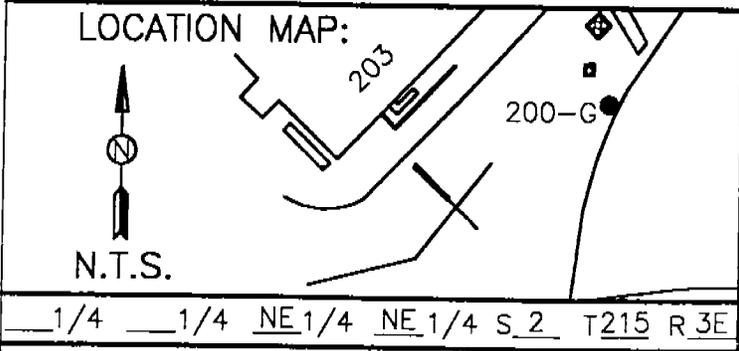


LITHOLOGIC LOG



SITE ID: NASA-WSTF LOCATION ID: 200-G
 SITE COORDINATES (FT.):
 N 227640.56 E 417961.55
 GROUND ELEVATION (FT. MSL): 4875.36
 STATE: NEW MEXICO COUNTY: DONA ANA
 DRILLING METHOD: MUD ROTARY/AIR FOAM ROTARY
 DRILLING CONTR: LARJON DRILLING CO
 DATE STARTED: 10-17-94 DATE COMPLETED: 11-14-94
 FIELD REP.: JACOBS, GILES, SUMMERS
 COMMENTS: 8 1/2" TRICONE W/MUD 0-65', 4 1/2" BUTTON/TRICONE W/FOAM 65-540', 5" STEEL CASING TO 65', CIRCULATION SPORADICALLY LOST 245-330' AND 370-440', TOTAL DEPTH = 540'.

DEPTH	LITH	VISUAL %	DRILLING TIME SCALE: MIN.	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
0-55'			TIMED BY DRILLER	CUTTINGS GRAB SAMPLE EVERY 5'	<p><u>0-55'</u> <u>ALLUVIUM (SANTA FE GROUP):</u> CUTTING SAMPLES CONSIST OF MULTICOLORED CLASTS WITH CLAY-RICH INTERVALS COLORED LIGHT BROWN (5 YR 6/4) TO MODERATE BROWN (5 YR 4/4). CUTTINGS RANGE IN SIZE FROM MUCH LESS THAN 8.1 INCHES (CLAY AND SILT SIZE) TO 1.3 INCHES, AND AVERAGE 0.1 TO 0.2 INCHES. CUTTINGS ARE SUBANGULAR TO ANGULAR. THE ALLUVIUM IS AN UNCONSOLIDATED TO MODERATELY CONSOLIDATED, POORLY SORTED, PEBBLE TO BOULDER, POLYGENETIC CONGLOMERATE. INTERMITTENT CLAY AND CALICHE-RICH INTERVALS ARE NOTED IN THE LOG. CUTTING CLASTS REPRESENTING VARIOUS LITHOLOGIES OCCURRING IN THE ALLUVIUM ARE LIGHT GRAY (N7) TO GRAYISH-BLACK (N2) LIMESTONE, WHITE (N9) IRON-STAINED RHYOLITE, MODERATE REDDISH BROWN (10 R 4/6) TO DUSKY RED (5 R 3/4) AND GREENISH-GRAY (5 GY 6/1) SILTSTONE, WHITE (N9) TO LIGHT GRAY (N7) QUARTZ, GRAYISH PINK (5 R 8/2) TO MODERATE PINK (5 R 7/4) CALICHE, MEDIUM LIGHT GRAY (N6) TO LIGHT BROWNISH GRAY (5 YR 6/1) TUFF, BLACKISH RED (5 R 2/2) ANDESITE, DUSKY BROWN (5 YR 2/2) SANDSTONE AND MINOR AMOUNTS OF CHERT.</p>
5					
10					
15					
20					
25					
30					
35					
40					
45					
50					

LITHOLOGIC LOG
(CONTINUED)

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LOCATION ID: 200-G

DEPTH	LITH	VISUAL %	DRILLING TIME SCALE: MIN.	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
55			TIMED BY DRILLER	CUTTINGS GRAB SAMPLE EVERY 5'	55'-65' LIMESTONE: ORANGE/YELLOW OCHRE, FINELY CRYSTALLINE, ABUNDANT FINE (1 MM) MICROVEINLETS FILLED WITH DOGTOOTH CALCITE, ABUNDANT FE-OX COATING ALONG FRACTURES PREVALENT THROUGHOUT SOME SAMPLES.
60					
65					65'-100' MIXED SILTSTONE AND CLAY: ORANGE YELLOW OCHRE, VERY FINE GRAINED, WELL SORTED, WELL CONSOLIDATED, FIRM.
70					@ 70'-85' CLAY HORIZON: DUSKY RED, YELLOW OCHRE, VERY SOFT, CRUMBLY, GUMMY, LAMINATED, NO FRACTURES VISIBLE.
75					
80					
85					
90					@ 90'-95' SILTSTONE/CLAYSTONE HORIZON: COLOR CHANGES TO PREDOMINATELY GRAY TO BROWNISH GRAY, FINELY LAMINATED, SLIGHTLY CALCAREOUS.
95					
100					100'-115' DOLOMITE: LIGHT TO DARK GRAY, FINELY CRYSTALLINE, SILICEOUS, SLIGHTLY ARENACEOUS, FOSSILIFEROUS (ABUNDANT FORAMINIFERA AND SHELL FRAGMENTS).
105					
110					
115					115'-175' LIMESTONE: BLACK TO DARK GRAY, MICRITIC, CALCAREOUS, SLIGHTLY ARENACEOUS, FIRM, BLOCKY, SOME SHELL FRAGMENTS VISIBLE, ABUNDANT CALCITE FILLED MICROVEINLETS.
120					@ 120'-125' LIGHT GRAY TO BROWN, FINE TO MEDIUM CRYSTALLINE, FOSSILIFEROUS, SILICIC, HEALED CALCITE FILLED FRACTURES AND EVIDENCE OF OPEN OXIDIZED FRACTURES.

LITHOLOGIC LOG (CONTINUED)

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LOCATION ID: 200-G

DEPTH	LITH	VISUAL %	DRILLING TIME SCALE: MIN.	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR,
125			TIMED BY DRILLER	CUTTINGS GRAB SAMPLE EVERY 5'	
130					130'-135' OOLITIC BED: MEDIUM GRAY, HIGHLY FOSSILIFEROUS, OOLITIC LIMESTONE, LIMESTONE, MODERATELY FRACTURED
135					
140					@ 140'-155' LIGHT GRAY, SILTY, FINELY, CRYSTALLINE, NON-FOSSILIFEROUS, ABUNDANT, DISSEMINATED PYRITE SLIGHTLY DOLOMITIC, SOME FOSSILS (BIVALVE SHELLS) PRESENT, ABUNDANT LOOSE CALCITE IN SAMPLE INDICATING LARGER AND POSSIBLY OPEN FRACTURES.
145					
150					
155					@ 155'-165' BROWNISH GRAY, YELLOW OCHRE, FINE TO MEDIUM CRYSTALLINE, VERY FOSSILIFEROUS, ABUNDANT SHELL HASH, REDUCED CALCITE. -GRAINED, ABUNDANT FRACTURE FILLED WITH CALCITE.
160					
165					
170					
175					175'-220' <u>MIXED LIMESTONE AND SHALE</u> : BLACK, FISSILE, VERY CALCAREOUS WITH CALCITE INCLUSIONS, PYRITIC. LIMESTONE IS LIGHT GRAY TO GRAYISH BROWN, FOSSILIFEROUS, DOLOMITIC, LOOSE CALCITE COMPRISES UP TO 40 PERCENT OF SAMPLE, FINELY CRYSTALLINE, FINE HAIRLINE FRACTURES. SHALE IS BLACK, FIRM, HARD, LAMINATED, CALCAREOUS, AND CONTAINS DISSEMINATED PYRITE.
180					
185					
190					

LITHOLOGIC LOG

(CONTINUED)

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LOCATION ID: 200-G

DEPTH	LITH	VISUAL %	DRILLING TIME SCALE: MIN.	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)		
195			TIMED BY DRILLER	CUTTINGS GRAB SAMPLE EVERY 5'			
200							
205							
210							
215							
220							220'-310'
225							<u>LIMESTONE</u> : MEDIUM GRAY, FINELY CRYSTALLINE, FOSSILIFEROUS ABUNDANT FRACTURING PRESENT WITH FE-OX LINING, 5 - 7 PERCENT LOOSE CALCITE IN SAMPLE.
230							@ 230'-240'
235							EXTREMELY FRACTURED WITH NUMEROUS X-CUTTING VEINLETS, APPROXIMATELY 50 PERCENT OF SAMPLE IS CALCITE HEAVILY FRACTURED, POSSIBLE FRACTURE/FAULT ZONE.
240							@ 240'-310'
245							YELLOW OCHRE, LIGHT GRAY, OXIDIZED, HIGHLY FRACTURED WITH CRYSTALLINE (DOGTOOTH CALCITE) LINED FRACTURES, ROCK MATRIX IS FINE-GRAINED LIMESTONE, FOSSILIFEROUS.
250							
255							
260							

LITHOLOGIC LOG

(CONTINUED)

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LOCATION ID: 200-G

DEPTH	LITH	VISUAL %	DRILLING TIME SCALE: MIN.	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)		
265			TIMED BY DRILLER	CUTTINGS GRAB SAMPLE EVERY 5'.			
270							
275							
280							
285							
290							
295							
300							
305							
310							310'–355' <u>MIXED LIMESTONE AND SILTSTONE</u> : LIGHT GRAY, VERY FINE GRAINED, WELL SORTED, CALCAREOUS, SLIGHTLY ARGILLACEOUS FINELY LAMINATED, NON FOSSILIFEROUS, NO OXIDATION, DISSEMINATED SULFIDES PREVALENT.
315							
320							
325							
330							

LITHOLOGIC LOG (CONTINUED)

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LOCATION ID: 200-G

DEPTH	LITH	VISUAL %	DRILLING TIME SCALE: MIN.	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
405			TIMED BY DRILLER	CUTTINGS GRAB SAMPLE EVERY 5'	
410					
415					
420					
425					
430					
435					
440					
445					
450					
455					
460					
465					
470					

410'-465'
SHALE; BLACK TO DARK GRAY, VERY FINE GRAINED, FISSILE, LAMINATED,
SEMIHARD, LOCALLY CRUMBLY, CALCAREOUS.

@ 420'-425'
LIMESTONE HORIZON: BLACK TO DARK GRAY, MICRITIC, SLIGHTLY
BRECCIATED IN PLANES, NUMEROUS CALCITE LINED FRACTURES, SILTY.

@ 450'-455'
DOGTOOTH CALCITE, ACCOUNTING FOR APPROXIMATELY 5 PERCENT OF SAMPLE
OF SAMPLE.

@ 455'-460'
CALCITE VEINING OCCURS THROUGHOUT SHALE, ACCOUNTING FOR
APPROXIMATELY 5 ? 10 PERCENT OF SAMPLE.

465'-480'
MIXED LIMESTONE AND SHALE; LIMESTONE IS DARK BLACK, VERY FINE
GRAINED, WITH SOME CALCITE VEINING IN FINE MICROFACTURES, PIECES OF
SILT/CLAY ALSO MIXED IN WITH SAMPLE. ABUNDANT INTERBEDDED SHALE
HORIZONS.

LITHOLOGIC LOG (CONTINUED)

PAGE 8 OF 8

LOCATION ID: 200-G

DEPTH	LITH	VISUAL %	DRILLING TIME SCALE: MIN.	SAMPLE TYPE AND INTERVAL	LITHOLOGIC DESCRIPTION (LITH., GRAIN SIZE PROPORTIONS, WET COLOR, RNDG., SRTG., CONSOL., DIST. FEATURES)
475			TIMED BY DRILLER	CUTTINGS GRAB SAMPLE EVERY 5'	<p>480'--495'</p> <p>SHALE: BLACK GRAY, CRUMBLY, FISSILE, VERY FINE GRAINED, CALCAREOUS. NUMEROUS CALCITE VEINLETS THROUGHOUT.</p> <p>495'--540'</p> <p>MIXED LIMESTONE AND SHALE; LIMESTONE IS MEDIUM TO DARK GRAY, FIRM, FINE GRAINED, EXTENSIVE CALCITE VEINING COMPRISES APPROXIMATELY 30-40 PERCENT OF SAMPLE, DOGTOOTH CALCITE EVIDENT, ABUNDANT SHALE INTERBEDS.</p> <p>TOTAL DEPTH (TD) 540 FEET.</p>
480					
485					
490					
495					
500					
505					
510					
515					
520					
525					
530					
535					
540					