:	UPPER MAIN ZONE	
CERTAINTY:	DRILL INFERRED	
RESERVES:	450,000 ST	
GRADE:	GOLD	0.18 OZ/ST
	SILVER	0.48 OZ/ST
	COPPER	2.06 %
	ZINC	3.87 %
	COBALT	0.05 %
REFERENCE:	AMERICAN CHROMIUM PRESS RELEASE 1982	

THIS ZONE COULD BE MINED BY OPEN-PIT MINING METHODS.

RESERVES REPORT 3

ZONE NAME:	LOWER MAIN ZONE	
CERTAINTY:	DRILL INFERRED	
RESERVES:	558,000 ST	
GRADE:	GOLD	0.13 OZ/ST
	SILVER	0.56 OZ/ST
	COPPER	2.01 %
	ZINC	4.55 %
	COBALT	0.05 %
REFERENCE:	AMERICAN CHROMIUM PRESS RELEASE 1982	

THESE RESERVES WOULD BE MINED BY UNDERGROUND METHODS.

GEOLOGY REPORT

GENESIS 1:	VOLCANOGENIC (EXHALATIVE)
OREBODY TYPE 1:	MASSIVE SULPHIDE
OREBODY TYPE 2:	STOCKWORK
OREBODY TYPE 3:	BRECCIA FILL
ORE 1:	SPHALERITE
ORE 2:	CHALCOPYRITE
CLASS 1:	SULFIDE
GANGUE 1:	PYRITE
GANGUE 2:	QUARTZ

LENGTH:	1600 FT
DEPTH:	2000 FT
HOST-ROCK:	OPHIOLITE (JURASSIC)
HOST-ROCK:	BASALT (JURASSIC)
HOST-ROCK:	VOLCANIC BRECCIA (JURASSIC)

FIELD RELATIONS AND PETROGRAPHIC AND GEOCHEMICAL DATA INDICATE THAT THE JOSEPHINE OPHIOLITE FORMED IN A MARGINAL BASIN BETWEEN THE NORTH AMERICAN PLATE MARGIN AND AN OFFSHORE VOLCANIC ARC DURING JURASSIC TIME.

THE ORE IS MADE UP OF A STEEPLY NORTHEAST-DIPPING LAYER OF MASSIVE SULFIDE BRECCIA, EXPRESSED BY PROMINENT LINEAR GOSSAN ZONES AT THE SURFACE. THIS BRECCIA GRADES NORTHWARD INTO A COLUMNAR ZONE OF MIXED VOLCANIC ROCKS, CHERT, AND SULFIDE BRECCIA. ADJACENT VOLCANIC ROCKS ARE STRONGLY CHLORITIZED AND SILICIFIED. (OREGON GEOLOGY 9/81)

FEASIBILITY COMMENTS

NORANDA CONDUCTED $10,000 WORTH OF METALLURGICAL TESTING. RESULTS REPORTED A DISAPPOINTING 60% PLUS RECOVERY. A SPOKESMAN FOR BARETTA MINING IS CONFIDENT THAT BETTER RESULTS CAN BE ACHIEVED WITH FURTHER TESTING. (PC 3/83)

TRANSACTION REPORT 1

TRANSACTION DATE: 1983
TRANSACTION TYPE: EARN-IN

PARTY#1:	BARETTA MINING INC
DESIGNATION 1:	OPTIONOR
ORIGINAL INT 1:	100
POTENTIAL INT 1:	50

PARTY#2:	RAYROCK RESOURCES LTD
DESIGNATION 2:	OPTIONEE
ORIGINAL INT 2:	0
POTENTIAL INT 2:	50

RAYROCK CAN EARN A 50% INTEREST IN THE PROPERTY BY SPENDING $2.8 MILLION ON EXPLORATION ON THE PROPERTY. RAYROCK WOULD CONTINUE AS THE OPERATOR. (GCNL 9/29/83)

RAYROCK HAS AGREED TO CARRY FORWARD WORK ON THE PROPERTY IN RETURN FOR THE RIGHT TO EARN UP TO A 50% INTEREST. IT MUST COMPLETE A WORK PROGRAM TOTALING $2.8 MILLION BY 2/28/88. A 25% INTEREST WILL BE EARNED UPON THE EXPENDITURE OF $750,000 BY 5/1/85, AND THE INTEREST WILL BE GRADUALLY INCREASED TO 50% AS EXPENDITURES UP TO $2.8 MILLION ARE MADE.

IF NO INTEREST IN THE PROPERTY HAS BEEN EARNED BY 5/1/85, AND EXPENDITURES OF AT LEAST $300,000 HAVE BEEN MADE, RAYROCK HAS THE THE OPTION OF PURCHASING CLASS B, NON-VOTING SHARES OF AMERICAN CHROMIUM AT $.01/SHARE FOR EACH $1.50 OF EXPENDITURE. (AMERICAN CHROMIUM AR 1983)

TRANSACTION COMMENTS

RAYROCK HAS EARNED ITS 25% INTEREST AND MAY EARN UP TO AN ADDITIONAL 25% WITH THE EXPENDITURE OF ANOTHER $2 MILLION BY 2/28/88. (AMERICAN CHROMIUM AR 1984)

TRANSACTION REPORT 2

TRANSACTION DATE:1982
TRANSACTION TYPE:EARN-IN-TERMINATED

PARTY#1: BARETTA MINING INC
DESIGNATION 1: OPTIONOR
ORIGINAL INT 1: 100
POTENTIAL INT 1: 50

PARTY#2: NORANDA EXP INC
DESIGNATION 2: OPTIONEE
ORIGINAL INT 2: 0
POTENTIAL INT 2: 50

NORANDA'S INITIAL PAYMENT TO BARETTA WAS $250,000.

NORANDA WILL BE RESPONSIBLE FOR ALL COSTS THROUGH FEASIBILITY. BARETTA WILL RECEIVE A 10% NPI AND A 40% WORKING INTEREST BY FINANCING ITS SHARE THROUGH TO PRODUCTION. (MR 3/17/82)

TRANSACTION COMMENTS

NORANDA DROPPED THE OPTION ON 12/28/82 BECAUSE OF BUDGET RESTRAINTS. (PC 3/83)

COMPANY INFORMATION

RAYROCK RESOURCES LTD
1011, 2200 YONGE ST.
TORONTO, ON M4S 2C6
(416) 977-6644

BIBLIOGRAPHY

BARETTA MINING INC ANNUAL REPORT 1981
BARETTA MINING CORP LTD PRESS RELEASE 1/12/82
BARETTA MINING CORP LTD PRESS RELEASE 5/27/81
BARETTA MINING CORP LTD PRESS RELEASE 3/23/81
NORTHERN MINER 2/19/81
MINING RECORD 3/17/82
OREGON GEOLOGY VOL.43 NO.9 9/81
PERSONAL CONVERSATION 1/83
PERSONAL CONVERSATION 3/83
NORTHERN MINER 1/13/83

NORTHERN MINER 3/31/83
MILS SEQUENCE # 0410330361
AMERICAN CHROMIUM PRESS RELEASE 1982
PERSONAL CONVERSATION 6/83
GEORGE CROSS NEWS LETTER 9/29/83
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PROGRESS REPORT THROUGH JULY 1981

on the

TURNER-ALBRIGHT MASSIVE SULFIDE DEPOSIT

Josephine County, Oregon

Sec. 15 & 16, Twp 41S, R9W, HBM

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I. SUMMARY

Exploration conducted to date by Baretta Mining, Inc., and others, indicates that significant massive to semi-massive sulfide mineralization occurs on Baretta's Turner-Albright property in Southwestern Oregon, U.S.A. Values are reported for gold, silver, copper, zinc, and cobalt.

Expressing all values as percent copper, and calculating tonnage and grade both with and without cobalt, the drill-indicated reserves (based on BMI drilling only) on the Turner-Albright, as of August, 1981, are:

WITH COBALT

Cut-off	Tons	Average Grade
1.0%	6,412,450	3.10%
2.5%	4,564,500	3.65%
3.0%	2,652,000	4.82%
5.0%	672,750	7.44%
10.0%	99,250	12.41%

WITHOUT COBALT

Cut-off	Tons	Average Grade
1.0%	4,951,000	2.50%
2.5%	2,155,000	3.80%
3.0%	1,238,500	5.02%
5.0%	386,500	7.65%
10.0%	52,250	13.11%

Note: See Appendix E for a detailed breakdown of reserve calculations.

II. LOCATION & ACCESSIBILITY

The Turner-Albright deposit is located approximately 40 miles south-southwest of Grants Pass, Oregon. Access to the property is via Highway 199 (the Redwood Highway from Grants Pass to Crescent City, California) to O'Brien, Oregon, located 5 miles north of the California border. From O'Brien, Lone Mountain Road leads west and south for approximately 6 miles to the turn-off to the deposit, thence southeast for an additional 3.7 miles of good gravel road to the property. Recent up-grading of the mine roads by Baretta Mining, Inc. allows all-weather access to the property.

III. LAND POSITION

Baretta Mining, Inc's land position in the vicinity of the Turner-Albright deposit consists of the original 60 acres of patented ground surrounding the mine workings and an additional 315 lode claims, comprising 6300 acres in three separate blocks of contiguous claims. An additional 265 acres of fee land directly west of the patented claims have been purchased from Rough and Ready Timber Company of Cave Junction, Oregon, under an agreement for sale. Negotiations with Josephine County are currently underway to acquire the mineral rights to approximately 330 acres of county-held ground north and west of the Rough and Ready option. (See the enclosed location and claim maps.)

IV. GEOGRAPHY & CLIMATE

The Turner-Albright claim block is situated in the mountainous terrain drained by the headwaters of the West Fork of the Illinois River, tributary to the Rogue River; and tributaries of the Middle Fork of the Smith River, which drains southwest into the Pacific Ocean approximately 20 miles south of the California-Oregon border. Local relief is moderate to steep, with slopes of 35°-45° common. Elevations range from 2000' at the north end of the claim block on the West Fork of the Illinois River to over 3800' on High Dome in the Turbo claim block.

Vegetation over the majority of the claims consists of thick stands of brush and second growth conifers. This, combined with the rugged terrain, increases the time and cost involved in doing regional exploration.

Annual precipitation amounts are heavy, and generally confined to the winter months. Rainfall totals range from 60" north of the Oregon border to nearly 100" in the south end. Snow is common at the upper elevations, but generally not in amounts heavy enough to seriously curtail on-going programs.

Summers are usually hot and dry from June through September, with daytime highs in the 90's to 100's, and nightly lows dipping into the 50's.

V. HISTORY

Gossans developed upon the Turner-Albright massive sulfide deposit were initially discovered in the early 1900's and were developed and mined sporadically for their gold content until 1942, when war-time conditions caused their closure.

The first preliminary attempts to explore the potential of the underlying sulfides were begun in 1954 by Granby Mining Co., and consisted of a modest program of underground sampling, trenching, and drilling. Discouraged by their results, Granby turned the property back to the owners after their first field season.

Beginning in the early 1960's and continuing into 1970, a limited exploration program, consisting of I.P. surveys and drilling, was conducted under the direction and guidance of Lloyd Frizzell, of Grants Pass, Oregon. Based upon his investigations, Mr. Frizzell became convinced that the possibility for ore-grade mineralization existed at the Turner-Albright, and has been instrumental in subsequent attempts to explore and develop the property.

In July, 1974, American Selco and Pechiney joint ventured the property under an option-purchase agreement with the owners, Rough & Ready Timber Co. of Cave Junction, Oregon. Their 1974/75 program consisted of establishing a survey grid for mapping, geochemical soil sampling and geophysics, and 2785.1 feet of diamond core drilling.

The majority of the Selco/Pechiney drill program was concentrated in the "South Zone", where they indicated reserves of 150,000 tons averaging .03 oz gold, 1.7% copper and 0.5% zinc.

The "North Zone" gossan was tested by three short drill holes. Two holes failed to reach their target depth, and the third, TA75-4, "penetrated a 350' interval of semi-massive sulfides containing erratic values in zinc and gold, and trace copper, under the strongest geophysical anomaly."

The Turner-Albright Property was turned back to Rough & Ready Timber Co. in early 1976 after American Selco concluded from their data that further work on the property was not justified.

(See "Appendix A" for location of drill holes prior to Baretta)

VI. EXPLORATION BY BARETTA MINING, INC.

1979 thru 1980

A lease-option agreement between Baretta Mining, Inc. and Rough and Ready Timber Co. for the exploration and subsequent development of the Turner-Albright property was signed in July, 1976. Extensive field work was begun in June 1979. Geological and geophysical supervision was then, and still remains, under the direction of Ace R. Parker and Associates, Calgary, Alberta, CANADA.

The primary thrust of Baretta's field exploration has been diamond core drilling in conjunction with extensive geophysical testing. To date, Baretta Mining, Inc. has drilled a total of 35,500.3' in 30 holes. Over 3300 samples have been assayed, primarily by Hunter Labs, Reno, Nevada, for gold, silver, copper, zinc, and cobalt. (See "Appendix B" for locations of BMI holes)

1981

At the close of 1980, with 3 holes in progress and a total of 9109 feet of drilling in 10 holes having been completed, Baretta management felt that more intensive co-ordination and supervision in the field was necessary. To this end, the current manager, James C. Haight, was hired.

Drilling

Drilling since the beginning of 1981 has totaled 26,391.3 feet in 20 holes. This has been accomplished by the utilization of up to four diamond core drills at a time, running a total of seven shifts per 24 hr. period. All drilling on the Turner-Albright property was stopped on August 12, 1981 due to an extreme fire danger, and to allow the Baretta field staff time to evaluate the data obtained to date.

Claimstaking

In January, 1981, while in the process of reviewing the status of the work completed prior to his arrival, it was discovered by Mr. Haight that possible defects existed in the location of some of the lode claims previously staked for Baretta in the vicinity of Turner-Albright. In mid-February, the writer was retained on a consulting basis by Baretta to organize and implement a program to amend and/or re-locate all pre-existing claims, and to stake new locations where deemed necessary. The result of this program, involving 278,500 feet of brushed line, are the current 315 claims held by Baretta. In conjunction with chaining the claim lines, over 2000 soil samples were taken at 100' intervals for geochemical analysis of their copper, zinc, and cobalt content.

Geophysics

Concurrently with the claim staking, an extensive geophysical (Turam) program was conducted by Ed Rockel of Calgary, Alberta, CANADA. This required the brushing and chaining of an additional 38,450 feet of line, for a total of over 60 miles of survey line brushed and chained between February and June, 1981.

Core-Logging

Toward the end of the claimstaking program, the writer began a preliminary compilation of the drilling data available at that time. It soon became apparent that minor discrepancies of terminology and identification existed among the various geologists who had logged drill core to that point. Re-logging of all previously drilled core, as well as maintaining the on-going program, by a single geologist, was felt necessary for a coherent view of the lithologic and mineralogic characteristics of the Turner-Albright property. Jan Haney, hired in late May, assumed all core logging duties in Mid-June. To date, she has re-logged approximately one third of the holes drilled prior to her involvement with the project.

VII. GEOLOGY AND MINERALOGY

Detailed reports on the regional and local geology and mineralogy of the Turner-Albright deposit have been previously issued by Ace R. Parker and Associates and are available through their Calgary, Alberta, CANADA offices on request.

The sulfide deposits of the Turner-Albright area are contained in an assemblage of intermediate to mafic volcanic rocks, mapped as the Jurassic Rogue Volcanics. Regionally, the Rogue Volcanics have been underthrust from the west by serpentinized peridotites of the Josephine Ultramafic Sheet, and are overlain to the east, apparently conformably, by sediments of the Jurassic Galice Formation.

In the Turner-Albright area, the predominant rock unit is an aphanitic to phaneritic meta-volcanic rock of andesitic to basaltic composition. Fairly well developed pillow structures in the vicinity of TAB-9 indicate that the unit has not been overturned, and has a moderate to steep southeasterly dip. Evidence of a uniform, relatively undisturbed, mudstone layer, 0.5' - 2.0' thick, overlying the upper sulfide contact also supports the above conclusion.

Immediately west of the deposit, the volcanics appear to have been faulted against the ultramafics of the Josephine Peridotite sheet. The nature of the contact has not been determined in detail. Conflicting data attest to the complexity of the contact. Locations of drilled serpentine intercepts at the north end of the deposit support a relatively flat, 15^{o} to 25^{o} southeasterly dip. At depth, however, reverse (?) faulting of the volcanics westward beneath the ultramafics is indicated, as in TAB 1 and TAB 24. A medium to coarse grain intermediate to mafic dyke association has been noted along the contact.

The dominant sulfide minerals occuring in the Turner-Albright deposit are pyrite, chalcopyrite and sphalerite. Glaucodot has been tentatively identified as one of the cobalt bearing minerals.

The original mineralization appears to have been a massive, strata-bound volcanigenic sulfide body. Subsequent replacement of pyrite by chalcopyrite and the addition of pyrite (with glaucodot and sphalerite) has been observed in thin and polished sections.

VIII. COMPILATION OF DATA

On August 5, 1981 it was decided that an immediate reduction of all data, to determine the drill-indicated tonnage and grade of the Turner-Albright deposit, should be undertaken by the O'Brien staff. Reserve calculations were to be made inclusive and exclusive of cobalt. Accordingly, the following data were generated:

1). Weighted Averages of mineralized sections by individual element. (See Appendix C).

2). Combined metal values, expressing all elements in percent copper. Values calculated with and without cobalt. (See Appendix D for an explanation and summary; also the accompanying packet, labeled "Assay Data", for a sample by sample listing of all assayed intervals, including a combined metal value recorded for all samples having a combined value ≥ 1.0%).

3). East-West Cross-Sections of the drill holes, including lithology and structure.

4). Individual drill hole profiles, graphically representing the relative proportions of each metal throughout the mineralized sections, as well as combined metal values (with and without cobalt) by the groupings outlined in Appendix D.

5). Level plans at 25' intervals through the mineralized section, used as the basis for the tonnage and grade calculations. (See accompanying packet, labeled "Level Plans" for a detailed explanation of the procedure, and a copy of each level.

The writer would like to thank the O'Brien staff for their help in compiling the data, with special thanks to the following for their long, often all night, sessions over the past two weeks: Tom Duebendorfer, for much time with the calculator; Jon Haney, for logging and x-section preparations; and Wizard Krisa, draftsman, and Sharon Anson, typist, for making it look presentable.

Michael D. Strickler
Geologist

BARETTA MINING, INC.

TURNER-ALBRIGHT PROPERTY

Supplement to Progress Report
dated August 20, 1981

Reserve Calculations
September 14, 1981

SUPPLEMENT TO PROGRESS REPORT
Dated August 20, 1981

A re-calculation of drill-indicated reserves has been made on Baretta Mining, Inc.'s Turner-Albright property in southwestern Oregon, U.S.A.

Original tonnage and grade estimates were based on the assayed values at the point of intersection of each drill hole with individual plan levels, cut at 25' intervals through the mineralized zone. The re-calculation utilizes a weighted average of all assayed core, 12,5' vertically above and below each level. In this way, all assayed drill core has been used in determining the Turner-Albright reserves.

Tonnage and grade estimates were calculated for four different groupings of metals:

1) Gold only, in oz/ton, using cut-off grades of 0.03,0.05, and 0.15 oz/ton
2) Gold and Copper
3) Gold,Copper, Silver and Zinc ("W/O Cobalt")
4) Gold, Copper, Silver, Zinc and Cobalt ("With Cobalt")

The last three groupings are expressed in copper equivalents, using the following values for combining the metals (same as in main report):

Copper:	95¢/pound
Gold:	$500/oz
Silver:	$10/oz
Zinc:	40¢/pound
Cobalt:	$20/pound

Cut-off grades of 1.0%, 2.5%, and 5.0% were used in the re-calculation.

A summary of the drill-indicated reserves, through the entire mineralized section (2875' through 1550') is as follows:

With Cobalt (all 5 metals) in % Copper

1% cut-off	6,682,000 tons	@ 3.35%
2.5% cut-off	4,004,750 tons	@ 4.43%
5% cut-off	820,750 tons	@ 7.65%

W/O Cobalt (4 metals) in % Copper

1% cut-off	5,074,000 tons	@ 2.74%
2.5% cut-off	1,778,750 tons	@ 4.77%
5% cut-off	588,250 tons	@ 7.39%

Gold and Copper in % Copper

1% cut-off	3,523,750 tons	@ 2.02%
2.5% cut-off	674,500 tons	@ 4.00%
5% cut-off	141,750 tons	@ 6.53%

Gold only in oz/ton

.03 cut-off	4,487,250 tons	@ .071 oz/ton
.05 cut-off	2,933,000 tons	@ .088 oz/ton
.15 cut-off	241,500 tons	@ .218 oz/ton

(Please see the attached data for a detailed breakdown of the distribution of the reserves.)

The above reserve estimates are based on a conversion factor of 10 ft^3/ton. Using a figure of 8.5 ft^3/ton, the tonnage estimated are as follows:

W/Cobalt	@ 1% cut-off	= 7,861,177 tons
W/O Cobalt	@ 1% cut-off	= 5,969,412 tons
Gold & Copper	@ 1% cut-off	= 4,145,588 tons
Gold	@ .03 cut-off	= 5,279,118 tons

Dated September 14, 1981 in O'Brien, Oregon:

Michael D Strickler

Michael D. Strickler
Geologist

THE TURNER-ALBRIGHT MASSIVE SULFIDE DEPOSIT: SEA-FLOOR MINERALIZATION IN THE JOSEPHINE OPHIOLITE, WESTERN KLAMATH MOUNTAINS, OREGON

Randolph A. Koski
U.S. Geological Survey
345 Middlefield Rd. MS 999
Menlo Park, CA 94025

Robert A. Zierenberg
U.S. Geological Survey
345 Middlefield Rd. MS 901
Menlo Park, CA 94025

Michael D. Strickler
P.O. Box 741
Selma, Oregon 97538

INTRODUCTION

Regional Geology

The Klamath Mountains province is an assemblage of arcuate, fault-bounded belts of oceanic volcanic and sedimentary rocks ranging in age from early Paleozoic to late Mesozoic (fig. 1). These lithotectonic belts were accreted to the North American craton along eastward dipping thrust faults during plate convergence predominantly in Mesozoic time (Irwin, 1981; Coleman and others, 1988). In southwestern Oregon and northwestern California, the western Klamath terrane (Blake and others, 1985), also the western Jurassic belt of Irwin (1966, 1972), includes a subterrane consisting of calcalkaline plutonic and volcanic rocks of the Chetco complex and Rogue Formation, and a subterrane consisting of ultramafic and mafic rocks of the Josephine ophiolite (fig. 2). Both of these subterranes are conformably overlain by flyschlike sedimentary rocks of the Late Jurassic Galice Formation (Harper, 1984; 1989). The Josephine ophiolite has been interpreted to have formed by sea-floor spreading in a back-arc basin between an older inactive remnant arc to the east (now part of the Rattlesnake Creek terrane) and an active volcanic arc to the north or west (the Chetco complex and Rogue Formation) (Harper, 1980, 1984). Tectonic collapse during the Late Jurassic Nevadan orogeny resulted in the imbrication of the western Klamath terrane along major eastward dipping thrust faults (Harper, 1984; Harper and Wright, 1984; Harper and others, 1994). To the west, the western Klamath terrane is overthrust onto metasedimentary and metavolcanic subterranes of the Franciscan Complex and Dothan Formation that were accreted during mid-Cretaceous to Early Tertiary time (fig. 2; Blake and others, 1985).

The Josephine ophiolite

The Josephine complex displays a complete ophiolite stratigraphy including a large body of harzburgite tectonite at the base, a plutonic suite including ultramafic and mafic cumulates and high-level gabbro, a sheeted dike complex, and an extrusive sequence consisting of pillow lavas with minor pillow breccia and massive lava flows (fig. 3; Dick, 1976; Harper, 1984). Pillow lavas of the Josephine complex are conformably overlain by chert and slaty argillite of the Galice Formation that grade upward into a sequence of slate, metagraywacke, and minor conglomerate (Pinto-Auso and Harper, 1985). The ophiolite stratigraphy is disrupted by faulting that occurred both on the sea floor and during thrusting of the ophiolite beneath the continental margin (Harper and Wright, 1984; Alexander and others, 1993). As much as 50° of crustal tilting also occurred along oceanic normal faults (Harper, 1982; Norrell and Harper, 1988; Alexander and others, 1993). The age of the Josephine ophiolite, based on $^{40}Ar/^{39}Ar$ and Pb/U geochronology, is 162 to 164 Ma (Saleeby and others, 1982; Harper and others, 1994). Emplacement during the Nevadan orogeny occurred within 10 to 12 m.y. after ophiolite formation.

The phenocryst assemblages and "stable" trace-element content of lavas and dikes in the Josephine ophiolite indicate magmatic affinities ranging from mid-ocean ridge basalt to island-arc tholeiites (fig. 4.) (Harper, 1984, 1988). These data are consistent with sea-floor spreading above a subduction zone ("suprasubduction setting"). Episodic magmatism and hydrothermal activity, deep oceanic normal faults with associated talus deposits, and crustal tilting are evidence for a slow to medium rate of sea-floor spreading (Alexander and Harper, 1992); thus, the proposed fault-dominated ridge morphology may be more comparable to the modern Mid-Atlantic Ridge or northern Gorda Ridge.

The regional metamorphic grade (produced during the Nevadan Orogeny) in the Josephine ophiolite and Galice-equivalent rocks increases from prehnite-pumpellyite facies in Oregon and northernmost California to lower greenschist facies in the southern Klamath Mountains (Harper, 1984; Harper and others, 1988, Beiersdorfer, 1993). In addition, Harper and others (1988) and Alexander and others (1993) have identified subsea-floor alteration types including (1) greenschist-facies assemblages in lavas and upper sheeted dikes and amphibolite-facies assemblages in lower sheeted dikes and gabbros related to recharge of seawater into hot oceanic crust, and (2) epidosites in the upper sheeted dikes and albite epidosites, hematite, and K-feldspar in the extrusive sequence related to upwelling of high-temperature evolved seawater toward the sea floor. The upwelling fluids also produced silicification and quartz-sulfide veins at the interface between sheeted dikes and lavas owing to increased permeability and fluid mixing. The channeling of similar high-temperature fluids along sea-floor faults resulted in formation of the sulfide deposit at Turner-Albright (Strickler, 1986; Zierenberg and others, 1988; Harper and others, 1988). During this hydrothermal cycle, conditions changed from rock-dominated to seawater-dominated with time (Alexander and others, 1993).

THE TURNER-ALBRIGHT SULFIDE DEPOSIT

Historical Record

The gossan outcrops at Turner-Albright were first prospected for gold in the late 1800's, but no production was reported. Serious exploration of the underlying sulfide deposit including mapping, geophysical surveys, and drilling by a succession of companies began in 1954 (Strickler, 1986). Through 1991, drilling on the deposit exceeds 19,810 m (65,000 ft) in 84 separate drill holes.

Three major northeast-striking and southeast-dipping sulfide bodies have been defined by the drilling (Strickler, 1986; Kuhns and Baitis, 1987): the Upper High-grade Zone (UHZ); the Main Upper Zone (MUZ); and the Main Lower Zone (MLZ). The MUZ and MLZ are thought to be the same stratigraphic horizon offset by faulting; the UHZ appears to be a separate mineralized horizon developed stratigraphically above the Main Zone. The total mass of sulfide at Turner-Albright is approximately 15 million metric tonnes (Kuhns and Baitis, 1987). Reserves for the UHZ, MUZ, and MLZ are presented in Table 1.

Table 1. Drill-indicated reserves for the Turner-Albright deposit (modified from Strickler, 1986).

	TONNAGE (10^6t)	GOLD (g/t)	SILVER (g/t)	COPPER (wt %)	ZINC (wt %)	COBALT (wt %)
Upper High Grade Zone	0.05	12.4	53	4.30	1.35	0.08
Main Upper Zone	1.5	4.0	16	1.40	3.00	0.05
Main Lower Zone	1.3	3.1	23	1.75	4.50	0.04

Geology and Structure

The geologic features of the Turner-Albright deposit have been described by Strickler (1986), Kuhns and Baitis (1987), and Zierenberg and others (1988). A geologic map of the area surrounding the Turner-Albright deposit, modified from Strickler (1986), is presented in figure 5. A block diagram, constrained by drill intercepts, illustrates the stratigraphy and structure of the deposit in figure 6.

The Turner-Albright deposit occurs near the base of the extrusive sequence of the Josephine ophiolite. The volcanic stratigraphy generally strikes north-northeast and dips steeply to the southeast, and the sulfide horizons are conformable with the volcanic sequence (fig. 6). The transition from extrusive basalt downward into the sheeted dike complex of the ophiolite is exposed west of the deposit (fig. 5) and diabase dikes were encountered in a few holes drilled near the northwest part of the deposit. The volcanic rocks are predominantly massive flows, lobate sheet flows, and coarse breccia and agglomerate with less abundant pillow lava, pillow breccia, and hyaloclastite breccia. Some basaltic cooling units with diabasic to microgabbroic textures exceed 50 m in thickness and appear to represent thick ponded lava flows.

Based on petrographic study of drill core samples, Zierenberg and others (1988) have identified two principal basalt lithologies. The more abundant type, typical of ponded flows and referred to as clinopyroxene basalt, is sparsely porphyritic with as much as 10% phenocrysts of clinopyroxene, plagioclase, and titanomagnetite. The other type, referred to as olivine basalt, occurs as thick units of altered hyaloclastite immediately underlying sulfide horizons and as altered fragments in sulfide horizons. Olivine basalt is characterized by phenocrysts and quenched crystals of olivine, plagioclase, and chromium spinel.

Talus breccia and thin hemipelagic mudstone horizons are interbedded with the volcanic rocks. Mudstone units are massive to poorly bedded, 0.3 to 5 m thick, range in color from red through brown to green, and may contain radiolarian tests. A mudstone layer commonly overlies the massive sulfide bodies, but mudstone also extends beyond the limits of sulfide mineralization (Strickler, 1986). At least two clastic horizons at the Turner-Albright deposit are not associated with sulfide deposits.

Strickler (1986) and Kuhns and Baitis (1987) describe several major structures in the Turner-Albright area. The major regional structure is a north-striking, east-dipping fault that cuts out much of the underlying sheeted dike complex and isotropic gabbro, and juxtaposes the extrusive sequence in the hanging wall against serpentinized ultramafic rock in the footwall (figs. 5, 6). The fault trace is irregular and bends around the northwestern part of the deposit where it truncates disseminated sulfide mineralization. This fault truncates other structures and is interpreted to have been active during and (or) after emplacement of the ophiolite.

Two other sets of faults affect the present distribution of the sulfide horizons. The F-series faults strike about 300° and dip to the northeast at 65° to 85° (Strickler, 1986; Kuhns and Baitis, 1987). The F-series fault zones are typically a few meters to a few tens of meters wide with numerous fault splays. The southernmost fault (F-1, fig. 5) marks the southern extent of known mineralization. Sulfide-bearing breccias containing fragments of different lava flows and occasionally fragments of mudstone suggest that these faults were active on the seafloor at the time of sulfide deposition. Post-mineralization movement on the F-series faults has resulted in the progressive downdrop of fault blocks and massive sulfide horizons to the north. Later movement along these faults may be related to emplacement of the ophiolite.

At least three R-series faults strike approximately east-west and dip approximately 20° to the north (fig. 5; Strickler, 1986). They appear to cut both the mineralized horizons and the

F-series faults and may be related to tectonic emplacement of the ophiolite during the Nevadan orogeny.

In addition to these major structures, shear and breccia zones are localized along major lithologic contacts, especially those at the tops and bottoms of sulfide lenses and ponded basalt flows. Shearing is also common in mudstone and fine-grained hyaloclastite units.

Pervasive Hydrothermal Metamorphism of Volcanic Rocks

On the basis of bulk mineralogical, chemical, and oxygen isotopic data, Zierenberg and others (1988) concluded that volcanic rocks at Turner-Albright have been subjected to pervasive hydrothermal metamorphism at low water to rock ratios and temperatures of 200° to 250°C. The hydrothermal metamorphism apparently formed as seawater-derived fluid circulated downward through hot oceanic crust, and is distinct from alteration related to focused discharge and the sulfide mineralization described below. All of the rocks from the volcanic sequence of the ophiolite above the transition to the dike complex contain secondary albite, chlorite, pumpellyite, and prehnite, whereas epidote and quartz are important secondary minerals in the sheeted dikes. The variations in mineralogy with depth in the ophiolite correspond to high subsea-floor geothermal gradients on the order of 100°C km^{-1} (Beiersdorfer, 1993). Bulk chemical data presented by Zierenberg and others (1988) indicate that the basaltic volcanic rocks have gained Na_2O and lost CaO, SiO_2, and possibly K_2O.

Sulfide Mineralization

The mineralogy of the sulfide zones at Turner-Albright is relatively simple. Pyrite is the predominant mineral, locally accompanied by marcasite, sphalerite, chalcopyrite, and in sphalerite-rich zones, minor amounts of tetrahedrite. Trace amounts of linnaeite, galena, arsenopyrite, pyrrhotite, stannite, and native gold are also reported (Strickler, 1986; Kuhns and Baitis, 1987). Native gold occurs as small (0.5 to 27 micron) grains in pyrite, chalcopyrite, and sphalerite (Kuhns and Baitis, 1987).

The sulfide-bearing horizons at Turner-Albright (MUZ and MLZ) generally grade downward from massive through semi-massive sulfide into mineralized basalt (fig. 7). The massive portions of the deposit (>50% sulfide) generally have a breccia texture with 0.2 to 10 cm clasts of sulfide in a pyritic sulfide matrix. Bedded and finely-laminated massive sulfide is rare, but colloform growth banding is widespread in pyritic ore. Colloform pyrite occasionally is interbanded with marcasite on a submillimeter scale suggesting that they were deposited together by the hydrothermal fluid. However, marcasite concentrated along cataclastic zones in massive pyritic sulfide is probably a late-stage product of sulfide deformation (Zierenberg and others, 1988).

Sphalerite is typically red-brown and often exhibits irregular to convoluted color banding and interbanding with pyrite on a millimeter scale. Replacement of sphalerite by chalcopyrite is common on all scales ranging from total replacement to incipient development of chalcopyrite disease (Barton and Bethke, 1987). Darker, Fe-rich(?) growth bands in sphalerite are especially susceptible to replacement. Chalcopyrite preferentially replaces sphalerite in zones of interbanded pyrite and sphalerite, but also invades and replaces pyrite along cracks and grain boundaries.

In semi-massive (20 to 50%) sulfide, the most abundant sulfide type at Turner-Albright, the brecciated texture consists of white, chert-like siliceous clasts in a sulfidic matrix. The amount of sulfide gradually decreases with depth. These clasts are generally equant, rounded to angular, and range from 0.1 to >10 cm and average 1 to 3 cm in diameter. Clasts at the top of the semi-massive sulfide zones are often featureless, but locally contain disseminated sulfide, sulfide veins and poorly defined millimeter-scale color banding.

The semi-massive sulfide grades downward into a clast-supported breccia with a sulfide matrix. Gray and green siliceous clasts become more common downward, and more clasts have irregular banding and spotting indicative of their origin as devitrified and replaced glassy volcanic rocks. With a continued downward decrease in sulfide content below 20%, the lithology gradually changes to sulfide-bearing volcanic and hyaloclastite breccia, the mineralized basalt of Figure 7. The degree of alteration also diminishes downward and green clasts with remnant volcanic textures are increasingly well preserved in the lower part of the sulfide-bearing horizons.

Fracture-controlled (stringer or vein) mineralization is rare at Turner-Albright. Where present, the veins consist of pyrite with 10 to 50% milky quartz, minor chalcopyrite, and rare sphalerite. Rock adjacent to the veins is pervasively altered to chlorite and quartz, and the surrounding rock contains a few percent disseminated euhedral pyrite.

Sulfide-Related Alteration

The degree of basalt alteration increases from weakly mineralized basalt underlying the sulfide zones to complete replacement at the semi-massive to massive sulfide transition. Sulfide-related alteration does not extend above the sulfide horizons. Although most sulfide-related alteration is spatially related to olivine basalt hyaloclastite, some talus breccia, which included fragments of clinopyroxene basalt and mudstone, is mineralized, and rare stringer vein alteration cuts clinopyroxene basalt below the UHZ.

Chlorite is the dominant alteration phase in least-altered olivine basalt, where it occurs in the groundmass and also replaces olivine phenocrysts. Increased alteration of olivine basalt results in quartz pseudomorphs of both olivine and plagioclase phenocrysts, and conversion of the groundmass to a mixture of chlorite, quartz, and sulfide. Areas originally occupied by titanomagnetite grains are filled with fine-grained leucoxene which recrystallizes to euhedral rutile as alteration intensity increases. Some grains of Fe-Ti oxide have been replaced by pyrite. The chlorite in the zone of sulfide-related alteration is Fe rich compared to chlorite from the pervasively metamorphosed clinopyroxene basalt (fig. 8; Zierenberg and others, 1988). Bulk samples of quartz-chlorite-rich altered olivine basalts are also enriched in FeO, but depleted in K_2O, Na_2O, and CaO relative to clinopyroxene basalt (Zierenberg and others, 1988).

At higher grades of olivine basalt alteration, chlorite is replaced by quartz and sericite. SEM analysis reveals that the sericite is potassium-rich and often contains abundant iron. Microprobe analysis of coarse-grained sericite shows that it is stoichiometric muscovite. Fine-grained material intergrown with sericite may be smectite or interlayered illite-smectite.

The most intense stage of alteration results in complete silicification of the rock with the total removal of all major cations including aluminum. Volcanic textures, observed in all lesser stages of sulfide-related alteration, are destroyed. This results in massive to semimassive sulfide with siliceous fragments resembling chert. The only evidence of the olivine basalt protolith remaining in these silicified fragments is the presence of euhedral chromium spinel microphenocrysts (Zierenberg and others, 1988).

Timing of Mineralization and Ore Genesis

The upper massive parts of the sulfide horizons are interpreted to have formed on the sea floor as mounds of sulfide similar to those observed at modern high temperature hydrothermal vent sites on sediment-starved mid-ocean ridges (e.g., Haymon and Kastner, 1981; Goldfarb and others, 1983; Embley and others, 1988; Thompson and others, 1988; Koski and others, 1994). The restriction of sulfide mineralization to volcanic breccia northeast of the F-1 fault zone (fig. 5) was interpreted by Strickler (1986) as evidence that this fault was active on the seafloor at the time of sulfide deposition and was probably a major conduit for hydrothermal fluids. In the massive part of the deposit, adjacent sulfide fragments have differing histories of veining and recrystallization, and are interpreted as evidence of *in situ* brecciation and redeposition of the sulfide mounds. The depositional contact between pelagic and hemipelagic mudstone and massive sulfide confirms the sea-floor origin for the uppermost part of the sulfide deposits and demonstrates that they formed during or shortly after eruption of the olivine basalt host rocks.

The Turner-Albright is a volcanogenic sulfide deposit formed by hydrothermal discharge onto the paleo-sea floor in a back-arck or marginal setting. A generalized model for formation of the deposit is illustrated in figure 9. Hydrothermal fluids presumably were channeled upward along active normal faults (of the F series) into permeable units of breccia and hyaloclastite. Although some massive sulfide in the uppermost part of the sulfide horizons formed above the seafloor-seawater interface, the bulk of the sulfide was deposited in porous breccia and hyaloclastite below the sea floor where the hydrothermal fluid was cooled by mixing with ambient seawater. Sulfide talus breccia formed on the sea floor by disaggregation of sulfide mounds.

The most intensive hydrothermal fluid-wallrock interaction resulted in complete replacement of olivine basalt hyaloclastite by quartz and sulfide and the removal of all other major cations including aluminum. The solution responsible for transport of metals and sulfide-related alteration was evolved seawater, transformed into a high-temperature acidic fluid by interaction with hot oceanic crust. Based on oxygen isotope data for the alteration products in basalt, the fluids were heated to temperatures of 225° to 365°C (Zierenberg and others, 1988). The abundance of Fe-rich chlorite and Fe-smectite(?) formed during mineralization indicate that the hydrothermal fluid was depleted in Mg before interacting with olivine basalt. The deposits were subsequently buried by mudstone, pillow basalt, and lava lakes that ponded in the seafloor graben where the sulfides formed. Alteration related to the sulfide deposition did not occur in the basalt above the sulfide horizons. The presence of metalliferous sediment within the overlying Galice Formation at a position 8 to 21 m above the ophiolite indicates that a later period of hydrothermal discharge occurred off the axis of spreading (Pinto-Auso and Harper, 1985).

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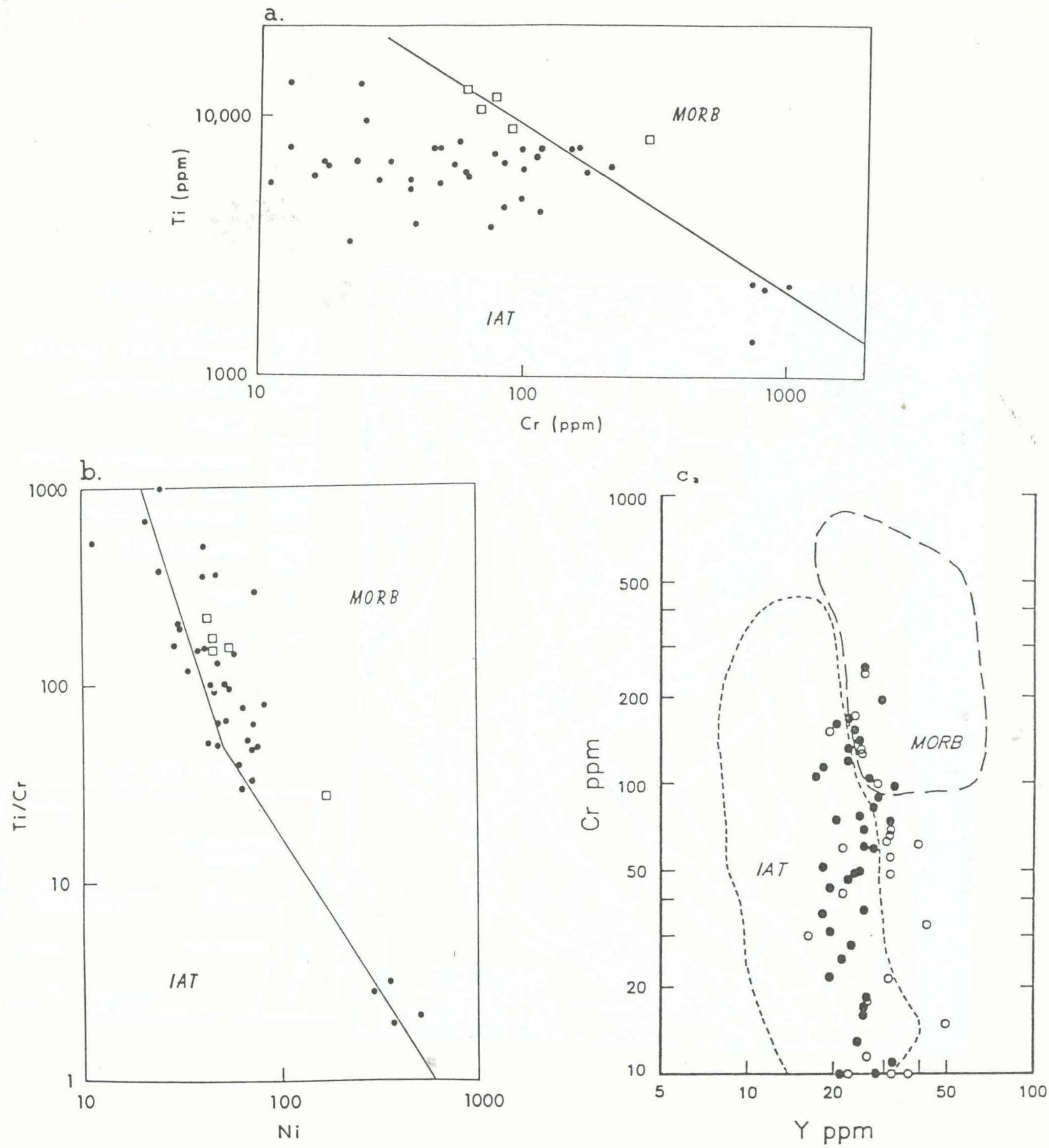

Figure 4. "Stable" element discriminant diagrams showing range in composition of lavas and dikes from the Josephine ophiolite (from Harper, 1984, 1988). IAT = island arc tholeiite; MORB = mid-ocean ridge basalt. (a) Ti vs. Cr diagram of Pearce (1975). Solid circles represent lavas; open squares represent dikes. (b) Ti/Cr vs. Ni diagram of Beccaluva and others (1979). Solid circles represent lavas; open squares represent dikes. (c) Y vs. Cr plot (from Harper, 1988). Open circules represent lavas; solid circles represent dikes.

SAVANNA
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TELEPHONE NUMBER: (403) 269-5369

FAX NUMBER: (403) 261-2866

TO: ANGIE KAREL

FROM: PAT HEANEY

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[redacted]

SAVANNA RESOURCES LTD

CORPORATE PROFILE

May, 1990

#810, 540 - 5th Avenue SW, Calgary, Alberta T2P 0M2 Telephone: 403-269-5369 Telecopier: 403-261-2866

Company Data

Incorporated	March 26, 1957
Shares Authorized	Unlimited
Shares Outstanding	28,599,601
Estimated Float	15,000,000
Recent Price	C$0.50
1989 Trading Price	C$0.28 - C$1.10
Shares Traded	Alberta Stock Exchange (SV)
Broker Contact	

Summary

Savanna Resources Ltd. is an aggressive mineral exploration and development company operating precious, strategic and base metal projects in Canada and the United States. Over the past ten years it has assembled twelve quality mineral properties, made two significant gold discoveries and delineated two gold bearing massive sulphide deposits, one of which is rapidly progressing through the pre-feasibility stage.

Canadian projects are operated by Courageous Exploration Inc., a 54%-owned subsidiary with head office in Calgary, Alberta, while U.S. projects are operated through Baretta Mining Inc., a 96%-owned subsidiary with offices in Grants Pass, Oregon. John Alston, president of Savanna Resources, is a former geologist for Shell Canada and former chief geologist for Whitehall Canadian Oils Ltd. Mr. Alston has been directing the mineral exploration program for Savanna and its affiliates for the past fifteen years.

Savanna trades on the Alberta Stock Exchange under the symbol SV. There are 28,599,601 shares outstanding, of which more than 6 million are owned by American Chromium Limited and an affiliate. The float is estimated at 15,000,000 shares. The company is listed with both Moody's Investor Service and Standard & Poor's, and an exemption under Rule 12g3-2(b) (No. 82-1258) was confirmed in April, 1986 with the United States Securities and Exchange Commission. Pink sheet market maker in the U.S. is Douglas Bremen and Company, New York, NY.

Mineral Properties

Turner-Albright Property, Oregon

Savanna's major asset is the Turner Albright gold, zinc, copper and cobalt deposit located in southwestern Oregon. Besides having a drill-indicated gross ore value of some $412 million, this polymetallic deposit is one of the few properties in North American with drill-indicated reserves of cobalt. Data from 81,000 feet of diamond drilling has established ore reserves estimated at 3.6 million tons containing, in addition to cobalt, 400,000 ounces gold, 1,600,000 ounces silver, 100,000,000 pounds copper and 240,000,000 pounds zinc.

The ore grades and values, utilizing a cut-off grade of US $75.00 per ton and prices as shown, are as follows:

Metal	Grade	Price	Value per ton	Gross Metal Value (000's)
Gold	0.114 oz./ton	$400.00/oz.	$45.60	$164,480
Silver	0.443 oz./ton	5.00/oz.	2.21	7,900
Copper	1.462%	0.90/lb.	26.32	94,800
Zinc	3.325%	0.50/lb.	33.25	119,700
Cobalt	0.055%	6.50/lb.	7.15	25,700
Total gross metal value				US $412,200

The most recent work on the property, consisting of some 6400 feet of diamond drilling and down hole pulse EM surveys, extended the ore body four hundred feet to the east and added some 387,000 tons grading 0.175 oz/ton gold, 1.09% copper and 2.32% zinc to the Main Lower Zone.

Island Mountain, California

The Company owns the Island Mountain copper-gold property located 35 miles east of Garberville, California. Mining of this deposit was carried on between 1917 and 1930 with recorded shipments of 131,000 tons averaged 3.29% copper 1.09 oz/ton silver and 0.065 oz/ton gold.

Recent diamond drilling intersected the massive sulphide mineralization below the old workings, demonstrating that the deposit is open to depth. The ultimate size of the deposit is as yet unknown.

Preliminary metallurgical test work has confirmed that the ore is amenable to normal flotation technology with acceptable recovery of gold in the copper concentrate.

Santa Rosa, California

The Company holds the mining rights to the 34 claim Santa Rosa property in Inyo County, California. The property includes the Santa Rosa Mine from which recorded production in excess of 80,00 tons grading 11.6 oz. per ton silver, 15.4% lead and 6.2% zinc was extracted from a series of steep parallel veins and latterly, from one major near-vertical ore shoot. The workings are open. At the bottom of the stope in the main shoot the mineralization was yielding 200 tons per vertical foot grading, based on the last five shipments 21.9 oz/ton silver, 17.3% lead, 5.3% zinc. Experience obtained from nearby mines at Darwin and Cerro Gordo suggests this mineralization may continue for a further 1000' in depth.

Other mineralized zones encountered in the underground workings point to the presence of other vertical shoots previously ignored during the early mining on the dipping vein system. Underground diamond drilling will be required to confirm the extension to depth of the main mineralized shoot and to test the other targets.

Courageous Lake, Northwest Territories

The Courageous Lake gold belt is the site of two firmer gold producers and numerous major new gold showings. In the 1960's the old Tundra gold mine was the world's most northerly. During the 1980's, Giant Yellowknife operated the very profitable Salmita Mine.

Courageous Exploration controls some 25 kilometres of the prospective greenstone contact zone along which the gold deposits occurs.

On the Sour Lake lease block a 25 kilometre grid of IP surveys and 6500 metres of diamond drilling in 54 holes have identified two zones of gold mineralization. One is near the surface showing at Sour Lake where an intersection of one meter assayed 0.25 oz gold per ton. It is thought that the IP anomaly tested by this hole represents the source of the high grade samples recovered from a nearby mudboil.

The second gold occurrence is located some 6 kilometres further north near Spectacle Lakes. Surface samples in float near a 1.5 kilometre long IP anomaly assayed up to 0.28 oz gold per ton. Two diamond drill holes drilled into the anomaly, intersected 3 meters and 2.5 meters grading 0.23 oz gold per ton.

In the northernmost 10 kilometres of our holdings diamond drilling indicates the Jax deposit contains some 40,000 tons grading 0.40 oz. gold per ton with the best intersection returning 5.2 metres grading 0.49 oz. gold per ton. The deposit is open to depth and on strike. Geophysical surveys have provided a number of additional targets which remain to be tested.

Silver Basin, Trout Lake, B.C.

In the Trout Lake area, high grade gold and silver values in polymetallic sulphide-rich pods occur in our Silver Basin property. Gold values ranged from 0.22 to 1.55 oz per ton, with silver values up to 24.05 oz. per ton. An extensive, intense alteration zone provides a target of considerable potential. On the Free Coinage Crown Grant Surface exploration relocated the old working from which high-grade silver values (up to 14.68 oz./ton) were recovered at the turn of the century.

Snowbird Lake, Northwest Territories

Courageous Exploration Inc. has completed two summers of what is expected to be a long term program of grass root exploration in the Snowbird Lake area, several hundred miles to the southwest of Courageous Lake.

We have optioned from Comaplex Minerals and Tempest Exploration some 40,000 hectares of prospecting permits and claims. Under the agreement Courageous may earn up to a 60% interest in the play by expending $1,100,000 in exploration.

Our initial program consisted of geological, geochemical and geophysical surveys and prospecting. Gold occurrences yielded a suite of samples which assayed up to 6.28 oz. gold per ton. The grade and mode of occurrence suggests the area has excellent potential for economic gold deposits.

Management

Management of Savanna Resources Ltd. boasts considerable experience in mining, accounting and general business management. They have displayed the ability to set and achieve aggressive objectives to survive in the rapidly-changing resource industry. Furthermore, their expertise and reputations have served the confidence of major mining companies which have chosen to joint venture with Savanna on a number of mining projects. A description of each member of the Savanna team follows;

John M. Alston, President and Director - Mr. Alston began his career as a geologist with Shell Canada Resources Ltd., and advanced to Chief Geologist for Whitehall Canadian Oils Ltd. in 1956. Subsequently he became operations manager for Canada Northwest Land Limited. For the past thirteen years, Mr. Alston has been directing the mineral exploration program of Savanna Resources and it affiliates.

Jan M. Alston, Secretary-Treasurer and Director - Mr. Alston is a practising lawyer and was admitted to the Law Society of Alberta in 1982. He attended the University of Alberta where he received his B.A. in Economics in 1978, and LL.B in 1981. Mr. Alston is presently President and Secretary-Treasurer of Canadian Northcor Energy Inc. and related companies.

Ross P. Alger, Director - Mr. Alger was formerly Vice-President of Finance and Secretary-Treasurer for the RGO Group of Companies. He has served terms as President of the Calgary Chamber of Commerce and as Mayor of the City of Calgary and previously was a practising chartered accountant.

Thomas W. Whittingham, Director - Mr. Whittingham was until recently Vice-President, Exploration with Westcoast Petroleum Limited in Calgary.

Consultants

Lloyd Frizzell, B.Sc., Mining Consultant - Mr. Frizzell has practised as a consulting geologist in the western United States for over 25 years. From his base in Grants Pass, Oregon, he has initiated pioneering mining exploration in the states of Oregon and California, and was first to recognize the potential of the Turner Albright deposit as a major reserve.

Michael D. Strickler B.Sc., Geological Consultant - Mr. Strickler has practised as a geological consultant in Oregon and northern California for eight years. Based in Grants Pass, Mr. Strickler has worked on the Turner Albright project continuously since 1979 under Baretta, Noranda, Rayrock and once again Baretta. The continuity of Mr. Strickler's involvement with the Turner Albright project has proven invaluable in developing the present geological model.

FINANCIALS

CONSOLIDATED STATEMENT OF CHANGES IN FINANCIAL POSITION

FOR THE YEAR ENDED 30 JUNE 1989

	1989	1988
CASH PROVIDED (USED) BY OPERATING ACTIVITIES		
Operations		
Net loss for the year	$(1,714,740)	$ (267,421)
Items not involving cash		
Loss of an affiliated company accounted for on the equity basis	426,927	76,451
Minority interest	(366,260)	(89,464)
Miscellaneous	–	(2,940)
Depletion and depreciation	9,406	7,591
(Gain) loss on issue of shares by subsidiary	23,615	(466,797)
Write-off of abandoned resource properties	–	299,549
Loss on disposal of investments	83,473	–
Write -down of investments	999,998	–
Cash used by operations	(537,581)	(443,031)
Changes in non-cash working capital balances		
Accounts and advances receivable	3,877	(32,995)
Accounts payable and accrued liabilities	115,624	72,068
Notes payable and accrued interest	114,027	(321,242)
Due to affiliated company	(867,741)	773,146
Current portion of long-term debt	–	(220,852)
	(1,171,994)	(172,906)
FINANCING ACTIVITIES		
Deferred share issue costs	–	16,650
Increase in minority interest	276,985	1,294,144
Issue of share capital	1,235,500	90,000
	1,512,485	1,400,794
INVESTING ACTIVITIES		
Proceeds on disposition of investments	59,071	8,000
Acquisition of investments	(59,005)	(8,003)
Acquisition of fixed assets	(375)	–
Acquisition of mining claims and property	(457,286)	(1,221,713)
	(457,595)	(1,221,716)
INCREASE (DECREASE) IN CASH	(117,104)	6,172
Bank indebtedness, beginning of year	(42,461)	(48,633)
BANK INDEBTEDNESS, END OF YEAR	$ (159,565)	$ (42,461)
Represented by		
Cash	$ 800	$ 348
Bank Indebtedness	(160,365)	(42,809)
	$ (159,565)	$ (42,461)

CONSOLIDATED STATEMENT OF INCOME AND DEFICIT

FOR THE YEAR ENDED 30 JUNE 1989

	1989	1988
REVENUE		
Oil and gas royalties	$ 17,632	$ 20,388
Rental	7,354	6,405
Miscellaneous income	–	3,041
	24,986	29,834
EXPENSES	562,567	489,925
Administrative	9,406	7,591
Loss of an affiliated Company accounted for on the equity basis	426,927	76,451
Write-off of abandoned resource properties	–	299,549
Loss on disposal of investments	83,473	–
Write-off of investments	999,998	–
(Gain) loss on issue of shares by subsidiaries	23,615	(466,797)
	2,105,986	386,719
LOSS BEFORE MINORITY INTEREST	(2,081,000)	(356,885)
Minority interest	366,260	89,464
NET LOSS FOR THE YEAR	(1,714,740)	(267,421)
Deficit, beginning of year	(7,548,579)	(7,281,158)
DEFICIT, END OF YEAR	$ (9,263,319)	$ (7,548,579)
LOSS PER SHARE	$ (.08)	$ (.01)

CONSOLIDATED BALANCE SHEET

AS AT 30 JUNE 1989

	1989	1988
ASSETS		
CURRENT		
Cash	$ 800	$ 348
Accounts and advances receivable	32,760	36,437
	33,560	36,785
INVESTMENTS	344,393	2,354,857
FIXED ASSETS	98,720	105,751
PETROLEUM AND NATURAL GAS PROPERTIES	28,797	28,797
MINERAL PROPERTIES AND DEFERRED COSTS	12,688,815	12,231,529
	$ 13,692,285	$ 14,757,719
LIABILITIES		
CURRENT		
Bank indebtedness	$ 160,365	$ 42,809
Accounts payable and accrued liabilities	359,017	243,393
Notes payable and accrued interest	1,168,841	1,054,814
Due to affiliated company	158,360	1,026,101
	1,846,583	2,367,117
MINORITY INTEREST	1,821,095	1,886,755
	3,667,678	4,253,872
SHAREHOLDERS' EQUITY		
SHARE CAPITAL	19,287,926	18,052,426
DEFICIT	(9,263,319)	(7,548,579)
	10,024,607	10,503,847
	$ 13,692,285	$ 14,757,719

Geologic Evolution of the Northernmost Coast Ranges and Western Klamath Mountains, California

Galice, Oregon to Eureka, California
July 20–28, 1989

Field Trip Guidebook T308

Leaders:
K. R. Aalto *G. D. Harper*

Associate Leaders:
G. A. Carver *S. M. Cashman*
W. C. Miller III *H. M. Kelsey*

American Geophysical Union, Washington, D.C.

FIELD GUIDE TO THE JOSEPHINE OPHIOLITE AND COEVAL ISLAND ARC COMPLEX, OREGON-CALIFORNIA

Gregory D. Harper

Department of Geological Sciences, State University of New York at Albany

INTRODUCTION

The Klamath Mountains occupy the fore-arc region of the Cascade volcanic arc. They consist of east-dipping thrust sheets ranging from early Paleozoic to late Mesozoic. The terranes and thrust faults generally become younger from east to west [Irwin, 1981; Wright and Fahan, 1988]. There is no Precambrian basement present; the Klamath terranes consist of magmatic arcs, ophiolites, and accretionary prisms.

The western Klamath terrane (Fig. 1) consists of two east-dipping thrust sheets emplaced during the Late Jurassic Nevadan orogeny. The lower sheet (Fig. 2) includes the Rogue Formation and calc-alkaline plutonic rocks of the Chetco intrusive complex. The upper sheet includes the Josephine ophiolite which is in thrust contact with the Chetco intrusive complex along an amphibolite sole (Figs. 1, 2) [Dick, 1976; Cannat and Boudier, 1985]. Late Jurassic flysch of the Galice Formation conformably overlies both the Rogue Formation and the Josephine ophiolite (Fig. 2) [Harper, 1984; Wood, 1987]. The Rogue-Chetco complex and the Josephine ophiolite apparently represent a Late Jurassic island arc [Dick, 1976; Garcia, 1979] and back-arc basin [Saleeby et al., 1982; Harper and Wright, 1984]. This interpretation is based on similarities in radiometric and fossil ages (Fig. 2), overlying flysch, age of emplacement, and regional geology [Saleeby et al., 1982; Harper and Wright, 1984; Harper et al., 1986].

THE ROGUE AND GALICE FORMATIONS (ISLAND ARC COMPLEX)

On the first day of the trip, we will be rafting down the Rogue River to observe the Rogue and Galice Formations (Fig. 3). The Rogue Formation consists of a thick sequence of tuffs, breccias, and rare flows which range from mafic to silicic in composition [Garcia, 1979; Riley, 1987]. Riley [1987] subdivided the Rogue Formation into units consisting, from oldest to youngest, of (1) andesitic breccia, (2) volcaniclastic turbidites, (3) massive fine-grained tuff (Figs. 2, 3). The presence of pillow lavas, Bouma sequences, and cherty tuffs containing radiolaria and sponge spicules indicate submarine deposition [Riley, 1987]. Trace-element geochemistry of the volcanic rocks indicates that they are calc-alkaline [Garcia, 1979]. Saleeby [1984] reports a concordant Pb/U zircon age of 157 ± 2 Ma on a tuff-breccia in the Rogue Formation (Fig. 2) and a 150 ± 2 Ma age on a felsic dike.

Kuroko-type massive sulfide deposits occur in the Rogue Formation [Koski and Derky, 1981; Wood, 1987]. We will visit one of these (Almeda Mine, Stop 3) which is exposed on the Rogue River, just below the contact between the Rogue Formation and overlying Galice Formation.

The Galice Formation consists of graywacke, slaty shale, and rare conglomerate. Bouma sequences are common and sole marks are locally present, indicating deposition by turbidity currents.

Bedding and foliation in the Rogue Formation generally dip steeply to the southeast, and the Galice Formation has a steeply dipping slaty cleavage. Tight to isoclinal folds occur in both the Rogue and Galice Formations (Fig. 3) [Kays, 1968; Riley, 1987; Park-Jones, 1988]. Folds are overturned to the west and axial planes generally strike northeast (Fig. 3). Fold hinges in the Galice plunge from 0-90° [Kays, 1968; Harper and Park, 1986; Park-Jones, 1988]; it is uncertain whether this variation is primary or the result of post-Nevadan cross folding. Volcanic rocks east of the village of Galice (Fig. 3) were originally mapped as volcanic members in the Galice Formation [Wells and Walker, 1953]; however, at least some of these rocks are overturned and may in fact be the Rogue Formation [Park-Jones, 1988].

We will not be visiting other parts of the island-arc complex. The probable plutonic roots of the arc are represented by the gabbroic Chetco intrusive complex which has yielded Late Jurassic K/Ar hornblende ages (Fig. 2). The southern part of the complex is predominantly gabbro, whereas the northern part is largely quartz diorite.

Other rocks associated with the Rogue Formation and Chetco intrusive complex include the Briggs Creek amphibolite, Rum Creek metagabbro (gneissic amphibolite), and minor peridotite (Figs. 2, 3) [Garcia, 1982]. The Briggs Creek amphibolite contains minor quartzites and has been interpreted to be metamorphosed pillow lava and chert. The association of metagabbro, peridotite, metabasalt, and metachert suggests that these rocks may represent a dismembered and regionally metamorphosed ophiolite [Coleman et al., 1976]. This interpretation is tentative, however, because of the possibility of large fault displacements, lack of structural work, and limited geochronology.

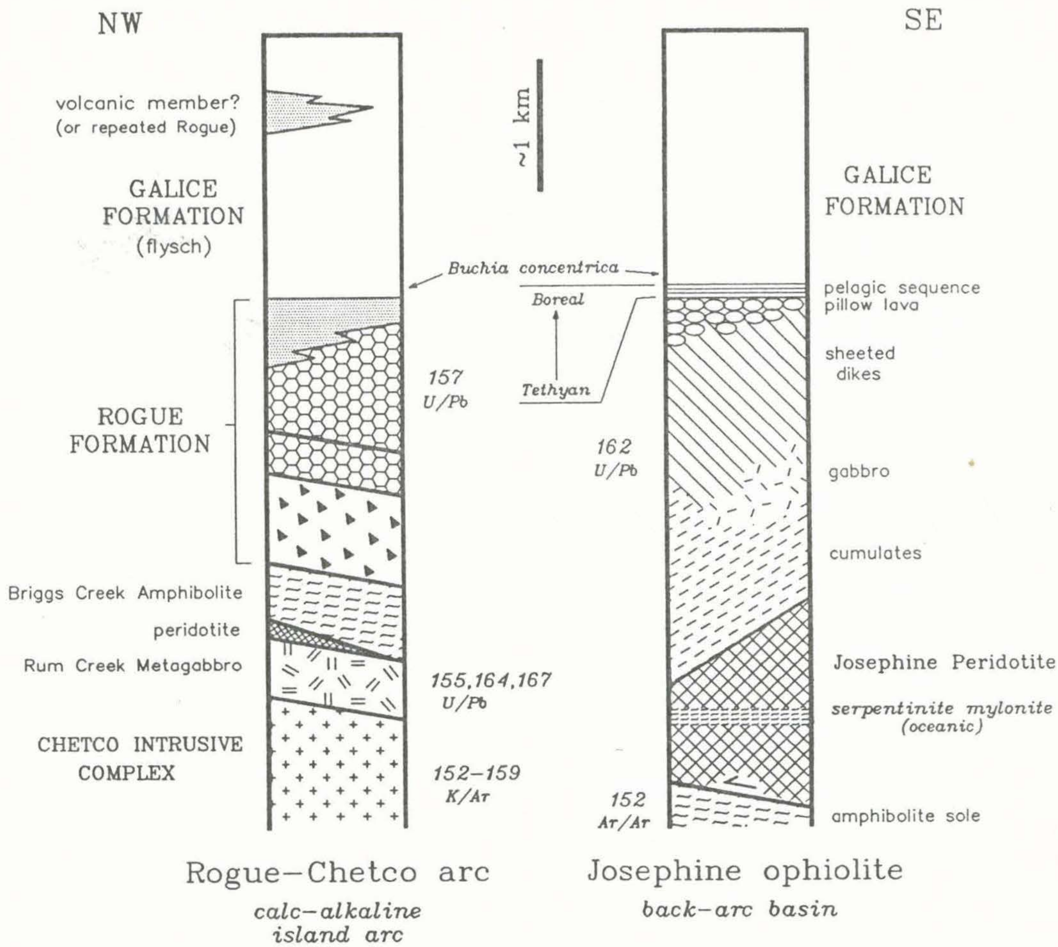

FIGURE 2 Late Jurassic island-arc complex and the Josephine ophiolite exposed along the Rogue River, Oregon, and the Smith River, California, repectively (Figs. 3 and 4) [Garcia, 1979, 1982; Riley, 1987; Park, 1987]. Symbols for the Rogue Formation are the same as those in Figure 3. The Josephine ophiolite was thrust over the island arc and thrust beneath western North America at ~150 Ma, at which time both sequences were intruded by calc-alkline dikes and sills [Saleeby, 1984; Harper and Wright, 1984; Harper et al., 1987]. K/Ar hornblende (recalculated using standardized decay constants), Ar/Ar hornblende, and U/Pb zircon ages are from Hotz [1971] and Dick [1976], Saleeby, [1984, 1987] and Harper [unpublished data], respectively.

THE JOSEPHINE OPHIOLITE AND GALICE FORMATION

The Josephine ophiolite is one of the largest and most complete ophiolites in the world. The ophiolite and overlying metasedimentary rocks compose a >10-km-thick, east dipping thrust sheet (Figs. 2, 4). The ophiolite consists of (1) depleted peridotite (mostly harzburgite) covering >800 km^2 (Fig. 1), (2) gabbroic and ultramafic cumulates (Fig. 5), (3) high-level gabbro (Fig. 6), (4) sheeted dikes (Figs. 7, 8), and (4) pillow lava (Fig. 9), massive lava, and pillow breccia.

The ophiolite was originally dated at 157±2 Ma by Pb/U on zircon from two plagiogranites [Saleeby et al., 1982]. With the use of newer techniques, it was discovered that the ages were slightly discordant. After abrasion of the zircon, one of the samples has yielded a concordant age of 162±1 [Saleeby, 1987]. In addition, a small fragment of the ophiolite exposed in the southwestern Klamath Mountains has yielded a zircon age of 164±1 Ma [Wright and Wyld, 1986]. In both areas, the dated plagiogranites are clearly part of the ophiolite because they are cut by mafic dikes.

Pelagic/hemipelagic rocks conformably overlie the Josephine ophiolite (Fig. 10) and grade upwards into the Galice flysch (Fig. 2). These rocks consist of chert, tuffaceous chert, and radiolarian argillite. Many of these rocks have high contents of terrigenous or tuffaceous detritus. Metalliferous horizons locally occur 8-23 m above the ophiolite and formed from low-T off-axis hydrothermal

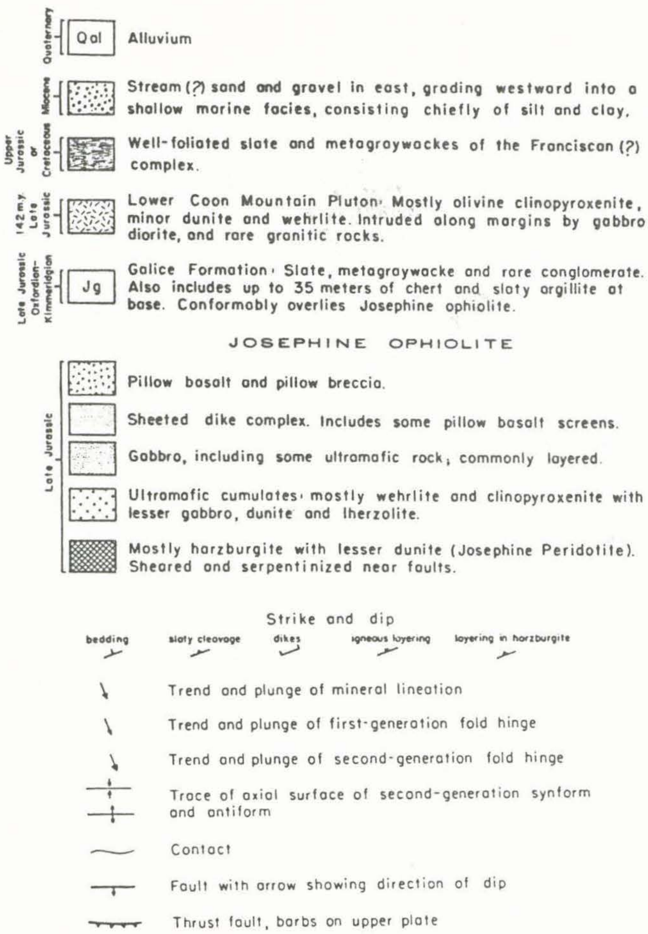

FIGURE 4 Geologic map of the Josephine ophiolite and overlying Galice Formation [Harper, 1984]. The ophiolite is broadly folded into an F_2 anticline and syncline, and the upper part of the ophiolite is repeated by three reverse faults in the northeastern part of the area. Numbers refer to field trip stops.

FIGURE 5 Layered gabbroic and ultramafic cumulates from near the base of the cumulate sequence, Josephine ophiolite.

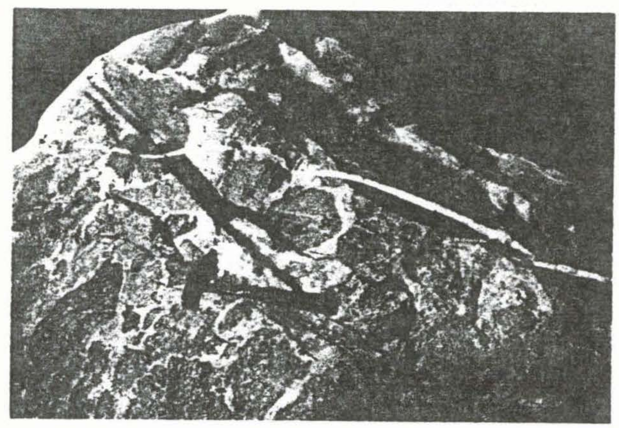

FIGURE 6 Complex intrusive breccia in high-level gabbro cut by a mafic dike and a thin plagiogranite dike (near Stop 5), Josephine ophiolite.

et al., 1982; Harper et al., 1986]. Dikes both intrude and are cut by small Nevadan faults; northwestward thrusting is indicated by fiberous slickensides and offset dikes and beds [G. Harper, in prep.]. Thrust directions inferred from the basal amphibolite sole of the Josephine ophiolite (Fig. 1) are north-northeast [Cannat and Boudier, 1985; K. Grady and G. Harper, in prep.].

Continued deformation after peak metamorphism is indicated by extensive folding of slaty cleavage, numerous reverse faults, and the local presence of a crenulation cleavage and lineation. The entire ophiolite was also folded during this later phase of deformation (Figs. 1, 4).

Igneous Geochemistry

Dikes and lavas of the Josephine ophiolite show a wide range in composition because of extreme fractionation and multiple types of parental magmas. The great majority of dikes and lavas have "immobile" trace element concentrations that indicate magmatic affinities transitional between island-arc tholeiites and mid-ocean ridge basalt (Figs. 12 and 13) [Harper, 1984, 1988]. Highly

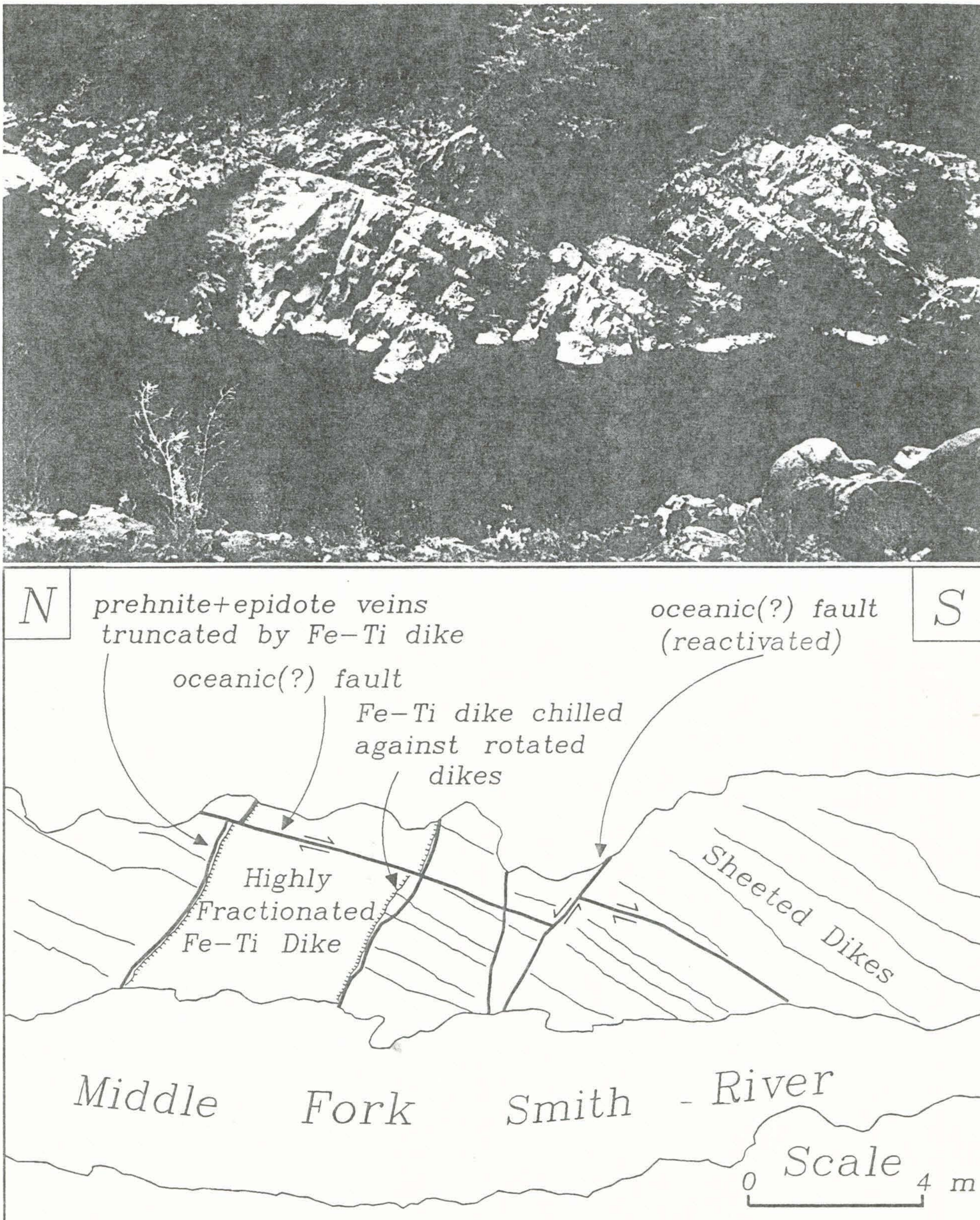

FIGURE 7 Sheeted dikes at Stop 5 dipping towards the south, viewed from Highway U.S. 199. This outcrop is in the hinge of a gently plunging syncline and thus the sheeted dikes are orientated essentially the same as when they were part of the oceanic crust (prior to ophiolite emplacement). The dip of the sheeted dikes reflects tilting at the spreading axis [Harper, 1982], probably by rotational faulting. The sketch shows the location of several probable oceanic faults, some of which are the locus of abundant prehnite veins. A late highly fractionated dike was intruded along one of these faults and much of its margins were subsequently sheared and veined with prehnite.

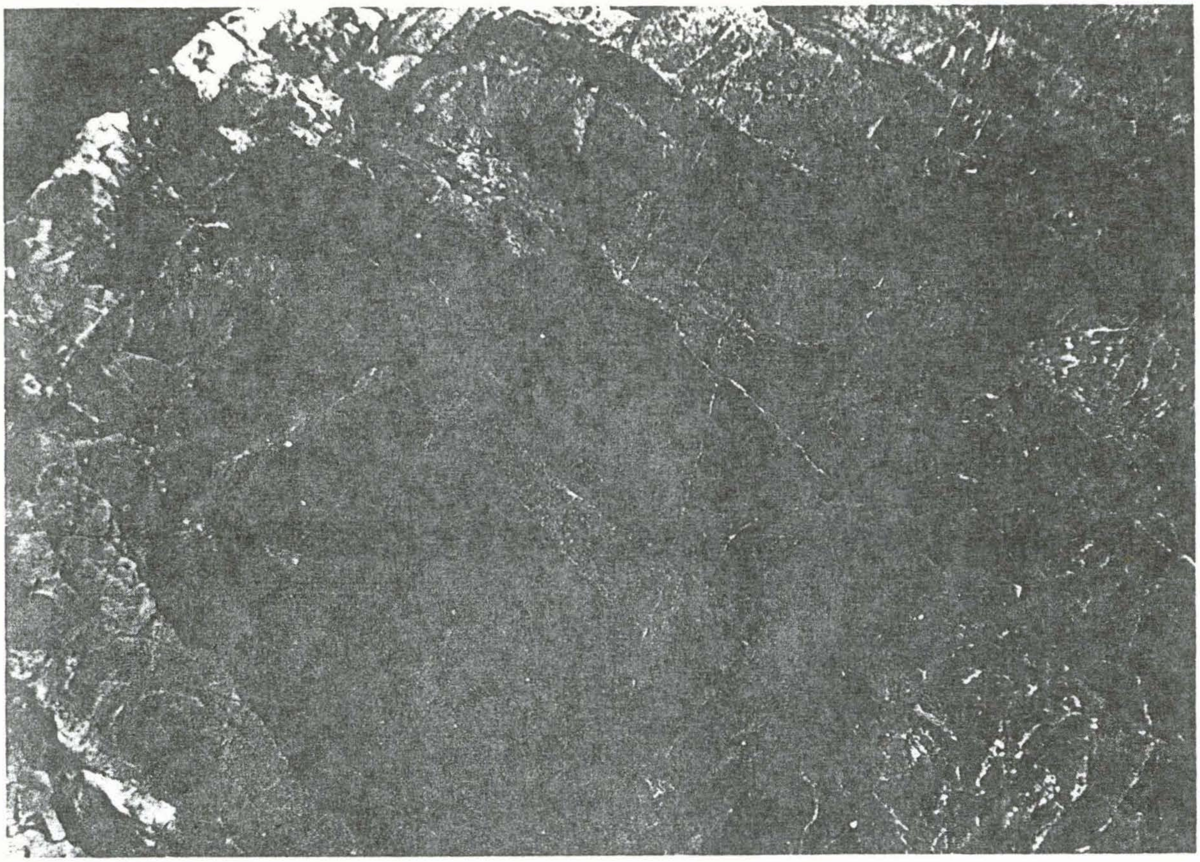

FIGURE 8 Sheeted dikes and gabbro screens (gb) at Stop 5. The center dike is ~0.4 m wide. In the right foreground is a probable oceanic normal fault; the lowermost gabbro screen is displaced 30 cm as shown by arrows. Prehnite veins (white), some with small offsets, occur on either side of the fault.

fractionated Fe-Ti basalts occur in the uppermost pillow lavas (Stop 2), and a Fe-Ti late dike (Fig. 7) and plagiogranite dikes and screens occur at the sheeted-dike/gabbro transition (Stop 4).

Very primitive lavas and dikes are widespread in Josephine ophiolite, and are highly variable in composition, ranging from primitive island-arc tholeiites to boninites (Fig. 12) We will look at a primitive pillow lava at Stop 1; black porphyritic primitive dikes also occur within high-level gabbro at Stop 4). The pillow lavas have thick chilled rims, distinctive variolitic textures, and abundant vesicles. Some of the lavas and dikes plot near melting curves, suggesting that they are primary mantle melts.

The geochemistry of the dikes and lavas clearly indicates a suprasubduction zone setting. Most of the lavas and dikes appear to have been generated by melting of a MORB-like source, but apparently involved higher degrees of partial melting than MORB (Fig. 12; or less melting of a depleted source). The high Th contents of the Josephine rocks compared to MORB (Fig. 13) reflects a "subduction-zone component" added to the source. The depleted primitive lavas (low Y, high Cr samples) apparently formed by hydrous partial melting of a depleted mantle source (Fig. 12). These inferred variations in conditions and source rocks during partial melting is consistent with studies of the residual Josephine Peridotite which suggest two stages of partial melting [Dick and Bullen, 1984].

Subseafloor Hydrothermal Metamorphism

A study of the subseafloor metamorphism of the Josephine ophiolite has recently been published by Harper et al. [1988]. The ophiolite shows an overall downward increase in metamorphic grade and decrease in ^{18}O, similar to other ophiolites and resulting from metamorphism under a steep thermal gradient. Most rocks in the extrusives and sheeted dike complex have lost Ca and gained Mg and Na (Fig. 14), but relict igneous textures are well preserved. These chemical chemical changes and pervasive metamorphism have been interpreted as the alteration by downwelling seawater (recharge, Fig. 15).

Alteration during upwelling (discharge) is much more localized at an outcrop scale. Mineral zonation resulting from discharging fluids is shown in Figure 15. One of the most significant recent discoveries in ophiolites is that the path of discharging fluids is represented by granoblastic

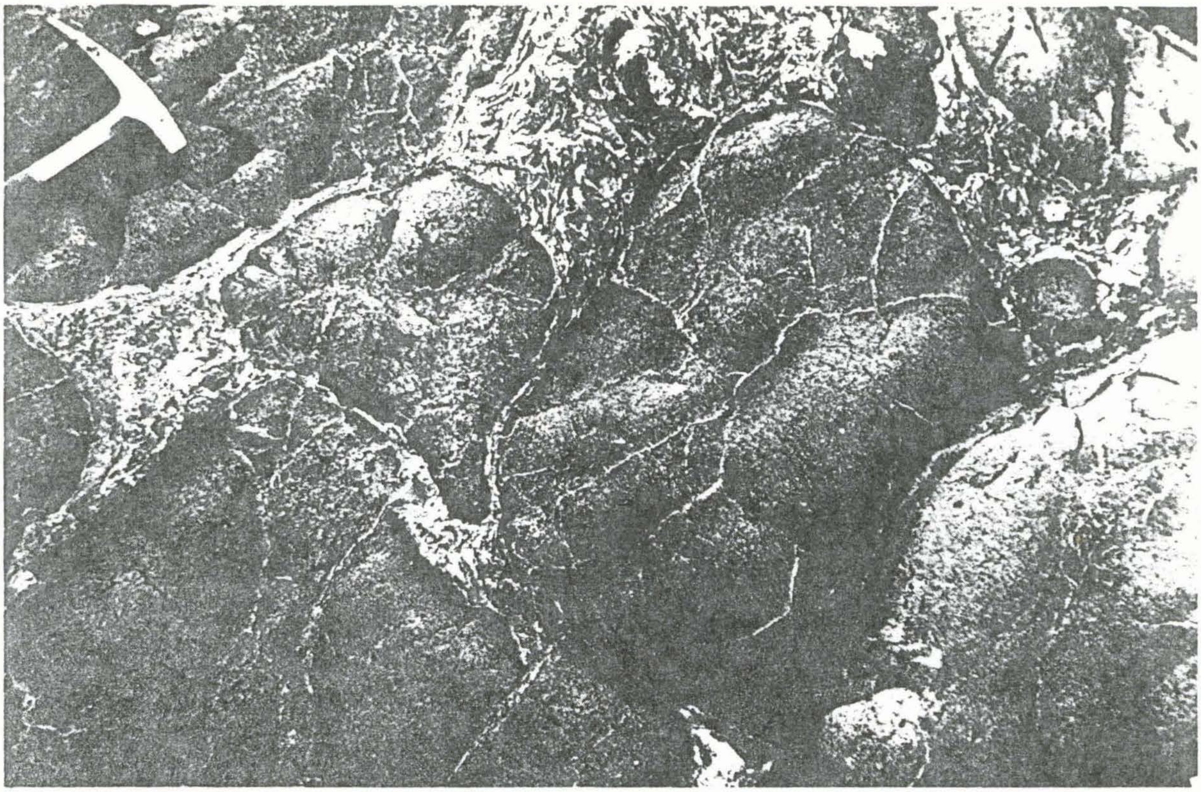

FIGURE 9 Pillow lavas ~50 m below the contact between the Josephine ophiolite and overlying sediments shown in Figure 10.

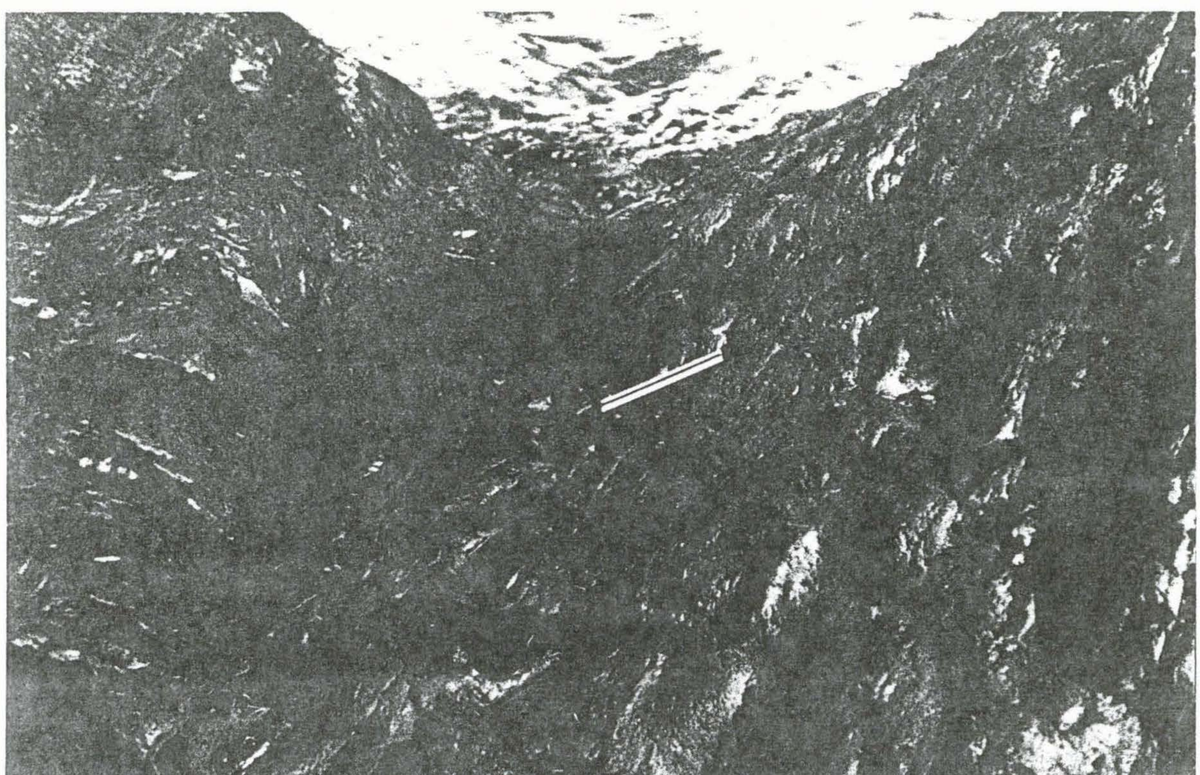

FIGURE 10 Depositional contact (15 cm scale rests on contact) between the uppermost pillow lavas of the Josephine ophiolite (left) and overlying thinly bedded chert and siliceous argillite (Stop 2). The contact dips 60° toward the left (east).

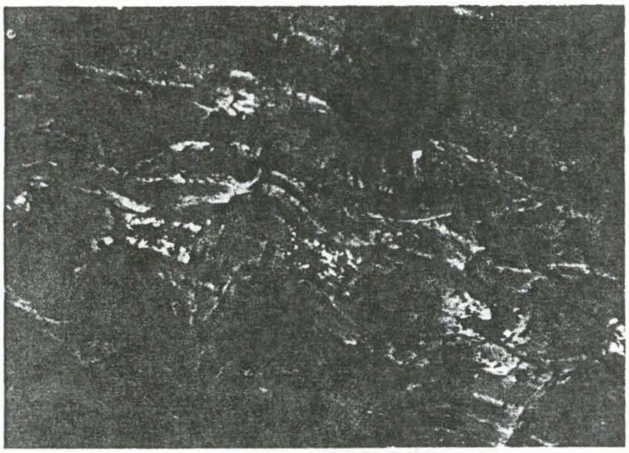

FIGURE 11 Boudinage in a sill within the pelagic/hemipelagic sequence overlying the Josephine ophiolite, near the mouth of Little Jones Creek (near Stop 1). Such calc-alkaline dikes and sills were intruded, deformed and regionally metamorphosed during the Nevadan orogeny at 145-150 Ma.

epidote + quartz ± chlorite rocks called epidosites (Fig. 16) [Harper et al., 1988; Schiffman and Smith, 1988; Seyfried et al., 1988]. The epidosites are metasomatized and strongly enriched in Ca and depleted in Na and Mg (Fig. 14), as well as Cu and Zn. Chemical, isotopic, and experimental work indicates that the epidosites represent pathways for huge volumes of fluids discharging at high velocities (meters/sec); the discharging fluids were probably similar to 350°C fluids exiting from "black smokers" at modern mid-ocean ridges [Seyfried et al., 1988].

We will see abundant dike-parallel epidosites in the sheeted dike complex at Stop 1, repsectively. The lowermost pillow lavas at Stop 1 are largely silicified and rich in sulfides. The silicification is almost certainly due to cooling of discharging fluids as they flow upwards into the more permeable pillow lavas. Above the lowermost pillows throughout the Josephine extrusives, bulbous "albite" epidosites and abundant hematite are evident in outcrop, and muscovite and K-

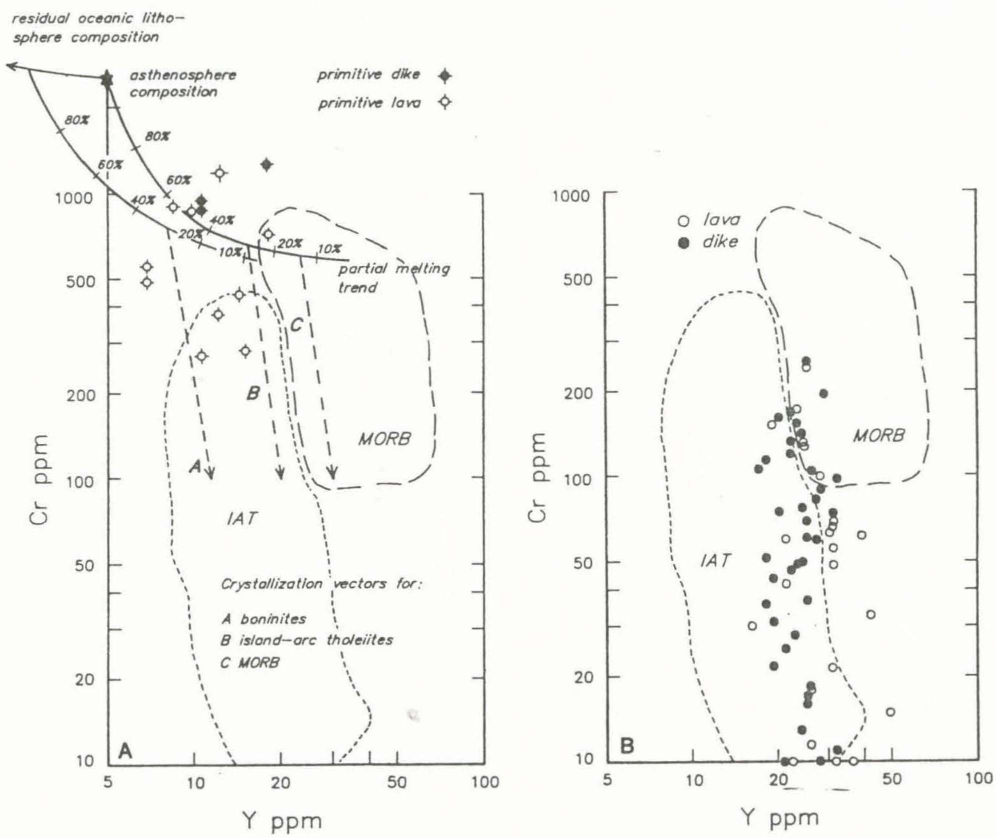

FIGURE 12 A. Y vs. Cr plot for primitive dikes and lavas from the Josephine ophiolite [Harper, 1988]. Note that several of the Josephine rocks plot near partial melting trends, indicating that they are essentially primary mantle partial melts. It is likely that the more depleted samples (lower Y) were derived by melting of a depleted mantle source because unrealistically high degrees of partial melting would be required for an undepleted source. B. Y vs. Cr plot for typical dikes and lavas of the Josephine ophiolite. This plot and other trace element data [Harper, 1984] indicate magmatic affinities transitional between IAT and MORB. Extrapolation upwards along fractionation trends suggests that these rocks were derived from partial melting of a relatively undepleted mantle source.

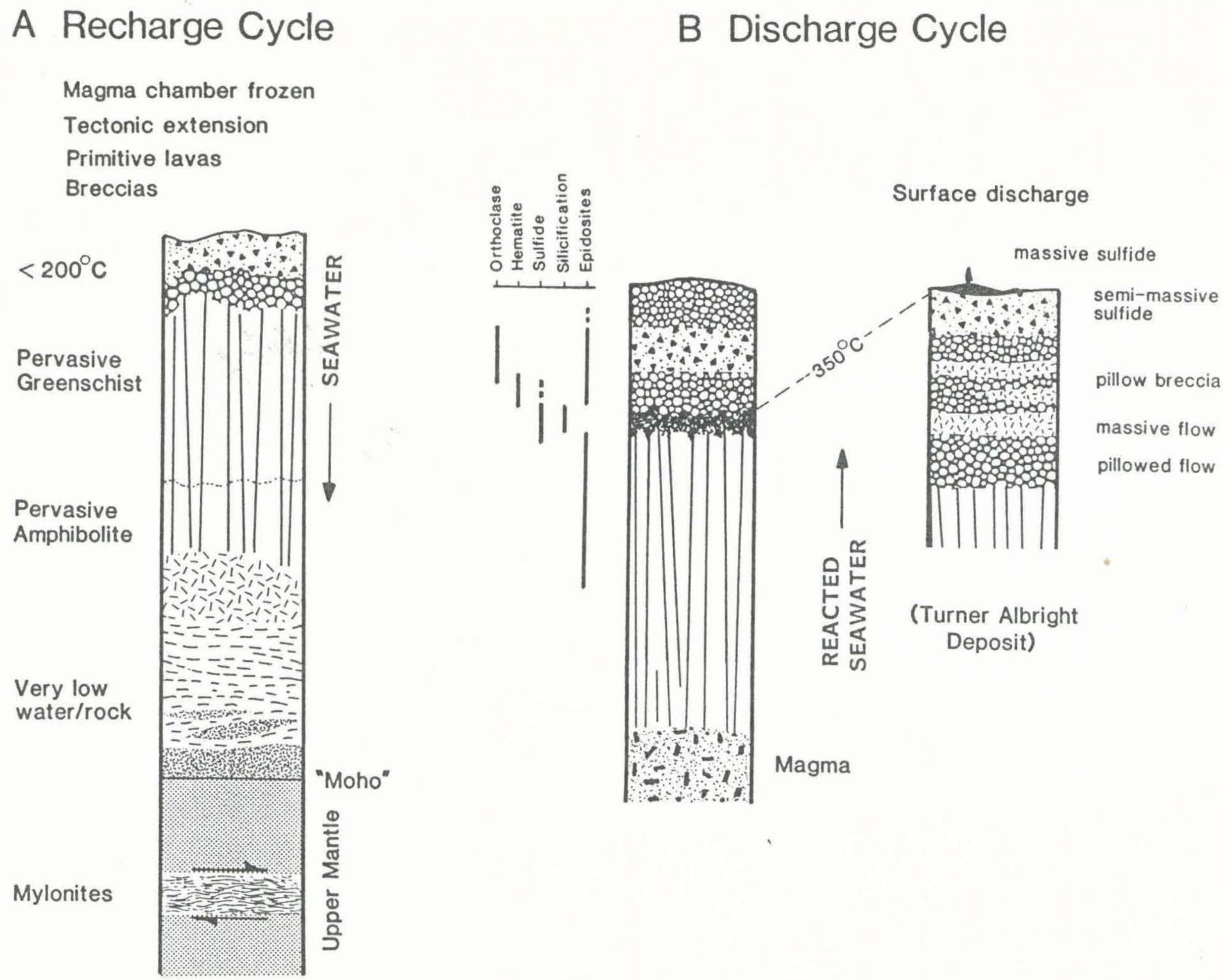

FIGURE 15 Summary diagram showing subseafloor metamorphism during recharge and discharge cycles [Harper et al., 1988]. Discharging fluids typically cooled as they flowed upward through the extrusives producing a distinctive mineral zonation. At the Turner-Albright deposit, however, high-T fluids vented onto the seafloor to form massive sulfide deposits [Zierenberg et al, 1988].

faults are probably oceanic because they have subseafloor hydrothermal alteration along including prehnite veins (Fig. 8), epidosite veins and epidosites. In addition, the late Fe-Ti at Stop 4 (Fig. 7) was intruded parallel to the steep faults, and much of its margins are sheared and contain abundant prehnite veins; this indicates that this dike was intruded during the faulting.

A likely mechanism for tilting is rotational normal faulting. In this case, both the fault blocks and the faults rotate. As the faults rotate, they become unfavorably oriented, and new steeper faults map form; the steep faults at Stop 4 (Fig. 7) may represent such new faults.

Because the entire crustal sequence of the Josephine ophiolite is tilted, oceanic faults would be expected to have extended into the upper mantle. Such faults could have died out into a zone of uniform ductile flow, or perhaps into a discrete subhorizontal horizon [Harper, 1985].

A regionally extensive flat shear zone in the upper mantle peridotite of the Josephine ophiolite has recently been mapped and consists of unusual antigorite mylonites and peridotite mylonites [Norrell et al., 1988]. This shear zone is interpreted to represent an oceanic detachment above which the crustal sequence was rotated by block faulting [Norrell and Harper, 1988]. If we assume that the >50° tilting above this fault took place by rotational faulting, then the ophiolite must have been stretched by ~100%. This would indicate the the crustal sequence, which is now ~3 km thick (Fig. 2), was originally ~6 km thick, similar to modern oceanic and back-arc basin crust.

These aspects of the Josephine ophiolite imply that it formed at a spreading center where the magma supply was low relative to the amount of extension. Slow spreading mid-ocean ridges appear to have a low magma supply as indicated by the absence of magma chambers along much of the

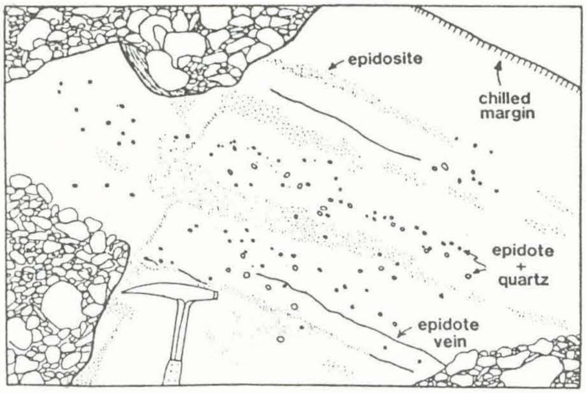

FIGURE 16 Sketch of epidosites in the upper-sheeted dike complex at Stop 1. These probably represent pathways for discharging, ~350°C fluids similar to those at modern "hot smokers" at mid-ocean ridges [Harper et al., 1988].

Mid-Atlantic Ridge [Sempere and Macdonald, 1987]. By analogy, the Josephine probably formed at a slow spreading center to account for the apparent episodic nature of magma chambers [Harper, 1988] and the extreme tilting of the crustal sequence [Harper, 1985; Norrell and Harper, 1988]. It is possible, however, that the spreading rate was intermediate or even fast if the spreading segments were short and bounded by transforms (i.e., cold edge effect). In any case, the Josephine is different from the Oman or Bay of Islands ophiolites which have thick, well layered cumulate sequence, little evidence for large-scale tilting, and which probably formed by fast spreading with steady-state magma chambers.

TECTONIC EVOLUTION

The similarities in age and overlying flysch of the Galice Formation (Fig. 2) suggests that the Rogue island-arc complex and Josephine ophiolite suggest that they were formed in a single magmatic arc. Because the Rogue arc is thrust beneath the Josephine ophiolite, which is in turn thrust beneath older rocks of the Klamath Mountains, it is likely that the arc was west-facing with the Josephine ophiolite forming in a back-arc basin between the arc and western North America [Harper and Wright, 1984]. The remains of an extensive Middle Jurassic magmatic arc occur east and structurally above the Josephine ophiolite, and is in the appropriate position to represent a remnant arc left behind as the Josephine back-arc basin opened. If this model is correct, the active arc (Rogue Formation and Chetco intrusive complex) migrated away from North America as spreading occurred in the back-arc basin.

Although it is difficult to directly tie the Rogue-Chetco arc and Josephine ophiolite to the western Klamath Mountains (i.e. rule out that they are exotic to North America), there are several strong arguments. Recently, it has been recognized that several areas within the western Klamath terrane contain fragments of what appear to be the Late Triassic and Early Jurassic Rattlesnake Creek terrane. This terrane consists of a suite of disrupted ophiolitic and metasedimentary rocks, much of which forms a distinctive serpentinite melange, and which currently is thrust over the Josephine ophiolite and Galice Formation (Fig. 1). These fragments may have been rifted off western North America during Late Jurassic extension [Wyld and Wright, 1988]. Possible Rattlesnake Creek fragments include the Lems Ridge olistostrome (Fig. 4), serpentinite melange along the western edge of the ophiolite in the area of Figure 4 and in the southern Klamath Mountains, and ophiolitic rocks containing Triassic chert [Roure and DeWever, 1983] west of Cave Junction, Oregon (Fig. 1) which appear to lie beneath the Rogue Formation (these workers mistakenly assigned these cherts to the Josephine ophiolite). The presence of older Klamath basement is required by the occurrence of xenocrystic Precambrian zircon in a southern remnant of the Josephine ophiolite in the southern Klamath Mountains [Wright and Wyld, 1986]; the dated plagiogranites are clearly part of the ophiolite and the xenocrystic zircon is probably from epiclastic rocks in Klamath basement. The lower part of this ophiolite remnant is not exposed, but it must have been built on the edge of the Josephine basin during extension but just prior to sea-floor spreading.

New data suggests that the back-arc basin model needs to be modified or replaced by a more complex tectonic scenario. Harper et al. [1985] noted that the orientation of spreading centers inferred from the strike of sheeted dikes, however, are approximately east-west [Harper et al., 1985; Norrell and Harper, 1988], suggesting that the back-arc basin may have had a geometry like the Gulf of California where long transforms separate short spreading segments. This geometry may result from intra-arc strike-slip faulting in response to oblique subduction as in the modern modern Anadaman Sea [Harper et al., 1985; Wyld and Wright, 1988]. In addition, preliminary dating suggested that the Middle Jurassic arc shut off just as the Josephine ophiolite formed, consistent with rifting to form a back-arc basin and remnant arc [Harper and Wright, 1984]. Recent Pb/U dating, however, has shown that the ophiolite is slightly older (164-162 Ma), and that the "Middle Jurassic" arc was active until 160 Ma [Saleeby, 1987; Wright and Fahan, 1988]. Thus, if the Rogue arc and Josephine ophiolite formed by rifting of the western Klamath Mountains, then the ophiolite must have been an intra-arc basin with active volcanism on both sides.

Radiolaria extracted from the pelagic\hemipelagic sequence overlying the Josephine ophiolite at Stop 2 indicates northward migration of the ophiolite prior to deposition of the overlying flysch. Radiolaria indicative of the Central to Northern Tethyan Province occur in the lower 45 m, above which the first graywackes appear and radiolaria from interbedded argillites are indicative of the Southern Boreal Province [Pessagno and Blome, 1988]. Buchia concentrica and plant fossils in the Galice flysch are also indicative of Boreal Realm [E. Pessagno, personal communication, 1988]. The amount of relative motion with respect to the North American plate is uncertain, however, because paleomagnetic studies indicate that the North American plate was also moving northward during this time [Debiche et al., 1987].

The Galice flysch may represent the earliest sign of the Nevadan orogeny which culminated with thrusting and regional metamorphism of the Josephine and Rogue-Chetco terranes. The Galice sandstones contain clasts of volcanic rock fragments, plagioclase, chert, shale, and minor monocrystalline quartz and metamorphic rock fragments. The basal graywackes that we will see at Stop 2 are much richer in volcanic rock fragments and plagioclase than those higher in the sequence; they also have abundant clinopyroxene and hornblende, but pebbles at the base are mostly radiolarian chert. Other minerals in Galice graywackes include zircon, tourmaline, apatite, chromian spinel, and muscovite; less common minerals include biotite, garnet, and glaucophane. The detrital zircons are highly variable in color and morphology and have yielded Pb/U zircon isotopic data that indicate sources which are ~1500-1600 Ma and early Mesozoic [Miller and Saleeby, 1987]. The graywacke petrography, zircon ages, and sparse paleocurrent indicators [Harper, 1980; Park-Jones, 1988], indicate derivation of the flysch from older rocks of the Klamath Mountains to the east. The volcanic component of the wackes is probably derived from a Middle Jurassic arc complex built on older rocks of the Klamath Mountains [Harper and Wright, 1984; Wright and Fahan, 1988]. The absolute age range for flysch deposition is constrained by the age of basement rocks (157-162 $\pm$ 1 Ma, Fig. 2) and by the age of cross-cutting sills, dikes, and plutons (139-150 $\pm$ 1 Ma) [Saleeby et al., 1982; Harper et al., 1986; Saleeby, 1987]. Thus the Galice flysch was deposited and thrust beneath western North America within approximately 7 Ma. The cause of uplift and erosion to the east of the Josephine ophiolite may have been from underthrusting which eventually involved the Josephine and Rogue-Chetco terranes. If this is true, then the Galice is syntectonic and heralds the change from extensional to compressional tectonics.

The Rogue arc and Josephine back-arc basin underwent compression during the latest Jurassic Nevadan orogeny and were thrust beneath the Klamath Mountains. During and following thrusting, the Josephine ophiolite and overlying Galice Formation became the locus of arc magmatism as indicated by the presence of abundant calc-alkaline dikes, sills (Fig. 11), and plutons (Fig. 1) ranging in age from 139-151 Ma [Saleeby et al., 1982; Saleeby, 1984; Harper et al., 1986]. The amount of underthrusting on the roof thrust overlying the Josephine ophiolite and Galice Formation (Fig. 1) is approximately 110 km [Jachens et al., 1986]. This thrust is cut by plutons as old as 150$\pm$1 Ma [Harper et al., 1986]. Uplift to the surface occurred by ~130 Ma because the Galice Formation is overlain with angular unconformity by a small remnant of Early Cretaceous (Hauterivian-Barremian) sedimentary rocks near the Oregon-California border (Fig. 1) [Nilsen, 1984].

The change from back-arc extension to compression (Nevadan orogeny) correlates with an abrupt change in the polar wander path of cratonic North America and with plate reorganization in the Atlantic recorded by marine magnetic anomalies [Steiner, 1983; May and Butler, 1986]. Thus the Nevadan orogeny in the Klamath Mountains may have resulted from compression due to a major change in plate motions.

DAY 1

Drive from Grants Pass, Oregon, northwest on Interstate 5; the light-colored road exposures consist of the 139 Ma Grants Pass pluton (Fig. 1). Take the exit to Merlin, a few km north of Grants Pass. Follow the road west, through Merlin, and on to the small village of Galice. Exposures of sheared serpentinite, greenstones, and gabbro will be evident as we drive into the area shown on Figure 3; these may be the northward continuation of the Josephine ophiolite (Fig. 1). As we are waiting for rafts to be loaded, notice the picture on the wall of the Galice store which shows the water level during the great 1964 flood.

We will board the rafts and float downstream for approximately 13 km, with three stops (Fig. 3). We will go through numerous rapids, and you should see large birds called Great Blue Herrons.

Stop 1

Paddle across the Rogue River, directly opposite where the rafts are launched. This outcrop shows excellent turbidites with flute casts (Late Jurassic Galice Formation). The beds are overturned and the shales have a slaty cleavage formed during the Nevadan orogeny. Cleavage cuts bedding at a moderate angle. Faulting and associated veining is also present and may be related to the Nevadan folding.

Stop 2

Thin-bedded graywacke and slate are evident in this exposure. The bedding is folded and there is an axial planar slaty cleavage. The folds and cleavage are Nevadan age. As we continue downstream, we will be approaching the Rogue Formation which is volcaniclastic and underlies the Galice Formation.

Stop 3

We will stop on the right side, just above the rapids and impressive iron staining. The staining is from weathering of a Kuroko-type massive sulfide (Almeda Mine) which is located just below the contact with the Galice Formation. The ore body was mined for gold, silver, copper, and lead. We will hike up to the mine shaft on the north side of the river. At the entrance to the mine shaft a contact between a massive sulfide and fine-grained bedded tuff is exposed. On the left side of the shaft, the massive sulfide locally contains barite. The tuff is exposed on the roof of the shaft, and on the right side of the shaft is a diorite dike [Wood, 1987].

Walk on up the road (east) to the black slate outcrops. This is the basal Galice Formation and the bivalve Buchia concentrica can be found. This is also an ammonite locality [Imlay, 1980]. The contact between the Rogue Formation and Galice Formation is not exposed here, but appears to be depositional as reported by [Wood, 1987].

Stop 3 to End of River Trip

As we continue down the river, we will enter a narrow, quiet part of the canyon with high walls. Notice the steeply dipping tuffs. Most of the tuffs are green and andesitic, but a few white silicic tuffs are evident. Upon careful observation, you may see overturned graded bedding and isoclinal fold hinges along the banks of the river. Many of the tuffs are turbidites.

Travel

We will drive back through Grants Pass and south on Highway U.S. 199 (Fig. 1), where we will stay overnight. Tomorrow we will visit the Josephine ophiolite.

DAY 2

We will leave Cave Junction and drive south on Highway U.S. 199. We are now situated on flysch of the Galice Formation which overlies the Josephine ophiolite. As we drive south, you will see the Josephine peridotite which forms the poorly vegetated mountains to the west; in this area, the entire crustal sequence of the ophiolite has been cut out by a large north-striking normal fault. As we cross into California, we will drive through a long tunnel. As we exit the tunnel, the topography will be much steeper. We have entered the drainage area of the Smith River which is rapidly down-cutting. The erosion is the result of late Cenozoic uplift, which is probably the result of subduction of young, hot oceanic lithosphere of the Juan de Fuca plate. Relicts of an extensive Miocene erosion surface (Klamath peneplain) can be seen forming relatively flat mountain tops.

Stop 1

Continue southwest on highway U.S. 199 to a highway maintenence station (Idlewild) on the right side of the road. Walk several hundred meters further down the highway to where the trees begin on the left side of the road. Walk down the embankment and cross the stream to the other side. The ophiolite is exposed as a homocline in this area which dips approximately 60° east.

We are now in the upper part of the sheeted dike complex and will walk up-stream to the contact with pillow lavas. Notice chilled margins on sheeted dikes, epidosites (Fig. 16), and disseminated sulfides. A screen (septa of country rock) of pillow lava will be pointed out. Notice the peculiar texture (variolitic) and thick chilled margin. This is a very primitive, depleted basalt (~1000 ppm Cr, 10 ppm Y) which contains Cr-spinel [sample R20, Harper et al., 1988].

Continue walking upsection to the contact of the sheeted-dike complex with the overlying pillow lavas (where trees begin on left). Notice the presence of a quartz-rich and sulfide-rich breccia near the contact; it was formed by discharging fluids and is very similar to "stockwork-like" rocks drilled from the sheeted-dike/pillow basalt transition zone in Deep-Sea Drilling Project Hole 504b, south of the Galapagos spreading center [J. Alt, personal communication, 1987].

The basal pillow lavas are sulfide-rich and strongly silicified, and the interpillow matrix is locally completely replaced by pyrite and chalcopyrite. This type of mineralization is typical along this contact in the Josephine ophiolite, although the intensity is highly variable. As noted above, this contact is apparently where discharging fluids cooled and possibly mixed with seawater.

Continue walking up-stream and observe red hematite-bearing lavas and light-green "albite epidosites" within the red lavas. Muscovite and/or K-feldspar typically occurs in the hematitic lavas, particularly in amygdules and interpillow matrix.

Travel Between Stops 1 and 2

Return to vehicles and continue to drive southwest along U.S. 199 for ~10 km. We will be driving through sheeted dikes, gabbros, and cumulate ultramafics. This sequence is faulted at the base (Fig. 4) and as a result we will drive back into the Galice Formation overlying the ophiolite.

We will cross several more N-S reverse faults that repeat the upper part of the ophiolite (Fig. 4); these faults were probably formed during late-stage Nevadan thrusting.

Stop at large pull-out on left, just before the place where the road narrows abruptly and passes through very tight curves.

Stop 2

A depositional contact is clearly exposed on the Smith River between the uppermost pillow lavas of the ophiolite and the basal pelagic/hemipelagic sediments (Fig. 10). The pillows below the contact are large and best observed on the lower, downstream part of the outcrop. They are highly fractionated Fe-Ti basalts containing abundant microphenocrysts of plagioclase and clinopyroxene. 400 m of pillow lava (Fig. 9), massive lava, and pillow breccias are well exposed along the river below the contact (see Fig. 10 of Harper [1984] for stratigraphic section), but we will not be able to observe them because rafts and much time are needed to travel the deep canyon.

The basal 45 meters of sediments overlying the ophiolite consist of chert, tuffaceous chert, siliceous argillite (black), and rare nodules and layers of limestone (gray), and several sills. The siliceous argillites are slaty and have high Al contents indicative of a large component of terrigenous sediment [Pinto-Auso and Harper, 1985]. Suprisingly, the limestones have yielded abundant perfectly preserved radiolarians which indicate an Oxfordian age; furthermore the radiolarians indicate that the ophiolite moved northward from the Central Tethyan to Southern Boreal Realms during deposition of the basal 45 meters of the pelagic/hemipelagic sequence [Pessagno and Blome, 1984; Pessagno and Mizutani, 1988].

At 45 meters stratigraphically above the contact, two thick bedded graywackes are present and mark the beginning of flysch deposition. These are overlain by silty radiolarian argillites and a few graywacke beds exposed continuously to a sharp bend in the river (100 m above the ophiolite). Slates with abundant limestone nodules occur at the bend. Massive graywackes and some pebble conglomerate is exposed further upsection (upstream).

Many sills and dikes are present at this locality. They are regionally metamorphosed, and the sills have been extended to form boudinage (Fig. 11). The sills are mafic, calc-alkaline, and usually contain hornblende. Recent $^{40}Ar/^{39}Ar$ step heating ages on two of these sills have yielded ages of 147 ± 1 and 150 ± 1 Ma (the ophiolite is 162 ± 1 Ma) and thus tightly constrain the timing of sediment deposition and subsequent deformation and associated prehnite-pumpellyite facies metamorphism.

Nevadan structures evident in this section include a bedding-parallel slaty cleavage, boudinage, extension veins, flattened pebbles, and bedding-parallel faults. The latter are preferentially eroded, have thin sheared calcite, and are especially evident ~25-30 m above the contact. A highly disrupted zone is evident for several meters below the first graywacke; small thrusts and ramps are evident on close examination, and some thrust surfaces have extension veins beneath them with fibers up to 25 cm long. Deformation in this zone is apparently due to bedding-parallel thrusting during the Nevadan deformation.

Travel Between Stops 3 and 4

Drive 1.5 km further south and west on U.S. 199 and take a right at the road just before the bridge (Patrick Creek Road). Drive 2.5 kilometers north and turn right. We are now at the base of the cumulates and will be driving all the way through the cumulates, sheeted dike complex and into the lower pillow lavas (Fig. 4). There are only weathered outcrops until we reach the pillow lavas, so this is a good time to enjoy the scenery.

Stop 3

Pillow lavas are exposed in a quarry on the east side of the road. Pillow lavas are best viewed on huge blocks on the quarry floor. Hydrothermal metamorphism during discharge is evident from epidote $\pm$ hematite between pillows. Hematitic veins are also present in some of the outcrop. Volcanic breccias are exposed on the far end (south) of the quarry.

Travel Between Stops 3 and 4

Drive back to U.S. 199, turn right and drive 12 km toward the village of Gasquet (pronounced Gas-Key). We will be driving through the Josephine Peridotite; most of what is exposed is sheared and serpentinized along a northeast-striking fault zone (Fig. 4). Many landslides are evident, some of which are active.

Continue driving on U.S. 199 for ~20 km to locality 4 on Figure 4. Stop ~1 km past the second bridge (over Hardscrabble Creek) where the road becomes very wide, and rock outcrops are clearly evident along the river.

Stop 4

Park on the left side of the highway and walk down to the river. Exposed on the opposite side of the river and upstream on the highway side are sheeted dikes (Figs. 7, 8) that grade down-stream into high-level gabbro. Subparallel dikes with chilled margins are clearly evident, and gabbro screens are locally present (Fig. 8). A plagiogranite screen intruded by dikes which has been dated by

Pb/U occurs on the side opposite the highway. As the contact with the gabbro is approached (downstream), dikes become less abundant, and intrusive breccias such as those in Figure 6 become abundant. A late, highly fractionated Fe-Ti dike intrudes the sheeted dikes at a high angle (Fig. 7). A few very primitive dikes intrude the high-level gabbro and are recognized by their blue-black color and porphyritic texture.

Tilting of the crustal sequence is clearly apparent in this outcrop. Because it is situated in the core of a gently plunging syncline, the ophiolite is essentially horizontal and the ~40° dip of the dikes is due to tilting at the spreading axis. Probable oceanic faults are present in these outcrops (Fig. 7); an oceanic origin is indicated by the presence of hydrothermal veins (Fig. 8) or by the presence of an ophiolitic dike along the fault (Fig. 7).

The sheeted dikes and gabbros have amphibolite-facies assemblages resulting from high-temperature subseafloor hydrothermal metamorphism, but many are partially retrograded to greenschist facies. Epidote veins and abundant white prehnite veins occur throughout this exposure (Fig. 8), and quartz veins or quartz-matrix breccias are locally present. The prehnite veins are clearly oceanic in origin because some are cut by dikes.

Travel Between Stops 4 and 5

Return to vehicles and continue southwest on U.S. 199 to a large pullout on the left side of the road. Walk down the road and descend to the river before reaching guardrail.

Stop 5

The exposures along the river consist of gabbroic and ultramafic cumulates intruded by mafic dikes. We are still in the hinge area of a syncline so that the structures are essentially in their oceanic orientation. Igneous layering is present and dips steeply northwest. Most dikes are similar in orientation to the last stop, but many sills parallel to igneous layering are also present.

The igneous layering is discontinuous, often faint, and irregular. High-T hydrothermal alteration has resulted in mm-wide black hornblende veins and amphibolite-facies assemblages. Coarse-grained pegmatites are also common and may also be the result of high-T interaction with seawater.

Travel from Stop 5 to Crescent City, California

As we drive west on U.S. 199 toward Crescent City we will enter the small village of Hiouchi which is situated on the basal thrust which separates the Josephine ophiolite from the Franciscan Complex. This change in rock type is reflected in a dramatic change in vegetation from Douglas Fir to Redwoods. Many of the Redwoods are more than 1000 years old and some are over 100 meters high. We will drive through several groves of giant Redwoods starting just west of Hiouchi, and we will make a stop for taking photographs. The redwoods and associated ferns once covered much of North America in the Cretaceous as indicated by fossils in coals of the western U.S. and Canada. Thus, the Redwoods are "living fossils". You may be able to imagine dinosaurs roaming through the Redwoods as often depicted in museums.

As we continue to drive west, we will drive down onto a large marine terrace which was uplifted in the Pleistocene. Crescent City is situated along the coast, at edge of the terrace. This town was largely destroyed by a tsunami resulting from the great 1964 Alaskan earthquake, and a huge "tetrapod" washed in from the breakwater sits along the side of U.S. 101. In a rare case of thoughtful urban planning, the coastal area of the town was turned into a park. Later in 1964 there was a gigantic flood that further damaged the town as well as much of coastal northern California and southwestern Oregon. This was the same flood that inundated the Galice resort on the Rogue River.

Acknowledgments

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D. <u>Properties Held By Baretta Mining Corporation Ltd., a Subsidiary of the Issuer</u>

The Issuer subsidiary, Baretta Mining Corporation Ltd., ("Baretta") holds the following interests in mining properties:

(a) Turner-Albright Property, Josephine County Oregon - Baretta holds an option to purchase a 100% interest in the following mining lands:

(i) <u>Parcel I</u>

The South Half of the Northeast Quarter; the North Half of the Southeast Quarter; Lots 3 and 4, all being in Section 16, Township 41 South, Range 9 West of the Willamette Meridian, Josephine County, Oregon.

(ii) <u>Parcel II</u>

Mineral Survey No. 936 being those certain patented mining claims formerly known as the Governor, Senator and Pay Day Lode Mining Claims, Patent No. 1194083, dated April 2, 1959 as the same appears of record in Josephine County Deed Records, in Volume 200, Pages 154 to 173, subject to conditions, restrictions and reservations contained in Mineral Patent from the United States of America to G. H. Grover and Clarence V. Hunt recorded in Volume 200, pages 154 to 173.

B. Properties Held by Baretta Mining Corporation Ltd., a subsidiary of the Issuer

(a) Turner-Albright Property, Josephine County, Oregon - By agreement dated December 21, 1976, made between the Issuer and Baretta Mining Corporation Ltd. (Baretta) Baretta acquired an assignment of an option to purchase the Turner-Albright property. Baretta has issued the Issuer 550,000 escrowed shares as consideration for the assignment. Upon issuance of the shares, Baretta became a subsidiary of the Issuer. Baretta must perform exploration work on the property at a minimum cost of $25,000 before July 31, 1978. In order to maintain the option in good standing Baretta made a payment of $5,000 on July 2, 1977 and a payment of $7,500.00 on July 2, 1978 and must pay James W. Basker and Rough and Ready Timber Company of Cave Junction, Oregon $85,000.00 as follows:

(i) $10,000.00 on or before July 2, 1979;

(ii) $20,000.00 on or before July 2, 1980.

Thereafter Baretta must exercise its option by agreeing to make the following payments:

(i) $30,000.00 on or before July 2, 1981;

(ii) $50,000.00 on or before July 2, 1982;

(iii) $75,000.00 on or before July 2, 1983;

(iv) $100,000.00 on or before July 2, 1984;

(v) $200,000.00 on or before July 2, 1985.

The only persons holding more than 10% of Rough and Ready Timber Co. are:

Fred Krause
Lou Krause — all of Cave Junction, Oregon.
John Krause

PERRY RIVER NICKEL MINES LTD.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

DECEMBER 31, 1977

4. OPTIONS TO ACQUIRE PROPERTIES:

The company is party to an option agreement to purchase a 50% interest in 198 claims in the Mathews Lake, Courageous Lake and Hope Bay areas of the Northwest Territories. To fully exercise this option, the company must make varying payments totalling $240,000 on or before February 18, 1982.

The company is also party to an option agreement to purchase an additional 20% interest in 134 claims in the Summit Lake area of the Northwest Territories. To exercise this option a payment of $200,000 must be made on or before December 31, 1978.

During 1975, the company became the assignee of an option agreement in consideration for a cash payment of $7,500 and the allotment and issue of 280,000 shares of the company over a period of time related to the commencement of production from the properties and shipment of concentrates. Under the agreement the company had the option to participate in the purchase of 75% of the shares of Island Copper Company, a California corporation, and during 1976, exercised its option. Accordingly the company has paid instalments of $202,400 and has instalments of $127,600 and $110,000 remaining to be paid in 1978 and 1979 respectively. The company also has the right to place the mine in production subject to a 10% royalty on net smelter returns that may be credited against the yearly payments required. The company will not receive its 75% of the shares until $1,500,000 has been paid or credited. The company also has the option, exercisable on or before August 1, 1980 to purchase the remaining 25% of the shares in Island Copper Company for $3,000,000.

Baretta is the assignee of an option agreement to purchase three patented mining claims and other fee lands containing the mining property known as the Turner Albright Mine in Oregon, U.S.A. for a total consideration of $500,000. The consideration for the option was a down payment of $2,500, an obligation to incur work program expenditures of not less than $25,000 prior to May 1, 1978 and varying payments to July 2, 1980 totalling $42,500. To fully exercise the option, the balance of payments of $455,000 must be made at varying times to July 2, 1985.

5. EARNINGS PER SHARE:

	1977	1976
Net (loss) income for the year	(0.35¢)	8.35¢

Earnings per share is calculated using the weighted average number of shares outstanding during the year. Fully diluted earnings per share is not presented as there would be no significant change.

GOLD HILL DIST.
ALBRIGHT (TURNER) MINE
BULL 61 PG 246
USGS BULL 846

about equally divided. All the minerals are greatly altered, the feldspars enough so to make their exact determination difficult. The plagioclase feldspar in the sections studied is everywhere partly altered to a very fine grained saussuritic product. Orthoclase, if present, occurs in minor amounts. Augite is largely altered to hornblende, biotite, and chlorite. The rock is very similar in appearance to the metagabbro of the Takilma district and, like that rock, is believed to have been intruded into the finer-grained greenstones and subsequently altered with them by dynamothermal processes.

The metabasalt is very fine grained, is dark grayish green to almost black, and near the ore bodies commonly has a greasy appearance. In thin sections the less altered portions of the metabasalts have pronounced basaltic textures, whereas the more altered areas are granular aggregates containing principally feldspar, epidote, chlorite, and saussuritic material too fine grained to classify. Some small patches of partly altered augite are usually visible. The green color of these rocks is due largely to the presence of chlorite and epidote. The evidence at hand indicates that the metabasalts were for the most part formed as flows.

Serpentine is the most widespread of the rocks near the Turner mine. As elsewhere in southwestern Oregon, it is dark green to almost black and is cut by many fractures, most of them with slick, greasy-appearing surfaces. In this vicinity, as in many other places, the serpentinization of the original rock is nearly complete. The texture and remnants of olivine and bastite (altered enstatite) indicate that the original rock was a peridotite composed largely of these two minerals. The serpentine, as at Takilma, is believed to have been intruded during late Jurassic or early Cretaceous time.

Considerable recent gravel and alluvium has been deposited along Elk Creek and its larger tributaries, Blue and Dwight Creeks. The gravel is composed of sand and pebbles derived from the erosion of the consolidated rocks of the region and includes various greenstones, slate, quartzite, argillite, chert, sandstone, several coarse-grained igneous rocks, and serpentine.

TURNER (ALBRIGHT) MINE

The Turner or Albright mine is just north of the California line, 45 miles southwest of Grants Pass, and 2½ miles by trail from the Redwood Highway. Between the highway and the mine the trail gains 1,200 feet in altitude. Waters Creek, the nearest railroad point, is 35 miles to the northeast. The property was located about 35 years ago and now belongs to Edward Turner and James Albright. It includes, according to Mr. Turner, three claims in sec. 15 and 20 acres of patented ground in sec. 16, T. 41 S., R. 8 W. Nine tunnels

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...URE 26.—Map showing rela

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GHT) MINE

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Creek, the nearest railroad point,
property was located about 35
rd Turner and James Albright.
three claims in sec. 15 and 260
T. 41 S., R. 8 W. Nine tunnels

with numerous crosscuts have been driven which, in all, have a total length of over 3,000 feet. (See fig. 26.) No production has been reported.

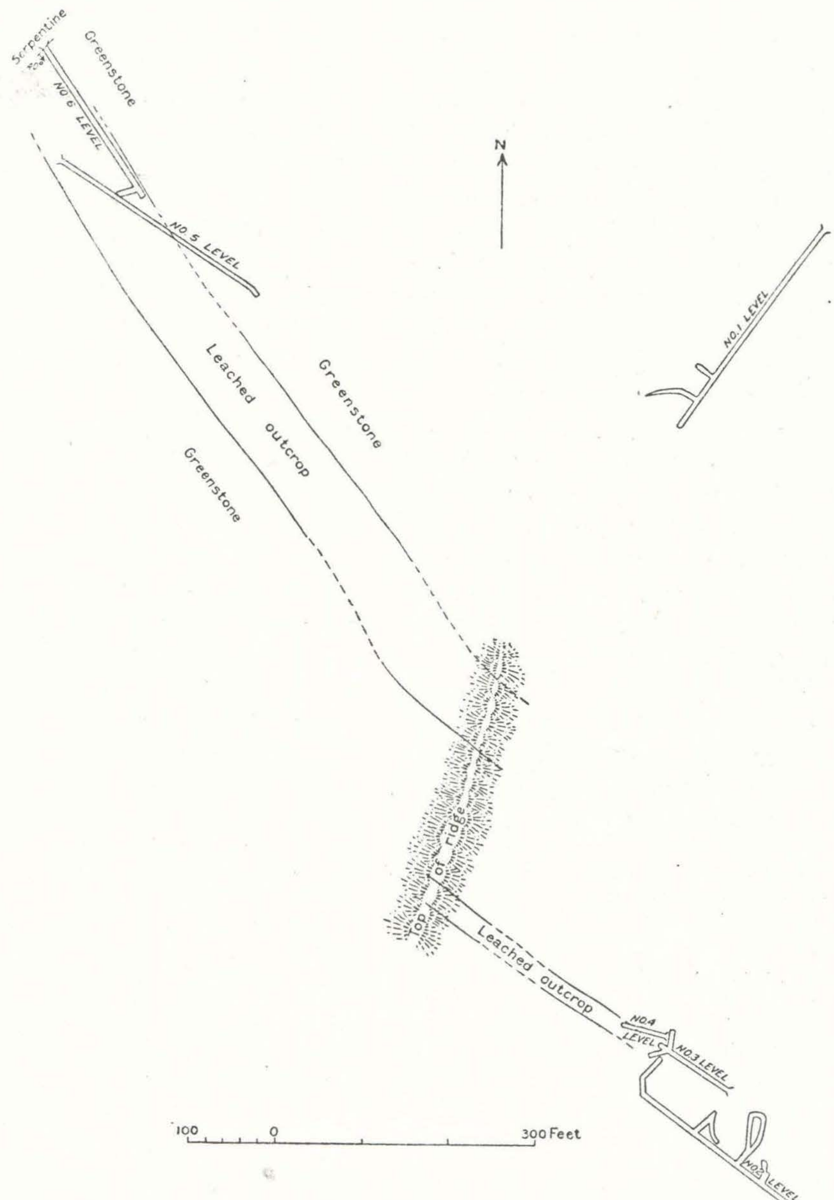

FIGURE 26.—Map showing relation of part of underground workings to leached outcrops at Turner mine

Two large bodies of porous iron-stained rock or "gossans", en-closed in fine-grained greenstone, crop out at the Turner mine. One is about 80 feet wide and can be traced on the surface for 900 feet. The other averages about 20 feet in width and is well defined on the surface for over 300 feet. (See pl. 22, *A*.) Both gossans crop out prominently, but the narrower one is much more conspicuous because of the fact that it rises 30 to 50 feet above its surroundings. The larger gossan is partly prospected by tunnels 5 and 6. Both tunnels are near the surface and run through soft brown oxidized material and iron-stained greenstone. Some pyrite occurs near the face of tunnel 5, but the oxidation is elsewhere nearly complete. The smaller gossan is composed of porous brown, highly silicified material, which in places contains cores of unoxidized pyrite. In other places practically all of the iron has been removed, and there remains a cavernous white residuum composed principally of silica ribs. However, because of the abundant silica, a prominent outcrop has been maintained in spite of the thorough leaching. Beautiful specimens of the type of gossan described by Locke [62] as "botryoidal jaspery limonite" have been mined from one of the workings known as the "picture rock" tunnel. Sulphides are exposed in several tunnels beneath the smaller gossan. Of these, pyrite is by far the most abundant, although considerable chalcopyrite is associated with it in tunnels 2 and 3. In spite of the fact that the development work has thus far shown a high proportion of pyrite in the sulphide ore, the presence of considerable chalcopyrite with the pyrite at the face of tunnel 3, and below in tunnel 2, seems to justify more exploration on these levels. Because silicification makes the rock hard to mine by hand methods, work was stopped in the tunnels in the two places appearing most favorable for prospecting. An extension of tunnel 3 another 200 or 300 feet would add a great deal of information as to the probable worth of the property.

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[62] Locke, Augustus, Leached outcrops as guides to copper ore, p. 138, Baltimore, Williams & Wilkins Co., 1926.

O

BARETTA MINING CORPORATION LTD.

217 - 513 - 8TH AVE., S.W.
CALGARY, ALBERTA, CANADA. T2P 1G3

TELEPHONE (403) 269-5369
TELEX 03-824611

RELEASE November 16, 1979

Assays have been received covering the first 265 feet of the third hole being drilled on the Company's Turner Albright property in southern Oregon.

In the massive sulphide interval 96 feet to 116 feet the weighted average grade was: 0.75 oz. gold per ton, 2.5 oz. silver per ton, 4.1% copper, 1.13% zinc, 1.75 lbs. cobalt per ton.

The brecciated andesite section 116 feet to 160 feet assayed between 0.034 and 0.060 oz. gold per ton. Assays are awaited on two further massive sulphide sections, 260 feet to 359 feet and 497 feet to 577 feet and a disseminated sulphide section from 811 feet to the current drilling depth of 911 feet, together with the intervening less obviously mineralized sections.

In the interval 497 feet to 577 feet a twenty foot section carries visible chalcopyrite.

Hole TAB #3 is being drilled at a minus 50° S 28° W and will be carried on to at least 1200 feet.

John M. Alston,
President

BARETTA MINING CORPORATION LTD.

217 - 513 - 8TH AVE., S.W.
CALGARY, ALBERTA, CANADA T2P 1G3

TELEPHONE (403) 269-5369
TELEX 03-824611

RELEASE FOR CANADA NEWS WIRE

2:00 P.M. September 24, 1979

BARETTA MINING CORPORATION LTD. Announces that the third hole TAB No. 3 currently being drilled on the Turner Albright property in Southern Oregon entered massive sulphides at a depth of 96 feet. Coring is continuing in massive sulfides at 108 feet. Grades are expected to be similar to those encountered in TAB No. 1 which penetrated 284 feet carrying a gross metal value of $77.00 U.S. per ton in gold, silver, zinc, copper and cobalt.

Hole TAB No. 3 is being drilled at minus 50° S 28° W from collar located 300' N 17° E from the collar of vertical hole TAB No. 1.

John M. Alston,
President

BARETTA MINING CORPORATION LTD.

217 - 513 - 8TH AVE., S.W.
CALGARY, ALBERTA, CANADA, T2P 1G3

TELEPHONE (403) 269-5369
TELEX 03-824611

R E L E A S E

With the receipt of the latest assays, significant cobalt and gold values have now been obtained from five zones totalling 284 feet of sulphide mineralization encountered in the first diamond drill hole on the Company's Turner Albright property located in Josephine County, Oregon, near the California border.

A summary of the assays by zones follows:

Zone	Interval	Length	Gold oz/ton	Silver oz/ton	Sulphur %	Zinc %	Copper %	Cobalt %
I	128-159'	31'	.100	.35	22.33	1.09	0.22	0.12
II	183.5-202'	18.5'	.040	.03	8.45	0.19	0.23	0.05
III	253-313'	60'	.046	.36	27.10	1.14	0.12	0.08
IV	410-445'	35'	.048	.13	7.71	0.49	--	0.03
V	458-598'	140'	.047	.08	11.92	0.50	--	0.05
Averages:	Five Zones							
		284.5'	.050	.17	15.51	0.68	0.17	0.06

Utilizing metal prices of \$287 U.S./oz gold, \$9.00 U.S./oz silver, 40¢/lb zinc, 80¢/lb copper, and \$40.00/lb cobalt the gross value of contained metal in the 284.5 feet of sulphides, averages some \$70.00 U.S. per ton.

August 7, 1979

"John M. Alston,"
President

BARETTA MINING CORPORATION LTD.

217 - 513 - 8TH AVE., S.W.
CALGARY, ALBERTA, CANADA, T2P 1G3

TELEPHONE (403) 265-5365
TELEX 03-824611

PROGRESS REPORT

July 9, 1979

TURNER ALBRIGHT PROPERTY, OREGON

Diamond drill hole TAB No. 1 is currently coring at 430 feet in the third zone of sulphides encountered to date. The vertical hole, which is being drilled to test a coincident geophysical and geochemical anomaly, penetrated the first sulphides at between 128 feet and 170 feet. This zone was heavily brecciated and consisted primarily of fine grained massive pyrite with traces of copper and zinc sulphides visible. The zone contains numerous clay filled voids indicating weathering has penetrated to a considerable depth.

The second sulphide zone encountered between 184 feet and 202 feet consisted of massive, fine grained pyrite with visible zinc mineralization increasing with depth. The third sulphide zone was entered at a depth of 251 feet and the hole is still in mineralization at 430 feet. Visible zinc mineralization continues to increase but because of the fine grained nature of the sulphides an estimate of grade based on visible characteristics is impossible. The core is being split and sent for assay on a current basis. In addition to the zinc and copper mineralization seen in the core, gold and silver values are probably present. First assays are expected in about ten days.

While drilling continues, an EM Survey is being extended over a wider area and has already picked up a previously unknown extension with very strong EM response.

It is planned to continue diamond drill hole TAB No. 1 to fully penetrate the mineralization.

"John M. Alston, President"

TURNER - ALBRIGHT

DRILL HOLE LOG - COVER SHEET

LOCATION

[1]Township/Range/Section 41S/9W [1]State OREGON

[4]Topo. Quad. Chetco Peak 15' [1]AMS Quad. Medford

Elevation 2942 feet [2] 897 meters [Source Mine Survey]

[1]Latitude 42-00.10 N [1]Longitude 123-45.30 W

[1]Hole Owner (and Number) Baretta Mining Co. - TAB 13

[1]Date(s) Logged 4-7-81 [4]Inclination & Bearing Vertical

[1]Geologic Province Klamath Mountains

KEY INFORMATION

[2]Depth Logged 205 [2]Max. Temp. 10.15°C [2]Bottom Hole Temp. 10.15°C

[2]Depth to Water 15 m [2]Min. Temp. 8.5°C [2]Surface Temp. 15°C

DRILLING INFORMATION

Drilling Contractor and Address Reno, Nev. ◇ drilling contractor ?

[2]Drilling Dates Completed 3-22-81

Drilling Method Rotary - Cored to T.D. Drilled Depth 612 m

Hole Size and Casing Record HG - NX small piece of surface casing.

Comments

TERRAIN INFORMATION

Ground Cover, Collar bedrock/metabasalt; Within 150 m forested- fir + hardwood etc.

Topographic Setting, Local near ridge top ; Regional Klamath Mts

Relief, Local (m) 150 m ; Regional (m) 600 m

Slope Orientation, Local drill pad on steep hillside; Regional steep sided ridge + valley

Slope Angle, Local ; Regional

HEAT FLOW INFORMATION

Shape of T-D Curve uniform Quality of Gradient good

Purpose of Hole Mineral exploration - massive sulfides

[4]Geologic Log (include aquifers) none available. Company has or is logging this hole.

[4]Geophysical Logs Available —

Thermal Conductivity Samples Core samples from selected intervals

[4]Radioactivity Samples —

References -

Comments Used probe # 18 - Cable reel only has 205 m of cable.

B	A
⊗C	D

Company * Would like to have information on the specific gravity of the core samples.

Turner-Albright

TEMPERATURE-DEPTH LOG

Hole Name Baretta Mining # TAB13 Twp/Rg/Sec 41S / 9W / 15 ccc
Company/Owner (address) Baretta Mining Co - O'Brien, Or Hole No. # TAB13
Map Chetco Peak 15 Drill Depth & Date 2006' 3/22/81 Zero Elev. 0
Probe, Cable, Bridge # 48 Operator N. Peterson
Comments Date Probed 4-7-81

Depth meters	Resistance ohms	Temperature °C	ΔT/Δx °C/km	Comments
10	124.60	11.55		
15	137.83	8.65		Static Water -
20	138.56	8.50	-30	
25	138.71	8.68	36	
30	138.48	8.52	-32	
35	138.58	8.50	-4	
40	138.58	8.50	0	
45	138.47	8.73	46	
50	138.21	8.57	8	
55	138.01	8.62	10	
60	137.75	8.67	10	
65	137.51	8.72	10	
70	137.19	8.79	14	
75	136.92	8.85	12	
80	136.69	8.90	10	
85	136.43	8.95	10	
90	136.40	8.96	2	
95	136.27	8.99	6	
100	136.15	9.01	4	
105	135.93	9.06	10	
110	135.64	9.12	12	

B	A
C	D

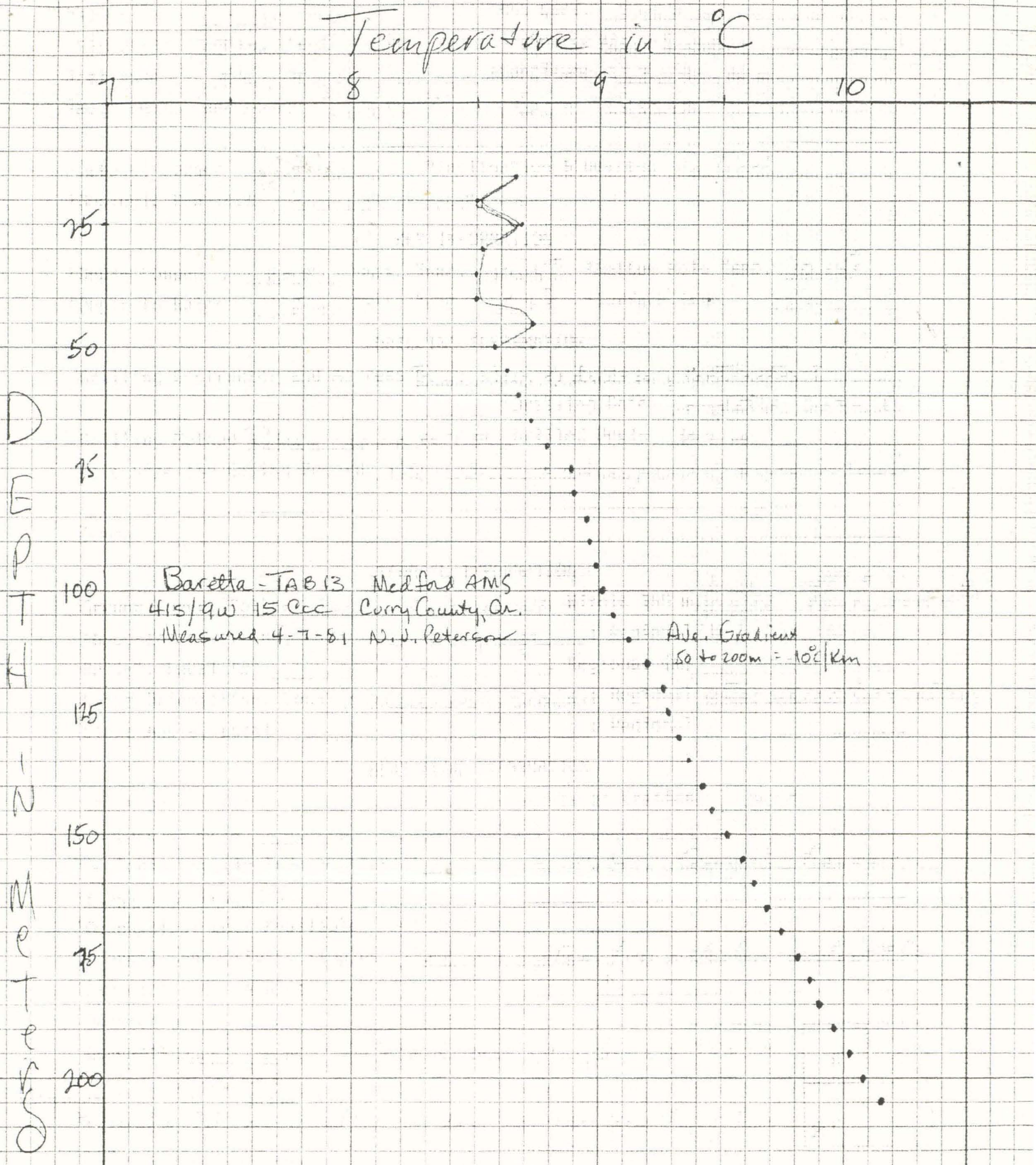
TEMPERATURE-DEPTH LOG

Hole Name Baretta Mining #TAB13 Twp/Rg/Sec 41S / 9W / 15 acc
Company/Owner (address) Baretta Mng Co. O'Brien, Or Hole No. #TAB13
Map Chetco Peak 15' Drill Depth & Date 2006' 3/22/81 Zero Elev. 0
Probe, Cable, Bridge #48 Operator N. Peterson
Comments This Cable reel has 205 m capability and 5m 10m intervals should be remarked! Date Probed 4-7-81

Depth meters	Resistance ohms	Temperature °C	ΔT/Δx °C/km	Comments
			16	
115	135.27	9.20		
			12	
120	135.00	9.26		
			4	
125	134.89	9.28		
			8	
130	134.72	9.32		
			10	
135	134.48	9.37		
			10	
140	134.24	9.42		
			8	
145	134.06	9.46		
			12	
150	133.77	9.52		
			14	
155	133.48	9.59		
			8	
160	133.26	9.63		
			12	
165	133.02	9.69		
			10	
170	132.75	9.74		
			14	
175	132.45	9.81		
			10	
180	132.24	9.86		
			8	
185	132.02	9.90		
			12	
190	131.77	9.96		
			12	
195	131.48	10.02		
			12	
200	131.21	10.08		
			14	
205	130.89	10.15		

No MORE Cable on this reel!

B	A
C	D



Temperature in °C
7
8
9
10
25
50
75
100
125
150
175
200
DEPTH IN Meters
Baretta - TAB13 Medford AMS
41S/9W 15 Ccc Curry County, Or.
Measured 4-7-81 N.V. Peterson
Ave. Gradient
50 to 200m = 10°C/Km

TEMPERATURE-DEPTH LOG

Hole Name Baretta Mining # TA 3 13 Twp/Rg/Sec 41S / 9W / 15ccc
Company/Owner (address) Hole No.
Map Chetco Peak 15 Drill Depth & Date 2006' 3/22/81 Zero Elev. 0
Probe, Cable, Bridge #48 Operator N. Peterson
Comments Date Probed 4-7-81

Depth meters	Resistance ohms	Temperature °C	ΔT/Δx °C/km	Comments
10	124.60	11.55		~~Static~~
15	137.83	8.65		Water -
			-30	
20	138.56	8.50		
			36	
25	138.71	8.68		
			-32	
30	138.48	8.52		
			-4	
35	138.58	8.50		
			0	
40	138.58	8.50		
			46	
45	138.47	8.73		
			8	
50	138.21	8.57		
			10	
55	138.01	8.62		
			10	
60	137.75	8.67		
			10	
65	137.57	8.72		
			14	
70	137.19	8.79		
			12	
75	136.92	8.85		
			10	
80	136.69	8.90		
			10	
85	136.43	8.95		
			2	
90	136.40	8.96		
			6	
95	136.27	8.99		
			4	
100	136.15	9.01		
			10	
105	135.93	9.06		
			12	
110	135.64	9.12		

0125775C

B	A
C	D

TEMPERATURE-DEPTH LOG

Hole Name Baretta Mining #TAB13 Twp/Rg/Sec 41S / 9W / 15 Ccc

Company/Owner (address) Baretta Mng Co. O'Brien, Or Hole No. #TAB13

Map Chetco Peak 15' Drill Depth & Date 200' 3/22/81 Zero Elev. 0

Probe, Cable, Bridge #48 Operator N. Peterson

Comments Date Probed 4-7-81

Depth meters	Resistance ohms	Temperature °C	ΔT/Δx °C/km	Comments
			16	
115	135.27	9.20		
			12	
120	135.00	9.26		
			4	
125	134.89	9.28		
			8	
130	134.72	9.32		
			10	
135	134.48	9.37		
			10	
140	134.24	9.42		
			8	
145	134.06	9.46		
			12	
150	133.77	9.52		
			14	
155	133.48	9.59		
			8	
160	133.26	9.63		
			12	
165	133.02	9.69		
			10	
170	132.75	9.74		
			14	
175	132.45	9.81		
			10	
180	132.24	9.86		
			8	
185	132.02	9.90		
			12	
190	131.77	9.96		
			12	
195	131.48	10.02		
			12	
200	131.21	10.08		
			14	
205	130.89	10.15		

No MORE Cable on this reel!

0125775C

B	A
C	D

July 20, 1976

Samples removed for microscopic examination were marked in their respective core boxes. The descriptions are:

Sample No.	Hole No.	Depth	Brief Description
H 338	74-1	173'	disseminated and veinlets of sulfides in greenstone-chert breccia.
H 339	74-1	186.6'	Brecciated chert, greenstone and sulfides. Approximately 60% sulfides.
H 340	74-1	195'	Chloritized greenstone
H 341	74-1	206.7'	Greenstone breccia
H 342	74-2	171.5'	Brecciated massive sulfide (75%) healed by later sulfides.
H 343	74-2	186.6'	Brecciated chert and greenstone. Fragments cut by Cp-Py.veinlets.
H 344	74-2	199'	Breccia 1-5mm chert fragments 10-20mm greenstone fragments. Reddish matrix.

702 Woodlark Building
Portland, Oregon

ALBRIGHT MINE (Copper, Gold) Waldo area

Owners: G. H. Grover, Clarence Hunt, and E. M. Albright, all of Grants Pass, Oregon.

Location: SE$\frac{1}{4}$ sec. 16, T41S., R9W., 2$\frac{1}{2}$ miles from the Redwood highway and 45 miles from Grants Pass. The property lies on the ridge between the west fork of the Illinois River and Blue Creek.

Area: 260 acres of patented ground.

History: Old names are; Mammoth mine; Turner mine; Turner and Albright mine.

The original discoverer is unknown. Albright has worked on the property intermittently since 1900, together with his partner, Mr. Turner. They also worked unpatented claims just to the west of this patented ground. The property has been sold on bond and lease several times. The present owners leased to Gilbert Stewart and others of Medford, Oregon in 1940. The leasees made a deal with Hughes and Fanchani, local cyaniders, to help them treat the ore. Three shipments were made. It is reported that the first shipment, cyanided from 100 tons of gossan netted $497 from ore that was supposed to assay $11. No data on the amount of the other two shipments. The leassees later turned over their lease to the Standar Cyanide and Chemical Company who built a road to the property and opened the gossan with power shovels. They planned to install a cyanide plant but the operation was closed by virtue of the federal order which removed all priorities from gold mines. At present the property is idle although several outfits are examining it with the idea of reviving the copper production.

General: Elevation is 3200 feet. Plenty of timber. There is a good mill site on the west fork of the Illinois River 1200 feet below the mine. Water power could be developed. The road constructed late in 1941 suffered considerable erosion during the winter but a slight amount of work would put it in shape. Snow might hamper operation for about two months of the year.

Development: It is reported that there are some 14 tunnels on this property and the unpatented claims to the east. The development and geology are reported by Shenon as follows:

Geology: "The Turner or Albright Mine is just north of the California line, 45 miles southwest of Grants Pass, and 2$\frac{1}{2}$ miles by trail from the Redwood highway. Between the highway and the mine the trail gains 1,200 feet in altitude. Waters Creek, the nearest railroad point, is 35 miles oto the northeast. (This station was on the Old C. & O. C. railroad which does not function as a public carrier south of Grants Pass. The roadbead is of use no farther south than Wilderville; - it is used by the Pacific Portland Cement Co. to haul lime rock from Marble Mountain to Grants Pass). The property was located about 35 years ago and now belongs to Edward Turner and James Albright. It includes, according to Mr. Turner, three claims in sec. 15 and 260 acres of patented ground in sec. 16, T.41S., R8W. Mine tunnels with numberous crosscuts have been driven which, in all, have a total length of over 3,000 feet. No production has been reported."

"Two large bodies of porous iron-stained rock or 'gossan', enclosed in finegrained greenstone, crop out at the Turner Mine. One is about 80 feet wide and can be traced on the surface for 900 feet. The other averages a bout 20 feet in width and is well defined on the surface for oger 300 feet. Both gossans crop out prominently, but the narrower one is much more conspicuous because of the fact that it rises 30 to 50 feet above its surroundings. The larger gossan is partly prospected by tunnels 5 and 6. Both tunnels are near the surface and run through sof brown oxidized material and iron-stained greenstone. Some pyrite occurs near the face of tunnel 5, but the oxidation is elsewhere nearly complete/ The smaller gossan is composed of porous brown, highly silicified material, which in places contains cores of unoxidized pyrite. In other places practically all of the iron has been removed, and there remains a carvernous white residium composed principally of silica ribs. However, because of the abundant silica, a prominent outcrop has been maintained in spite of the thorough leaching. Beautfful specimens of the type of gossan described by Locke as 'botryoidal jaspery limonite' have been mined from one of the workings known as the ' picuture rock' tunnel. Sulphides are exposed in several tunnels beneath the smaller gossan. Of these, pyrite is by far the most abundant, although considerable chalcopyrite is s associated with it in tunnels 2 and 3. In spite of the fact that the development work has thus far shown a high porportion of pyrite in the sulphide ore, the presence of considerable chalcopyrite with the pyrite at the face of the tunnel 3, and below in tunnel 2, seems to justify more exploration on these levels. Because silicification makes the rock hard to mine by hand metods, work was stopped in the tunnels in the two places appearing most favorable for prospecting. An extension of tunnel 3 another 200 or 300 feet would add a great deal of information as to the probable worth of the property."

Reference: Shenon 33;192 (quoted from USGS Bull. 846-B)

Informant: G. H. Grover, June 3, 1942

# # # # # # #

STATE DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES

702 WOODLARK BUILDING
PORTLAND 5, OREGON

August 22, 1947

Sample submitted by R. S. Mason (D.O.G.A.M.I.)

Sample received on July 8, 1947

Analysis requested As reported

Analysis by:

L L Hoagland
Assayer

Lab. No.	Sample Marked	Results of Analysis: Gold	Results of Analysis: Silver		Remarks
P-6257	Albright Mine	0.07 oz.	0.60 oz.		Grab sample from Portal of #4 tunnel - sulphide ore
P-6258	" "	0.05 oz.	Trace		Chip sample across ~~ridge~~ 80' outcrop on ridge.
P-6259	" "	0.02 oz.	0.60 oz.		Ore stockpile near leach tanks
P-6260	" "	0.03 oz.	Trace		Just above #4 tunnel 10' chip sample of sil. gossan
P-6261	" "	Trace	Trace	From Dozer cuts at North end of prop.	Larger gossan E. wall rock
P-6262	" "	0.33 oz. 12.00	0.87 oz.		Larger gossan in place 6' wide
P-6263	" "	0.20 oz. 7.00	Trace		cont. of ? to Soft gossan - right of P-6262
* * *	* * * *	* * * * * * * * * * * * * *			* * * * * * * * * * * *

10

The Department did not participate in the taking of this sample and assumes responsibility only for the analytical results.

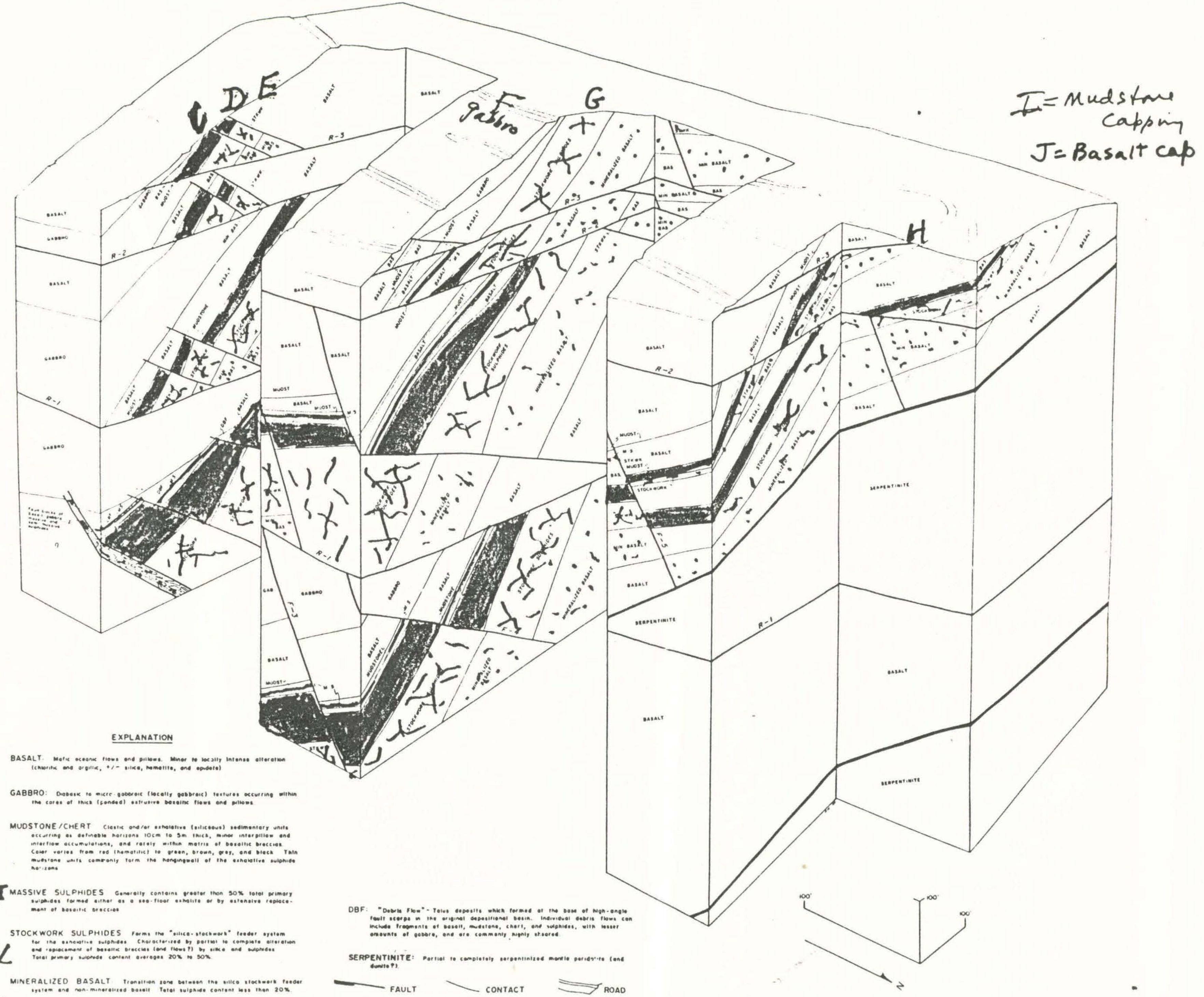


Plate 1. Simplified schematic block diagram of the Turner-Albright massive sulfide deposit.

Sketch showing location K, L, M:

T-A analyses (Turner-Albright)
Specimen from Cone RE: Mike Strickler

↑ arrows shown are part of composite sample = M
general Sulfide sample = K
Lower half mixture M and K = L

WILLIAM A. BOWES and ASSOCIATES
P.O. Box 140 • Steamboat Springs
Colorado 80477 • 303-879-6284

ATOMIC ABSORPTION

INSTRUMENT: VARIAN TECHTRON MODEL 1200 AA SPECTROPHOTOMETER

OFFICE NO.	FIELD NO.	Au	Ag				Hg		
587-231	T-A - H	0.022							
242	COMP CDEG	1.76							
DETECTION LIMITS		0.01	1				.05		

< - LESS THAN

RESULTS IN PARTS PER MILLION (PPM)

REMARKS

JOB NO. 587-46

CUSTOMER Bowes / C10-T-A

ANALYST

120 S. Walnut P.O. Box BB
Hayden, Colorado 81639
(303) 276-3377

INSTRUMENT: WADSWORTH MOUNTED, JARRELL-ASH, 1.5 METER, DC ARC EMISSION SPECTROGRAPH
Fe, Mg, Ca, Ti, Na, K, Si, Al & P reported in %, all other elements reported in PPM

DATE 5/

Office No.	Field No.	Au	Ag	Cu	Pb	Zn	Mo	Fe	W	Ni	Co	Cr	Cd	As	Sb	Mn	V	Bi	Sn	Zr	B	Ba	Be	La	Nb	Sc	Sr	Y	Ca	Mg	Ti	Na	K	Si
Reference	7D80-2	N	3	30	100	300	N	1.5	N	30	30	150	N	N	N	500	100	N	N	150	N	1500	3	100	10	5	300	10	.2	.15	.2	1.5	6.	30
587-231	T-A- C	N	3	3000	50	200	10	20.	N	N	N	150	N	1000	N	30	70	N	N	N	N	200	N	20	N	N	N	N	L	L	.05	N	N	25
232	D	N	1	5000	30	L	10	15.	N	N	N	150	N	500	N	200	100	N	N	N	N	50	N	N	N	N	N	N	L	L	.07	L	N	25.
233	E	N	3	3000	N	L	50	G 20.	N	N	N	150	N	1500	N	70	20	N	N	N	N	50	N	N	N	N	N	N	L	L	.07	N	N	30.
234	F	N	N	70	10	N	N	3.		30	50	200	N	N	N	1000	500		N	70	N	50	N	N	N	30	150	20	5.	2.	.3	3.	.5	25.
235	G	N	5	1500	70	200	N	15.		N	20	50	N	N	200	50	70		N	L	N	500	N	20		5	N	N	N	N	.1	.15	N	20
236	H	N	1	500	100	1500	N	G		N	50	300	N	N	N	100	200		N	50	N	700	N	30		10	N	N	N	.2	.15	N	.5	20
237	I	N	7	200	200	200	N	2.		5	20	500	N	N	N	150	1000		10	100	70	3000	1	L		70	N	30	.05	.7	.7	.15	3.	G 30.
238	J	N	.7	300	70	300	N	3.		30	30	150	N	N	N	500	300		N	100	30	1000	3	70		30	700	50	2.	1.	.5	.5	1.	G
239	K	30	15	5000	20	10,000	N	GG		5	500	N	N	500	N	200	10		N	N	N	150	N	50		N	N	20	L	N	L	N	N	2.
240	L	L	50	7000	150	GGG 10,000	N	G		N	300	N	200	300	1000	200	L		N	N	N	20	L	30		N	N	10	L	N	N		N	2.
241	5.5mm M	20	30	5000	100	GG	N	20.		700	300	N	150	300	700	150	L		N	N	N	150	N	20		N	N	10	.05	L	.007		N	2.
Lower Detection Limit		10	0.5	5	10	200	5	0.05%	50	5	5	10	20	200	100	10	10	10	10	10	10	10	1	20	10	5	100	10	0.05	0.02%	.001%	.15%	0.5%	1%

N - Not detected L - Detected, but below limit of determination G - Greater than value shown

Instructions: 35el(11), AA-Au(2), grind(4), mortar(12)

JOB NO: 587-46

Remarks: high Zn interference on Na

CUSTOMER: B Bowes / C10-TA

ANALYST [illegible]

ot Print

Turner - Albright

Core samples from Baretta for specific gravity —

Hole TAB13

Massive sulfides comprise the whole core

G = 4.40

518' - disseminated sulfide 30 to 40%

G = 3.13

215.5' Amygdaloidal basalt some sulfides

2.91

Evergreen

13

Copy

Report on the Mammoth Mine,
by R. A. LeRoy, M.E.

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Location:

The mine is situated in the south west corner of Josephine County, Oregon, Range 9 West; Township 41 South Sections 10, 15 and 16. This property is shown on the Siskiyou Forest Map as the Albright and Webb property, and consists of eleven claims. The south end of the property borders on the California line. It is about 1-3/4 miles from the Redwood Highway and 48 miles from Grant's Pass, Oregon.

Formation:

The surface is covered by large bunches of gossan, some of it 200 feet wide. This is supposed to attain a depth of about 60 feet. General samples all over show it to run $7.00 and over. The east wall is serpentine, the west diorite.

Workings:

The upper tunnel, No. one, is run in about 85 feet and intersects with the vein, which is about 50 feet in width and of sulphide ore. This tunnel attains a depth of about 60 feet from the surface. The assays show that ore here runs $2.80 per ton in gold, 3% copper.

Tunnel No. 2 runs in 270 feet to reach the vein and is 50 feet vertically below tunnel No. 1. Assays show $4.20 in gold, 2.5% copper.

Tunnel No. 3 runs in 232 feet, and is 70 feet vertically lower than tunnel No. 2. Assays show $18.00 in gold, 2% copper. (All gold prices old standard - $20.67 per ounce.)

There are no buildings of note on the property. The water and timber supply is ample. The new tunnel driven 400 feet will attain a depth 400 feet lower than the old workings.

Price:

Full price of property is $100,000 with terms to be arranged. Time will be given the purchasers of the mine to do necessary development work before any payment need be made. All dealings will be done with the owners direct.

October 30, 1934.

R. A. LeRoy, M. E.

Trip to Albright Mine with J. W. L.
and Harvey Parliament — Aug 4, '54

Visited mine. Examined N. ext.
of gossan. Rock is boxwork with 1 mm
average leached X'ls. Shows fairly
heavy chalcopyrite stain. Some shows
botryoidal structure. On next to
N gossan zone - no extension found.
Probably joins with H. zone as H. Parliament has
it in his map. He will give us any
map we want + maybe his report. He
expects to start drilling any day. Doing
both surface + underground drilling.
Will get structural + ore info. from
him.

H. P. is sharp + practical. If there
is anything there, he ~~w~~ will prob. get
it.

by - Mad Schafer

12-74 Turner Albe
American Selco Reno
Pechiney, French Co.
Joint Venture
over 1,000 ft DX
in 4 holes
10 miles grid line &
geochem 200' centers
400' centers away from
core area
27 claims around property
underground sampling
& mapping 3 adits on
N. Zone 1 on S. Zone
mainly checking S. Zone

John Pticnaw mapping
Amer Selco.
plan more wk
R.&R. Lumber Fred Krause