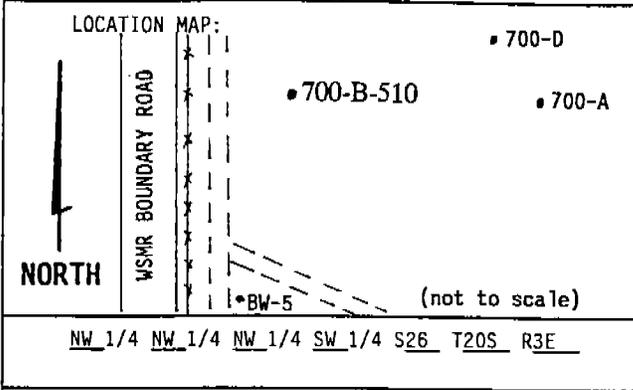


LITHOLOGIC LOG



SITE ID: NASA-WSTF LOCATION ID: 700-B-510
 SITE COORDINATES (ft.):
 N 236139.75 E 413809.71
 GROUND ELEVATION (ft. MSL): 4805.89 (BC)
 STATE: NEW MEXICO COUNTY: DOÑA ANA
 DRILLING METHOD: Mud and Air-foam Rotary
 DRILLING CONTR.: Larjon Drilling Co.
 DATE STARTED: 06/25/90 DATE COMPLETED: 08/14/90
 FIELD REP.: M. Canavan, D. Menzie
 COMMENTS: Mud rotary 0-80' (7 7/8" bit); reamed to 16", in-
stalled 10"x80' surface casing; Air foam rotary; 80'-226',
(9 7/8" bit) 266'-550' (9" air hammer bit); top of andesite
bedrock at 285'; Total Depth (TD) = 550'.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
			Time recorded by driller every 5'	Cuttings 0-550'	0'-285' Alluvium (Santa Fe Group): Pale red (10 R 6/2) to light brown (5 YR 6/4) alluvium colored by silt and clay content. Cutting samples are multicolored. Cutting sizes range from 1.5 inches to much less than 0.1 inches (silt and clay size). Cutting shapes range from angular to rounded. Subrounded to rounded alluvial grains comprise 20 to 80% of each sample. Alluvium is an unconsolidated to consolidated pebble to boulder polygenetic conglomerate. Alluvial clasts include grayish black (N2) to light olive gray (5 Y 6/1) micritic limestone; pale olive (10 Y 6/2) to grayish red (10 R 6/2) (laminated to non-laminated) siltstone; pinkish gray (5 YR 8/1) to moderate orange pink (10 R 7/4 iron-stained rhyolite; moderate red (5 R 6/4) to grayish pink (5 R 8/2) granite; grayish red (10 R 4/2) to pale yellowish brown (10 YR 6/2) sandstone; grayish red (5 R 4/2) to medium gray (N5) andesite; colorless to light gray (N7) quartz; moderate orange pink (5 R 8/4) caliche; and various colored chert and white calcite. Caliche is present in the uppermost 200' of the alluvium and clay horizons occur above 175'. Alluvium is well-cemented from 210'-230'. Limestone is the predominant clast above 230' and rhyolite is the predominant igneous clast above 225'. Andesite first appears in the cuttings at 225'. Andesite-rich alluvium occurs from 255'-285'.
5	000++VVV=		15		
10	++VVV//::=		12		
15	++VVV//::=		21		
20	++VVV//::=		19		
25	++VVV//::=		25		
30	==++VVV//		6		
35	VVV++//::=		6		
40	VVV++//::=		11		0'-10' Cuttings range from .05" to .4" in diameter. Wide range of grain sizes with 10% clay. Grains are angular to rounded.
45	++VVV//		12		10'-20' Cuttings are more uniform in size (avg. 0.1") and shapes range from subangular to subrounded. Less than 2% clay and approximately 5% caliche.
50	VVV++//::=		21		20'-25' Grain sizes more variable and range from .02" to .4" in diameter. Shapes are angular to sub-rounded.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
50			Time recorded by driller every 5'	Cuttings (cont'd)	25'-30' Significant increase in clay. Remainder of sample is bimodal in grain size. (.1" avg. and .6" avg) up to 1.2". Gravel shapes range from subrounded to rounded.
55	≡≡≡≡++//		23		30'-35' Bimodal sample with less than 10% clay. Small fraction angular to subrounded.
60	++++VVVV..		11		35'-40' Sample still somewhat bimodal although smaller fraction ranges from .05"-2".
65	VVVV++//..		7		40'-45' Limonite-stained quartz sandstone dominates sample (possible boulder indicated by angular cuttings). 40% of sample is large cobbles of limestone and siltstone (1.5" diameter). Bimodal sample.
70	VVVV++..==//		23		45'-50' Cuttings are angular to subrounded and range from .05" to 1.5" in diameter. Decrease in percent of cobbles to less than 10%.
75	VVVV++..==//		15		60'-65' Cuttings are angular to subrounded and range from .01" to .5". Approximately 5% clay present.
80	VVVV++//..		21 Start drilllograph		65'-70' Overall sample is slightly coarser-grained (.05" to .5") and grains are angular to rounded in shape. Slight increase in clay fraction.
85	GGGG++//VV		11		75'-80' Coarse gravel (average grain size .5") includes angular to subrounded cuttings.
90	++++VVVV//		8		80' Switch to air-foam rotary drilling.
95	≡≡≡≡++//		8		80'-85' 50% cement (grout); 50% cuttings.
100	++++VVVV//		7		85'-95' Siltstone fraction dominantly brick-red Abo Formation. Volcanic fraction is rhyolite (90%) and granite (10%).
105	++++VVVV//		15		
110	++++VVVV//		15		95'-100' Cuttings fairly uniform (average .2").
115	++++VVVV//		4		110'-115' Cuttings subangular to subrounded (average .3").

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
115				Cuttings (cont'd)	
120			7		
125			12		125'-130' Cuttings fairly uniform in size (.05"-.4") and subangular to subrounded.
130			10		
135			16		
140			41		140'-145' Cuttings much finer grained and uniform (average .05").
145			16		145'-150' Cuttings are coarser grained and less uniform in size.
150			8		150'-155' Gravel-size (average .3") cuttings are subangular to rounded.
155			14		
160			18		160'-165' Average grain size .1".
165			7		165'-180' Significant decrease in percentage of clay. Cuttings are subangular to subrounded and average grain size is .3".
170			12		
175			12		
180			11		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
180				Cuttings (cont'd)	180'-185' Increase in fine grain sizes. Sample is less uniform and cuttings range from .05" to .4".
185			21		
190			14		190'-215' Cuttings are angular and finer grained (average .1"). Increase in clay from 195'-205'. Approximately 5% calcite and minor amounts of caliche present.
195			12		
200			13		
205			16		
210			19		
215			22		215'-226' Significant increase in drill times and decrease in cutting size (avg. .05") indicates highly cemented alluvium. 5% calcite and minor quartz present in cuttings.
220			74		
225			63		225'-230' First indication of andesite in alluvium cuttings. Calcite still 5%. Change from 9 7/8" tricorne to 9" hammer bit.
230			25		230'-235' Volcanic fraction is approximately 50% andesite. Calcite still 5%.
235			12		235'-245' Increase in cutting size to average .1". Grains are subrounded to rounded.
240			18		
245			12		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
				Cuttings (cont'd)	
310		+ + +			305'-310' Fine to medium sand-size cuttings. Possible weathered zone in andesite flow.
		+ + +			310'-315' Cuttings include fine sand to clay sizes. (Most washed through screen).
315	VVVVVVVVVVVVV	+ + +	16		315'-330' Medium sand-size cuttings with approximately 1% uphole contamination. At 317', foam changed to reddish brown color, possibly indicating a thin clay zone. No indication of clay in sample. Glassy aphanitic to porphyritic (< 10% phenocrysts of white plagioclase) andesite, same color as foam (grayish red 5 R 4/2).
		+ + +			
320	VVVVVVVVVVVVV	+ + +	15		
		+ + +			
325	VVVVVVVVVVVVV	+ + +	14		
		+ + +			
330	VVVVVVVVVVVVV	+ + +	13		330'-335' Cuttings are silt to coarse sand size (.1"). Approximately 5% uphole contamination.
		+ + +			
335	VVVVVVVVVVVVV	+ + +	14		335'-345' Cuttings are flaky and angular. Coarse (.1"-.3" diameter). Grayish red andesite (5 R 4/2) dominates sample (70%). Glassy to porphyritic-aphanitic with less than 10% white plagioclase phenocrysts. Appears less weathered. This observation corresponds with slower drill times.
		+ + +			
340	VVVVVVVVVVVVV	+ + +	34		
		+ + +			
345	VVVVVVVVVVVVV	+ + +	29		345'-350' Increase in very dusky purple (5 RP 2/2) andesite porphyry.
		+ + +			
350	VVVVVVVVVVVVV	+ + +	26		350'-365' Dominantly dusky purple andesite porphyry appears weathered. (Cuttings break easily). Fractures filled with calcite are apparent. Cuttings range widely in size from .05" to 1.0" and are angular to rounded.
		+ + +			
355	VVVVVVVVVVVVV	+ + +	21		355'-365' 5% uphole contamination. Plagioclase phenocrysts, up to .1" in length, are euhedral to anhedral. Bladed hornblende euhedral phenocrysts make up approximately 5% of rock (plagioclase makes up 20-40%). Calcite-healed fractures are common.
		+ + +			
360	VVVVVVVVVVVVV	+ + +	30		
		+ + +			
365	VVVVVVVVVVVVV	+ + +	21		
		+ + +			
370	VVVVVVVVVVVVV	+ + +	23		370'-380' Andesite is slightly more altered than above and is calcite abundant. Cuttings are soft and smaller in diameter. (.05"-.1" diameter).
		+ + +			
375	VVVVVVVVVVVVV	+ + +	21		
		+ + +			

