

TEST BORING RESULTS

A test boring program was utilized in this study in order to verify existing information, and to obtain otherwise unavailable data that was considered vital for the formulation of an abatement plan. A total of 23 bore holes were drilled as located on the Test Boring Plan Sheet. All of the holes were cored and pressure tests were made at selectively chosen points where permeability data was required to determine the feasibility of various sealing methods. Pennsylvania Drilling Company performed the drilling under the field direction of a geologist provided by SKELLY and LOY. At the completion of drilling and logging, the cores were given to the Pennsylvania Topographic and Geologic Survey for a more detailed lithologic study, in order to supplement their previous work in this area.

A reliable abatement method could not be formulated for some of the larger pollution sources using only presently available data. Most of the borings were subsequently utilized to gather information concerning large, discharging deep mines that were designated as Quick Start projects. Sealing of these mines will place large hydrostatic heads on adjacent rock units. The core borings and pressure tests were used to determine:

- 1) the ability of the adjacent rock strata to hold the anticipated

- head (type and condition of rocks, permeability);
- 2) condition of the mine working in which the seal was to be placed;
 - 3) the best location for the seal;
 - 4) the best type of sealing procedure;
 - 5) parameters that permit more accurate design specifications; and
 - 6) reliability of previously available information.

Item 6 proved to be more important than it seemed at the inception of the boring program.

For instance:

- 1) It was believed that the entryways for the White Oak Mine were all drifts. However, test borings showed that the "A" coal cropped much lower on the hillside, and that some of the "drifts" were slopes. When this mine was first sealed, flows occurred through the outcrop barrier, and the basements of some of the homes along Route 453 south of Madera were flooded. A diversion drain will be placed in the area back of the houses to prevent this from recurring when this mine is resealed. The test borings provided the coal elevation

data necessary for the determination of the, location of. this trench. The borings also provided information that allowed more accurate placement of the mine maps with relation to the surface features. The test borings indicated that the rock units are very permeable. This will require the seals to be placed as far back from the portals as possible, and points out the necessity for construction of a grout curtain..

- 2) It, was discovered that the two largest pollution sources (the Brookwood Shaft Mine and the Eureka Mine Complex) were flooded to a greater degree than was originally assumed. Since no direct measure of mine water elevation was available initially, the mine water elevation was assumed to be the same as the elevation of the discharge point. It was found during the borings that the mine water elevation was much higher. This is due to the existence of a driving head (of water) that caused artesian discharges long distances from the surface of the mine pool. It was discovered that both Brookwood and Eureka were flooded approximately 60 feet higher than the elevation of the discharge point.

3) Adjustments were made to coal contours in critical areas. It was also discovered that the Eureka Mine Complex was originally mapped on a datum that was 17 feet below the U.S.G.S. datum.

Prior to the test boring program, the Lower Kittanning coal contours were drawn by extrapolation across the Great Bend Mine between Mountindale and Blandburg, because of inadequate data within this interval. The test borings provided data for more accurate adjustment of the coal contours. This, in turn, provided more accurate determination of the heads to be produced by the sealing operations.

4) The water level in test boring no. 19 provided answers to the many questions concerning the water situation in the Bucket Mine and Cambria Mills Smokeless Mine No. 2 near Mountindale. Some local residents thought these mines were directly connected to the Scott Brothers Mine No. 2, which is part of a large mine complex on the "B" seam located to the north. If this condition did exist, then the additional head would render the sealing of this large complex next to impossible. Prior to the test borings the origin of

the water discharging at pollution source 118 was unknown. The discharge could have been from either: (1) the overflow from a fully flooded Bucket Mine Complex; or (2) gravity drainage from the Great Bend Mine. The appropriate abatement scheme could not be determined until these questions were answered. The water level in hole no. 19 proved that the Bucket Mine and Cambria Mills Smokeless Mine No. 2 were not directly connected to the Scott Brothers Mine No. 2. It indicated that seepage is probably occurring at a slow rate through the coal barrier between these mines. It also indicated the Bucket Mine and Cambria Mills Smokeless Mine No. 2 share a common pool, but that they are not flooded to a high enough elevation to cause a discharge at pollution source 118.

In summation, the boring program provided extremely useful and necessary information required to formulate a feasible abatement plan within this watershed.

COMMONWEALTH OF PENNSYLVANIA

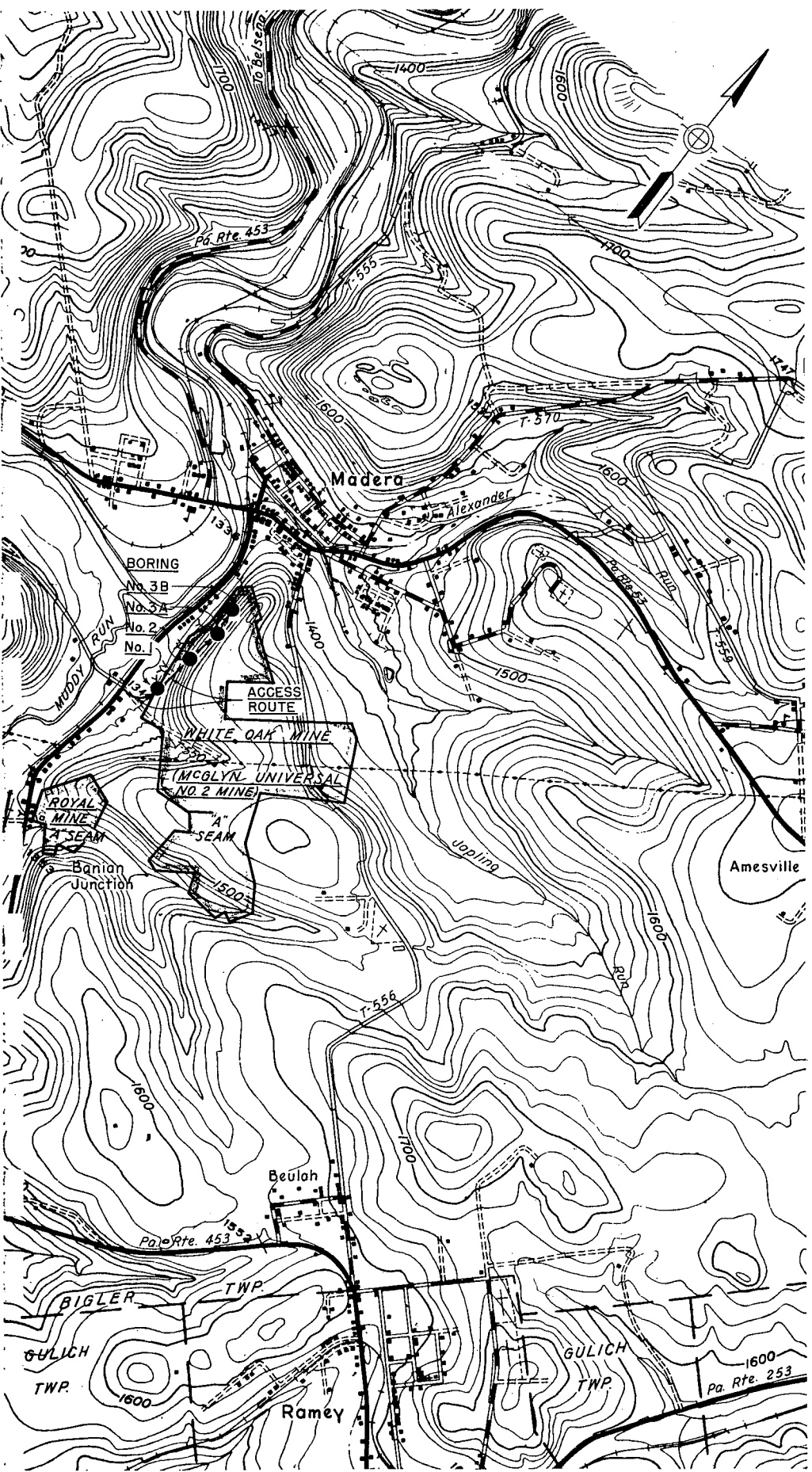
DEPARTMENT OF ENVIRONMENTAL RESOURCES

MUDDY RUN WATERSHED

PROJECT NO. SL-155-3

TEST BORINGS

CLEARFIELD AND CAMBRIA COUNTIES



SCHEDULE OF DRILLING

BORING NO.	OVERBURDEN	BEDROCK
1	12.4'	60.1'
2	20.0'	65.0'
3A	16.0'	80.0'
3B	20.0'	82.0'
4	12.5'	183.5'
5	24.0'	172.5'
6	9.0'	187.0'
7	9.5'	198.5'
* 8	—	—
* 9	—	—
* 10	—	—
11	14.9'	129.6'
12	10.0'	105.5'
13	10.5'	184.0'
14	10.5'	164.5'
15	11.0'	155.0'
16	11.5'	184.5'
17A	11.0'	34.0'
17B	10.0'	36.5'
17C	16.0'	34.5'
17D	10.5'	31.5'
17E	10.5'	45.5'
17F	12.0'	32.0'
18A	14.5'	28.0'
18B	16.0'	15.0'
19	10.0'	162.0'
TOTALS - 302.3'		2,370.7'

Note: Test Boring Sites are approximate. Final locations were determined by the Engineer in the Field.

* Boring omitted. Release unavailable.

- LEGEND -

- Denotes Test Borings
- Denotes Access Route
- |— Denotes Drift Openings
- Denotes Shaft
- |— Denotes Mine Boundary

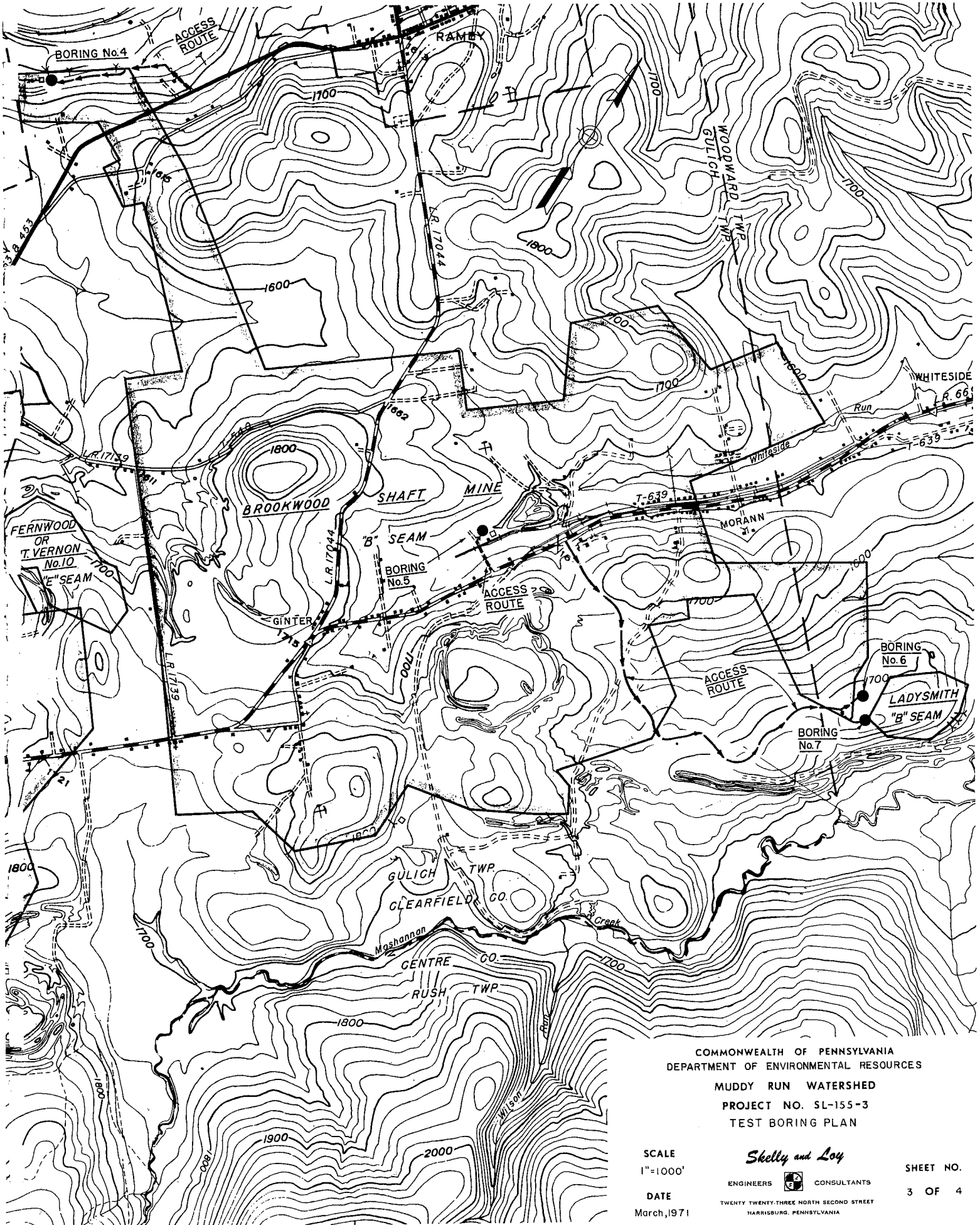
COMMONWEALTH OF PENNSYLVANIA
 DEPARTMENT OF ENVIRONMENTAL RESOURCES
 MUDDY RUN WATERSHED
 PROJECT NO. SL-155-3
 TEST BORING PLAN

SCALE
 1"=1000'
 DATE
 March, 1971

Skelly and Loy
 ENGINEERS & CONSULTANTS
 TWENTY TWENTY-THREE NORTH SECOND STREET
 HARRISBURG, PENNSYLVANIA

SHEET NO.
 2 OF 4



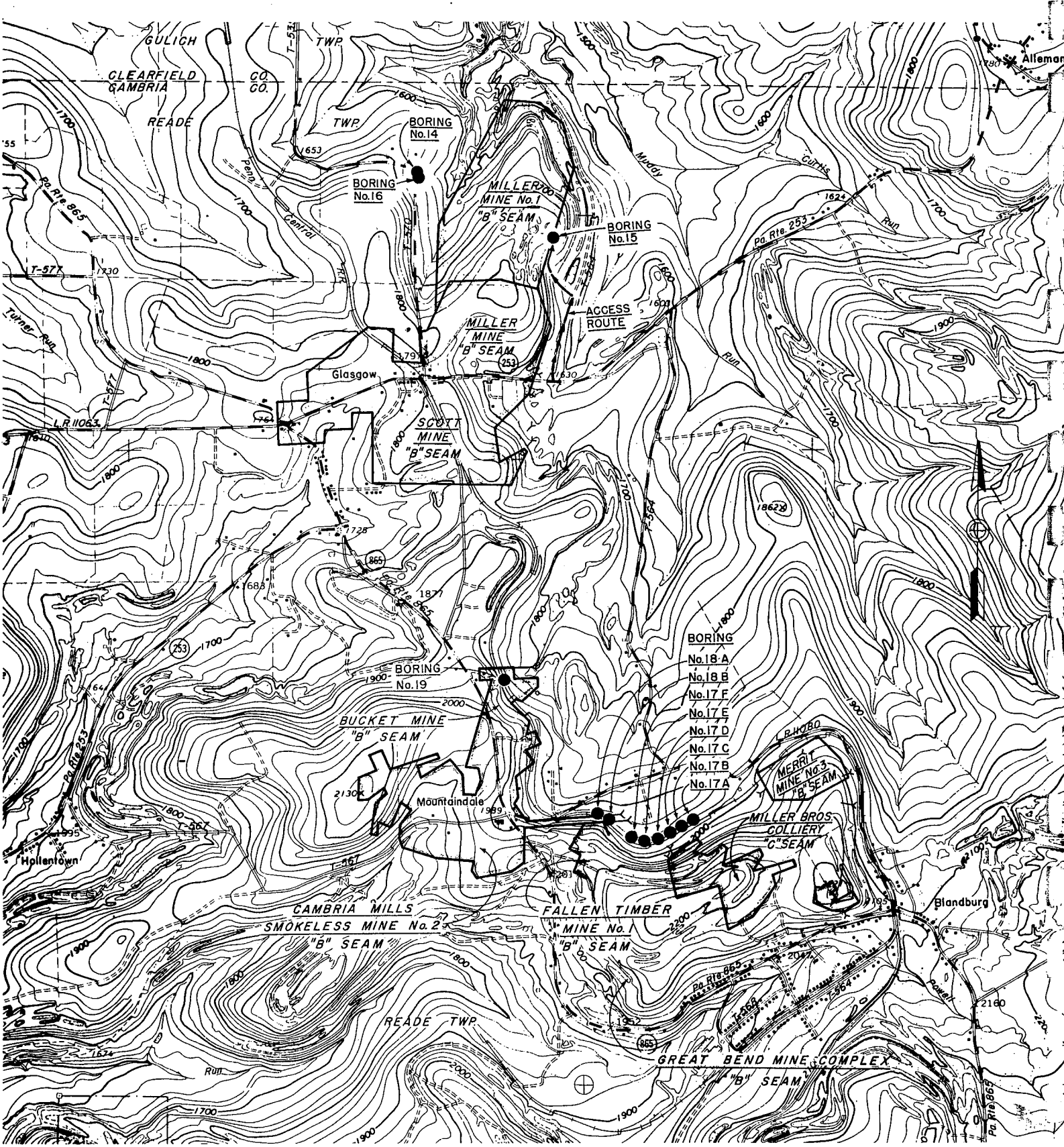


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SHEET NO.
 3 OF 4



COMMONWEALTH OF PENNSYLVANIA
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 TEST BORING PLAN

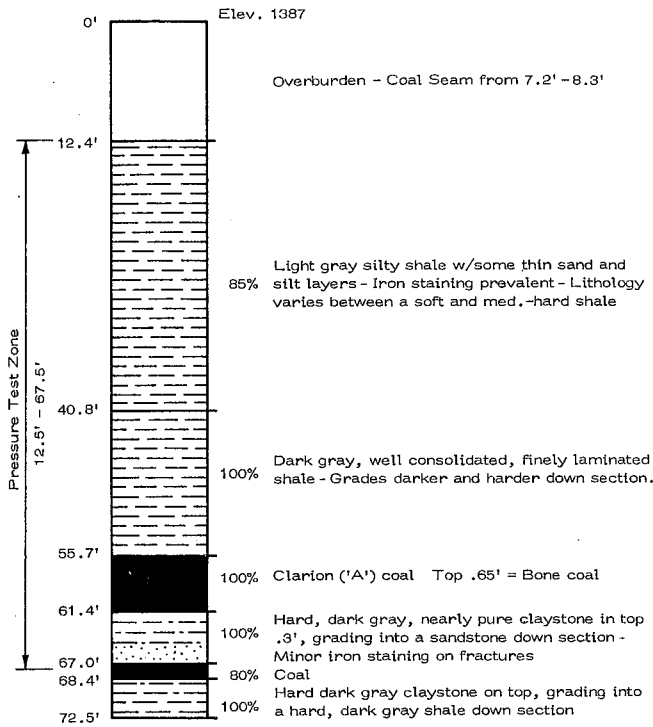


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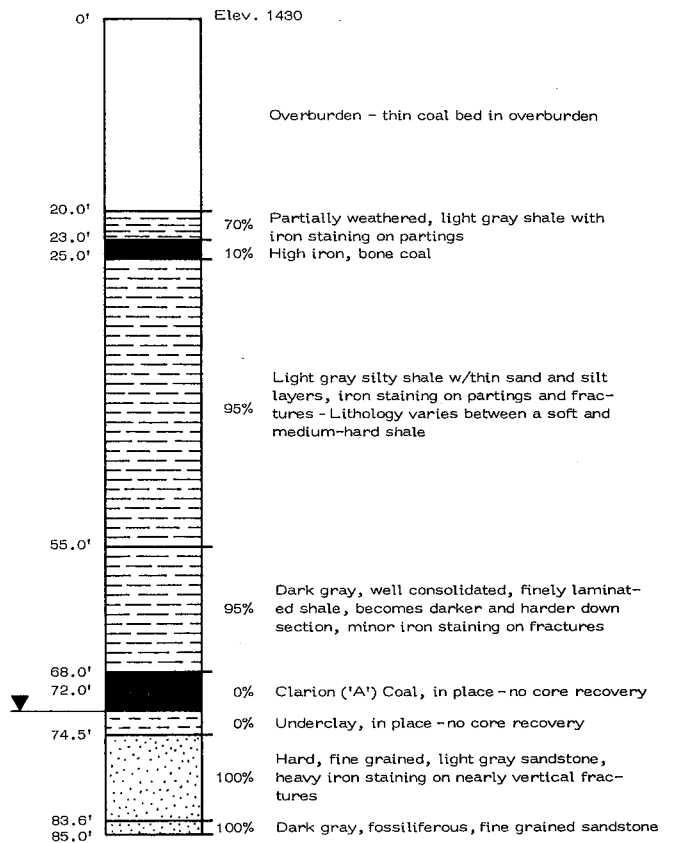
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 4 OF 4

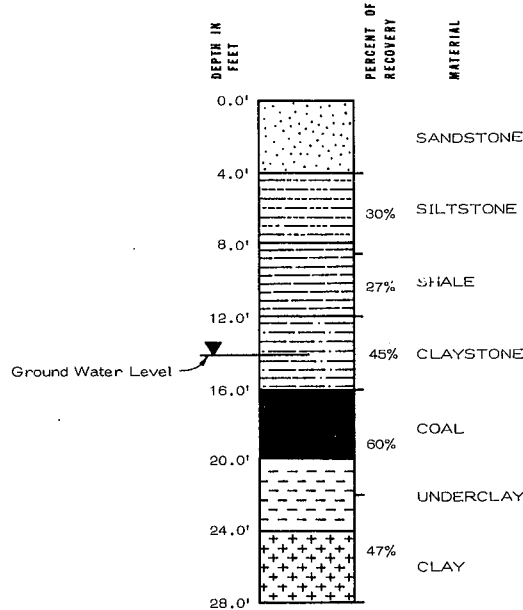
BORING NO. 1



BORING NO. 2



-LEGEND-

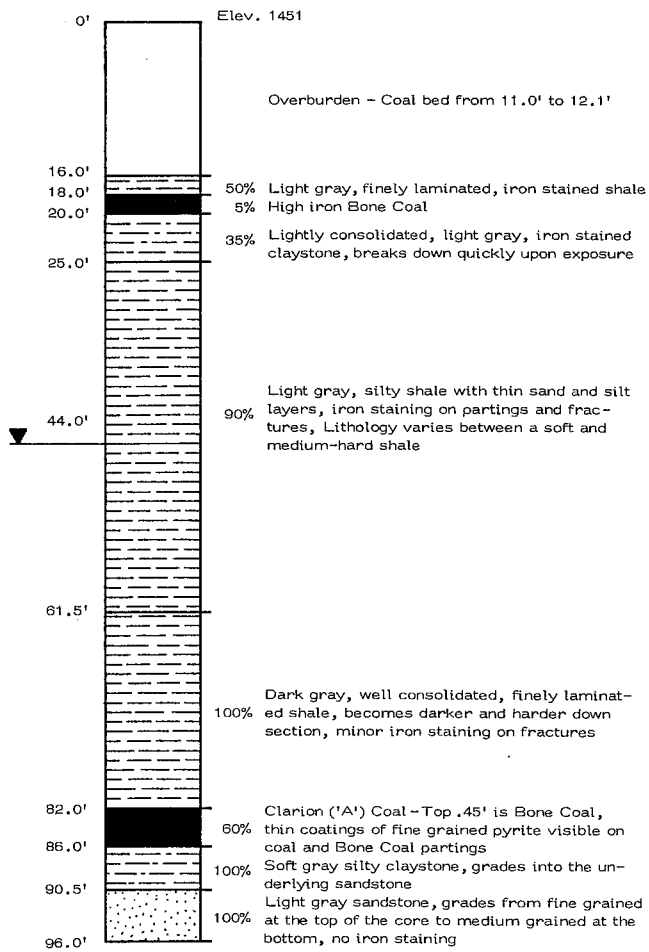


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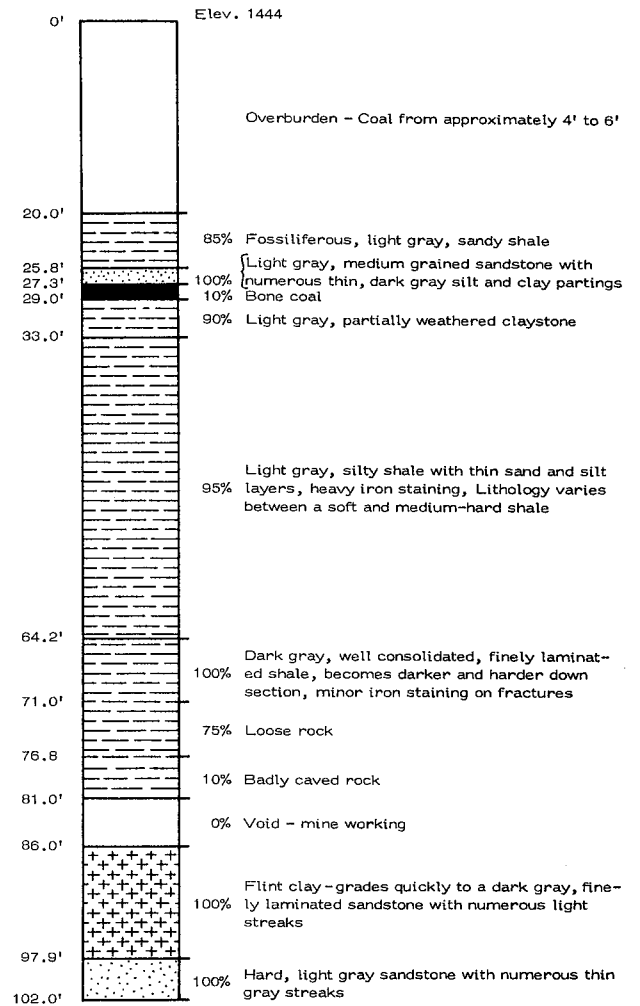


TEST BORING DATA

BORING NO. 3-A



BORING NO. 3-B

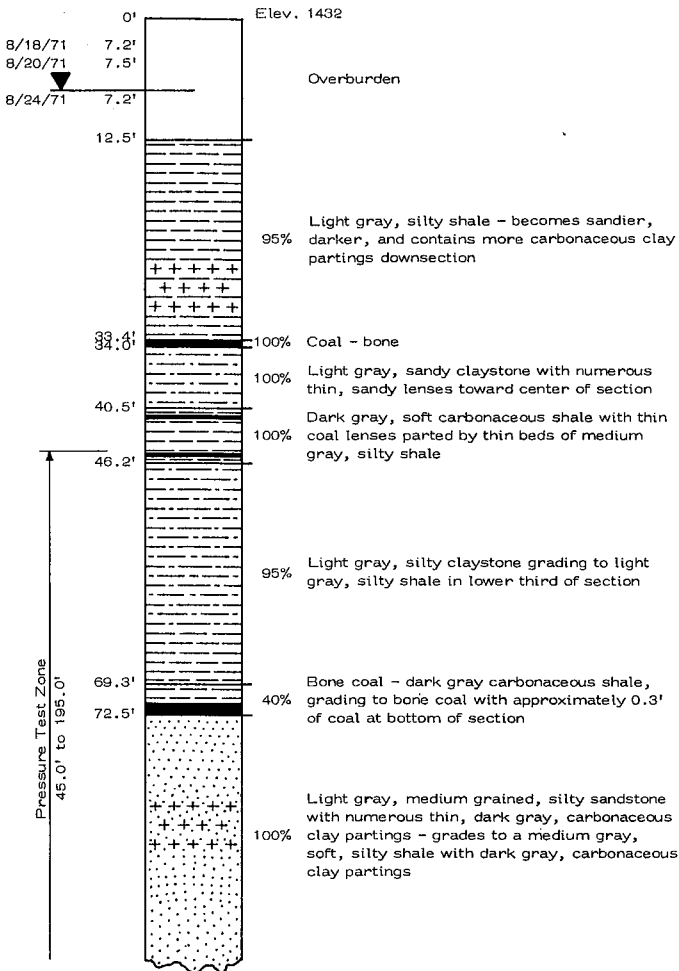


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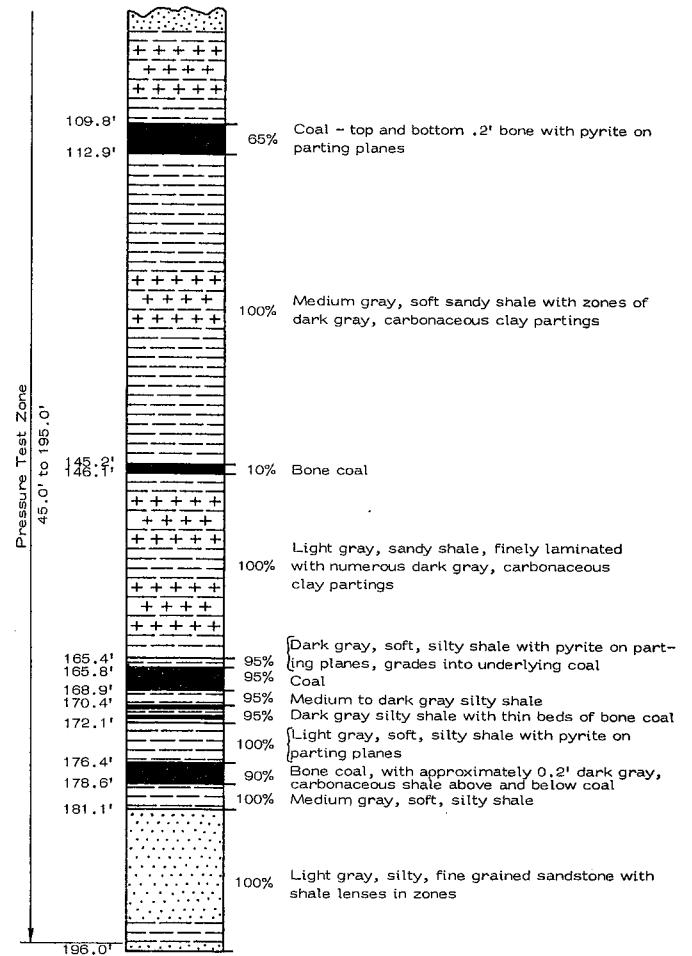


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BORING NO. 4



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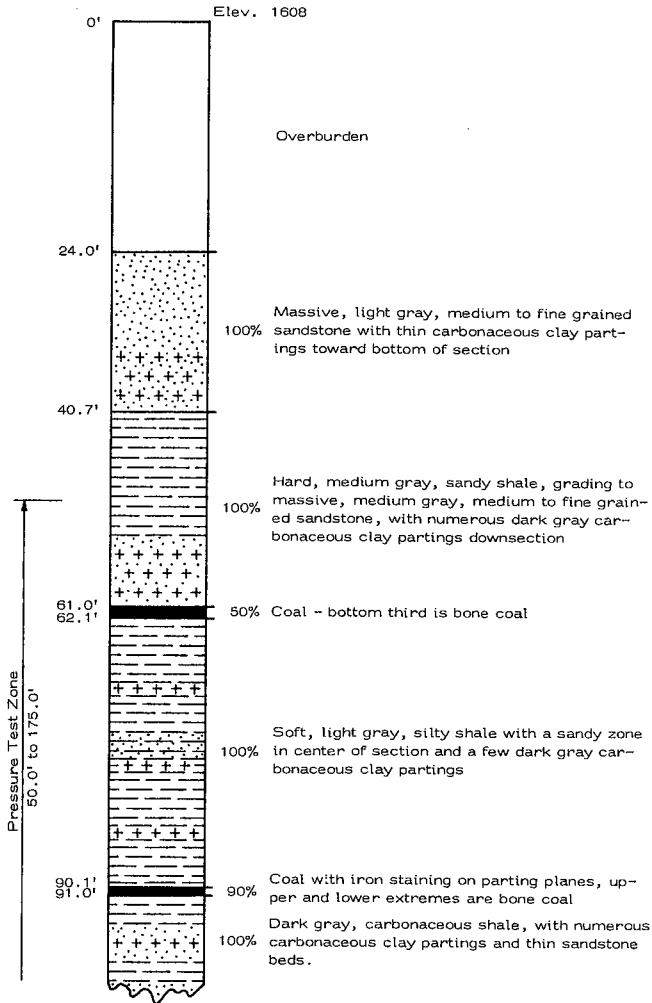


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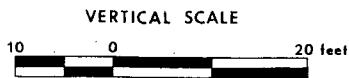
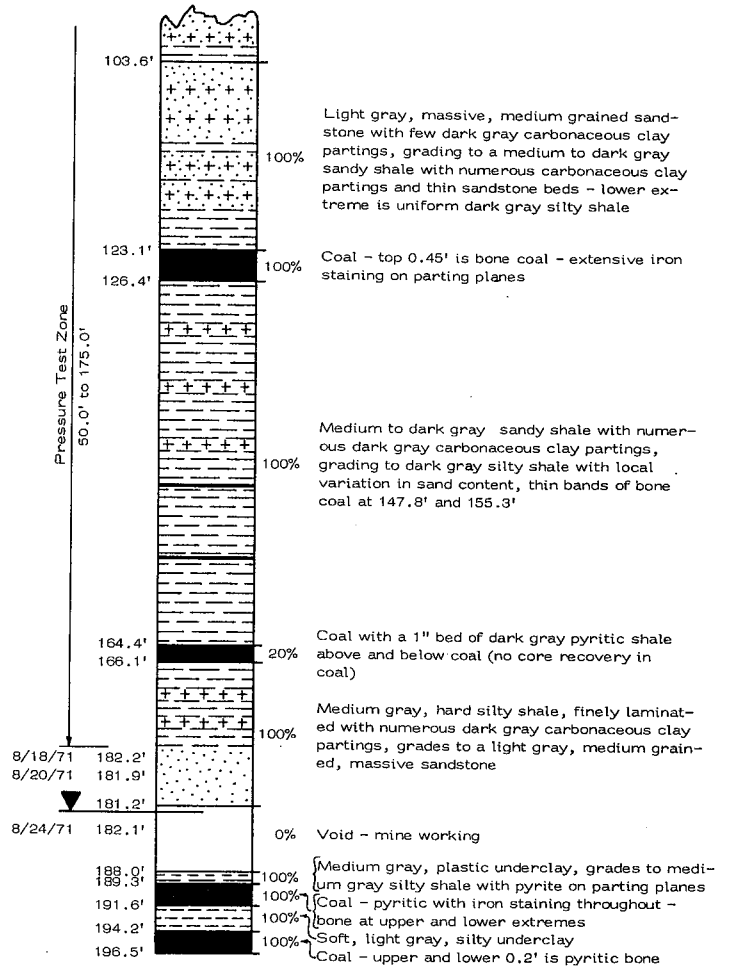


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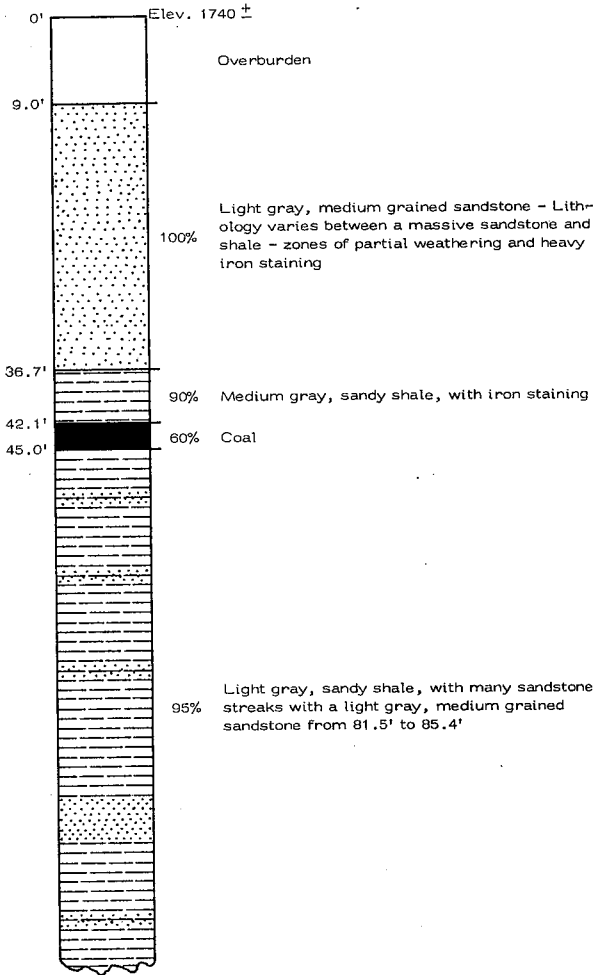


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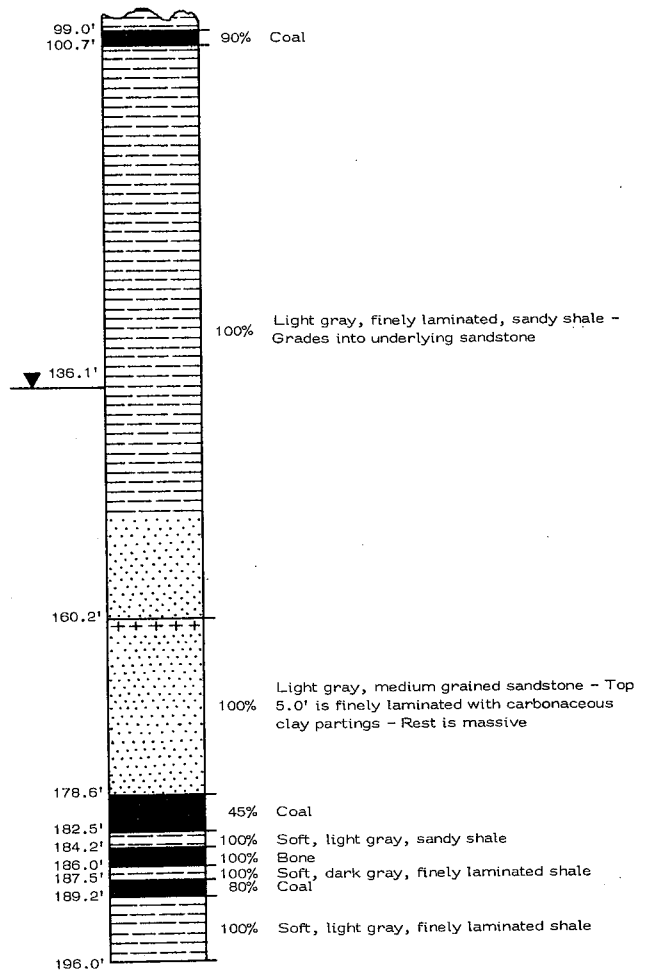


TEST BORING DATA

BORING NO. 6



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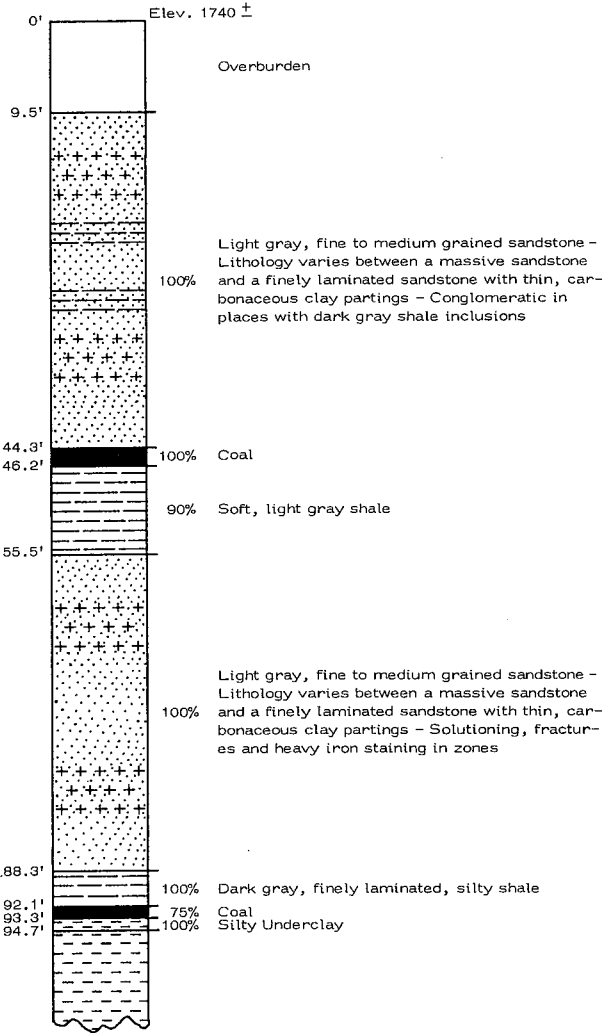


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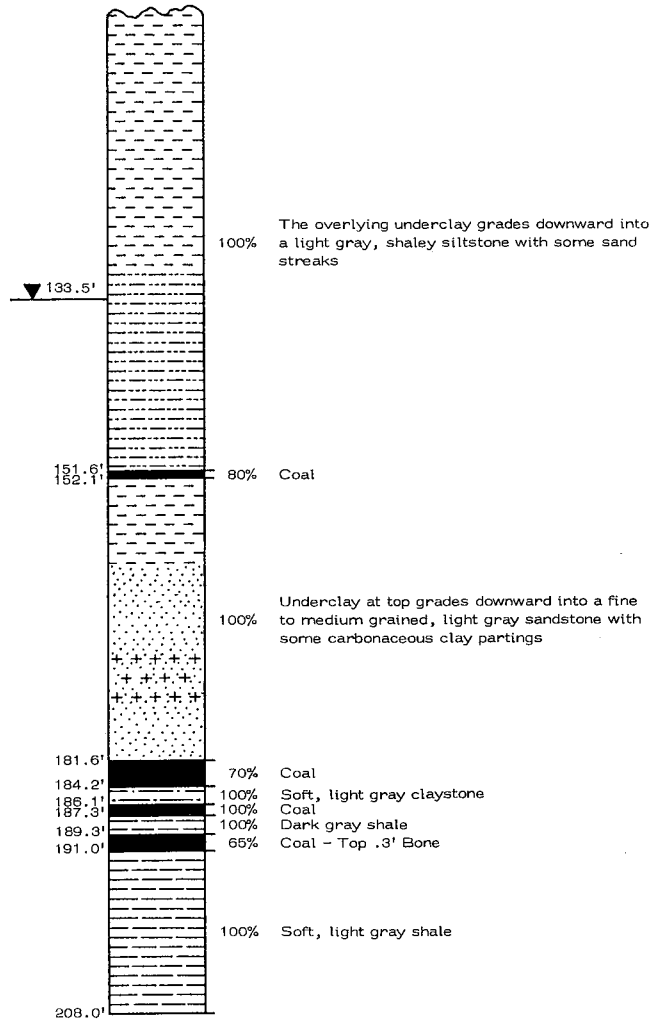


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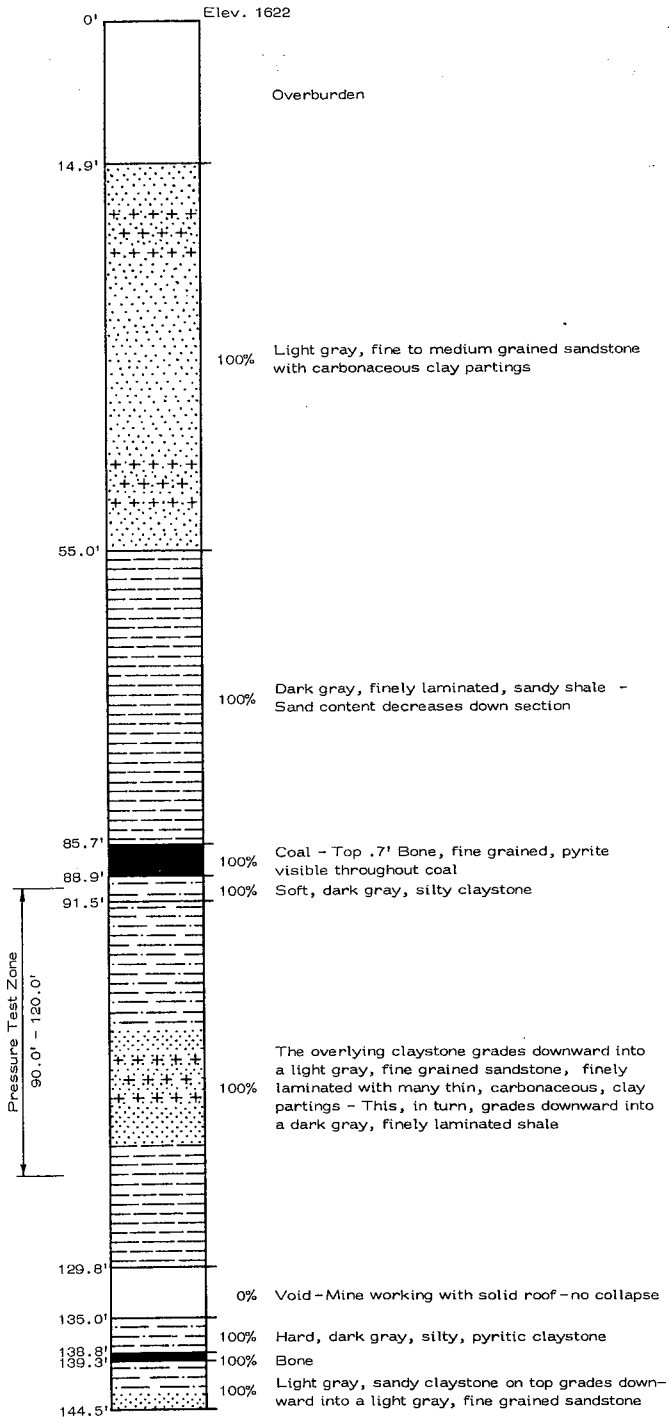
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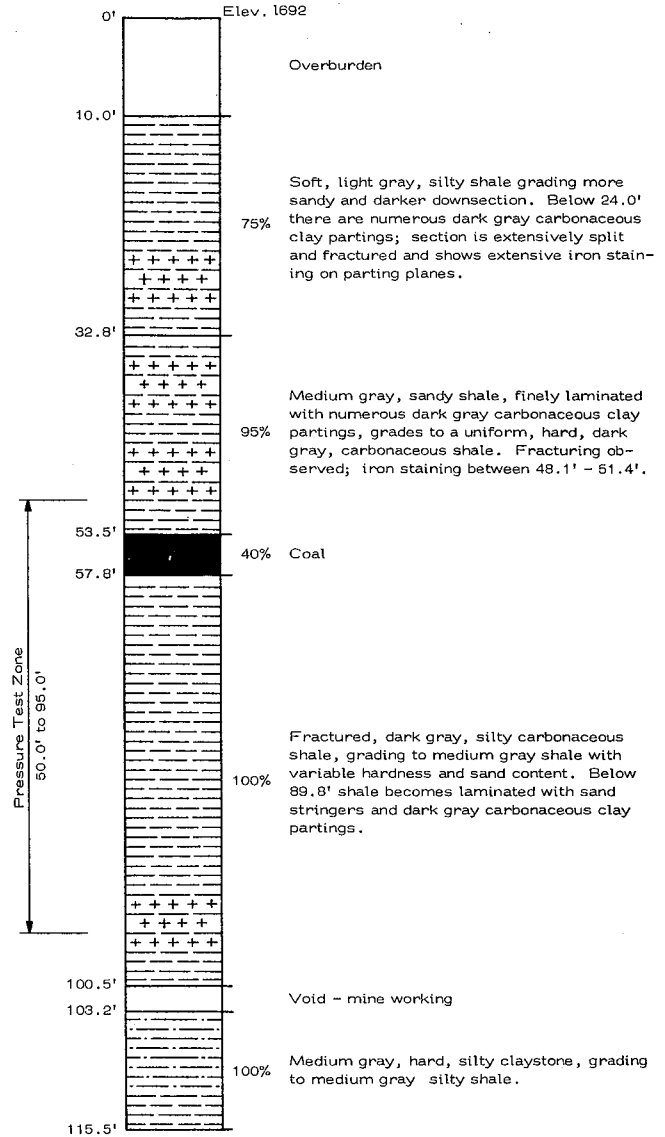
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BORING NO. 11



BORING NO. 12

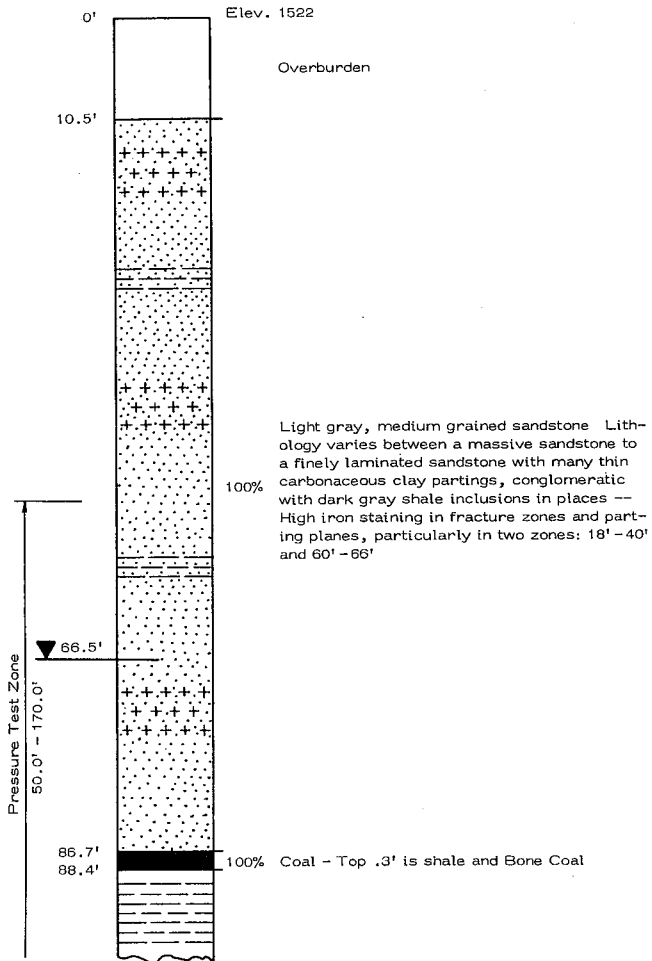


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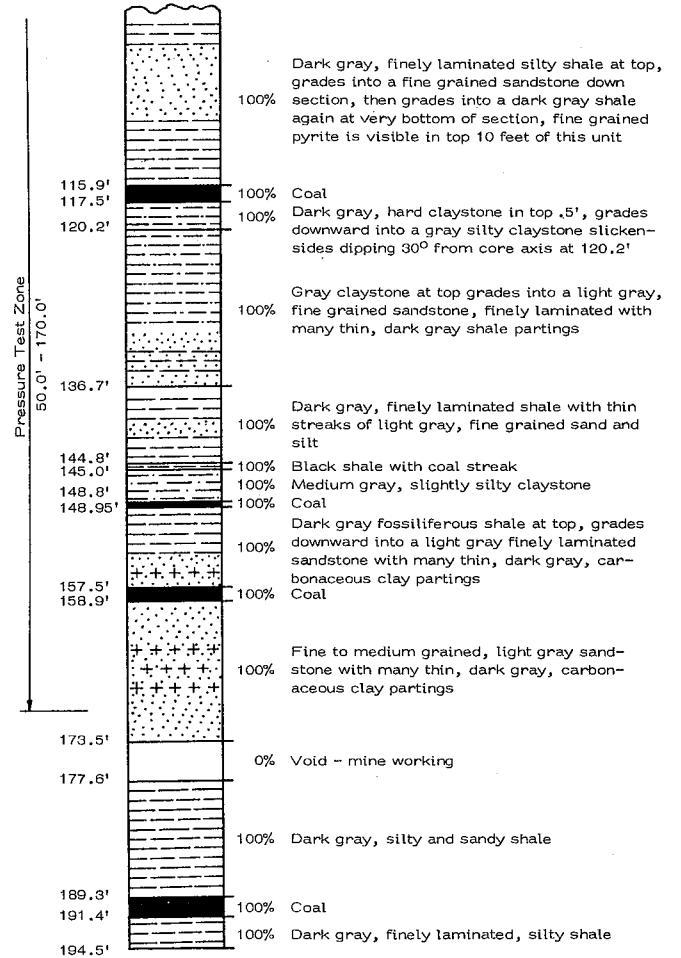


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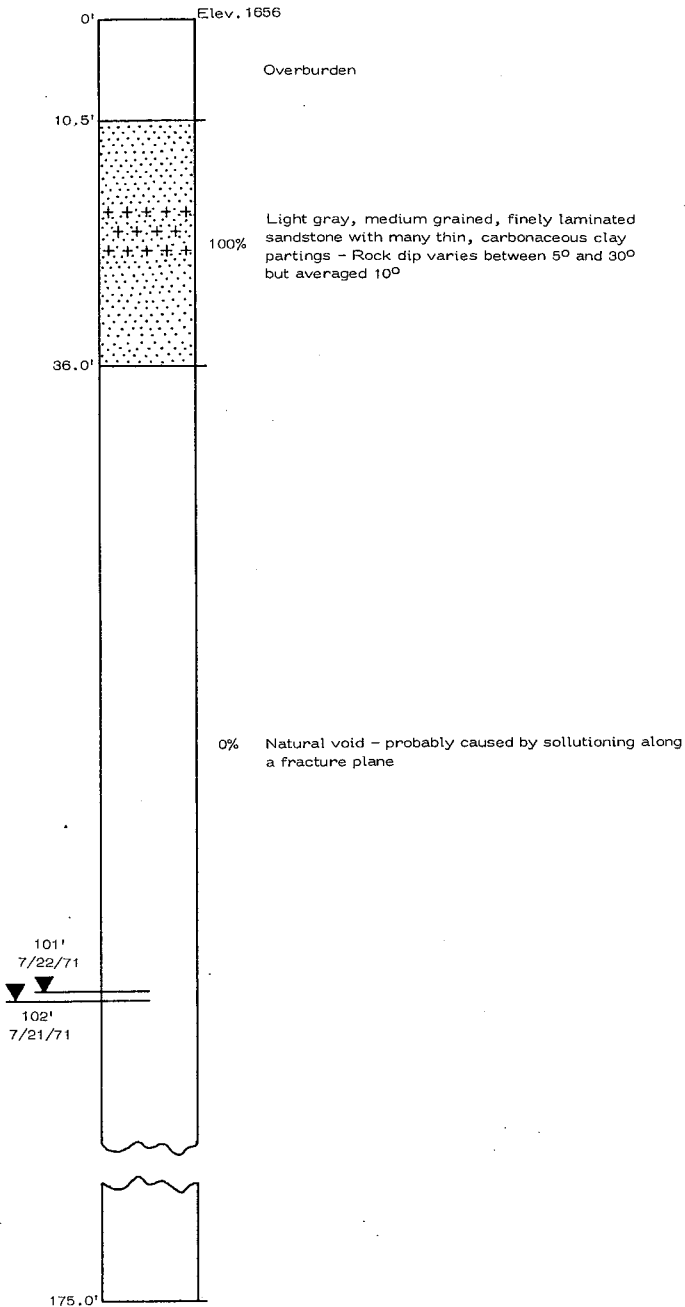


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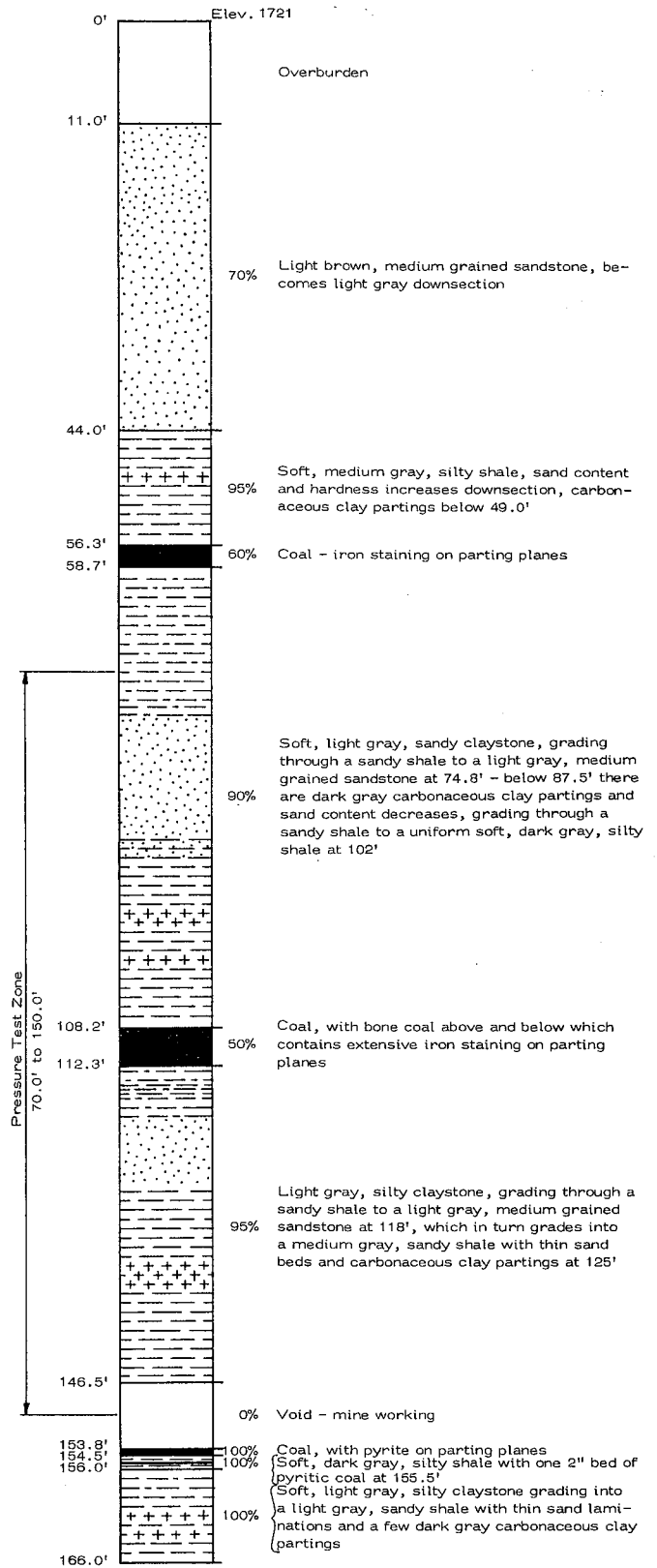


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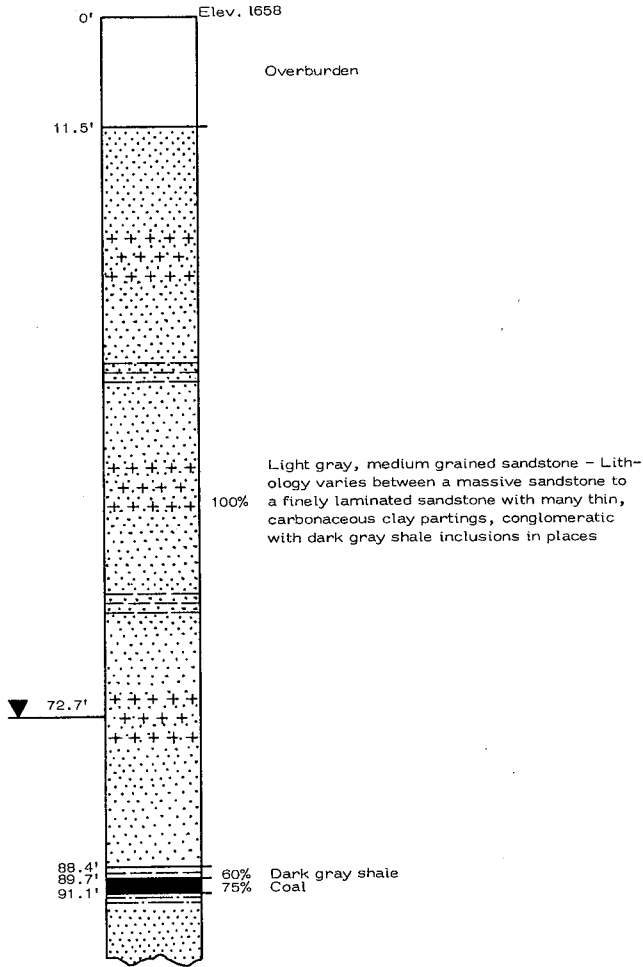


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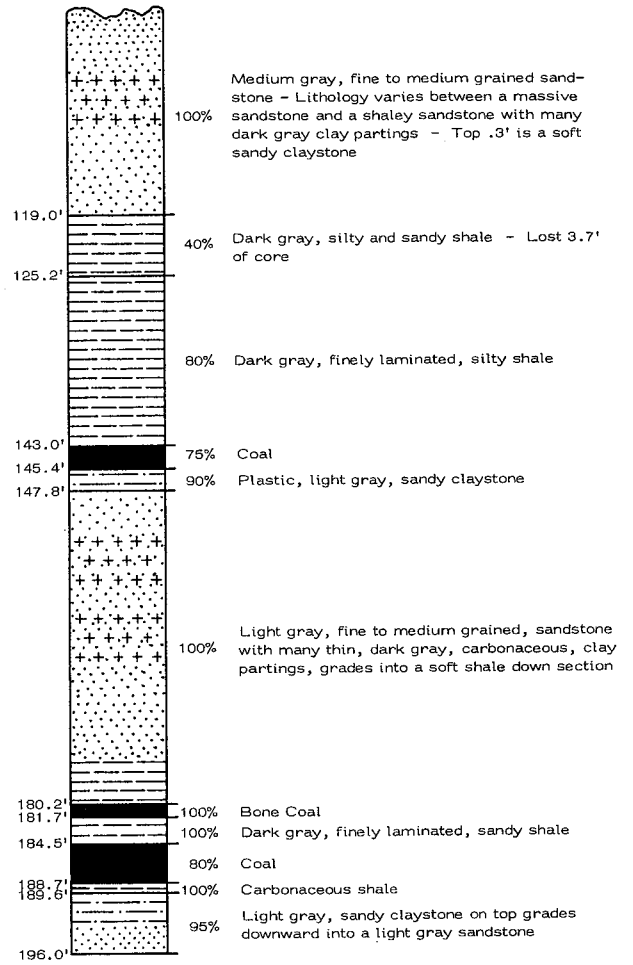


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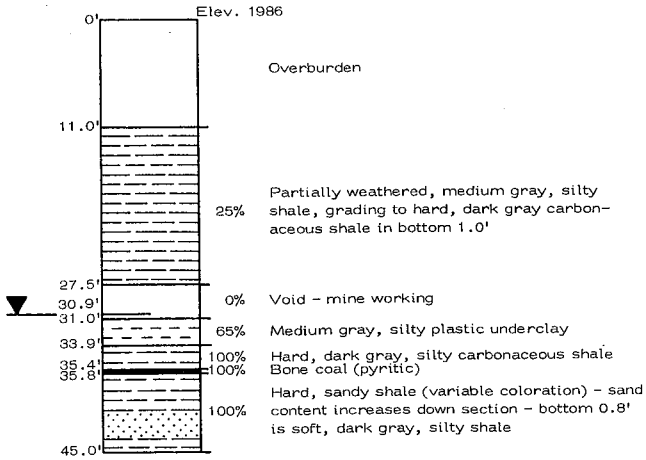


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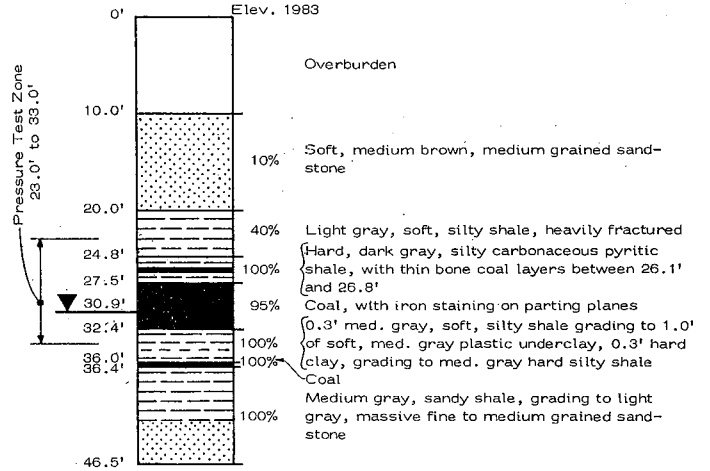


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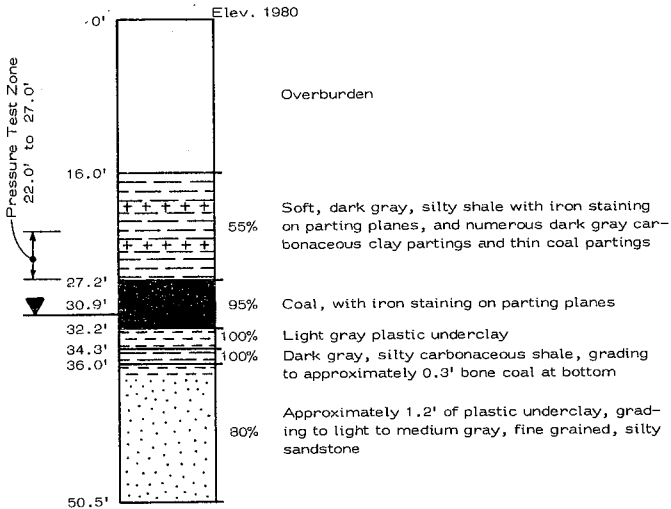
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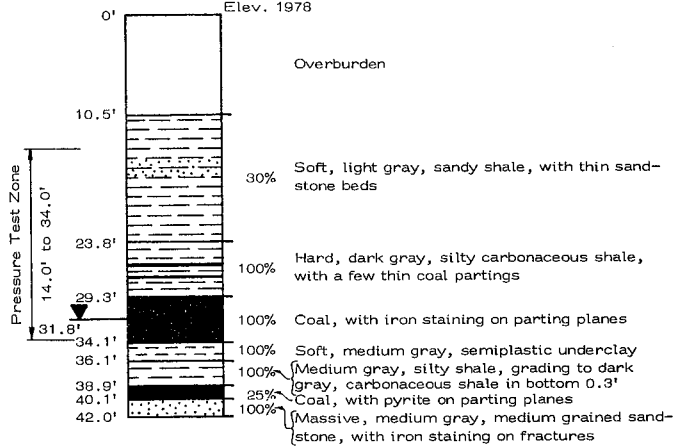
BORING NO. 17-B



BORING NO. 17-C



BORING NO. 17-D



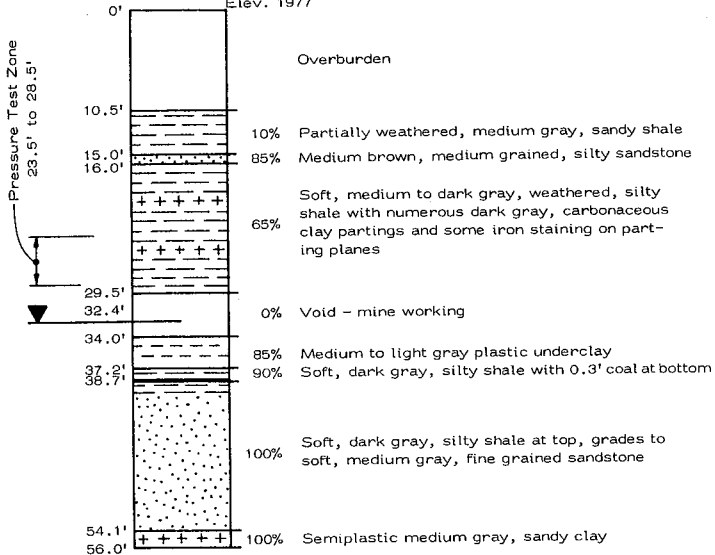
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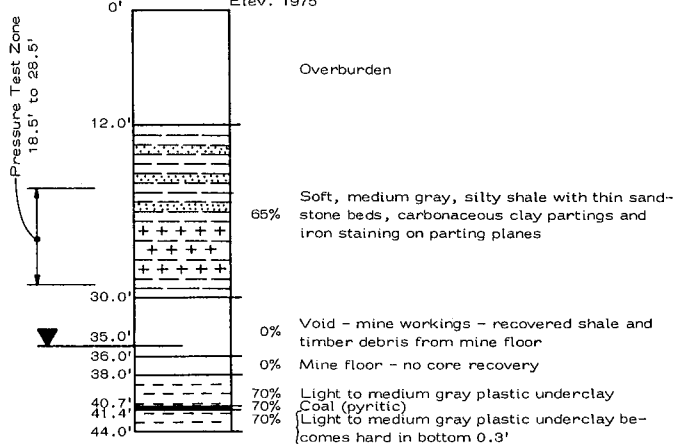
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Elev. 1977



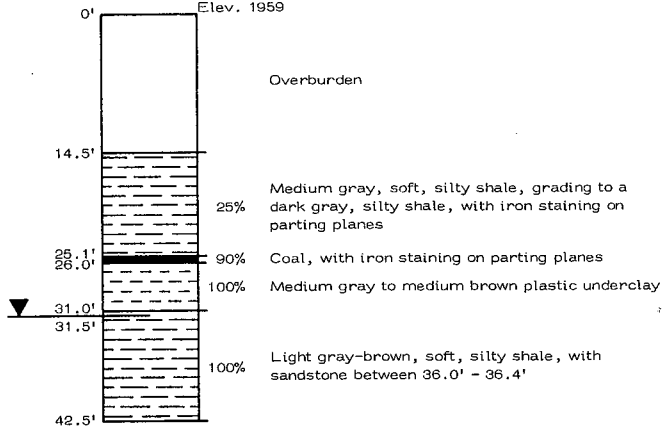
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Elev. 1975



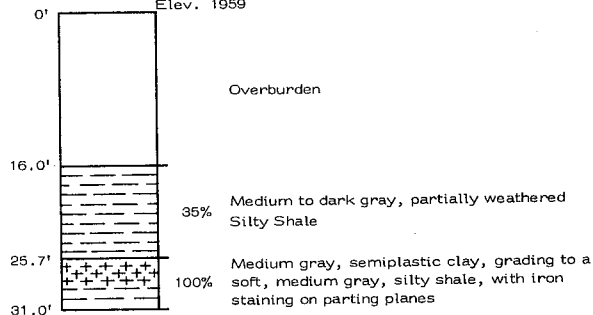
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Elev. 1959



BORING NO.18-B

Elev. 1959

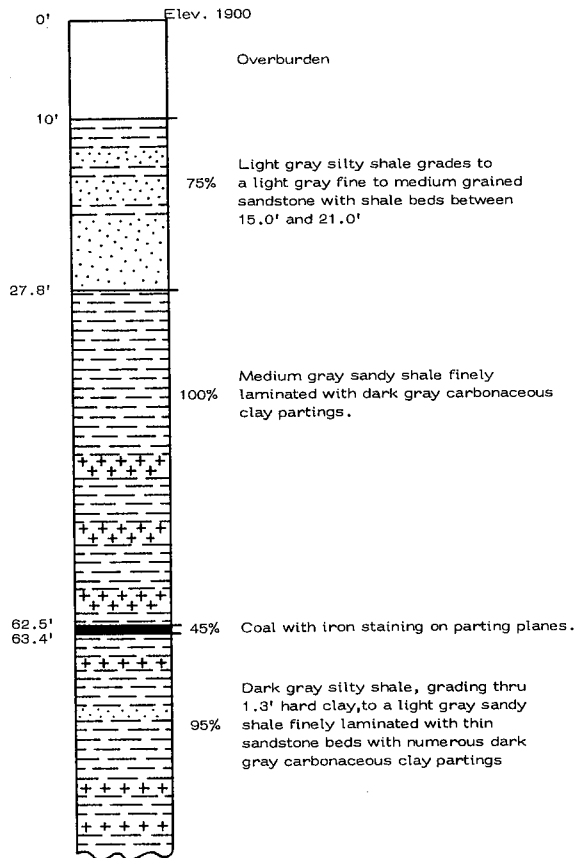


VERTICAL SCALE

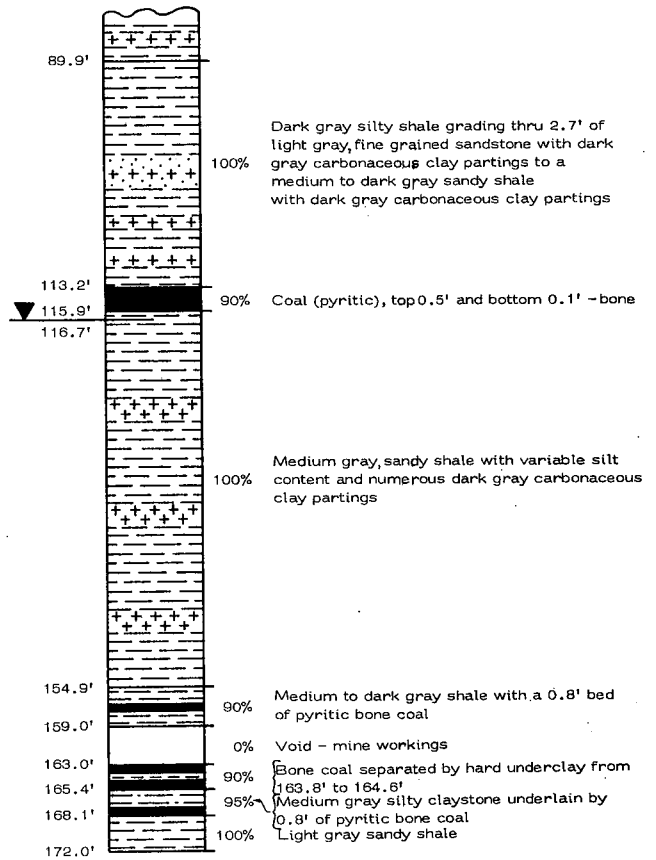


TEST BORING DATA

BORING NO. 19



BORING NO. 19 (Cont'd.)



VERTICAL SCALE



TEST BORING DATA