

LITHOLOGIC LOG

SHEET 3 OF 17

PROJECT McCoy HOLE NO. 66-8
 LOCATION Churchill County, Nevada COLLAR EL. 5795 feet
 COMPANY AMAX - O'Brien Resources TOTAL DEPTH 2510 feet
 CONTRACTOR American Geothermal Drilling SPUDED 10/30/79 FINISHED 3/16/80
 LOGGED BY Jim Gross

DEPTH	LITHOLOGY	DESCRIPTION	CASING
300 310 320 330 340 350 360 370 380 390 400 410 420 430 440 450		<p>@ 340' 90% of material is now white and aphanitic.</p> <p>@ 350' same as 340' with orange yellow stain.</p> <p>@ 360' same as 350' mostly white, very few sanidine xls, yellow stain.</p> <p>@ 390' same as 360', trace sphalerite.</p> <p>@ 400' note: coatings seen on and through aphanitic cuttings.</p> <p>@ 410' same, less orange & yellow, faint purple color to some fragments and HgS(?).</p> <p>@ 420' purple color zone - orange & yellow color back.</p> <p>@ 440' concentrations of yellow mineral on rotted, altered feldspar (sanidine).</p>	CASING

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
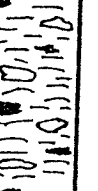



LOGGED BY Jim Gross

DEPTH	LITHOLOGY	DESCRIPTION	CASING	
450				
460				
470				
480				
490				
500				
510				
520			520'-530' No sample	
530		NO SAMP.	530'-540' same as @ 510-520'	
540				
550	NO SAMPLE	540'-560' No sample		
560				
570		@ 570' reappearance of green celadonite & prominent black biotite to 1 mm.		
580		@ 580' same as 570'		
590		@ 590' significant steel chips		
600		@ 600' same as above, noticeable amounts < 10% fine grained material (not all submicronic now).		

8 5/8"
@
488'

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 LOGGED BY Jim Gross to 700' - Eugene V. Ciancanelli below 700'

DEPTH	LITHOLOGY	DESCRIPTION -	CASING
600		600'-650' No sample	6 5/8" @ 704'
610			
620			
630	NO SAMPLE		
640	NO SAMPLE		
650		650'-660' first appearance of cherty or fine grained quartzite material, light brown color. This could be xenoliths in tuff.	
660		660'-680' No sample	
670	NO SAMPLE	NOTE: Sample recovery in this portion of hole was poor. Also sample collection and labeling by American Geothermal Drilling was not properly performed and some samples mislabeled.	
680	NO SAMPLE	The actual contact between tuff and limestone was probably at about 725 feet. Check gamma log as tuffs much more radioactive than limestone. Check temperature and S.P. logs in this interval also.	
690		700'-725' approx. TUFF	
700		Overall color of fine powdery cuttings, light brownish gray with dark and light colored fragments including shades of red, brown, black, white & gray rock and xl fragments. The section is probably interbedded tuffs with some welded zones. Sulfides present as pyrite.	
710		725' to 777' BLACK LIMESTONE? Check this rock type for positive identification. Unknown black rock possibly limestone, partially effervesces in HCl acid, some shiny black xl faces seen. Should check in case economic minerals present, possibly carbon or manganese. Formation of shiny black scum on water surface when samples washed. Sulfides also present.	
720			
730			
740			
750			

ALL SAMPLES IN THIS INTERVAL COULD BE MISLABELED

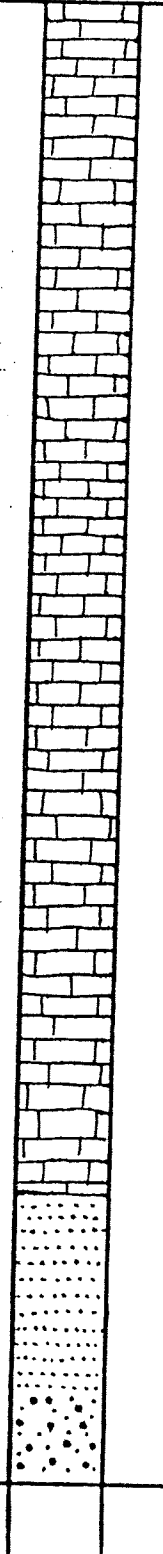
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PROJECT McCoy HOLE NO. 66-8
 LOCATION Churchill County, Nevada COLLAR EL. 5795 feet
 COMPANY AMAX - O'Brien Resources TOTAL DEPTH 2510 feet
 CONTRACTOR American Geothermal (to 800') Anderson SPUDDED 10/30/79 FINISHED 3/16/80
 LOGGED BY Eugene V. Ciancanelli Drilling (below 800')

DEPTH	LITHOLOGY	DESCRIPTION	CASING
<p>750</p> <p>760</p> <p>770</p> <p>780</p> <p>790</p> <p>800</p> <p>810</p> <p>820</p> <p>830</p> <p>840</p> <p>850</p> <p>860</p> <p>870</p> <p>880</p> <p>890</p> <p>900</p>		<p>775'-790' SANDSTONE - CALCAREOUS Sandstone, medium dark gray, fine grained, sulfides present, calcareous SS.</p> <p>@ 790' becomes darker in color and more like the unknown rock in 730-775 interval. It is possible that the black rock is a limestone.</p> <p>790'-1020' LIMESTONE Limestone - dark gray N3, sulfides & calcite veins both present, but sulfides less common in limestone below 790' than higher in hole.</p> <p>@ 800' Anderson Drilling Co. began sampling and samples are correct below 800 feet.</p> <p>@ 840' becomes like interval 730'-775' then gradually downward changes to interval 790' type limestone.</p>	<p>CASING</p>

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DEPTH	LITHOLOGY	DESCRIPTION	CASING
<p>900</p> <p>910</p> <p>920</p> <p>930</p> <p>940</p> <p>950</p> <p>960</p> <p>970</p> <p>980</p> <p>990</p> <p>1000</p> <p>1010</p> <p>1020</p> <p>1030</p> <p>1040</p> <p>1050</p>		<p>@ about 980' limestone becoming sandy toward bottom of interval.</p> <p>1020'-1040' SANDSTONE Sandstone, medium dark gray, medium to fine grained poorly sorted, sulfides again present after being virtually absent in the interval 790'-1020'. The grain size gradually coarsens downward until becoming a conglomerate at 1040'.</p> <p>1040'-1060' CONGLOMERATE OR COARSE SANDSTONE except for coarser grain size same as 1020-1040'.</p>	<p>CASING</p>

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DEPTH	LITHOLOGY	DESCRIPTION	CASING
1050		Veinlets of sulfide probably mostly pyrite.	
1060		1060'-1080' SANDSTONE Sandstone same as interval 1020'-1040'	
1070			
1080		1080'-1240' CONGLOMERATE OR COARSE SANDSTONE Probably coarse sandstone, veins of sulfides as pyrite.	
1090			
1100		@ 1100' becomes lighter colored to medium gray N5.	
1110			
1120			
1130			
1140			
1150			
1160			
1170			
1180			
1190			
1200			

1700 ~ 2.67
2120 > 2.67

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DEPTH	LITHOLOGY	DESCRIPTION	CASING
1200 1210 1220 1230 1240 1250 1260 1270 1280 1290 1300 1310 1320 1330 1340 1350		<p>The grain size has been becoming less coarse so that by 1220' there is more of medium to fine grained sandstone.</p> <p>@ 1230' begin to get some light gray N7 quartzite fragments.</p> <p>1240'-2180' CONGLOMERATIC QUARTZITE Medium dark gray N5 pebbles & cobbles in a Medium light gray N6 matrix sulfides present as pyrite. The pebbles all are the same light gray to medium dark gray quartzite with the matrix being the light gray color. The pebbles are rounded.</p>	

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DEPTH	LITHOLOGY	DESCRIPTION	CASING
1350		@ 1370' increase in pyrite.	
1360			
1370			
1380			
1390			
1400			
1410			
1420			
1430			
1440		@ about 1440' unit becomes somewhat more sandy.	
1450			
1460			
1470			
1480			
1490			
1500			

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DEPTH	LITHOLOGY	DESCRIPTION	CASING
1500		<p>@ 1520' color gradually darkened down to 1620' and then became lighter to medium gray to medium light gray. At this point it is again becoming a conglomerate and less sandy.</p>	
1510		<p>@ 1550' cuttings became very fine and brown mud was a large portion of the sample. Occasional sample of fault gouge. This continues to about 1620'.</p>	
1520		<p>@ 1620' QUARTZITE CONGLOMERATE Quartzite, relict pebble outlines, light gray N7.</p>	
1530			
1540			
1550			
1560			
1570			
1580			
1590			
1600			
1610			
1620			
1630			
1640			
1650			

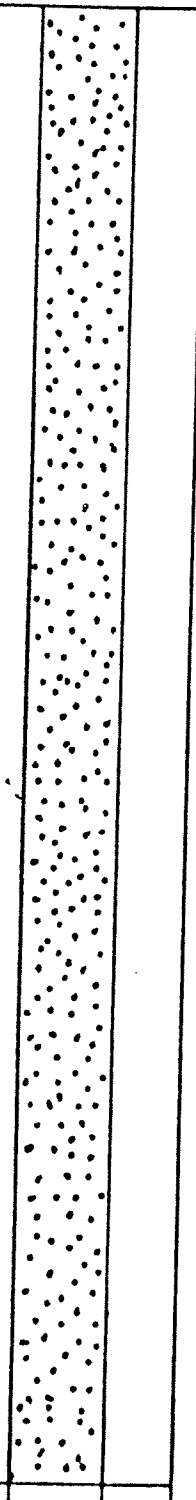
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DEPTH	LITHOLOGY	DESCRIPTION	CASING	
1650		@ 1650' began to get light brownish gray colored quartzite. Sulfides fairly abundant.		
1660				
1670				@ 1670' began to get dark reddish brown cuttings with micaceous foliated texture, possibly this is hematitic quartzite. These cuttings are 15% of sample.
1680				@ 1680' same as above 1670' - sulfides other than pyrite possibly present. Some fault gouge cuttings. The cuttings are light gray N7 in color.
1690				
1700				
1710				
1720				
1730				@ 1730' same as at 1650'
1740				@ 1740' same as at 1680'
1750				
1760				
1770				
1780				
1790				
1800				

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 LOGGED BY Chris Tower (1800' to 1880') - Eugene V. Ciancanelli (below 1880')

DEPTH	LITHOLOGY	DESCRIPTION	CASING
1800 1810 1820 1830 1840 1850 1860 1870 1880 1890 1900 1910 1920 1930 1940 1950		<p>@ 1800' white quartzite w/ abundant pyrite and other sulfides minor about 5% reddish quartzite probably hematized.</p> <p>@ 1830' white quartzite no hematized chips, some quartzite is red stained probably along fractures, decrease in sulfides.</p> <p>@ 1880' quartz pebble fragments from quartzite conglomerate, fine grained, medium light gray N6, minor light brownish gray fragments, abundant sulfides, euhedral pyrite < 0.5 mm grains and as seams and coatings. Some pyrite oxidized to yellowish brown.</p> <p>@ 1890' slightly less sulfides; light N7 to medium light gray N6 color.</p> <p>@ 1930' to 1980' some white crushed fault gouge with slicken sides.</p>	

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DEPTH	LITHOLOGY	DESCRIPTION	CASING
1950		@ 1960' sulfides decreasing.	
1960		@ 1980' gouge material reappears.	
1970		@ 1990' darkening in color to medium gray and medium dark gray.	
1980		@ 2000' sulfides rare.	
1990		@ 2010' color light gray to medium light gray.	
2000		@ 2020' some chips big enough to see pebble outlines.	
2010		@ 2030' sulfides increasing.	
2020		@ 2040' minor light brownish gray colored fragments.	
2030		@ 2060' - 2080' sulfides rare.	
2040		@ 2090'-2100' minor sulfides, plus minor light brownish gray fragments.	
2050			
2060			
2070			
2080			
2090			
2100			



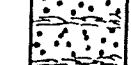
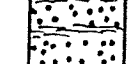
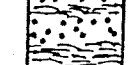

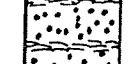
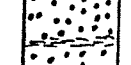
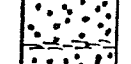
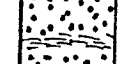


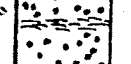

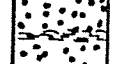
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DEPTH	LITHOLOGY	DESCRIPTION	CASING
2100		@ 2110' color medium gray - some minor gouge material.	
2110		@ 2120' vein pyrite common, one fragment showed secondary silicification following brecciation. Color is medium light gray with abundant light brownish gray fragments.	
2120		@ 2140' minor green chlorite.	
2130		@ 2160' gradual increase in percent of light brownish gray fragments - other fragments medium light gray to medium gray. There seems to be more evidence of crushing of the quartzite conglomerate.	
2140		@ 2180'-2370' HEMATITIC (?) QUARTZITE CONGLOMERATE Approximate top of hematitic (?) zone in the quartzite conglomerate. About 10 to 20% of fragments are hematite (?) material present as grayish red finely laminated micaceous material which is friable. The remaining 80-90% of fragments are quartzite conglomerate. Acid showed some minor gouge material to be carbonate. No evidence of sulfides.	
2150		@ 2190' hematitic material grayish red to dark reddish brown.	
2160		@ 2200' same as 2180' except 30-40% hematitic material.	
2170		@ 2210' about 10% hematitic material.	
2180		@ 2220' same as 2190'.	
2190		@ 2230'-2240' about 80% hematitic material.	
2200			
2210			
2220			
2230			
2240			
2250			

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DEPTH	LITHOLOGY	DESCRIPTION	CASING
2250		@ 2250' about 50% hematitic material.	
2260		@ 2260' about 20-30% hematitic material grayish red - also abundant pale red fragments.	
2270		@ 2270' same as 2250'.	
2280		@ 2280' about 50% grayish red hematitic material.	
2290		@ 2290' about 10-20% hematitic material.	
2300		@ 2300'-2310' 5% grayish red hematitic material - the rest is pale red sugary textured quartzite fragments with minor sulfides.	
2310			
2320		@ 2320' more white quartzite fragments now present.	
2330		@ 2330'-2360' 5% grayish red hematitic quartzite, 20% pale red quartzite, 75% pinkish gray to white quartzite, minor sulfides.	
2340			
2350			
2360			
2370		@ 2370' - QUARTZITE CONGLOMERATE Sample is white quartzite with some fault gouge fragments.	
2380			
2390			
2400			

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 LOGGED BY Eugene V. Ciancanelli to 2410' - Chris Tower below 2410' to T.D.

DEPTH	LITHOLOGY	DESCRIPTION	CASING
2400		2410' to 2420' white quartzite w/ occasional hematite, minor sulfides, slightly calcareous.	
2410		2420' to 2510' 50% white quartzite, 50% hematite and hematized quartzite w/ opalescent coatings on some grains.	
2420		2440' slightly calcareous.	
2430		2470' decrease in hematite, white quartzite 65%, hematite 15%, hematized quartzite 20%, cuttings are large.	
2440			
2450			
2460			
2470			
2480			
2490			
2500			
2510			