

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

INTERVAL SHEET

Page 1 of 1

Well Repository No.: W- 5635

Date rec'd: Date Processed: 1/10/80

Sample Interval: from 40 to: 1000

PROPERTY:

Number of samples: 67

COMPANY: D'Appolonia (Dapp - 3)

Total Depth: 1000'

COUNTY: Accomack

Oil or Gas: Water: Exploratory: X

From-To	From-To	From-To	From-To	From-To
-	190 - 300	640 - 650	970 - 980	-
-	300 - 310	650 - 660	-	-
-	310 - 320	-	990 - 1000	-
-	320 - 330	670 - 680	-	-
40 - 50	330 - 340	680 - 690	-	-
50 - 60	340 - 350	690 - 700	-	-
60 - 65	350 - 360	-	-	-
-	360 - 370	710 - 720	-	-
70 - 80	370 - 380	720 - 730	-	-
80 - 90	380 - 390	-	-	-
100 - 110	390 - 400	750 - 760	-	-
110 - 120	-	760 - 770	-	-
120 - 130	410 - 420	-	-	-
-	-	780 - 790	-	-
-	430 - 440	790 - 800	-	-
140 - 150	-	810 - 820	-	-
150 - 160	490 - 500	-	-	-
160 - 170	-	830 - 840	-	-
-	510 - 520	-	-	-
180 - 190	-	850 - 860	-	-
190 - 200	530 - 540	860 - 870	-	-
200 - 210	540 - 550	870 - 880	-	-
210 - 220	-	-	-	-
220 - 230	570 - 580	890 - 900	-	-
230 - 240	580 - 590	-	-	-
140 - 150	590 - 600	910 - 920	-	-
150 - 160	600 - 610	-	-	-
160 - 170	-	930 - 940	-	-
170 - 180	620 - 630	-	-	-
180 - 190	630 - 640	950 - 960	-	-

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COMPANY: D'Appolonia (Dapp-3)

Total Depth: 1000'

COUNTY: Accomack

Oil or Gas: Water: Exploratory: ✓

From-To	From-To	From-To	From-To
-	40-50	30-40	80-20
-	50-60	40-50	-
-	60-70	-	30-40
-	70-80	70-80	-
40-50	80-90	80-90	50-60
50-60	90-300	90-600	60-70
60-65	300-10	600-10	70-80
-	10-20	-	90-900
70-80	20-30	20-30	-
80-90	30-40	30-40	910-20
-	40-50	40-50	30-40
100-10	50-60	50-60	50-60
10-20	60-70	-	-
20-30	70-80	70-80	-
-	80-90	80-90	-
40-50	90-400	90-700	70-80
50-60	410-20	-	90-1000
60-70	30-40	710-20	-
80-90	-	20-30	-
90-200	90-500	-	-
200-10	-	50-60	-
10-20	10-20	60-70	-
20-30	-	80-90	-
30-40	-	90-800	-

unwashed only

County: ACCOMACK
VDMR Well # 5635

Well: DAPP-3
Farm:
Driller: D'Appolonia
Location: Hallwood 7.5' quadrangle; Makenie Park; on State Route 695;
37°54'32"N; 75°34'16"W
Elevation: 12'+ (4 m)
Total Depth: 1000'
Started drilling: 1979
Finished drilling: 1979
Sample description by: Joan K. Polzin; Virginia Division of Mineral Resources
Reference: D'Appolonia; 1980, Hot dry rock geothermal evaluation, Cris-Wall
site, eastern shore of Maryland and Virginia: Los Alamos
Scientific Laboratory, Los Alamos, N. M.

GEOLOGIC SUMMARY

Depth	Thickness	Formation (and remarks)
0-40	40	No sample
40-235	195	Yorktown Fm.
235-480	245	St. Mary's Fm.
480-600	120	Choptank Fm.
600-1010	410	Calvert Fm.

Note: All units picked from gamma log.

WELL LOG

0 - 40	No Sample
40 - 50	Sand - yellowish gray (5y 7/2); very sparse clay clasts; fine- to coarse-grained sub-angular; moderate sorting; quartz; few glauconite, few wood fragments; mica (muscovite)
50 - 60	Sand - as above, except: few clay clasts; fine- to medium-grained; few coarse grained; chromite mica.
60 - 70	Sand - as above, except: no clay; fine- to granule; poor sorting; limestone; feldspar.
70 - 80	Sand - as above, except: medium- to very coarse-grained; feldspar; rare glauconite.
80 - 90	Sand - as above, except: 10% granule; garnet.
90 - 100	No sample.
100 - 110	Sand - as above, except: medium-grained; few coarse-grains; moderately well sorted; 3% fine wood fragments 1% mica (muscovite).
110 - 120	Sand - as above, except: well sorted; 1% fine black phosphatic fragments; mica.
120 - 130	Sand - as above, except: 1% wood fragments.
130 - 140	No sample.
140 - 150	Sand - as above, except: 10% fine black to dark green glauconite; wood fragments; feldspar; mica.
150 - 160	Sand - as above, except: few coarse grains.
160 - 170	Sand - as above, except: fine- to coarse-grained; poor sorting; few feldspar grains.
170 - 180	Sand - as above, except: granules; shell fragments.
180 - 190	No sample.
190 - 200	Sand - greenish gray (3GY 6/1); medium- to coarse-grained, wood fragments; shell fragments rare; feldspar.
200 - 210	Sand - as above, except: 1% fine shell fragments; 10% fine black

VDMR Well # 5635

DEPTH (FEET)	DESCRIPTION
210 - 220	Sand - as above, except: few coarse-grains; moderately well sorted; few wood fragments.
220 - 230	Sand - as above, except: medium- to coarse-grained; poor sorting; some fine shell fragments.
230 - 240	Sand - "Salt and Pepper", 30% glauconite, 10% fine shell fragments; wood fragments.
240 - 250	Sand - as above, except: medium-grained; few coarse grains; moderately well sorted; 35% glauconite; 10% fine shell fragments.
250 - 260	Sand - as above, except: 10% glauconite; 5% shell fragments.
260 - 270	Sand - as above, except: 15% glauconite; iron.
270 - 280	Sand - as above, no iron.
280 - 290	Sand - greenish gray (5GY 6/1), medium-grained, well sorted; 7% glauconite; 3% shell fragments; few wood fragments.
290 - 300	Sand - as above, except: 6% glauconite; 2% shell fragments.
300 - 310	Sand - as above except: fine- to medium-grained; 5% glauconite; 1% shell fragments.
310 - 320	Sand - as above, except: fine- to coarse-grained; moderate sorting; 3% glauconite; 1% shell fragments.
320 - 330	Sand - as above, except: poor sorting.
330 - 340	Sand - as above, except: some very coarse grains; 1% glauconite; 3% shell fragments; wood.
340 - 350	Sand - as above, except: 1% shell fragments.
350 - 360	Sand - as above, except: coarse- to very coarse-grained; well sorted; some fine grains; 10% shell fragments; mollusks-barnacle, gastropod; echinoderm spines; minor glauconite; feldspar.
360 - 370	Sand - as above, except: fine- to very coarse-grained; poor sorting; 5% shell fragments; wood fragments.
370 - 380	Sand - as above, except: fine- to very coarse-grained; poor sorting; mica; wood.

DEPTH (FEET)	DESCRIPTION
380 - 390	Sand - as above, except: fine- to medium-grained; some very coarse grains; well sorted; 4% fine black glauconite; 3% shell fragments; wood fragments; mica.
390 - 400	Sand - light olive gray (5Y 6/1); medium-grained; 2% fine glauconite; 3% shell fragments; 1% wood fragments; mica.
400 - 410	No sample.
410 - 420	Sand - as above, except: few wood fragments.
420 - 430	Sand - as above.
430 - 440	Sand - as above, except: fine- to medium-grained; well sorted; some very coarse grains; few coarse grains; some glauconite; 1% shell fragments; wood fragments; mica.
440 - 490	No sample.
490 - 500	Sand - as above, except: fine-grained; some coarse grains; minor glauconite, shell and wood.
500 - 510	No sample.
510 - 520	Sand - as above, except: 8% fine glauconite.
520 - 530	No sample.
530 - 540	Sand - as above, except: some shell fragments and wood.
540 - 550	Sand - as above, except: fine-grained to granule; sub-angular to sub-rounded; poor sorting; 1% glauconite; 5% shell fragments; feldspar, garnet; blue quartz; Foram - <u>Nonion</u> .
550 - 580	No sample.
580 - 590	Sand - as above, except: fine- to medium-grained; some coarse grains; moderate sorting; 2% fine glauconite; 10% fine shell fragments wood fragments; mica; feldspar.
590 - 600	Sand - very light olive gray (5Y 7/1); moderate sorting; 1% shell fragments; 2% glauconite; Foram - <u>Nonion</u> ; mica; wood fragments.
600 - 610	Sand - as above except: fine- to medium-grained; moderately well sorted.

DEPTH (FEET)	DESCRIPTION
610 - 620	No sample.
620 - 630	Sand - as above, except: iron; some wood fragments.
630 - 640	Sand - as above.
640 - 650	Sand - as above, except: Forams - <u>Eponides</u> , <u>Nonion</u> .
650 - 660	Sand - as above, except: medium- to coarse-grained; moderate sorting; 2% fine glauconite; 7% shell fragments; Forams - <u>Nonion</u> , <u>Robulus</u> ; wood fragments, mica.
660 - 670	No sample.
670 - 680	Sand - light olive gray - (5Y 5/1); sparse silt; poor sorting; 1% shell fragments; Foram- <u>Nonion</u> ; wood.
680 - 690	Sand - as above, except: 2% shell fragments; 1% wood fragments; Foram- <u>Uvigerina</u> ; <u>Nonion</u> , <u>Textularia</u> , <u>Bolivina</u> , <u>Nodosaria</u> , <u>Quinqueloculina</u> , <u>Guttulina</u> , <u>Globigerina</u> , <u>Lagena Substrata</u> ; feldspar, iron, echinoderm spines.
690 - 700	Sand - as above, except; moderate sorting; 1% glauconite; 1% shell fragments; ostracod; Foram- <u>Nonions</u> , <u>Textularia</u> ; <u>Quinqueloculina</u> , <u>Bolivina</u> .
700 - 710	No sample.
710 - 720	Sand-as above, except: abundant small sand clasts; some very coarse grains; poor sorting; 1% foram- <u>Nonions</u> , <u>Bolivina</u> ; <u>Textularia</u> ?
720 - 730	Sand - as above, except: fine- to coarse-grained; moderate sorting; 1% iron; Forams - as above; minor; mica, feldspar.
730 - 750	No sample.
750 - 760	Sand - as in 720' - 730': 1%+ Forams- <u>Globigerina</u> , <u>Siphogenerina</u> , <u>Nonions</u> , <u>Lagena</u> .
760 - 770	Sand - as above.
770 - 780	Sand - medium- to coarse-grained; few very coarse grains; moderate sorting; 1% glauconite; some shell fragments; 1% iron stains; 1% Forams; wood fragments; mica.

780 - 790	Sand - as above.
790 - 800	Sand - as above.
800 - 810	Sand - as above, except: poor sorting; some phosphate particles; minor glauconite; 1% shell fragments; 3% Forams - <u>Globigerina</u> , <u>Nonion</u> , <u>Uvigerina</u> , <u>Lagena</u> , <u>Bolivina</u> , <u>Quinqueloculina</u> ; wood.
810 - 820	Sand - as above.
820 - 830	No sample.
830 - 840	Sand - as above.
840 - 850	No sample.
850 - 860	Sand - as above, except: forams- <u>Robulus</u> (L); feldspar.
860 - 870	Sand - as above, except: 1% glauconite.
870 - 880	Sand - as above, except: moderate clay; 1% Forams.
880 - 890	No sample.
890 - 900	Sand - as above, except: sparse clay; medium-grained; few very coarse grains; 1% Forams; wood fragments; mica; feldspar.
900 - 910	No sample.
910 - 920	Sand - as above, except: very fine- to medium-grained; some coarse grains; poor sorting; Forams.
920 - 930	No sample.
930 - 940	Sand - light olive gray (5Y 5/2); medium-grained, few coarse grains; moderately well sorted; 1% Forams- <u>Bulimina</u> .
950 - 960	Sand - as above, except: 8% glauconite; 8+% Forams.
960 - 970	No sample.
970 - 980	Sand - as above, except: ostracod, Forams- <u>Elphidium florentinae</u> , <u>Siphogenerina</u> , <u>Nonion</u> , <u>Robulus</u> , <u>Bolivina</u> , <u>Globigerina</u> .
980 - 990	No sample.
990 - 1000	Sand - as above, except: 20%+ Forams- <u>Uvigerina</u> , <u>Robulus calcar</u> , <u>Siphogenerina</u> , <u>Nonion</u> , <u>Globigerina</u> , <u>Marginulina</u> ; ostracod; mica.

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 ⁴	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 ²	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

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 3/16 in. (4.75 mm) sieve size. (Asterisk size may be used on flow chart classification, the 1/4 in. size may be used on appropriate in 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 3/16 in. (4.75 mm) sieve size. (Asterisk size may be used on flow chart classification, the 1/4 in. size may be used on appropriate in 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>	<p>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:</p> <p>GW, GP, SW, SP, GM, GC, SM, SC, SC. Some soils may require use of dual symbols.</p> <p>Less than 5% More than 12% 5% to 12%</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.					
		Gravels 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.)					
		Sands with Fines (Appreciable amount of fines)	Clean Sands (Little or no fines)	ML	Inorganic silts and very fine sands, such as flour, silty or clayey fine sands or clayey silts with slight plasticity.			None to slight	Quick to slow	None
				CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays.			Medium to high	None to very slow	Medium
Sands with Fines (Appreciable amount of fines)	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				
Silty and Clayey Liquid limits less than 50	Silty and Clayey Liquid limits greater than 50	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, sponging 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 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)

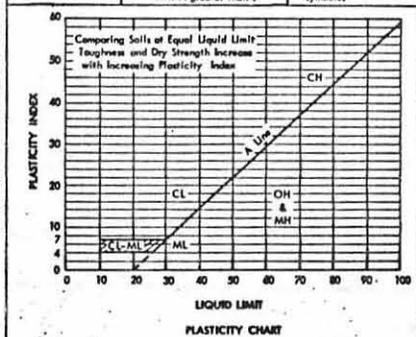
After removing particles larger than No. 40 sieve size, mold a pat of soil to the consistency of putty, rolling with fingers if necessary. Allow the pat to dry completely by oven, sun, or air-drying, and then test its strength by breaking and crumbling between the fingers. This strength is a measure 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-silty silt passes 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:



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
3"
1/2"
3/4"
3/8"
#4
#10
#20
#40
#60
#80
#100
#140
#200
SIZE IN MM
10
1
0.1

CLEAR SIEVE OPENINGS
U.S. STANDARD SIEVE OPENINGS

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-8	COORDINATES N 37° 54' 32" W 35° 34' 16"	DATE: 29 OCT 79
ELEVATION: 17 ft	GWL: AT HRS.	DATE STARTED: 29 OCT. 79
ENGINEER/GEOLOGIST: <i>Wm J. Jelen</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS: 3/4" FLUSH JOINT CASING - 3 ROLLER BIT, BENTONITE		PAGE 1 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
20	NO SAMPLE			CLAY - AUGER	CL		
30	NO SAMPLE			CLAY - AUGER	CL		AUGERED? CASED TO 46'
40	SS-1		1342	FINE GRAINED QUARTZ SAND, POORLY GRADED (FINE TO MED.)	SP		LOTS OF ORGANIC MATERIAL FROM PIT WATER,
50	SS-2		1345	VERY COARSE, SUB-ROUNDED TO WELL ROUNDED GRAVEL, QUARTZ & CHERT	GP		MAYBE OLD LEACH FIELD FROM OLD HOTEL - CLOGGED BIT
NOTES: AUGERED TO 40', SURFACE SOIL CASING IN TO 40'							

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL - HDR	
BORING NUMBER: DAR-3	COORDINATES	DATE: 29 Oct 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 Oct 79
ENGINEER/GEOLOGIST: W. Miller	AT HRS.	DATE COMPLETED: 1 Nov 79
DRILLING METHODS:	PAGE 2 OF 34	

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
50			1435	GRAVEL & MEDIUM QUARTZ SAND	GP		STOPPING FROM 1450-1700 SAND IS CLOGGING UP ROD & BIT
60	53-3		1450	FINE GRAINED QUARTZ SAND, POORLY GRADED VERY CLEAN	SP		

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356		PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-3		COORDINATES		DATE: 30 OCT. '79
ELEVATION:		GWL: AT	HRS.	DATE STARTED: 29 OCT '79
ENGINEER/GEOLOGIST: <i>usmiller</i>		AT	HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:				PAGE 3 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
60 ✓	53-4		0735	FINE TO COARSE, WELL GRADED QUARTZ SAND WITH TRACE CHERT (5%) AND TRACE GLAUCONITE (2%)	SW		
65 ✓	53-5		0750 0828	SAME	SW		THICKENED MUD
70 ✓	53-6		2842 0850	FINE TO MEDIUM QUARTZ SAND POORLY GRADED SOME CLAY (PROBABLY BENSONITE)	SP		SIEVE SAMPLE (140)
80 ✓	53-7		0900 0908	SAME - NO CLAY	SP		SIEVE SAMPLE (140)
70			0915				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-14R	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 30 OCT 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>W. Miller</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 4 OF 34	

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
90	S3-8		720	VERY FINE TO FINE QUARTZ SAND WITH SOME 30% DARK CHLORITE OR MICA POORLY GRADED TRACES OF CLAY (NOT RETAINED IN SAMPLE)	SP		SIEVE SAMPLE - SMALL (140) SAMPLE
100	S3-9		935 0740	SAME (NO CLAY)	SP		SIEVE SAMPLE (SMALL) (140)
110	S3-10		0750 0755	SAME	SP		SIEVE SAMPLE (140)
120			1002				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-754	PROJECT NAME: LASL-HDR		DATE: 30 OCT 79
BORING NUMBER: DAPP-3	COORDINATES		DATE STARTED: 29 OCT 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 1 NOV 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	PAGE 5 OF 34
DRILLING METHODS:			

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
120	S3-11		1007	VERY FINE TO FINE GREY QUARTZ SAND POORLY GRADED	SP		SIEVE SAMPLE (140)
130	S3-12		1011 1014	SAME	SP		SIEVE SAMPLE (140) FROM NOW ON, SIEVE SAMPLES UNLESS OTHERWISE NOTED
140	S3-13		1020 1025	SAME	SP		
150			1033				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HOR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 30 OCT 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>W. Miller</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 6 OF 34	

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
150	53-14		1036	VERY FINE TO FINE DARK GRAY QUARTZ SAND POORLY GRADED	SP		
160	53-15		1042 1044	SAME - TRACE SHELLS (L1%)	SP		DRILLER SAYS GETTING GRAVELLY @ 140'
170	53-16	32 min	1052 1056	SAME - 20% BROKEN SHELL FRAGMENTS	SP		
180			1059				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL - HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 30 OCT. 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: Wampler	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:		PAGE 7 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
180	55-17		1103	SAME - SLIGHTLY LESS SHELLS (10%)	SP		
190	53-18		1112	SAME - 10% BROKEN SHELL FRAGMENTS	SP		
200	55-19		1120 1135	FINE TO COARSE GREY QUARTZ SAND 20-30% COARSE BROKEN SHELL FRAGMENTS TRACE GLAUCONITE (2%) GOOD GRADING	SW		15 MINUTES FOR MINOR REPAIRS
210			1145				

NOTES:

Wampler
11/1/79

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-3	COORDINATES		DATE: 30 OCT. 79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:			PAGE 8 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
210	53-20		1153	VERY FINE TO FINE GREY QUARTZ SAND POORLY GRADED	SP		
220	53-21		1200 1203	SAME	SP		
230	53-22		1210 1245	SAME	SP		
240			1255				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356		PROJECT NAME: LPSL-HDR	
BORING NUMBER: DAPP-3		COORDINATES	
ELEVATION:		GWL: AT	HRS.
ENGINEER/GEOLOGIST: <i>wsmiller</i>		AT	HRS.
DRILLING METHODS:		PAGE 7 OF 34	

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
240	53-23		1300	VERY FINE TO FINE GREY QUARTZ SAND POORLY GRADED	SP		
250	53-24	<i>n 150 gals</i>	1317 1325	SAME - TRACE VERY FINELY BROKEN SHELL FRAGMENTS	SP		MUD HAS THICKENED APPRECIABLY DUE TO FORMATION CLAY
260	54-25		1336 1347	SAME	SP		
270			1355				

NOTES:

MUD FLOW RETURN *n* 12 GAL/MIN

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 30 OCT. 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>W. J. Miller</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 10 OF 34	

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
270	53-26		1402	VERY FINE TO FINE GREY QUARTZ SAND, TRACE VERY FINELY BROKEN SHELLS	SP		
280	53-27		1414	SAME	SP		
290	53-28		1425 1430	SAME	SP		
300			1440				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 30 OCT 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>usmiller</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:		PAGE 11 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
300	53-29		1450	VERY FINE TO FINE GRAY QUARTZ SAND, TRACE FINELY BROKEN SHELL FRAGMENTS (5%) POORLY GRADED	SP		
310	53-30		1458 1505	SAME	SP		
320	53-31		1511 1520	SAME - 10% SHELL FRAGMENTS	SP		
330			1527				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 30 Oct. 79
BORING NUMBER: DAPP-3	COORDINATES		DATE STARTED: 29 Oct 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 1 NOV 79
ENGINEER/GEOLOGIST: Wampler	AT	HRS.	PAGE 12 OF 34
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
330	53-32		1533	FINE TO MEDIUM GREY QUARTZ SAND TRACE COARSE ANGULAR QUARTZ (5%) SOME 20% BROKEN SHELL FRAGMENTS FAIR TO GOOD GRADING	SP & SW		
340	53-33		1542 1548	VERY FINE TO FINE GREY QUARTZ SAND, TRACE 5% FINELY BROKEN SHELL FRAGMENTS POORLY SORTED GRADING	SP		
350	53-34		1555 1600	FINE TO MEDIUM GREY QUARTZ SAND, TRACE GLAUCONITE (2%) 30% COARSE TO FINELY BROKEN SHELL FRAGMENTS FAIR GRADING TRACES OF CLAY	SP		
360			1607				

NOTES:

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 30 OCT. 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT. 79
ENGINEER/GEOLOGIST: <i>usmiller</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:		PAGE 13 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
360	53-35	170 sec	1612	FINE TO MEDIUM GRAINED GREY QUARTZ SANDS, SOME 30% COARSE TO FINELY BROKEN SHELLS TRACE GLAUCONITE (42%) SMALL TRACES OF CLAY POOR TO FAIR GRADING	SP		
370	53-36		1620 1629	FINE QUARTZ SANDS AND CLAY. TRACE 10% BROKEN SHELL FRAGMENTS MOST OF CLAY IN VERY SMALL BALLS	SP ↓ SC		SMALLER QUANTITY OF SAND BUT GETTING SOME CLAY IN SAMPLE. DRILLER SAYS LIKEWISE FEELS LIKE CLAY.
380	53-37		1638 1655	SAME - LITTLE IF ANY CLAY IN SAMPLE	SP ↓ SC		NOTICED TRACES OF CLAY WHILE WASHING SIEVE WASHING FROM 1640-1655
390			1710				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 31 OCT 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>W. J. Miller</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 14 OF 34	

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
390	53-38		0759	VERY FINE TO FINE GREY QUARTZ SAND TRACE FINELY BROKEN SHELL FRAGMENTS POORLY GRADED	SP		
400	53-39		0805 0815	SAME- TRACE COARSELY BROKEN SHELL FRAGMENTS	SP		
410	53-40		0822 0827	SAME	SP		
420			0893				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-472	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 31 OCT. 79
ELEVATION:	GWL: AT HRS:	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>wmjelly</i>	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 15 OF 34	

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
420	S3-41		0835	VERY FINE TO FINE GREY QUARTZ SAND TRACE FINELY BROKEN SHELL FRAGMENTS POORLY GRADED	SP		SMALL AMOUNT OF MATERIAL WASHING UP
430	S3-42		0843 0848	SAME VERY SLIGHT TRACE OF CLAY	SP		
440	S3-43		0858 0902	SAME	SP		VERY SMALL AMOUNT OF MATERIAL WASHING UP
450			0911				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 31 OCT 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: W. Smiley	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 16 OF 34	

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
450	53-44		0914	VERY FINE TO FINE GREY QUARTZ SAND, TRACE BOUNDED COARSE QUARTZ TRACE FINELY BROKEN SHELL FRAGMENTS TRACE CLAY POORLY GRADED	SP ↓ SC		VERY LITTLE MATERIAL
460	53-45		0922 0925	SAME	SP ↓ SC		VERY LITTLE MATERIAL
470	53-46		0934 0935	VERY FINE TO FINE DARK GREY QUARTZ SAND, SOME 20% FINELY BROKEN SHELLS	SP		FAIR AMOUNT OF MATERIAL
480			0942				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL HDR		DATE: 31 OCT 79
BORING NUMBER: DAPP-3	COORDINATES		DATE STARTED: 29 OCT 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 1 NOV 79
ENGINEER/GEOLOGIST: Wampler	AT	HRS.	PAGE 17 OF 34
DRILLING METHODS:			

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
480	53-47	35 GAL/MIN	0946	VERY FINE TO FINE DARK GREY QUARTZ SAND TRACE OF FINELY BROKEN SHELL FRAGMENTS (10%) POORLY GRADED	SP		FAIR AMOUNT OF MATERIAL
490	53-48		0952 0958	SAME	SP		SMALL AMOUNT OF MATERIAL
500	53-49		1005 1067	SAME - TRACE CLAY	SP ↓ SC		VERY SMALL AMOUNT OF MATERIAL
510			1017				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 31 OCT. '79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT. '79
ENGINEER/GEOLOGIST: Wampler	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 18 OF 34	

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
510	53-50		1022	VERY FINE TO FINE GREY QUARTZ SAND TRACE VERY FINELY BROKEN SHELL FRAGMENTS TRACE CLAY POORLY GRADED	SP ← SC		VERY SMALL AMOUNT OF MATERIAL REPAIRS - 1035-1100 BROKEN HOSE AT SWIVEL
520	53-51		1032 1110	SAME	SP ← SC		SAMPLE TAKEN WITH MASON NET
530	53-52		1120 1140	SAME	SP ← SC		SIEVE SAMPLE (140)
540			1155				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-40R	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 31 OCT 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: WSM/ella	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:	PAGE 19 OF 34	

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
540	53-53		1223	FINE TO MEDIUM GRAINED LIGHT GLOW QUARTZ SAND, TRACE SUB-ROUNDED COARSE QUARTZ AND COARSE TO FINELY BROKEN SHELL FRAGMENTS POOR TO FAIR GRADING	SP ↓ SW		WASHING FROM 1200-1215 DURING LUNCH BREAK
550	53-54		1230 1235	VERY FINE TO FINE DARK GREY QUARTZ SAND, TRACE VERY FINELY BROKEN SHELL FRAGMENTS TRACE CLAY POORLY GRADED	SP ↓ SC		WASHING 1 GALLON OF RETURN FLUID THROUGH THE SIEVE FOR SAMPLE TRACES OF CLAY APPEAR WHILE WASHING BUT GENERALLY DON'T STAY IN BAGGED SAMPLE SMALL AMOUNT OF MATERIAL
560	53-55		1245 1248	SAME - COARSE SHELL FRAGMENTS	SP ↓ SC		SMALL AMOUNT OF MATERIAL
570			1257				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: <u>B-356</u>	PROJECT NAME: <u>LASL HDR</u>		
BORING NUMBER: <u>DAPP-3</u>	COORDINATES	DATE: <u>31 OCT 79</u>	
ELEVATION:	GWL: <u>AT</u>	HRS.	DATE STARTED: <u>29 OCT 79</u>
ENGINEER/GEOLOGIST: <u>W. J. Miller</u>	<u>AT</u>	HRS.	DATE COMPLETED: <u>1 NOV 79</u>
DRILLING METHODS:	PAGE <u>20</u>		OF <u>34</u>

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
570	53-56		1302	VERY FINE TO FINE GRAY QUARTZ SAND, TRACE (10%) BROKEN SHELL FRAGMENTS POORLY GRADED	SP		SMALL AMOUNT OF MATERIAL
580	53-57		1312 1315	SAME	SP		FAIR TO GOOD AMOUNT OF MATERIAL
590			1328 1340	SAME	SP		HIT HARD MATERIAL @ 570 - (DRILLER) GOOD AMOUNT OF MATERIAL
600			1352				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 31 OCT '79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT '79
ENGINEER/GEOLOGIST: Wampler	AT HRS.	DATE COMPLETED: 1 NOV '79
DRILLING METHODS:		PAGE 21 OF 34

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
600	53-57		1356	VERY FINE TO FINE GREY QUARTZ SAND, TRACE S2 FINELY BROKEN SHELL FRAGMENTS POORLY GRADED . .	SP		
610	53-100		1407 1419	SAME	SP		
620	53-101		1428 1432	SAME	SP		GOOD AMOUNT OF MATERIAL
630			1440				

NOTES:
ACTUAL DEPTHS ALWAYS +6' DUE TO FIRST LENGTH IN THE TURN TABLE

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 31 OCT. 79
BORING NUMBER: DAPP-3	COORDINATES		DATE STARTED: 29 OCT '79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 1 NOV '79
ENGINEER/GEOLOGIST: W. J. Miller	AT	HRS.	PAGE 22 OF 34
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
630	53-62		1444	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (2%) FINELY BROKEN SHELL FRAGMENTS POORLY GRADED	SP		
640	53-63		1450 1455	SAME	SP		
650	53-64		1500 1504	SAME - TRACE (5%) BROKEN SHELL FRAGMENTS	SP		
660			1511				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 31 OCT 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>Wangler</i>	AT HRS.	DATE COMPLETED: 1 Nov 79
DRILLING METHODS:	PAGE 23 OF 34	

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
660	53-65		1519	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (5%) FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		
670	53-66		1526 1531	SAME SOME VERY SLIGHT TRACES OF CLAY	SP		
680	53-67		1537 1540	SAME	SP		
670			1547				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-4DR		DATE: 31 OCT. '79
BORING NUMBER: DAPP-3	COORDINATES		DATE STARTED: 29 OCT '79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 1 NOV 79
ENGINEER/GEOLOGIST: Wasmiller	AT	HRS.	PAGE 24 OF 34
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
690	53-68		1551	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (5%) FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		
700	53-69		1600	SAME - SOME COARSE SHELL FRAGMENTS	SP		
710	53-70		1613	SAME	SP		
720			1619				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		DATE: 31 OCT 79
BORING NUMBER: DAPP-3	COORDINATES		DATE STARTED: 29 OCT 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 1 NOV 79
ENGINEER/GEOLOGIST: W. J. Miller	AT	HRS.	PAGE 25 OF 34
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
720	S3-71		1622	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (2%) VERY FINELY BROKEN SHELL FRAGMENTS POORLY GRADED	SP		
730	S3-72		1628 1630	SAME	SP		
740	S3-73		1636 1640	SAME - TRACE (2%) OF MEDIUM SUBROUNDED QUARTZ	SP		
750			1647				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-3	COORDINATES		DATE: 31 OCT '79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 29 OCT '79
ENGINEER/GEOLOGIST: Wasmiller	AT	HRS.	DATE COMPLETED: 1 NOV '79
DRILLING METHODS:	PAGE 26 OF 34		

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
750	S3-74		1653	VERY FINE TO FINE GREY QUARTZ SAND, TRACE (5%) FINELY BROKEN SHELL FRAGMENTS POORLY GRADED	SP		SMALL AMOUNT OF MATERIAL
760	S3-75		1700 1704	SAME	SP		
770			1712				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-3	COORDINATES		DATE: 1 NOV. 79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 29 OCT. 79
ENGINEER/GEOLOGIST: Wasmiller	AT	HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:			PAGE 27 OF 34

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
770	NO SAMPLE		0805	VERY FINE TO FINE GREY QUARTZ SAND, TRACE COARSE SUB-ROUNDED QUARTZ, POORLY GRADED	SP		MUD IS THIN DUE TO ADDING WATER TO PIT
780	53-76	NO MUD FLOW	0815 0819	VERY FINE TO FINE GREY QUARTZ SAND, TRACE FINELY BROKEN SHELLS, POORLY GRADED	SP		
790	53-77		0825 0830	SAME	SP		
800			0840				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-3	COORDINATES		DATE: 1 NOV 79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: <i>usmiller</i>	AT	HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:			PAGE 28 OF 34

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
800	53-78		0842	VERY FINE TO FINE GREY QUARTZ SAND, TRACE BROKEN SHELL FRAGMENTS (10%) TRACE COARSE QUARTZ (2%) POORLY GRADED	SP		
810	53-79		0850 0853	SAME	SP		
820	53-80		0902 0906	SAME BUT ONLY 2% SHELLS AND NO COARSE QUARTZ	SP		VERY LITTLE MATERIAL
830			0911				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-256	PROJECT NAME: LASL-ADR		
BORING NUMBER: DAPP-3	COORDINATES		DATE: 1 Nov 79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 29 OCT 79
ENGINEER/GEOLOGIST: W. Miller	AT	HRS.	DATE COMPLETED: 1 Nov 79
DRILLING METHODS:			PAGE 29 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
830	53-81		0916	VERY FINE TO FINE GREY QUARTZ SAND TRACE (5%) VERY FINELY BROKEN SHELL FRAGMENTS POORLY GRADED	SP		SMALL AMOUNT OF MATERIAL, MAYBE DUE TO THINNER MUD
840	53-82		0927 0933	SAME - SLIGHT TRACES OF CLAY	SP		SMALL AMOUNT OF MATERIAL
850	53-83		0940 0947	SAME	SP		
860			0958				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR		
BORING NUMBER: DAPP-3	COORDINATES		DATE: 1 Nov 79
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 29 Oct 79
ENGINEER/GEOLOGIST: Wsmiller	AT	HRS.	DATE COMPLETED: 1 Nov 79
DRILLING METHODS:			PAGE 30 OF 34

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
860	53-84		1003	VERY FINE TO FINE GREY QUARTZ SAND, TRACE FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED	SP		
870	53-85		1010 1016	SAME	SP		SMALL AMOUNT OF MATERIAL
880	53-86		1023 1028	SAME SEEMS CLAYEY BY TOUCH TRACES OF CLAY	SP ↓ SL		SMALL AMOUNT OF MATERIAL
890			1036				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HDR	
BORING NUMBER: DAPP-3	COORDINATES	DATE: 1 NOV 79
ELEVATION:	GWL: AT HRS.	DATE STARTED: 29 OCT '79
ENGINEER/GEOLOGIST: Wampler	AT HRS.	DATE COMPLETED: 1 NOV 79
DRILLING METHODS:		PAGE 31 OF 34

DEPTH ()	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
890	53-87		1043	VERY FINE TO FINE CLAYEY GREY QUARTZ SAND, TRACE (2%) VERY FINELY BROKEN SHELL FRAGMENTS, POORLY GRADED	SP ↓ SC		
900	53-88		1052 1055	SAME	SP ↓ SC		WASHING FROM 1105-1245 WHILE DRILLERS GOT MORE ROD & ANOTHER SWIVEL
910	53-89		1105 1246	SAME	SP ↓ SC		VERY LITTLE MATERIAL
920			1254				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL - HDR			DATE: 1 NOV '79
BORING NUMBER: DAPP-3	COORDINATES			DATE STARTED: 29 OCT. '79
ELEVATION:	GWL:	AT	HRS.	DATE COMPLETED: 1 NOV 79
ENGINEER/GEOLOGIST: <i>W. Miller</i>		AT	HRS.	PAGE 32 OF 34
DRILLING METHODS:				

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
920	53-90	7600 SEC	1257	VERY FINE TO FINE GREY CLAYEY QUARTZ SAND POORLY GRADED TRACE VERY FINELY BROKEN SHELL FRAGMENTS	SP ↓ SC		NO CLAY VISIBLE IN SAMPLE BUT TEXTURE IS PLASTIC.
930	53-91		1306 1330	SAME	SP ↓ SC		SAME COMMENT AS ABOVE VERY LITTLE MATERIAL WASHING THROUGH
940	53-92		1341 1346	SAME	SP ↓ SC		VERY LITTLE MATERIAL
950		ROCK RATE 6 GPM/MIN	1353				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL - HDR		
BORING NUMBER: DAPP-3	COORDINATES		DATE: 1 NOV 1979
ELEVATION:	GWL: AT	HRS.	DATE STARTED: 29 OCT. '79
ENGINEER/GEOLOGIST: Wasmiller	AT	HRS.	DATE COMPLETED: 1 NOV '79
DRILLING METHODS:			PAGE 33 OF 34

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
950	53-93		1357	VERY FINE TO FINE GREY CLAYEY QUARTZ SAND, POORLY-GRADED TRACE OF VERY FINELY BROKEN SHELL FRAGMENTS.	SP ↓ SC		VERY LITTLE MATERIAL WASHING THROUGH MUD IS MUCH THICKER NOW DUE TO FORMATION CLAYS.
960	53-94		1405 1408	SAME - GETTING MUCH MORE DARKER MATERIAL	SP ↓ SC		
970	53-95		1420 1423	SAME	SP ↓ SC		
980			1430				

NOTES:

D'APPOLONIA

VISUAL CLASSIFICATION OF SOILS

PROJECT NUMBER: 78-356	PROJECT NAME: LASL-HOR		DATE: 1 NOV 79
BORING NUMBER: DAPP-3	COORDINATES		DATE STARTED: 29 OCT 79
ELEVATION:	GWL: AT	HRS.	DATE COMPLETED: 1 NOV 79
ENGINEER/GEOLOGIST: W.M. J. J. J.	AT	HRS.	PAGE 34 OF 34
DRILLING METHODS:			

DEPTH	SAMPLE TYPE & NO.	ESTIMATED MUD FLOW RATE	DRILLING RATE	DESCRIPTION	USCS SYMBOL	ESTIMATED DEPTH CORRECTION	REMARKS
980	53-94		1433	VERY FINE TO FINE GREY CLAYEY QUARTZ SAND, TRACE VERY FINELY BROKEN SHELL FRAGMENTS	SP ↓ SC		
990	53-94		1442 1448	SAME	SP ↓ SC		
1000			1495				

NOTES:

DRILLING ALWAYS THROUGH THE TOP LAYER OF SOIL TO THE HARDER MATERIAL