LITHOLOGIC LOG

LOCATION MAP:

•BLM-20
•100-B (2)-* 8100-A
•100-B-*
•100-C

NORTH

SE 1/4 SE 1/4 SE 1/4 SE 1/4 S 3 T 21S R 3E

SITE ID: NASA-WSTF LOCATION ID: 100-B(2)-*

SITE COORDINATES (ft.):

N 223085.99 E 413332.71

GROUND ELEVATION (ft. MSL): 4756.61 (BC)

STATE: NEW MEXICO COUNTY: DOÑA ANA

DRILLING METHOD: Mud/Air Foam Rotary

DRILLING CONTR.: Larjon Drilling Co.

DATE STARTED: 08/09/89 DATE COMPLETED: 10/02/89 (P & A)

FIELD REP.: P.S. Egan/S. Dubyk

COMMENTS: 12 1/4" pilot hole reamed to 16"; 0'-80', 10" surface casing to 0'-79.5'. 80'-212', 9 7/8" bit; 212'-401'

LOCATION DESCRIPTION: 9" bit. Bedrock encountered at 185'. T.D. = 401'. Borehole not complete as monitor well.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
			Start Drillograph	Cutting: 0'-400	0'-180' Alluvium (Santa Fe Group): Dark gray (N3) to yellowish orange (10 YR 6/6) cuttings, moderate yellowish brown (10 YR 5/4) clay. Cuttings range in size from less than 0.1 inch to 0.6 inches, are angular to subrounded, and poorly sorted. Natural (uncut) grains are clay, silt, and fine to medium, subrounded to rounded sand. Unconsolidated to consolidated polygenetic pebble to boulder conglomerate. Lithology of cuttings: light gray (N7) to grayish black (N2) micritic limestone, white (N9) rhyolite mottled with various degrees of iron staining, dusky red (5 R 3/4) to grayish olive (10 Y 4/2) siltstone, translucent, white (N9), to light olive gray (5 Y 6/1) quartzite and chert, dark grey (N3) to very dusky red (10 R 2/2) aphanitic, microporphyritic, and/or porphyritic andesite sometimes exhibiting phenocryst alteration to chlorite or epidote. Also reddish granite, yellowish brown sandstone, and caliche as both cuttings and/or coating on other cuttings. Comments: Surficial caliche hard-pan. Thin clay lenses present in upper section. In alluvium, increased drill times with depth interpreted as increasing induration with depth.
5			7		0'-80' Drill using mud rotary.
10			5		0'-15' Caliche rich zone. Caliche was visible on walls of excavated mud pit. Cuttings small (0.1 inch) and moderately uniform indicating the hard zone.
15			5		15'-35' Increase in average cutting size to 0.3 inches. Clay is less than 10% of visual percentage.
20			5		35'-45' Decrease in average cutting size to 0.1 to 0.15 inches.
25			9		40'-45' More clay present in this sample.
30			9		45'-50' Silty, sandy clay interval.
35			9		
40			10		
45			9		
50			9		

LOCATION ID: 100-B(2)-*

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description	
				Cuttings (cont'd,) 0'-400		
50			9		50'-55'	Some clay present, but less than 10%.
55			13		55'-60'	Very sandy, silty clay.
60			10		60'-65'	Silty clay with some coarse sand.
65			13		65'-70'	Increase in cutting size to an average of 0.4 inches. Poorly sorted (Bimodal distribution).
70			8 1/2		70'-79'	Decrease in cutting size to an average of 0.1 inches.
75			6 1/2			
80			6 (79)		80'	Switch to air foam rotary drilling after installing surface casing.
					79'-85'	Most of sample is contaminated with grout cuttings.
85			79'-85' not recorded by drillo-graph		85'-90'	Minor grout; cutting size is 0.1 inches/average.
90			6			
95			6			
100			7			
105			10			
110			6			
115			4			

Depth	Visual X	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Oescription
				Cuttings (cont'd) 0'-400'	
115			4		
120			6		
125			10		125'-130' Increase in cutting size to 0.2 inches average.
130			8		
135			8		135'-140' Decrease in cutting size to 0.1 inches average.
140			7		140'-145' Increase in cutting size to 0.2 inches average.
145			7 112		145'-150' Increase in cutting size to 0.3 inches average.
150			8 1/2		150'-155' Decrease in cutting size to 0.1 inches average.
155			5		
160			7		160'-165' Some clay in cuttings.
165			6		165'-180' Alluvium is becoming more indurated.
170			20		170'-175' Increase in cutting s size to 0.3 inches.
175			10		
180			14		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
				Cuttings (cont'd,) 0'-400	
180			14		180'-185' Volcanic Litharenite: Pale yellowish brown (10 YR 6/2) cuttings, but foam exiting borehole is purple. Cuttings range in size from 0.2 inches to 0.3 inches, are subangular, and poorly sorted. Lithology is a fine to medium grained sandstone containing horneblende, mica, volcanic grains in a fine grained carbonate matrix. Comments: sandstone is indurated but friable (some pieces can be broken between the fingers).
185			10		
190			15		
195			16		185'-401' Orejon Andesite: Very dusky red (10 R 2/2) when wet. Cuttings range in size from less than 0.1 inch to 0.6 inches, are angular to subrounded. The lithology is aphanitic microporphyritic to porphyritic andesite. Comments: Varying percentages of calcite (from fracture fill) present in cuttings. Reddish brown iron oxide staining sometimes present on cuttings.
200			15		
205			10		185'-225' Gradual increase in cutting size from 0.1 inches to 0.4 inches. Calcite content in cuttings less than 10%. Andesite is aphanitic.
210			9		
215			27		
220			15		
225			13		225'-240' Decrease in cutting size to 0.14 inches. Calcite content approximately 3-5%.
230			17		
235			16		
240			16		240'-245' Average cutting size increases to 0.4 inches: calcite approx. 3%; calcite is both milky white to grayish orange pink (5 YR 7/21; veinlets of calcite appear to be mixed with fine-grained silica. Andesite is aphanitic with small dark green patches (chlorite).
245			14		

Depth	Visual X	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
				Cuttings (cont'd) 0'-400'	
'45			14		245'-250' Cutting size decreases to 0.1 inches; calcite decreases to approx. 2%. Andesite is aphanitic.
150			17		250'-255' Cutting size increases to 0.4 inches; calcite decreases to approx. 1%. Andesite is aphanitic. Color ranges from blackish-red (5 R 2/2) to grayish black (N2).
!55			16		255,'-260' Cutting size decrease to 0.3 inches; calcite decreases to 1%(or less); andesite is aphanitic.
!60			15		
265			14		
270			15		270'-275' As above; andesite is grayish black (N2) and has small feldspar porphyries.
275			14		275'-280' Porphyritic andesite as above, calcite content is approx. 2%.
280			13		
285			10		285'-290' As above, cutting size decreases to 0.1 inches average.
290			16		290'-295' As above, cutting size increases to 0.3' average. Calcite content decreases to approx. 1%.
295			13		
300			11		
305			17		305'-310' As above, but cutting size is 0.1 inches average.
310			11		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
				Cuttings (cont'd) 0'-400'	
310			11		310'-315' Porphyritic andesite, as above; cutting size increases to 0.3 inches; calcite content is approx. 2%.
315			16		315'-320' As above, 310'-315'; calcite content increases to approx. 3%.
320			12		320'-325' As above, 310'-315'; cutting size increase to 0.4 inches, calcite content approx. 4%.
325			12		325'-330' Porphyritic andesite, as above; cutting size decreases to 0.1 inches; calcite content decreases to approx. 1%.
330			12		330'-335' As above, increase in cutting size to 0.2 inches.
335			3		335'-345' Increase in cutting size to 0.5 inches Iron staining present on some cuttings.
340			16		
345			10		345'-350' Decrease in cutting size to less than 0.1 inch average.
350			13		350'-365' Increase in cutting size to 0.5 inches average. Calcite less than 3% of sample.
355			22		
360			13		
365			20		365'-370' Decrease in cutting size to less than 0.1 inches average.
370			15		370'-390' Increase in average cutting size to 0.6 inches.
375			20		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
				Cuttings (cont'd)	
375			20		
380			11		
385			11		
390			10		390'-395' Decrease in cutting size to 0.4 inches average. Chlorite alteration products present.
395			16		395 -400' Increase in average cutting size to 0.5 inches. Chlorite present.
400			16		TD = 401
405					
410					
415					
420					
425					
430					
435					
440					