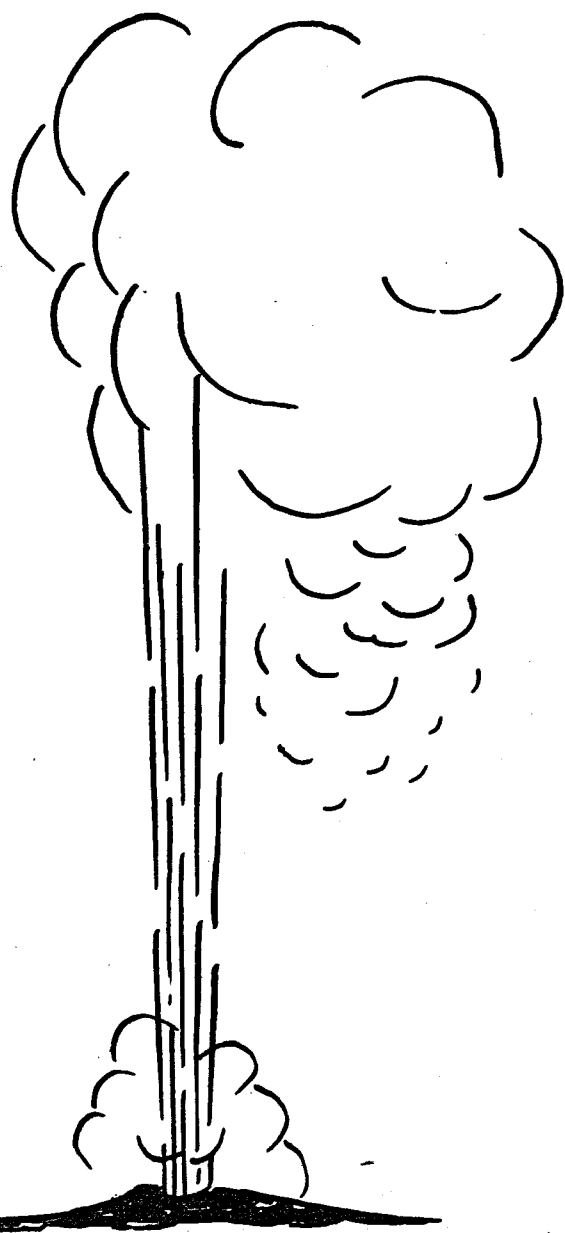


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**EVALUATION AND TARGETING OF GEOTHERMAL
ENERGY RESOURCES IN THE SOUTHEASTERN
UNITED STATES**

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**



**U. S. DEPARTMENT OF ENERGY
Geothermal Energy**

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IN THE SOUTHEASTERN UNITED STATES**

Progress Report

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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.

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INTERVAL (METERS)	FORMATION-AGE	DESCRIPTION	COMMENTS	RATIO PERCENT	
				SAMPLES SIEVED	COARSE/FINE FINES
0-3.0	Columbia Gr. Pliocene	Slightly granular fine-medium sand	Minor shells		
3.0-6.1	Columbia Gr. Pliocene	Fine sand	Minor shells		
6.1-9.1	Columbia Gr. Pliocene	Slightly granular fine sand	Minor shells		
9.1-12.2	Columbia Gr. Pliocene	Large pebbly fine to medium sand	Minor shells		
12.2-15.2	Yorktown Miocene	Fine sand	Shells		
15.2-18.3	Yorktown Miocene	Slightly granular silty fine sand	Shells		
18.3-24.4	Yorktown Miocene	Fine-medium sand with heavy minerals	Minor shells		
24.4-27.4	Yorktown Miocene	Pebbly, granular fine sand. Some rounded sandstone fragments	Shells		
27.4-30.5	Yorktown Miocene	Silty fine sand. Some coarse grains.	Shells		
30.5-33.5	Yorktown Miocene	Fine sand with heavy minerals	Shells		
33.5-36.6	Yorktown Miocene	Silty very fine to fine sand with heavy minerals	Shells		
36.6-61.0	Yorktown Miocene	Very fine to fine sand with heavy minerals	Shells		
61.0-64.0	Yorktown Miocene	Slightly micaceous very fine to fine sand with heavy minerals	Abundant shells		
64.0-94.5	Yorktown Miocene	Very fine to fine sand with heavy minerals	Shells		

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94.5-128.0	Calvert Miocene	Very fine to fine sand with heavy minerals	Shells
128.0-131.1	Calvert Miocene	Very fine to fine sand	Shells
131.1-134.1	Mattaponi U.Cretaceous	Very fine to fine sand	Abundant shells
134.1-161.5	Mattaponi U.Cretaceous	Very fine to fine sandy shell hash	
161.5-179.8	Mattaponi U.Cretaceous	Silty very fine sandy shell hash	
179.8-182.9	Mattaponi U.Cretaceous	Glauconitic silty very fine sand	Shells
182.9-189.0	Mattaponi U.Cretaceous	Glauconitic fine to medium sand	Shells
189.0-192.0	Mattaponi U.Cretaceous	Glauconitic silty fine sand	Shells
192.0-198.1	Mattaponi U.Cretaceous	Glauconitic silty fine sand. Some coarse sand.	Shells
198.1-201.2	Mattaponi U.Cretaceous	Glauconitic fine to coarse sand	Minor shells
201.2-204.2	Mattaponi U.Cretaceous	Glauconitic coarse sand	Minor shells
204.2-207.3	Mattaponi U.Cretaceous	Glauconitic medium to coarse sand	Minor shells
207.3-210.3	Mattaponi U.Cretaceous	Glauconitic fine to coarse sand	Minor shells
210.3-216.4	Transitional Bed	Glauconitic fine to coarse sand	Shells
216.4-219.5	Transitional Bed	Glauconitic fine to medium sand	Minor shells
219.5-225.6	Transitional Bed	Glauconitic fine to coarse sand	Minor shells
225.6-228.6	Transitional Bed	Glauconitic fine to coarse sand. Some sandstone fragments.	Minor shells

228.6-234.7	Transitional Bed	Same as 225.6-228.6, but no sandstone fragments	Minor shells
234.7-240.8	Transitional Bed	Glauconitic fine to medium sand	Minor shells
240.8-243.8	Transitional Bed	Silty fine to coarse sand	Shells
243.8-249.9	Patuxent	Glauconitic fine to medium sand	Minor shells
249.9-253.0	Patuxent	Glauconitic silty fine sand	Minor shells
253.0-256.0	Patuxent	Glauconitic silty fine to coarse sand	Minor shells
256.0-259.1	Patuxent	Glauconitic fine sandy silt	Minor shells
259.1-262.1	Patuxent	Fine sandy silt	Minor shells
262.1-265.2	Patuxent	Glauconitic silty fine to coarse sand	Minor shells
265.2-268.2	Patuxent	Fine sandy silt	Minor shells
268.2-271.3	Patuxent	Silty fine to coarse sand	Minor shells
271.3-274.3	Patuxent	Glauconitic silty fine sand	Minor shells
274.3-277.4	Patuxent	Glauconitic fine sandy silt	Minor shells
277.4-280.4	Patuxent	Silty fine to coarse sand	Minor shells
280.4-286.5	Patuxent	Glauconitic silty fine to medium sand	Minor shells
286.5-289.6	Patuxent	Glauconitic silty fine to coarse sand with some pebbles and granules	Shells
289.6-292.6	Patuxent	Pebbly, fine sandy silt	Minor shells

292.6-298.4

Patuxent

Slightly granular
silt

Abundant shells

298.4-307.5

Cored

Recovery of 4.6 meters
within the interval
298.4-307.5