



VIRGINIA DIVISION OF MINERAL RESOURCES  
 Box 3667, Charlottesville, VA 22903

INTERVAL SHEET

Page \_\_\_\_\_ of \_\_\_\_\_

Well Repository No.: 5565

Date rec'd \_\_\_\_\_ Date Processed: 12-1-79

Sample Interval: from 50 to 1000

PROPERTY: Town of Saxis

Number of samples: 89

COMPANY: D'Appolonia

Total Depth: 1005'

COUNTY: Accomac (Saxis)

Oil or Gas: Water: Exploratory

From-To	From-To	From-To	From-To
-	250-60	500-10	750-60
-	260-70	510-20	760-70
-	270-80	520-30	770-80
-	280-90	530-40	780-90
-	290-100	540-50	790-100
50-60	300-10	-	800-10
60-70	310-20	-	810-20
70-80	320-30	570-80	820-30
80-90	330-40	580-90	830-40
90-100	340-50	590-100	840-50
100-110	350-60	600-10	850-60
110-120	360-70	610-20	860-70
120-130	370-80	620-30	870-80
130-140	380-90	-	880-90
140-150	390-100	640-50	890-100
150-160	400-10	650-60	900-10
160-170	<del>410-20</del>	660-70	910-20
170-180	420-30	670-80	920-30
180-190	-	680-90	930-40
190-200	440-50	690-100	940-50
200-210	-	700-10	950-60
210-220	460-70	710-20	960-70
220-230	470-80	720-30	970-80
230-240	480-90	730-40	980-90
240-250	490-100	740-50	990-1000

No sample

Unwashed only

VDMR Well #: 5565  
County : Accomack

Well : DAPP-2  
Property :  
Driller : D'Appolonia Consulting Engineers, Incorporated  
Location : On State Road 709, 1.4 miles north of U.S. Highway  
13; near New Church.  
Elevation : 35 feet  
Total Depth : 1,005 feet  
Started drilling : November 3, 1979  
Completed drilling : November 7, 1979  
Gamma log : Available  
Sample description by: E. K. Rader, December 20, 1979

GEOLOGIC LOG

<u>Depth</u> <u>(feet)</u>	
0-50	No sample.
50-60	Sand, very light gray (N 8), very fine to medium grained, angular, poor sorting, glauconite less than 2%,* shell fragments less than 2%.*
60-70	As above.
70-80	As above.
80-90	As above, except a few flakes of muscovite.
90-100	As 80-90 above, no shell fragments.
100-110	As 80-90 above.
110-120	Sand, very light gray (N 8), very fine to medium grained, angular, poor sorting; minor glauconite, muscovite, phosphate, chert, and gypsum.
120-130	Sand, light gray (N 7), very fine to medium grained, angular, poor sorting; phosphate less than 2%; minor glauconite, chert, shell fragments, echinoid spines.
130-140	Sand, light gray (N 7), very fine to medium grained, angular, poor sorting; shell fragments less than 2%,* minor phosphate, glauconite, and chert.
140-150	As above.
150-160	As above.
160-170	As above.

VDMR Well #: 5565

Depth  
(feet)

170-180	As above, about 2% phosphate.
180-190	As 170-180 above.
190-200	As 170-180 above.
200-210	As 170-180 above.
210-220	As 130-140 above, 5% shell fragments.
220-230	Sand, light gray (N 7), very fine to medium grained, angular, poor sorting; shell fragments 10%, glauconite 10%, phosphate less than 2%.
230-240	As above.
240-250	As above.
250-260	As above.
260-270	As above.
270-280	As above.
280-290	As 220-230 above, glauconite 5%.
290-300	As 220-230 above, glauconite 3 to 4%.
300-310	As 290-300 above.
310-320	As 220-230 above, glauconite 2%.
320-330	As 310-320 above.
330-340	Sand, light gray (N 7), fine to medium grained, angular to subrounded, moderate sorting; glauconite 4 to 5%, phosphate less than 2%, shell fragments 15 to 20%.
340-350	As above, very fine to medium grained.
350-360	Sand, light gray (N 7), fine to very coarse grained, angular to subrounded, poor sorting; shell fragments 20 to 25%, glauconite less than 1%, phosphate trace.
360-370	As above, more fine materials.

VDMR Well #: 5565

Depth  
(feet)

370-380	Sand, light bluish gray (5 B 7/1), fine to medium grained, angular, moderate sorting; *shell fragments less than 2%, glauconite and phosphate less than 1%. *
380-390	As above.
390-400	As above.
400-410	As above, euhedral pyrite, shell fragments 10%.
410-420	No sample.
420-430	As 370-380 above, ostracode.
430-440	No sample.
440-450	As above 370-380, shell fragments 10%.
450-460	No sample.
460-470	As 370-380 above.
470-480	Sand, light bluish gray (5 B 7/1), very fine to fine grained, angular, moderate sorting; glauconite and phosphate 2-4%, shell fragments less than 2%. * 3
480-490	As above.
490-500	As above.
500-510	As above, shell fragments 12 to 15%, pyrite.
510-520	As above, shell fragments 10%, <u>Nonion</u> , pyrite, <u>Turritella</u> , limestone fragments 3 to 5%.
520-530	Same as 470-480, <u>Nonion</u> , ostracodes, <u>Quinqueloculina</u> , pyrite.
530-540	Same as 520-530 above.
540-550	Same as 520-530 above.
550-560	No sample.
560-570	No sample.
570-580	Same as 520-530 above, less fines.

VDMR Well #: 5565

Depth  
(feet)

580-590	Same as 520-530 above.
590-600	Same as 520-530 above.
600-610	Sand, very light gray (N 6), very fine to fine grained, angular, moderate sorting; glauconite, pyrite, and phosphate less than 1%, *shell fragments less than 1%.*
610-620	As above, less than 1% gypsum.
620-630	As above, less than 1% gypsum and muscovite.
630-640	No sample.
640-650	Same as 620-630, shell fragments 4 to 5%.
650-660	Same as 620-630, <u>Nonion</u> , shell fragments 4 to 5%.
660-670	Same as 620-630.
670-680	Same as 620-630.
680-690	Same as 620-630.
690-700	Same as 620-630, <u>Nonion</u> , <u>Uvigerina</u> , <u>Robulus</u> , <u>Bolivina</u> .
700-710	Same as 620-630, forams present.
710-720	Same as 620-630.
720-730	Same as 620-630, forams present.
730-740	Same as 620-630, forams present.
740-750	Same as 620-630, forams present.
750-760	Same as 620-630, forams present.
760-770	Same as 620-630, forams present.
770-780	Same as 620-630, forams present, minor limestone fragments.
780-790	Same as 620-630, minor limestone present.
790-800	Same as 620-630.
800-810	Same as 620-630, forams present.

VDMR Well #: 5565

<u>Depth</u> <u>(feet)</u>	
810-820	Same as 620-630, 2 to 4% iron stained quartz.
820-830	Same as 620-630.
830-840	Same as 620-630.
840-850	Same as 620-630.
850-860	Same as 620-630, minor silty clay.
860-870	Same as 620-630, 4 to 6% clay.
870-880	Same as 620-630, 4 to 6% clay.
880-890	Sand and clay- sand, light gray (N 7), very fine to fine grained, angular, poor sorting; clay medium light gray (N 6), silty; glauconite, phosphate, and gypsum less than 2%; shell fragments 2 to 5%.
890-900	Sand, light gray (N 7), very fine to fine grained, angular, poor sorting; clay 5%; glauconite, phosphate, and gypsum less than 2%; shell fragments 2 to 5%. 2*
900-910	As above.
910-920	Same as above, forams present.
920-930	Same as above, forams present.
930-940	Same as above, forams present.
940-950	Same as above, forams present.
950-960	Same as above, forams and pyrite present.
960-970	Same as above, forams present.
970-980	Same as above, forams present.
980-990	Same as above, forams present.
990-1000	Same as above, forams present.
1000-1005	No sample.

VDMR Well No. 5565

County: Accomack

Well: DAPP-2

Property:

Driller: D'Appolonia Consulting Engineers, Inc.

Location: On state Road 709, 1.4 miles N. of U.S. Highway 13;  
near New Church

Elevation: 35 feet

Total Depth: 1005 feet

Started drilling: November 3, 1979 Completed drilling: November 7, 1979

Gamma log available

Sample description by: E. K. Rader, December 20, 1979

### GEOLOGIC LOG

Depth in  
feet

0-50

No sample.

50-60

Sand, very light gray (NB), <sup>very</sup> fine to medium grained, angular, poor sorting, glauconite  $\leq 2\%$ , shell fragments  $\leq 2\%$ .

60-70

As above.

70-80

As above.

80-90

As above, except a few flakes of muscovite.

90-100

As 80-90 above, no shell fragments

100-110

As 80-90 above

110-120

Sand, very light gray (NB), very fine to medium grained, angular, poor sorting; minor glauconite, muscovite, phosphate, chert and gypsum.



- 120-130 Sand, light gray (N7), very fine to medium grained, angular, poor sorting; phosphate < 2%; minor glauconite, chert, shell fragments, echinoid spines.
- 130-146 Sand, light gray (N7), very fine to medium grained, angular, poor sorting; shell fragments < 2%, minor phosphate, glauconite, and chert
- 140-150 As above.
- 150-160 As above.
- 160-170 As above.
- 170-180 As above, about 2% phosphate.
- 180-190 As 170-180 above.
- 190-200 As 170-180 above.
- 200-210 As 170-180 above.
- 210-220 As 130-140 above, 5% shell fragments
- 220-230 Sand, light gray (N7), very fine to medium grained, angular, poor sorting; shell fragments 10%, glauconite 10%, phosphate < 2%.
- 230-240 As above.
- 240-250 As above.
- 250-260 As above
- 260-270 As above
- 270-290 As above
- 290-290 As 220-230 above, glauconite 5%.
- 290-300 As 220-230 above, glauconite 3.4%
- 300-310 As 290-300 above.
- 310-320 As 220-230 above, glauconite 2%

- 320-330 As 310-320 above.
- 330-340 Sand, light gray (N 7), fine to medium grained, angular to subrounded, moderate sorting; glauconite 4 to 5%, phosphate < 2%, shell fragments 15 to 20%.
- 340-350 As above, very fine to medium grained.
- 350-360 Sand, light gray (N 7), fine to <sup>very</sup> coarse grained, angular to subrounded, poor sorting; shell fragments 20 to 25%, glauconite < 1%, phosphate trace
- 360-370 As above, more fine materials
- 370-380 Sand, light bluish gray (5 B 7/1), fine to medium grained, angular, moderate sorting; shell fragments < 2%, glauconite and phosphate < 1%.
- 380-390 As above.
- 390-400 As above.
- 400-410 As above, euhedral pyrite, shell fragments 10%
- 410-420 No sample
- 420-430 As 370-380 above, ostracode.
- 430-440 No sample
- 440-450 As 370-380 above, shell fragments 10%
- 450-460 No sample
- 460-470 As 370-380 above.
- 470-480 Sand, light bluish gray (5 B 7/1), very fine to fine grained, angular, moderate sorting; glauconite and phosphate 2-4%, shell fragments < 2%.

- 480-490 ← As above.
- 490-500 ← As above.
- 500-510 ← As above, shell fragments 12+15%, pyrite.
- 510-520 ← As above, shell fragments 10%, Nonion, pyrite, Turritella, limestone fragments 3+5%.
- 520-530 Same as #70-480, Nonion, ostracodes, Quingueloculina, pyrite.
- 530-540 Same as 520-530 above.
- 540-550 same as 520-530 above.
- 560-570 No sample.
- 570-580 Same as 520-530 above, less fines.
- 580-590 Same as 520-530 above.
- 590-600 Same as 520-530 above.
- 600-610 Sand, very light gray (NG), very fine to fine grained, angular, moderate sorting; glauconite, pyrite, and phosphate <1%, shell fragments <1%.
- 610-620 ← As above, <1% gypsum.
- 620-630 ← As above, <1% gypsum and muscovite.
- 630-640 No sample.
- 640-650 same as 620-630, shell fragments 4+5%.
- 650-660 Same as 620-630, Nonion, shell fragments 4+5%.
- 660-670 Same as 620-630.
- 670-680 Same as 620-630.
- 680-690 Same as 620-630.
- 690-700 Same as 620-630, Nonion, Uvigerina, Robulus, Bolivina,

- 700-710 Same as 620-630, forams present.
- 710-720 Same as 620-630.
- 720-730 Same as 620-630, forams present.
- 730-740 Same as 620-630, forams present.
- 740-750 Same as 620-630, forams present.
- 750-760 Same as 620-630, forams present.
- 760-770 Same as 620-630, forams present.
- 770-780 Same as 620-630, forams present, minor limestone fragments.
- 780-790 Same as 620-630, minor limestone present.
- 790-800 Same as 620-630.
- 800-810 Same as 620-630, forams present.
- 810-820 Same as 620-630, 2 to 4% iron stained quartz.
- 820-830 Same as 620-630.
- 830-840 Same as 620-630.
- 840-850 Same as 620-630.
- 850-860 Same as 620-630, minor silty clay.
- 860-870 Same as 620-630, 4 to 6% clay.
- 870-880 Same as 620-630, 4 to 6% clay.
- 880-890 Sand and clay - sand, light gray (N 8), <sup>very</sup> fine to fine grained, angular, poor sorting; clay medium light gray (N 6), silty; glauconite, phosphate, and gypsum  $\leq 2\%$ ; shell fragments 2 to 5%.
- 890-900 Sand, light gray (N 7), very fine to fine grained, angular, poor sorting; clay 5%; glauconite phosphate, and gypsum  $\leq 2\%$ ; shell fragments 2 to 5%.

900 - 910	← As above.
910 - 920	Same as above, forams present.
920 - 930	Same as above, forams present.
930 - 940	Same as above, forams present.
940 - 950	Same as above, forams present.
950 - 960	Same as above, forams and pyrite present.
960 - 970	Same as above, forams present.
970 - 980	Same as above, forams present.
980 - 990	Same as above, forams present.
990 - 1000	Same as above, forams present.
1000 - 1005	No sample.

# D'APPOLONIA

CONSULTING ENGINEERS, INC.

December 10, 1979

Project No. 78-356

Mr. Gene Rader  
Virginia Division of Mineral Resources  
P. O. Box 3667  
Charlottesville, VA 22903

Accomack County Well  
Data Transmittal

Dear Mr. Rader:

In response to your request to our client, Los Alamos Scientific Laboratories, we are providing you with samples and well logs for the borings we have completed in Accomack County, Virginia. We thank you for the logs of the Tangier Island well you promised to send, as well as for past information exchanges. D'Appolonia appreciates the cooperative working relationship we have established.

Samples collected from Borings DAPP-1, DAPP-3, and DAPP-4 are being sent separately. Gamma logs and field logs for these holes, as well as for DAPP-2, are enclosed. Gamma logging will be performed on DAPP-1 in mid-January and a copy will be forwarded shortly after it becomes available.

Sediment samples were collected from the return fluid flow by washing in a No. 140 sieve. A nylon mesh was used for DAPP-4. For Borings DAPP-3 and DAPP-4, the samples are incomplete due to very small amounts of material in the return flow. Indicated with a check mark on the field logs are the samples which are being made available to you. We do not require return of these samples.

We have enclosed a copy of the preliminary correlations of the gamma logs with a gamma log and geologic description from the Taylor well near Atlantic, Virginia. The gamma logging in the Taylor well was done to the same parameters as used in the logging of DAPP-2, DAPP-3, and DAPP-4 but, of course, the response is different here due to it being a much larger diameter well. Of interest is a marker bed at 630 feet in the Taylor well which can be identified throughout each boring. Conversations with VPI&SO indicate that this may be a radioactive sand that they observed in their Crisfield, Maryland well.

10 DUFF ROAD, PITTSBURGH, PA 15235 TELEPHONE: 412/243-3200

BECKLEY, WV      CHESTERTON, IN      CHICAGO, IL      DENVER, CO      HOUSTON, TX      LAGUNA NIGUEL, CA  
WILMINGTON, NC      BRUSSELS, BELGIUM      SEOUL, KOREA      TEHERAN, IRAN

Mr. Gene Rader

- 2 -

December 10, 1979

You will also find enclosed a geologic description from the Taylor well, as well as coordinates of each of our borings.

Bill Miller, who performed the logging and sampling will be out of the country until February 1, 1980, therefore, please direct any future questions to Carl Schubert or Bill Johnson.

D'Appolonia trusts that these samples and logs will be of value to you and would appreciate your technical comments.

Sincerely yours,

*W.A. Miller*

William Miller *WAM*  
Geophysicist

*Carl E. Schubert*

Carl E. Schubert  
Senior Project Engineer

WM:CES:rt  
Enclosures

**D'APPOLONIA**

October 9, 1979

Project No. 78-356

Commonwealth of Virginia  
 Department of Labor and Industry  
 Division of Mines and Quarries  
 Big Stone Gap, Virginia 24219

Attention: Mr. William Kelly

Revision to Request for Approval  
 to Conduct Drilling Operations in  
 Accomack County, Virginia

Dear Mr. Kelly:

In the Request for Approval to Conduct Drilling for geothermal test borings sent to your attention on October 1, 1979, proposed drilling locations were provided. These drilling locations have been finalized by establishing agreements with specific landlords and this has resulted in slight changes to the locations presented to you on October 1, 1979. The revised final locations are shown on the attached topographic maps and are described as follows:

BORING NO.	LOCATION	COORDINATE	ELEVATION
DAPP-1	Wallops Island	37° 52' 58" N- 75° 25' 59" W	El. 15 ft
DAPP-2 <sup>4</sup>	New Church - East	37° 58' 34" N- 75° 30' 30" W	El. 35 ft
DAPP-3	Makemie Park	37° 54' 32" N- 75° 34' 16" W	El. 17 ft
DAPP-4 <sup>2</sup>	Saxis	37° 55' 12" N- 75° 43' 39" W	El. 5 ft

The drilling procedures remain as presented in our letter of October 1, 1979. The drilling program is still scheduled to begin about October 15. The incorporation of the revised drilling locations into your permit is greatly appreciated. If you require any additional information,



# D'APPOLONIA

CONSULTING ENGINEERS, INC.



By \_\_\_\_\_ Date \_\_\_\_\_ Subject \_\_\_\_\_ Sheet No. \_\_\_\_\_ of \_\_\_\_\_

Chkd. By \_\_\_\_\_ Date \_\_\_\_\_ Proj. No. \_\_\_\_\_

GENE RADER  
VIRGINIA DIVISION OF MINERAL RESOURCES  
P.O. BOX 3667  
CHARLOTTESVILLE, VA 22903

MR. RADER:

ENCLOSED PLEASE FIND SAMPLES FROM WELL DAPP-2 TAKEN BY MYSELF AT NEW CHURCH, VIRGINIA. SAMPLES WERE COLLECTED FROM THE RETURN FLOW USING A # 100 SIEVE (.0041 INCHES).

COORDINATES OF THE WELL ARE APPROXIMATELY:

42 03 000 N  
4 55 000 E

OR

37° 58' N  
75° 30' 30" E

THE WELL IS LOCATED ON Rt. 709, 1.4 MILES EAST OF HIGHWAY 13, NEAR NEW CHURCH, VIRGINIA.

FINAL DEPTH OF THE WELL WAS 1005'.

IF YOU HAVE ANY QUESTIONS OR COMMENTS, PLEASE DIRECT THEM TO BILL JOHNSON IN OUR PITTSBURGH OFFICE. (PHONE # 412-243-3200).

WE WILL BE IN TOUCH SHORTLY, AND I WILL FORWARD SAMPLES FROM OUR REMAINING WELLS AS SOON AS THEY ARE COMPLETED AND CATALOGUED.

Sincerely,

William Miller

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER:		PROJECT NAME:		
BORING NUMBER:		COORDINATES		DATE:
ELEVATION:		GWL:	AT	HRS.
ENGINEER/GEOLOGIST:			AT	HRS.
DRILLING METHODS:				PAGE OF

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
				OVER			

NOTES:

THIS IS THE CLASSIFICATION SYSTEM USED IN THE FIELD LOGS.

W. S. M. J.

Unified Soil Classification System

UNIFIED SOIL CLASSIFICATION (Including Identification and Description)							
Major Division	Group Symbols	Typical Names	Field Identification Procedures (Excluding particles larger than 3 in., and listing fractions on estimated weights.)	Information Required for Describing Soil	Laboratory Classification Criteria		
1	2	3	4	5	6		
Coarse-grained Soils More than half of material is larger than No. 200 sieve size. The No. 200 sieve size is about the smallest particle which is to be retained.	Gravels More than half of coarse fraction is larger than 4.75 mm (No. 40 sieve) size. For visual classification, the 1/4-in. size may be used as approximate to the No. 4 sieve size.	GW	Well-graded gravels, gravel-sand mixtures, little or no fines.	Wide range in grain sizes and substantial amounts of all intermediate particle sizes.	For undisturbed soils add information on stratification, degree of compaction, cementation, moisture conditions, and drainage characteristics.	$C_u = \frac{D_{60}}{D_{10}} \text{ Greater than } 4$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} \text{ Between } 1 \text{ and } 3$ <p>Not meeting all gradation requirements for GW</p> <p>Atterberg limits below "A" line or PI less than 4</p> <p>Atterberg limits above "A" line with PI greater than 7</p> $C_u = \frac{D_{60}}{D_{10}} \text{ Greater than } 6$ $C_c = \frac{(D_{30})^2}{D_{10} \times D_{60}} \text{ Between } 1 \text{ and } 3$ <p>Not meeting all gradation requirements for SW</p> <p>Atterberg limits below "A" line or PI less than 4</p> <p>Atterberg limits above "A" line with PI greater than 7</p>	
		GP	Poorly graded gravels or gravel-sand mixtures, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.			
		GMH	Silty gravels, gravel-sand-silt mixture.	Nonplastic fines or fines with low plasticity (For identification procedures see ML below.)			
		GM	Clayey gravels, gravel-sand-clay mixtures.	Plastic fines (For identification procedures see CL below.)			
	Sands More than half of coarse fraction is finer than 4.75 mm (No. 40 sieve) size. For visual classification, the 1/4-in. size may be used as approximate to the No. 4 sieve size.	Clean Gravels (Little or no fines)	SW	Well-graded sands, gravelly sands, little or no fines.	Wide range in grain size and substantial amounts of all intermediate particle sizes.	<p>Examples:</p> <p>Silty sand, gravelly, about 20% hard, angular gravel particles 1/2-in. maximum size; rounded and subangular sand grains, coarse to fine; about 15% nonplastic fines with low dry strength; well compacted and moist in place; at least sand. (SM)</p>	
			SP	Poorly graded sands or gravelly sands, little or no fines.	Predominantly one size or a range of sizes with some intermediate sizes missing.		
		Sands with Fines (Appreciable amount of fines)	SM	Silty sands, sand-silt mixtures.	Nonplastic fines or fines with low plasticity (For identification procedures see ML below.)		
			SC	Clayey sands, sand-clay mixtures.	Plastic fines (For identification procedures see CL below.)		
			Identification Procedures on Fraction Smaller than No. 40 Sieve Size				<p>For undisturbed soils add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions.</p> <p>Give typical name; indicate degree and character of plasticity amount and maximum size of coarse grains; color in wet condition; odor, if any; local or geologic name and other pertinent descriptive information; and symbol in parentheses.</p> <p>Examples:</p> <p>Clayey silt, brown, slightly plastic, small percentage of fine sand, numerous vertical root holes; (MH)</p>
			Silty and Clays Liquid limits less than 50	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity.		
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.	Medium to high		None to very slow	Medium		
Silty and Clays Liquid limits greater than 50	OL	Organic silts and organic silty clays of low plasticity.	Slight to Medium	Slow	Slight		
	MH	Inorganic silts, micaceous or silty silts, silty silts.	Slight to medium	Slow to none	Slight to medium		
	CH	Inorganic clays of high plasticity, fat clays.	High to very high	None	High		
	OH	Organic clays of medium to high plasticity, organic silts.	Medium to high	None to very slow	Slight to medium		
Highly Organic Soils	U	Peat and other highly organic soils.	Readily identified by color, odor, spongy feel and frequently by fibrous texture.				

(1) Boundary classification: Soils possessing characteristics of two groups are designated by combinations of group symbols. For example, GW-GC, well-graded gravel-sand mixture with clay binder. (2) All sieve sizes on this chart are U.S. standard.

FIELD IDENTIFICATION PROCEDURES FOR FINE-GRAINED SOILS OR FRACTIONS  
These procedures are to be performed on the minus No. 40 sieve particles, approximately 1/44 in. For field classification purposes, rounding is not intended, simply remove by hand the coarse particles that interfere with the tests.

Dilatancy (reaction to shaking)

After removing particles larger than No. 40 sieve size, prepare a pat of moist soil with 1/2 volume of about one-half cubic inch. Add enough water if necessary to make the soil soft but not sticky. Place the pat in the open palm of one hand and shake horizontally, shifting vigorously against the other hand several times. A positive reaction consists of the appearance of water on the surface of the pat which changes to a livery consistency and becomes glossy. When the sample is squeezed between the fingers, the water and silt disappear from the surface, the pat stiffens, and finally it cracks or crumbles. The rapidity of appearance of water during shaking and its disappearance during squeezing assist in identifying the plasticity of the fines in a soil. Very fine clays are the stiffest and most dilatant reaction whereas a plastic clay has the softest and least dilatant reaction whereas a lean clay has a moderate reaction.

Dry Strength (crushing characteristics)

After removing particles larger than No. 40 sieve size, mold a pat of soil to the consistency of putty, rolling with a roller if necessary. Allow the pat to dry completely by oven, sun, or air-drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure of the character and quantity of the colloidal fraction contained in the soil. The dry strength increases with increasing plasticity. High dry strength is characteristic for clays of the CH group. A typical lean-silt pat shows only very slight dry strength. Silty fine sands and silts have about the same slight dry strength, but can be distinguished by the feel when powdering the dried specimen. Fine sand feels gritty whereas a typical silt has the smooth feel of flour.

Toughness (consistency near plastic limit)

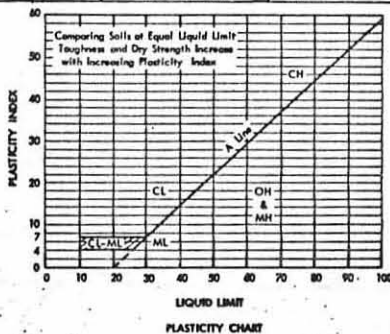
After particles larger than the No. 40 sieve size are removed, a specimen of soil about one-half inch in cube size is molded to the consistency of putty. If too dry, water must be added and if silty, the specimen should be spread out in a thin layer and allowed to lose some moisture by evaporation. Then the specimen is rolled out by hand on a smooth surface or between the palms into a thread about one-eighth inch in diameter. The thread is then folded and rolled repeatedly. During this manipulation the moisture content is gradually reduced and the specimen stiffens, finally loses its plasticity, and crumbles when the plastic limit is reached. After the thread crumbles, the pieces should be lumped together and a slight kneading action continued until the lump crumbles. The tougher the thread near the plastic limit and the stiffer the lump when it finally crumbles, the more potent is the colloidal clay fraction in the soil. Weakness of the thread at the plastic limit and quick loss of coherence of the lump below the plastic limit indicate either inorganic clay of low plasticity, or materials such as kaolin-type clays and organic clays which occur below the A-line. Highly organic clays have a very weak and spongy feel at the plastic limit.

Use plasticity curves in identifying the fractions as given under field identification.

Determine percentages of gravel and sand from gravimetric curves. Depending on percentages of fines (fraction smaller than No. 200 sieve size) coarse-grained soils are classified as follows:

GW, GP, SW, SP, GM, GC, SM, SC, SC. Some soils may require use of dual symbols.

Less than 5%  
More than 12%  
5% to 12%



For laboratory classification of fine-grained soils

U.S.C.S. CLASSIFICATION FOR SOILS

COBBLES  
GRAVEL  
FINE  
COARSE  
SAND  
MEDIUM  
FINE  
SILT AND CLAY

1000  
100  
10  
1  
0.1  
0.01  
0.001

3" CLEAR SIEVE OPENINGS  
1 1/2"  
3/4"  
3/8"  
#4  
#10  
#20  
#40  
#60  
#80  
#100  
#140  
#200  
U.S. STANDARD SIEVE OPENINGS

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-2	COORDINATES N 37° 58' 34"		DATE: 3 NOV 79
ELEVATION: 35 ft	GWL: AT	HRS.	DATE STARTED: 3 NOV 79
ENGINEER/GEOLOGIST: W. M. Miller	AT	HRS.	DATE COMPLETED: 7 NOV 79
DRILLING METHODS: FLUSH JOINT 3/4" ROD, ROLLER BIT, BENTONITE			PAGE 1 OF 33

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
40	52-5		1110	VERY FINE TO FINE TAN QUARTZ SAND, POORLY GRADED	SP		CASING TO 40'
			1120				WATER ROSE BROKE @ 1135 HRS STEEL CLOSED
50	52-6		1310	VERY FINE TO FINE LIGHT GREY WELL ROUNDED QUARTZ SAND POORLY GRADED, VERY CLEAN	SP		MATERIAL IS CLOGGING STEEL - VERY FINE
60			1320				
			1503	SAME	SP		
	52-7		1513				

NOTES:

70

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-756	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-2	COORDINATES		DATE: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 3 NOV 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	DATE COMPLETED: 7 NOV 79
DRILLING METHODS:			PAGE 2 OF 33

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
70	52-8		1519	VERY FINE TO FINE LIGHT GREY QUARTZ SANDS, VERY CLEAN, POORLY GRAINED	SP		
80	52-9		1532 1538	SAME	SP		
90	52-10		1546 1552	SAME	SP		
100			1602				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 70-356	PROJECT NAME: LASL - HDR		DATE: 3 NOV 1979
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 1979
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: <i>asj/llh</i>	AT	HRS.	PAGE 8 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
100	52-11		1605	VERY FINE TO FINE LIGHT GREY SAND, POORLY GRADED, TRACE CLAY	SP ↓ SC		DRILLER SAYS FEELS LIKE A CLAY SEAM @ 105'
110	52-12		1620 1630	VERY FINE TO FINE GREY QUARTZ SAND, POORLY GRADED	SP		
120	52-13		1650 1655	VERY FINE TO FINE DARK GREY QUARTZ SAND, TRACE (2%) BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		MUD HAS THICKENED DUE TO THE CLAY SEAM
130			1704				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <i>FR-356</i>	PROJECT NAME: <i>LASL-HDR</i>	
BORING NUMBER: <i>DAPP-2</i>	COORDINATES	DATE: <i>4 NOV 79</i>
ELEVATION:	GWL: <i>AT</i> HRS.	DATE STARTED: <i>3 NOV 79</i>
ENGINEER/GEOLOGIST: <i>wsmjlln</i>	<i>AT</i> HRS.	DATE COMPLETED: <i>7 NOV 79</i>
DRILLING METHODS:	PAGE <i>4</i> OF <i>33</i>	

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
<i>130</i>	<i>52-14</i>		<i>0655</i>	<i>VERY FINE TO FINE GREY QUARTZ SAND TRACE (2%) FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED</i>	<i>SP</i>		
<i>140</i>	<i>52-15</i>		<i>0706 0710</i>	<i>SAME</i>	<i>SP</i>		
<i>150</i>	<i>52-16</i>		<i>0718 0722</i>	<i>SAME</i>	<i>SP</i>		
<i>160</i>			<i>0732</i>				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: CASL HDR	
BORING NUMBER: DAPP-2	COORDINATES	DATE: 4 NOV 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 3 NOV 79
ENGINEER/GEOLOGIST: <i>Wampler</i>	AT HRS.	DATE COMPLETED: 7 NOV 79
DRILLING METHODS:		PAGE 5 OF 33

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
160	52-17		0737	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (2%) FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED.	SP		
170	52-18		0745 0750	SAME	SP		
180	52-19		0757 0802	SAME	SP		
190			0812				

NOTES:



# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-256	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-2	COORDINATES	DATE: 4 NOV '79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 3 NOV '79
ENGINEER/GEOLOGIST: W. M. Miller	AT HRS.	DATE COMPLETED: 7 NOV '79
DRILLING METHODS:		PAGE 6 OF 33

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
190	52-20		0817	VERY FINE TO FINE GREY QUARTZ SAND, TRACE OF IRON STAINED QUARTZ, TRACE BROKEN SHELL FRAGMENTS, POORLY GRADED.  SOME TRACES OF CLAY IN WASHING	SP		DRILLING VERY SLOW THROUGH THIS SECTION - PERHAPS CLAY
200	52-21		0831 0837	SAME BUT MORE SHELLS (10%) AND TRACE GREEN TINGED QUARTZ NO CLAY	SP		
210	52-22		0845 0849	VERY FINE TO FINE GREY QUARTZ SAND, WELL ROUNDED, SOME 25% VERY FINELY BROKEN SHELL FRAGMENTS, TRACE (2%) TAN STAINED QUARTZ GRAINS	SP		
220			0857				

NOTES:

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 4 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: <i>W. J. J. J.</i>	AT	HRS.	PAGE 7 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
220	52-23		0900	VERY FINE TO FINE GREY QUARTZ SAND, SOME 20% FINELY BROKEN SHELL FRAGMENTS, TRACE (2%) OF TAN STAINED QUARTZ GRAINS, POORLY GRADED	SP		
230	52-24		0907 0909	SAME	SP		
240	52-25		0917 0922	SAME BUT FINE TO MEDIUM	SP		
250			0933				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-556	PROJECT NAME: LASL-HDR		DATE: 4 NOV '79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV '79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV '79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	PAGE 8 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
250	52-26		0938	FINE DARK GREY QUARTZ SAND, SOME 20% FINELY BROKEN SHELL FRAGMENTS TRACE TAN STAINED QUARTZ GRAINS TRACE MEDIUM QUARTZ GRAINS POORLY GRADED	SP		
260	52-27		0953 0958	SAME - VERY FINE TO FINE	SP		
270	52-28		1010 1013	VERY FINE TO FINE GREY QUARTZ SAND, SOME 20% FINELY BROKEN SHELL FRAGMENTS, TRACE COARSE SHELL FRAGMENTS, TRACE TAN STAINED QUARTZ GRAINS POORLY GRADED	SP		
280			1022				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL - HDR		DATE: 4 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: Womiller	AT	HRS.	PAGE 9 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
280	52-29		1027	FINE TO MEDIUM GREY QUARTZ SAND, SOME 25% BROKEN SHELL FRAGMENTS (FINE TO COARSE) TRACE (<2%) TAN STAINED QUARTZ GRAINS POORLY GRADED	SP		
290	52-30		1034 1038	SAME BUT VERY LITTLE MEDIUM GRAINED SAND	SP		
300	52-31		1045 1050	SAME	SP		
310			1057				

NOTES:

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 4 NOV '79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV '79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV '79
ENGINEER/GEOLOGIST: WAMiller	AT	HRS.	PAGE 10 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
310	52-32		1108	VERY FINE TO FINE GRAINED GREY QUARTZ SAND, SOME 15% FINE TO COARSE BROKEN SHELL FRAGMENTS. POORLY GRADED	SP		
320	52-33		1115 1123	VERY FINE TO MEDIUM GREY QUARTZ SAND, SOME 20% FINE TO COARSE BROKEN SHELL FRAGMENTS. TRACES OF GLAUCONITE AND TAN STAINED QUARTZ, POOR TO FAIR GRADING	SP		
330	52-34		1130 1136	SAME - MORE COARSE SHELL FRAGMENTS. FAIR GRADING. VERY SLIGHT TRACES OF CLAY	SP ↓ SW ↓ SC		MUD HAS THICKENED APPRECIABLY
340			1145				

NOTES:

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LAS-HDR		DATE: 4 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. J. Miller	AT	HRS.	PAGE 11 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
340	SZ-35		1210	VERY FINE TO MEDIUM GREY QUARTZ SANDS, SOME 15% FINE TO COARSE BROKEN SHELL FRAGMENTS, TRACE TAN STAINED QUARTZ GRAINS, FAIR TO GOOD GRADING	SW		WASHED FROM 1148-1200 NOTICED COARSE QUARTZ & COARSE SHELLS WASHING UP.
350	SZ-36		1230	FINE TO COARSE GREY QUARTZ SAND, 40% FINE TO VERY COARSE BROKEN SHELL FRAGMENTS, TRACE 5% TAN STAINED QUARTZ GRAINS, SLIGHT TRACES OF CLAY, WELL GRADED	SW u CL		
360			1242				

NOTES: TO IDENTIFY CLAY - PUT A SMALL AMOUNT OF FLUID ON SIEVE AND SPREAD IT AROUND TO FORM A FILM, NOT AGITATING THE FLUID TO KEEP CLAY PARTICLES FROM DISSOLVING.

HAD TO STOP @ 1300 DLS BECAUSE OF LACK OF WATER TO THIN THE MUD OUT WITH

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-2	COORDINATES		DATE: 5 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 3 NOV 79
ENGINEER/GEOLOGIST: W. J. Miller	AT	HRS.	DATE COMPLETED: 7 NOV 79
DRILLING METHODS:	PAGE 12 OF 33		

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
360	52-37		0910	FINE TO MEDIUM GREY QUARTZ SAND, SOME 15% FINE TO COARSE BROKEN SHELL FRAGMENTS, TRACE 5% TAN STAINED QUARTZ AND COARSE QUARTZ, FAIR TO GOOD GRADING TRACE CLAY	SP G SW SC		
320	52-38		0923 0928	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (2%) VERY FINELY BROKEN SHELL FRAGMENTS, TRACES OF CLAY POORLY GRADED	SP G SC		
380	52-39		0937 0941	SAME	SP G SC		
390			0952				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	DATE: 5 NOV 99
BORING NUMBER: DAPP-2	COORDINATES	DATE STARTED: 3 NOV 99
ELEVATION:	GWL: AT HRS.	DATE COMPLETED: 7 NOV 99
ENGINEER/GEOLOGIST: W. Miller	AT HRS.	PAGE 13 OF 33
DRILLING METHODS:		

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
390	S2-40		0959	VERY FINE TO FINE DARK GREY SAND SLIGHT TRACES (L20) FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		
400	S2-41		1006 1016	SAME - TRACES OF CLAY	SP ↓ SC		SMALL AMOUNT OF MATERIAL WASHING UP
410	S2-42		1038 1041	SAME	SP ↓ SC		SMALL AMOUNT OF MATERIAL
420			1052				

NOTES: MUD IS THIN DUE TO ADDING WATER TO THE PIT - THICKENS WITH NATURAL CLAYS IN THE FORMATION, THOUGH.



## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 5 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	PAGE 14 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
420	52-43		1059	VERY FINE DARK GREY QUARTZ SAND, CLAYEY, POORLY GRADED	SC ↓ SP		SMALL AMOUNT OF MATERIAL
430	52-44		1106 1109	SAME	SC ↓ SP		SMALL AMOUNT OF MATERIAL
440	52-45		1116 1122	VERY FINE TO FINE DARK GREY QUARTZ SAND, TRACE (10%) BROKEN SHELL FRAGMENTS POORLY GRADED TRACES OF CLAY	SP ↓ SC		SMALL AMOUNT OF MATERIAL
450			1133				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 5 NOV '79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV '79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV '79
ENGINEER/GEOLOGIST: WSM Miller	AT	HRS.	PAGE 15 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
450	52-46		1143	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (10%) BROKEN SHELL FRAGMENTS POORLY GRADED, TRACES OF CLAY	SP ↓ SC		
460	52-47		1200 1205	VERY FINE GREY QUARTZ SAND SOMEWHAT CLAYEY, POORLY GRADED MINUTE TRACES OF CLAY	SP ↓ SC		
470	52-48		1214 1217	SAME	SP ↓ SC		
480			1225				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 5 NOV '79
BORING NUMBER: DAPP-Z	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: Womjles	AT	HRS.	PAGE 16 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
480	SZ-49		1230	VERY FINE GREY QUARTZ SAND SOMEWHAT CLAYEY TO THE TOUCH MINUTE TRACES CLAY BIRLY GRADED	SP ↓ SC		
490	SZ-50		1238 1244	SAME	SP ↓ SC		
500	SZ-51		1354 1331	VERY FINE TO FINE GREY QUARTZ SAND, SOME 15% BROKEN SHELL FRAGMENTS, POORLY GRADED  MINUTE TRACES OF CLAY (BLUE-GREY) TRACE TAN STAINED QUARTZ GRAINS	SP ↓ SC		
60			1343				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 5 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: <i>W. Miller</i>	AT	HRS.	PAGE 17 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
510	S2-52		1347	VERY FINE TO FINE GREY QUARTZ SAND TRACE (10%) BROKEN SHELL FRAGMENTS MINUTE TRACES CLAY TRACE (<2%) TAN STAINED QUARTZ GRAINS POORLY GRADED	SP ↓ SC		
520	S2-53		1400	SAME - FEWER SHELLS	SP ↓ SC		
530	S2-54		1408	SAME	SP ↓ SC		
540			1423				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL - HDR		DATE: 5 NOV '79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV '79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV '79
ENGINEER/GEOLOGIST: <i>W. J. Miller</i>	AT	HRS.	PAGE 18 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
540	52-55		1428	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (5%) BROKEN SHELL FRAGMENTS, POORLY GRADED MINUTE TRACES OF CLAY	SP ↓ SC		
550	52-56		1435 1440	SAME - LESS FINES	SP ↓ SC		
560	52-57		1450 1457	SAME	SP ↓ SC		VERY SMALL AMOUNT OF MATERIAL WASHED UP
570			1508				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 5 Nov 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 Nov 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 Nov 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	PAGE 19 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
570	52-58		1512	FINE GREY QUARTZ SAND TRACE (5%) BROKEN SHELL FRAGMENTS POORLY GRADED	SP		
580	52-59		1528	FINE GREY QUARTZ SAND, TRACE (6%) FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		
590	52-60		1550	SAME - APPROACHING FINE TO MEDIUM	SP		HARD SPOT @ 594' (DRILLER'S COMMENT)
600			1608				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	DATE: 5 NOV '79
BORING NUMBER: DAPP-2	COORDINATES	DATE STARTED: 3 NOV '79
ELEVATION:	GWL: AT HRS.	DATE COMPLETED: 7 NOV '79
ENGINEER/GEOLOGIST: W. Miller	AT HRS.	PAGE 20 OF 33
DRILLING METHODS:		

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
600	52-61		1612	VERY FINE TO FINE GREY QUARTZ SAND, POORLY GRADED VERY CLEAN	SP		
610	52-62		1627 1632	SAME	SP		
620	52-63		1645 1655	SAME - TRACE (2%) BROKEN SHELL FRAGMENTS	SP		
630			1705				

NOTES:

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	DATE: 6 NOV 79
BORING NUMBER: DAPP-2	COORDINATES	DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: <i>wsmiller</i>	AT HRS.	PAGE 21 OF 33
DRILLING METHODS:		

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
630	SZ-6A		0040	VERY FINE TO FINE LIGHT GREY QUARTZ SAND, POORLY GRADED, TRACE (<2%) BROKEN SHELL FRAGMENTS	SP		
640	SZ-65		0648 0653	SAME - MORE SHELLS (10%)	SP		
650	SZ-66		0702 0704	SAME	SP		
660			0710				

NOTES:



# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASC-HDR	DATE: 6 NOV 79
BORING NUMBER: DAPP-2	COORDINATES	DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. S. Miller	AT HRS.	PAGE 22 OF 33

DRILLING METHODS:

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
660	SZ-67		0715	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (5%) BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		
670	SZ-68		0720 0724	SAME	SP		
680	SZ-69		0730 0734	SAME	SP		
690			0739				

NOTES:

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <b>78-356</b>	PROJECT NAME: <b>LASL-HDR</b>		DATE: <b>6 Nov 79</b>
BORING NUMBER: <b>DAPP-2</b>	COORDINATES		DATE STARTED: <b>3 Nov 79</b>
ELEVATION:	GWL: <b>AT</b>	HRS.	DATE COMPLETED: <b>7 Nov 79</b>
ENGINEER/GEOLOGIST: <b>W. Miller</b>	<b>AT</b>	HRS.	PAGE <b>23</b> OF <b>33</b>
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
690	52-70		0743	VERY FINE TO FINE GREY QUARTZ SAND, POORLY GRADED	SP		
700	52-71		0748 0753	SAME - VERY MINUTE TRACES OF TAN-STAINED QUARTZ	SP		
710	52-72		0800 0809	VERY FINE TO FINE GREY QUARTZ SAND	SP		
720			0816				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 6 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	PAGE 24 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
720	S2-73		0821	VERY FINE TO FINE GREY QUARTZ SANDS, TRACE (2%) BROKEN SHELL FRAGMENTS POORLY GRADED	SP		
730	S2-74		0827 0844	SAME	SP		VERY HARD THIN LAYER @ 730'
740	S2-75		0853 1013	SAME - SLIGHT TRACE TAN-STAINED QUARTZ GRAINS	SP		STOPPED FROM 0900-1010 TO GET MORE WATER AND ATTACH SWATCH BLOCK
750			1024				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 28-356	PROJECT NAME: LASL-HOR		DATE: 6 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. Smiley	AT	HRS.	PAGE 25 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
750	52-76		1055	VERY FINE TO FINE GREY QUARTZ SAND, POORLY GRADED VERY CLEAN	SP		DELAYS DUE TO PROBLEMS WITH CABLE ON RIG
760	52-77		1106 1137	SAME - TRACE (2%) VERY FINELY BROKEN SHELL FRAGMENTS	SP		DRILLERS SAYS FEELS LIKE CLAY @ 765'
770	52-78	76 min	1146 1150	SAME - VERY MINUTE TRACES OF CLAY	SP		
780			1201				

NOTES:

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	DATE: 6 NOV '79
BORING NUMBER: DAPP-2	COORDINATES	DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: <i>unmiller</i>	AT HRS.	PAGE 26 OF 33
DRILLING METHODS:		

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
780	SZ-79		1208	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (2%) FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		
790	SZ-80		1220 1224	SAME - TRACES OF CLAY	SP ↓ SC		SMALL AMOUNT OF MATERIAL  STOPPED TO FIX NOSE
800	SZ-81		1235 1300	SAME - MORE CLAY THAN LAST SAMPLE	SP ↓ SC		SMALL AMOUNT OF MATERIAL  NO MORE PROGRES-NEED TO MAKE A SUB
810			1315				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL HDR		DATE: 7 NOV '99
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	PAGE 27 OF 33

DRILLING METHODS:

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
810	52-82		0918	VERY FINE TO FINE LIGHT GREY QUARTZ SAND, POORLY GRADED, VERY CLEAN	SP		FIRST SAMPLE AFTER WASHING FROM 6630-0915  LOST A LOT OF WATER DURING WASHING PRESSURIZED THE FORMATION.
820	52-83	710 MIN	0938 0947	SAME - TRACE (2%) TAN-STAINED QUARTZ GRAINS	SP ↓ SC		TRACES OF CLAY IN RETURN WATER, BUT LARGE AMOUNT OF SAND WASHING UP
840	52-84		0955 1002	SAME - TRACE CLAY AND FINELY BROKEN SHELL FRAGMENTS (2%)	SP ↓ SC		
840			1007				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 7 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. J. Miller	AT	HRS.	PAGE 28 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
848	52-85		1015	VERY FINE TO FINE LIGHT GREY QUARTZ SAND, TRACE (5%) CLAY, TRACE (2%) BROKEN SHELL FRAGMENTS POORLY GRADED	SP ↓ SC		CLAY IS FLAT & PLATY, DEEP GREYISH BLUE
850	52-86		1023 1028	SAME	SP ↓ SC		
860	52-87		1035 1039	SAME	SP ↓ SC		
870			1046				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL HDR		DATE: 7 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: Wampler	AT	HRS.	PAGE 29 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
870	52-88		1051	VERY FINE TO FINE LIGHT GREY QUARTZ SAND, TRACE (5%) DARK GREY BLUE CLAY, TRACE (2%) BROKEN SHELL FRAGMENTS, POORLY GRADED	SP ↓ SC		
880	52-89		1058 1102	SAME	SP ↓ SC		
890	52-90		1107 1111	SAME	SP ↓ SC		
900			1116				

NOTES:



# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-35C	PROJECT NAME: LASL-MDR	DATE: 7 NOV 79
BORING NUMBER: DAPP-2	COORDINATES	DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: W. M. Miller	AT HRS.	PAGE 30 OF 33

DRILLING METHODS:

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
920	52-91		1125	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (5%) BROKEN SHELL FRAGMENTS, MINUTE TRACES CLAY POORLY GRADED	SP ↓ SC		
910	52-92		1131 1138	SAME- LESS CLAY	SP ↓ SC		
920	52-93		1144 1149	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (2%) FINE BROKEN SHELL FRAGMENTS POORLY GRADED	SP		
930			1157				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 7 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: <i>Wampler</i>	AT	HRS.	PAGE 31 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
920	52-9A		1200	VERY FINE TO FINE DARK GREY QUARTZ SAND, TRACE (5%) VERY FINELY BROKEN SHELL FRAGMENTS POORLY GRADED	SP		LARGE AMOUNT OF MATERIAL WASHING UP MUD HAS THICKENED
940	52-9B		1205 1210	SAME BUT FEWER SHELLS (22%) AND TRACES (5%) OF CHLORITE (DARK) AND TAN STAINED QUARTZ	SP		
960	52-9C		1216 1220	VERY FINE LIGHT GREY QUARTZ SAND, VERY CLEAN, POORLY GRADED	SP		
980			1226				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 7 NOV '79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV '79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV '79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	PAGE 32 OF 33
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
960	52-97		1233	VERY FINE LIGHT GRAY QUARTZ SAND, POORLY GRADED, VERY CLEAN	SP		
970	52-98		1237 1243	SAME	SP		
980	52-99		1247 1254	SAME - SLIGHT TRACE BROKEN SHAL FRAGMENTS	SP		
990			1259				

NOTES:

# D'APPOLONIA

## VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 7 NOV 79
BORING NUMBER: DAPP-2	COORDINATES		DATE STARTED: 3 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 7 NOV 79
ENGINEER/GEOLOGIST: <i>W. J. M. [unclear]</i>	AT	HRS.	PAGE 33 OF 33
DRILLING METHODS:			

DEPTH ( )	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
990	52-100	~12-15 GAL/MIN RETURN	1230	VERY FINE GREY QUARTZ SAND POORLY GRADED VERY CLEAN	SP		
1000			1235				

NOTES: