Project Report No. 10
South Georgia Minerals Program

Georgia
State Division Of Conservation
Department of Mines, Mining and Geology

A. S. Furcron, Director

SAVANNAH AREA

By

Mineral Engineering Branch, Engineering Experiment Station
Georgia Institute of Technology, and
Georgia Department of Mines, Mining, and Geology

SAVANNAH AREA

This program is being carried out under contract as
Project A-880-004 of the Georgia Institute of Technology,
Atlanta, Georgia

Project Report No. 10

Savannah Area

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INTRODUCTION

Nine project reports have been issued on this program which was initiated July 1, 1965. All information is published and released as progress reports as soon as feasible. Most of the reports have therefore been primarily factual in nature. An exception was Project Report No. 7, which was a contribution of the U. S. Geological Survey.

Emphasis in reports number 2, 3, 4, 5, and 9 was on phosphorite. Report No. 6 was on heavy minerals and phosphorite, while Report No. 8 was on heavy minerals.

Project Report No. 9 included data from five wells drilled in Chatham County. Pending laboratory results and engineering evaluation, drilling operations were moved to other areas. The data shown in Report No. 9, and definite industrial interest, dictated the need for additional drilling in the Savannah area. This report, Project Report No. 10, presents data from this second phase program.

Figure 1 shows the locations of holes drilled to date. While this shows a number of as yet unreported holes in Berrien, Brooks, Clinch, Lowndes, and Thomas Counties, data from these will be reported in another report in order to focus attention at this time on the Savannah area.

Current and near future drilling will have emphasis directed towards heavy minerals, high alumina clays, fullers earth, and limestone deposits. Drilling for heavy minerals is progressing rapidly along coastal Georgia. Drilling for the other minerals will be in the southwestern area of the state.

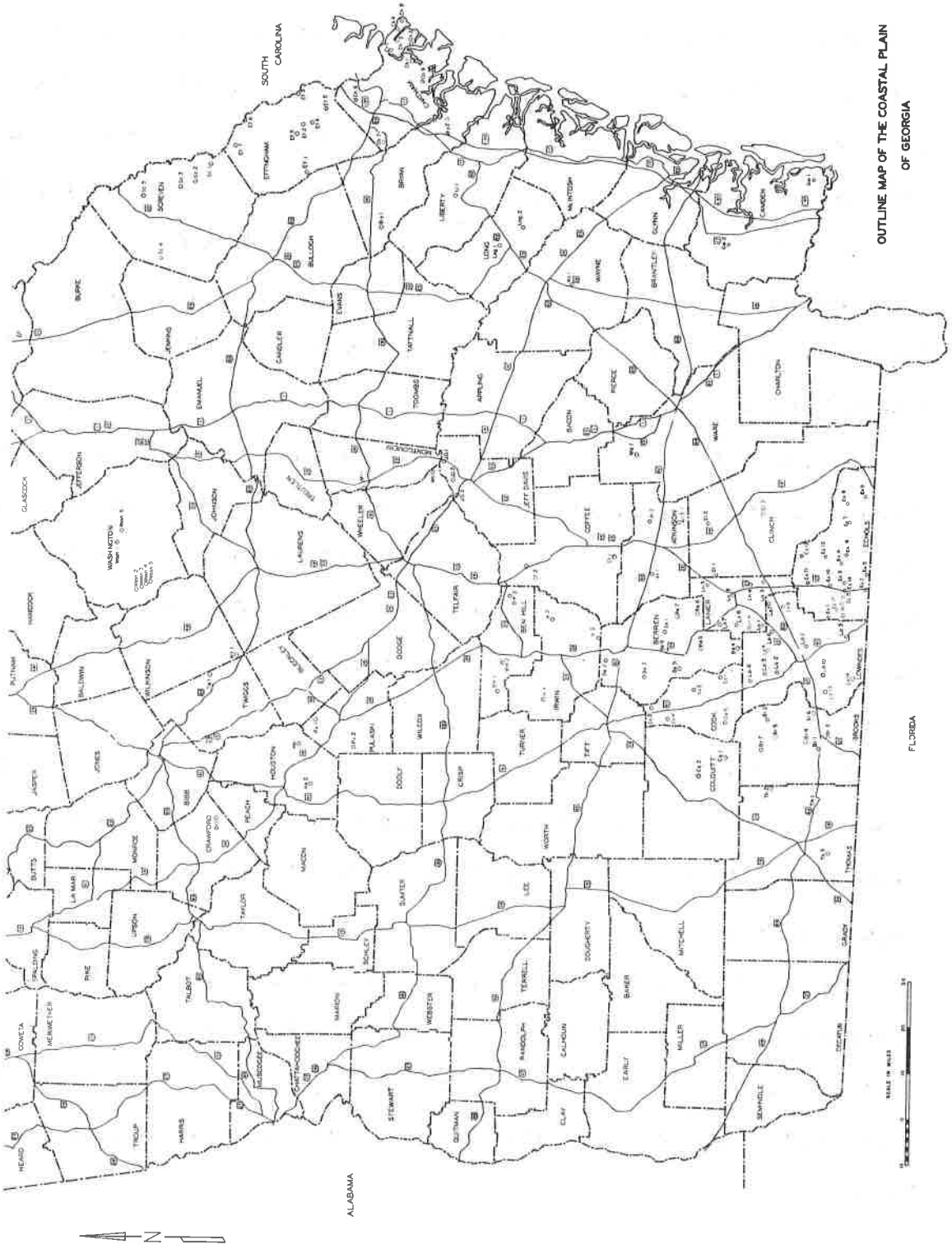

Figure 1. Index Map of Program Area

OBJECTIVE AND SCOPE

The objective of the South Georgia Mineral Program is to determine the existence, preliminary quality-quantity data, and approximate location of mineral deposits having economic feasibility potential for establishing new, or expanded, mineral industries in Georgia.

This report, Project Report Number 10, includes data from cores obtained from drilling in Screven, Bryan, Effingham, and Chatham Counties. The data for the latter two counties was to supplement earlier drilling reported for Effingham County in Report Number 6 and for Chatham County in Report Number 9.

PROCEDURE

There were no changes in project procedures not shown in earlier reports with the exception that qualitative x-ray diffraction analysis was made on phosphorite concentrates of Chatham County, reported in Progress Report No. 9. Qualitative x-ray diffraction of "clays" (minus 325 mesh) of selected portions of cores for all counties of this report was made.

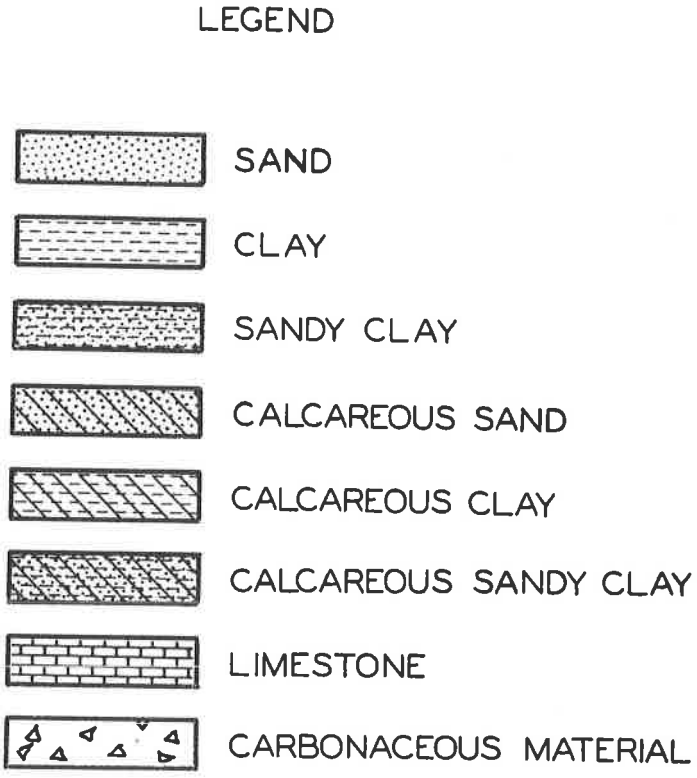

Figure 2. Legend for Lithologic Logs

BRYAN COUNTY

BRYAN COUNTY

SUMMARY OF RESULTS

Two holes were cored in Bryan County, one from near Pembroke and the other from south of Richmond Hill.

Phosphorite

Phosphorite of economic potential was not found in either of the two holes. A five foot zone of 17 percent BPL was found at a depth of 200-205 feet in Bryan Number 2 hole. All phosphorite was of the "Florida" type.

Glass Sand

Potential glass sand deposits were found in both wells. The sands of Bryan Number 1 merit special attention due to the thickness of the deposit, although it is overlaid by 15 feet of overburden.

Heavy Minerals

Three zones were found in Bryan Number 1: 150 to 165 feet, 235 to 240 feet, and 290 to 295 feet. None appear economic. Bryan Number 2 shows about 0.5 percent TiO_2 in the top 15 feet, and 0.8 percent ± 0.1 TiO_2 from 15 to 60 feet. A layer at 80 to 85 feet also shows TiO_2.

Figure BRY-1. Location of Holes - Bryan County

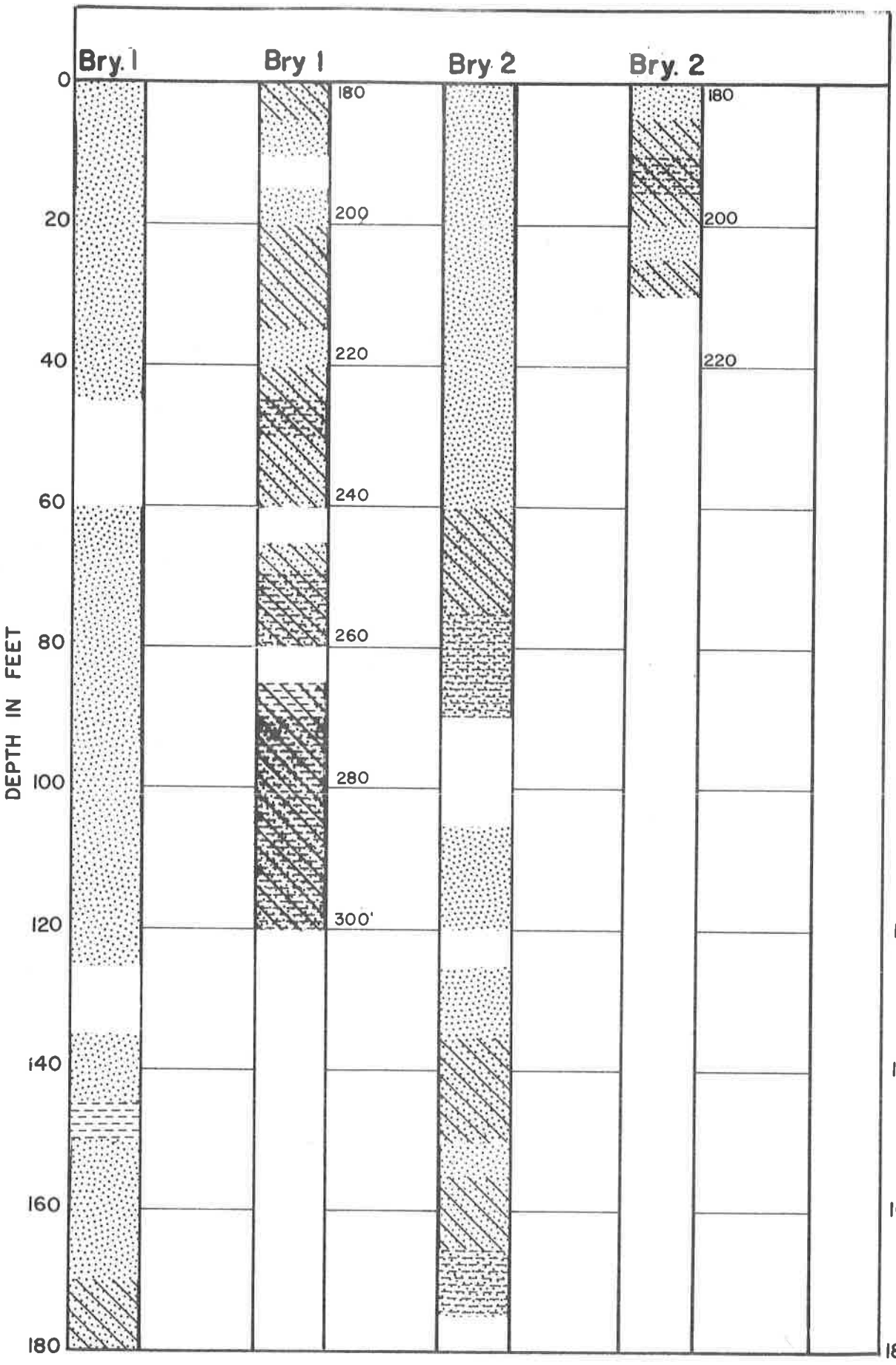

Figure BRY-2. Lithologic Logs - Bryan County

TABLE BRY-1

BPL DETERMINATION ON CORES

Bryan County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Bry-1	102.0	0-5	W.S.	-	0.00
		5-10	W.S.	-	0.00
		10-15	W.S.	-	0.00
		15-30	2	13	0.00
		30-45	10	67	0.00
		45-60	-	-	----
		60-75	W.S.	-	0.00
		75-90	W.S.	-	0.00
		90-105	W.S.	-	0.00
		105-120	W.S.	-	0.00
		120-125	W.S.	-	0.88
		125-130	W.S.	-	0.74
		130-135	W.S.	-	0.78
		135-140	W.S.	-	0.74
		140-145	W.S.	-	0.88
		145-150	W.S.	-	0.78
		150-155	W.S.	-	0.61
		155-160	W.S.	-	0.78
		160-165	W.S.	-	2.90
		165-170	W.S.	-	2.02
		170-175	W.S.	-	3.10
		175-180	W.S.	-	2.93
		180-185	W.S.	-	3.34
		185-190	W.S.	-	3.78
		190-195	W.S.	-	3.47
		195-200	W.S.	-	3.54
		200-205	W.S.	-	4.05
		205-210	W.S.	-	5.73
		210-215	W.S.	-	6.74
		215-220	W.S.	-	10.96
		220-225	W.S.	-	7.42
		225-230	W.S.	-	2.07
		230-235	W.S.	-	2.87
		235-240	W.S.	-	2.60
		240-245	W.S.	-	3.03
		245-250	W.S.	-	4.72
		250-255	W.S.	-	4.18
		255-260	W.S.	-	6.54
		260-265	W.S.	-	5.46
		265-270	W.S.	-	3.07
		270-275	W.S.	-	3.37

(Continued)

TABLE BRY-1 (Continued)

BPL DETERMINATION ON CORES

Bryan County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Bry-1	102.0	275-280	W.S.	-	4.42
		280-285	W.S.	-	3.74
		285-290	W.S.	-	3.81
		290-295	W.S.	-	4.65
		295-300	W.S.	-	4.38
Bry-2	15.0	0-15	W.S.	-	0.17
		15-30	1	20	0.20
		30-45	3	60	2.02
		45-60	3	60	2.06
		60-75	3	60	1.35
		75-80	5	100	1.52
		80-85	5	100	1.75
		85-90	5	100	1.38
		90-105	-	-	----
		105-120	13	87	2.02
		120-125	W.S.	-	1.48
		125-130	W.S.	-	0.47
		130-135	W.S.	-	0.81
		135-140	W.S.	-	1.79
		140-145	W.S.	-	1.69
		145-150	W.S.	-	1.82
		150-155	W.S.	-	2.33
		155-160	W.S.	-	2.39
		160-165	W.S.	-	3.20
		165-170	W.S.	-	4.45
		170-175	W.S.	-	4.28
		175-180	W.S.	-	5.12
		180-185	W.S.	-	5.06
		185-190	W.S.	-	5.06
		190-195	W.S.	-	6.88
		195-200	W.S.	-	6.34
		200-205	W.S.	-	17.10
		205-210	W.S.	-	7.32

TABLE BRY-2

CHEMICAL COMPOSITION OF PROCESSED SANDS

-35+150 MESH FRACTION

(Results are in weight percent)

Hole No.	Layer Depth, Feet From	To	Loss on Ignition (LOI)	SiO_2	P_2O_5	Fe_2O_3	Al_2O_3	CaO	MgO
Bry-1	15	30	0.03	99.56	.00	.03	0.00	0	.000
	30	45	0.09	98.02	.00	.08	0.13	0	.000
Bry-2	15	30	0.11	96.62	.00	.13	0.35	.03	.000
	30	45	0.37	88.02	.68	.56	3.54	.66	.013
	45	60	0.72	87.34	.94	.94	2.96	.69	.014

TABLE BRY-3

PARTICLE SIZE OF CORE MATERIAL

WEIGHT (%) DISTRIBUTION

Bryan County

Hole No.	Layer Depth, Feet From	To	Core +35	-35 +150	-150 +325	-325
Bry-1	15	30	6.4	65.7	12.5	15.4
	30	45	44.4	40.6	2.9	12.1
Bry-2	15	30	9.0	59.7	11.0	20.3
	30	45	0.7	86.8	4.8	7.7
	45	60	8.0	61.1	17.7	13.2

TABLE BRY-4

BRYAN COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white
Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction: Visual Color	Microscopic
Bry-1	15	45	78.6	White	
	15	30			Mostly clear. Some white Muscovite. Heavy minerals.
	30	45			Mostly clear. Some colored white, red. Phosphorite?
Bry-2	15	60	75.1	White to dark grey	
	15	30			Mostly clear. Some sand colored white, grey. Some coated with iron oxide. Muscovite. Phosphorite. Organic material.
	30	45			Mostly clear. Some colored white, grey, green, red. Muscovite. Phosphorite.
	45	60			Mostly clear. Some colored white, grey, green, red. Some sand coated with clay. Muscovite. Phosphorite.

TABLE BRY-5

BRYAN COUNTY

QUALITY OF SANDS (35 X 150 MESH)

Well No.	Layer Depth (Feet)	% +150 Mesh Sands in core	Meets Approx. Chem. Specifications for Quality Number *	Uniformity (2) Chemical	Size
Bry-1	15 - 45	78.6	1(2), 2	F	P
Bry-2	15(3,4) - 30	68.7	7	G	G
Bry-3	30 - 60(5)	-	-	-	-

(1) G = good; F = fair; P = poor

(2) Fe_2O_3 content somewhat higher for quality no.

(3) Note overburden to be removed.

(4) High loss on ignition - probably due to clay and organic matter.

(5) Too low silica content for glass sand use - probably suitable if strongly scrubbed and washed.

* Specifications are given and discussed on page 28, Project Report Number 6. Quality numbers and potential use are: 1 = optical; 2 = Flint, glass and tableware; 3 = flint; 4 & 5 = Sheet, rolled, polished plate and window; 6 = green containers; 7 = Green glass; 8 & 9 = Amber glass.

CHATHAM COUNTY

CHATHAM COUNTY

SUMMARY OF RESULTS

Four new holes were cored in Chatham County. These holes were directed at finding the limits of the ore body previously found and its structural relationship to the area. The ore body, described in Project Report No. 9, has phosphorite similar in character to the North Carolina deposits. The top of the uppermost and only matrix, currently economic, is gently undulated with dips of 2 to 9 feet per mile south Southwestward. It also appears to pinch out westward as only an eight to ten inch thickness was found in hole Number 9 at a depth of 117-119 feet, and none was found in Bryan County at depths drilled (300 feet and 210 feet). In the direction of Effingham County (northwestward) there appears to be a dissemination of phosphorite as there are no zones of economic concentration in Ch-6 or Ch-7, but the phosphorite present is similar in appearance to Ch-8. The way the phosphorite in Ch-6 is associated with quartz sand indicates reworking of the material.

Beneficiation procedures were described in Project Report No. 9.

The +4 mesh portion of Chatham No. 8 consisted of tan nodules as well as the normal black Chatham phosphorite. X-ray diffraction analyses of phosphorite concentrates reported in Project Report No. 9 show that the concentrates consist essentially of fluorapatite with traces of hydroxylapatite. The variable amount of quartz present in these concentrates depends on the efficiency of the particular flotation test through which the concentrates were obtained.

Glass Sands

Sands from Chatham 6 and Chatham 7 are of sufficient thickness and quality to be considered as potential sources for glass sands. Sands from the other holes were considered to be of interest if beneficiation proved to be commercially feasible.

Heavy Minerals

Chatham 6 presents two zones with TiO_2, none of which exceeds 0.5% TiO_2. The zones are 0-34 feet and 85-170 feet.

Chatham 7 has some TiO_2 in a 5 foot layer at the surface, and two areas, 135 to 145 feet and 155 to 175 feet, neither of which is of commercial interest.

Clays

Clays from Chatham County have montmorillonite and attapulgite as major components, and therefore are potential material for Fuller's earths. It should be noted that dolomite is present along with some clay minerals in Chatham 8.

Figure CH-1. Location of Holes - Chatham County.

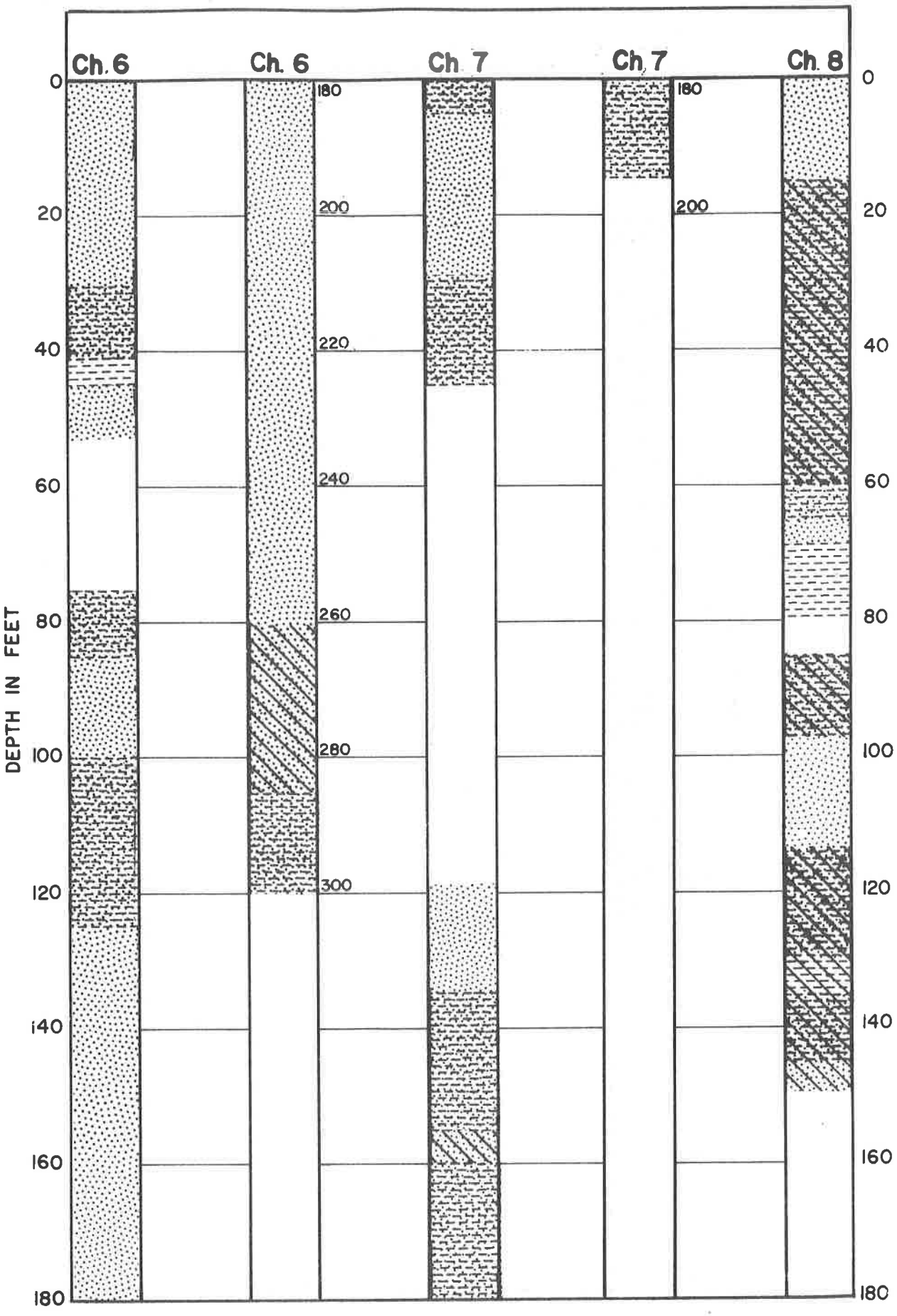

Figure CH-2. Lithologic Logs - Chatham County.

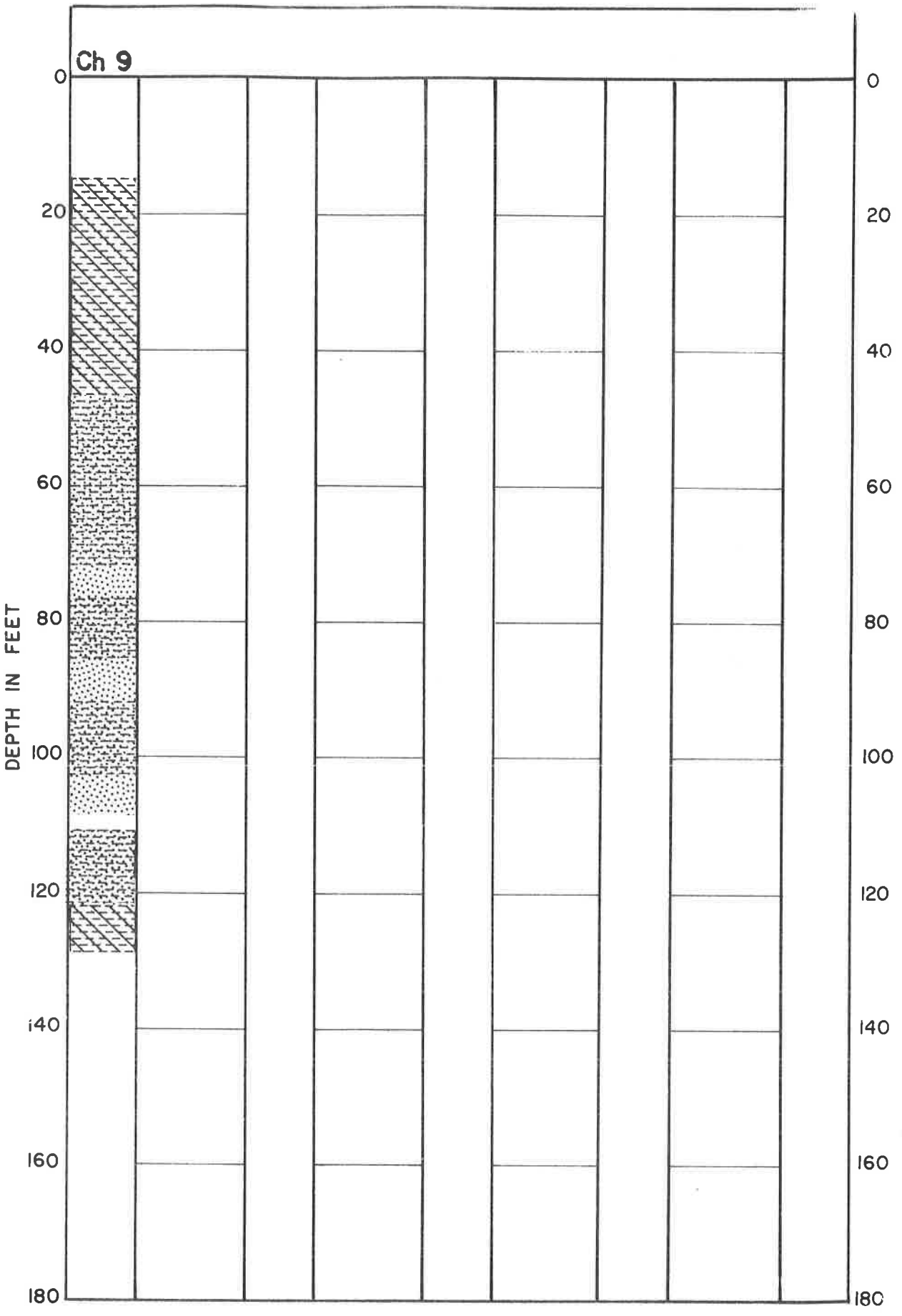

Figure CH-2. Lithologic Logs - Chatham County (Cont.)

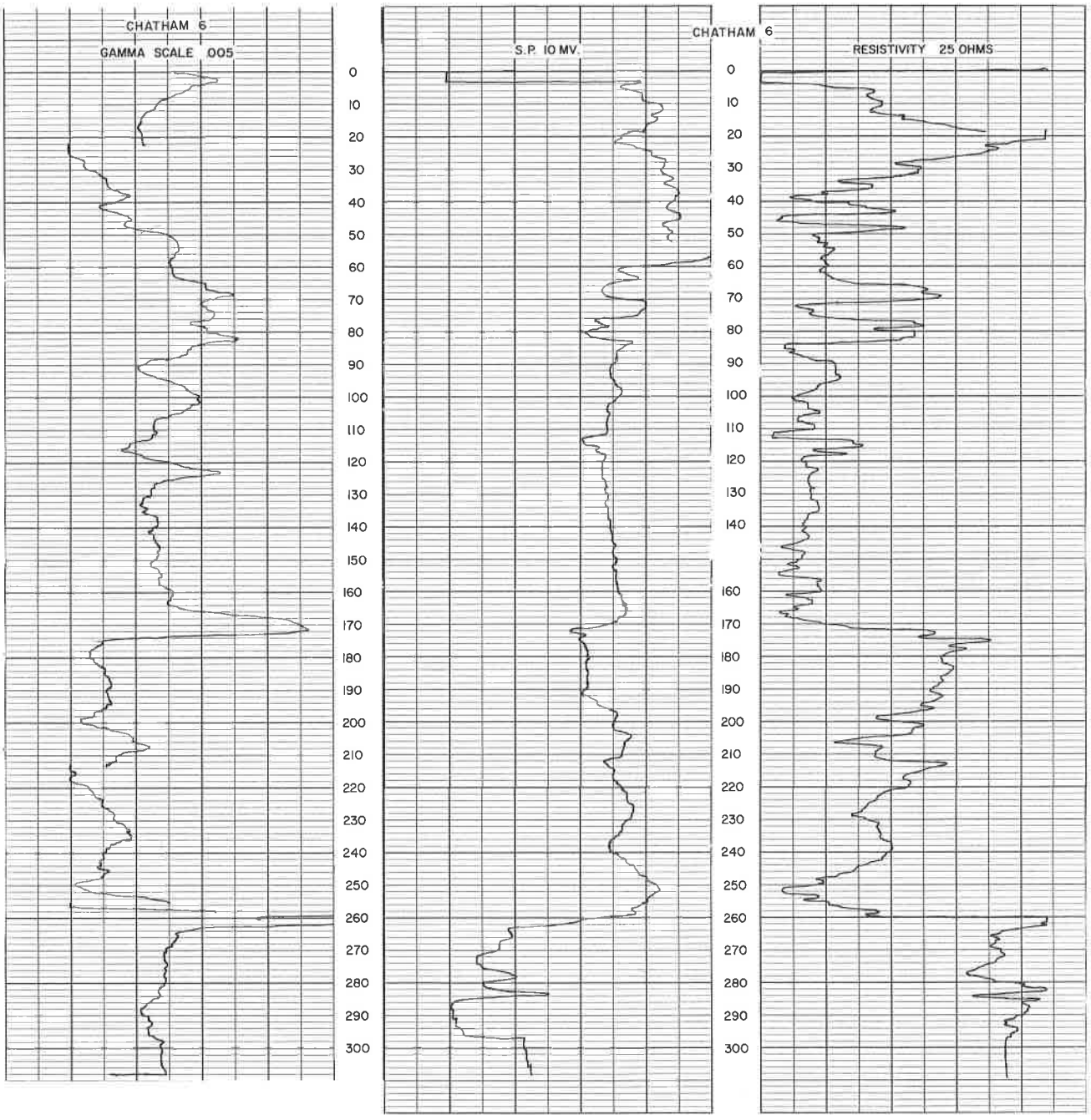

Figure CH-3. Electric and Gamma-Ray Logs - Chatham County
Hole Ch-6

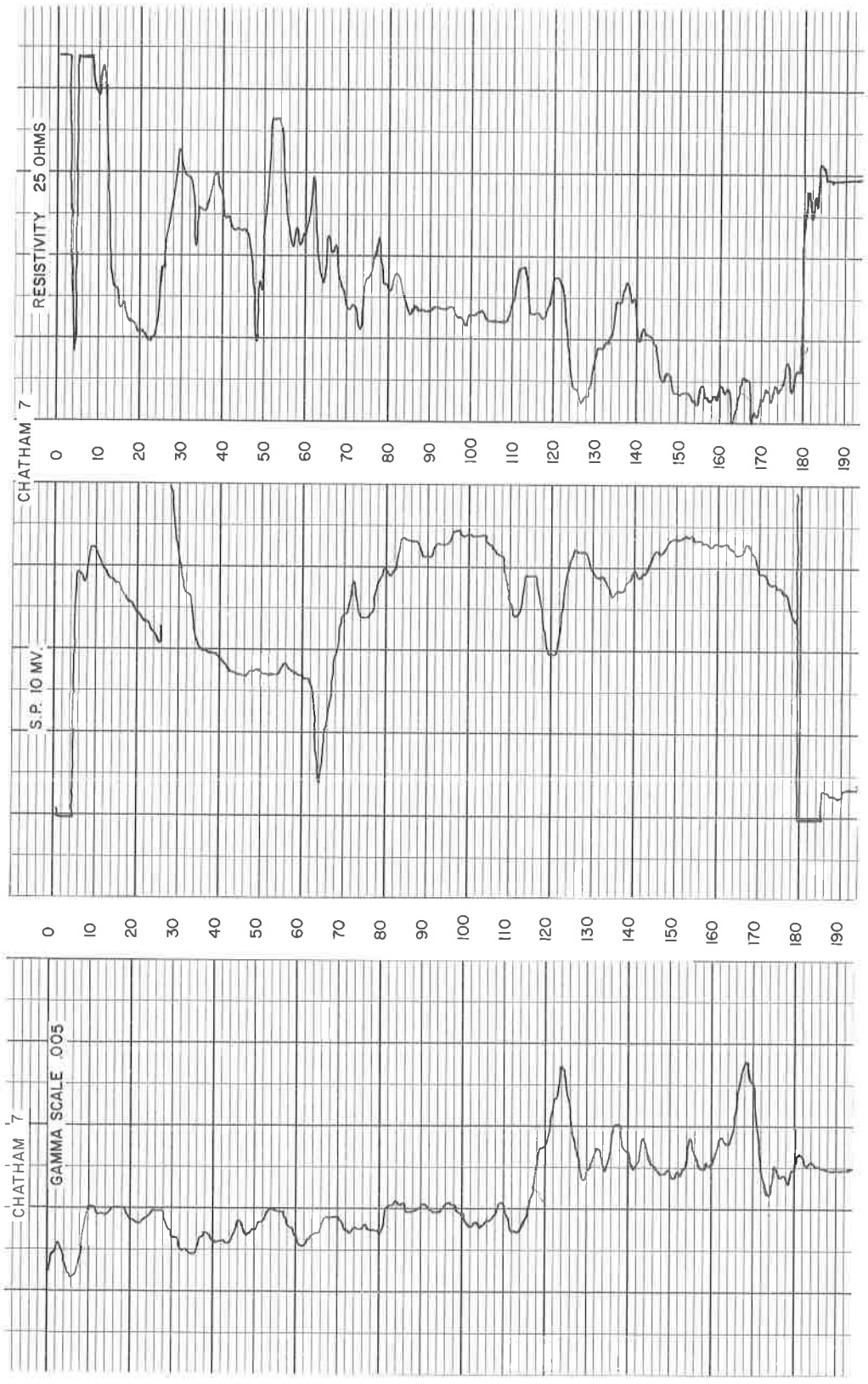

Figure CH-3. Electric and Gamma-Ray Logs - Chatham County
Hole Ch-7

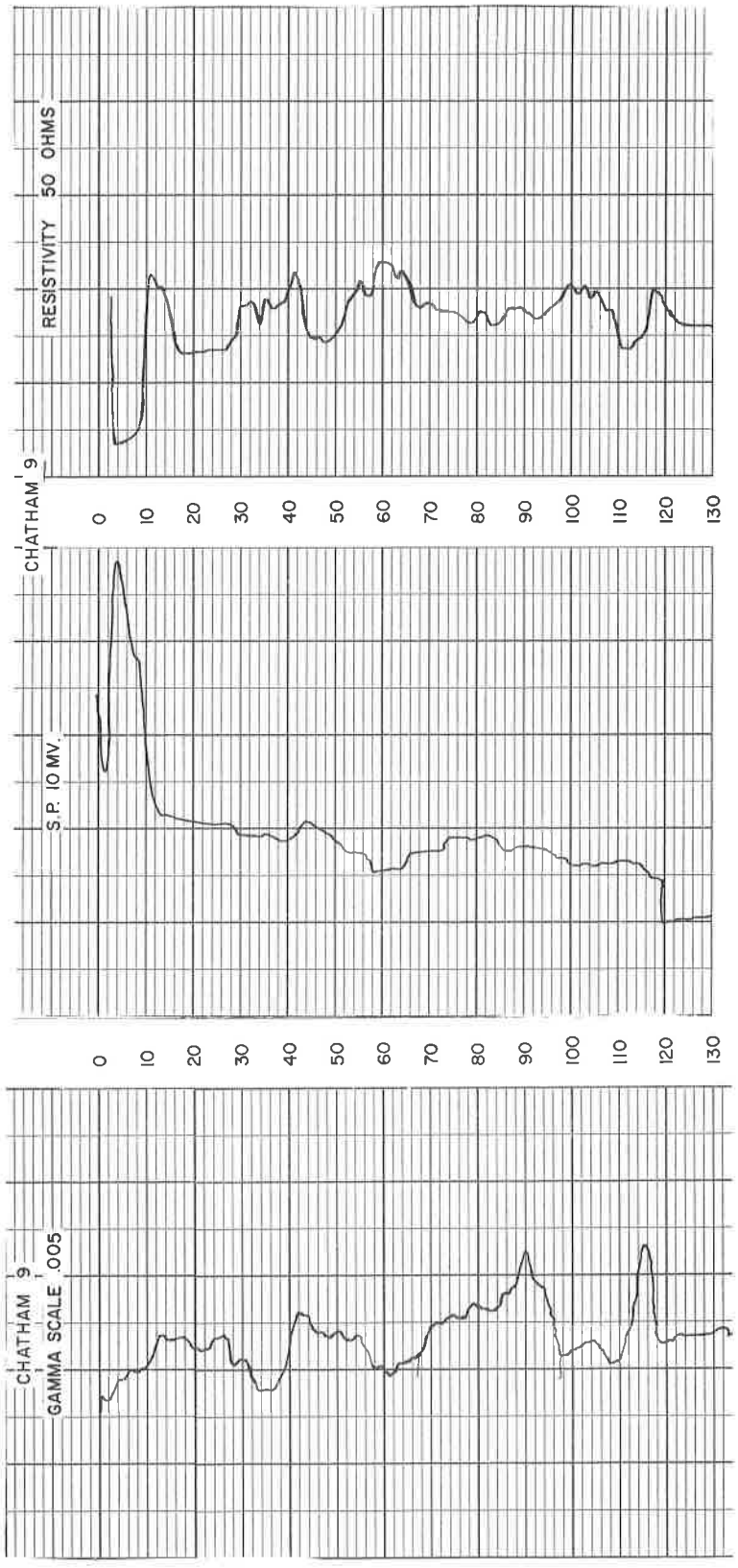

Figure CH-3. Electric and Gamma-Ray Logs - Chatham County
Hole Ch-9

TABLE CH-1

BPL DETERMINATION ON CORES

Chatham County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Ch-6	17.0 *	0-5	W.S.	-	0.00
		5-10	W.S.	-	0.00
		10-15	W.S.	-	0.00
		15-30	5	33	0.00
		30-34	5	100	0.34
		34-41	5	71	0.00
		41-45	3	75	0.88
		45-48	2.2	73	0.91
		48-53	3.8	76	1.08
		53-75	---	-	----
		75-85	5	50	1.52
		85-90	4.5	90	0.47
		90-100	5	50	6.41
		100-105	4	80	3.30
		105-110	1	20	2.39
		110-120	5	50	1.18
		120-125	W.S.	-	2.50
		125-130	W.S.	-	2.39
		130-135	W.S.	-	2.53
		135-140	W.S.	-	2.83
		140-145	W.S.	-	2.97
		145-150	W.S.	-	3.27
		150-155	W.S.	-	2.87
		155-160	W.S.	-	3.40
		160-165	W.S.	-	5.19
		165-170	W.S.	-	4.25
		170-175	W.S.	-	6.68
		175-180	W.S.	-	7.25
		180-185	W.S.	-	5.23
		185-190	W.S.	-	5.40
		190-195	W.S.	-	6.84
		195-200	W.S.	-	4.05
		200-205	W.S.	-	3.91
		205-210	W.S.	-	4.25
		210-215	W.S.	-	2.93
		215-220	W.S.	-	3.14
		220-225	W.S.	-	4.69
		225-230	W.S.	-	2.60
		230-235	W.S.	-	3.98
		235-240	W.S.	-	3.74
		240-245	W.S.	-	4.11

(Continued)

TABLE CH-1 (Continued)

BPL DETERMINATION ON CORES

Chatham County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Ch-6	17.0 *	245-250	W.S.	-	3.88
		250-255	W.S.	-	4.05
		255-260	W.S.	-	3.07
		260-265	W.S.	-	5.94
		265-270	W.S.	-	2.53
		270-275	W.S.	-	3.84
		275-280	W.S.	-	3.37
		280-285	W.S.	-	1.58
		285-290	W.S.	-	0.91
		290-295	W.S.	-	1.35
		295-300	W.S.	-	0.78
Ch-7	21.7 *	0-5	5	100	0.00
		5-10	5	100	0.00
		10-15	5	100	0.00
		15-30	2	13	0.00
		30-45	2	13	0.67
		45-120	-	-	1.28
		120-125	W.S.	-	0.74
		125-130	W.S.	-	0.61
		130-135	W.S.	-	0.74
		135-140	W.S.	-	1.35
		140-145	W.S.	-	1.69
		145-150	W.S.	-	1.01
		150-155	W.S.	-	1.35
		155-160	W.S.	-	2.02
		160-165	W.S.	-	2.02
		165-170	W.S.	-	4.72
		170-175	W.S.	-	3.37
		175-180	W.S.	-	3.71
		180-185	W.S.	-	4.65
		185-190	W.S.	-	6.81
		190-195	W.S.	-	7.25

* Determined at drilling site

(Continued)

TABLE CH-1 (Continued)

BPL DETERMINATION ON CORES

Chatham County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Ch-8	5.2 *	0-5	W.S.	-	0.24
		5-10	W.S.	-	0.44
		10-15	W.S.	-	0.07
		15-30	W.S.	-	0.30
		30-45	W.S.	-	0.13
		45-60	8	53	0.20
		60-65	3	60	0.54
		65-69	1	25	0.84
		69-72	4	100	7.45
		72-78	6	100	19.96
		78-80	2	100	10.86
		80-85	---	-	----
		85-90	5	100	27.96
		90-97	5	71	14.47
		97-102	5	100	3.03
		102-107	---	-	----
		107-114	3	43	3.41
		114-122	7	88	3.78
		122-125	W.S.	-	4.55
		125-130	W.S.	-	11.90
		130-135	W.S.	-	3.00
		135-140	W.S.	-	2.02
		140-145	W.S.	-	1.52
		145-150	W.S.	-	1.52
Ch-9	12.5 *	15-30	11.2	75	0.61
		30-47	8.5	50	0.74
		47-52	6.3	100	0.84
		52-72	10	100	0.77
		72-77	4.3	86	0.88
		77-86	13.6	100	1.38
		86-92	10.3	100	2.19
		92-103	15	100	3.71
		103-111	11.9	100	0.67
		111-122	11.7	100	4.85
		122-129	11	100	4.38

* Determined at drilling site.

TABLE CH-2

CHEMICAL COMPOSITION OF PROCESSED SANDS

-35+150 MESH FRACTION

(Results are in weight percent)

Hole No.	Layer Depth, Feet From	To	Loss on Ignition (LOI)	SiO_2	P_2O_5	Fe_2O_3	Al_2O_3	CaO	MgO
Ch-6	15	30	0.01	93.98	.00	.09	0.28	0	.002
	45	48	0.32	86.56	.28	.50	3.80	.38	.023
	48	53	0.48	84.84	.08	.51	4.31	.48	.041
Ch-7	0	5	0.06	99.90	.00	.08	0.00	0	.000
	5	15	0.17	98.34	.00	.14	0.34	.01	.002
	15	30	0.13	89.42	.00	.19	3.66	.23	.007
Ch-9	30	52	0.32	92.66	.38	.21	2.44	.41	.017
	52	72	0.34	88.84	.32	.26	3.15	.44	.025

TABLE CH-3

PARTICLE SIZE OF CORE MATERIAL

WEIGHT (%) DISTRIBUTION

Chatham County

Hole No.	Layer Depth, Feet From	To	Matrix +35	-35 +150	-150 +325	-325
Ch-6	15	30	48.4	33.7	7.7	10.2
	45	48	29.0	29.2	26.7	15.1
	48	53	0.4	60.1	23.4	16.1
Ch-7	0	5	24.2	45.3	6.7	23.8
	5	10	27.2	50.9	6.4	15.5
	10	15	24.7	59.4	8.7	7.2
	15	30	12.0	57.3	16.9	13.8
Ch-8	60	65	28.6	29.5	6.7	35.2
	65	69	35.3	40.4	7.8	16.5
Ch-9	30	47	2.6	50.7	22.9	23.8
	47	52	8.2	21.9	41.1	28.8
	52	72	20.9	30.4	30.2	18.5

TABLE CH-4

CHATHAM COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction Visual Color	Microscopic
Ch-6	15	30	82.1	White	
	45	53	59.5	Light grey	
	15	30			Mostly clear. Some sand colored white and some coated with iron oxide. Muscovite. Heavy minerals.
	45	48			Mostly clear. Some colored yellow, grey, green, white. Muscovite. Heavy minerals.
	48	53			Mostly clear. Some colored white, green, grey. Muscovite. Heavy minerals. Phosphorite.
Ch-7	0	30	73.3	Cream to white to light grey	
	0	5			Mostly clear. Some colored yellow. Some coated with iron oxide. Clay balls. Muscovite. Heavy minerals.

TABLE CH-4 (Continued)

CHATHAM COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction: Visual Color	Microscopic
Ch-7	10	15			Mostly clear. Some colored white. Some coated with iron oxide. Muscovite. Heavy minerals. Organic materials.
	15	30			Mostly clear. Some colored green, grey, white. Muscovite. Heavy minerals.
Ch-8	60	69	65.9	Light grey	
	60	65			Mostly clear. Some light brown opaque, white semi-transparent. Phosphorite.
	65	69			Mostly clear. Small amounts of black phosphorite.
Ch-9	30	72	49.1	Light grey to grey	
	30	47			Mostly clear. Some colored white, grey, green. Muscovite. Phosphorite. Heavy minerals.

(Continued)

TABLE CH-4 (Continued)

CHATHAM COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction: Visual Color	Microscopic
Ch-9	47	52			Mostly clear. Some colored white, grey, red. Muscovite. Biotite. Phosphorite.
	52	72			Mostly clear. Some colored white, red, green. Muscovite. Phosphorite.

TABLE CH-5

CHATHAM COUNTY

QUALITY OF SANDS (35 X 150 MESH)

Well No.	Layer Depth (Feet)	% +150 Mesh Sands in core	Meets Approx. Chem. Specifications for Quality Number *	Uniformity (1) Chemical	Size
Ch-6	15(2) - 30	82.1	2(3)	G	G
Ch-7	0 - 15	56.4	1, 6(4)	P	G
	15 - 30	69.3	7	G	G

(1) G = good; F = fair; P = poor

(2) Note overburden to be removed

(3) SiO_2 may be somewhat low

(4) Lower layer 5-15 feet

* Specifications are given and discussed on page 28, Project Report Number 6. Quality numbers and potential use are: 1 = optical; 2 = Flint, glass and tableware; 3 = flint; 4 & 5 = Sheet, rolled, polished plate and window; 6 = green containers; 7 = Green glass; 8 & 9 = Amber glass.

TABLE CH-6

X-RAY DIFFRACTION OF CLAYS (-325 MESH)

Hole No.	Layer Depth (Feet)	Description
Ch-6	41-45	Mostly montmorillonite and illite, some kaolinite. Possible mixed layer montmorillonite-illite. Trace of attapulgite.
	105-110	Mostly montmorillonite and dolomite. Some quartz and illite. Some attapulgite.
	110-120	Mostly dolomite. Some montmorillonite and illite and attapulgite.
Ch-7	30-45	Mostly montmorillonite and illite. Could possibly be a mixed layer mineral of 60:40 montmorillonite-illite. Trace of kaolin and quartz, more attapulgite.
Ch-8	85-90	Mostly montmorillonite and kaolinite. Some illite and quartz. Some attapulgite.
	95-97	Dolomite. Trace of illite. Some attapulgite.
	107-114	Mostly dolomite and attapulgite. Trace of quartz, and illite.
	114-122	Illite, and attapulgite. Slight trace of dolomite.
Ch-9	15-30	Mostly montmorillonite and kaolinite. Some illite. Some attapulgite.
	122-129	Mostly montmorillonite-chlorite, montmorillonite. Some illite and quartz. Small amount of attapulgite.

TABLE CH-7

X-RAY DIFFRACTION OF PHOSPHATE FLOTATION CONCENTRATES

Hole No.	Layer Depth (Feet)	Test No.	Description
Ch-1	60-70	1	Mostly fluropatite, large amounts of quartz, and trace of hydroxylapatite.
Ch-1	60-70	2	Mostly fluorpatite, some quartz, and trace of hydroxylapatite.
Ch-1	117-122	1	Mostly fluorapatite, some quartz, and trace of hydroxylapatite.
Ch-1	117-122	1R	Mostly fluorapatite, some quartz, and trace of hydroxylapatite.
Ch-1	132-142	1R	Mostly fluorapatite, some quartz, and trace of hydroxylapatite.
Ch-1	152-160	2	Mostly fluorapatite, some quartz, and trace of hydroxylapatite.
Ch-2	105-110	1R	Mostly fluorapatite, large amounts of quartz.
Ch-2	115-120	1	Mostly fluorapatite, trace of quartz, and trace of hydroxylapatite.
Ch-2	125-150	1	Mostly fluorapatite, trace of quartz, and trace of hydroxylapatite.
Ch-2	155-160	2	Mostly fluorapaptite, trace of quartz, and trace of hydroxylapatite.
Ch-3	83-90	3	Mostly fluorapatite, trace of quartz, and trace of hydroxylapatite.
Ch-3	93-108	1	Mostly fluorapatite, large amounts of quartz, trace of hydroxylapatite.
Ch-4	82-97	3	Mostly fluorapatite, trace of quartz, and trace of hydroxylapatite.
Ch-5	98-101	1	Mostly fluorapatite, trace of quartz, trace of hydroxylapatite.

TABLE CH-8

MATRIX BENEFICIATION RESULTS

Chatham County

	Feed	+4	4X8	8X16	(Flot. feed) 16X150	16X35	35X150	(Slime) -150	Concen-trates	Fatty Acid Tailing	Amine Float
HOLE NO. Ch-8 Surface Elevation =					(sea level)		Matrix Interval = 69-95				
Total matrix footage	26										
Dry Density lb/cu ft	87.45										
Percent dry weight	100.0	1.43	1.77	8.67	57.70	10.79	46.91	30.44	31.85	56.32	11.83
Percent BPL	24.35	41.00	33.18	24.95	26.50	14.23	29.30	18.81	66.43	3.68	24.52
Percent acid insol	56.64	18.70	45.52	61.42	60.30	77.66	55.76	50.76	1.62	94.05	63.94
Percent Fe_2O_3	.79	.54	.69	.39	.26	.17	.27	1.93	.47	.09	.46
Percent Al_2O_3	2.70	1.11	2.12	1.11	1.23	1.14	1.28	6.05	.47	1.11	1.88
Percent CaO	20.15	38.13	25.54	17.84	18.54	9.79	20.64	22.70	51.77	1.75	16.79

Note: Tan phosphorite nodules were observed in the +4 portion of pebble, together with the normal black Chatham phosphorite.

TABLE CH-9

ECONOMIC FACTORS - FIGURES OF MERIT

Chatham County

ITEM	UNIT (M=1000)	HOLE NO. Ch-8
Matrix No.:		First
Matrix Interval, Ft.:		69-95
ECONOMIC FACTORS		
* Overburden,	ft	69.00
Overburden,	MT/Ac	135.2
* Matrix,	ft	26.00
Matrix,	MT/Ac	49.5
* BPL in Matrix,	%	24.35
BPL in Matrix,	MT/Ac	12.1
* Overburden/Matrix,	Ratio	2.65
Wash-Screen Products		
+16 Mesh	MT/Ac	5.9
-16+150	MT/Ac	28.6
-150 (Loss)	MT/Ac	15.1
* Flotation Concentrate Product	MT/Ac	9.1
Total Useful Products*	MT/Ac	15.0
BPL Recovery		
+16 Mesh	MT/Ac	1.7
* -16+150 (Flot. Conc.),	% BPL	66.4
-16+150 (Flot. Conc.),	MT/Ac	6.0
* Total	MT/Ac	7.7
* Recovered from Matrix	%	63.83
* Overburden/Products	cu yd/T	7.7
* Matrix/Products	cu yd/T	2.80
* I+A in Flot. Conc.	%	.94

FIGURES OF MERIT	Unit	Econ. Level	
Overburden	ft	88 max	1.28
Matrix	ft	3 min	8.67
BPL in Matrix	%	10 min	2.44
BPL in Flot. Conc.(1)	%	66 min	1.01
BPL in Flot. Conc.(2)	%	52 min	1.28
Overburden/Matrix	Ratio	2 max	.75
Overburden/Products	cu yd/T	17.5 max	2.29
I+A in Flot. Conc.	%	5 max	5.32
Products Recovery	T/Ac-ft	400 min	1.44
BPL (+150) Recovery	%	63 min	1.01
Matrix/Products	cu yd/T	6 max	2.14

(1) For wet acid process. (2) For electric furnace process. * Sum of +16 mesh and flotation concentrate.

NOTES: Overburden based on dry density @ average = 90 lb./cu. ft. Matrix factors based on actual dry density.
Factors used: ft. thickness x 1613 = cu. yd./Ac; cu. yd x 1.215 = T(2000 lb.); ft. x 1960 = T(2000 lb.)/Ac.

EFFINGHAM COUNTY

EFFINGHAM COUNTY

SUMMARY OF RESULTS

Only one new hole, Number 8, was drilled in Effingham County.

Phosphorite

Hole number 8 had no phosphorite of economic interest less than 150 feet of depth. The best zone was between 225 and 245 feet in depth, which is not within present mining range for this grade of phosphorite.

Glass Sands

Effingham 8 has a layer from 30 to 39 feet that may be developed into a glass sand source, although overburden thickness may offset its value completely. Clay coating on sand grains as well as clay chips can probably be removed if strong scrubbing action is used.

Heavy Minerals

Two layers containing TiO_2 are shown in this well: 0 to 33 feet and 38 to 105 feet. The content of TiO_2 does not exceed 0.5% TiO_2.

Clays

If the heavy mineral content of the layers above 105 feet merits exploitation, the clay layer from 105 to 120 feet may be a source of fuller's earths material, since it is mainly montmorillonite - a highly absorbent clay (Table Ef-4).

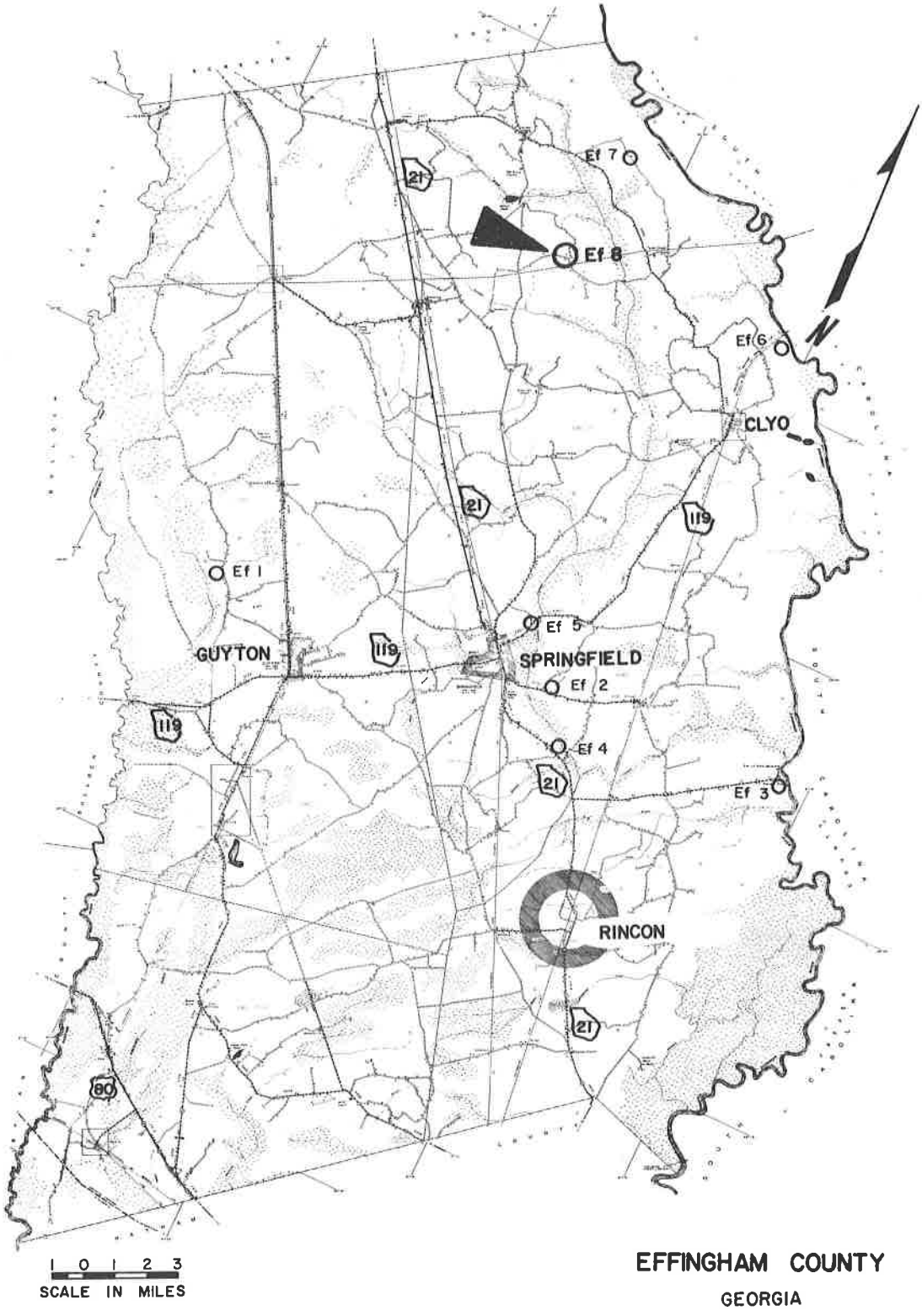

Figure EF-1. Location of Holes - Effingham County.

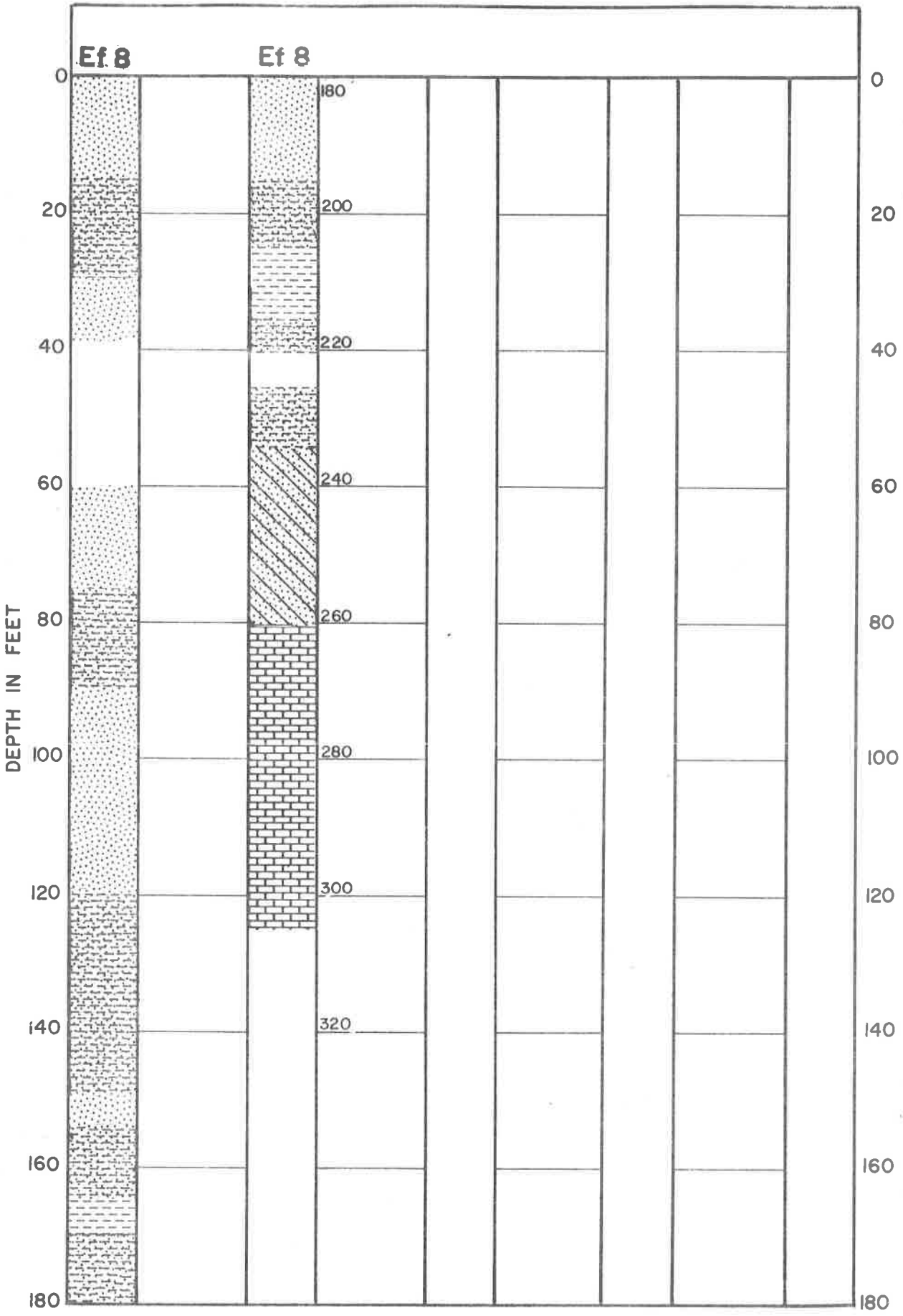

Figure Ef-2. Lithologic Logs - Effingham County.

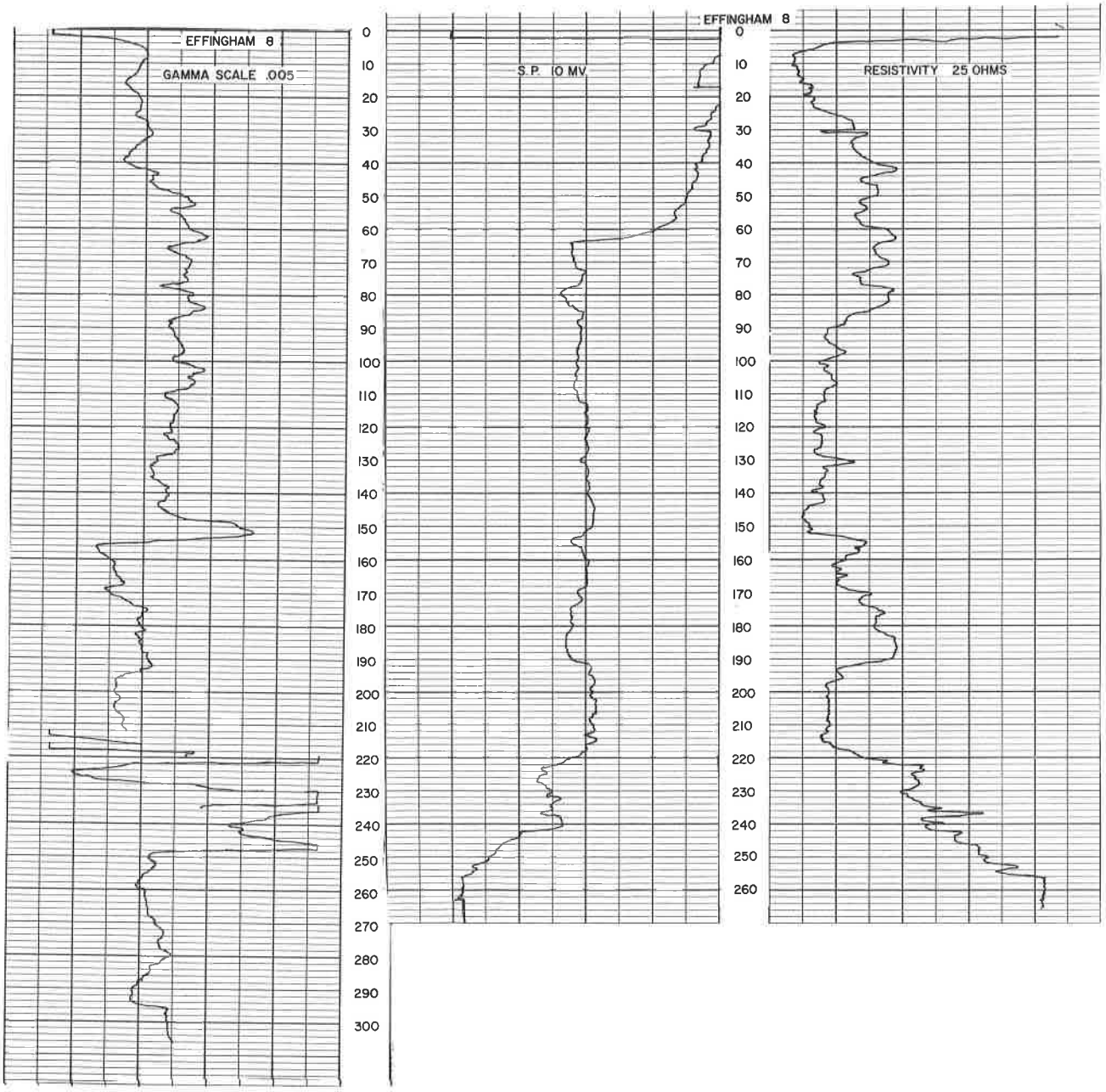

Figure EF-3. Electric and Gamma-Ray Logs - Effingham County Hole Ef-8

TABLE EF-1

BPL DETERMINATION ON CORES

Effingham County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Eff-8	37.6	0-5	W.S.	-	0.00
		5-10	W.S.	-	0.00
		10-15	W.S.	-	0.00
		15-30	17	100	0.00
		30-33	3	100	0.77
		33-38	5	100	0.74
		38-39	1	100	0.61
		39-60	---	-	----
		60-75	2	13	0.67
		75-90	5	33	0.98
		90-105	11	73	1.01
		105-120	11	73	1.69
		120-125	W.S.	-	2.63
		125-130	W.S.	-	2.66
		130-135	W.S.	-	4.11
		135-140	W.S.	-	4.11
		140-145	W.S.	-	4.96
		145-150	W.S.	-	2.43
		150-155	W.S.	-	12.58
		155-160	W.S.	-	2.06
		160-165	W.S.	-	5.94
		165-170	W.S.	-	3.57
		170-175	W.S.	-	3.47
		175-180	W.S.	-	6.17
		180-185	W.S.	-	3.40
		185-190	W.S.	-	2.73
		190-195	W.S.	-	3.10
		195-200	W.S.	-	2.02
		200-205	W.S.	-	1.89
		205-210	W.S.	-	1.96
		210-215	W.S.	-	3.64
		215-220	W.S.	-	7.45
		220-225	---	-	----
		225-230	W.S.	-	12.14
		230-235	W.S.	-	11.20
		235-240	W.S.	-	18.07
		240-245	W.S.	-	14.80
		245-250	W.S.	-	6.74
		250-255	W.S.	-	4.69
		255-260	W.S.	-	10.69
		260-265	W.S.	-	3.34

(Continued)

TABLE EF-1 (Continued)

BPL DETERMINATION ON CORES

Effingham County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Eff-8	37.6	265-270	W.S.	-	6.14
		270-275	W.S.	-	3.57
		275-280	W.S.	-	2.70
		280-285	W.S.	-	5.33
		285-290	W.S.	-	3.20
		290-295	W.S.	-	2.33
		295-300	W.S.	-	1.15
		300-305	W.S.	-	0.98

TABLE EF-2

CHEMICAL COMPOSITION OF PROCESSED SANDS

-35+150 MESH FRACTION

(Results are in weight percent)

Hole No.	Layer Depth, Feet From	To	Loss on Ignition (LOI)	SiO_2	P_2O_5	Fe_2O_3	Al_2O_3	CaO	MgO
Eff-8	30	39	0.25	88.12	.00	.19	4.05	.28	.016

TABLE EF-3

PARTICLE SIZE OF CORE MATERIAL

WEIGHT (%) DISTRIBUTION

Effingham County

Hole No.	Layer Depth, Feet From	To	Core +35	-35 +150	-150 +325	-325
Eff-8	30	33	2.7	60.7	21.7	14.9
	33	38	1.8	68.2	15.2	14.8
	38	39	0.6	63.9	20.1	15.4

TABLE EF-4

EFFINGHAM COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction Visual Color	Microscopic
Eff-8	30	39	67.2	Grey	
	30	33			Mostly clear. Some colored grey, white, green. Muscovite. Limonite.
	33	38			Mostly clear. Some colored green, grey, white. Some coated with clay. Muscovite. Heavy minerals.
	38	39			Mostly clear. Some colored green, white, grey. Muscovite. Phosphorite.

TABLE EF-5

EFFINGHAM COUNTY

QUALITY OF SANDS (35 X 150 MESH)

Well No.	Layer Depth (Feet)	% +150 Mesh Sands in core	Meets Approx. Chem. Specifications for Quality Number *	Uniformity (1) Chemical	Size
Eff-8	30(2) - 39	67.2	7(3)	G	G

(1) G = good; F = fair; P = poor

(2) Note overburden to be removed

(3) Strong scrubbing action may produce a sand of higher quality number.

* Specifications are given and discussed on page 28, Project Report Number 6. Quality numbers and potential use are: 1 = optical; 2 = Flint, glass and tableware; 3 = flint; 4 & 5 = Sheet, rolled, polished plate and window; 6 = green containers; 7 = Green glass; 8 % 9 = Amber glass.

TABLE EF-6

X-RAY DIFFRACTION OF CLAYS (-325 MESH)

Hole No.	Layer Depth (Feet)	Description
Eff-8	105-120	Mostly montmorillonite. Some illite, quartz, and attapulgite.

SCREVEN COUNTY

SCREVEN COUNTY

SUMMARY OF RESULTS

Five holes were drilled in Screven County.

Phosphorite

All holes were essentially barren.

Glass Sands

The five wells show sand of sufficient quality to be considered potential sources of glass sands. In general, the crude sands contain too much clay and organic matter for a glass sand, but with normal beneficiation procedures the crude sands may meet chemical specifications for qualities 1 or 2.

Heavy Minerals

Screven 4 from 0 to 100 feet shows 0.1 to 0.2% TiO_2. The other holes present substantially smaller amounts of TiO_2.

Clays

Two layers in Screven 1, 75-80 and 80-86 feet were identified as being mainly calcite, although dispersed particle sizes approach that of clay. The first 9 feet in Screven 2 show kaolinite contaminated with illite, montmorillonite, and quartz. Since this is a very thin layer, no economic importance is attached to it.

Screven 4, however, shows kaolinite in some layers where montmorillonite predominates. Kaolinite is present from 10 to 78 feet along with the montmorillonite, and from 86 to 90 feet predominates over the other clay minerals. Additional drilling in this area may show kaolin deposits of economic importance.

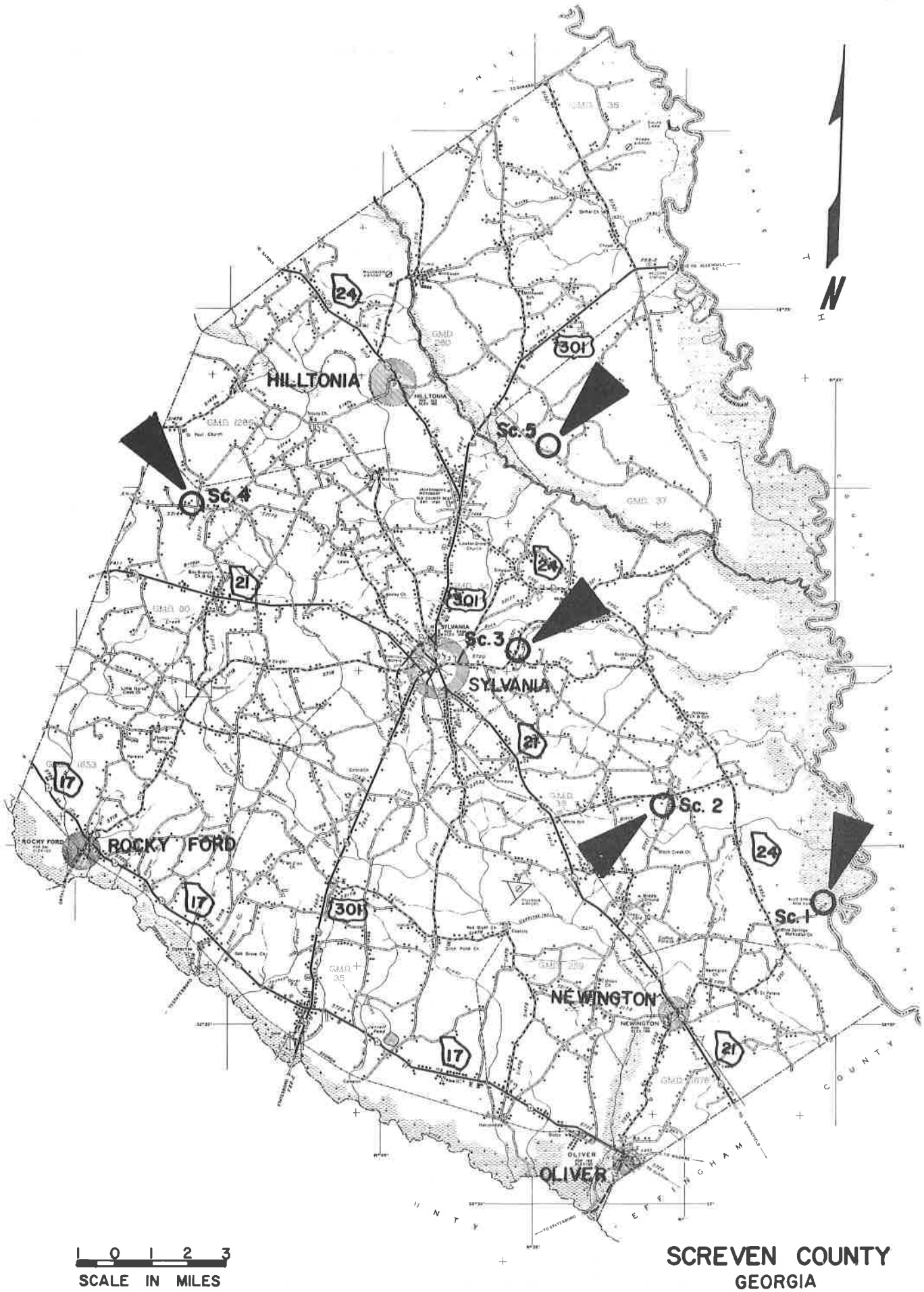

Figure Sc-1. Location of Holes - Screven County

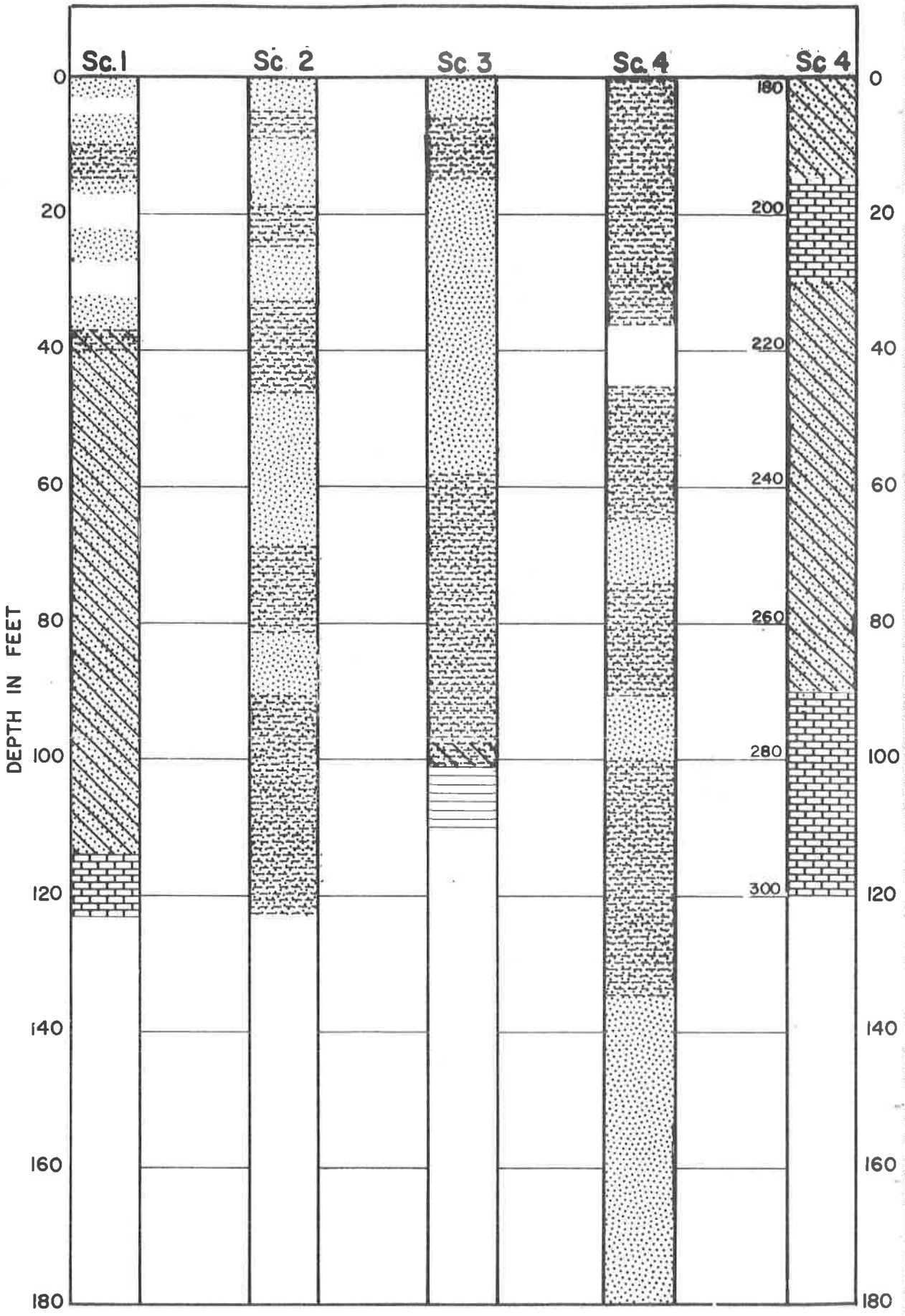

Figure Sc-2. Lithologic Logs - Screven County

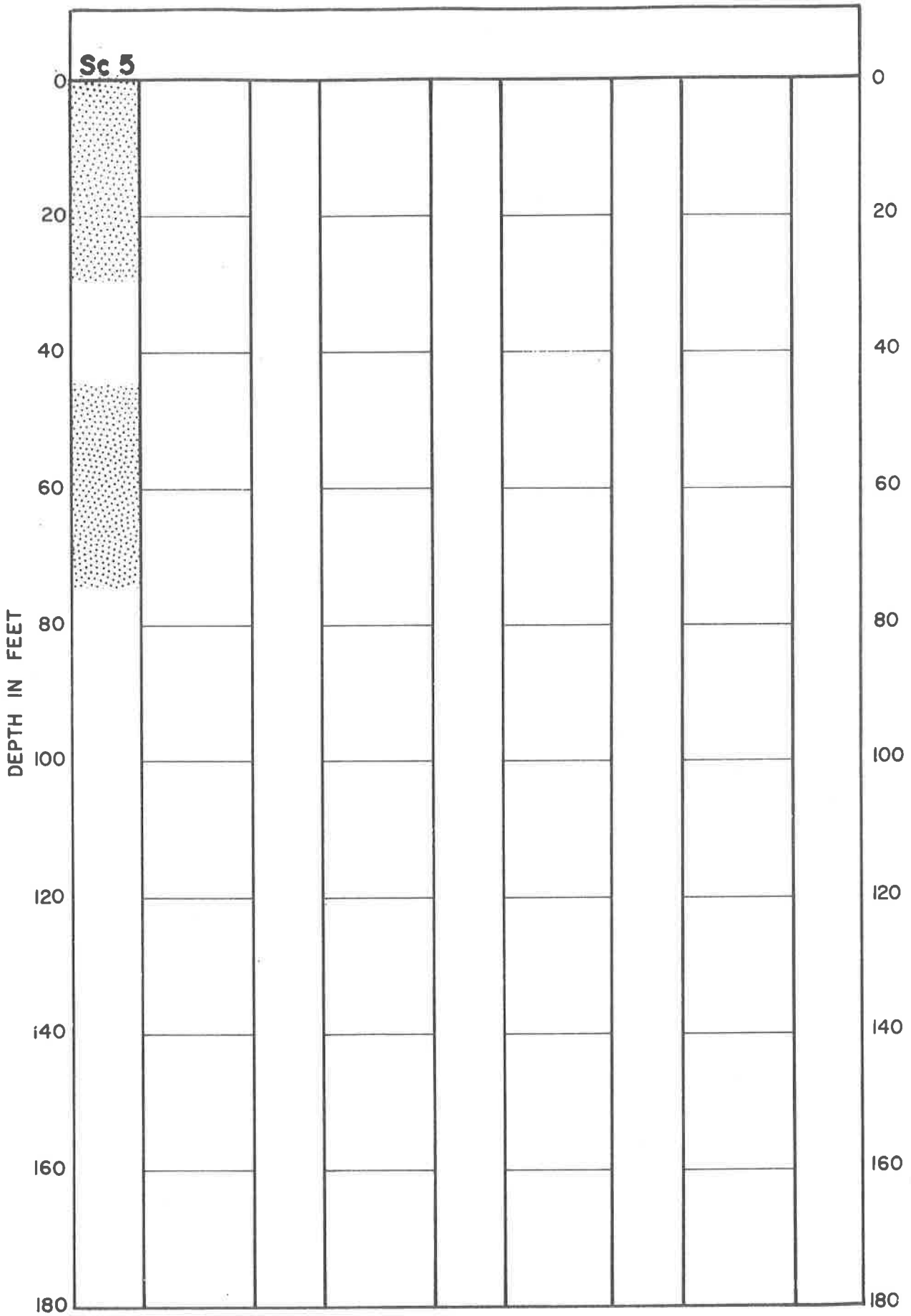

Figure Sc-2. Lithologic Logs - Screven County (Cont.)

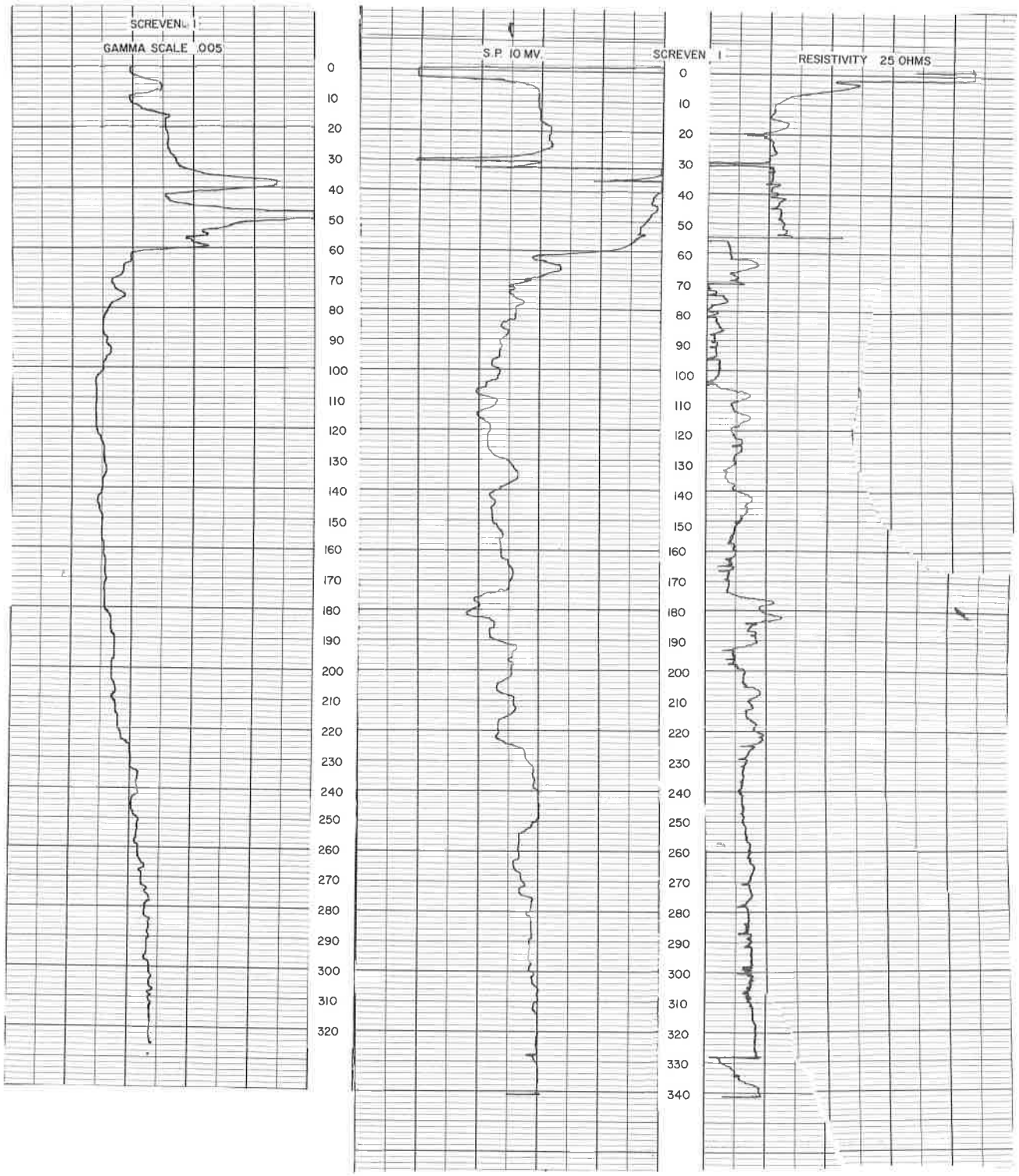

Figure Sc-3. Electric and Gamma-Ray Logs - Screven County Hole Sc-1

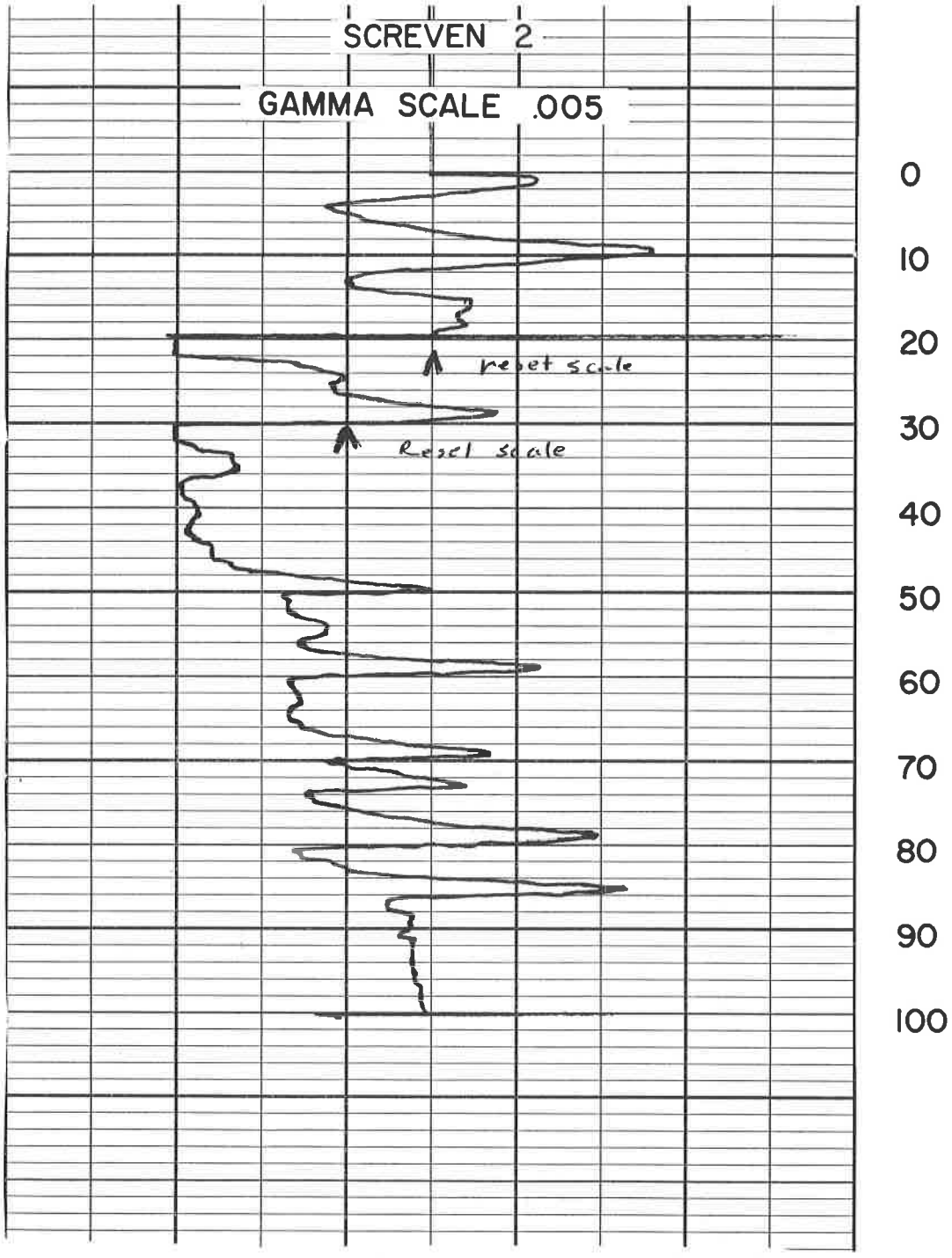

Figure Sc-3. Electric and Gamma-Ray Logs - Screven County Hole Sc-2

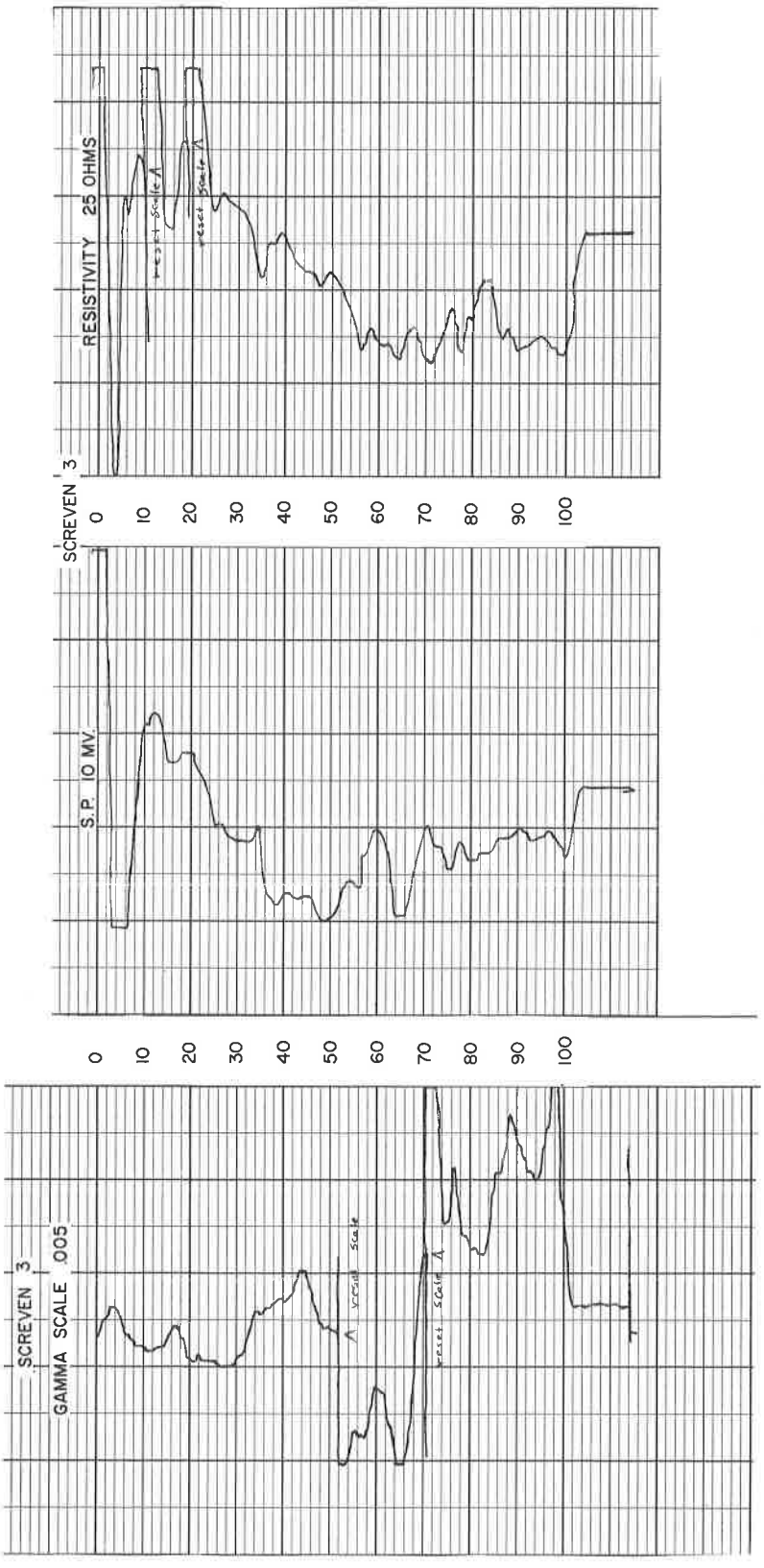

Figure Sc-3. Electric and Gamma-Ray Logs - Screven County Hole Sc-3

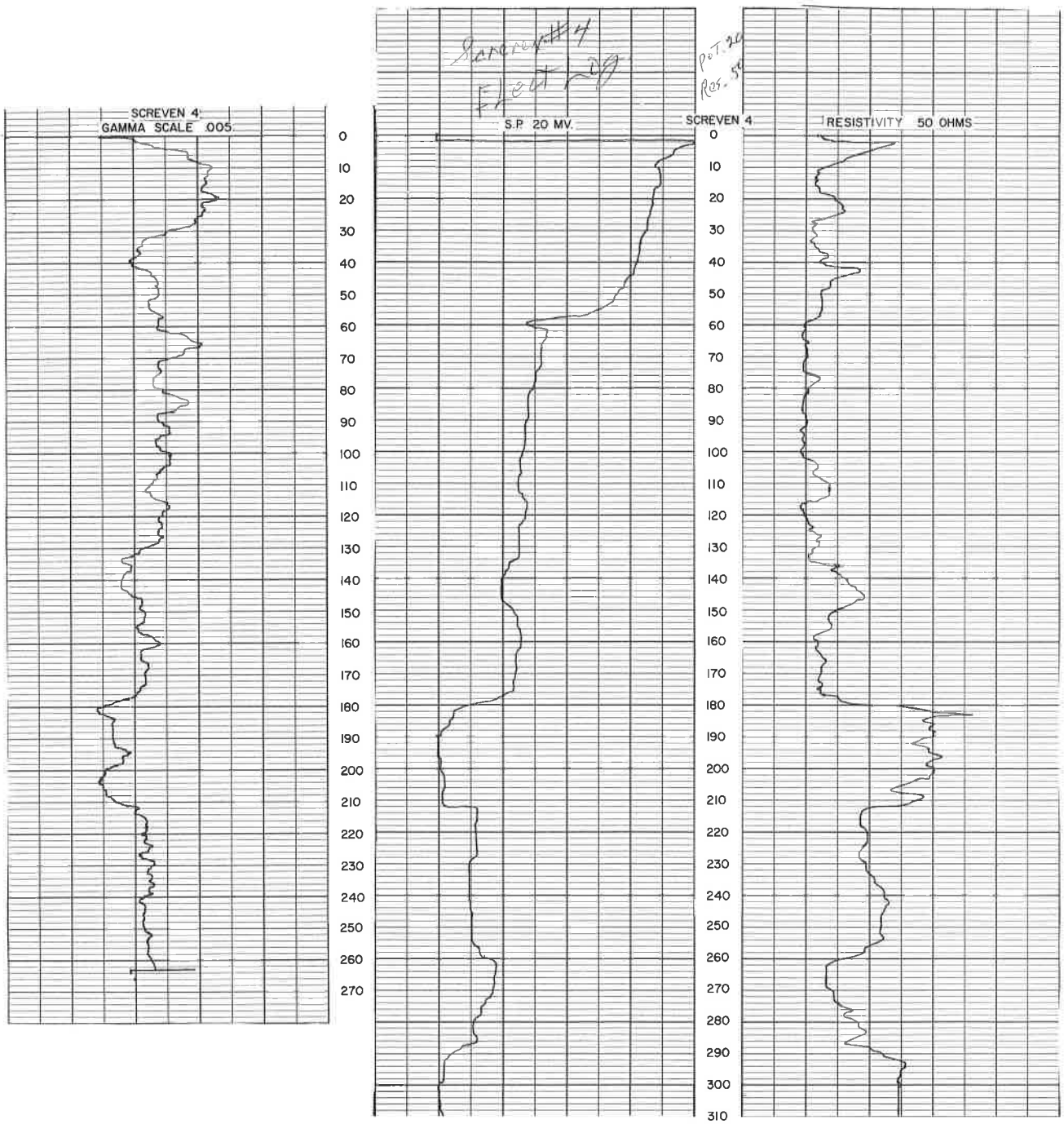

Figure Sc-3. Electric and Gamma-Ray Logs - Screven County
Hole Sc-4

TABLE SC-1

BPL DETERMINATION ON CORES

Screven County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Sc-1	52.1	0-5	5	100	0.00
		5-10	5	100	0.00
		10-15	5	100	0.00
		15-17	1	50	0.00
		17-22	Lost	-	----
		22-27	4	80	1.48
		27-32	5	100	2.53
		32-37	5	100	5.60
		37-40	1	33	2.19
		40-46	6	100	5.90
		46-57	5	45	2.12
		57-60	4	100	0.00
		60-75	3	20	0.00
		75-80	5	100	0.00
		80-86	5	83	0.00
		86-96	5	50	0.00
		76-114	4	22	0.00
		114-123	1	11	0.00
		123-125	W.S.	-	0.00
		125-130	W.S.	-	0.00
		130-135	W.S.	-	0.00
		135-140	W.S.	-	0.00
		140-145	W.S.	-	0.00
		145-150	W.S.	-	0.00
		150-155	W.S.	-	0.00
		155-160	W.S.	-	0.00
		160-165	W.S.	-	0.00
		165-170	W.S.	-	1.18
		170-175	W.S.	-	0.74
		175-180	W.S.	-	0.00
		180-185	W.S.	-	0.00
		185-190	W.S.	-	0.00
		190-195	W.S.	-	0.00
		195-200	W.S.	-	0.00
		200-205	W.S.	-	0.00
		205-210	W.S.	-	0.00
		210-215	W.S.	-	0.00
		215-220	W.S.	-	0.00
		220-225	W.S.	-	0.00
		225-230	W.S.	-	0.00
		230-235	W.S.	-	0.00

(Continued)

TABLE SC-1 (Continued)

BPL DETERMINATION ON CORES

Screven County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Sc-1	52.1	235-240	W.S.	-	0.00
		240-245	W.S.	-	0.00
		245-250	W.S.	-	0.00
		250-255	W.S.	-	0.00
		255-260	W.S.	-	0.00
		260-265	W.S.	-	0.00
		265-270	W.S.	-	0.00
		270-275	W.S.	-	0.00
		275-280	W.S.	-	0.00
		280-285	W.S.	-	0.00
		285-290	W.S.	-	0.00
		290-295	W.S.	-	0.00
		295-300	W.S.	-	0.00
		300-305	W.S.	-	0.00
		305-310	W.S.	-	0.00
		310-315	W.S.	-	0.00

TABLE SC-1 (Continued)

BPL DETERMINATION ON CORES

Screven County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Sc-2	171.0	0-3	2	67	0.00
		3-9	5	83	0.00
		9-12	3	100	0.00
		12-15	2	67	0.00
		15-19	4	100	0.00
		19-23	4	100	0.00
		23-25	2	100	0.00
		25-33	8	100	0.00
		33-39	8	100	0.71
		39-46	8	100	0.40
		46-54	10	100	1.85
		54-62	8	100	3.03
		62-69	2	29	4.08
		69-74	7	100	2.87
		74-82	3	38	1.45
		82-86	2	50	1.04
		86-91	2	40	1.85
		91-99	7	88	0.88
		99-107	5	63	1.55
		107-114	4	57	2.12
		114-119	7	100	3.10
		119-123	5	100	2.50
Sc-3	159.0	0-6	4	67	0.00
		6-15	5	56	0.00
		15-20	5	100	0.00
		20-30	4	40	0.00
		30-45	2	13	0.00
		45-49	3	75	0.00
		49-58	5	56	0.00
		58-60	2	100	0.00
		60-72	3	25	0.00
		72-75	3	100	0.00
		75-79	2	50	0.00
		79-90	5	45	0.00
		90-93	3	100	0.00
		93-98	5	100	6.50
		98-103	5		6.50
		103-110	W.S.	-	0.00

(Continued)

TABLE SC-1 (Continued)

BPL DETERMINATION ON CORES

Screven County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Sc-4	325.0	0-10	5	50	0.00
		10-15	5	100	0.00
		15-20	4	80	0.00
		20-28	5	63	0.00
		28-36	5	63	0.00
		45-50	5	100	0.00
		50-55	5	100	0.00
		55-60	5	100	0.00
		60-65	5	100	0.00
		65-69	5	100	0.00
		69-74	5	100	0.00
		74-78	4	100	0.00
		78-86	5	63	0.00
		86-90	4	100	0.00
		90-95	5	100	0.00
		95-100	5	100	0.00
		100-105	5	100	0.00
		105-110	5	100	0.00
		110-117	5	71	0.00
		117-124	5	71	0.00
		124-130	W.S.	-	0.00
		130-135	W.S.	-	0.00
		135-140	W.S.	-	0.00
		140-145	W.S.	-	0.00
		145-150	W.S.	-	0.00
		150-155	W.S.	-	0.00
		155-160	W.S.	-	0.00
		160-165	W.S.	-	0.00
		165-170	W.S.	-	0.00
		170-175	W.S.	-	0.44
		175-180	W.S.	-	2.16
		180-185	W.S.	-	1.08
		185-190	W.S.	-	0.64
		190-195	W.S.	-	2.22
		195-200	W.S.	-	2.73
		200-205	W.S.	-	0.78
		205-210	W.S.	-	0.54
		210-215	W.S.	-	0.81
		215-220	W.S.	-	0.98
		220-225	W.S.	-	1.38
		225-230	W.S.	-	0.44

(Continued)

TABLE SC-1 (Continued)

BPL DETERMINATION ON CORES

Screven County

Hole No.	Surface Elevation (Sea Level) Feet	Depth Feet	Core Recovery Feet	Core Recovery %	BPL %
Sc-4	325.0	230-235	W.S.	-	0.71
		235-240	W.S.	-	1.04
		240-245	W.S.	-	0.57
		245-250	W.S.	-	0.98
		250-255	W.S.	-	0.91
		255-260	W.S.	-	0.54
		260-265	W.S.	-	0.54
		265-270	W.S.	-	0.00
		270-275	W.S.	-	0.00
		275-280	W.S.	-	0.00
		280-285	W.S.	-	0.00
		285-290	W.S.	-	0.00
		290-295	W.S.	-	0.00
		295-300	W.S.	-	0.00
Sc-5	118.2	0-3	2½	83	0.00
		3-6	2½	83	0.00
		6-9	2½	83	0.00
		9-12	2½	83	0.00
		12-15	2	67	0.00
		15-30	2	13	0.00
		30-45	-	-	0.00
		45-60	3	20	0.00
		45-60	W.S.	-	0.00
		60-75	1	7	6.98

TABLE SC-2

CHEMICAL COMPOSITION OF PROCESSED SANDS

-35+150 MESH FRACTION

(Results are in weight percent)

Hole No.	Layer Depth, Feet From	To	Loss on Ignition (LOI)	SiO_2	P_2O_5	Fe_2O_3	Al_2O_3	CaO	MgO
Sc-1	0	5	0.11	95.68	.00	.26	0.38	.03	.007
	10	15	0.00	94.74	.00	.27	0.24	0	.004
	22	27	0.17	87.28	.06	.27	3.78	.31	.025
	32	40	2.34	84.50	.80	.28	2.64	2.63	.052
	46	57	1.99	84.46	.91	.31	2.70	2.35	.119
Sc-2	12	19	0.05	95.66	.00	.19	0.89	0	.009
	25	39	0.39	96.22	.00	.14	0.63	0	.014
	39	46	0.10	96.06	.00	.26	0.71	0	.010
	54	62	0.13	93.72	.48	.34	0.87	.34	.016
Sc-3	0	6	0.14	97.04	.00	.14	0.06	0	.002
	6	49	0.78	96.60	.00	.16	0.24	0	.004
	49	58	0.12	96.84	.00	.12	0.32	0	.002
Sc-4	45	50	0.84	89.84	.00	.88	1.79	0	.008
Sc-5	0	3	0.20	96.04	.00	.10	0.05	0	.002
	3	6	0.25	96.78	.00	.77	0.14	0	.004
	6	9	0.11	99.30	.00	.24	0.12	0	.002
	9	12	0.10	97.48	.00	.12	0.08	0	.003
	12	15	0.11	97.62	.00	.23	0.20	0	.007
	15	30	0.12	92.62	.00	.79	1.11	0	.022
	45	60	0.13	97.54	.00	.09	0.19	0	.005

TABLE SC-3

PARTICLE SIZE OF CORE MATERIAL

WEIGHT (%) DISTRIBUTION

Screven County

Hole No.	Layer Depth, Feet From	To	Core +35	-35 +150	-150 +325	-325
Sc-1	0	5	40.4	38.2	8.8	12.6
	10	15	26.6	39.0	14.4	20.6
	22	27	4.9	60.1	13.0	22.0
	32	37	2.3	52.4	19.4	25.9
	37	40	3.8	9.8	56.5	29.9
	46	57	7.1	51.1	14.9	26.9
Sc-2	12	15	51.6	24.7	3.3	20.4
	15	19	43.1	33.3	2.1	21.5
	25	33	2.8	64.0	6.7	26.5
	33	39	1.7	54.3	15.3	28.7
	39	46	0.9	56.7	17.0	25.4
	54	62	18.4	64.8	3.3	13.5
Sc-3	0	6	34.9	38.7	7.2	19.2
	6	15	34.2	33.4	6.4	26.0
	15	20	43.1	25.9	2.3	28.7
	20	30	48.4	21.5	2.9	27.2
	30	45	74.6	8.4	2.1	14.9
	45	49	38.0	39.5	3.7	18.8
	49	58	26.0	51.0	5.9	17.1
Sc-4	45	50	46.8	19.6	3.9	29.7

(Continued)

TABLE SC-3 (Continued)

PARTICLE SIZE OF CORE MATERIAL

WEIGHT (%) DISTRIBUTION

Screven County

Hole No.	Layer Depth, Feet From	To	Core +35	-35 +150	-150 +325	-325
Sc-5	0	3	28.0	54.0	13.1	4.9
	3	6	49.9	24.9	8.4	16.8
	6	9	50.2	25.0	4.5	20.3
	9	12	47.8	33.7	7.0	11.5
	12	15	52.9	39.9	2.2	5.0
	15	30	60.5	22.9	7.6	9.0
	45	60	19.8	50.2	8.4	21.6

TABLE SC-4

SCREVEN COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 Mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction Visual Color	Microscopic
Sc-1	0	5	78.7	White to tan	
	10	15	65.6	White to tan	
	22	27	65.0	White to grey	
	32	40	38.8	Dark grey	
	46	57	58.2	Dark grey	
	0	5			Clear sand. Small amount of clay coated on sand. Colored tan, yellow. Phosphorite?
	10	15			Some clear sand. Some colored white, yellow. Some coated with clay. Phosphorite? Limonite.
	22	27			Some sand clear. Some colored yellow, red. Traces of clay coating. Muscovite. Phosphorite.
	32	37			Mostly clear. Some colored green, yellow. Muscovite. Limonite. Phosphorite.

(Continued)

TABLE SC-4 (Continued)

SCREVEN COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction: Visual Color	Microscopic
Sc-1	37	40			Mostly clear. Some colored white. Some coated with clay. Phosphorite. Muscovite. Limonite.
	46	57			Mostly clear. Some colored white. red, a few coated with clay. Muscovite. Phosphorite. Limonite.
Sc-2	12	19	76.3	Tan to cream	
	25	46	60.6	White to tan	
	54	62	83.2	Cream	
	12	15			Mostly clear. Some colored white, green, yellow, red. Some coated with clay. Phosphorite?
	15	19			Mostly clear. Some colored white, red dark. Some coated with clay. Muscovite.
	25	33			Mostly clear. Some colored white, tan. Phosphorite?
	33	39			Mostly clear. Some colored white, tan. Phosphorite.

(Continued)

TABLE SC-4 (Continued)

SCREVEN COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction: Visual Color	Microscopic
Sc-2	39	46			Mostly clear. Some colored white, green, red. Phosphorite. Clay.
	54	62			Mostly clear. Some colored white, red. Phosphorite.
Sc-3	0	58	7.49	Cream to white to reddish	
	0	6			Mostly clear. Some colored white. Some coated with clay. Heavy minerals. Organic material.
	6	15			Mostly clear. Some colored red. Some coated with clay. Heavy minerals. Muscovite.
	15	20			Mostly clear. Some coated with clay and iron oxide. Muscovite. Heavy minerals.
	20	30			Mostly clear. Some colored white, yellow. Some coated with iron oxide. Muscovite. Heavy minerals.
	30	45			Mostly clear. Some colored white, red, yellow. Muscovite. Heavy minerals.

(Continued)

TABLE SC-4 (Continued)

SCREVEN COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 Mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction: Visual Color	Microscopic
Sc-3	45	49			Mostly clear. Some colored white, yellow. Some coated with iron oxide. Muscovite. Heavy minerals.
	49	58			Mostly clear. Some colored white, red, grey, yellow. Some coated with iron oxide. Heavy minerals.
Sc-4	45	50	66.4	Cream to red	
	45	50			Some clear sand. Some colored white. red, grey. Some coated with iron oxide. Heavy minerals. Feldspar.
Sc-5	0	30	82.3	Reddish tan to cream to white	
	45	60	70.0	Cream	
	0	3			Some clear. Some colored white, red. Some coated with iron oxide. Organic matter. Heavy minerals.

(Continued)

TABLE SC-4 (Continued)

SCREVEN COUNTY

VISUAL AND MICROSCOPIC OBSERVATIONS OF SANDS (35X150 MESH)

Note: Color abbreviations are: Br = brown, Cr = cream, Lt = light, Or = orange, Wh = white, Y = yellow

Hole No.	Layer Depth (Feet) From	To	+150 Mesh Sands in Core Weighted Average Percent	Observations of -35+150 Mesh Fraction: Visual Color	Microscopic
Sc-5	3	6			Mostly clear. Some colored green, white, red. Some coated with iron oxide. Heavy minerals. Organic matter.
	6	9			Mostly clear. Some colored red, white. Some coated with iron oxide. Organic matter.
	9	12			Mostly clear. Some colored red, white. Some coated with iron oxide. Heavy minerals.
	12	15			Mostly clear. Some colored white, green. Some coated with iron oxide. Heavy minerals.
	15	30			Mostly clear. Some colored red, white. Muscovite. Heavy minerals.
	45	60			Mostly clear. Some colored white, red. Some coated with iron oxide. Heavy minerals.

TABLE SC-5

SCREVEN COUNTY

QUALITY OF SANDS (35 X 150 MESH)

Hole No.	Layer Depth (Feet)	% +150 Mesh Sands in core	Meets Approx. Chem. Specifications for Quality Number *	Uniformity (1) Chemical	Size
Sc-1	0 - 5	78.7	7(5)	G	G
	10 - 15	65.6	7	G	G
	22 - 27(2,3)	65.0	7	G	G
	32 - 40(2,3,4)	38.8	7	G	G
Sc-2	12 - 19	76.3	7	G	G
	25 - 46	60.6	7	F	G
Sc-3	0 - 58	74.9	7	G	F
Sc-4	45 - 50	66.4	8	G	G
Sc-5	0 - 30	82.3	7, 8, 9	F	F
	45 - 60	70.0	7, 8, 9	G	G

(1) G = good; F = fair; P = poor

(2) Silica may be low

(3) Alumina too high - sample may meet higher quality no if well scrubbed.

(4) Layer from 37 to 40 very fine sand.

(5) All these samples may meet higher quality numbers if beneficiated.

* Specifications are given and discussed on page 28, Project Report Number 6. Quality numbers and potential use are: 1 = optical; 2 = Flint, glass and tableware; 3 = flint; 4 & 5 = Sheet, rolled, polished plate and window; 6 = green containers; 7 = Green glass; 8 & 9 = Amber glass.

TABLE SC-6

X-RAY DIFFRACTION OF CLAYS (-325 MESH)

Hole No.	Layer Depth, (Feet)	Description
Sc-1	75-80	Calcite.
	80-86	Calcite. Trace of illite.
Sc-2	0-3	Mostly kaolinite. Some illite and quartz.
	3-9	Mostly kaolinite. Some montmorillonite and quartz.
	19-23	Mostly montmorillonite. Some kaolinite, illite and quartz.
	23-25	Montmorillonite.
Sc-4	10-15	Mostly montmorillonite. Some kaolinite, and illite.
	15-20	Mostly montmorillonite. Some kaolinite, illite, quartz, and attapulgite.
	20-28	Mostly montmorillonite. Some kaolinite, illite and quartz and attapulgite.
	28-36	Mostly montmorillonite and kaolinite. Some illite and quartz. Trace of attapulgite.
	60-65	Mostly kaolinite and montmorillonite. Some illite and quartz. Trace of attapulgite.
	65-69	Mostly montmorillonite and kaolinite. Some illite and quartz. Trace of attapulgite.
	69-74	Mostly montmorillonite and kaolinite. Some quartz. Traces of illite and attapulgite.
	74-78	Mostly montmorillonite and kaolinite. Some illite and quartz.
	86-90	Mostly kaolinite. Some montmorillonite, illite, and attapulgite.