Project No. 85-154
May 1986

Paul C. Rizzo Associates, Inc.
CONSULTANTS

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Report

Groundwater Assessment
Westinghouse Plant, Area A-9

Beaver, Pennsylvania

Westinghouse Electric Corp.
Beaver, Pennsylvania

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REPORT
GROUNDWATER ASSESSMENT
WESTINGHOUSE PLANT, AREA A-9
BEAVER, PENNSYLVANIA

May 28, 1986
Project No. 85-154

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WESTINGHOUSE PLANT, AREA A-9
BEAVER, PENNSYLVANIA

1.0 INTRODUCTION

This report summarizes the results of a survey by Rizzo Associates to assess groundwater conditions in the vicinity of Area A-9 at the Westinghouse Plant in Beaver, Pennsylvania. Existing conditions were described in our report dated September 17, 1985. In this previous study, the presence of both high-pH and low-pH fluids in the ground was documented. Based on chemical testing from existing wells and geophysical measurements, it was concluded that high-pH liquid had leaked from the old cyanide waste tank, and probably from the collection sump for the cyanide rinsewater. This leak was suspected to be inactive. The groundwater containing cyanide is referred to as the cyanide or high-pH plume in the text. Low-pH groundwater, suspected to be from an active unidentified leak, was also documented. This acidic groundwater is referred to as the acid or low-pH plume.

The subsequent investigations, documented in this report, essentially confirm and refine previous observations. The scope of work for this study was consistent with the October 15, 1985 Work Plan and included drilling, sampling, and chemical testing of soil samples and groundwater from four borings located on Figure 1: one deep boring to bedrock (B-5) and three shallow borings (B-6, B-7, and B-8). Monitoring wells were installed in all of these borings to allow for the sampling of groundwater and to monitor the water levels during a pumping test performed as part of the study.

Drilling operations for the shallow borings were conducted from October 21-24, 1985 by Lambert, Inc., of Bridgeville, Pennsylvania with a rotary rig. The deep well was drilled October 28-30 by

James C. Toward of McDonald, Pennsylvania using a cable tool rig. All of the drilling operations were supervised by William C. Smith of Rizzo Associates. The pumping test was conducted from Boring B-4 by Messrs. Mark Zatezalo and William Baughman of Rizzo Associates on November 8, 1985.

The results of these additional studies lead to the following conclusions, discussed in more detail in Section 5.0:

- High-pH groundwater containing cyanide probably originated from leaks in the cyanide waste tank and the cyanide sump. These leaks have been stopped and only residual contamination persists. Ion concentrations are much reduced from the time prior to the installation of a new cyanide sump and removal of the waste tank. Although previously found only in a clayey fill, high-pH groundwater has been encountered in a permeable sand and gravel unit. The lateral extent of contaminant migration in this unit attenuates by an order of magnitude over a distance of about 20 feet. Available evidence indicates the leakage has been contained within a layer of fill found to a depth of between 10 and 20 feet from ground surface.

- Low-pH groundwater persists only in Boring B-4, even though borings have now been completed to surround this location. The results of the pumping test, as well as the water quality testing, indicate that an active leak may exist from an unknown source.

- Groundwater encountered at a depth of approximately 61 feet below ground surface and perched on a shale bedrock found at a depth of 63.5 feet was not found to be contaminated. This indicates that the near-surface leaks have not impacted the main alluvial aquifer.

Subsequent sections of this report provide a description of the investigations performed (Section 2.0); a re-evaluation of the hydrogeological setting (Section 3.0); a summary of geochemical conditions (Section 4.0); and an assessment of soil and groundwater impacts (Section 5.0). It is noted that this report is complementary to the September 17 study and that emphasis has been made to present only the newly acquired data. Older data and background information have been repeated only to the degree necessary to facilitate an understanding of the current results.

2.0 DESCRIPTION OF INVESTIGATIONS PERFORMED

The field operations conducted at the Westinghouse Beaver Plant consisted of drilling and soil sampling, geophysical well logging, groundwater sampling, and a pumping test. Soil and groundwater samples were subsequently delivered to the IT Corporation laboratory in Export, Pennsylvania for testing. All of the work was conducted consistent with the Health and Safety, Sampling and Testing, and Decontamination and Waste Disposal procedures presented in the document "Proposed Work Procedures" submitted to Westinghouse on October 15, 1985. These operations are discussed separately.

2.1 HEALTH AND SAFETY

All site operations were conducted following health and safety procedures as defined in the October 15 "Proposed Work Procedures" document. At the commencement of the drilling activities, a health and safety briefing was provided by the Health and Safety Coordinator (HSC), Mr. Kenneth J. Bird. Site personnel were provided liquid-resistant coveralls, chemical-resistant boots or boot covers, gloves, eye protection and hard hats. The protective gear was cleaned with soap and water or properly disposed of before leaving the site. Disposables were double bagged and placed in a sanitary landfill. Disposable floor mats were used with all vehicles on site.

Air was continuously monitored in the work area for hydrogen cyanide gas (HCN). If HCN had been detected in concentrations greater than five parts per million, work would have stopped and the area evacuated. No HCN gas was encountered during the actual subsurface investigation.

The responsible individual for executing the health and safety program during the field investigations was Mr. William C. Smith. Mr. Smith maintained a daily log documenting the names of site personnel involved, protective equipment used, activities, and any unusual occurrences. This log is available to Westinghouse.

2.2 DRILLING, SOIL SAMPLING, AND WELL INSTALLATIONS

Two different procedures were used to drill the site borings. Boring B-5 was drilled using a cable tool rig, which functions by raising and dropping a hammer device which breaks the ground and bails up the cuttings. As the hammer is lowered, casing is driven downward allowing for a flush contact with the soil/rock formations. Samples representing a composite of what was drilled were retrieved at five-foot intervals and stored in jars after being classified by visual inspection.

Borings B-6, B-7, and B-8 were drilled by a conventional rotary rig. Drilling was accomplished using a hollow-stem auger and sampling performed using a split-spoon sampler at three-foot intervals. Results are provided in the boring logs in Appendix A. Samples were stored in clean jars after being visually classified. The jar samples were then placed on ice for shipment to the testing laboratory. Chain-of-custody forms were initiated for each of the samples as they were obtained.

As wet zones were encountered at each drill site, well screens were installed in all of the borings in order to attempt to determine the water table under open-hole conditions. In the case of Boring B-5, water was encountered at the top of bedrock; consequently, bentonite was placed from the bottom of the boring to the top of bedrock then 4-inch I.D. threaded, flush-joint mechanically slotted PVC pipe was placed in the bottom nine feet of the well above the bentonite.

In Borings B-6, B-7, and B-8, wet zones were identified from the soil samples. Bentonite pellets were placed in the hole up to the base of the zone desired to be monitored and a 2-inch I.D. threaded flush-joint PVC pipe with 10 feet of mechanically slotted well screen at the bottom was lowered to the top of the bentonite seal. Ottawa sand was placed in the annular space to a depth at least one foot above the top of the screened section. A layer of bentonite pellets were placed over the sand. These pellets were then hydrated to allow for expansion. A cement-bentonite grout slurry was then tremied from the top of the bentonite seal up to the surface. At the surface, a 4-inch I.D. protective steel casing with a locking cap was grouted in place. The details of the well installation are provided on the boring logs in Appendix A.

2.3 GEOPHYSICAL WELL LOGGING

In order to provide for a means to compare the conditions encountered in the four new borings with those from the existing wells, geophysical well logs were run in all open borings. The survey was conducted by Appalachian Coal Surveys on November 8, 1985. Three types of logs were run:

- Natural Gamma - Increased natural gamma response usually reflects an increase in clay content of the soil penetrated.
- Neutron - This log responds to moisture content, where the lower the response, the higher the moisture content; i.e., completely saturated material would have a response of zero, whereas completely dry material would have a response of 100.
- Density - This log responds to density variations.

Copies of the logs are included in Appendix B.

2.4 GROUNDWATER SAMPLING AND TESTING

Groundwater was sampled from all wells where a sufficient quantity of groundwater was present. Sampling took place in November and December. Prior to the water sampling, the wells were purged by evacuating a minimum of three times the volume of fluid in the well or until wells were evacuated to dryness. Sample preservation was accomplished as documented in Table 1 to enable proper analysis for cyanide, copper, silver, sulfate, nitrate, ammonia, chloride, and pH. Chain-of-custody records were completed for each sample and are maintained in Rizzo Associates' project files.

Testing of all water and soil samples was conducted by the laboratory of IT Corporation in Export, Pennsylvania. The procedures followed for analytical testing are defined in Table 2.

2.5 DECONTAMINATION AND WASTE DISPOSAL

Decontamination procedures were required to clean the sampling equipment at the beginning of the project and between borings to avoid cross contamination. This was accomplished with a steam cleaner. Water from this operation was contained on a sheet of plastic and then pumped into a drum for subsequent disposal at the on-site wastewater treatment plant. Cuttings from the drilling operations were also drummed for subsequent testing and appropriate disposal by Westinghouse site personnel. Personnel decontamination was accomplished consistent with the health and safety criteria discussed in Section 2.1.

2.6 PUMPING TESTING

To determine the hydrogeologic characteristics of the shallow saturated zone, a pumping test was performed using Well B-4 as the pumping well. During the test, Well B-4 was pumped in seven five-gallon increments and one 15-gallon increment. During pumping, water levels were recorded in Wells B-6 and B-1B. After each pumping increment, the recovery of water level with time was monitored in Well B-4 to aid in determining hydraulic characteristics of the saturated zone. Actual data collected in the field are summarized in Appendix C. The results of the pumping test are summarized in Section 3.3.

3.0 HYDROGEOLOGIC CONDITIONS

The drilling of the four new borings, as well as information and drawings provided by Westinghouse from previous geotechnical investigations at the plant, have allowed for a more refined interpretation of subsurface conditions than presented in the September 17 report. The revised descriptions of the overall hydrogeological setting and the hydrogeologic conditions specific to Area A-9 of the plant are discussed separately.

3.1 HYDROGEOLOGICAL SETTING

The Westinghouse plant in Beaver, Pennsylvania is founded on a large alluvial terrace overlooking the Ohio River. As the glacial ice sheets terminated their southern movement about 10 miles north of the site, glacial till is not a constituent of the terrace and all of the sediments are alluvial in nature. Borings to bedrock in different parts of the plant have encountered either sandstone or shale of the Pennsylvanian age Allegheny Group. Bedrock is frequently within 20 feet of the surface along the northwestern side of the plant. Sporadic borings in other parts of the plant indicate the bedrock surface is irregular, but generally deepens toward the Ohio River. The depth to bedrock in Area A-9 based on the results of Boring B-5 (Figure 1) is 63.5 feet.

Regional information on terraces along the Ohio River indicates that the terrace deposits consist of sand and gravel capped with about a 50-foot thickness comprised predominantly of silt. Silt and clay to a thickness of 10-15 feet appear to be present irregularly across much of the plant. Results of the subsurface investigation indicate that in Area A-9 this material is fill and it appears likely that much of the plant may be constructed on similar fill. Although some thin silt and/or clay layers may be present, undisturbed alluvial terrace deposits under most of the plant appear to be mainly sand or sand and gravel.

The water table across the plant, as well as in Area A-9, is erratic. This appears to be because the alluvium under the site is generally unsaturated, except in a few areas where conditions have allowed groundwater to be locally perched. The main alluvial aquifer does not appear to be under the plant, but is reportedly present farther towards the Ohio River, where the alluvium may be in excess of 150 feet thick. Boring B-5, which encountered water at a depth of approximately 61 feet, appears to have intersected just the fringe of the main aquifer.

3.2 HYDROGEOLOGIC CONDITIONS IN AREA A-9

The four borings added as part of this study allow for a more refined interpretation of site conditions from that presented in the September 17 report. Based on the visual classification of soil samples taken during this study, the presence of rock fragments, cinders, brick fragments, etc., indicate that much of the surficial material is fill. With this in mind, the Michael Baker boring logs drilled in 1983 were re-interpreted. Revised cross sections are presented on Figure 2. The clayey silt/silty clay material previously identified in the September 17 report is fill. Sand and gravel beneath this material is also probably fill. A layer of fine to medium sand found in all of the borings appears to represent the top of natural ground, although some of the sand and gravel may also be natural. Sand, with occasional layers containing gravel, is present to the top of a shale bedrock.

The presence of between 10 and 20 feet of fill in Area A-9 helps explain the highly variable soil conditions and complex groundwater flow regime encountered. The most recently obtained water levels (12/85) are plotted on Figure 2. Most of the groundwater encountered appears to be present within the sand and gravel fill or sand and gravel that is interpreted as fill. Although the situation is unusual, the underlying fine to medium sand appears to be able to perch, at least somewhat, the water encountered in the sand and gravel. It is possible that a very thin layer of low permeability separates these two zones, although such a layer was not disclosed during this investitation. In Boring B-7, wet sand and gravel was observed to directly overlie essentially dry fine to medium sand.

Boring B-4 continues to represent the most anomalous groundwater conditions. This boring is now essentially surrounded by dry wells, except for Boring B-2B, which does not appear to have a hydraulic connection with B-4 based on the stratigraphy, as well as the results of the pump test presented in Section 3.3 and the geochemical differences between the two borings discussed in Section 4.0. This is evidence that fluid from an unknown source may be infiltrating the ground directly in the vicinity of B-4.

3.3 PUMPING TEST RESULTS

Results of the pumping test indicate that sustained yield from B-4 is less than one gallon per minute. The yield during the extended pumping test was 15 gallons per hour (0.25 gallons per minute). The maximum drawdown recorded during the recovery portion of tests was 5.3 feet measured one minute after pumping ceased. It is likely, based on pumping rates noted during the test, that actual drawdown was as high as 7 feet.

Recovery times required for 90 percent recovery during the five-gallon increment tests ranged from eight minutes to 30 minutes while 90 percent recovery for the 15 gallon test was 39 minutes. The 90 percent recovery level was used as a cutoff point.

During the pumping of Well No. B-4 drawdown was detected in only one other well, that being Well No. B-6. Well No. B-1B, which was the closest well to B-4 that was not dry, showed no response to the pumping program indicating that the sensing zone in this well is not directly connected hydraulically to Well No. B-4. The same can be said for Well B-1A. There was a rise in water level in Well B-1 suggesting some other phenomenon unrelated to pumping is affecting this well. Well B-1 was damaged prior to this study, which may have been responsible for the anomalous readings in this well. Other wells in the vicinity of the pump test were either dry (B-2B and B-8), too deep (B-5), or exhibited water levels so low (B-7) that they showed no effect of pumping.

As part of the pump test procedures, pH and specific conductance were taken during the first five pumping increments. The results are shown in Appendix C.

4.0 GEOCHEMICAL CONDITIONS

4.1 RESULTS OF CHEMICAL ANALYSES OF SOIL SAMPLES

Soil samples were obtained at three-foot intervals in Borings B-6, B-7, and B-8 and representative samples were analyzed for the ions listed in Table 1. Test results are provided in Table 3 and shown schematically on Figure 2. Soil samples were not tested from Boring B-5. Samples would have been analyzed from this boring had any anomalous pH readings been obtained, but litmus paper testing indicated a pH of 7 for all samples.

Borings B-6 and B-7 both indicate elevated concentrations of cyanide. This cyanide in a basic solution appears to be confined strictly to the sand and gravel layer that may be fill. The silty clay/clayey silt fill above this horizon is somewhat acidic. The fine to medium sand, which is interpreted to be a natural soil, exhibits essentially a neutral pH, with only sulfate found in an anomalous concentration.

Boring B-8 exhibits soil which is moderately acidic with anomalous nitrate and sulfate concentrations in samples taken from depths between 5 and 20-25 feet. Below this depth, the soil is essentially neutral with no strongly anomalous ion concentrations. This is the only boring, including those previously drilled, that exhibits any anomalous ion concentrations in what is interpreted to be natural soil. Levels of contaminants in this boring decrease rapidly with depth.

4.2 RESULTS OF CHEMICAL ANALYSES OF WATER SAMPLES

The results of the chemical analyses of all groundwater samples taken to date at the site are provided in Table 4. Several observations can be made from the data set as a whole:

- Water from the deep well (B-5) is essentially clean. None of the chemical parameters tested exceed federal water quality criteria for drinking water.

- Groundwater from Borings B-6 and B-7 exhibit cyanide contamination. This is consistent with the soil analyses.

- The water quality in Wells B-1A and B-1B, which historically have had the highest cyanide concentrations, is improving. In B-1A, cyanide concentrations have been reduced from 1,050 ppm to 38 ppm since August 1984. In B-1B, cyanide has been reduced from 2,300 ppm to 1,400 ppm since May 1985.

- The water quality in B-4 has remained more or less stationary since May 1984. Sulfate concentrations have fallen, but nitrate and cyanide have increased with copper and silver remaining approximately the same.

- Boring B-1, previously considered "clean," exhibits groundwater contamination. At the present time, ion concentrations, with the exception of silver, are more concentrated in B-1 than in B-1A. Although most of the parameters were not tested for previously, the slight increase in pH since October 1983 indicates that water quality may have deteriorated since the boring was initially drilled and sampled. It is noted, however, that the concentrations reported are suspect, as the well was physically damaged prior to this investigation.

Water samples were not taken from Borings B-2 and B-3, which no longer exist, and from B-2B and B-8, which were dry.

5.0 ASSESSMENT OF IMPACTS

Several important observations can be made from the newly acquired data:

- Evidence from this investigation indicates that the high-pH groundwater containing cyanide is contained within the surficial fill and is residual.
- Low-pH groundwater in B-4 may be due to an active leak of unknown origin.
- No impact has been made to the deep aquifer directly beneath the site.

The following paragraphs discuss these observations in greater detail.

5.1 HIGH-pH PLUME

High-pH groundwater containing cyanide is encountered within two different soil environments; fill comprised mainly of silt and clay and the sand and gravel that is now interpreted as fill. Prior to the drilling of Borings B-6 and B-7, the only soil known to contain anomalously high cyanide was the silty clay/clayey silt fill (Figure 2). Within this material, the extent of cyanide movement is well defined. Cyanide contamination in Borings B-6 and B-7 exists within a permeable sand and gravel unit that is now interpreted as fill. Concentrations were found to mitigate rapidly.

The silty clay/clayey silt fill appears to have received cyanide from the cyanide waste tank and the leak from the old cyanide sump. Cyanide values in this clayey soil are highest in B-1A and B-1B. Tests from this same fill material taken from underneath the former waste storage tank locations show a rapid attenuation to essentially a background level of cyanide within about 20 feet of the cyanide waste tank. The soil samples from the silty clay/clayey silt fill taken from B-4 exhibit similar evidence for this rapid attenuation, as cyanide concentrations measured from B-4 are nearly identical to those measured from beneath the acid waste tank. Borings B-6 and B-7 also indicate that cyanide values within 20 feet of the cyanide waste tank also attenuate rapidly in this clayey fill.

The influence of the leak from the cyanide sump and/or the old pipeline from the cyanide sump is not as clear as that from the cyanide waste tank. The cyanide concentrations in the silty clay/clayey silt fill penetrated by B-1A are the highest recorded, but this may be a highly localized phenomenon. In B-8, a distance of approximately 20 feet from B-1A, significant amounts of cyanide were not detected.

The cyanide encountered in Borings B-6 and B-7 is present within a sand and gravel unit that is interpreted as fill. This is a permeable unit and the cyanide has been transported a greater distance than in the silty clay/clayey silt fill. The groundwater samples indicate that there is substantial attentuation of cyanide concentration from the values encountered in B-1B.

The high-pH plume containing cyanide is not due to an active leak. As discussed in Section 4.2, the concentration of cyanide at all locations where several measurements have been made is decreasing. The available evidence indicates that conditions began to improve when the cyanide waste tank was decommissioned and the cyanide sump repaired. Considering that the level of decrease in cyanide concentrations in Well B-1A has been approximately two orders of magnitude, we conclude that no significant amounts of additional high-pH fluid containing cyanide are entering the ground in this area.

5.2 LOW-pH PLUME

The acidic groundwater conditions encountered in Boring B-4 are unique to Area A-9. With the drilling of B-8, Boring B-4 is essentially surrounded by borings which exhibit very different hydrogeologic and geochemical characteristics. The intended purpose of Boring B-8 was to intersect the acid plume at a separate location so that B-4 could be monitored while a pumping test was conducted out of B-8. B-8 proved to be dry. Although B-8 was drilled to a depth of 40 feet, only mildly acidic soil was encountered to a depth of 20-25 feet with no groundwater. The pumping test conducted from B-4 indicated that the only boring with a slight hydraulic connection to B-4 is B-6, and this boring has a substantially different geochemistry. However, the pumping test indicated that the acidic water in B-4 will recharge.

The fact that the acidic water in B-4 will recharge after being pumped indicates that an active leak may be present. This observation is supported by the water quality test data, which show that the groundwater in B-4 has fairly constant values of ion concentrations.

The source of this leak is unknown. The extremely restricted area where acidic groundwater is found suggests that the source is a break in a pipe or some other conduit from the plant, such as an old trench. However, it is believed by plant personnel that all such sources have either been plugged, removed, or replaced. Given that the acid waste tank has been removed, and the tests of soil from underneath this tank did not indicate that it had leaked, the evidence points to the plant as the source, but the transport mechanism to B-4 is unknown.

5.3 DEEP AQUIFER

The goal of drilling Boring B-5 was to investigate the main alluvial aquifer beneath the site and to determine if any of the chemical leaks had entered the groundwater. As it was anticipated that groundwater at the site would have a general flow toward the Ohio River, B-5 was located so as to be downgradient of surficial contamination.

Bedrock was expected to be over 90 feet deep based on information from nearby water wells and borings from the railroad bridge in Beaver. However, bedrock was shallower than anticipated, having been encountered at a depth of 63.5 feet. Water was located at a depth of about 61 feet and it appears reasonable to conclude that this aquifer represents the upgradient fringe of the main alluvial aquifer used as a water supply in Beaver.

No evidence of soil or water contamination was encountered in B-5. pH measurements were taken from composite soil samples at a five-foot spacing and neutral conditions were encountered. The groundwater from this well showed no indication of contamination and none of the parameters analyzed exceeded federal drinking water standards.

Very truly yours,

William J. Johnson

William J. Johnson
Project Manager

WJJ/dlm
Enclosure

TABLES

TABLE 1

SAMPLE CONTAINERS AND PRESERVATION FOR WATER SAMPLES[1]

Parameter	Container[2]	Preservation
Cyanide	P, G	4°C, NaOH to pH12
Copper	P, G	HNO_3 to pH<2
Silver	P, G	HNO_3 to pH<2
Sulfate	P, G	4°C
Nitrate	P, G	4°C
pH	Determined in Field and Laboratory	
Ammonia	P, G	4°C, H_2SO_4 to pH<2
Chloride	P, G	None Required

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1. Soil samples will be collected in glass containers with teflon-lined lids and stored at 4°C.

2. P = Plastic
   G = Glass

TABLE 2

ANALYTICAL PROCEDURES

PARAMETERS	SAMPLE TYPE	
	SOIL	WATER(2)
Cyanide	9010(1)	335.5
Copper	1310(1), 220.1(2)	220.1(3)
Silver	1310(1), 7760(1)	272.1, 272.2(3)
Sulfate	(A), 375.3(2)	375.3
Nitrate	(A), 352.1(2)	352.1
pH	(B)	150.1
Ammonia	350.2(2), 350.3(2)	350.2, 350.3
Chloride	(A), 325.3(2)	325.3

A. Methods of Soil Analysis, Part II, Chemical and Microbiological Properties, C. A. Black, Section 10-2, American Society of Agronomists, Madison, Wisconsin, 1982.

B. Field and Laboratory Methods Applicable to Overburden and Mine Soil, Zoebek, Schuller, Freeman, Black, West Virginia University, March 1978.

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1. Test Methods for Evaluating Solid Waste Physical/Chemical Methods, Second Edition, SW-846, USEPA, 1982.
2. Methods for Chemical Analysis of Water and Wastes, USEPA, 1979.
3. Includes Acid Digestion for Total Metals.

TABLE 3

ANALYTICAL RESULTS OF SOIL SAMPLES TAKEN FROM SITE BORINGS (OCTOBER, 1985)

BORING NUMBER	BOTTOM DEPTH OF SAMPLE BELOW SURFACE (ft)	AMMONIA (mg/kg* NH_3-N)	CHLORIDE (mg/kg)	CYANIDE (mg/kg)	NITRATE (mg/kg-NO_3^--N)	SULFATE (mg/kg SO_4^{-2})	COPPER (mg/1**)	SILVER (mg/1)	pH (1:1)
6	2.0	9.7	41	0.71	37/37***	470	<0.01	<0.01/<0.01	6.80
6	5.0	7.4	36	0.50	11	400/380	<0.01	<0.01	4.60
6	8.0	9.4	62	<0.50	11	420	<0.01	<0.01	4.40
6	11.0	56	120	16	140	120	3.0/3.0	0.01	8.70
6	14.0	64	96	27	74	67	0.81	<0.01	8.70
6	17.0	110	450	90	130	110	2.5	0.03	9.00/9.00
6	20.0	6.3	18	0.89	1.1	110	<0.01	<0.01	6.50
7	3.5	34	53	<0.50	4.9	200	<0.01	<0.01	6.40
7	6.5	7.1/5.7	48	0.50/0.50	16	43	<0.01	<0.01	4.95

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* mg/kg = milligrams per kilogram or parts per million.
** mg/1 = milligrams per liter or parts per million.
*** The indicated sample was analyzed in duplicate.

TABLE 3
(Continued)

BORING NUMBER	BOTTOM DEPTH OF SAMPLE BELOW SURFACE (ft)	AMMONIA* (mg/kg NH_3-N)	CHLORIDE (mg/kg)	CYANIDE (mg/kg)	NITRATE (mg/kg-NO_3^{-}N)	SULFATE (mg/kg SO_4^{-2})	COPPER (mg/l**)	SILVER (mg/l)	pH (1:1)
7	12.5	15	70	<0.50	44	63	1.5	<0.01	9.35
7	15.5	28	110	84	92	140	1.6	<0.01	8.80
7	18.5	3.7	51	<0.50	3.7	270	<0.01	<0.01	6.55
7	20.0	5.7	27	1.2	2.2	120	<0.01	<0.01	7.10
8	3.0	130	67	<0.50	2.7/4.0	880	0.04	<0.01	7.70
8	6.0	120	67	<0.50	8.2	540/530	0.40/0.40	<0.01	4.45
8	9.0	43	65/67	2.8	14/13	400	0.32	0.22/0.22	4.10
8	12.0	24/19	48	<0.50	310/310	86	0.08	<0.01	5.10
8	15.0	4.0	31	<0.50	310/310	250/220	<0.01	<0.01	5.60
8	18.0	4.3/2.3	39	<0.50/0.67	190/190	160	<0.01	<0.01	5.50
8	21.0	2.3	55	0.87	660	140	<0.01	<0.01	5.15
8	27.0	<0.5	34	<0.50	15	52	<0.01	<0.01	7.00
8	36.0	9.1	22	0.77	19	54	<0.01	<0.01	7.50

TABLE 4

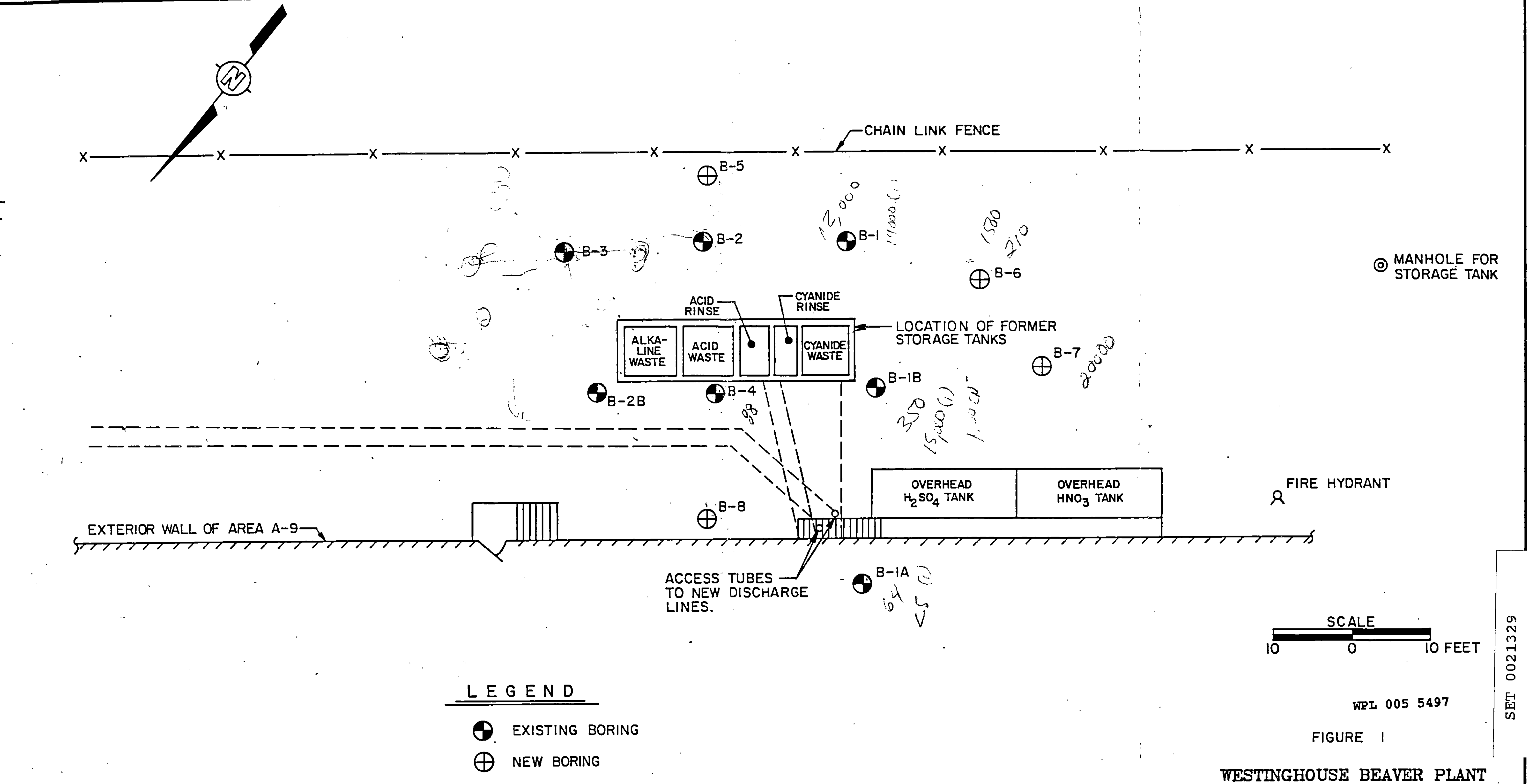
ANALYTICAL RESULTS OF GROUNDWATER SAMPLES TAKEN FROM SITE BORINGS

Well	1	1	1A	1A(1)	1A	1A	1A	1B	1B	1B	2B	4(2)	4(3)	4	4	4	4	4	5	5	6	6	7	7
Date	(10-83)	(11-85)	(6-84)	(8-84)	(5-85)	(11-85)	(12-85)	(5-85)	(11-85)	(12-85)	(5-85)	(10-83)	(10-83)	(11-83)	(5-84)	(5-85)	(11-85)	(12-85)	(11-85)	(12-85)	(11-85)	(12-85)	(11-85)	(12-85)
Ammonia (NH_3)		49			140	41	18	76	85	46	3.5					2.0	40/44	1.4	0.83	4.5	59	41/38	IS(4)	30
Residual Chlorine (Cl)													160	650	<1									
Chloride (Cl)		140			585	120	76	3500	2700	2400	390					490	380/370	330/350	15	17	270	180	370	700
Cyanide (CN)		45	950	1050	210	61/58	38	2300	1100	1400	1.5	11	49	250	2.3	11	18	31/25	<0.02	0.03	120	91	180	290
Nitrate (NO_3)		180	450	156	33	32	22	390	570	870	160			6440	825	520	1960/1970	1800	1.9/1.9	2.6/2.8	180	120	220	400
Sulfate (SO_4)		220	910	1240	650	180	98	345	640	230	260			1160	5600	340	820	710/780	20	16	150	170	530	280
Copper (Cu)		43	170	1000	110	34	11/10	1600	1100	1000	3.4			198	190	130	250	270	0.06/0.06	0.17	150/160	120	290	700
Silver (Ag)	0.72	0.035	0.4	0.08	38	37	17/16	2.3	0.013/0.004	0.1	0.39	3.3	2.2	0.08	0.05	1.5	0.008	0.06	<0.001/<0.001	0.02	0.027/0.021	0.04	0.075	0.02
Zinc (Zn)	0.19			37								64	75											
Cadmium (Cd)	0.06											0.73	0.64	0.38										
Chromium (Cr)	<0.05			0.40								0.19	2.6	0.55										
Mercury (Hg)												13	11	3										
Lead (Pb)	3.8											4.2	1.1	0.11										
Barium (Ba)														3.0										
Nickel (Ni)			1.0											1.42	0.59									
Selenium (Se)														<0.02										
pH	7.4	7.95	10.6	10.8	10.7	10.4	11.3(5)	10.3	9.9	10.5	7.5	2.6/3.2	2.1	3.0	2.7	2.8	3.15	3.7(5)	7.45	7.3(5)	9.1	9.1	8.3	7.4(5)

NOTE: All concentrations are provided in mg/l, except for mercury, which is provided in μg/l. Where blanks are present in the table, no tests were conducted. Where two values are provided, the sample was analyzed in duplicate.

1. Water sample actually taken from A-9 trench, considered to be equivalent to B-1A
2. Before purging.
3. After purging.
4. Insufficient sample for analysis.
5. Field pH; other pH values from samples taken by Rizzo Associates are laboratory pH.

FIGURES



WPL 005 5497

SET 0021329

FIGURE 1

WESTINGHOUSE BEAVER PLANT
LOCATION MAP OF EXISTING AND PROPOSED BORINGS

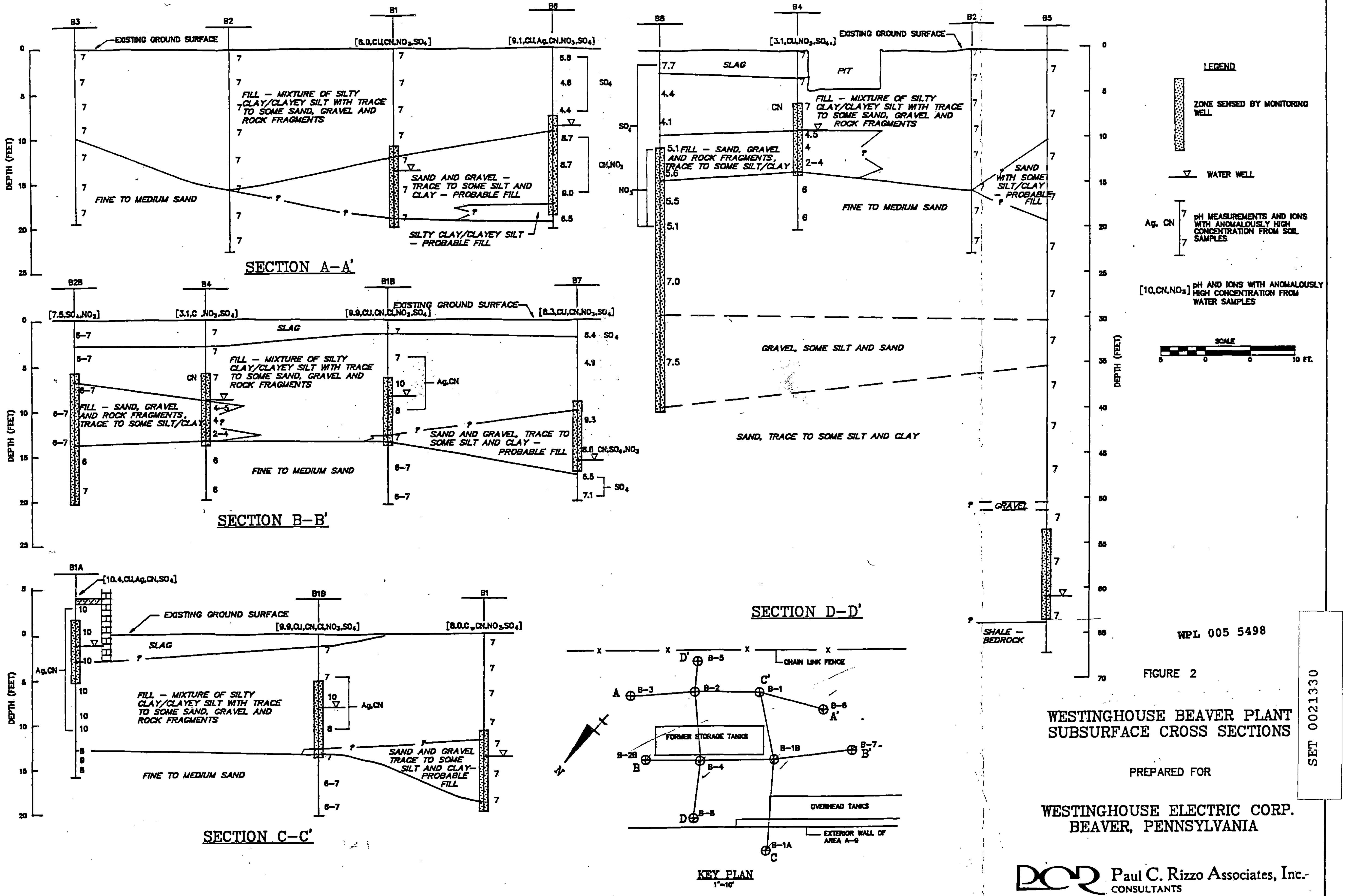
PREPARED FOR

WESTINGHOUSE ELECTRIC CORP.
BEAVER, PENNSYLVANIA

Paul C. Rizzo Associates, Inc.
CONSULTANTS

DRAWN BY	CHECKED BY	APPROVED BY		DRAWING NUMBER
D.J.D. 7-20-85			9/16/85	85-154-B10

71579



WPL 005 5498

FIGURE 2

WESTINGHOUSE BEAVER PLANT SUBSURFACE CROSS SECTIONS

PREPARED FOR

WESTINGHOUSE ELECTRIC CORP.
BEAVER, PENNSYLVANIA

Paul C. Rizzo Associates, Inc.
CONSULTANTS

SET 0021330

DRAWN BY	R.F.T.	CHECKED BY			DRAWING NUMBER
	1-22-86	APPROVED BY			85-154-E1

APPENDIX A

BORING LOGS

DATE BEGAN: 10/28/85
DATE FINISHED: 10/30/85
GROUND SURFACE EL. ______

BORING B5

FIELD ENGINEER: WCS
CHECKED BY: WJJ

ELEV. (FEET)	DEPTH (FEET)	SAMPLE TYPE	PROFILE	DESCRIPTION	U.S.C.S.	PIEZOMETER INSTALLATION	PENETRATION RESISTANCE (BLOWS PER FOOT) 10 30 50
	0	DESTRUCTIVE DRILLING - 5 FOOT COMPOSITE SAMPLES FROM CABLE TOOL BAILER		BROWN SILTY CLAY TO CLAYEY SILT		STICKUP= 2.3'	
	5				ml-cl	6"I.D. WELDED STEEL CASING WITH PROTECTIVE CAP	
	10			10.0' BROWN MEDIUM SAND WITH SOME SILT AND CLAY			
	15			19.0'	sm-sc		
	20			BROWN FINE TO MEDIUM SAND		CASED BOREHOLE (55.0')	
	25			29.5'	sp		
	30			BROWN FINE TO MEDIUM SAND WITH TRACE TO SOME SILT AND CLAY, TRACE TO SOME GRAVEL 30-35'	gm-gc	6.25" DIA. BORING	
	35				sm-sc		
	40				sp-sm		
	45				sp-sm		
	50						

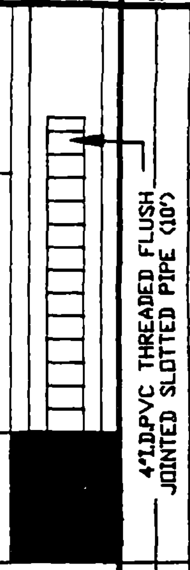
BORING NO. B5
SHEET 1 OF 2

DATE BEGAN: 10/28/85
DATE FINISHED: 10/25/85
GROUND SURFACE EL. ________

BORING B5

FIELD ENGINEER: WCS
CHECKED BY: WJJ

ELEV. (FEET)	DEPTH (FEET)	SAMPLE TYPE	DESCRIPTION	U.S.C.S.	PIEZOMETER INSTALLATION	PENETRATION RESISTANCE (BLOWS PER FOOT) 10 30 50
	50	DESTRUCTIVE DRILLING - 5 FOOT COMPOSITE SAMPLES FROM CABLE TOOL BAILER	BROWN GRAVEL WITH SOME SAND AND TRACE SILT AND CLAY 51.0'	GP-GM	CASED BOREHOLE (55.0')	
			BROWN MEDIUM TO COARSE SAND SOME SILT AND CLAY 55.0'	GM-GC		
	55		BROWN WELL GRADED SAND WITH SOME SILT AND CLAY	SW SM	COLLAPSED MATERIAL (8.3')	
▽ 12-85	60		TOP OF ROCK 63.5'	SW-SM		
	65		HARD DARK GRAY SHALE, SLIGHTLY CLAYEY AT TOP 67.0'		BENTONITE (4.0')	
			BOTTOM OF BORING AT 67.0'			
	70					

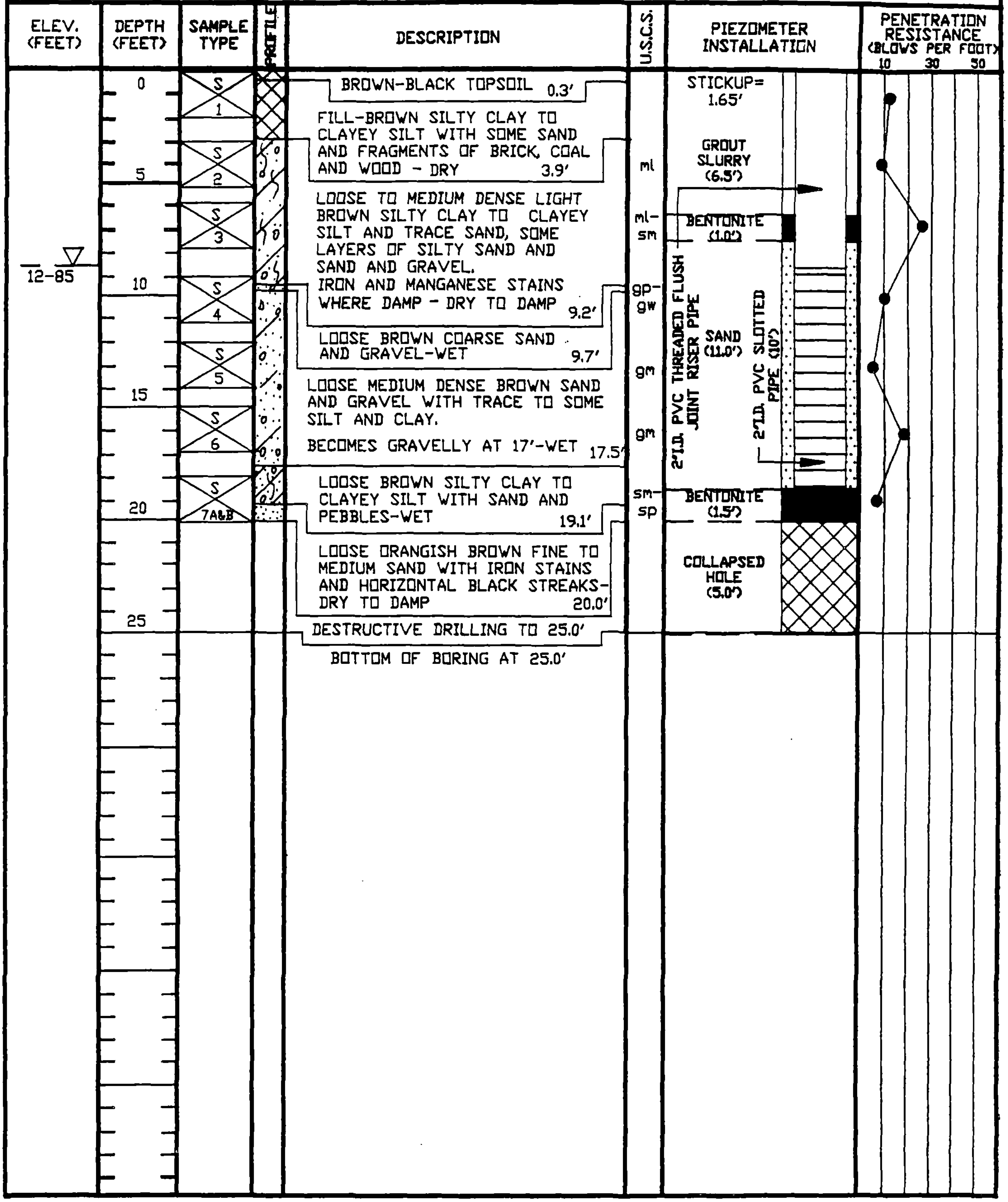


BORING NO. B5
SHEET 2 OF 2

DATE BEGAN: 10/22/85
DATE FINISHED: 10/22/85
GROUND SURFACE EL. ______

BORING B6

FIELD ENGINEER: WCS
CHECKED BY: WJJ



BROWN-BLACK TOPSOIL 0.3'

FILL-BROWN SILTY CLAY TO CLAYEY SILT WITH SOME SAND AND FRAGMENTS OF BRICK, COAL AND WOOD - DRY 3.9'

LOOSE TO MEDIUM DENSE LIGHT BROWN SILTY CLAY TO CLAYEY SILT AND TRACE SAND, SOME LAYERS OF SILTY SAND AND SAND AND GRAVEL.
IRON AND MANGANESE STAINS WHERE DAMP - DRY TO DAMP 9.2'

LOOSE BROWN COARSE SAND AND GRAVEL-WET 9.7'

LOOSE MEDIUM DENSE BROWN SAND AND GRAVEL WITH TRACE TO SOME SILT AND CLAY.

BECOMES GRAVELLY AT 17'-WET 17.5'

LOOSE BROWN SILTY CLAY TO CLAYEY SILT WITH SAND AND PEBBLES-WET 19.1'

LOOSE ORANGISH BROWN FINE TO MEDIUM SAND WITH IRON STAINS AND HORIZONTAL BLACK STREAKS-DRY TO DAMP 20.0'

DESTRUCTIVE DRILLING TO 25.0'

BOTTOM OF BORING AT 25.0'

BORING NO. B6
SHEET 1 OF 1

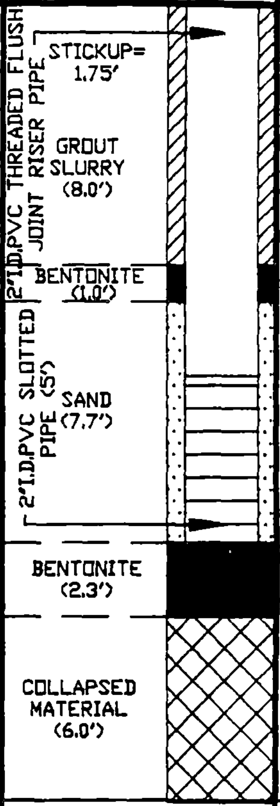
DATE BEGAN: 10/21/85
DATE FINISHED: 10/22/85
GROUND SURFACE EL.

BORING B7

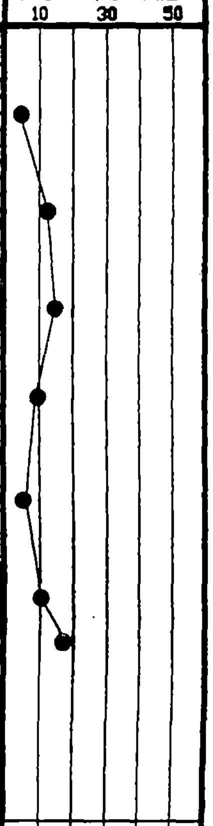
FIELD ENGINEER: WCS
CHECKED BY: WJJ

ELEV. (FEET)	DEPTH (FEET)	SAMPLE TYPE	PROFILE	DESCRIPTION	U.S.C.S.
	0			ASPHALT 0.3'	
		S 1		BLACK-GRAY SLAG 1.8'	
	5	S 2 S 3		FILL-MIXTURE OF CLAYEY SILT, SAND AND GRAVEL WITH FRAGMENTS OF BRICK AND WOOD. - GENERALLY DRY, MOIST AT BOTTOM 10.0'	
12-85	10 15	S 4 S 5		LOOSE BROWN TO BROWN-GRAY SAND AND GRAVEL, TRACE TO SOME SILT, TRACE TO SOME COBBLES; BLACK STAINS (POSSIBLY MANGANESE) AT BOTTOM - WET 17.0'	gm sp-gm
		S 6		LOOSE BROWN FINE TO MEDIUM SAND, TRACE SILT-DRY 19.2'	sp
	20	7		MEDIUM DENSE BROWN SAND AND GRAVEL.-DRY TO MOIST 20.0'	sp
	25			DESTRUCTIVE DRILLING TO 25.0' 25.0'	
				BOTTOM OF BORING AT 25.0'	

PIEZOMETER INSTALLATION



PENETRATION RESISTANCE (BLOWS PER FOOT)

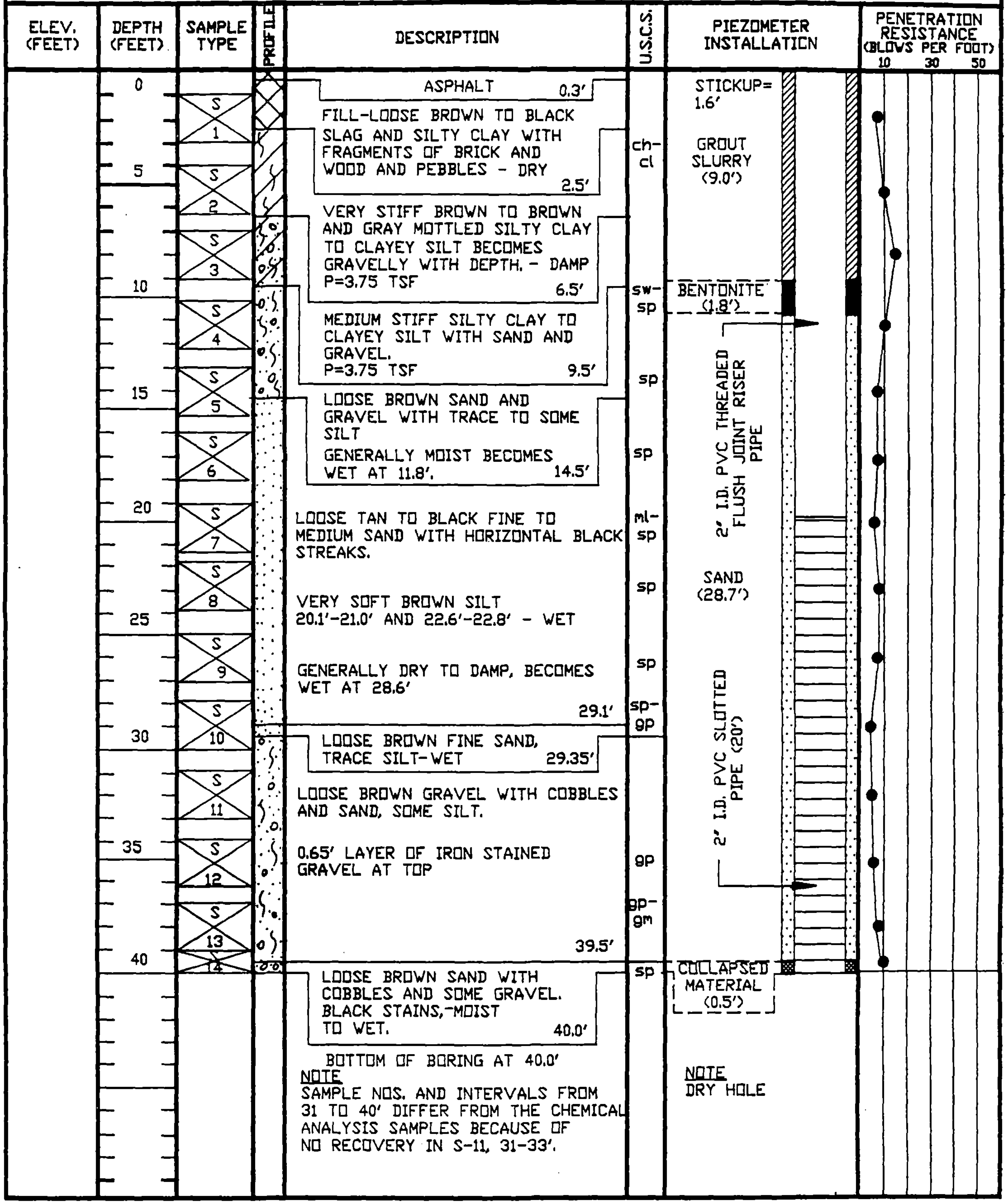


BORING NO. B7
SHEET 1 OF 1

DATE BEGAN: 10/23/85
DATE FINISHED: 10/23/85
GROUND SURFACE EL. ______

BORING B8

FIELD ENGINEER: WCS
CHECKED BY: WJJ



ASPHALT 0.3'

FILL-LOOSE BROWN TO BLACK SLAG AND SILTY CLAY WITH FRAGMENTS OF BRICK AND WOOD AND PEBBLES - DRY 2.5'

VERY STIFF BROWN TO BROWN AND GRAY MOTTLED SILTY CLAY TO CLAYEY SILT BECOMES GRAVELLY WITH DEPTH. - DAMP P=3.75 TSF 6.5'

MEDIUM STIFF SILTY CLAY TO CLAYEY SILT WITH SAND AND GRAVEL. P=3.75 TSF 9.5'

LOOSE BROWN SAND AND GRAVEL WITH TRACE TO SOME SILT
GENERALLY MOIST BECOMES WET AT 11.8'. 14.5'

LOOSE TAN TO BLACK FINE TO MEDIUM SAND WITH HORIZONTAL BLACK STREAKS.

VERY SOFT BROWN SILT 20.1'-21.0' AND 22.6'-22.8' - WET

GENERALLY DRY TO DAMP, BECOMES WET AT 28.6'
29.1'

LOOSE BROWN FINE SAND, TRACE SILT-WET 29.35'

LOOSE BROWN GRAVEL WITH COBBLES AND SAND, SOME SILT.

0.65' LAYER OF IRON STAINED GRAVEL AT TOP

39.5'

LOOSE BROWN SAND WITH COBBLES AND SOME GRAVEL. BLACK STAINS,-MOIST TO WET. 40.0'

BOTTOM OF BORING AT 40.0'

NOTE
SAMPLE NOS. AND INTERVALS FROM 31 TO 40' DIFFER FROM THE CHEMICAL ANALYSIS SAMPLES BECAUSE OF NO RECOVERY IN S-11, 31-33'.

NOTE
DRY HOLE

BORING NO. B8
SHEET 1 OF 1

APPENDIX B

GEOPHYSICAL WELL LOGS

NOTES

Well 4 was not logged because of an obstruction in the well. Interpretation is provided in terms of rock equivalents of the soils penetrated; i.e, the symbol for sandstone means sand; the symbol for shale/claystone means clay; etc.

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APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
B · 1

COMPANY PC Rizzo & Associates | LOCATION | UNIT 61 OFFICE Pgh
PROJECT 85-154 HOLE NO. B-1 | OPERATOR CBC
CLIENT REPRESENTATIVE W. Smith | COUNTY Beaver STATE PA | DATE 11/8/85
DRILLED DEPTH 19.7 FT. ELEVATION FT. | CASING DEPTH 19.7 FT. | DRILLING FLUID USA
HOLE DIAMETER 8 IN. WATER LEVEL 17.7 FT. | DIAMETER 2 IN. FACTOR | DRILLING CO. DRILLER
WALL THICKNESS IN.

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
	CALIPER		in/in			
1	NATURAL γ	3 - 19.7	100 CPS	2 SEC	NATURAL	
	H.R. DENSITY		CPS	SEC	Am 241	
2	γγ DENSITY	3 - 19.7	2.5k CPS	2 SEC	Ra 226	16"
3	NEUTRON	3 - 19.7	2.5k CPS	2 SEC	Am-Be	16"
	RESISTIVITY		Ω			
	SPONTANEOUS POTENTIAL		MV			
	TEMPERATURE		°F			
	FLUID CONDUCTIVITY		Ω.M			
	SONIC		us/ft			2.0 FT.
	OTHER					

INTERPRETATION
- COAL < 10% ASH
- COAL > 10% ASH
- BONE/CARBONACEOUS SHALE > 50% ASH
- FIRECLAY/HOT SHALE
- LIMESTONE/OTHER CARBONATE
- SANDSTONE
- SILTY SANDSTONE
- SHALE/CLAYSTONE
- SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

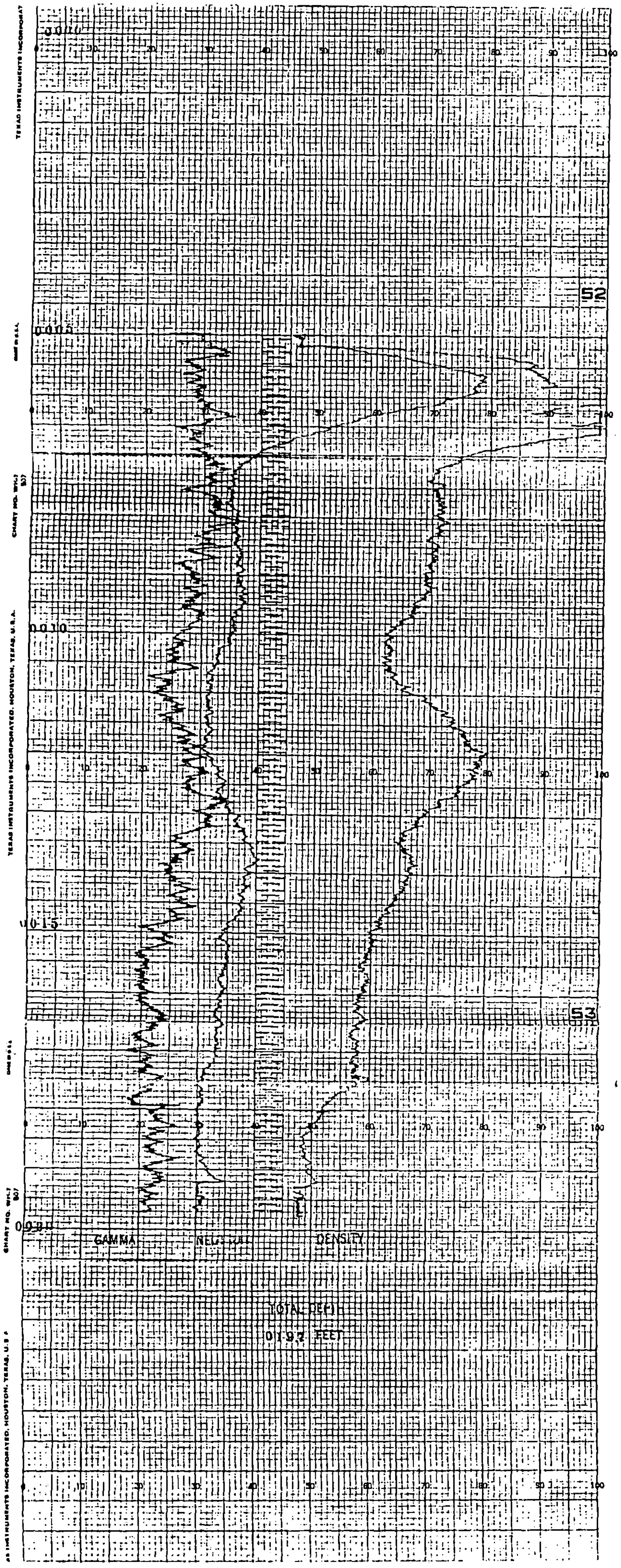
RUNS

RUN #	INTERVAL (DEPTH) FT.	SCALE FT/IN	LOGGING SPEED FT/MIN
1	SUR - 19.7	1	2
2	SUR - 19.7	1	2
3	SUR - 19.7	1	2

NOTES: Datum is top of casing

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ

H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



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APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
1 · B

COMPANY PC Rizzo & Associates | LOCATION | UNIT 61 OFFICE Pgh
PROJECT 85-154 HOLE NO. 1-B | OPERATOR CBC
CLIENT REPRESENTATIVE W. Smith | COUNTY Beaver STATE PA | DATE 11/8/85
DRILLED DEPTH 14 FT. ELEVATION FT. | CASING DEPTH 14 FT. | DRILLING FLUID USA
HOLE DIAMETER 8 IN. WATER LEVEL 10 FT. | DIAMETER 2 IN. FACTOR | DRILLING CO. DRILLER
WALL THICKNESS IN.

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
	CALIPER		in/in			
1	NATURAL γ	3 - 14	100 CPS	2 SEC	NATURAL	
	H.R. DENSITY		CPS	SEC	Am 241	
2	γγ DENSITY	3 - 13.5	2.3k CPS	2 SEC	Ra 226	16"
3	NEUTRON	3 - 13.5	2.3k CPS	2 SEC	Am-Be	16"
	RESISTIVITY		Ω			
	SPONTANEOUS POTENTIAL		MV			
	TEMPERATURE		°F			
	FLUID CONDUCTIVITY		Ω.M			
	SONIC		us/ft			2.0 FT.
	OTHER					

INTERPRETATION
- COAL < 10% ASH
- COAL > 10% ASH
- BONE/CARBONACEOUS SHALE > 50% ASH
- FIRECLAY/HOT SHALE
- LIMESTONE/OTHER CARBONATE
- SANDSTONE
- SILTY SANDSTONE
- SHALE/CLAYSTONE
- SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

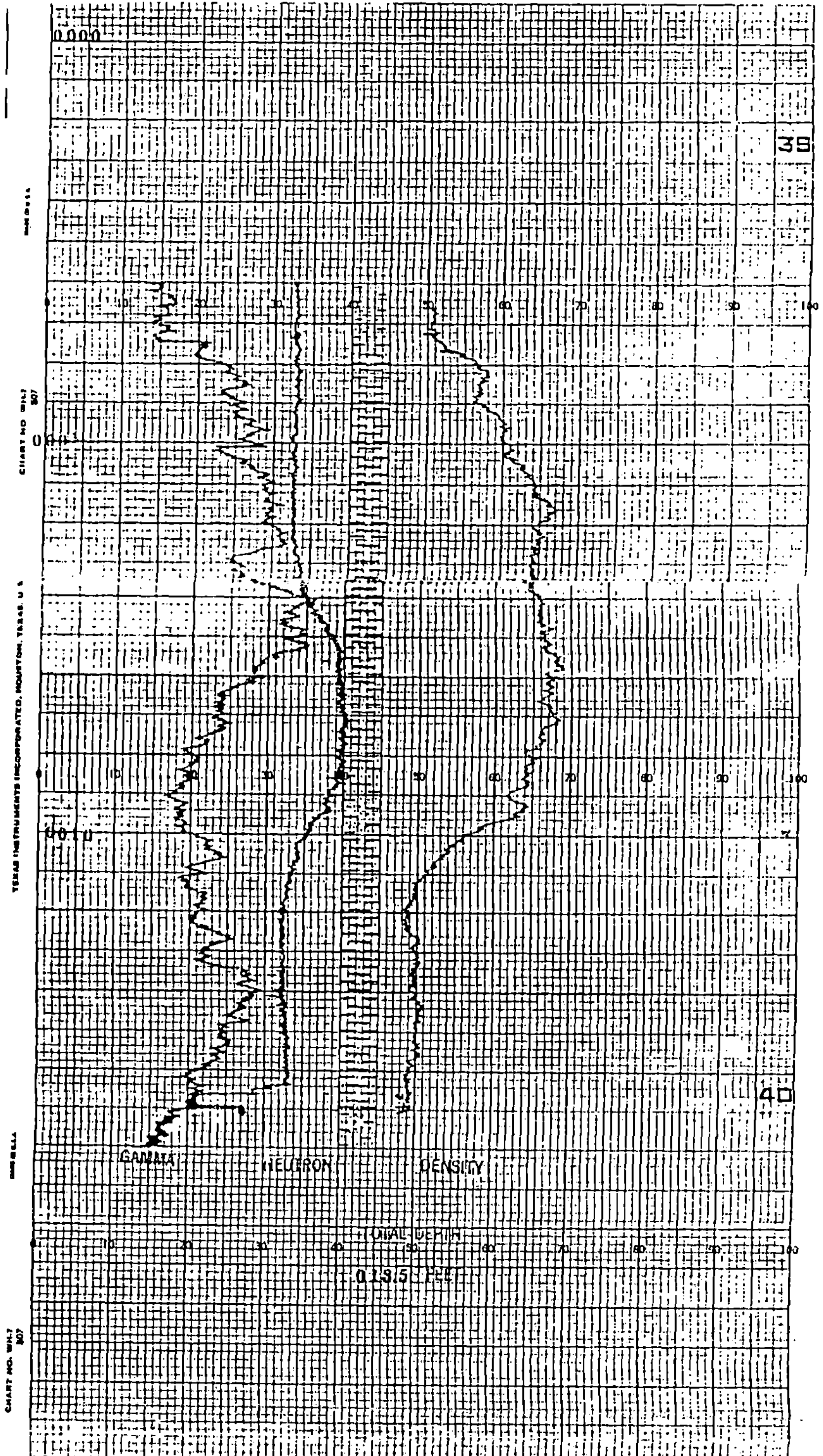
RUNS

RUN #	INTERVAL (DEPTH) FT.	SCALE FT/IN	LOGGING SPEED FT/MIN
1	SUR - 14	1	2
2	SUR - 13.5	1	2
3	SUR - 13.5	1	2

NOTES: Datum is top of casing

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ

H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



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APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
B · 2B

COMPANY PC RIZZO & ASSOCIATES
PROJECT 85-134 HOLE NO. 2-B
CLIENT REPRESENTATIVE W. Smith
DRILLED DEPTH 15.0 FT. ELEVATION FT.
HOLE DIAMETER 8 IN. WATER LEVEL Dry FT.
LOCATION
COUNTY Beaver STATE PA
CASING DEPTH 15 FT.
DIAMETER 2 IN. FACTOR
WALL THICKNESS IN.
UNIT 41 OFFICE Pgh
OPERATOR CBC
DATE 11/8/85
DRILLING FLUID USA
DRILLING CO. DRILLER

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
	CALIPER		in/in			
1	NATURAL γ	2 - 15	100 CPS	2 SEC	NATURAL	
	H.R. DENSITY		CPS	SEC	Am 241	
2	γγ DENSITY	2 - 15	2.5k CPS	1 SEC	Ra 226	16"
3	NEUTRON	2 - 15	2.5k CPS	1 SEC	Am-Be	16"
	RESISTIVITY		Ω			
	SPONTANEOUS POTENTIAL		MV			
	TEMPERATURE		°F			
	FLUID CONDUCTIVITY		Ω M			
	SONIC		µs/ft			2.0 FT.
	OTHER					

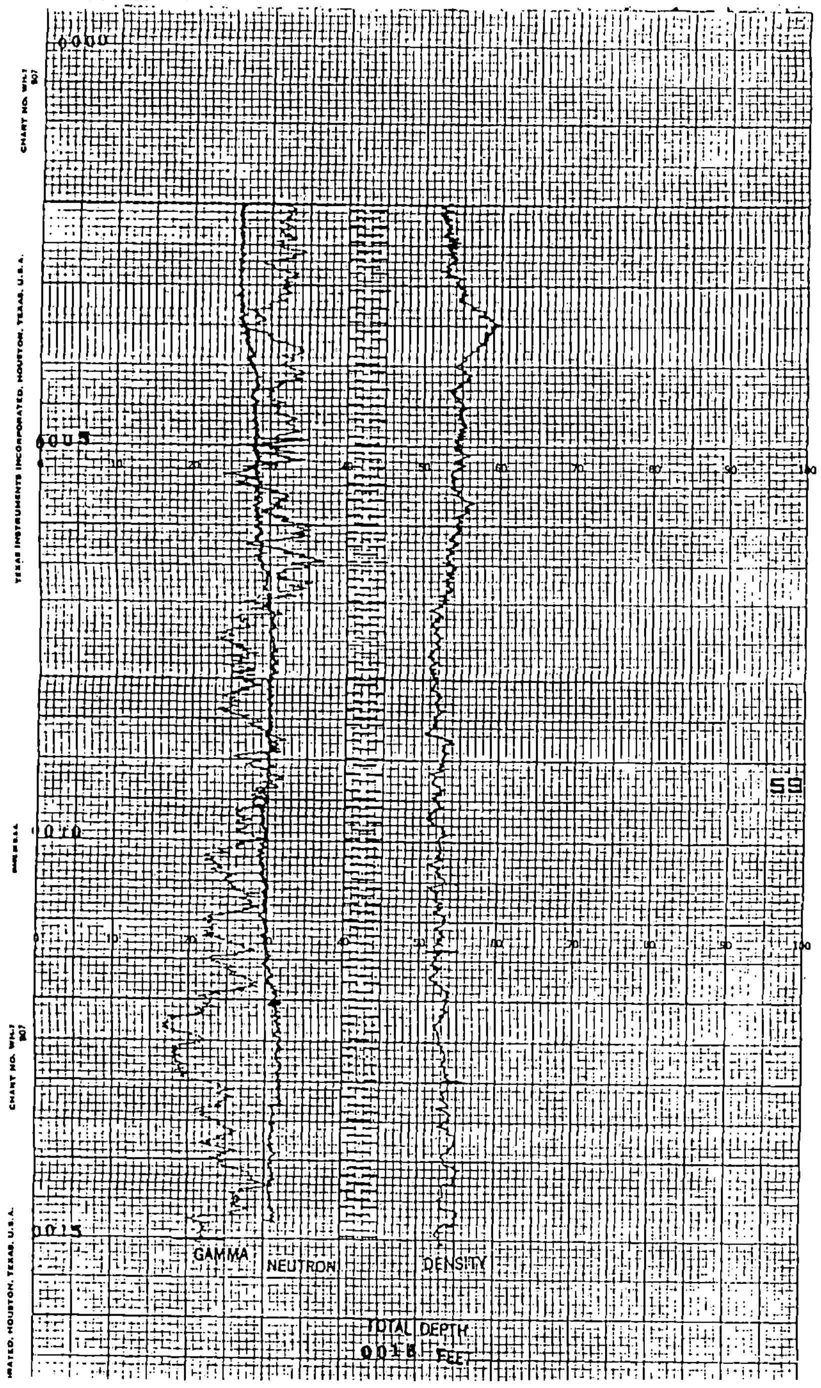
INTERPRETATION
- ■ COAL < 10% ASH
- ▥ COAL > 10% ASH
- ▤ BONE/CARBONACEOUS SHALE > 50% ASH
- ▤ FIRECLAY/HOT SHALE
- ▦ LIMESTONE/OTHER CARBONATE
- ▨ SANDSTONE
- ▨ SILTY SANDSTONE
- ▤ SHALE/CLAYSTONE
- ▤ SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

RUNS

RUN #	INTERVAL (DEPTH) FT.	SCALE FT./IN.	LOGGING SPEED FT./MIN.
1	SUR - 15	1	2
2	SUR - 15	1	2
3	SUR - 15	1	2

NOTES: Datum is top of casing

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ
H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



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APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
B · 5

COMPANY PC RIZZO & ASSOCIATES
PROJECT 85-134 HOLE NO. B-5
CLIENT REPRESENTATIVE W. Smith
DRILLED DEPTH 64 FT. ELEVATION FT.
HOLE DIAMETER 8 IN. WATER LEVEL 62.5 FT.
LOCATION
COUNTY Beaver STATE PA
CASING DEPTH 58 FT.
DIAMETER 6 IN. FACTOR
WALL THICKNESS IN.
UNIT 41 OFFICE Pgh
OPERATOR CBC
DATE 11/8/85
DRILLING FLUID CT
DRILLING CO. DRILLER

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
	CALIPER		in/in			
1/4	NATURAL γ	3 - 64	100 CPS	1 SEC	NATURAL	
	H.R. DENSITY		CPS	SEC	Am 241	
2/5	γγ DENSITY	4 - 63.5	2.5k CPS	1 SEC	Ra 226	16"
3/6	NEUTRON	4 - 64	2.5k CPS	1 SEC	Am-Be	16"
	RESISTIVITY		Ω			
	SPONTANEOUS POTENTIAL		MV			
	TEMPERATURE		°F			
	FLUID CONDUCTIVITY		Ω M			
	SONIC		µs/ft			2.0 FT.
	OTHER					

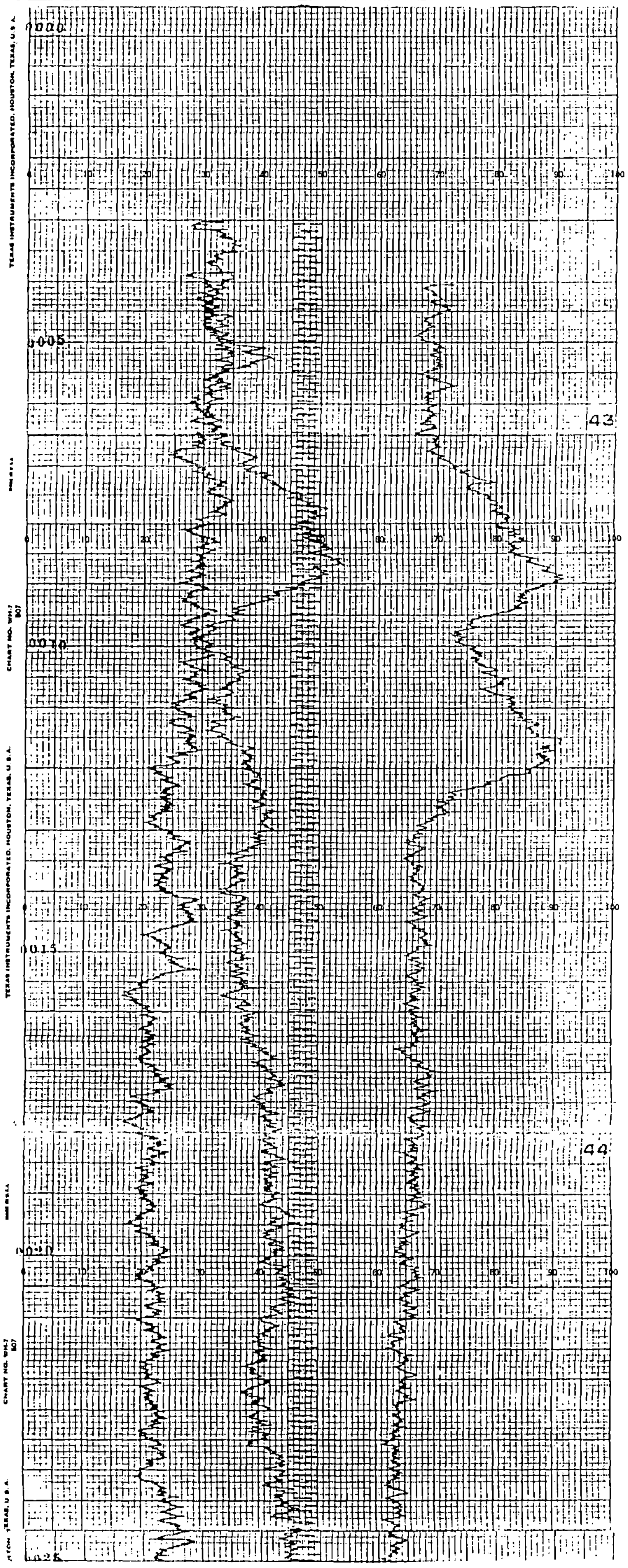
INTERPRETATION
- ■ COAL < 10% ASH
- ▥ COAL > 10% ASH
- ▤ BONE/CARBONACEOUS SHALE > 50% ASH
- ▤ FIRECLAY/HOT SHALE
- ▦ LIMESTONE/OTHER CARBONATE
- ▨ SANDSTONE
- ▨ SILTY SANDSTONE
- ▤ SHALE/CLAYSTONE
- ▤ SANDY SHALE/SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

RUNS

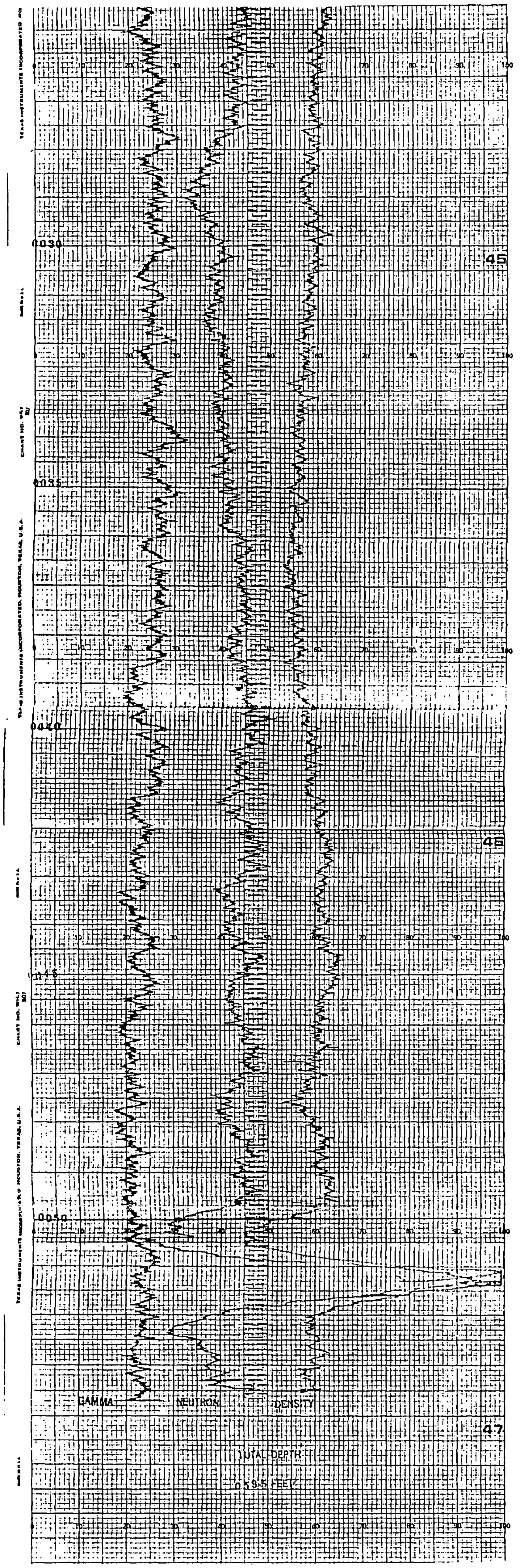
RUN #	INTERVAL (DEPTH) FT.	SCALE FT./IN.	LOGGING SPEED FT./MIN.
1	SUR - 53.5	1	2
2	SUR - 53.5	1	2
3	SUR - 53.5	1	2
4	50 - 64	1	2
5	50 - 64	1	2
6	50 - 64	1	2

NOTES: datum is top of casing. Cap in casing noted at 50.5'

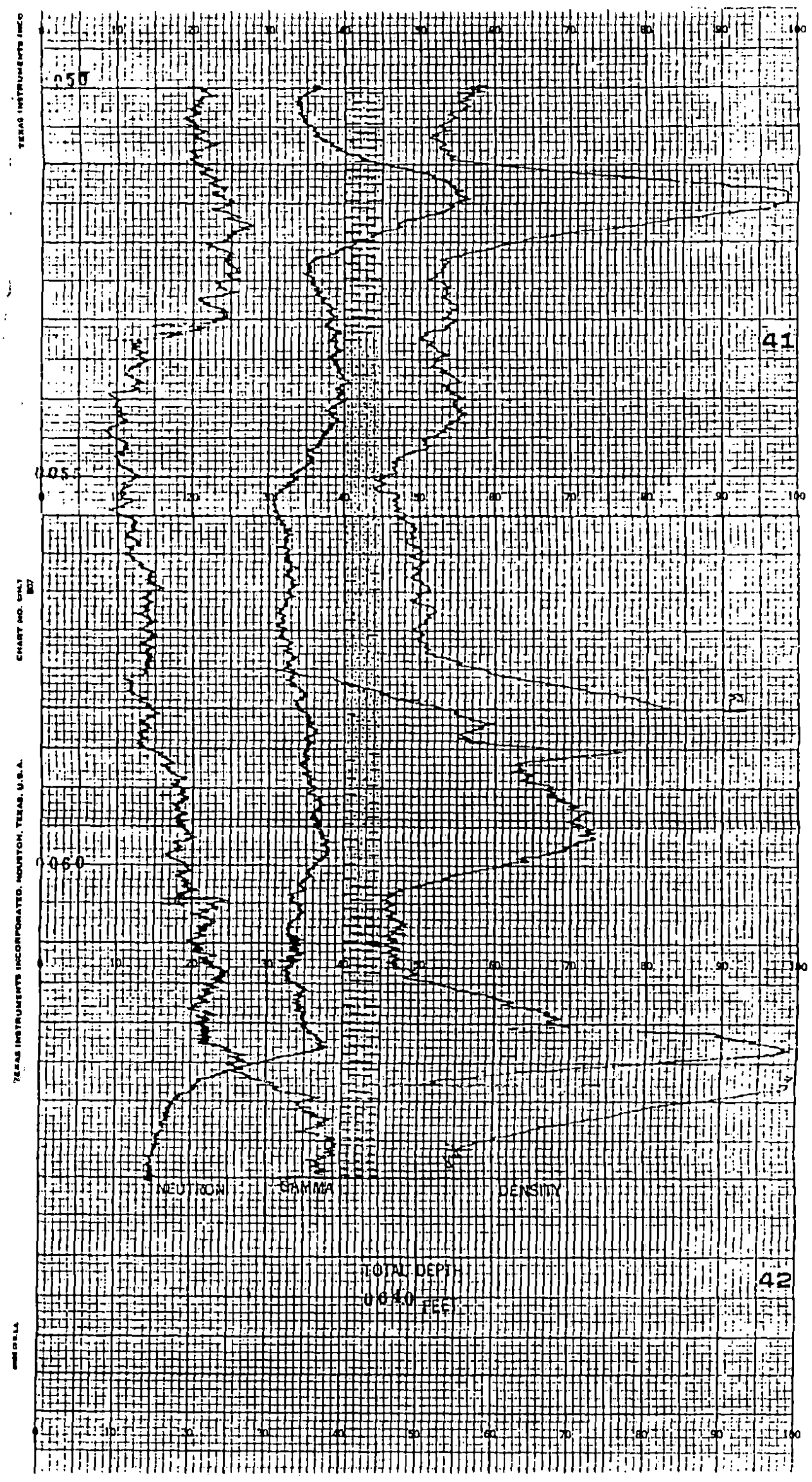
0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ
H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



Well Log for B-5, continued



Well Log for B-5, continued
(Repeat of Lower Section of Log)



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APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
B · 6

COMPANY PC RIZZO & ASSOCIATES
LOCATION
UNIT 61 OFFICE Pgh
PROJECT 85-134 HOLE NO. B-6
OPERATOR CRC
CLIENT REPRESENTATIVE W. Smith
COUNTY Beaver STATE PA
DATE 11/8/85
DRILLED DEPTH 19.5 FT. ELEVATION FT.
CASING DEPTH 19.5 FT.
DRILLING FLUID HSA
HOLE DIAMETER 8 IN. WATER LEVEL 18.4 FT.
DIAMETER 2 IN. FACTOR
WALL THICKNESS IN.
DRILLING CO. DRILLER

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
	CALIPER		In/in			
1	NATURAL γ	3 - 19.5	100 CPS	2 SEC	NATURAL	
	H.R. DENSITY		CPS	SEC	Am 241	
2	γγ DENSITY	3 - 19.5	2.5k CPS	1 SEC	Ra 226	16"
3	NEUTRON	3 - 19.5	2.5k CPS	1 SEC	Am-Be	16"
	RESISTIVITY		Ω			
	SPONTANEOUS POTENTIAL		MV			
	TEMPERATURE		°F			
	FLUID CONDUCTIVITY		Ω M			
	SONIC		us/ft			2.0 FT.
	OTHER					

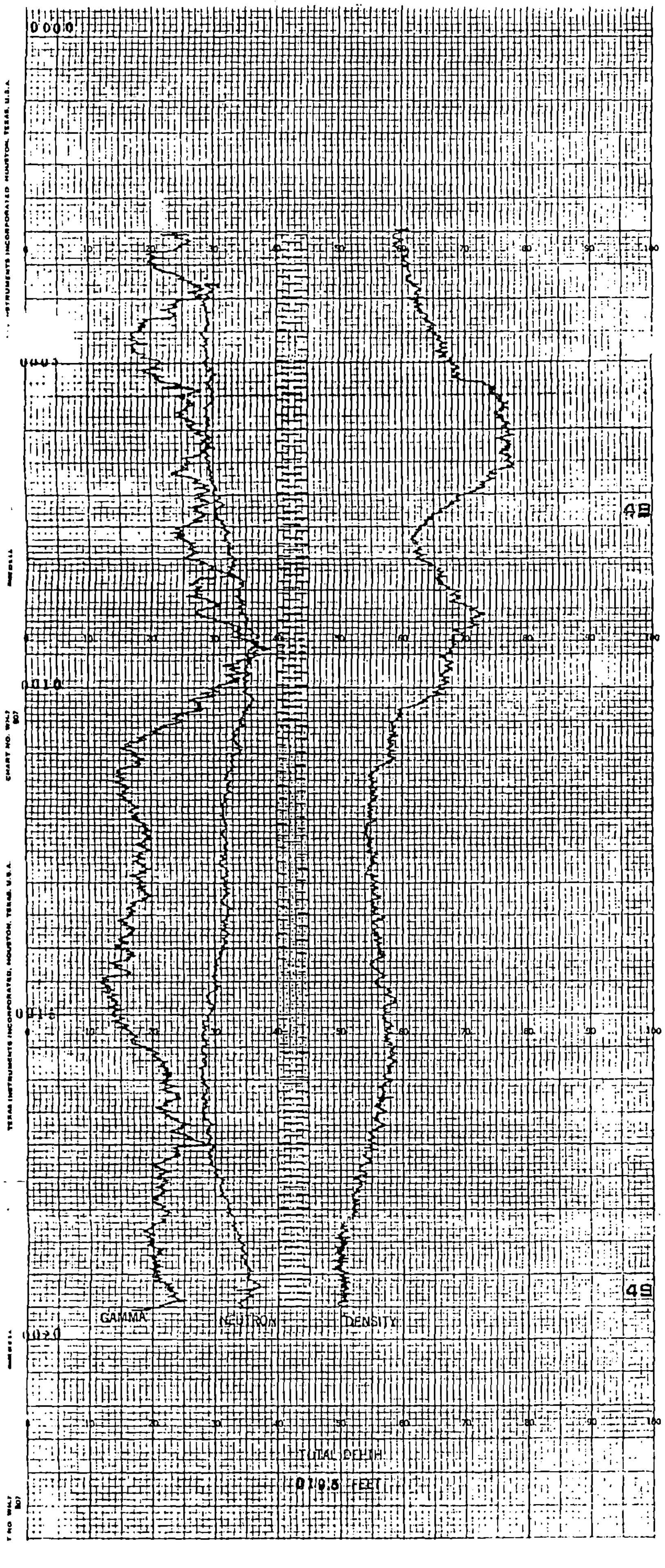
INTERPRETATION
- ■ COAL < 10% ASH
- ▥ COAL > 10% ASH
- ▤ BONE / CARBONACEOUS SHALE > 50% ASH
- ▤ FIRECLAY/ HOT SHALE
- ▦ LIMESTONE/OTHER CARBONATE
- ⁙ SANDSTONE
- ▤ SILTY SANDSTONE
- ▤ SHALE/CLAYSTONE
- ▤ SANDY SHALE / SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

RUNS

RUN #	INTERVAL (DEPTH) FT.	SCALE FT./IN	LOGGING SPEED FT./MIN
1	SUR - 19.5	1	2
2	SUR - 19.5	1	2
3	SUR - 19.5	1	2

NOTES:
Datum is top of casing

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ
H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



P O Box 17203
Pittsburgh, PA 15235
Telephone (412) 243-3030

APPALACHIAN COAL SURVEYS

LOG HEADING
HOLE NO.
B · 7

COMPANY PC RIZZO & ASSOCIATES
LOCATION
UNIT 61 OFFICE Pgh
PROJECT 85-134 HOLE NO. B-7
OPERATOR CRC
CLIENT REPRESENTATIVE W. Smith
COUNTY Beaver STATE PA
DATE 11/8/85
DRILLED DEPTH 17.5 FT. ELEVATION FT.
CASING DEPTH 17.5 FT.
DRILLING FLUID HSA
HOLE DIAMETER 8 IN. WATER LEVEL 15.4 FT.
DIAMETER 2 IN. FACTOR
WALL THICKNESS IN.
DRILLING CO. DRILLER

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
	CALIPER		In/in			
1	NATURAL γ	2.0 - 17.5	100 CPS	2 SEC	NATURAL	
	H.R. DENSITY		CPS	SEC	Am 241	
2	γγ DENSITY	2.5 - 17.2	2.5k CPS	1 SEC	Ra 226	16"
3	NEUTRON	2.5 - 17.2	2.5k CPS	1 SEC	Am-Be	16"
	RESISTIVITY		Ω			
	SPONTANEOUS POTENTIAL		MV			
	TEMPERATURE		°F			
	FLUID CONDUCTIVITY		Ω M			
	SONIC		us/ft			2.0 FT.
	OTHER					

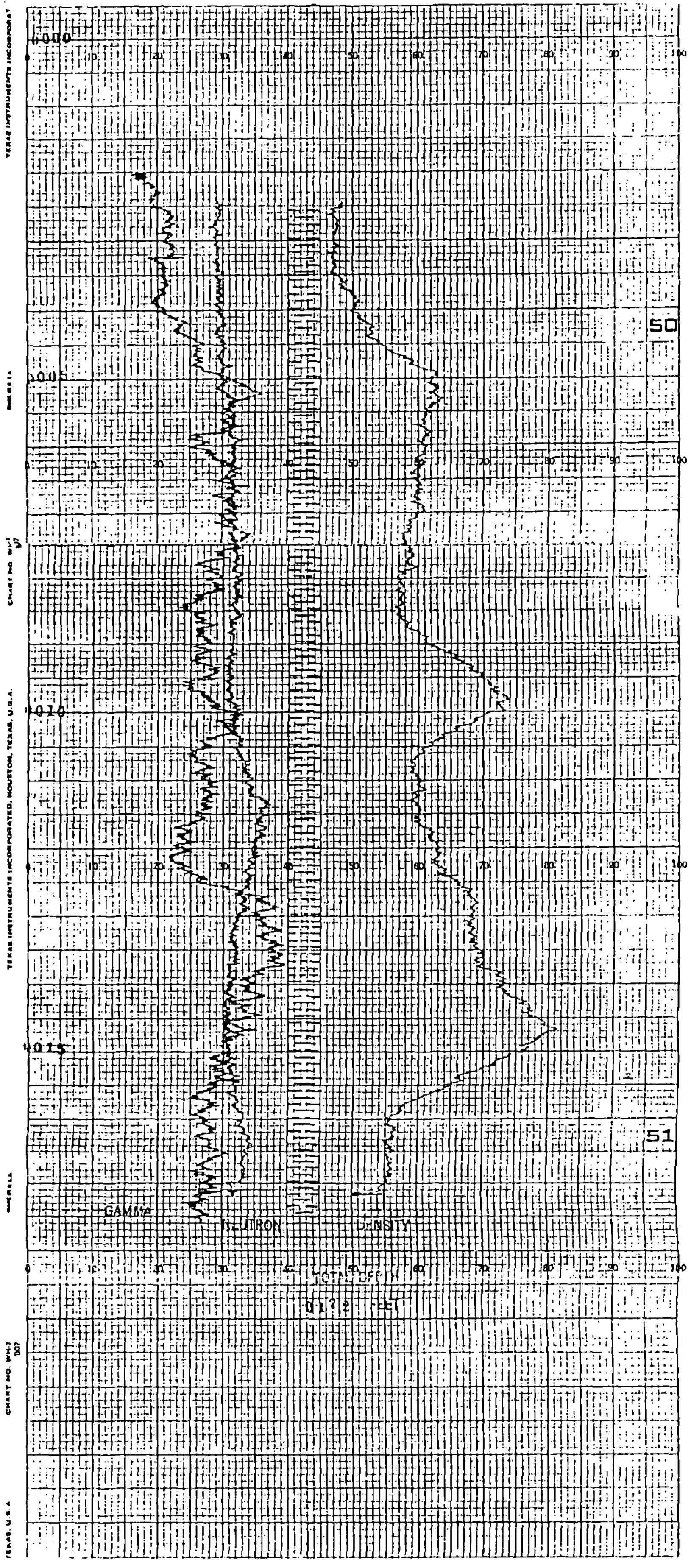
INTERPRETATION
- ■ COAL < 10% ASH
- ▥ COAL > 10% ASH
- ▤ BONE / CARBONACEOUS SHALE > 50% ASH
- ▤ FIRECLAY/ HOT SHALE
- ▦ LIMESTONE/OTHER CARBONATE
- ⁙ SANDSTONE
- ▤ SILTY SANDSTONE
- ▤ SHALE/CLAYSTONE
- ▤ SANDY SHALE / SILTSTONE
- GROUNDWATER INFLOW
- GROUNDWATER OUTFLOW

RUNS

RUN #	INTERVAL (DEPTH) FT.	SCALE FT./IN	LOGGING SPEED FT./MIN
1	SUR - 17.5	1	2
2	SUR - 17.2	1	2
3	SUR - 17.2	1	2

NOTES:
Datum is top of casing

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ
H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



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Telephone (412) 243-3038

APPALACHIAN
COAL SURVEYS

LOG HEADING
HOLE NO.
8 · B

COMPANY PC RIZZO & ASSOCIATES
PROJECT 85-154 HOLE NO. B-8
CLIENT REPRESENTATIVE V. Smith
DRILLED DEPTH 39.5 FT. ELEVATION FT.
HOLE DIAMETER 8 IN. WATER LEVEL Dry FT.

LOCATION
COUNTY Beaver STATE PA
CASING DEPTH 39.5 FT.
DIAMETER 2 IN. FACTOR
WALL THICKNESS IN.

UNIT 61 OFFICE Pgh
OPERATOR CRC
DATE 11/8/85
DRILLING FLUID NSA
DRILLING CO. DRILLER

RUN #	LOG	INTERVAL (DEPTH) FT.	RANGE	TIME CONSTANT	SOURCE	SPACING
	CALIPER		in/in			
1	NATURAL γ	2.0 - 39.5	100 CPS	2 SEC	NATURAL	
	H.R. DENSITY		CPS	SEC	Am 241	
2	γγ DENSITY	2.5 - 39.5	2.5k CPS	1 SEC	Ra 226	16"
3	NEUTRON	2.5 - 39.5	2.5k CPS	1 SEC	Am-Be	16"
	RESISTIVITY		Ω			
	SPONTANEOUS POTENTIAL		MV			
	TEMPERATURE		°F			
	FLUID CONDUCTIVITY		Ω.M			
	SONIC		us/s			2.0 FT.
	OTHER					

INTERPRETATION

■	COAL < 10% ASH
▥	COAL > 10% ASH
▤	BONE/CARBONACEOUS SHALE > 50% ASH
▤	FIRECLAY/HOT SHALE
▦	LIMESTONE/OTHER CARBONATE
⁙	SANDSTONE
▤	SILTY SANDSTONE
▤	SHALE/CLAYSTONE
▤	SANDY SHALE/ SILTSTONE
	GROUNDWATER INFLOW
	GROUNDWATER OUTFLOW

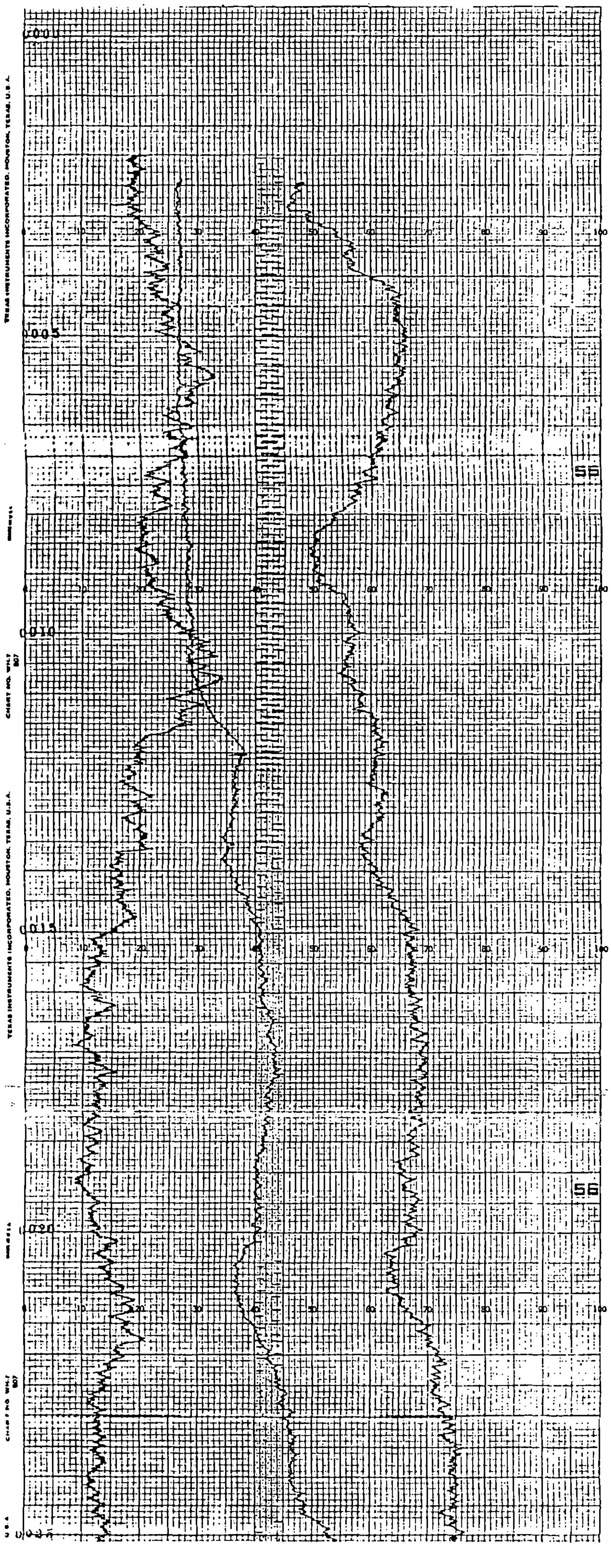
RUNS

RUN #	INTERVAL (DEPTH) FT.	SCALE FT/IN	LOGGING SPEED FT/MIN
1	SUR - 39.5	1	2
2	SUR - 39.5	1	2
3	SUR - 39.5	1	2

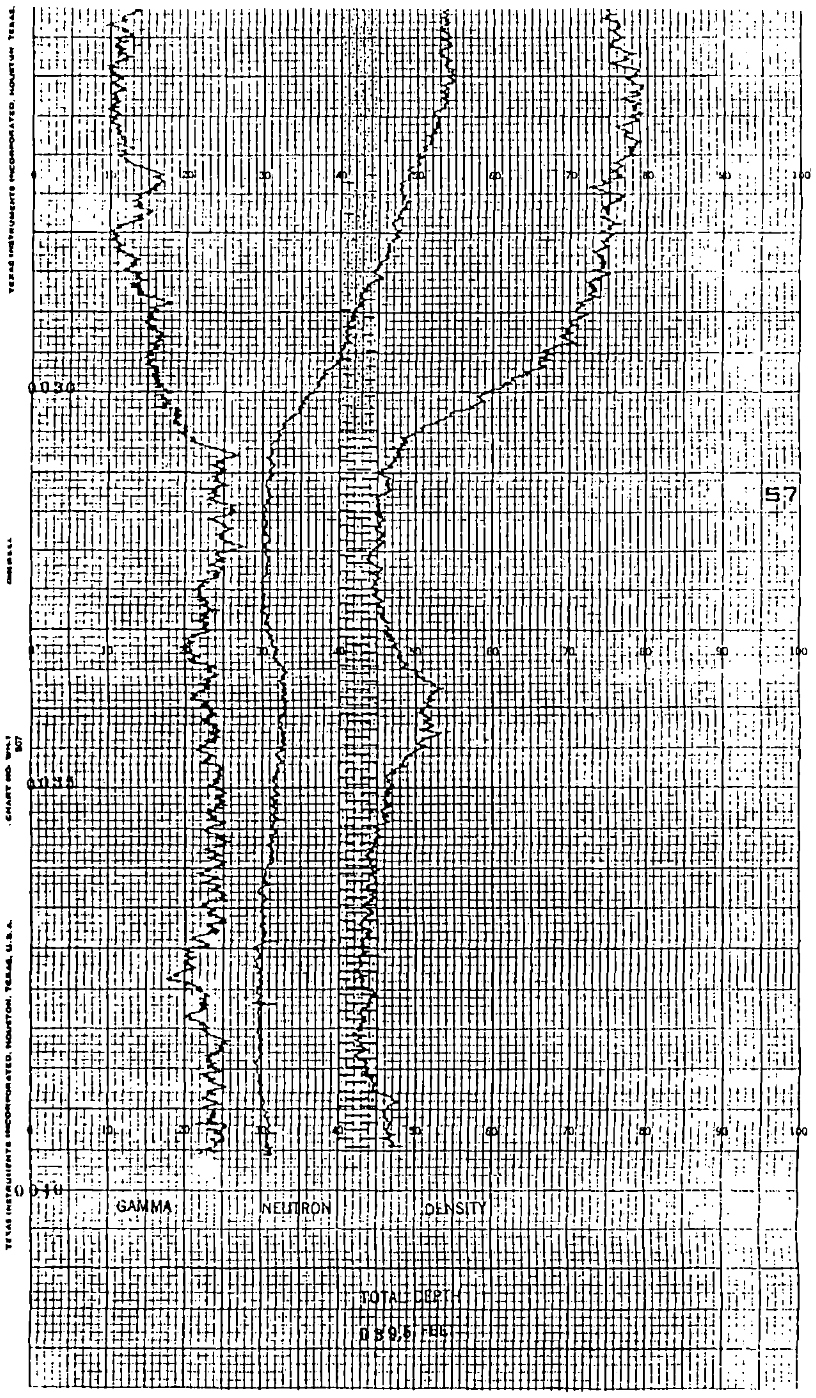
NOTES:
Datum is top of casing

0 10 20 30 40 50 60 70 80 90 100
% CLAY FROM NATURAL γ

H.R. DENSITY CALIBRATION g/cc
2.7 2.6 2.5 2.4 2.3 2.2 2.1 2.0 1.9 1.8 1.7 1.6 1.5 1.4 1.3



Well Log for B-8, continued



APPENDIX C

PUMPING TEST DATA

TABLE C1

PUMPING TEST WATER QUALITY DATA

PUMPING INCREMENT	pH (pH units)	SPECIFIC CONDUCTANCE (umhos/cm)	TEMPERATURE °C
1	3.9	8,000	15°
2	3.1	9,500	12°
3	3.0	9,000	13°
4	2.85	9,200	12°
5	2.9	9,200	14°
6	2.85	8,000	14°
7	2.95	8,000	13°
8	NA*	8,000	13°

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* NA indicates information not available, due to malfunction of instrument.

AQUIFER TESTING DATA

PROJECT NAME *WESTINGHOUSE - BEAVER PLANT, AREA A-9* PROJECT NO. *85154*
PIEZOMETER DESIGNATION *B-1* FORMATION SENSED *Sand + gravel*
LOCATION *—* DISTANCE FROM TEST WELL *25'*
ELEVATION OF RISER PIPE *—* SCREEN ELEVATION ______ TO ______
DATE TEST BEGAN *11-25-85* TIME TEST BEGAN *11:43 Am*
DEPTH TO WATER READ BY "M SCOPE" NO. *IT-2*

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
10:02	17.6	MPZ	—	—	—	—	—	—
15:32	16.8	MPZ	225	—	—	—	—	—

**ATMOSPHERIC

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE- BEAVER PLANT AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-1A FORMATION SENSED Fill
LOCATION —— DISTANCE FROM TEST WELL 31'
ELEVATION OF RISER PIPE —— SCREEN ELEVATION ______ TO ______
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 AM
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
11:40	6.3'	mPZ						
15:37	6.3'	↓						

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE - BEAVER PLANT A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-1B FORMATION SENSED FILL - ALLUVIUM - TILL
LOCATION —— DISTANCE FROM TEST WELL 22'
ELEVATION OF RISER PIPE —— SCREEN ELEVATION —— TO ——
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 am
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
9:45	9.8	mp2	–					BEGAN PUMPING B-4 @ 11:43
11:44^{30}	9.9		1.5					
11:46	9.9		3					
12 08	9.7		25					
12 30	9.7		9					BEGAN PUMPING B-4 @ 12:21
13 04	9 7		8					BEGAN PUMPING B-4 @ 12:56
13:39	9.7		6					BEGAN PUMPING B-4 @ 13:33
14:19	9.7		22					
15:10	9.7		1					BEGAN PUMPING B-4 @ 15:09

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* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE- BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-2-B FORMATION SENSED Sand & gravel
LOCATION ← DISTANCE FROM TEST WELL 15'
ELEVATION OF RISER PIPE — SCREEN ELEVATION — TO —
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 Am
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS ATM.**	CORRECTIONS TIDAL	CORRECTED ELEVATION OF WATER	REMARKS
9:50	DRY	mPZ	—	—	—	—	—	—

SET 0021349

* FROM THE TOP OF THE RISER PIPE ** ATMOSPHERIC

1/4

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE - BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-4 FORMATION SENSED —
LOCATION — DISTANCE FROM TEST WELL —
ELEVATION OF RISER PIPE — SCREEN ELEVATION ____ TO ____
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 AM
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
11:43	8.5'	MPZ	0					START PUMPING B-4
11:47	–		4					2 GAL.
11:51	-		8					4 GAL.
12:00	–		17					5 GAL (SHUT OFF PUMP)
12:01	10.0'		18					
12:02	9.0'		19					
12:03	9.0		20					
12:04	8.7		21					
12:05^{30}	8.7		22.5					
12:07	8.7		24					
12:16	8.7		33					
12:21	–		0					START PUMPING B-4
12:25	-		4					3 GAL.
12:27	-		6					4 GAL.
12:31			10					5 GAL. (SHUT OFF PUMP)
12:33	11.1		12					
12:36	10.5		15					
12:38	9.5		17					
12:39	9.3		18					
12:40	9.2		19					
12:43	9.0		22					
12:56	–		0					START PUMPING B-4
12:58	–		2					2.5 GAL.
12:59	–		3					3 GAL.
13:01	-		5					4 GAL.
13:05^{50}	–		9.8					5 GAL (SHUT OFF PUMP)
13:07	10.2'		11					
13:08	9.7'		12					
13:08^{30}	9.6'		12.5					
13:11^{30}	10.5'		15.5					
13:12	10.0'		16					
13:12^{50}	9.7'		16.5					
13:13^{30}	9.5'		17.5					
13:15^{50}	9.2'		19.5					
13:33	–		0					START PUMPING B-4
13:35	-	↓	2					2.5 GAL.

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

SET 0021350

2/4

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE - BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-4 FORMATION SENSED Sand & Gravel
LOCATION —— DISTANCE FROM TEST WELL
ELEVATION OF RISER PIPE —— SCREEN ELEVATION —— TO ——
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 Am
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
13:37	-	mpz	4					4 GAL
13:39	-		6					4.5 GAL
13:43	-		10					5 GAL. (SHUT OFF PUMP)
13:45	10.6'		12					
13:45^{40}	11.0'		12.7					
13:46'	10.1'		13					
13:47	10.5'		14					
13:49	9.5'		16					
13:50	9.4'		17					
13:53	9.2		20					
13:55	-		22					
13:57	-		0					START PUMPING B-4
13:59	-		2					2 GAL.
14:02^{30}	-		5.5					3 GAL.
14:08	-		11					4 GAL
14:10	12.3		13					5 GAL. (SHUT OFF PUMP)
14:11	12.0		14					
14:11^{30}	11.9		14.5					
14:12	11.7		15					
14:13	11.2		16					
14·13^{30}	10.7		16.5					
14:14	10.4		17					
14:14^{30}	10.3		17.5					
14:16	9.5		19					
14:18	9.3		21					
14:21	-		0					START PUMPING B-4
14:22	—		1					2 GAL
14:24^{30}	—		3.5					3 GAL
14:27	—		6					3.5 GAL
14:33	—		12					5 GAL (SHUT OFF PUMP)
14:34^{30}	12.7'		13.5					
14·35	12.5'		14					
14:36	12.4'		15					
14:36^{30}	12.3'		15.5					
14:38	11.4'		17					
14:40	10.2'	↓	19					

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

SET 0021351

3/4

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE - BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-4 FORMATION SENSED Sand & Gravel
LOCATION —— DISTANCE FROM TEST WELL
ELEVATION OF RISER PIPE —— SCREEN ELEVATION —— TO ——
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 AM
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
14:42	9.5'	MP2	21					
14:43	9.4'		22					
14:46^{30}	-		0					START PUMPING B-4
14:48	-		1.5					2 GAL.
14:50^{30}	-		4					3 GAL.
14:54	-		7.5					4 GAL.
14:59	-		12.5					5 GAL. (SHUT OFF PUMP)
15:00	13.8'		13.5					
15:00^{30}	13.3'		14					
15:01	12.8'		14.5					
15:01^{30}	12.6'		15					
15:02^{30}	12.3'		16					
15:03^{30}	12.0'		17					
15:06^{30}	10.2'		20					
15:07^{20}	9.8		21					
15:09	9.5'		22.5					
15:12	-		0					START PUMPING B-4
15:15	-		3					2 GAL.
15:16^{30}	-		4.5					3 GAL.
15:25	-		13					5 GAL.
15:29^{30}	-		17.5					6 GAL
15:38	-		26					9.5 GAL.
16:11	-		59					15 GAL. (SHUT OFF PUM
16:12^{30}	13.2'		60.5					
16:13	12.9'		61					
16:13^{30}	12.7'		61.5					
16:14	12.5'		62					
16:14^{30}	12.3'		62.5					
16:15	12.0'		63					
16:16	11.8'		64					
16:17	11.4'		65					
16:18	10.9'		66					
16:19	10.5'		67					
16:20	9.8'		68					
16:21	9.7'		69					
16:22	9.5'	↓	70					

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

4/4

AQUIFER TESTING DATA

PROJECT NAME Westinghouse - Beaver Plant, Area A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-4 FORMATION SENSED Sand & gravel
LOCATION — DISTANCE FROM TEST WELL -
ELEVATION OF RISER PIPE — SCREEN ELEVATION — TO —
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 AM
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
16:23	9.4'	MPZ	71	—	—	—	—	—
16:25	9.4'		73	—	—	—	—	—
16:30	9.3'		78	—	—	—	—	—
16:35	9.2'		83	—	—	—	—	—
16:40	9.2'	↓	88	—	—	—	—	—

* FROM THE TOP OF THE RISER PIPE ** ATMOSPHERIC

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE - BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-5 FORMATION SENSED Sand and gravel
LOCATION —— DISTANCE FROM TEST WELL 27'
ELEVATION OF RISER PIPE —— SCREEN ELEVATION —— TO ——
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 Am
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
9:05	63.0'	mPz	—	—	—	—	—	—
15:30	63.3'	MPz	—	—	—	—	—	—

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

1/2

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE - BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-6 FORMATION SENSED Terrace sands and grave
LOCATION —— DISTANCE FROM TEST WELL 37'
ELEVATION OF RISER PIPE —— SCREEN ELEVATION —— TO ——
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 Am
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
9:42	10.5'	MPZ	0					BEGAN PUMPING B-4 @ 11:43
11:54	11.0'		11					
12:00	11.0'		17					
12:09	11.5'		26					
12:09 30	11.5		26.5					
12:24	11.0'		3					BEGAN PUMPING B-4 @ 12:21
12:26	11.0'		5					
12:28	11.4'		7					
12:30	11.7'		9					
12:41	11.4		20					
12:57	11.3		1					BEGAN PUMPING B-4 @ 12:56
12:59	11.5		3					
13:01	11.6		5					
13:03	11.6		7					
13:20	11.7		24					
13:34	11.7		1					BEGAN PUMPING B-4 @ 13:33
13:35	11.7		2					
13:36 30	11.7		3.5					
13:38	11.7		5					
13:55	11.5		22					
13:57	11.7		0					BEGAN PUMPING B-4 @ 13:57
13:59	11.7		2					
14:01 30	11.7		4.5					
14:06	11.7		9					
14:20	11.7		23					
14:21	11.7		0					BEGAN PUMPING B-4 @ 14:21
14:24 30	11.7		3.5					
14:27	11.7		6					
14:44	11.6		23					
14:48	11.6		1.5					BEGAN PUMPING B-4 @ 14:46 30
14:53	11.5		6.5					
15:11	11.7		24.5					
15:14	11.6		2					BEGAN PUMPING B-4 @ 15:12
15:18	11.5		6					
15:26	11.6		14					
15:33	11.6		21					

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

2/2

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE - BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-6 FORMATION SENSED Sand & Gravel
LOCATION —— DISTANCE FROM TEST WELL 37'
ELEVATION OF RISER PIPE —— SCREEN ELEVATION — TO ——
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 Am
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
16:08	11.5	MPZ	56	——	——	——	——	——

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE- BEAVER PLANT, AREA A-9 PROJECT NO. 85-154
PIEZOMETER DESIGNATION B-7 FORMATION SENSED Sand & gravel
LOCATION — DISTANCE FROM TEST WELL 42'
ELEVATION OF RISER PIPE — SCREEN ELEVATION — TO —
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 Am
DEPTH TO WATER READ BY "M SCOPE" NO. TT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
9:36	17.5'	MP2	—	—	—	—	—	
15:34	17.4'	↓	—	—	—	—	—	

* FROM THE TOP OF THE RISER PIPE

** ATMOSPHERIC

AQUIFER TESTING DATA

PROJECT NAME WESTINGHOUSE-BEAVER PLANT, AREA A-9 PROJECT NO. 85154
PIEZOMETER DESIGNATION B-8 FORMATION SENSED Sand & gravel
LOCATION —— DISTANCE FROM TEST WELL 16'
ELEVATION OF RISER PIPE —— SCREEN ELEVATION —— TO ——
DATE TEST BEGAN 11-25-85 TIME TEST BEGAN 11:43 Am
DEPTH TO WATER READ BY "M SCOPE" NO. IT-2

TIME	DEPTH TO WATER *	READ BY	ELAPSED TIME (MIN.)	ELEVATION OF WATER	CORRECTIONS		CORRECTED ELEVATION OF WATER	REMARKS
					ATM.**	TIDAL		
9:52	DRY	MPZ	—	—	—	—	—	

* FROM THE TOP OF THE RISER PIPE ** ATMOSPHERIC