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Report

on

Exploration

at the

United Verde Extension Mine

Jerome, Yavapai County, Arizona

February, 1986

Ben F. Dickerson, III, C.P.G.
Carole A. O'Brien, C.P.G.
Donald C. White, C.P.G.

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United Verde Extension Mine

Jerome, Yavapai County, Arizona

Introduction & Summary

The historic high grade copper property of the United Verde Extension Mine in Jerome, Arizona, is held under lease by A.F. Budge (Mining) Limited from Verde Exploration, Ltd., of New York City.

The U.V.X. Mine produced 3.8 million tons of ore averaging 10.2 percent copper, 0.04 ounce/ton gold and 1.7 ounce/ton silver. This was direct smelting ore. Between 1915 and 1938, the mine also produced about 153,000 ounces of gold.

In 1982, the property was leased from Verde by the Phelps Dodge Corporation, who renovated the Edith Shaft and erected a new headframe. During 1982-83, Phelps Dodge drilled two diamond drill holes (UVX-1 and 2) from a station on the 1100 level.

Access to the mine is via the Edith Shaft, 1900 feet deep. The shaft is serviced by a headframe and hoist under lease-purchase option by Budge's agent, Ben F. Dickerson III d/b/a DMEA Ltd., from the Phelps Dodge Corporation.

Chert-hosted gold and silver mineralization has been found to occur both stratigraphically above and as lateral extensions of the main massive sulfide bodies. Chert zones have been identified by drilling on the 800, 950 and 1100 levels. Areas over 1,000 feet in strike length have been found to contain significant precious metal concentrations analagous to the "Gold

Stope" area. The latter zone was mined in the mid 1930's. It contained about 35,000 tons of silicious smelter flux ores averaging 0.4 oz/ton gold and 2.0 oz/ton silver. Other similar bodies would appear to exist from drilling to date. For example, DDH 806-1, intersected 64 feet of 0.11 oz/ton gold and 1.4 oz/ton silver. Some higher grade sections are included.

More diamond drilling from available sites could be done, however, each of the several idenitifed mineralized zones occur within a few hundred feet of existing workings. A program combining clean-up of caved workings, possibly some new drifting, and additional drilling would allow a more thorough and cost-effective testing of the targets.

Development and Present Access

The Edith Shaft provides current access. It and an adjacent shaft, the Audrey, located 200 feet to the east, are both concrete-lined, three compartment shafts. The Edith bottoms at the 1900 level; the Audrey, at the 1700 level. Water level fluctuates around the sill of the 1300 level. The mine has not been dewatered since its closure in 1938. The Josephine Tunnel, driven over two miles from the Verde Valley, provided haulage, and now, drainage, from the 1300 level of the shafts.

Levels accessible via the Edith Shaft are the 550, 800, 950, 1100 and 1200. Levels below that are at 100-foot intervals. Most of the sulfide ores were mined from an area between the 1300 and 1500 levels. The siliceous, precious metal bearing, flux ores came mainly from the 950 and 1100 levels.

Caving of workings precludes easy access to any of the old productive base-metal sulfide zones. Only a few siliceous bodies with insignificant production and minor gold values are physically accessible on the 800 and 1200 levels. The expense and uncertainty involved in re-opening old workings has confined current exploration to diamond drilling.

Underground Drilling

In June of 1985, Brooks Minerals Inc., of Lakewood, Colorado was retained as mining contractor in order to prepare certain areas of the mine for underground drilling.

Longyear Drilling Company mobilized an air-powered drill rig and drilling began August 12 on hole 1104-1. In September, a second drill rig was added. This rig began drilling on hole 901-1.

A total of 3,517 ft of underground drilling (HW, NW, BW) was carried out: three holes were drilled from the 1100 level; three, including one abandoned before reaching its target, were drilled from the 950 level; and one hole was drilled from the 800 level.

In general, core recovery was quite satisfactory. Summary data on the results are presented in Figure 7. Overall assay results are presented in Appendix A.

Appendix A also includes more detailed analyses of a few samples, selected in order to determine the cherts' potential as a smelter flux.

Geologic Setting

The copper-bearing bodies at the U.V.X. are of a Proterozoic, volcanogenic massive sulfide nature. They lie within a sequence of structurally deformed intermediate to felsic volcanic submarine flows, containing pyroclastics and chemical precipitates. In the mine area, this sequence stands nearly vertical. Their stratigraphic tops lie to the northeast.

The copper orebodies were blind since they were completely covered by a sequence of Paleozoic and Tertiary rocks about five hundred feet thick.

All of the U.V.X. copper orebodies, plus the mineralized chert, are found in a structural block lying northeast of the major Verde Fault, which truncated the main U.V.X. orebody. This normal fault forms the west side of the Verde graben, and has dropped the U.V.X. deposit to a lower elevation than the United Verde orebody which lies in the footwall block of the Verde Fault.

Precious Metal Mineralization

The massive sulfide ores averaged 0.04 oz/ton gold and locally contained as much as 0.1 oz/ton gold. However, the best precious metal mineralization is clearly segregated from the massive sulfides. Gold and silver, with virtually no base metals, occur within meta-chert bodies which appear to surround and extend laterally from, the massive sulfide bodies.

These meta-cherts are, in part, true cherts in that they contain finely banded, siliceous chemical precipitates. They are also silicified hydrothermal breccias containing lithic fragments from below, such as the Cleopatra quartz porphyry, the

footwall of the massive sulfide and ore.. Nearly all the primary chert has been fractured by hydrothermal activity and then healed by material containing additional silica and iron.

So far, the evidence indicates the probability of at least two major mineralizing events. One was the syngenetic, auriferous chert formation. Syngenesis is suggested by a classic precious metal and trace element association which includes minor quantities of arsenic, antimony, bismuth, tin, molybdenum and vanadium. Secondly, the ubiquitousness of the hydrothermal brecciation, coupled with the nature of some wall rock alteration suggests some mineralizing epigenetic event. It seems probable that the chemical evolution of the hydrothermal fluids yielded a solution rich in precious metals, silica and gas, in particular, CO_2. Under confining pressure, this solution hydro-fractured its way through the pre-existing chert, silicifying and mineralizing it enroute. Certain components of the mineralizing fluids passed completely through, causing silicification, sericitization and kaolinization of the chert zone's immediate hanging wall. The gas-rich fractions of these fluids were more mobile. They appear to have produced more distant hanging wall carbonate alteration which is found as much as two hundred feet stratigraphically above the known gold zones.

This combined sequence of syngenetic and epigenetic activity may explain why the gold mineralization seems to be stratabound, but not necessarily stratiform. An example is shown in cross-section A-A'.

One small precious-metal-rich chert body was mined in the 1930's and was mixed as "flux rock" with the massive sulfide ore.

This body was known as the "Gold Stope", and produced about 35,000 tons averaging 0.4 oz/ton gold (range from 0.1 oz/ton to 2.5 oz/ton). Silver averaged nearly 2.0 oz/ton. This production came from an irregularly mined zone approximately 20 feet thick, 300 feet long and 150 feet high. Its center was on the 950 level. The "Gold Stope" is shown in both longitudinal and cross section, in figure 6.

From this stope's geometry and grade distribution, it appears that the "Gold Stope" may represent a coalesing series of small mineralizing vents lying peripheral to the main massive sulfide vent(s). These smaller vents produced a gold grade zonation as shown in figure 6. Gold content is higher near the footwall of the vents and appears to spread radially from each point source.

Diamond drill hole 901-3 was drilled just up-dip from the center of the "Gold Stope" in order to confirm the lithology of the host rocks and to gain some feel for the grade of the material not mined. This mineralized intercept is similar in grade and lithology to that of other gold occurrences in other sections of the mine, as found from recent drilling. This indicates that other relatively high grade gold concentrations probably occur within the fairly extensive chert zones. The extent of the known chert occurrences are shown on the level plans, figure 2, and as projected vertically from each of three levels to a common plane, in figure 1. The plunge of the chert bodies is such that drilling was performed from the 1100 level, near the southeast end of the identified cherts; at the 950

level in proximity to the "Gold Stope" (mid-point); and from the 800 level in the northwest. Three sections are presented, A-A', C-C' and E-E' (figures 3, 4 and 5) to show some of the drilling from these three levels. The nomenclature for the various target areas is shown in figure 1. Essentially, the 1100-level drilling tested the "Florencia area", just north of the southerly dipping Florencia Fault; the 950-level drilling, the "1205-vein area" encompassing the gold stope; and the 800-level drilling, the "Verde area" to the west, in proximity to the Verde Fault.

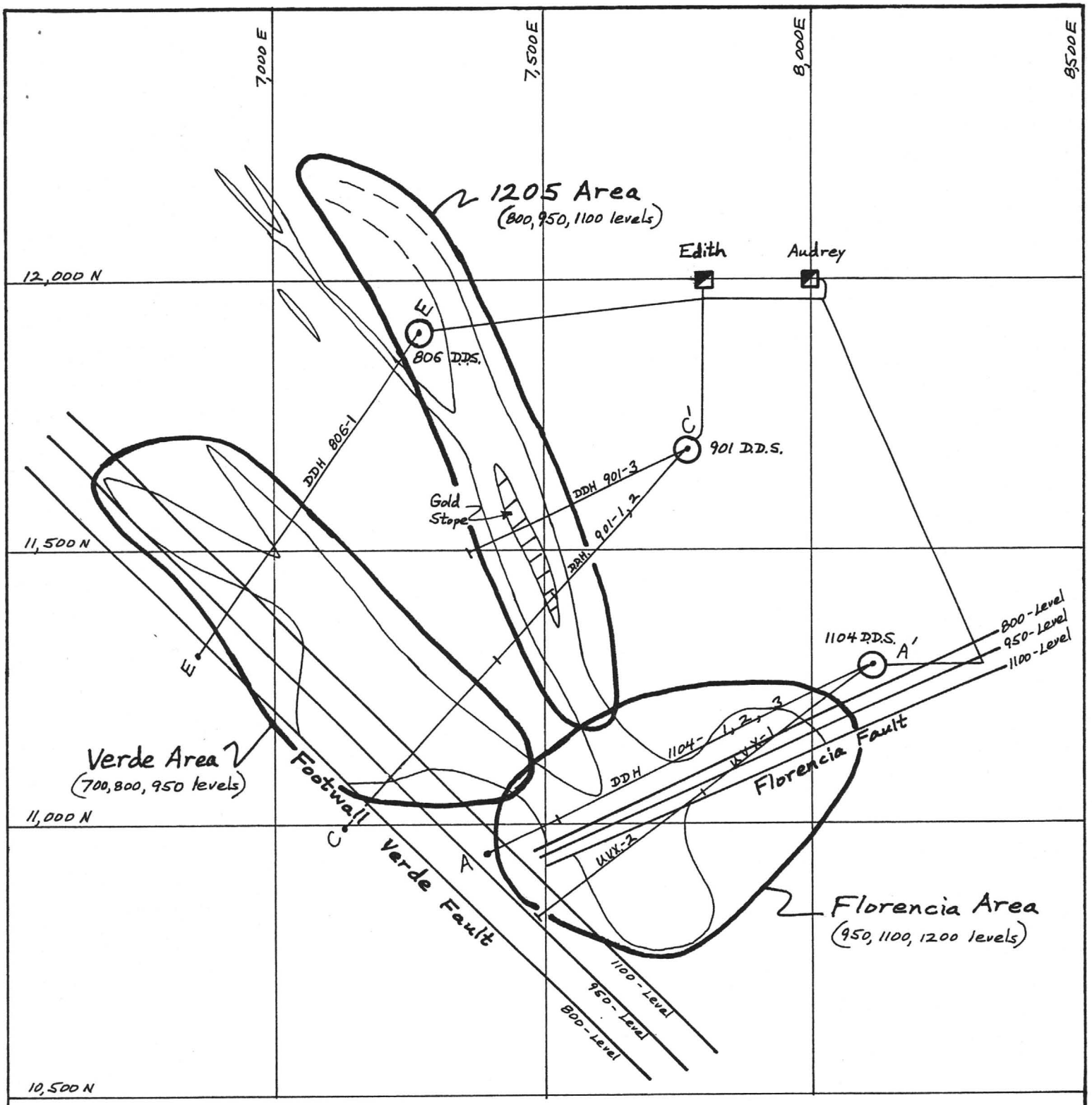
The Florencia area has been drilled the most because it is only 200 feet from the initial drill station used by both Phelps Dodge in 1982 (DDH UVX-1 and UVX-2) and by DMEA (DDH 1104-1, 2 and 3). Despite the more concentrated drilling, it is possibly an area of only modest tonnage potential, (see figure 7).

The 1205 vein area encompasses the "Gold Stope" and extends northwesterly from the Florencia area for at least 1,000 feet. The gold content of the margins of the "Gold Stope" are reasonably well documented from historical production data. They range from 0.1 to 0.5 oz/ton gold. The northern extremity of the zone seems to be only slightly mineralized, judging from sampling on the 1200 and 800 levels.

The Verde chert zone is by far the most extensive of the targets and has the largest tonnage potential. One drill hole has penetrated this zone. Hole 806-1 intercepted 64 feet averaging 0.11 oz/ton gold and 1.4 oz/t silver. This section includes three higher grade intervals, the best of which is 13 feet of 0.24 oz/ton gold and 2.2 oz/ton silver.

Conclusions

Additional exploration is required in order to acquire a better grasp of the economic potential of the United Verde Extension mine property.



U.V.X. GOLD PROJECT

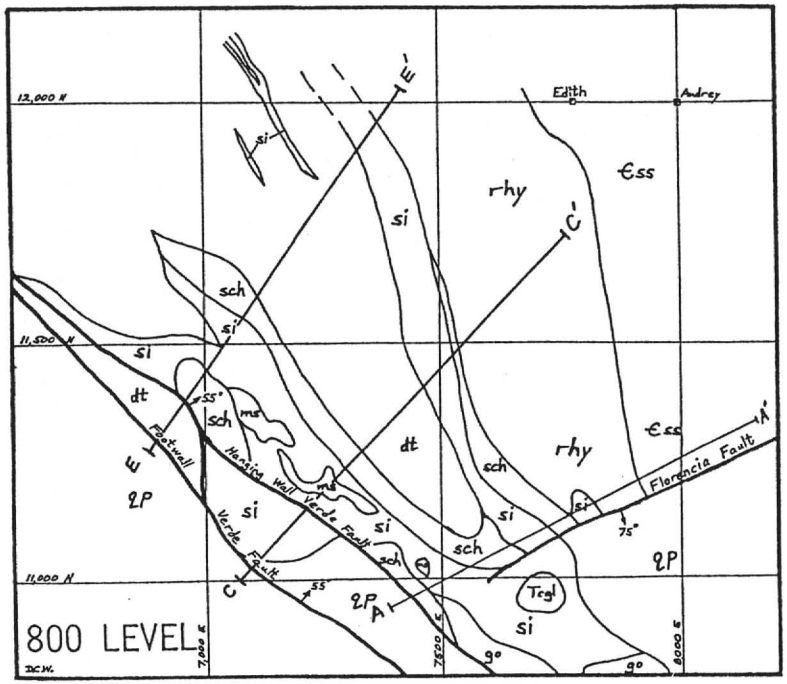
Sketch map showing:
chert bodies/target areas, key cross sections, diamond drill stations.

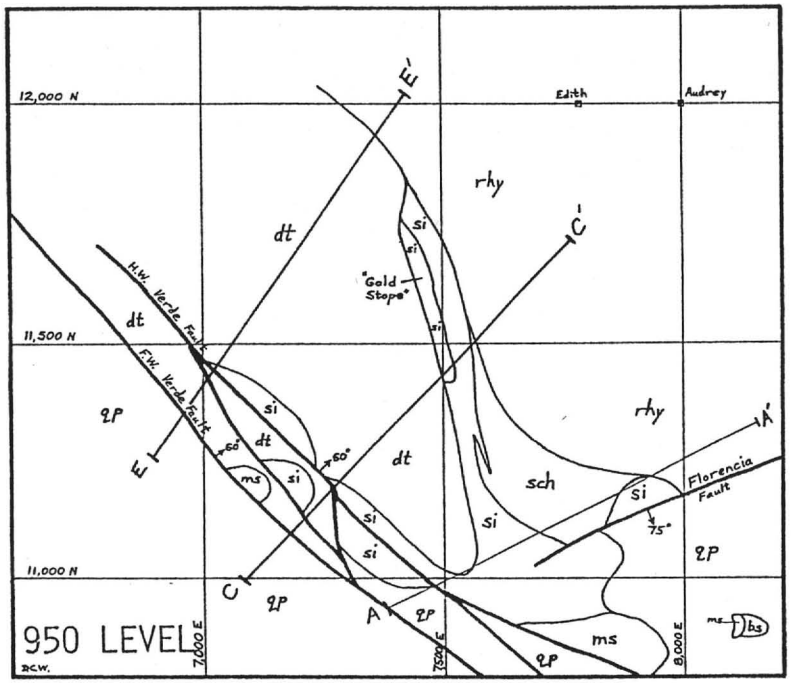
N

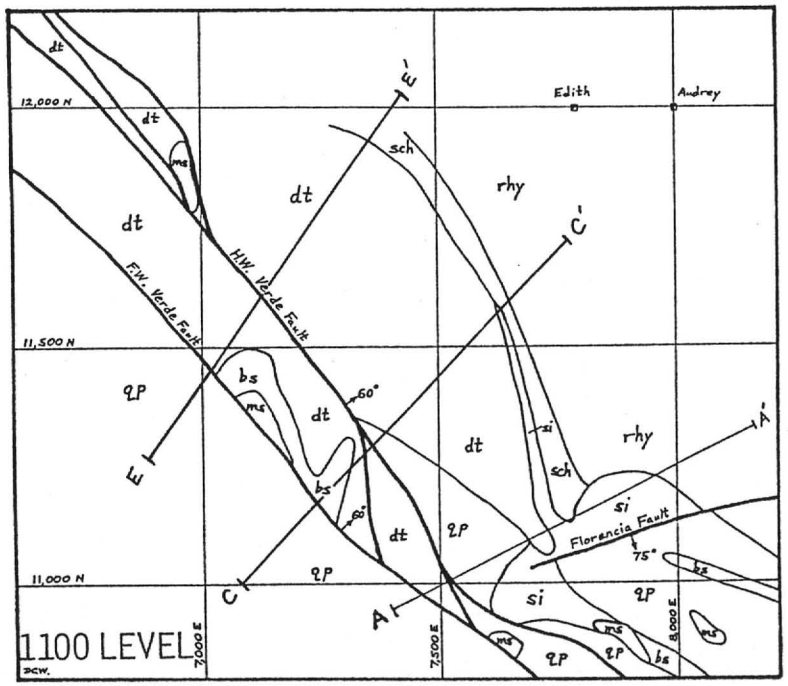
1" = 250'

Figure 1

D.C. White & R.W. Hodder - Feb. 1986







FEET

0 100 200 300 400 500

UNITED VERDE EXTENSION MINE
LEVEL PLAN GEOLOGY

Tertiary	cgl	Conglomerate (Hickey Fm.)
Devonian	ls	Limestone (Martin Fm.)
Cambrian	ss	Sandstone (Tapeats Fm.)
Proterozoic	rhy	Rhyolitic and intermediate flows and pyroclastics
	sch	Schistose volcanics (Grapevine Gulch Fm.)
	si	Silica; massive, banded, and brecciated chert and silicified volcanics
	go	Gossan after ms
	ms	Massive sulfide
	bs	Black (chloritized) schist
	qp	Quartz porphyry (incl. Cleopatra Fm.)
	dt	"Diorite"; may be subvolcanic dome or possibly an extrusive andesitic flow

FIGURE 2

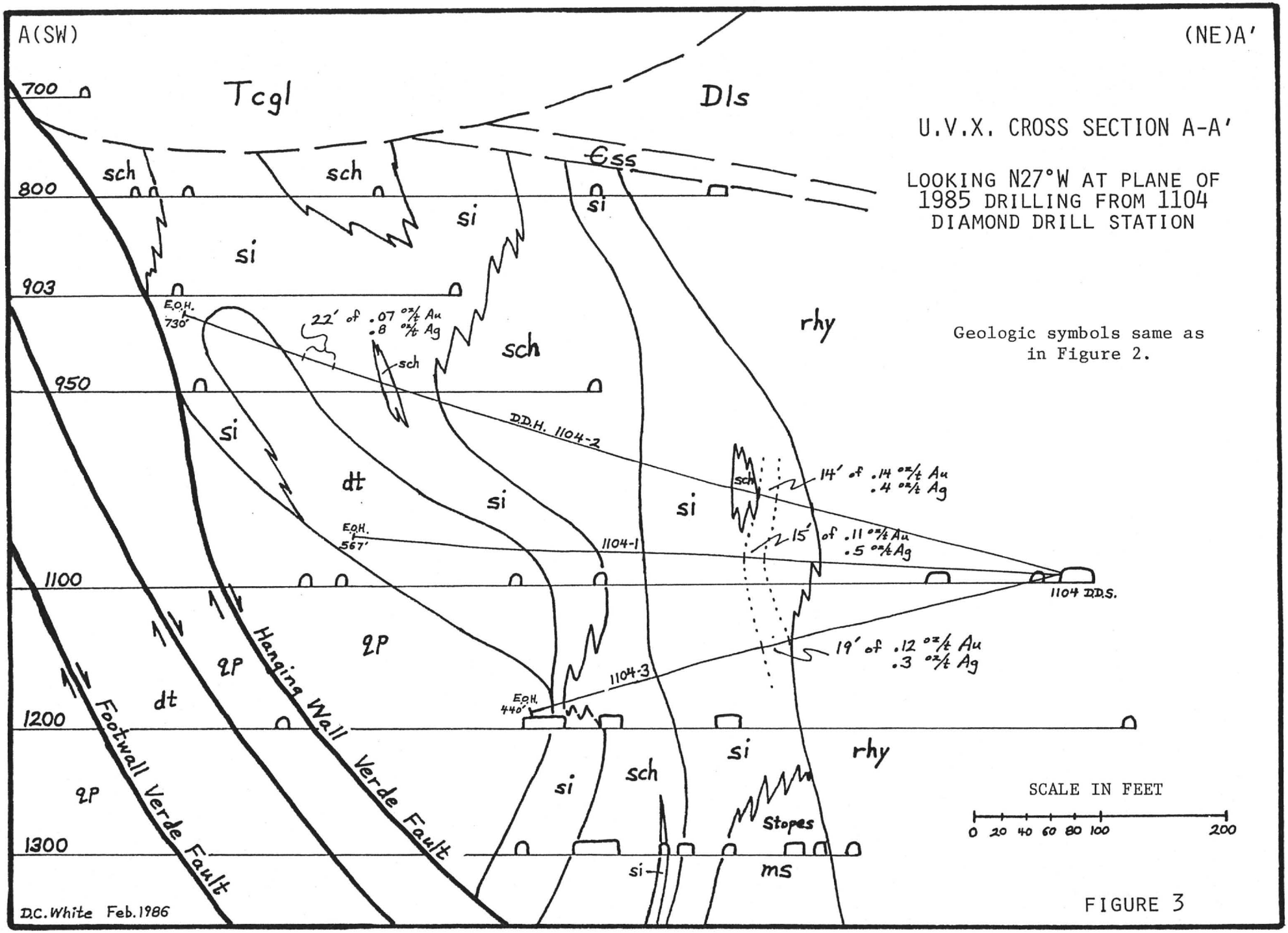

A(SW)
(NE)A'
700
800
903
950
1100
1200
1300
Tcgl
Dls
Css
sch
si
rhy
dt
qp
ms
E.O.H. 730'
22' of .07 oz/t Au .8 oz/t Ag
D.D.H. 1104-2
14' of .14 oz/t Au .4 oz/t Ag
E.O.H. 567'
1104-1
15' of .11 oz/t Au .5 oz/t Ag
1104 D.D.S.
19' of .12 oz/t Au .3 oz/t Ag
1104-3
E.O.H. 440'
Hanging Wall Verde Fault
Footwall Verde Fault
Stopes
U.V.X. CROSS SECTION A-A'
LOOKING N27°W AT PLANE OF 1985 DRILLING FROM 1104 DIAMOND DRILL STATION
Geologic symbols same as in Figure 2.
SCALE IN FEET
0 20 40 60 80 100 200
D.C. White Feb. 1986

FIGURE 3

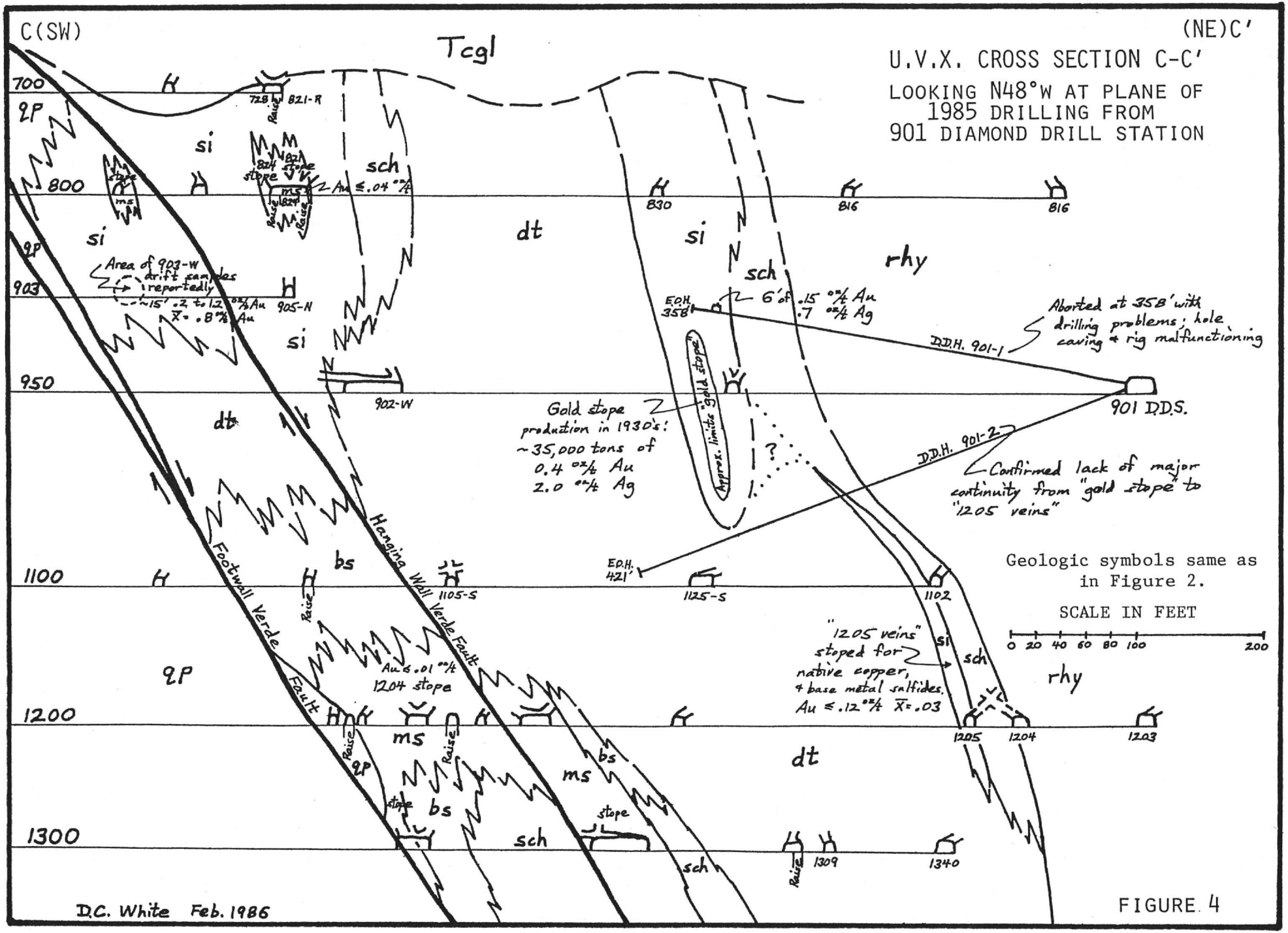

C(SW)
(NE)C'
Tcgl
U.V.X. CROSS SECTION C-C'
LOOKING N48°W AT PLANE OF
1985 DRILLING FROM
901 DIAMOND DRILL STATION
700
800
903
950
1100
1200
1300
QP
si
sch
dt
rhy
ms
bs
Area of 903-W drift samples reportedly ~15' .2 to 1.2 oz/t Au X̄ = .8 oz/t Au
905-N
902-W
Gold stope production in 1930's: ~35,000 tons of 0.4 oz/t Au 2.0 oz/t Ag
Approx. limits "gold stope"
E.O.H. 358'
6' of .15 oz/t Au .7 oz/t Ag
Aborted at 358' with drilling problems; hole caving & rig malfunctioning
D.D.H. 901-1
901 D.D.S.
D.D.H. 901-2
Confirmed lack of major continuity from "gold stope" to "1205 veins"
E.O.H. 421'
1105-S
1125-S
1102
"1205 veins" stoped for native copper, & base metal sulfides. Au ≤ .12 oz/t X̄ = .03
1205
1204
1203
Au ≤ .01 oz/t 1204 stope
Hanging Wall Verde Fault
Footwall Verde Fault
Raise
stope
B30
B16
B16
1309
1340
Geologic symbols same as in Figure 2.
SCALE IN FEET
0 20 40 60 80 100 200
D.C. White Feb. 1986

FIGURE 4

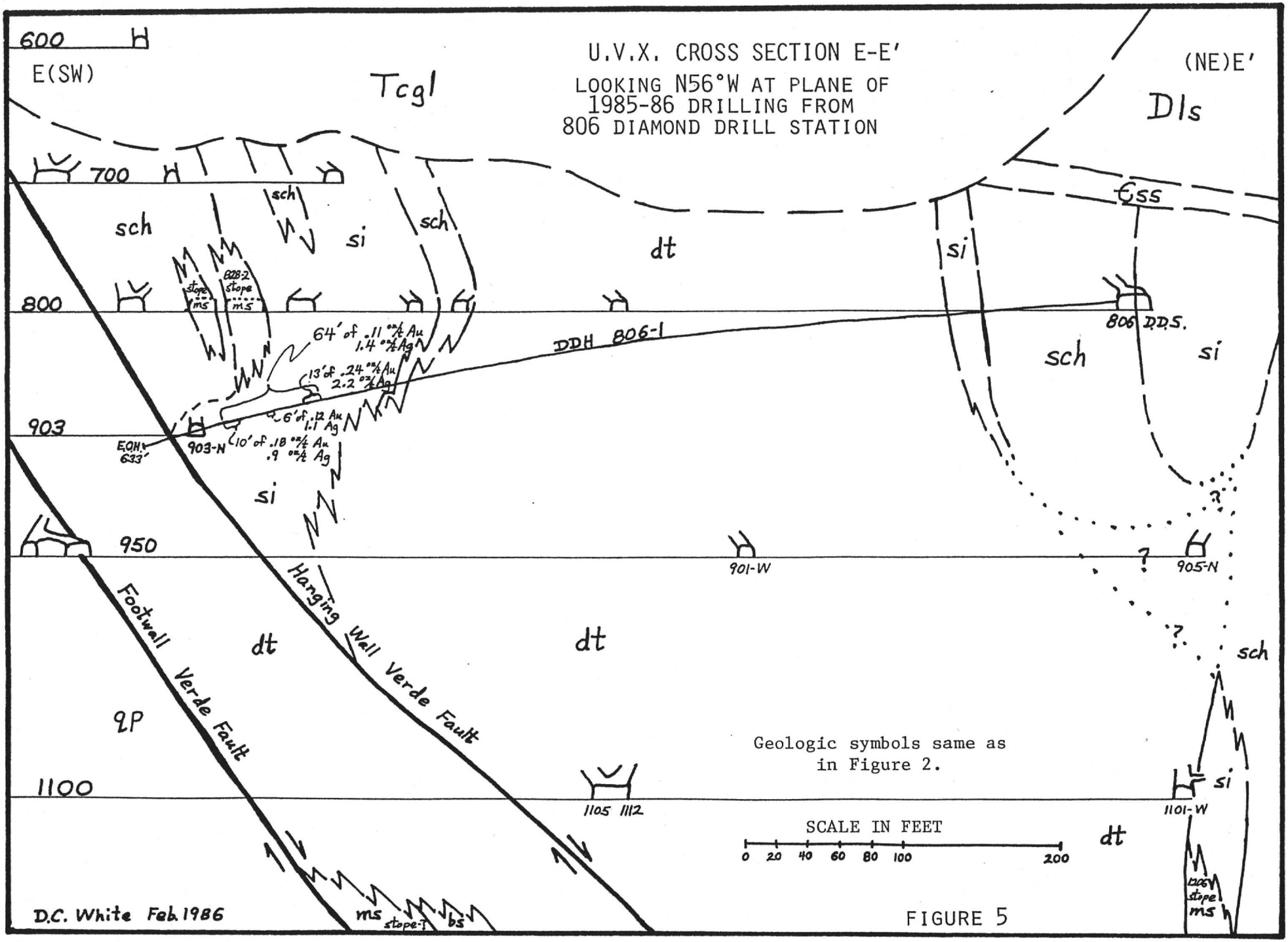
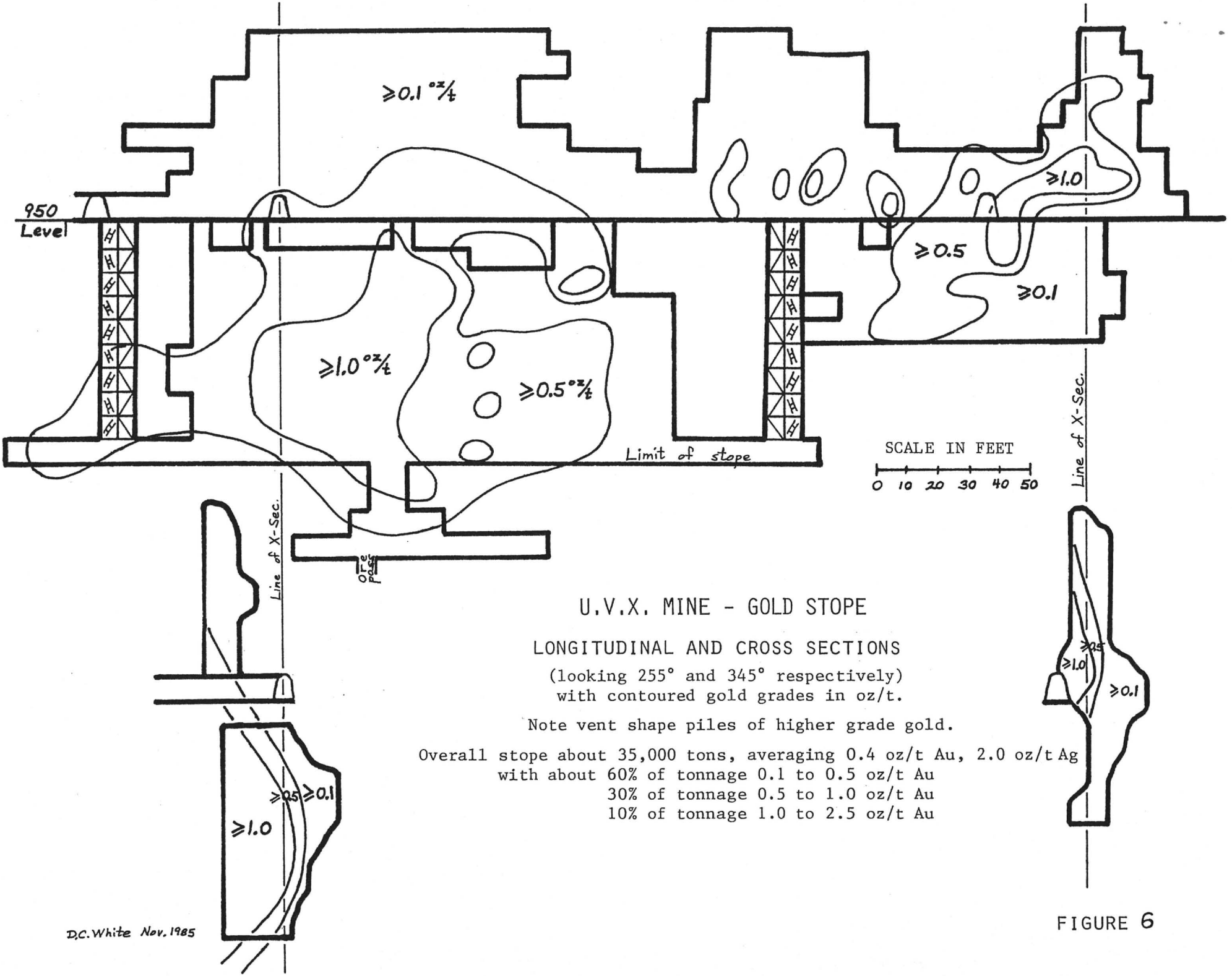

U.V.X. CROSS SECTION E-E'
LOOKING N56°W AT PLANE OF
1985-86 DRILLING FROM
806 DIAMOND DRILL STATION
E(SW)
(NE)E'
600
700
800
903
950
1100
Tcgl
Dls
Css
sch
si
dt
qp
806 D.D.S.
DDH 806-1
64' of .11 oz/t Au 1.4 oz/t Ag
13' of .24 oz/t Au 2.2 oz/t Ag
6' of .12 Au 1.1 Ag
10' of .18 oz/t Au .9 oz/t Ag
E.O.H. 633'
903-N
901-W
905-N
1105 1112
1101-W
Footwall Verde Fault
Hanging Wall Verde Fault
Geologic symbols same as
in Figure 2.
SCALE IN FEET
0 20 40 60 80 100 200
D.C. White Feb. 1986

FIGURE 5



U.V.X. MINE - GOLD STOPE

LONGITUDINAL AND CROSS SECTIONS

(looking 255° and 345° respectively)
with contoured gold grades in oz/t.

Note vent shape piles of higher grade gold.

Overall stope about 35,000 tons, averaging 0.4 oz/t Au, 2.0 oz/t Ag
with about 60% of tonnage 0.1 to 0.5 oz/t Au
30% of tonnage 0.5 to 1.0 oz/t Au
10% of tonnage 1.0 to 2.5 oz/t Au

FIGURE 6

U.V.X. DRILLHOLE SUMMARY

D.D.H	Collar location (UVX grid) N	E	Elev.	Orientation at collar Bearing	Inclination	E.O.H. Inclination	Length of hole	Chert Intercepts	Avg. core recovery in chert (%)	Remarks
UVX-1				S52°W	+14°	Not surveyed	393	150-274	80	P.D. hole; aborted in Florencia fault.
UVX-2					+6°		686	176-321 482-640	80 80	P.D. hole
1104-1	11,310	8,140	4,024		+5°	+4°	567	192-331 362-413	90 100	"Florencia area"
1104-2				S63°W	+15°	+21°	730	209-350 521-642 712-E.O.H.	90 80 30	
1104-3					-11°	-15°	440	207-335 420-422	80 40	
901-1				S42°W	+11°	+8°	358	329-E.O.H.	80	Aborted with drilling problems in HW up-dip from Gold Stope
901-2	11,690	7,750	4,180	S40°W	-20°	Not surveyed	421	244-249	30	Intercepted up-dip pinch-out of "1205-vein" cherts
901-3				S65°W	+18°	+7°	367	272-326	70	Up-dip from Gold Stope; clipped fractured back of 903 level drift
806-1	11,890	7,335	4,335	S33.5°W	-4°	-12°	633	84-108 481-615	100 60	Verde area; clipped 903-N drift

NOTES: Two P.D. holes drilled by Connors; commenced UVX-1 Dec. 18, 1982, completed UVX-2 June 9, 1983. Five DMEA holes drilled with pneumatic Longyear 34; two DMEA holes, 901-1 & 2, drilled with electric-hydraulic LM-37. DMEA drilling done between Aug. 12, 1985 (collaring of 1104-1) and Jan. 29, 1986 (completion of 806-1). Each hole commenced HQ or NQ and reduced core size as needed to case off bad ground or allow power for drilling chert in long holes. Core recovery averaged 90%; usually over 90% in HW stratigraphy; about 80% in FW rocks; chert recovery as noted in chart.

Compiled by Don White
March, 1986

FIGURE 7

Centennial Development Company

P.O. BOX 151065
3808 SOUTH WEST TEMPLE
SALT LAKE CITY, UTAH 84115
PHONE (801) 262-2914
TELEX 3789532

December 4, 1986

Mr. A. J. Fernandez
Senior Mining Engineer
A. F. Budge (Mining) Limited
7340 East Shoeman Lane
Suite 111 "B" (E)
Scottsdale, AZ 85251

Dear Mr. Fernandez:

Centennial Development Company is pleased to submit the following proposal for underground drilling at your Edith Shaft near Jerome, Arizona. Our proposal covers both the percussion drilling and the diamond drilling; we would prefer to perform both types of drilling but would be willing to handle either one separately.

Percussion Drilling

It is our understanding there will be five holes at 100± feet each in two stations for a total of 1,000 feet ± on the 950 Level and five holes at 150± feet each from one station on the 1100 Level. The hole size will be from 2" to 2½" diameter. CDC will provide packers with tees to allow sample collection. The drilling will be done with Gardner-Denver PR123's and a short feed to allow 4-foot changes of drill steel. Our rates for the percussion drilling are as follows:

1. Mobilization and demobilization . . Lump Sum $2,450.00
2. Drill hole, approximately 1,750 feet . . . $ 5.50/ft.
3. Moving and setup (four required). . . . . $ 650.00/ea.

We are estimating 16 working days to complete the percussion drilling on a one 10-hour shift, five days per week schedule.

2.75/ft
a55a7

14.5'/hr.
For 2500'
includes mobe & setup
$7.26/FT
+ four reps. 1.20
$8.96/FT
LH only

$8.58/FT
with OD

Diamond Drilling

There will be a minimum of five 400-foot holes on the 950 Level and one 800-foot hole on the 1100 Level. We would use a Longyear 38 air-hydraulic drill with NQ rod. The diamond drilling is estimated to take 30 working days on two 10-hour shifts per day, five days per week schedule. Our rates would be as follows:

HQ - Questionable would have to buy rods -

1. Mobilization and demobilization of personnel and equipment . . . .Lump Sum $3,000.00

2. Diamond core drilling, NQ (includes diamonds)
   - 0-500 feet . . . . . $ 25.00/ft.
   - 501-800 feet . . . . . $ 28.00/ft.

3. Rig time, two-man crew
   - a. Cementing, hole preparation, grouting, and drilling (drilling through cement not applied above -), including necessary rod handling time . . . . $ 65.00/hr.
   - b. Hole stabilizing and/or plugging . . . $ 65.00/hr.
   - c. Installing and pulling of casing . . . $ 65.00/hr.
   - d. Moving between holes . . . . . $ 45.00/hr.
   - e. Hole survey plus rental charge for survey tool. . . . . $ 45.00/hr.
   - f. Wedging operations, plus cost of wedge and wedge bits . . . . . $ 65.00/hr.

4. Standby or delays, for the convenience or responsibility of client
   - Two-man crew . . . . . $ 45.00/hr.

5. Reaming per foot, plus bits. . . . . $ 10.00/ft.

6. Core boxes

   Cardboard boxes, 10 feet of core . . . . $ 2.75/ea.

7. In-hole materials invoiceable to client at CDC cost plus 10%

   a. Drill mud and chemical mud
   b. Mud additives
   c. Hole stabilization or plugging materials
   d. Cement
   e. Hole plugs
   f. Packers, if nesessary

For both types of drilling we have figured on the owner providing the following:

--Compressed air, 700 c.f.m. for diamond drilling, 500 c.f.m. for percussion drilling

--Drill water

--Underground access and transportation as required

--Labor to assist in moving

--Changeroom facilities

Should our bid be accepted for percussion and diamond drilling, the mobilization for both will be $3,000.00.

We appreciate the opportunity to submit this proposal, if you need additional information or have any questions, please let us know.

Sincerely,

CENTENNIAL DEVELOPMENT COMPANY

Dave Bovee

Dave Bovee
President

DB:ce

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104 SUPERIOR
PO BOX 248
SANDPOINT ID 83864

COMPANIES AFFORDING COVERAGES:

COMPANY A: WESTERN CASUALTY & SURETY

COMPANY B:

COMPANY C:

NAME AND ADDRESS OF INSURED:
Ruen Core Drilling Inc
Po Box 267
Clark Fork ID 83811

COMPANY D:

COMPANY E:

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	X PREMISES-OPERATIONS		BODILY INJURY
	UNDERGROUND EXPLOSION & COLLAPSE HAZARD		PROPERTY DAMAGE
	X PRODUCTS COMPLETED OP.		BI & PD COMBINED $ 1,000 $ 1,000
	X CONTRACTUAL		
	BROAD FORM PROP. DAMAGE		
	INDEP. CONTRACTORS		
	PERSONAL INJURY		PERSONAL INJURY
A	AUTOMOBILE LIABILITY	P 1568415	
	X ANY AUTO	09/01/86 TO 09/01/87	BI: (EACH PERSON)
	ALL OWNED AUTOS (PRIV. PASSENGER)		BI: (EACH ACCIDENT)
	ALL OWNED AUTOS (NON PRIV. PASSENGER)		PROPERTY DAMAGE:
	X HIRED AUTOS		
	X NON-OWNED AUTOS		BI & PD COMBINED: $ 1,000
	GARAGE LIABILITY		

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	EXCESS LIABILITY UMBRELLA FORM	TO	
	OTHER THAN UMBRELLA FORM		BI & PD COMBINED
	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	TO	*STATUTORY* EACH ACCIDENT: DISEASE POLICY LIMIT: DISEASE EACH EMPLOYEE:
	OTHER	TO	

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/SPECIAL ITEMS:
All Operations

CANCELLATION: SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 10 DAYS WRITTEN NOTICE TO THE BELOW NAMED CERTIFICATE HOLDER, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

NAME AND ADDRESS OF CERTIFICATE HOLDER:
D.M.E.A.
7340 E. Shoeman Lane
Suite 111-B East
Scottsdale, AZ 95251

DATE ISSUED: 09/24/86

James W Semik
AUTHORIZED SIGNATURE

JOY MACHINERY COMPANY

707 BOYD BOULEVARD
P. O. DRAWER 489
LaPORTE, INDIANA 46350
Phone: (219) 362-2191

December 12, 1986

Mr. Joe Fernandez
A. F. Budge Mining Ltd.
7340 E. Shoeman Lane, Suite 111BE
Scottsdale, AZ 85251

DMEA LTD.
DEC 17 1986
RECEIVED

Dear Joe:

I appreciated talking with you by telephone on 12/12/86 concerning your proposed core drilling program. Confirming that it is all underground work, we are not in a position to bid since we drill only from surface.

Should you require any surface core drilling in the future, we would appreciate the opportunity to bid.

Enclosed is some literature on our Contract Core Drill Division.

Yours very truly,

JOY MANUFACTURING COMPANY

J. H. Koontz
General Manager
Contract Drill Division

JHK/js

Enclosures

File
10

Economy

When you contract Joy core drilling services, you receive the benefits of significant economies.

- Maximum core recovery for maximum analysis
- Use of the best equipment and crews available without large capital outlays
- Guaranteed satisfactory results and a guaranteed footage at a stipulated price per-foot

For more information on Joy Contract Core Drill Division services, or for a quotation, call (800) 458-1115 outside Pennsylvania and (800) 458-1116 within Pennsylvania or write:

Joy Manufacturing Company
Contract Core Drill Division
Marketing Services
301 Grant Street
Pittsburgh, Pennsylvania 15219

Joy Manufacturing Company
Contract Core Drill Division
1631 Carolina Avenue
Bessemer, Alabama 35020

Telephone: (205) 425-3767

Joy Manufacturing Company
Contract Core Drill Division
Perkins & Associates Drilling
5468 Leestown Road
Lexington, Kentucky 40511

Telephone: (606) 255-2154

Joy Manufacturing Company
Contract Core Drill Division
1012 S. Burnett Street
Jefferson City, Tennessee 37760

Telephone: (615) 475-2751

Joy Manufacturing Company
Contract Core Drill Division
750 E. Evans Boulevard
Tucson, Arizona 85713

Telephone: (602) 884-5866

Joy Manufacturing Company
Contract Core Drill Division Headquarters
707 Boyd Boulevard
LaPorte, Indiana 46350

Telephone: (219) 362-2191

B4107

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JOY MANUFACTURING COMPANY

CONTRACT CORE DRILLING

Confidential service. Guaranteed results.

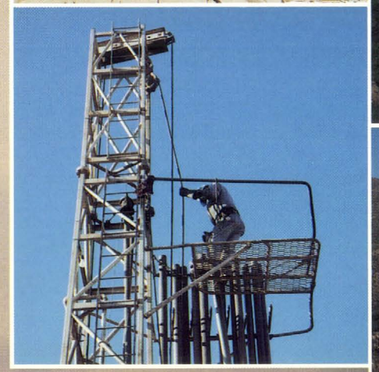
Joy Manufacturing Company offers exploratory and developmental contract core drilling services for metallic and non-metallic minerals, including copper, zinc, lead, iron, clay, limestone, potash, gypsum, asbestos, coal and marble; for investigation of dam sites and underground gas storage formations; and for foundation testing.

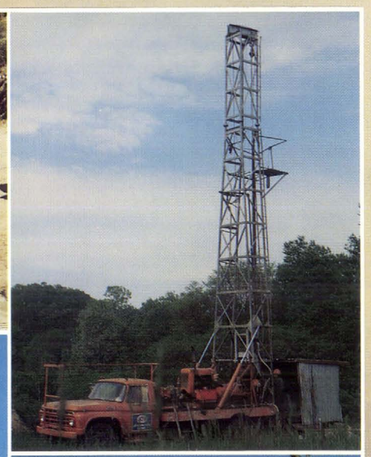
When you engage Joy contract core drilling services you gain the benefits of unsurpassed experience. As a result of continuous involvement in the industry since 1884, Joy personnel have a comprehensive knowledge of proven vertical and angle hole core drilling techniques and access to the latest drilling technology. They also appreciate the importance of the strictest confidentiality. Experience also allows Joy to offer clients important assurances: guaranteed quotations, and guaranteed satisfactory core recovery.

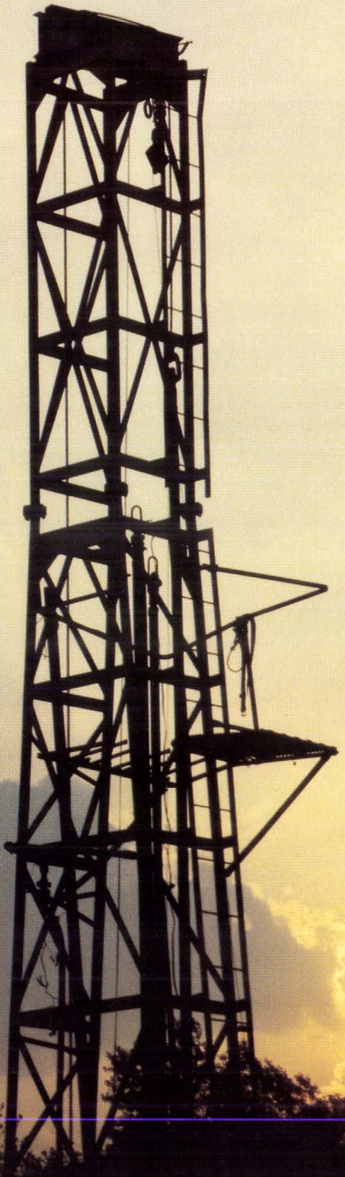
Joy Contract Core Drill Division is headquartered in LaPorte, Indiana and serves clients nationwide from four strategically located warehouses.

Confidentiality

Any firm engaged in contract core drilling strives to achieve a reputation for confidential service. With Joy, clients are assured that extracted cores are treated as valuable and restricted information. This assurance is backed by the reputation of one of the world's largest manufacturers of mining machinery.







Guaranteed Cores. Guaranteed Quotations.

Joy Contract Core Drill Division guarantees clients that all samples retrieved are representative of the strata. Clients are assured of satisfactory results, even in soft, friable formations, because Joy's experienced core drilling crews are equipped with the latest available drilling technology. Cores are extracted in optimum condition and packaged with care, ready for analysis.

Joy also guarantees all drilling quotations. The per-foot price quoted at the beginning of the job is the price at the end of the job, regardless of conditions encountered in drilling.

Experience

Every one of the technicians who staff the Joy core drilling crews located throughout the United States is a skilled specialist in core retrieval. They bring an average of over 15 years of experience to the job site. Normally, each crew is assigned permanently within particular territories, so they know the local terrain and geological formations.

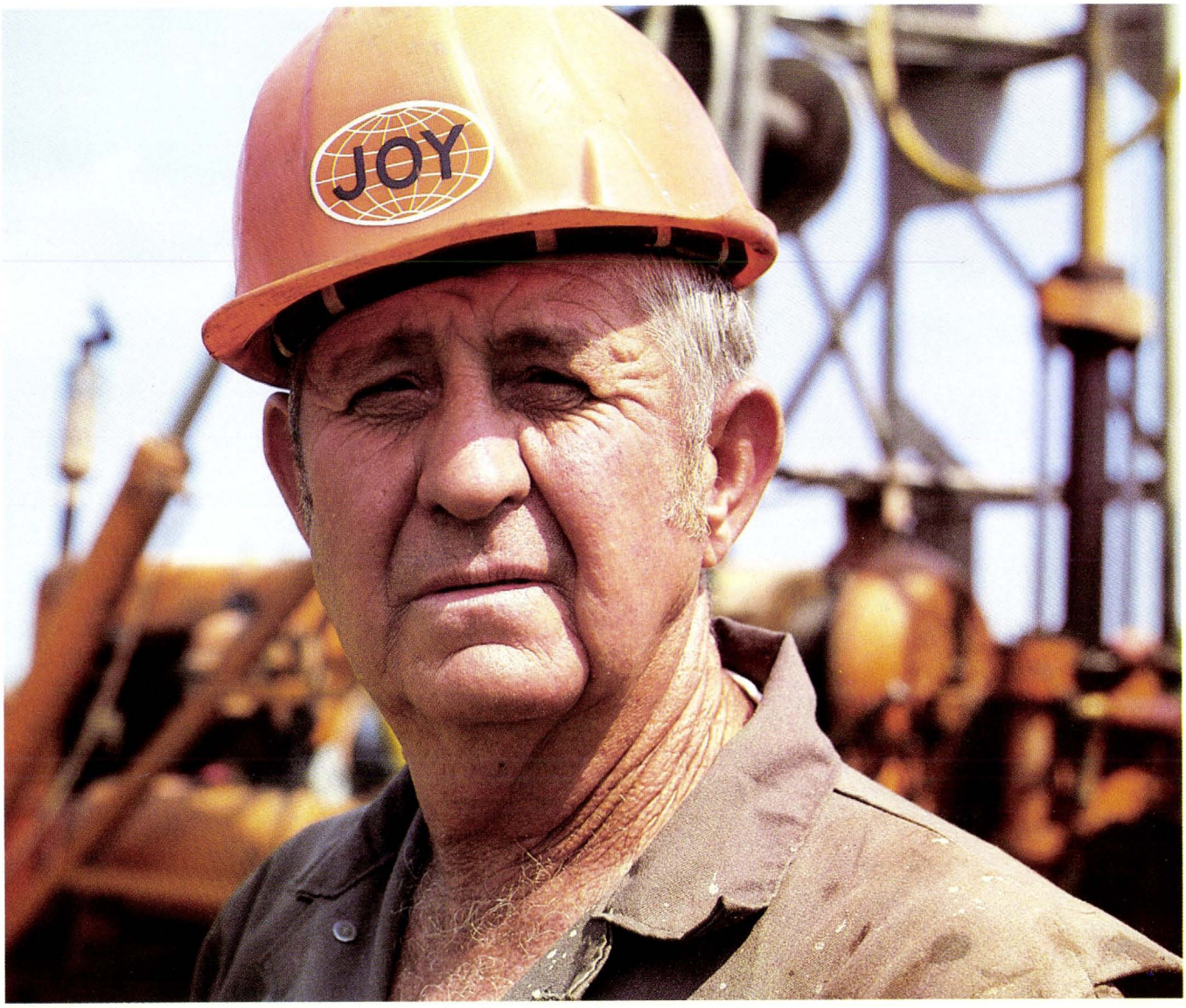
Modern Drilling Equipment and Techniques

Joy Manufacturing Company is one of the world's leading designers and manufacturers of mining machinery, so the Contract Core Drill Division has access to the most modern drilling equipment available—*as it is developed.* All of Joy's completely self-sufficient drilling rigs are equipped to employ the latest drilling techniques. And all machinery is kept in top working order by the best mechanics in the business.

Nationwide Service

Joy Contract Core Drill Division field offices and warehouses are strategically located to insure all clients of fast, nationwide service. These offices and warehouses are totally dedicated facilities; servicing core drilling clients is their sole function. Core drilling teams can be dispatched quickly from any of these locations to any site in the United States, and they are backed by all of Joy's resources.

Experience.



It can't be taught.

When Leland Machen joined Joy Contract Core Drill Division in 1953, his father already had been working for us for almost 20 years.

Leland is typical of the Joy employees working on our drilling teams. They're a special breed. Tough. Sophisticated in the use of the latest drilling techniques and technology. But with a certain kind of horse sense that just can't be taught.

Call it experience.

The members of our drilling teams bring an average of over 15 years of experience to the job site. Like Leland, they know the importance of maintaining the absolute confidentiality of core samples. And they work to fulfill Joy's commitment to its customers of guaranteed satisfactory core recovery on every job.

Since 1884, we have been providing exploratory and developmental contract core drilling services for metallic and non-metallic minerals for investigation of dam sites and underground gas formations, and for foundation testing. So when you deal with Joy, you're dealing with people who have learned many lessons that just can't be taught.

Joy Contract Core Drill Division celebrates its 100th Anniversary this year.

For information on our services, call or write:

Joy Manufacturing Company

Contract Core Drill Division, Marketing Services
301 Grant Street, Pittsburgh, PA 15219
(800) 458-1115—Outside Pennsylvania
(800) 458-1116—Within Pennsylvania

Joy Contract Core Division Quotation Request

707 Boyd Boulevard • LaPorte, Indiana 46350 • Telephone: (219) 362-2191

Please fill in as much of the information you have available so that we can evaluate your project and prepare a quotation.

Name _____

Title _____

Telephone (Home) _____

(Office) _____

Company Name _____

Mailing Address _____

_____

_____

PROJECT LOCATION

Nearest Town _____

How many miles to site _____ Direction _____

Project Site Elevation _____

County _____

State _____

Terrain ☐ Flat ☐ Rolling ☐ Mountainous

Access Road Condition _____

Is access road difficult when wet? ☐ Yes ☐ No

Will a dozer be available? ☐ Yes ☐ No

PROJECT DESCRIPTION

Purpose of Drilling _____

Overburden Description _____

Overburden Depth _____ Feet

Rock/Formation to Maximum Drill Depth

_____

Total Project Footage _____

Number of Holes _____

Hole Depth in Feet

Minimum _____ Maximum _____ Average _____

Distance Between Holes

Minimum _____ Feet or _____ Miles

Maximum _____ Feet or _____ Miles

HOLE INFORMATION

Inclination ☐ Vertical ☐ Flat ☐ Angle

From _____ Degrees to _____ Degrees

Core Size (Diameter)

☐ NCWL (2-7/16") ☐ BXWL (1-7/16")

☐ NXWL (2") ☐ AXWL (1")

WATER SUPPLY

Distance from Drilling Site _____ Feet _____ or Miles

☐ Stream ☐ Pond or Lake ☐ Other

Maximum Elevation Difference from Water Supply to Drill Sites _____ Feet

Is Water Source ☐ Uphill ☐ Downhill from Site

WORK SCHEDULE

Shifts Per Day _____

☐ 5 or 6 Days Per Week ☐ 10 Days On—4 Days Off

☐ Other _____

Desired Starting Date _____

Desired Completion Date (if any) _____

PREVIOUS DRILLING DATA (if any)

Total Footage Drilled _____

Average Bit Life _____

Minimum Hole Depth Footage _____

Maximum Hole Depth Footage _____

Average Footage Drilled Per 8-Hour Shift _____

OTHER

Please provide any other important information (Hole Surveying? Soil Sampling? Etc.)

_____

_____

_____

_____

_____

_____

MY REQUIREMENTS

☐ Estimate for Information or Budgeting

☐ Firm Bid—Can We Arrange A Site Visit ☐ Yes ☐ No

☐ Project is Confidential—Desire Telephone Call

_____

Signature

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LaPorte, IN 46350

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Mailing Address _____

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PROJECT LOCATION

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How many miles to site _____ Direction _____

Project Site Elevation _____

County _____

State _____

Terrain ☐ Flat ☐ Rolling ☐ Mountainous

Access Road Condition _____

Is access road difficult when wet? ☐ Yes ☐ No

Will a dozer be available? ☐ Yes ☐ No

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OTHER

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_____

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Signature

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