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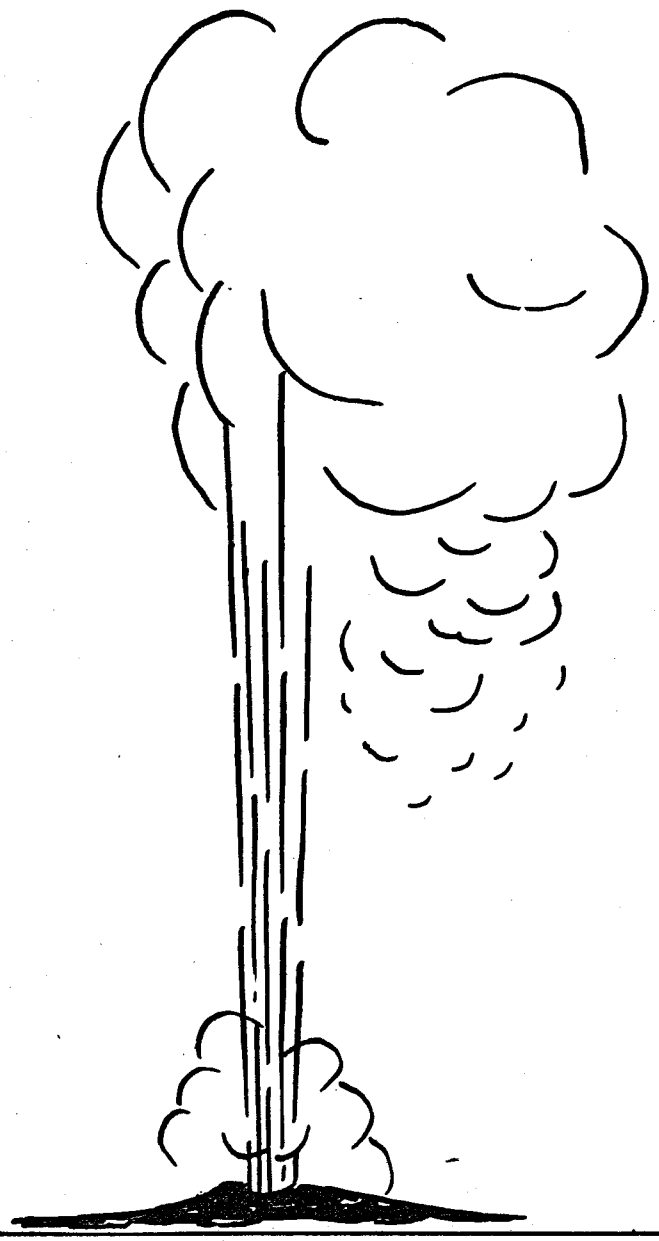


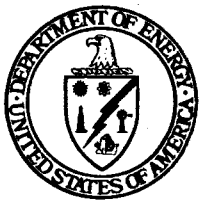
EVALUATION AND TARGETING OF GEOTHERMAL ENERGY RESOURCES IN THE SOUTHEASTERN UNITED STATES

Progress Report, October 1, 1978—March 30, 1979

By
John K. Costain
Lynn Glover III
A. Krishna Sinha

Work Performed Under Contract No. ET-78-C-05-5648

Virginia Polytechnic Institute and State University
Blacksburg, Virginia



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John K. Costain, Lynn Glover III, and A. Krishna Sinha

Principal Investigators

Department of Geological Sciences

Virginia Polytechnic Institute and State University

Blacksburg, VA 24061

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PREPARED FOR THE U. S. DEPARTMENT OF ENERGY UNDER

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Lithologic Analysis of Sediment Samples from the Intermediate Drilling Program

Michael Svetlichny

During the period October 1, 1978 - March 15, 1979, 32 holes were completed as part of the Atlantic Coastal Plain drilling program. In each of the 300 m deep holes, drill cuttings were collected at 3.0 m intervals and sealed in airtight plastic bags to prevent sediments from drying out.

At least two attempts were made to recover core in each hole. A minimum of 15 m was cored. Recovery of unconsolidated, clean sand frequently was poor because material tends to be washed away by the coring process, and sediments were not always retained in the core barrel by the core catcher. In an effort to maximize core recovery and minimize drilling costs, one coring interval was selected to be within a thick (↑15 m) sequence of clayey, silty, or consolidated sediments, and the other coring attempt was made near the maximum depth of 300 m. Detailed analyses of the cores has begun, but there are no results to report as yet.

Lithologic descriptions of the drill cuttings have been completed for each hole; the results are presented as a table following this text. The descriptions are based on Folk's (1974) classification. Each category reflects the proportion of gravel, sand, and silt plus clay in that sample. In cases where well-sorted gravel was present, a distinction was made between granules, pebbles, and cobbles. Similarly, the sand fraction was subdivided into very fine, fine, medium, coarse, and very coarse sand. If silt and clay occurred in equal proportion, they were collectively referred to as mud. Whole and fragmented macrofossils were reported as shells.

Selected samples from each hole are being wet sieved with a number 230 U.S. standard sieve to determine the proportion of sediment that is finer than 4.0 phi. This work began recently so that the data set is incomplete. The results to date are included in the table that follows this text.

ACKNOWLEDGEMENT

The following Gruy Federal Personnel assisted in sample descriptions and sieving: Kenneth Hurst, Ronald Herzick, Paul Caprio, Michael Hoffman, and Donald Hostvedt.

NO. 26 Isle of Wight, VA

INTERVAL (METERS)	FORMATION-AGE	DESCRIPTION	COMMENTS	SAMPLES SIEVED	RATIO COARSE/FINE	PERCENT FINES
0-3.0	Columbia Gr.	Silty fine sand				
3.0-9.1	Columbia Gr.	Fine sandy silt				
9.1-12.2	Yorktown	Silty fine sand				
12.2-15.2	Yorktown	Silty fine to medium sand				
15.2-18.3	Yorktown	Silty fine sand				
18.3-27.4	Yorktown	Silty very fine sand				
27.4-33.5	Yorktown	Silty fine sand	Minor shells			
33.5-36.6	Yorktown	Slightly pebbly silty fine sand				
36.6-42.7	Yorktown	Fine sand	Shells			
42.7-48.8	Yorktown	Fine sand	Minor shells			
48.8-51.8	Yorktown	Slightly granular silty fine sand	Minor shells			
51.8-54.9	Yorktown	Fine sand	Minor shells			
54.9-64.0	Yorktown	Fine sand	Abundant shells			
64.0-67.1	Calvert	Fine to medium sand	Abundant shells			
67.1-70.1	Calvert	Fine sand	Abundant shells			
70.1-75.0	Calvert	Fine sand	Shells			
75.0-82.6	Calvert	Cored	Core recovery from 79.6-82.3			
85.3-91.4	Calvert	Medium, slightly calcareous sand				
91.4-94.5	Calvert	Medium to coarse sand, slightly glauconitic				
94.5-100.6	Nanjemoy	Glauconitic sand				
100.6-106.7	Nanjemoy	Greensand, slightly calcareous				

106.7-121.9	Mattoponi	Greensand	
121.9-124.9	Mattoponi	Glauconitic sand	
124.9-128.0	Mattoponi	Silty fine sand	Minor shells
128.0-134.1	Mattoponi	Silty fine to medium sand, slightly glauconitic	Minor shells
134.1-137.2	Patuxent	Medium sand, slightly glauconitic	
137.2-149.3	Patuxent	Medium coarse sand	
149.3-152.4	Patuxent	Fine to medium sand, slightly glauconitic	
152.4-170.7	Patuxent	Fine to medium sand	
170.7-173.7	Patuxent	Silty fine sand	
173.7-185.9	Patuxent	Medium sand	
185.9-192.0	Patuxent	Medium sand	Shells
192.0-195.1	Patuxent	Silty fine sand	
195.1-198.1	Patuxent	Silty fine-medium sand	
198.1-201.2	Patuxent	Silty fine sand	
201.2-210.3	Patuxent	Coarse sand	
210.3-213.4	Patuxent	Very coarse sand	
213.4-219.5	Patuxent	Silty very coarse sand	
219.5-225.6	Patuxent	Granular very coarse sand with silt, slightly calcareous	
225.6-231.6	Patuxent	Very coarse sandy granules, calcareous	Shells
231.6-234.7	Patuxent	Granular silty fine sand	Shells
234.7-237.7	Patuxent	Slightly granular silty fine sand	
237.7-243.8	Patuxent	Granular silty fine	

		sand	
243.8-249.9	Patuxent	Slightly granular silty fine sand	
249.9-253.0	Patuxent	Silty fine-medium sand	
253.0-256.0	Patuxent	Silty granular medium sand	
256.0-268.2	Patuxent	Fine sandy silt	
268.2-277.4	Patuxent	Silty fine-medium sand	
277.4-280.4	Patuxent	Silt	
280.4-283.5	Patuxent	Medium sandy silt	
283.5-286.5	Patuxent	Granular medium-coarse sand with minor silt	
286.5-292.6	Patuxent	Silty medium-coarse sand	Shells
292.6-295.7	Patuxent	Fine-medium sand	
295.7-304.8	Patuxent	Cored	Recoveries from 296.0-296.6 and 298.4-301.8