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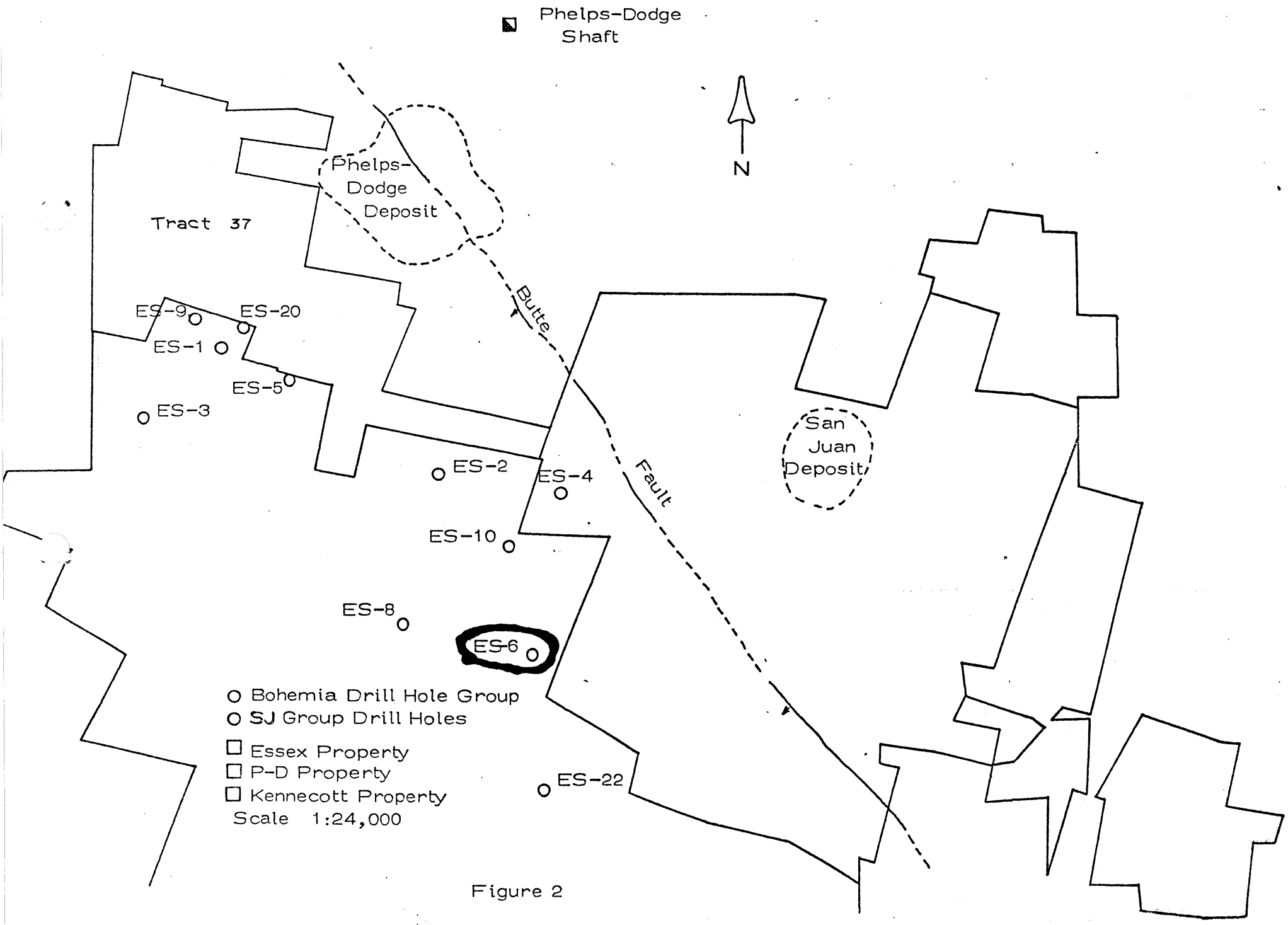
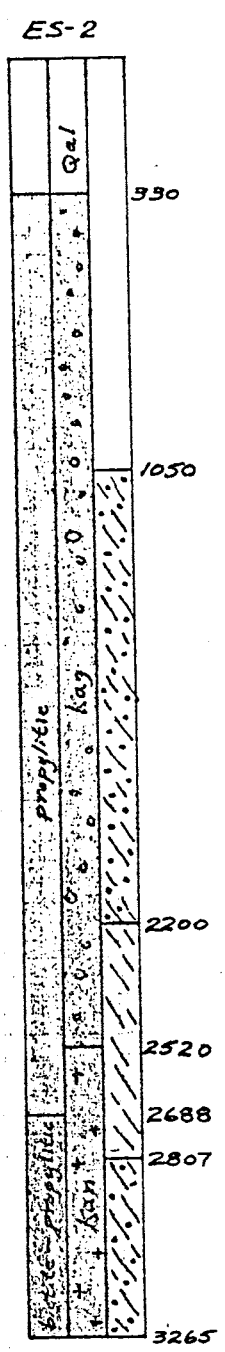
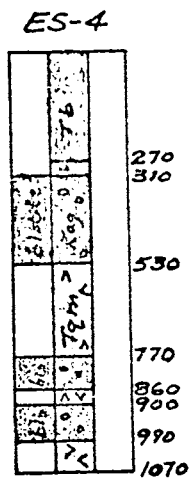
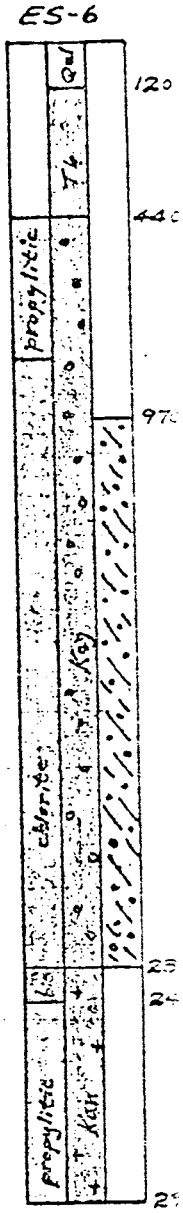

Phelps-Dodge
Shaft
N
Phelps-
Dodge
Deposit
Tract 37
Butte
Fault
San
Juan
Deposit
ES-9
ES-20
ES-1
ES-5
ES-3
ES-2
ES-4
ES-10
ES-8
ES-6
ES-22
Bohemia Drill Hole Group
SJ Group Drill Holes
Essex Property
P-D Property
Kennecott Property
Scale 1:24,000

Figure 2


ES-2
Qal
propylitic
Kag
Kan
330
1050
2200
2520
2688
2807
3265


ES-4
270
310
530
770
860
900
990
1070


ES-6
Qal
propylitic
chlorite
Kag
Kan
120

105,975.3

ES-6 COLLARED 9-8-72 COMPLETED 11/4/72 TD 2958'

ROTARY: 0 - 1085'

DIAMOND: 1085' - 2958'

ROTARY: 1085'

NUMBER OF SHIFTS : 25

COST PER SHIFT : $~~542.46~~ 375.94

AVG FOOTAGE PER SHIFT : 43

COST PER FOOT : $~~12.49~~ 8.66 *9398.79

TOTAL COST: $~~13,561.74~~

DIAMOND: 1873' NX

NUMBER OF SHIFTS : 78

COST PER SHIFT : $283.10

AVG FOOTAGE PER SHIFT : 24

COST PER FOOT : $11.78

TOTAL COST: $22,082.35

COMPLETE HOLE 2958'

NUMBER OF SHIFTS : 103

COST PER SHIFT : $~~346.05~~ 305.64

AVG. FOOTAGE PER SHIFT : 28

COST PER FOOT : $~~12.05~~ $10.69 *31,481.09

TOTAL COST: $~~35,644.09~~

* BOYLES CHARGED US FOR 3860 FEET OF CASING ON THIS HOLE. THE DIFFERENCE IN COST REPRESENTS A FIGURE IF THEY WOULD HAVE CHARGED CASING OF 1085 FEET @ 1.50/FT.

Sample No. ES-6 1176

Thin section texture: Porphyritic, fine grained groundmass.

Mineralogy

plagioclase
chlorite
epidote
opaques
(pyrite)
(something else)
biotite
glass(?)
calcite
orthoclase

Plagioclase-Subhedral phenocrysts up to 3mm in length. Some are cloudy. Some epidote and calcite alteration. In areas where biotite occurs in the groundmass, some biotite also occurs in plagioclase sites.

Chlorite-Fine to medium grained crystals. Fairly abundant where biotite is absent.

Epidote-Not too abundant. Mostly in areas where chlorite occurs.

Biotite-Very fine grained biotite is fairly abundant in one end of the thin section. Occurs in the groundmass in some plagioclase sites. In other areas of the thin section biotite seems to be absent and the groundmass is mostly glass(?). Colorless mineral(?) intergrown with biotite in some areas.

Calcite-In one small area calcite is fairly abundant associated with chlorite. Some pyrite is present in the same area. Staining the slab shows that orthoclase is also present.

Sample No. ES-6 1425

Thin section texture: Porphyritic, fine grained groundmass.

Mineralogy	Est. %
Plagioclase	40
Chlorite	<5
Quartz	20-25
Pyrite	1-2
Sphene	
Sericite	
Epidote	
Glass(?)	25-30
Apatite	

Plagioclase-Subhedral phenocrysts up to 3mm in length. Moderate to strong sericite alteration. Some clay minerals.

Chlorite-Scattered throughout slide. Mostly in irregular masses, some more or less prismatic masses. Sometimes associated with quartz.

Quartz-Fine grained, scattered throughout groundmass.

Pyrite-Disseminated

Glass-Approximately one half of the groundmass is a cloudy material with very low birefringence. Some very fine grains can be recognized. Appears to be a partially devitrified glass. Plagioclase and fine-grained quartz are set in this material.

Sample No. ES-6 2743

Texture: Fine grained porphyritic, lithic fragments

Mineralogy

Plagioclase	50-55
Hornblende	~ 10
Chlorite	
Epidote	
Sphene	
Magnetite	
Hematite	
Sericite	
Quartz	
Calcite	
Orthoclase	

Plagioclase occurs as anhedral to subhedral phenocrysts. Maximum size 1.5mm. Moderate epidote alteration, some sericite alteration. Irregular phenocrysts of hornblende are fairly abundant and are being replaced by epidote. Pale green chlorite is fairly abundant in the groundmass. Sphene is scattered throughout the rock. Most of the groundmass is too fine grained to permit identification and some glass is present. The lithic fragments are similar to the rock itself. Epidote is more abundant in some of them than in the matrix and one fragment contains noticeable amounts of orthoclase along with plagioclase.

Sample No. ES-6 2945

Texture: Porphyritic, fine-grained, some flow orientation, heterogeneous, lithic fragments.

Mineralogy

Plagioclase
Quartz
Epidote
Chlorite
Orthoclase
Sericite
Calcite
Biotite (?)
Glass
Apatite

This rock is very heterogeneous. The major part of the thin section is composed of a very fine grained groundmass which appears to be glass in part. Set in this are minute feldspar laths that show a poor flow orientation. Staining indicates that orthoclase is present in the groundmass in some areas. Layer (up to 2mm) plagioclase phenocrysts are present but make up less than ~30% of the total vulume. These phenocrysts show moderate alteration to wericite and epidote. Coarser grained epidote is also present in some areas. Chlorite is fairly abundant as masses usually less than 1mm in diameter. A few clusters of a darker green mineral are present with higher birefringences that appear to be biotite. These make up less than 2% of the slide. Some lithic fragments appear very similar to the rock described above. Some others are coarser grained and appear to be composed largely of orthoclase, plagioclase and variable amounts of quartz. Calcite occurs in small veinlets.

DRILL HOLE SAMPLES														PAGE 1	OF
	PROPERTY			DISTRICT	COUNTY	STATE	COUNTRY								
HOLE NO. ES-6		CONTRACTOR		COLLAR COORD. N E		COLLAR ELEV.									
BEARING		INCLINATION		DEPTH		STARTED	STOPPED								

SAMPLE NUMBER	BIT SIZE	RECOVERY FEET	RECOVERY %	DRILL RUN FROM	DRILL RUN TO	INT.	ASSAYS	REMARKS
				60	70		poor sample, mixed latite(?) agglomerate	
				70	80		Tb - mostly latite, reddish-gray-tan, v.f.g.	
				89	90	gravel zone	" " gray or tan	
				90	100		mixed latite + biotized andesite agglomerate (traces	
				100	110		" " also some only propylitized chrysocolla	
				110	120		" " " "	
				120	130		Tb gray v.f.g. latite(?) speaked % orange-red Fe oxide	
				130	140		" " " "	
				140	150		" " " "	
				150	160		" " " marked increas in Fe oxid 20%	
				160	170		" " " " "	
				170	180		decrease in Fe oxide to 5%	
				180	190		" " "	
				190	200		" " "	
				200	210		" " " mostly chips % high Fe oxide content	
				210	220		" " "	
				220	230		" " " lower Fe oxide	
				230	240		" " " "	
				240	250		" " " "	
				250	260		" " " "	
				260	270		" " several chips red vesicular material	
				270	280		" " " " "	
				280	290		brick red, weakly vesicular, baked zone, good	
				290	300		secondary quartz; microscopic lineation strong	
				300	310		due to alignment of needle like plagioclase lathes	
				310	320		" "	
				320	330		" "	
				330	340		" "	
				340	350		" " 20% gray v.f.g. latite as above	
				350	360	mostly	Tb - andesite(?) dark gray, very little Fe oxide, v.f.g. with	
				360	370		microscopic texture same as 280-340	
				370	380		" " " "	
				380	390		" " " "	
				390	400		20% brick red chips	
				400	410		dark gray v.f.g. andesite(?) same texture as above	
				410	420		" " % more Fe oxide, secondary qtz	
				420	430		" " " "	
				430	440		" " " "	
				440	450		80% Kag light brownish, bleached, Fe stained with	
				450	460		pretty good secondary quartz but weak if any sericite;	
				460	470		traces propylitic alteration	
				470	480		450-460 20% white siliceous chips	
				480	490		470- Kag, bright reddish orange Fe oxide as discrete strong staining,	
				490	500		angular dissemations, occasionally as coatings, the Fe oxide is	
				500	510		dull light brown, good silicification	
				510	520		" " " "	
				520	530		" " " "	
				530	540		less Fe, fragments not stained % Fe are usually a neutral light gray	
				540	550		color % some being darker suggesting incipient biotite	
				550	560		Kag, 50-60% light-med gray; rest are Fe stained	
				560	570		" " " " contaminated % Tb	
				570	580		golden limonite, qtz-sericite strong, <10% light gray	
				580	590		" " " " "	
				590	600		" " " " " "	
				600	610		" " " " " 60% " "	
				610	620		" " " " " "	
				620	630		" " " " " 40% " "	
				630	640		" " " " " "	
				640	650		mixed limonite stained vein material + chl-biot agglom.	
				650	660		" " " " " "	
				660	670		" " " " " pretty good biotite	
				670	680		" " " " " "	
				680	690		" " " " weaker biotite	
				690	700		" " " " "	
				700	710		" " " " "	

DRILL HOLE SAMPLES

PAGE | OF

PROPERTY	DISTRICT	COUNTY	STATE	COUNTRY

HOLE NO. ES-6	CONTRACTOR	COLLAR COORD. N E	COLLAR ELEV.
BEARING	INCLINATION	DEPTH	STARTED STOPPED

SAMPLE NUMBER	BIT SIZE	RECOVERY FEET	RECOVERY %	DRILL RUN FROM	DRILL RUN TO	INT.	ASSAYS	REMARKS
				710	720		" " "	"
				720	730		Kag, 40% Fe stained, rest shows incipient- to weak	
				730	740		" " of trace chlorite biotite	
				740	750		" " " some Fe is hematite	
				750	760		" " alteration obscured by veir mineralization	
				760	770		" " " " finely disem magnetite	
				770	780		" " biotite quite impaired to break	
				780	790		" " "	
				790	800		" " " decrease in Fe stained chips	
				800	810		predominately Kag of incipient biotite, red Fe from magnetite	
				810	820		" " " some weak chlorite alteration	
				820	830		mostly chlorite alteration	
				830	840		" " " "	
				840	850		" " " " "	
				850	860		" " " " "	
				860	870		marked change to red vein material of qtz-sericite lim-hem	
				870	880		lost circulation no sample	
				880	890		" " " "	
				890	900		" " " "	
				900	910		primarily Fe stained vein material small amounts chlor. agglom.	
				910	920		" " " also traces secondary biotite	
				920	930		60% vein material, 40% chloritized agglom of some biotite + weak sericite	
				930	940		" " " " "	
				940	950		" " " " little better biotite	
				950	960		60% Kag of chlor.-biot-ser-Fe stain, rest is vein material	
				960	970		" " " " "	
				970	980		30% Kag chloritized-bleached of 3-5% disem pyrite } plus other material	
				980	990		" " " " "	
				990	1000		Kag chloritic of some biotitic alteration, 3-5% pyrite	
				1000	1010		" " " traces chalcopyrite of lesser bornite	
				1010	1020		" " " " + possibly chalcopyrite? (< 0.1% Cu)	
		→		1020	1030		little stronger pyrite, weaker biotite	
				1030	1040		" " 1-2% magnetite	
				1040	1050		" " lower sulfides	
				1050	1060		" "	
				1060	1070		" "	
				1070	1085		Kag, weak biotite, moderate chlorite, weak sericite	
							= 3% sulfides, traces chalcopyrite with even	
							smaller amounts of bornite; sulfides are disseminated	
				1085	END OF HOLE			
					CASED 9-20-72			

DRILL HOLE SAMPLES — WORK SHEET — PAGE ___ OF ___

PROPERTY: ES-6 | DISTRICT | COUNTY | STATE | COUNTRY

HOLE NO. | CONTRACTOR | COLLAR COORD N E | COLLAR ELEV.

BEARING | INCLINATION | DEPTH | STARTED | STOPPED

SAMPLE NUMBER	BIT SIZE	RECOVERY FEET	RECOVERY %	DRILL RUN FROM	DRILL RUN TO	INT.	ASSAYS							REMARKS
6301	NX	5	100	1135	1140	5'								
6302		5	100	1202	1207	5'								
6303		5	100	1248	1253	5'								
6304		5	100	1305	1310	5'								
6305		5	100	1349	1356	5'								
6306		5	100	1414	1419	5								
6307		5	100	1457	1462	5'								
6308		5	100	1500	1505	5'								
6309		5	100	1555	1560	5'								
6310		5	100	1600	1605	5'								
6311		5	100	1650	1655	5								
6312		5	100	1700	1705	5'								
6313		5	100	1751	1756	5'								
6314		5	100	1802	1807	5'								
6315		5	100	1849	1849	5'								
6316		5	100	1905	1910	5'								
6317		5	100	1951	1956	5'								
6318		5	100	2002	2007	5'								
6319	(ES-5)	5	100	2902	2907	5'								
6320	"	5	100	2950	2955	5'								
6321	"	5	100	3000	3005	5'								
6322	"	5	100	3048	3053	5'								
6323	"	5	100	3102	3107	5'								
6324	"	5	100	3153	3158	5								
6325	"	5	100	3205	3210	5								
6326	"	"	"	3210	3215	5								
6327	"	"	"	3255	3260	5								
6328	"	"	"	3300	3305	5								
6329	(ES-6)	"	"	2051	2056	5								
6330	"	"	"	2104	2109	5								
6331	"	"	"	2149	2154	5								
6332	"	"	"	2204	2209	5								
6333	"	"	"	2247	2252	5								
6334	"	"	"	2297	2302	5								
6335	"	"	"	2352	2357	5								
6336	"	"	"	2397	2402	5								
6337	"	"	"	2451	2456	5								
6340	"	"	"	2503	2508	5								
6341	"	"	"	2551	2556	5								
6342	"	"	"	2607	2612	5								
6343	"	"	"	2649	2654	5								
6344	"	"	"	2697	2702	5								
6345	"	"	"	2753	2758	5								
6346	"	"	"	2802	2807	5								
6347	"	"	"	2849	2854	5								
6348	"	"	"	2899	2904	5								
6349	"	"	"	2951	2956	5								

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 1 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU	% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
			1085				disseminated sulfides 1-5% averaging about 3% predominantly Fe but Cu chalcopyrite also present in small amounts pyrite also common on fx and in veinlets; veinlets have bleached sericitized zones bordering	weak to moderate chloritic w/ weak sericitic; matics → chlorite with an occasional black core possibly biotite no epidote chlorite selvages on fx and in veinlets very finely dissem. black specks probably magnetite, some of bigger grains are, ≈1%	Kag - andesite agglomerate gray - greenish gray
		95							
			1095						
		100							
			1105						
		90							
			1115						
		100							
			1119						
		100							
			1128						
		90							
			1138						
		100							
			1148						
		100							
			1158						
		100							
			1168						
		100							
			1178						

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 2 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
									same weak to mod. chlorite-sericite	same
			100					≈1185 marked decrease in dissem sulfides to <0.5%; increase in magnetite up to 6% also less pyrite on fy's		
				1188						
			100							
				1194						
			100							
				1204						
			100							
				1214						
			100							
				1222						
			90							
				1232						
			100							
				1240						
							interesting x-stals 1243			
			100				1245-1256 golden limonite + waxy green mineral on oxidized fy			
				1250						
			100							
				1256				≈1256 dissem pyrite increasing		
			100							
				1265						
			100							
				1275						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 3 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
			100					2% dissem. pyrite	Same	Same
				1285						
			100							
				1295						
			100							
				1305				1304 - 1315 another zone of gold limonite + green mineral on fx + veinlets small fissure vein 1313		
			100				1308-1309 traces acid dikes w/ chloritized mafic phenocrysts in v.f.g. light groundmass; strong dissem pyrite			
				1311						
			100							
				1321				≈1321 zone of low dissem sulfides veinlets uncommon, usually chlorite on fx		≈1321 - 1356 fragmental texture very poor, probably tuff or flow unit
			100							
				1331						
			100							
				1340			1342 - 1350 yellow to gold limonite and green mineral related to small fissure vein at 1349			
			100							
				1350						
			100							
				1360						
			100							
				1370						
			100							
				1380						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 4 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
									same	same
			100							
				1390						
			100							
				1400						
			100							
				1410						
			100				1417 3/4 in pyrite vein w/ silicification	good diss pyrite below 1417 ≈ 5%+	strong increase in hardness of rock probably due to added silica - persists with depth	
				1420						
1425 thin section			100							
				1429			1431 - 1447 broken zone w/ moderate yellow limonite on fx			
			95							
				1435						
			95							
				1440						
			95							
				1449						
			100				moderately broken dominant direction subparallel to core axis		predominantly chloritic, weak sericite most intense along sulfide veinlets; weak epidote	Kag - andesite agglomerate green-gray fragmental structure generally poorly defined
				1458				finely disseminated pyrite varies 1-3% average 2% very locally 10%, only smallest trace chalcopyrite		
			100							
				1468				sulfide veinlets subparallel core axis usually partially oxidized to red goethite but in a few areas is yellow jarosite	disseminated magnetite varies 1-4% but generally low	
			100							
				1478						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 5 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY COLLAR COORD. N. E. COLLAR ELEV.

STATE

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
									Same	Same
			100							
				1487						
			100							
				1497						
			100				zone of stronger sulfide veining subparallel core axis; partially oxidized to brown goethite			
				1505						
			100							
				1515						
			100							
				1525						
			100							
				1535					1533 1/2 halo of f.g. biotite around thin pyrite-chl-ser veinlets	
			100							
				1545						
			100							
				1555						
			100				oxidation products predominantly brown goethite w/ minor yellow jarosite; markedly less red goethite-hematite(?)			
				1561						
			100							
				1569						
			100							
				1579						

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 6 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
									Same	Same
			100							
				1588						
			100							
				1598						
			95							
				1604						
			100	1606						
			100							
				1616						
			5							
				1621						
			100							
				1631						
			100							
				1640						
			100							
				1650						
			100							
				1655						
			100							
				1663						
			100							
				1673						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 7 OF

SCALE
STARTED
STOPPED
NOTES BY
DEPTH
BEARING
INCLINATION
PROPERTY
COUNTY
STATE
COLLAR COORD. N. E.
COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
			100						same	same
				1683				quartz appearing in sulfide veinlets		
			100							
				1691						
			100							
				1700						
			100							
				1710						
			95							
				1718						
			100							
				1728						
			100							
				1738			1731-1737 good 1/8-1/4" pyrite vein with thin halo of quartz and bleaching			
			100							
				1748						
			95							
				1758						
			100				1761-1778 strong brn-red-yellow limonite on fx, strong dark red limonite flooding and dissem.			
				1768						
			100				1778-1799 good brn limonite on fx and veinlets			
				1775			strong pyrite in and adjacent to vein 1777-1781			

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 8 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU	% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
		100				below here weak brown limonite or no limonite, only pyrite + sericite on fx		same	same
			1785						
		90							
			1789						
		95					total sulfide content lower below here due to absence of veins and fx coatings	finely dissem magnetite varies widely from 0.5% to 4%, average 1-2%	
			1799						
		100							
			1802			1800-1806 badly broken			
		100					dissem. pyrite 1-2%		
			1806						
		100							
			1810						
		90							
			1818						
		100							
			1826						
		100							
			1831						
		100							
			1839						
		100							
			1849				1848 trace bornite		
		100							
			1859			small zone of high magnetite and high chalcopyrite/pyrite ratio			
		100							
			1867						
		100							
			1876						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 9 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY COLLAR COORD. N. E. COLLAR ELEV.

STATE

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
			100						Same	Same
				1883			moderately broken throughout			
			100							
				1887						
			100							
				1890						
			100							
				1895						
			100							
				1904				disseminated pyrite varies from <.5% to 5%; averages 2-3% veinlets sub parallel to core axis or at about 30° limonite is gold to orange-brown	generally a weak bleached + sericitized halo around veinlets ± thin layer of chlorite	
			100							
				1912						
			Box goes 1905 to 1924							
				1924						
			100				1928 good dissem chalcopyrite with bornite			
				1930						
			90							
				1939						
			100							
				1949						
			100							
				1959						
			100							
				1968						
			100							
				1978						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 10 OF

SCALE
STARTED
STOPPED
NOTES BY
DEPTH
BEARING
INCLINATION
PROPERTY
COUNTY
STATE
COLLAR COORD. N. E.
COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU	% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
								Same	Same
		100							
			1988						
		100							
			1998				below ≈ 2000 there is pretty marked decrease in veinlet frequency but not so much in diss. pyrite		
		100				generally moderately broken but locally strong			
			2008						
		100							
			2016						
		100							
			2020						
		100							
			2023						
		90							
			2026						
		100							
			2031						
		88							
			2039						
		95							
			2041						
		30							
			2042						
		95							
			2049						
		100							
			2057						
		100							
			2063						
		100							
			2071						
		100							
			2076						
		100							

DIAMOND DRILL LOG

SCALE _____ STARTED _____ STOPPED _____ NOTES BY _____

DEPTH ES-6 BEARING _____ INCLINATION _____

HOLE No. ES-6 SHEET 11 OF _____

PROPERTY _____ COUNTY _____ STATE _____ COLLAR COORD. N. _____ E. _____ COLLAR ELEV. _____

ASSAYS % MO	ASSAYS % CU	% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
			2081					Same	Same
		90							
			2088						
		100							
			2094						
		100							
			2104						
		100							
			2114						
		100							
			2121						
		100							
			2131			2130 approximate bottom of broken zone; good solid core below here also very little oxidation below here	below 2130 sulfide veinlets are sparse diss pyrite persists for 20-30 feet then gradually decreases to less than 1% by 2170 still traces of chalcopyrite		
		100							
			2141						
		100							
			2150						
		100							
			2160						
		100							
			2170						
		100							
			2180						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 12 OF

SCALE
STARTED
STOPPED
NOTES BY
DEPTH
BEARING
INCLINATION
PROPERTY
COUNTY
STATE
COLLAR COORD. N. E.
COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
								sparse veinlets tend to be at high angle to core axis	Same	Same
			100				weakly fractured w/ sericite on most surfaces			color more gray than green
				2190				trace cpy		
			100					total diss. sulfides low, 1-2%, but ratio of cpy/py appears to be higher		
				2200						
			100			cpy				
				2210						
			100							
				2220						
		+3.5	100							
				2230						
			100							
				2238						
			80	2240						
			100							
				2248						
			100							
				2255						
			100							
				2265						
			100							
				2275						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 13 OF

SCALE
STARTED
STOPPED
NOTES BY
DEPTH
BEARING
INCLINATION
PROPERTY
COUNTY
STATE
COLLAR COORD. N. E.
COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU	% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
		100						Same	Same
			2285				pyrite veinlets have pyrite-calcite core with rim of sericite + bleaching and chlorite halo outside the sericite; some of the chlorite halos contain black areas possibly biotite		
		100							
			2295						
		100							
			2305				dissem sulfides weak <.5% but a lot of it is cpy		
		100							
			2315					3-5%, dissem. magnetite	
		100							
			2325						
		100							
			2335						
		100							
			2345						
		100							
			2355			moderately broken zone with strong sericite and/or clay on fractures	no sulfides mod-strong brick red limonite (hematite) dissem, flooding and on most fractures, appears to result from oxidation of magnetite	2355 start of biotite alteration with some chlorite and ubiquitous epidote	also start of a section of fine-grained andesite unit Kan
		100							
			2364						very weak fragmental structure
		100							
			2373						
		100				2380 bottom of clay zone			

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 14 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	% CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
									Same	Kan
				2383						
			100							
				2390			start of another			
			100							
				2396						
			100							
				2405			bottom of clay zone			
			100							
				2415			2413 broken zone adjacent to fissure vein, dark red limonite flooding massive and on fractures	Some oxidized veinlets contain gold limonite	strong qtz-sericite alteration and zone 2424-2426 contains some massive pink areas due to K-feldspar alteration	
			100							
				2423						
			100							
							2429 base of zone		biotite	
				2433					weak epidote usually in small clumps ≤ 1/4"	
			100							
				2443						
			100							
				2450					no biotite	
			100						chlorite alteration weak sericite	
				2460						
			100							
				2470			2468 start of another zone, moderately broken, strong clay/sericite on f&s			
			100							
				2477						

DIAMOND DRILL LOG

HOLE No. ES-6 SHEET 15 OF

SCALE | STARTED | STOPPED | NOTES BY | DEPTH | BEARING | INCLINATION | PROPERTY | COUNTY | STATE | COLLAR COORD. N. | E. | COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU	% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
		100	2486					Same	Same still fragmental structure
		100	2493						
		100	2501						
		100	2503						
		85	2508			approx base of zone			
		95	2510						
			2520					moderate epidote	color grayish-green to dark red due to hematite oxidation products from magnetite
		100	2530						
		100	2540						
		100	2550				local traces pyrite		
		100	2559						
		100	2569						
		100	2575						

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 16 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
			100						Same	Same
				2585						
		2								
				2595						
			100							
				2606						
			100							
				2612			fxs and rare veins carry dark red limonite			
			100							
				2618						
			100							
				2628						
								none		
			100						epidote is strong in the clastic fragments but weak to moderate in the matrix	fragments common up to 2-4"
				2638						
			100				the brick red limonite (hematite) usually rims magnetite grains			
				2648						
			100							
				2658						
			100							
				2668						
			100							
				2678						

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 17 OF

SCALE STARTED STOPPED NOTES BY

DEPTH BEARING INCLINATION

PROPERTY COUNTY STATE COLLAR COORD. N. E. COLLAR ELEV.

ASSAYS % MO	% CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
									Same	Same
			100					dark red limonite + clay? on fxs	proylitic, weak seriate	Kan
				2688				weak diss brick red		
			95					also calcite on fxs and in groundmass	mod-strong dissem magnetite 2-4% locally 6-8%	
				2697						
			100				moderate fracturing			
				2707						
			100							
				2717						
			90							
				2723						
			100							
				2733						
			100					very rare pyrite on fx		
				2743						
			100							
				2753						
			100							
				2763						
			100							
				2773						

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 17 OF

SCALE
STARTED
STOPPED
NOTES BY
DEPTH
BEARING
INCLINATION
PROPERTY
COUNTY
STATE
COLLAR COORD. N. E.
COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
			100						Some weak to moderate epidote in clumps mod to strong clay? on fxs with brown or dark red limonite	Kan
				2783						
			100							
				2793						
			100					small patch diss pyrite 2799		
				2803					some areas weakly silicified	
			100							
				2813						
			100							
				2823			end of limonite			
			90					a few fxs carry pyrite, traces diss pyrite	mostly calcite on fx with varying amounts of clay	
				2833						
			100							
				2843						
			100							
				2852						
			100							
				2862						
			95				2867-2869 small shear zone	weak dark red limonite down to about 2874		
				2872				only very little below that		
			100							

DIAMOND DRILL LOG

HOLE No. ES-1 SHEET 18 OF

SCALE
STARTED
STOPPED
NOTES BY
DEPTH
BEARING
INCLINATION
PROPERTY
COUNTY
STATE
COLLAR COORD. N. E.
COLLAR ELEV.

ASSAYS % MO	ASSAYS % CU		% RECOV.	DEPTH	Graph	COL.	DETAIL	MINERALIZATION	ALTERATION	ROCK TYPE
				2881				rare pyrite seams about 70° to core axis with thin chlorite selvage, bleached halo	Same	Same Kan
			100							
				2891						
			100							
				2901						
			100							
				2911						
			100							
				2921						
			100							
				2931						
			95							
				2941				only traces pyrite very weak dark red limonite on fts w/ clay?	chlorite + epidote + calcite weak silicification general alteration at bottom of hole is weak	
			95							
				2951						Kan fragmental but fine-grained
			90							
				2958			EOH			

DRILL HOLE SAMPLES — Nail Keg 8 claim — PAGE 1 OF

PROPERTY	DISTRICT	COUNTY	STATE	COUNTRY

HOLE NO.	CONTRACTOR	COLLAR COORD.	COLLAR ELEV.
ES-6		N E	

BEARING	INCLINATION	DEPTH	STARTED	STOPPED

SAMPLE NUMBER	BIT SIZE	RECOVERY FEET	RECOVERY %	DRILL RUN FROM	DRILL RUN TO	INT.	ASSAYS	REMARKS
				60	70			poor sample, mixed latite(?) + agglomerate
				70	80		Tb - mostly latite, reddish-gray-tan, v.f.g.	
				80	90	gravel zone	" " gray or tan	
				90	100		mixed latite + bitized andesite agglomerate (traces	
				100	110		" " also some only propylitized chrysocolla	
				110	120		" " "	
				120	130		Tb gray v.f.g. latite(?) speckled % orange-red Fe oxide	
				130	140		" " " "	
				140	150		" " " "	
				150	160		" " " marked increase in Fe oxide 20%	
				160	170		" " " "	
				170	180		decrease in Fe oxide to 5%	
				180	190		" " "	
				190	200		" " "	
				200	210		" " " mostly chips % high Fe oxide content	
				210	220		" " "	
				220	230		" " " lower Fe oxide	
				230	240		" " " "	
				240	250		" " " "	
				250	260		" " " "	
				260	270		" " several chips red vesicular material	
				270	280		" " " "	
				280	290		brick red, weakly vesicular, baked zone, good	
				290	300		secondary quartz; microscopic lineation strong	
				300	310		due to alignment of needle like plagioclase laths	
				310	320		" "	
				320	330		" "	
				330	340		" "	
				340	350		" " 20% gray v.f.g. latite as above	
				350	360	mostly	Tb - andesite(?) dark gray, very little Fe oxide; v.f.g. with	
				360	370		microscopic texture same as 280-340	
				370	380		" " " "	
				380	390		" " " "	
				390	400		20% brick red chips	
				400	410		dark gray v.f.g. andesite(?) same texture as above	
				410	420		" " " % more Fe oxide, secondary qtz	
				420	430		" " " "	
				430	440		" " " "	
				440	450		80% Kag light brownish, bleached, Fe stained with	
				450	460		pretty good secondary quartz but weak if any sericite;	
				460	470		tracks propylitic alteration	
				470	480	propylitic alteration	450-470 20% white siliceous chips strong staining,	
				480	490		470- Kag, bright reddish orange Fe oxide as discrete	
				490	500		angular disseminations, occasionally as coatings, other Fe oxide is	
				500	510		dull light brown; good silicification	
				510	520		" " " "	
				520	530		" " " "	
				530	540		less Fe, fragments not stained % Fe are usually a neutral light gray	
				540	550		color % some being darker suggesting incipient biotite	
				550	560		Kag, 50-60% light-red gray; rest are Fe stained	
				560	570		" " " " contaminated % Tb	
				570	580	incipient biotite	golden limonite, qtz-sericite strong; <10% light gray	
				580	590		" " " " "	
				590	600		" " " " "	
				600	610		" " " " " 60% " "	
				610	620		" " " " " "	
				620	630		" " " " " 40% " "	
				630	640		" " " " " "	
				640	650		mixed limonite stained vein material + chl-biot agglom.	
				650	660		" " " " " "	
				660	670		" " " " " pretty good biotite	
				670	680		" " " " " "	
				680	690		" " " " weaker biotite	
				690	700		" " " " "	
				700	710		" " " " "	

DRILL HOLE SAMPLES

PAGE | OF

PROPERTY	DISTRICT	COUNTY	STATE	COUNTRY

HOLE NO. ES-6	CONTRACTOR	COLLAR COORD. N E	COLLAR ELEV.
BEARING	INCLINATION	DEPTH	STARTED STOPPED

SAMPLE NUMBER	BIT SIZE	RECOVERY FEET	RECOVERY %	DRILL RUN FROM	DRILL RUN TO	INT.	ASSAYS	REMARKS
				710	720		" " "	"
				720	730		Kag, 40% Fe stained, rest shows incipient- to weak biotite	
				730	740		" " w/ trace chlorite	
				740	750	incipient biotite	" " "	some Fe is hematitic
				750	760		" " alteration obscured by vein mineralization	
				760	770		" " " "	finely disseminated magnetite
				770	780		" " biotite quite improved to weak	
				780	790		" " "	
				790	800		" " "	decrease in Fe stained chips
				800	810		predominantly Kag w/ incipient biotite, red Fe from magnetite	
				810	820	chlorite alteration	" " "	some weak to moderate chlorite alteration
				820	830		mostly chlorite alteration	
				830	840		" " " "	
				840	850		" " " "	
				850	860		" " " "	
				860	870		marked change to red vein material w/ qtz-sericite lim-hem	
				870	880		lost circulation no sample	
				880	890		" " " "	
				890	900		" " " "	
				900	910		primarily Fe stained vein material, small amounts chlor. agglom.	
				910	920		" " " also traces secondary biotite	
				920	930		60% vein material, 40% chloritized agglom. w/ some biotite	
				930	940		" " " " " + weak sericite	
				940	950		" " " " little better biotite	
				950	960		60% Kag w/ chlor.-biot.-ser.-Fe stain, rest is vein material	
				960	970		" " " " " "	
				970	980		30% Kag chloritized bleached w/ 3-5% dissem pyrite } plus vein material	
				980	990		" " " " "	
				990	1000		Kag chloritic w/ some biotitic alteration, 3-5% pyrite	
				1000	1010		" " " traces chalcopyrite w/ lesser bornite	
				1010	1020		" " " + possibly chalcopyrite? (<0.1%)	
	→			1020	1030		little stronger pyrite, weaker biotite	
				1030	1040		" " 1-2% magnetite	
				1040	1050		" " lower sulfides	
				1050	1060		" "	
				1060	1070		" "	
				1070	1085		Kag, weak biotite, moderate chlorite, weak sericite ≈ 3% sulfides, traces chalcopyrite with even smaller amounts of bornite; sulfides are disseminated	
				1085	END OF HOLE CASED 9-20-72			

DRILL HOLE SAMPLES — WORK SHEET

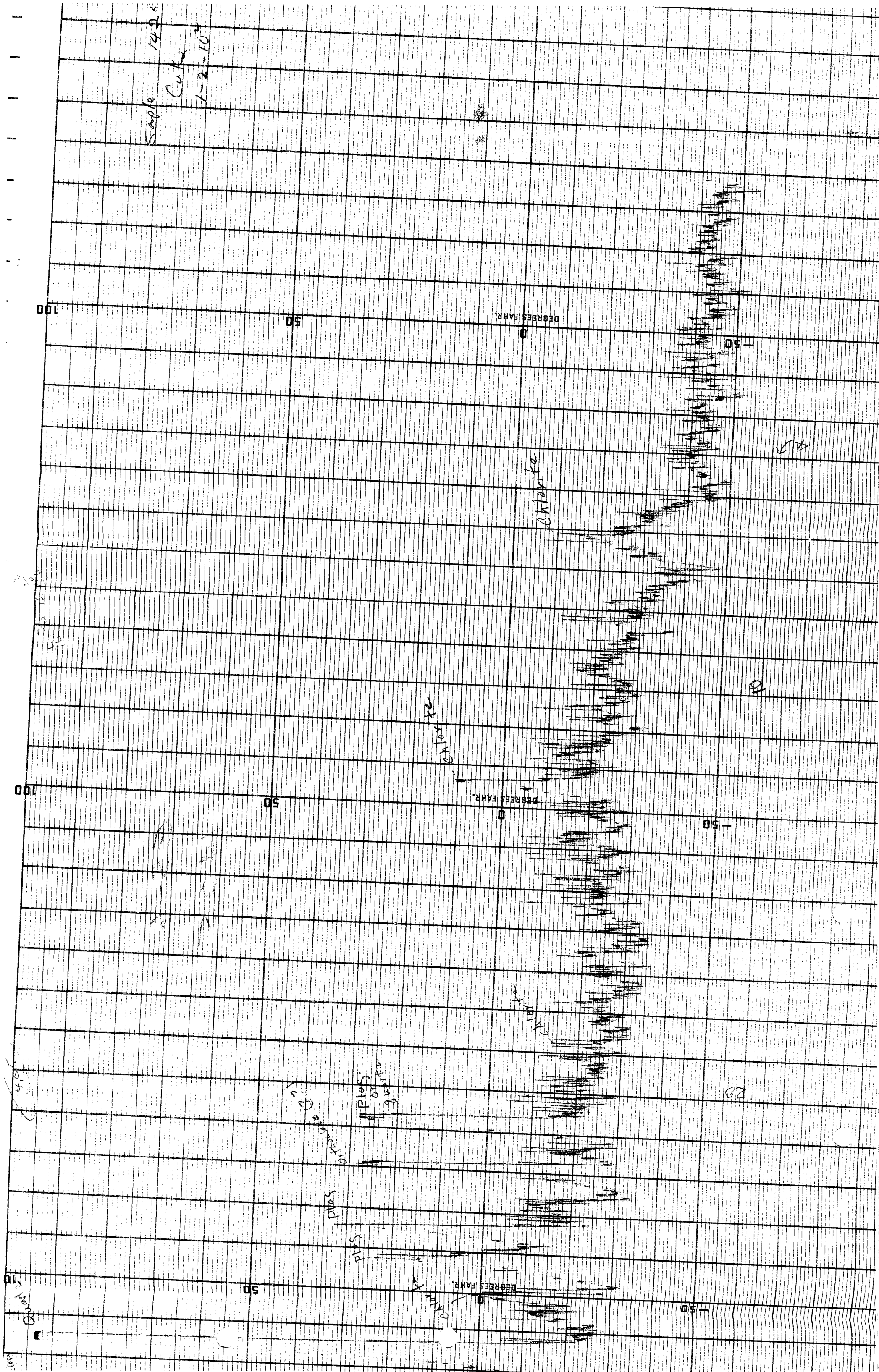
PAGE | OF

PROPERTY: ES-6 | DISTRICT | COUNTY | STATE | COUNTRY

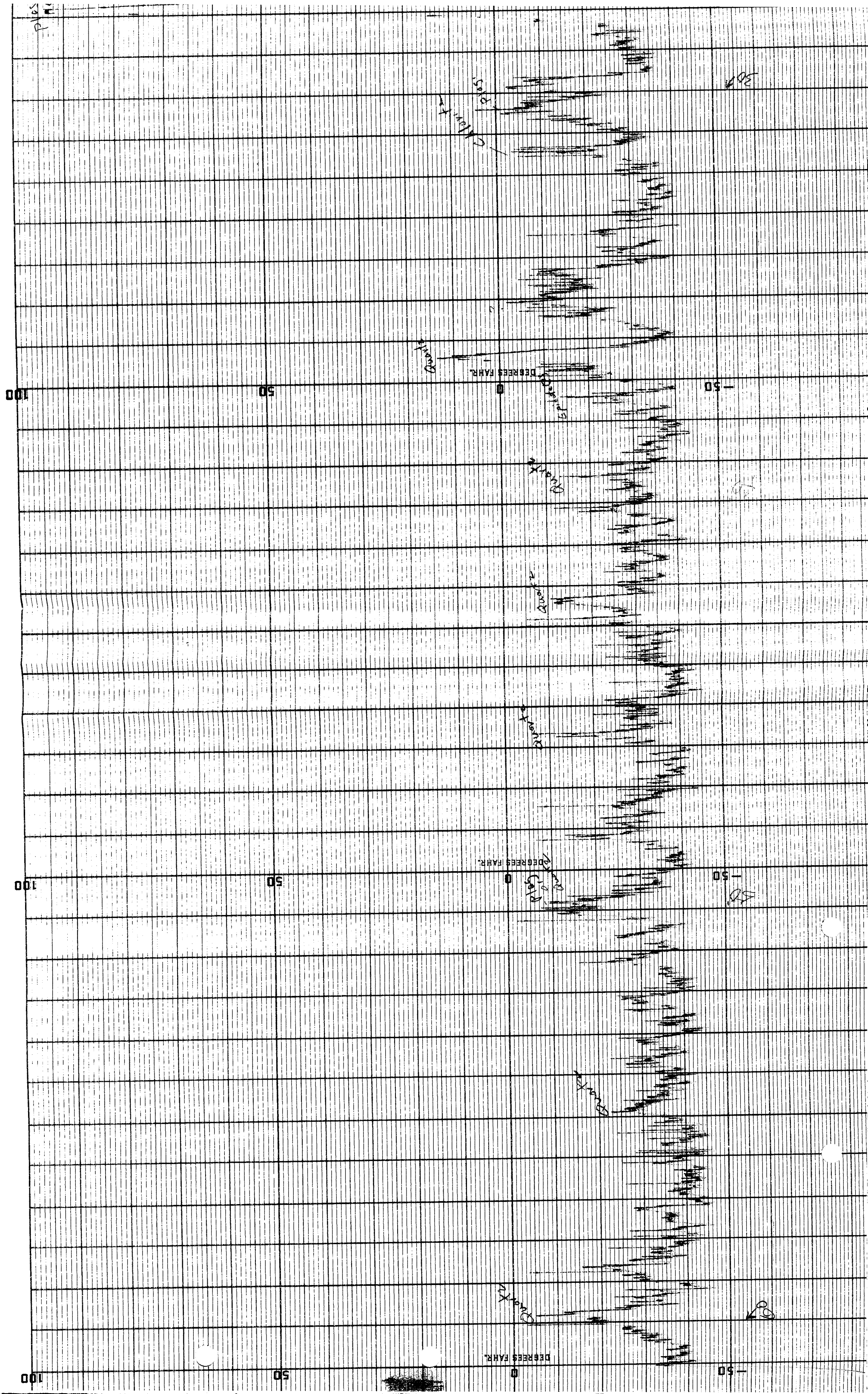
HOLE NO. | CONTRACTOR | COLLAR COORD. N E | COLLAR ELEV.

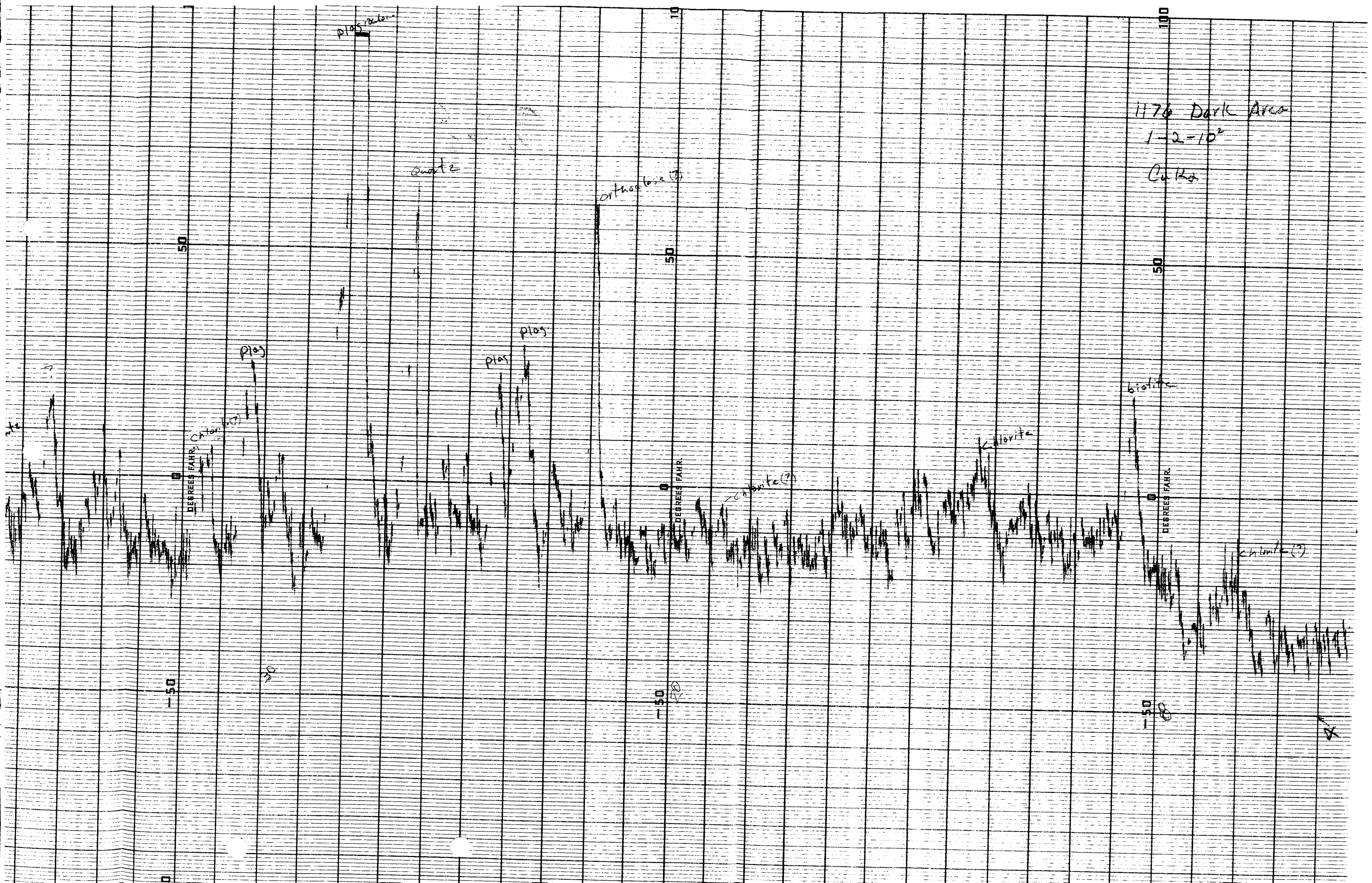
BEARING | INCLINATION | DEPTH | STARTED | STOPPED

SAMPLE NUMBER	BIT SIZE	RECOVERY FEET	RECOVERY %	DRILL RUN FROM	DRILL RUN TO	INT.	ASSAYS Cu							REMARKS
6301	NX	5	100	1135	1140	5'	.01							
6302		5	100	1202	1207	5'	.03							
6303		5	100	1248	1253	5'	.03							
6304		5	100	1305	1310	5'	.04							
6305		5	100	1349	1356	5'	.02							
6306		5	100	1414	1919	5	.06							
6307		5	100	1457	1462	5'	.02							
6308		5	100	1500	1505	5'	.04							
6309		5	100	1555	1560	5'	.04							
6310		5	100	1600	1605	5'	.02							
6311		5	100	1650	1655	5	.04							
6312		5	100	1700	1705	5'	.05							
6313		5	100	1751	1756	5'	.02							
6314		5	100	1802	1807	5'	.04							
6315		5	100	1849	1849	5'	.03							
6316		5	100	1905	1910	5'	.03							
6317		5	100	1951	1956	5'	.05							
6318		5	100	2002	2007	5'	.05							
6319	(ES-5)	5	100	2902	2907	5'	.12							
6320	"	5	100	2950	2955	5'	.09							
6321	"	5	100	3000	3005	5'	.01							
6322	"	5	100	3048	3053	5'	.03							
6323	"	5	100	3102	3107	5'	.01							
6324	"	5	100	3153	3158	5								
6325	"	5	100	3205	3210	5								
6326	"	"	"	3210	3215	5'								
6327	"	"	"	3255	3260	5'								
6328	"	"	"	3300	3305	5								
6329	(ES-6)	"	"	2051	2056	5	.10							
6330	"	"	"	2104	2109	5	.06							
6331	"	"	"	2149	2154	5	.01							
6332	"	"	"	2204	2209	5	.02							
6333	"	"	"	2247	2252	5	.05							
6334	"	"	"	2297	2302	5	.03							
6335	"	"	"	2352	2357	5	.13							
6336	"	"	"	2397	2402	5	.07							
6337	"	"		2451	2456	5	.03							
6340	"	"	"	2503	2508	5	.03							
6341	"	"	"	2551	2556	5	.03							
6342	"	"	"	2607	2612	5	.02							
6343	"	"	"	2649	2654	5	.01							
6344	"	"	"	2697	2702	5	.01							
6345	"	"	"	2753	2758	5	.02							
6346	"	"	"	2802	2807	5	.01							
6347	"	"	"	2849	2854	5	.01							
6348	"	"		2899	2904	5	.01							
6349	"	"	"	2951	2956	5	.01							

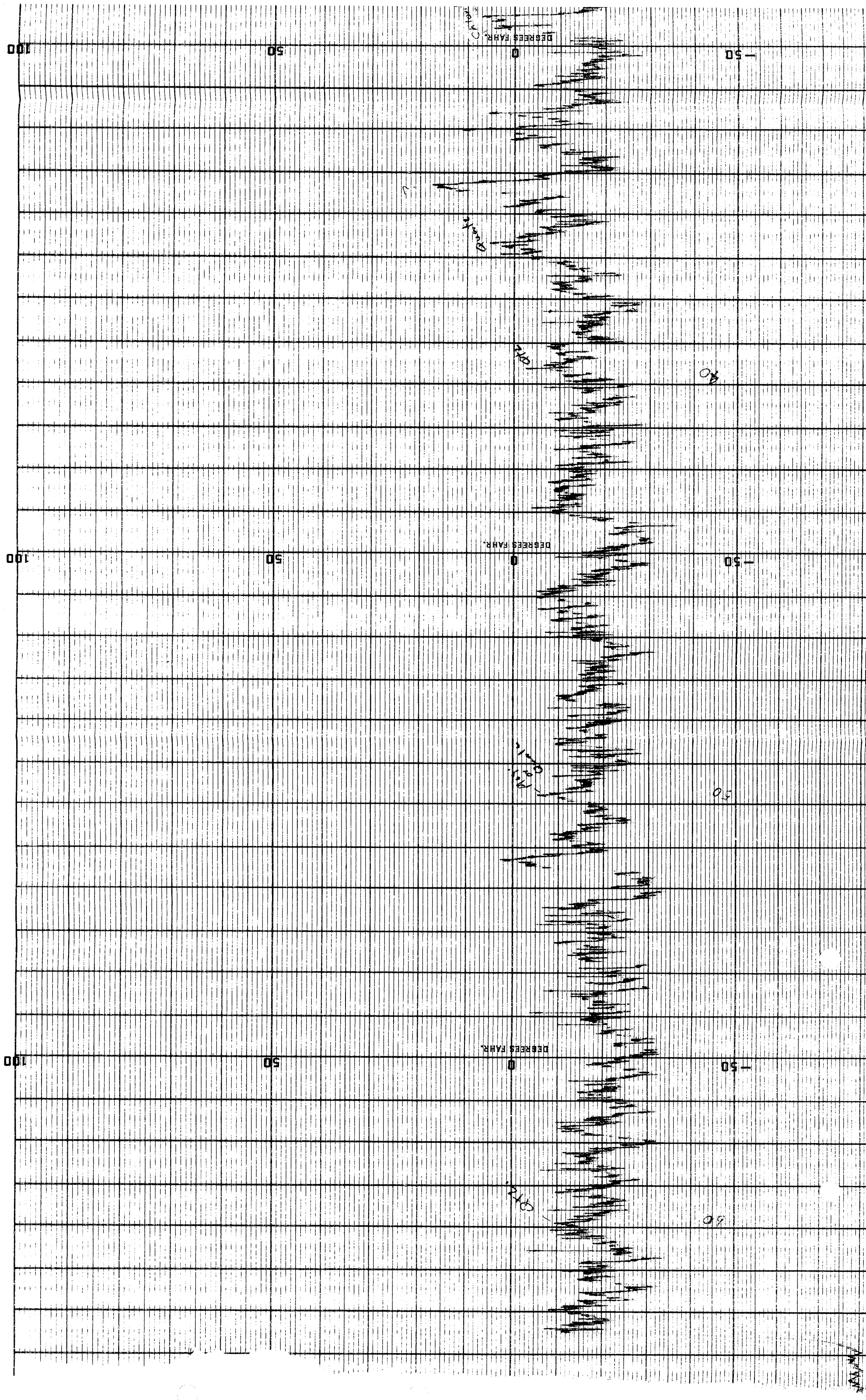


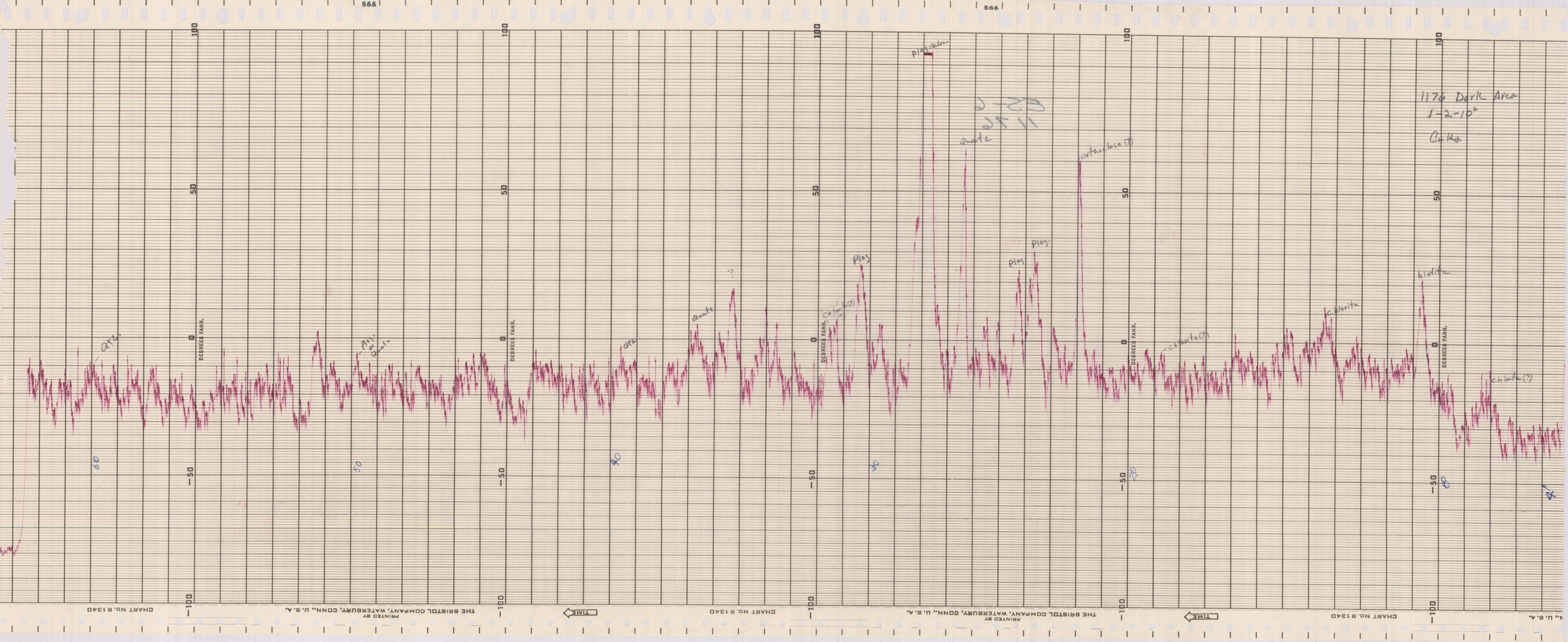
Sample 1425
Cu K
1-2-10
DEGREES FAHR.
100
50
0
-50
chlorite
chlorite
chlorite
plos
plos
plos


-50
0
50
100
DEGREES FAHR.
-50
0
50
100
DEGREES FAHR.
-50
0
50
100
DEGREES FAHR.



1176 Dark Area
1-2-10²
Cu Kα
plag
Quartz
orthoclase (?)
plag
plag
plag
chlorite (?)
chlorite (?)
chlorite
biotite
chlorite (?)
DEGREES FAHR.
DEGREES FAHR.
DEGREES FAHR.
50
0
-50
10
100


DEGREES FAHR.
-50
0
50
100
DEGREES FAHR.
-50
0
50
100
DEGREES FAHR.
-50
0
50
100


566
1176 Dark Area
1-2-10²
Cuka
DEGREES FAHR.
100
50
0
-50
-100
Qtz.
Plag. or Quartz
Quartz
Plag
Chlorite(?)
Quartz
Plag
Plag.
Plag.
orthoclase(?)
chlorite(?)
Chlorite
biotite
chlorite(?)
60
50
40
30
20
10
8
4
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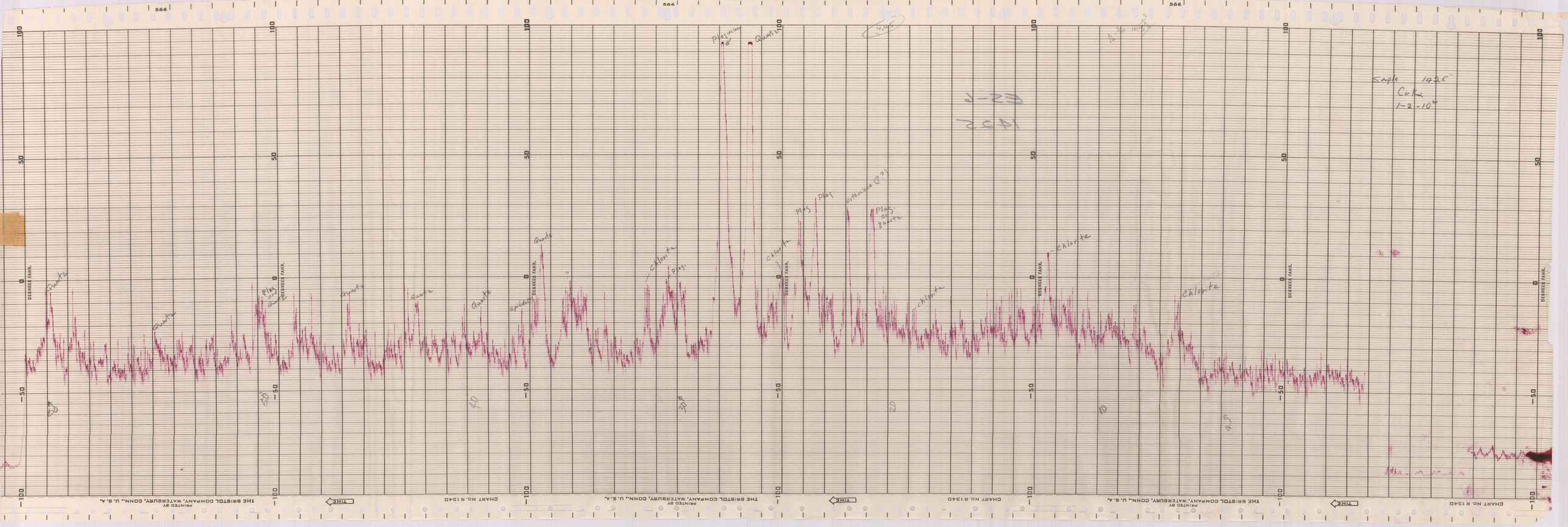
TIME



Sample 1425'
Cuka
1-2-10
Quartz
Plag or Quartz
Chlorite
Plag
Orthoclase (??)
Epidote
DEGREES FAHR.
THE BRISTOL COMPANY, WATERBURY, CONN., U.S.A.
CHART NO. R 1340
PRINTED BY
TIME