

# LITHOLOGIC LOG

LOCATION MAP: Section 11

←  
to WB-14

NASA-WSTF Access Road

↑  
NORTH

WB-9

\*not to scale

SE 1/4 SE 1/4 SE 1/4 SE 1/4 S11 T21S R3E

SITE ID: NASA-WSTF LOCATION ID: WB-9

SITE COORDINATES (ft.):  
 N 217668.87 E 418524.20

GROUND ELEVATION (ft. MSL): 5001.61'

STATE: NEW MEXICO COUNTY: DOÑA ANA

DRILLING METHOD: Mud Rotary; Air/Foam Rotary

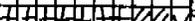
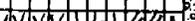
DRILLING CONTR.: Larjon Drilling Co.

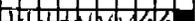
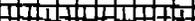
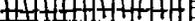
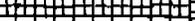
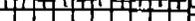
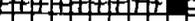
DATE STARTED: 02/12/92 DATE COMPLETED: 02/26/92

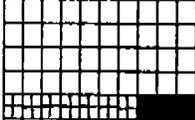
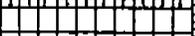
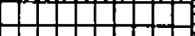
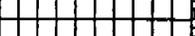
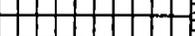
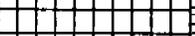
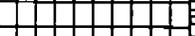
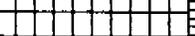
FIELD REP.: M. Canavan

COMMENTS: Drilled 0'-139' (7 7/8" tri-cone button bit) mud rotary and installed 139' of 5" surface casing. Drilled air/foam rotary 139'-380' with 4" air hammer. Limestone (Panther Seep) Bedrock 129'-380'. Total Depth (TD) = 380'.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
			Timed by driller 0'-380'	Cuttings 0'-380'	0'-129' Alluvium (Santa Fe Group): Overall color of samples ranges from moderate yellowish brown (10 YR 5/4) to olive black (5 Y 2/1), while individual grains vary widely in color. Grains range from .05"-1.5" in diameter and are angular to subrounded. One clay-rich zone (105'-110') was present as were several coarse grained gravel lenses (20'-25', 40'-45' and 75'-90'). Alluvium is a poorly to moderately sorted, unconsolidated to semi-consolidated polygenetic pebble to boulder conglomerate. Limestone is the dominant rock type present. It is predominantly micritic and may be silty. Color ranges from medium dark gray (N4) to grayish black (N2). Other sedimentary clasts include poorly- to well-sorted sandstones, laminated and non-laminated greenish gray (5 GY 6/1) to olive gray (5 Y 4/1) siltstones, and chert. Volcanic constituents include a wide variety of tuffs and rhyolites, dusky blue (5 PB 3/2) to grayish purple (5 P 4/2) andesite porphyrys and moderate reddish brown coarse grained granite. Quartzite is also present in minor quantities. Individual quartz and feldspar mineral grains are prevalent.
5			3		
10			6		
15			11		
20			8		
25			17		
30			17		
35			5		0'-5' Alluvium has "sandy" texture. Grains range from .05" to .5" and are predominantly quartz in composition.
40			4		05'-10' Coarser grained sample with quite a bit of clay. Caliche grains and coatings are abundant.
45			9		10'-15' Grains are rounded to subangular and average .2" in diameter. Quartz and volcanics predominate.
50			10		15'-40' Limestone is predominate clast. Percent of caliche drops off from 30'-40'. Some present but much less than 10%. 40'-45' Bimodal sample. Grains are ≈ .1" in diameter and ≈ .5"-1.0" in diameter.

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
50			10	Cuttings (cont'd)	
55			8		55'-60' 10% clay as clayballs. Cuttings are .25" to 1.5" in diameter. Shapes range from rounded to angular.
60			11		
65			22		
70			23		70'-75' Cuttings average .25" in diameter and are mostly angular.
75			7		75'-95' Formation is very gravelly. Cuttings and clasts range from .2" to 1.25" and are subangular to rounded. Formation clay makes up 5%-10% of samples. Limestone predominates.
80			7		
85			15		
90			5		
95			9		95'-100' Cuttings have decreased in size to an average of .3". Few (10%) clasts are = 1.0". Grains are angular to rounded. Increase in volcanics (andesite).
100			14		100'-105' At least 5% clay present.
105			9		105'-110' 80% gummy clay.
110			16		110'-125' Cuttings average .25" and are subrounded to angular.
115			20		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
115			20	Cuttings (cont'd)	
120			9		
125			13		126' Drilling slowed significantly.
130			85		129'-380' <u>Limestone Bedrock (Panther Seep Formation)</u> : Grayish black (N2) micritic limestone. Mottled to gray in partially recrystallized zones. Fractured zones contain white fracture filling calcite. 145'-175' contains silty micritic moderate brown 5 YR 4/4 to dark gray (N3) limestone. 175'-200' shows increasing percentage (to 95% at 200') of moderate yellowish brown (10 YR 5/4) and moderate reddish brown (10 R 4/6) to dark reddish brown fine-grained siltstone or sandstone. It is probably quartz, cemented with hematite and limonite. Laminations are not obvious but are probably present. 200'-260' samples represent interbedded micritic to silty limestone (containing fracture fill calcite), siltstones and poorly sorted limey sandstones. 260'-380' cuttings contain from 0%-15% white fracture-filling calcite. Shapes are predominantly flakey and angular. Limestone may be somewhat silty and is dark gray (N3) to black (N1).
135			177		
140			95 (139')		
145			9		
150			5		
155			6		129'-133' 10% cemented alluvium containing angular limestone clasts. Micritic limestone, possibly partially recrystallized. Calcite-filled fractures and recrystallized patches are evident. 1% pale reddish brown clay (tiny balls of clay .25" in diameter). Cuttings are angular and flakey.
160			7		
165			8		139' Similar to above, but with abundant iron-stained fracture surfaces.
170			7		
175			6		
180			5		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
180			5	Cuttings (cont'd)	
185			7		
190			7		
195			9		
200			8		
205			13		
210			9		
215			7		
220			7		
225			9		
230			9		
235			8		
240			9		
245			9		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
				Cuttings (cont'd)	
245			9		
250			8		
255			10		
260			7		260' Increasing percentages of fracture-filling calcite in limestone.
265			6		
270			8		
275			10		
280			9		
285			13		
290			14		
295			12		
300			10		
305			8		
310			9		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
				Cuttings (cont'd)	
310			9		
315			15		
320			27		
325			10		
330			8		
335			7		
340			7		
345			13		
350			15		
355			10		
360			19		
365			17		
370			11		
375			8		

Depth	Visual %	Lith	Drilling Time Scale: min	Sample Type and Interval	Lithologic Description
375			8	Cuttings (cont'd)	TD = 380'
380			9		
385					
390					
395					
400					
405					
410					
415					
420					
425					
430					
435					
440					