PARSONS LAKE GAS DEVELOPMENT

PRELIMINARY GEOTECHNICAL EVALUATION

GULF OIL CANADA LIMITED

OCTOBER 1975

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Submitted To:

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EBA Engineering Consultants Ltd.

ABSTRACT

This report presents the findings and recommendations of a geotechnical site evaluation initiated to select a site for a proposed gas processing plant in the Parsons Lake area, N.W.T. Preliminary geotechnical data was obtained for a gas plant and airstrip at three locations, two of which were recommended by the client, Gulf Oil Canada Limited and the third by EBA Engineering Cosultants Limited. A site for a dock and associated staging areas were also investigated.

An extensive drilling program was conducted between July 15 and August 17, 1975. A helicopter portable "Ranger Drill" which uses a dry core barrel was the principal means of obtaining subsurface data. This was augmented with a shallow refraction siesmic survey and a Winki drill program after difficulty was encountered in penetrating the till-like material. Bulk density and water content tests were performed in a field laboratory. Representative dry samples and selected frozen core samples were returned to the EBA Edmonton laboratory for further testing and storage.

Sufficient preliminary geotechnical data were obtained to assist in the rational location of the plantsite. Area A, which is adjacent to Hans Bay on the Eskimo Lakes, was considered the best suited for plant site development for the following reasons:

1) It has adequate foundation conditions.

2) A choice of favourable locations for jet and STOL airstrips is available.

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B	E2	25 098 540	1 849 930	B.89
B	E2 Winki	25 098 540	1 849 930	B.90
B	E3	25 098 215	1 850 310	B.92
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B	G4	25 098 650	1 851 340	B.95
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1. INTRODUCTION

1.1 General

Gulf Oil Canada Limited proposes to construct a gathering system and processing plant to develop proven natural gas reserves from the Parsons Lake area. EBA Engineering Consultants Limited were retained to undertake a preliminary geotechnical study of the Parsons Lake area. The purpose of the study was to obtain sufficient geotechnical data to assist with the location of the plantsite and related facilities.

The location of the study area is shown in Figure 1.1. Two potential plantsites (Area A and B, Figure 1.2) were proposed by Gulf Oil Canada Limited and a third alternative (Area C) was suggested by EBA. The docksite, which is in Area A, was selected by Gulf Oil Canada Limited as the only suitable harbour site within the study area. This report presents the results of a field drilling program and makes recommendations as to the geotechnical suitability of the several proposed locations.

1.2 Authorization

Authorization to proceed with the investigation was received in a letter from Mr. J.C. Stamberg dated June 3, 1975. The project was conducted under the supervision of Mr. F.J. Robinson of Gulf Oil Canada Limited. The field work, carried out between July 15 and August 17, 1975, was overseen and assisted in by Mr. B. Charko and Mr. W.E. Andrew of Gulf Oil Canada Limited. All technical aspects of the field work were directed by EBA personnel.

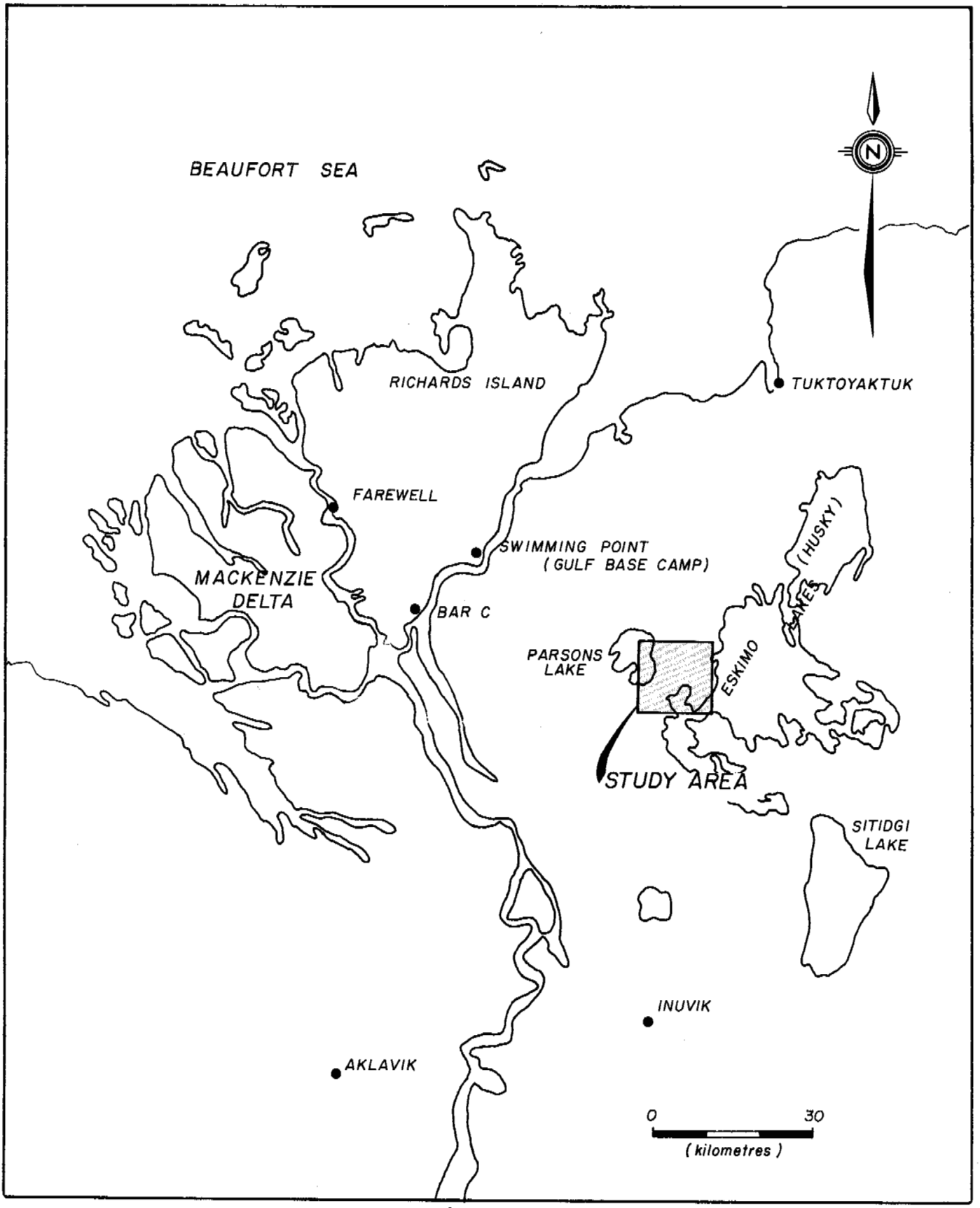


FIGURE 1·1 LOCATION OF STUDY AREA

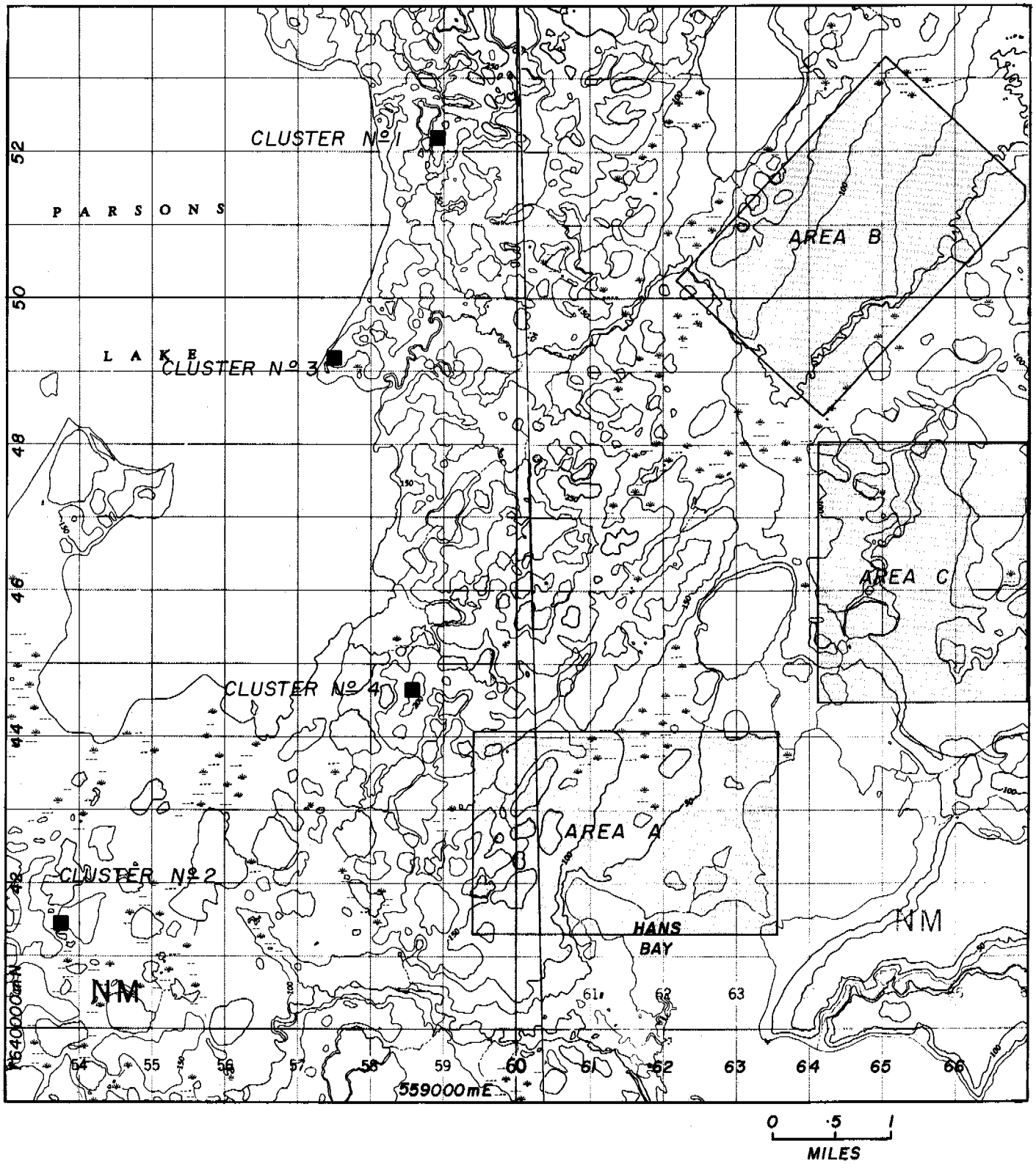


FIGURE 1·2 LOCATION PLAN

1.3 Objectives

The objectives of this preliminary study were to obtain geotechnical field data necessary to make recommendations pertinent to the location of a gas processing plant, dock and airstrip in the Parsons Lake area. A review of previous granular resources studies in the area and a route location for a gathering line and associated roadway corridor were also required.

1.4 Report Organization

The first three sections of the report provide background data to the study. Section IV discusses the relative merits of the three potential plantsite areas. Area A was preferred because of its central location relative to the proposed gas development clusters and its proximity to the docksite and the borrow areas. The consideration given to Area A during the field program and in this report reflect its preferred nature.

Area B and Area C are discussed in lesser detail herein. Potential access road routes connecting these areas to the docksite and borrow source were briefly investigated in the field but they have not been discussed in the report.

Detailed drawings, borehole logs and laboratory test results have been presented in Appendices A, B and C respectively.

2.2 Ranger Rig Drilling Program

The Ranger rig drilling program consisted of coring 94 boreholes between July 17 and August 7 inclusive. The Ranger rig was selected for this summer drilling operation because it is transportable with a light turbine helicopter (1100 lbs. sling load). The rig, crew and equipment could be moved between borehole sites with two trips of the Bell 206 helicopter.

A core barrel, designed for drilling fine grained frozen soils with the Ranger rig, was used. The drilling technique provides a 2.9 inch diameter undisturbed core of frozen ground without using any circulating medium. Excellent core recovery was obtained in all frozen soils which could be penetrated by the core barrel.

The core was visually logged in the field and a representative frozen sample from each core was returned to a field lab set up at the base camp. Dry ice in an insulated core box was used to preserve the samples during delivery to the lab.

The sampling capabilities of the corebarrel were limited by gravel and cobbles encountered in the glacial till and outwash material which resulted in many holes being terminated at shallow depths.

2.3 Seismic Program

A shallow refraction seismic program was initiated to determine the extent of a dense, dry sand. This sand was thought to underlie the surficial till-like material which was only penetrated by the corebarrel in a few boreholes.

Although detailed borehole logs were not obtained, stratigraphic contacts were determined from the returned cuttings and the drillers remarks. These boreholes are specially denoted as Winki holes in the location drawings and borehole logs.

2.5 Laboratory Program

Laboratory testing was carried out both at the Swimming Point base camp and at EBA's Edmonton laboratory. The field laboratory was equipped primarily to determine bulk density and moisture content of frozen cores.

In the field laboratory, density and moisture content determinations were made of every suitable sample. A masonry saw was required to square the ends of the frozen cores for accurate measurements to determine the frozen bulk density. An electric oven was installed in order to perform moisture content tests.

Selected frozen core samples and a dry sample from each bulk density test were returned to Edmonton for further testing and storage. Insulated core boxes and dry ice were used to preserve the frozen samples during shipping. The frozen core samples are being stored until such time as soil behavioral tests such as thaw settlement, shear strength and possibly creep tests are required.

Grain size analyses and Atterberg limits were performed at the Edmonton Laboratory on the selected dry samples in order to provide a verification for field soil classification.

till could be found in only a small percentage of the numerous bluffs which he examined and "in no region were thick deposits of till seen".

3.2 Regional Physiography and Surficial Geology

3.2.1 General

The region under study for a plant site location lies on the border of two physiographic subdivisions of the Pleistocene Coastland Region. Figure 3.1 shows the approximate location of the boundary between the Morainic Hills and Pitted Outwash Plains Physiographic subdivisions as defined by Mackay (1963). The Caribou Hills Physiographic Region lies to the immediate south and west of the study area.

The entire study area lies within the continuous permafrost zone and thus the terrain has been greatly influenced and modified by ground ice features.

3.2.2 Morainic Hills

The Morainic Hills are characterized by higher and rougher topography than the areas of Pleistocene sediments but are lower than the Caribou Hills. Pre-Pleistocene Mackenzie delta sediments are believed to underlie the area. The highest hills in the area are over 250 feet elevation but are generally between 100 and 200 feet. The hills are frequently capped with kame-like sand and gravel deposits which have been exploited for some local borrow.

The morainic topography is believed to reflect terminal ice conditions along an irregular belt 5 to 10 miles wide through Parsons Lake and

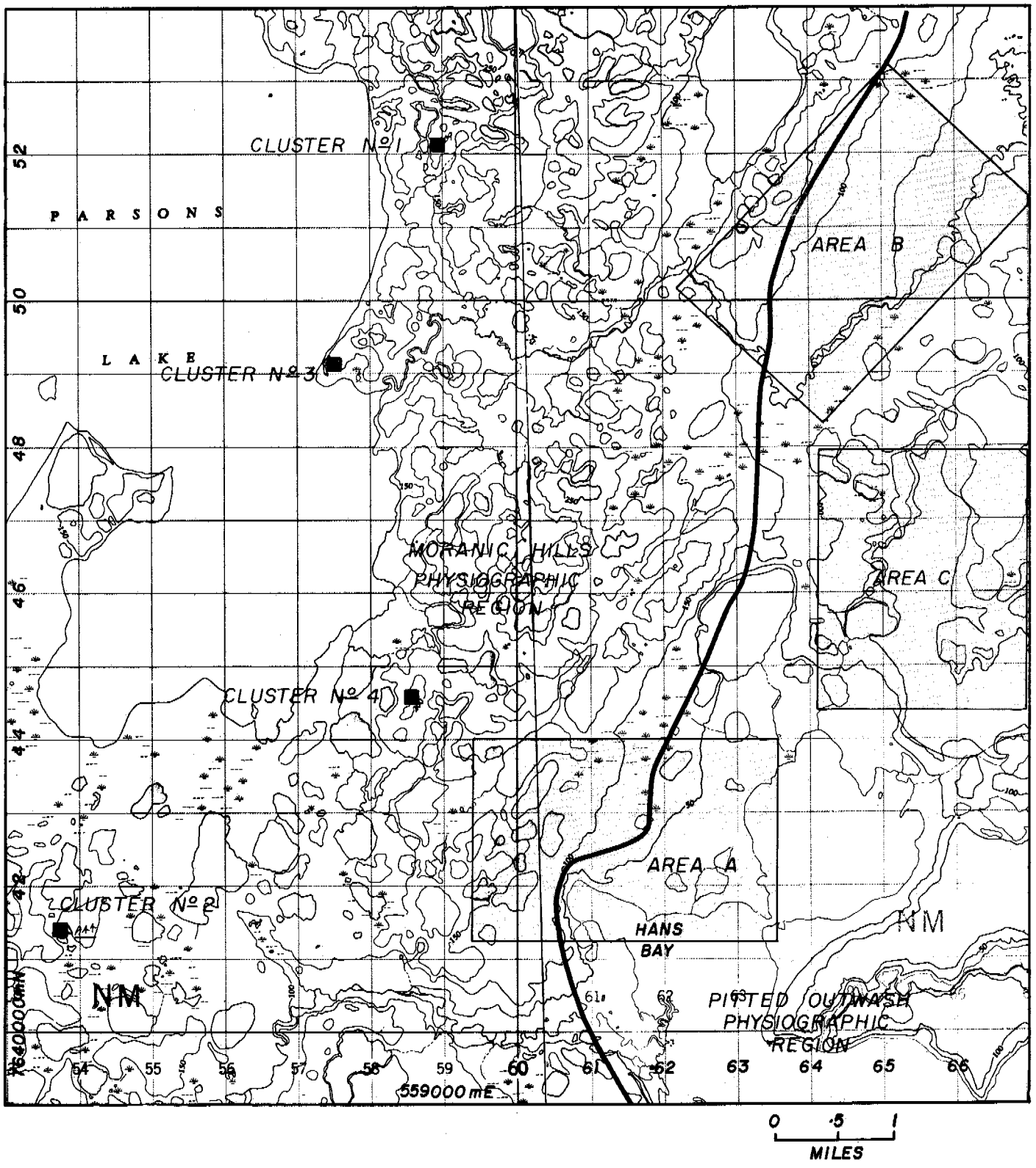


FIGURE 3·1 PHYSIOGRAPHIC REGIONS

north of the Eskimo Lakes. The amount of glacial drift is believed to be small.

3.2.3 Pitted Outwash Plains

The pitted outwash plains were formed when outwash was deposited into a large proglacial lake which formed in the Eskimo Lakes - Sitidgi Lake lowland. The outwash deposits are reddish-brown sands with some gravel which form a capping over grey Pleistocene sands and gravels. They are not much over 5 to 10 feet in thickness. "The area is composed of many flat-topped mesa-like areas interspersed among numerous large and small irregularly shaped highly indented lakes "(Mackay, 1963) Area C is on one of these mesa-like areas. Generally the elevation is below 150 feet altitude in the study area. Dead ice and morainic terrain are interspersed with patches of outwash, kettle holes and glacial-fluvial deposits. The strand lines from many lake elevations can be seen in the form of wave-cut terraces and shallow beaches.

IV. SITE CONDITIONS AND FOUNDATION RECOMMENDATIONS

4.1 General

The drilling program has shown that significant geotechnical differences exist between the three areas investigated. This section discusses the site conditions and makes conceptual recommendations on foundation design.

The thickness of the active layer varies across the site according to the drainage and the thickness of the peat layer. At the time of the drilling program the depth of thaw ranged from 0.4 to 2.2 feet and averaged 1 foot. The depth of the active layer, which is the maximum depth of thaw in a season, would occur in the fall and be greater than the observed thaw depth. It is believed that the average active layer thickness at the proposed plantsite is about 1.5 feet.

The slope provides excellent drainage over the entire site. The drainage courses which are evident from the air-photos are shown in Drawing A.2. Because of the constant slope, few concentrated drainage courses have developed. Wet, poorly drained areas, characterized by extensive ice wedge polygon and thick peat deposits, are evident to the east of the proposed site. The ice wedge polygons probably extend up the slope to the proposed plant area where vegetation and minor down slope creep mask their presence. Some ground water flow will occur downslope in the active layer during the summer months.

4.2.3 Subsurface Conditions

The site is located on the boundary of the moranic hills and pitted outwash physiographic regions (Section 3.2) which makes the inter-relationship of the till, lacustrine and pre-glacial sediments difficult to establish. In general the stratigraphy consists of one foot of peat overlying 6 to 8 feet of glacial lacustrine sediments over 6 to 10 feet of glacial (clay) till. Sandy or gravelly pre-glacial sediments appear to underlie the till. The peat is absent or very thin to the north of

GRAIN SIZE DISTRIBUTION

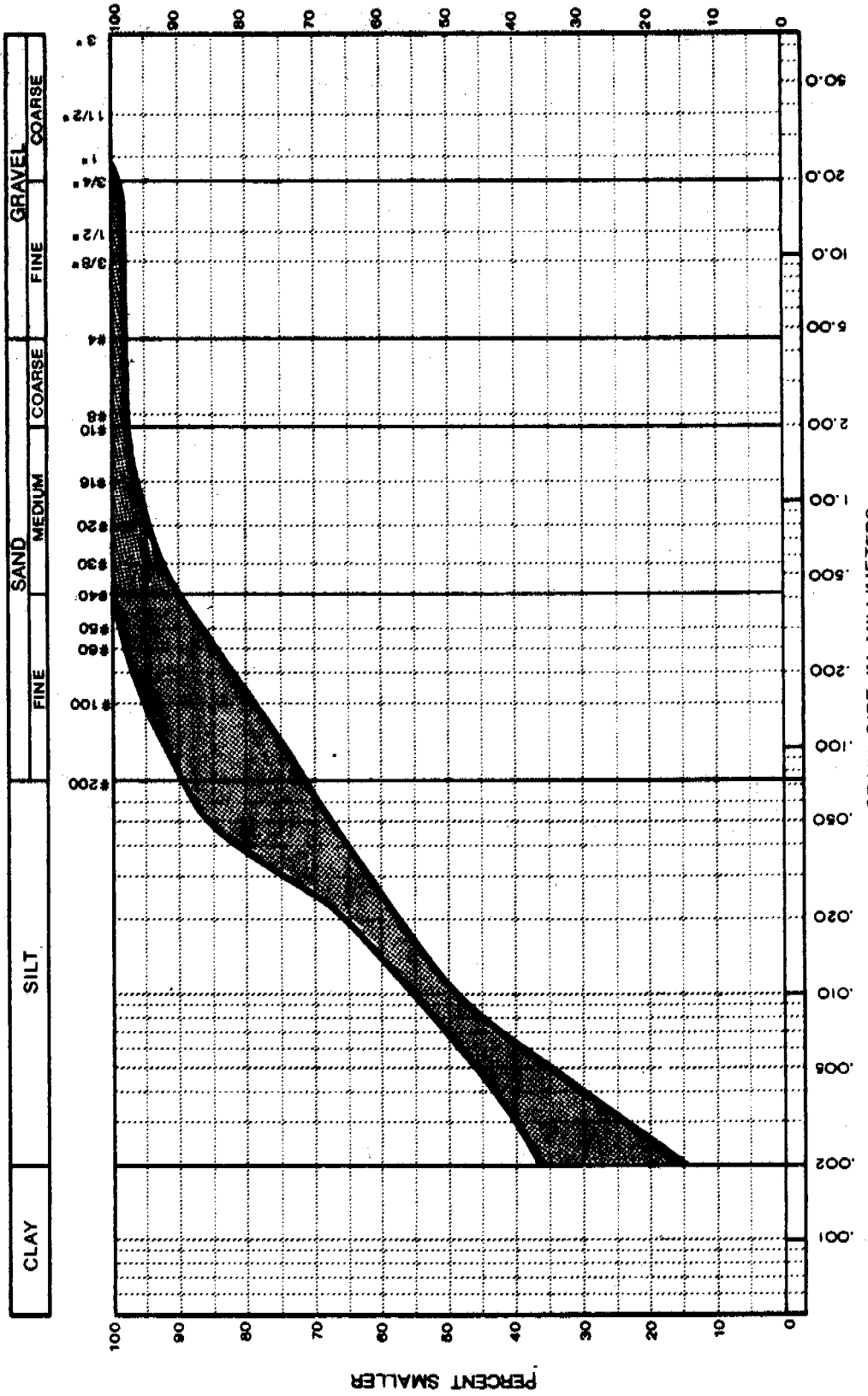


FIGURE 4-1 GRAIN SIZE ENVELOPE FOR CLAY TILL – AREA A

The glacial-lacustrine sediments which overlie the till are believed to have been derived from a glacial front only a few miles away and deposited in a pro-glacial lake. The material, whose grain size distribution range is presented in Figure 4.2, is mainly silt with some clay.

The fine grained materials were classified according to the Unified Soil Classification system which is based on the materials plasticity characteristics. Generally, the till materials were classed CL while the glacial-lacustrine materials were ML although some CL glacial-lacustrine material was encountered at Area B. A further explanation of the unified classification system is given in Appendix B.1 and a summary of the laboratory results are given in Appendix C.6.

Significant ground ice has developed in areas other than the obvious ice wedge polygon areas mapped in Drawing A.2. Figure 4.3 shows the average ground ice content for the boreholes in and near the proposed plant site. Significant excess ground ice (ice in excess of the normal pore volume in the thawed state) has developed in the upper 15 feet.

The moisture content and bulk density profiles of the till and lacustrine sediments are compared in Figure 4.4. It is apparent that no significant difference in bulk density or moisture content exists between the lacustrine or till materials.

Ground temperature measurements taken at Borehole B5 and E3 in the plant site area, are presented in Figure 4.5. The maximum depth of seasonal temperature change is 15 feet, below which the temperature is 21 degrees F.

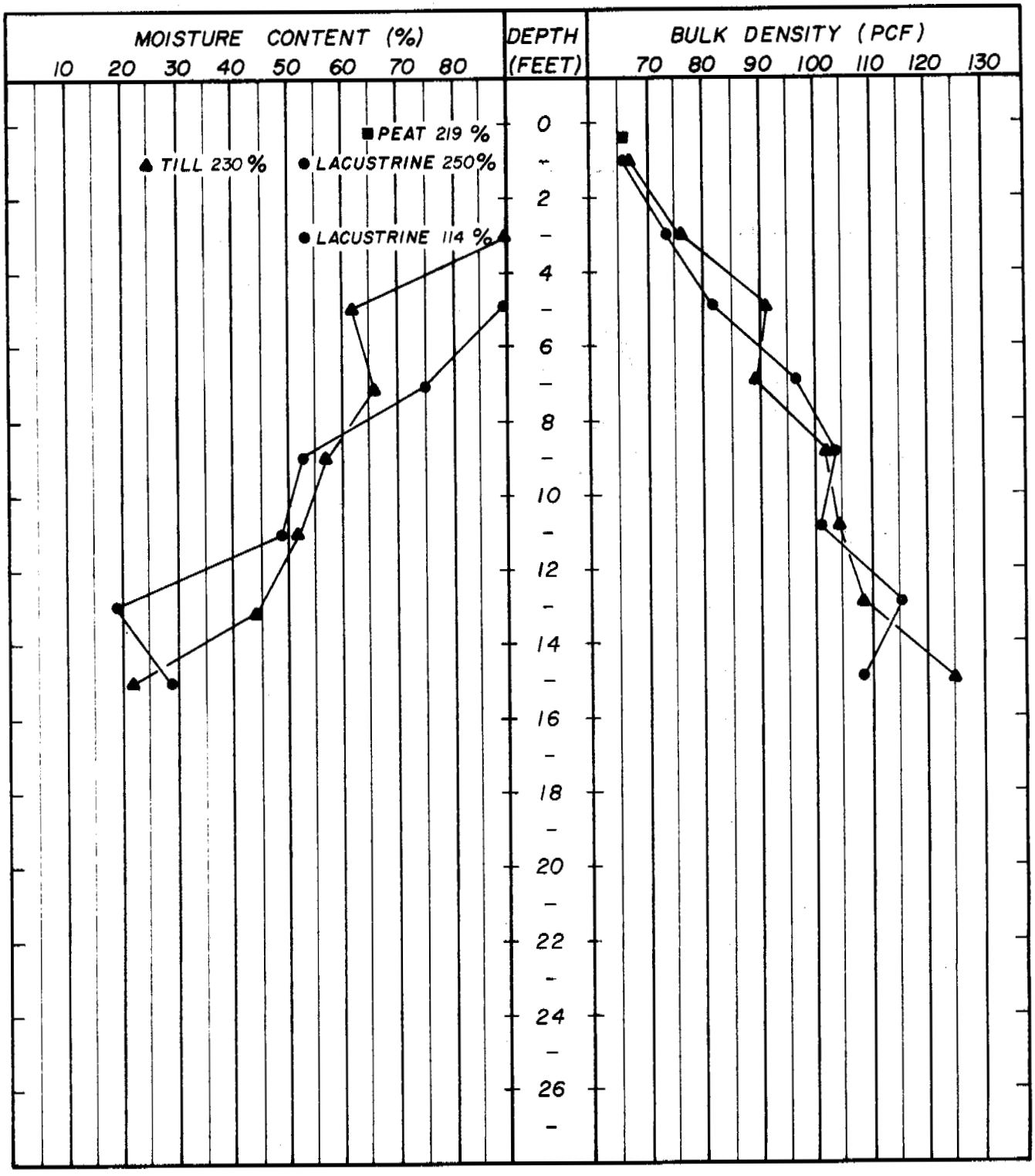


FIGURE 4-4 SUBSURFACE CONDITIONS, AREA A PLANTSITE

4.2.4 Discussion

A 4.1 million square foot gas plant site, outlined in Drawing A.1, was selected from the area investigated. A design philosophy which keeps the permafrost material frozen must be adopted in view of the high excess ice contents of the supporting soils. For tentative design purposes it is estimated that a minimum fill thickness of 5 feet is required for a working pad where it is assumed that a nominal amount of thaw settlement can be tolerated. Detailed geothermal analyses should be undertaken to confirm the 5 foot thickness estimate and to assess the effect of various design alternatives such as an insulating layer.

In this area there is no significant bearing strata within 20 feet of the surface. "Freeze-back piles" extending to depths greater than 15 feet below the original ground surface are a viable means of achieving stable support conditions. At 15 feet the bulk density and moisture content profiles (Figure 4.4) for both the till and lacustrine materials have achieved some degree of stability indicating reasonably uniform ice contents. Sufficiently low ground temperatures exist for freezeback piles to be effective.

If the sand strata beneath the till is found to be continuous, it would be an excellent bearing strata for heavy loads. Significantly higher bearing capacities should be obtainable for piles founded in this sand.

Where light or temporary loads are anticipated, structures founded on spread footings in a prepared gravel pad with an open crawl space are feasible. Light buildings, which are relatively flexible may be founded in such a way.

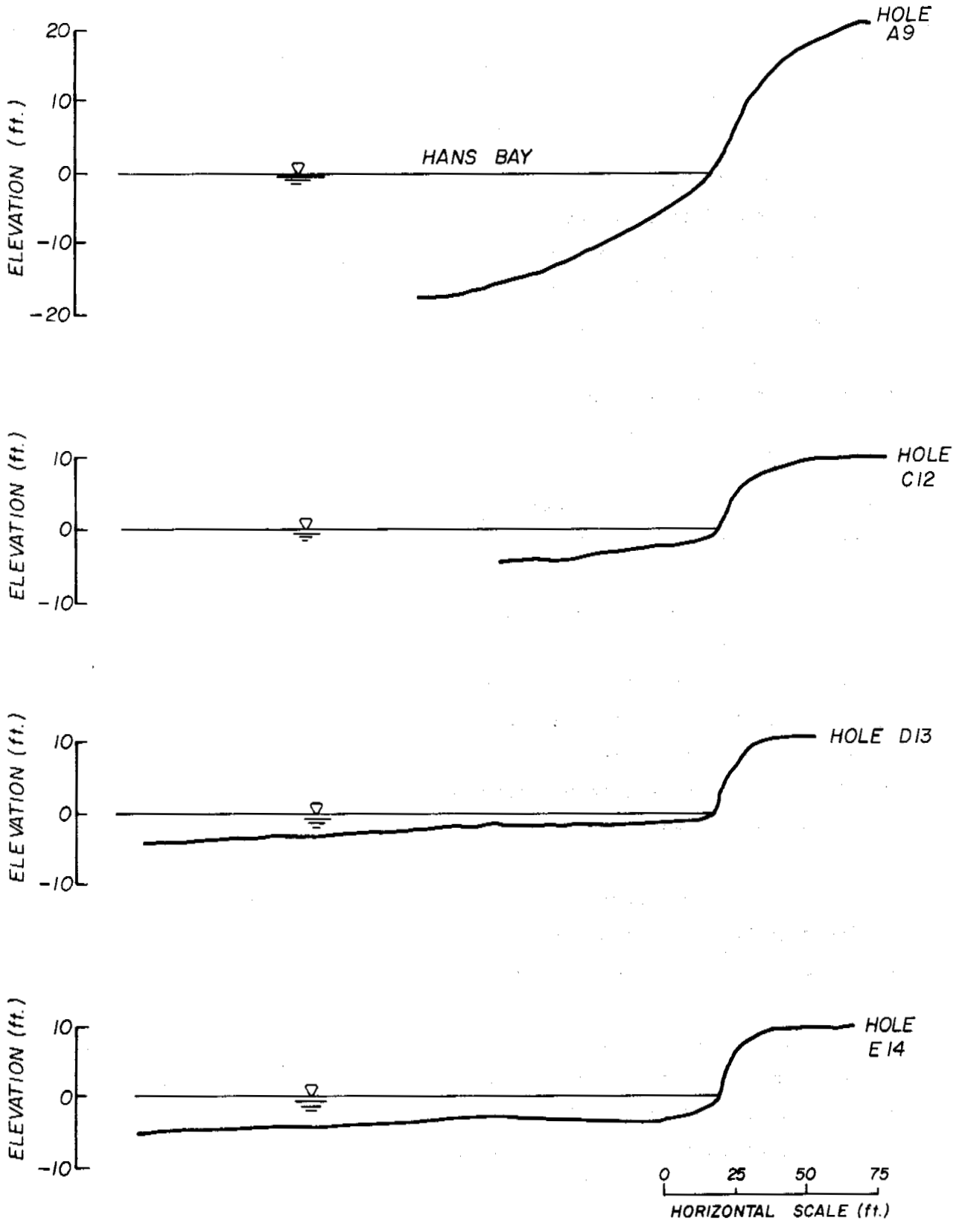


FIGURE 4·6 DEPTH PROFILES IN HANS BAY

4.3.3 Subsurface Conditions

Stratigraphic cross sections of the docksite and staging areas are presented in Figures 4.7 and 4.8. The location of these sections are shown in Drawing A.1. The stratigraphy in the docksite and staging area consists of a thin layer of outwash and glacial-lacustrine sediments overlying preglacial deltaic deposits.

The ice contents of the material are moderate to high. The volume of segregated ground ice is typically in the order of 50 percent in the surficial silts and clays. Some excess ice has developed in the outwash sand, especially in the vicinity of Borehole E14 where the sand is at the surface. The preglacial silts and clays have excess ice contents in the order of 20 to 30 percent while the preglacial sand has little or no excess ice. Large vertical wedges of segregated ice obviously exist in the ice wedge polygon areas; however, no wedges were penetrated by a borehole.

Ground temperature measurements were obtained in Borehole E14 and the results presented in Figure 4.5. Because of the proximity to the bank, the temperatures are very warm until approximately lake (sea) level where they begin to decrease. The interior of the staging area would have temperature profiles similar to Borehole B5 and E3 which reach a constant temperature of 21^{o}F at approximately 15 feet.

4.3.4 Discussion

The proposed docksite is shown in Drawing A.1. The bank materials in this area are more granular resulting in lower ice contents and less thaw susceptability. The location is at a wide portion of the bay where

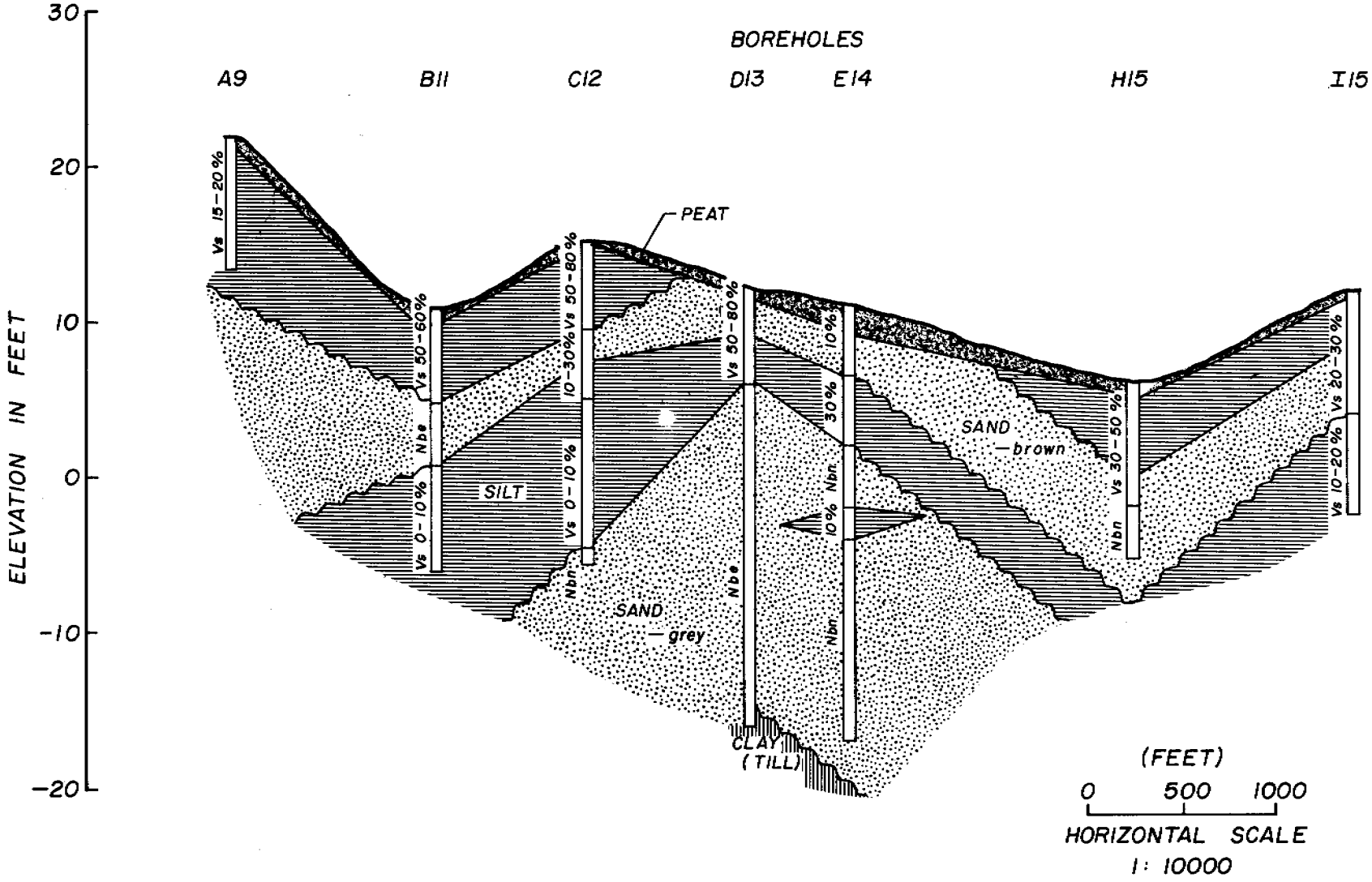


FIGURE 4.7 STRATIGRAPHIC CROSS SECTION A-A DOCKSITE

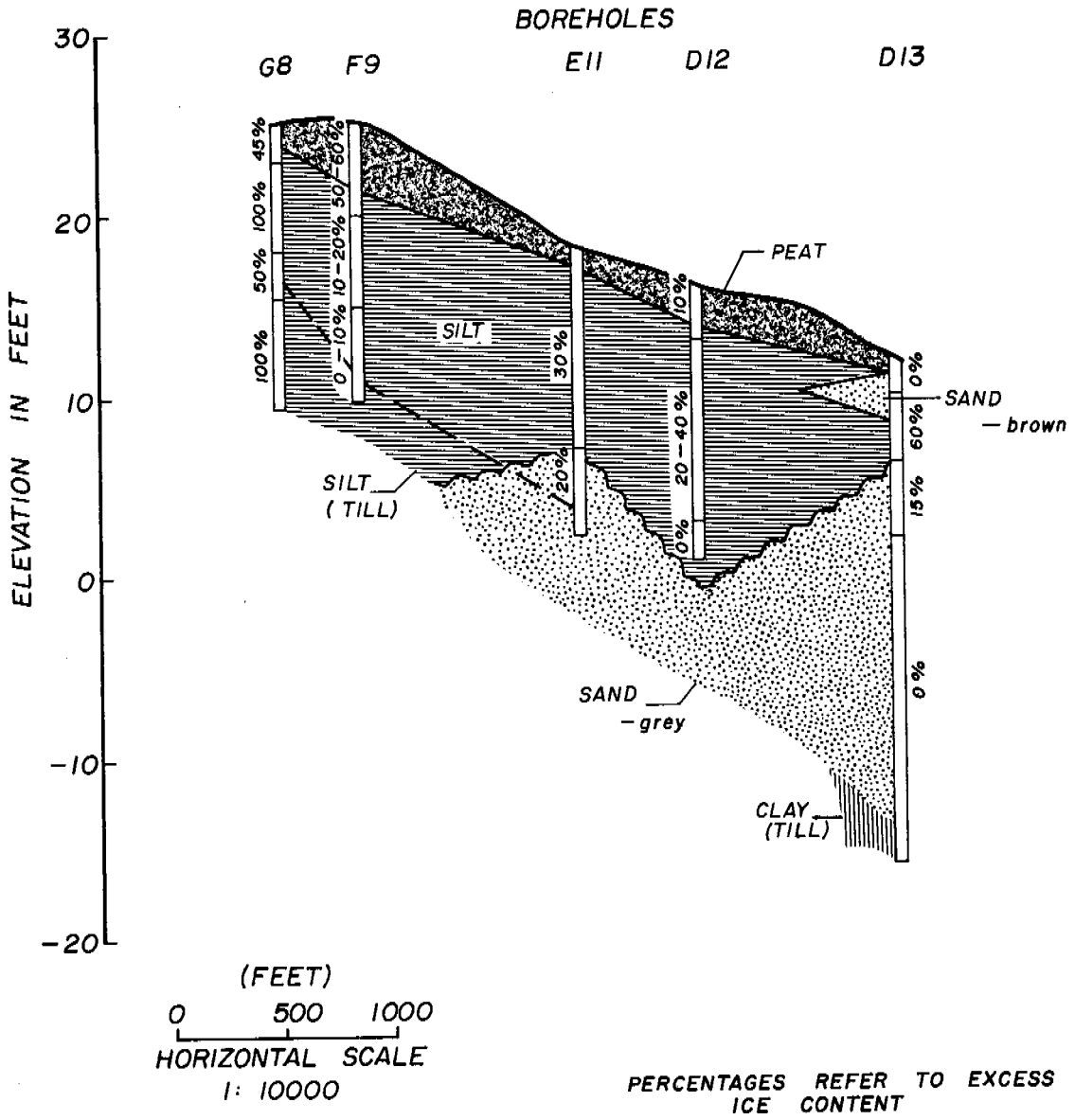


FIGURE 4.8 STRATIGRAPHIC CROSS SECTION B-B DOCKSITE

barge manoevering will be easier. Deeper water was found near Borehole A9 but the confined location and the greater bank relief discouraged this location. Because of the shallow underwater slopes (Figure 4.6), some dredging will be required to accommodate the anticipated barge draft requirements of 8 feet.

For the heavy loads which must be supported, an earth fill dock with sheet pile retaining walls appears to be the most practical. A significant amount of earthwork may be required to transport the heavy modules from barge level (4 to 5 feet a.s.l) to the graded staging area (20 feet a.s.l) without exceeding a recommended maximum slope of 7%.

Sheet pile placement and dredging feasibility is contingent on the absence of permafrost under the lake. It may be necessary to extend the structure farther offshore to overcome difficulties with frozen ground. Additional drilling, preferably from the ice on Hans Bay to profile the extent of the permafrost table under the lake is essential to dock design. Moreover the lake bed material should be assessed for possible use as hydraulic fill.

The proposed staging area is outlined in Drawing A.1. From a geotechnical point of view, the site is excellent. It is expected that approximately 5 feet of granular fill will be required to prevent degradation of the permafrost.

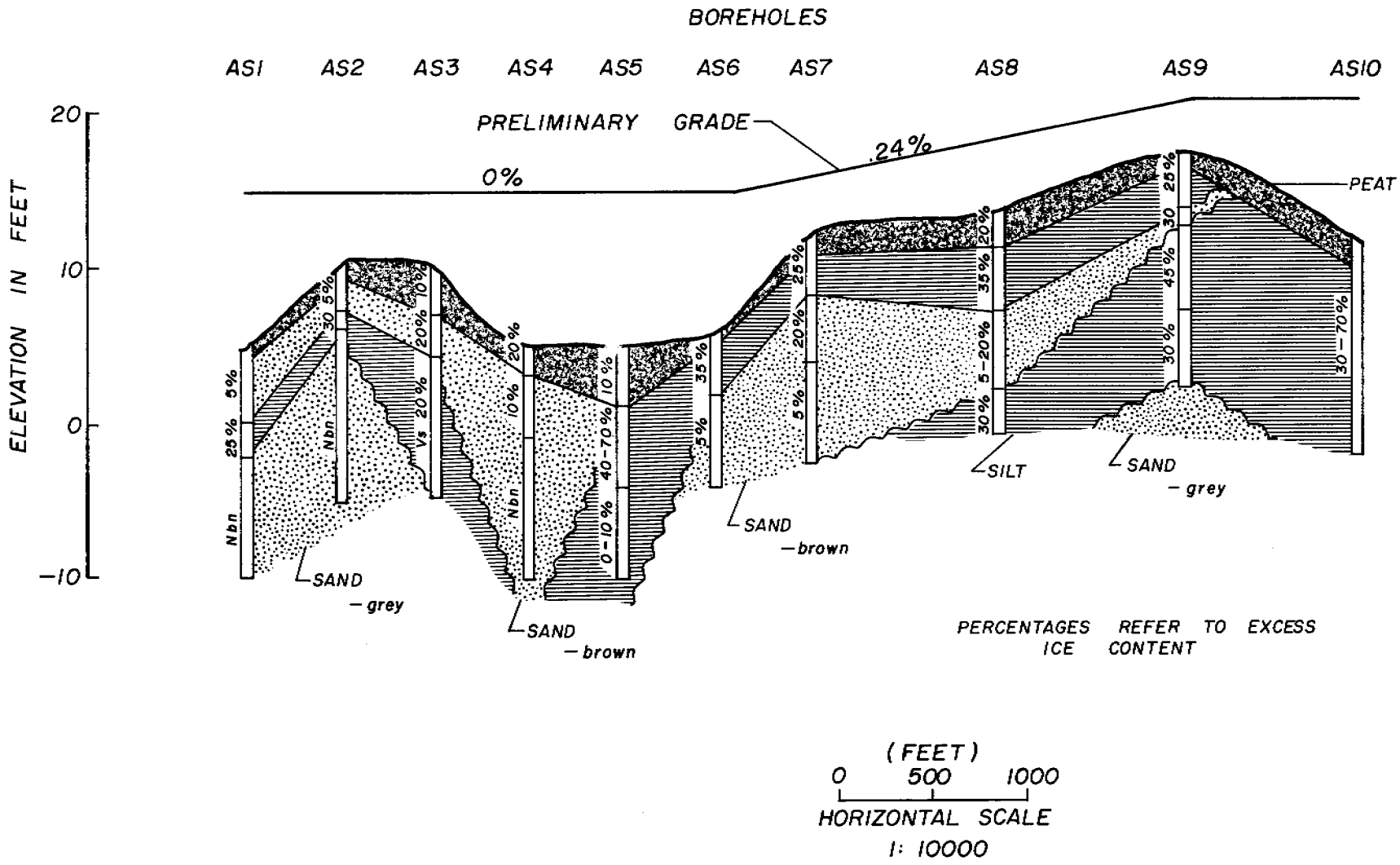


FIGURE 4.9 STRATIGRAPHIC CROSS SECTION ALONG AIRSTRIP A - AREA A

4.4.2 Surficial Conditions

Proposed Airstrip A is located on relatively flat glacial outwash and lacustrine area (Drawing A.2). The maximum relief along the strip is 12 feet. The drainage of the surrounding region is good as no major drainage courses are intercepted by the proposed fill. Permanent water ponding adjacent to the fill would not be expected except possibly at the north end where the strip is situated on a drained lake basin and some seasonal ponding probably occurs.

The vegetation consists of reindeer moss and grasses in the well drained areas and sedges in the more moist locations.

Airstrip B is situated on two high and flat ridges which are probably glacial outwash deposits. A 35 foot gully exists between them. The drainage from the outwash deposits is excellent but a major drainage course exists in the gully (Drawing A.2). The vegetation consists of grasses and mosses on the outwash deposits with sedges in the gully. A profile and proposed grade is presented in Figure 4.10.

4.4.3 Subsurface Conditions

A cross section of proposed Airstrip A is presented in Figure 4.9. The area, which is very similar to the docksite, is characterized by glacial lacustrine and outwash sediments overlying deltaic sand. The generalized stratigraphy presented in Figure 4.9 has been complicated by thaw collapse scars associated with thaw settlement of a small lacustrine basin. This basin is now a bay in the large lake east of the airstrip location.

A peat layer from one to five feet thick, covers the entire area. The sand is very near the surface at the southern end of the strip and underlies approximately five feet of silt towards the northern end.

The ground ice conditions are moderate. The sand deposits within 10 feet of the surface contain an average of 15% ice while no excess ice was encountered in the sand below that depth. The silt has approximately 30 to 40 percent excess ice while the clay material has from 30 to 70 percent excess ice.

No borings were obtained at proposed Airstrip B; however, since the landform appears to be the same as Area C, the subsurface conditions are expected to be similar. In Area C, approximately 8 feet of high ice content lacustrine silt and clay was encountered over sand with a low ice content.

4.4.4 Discussion

An airstrip capable of handling jet traffic can be constructed at the site designated "Airstrip A". The airstrip bearing of 346° from true north is satisfactory as the prevailing winds in the area are from the north-west. The proposed final grade shown in Figure 4.9 has a maximum slope of 0.24% which is well within the 2% specified. It is anticipated that a minimum of 8 feet of fill will be required to preserve the permafrost condition with no anticipated thaw settlement. This results in a fill volume of approximately 430,000 yd^3. If a jet strip is required and it is to be paved, the thermal influence of the pavement may necessitate even thicker fill or insulation to protect the permafrost. The location is approximately 2 miles from the proposed Area A plantsite.

The location meets all of the longitudinal set back and obstacle clearance requirements; however, a small amount of excavation is necessary on the west side of the runway, midway between Boreholes AS9 and AS10 to meet lateral obstacle clearance requirements.

4.5 Area B

4.5.1 General

Twenty-two boreholes were drilled in Area B, of which 6 were located at a possible airstrip site. The borehole locations are shown in Figure A.3, the borehole logs are presented in Appendix B.5 and the results of grain size analyses are included in Appendix C.4. A brief aereal photography interpretation was undertaken and the results presented in Drawing A.4. The subsurface conditions were more uniform and as favourable at Area B as at Area A. However, the surficial conditions are less desireable and overall site location relative to the dock site and prospective borrow areas is clearly not as desireable as that for Area A.

4.5.2 Surficial Conditions

Area B is situated near what is believed to be the shore of a post glacial lake. Glacial-lacustrine deposits have smoothed out the topography resulting in a very gentle (0.8%) slope towards the east. Because of the gentle slope the drainage was quite poor. No major drainage courses were noted and moisture content of the active layer was found to be considerably greater than at Area A. Extensive ice wedge polygon features have developed over the site, especially in the vicinity of Borehole A3 where the local relief between the center and the edges of the polygons is 3 to 4 feet (raised centres).

The vegetation consists mainly of grasses and mosses. A moderate growth of willow and alder shrubs is present towards the north end of the site.

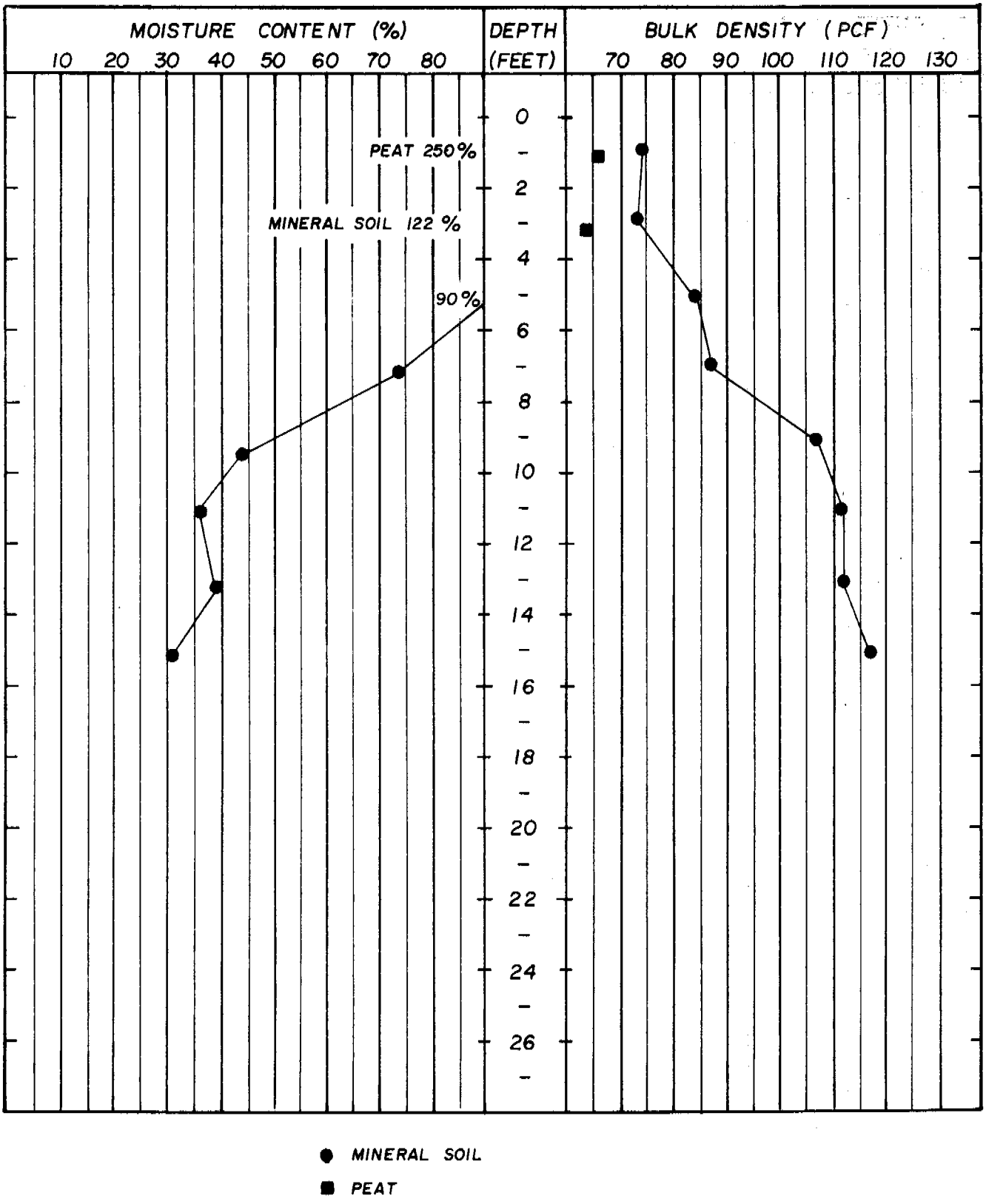


FIGURE 4.11 SUBSURFACE CONDITIONS AREA B

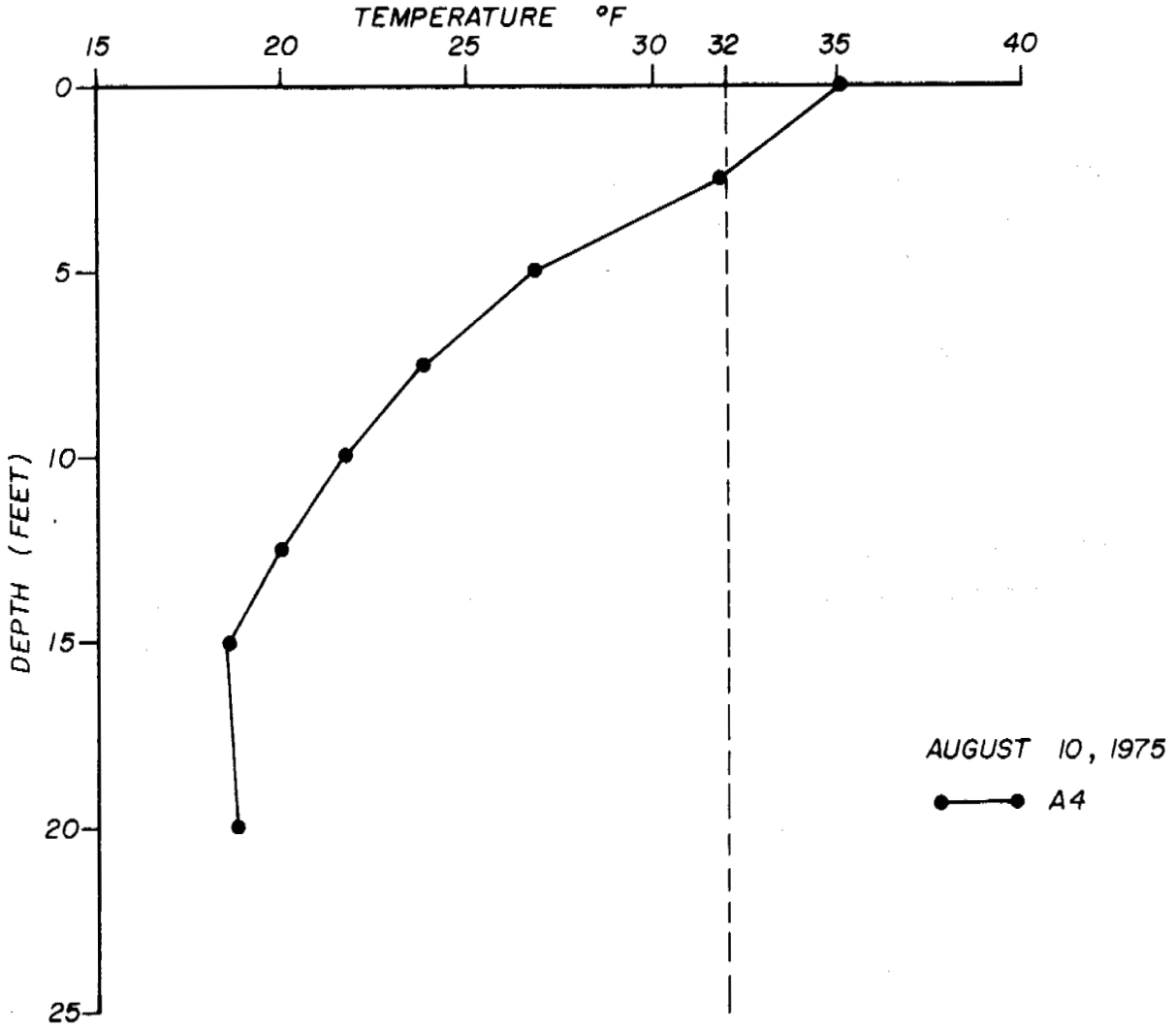


FIGURE 4.13 TEMPERATURE PROFILE - AREA B

of 2 feet. The slopes from the terrace down to the surrounding terrain are quite steep. A 40 foot deep gully separates Boreholes C6 and C7 from the remainder of the site.

The area is very well drained. No free water was observed in the active layer and the vegetation was typical of dryer regions. Some local spots which supported a lusher vegetation were observed; however, the moisture conditions at these spots were still quite dry. It is thought that a significant portion of the area is swept free of snow by the winter winds.

The average depth of thaw at the time of the drilling program was 1 foot and the depth of the active layer is expected to be about 1.5 feet. Some ground ice features are apparent in the south half of the area but they are quite subtle. The vegetation consists of hummocky moss and grass cover with sparse stunted shrubs.

4.6.3 Subsurface Conditions

A stratigraphic cross section is presented in Figure 4.14. The subsurface conditions consist of approximately 8 to 15 feet of lacustrine silt and clay overlying sand. The sand was found to extend to the maximum depth of drilling which was 28 feet. The surficial peat layer was typically one foot thick.

The excess ice content in the silt and clay ranged from 20 to 60 percent while the excess ice content in the sand was less than 10 percent. The moisture content in the sand ranged from 25 to 35 percent.

No ground temperature measurements were made, however it is believed that the temperatures are similar to the interior boreholes at Areas A and B.

4.6.4 Discussion

The foundation conditions at this site are excellent. If freeze back piles were used, the overall length could be kept significantly shorter than for the other sites. It may even be possible to strip the high ice content clay and silt and place footings directly on the sand. This possibility would require considerably more data before a decision could be made.

The relative ease of site preparation makes this area very attractive from an engineering standpoint. Although the haulage distances to the borrow areas are considerably longer than for Area A, the gravel quantities which would be required are certainly less. The grading requirements for a high quality road to transport heavy modules up to Area C are quite demanding. Moreover, the site location will add substantially to the length of access roads and gas gathering pipelines. These factors must be evaluated to determine the realtive merits of the site.

Airstrip conditions at Area C are excellent. The flat terrain minimizes the amount of fill required and the high elevation would avoid considerable ground fog. Also, there is sufficient room for a cross strip.

5.2 Origin of Granular Borrow

The prime sources considered for granular material exploitation in the Parson Lake area are deltaic and fluvial terraces formed along a small river which enters the Eskimo Lakes between Hans Bay and Bonnieville Point. These terraces contain interbedded gravel, sand and silt. The gravel beds range from a few feet to over 60 feet. Stratified gravel and sand beds have been observed on bank exposures at Source 1.

5.3 Ground Ice Conditions

The ice content of the gravel, occurring as ice inclusions and lenses is reported to range from 5% to 20% by volume. The average ice content appears to be 10% by volume. The moisture content of the gravel material was found to be 4.1% to 18.3% with an average of 10% over the four source areas.

The underlying fine sands, silts and clays contain ground ice in the form of segregated ice lenses and non-visible well bonded ice. Average moisture content are in the order of 25%. These materials are considered to be unsuitable for borrow development.

Massive ground ice formations up to 17 feet thick have been encountered in Sources 1 and 4. The massive ground ice usually occurs between the fine materials and the overlying coarse granular materials or between organic peat layers and underlying granular material. The massive ice features could restrict or impede the development of a borrow source because of the ponds formed from the melting ice and extensive subsidence of the pit floor.

On this basis it is evident that a detailed peterographic and trial mix design program will be required to determine the material suitability for concrete applications. The material will be very suitable as general fill, for foundation pads and subgrade construction.

5.6 Volume Estimate

Sources 1, 2, 3 and 4 contain gravel and sand materials in sufficient quantities for exploitation. The minimum quantities of granular material which can be recovered from these sources have been estimated (Reference No. 3) as follows:

TABLE 5.1
ESTIMATED VOLUME OF GRANULAR MATERIAL

SOURCE	VOLUME ESTIMATE (CUBIC YARDS)	BORROW THICKNESS (FEET)
1	1,000,000	16
2	250,000	5
3	370,000	7-10
4	200,000	15
TOTAL	1,820,000 cubic yards	

5.7 Overburden and Surface Cover

The area is sparsely vegetated with grasses, lichens, willows and laurel. The overburden consists of organic peat and frozen silt between 5 and 14 feet thick.

The summer operation consists simply of stripping and stockpiling the newly thawed material. This allows the material to drain rapidly and increases the thawing in the deposit. Stockpiling operations take place when the thaw front has penetrated 1 to 2 feet into the deposit.

An important consideration from the ecological and construction viewpoint is the existance of massive ground ice layers below the gravel deposit. Up two 17 feet of massive ice was encountered in sources 1 and 4. If the pit development encounters massive ice bodies, thaw ponds may form, impeding drainage and mobility in the pit. Further drilling is recommended to better define the extent of these massive ice bodies. In many instances it will be necessary to leave a soil cover of approximately 5 feet over the ice to limit thawing.

The haul routes are shown in Drawing A.4. A winter route over the ice of Hans Bay should be considered since it would reduce the consumption of granular materials and the environmental impact. This decision would depend upon construction scheduling.

As the stockpiled borrow material and the excavated overburden thaws and drains, large amounts of silty water will be produced. The environmental implications of this dirty water reaching the Eskimo Lakes could be severe. It may be necessary to construct retaining or settling ponds to collect the runoff and allow the silt to settle out before discharging the water into the lake.

5.10 Pit Management

The gravel pit should be opened and the initial lift of gravel stockpiled for one or more years in advance of construction. Since the volume of material in these deposits is estimated to be very close to the volume of material required, careful planning and tight control should be exercised throughout the recovery operation. Care is also required in the pit operation to insure adequate sorting of the sand, gravel and overburden materials.

VI. ROADWAY AND GATHERING LINE ROUTES

6.1 General

A gas gathering pipeline system and associated roadway access connecting the producing well clusters with the selected plantsite is required. A gathering system route, shown in Drawing A.4 and Figure 6.1, is proposed. It consists of a header line connecting all of the well clusters and a main line connecting either the Area A or B plantiste to the header line. It is understood that an above ground pile supported pipeline system is considered to be the most viable design possibility at this time.

A second road system is also required to transport heavy modules from the dock to the plant areas. The geometric design criteria for such a road are well defined. The heavy module transporters require a maximum grade of 7 percent and a minimum radius of vertical curvature of 2500 feet. Moreover, the subgrade must be constructed to the highest standards in order to carry the heavy loading anticipated.

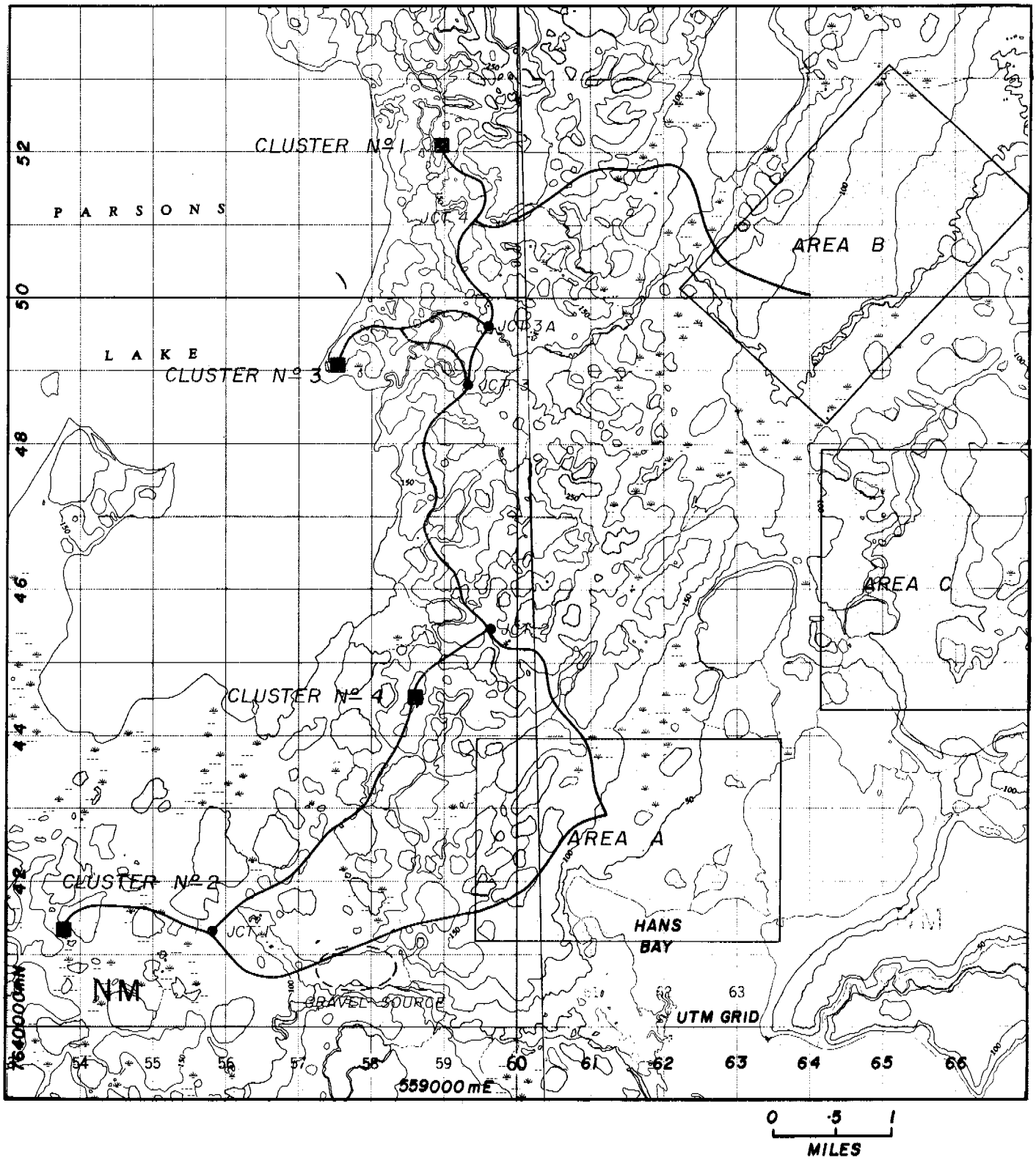


FIGURE 6.1 ROADWAY AND PIPELINE CORRIDOR LOCATION PLAN

The geometric standards for the gathering system are not as well defined. A maximum roadway slope of 10% was adopted. It is desireable to keep the pipeline grades shallow in order to prevent "slug flow" of the gas and liquid components of the well product. Some adjustments of the grade, however, can easily be accommodated by varying the above ground pile length.

The routes were selected from an aerial photographic interpretation in conjunction with detailed contour maps. The routes chosen are shown in Drawing A.4 and the profiles are shown in Drawings A.5 to A.12. Because of the realtively high cost of the pipeline structure with respect to the roadway, a high priority was placed on obtaining the shortest possible route. The shortest route was often selected over alternate segments with more favourable foundation and terrain conditions. In some locations the natural grades are greater than 10 percent and grade reducing fills will be required. It is believed that as economical a route as is possible using an "intuitive" approach was obtained. A detailed economic analysis of pipeline versus fill costs is required when the specifications and unit costs are known.

6.2 Terrain Evaluation

An aereal photographic terrain interpretation, presented in Drawing A.4, was performed along the gathering system corridor. The material types of various landforms obtained from boreholes in the study area were extrapolated to similar landforms in the gathering line corridor. No borehole data was obtained in the gathering corridor. A description of the landforms is presented in the legend accompanying Drawing A.4.

The second major landform in the area is the glacial-lacustrine sediments similar to those which were encountered in Areas A and B. These sediments are mostly clayey silt with some pockets of clay. The glacial-lacustrine deposits commonly occur in the low lying areas where the drainage is poor to very poor. Thick peat deposits can be expected in some of the poorest drained areas. Well developed ice wedge polygons were evident throughout the lacustrine deposits and in some of these standing water was noted. Because of the poor drainage, thick peat layer and thin active layer, the glacial-lacustrine sediments are especially sensitive to terrain disturbances. Where a thin layer of glacial-lacustrine sediments exists over the ground moraine, the drainage is somewhat better, but significant ground ice features are evident.

Although the relief was much gentler, the route considered for the gathering system avoided the glacial-lacustrine deposits wherever possible. The poor drainage and sensitivity to terrain disturbances were the main reasons for this.

6.3 Discussion of Route Segments

6.3.1 General

This section discusses briefly each of the route segments with respect to foundation conditions, grades and drainage.

6.3.4 Junction 3 to Cluster 1 (Drawing A.7)

The major feature in this section is the river crossing at STN 420. A bridge structure will probably be required. The flood plain is relatively narrow at this section (200 ft) and both banks appear to consist of a thin layer of glacial-lacustrine material overlying ground moraine. The rest of the section crosses ground moraine with many kame hummocks which are composed of granular material of varying quality. Several grades in excess of 10 percent exist but they can probably be reduced by a slight rerouting in the detailed design.

6.3.5 Junctions 3 and 3B to Cluster 3 (Drawing A.8)

Two alternates were chosen for this route. The first alternate from Junction 3B to Junction 3 requires an additional river crossing plus major grade reducing fills and is not recommended. The second alternate traverses ground moraine from Cluster 3 to STN 50A. It then crosses a thin glacial-lacustrine deposit over ground moraine. Some ice wedge polygons are apparent on the airphoto. Although a major river crossing is not required with this alternative route at least one major culvert is needed.

6.3.6 Plantsite, Area A to Junction 2 (Drawing A.9)

The first section of the route traverses mainly gently sloping ground moraine and glacial-lacustrine sediments over ground moraine. Two short terrain sections, with peat over glacial-lacustrine sediments are also crossed. A major topographic low was crossed at STN 60. The foundation conditions consisted of peat over glacial-lacustrine sediments. Although no established drainage course was evident, significant flows may occur in this channel during spring breakup.

VII. RECOMMENDATIONS

7.1 General

This section summarizes the recommendations which have been implied or stated in the previous sections. Although geotechnical considerations were primary, the logistical and functional aspects of the construction and operation of the gas plant were considered in formulating these recommendations.

7.2 Plantsite - Area A

Area A is considered the primary location for a plantsite. Adequate foundation and drainage conditions exist along with several logistical advantages. The location is close to the proposed dock site and borrow areas which will minimize the amount of roadwork. A choice of two good airstrip locations is available.

As an initial estimate at least five feet of fill is required where a small amount of thaw settlement can be tolerated. Freeze-back piles extending to depths below 15 feet should be considered the prime foundation type, however there is an excellent possibility of utilizing end bearing piles. This must be verified by further exploration and testing. Spread footings in the fill in conjunction with a ventilated crawl space are considered adequate for lightly loaded or temporary structures where minor movements can be tolerated. Granular pads which provide building foundation support should be constructed at least one full year prior to building erection. At present there does not seem to be any geotechnical factors which would limit construction to a winter operation. The terrain and ground ice conditions should be reasonably tolerant of summer

be undertaken to profile the permafrost table which may extend under the lake and to evaluate the lake sediments for possible use as a hydraulic fill.

7.6 Airstrip

Possible airstrip locations were investigated at all three areas. An airstrip with jet capabilities (6000 ft.) and an airstrip with STOL capabilities (3200 ft.) were investigated at Area A. The jet airstrip is approximately 2 miles from the proposed Area A plantsite and at a bearing of 346° from true North. The STOL airstrip is approximately 3/4 mile from the plantsite and at a bearing of 12° from true North. Approximately 8 feet of fill is required to ensure freeze-thaw stability of the underlying foundation soils. Foundation and drainage conditions at each of the sites are equally good, but a slight amount of excavation is required to meet obstacle clearance requirements at the jet strip.

The Area B airstrip, which has jet capabilities, has a bearing of 356° from true North. The foundation conditions are poor, especially at the north end where extensive ice wedge polygon development is evident and where the drainage is very poor.

Sufficient room exists at Area C for a jet airstrip and a cross strip. The foundation and drainage conditions are excellent.

7.7 Future Geotechnical Requirements

This report is the first phase of the geotechnical evaluation of the Parsons Lake Gas Plant Development. It is anticipated that sufficient geotechnical data has been collected and presented to assist with a

Respectfully submitted,

EBA Engineering Consultants Ltd.

David D. Kent, P. Eng.

N.R. MacLeod, P. Eng.

D.W. Hayley, P. Eng.

DDK:lmh

LEGEND

- DRILL HOLES
- WINKI DRILL HOLES

0 500 1000

SCALE (FEET)

UTM GRID (FT)

PROPOSED PLANTSITE SITE AREA 4.07 x 10^6 FT.^{2}

PROPOSED STAGING AREA 2.1 x 10^6 FT.^{2}

PROPOSED DOCKSITE

PROPOSED AIRSTRIP

3200 FT.

200 FT.

6000 FT.

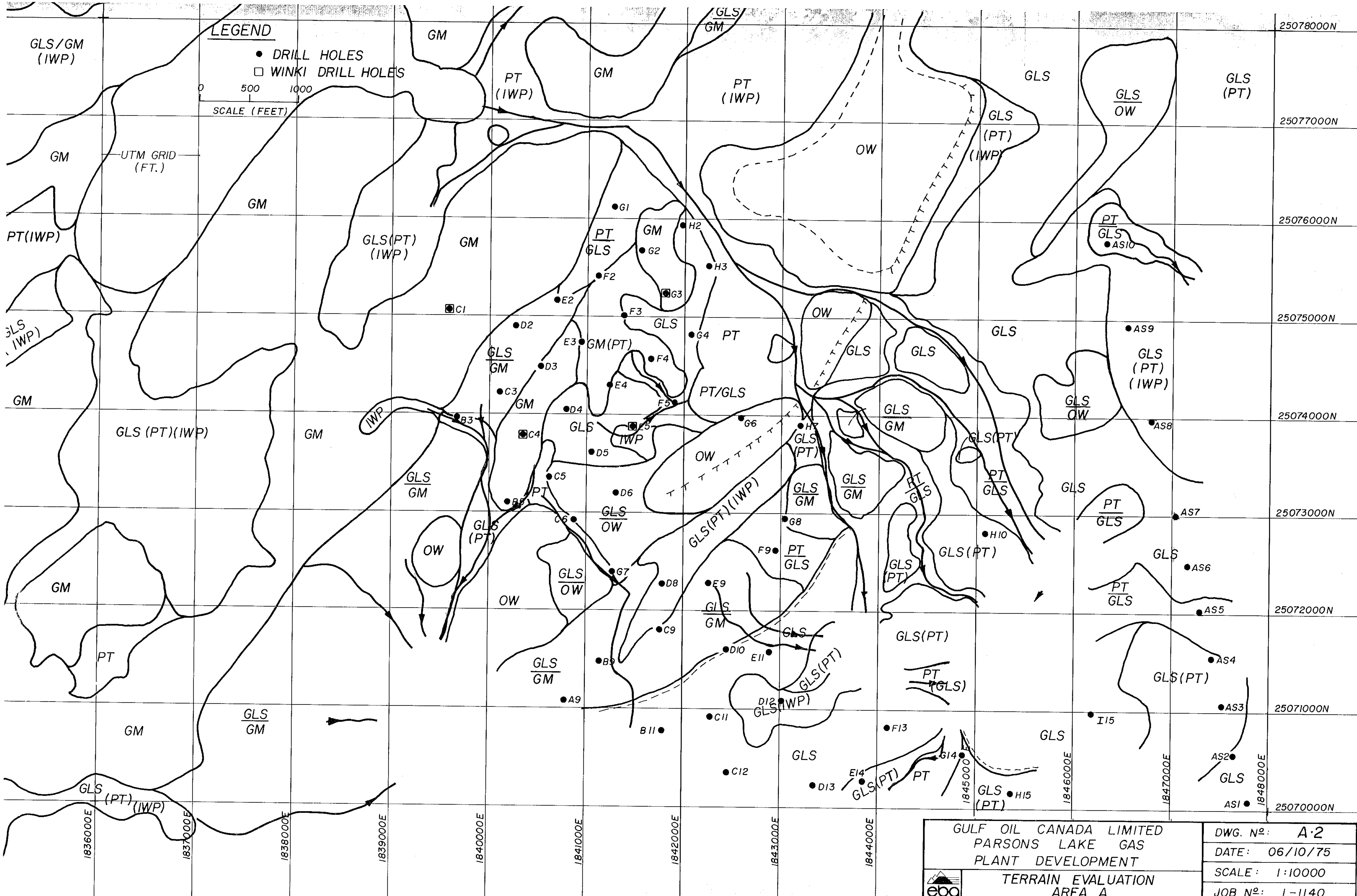
3000 FT.

AIRSTRIP B

25078000N
25077000N
25076000N
25075000N
25074000N
25073000N
25072000N
25071000N
25070000N

1836000E
1837000E
1838000E
1839000E
1840000E
1841000E
1842000E
1843000E
1844000E
1845000E
1846000E
1847000E
1848000E

GULF OIL CANADA LIMITED PARSONS LAKE GAS PLANT DEVELOPMENT	DWG. Nº: A-1
	DATE: 06/10/75
eba BOREHOLE & FACILITY LOCATIONS, AREA A	SCALE: 1:10000
	JOB Nº: 1-1140



LEGEND
• DRILL HOLES
□ WINKI DRILL HOLES
0 500 1000
SCALE (FEET)
UTM GRID (FT.)
GLS/GM (IWP)
GM
PT (IWP)
GLS (PT) (IWP)
GLS/OW
PT/GLS
GLS/GM
GM (PT)
PT/GLS
OW
GLS (PT)
GLS (IWP)
GLS
PT
IWP
GLS (PT) (IWP)
PT (GLS)
25078000N
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1839000E
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1843000E
1844000E
1845000E
1846000E
1847000E
1848000E
GULF OIL CANADA LIMITED
PARSONS LAKE GAS
PLANT DEVELOPMENT
TERRAIN EVALUATION
AREA A
eba
DWG. Nº: A·2
DATE: 06/10/75
SCALE: 1:10000
JOB Nº: 1-1140

LEGEND

● DRILL HOLES

□ WINKL DRILL HOLES

UTM GRID (FT.)

SCALE (FEET) 0 500 1000

B1 C1 D1 A2 B2 C2 D2 E2 F2 A3 C3 E3 A4 C4 E4 G4 H4 AS1 AS2 AS3 AS4 AS5 AS6

1847000E 1848000E 1849000E 1850000E 1851000E 1852000E 1853000E 1854000E 1855000E 1856000E 1857000E 1858000E

2509500ON 2509600ON 2509700ON 2509800ON 2509900ON 2510000ON 2510100ON 2510200ON 2510300ON 2510400ON 2510500ON 2510600ON 2510700ON

GULF OIL CANADA LIMITED PARSONS LAKE GAS PLANT DEVELOPMENT	DWG. Nº: A·3
eba BOREHOLE LOCATIONS AREA B	DATE: 06/10/75
	SCALE: 1:10000
	JOB Nº: 1-1140

TERRAIN CLASSIFICATION

I. LANDFORMS

SYMBOL	TERM	DESCRIPTION
GLS	Glacial Lacustrine Sediments	Interbedded organics, sands, silts and clays deposited in a pro-glacial lake overlying similar sediments which are probably pre-glacial or interglacial deposits. Generally low relief but some relief may be present when thin lacustrine sediments overlie ground moraine. (see phases below)
OW	Glacial Outwash Deposits (pitted)	Flat topped mesa like landforms with steep side slopes. Generally consist of a surficial layer of lacustrine silt and clay over fine outwash sands.
GM	Ground Moraine	Rounded hummocks and ridges to a thin basal till layer. Material ranges from a silty clay till to a sand-silt till. Overlies pre-glacial or interglacial deltaic sediments.
K	Kame	Hummocky, rugged landform composed of granular materials of varying quality. Superimposed on ground moraine.
PT	Peat	Thick organic mass occurring in low lying, poorly drained areas. Usually associated with well developed ground ice features. (see phases below)
FP	Flood Plain	Section of stream valley frequently inundated during floods
AT	Abandoned Terrace	A bench along the side of a valley, the upper surface of which was formerly the alluvial floor of the valley

II FEATURES

IWP	Ice Wedge Polygons	Polygonal ground ice feature visible from the air. Generally indicative of ice rich organic or silty soils. (Not necessarily limited to area in which they have been mapped)
SF	Solifluction Features	Stripes or lobes caused by the slow downslope movement of the active layer material as a result of freeze-thaw cycles.

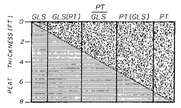
III SYMBOLS

Glacial beach, terrace

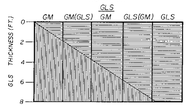
Drainage course indicating direction

PHASE NOTATION

PEAT OVER SUBSTRATA (eg. GLS)



GLACIAL LAKE SEDIMENTS OVER GROUND MORAINE



LEGEND

70+00 Roadways with stations in 100's of feet

Granular borrow areas

Boreholes

CLUSTER Nº. 1
CLUSTER Nº. 2
CLUSTER Nº. 3
CLUSTER Nº. 4
JUNCTION
JUNCTION 2
JUNCTION 3
JUNCTION 3A
JUNCTION 3B
JUNCTION 4
SOURCE 1
SOURCE 2
SOURCE 3
SOURCE 4
R1 (approximate)
R2 (approximate)
R3 (approximate)
R4 (approximate)
R5 (approximate)
R6 (approximate)
1-C (approximate)
2-C (approximate)
3-C (approximate)
4-C (approximate)
5-C (approximate)
6-C (approximate)
7-C (approximate)
PARSONS LAKE
HANS BAY
PINGO
reworked OW
SEE DRAWING A-2 FOR DETAILED TERRAIN EVALUATION

0 1000 2000
SCALE (FEET)

GULF OIL CANADA LIMITED PARSONS LAKE GAS PLANT DEVELOPMENT	DWG Nº. A-4
TERRAIN EVALUATION AND ROADWAY CORRIDOR LOCATION PLAN	DATE DWN. 14/10/75
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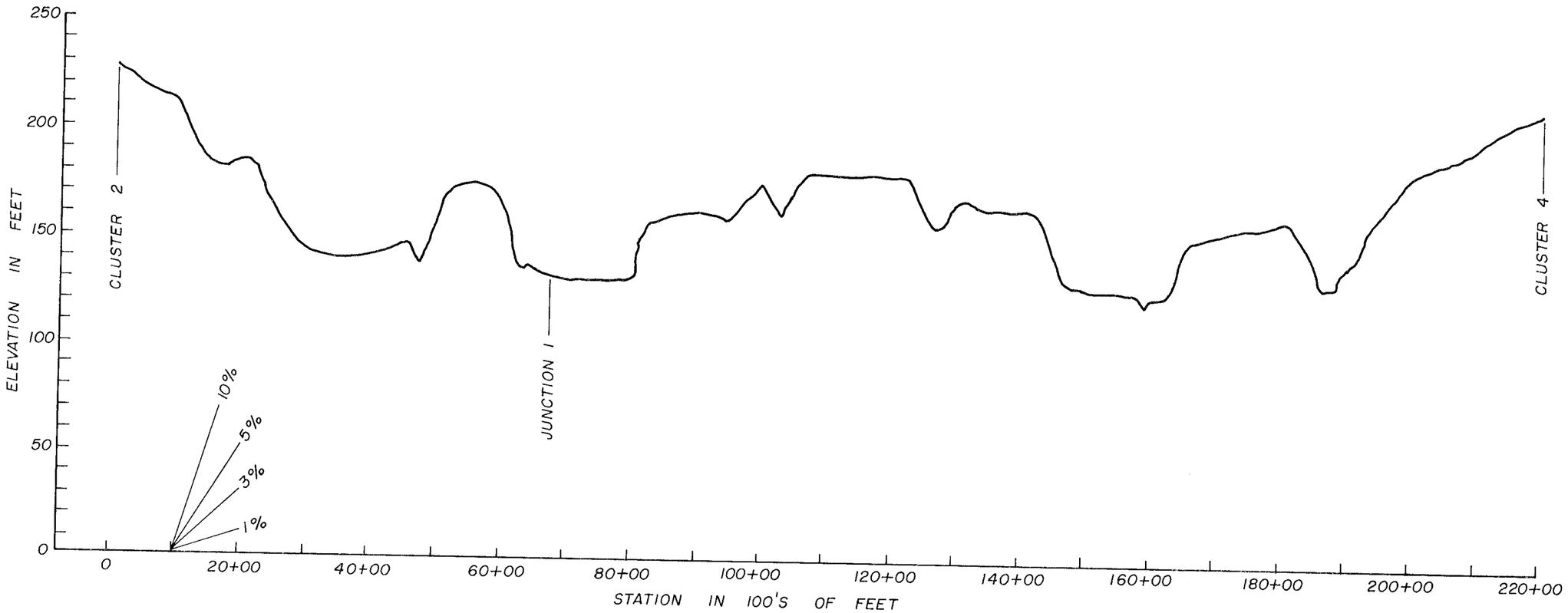
	JOB Nº: 1-1140



HORIZONTAL SCALE
1 : 20000

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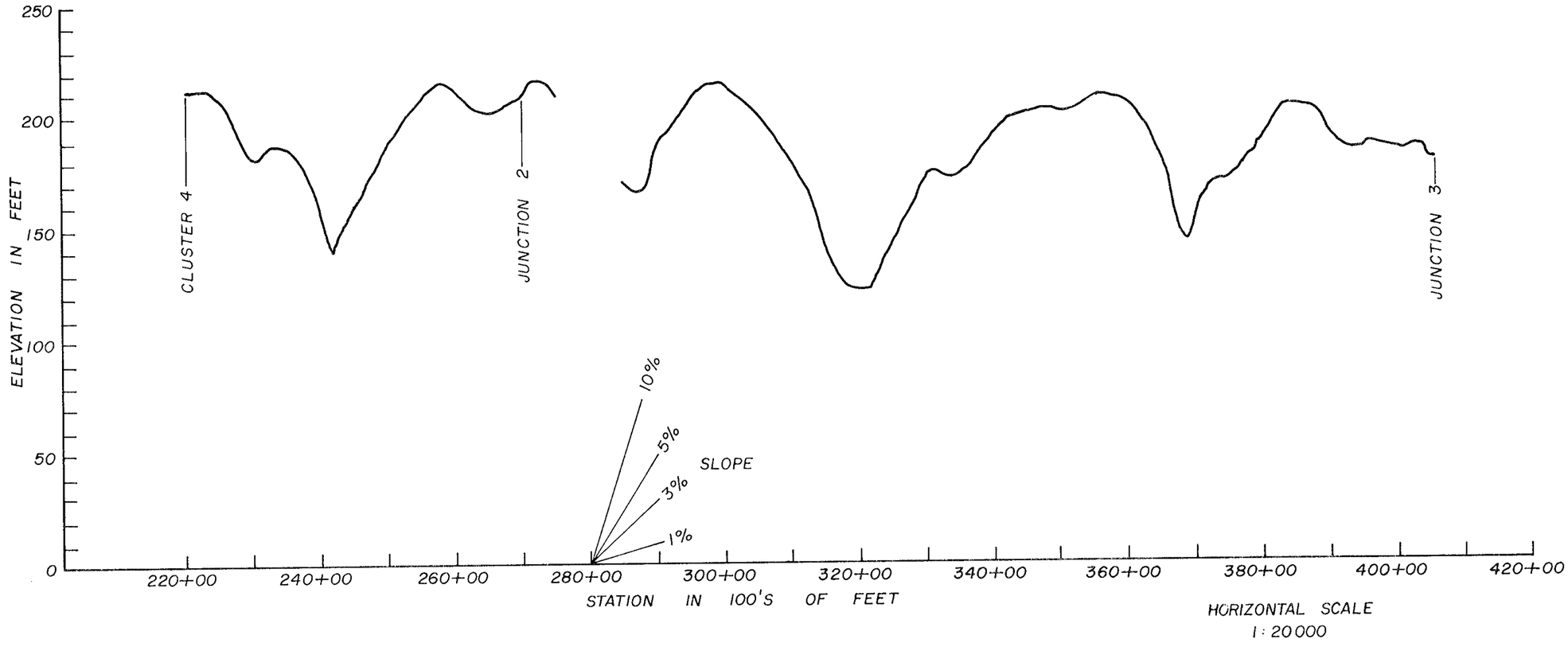
	SCALE: AS SHOWN
	JOB Nº: 1-1140



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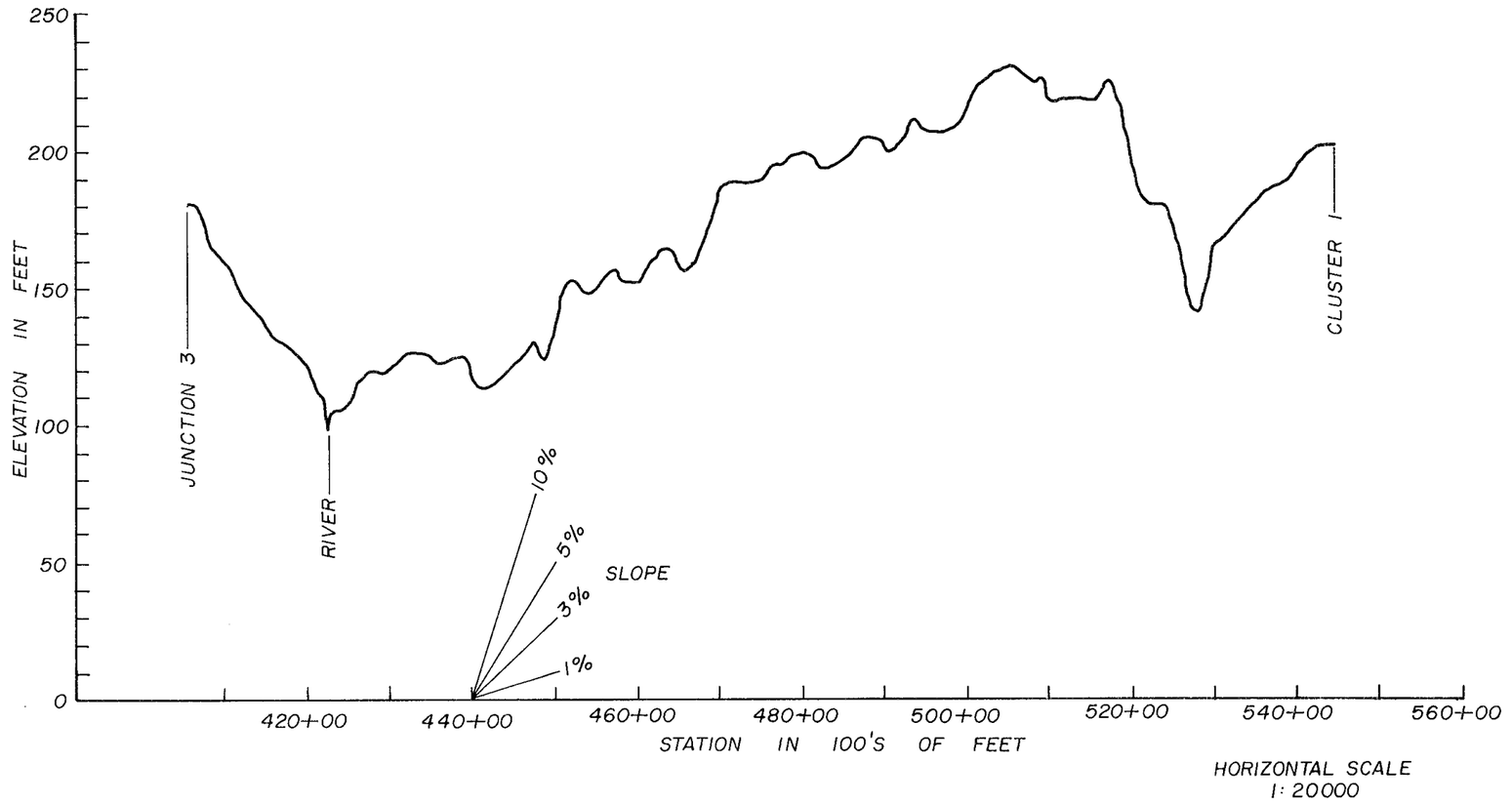
	JOB Nº: 1-1140



HORIZONTAL SCALE
1: 20000

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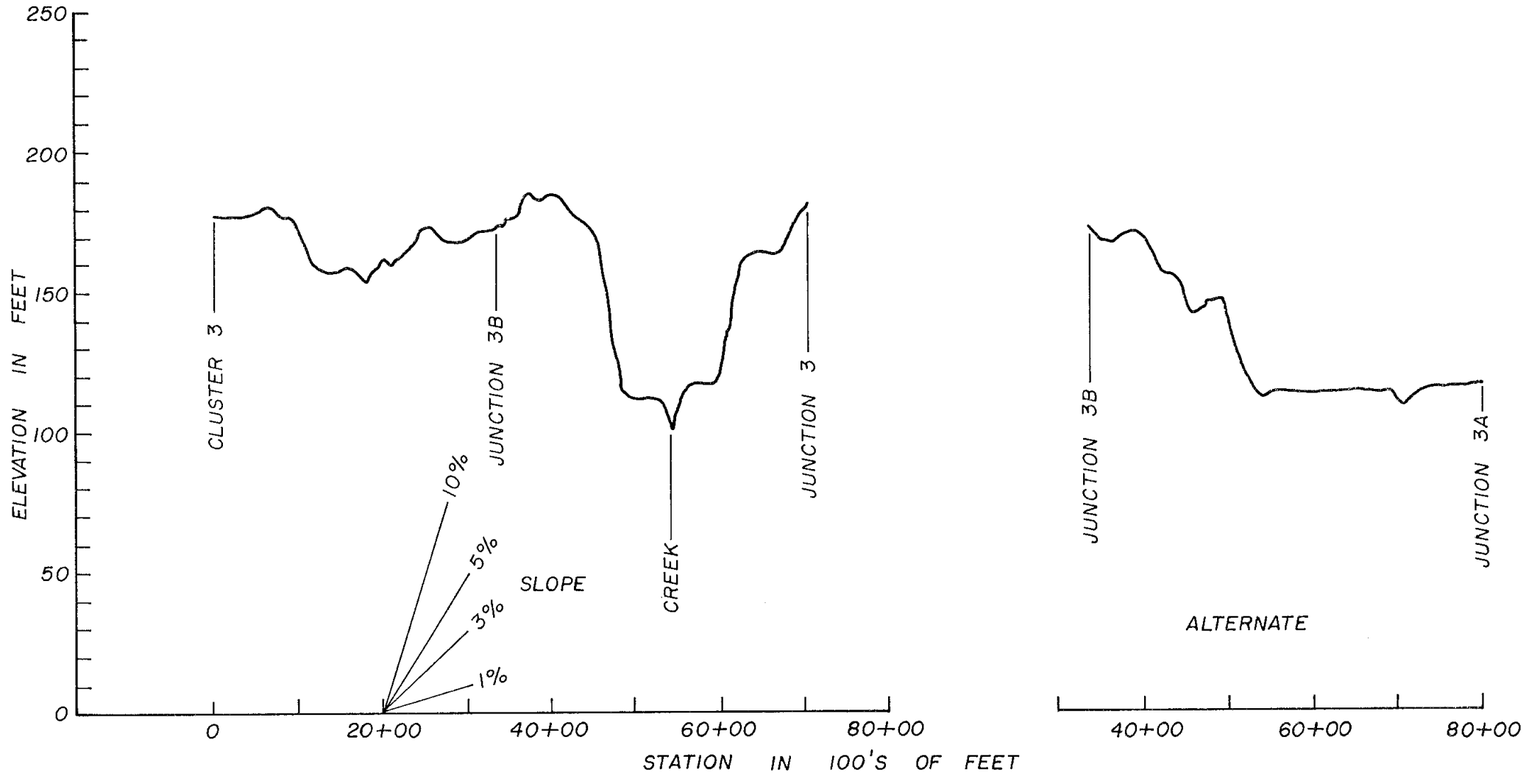
	SCALE: AS SHOWN
	JOB Nº: 1-1140



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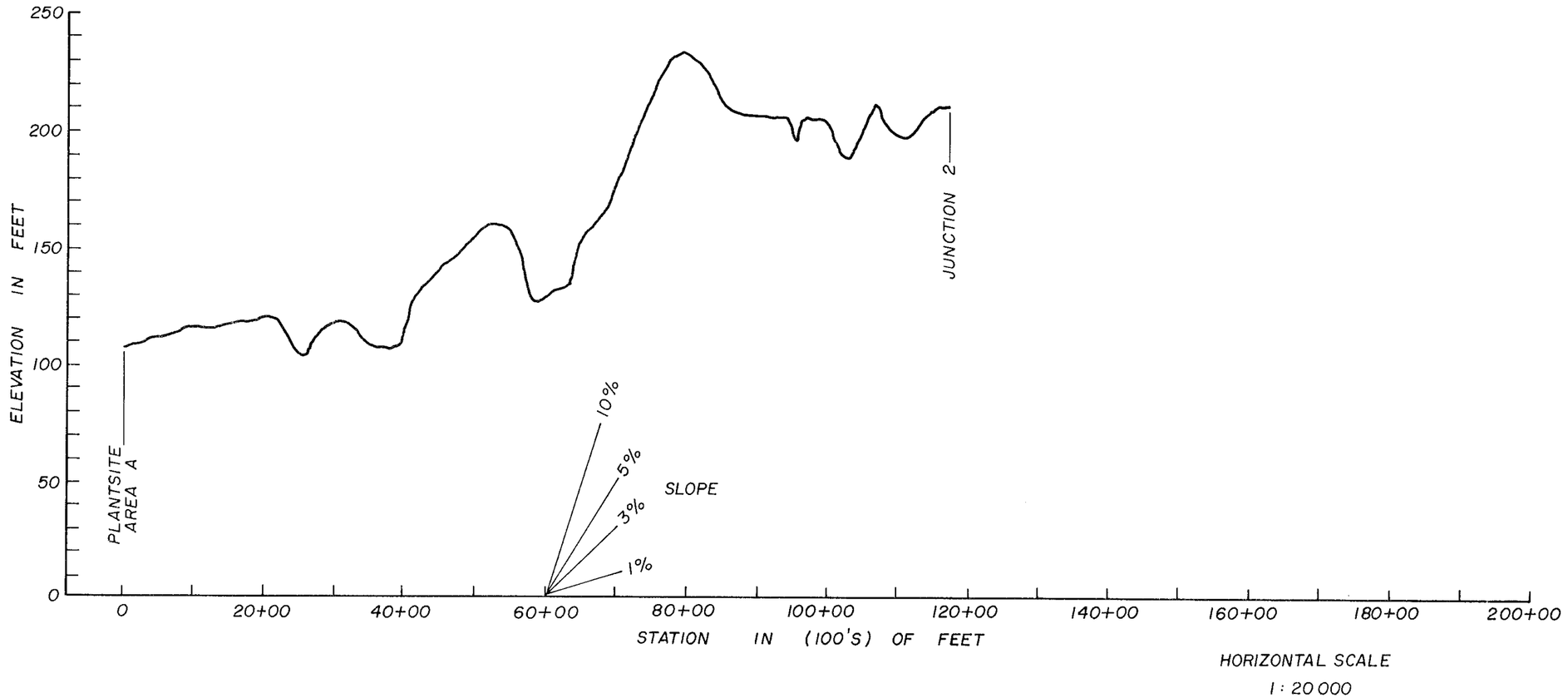
	SCALE: AS SHOWN
eba	JOB Nº: 1-1140



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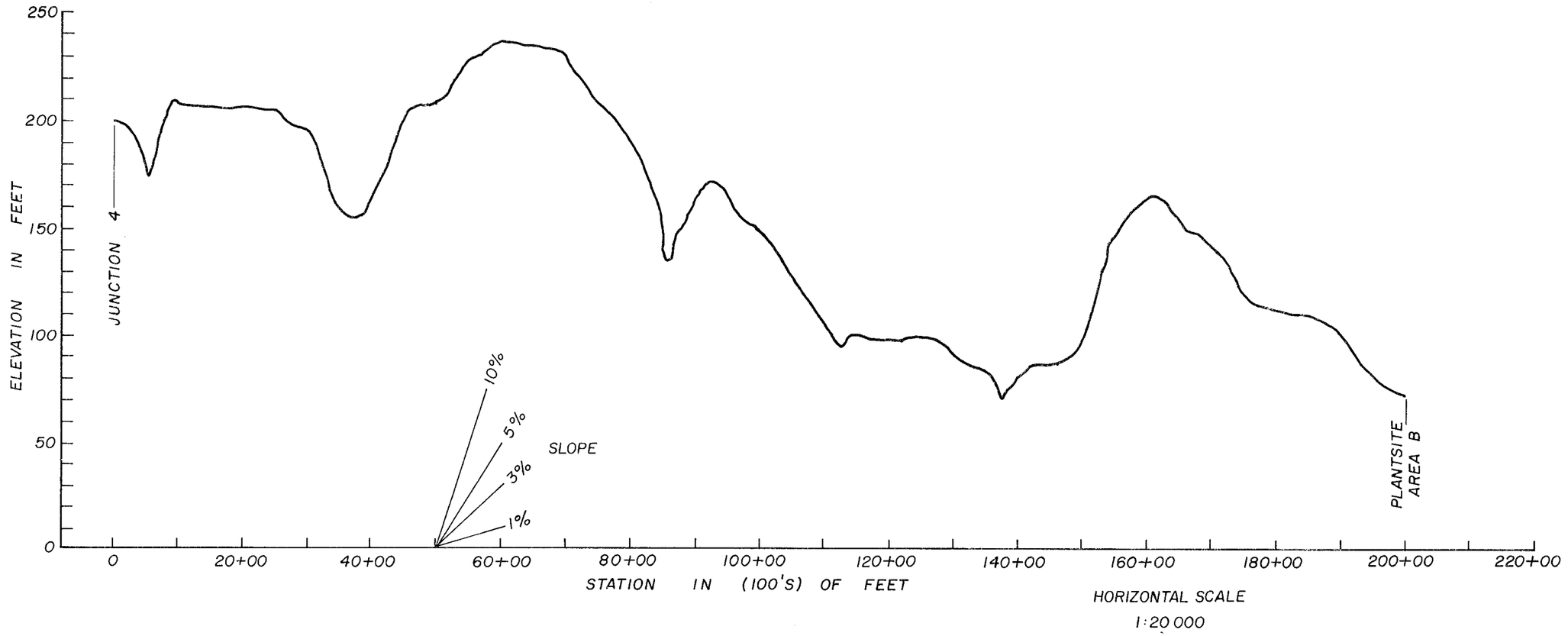

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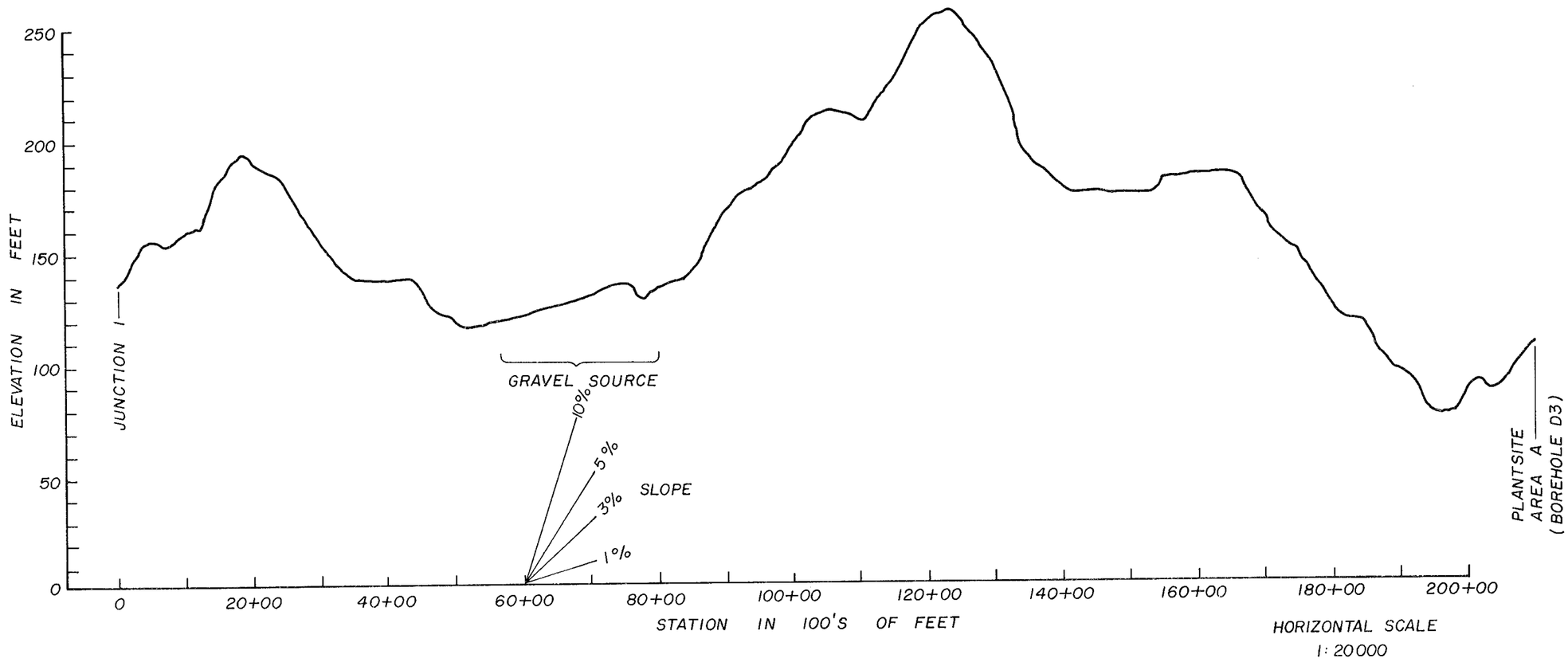

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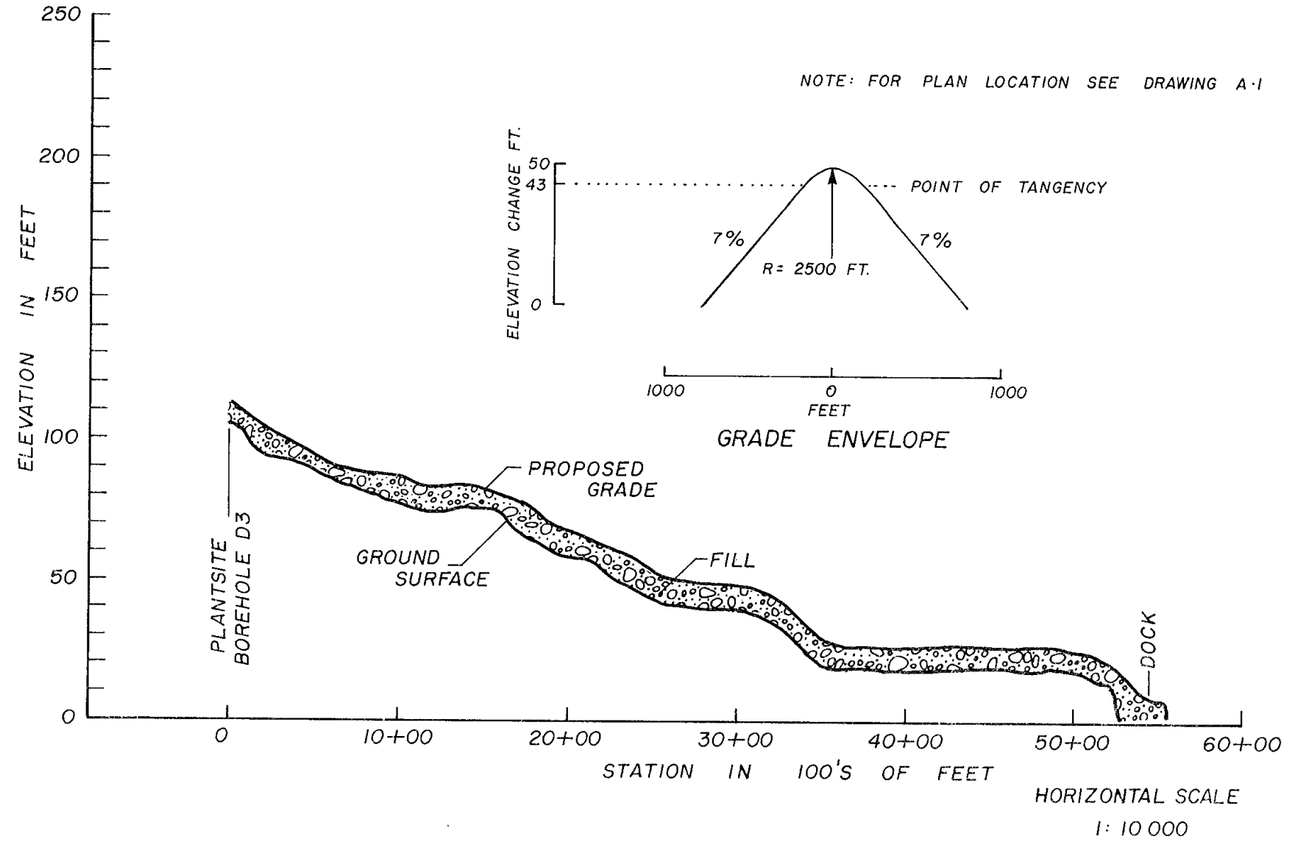
	DATE: 07/10/75
CORRIDOR PROFILE JCT. No. 1 TO AREA A PLANTSITE	SCALE: AS SHOWN
eba	JOB Nº: 1-1140

NOTE: FOR PLAN LOCATION SEE DRAWING A-1

GRADE ENVELOPE



HORIZONTAL SCALE
1: 10 000

GULF OIL CANADA LIMITED PARSONS LAKE GAS PLANT DEVELOPMENT	DWG. Nº: A.12
	DATE: 07/10/75
eba ROADWAY PROFILE DOCKSITE TO AREA A PLANTSITE	SCALE: AS SHOWN
	JOB Nº: 1-1140

B.1 Soil Classification and Description

The National Research Council of Canada system for the field description of permafrost was utilized for this project. Permafrost is defined as any earth material which exists at temperatures below 0^{o} C continuously for a number of years. Although very important from an engineering standpoint, the presence of ground ice is not a requisite for permafrost.

The soil and ice phases of the permafrost are independently described. The soil was described in the field with respect to color, gradation, structure and plasticity. The color is that if the insitu material and structural properties such as stratification, cross-bedding and fissuring were noted. The soil was classified according to the Unified Soil Classification system which is summarized in Drawing B.1. The material which is retained on the #200 sieve is classified as silt or clay by its plastic properties using the Atterberg limits obtained in the laboratory and the plasticity chart shown in Drawing B.1.

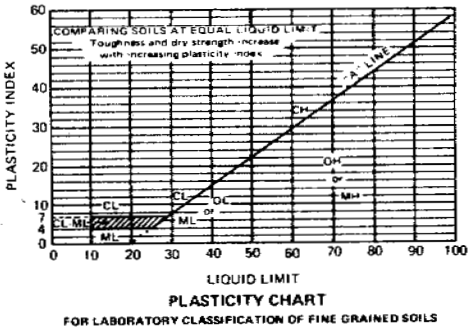
The ice classification consists of three basic divisions: non-visible ice, visible ice and visible ice greater than one inch thick (massive ice).

UNIFIED SOIL CLASSIFICATION
INCLUDING IDENTIFICATION AND DESCRIPTION

FIELD IDENTIFICATION PROCEDURES (Excluding particles larger than 3 inches and basing fractions on estimated weights)				GROUP SYMBOLS (1)	TYPICAL NAMES	INFORMATION REQUIRED FOR DESCRIBING SOILS	LABORATORY CLASSIFICATION CRITERIA
COARSE GRAINED SOILS More than half of material is larger than No. 200 sieve size (1)	GRAVELS More than half of coarse fraction is larger than No. 4 sieve size (For visual classifications, the ¼" size may be used as equivalent to the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines)	Wide range in grain size and substantial amounts of all intermediate particle sizes	GW	Well graded gravels, gravel-sand mixtures, little or no fines.	Give typical name, indicate approximate percentages of sand and gravel, max. size; angularity, surface condition, and hardness of the course grains; local or geologic name and other pertinent descriptive information, and symbol in parentheses.	$Cu = \frac{D60}{D10}$ Greater than 4; $Cc = \frac{(D30)^2}{D10 \times D60}$ Between one and 3
			Predominantly one size or a range of sizes with some intermediate sizes missing	GP	Poorly graded gravels, gravel-sand mixtures, little or no fines.		Not meeting all gradation requirements for Gw
		GRAVELS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below.)	GM	Silty gravels, poorly graded gravel-sand-silt mixtures.	For undisturbed soils add information on stratification, degree of compactness, cementation, moisture conditions and drainage characteristics.	Atterberg limits below "A" line or PI less than 4 / Above "A" line with PI between 4 and 7 are **borderline** cases requiring use of dual symbols
			Plastic fines (for identification procedures see CL below.)	GC	Clayey gravels, poorly graded gravel-sand-clay mixtures.		Atterberg limits above "A" line with PI greater than 7
	SANDS More than half of coarse fraction is smaller than No. 4 sieve size (For visual classifications, the ¼" size may be used as equivalent to the No. 4 sieve size.)	CLEAN SANDS (Little or no fines)	Wide range in grain sizes and substantial amounts of all intermediate particle sizes	SW	Well graded sands, gravelly sands, little or no fines.	EXAMPLE:— Silty sand, gravelly; about 20% hard, angular gravel particles ½ in. maximum size; rounded and subangular sand grains coarse to fine; about 15% non-plastic fines with low dry strength; well compacted and moist in place; alluvial sand; (SM)	$Cu = \frac{D60}{D10}$ Greater than 4; $Cc = \frac{(D30)^2}{D10 \times D60}$ Between one and 3
			Predominantly one size or a range of sizes with some intermediate sizes missing.	SP	Poorly graded sands, gravelly sands, little or no fines.		Not meeting all gradation requirements for SW
		SANDS WITH FINES (Appreciable amount of fines)	Non-plastic fines (for identification procedures see ML below.)	SM	Silty sands, poorly graded sand-silt mixtures.		Atterberg limits below "A" line or PI less than 4 / Above "A" line with PI between 4 and 7 are **borderline** cases requiring use of dual symbols
			Plastic fines (for identification procedures see CL below.)	SC	Clayey sands, poorly graded sand-clay mixtures.		Atterberg limits above "A" line with PI greater than 7
FINE GRAINED SOILS More than half of material is smaller than No. 200 sieve size (The No. 200 sieve size is about the smallest particle visible to the naked eye)	IDENTIFICATION PROCEDURES ON FRACTION SMALLER THAN No. 40 SIEVE SIZE						
		DRY STRENGTH (CRUSHING CHARACTERISTICS)	DILATANCY (REACTION TO SHAKING)	TOUGHNESS (CONSISTENCY NEAR PLASTIC LIMIT)			
	SILTS AND CLAYS Liquid limit less than 50	None to slight	Quick to slow	None	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands with slight plasticity	Give typical name; indicate degree and character of plasticity, amount and maximum size of coarse grains; color in wet condition, odor if any, local or geologic name, and other pertinent descriptive information; and symbol in parentheses.
		Medium to high	None to very slow	Medium	CL	Inorganic clays of low to medium plasticity, gravelly clays, silty clays, lean clays	
		Slight to medium	Slow	Slight	OL	Organic silts and organic silt-clays of low plasticity.	For undisturbed soils add information on structure, stratification, consistency in undisturbed and remolded states, moisture and drainage conditions.
	SILTS AND CLAYS Liquid limit greater than 50	Slight to medium	Slow to none	Slight to medium	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts.	EXAMPLE:— Clayey silt, brown, slightly plastic, small percentage of fine sand; numerous vertical root holes; firm and dry in place; loess; (ML)
		High to very high	None	High	CH	Inorganic clays of high plasticity, fat clays.	
		Medium to high	None to very slow	Slight to medium	OH	Organic clays of medium to high plasticity.	
HIGHLY ORGANIC SOILS		Readily identified by color, odor, spongy feel and frequently by fibrous texture.				Peat and other highly organic soils.	

Use grain size curve in identifying the fractions as given under field identification

Determine percentages of gravel and sand from grain size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size) coarse grained soils are classified as follows:
- Less than 5% — GW, GP, SW, SP.
- More than 12% — GM, GC, SM, SC.
- 5% to 12% — **Borderline** cases requiring use of dual symbols.



PLASTICITY CHART
FOR LABORATORY CLASSIFICATION OF FINE GRAINED SOILS

(1) **Boundary classifications:** — Soils possessing characteristics of two groups are designated by combinations of group symbols. For example GW-GC, well graded gravel-sand mixture with clay binder.

(2) All sieve sizes on this chart are U.S. standard.

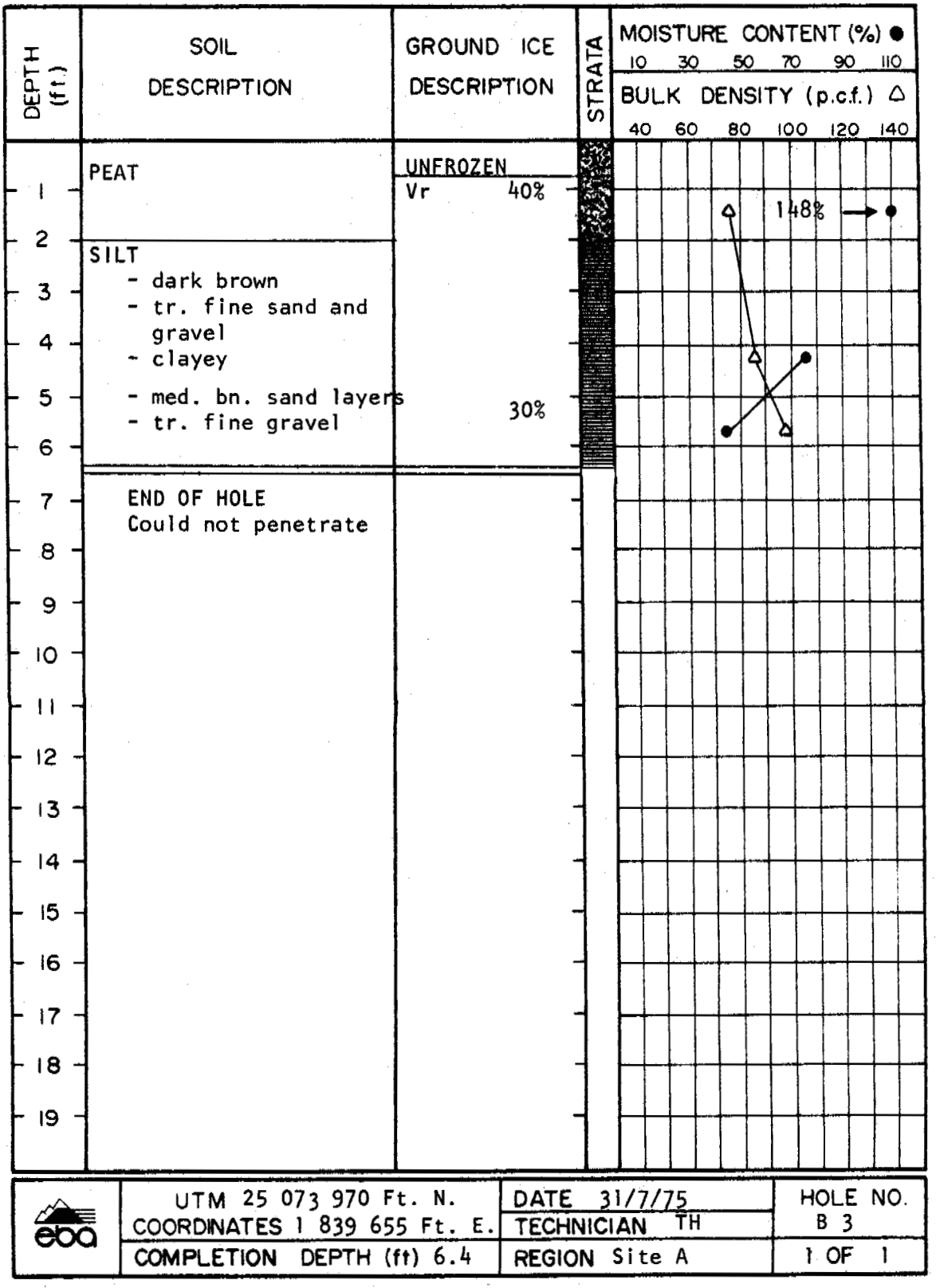
UNIFIED SOIL CLASSIFICATION CHART

E B A Engineering Consultants Ltd.

DRAWING Nº B·1

B-4

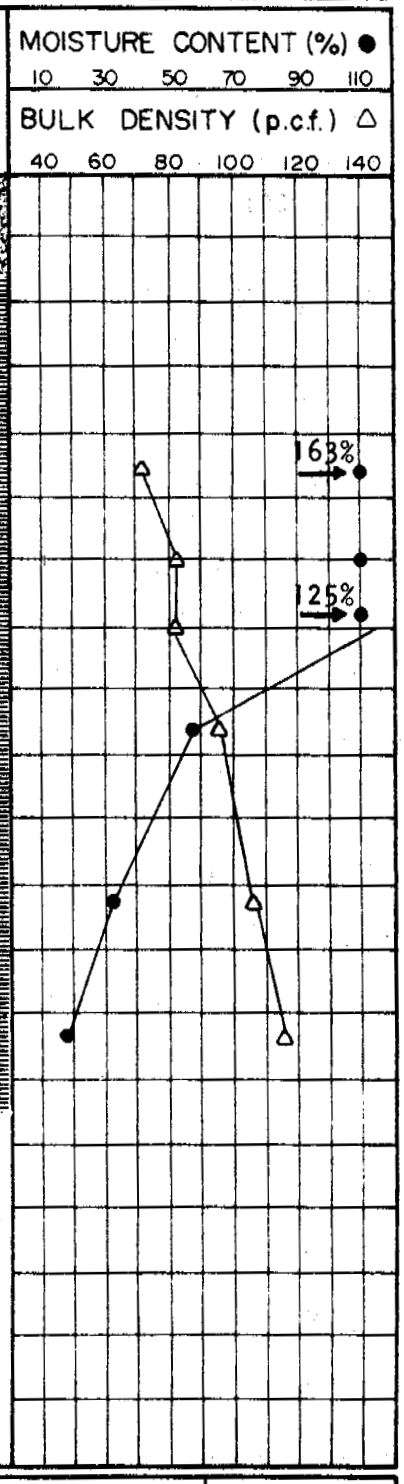
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 073 970 Ft. N.	DATE 31/7/75	HOLE NO.
	COORDINATES 1 839 655 Ft. E.	TECHNICIAN TH	B 3
	COMPLETION DEPTH (ft) 6.4	REGION Site A	1 OF 1

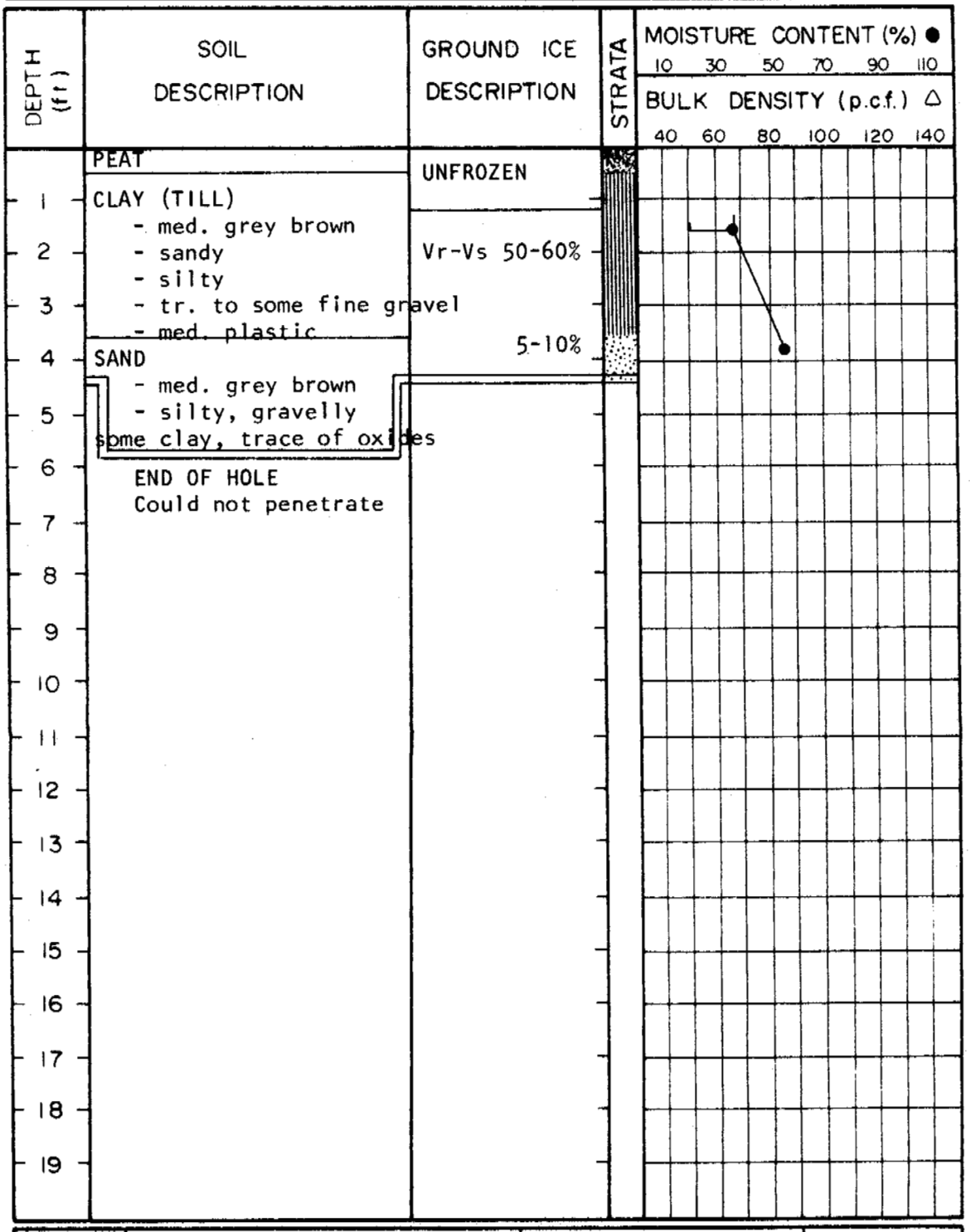
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - drk brown to black	UNFROZEN Vr 50%	
2	SILT - drk. brown - organic	ICE +	
3			
4			
5			
6			
7	- drk brown - lt. to med. brown	Vs 35%	
8	- fine to med grained sand pockets	Vr 5%	
9	drk. grey brown - clayey	35%	
10	tr. sand - organic		
11	- tr. clay - some fine sand	15%	
12	tr. organics	20%	
13			
14			
15	END OF HOLE		
16			
17			
18			
19			



eba	UTM 25 073 115 Ft. N. COORDINATES 1 840 170 Ft. E.	DATE 31/7/75 TECHNICIAN TH	HOLE NO. B5
	COMPLETION DEPTH (ft) 14.5	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25075 075 Ft. N.	DATE 22/7/75	HOLE NO.
	COORDINATES 1 839 560 Ft. E.	TECHNICIAN JK	C 1
	COMPLETION DEPTH (ft) 4.2	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT - dk. brown	UNFROZEN
2	SILT - dk. brown - tr. organics	FROZEN
5	GRAVEL - clean - well graded - up to 3/4"	
10	SAND - med. grey - fine - gravelly - tr. silt	
12	END OF HOLE	

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

eba	UTM 25 075 075 ft. N. COORDINATES 1 839 560 ft.E.	DATE 5/8/75 TECHNICIAN TH	HOLE NO. C1-Winki
	COMPLETION DEPTH (ft) 12	REGION Area A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
0	PEAT	UNFROZEN
1	SILT	
2	- med. brown	Vr 5-10%
3	- silty	ICE +
4	- med. plastic	
5	- organic	
6	PEAT	Vr-Vs 10-15%
7	- dark brown	
8	- laminated with med. brown silty clay	
9	SILT	30-40%
10	- med. brown	
11	- sandy, silty	V_s 5-10%
12	CLAY (till)	
13	- med. to drk gr. brown sandy, silty, tr. fine gravel	ICE +
14	PEAT - drk. brown	
15	SILT	
16	- med. grey brown	
17	- sandy	
18	- some clay	
19	- tr. of gravel & coal	Vr 15-20%
	- tr. of iron oxide	25-30%
	- tr. organics	
	- cobble	
	END OF HOLE	
	Could not penetrate	

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

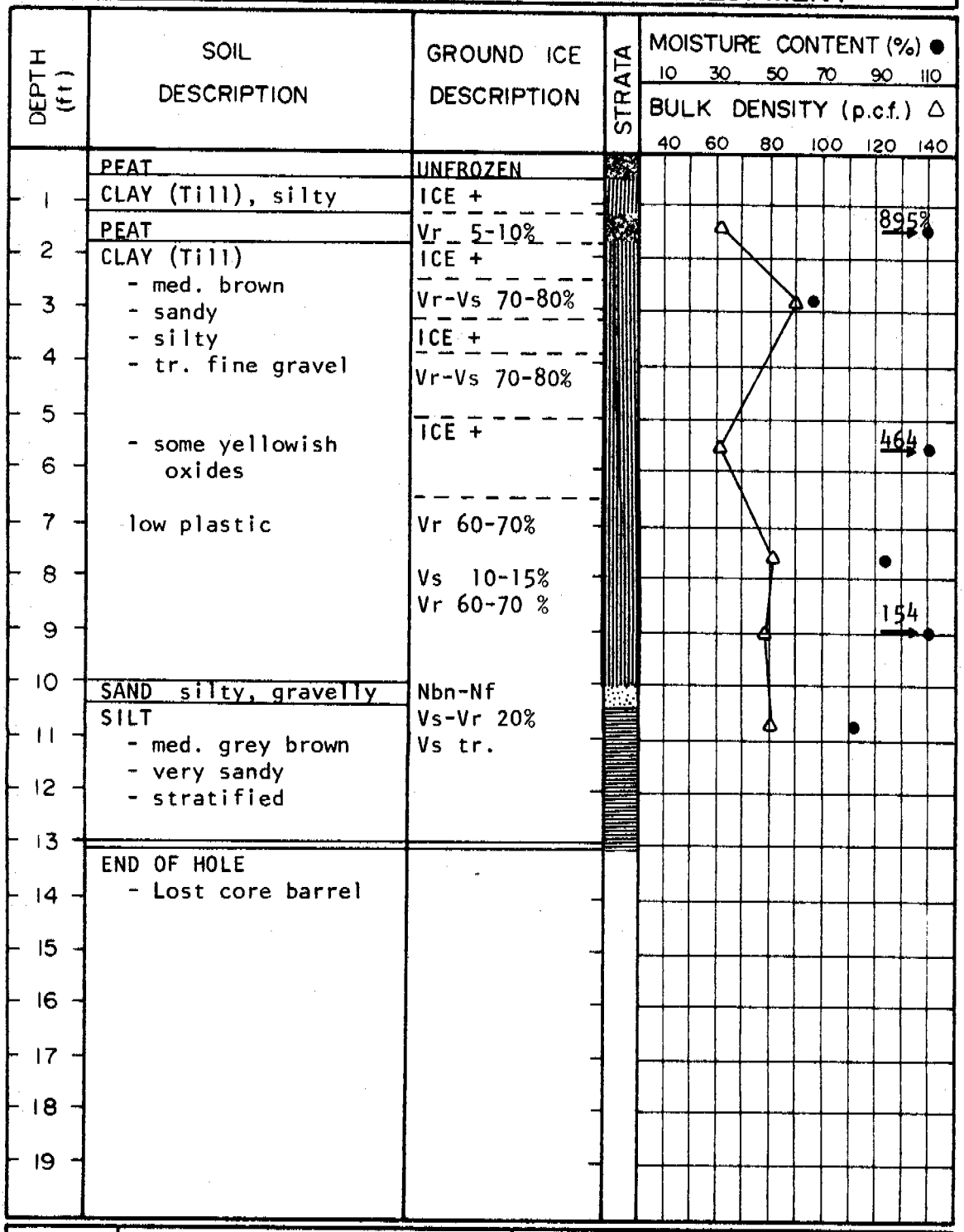
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

162%

273%

eba	UTM 25 074 225 Ft. N.	DATE 22/7/75	HOLE NO.
	COORDINATES 1 840 085 Ft. E.	TECHNICIAN JK	C 3
	COMPLETION DEPTH (ft) 15.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 073 795 Ft. N.	DATE 20/7/75	HOLE NO. C 4
	COORDINATES 1 840 340 Ft. E.	TECHNICIAN JK	
	COMPLETION DEPTH (ft) 13.0	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - med. brown	UNFROZEN	
2			
3	- dk. grey brown - tr. of clay	FROZEN	
4			
5			
6			
7			
8	CLAY (TILL) - dk. grey - silty, tr. sand - tr. fine gravel - some pebbles to 3/4" - coal specs - oxides		
9			
10			
11			
12			
13			
14			
15			
16			
17			
18	- pockets of lt. brown dry silt		
19			

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

eba

UTM 25 073 795 ft.N. COORDINATES 1 840 340 ft. E.	DATE 13/8/75 TECHNICIAN TH	HOLE NO. C4-Winki
COMPLETION DEPTH (ft) 28	REGION Area A	1 OF 2

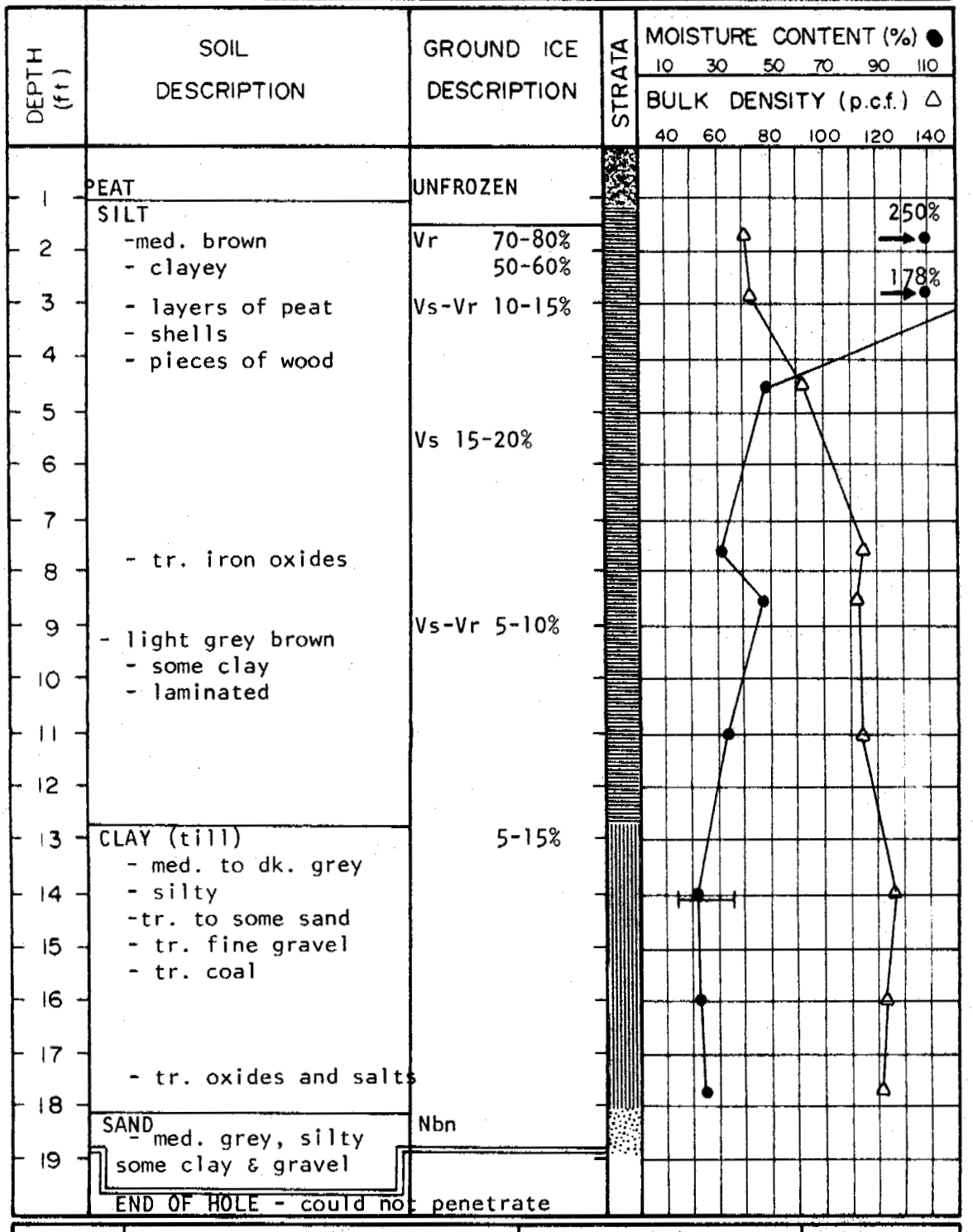
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
21	CLAY (TILL) cont'd		
22	SAND - dark grey - coarse - some gravel		
23			
24			
25			
26			
27			
28	END OF HOLE		

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

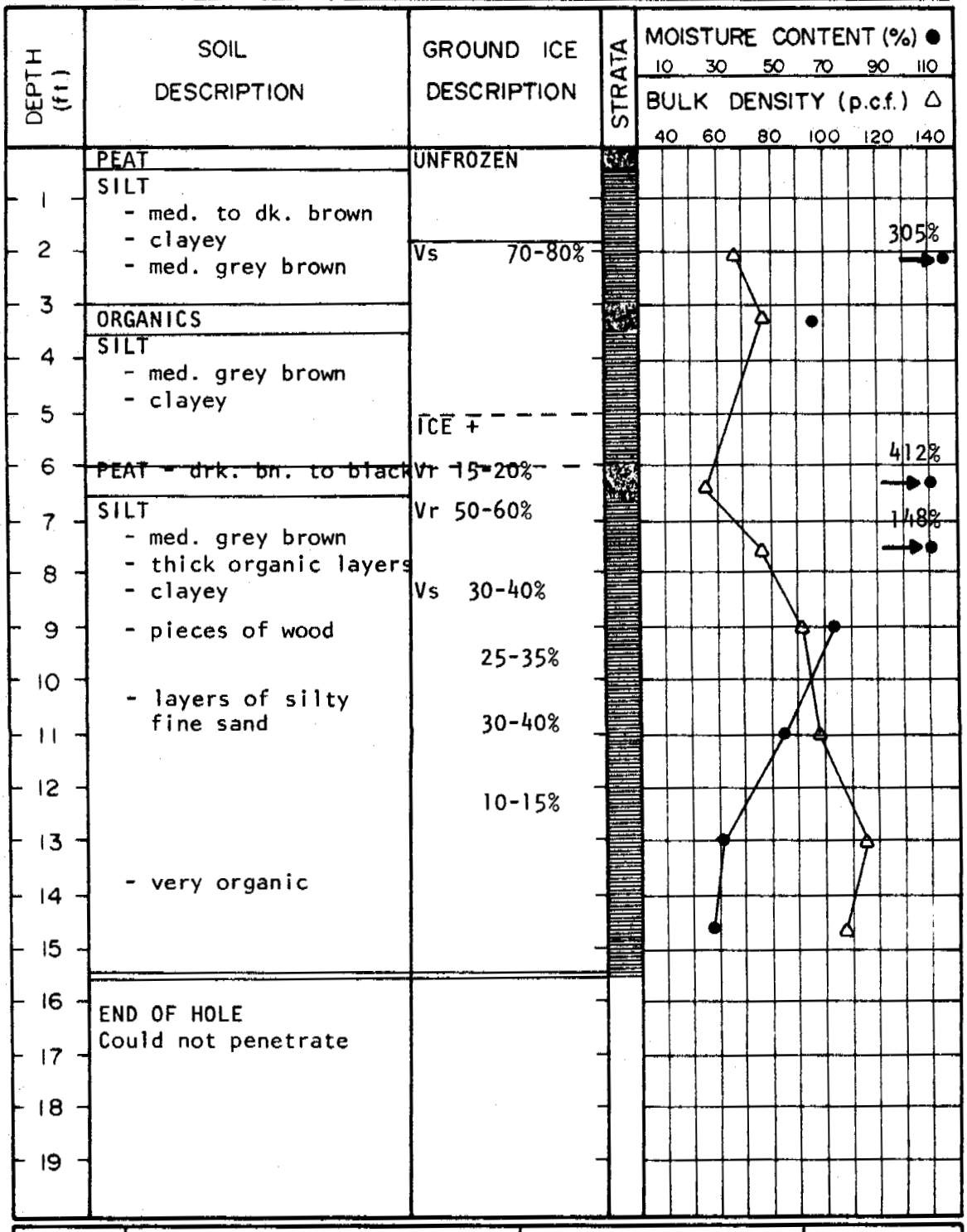
eba	UTM 25 073 795 ft.N. COORDINATES 1 840 340 ft.E.	DATE 13/8/75 TECHNICIAN TH	HOLE NO. C4-Winki
	COMPLETION DEPTH (ft) 28	REGION Area A	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



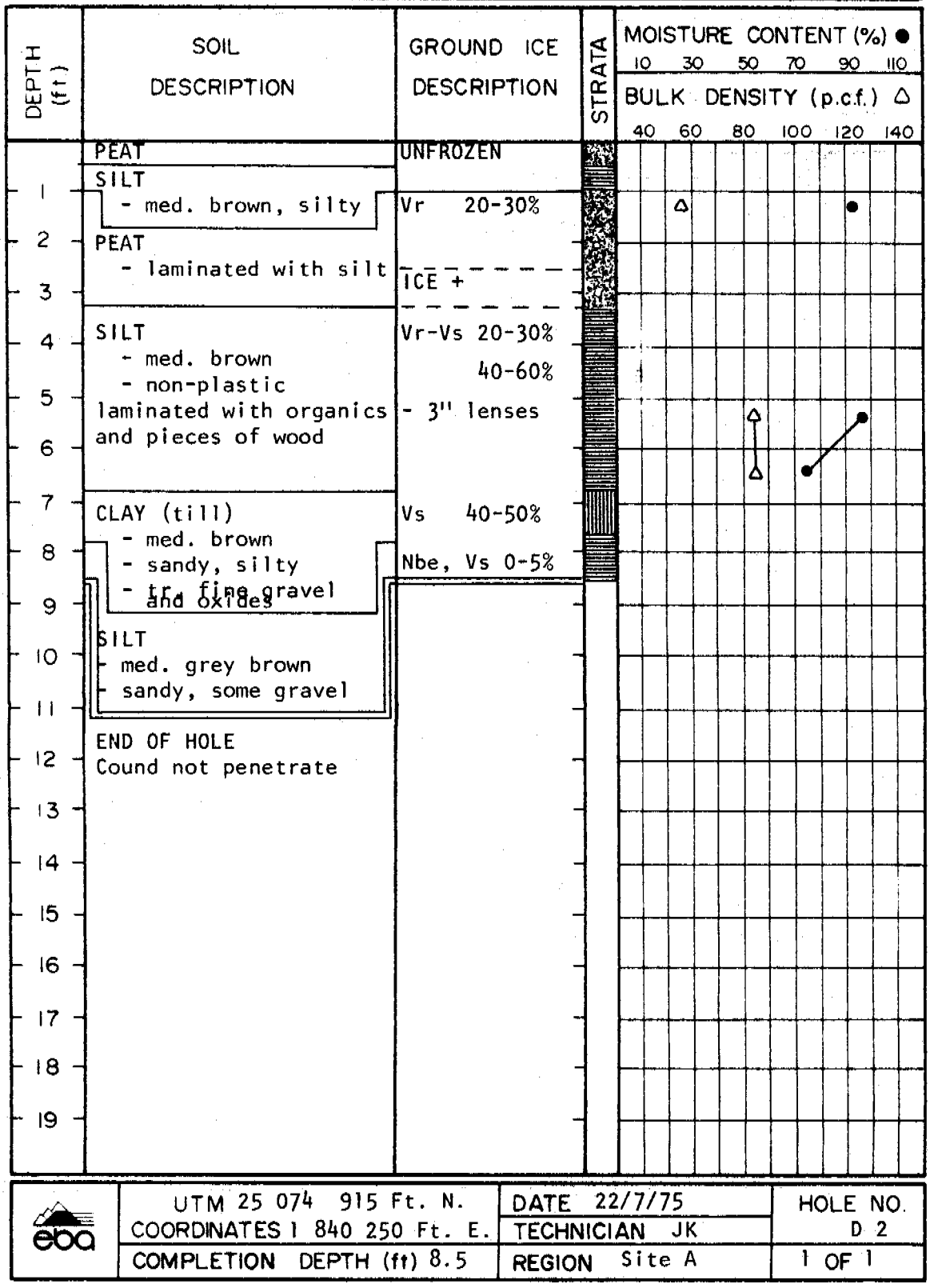
eba	UTM 25 073 370 Ft. N.	DATE 20/7/75	HOLE NO. C 5
	COORDINATES 1 840 600 Ft. E.	TECHNICIAN JK	
	COMPLETION DEPTH (ft) 18.7	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



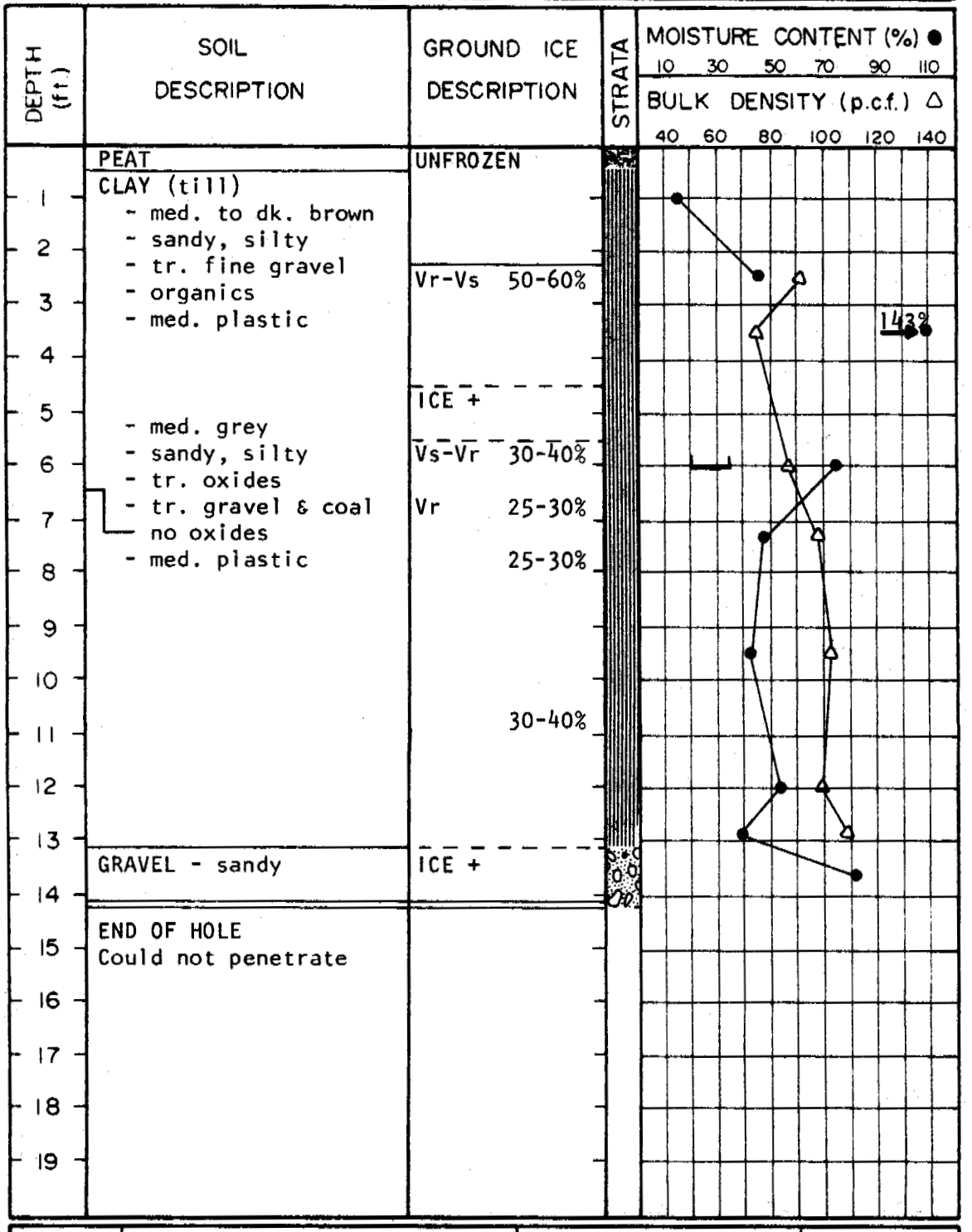
eba	UTM 25 072 940 Ft. N.	DATE 19/7/75	HOLE NO. C 6
	COORDINATES 1 840 860 Ft. E.	TECHNICIAN JK	
	COMPLETION DEPTH (ft) 15.6	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 074 915 Ft. N.	DATE 22/7/75	HOLE NO. D 2
	COORDINATES 1 840 250 Ft. E.	TECHNICIAN JK	
	COMPLETION DEPTH (ft) 8.5	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 074 485 Ft. N.	DATE 22/7/75	HOLE NO.
	COORDINATES 1 840 510 Ft. E.	TECHNICIAN JK	D-3
	COMPLETION DEPTH (ft) 14.1	REGION Site A	1 OF 1

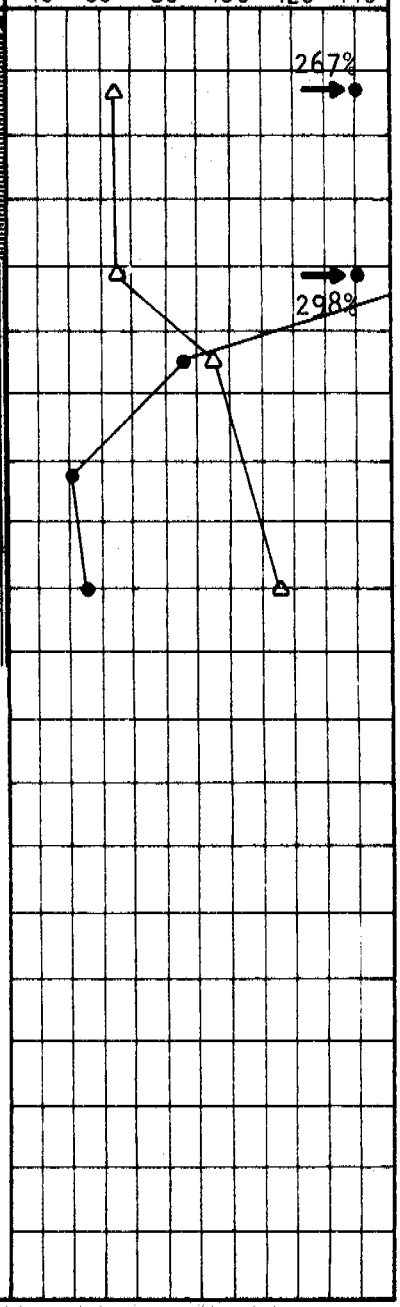
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
0	PEAT	UNFROZEN
1	SILT	Vr-Vs 20-30%
2	- med. grey brown	ICE +
3	- clayey thickly bedded with organics	
4		
5	CLAY (till)	Vs-Vr 30-40%
6	- med. grey brown	ICE +
7	- sandy, silty	Vs 20-25%
8	- tr. fine gravel & coal	
9	- med. brown	Vs-Vr 5-10%
10	- med. grey	Nbe, Vr 0-5%
11	END OF HOLE	
12	Could not penetrate	
13		
14		
15		
16		
17		
18		
19		

STRATA

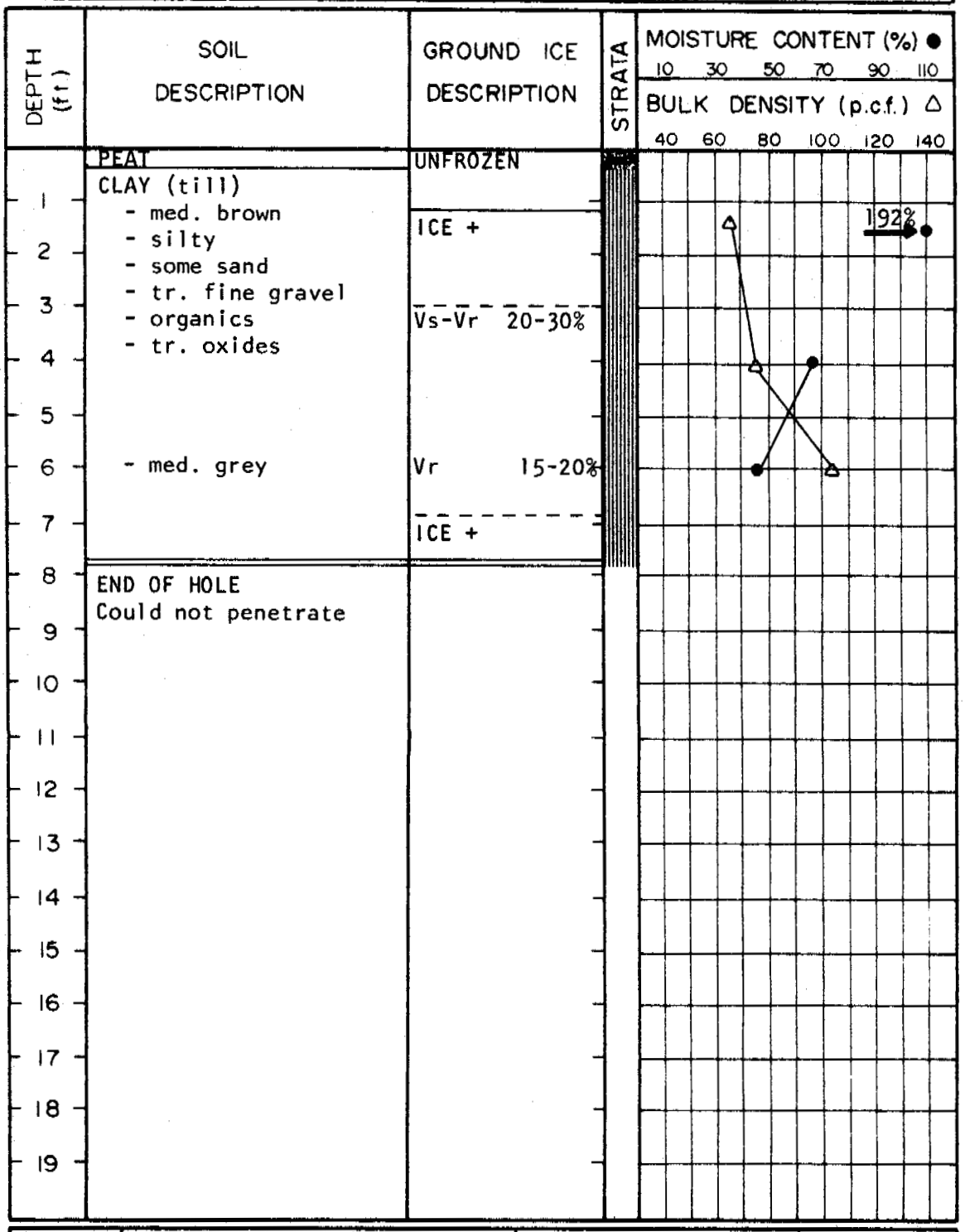
MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



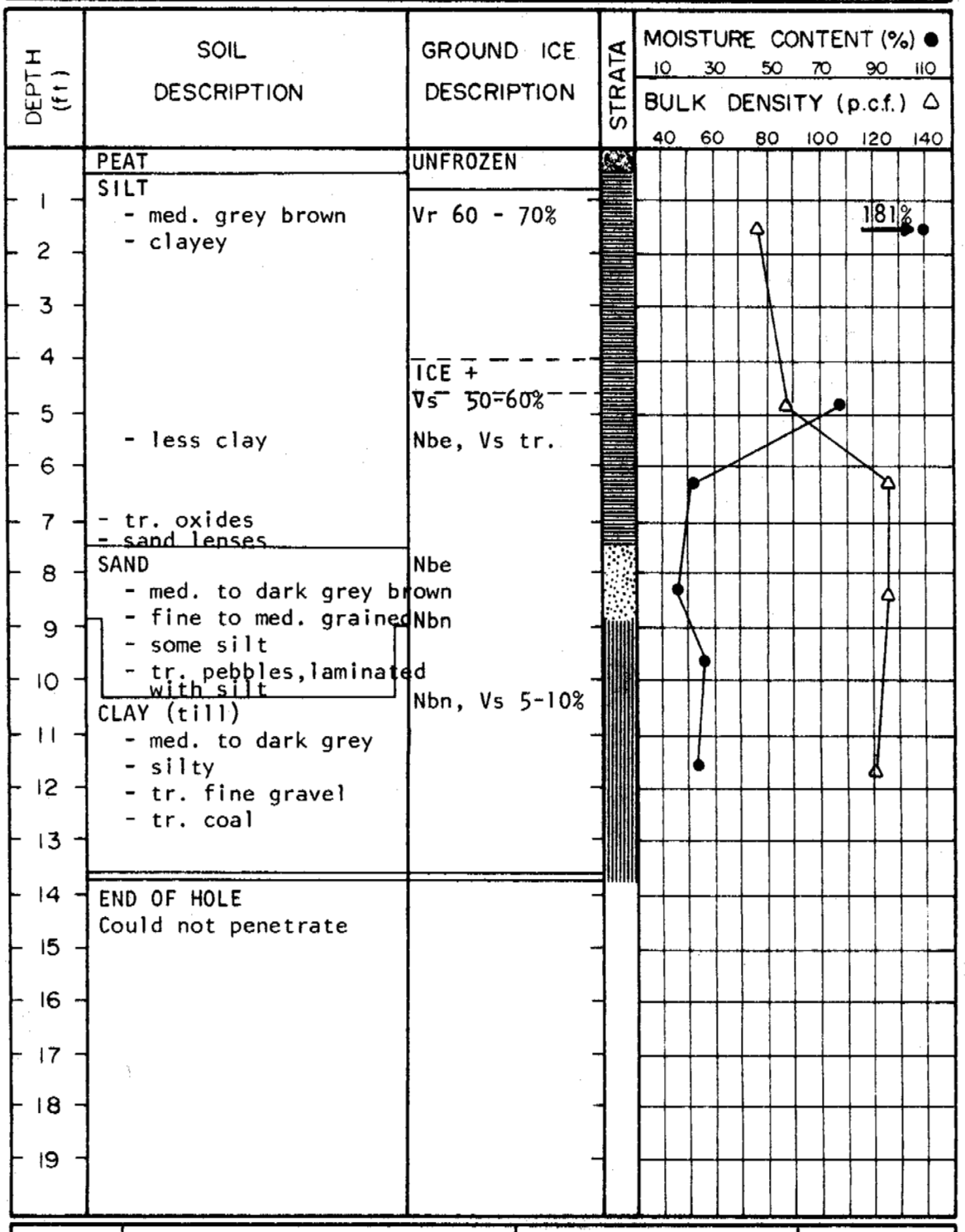
eba	UTM 25 074 060 Ft. N.	DATE 22/7/75	HOLE NO. D 4
	COORDINATES 1 840 790 Ft. E.	TECHNICIAN JK	
	COMPLETION DEPTH (ft) 10.1	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 073 625 Ft. N.	DATE 22/7/75	HOLE NO.
	COORDINATES 1 841 135 Ft. E.	TECHNICIAN JK	D 5
	COMPLETION DEPTH (ft) 7.7	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 073 205 Ft. N.	DATE 19/7/75	HOLE NO.
	COORDINATES 1 841 290 Ft. E.	TECHNICIAN JK	D 6
	COMPLETION DEPTH (ft) 13.7	REGION Site A	1 OF 1

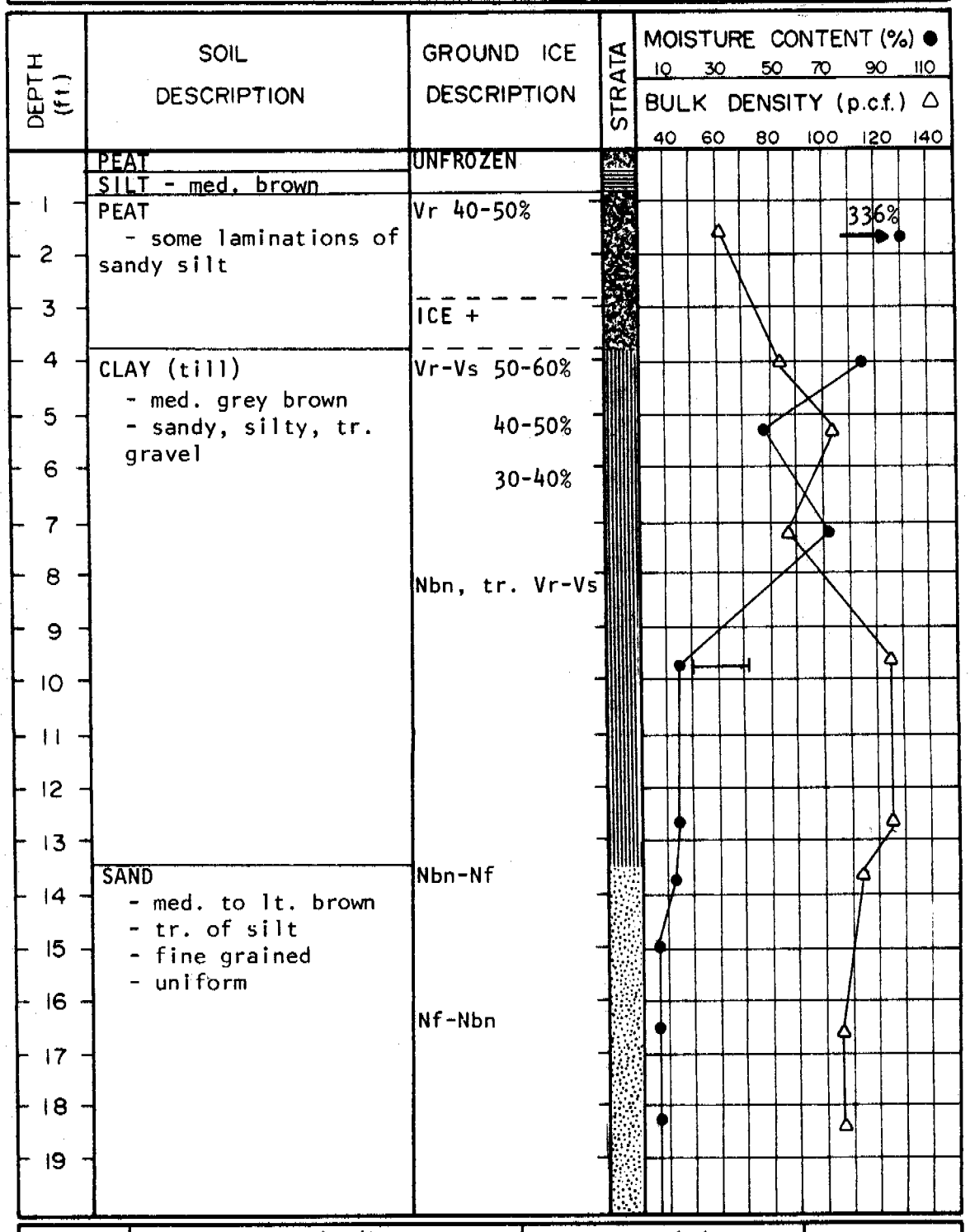
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN Vr 20-30% ICE +	
2	SILT — med. grey - sandy - clayey - tr. fine gravel - tr. organics - low plastic		
3			
4		Vr - Vs 40-50%	
5			
6	END OF HOLE Could not penetrate		
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

eba	UTM 25075 170 Ft. N. COORDINATES 1 840 675 Ft. E.	DATE 23/7/75 TECHNICIAN JK	HOLE NO. E2
	COMPLETION DEPTH (ft) 5.0	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



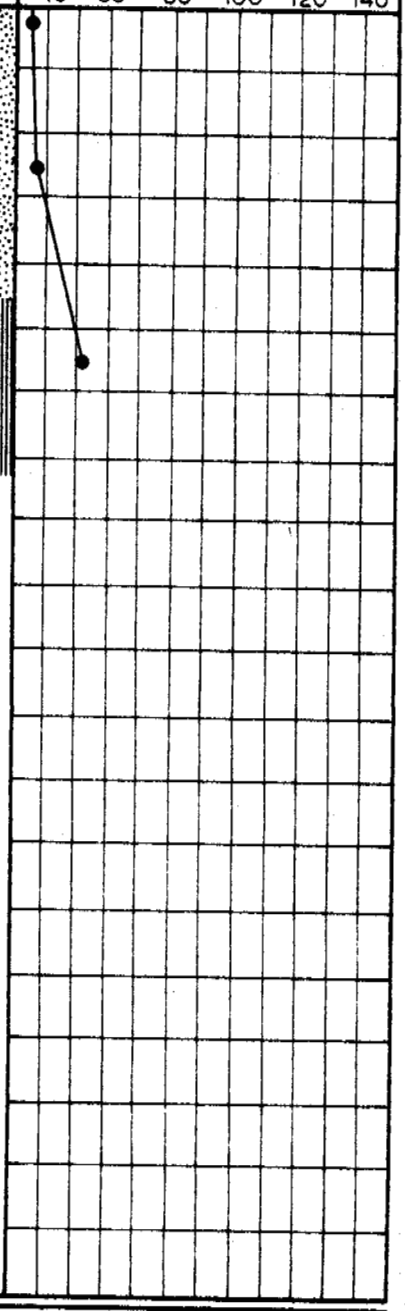
eba	UTM 25 074 745 Ft. N.	DATE 23/7/75	HOLE NO.
	COORDINATES 1 840 930 Ft. E	TECHNICIAN JK	E3
	COMPLETION DEPTH (ft) 27.2	REGION Site A	1 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
21	- same	Nf	
22			
23			
24			
25	CLAY - med. grey - very silty - low plastic - laminated with coarse sand and fine gravel	Nbn	
26			
27			
	END OF HOLE Could not penetrate		

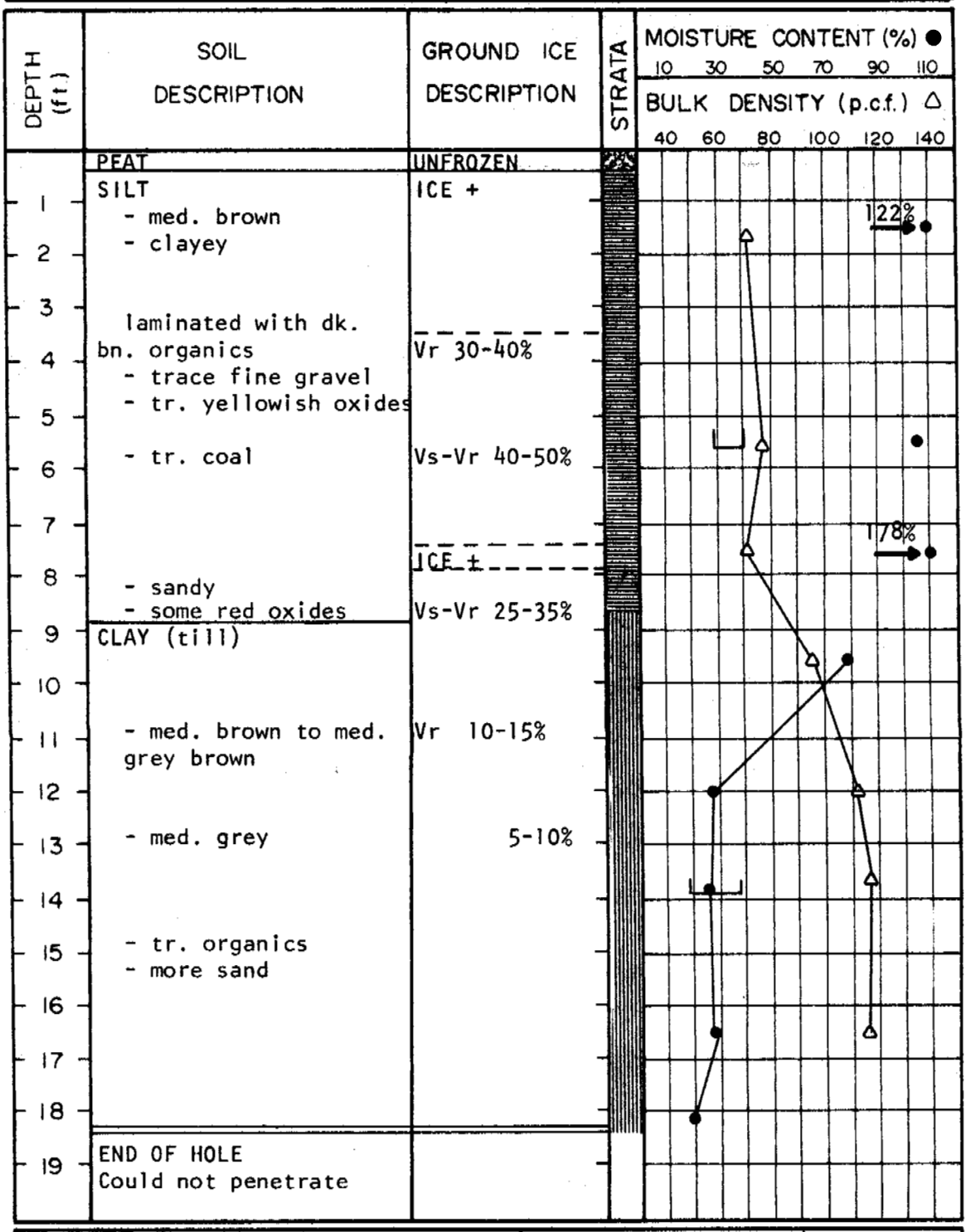
MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM 25 074 745 Ft. N. COORDINATES 1 840 930 Ft. E.	DATE 23/7/75 TECHNICIAN JK	HOLE NO. E 3
	COMPLETION DEPTH (ft) 27.2	REGION Site A	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



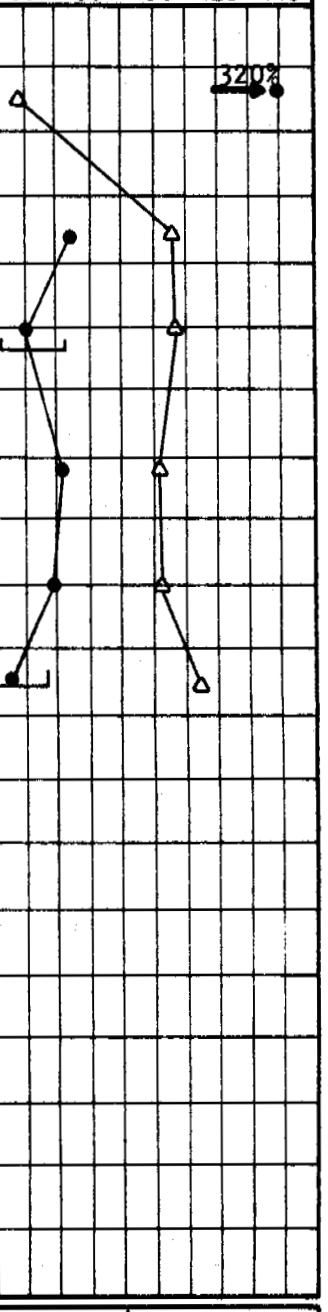
eba	UTM 25 074 315 Ft. N.	DATE 23/7/75	HOLE NO.
	COORDINATES 1 841 205 Ft. E.	TECHNICIAN JK	E 4
	COMPLETION DEPTH (ft) 18.3	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
0	PEAT	UNFROZEN
1	CLAY (till)	ICE +
2	- med. grey - silty - sandy	
3	- some sand	Vr 5-10%
4	- tr. fine gravel	
5	- tr. iron oxides	20 - 25%
6		
7	- tr. organics	30 - 40% Vr-Vs 20-30%
8		
9		
10	CLAY - thickly laminated with med. brown very sandy silt	Vs 3-5%
11		TCE +
12	END OF HOLE	
13		
14		
15		
16		
17		
18		
19		

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM 25 073 890 Ft. N.	DATE 23/7/75	HOLE NO.
	COORDINATES 1 841 460 Ft. E.	TECHNICIAN JK	E 5
	COMPLETION DEPTH (ft) 11.2	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - dk. brown-black	UNFROZEN	
2			
3			
4		FROZEN	
5	SILT - dk. grey brown - mottled with reddish brown - trace oxides & organics		
6			
7			
8			
9			
10			
11	CLAY (TILL) - dk. grey brown - tr. fine sand & silt - some fine gravel		
12			
13			
14			
15			
16	SAND - dk. grey - fine grained - silty		
17			
18			
19	END OF HOLE		

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

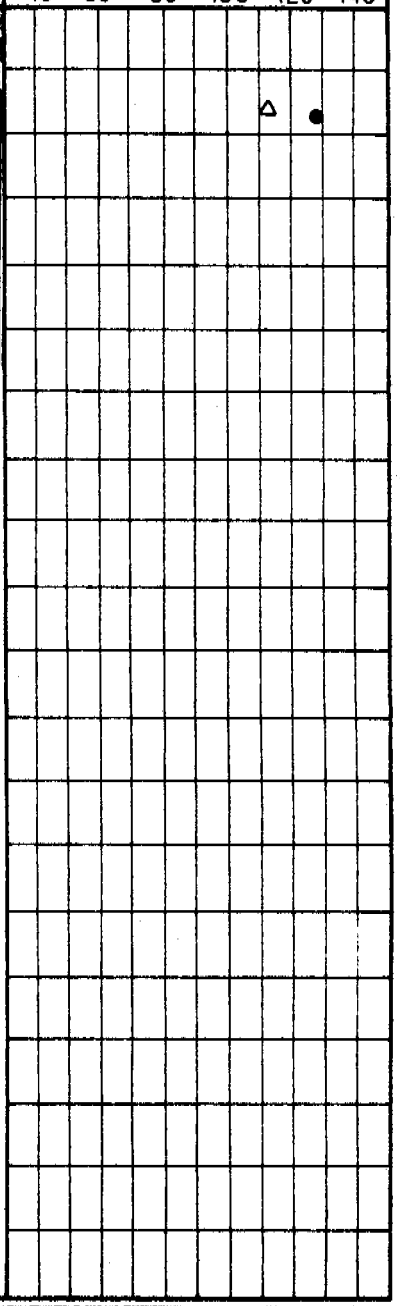
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

eba	UTM 25 073 890 ft.N. COORDINATES 1 841 460 ft.E.	DATE 13/8/75 TECHNICIAN TH	HOLE NO. E5 Winki
	COMPLETION DEPTH (ft) 20	REGION Area A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

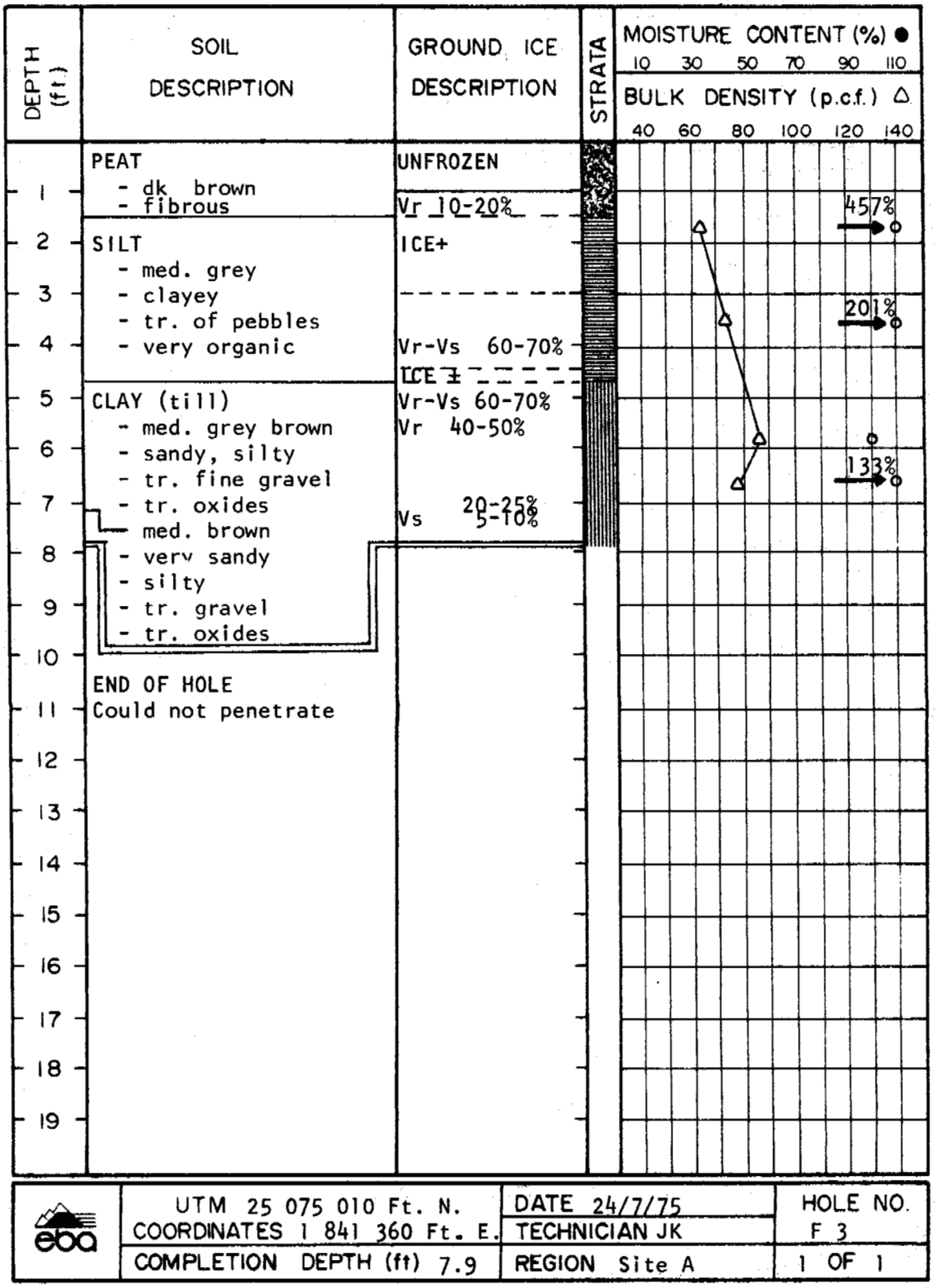
DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	CLAY (till) - med. grey brown - sandy - silty - tr. fine gravel - some organics	Vr 40-50% Vs-Vr 30-40% Vs 5-10%	
6	END OF HOLE Could not penetrate		

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM 25 075 430 Ft. N.	DATE 23/7/75	HOLE NO.
	COORDINATES 1 841 100 Ft. E.	TECHNICIAN JK	F 2
	COMPLETION DEPTH (ft) 5.5	REGION Site A	1 OF 1

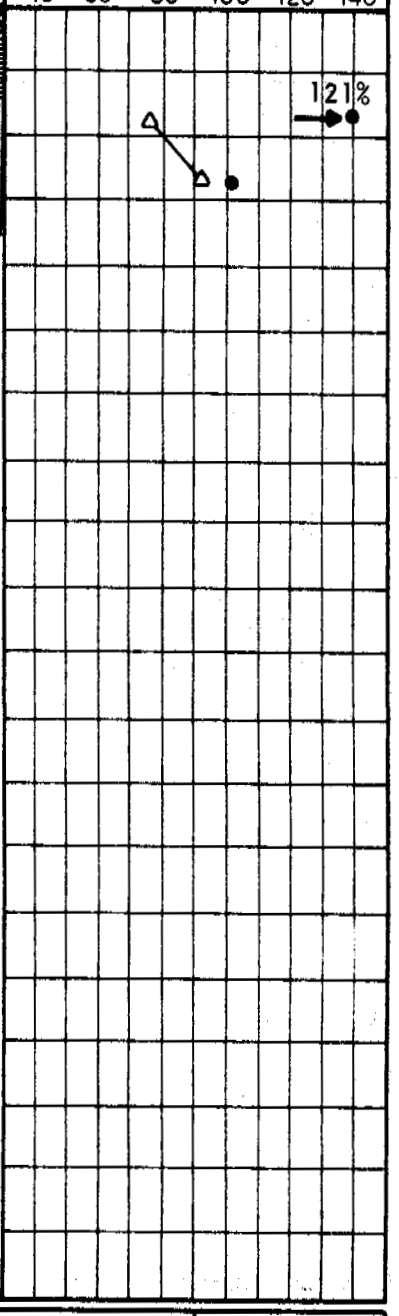
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 075 010 Ft. N.	DATE 24/7/75	HOLE NO.
	COORDINATES 1 841 360 Ft. E.	TECHNICIAN JK	F 3
	COMPLETION DEPTH (ft) 7.9	REGION Site A	1 OF 1

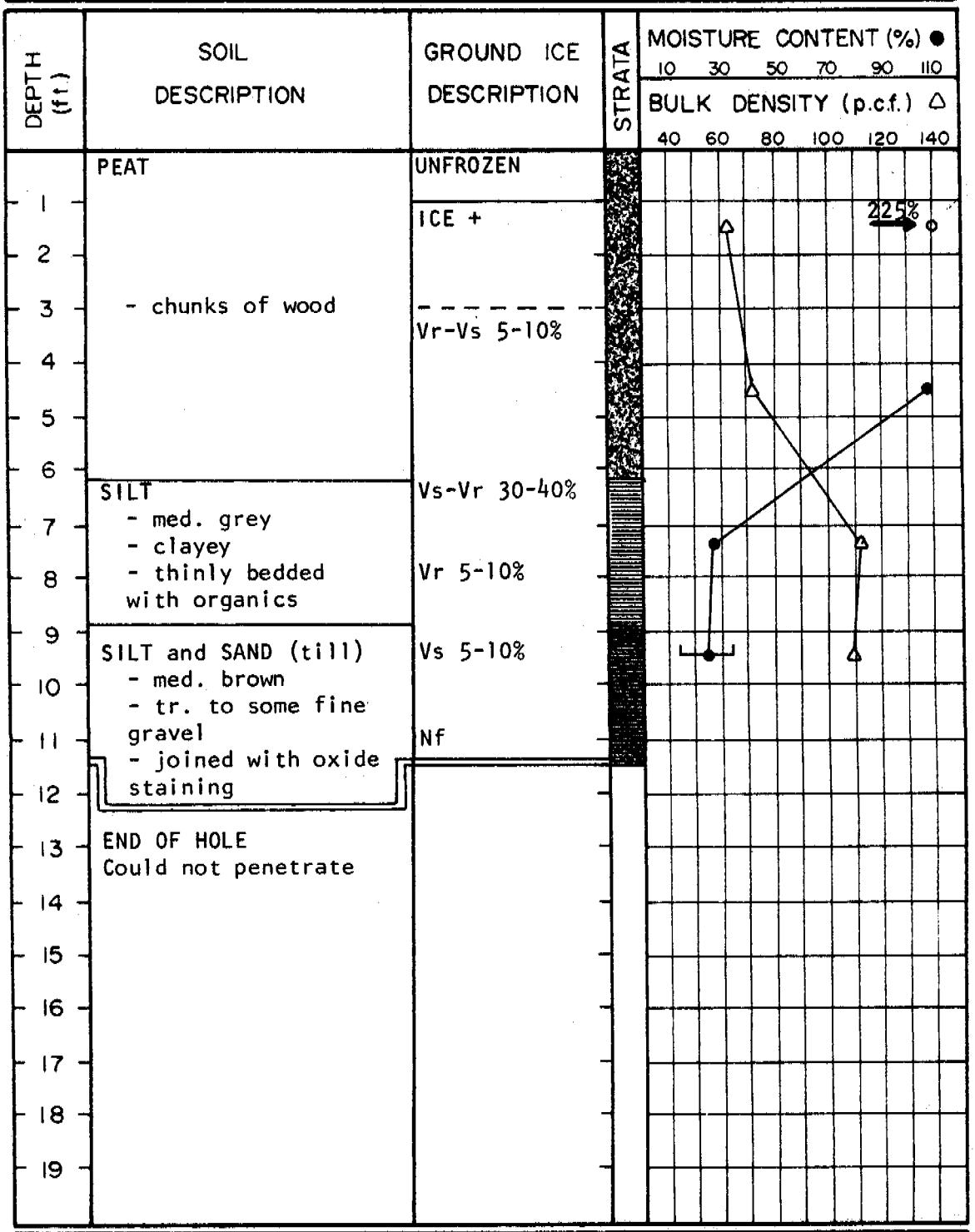
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	SILT - med. to dk. brown - organic - highly plastic	ICE± - - - - - -	
3	CLAY (till) - med. brown - sandy, silty - tr. of fine gravel - tr. oxides & coal	Vr-Vs 40-50% 50-60%	
4			
5			
6	- med. grey brown - silty - tr. to some sand - tr. fine gravel		
7			
8	END OF HOLE Could not penetrate		
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			



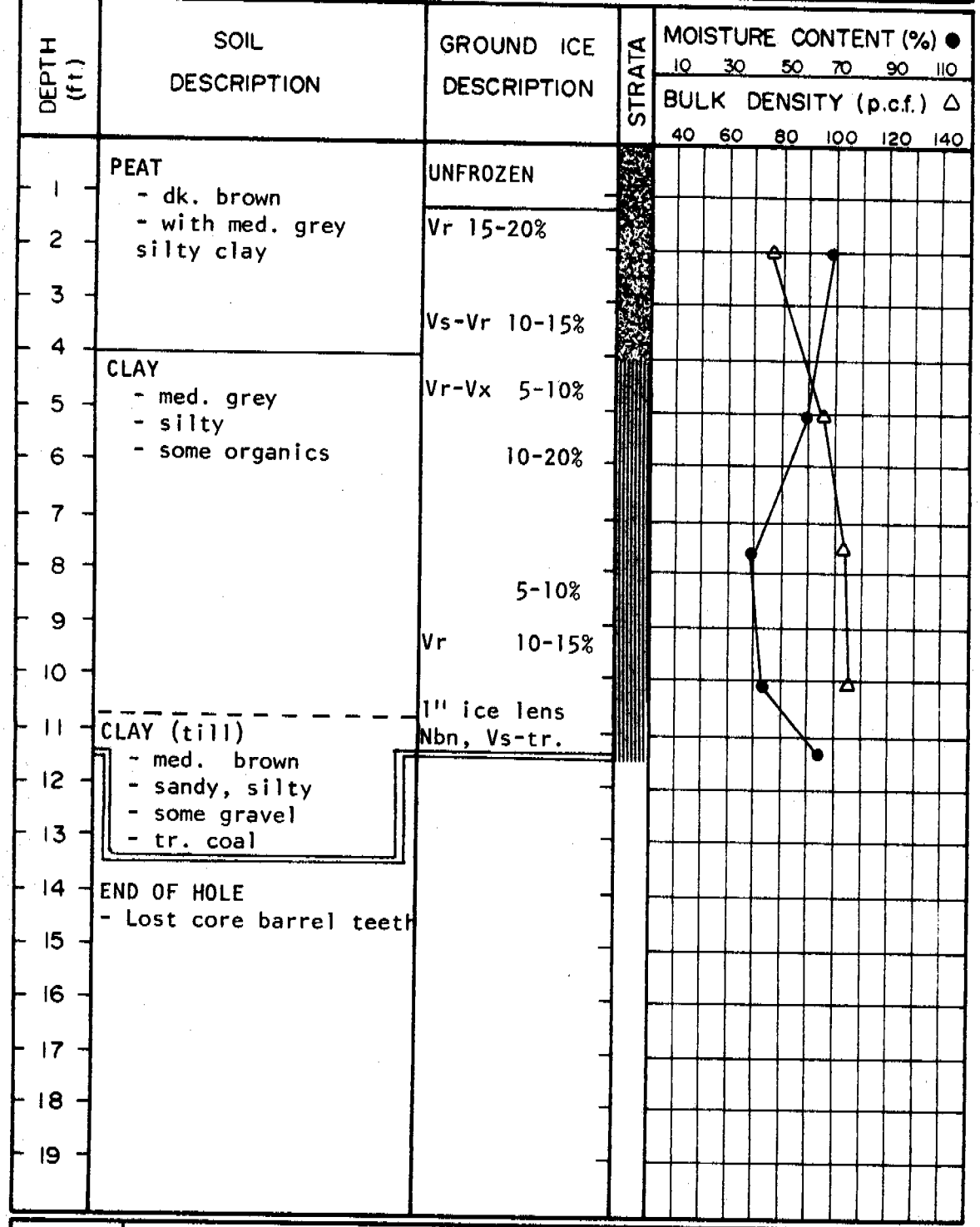
eba	UTM 25 074 575 Ft. N. COORDINATES 1 841 625 Ft. E.	DATE 19/7/75 TECHNICIAN JK	HOLE NO. F 4
	COMPLETION DEPTH (ft) 3.6	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 074 145 Ft. N. COORDINATES 1 841 890 Ft. E	DATE 19/7/75 TECHNICIAN JK	HOLE NO. F 5
	COMPLETION DEPTH (ft) 11.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 076 125 Ft. N.	DATE 25/7/75	HOLE NO.
	COORDINATES 1 841 260 Ft. E.	TECHNICIAN JK	G 1
	COMPLETION DEPTH (ft) 11.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN
2	CLAY (till) - med. grey brown	Vr 60-70%
3	- silty - tr. fine gravel	
4	- med. brown - tr.coal and oxides	
5	- medium plastic fines	
6		Vr 5 - 10%
7	- med. grey	3 - 5%
8	- some gravel	Vr 20-25%
9		
10	END OF HOLE Could not penetrate	
11		
12		
13		
14		
15		
16		
17		
18		
19		

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

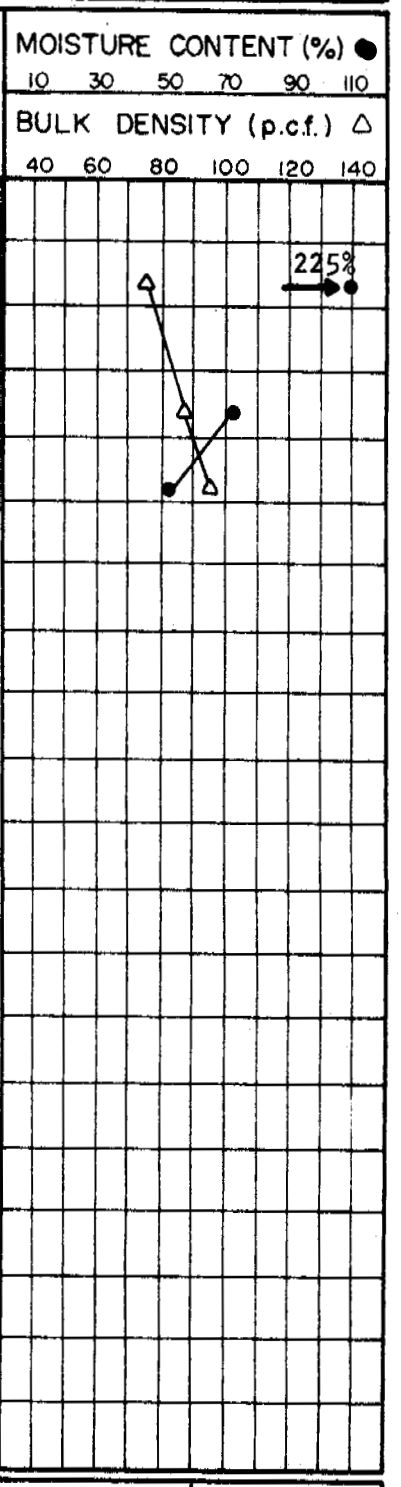
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

130%

eba	UTM 25 075 690 Ft. N. COORDINATES 1 841 530 Ft. E.	DATE 24/7/75 TECHNICIAN JK	HOLE NO. G 2
	COMPLETION DEPTH (ft) 8.8	REGION Site A	1 OF 1

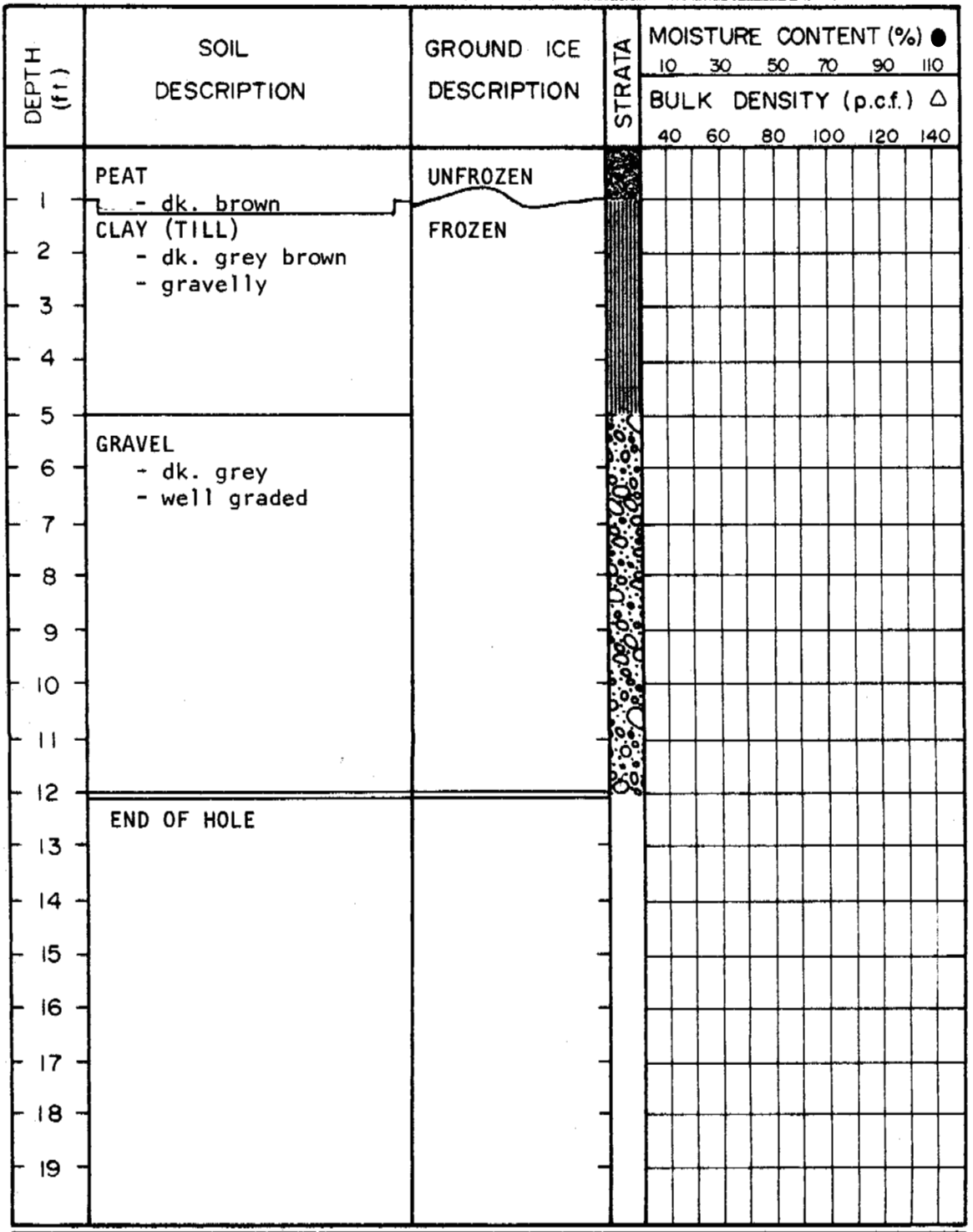
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
0	PEAT	UNFROZEN	
1	CLAY (till)		
2	- med. brown - sandy - silty - tr. fine gravel	ICE +	
3			
4	- pockets of lt. brn. - fine sand & oxides - tr. oxides - tr. of coal	Vr 60-70% Vs-Vr 40-50% Vs 30-40%	
5			
6	END OF HOLE Could not penetrate		
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			



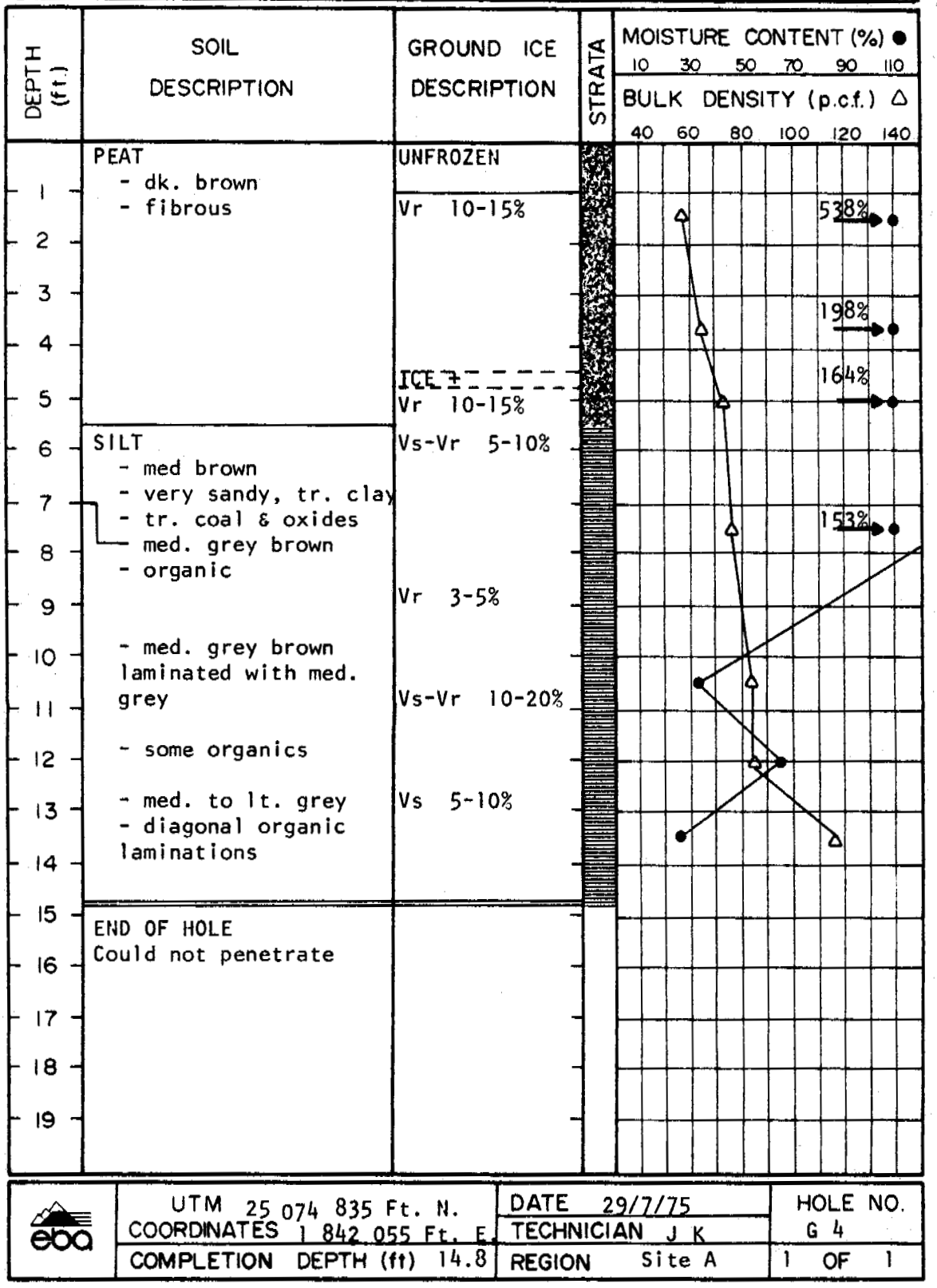
eba	UTM 25 075 265 Ft. N.	DATE 24/7/75	HOLE NO.
	COORDINATES 1 841 785 Ft. E.	TECHNICIAN JK	G 3
	COMPLETION DEPTH (ft) 5.0	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



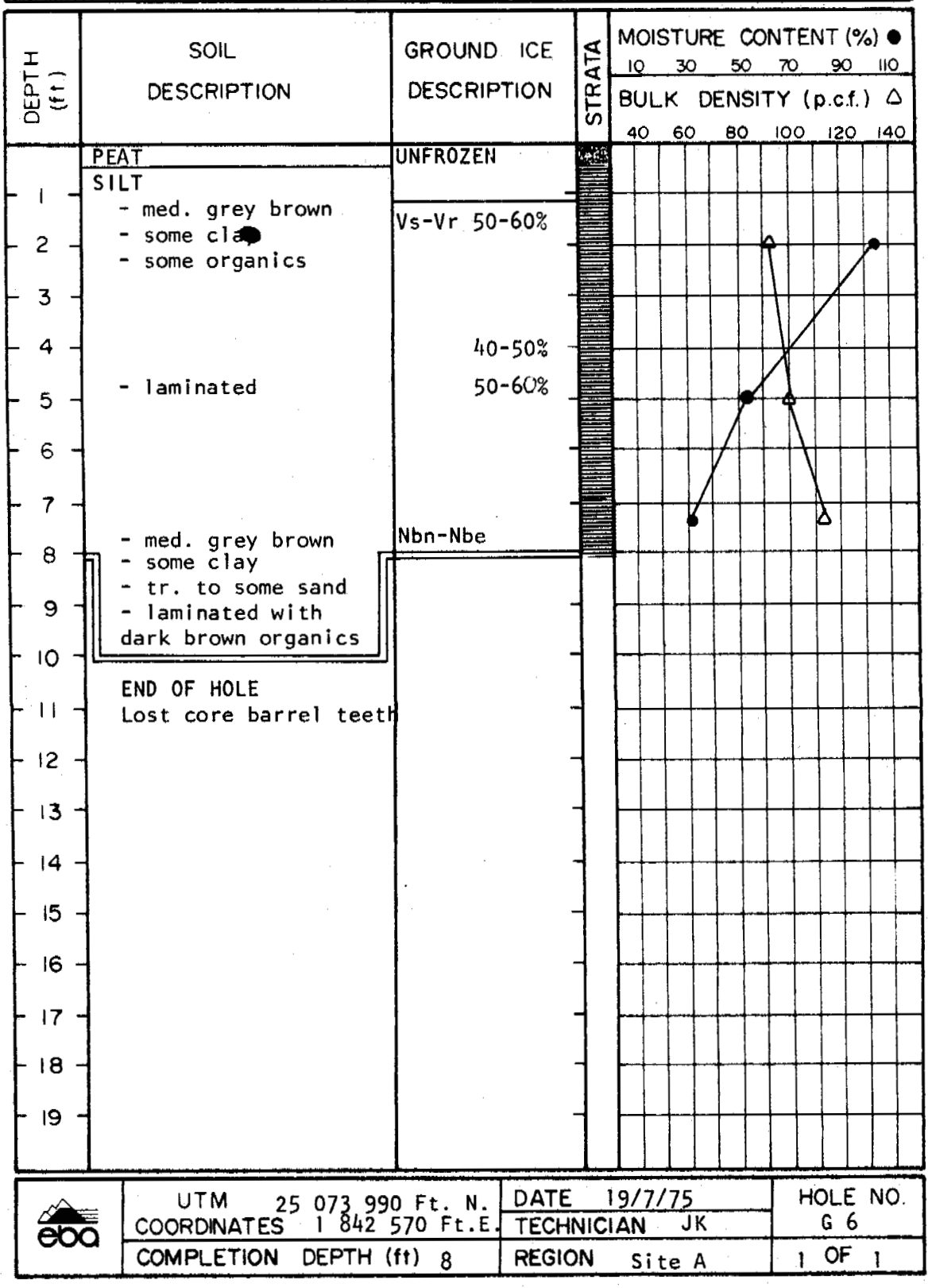
eba	UTM 25 075 265 ft.N.	DATE 14/8/75	HOLE NO.
	COORDINATES 1 841 785 ft.E.	TECHNICIAN TH	G3-Winki
	COMPLETION DEPTH (ft) 12	REGION Area A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



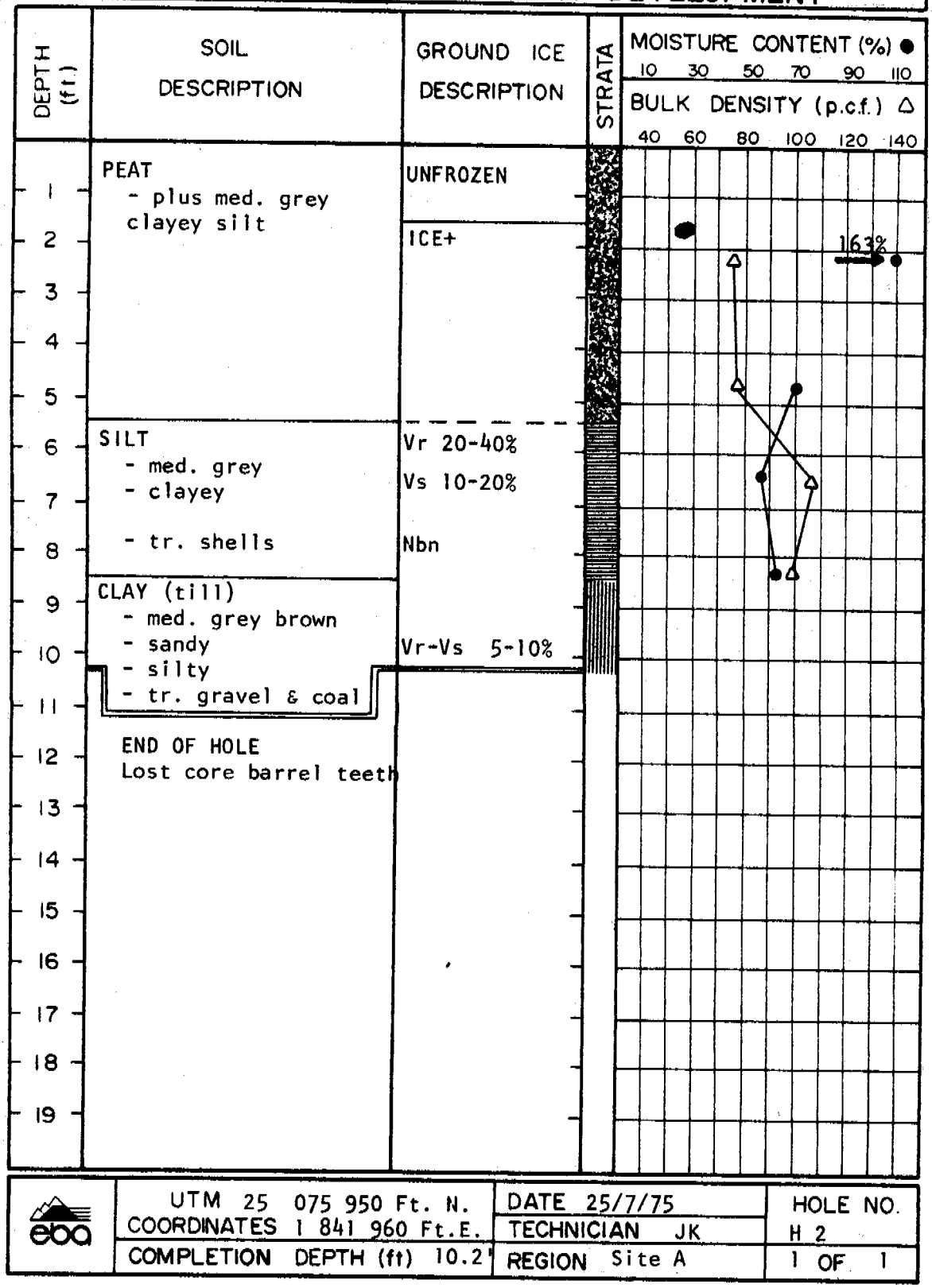
eba	UTM 25 074 835 Ft. N.	DATE 29/7/75	HOLE NO.
	COORDINATES 1 842 055 Ft. E.	TECHNICIAN J K	G 4
	COMPLETION DEPTH (ft) 14.8	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



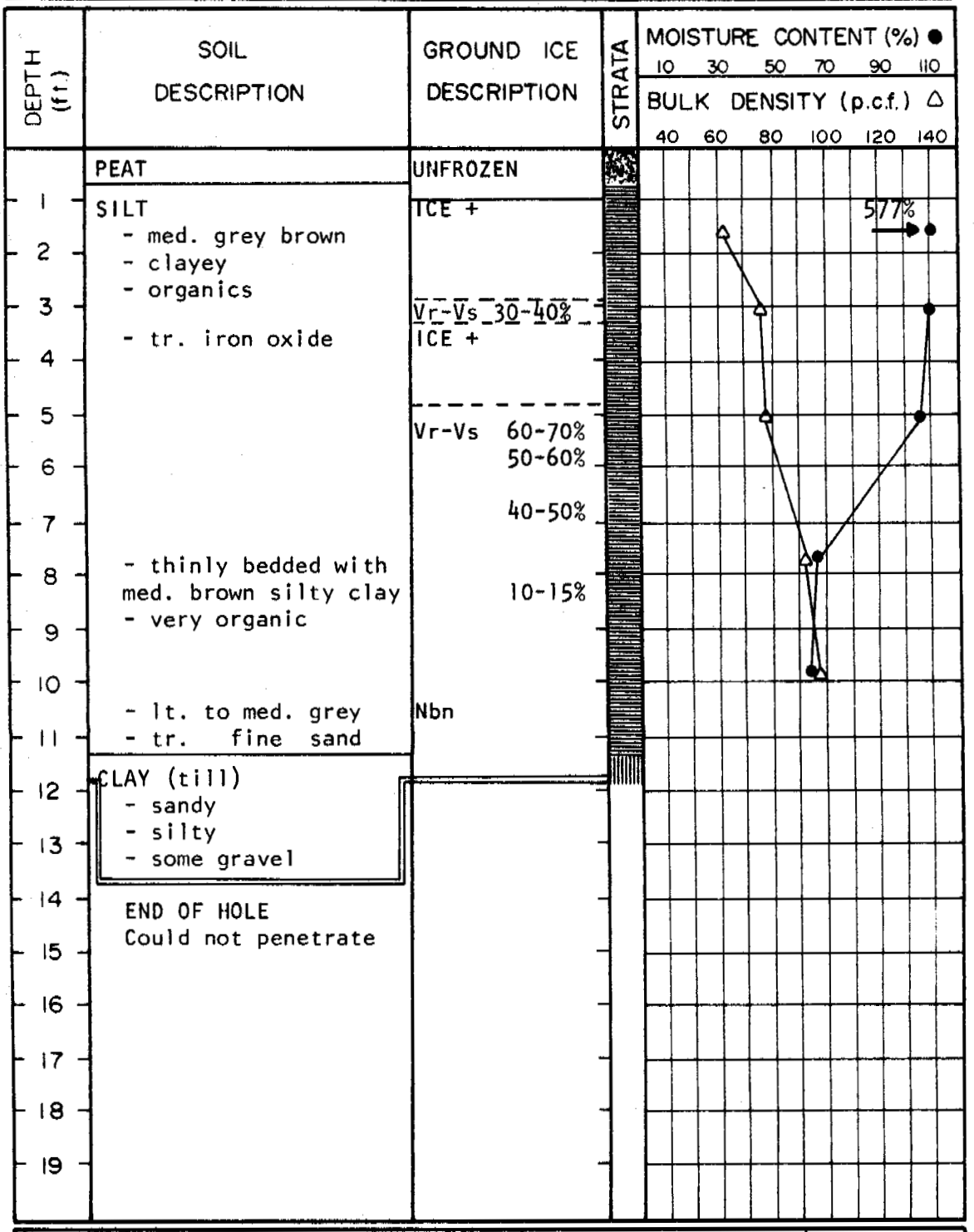
eba	UTM COORDINATES 25 073 990 Ft. N. 1 842 570 Ft.E.	DATE 19/7/75	HOLE NO. G 6
	COMPLETION DEPTH (ft) 8	TECHNICIAN JK	
		REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 075 950 Ft. N.	DATE 25/7/75	HOLE NO.
	COORDINATES 1 841 960 Ft.E.	TECHNICIAN JK	H 2
	COMPLETION DEPTH (ft) 10.2'	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



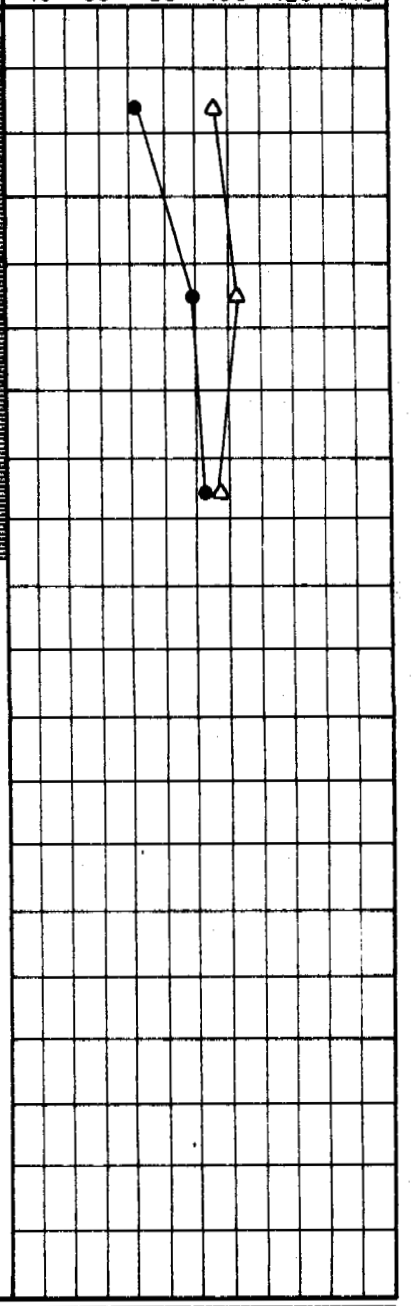
eba	UTM 25 075 530 Ft. N. COORDINATES 1 842 220 Ft.E.	DATE 25/7/75	HOLE NO. H 3
		TECHNICIAN JK	
	COMPLETION DEPTH (ft) 11.8	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	SILT - med. brown - sandy, silty	Vr-Vs 15-20%	
3	- interbedded with med. brown silty sand - tr. fine gravel		
4			
5			
6	- some organics		
7			
8			
9	END OF HOLE Could not penetrate		
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

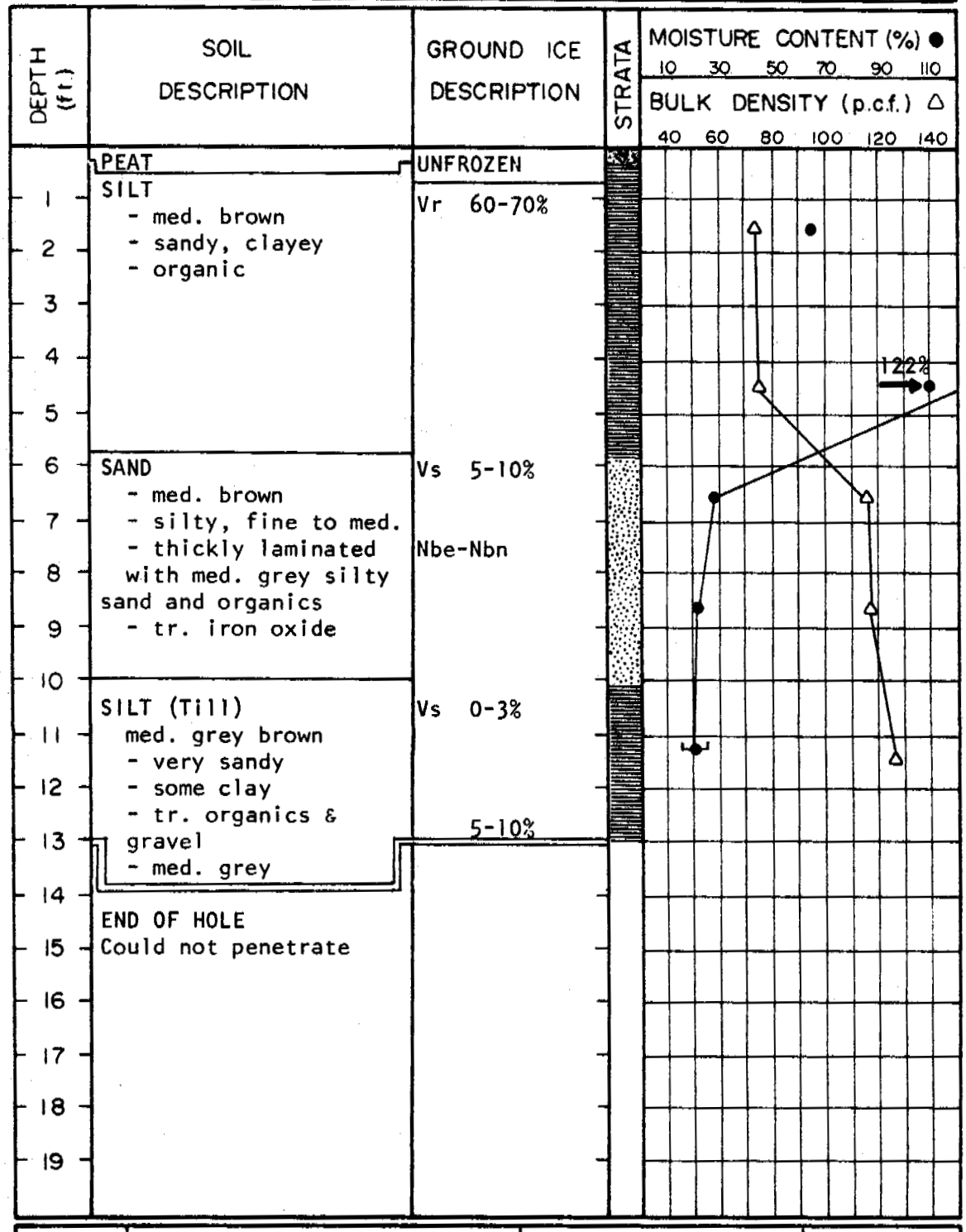
MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



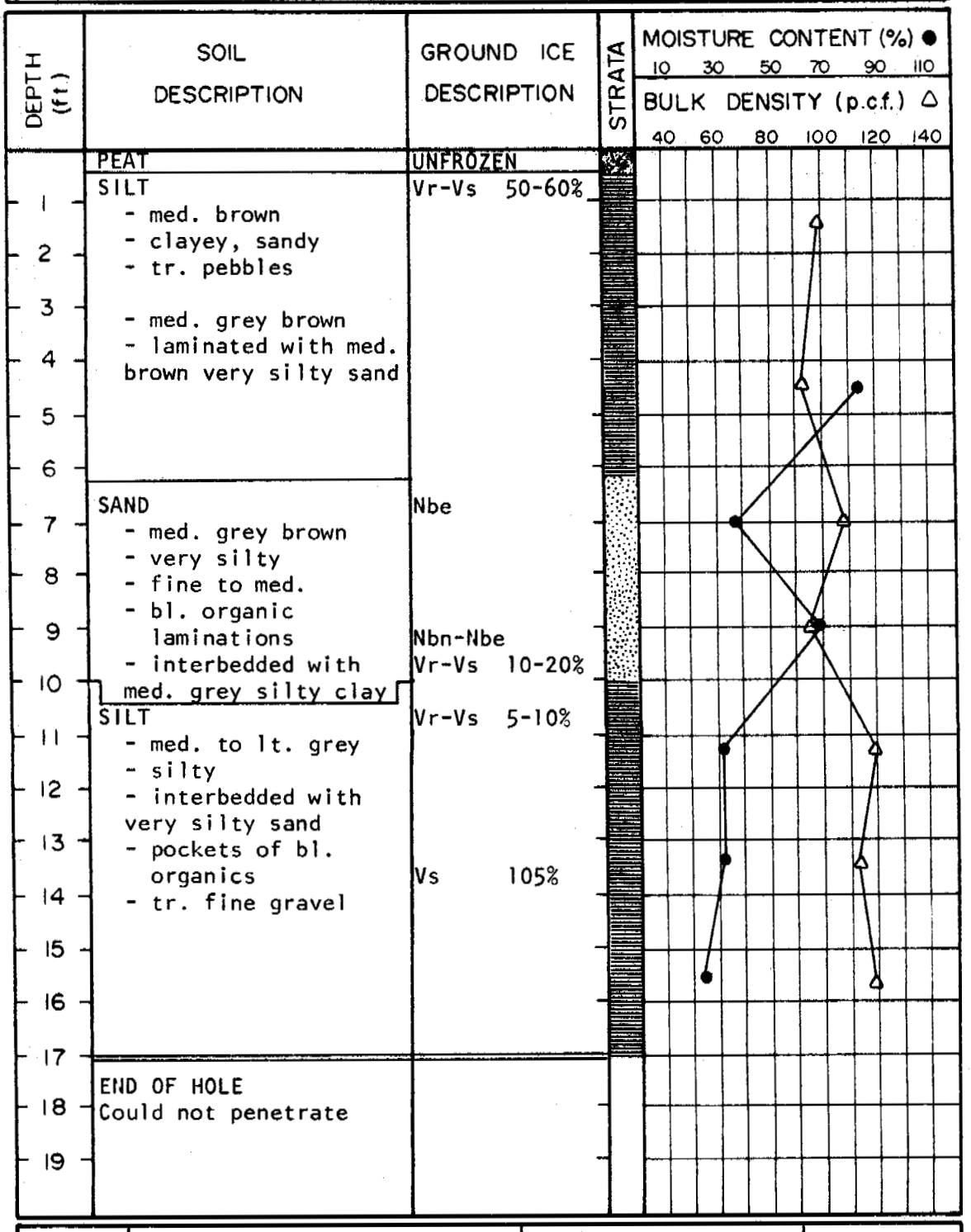
eba	UTM 25 071 190 Ft. N. COORDINATES 1 840 760 Ft.E.	DATE 28/7/75 TECHNICIAN JK	HOLE NO. A 9
	COMPLETION DEPTH (ft) 8.5	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



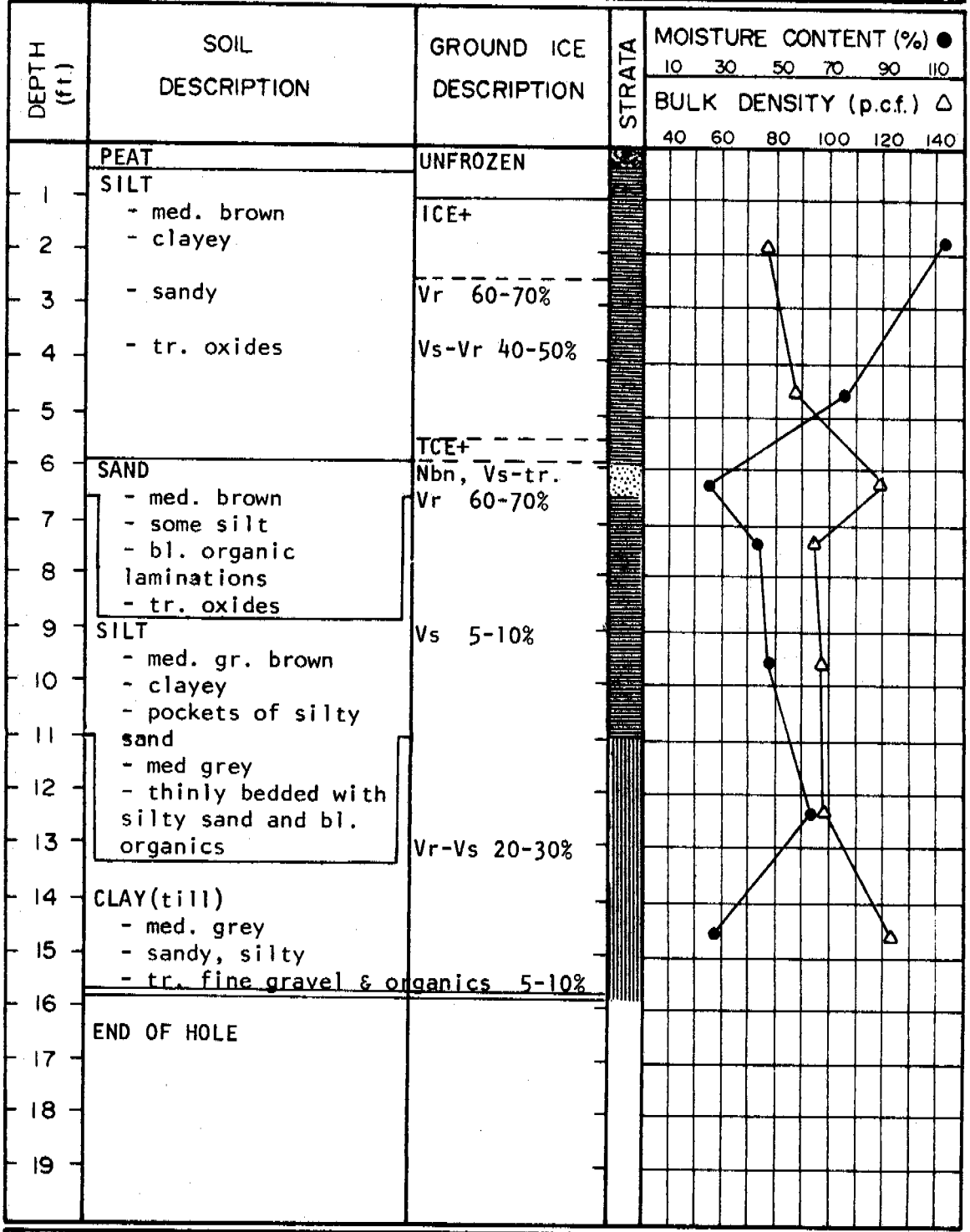
eba	UTM 25 071 485 Ft.N.	DATE 27/7/75	HOLE NO.
	COORDINATES 1 841 125 Ft. E.	TECHNICIAN JK	B-9
	COMPLETION DEPTH (ft) 13	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 070 790 Ft. N.	DATE 28/7/75	HOLE NO.
	COORDINATES 1 841 770 Ft.E.	TECHNICIAN JK	B 11
	COMPLETION DEPTH (ft) 17.0	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 072 405 Ft. N.	DATE 27/7/75	HOLE NO.
	COORDINATES 1 841 250 Ft.E.	TECHNICIAN JK	C 7
	COMPLETION DEPTH (ft) 15.8	REGION Site A	1 OF 1

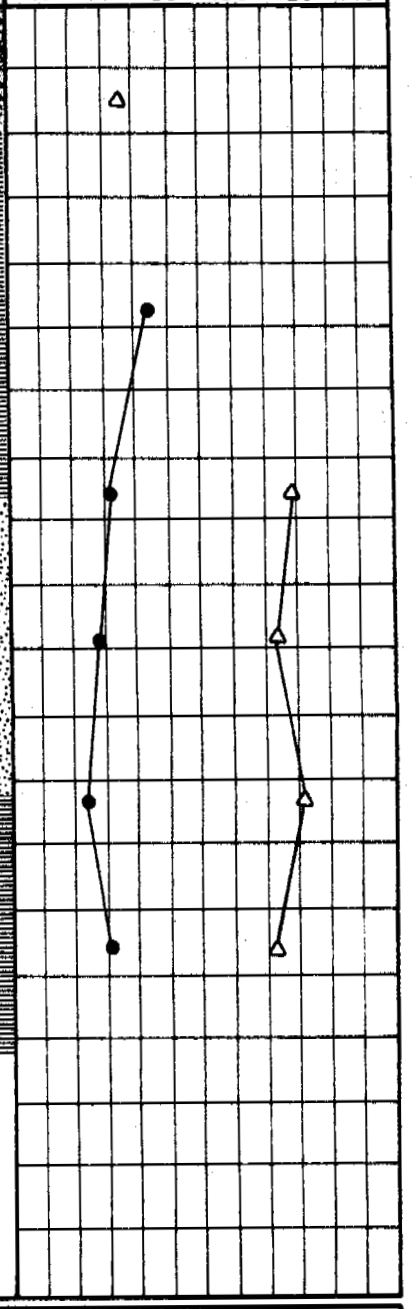
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN
2		Vr 5-10%
3	SILT - med. grey brown - clayey - organic	Vr-Vs 15-25%
4		10-20%
5		
6		20-30%
7		
8	SAND - lt. to med. grey - fine - very silty, some clay - tr. fine gravel - stratified	Vs-Vr 5-10%
9		15-25%
10		
11		Nbe, Vs-tr. Vs 1-5%
12		
13	SILT - lt. to med. grey - some clay - thickly laminated with silty sand and bl. organics - laminated with silt-clay	Vs-Vr 5-10%
14		
15		
16		
17	END OF HOLE	
18		
19		

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

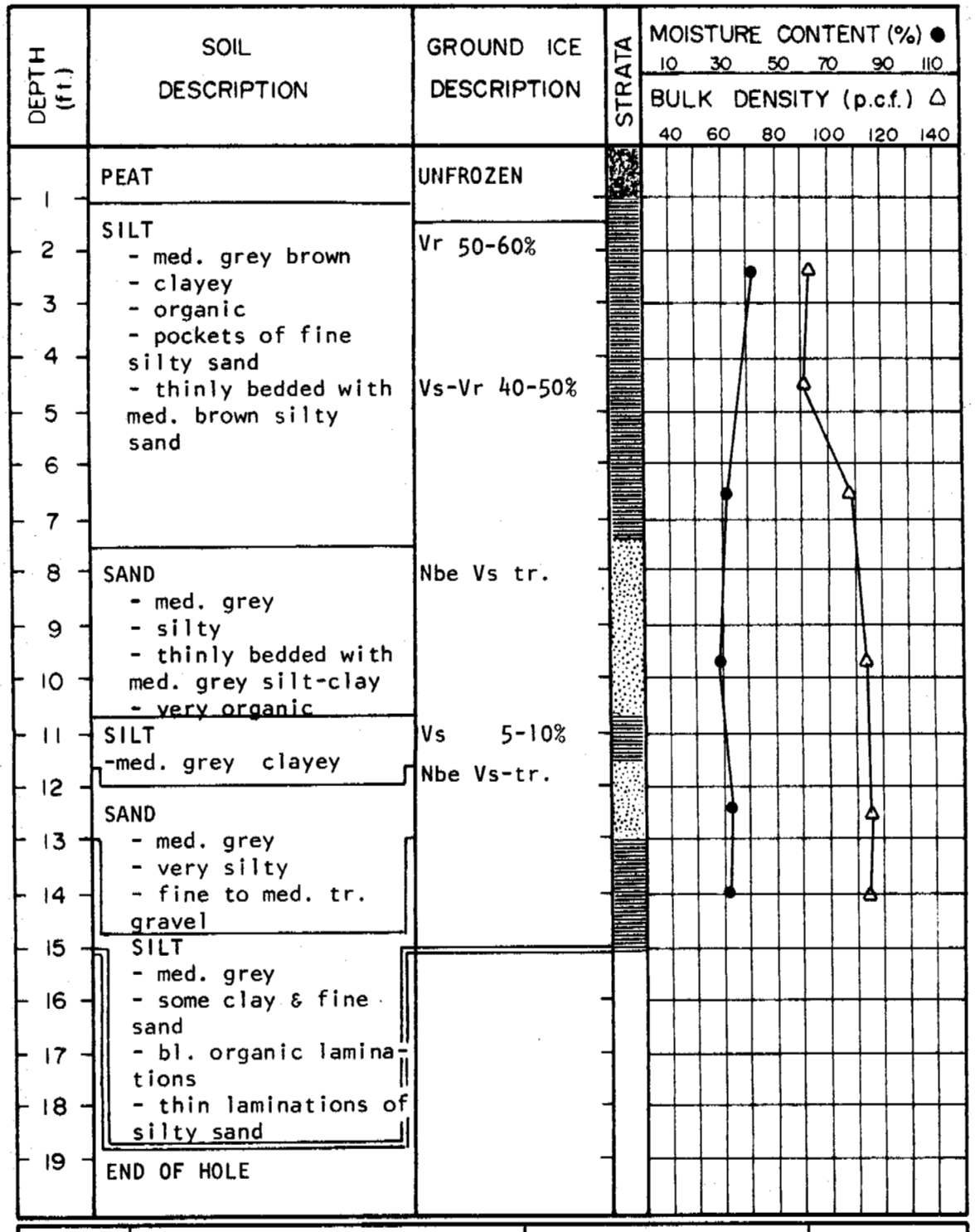
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba

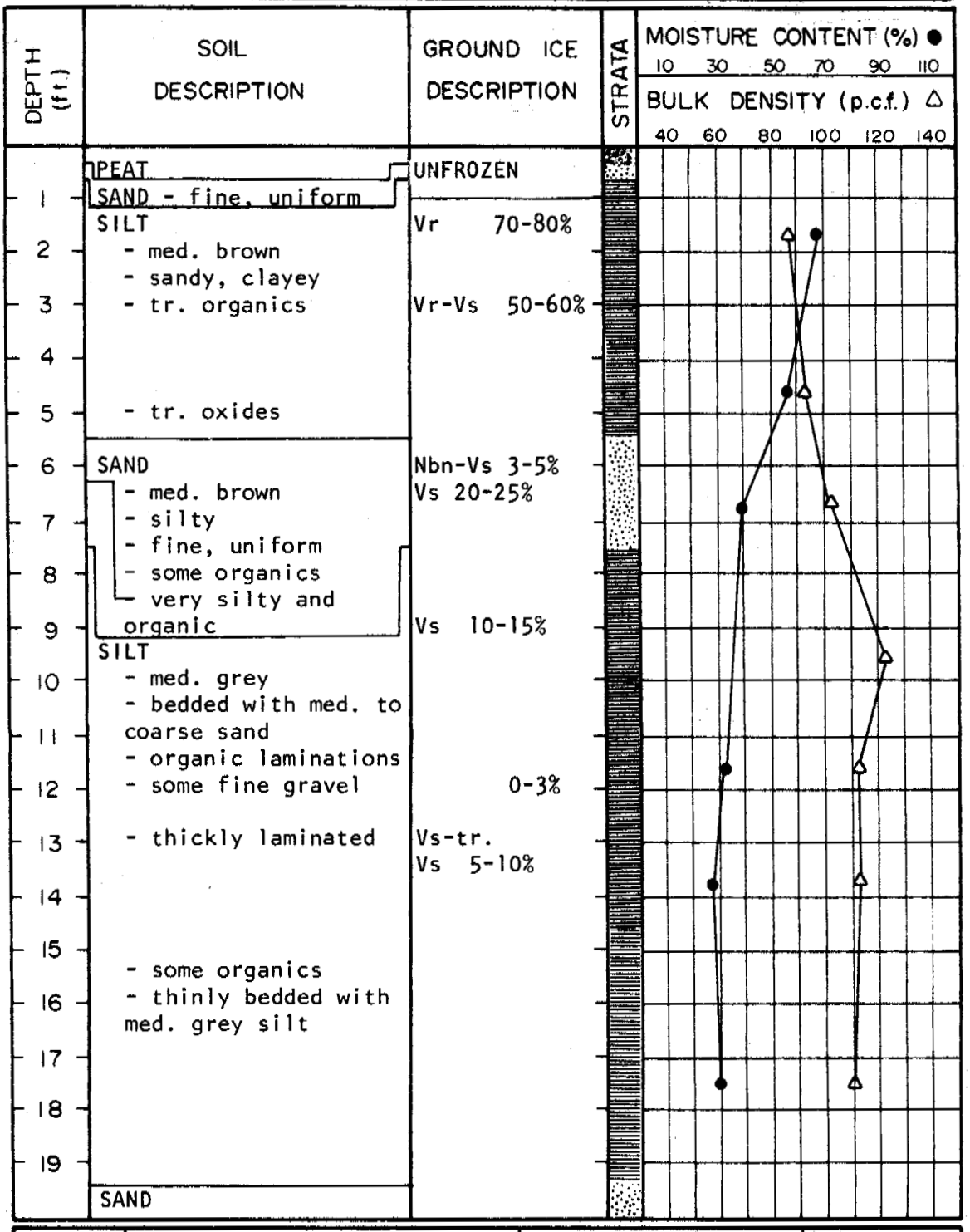
UTM COORDINATES 25 071 820 Ft. N. 1 841 750 Ft.E.	DATE 27/7/75	HOLE NO. C 9
	TECHNICIAN JK	
COMPLETION DEPTH (ft) 16.2	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 070 985 Ft.N.	DATE 27/7/75	HOLE NO.
	COORDINATES 1 842 255 Ft.E.	TECHNICIAN JK	C 11
	COMPLETION DEPTH (ft) 15.0	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 070 565 Ft. N.	DATE 26/7/75	HOLE NO.
	COORDINATES 1 842 440 Ft.E.	TECHNICIAN JK	C 12
	COMPLETION DEPTH (ft) 20.5	REGION Site A	1 OF 2

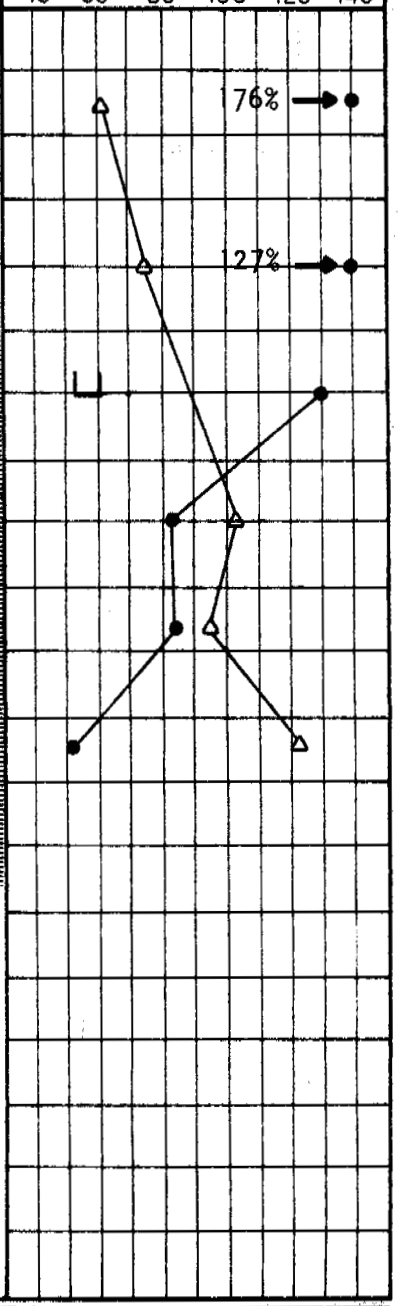
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA	MOISTURE CONTENT (%) ● 10 30 50 70 90 110 / BULK DENSITY (p.c.f.) △ 40 60 80 100 120 140
20	SAND - med. grey - silty - fine to med. grained - some thin laminations of silty clay	Nbn, Vs-tr.		● △
21	END OF HOLE			

eba	UTM 25 070 565 Ft. N. COORDINATES 1 842 440 Ft.E.	DATE 26/7/75 TECHNICIAN JK	HOLE NO. C 12
	COMPLETION DEPTH (ft) 20.5	REGION Site A	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

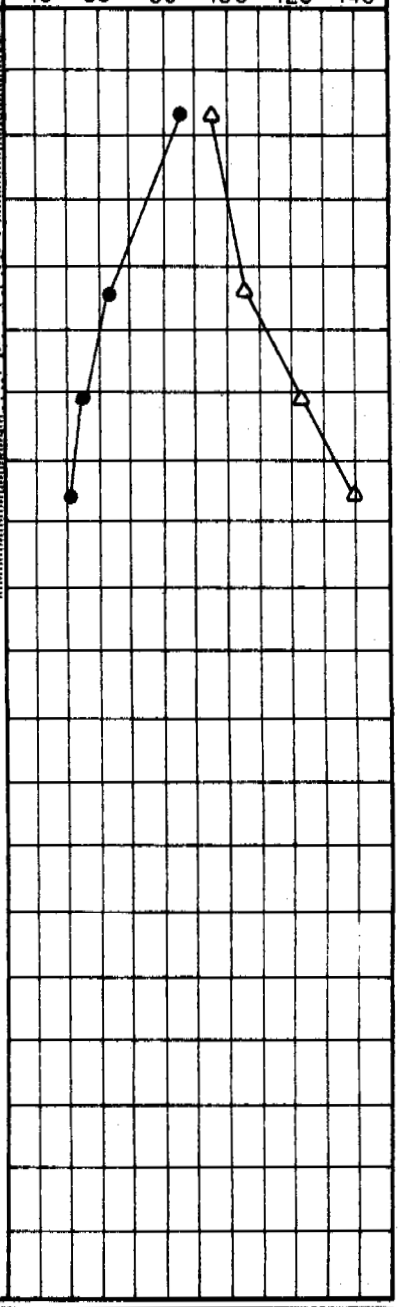
DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - dk. brown - tr. of silt	UNFROZEN ICE+ Vr 50%	
2			
3			
4	SILT - dk. grey brown - clayey - pockets of organics - tr. iron oxides - low plastic	Vr 25-30%	
5			
6		Vs 55%	
7			
8			
9	- med. brown - clayey - very sandy - tr. fine gravel & coal	30%	
10		Vr 35%	
11	dk. grey brown mottled with med. brown - tr. organics & coal		
12			
13		10%	
14	END OF HOLE		
15			
16			
17			
18			
19			



eba	UTM 25 072 290 ft.N COORDINATES 1 841 775 ft.E.	DATE 30/7/75 TECHNICIAN TH	HOLE NO. D 8
	COMPLETION DEPTH (ft) 13.5	REGION Site A	1 OF 1

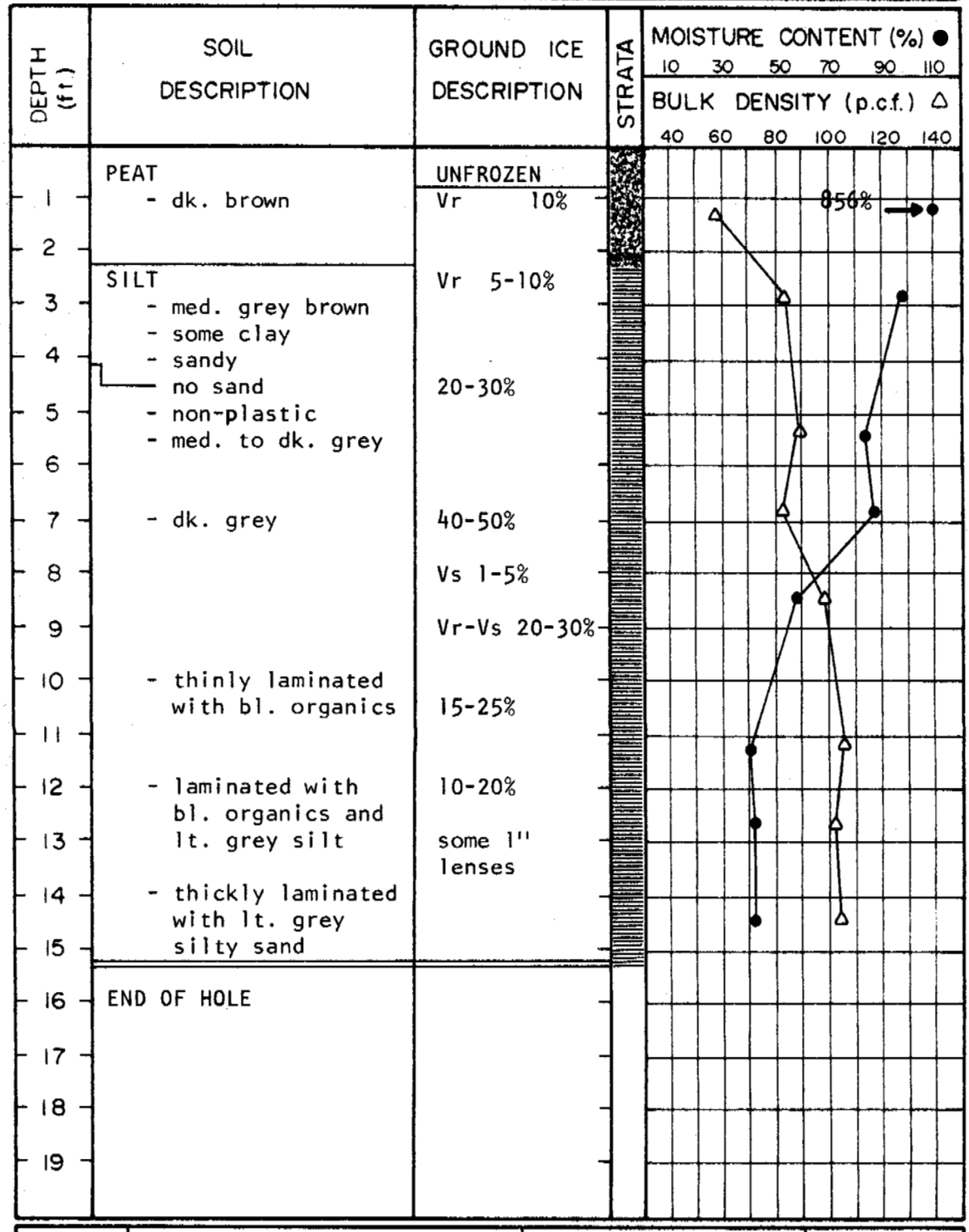
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	SILT - dark brown - sandy	ICE+	
3			
4	SAND - lt. to med. brown - silty - tr. fine gravel & coal	Vr 10%	
5			
6			
7	SILT - dk. grey brown - very sandy - tr. fine gravel & coal	Nbn, Vr-5%	
8			
9			
10	END OF HOLE No Recovery		
11			
12			
13			
14			
15			
16			
17			
18			
19			



eba	UTM 25 071 615 ft.N.	DATE 30/7/75	HOLE NO.
	COORDINATES 1 842 430 ft.E	TECHNICIAN TH	D 10
	COMPLETION DEPTH (ft) 9.1	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



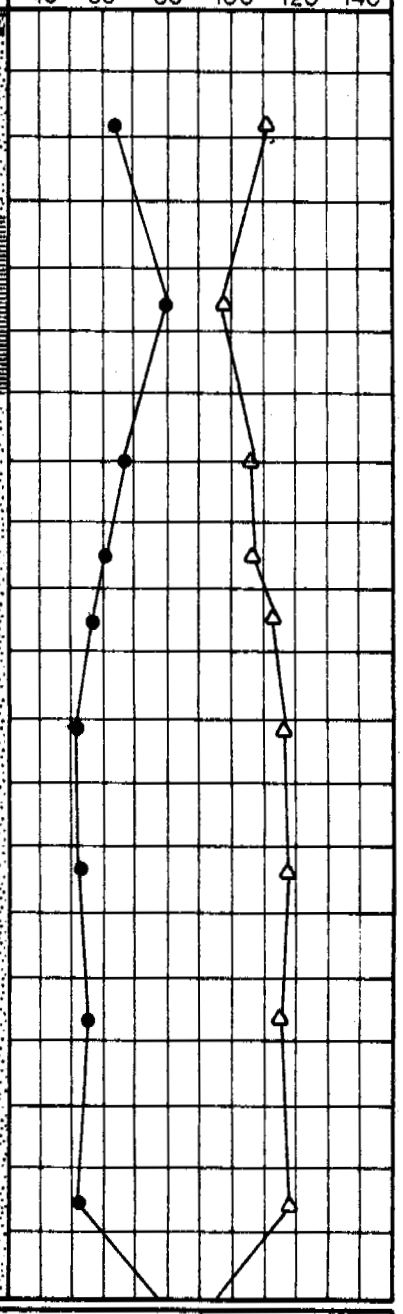
eba	UTM 25 071 090 ft.N.	DATE 28/7/75	HOLE NO.
	COORDINATES 1 843 000 ft.E.	TECHNICIAN JK	D12
	COMPLETION DEPTH (ft) 15.2	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
	PEAT	UNFROZEN
1	SAND - med. grey brown - fine to med. - some silt - some oxides	Nbe
2		
3		Vs-Vr 70-80%
4	- med. brown - fine silty	
5	SILT - med. brown - clayey	Vs 50-60%
6		
7	- med. grey - laminated with sand and organics	
8	SAND - med. grey - silty	Sand Nbn-Nbe Clay Vs 40-50
9	- thickly laminated with silty, organic clay	
10		Clay Vs 20-25%
11		Clay Vs 10-15%
12	- med. to lt. grey - silty - tr. fine gravel	Nbe-Nbn
13	- pockets of silty clay	Nbn-Nbe Vs-Tr
14		
15	- thinly laminated with black organics	
16		
17		Nbn
18		
19		

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

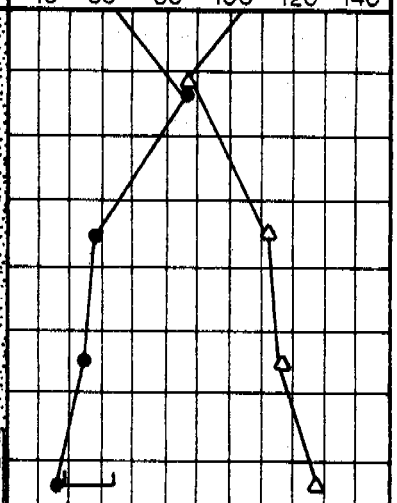


eba	UTM 25 070 240 ft.N. COORDINATES 1 843 325 ft.E.	DATE 26/7/75 TECHNICIAN JK	HOLE NO. D13
	COMPLETION DEPTH (ft) 28	REGION Site A	1 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

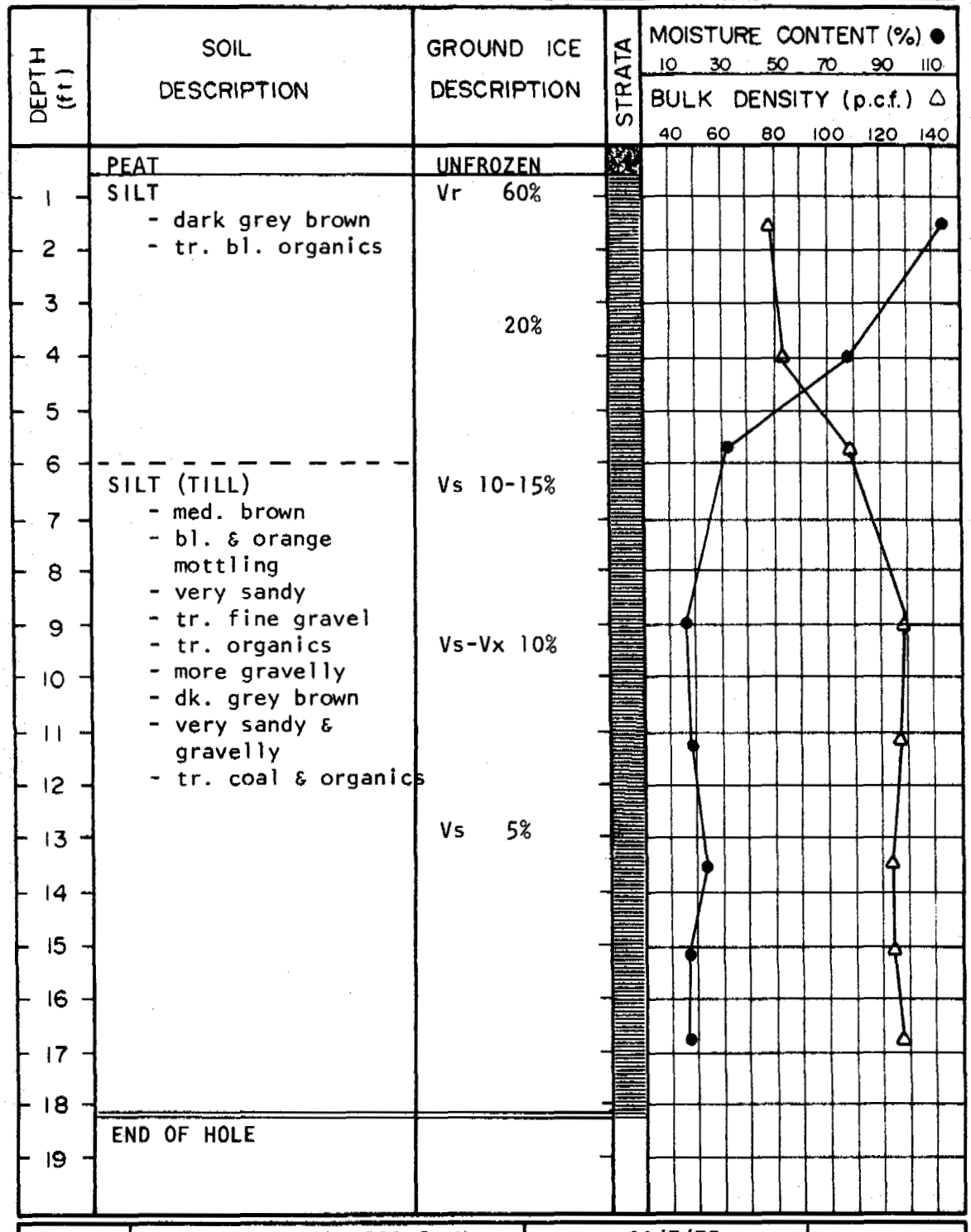
DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
21	SAND - med. to lt. grey - silty - fine, uniform - large pockets of black organics - some silt clay pockets - thinly laminated with black organics - some gravelly sand layers	Nbn	
27	CLAY (TILL) - med. grey - silty - some sand - tr. fine gravel - low plastic	Vs-Vr 3-5%	
28	END OF HOLE Could not penetrate		

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM 25 070 240 ft. N.	DATE 26/7/75	HOLE NO.
	COORDINATES 1 843 325 ft.E.	TECHNICIAN JK	D13
	COMPLETION DEPTH (ft) 28	REGION Site A	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



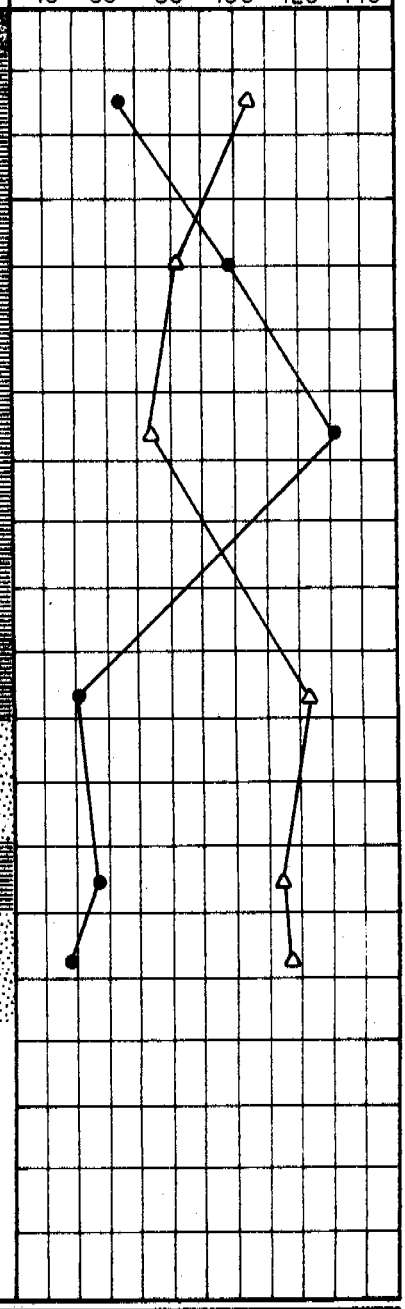
eba	UTM COORDINATES 25 072 300 ft.N. 1 842 250 ft.E	DATE 30/7/75	HOLE NO.
		TECHNICIAN TH	F9
	COMPLETION DEPTH (ft) 20	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN
2	SILT - dark brown - some thin organic layers	Vr 35%
3	- dark grey brown - tr. organics	
4		40%
5		
6		Vs 65%
7		
8	- dark brownish grey	
9		Vr 20%
10		Vs 25%
11	SAND	20%
12	- med. brown - med. grained	
13	- laminated with silt	30%
14	SILT (TILL) - dark grey brown	Nbn, Vr-5%
15	SAND (TILL) - med. brown	
16	- tr. coal & fine gravel	
17	END OF HOLE	
18		
19		

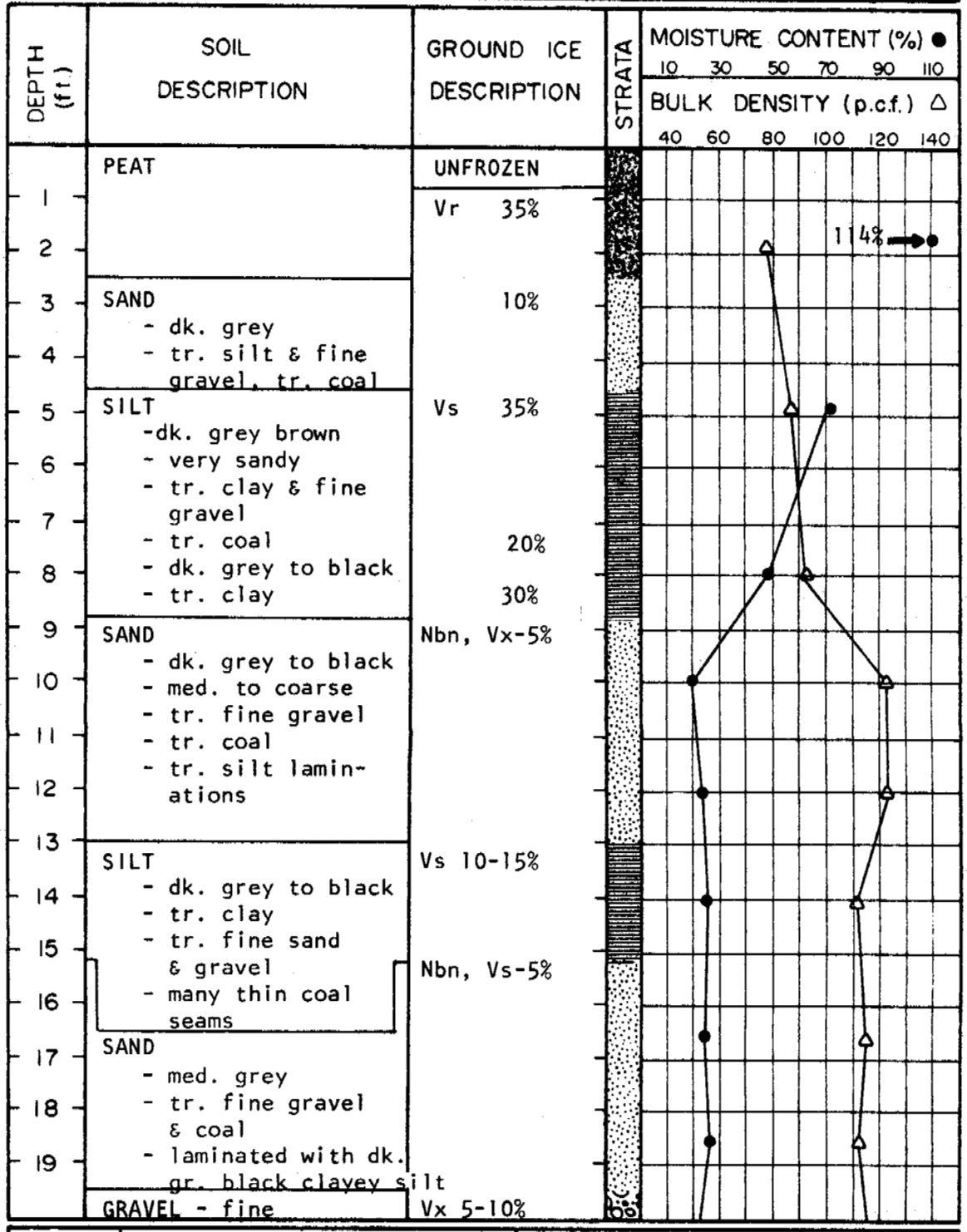
STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



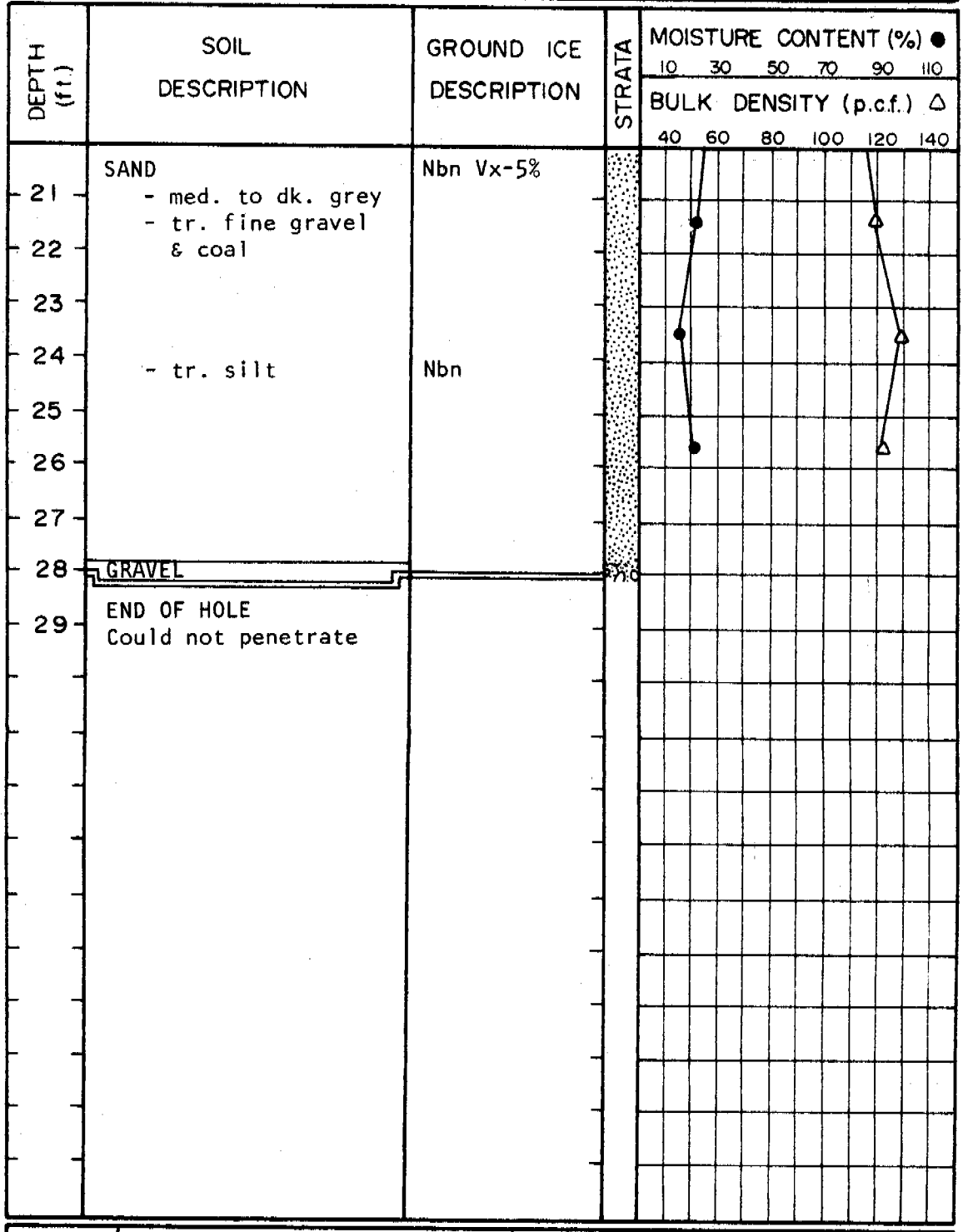
eba	UTM 25 071 590 ft.N. COORDINATES 1 842 870 Ft E	DATE 30/7/75 TECHNICIAN TH	HOLE NO. E 11
	COMPLETION DEPTH (ft) 15.7	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



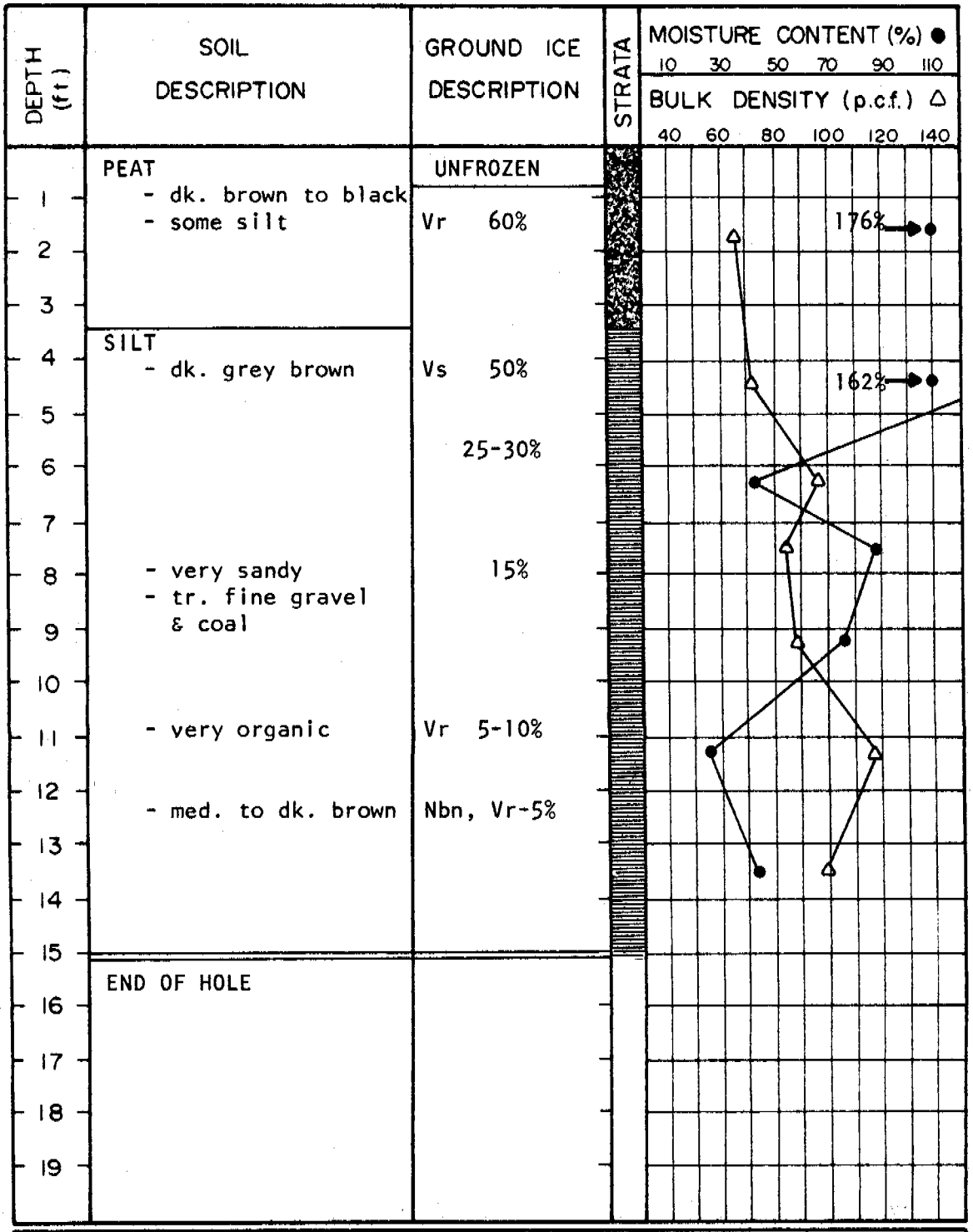
eba	UTM 25 070 280 ft. N.	DATE 31/7/75	HOLE NO.
	COORDINATES 1 843 840 Ft.E	TECHNICIAN TH	E 14
	COMPLETION DEPTH (ft) 28	REGION Site A	1 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM COORDINATES 25 070 200 ft. N. 1 843 840 Ft.E.	DATE 31/7/75	HOLE NO. E14
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 28	REGION Site A	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



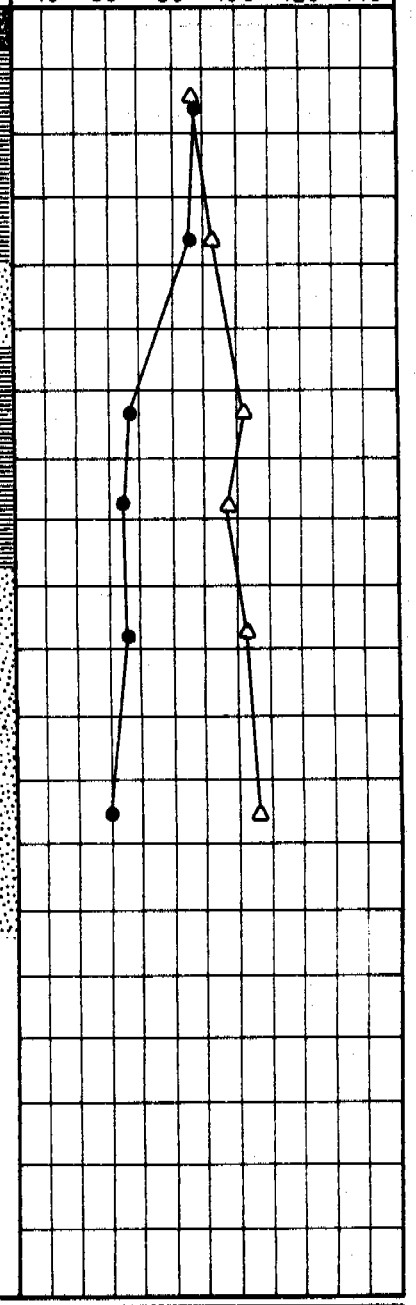
eba	UTM 25 072 625 ft.N.	DATE 30/7/75	HOLE NO.
	COORDINATES 1 842 935 ft.E.	TECHNICIAN TH	F 9
	COMPLETION DEPTH (ft) 15	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
	PEAT	UNFROZEN
1	SILT - dk. brown - tr. sand - some organics	Vr 25-35%
4	SAND - reddish dk. brown - laminated with dk. grey brown silt - some organics	10% Vs 40%
7	SILT - dk. brown grey - clayey - tr. iron oxide	
9	SAND - dk. grey to black - very silty - coal bands	15%
12	- dk. grey with lt. grey mottling - tr. silt gravel	Nbn, Vx-5%
15	END OF HOLE	

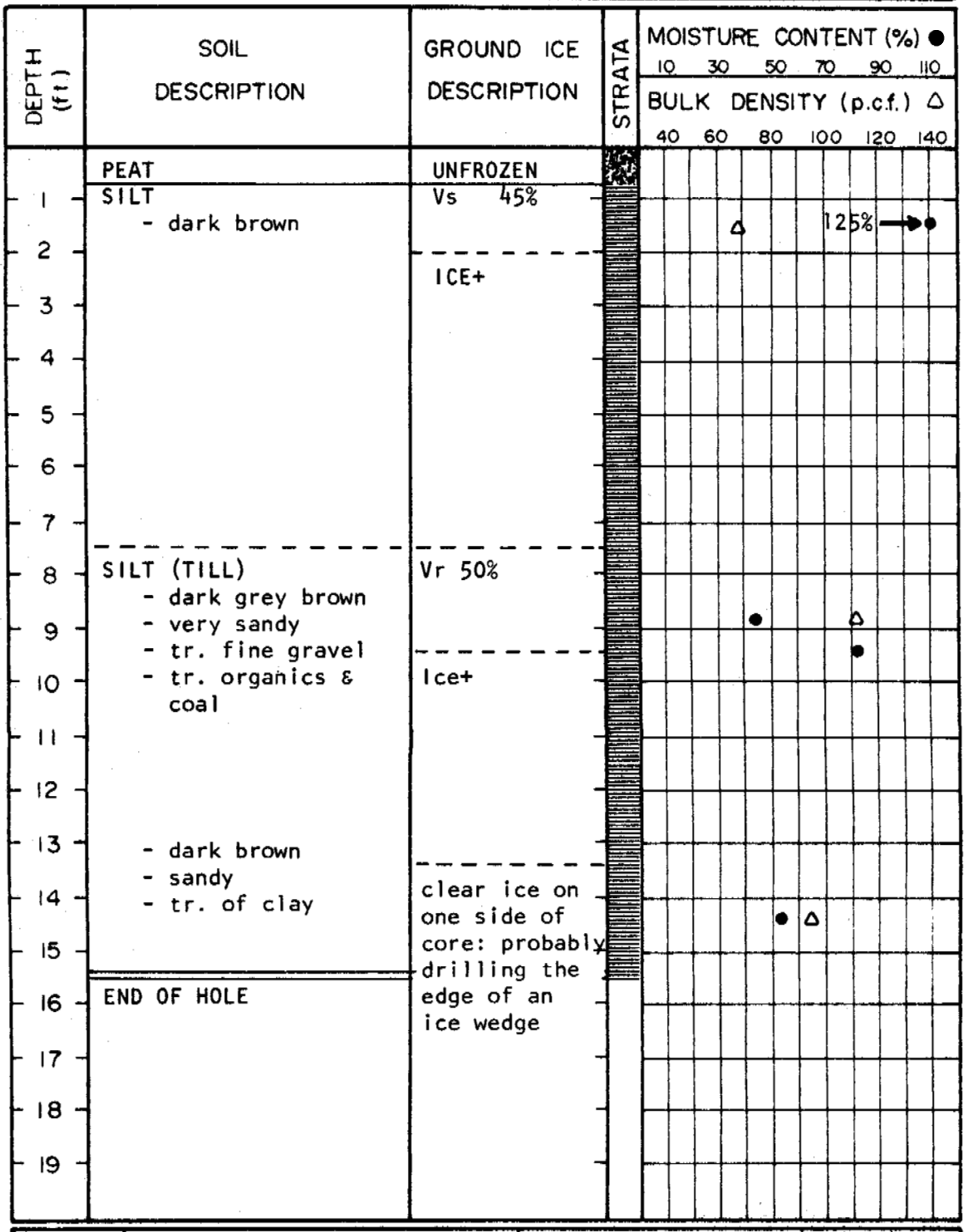
STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



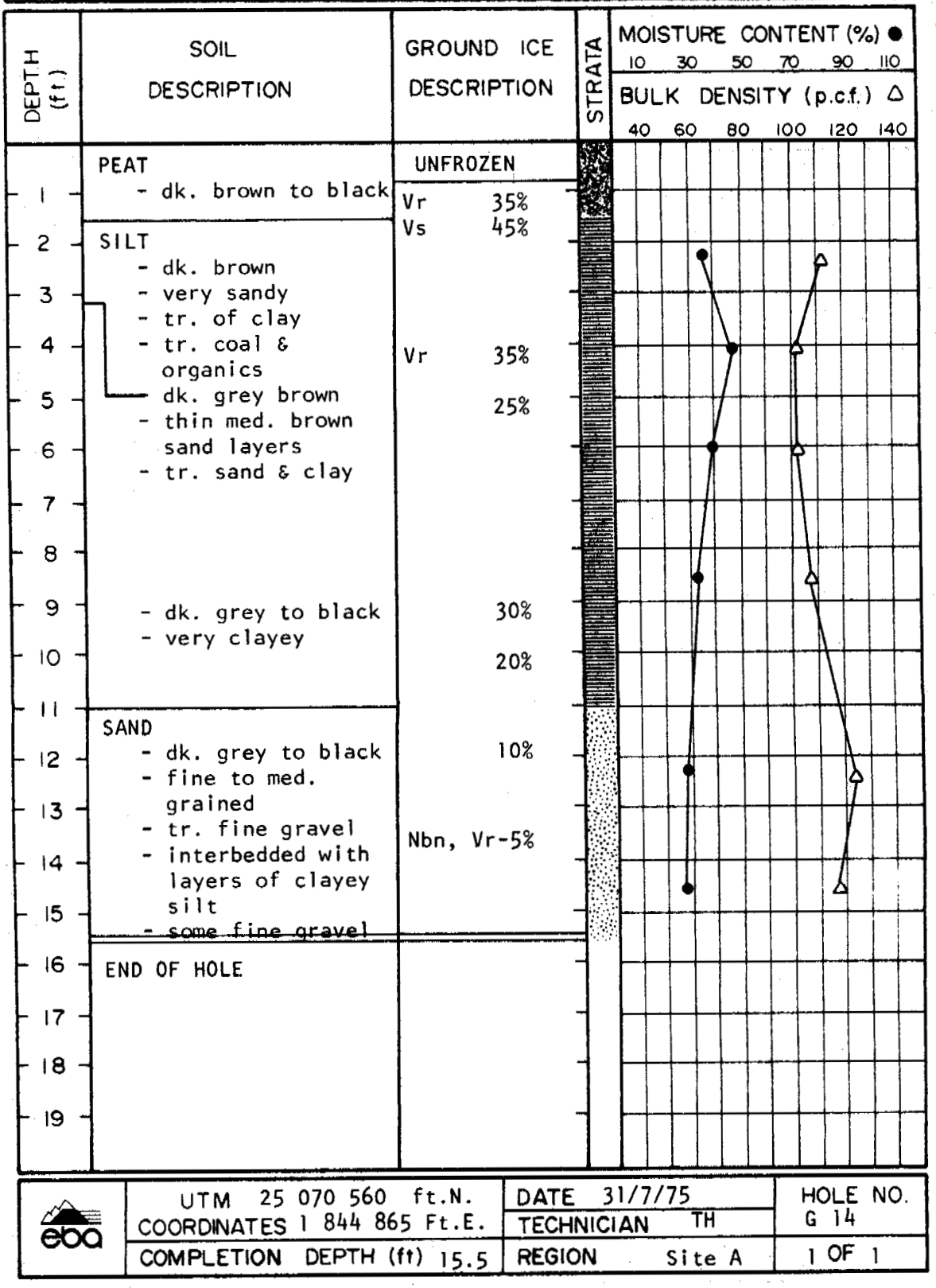
eba	UTM 25 070 830 ft.N. COORDINATES 1 844 090 Ft.E.	DATE 31/7/75 TECHNICIAN TH	HOLE NO. F13
	COMPLETION DEPTH (ft) 14.3	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



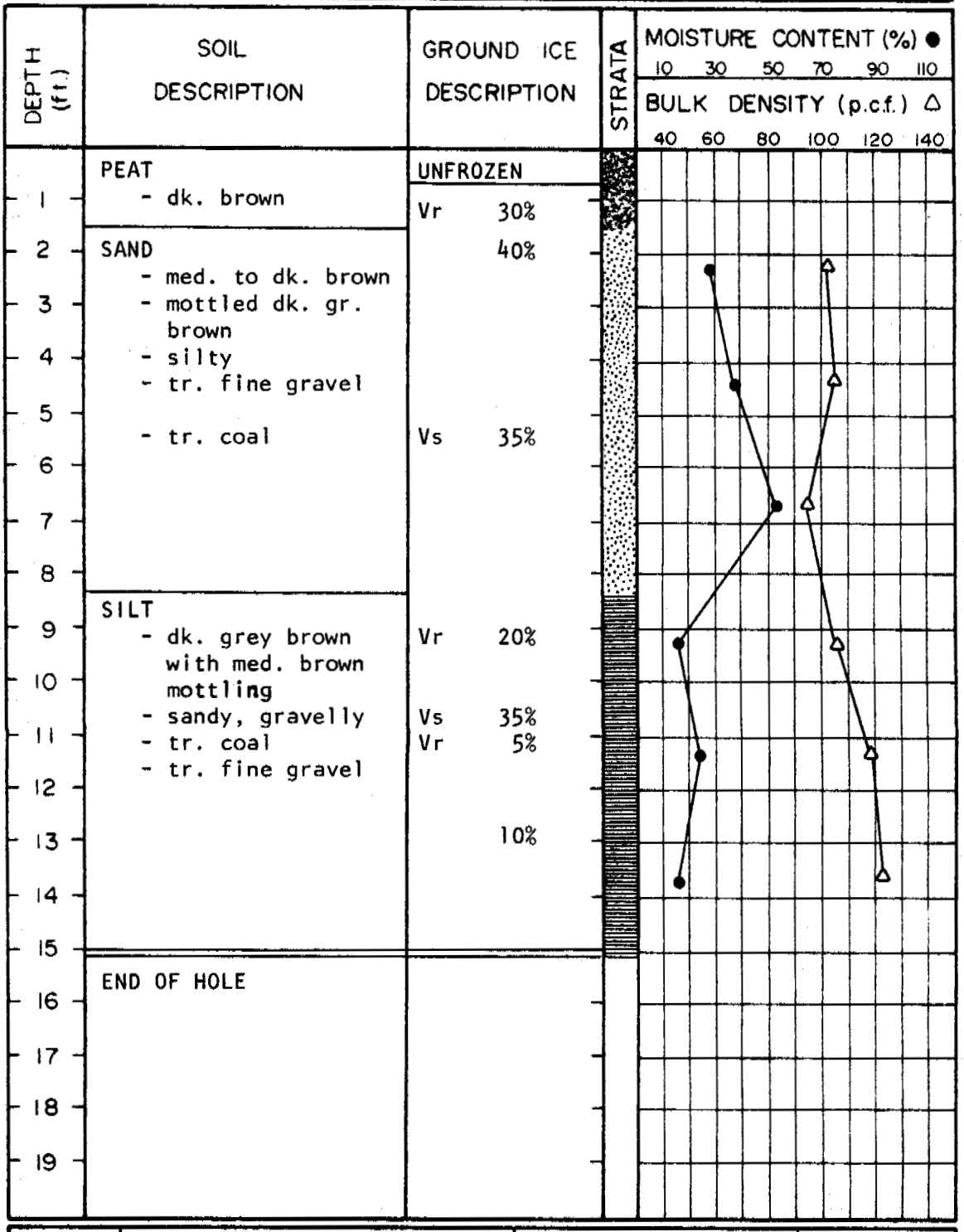
eba	UTM 25 072 975 ft.N.	DATE 31/7/75	HOLE NO.
	COORDINATES 1 843 030 ft.E.	TECHNICIAN TH	G8
	COMPLETION DEPTH (ft) 15.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 070 560 ft.N. COORDINATES 1 844 865 Ft.E.	DATE 31/7/75 TECHNICIAN TH	HOLE NO. G 14
	COMPLETION DEPTH (ft) 15.5	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



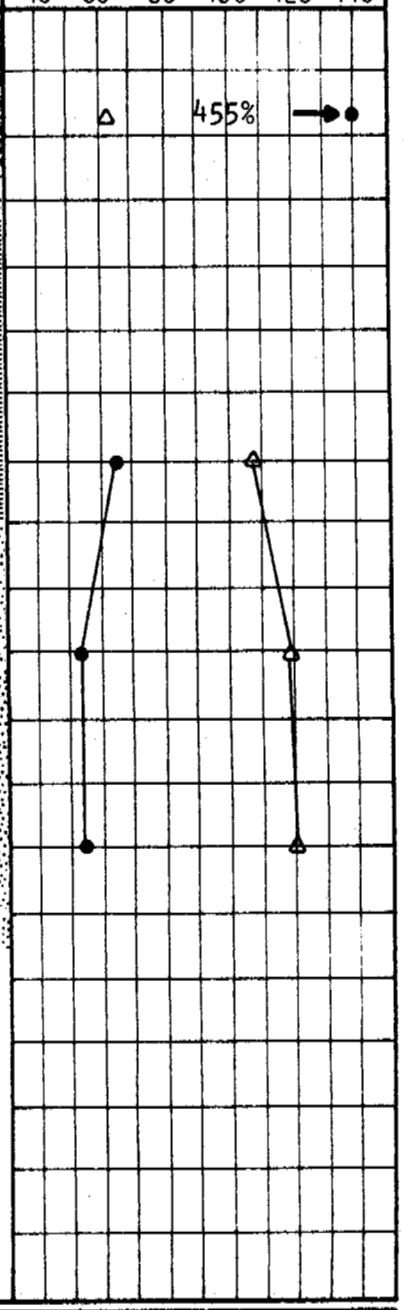
eba	UTM 25 073 915 ft.N. COORDINATES 1 843 175 ft.E.	DATE 31/7/75 TECHNICIAN TH	HOLE NO. H 7
	COMPLETION DEPTH (ft) 15	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT - dk. brown	UNFROZEN Vr 30%
2		
3	SAND - dk. brown tr. silt & fine gravel	10%
4	SILT - dk. brown - clayey - tr. fine sand - tr. fine gravel - dk. grey brown mottling - reddish brown med. sand laminations	Vs 40% 20%
5		
6		
7		
8	SAND - med. to dk. grey - med. to coarse - tr. fine gravel - tr. coal & organics	Vx 5% Vs 20% Nbn, Vx 5%
9		
10		
11		
12		
13		
14		
15	END OF HOLE	
16		
17		
18		
19		

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



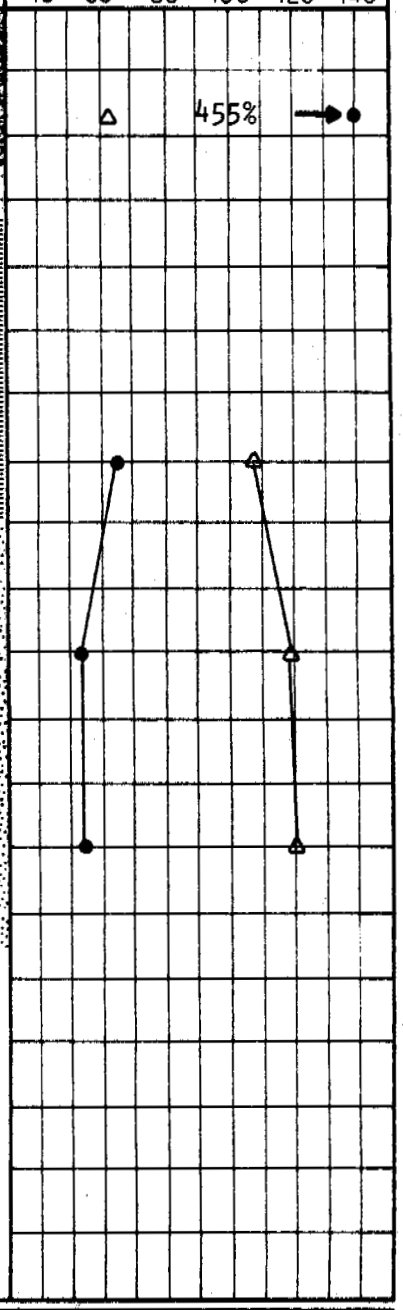
eba	UTM 25 072 830 ft.N. COORDINATES 1 845 070 ft.E.	DATE 1/8/75 TECHNICIAN TH	HOLE NO. H10
	COMPLETION DEPTH (ft) 14.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT - dk. brown	UNFROZEN Vr 30%
2		
3	SAND - dk. brown tr. silt & fine gravel	10%
4	SILT - dk. brown - clayey - tr. fine sand - tr. fine gravel	Vs 40%
5		
6		
7	- dk. grey brown mottling - reddish brown med. sand laminations	20%
8		
9	SAND - med. to dk. grey - med. to coarse	Vx 5% Vs 20%
10	- tr. fine gravel - tr. coal & organics	Nbn, Vx 5%
11		
12		
13		
14		
15	END OF HOLE	
16		
17		
18		
19		

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

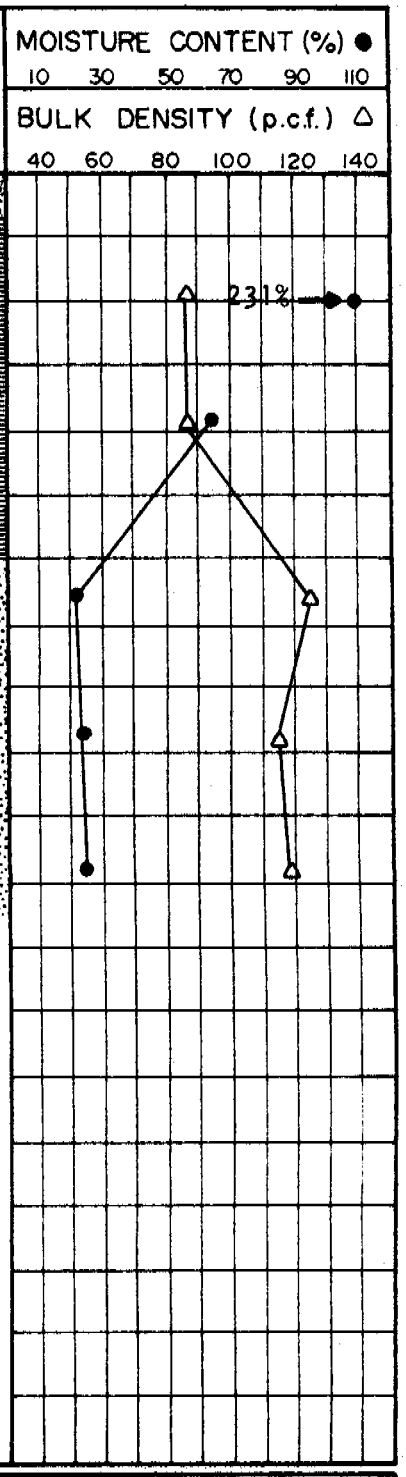


eba	UTM 25 072 830 ft.N. COORDINATES 1 845 070 ft.E.	DATE 1/8/75 TECHNICIAN TH	HOLE NO. H10
	COMPLETION DEPTH (ft) 14.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
	PEAT	UNFROZEN
1	SILT	Vr 70-80%
2	- dk.grey brown	
	- some clay	
3	- dk. brown	Vs 35-40%
	- clayey	
4		
	- 2" sand layer	
5	- tr. sand	
6		
	SAND	
7	- med. brown	
	- tr. of silt & gravel	
8	- med. to coarse grained	
9		Nbn, Vr-5%
	- some 2" coal layers	
10		
11		
12	END OF HOLE	
	Could not Penetrate	
13		
14		
15		
16		
17		
18		
19		

STRATA



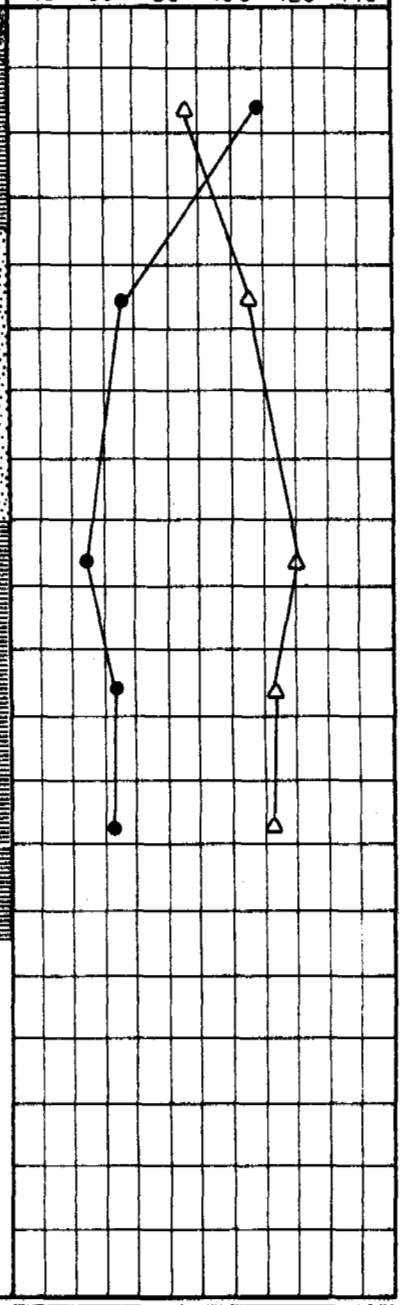
eba	UTM 25 070 170 ft.N.	DATE 31/7/75	HOLE NO.
	COORDINATES 1 845 350 ft.E.	TECHNICIAN TH	H15
	COMPLETION DEPTH (ft) 11.3	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1–3	PEAT SILT - med. to dk. brown - very sandy - tr. clay	UNFROZEN Vs 30%
4–8	SAND - med. to dk. brown - med. grained - tr. silt & fine gravel - tr. coal	25%
8–14	SILT - dk. grey brown - clayey - med. to dk. grey - very sandy - med. to dk. brown - some sand - laminated with orange-brown sandy silt	15% Vs 5-10%
15	END OF HOLE	

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM 25 070 990 ft.N. COORDINATES 1 846 170 Ft E.	DATE 1/8/75 TECHNICIAN TH	HOLE NO. 1 15
	COMPLETION DEPTH (ft) 14.3	REGION Site A	1 OF 1

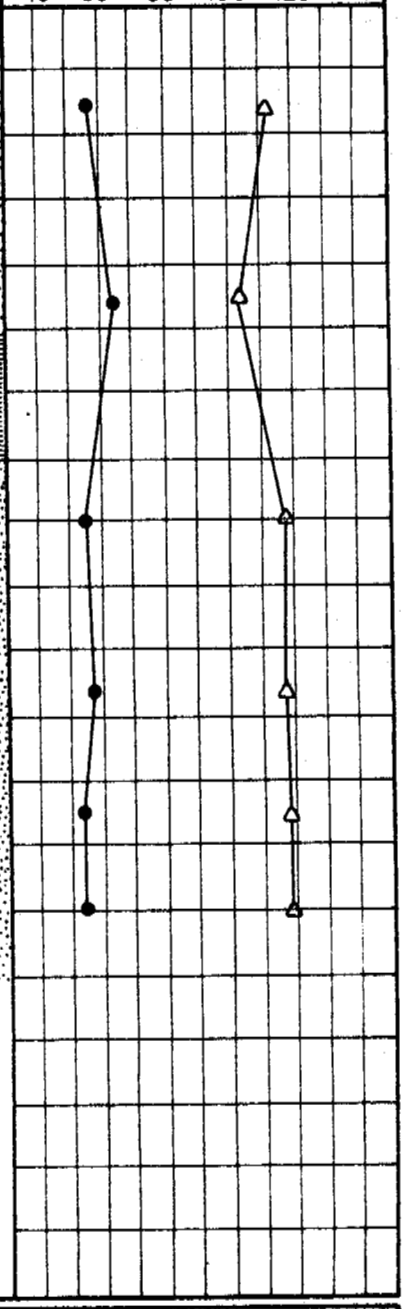
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN
2	SAND - med. grey brown with mottled reddish br. - tr. of silt & fine gravel - some coal	Vs 5%
5	SILT - dk. grey brown - clayey - trace fine sand	25%
7	SAND - lt. to med. grey - fine to med. grained - clean & uniform - tr. coal - some thin silty clay laminations	Nbn
15	END OF HOLE	

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

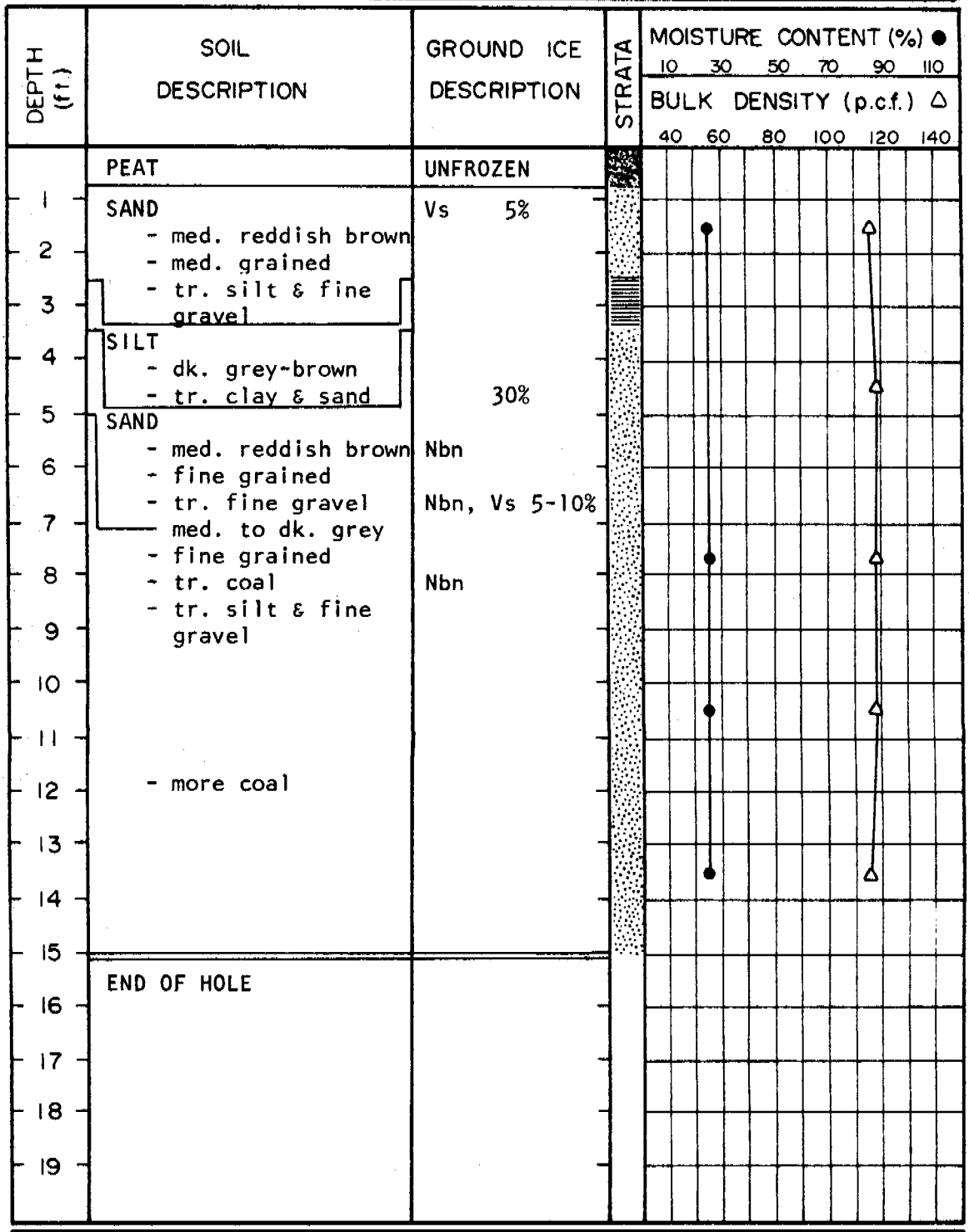
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba

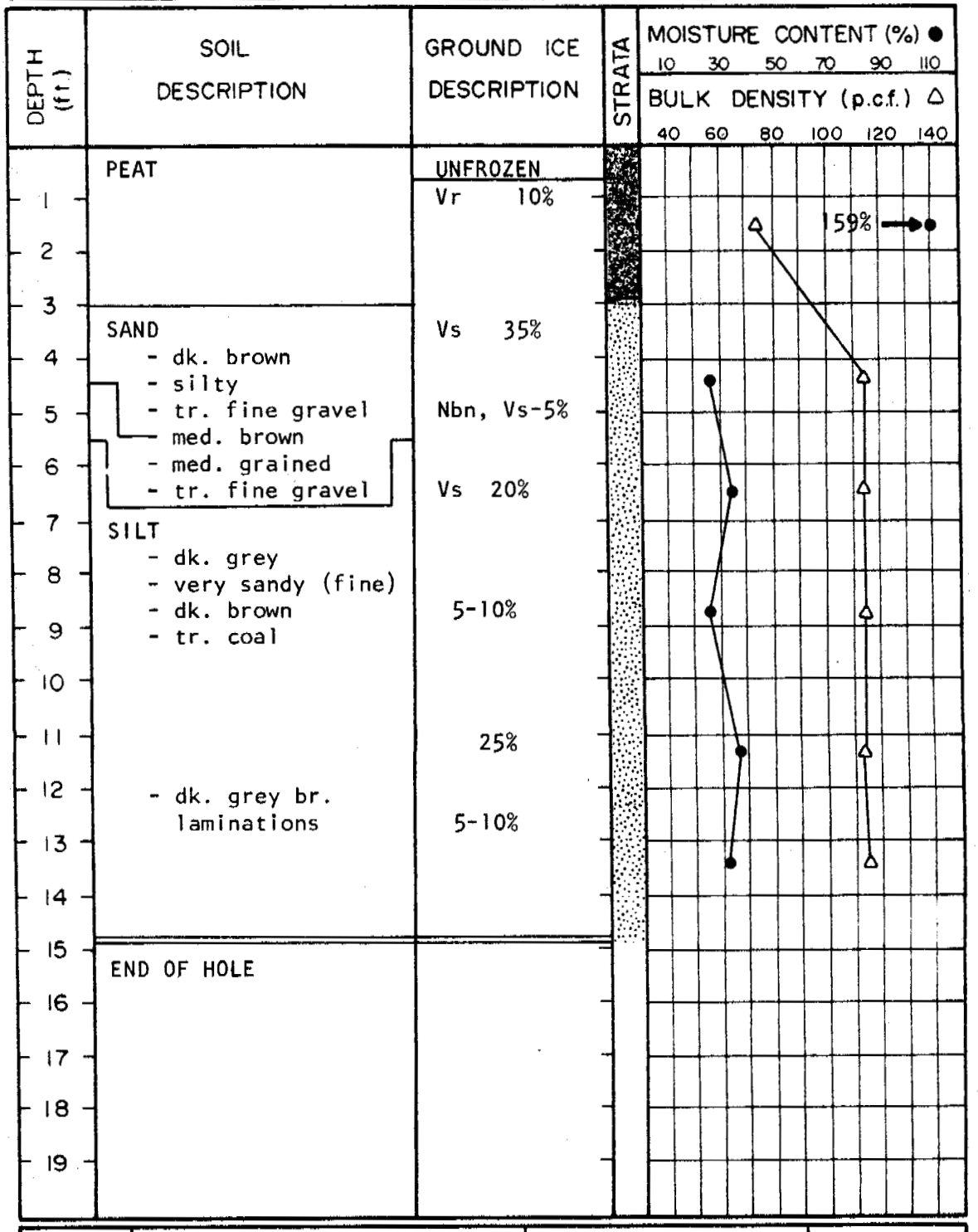
UTM 25 070 090 ft.N. COORDINATES 1 847 755 ft.E	DATE 1/8/75 TECHNICIAN TH	HOLE NO. AS 1
COMPLETION DEPTH (ft) 15'	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 070 575 ft.N.	DATE 1/8/75	HOLE NO.
	COORDINATES 1 847 630 ft.E.	TECHNICIAN TH	AS2
	COMPLETION DEPTH (ft) 15	REGION Site A	1 OF 1

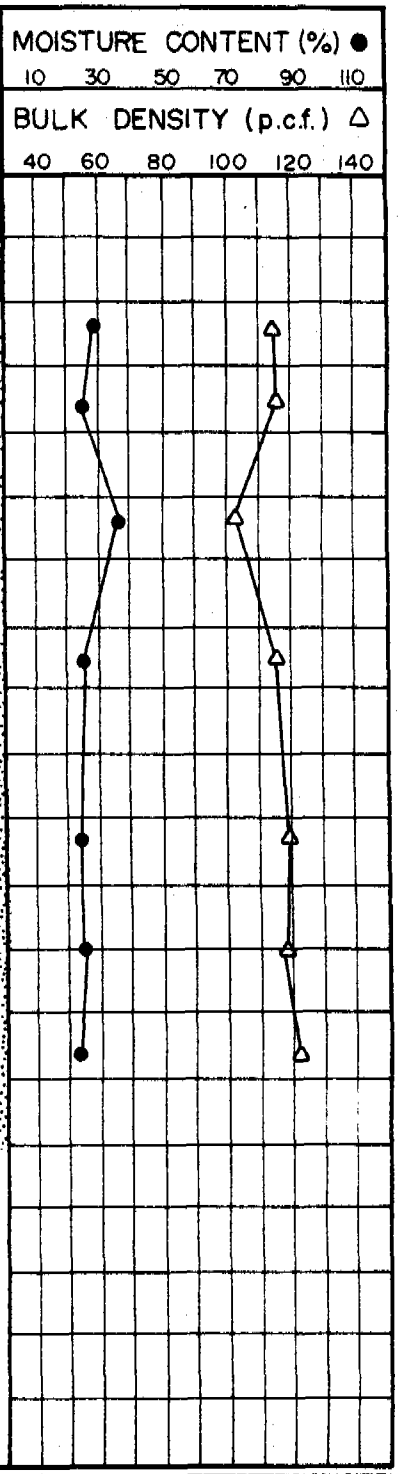
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 071 070 ft.N.	DATE 1/8/75	HOLE NO.
	COORDINATES 1 847 505 ft.E.	TECHNICIAN TH	AS3
	COMPLETION DEPTH (ft) 14.8	REGION Site A	1 OF 1

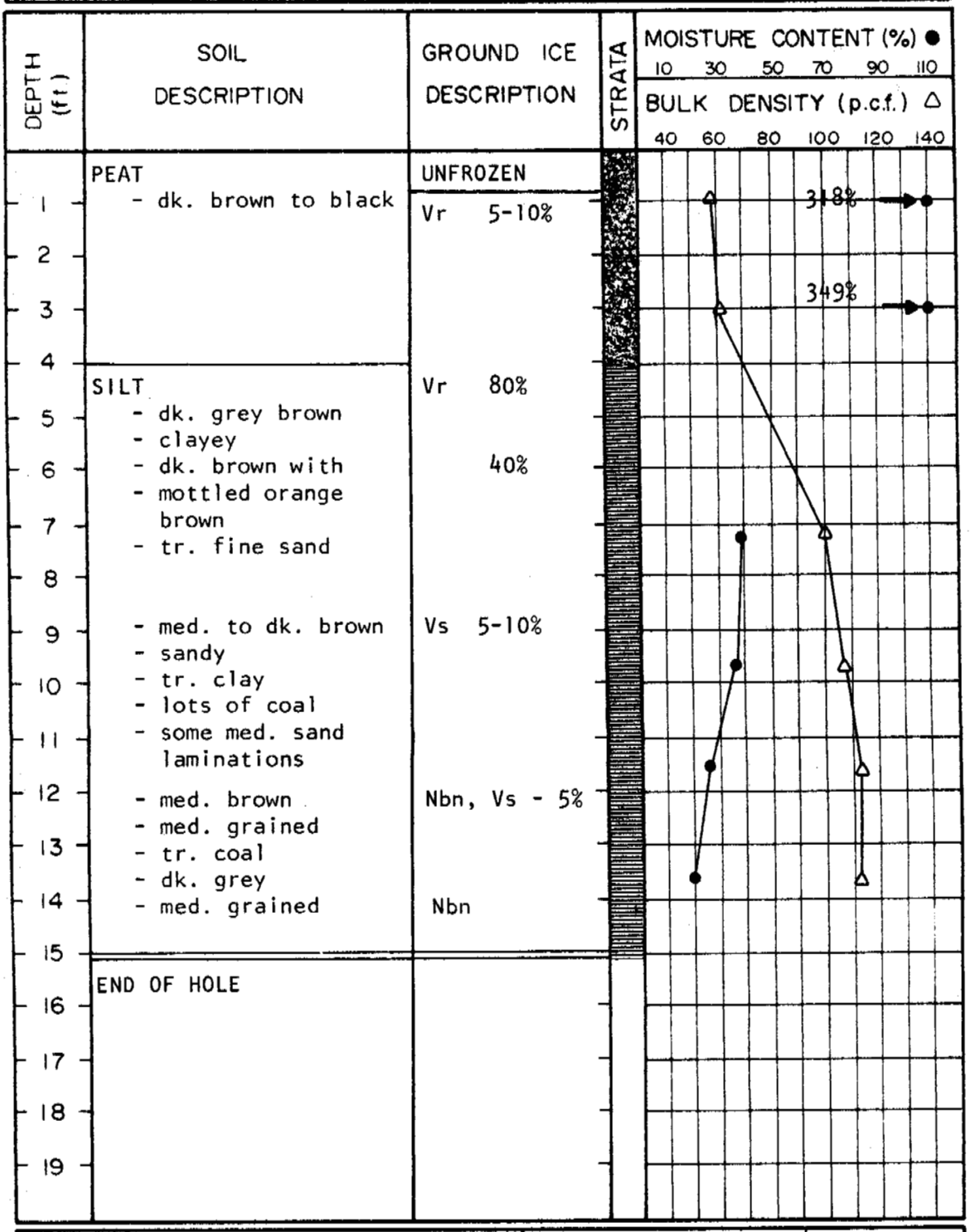
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - dk. brown	UNFROZEN Vr 20%	
2	SAND - med. brown - med. grained - uniform - tr. fine gravel & coal	Vs 5%	
3			
4			
5			
6	- tr. silt	15% Nbn	
7			
8			
9	- med. to dk. grey - fine to med. grained - uniform - tr. coal		
10			
11			
12	- med. grained - lots of coal		
13			
14			
15	END OF HOLE		
16			
17			
18			
19			



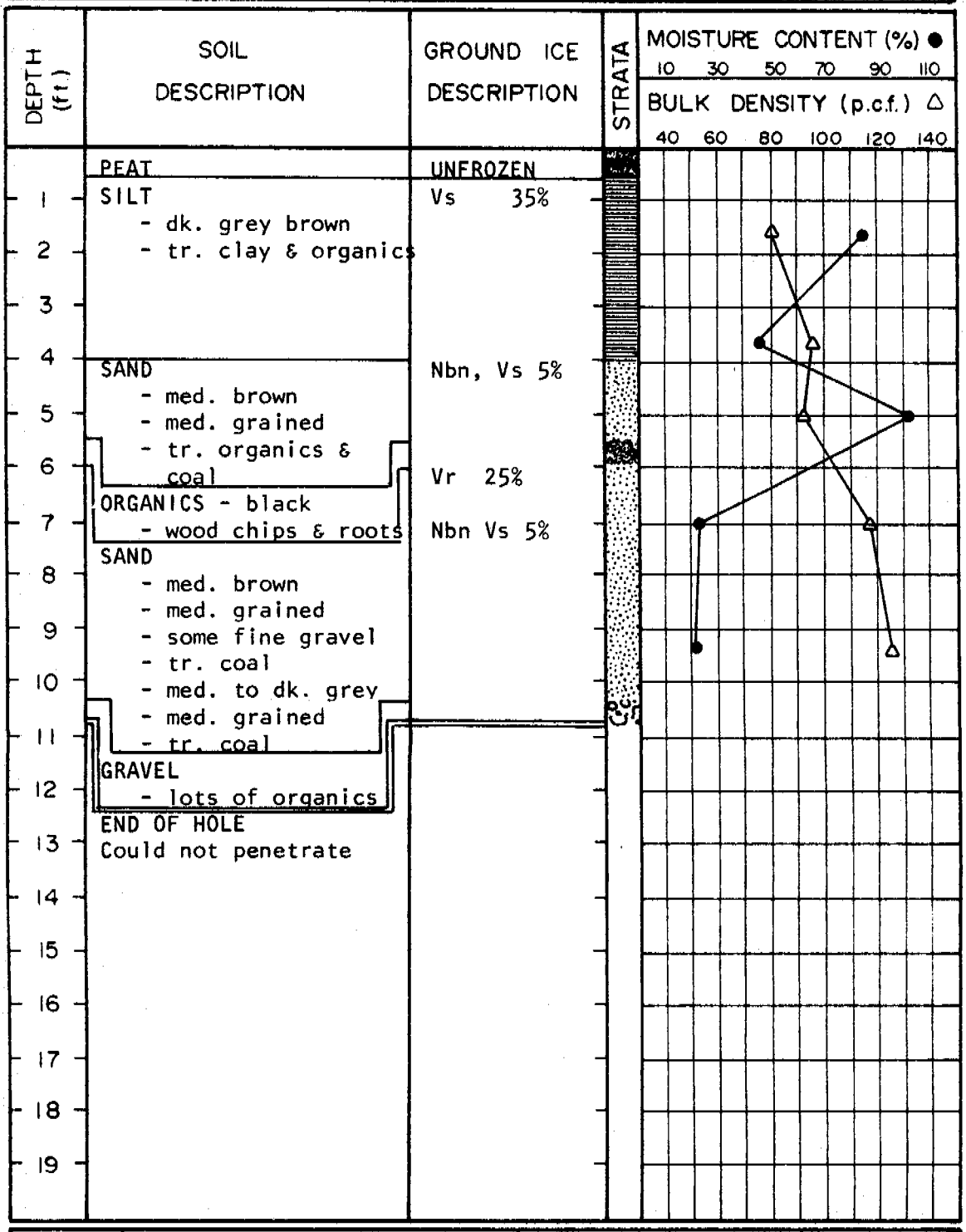
eba	UTM 25 071 550 ft.N. COORDINATES 1 847 390 Ft.E.	DATE 1/8/75 TECHNICIAN TH	HOLE NO. AS4
	COMPLETION DEPTH (ft) 15	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 072 035 ft.N.	DATE 1/8/75	HOLE NO. AS5
	COORDINATES 1847 265 ft. E.	TECHNICIAN TH	
	COMPLETION DEPTH (ft) 15	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



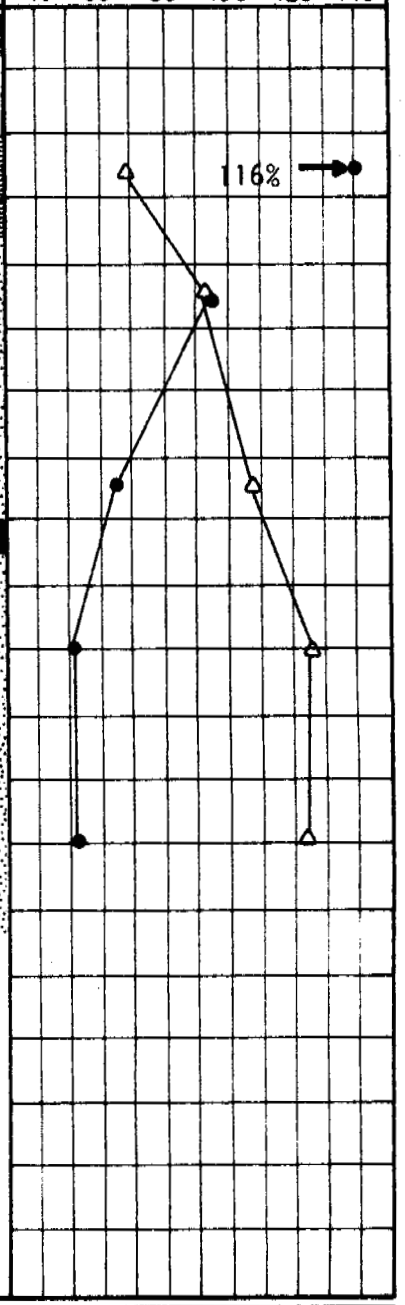
eba	UTM 25 072 510 ft. N.	DATE 2/8/75	HOLE NO.
	COORDINATES 1847 145 ft.E.	TECHNICIAN TH	AS6
	COMPLETION DEPTH (ft) 10.8	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
0	PEAT	UNFROZEN
1	CLAY - med. brown - silty - organic	
3	SILT and ORGANICS	Vr 25%
4	SAND - med. to dk. brown - silty - some clay - tr. organics & coal	Vs 20%
7	- med. to dk. brown - gravelly (1½" max)	Vr 15%
8	COAL	
9	SAND - med. grey brown - med. grained - tr. fine gravel - tr. coal - tr. organics	Nbn, Vs 5%
15	END OF HOLE	

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

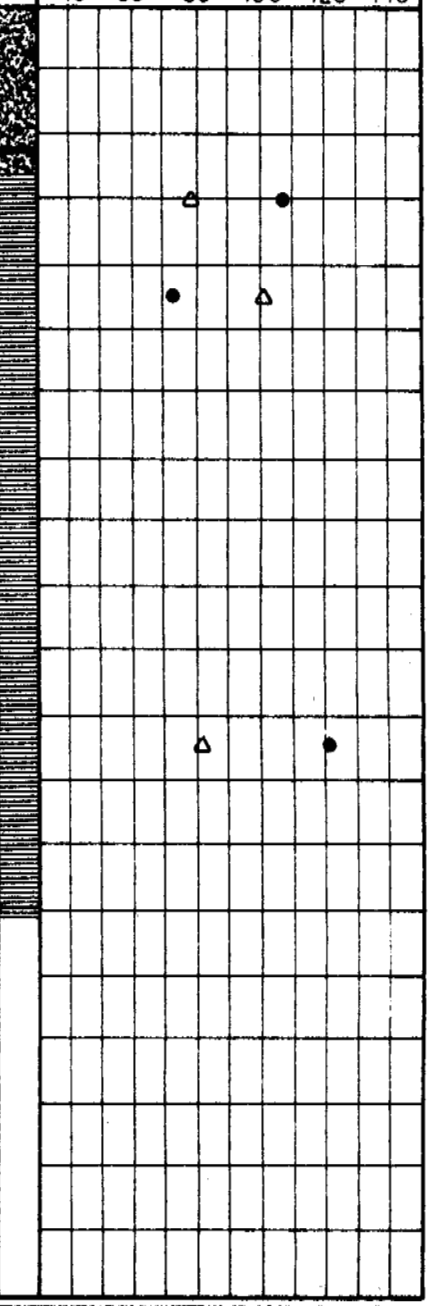


eba	UTM COORDINATES 25 073 010 ft.N. 1 847 020 ft.E.	DATE 2/8/75	HOLE NO. AS 7
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 14.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2			
3	SILT - dk. grey brown	Vr 35%	
4	- clayey	40%	
5			
6		70%	
7			
8			
9			
10	- dk. gr. brown to black		
11		50%	
12	- dk. grey brown	30%	
13	- laminated with med. grey, med. sand lenses		
14	- tr. fine gravel		
15	END OF HOLE		
16			
17			
18			
19			

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



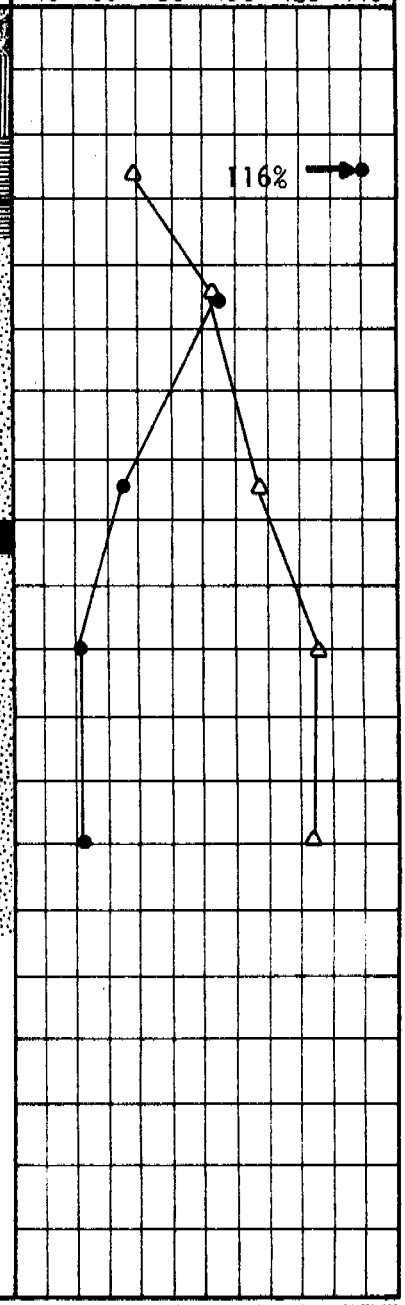
eba	UTM 25 075 810 ft.N. COORDINATES 1 846 300 ft.E.	DATE 2/8/75 TECHNICIAN TH	HOLE NO. AS10
	COMPLETION DEPTH (ft) 14	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN
2	CLAY - med. brown - silty - organic	
3	SILT and ORGANICS	Vr 25%
4	SAND - med. to dk. brown - silty - some clay - tr. organics & coal	Vs 20%
7	- med. to dk. brown - gravelly (1½" max)	Vr 15%
8	COAL	
9	SAND - med. grey brown - med. grained - tr. fine gravel - tr. coal - tr. organics	Nbn, Vs 5%
15	END OF HOLE	

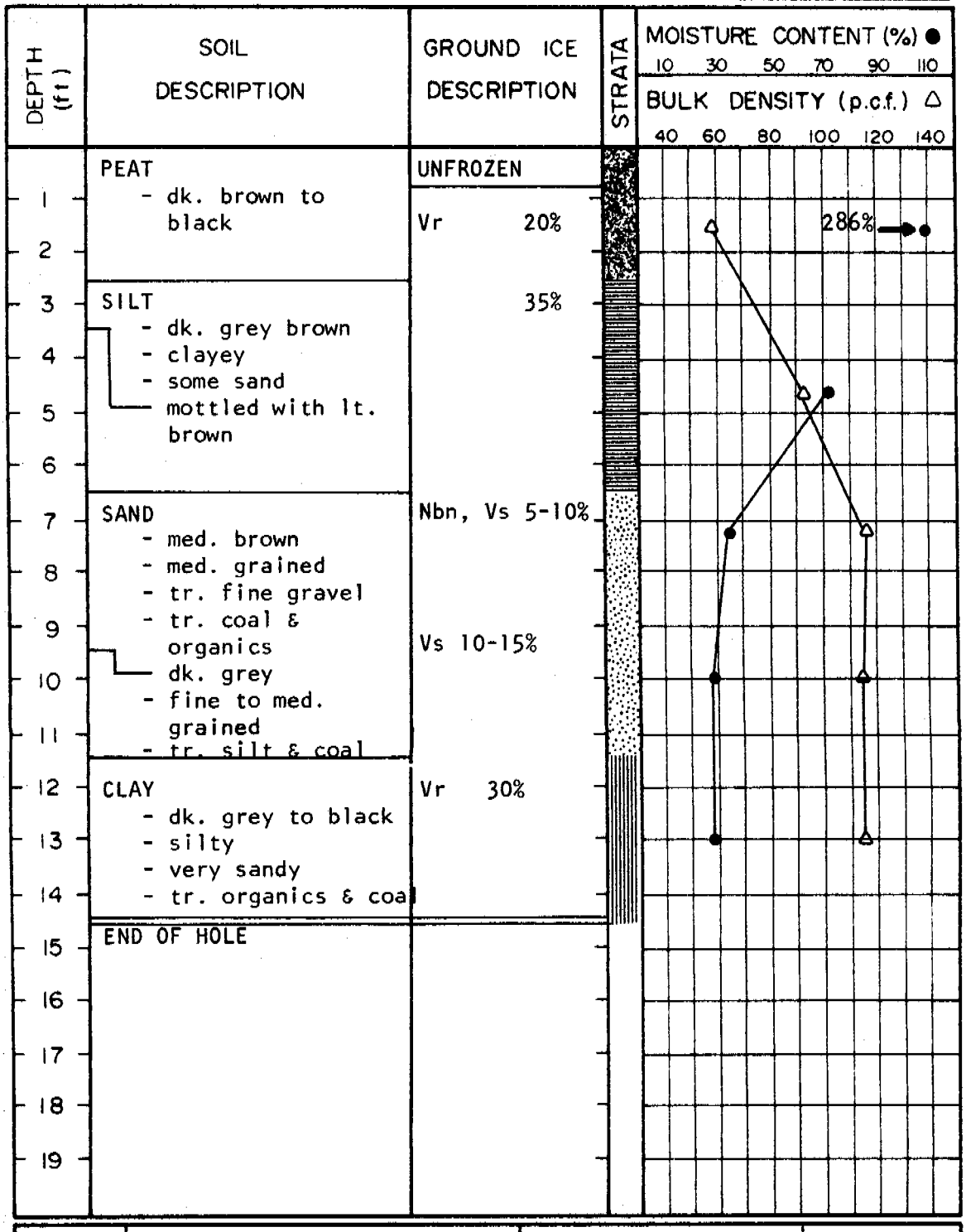
STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



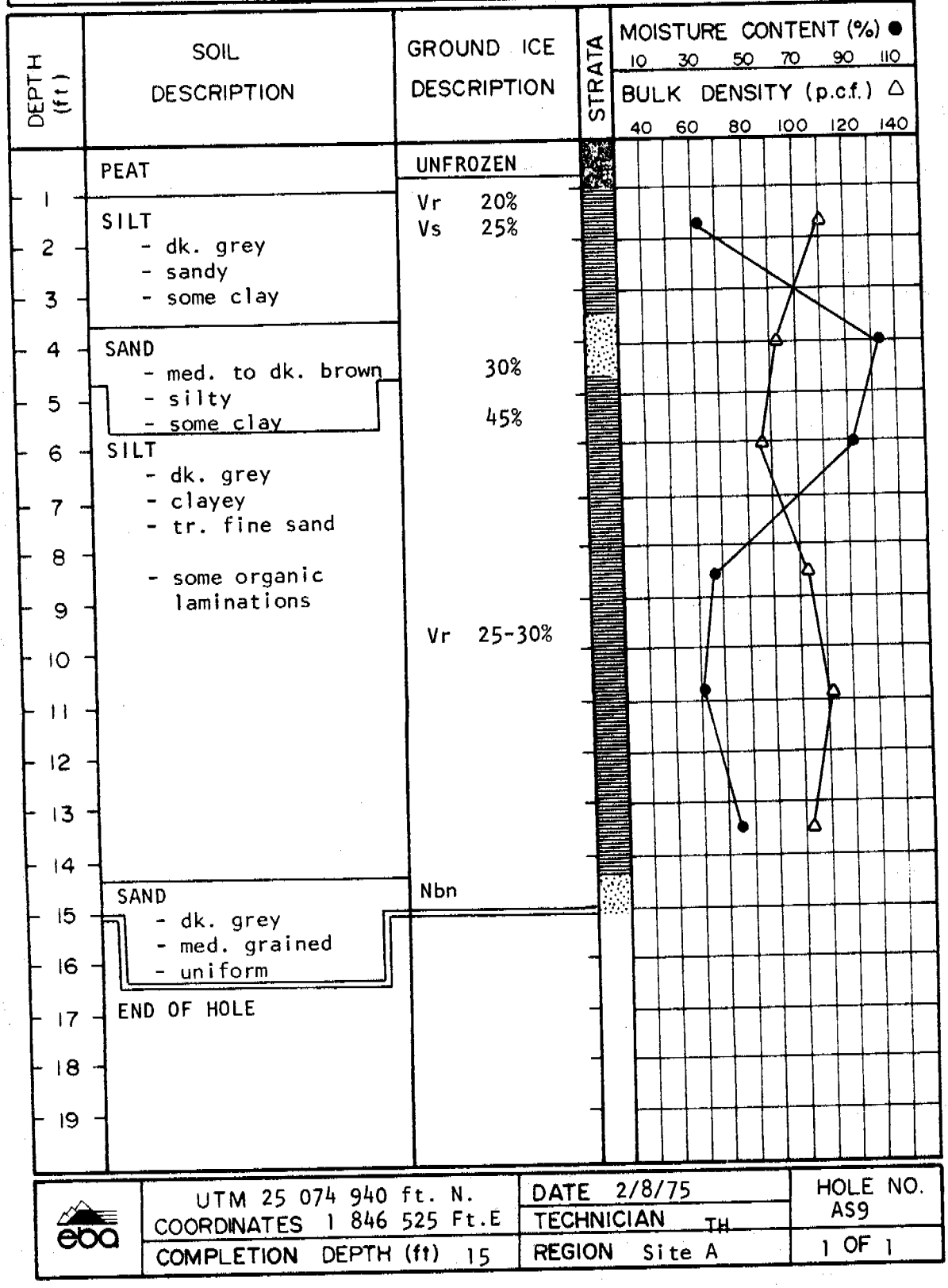
eba	UTM COORDINATES 25 073 010 ft.N. 1 847 020 ft.E.	DATE 2/8/75	HOLE NO. AS 7
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 14.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



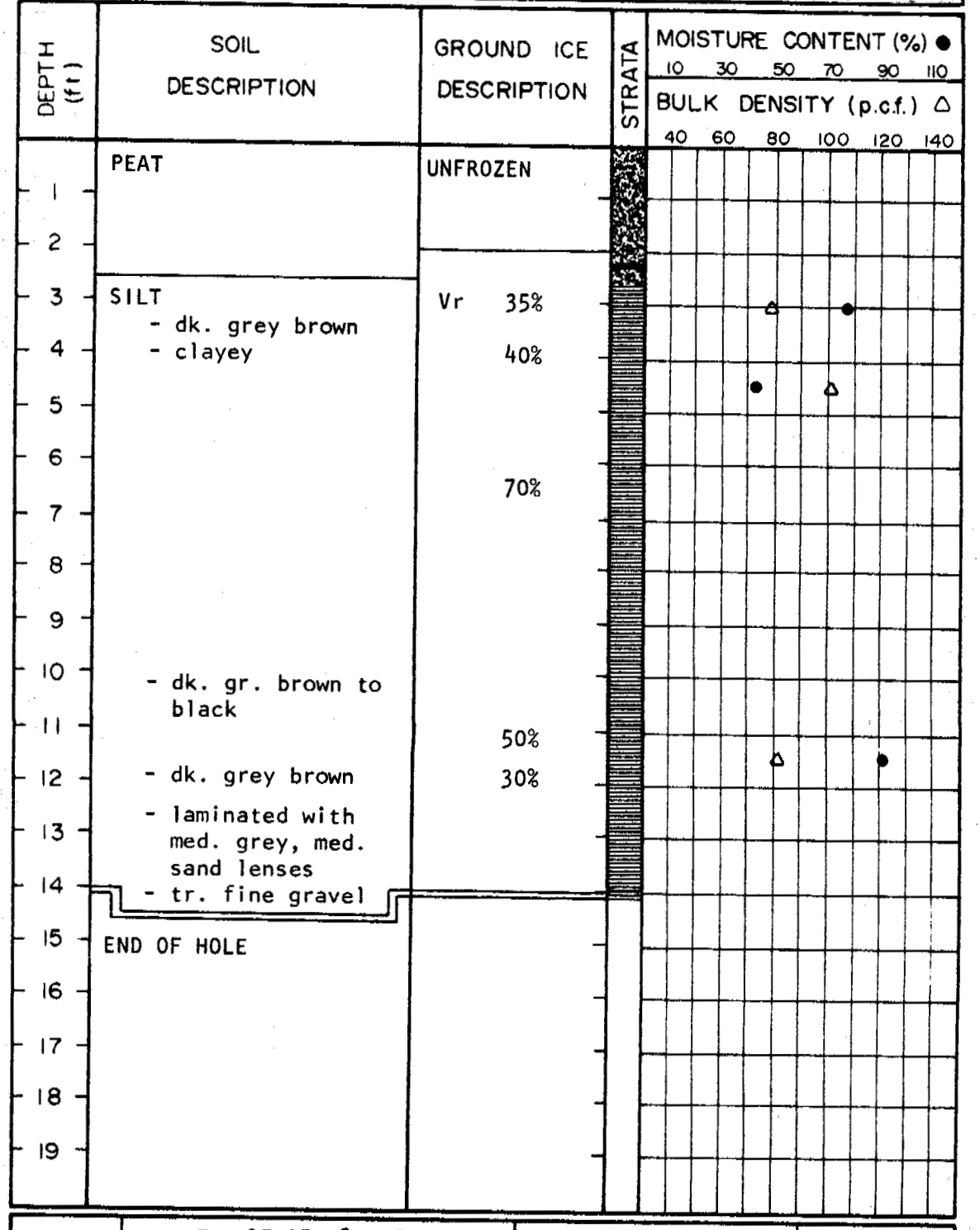
eba	UTM 25 073 980 ft.N.	DATE 2/8/75	HOLE NO.
	COORDINATES 1 846 770 ft.E	TECHNICIAN TH	AS8
	COMPLETION DEPTH (ft) 14.4	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



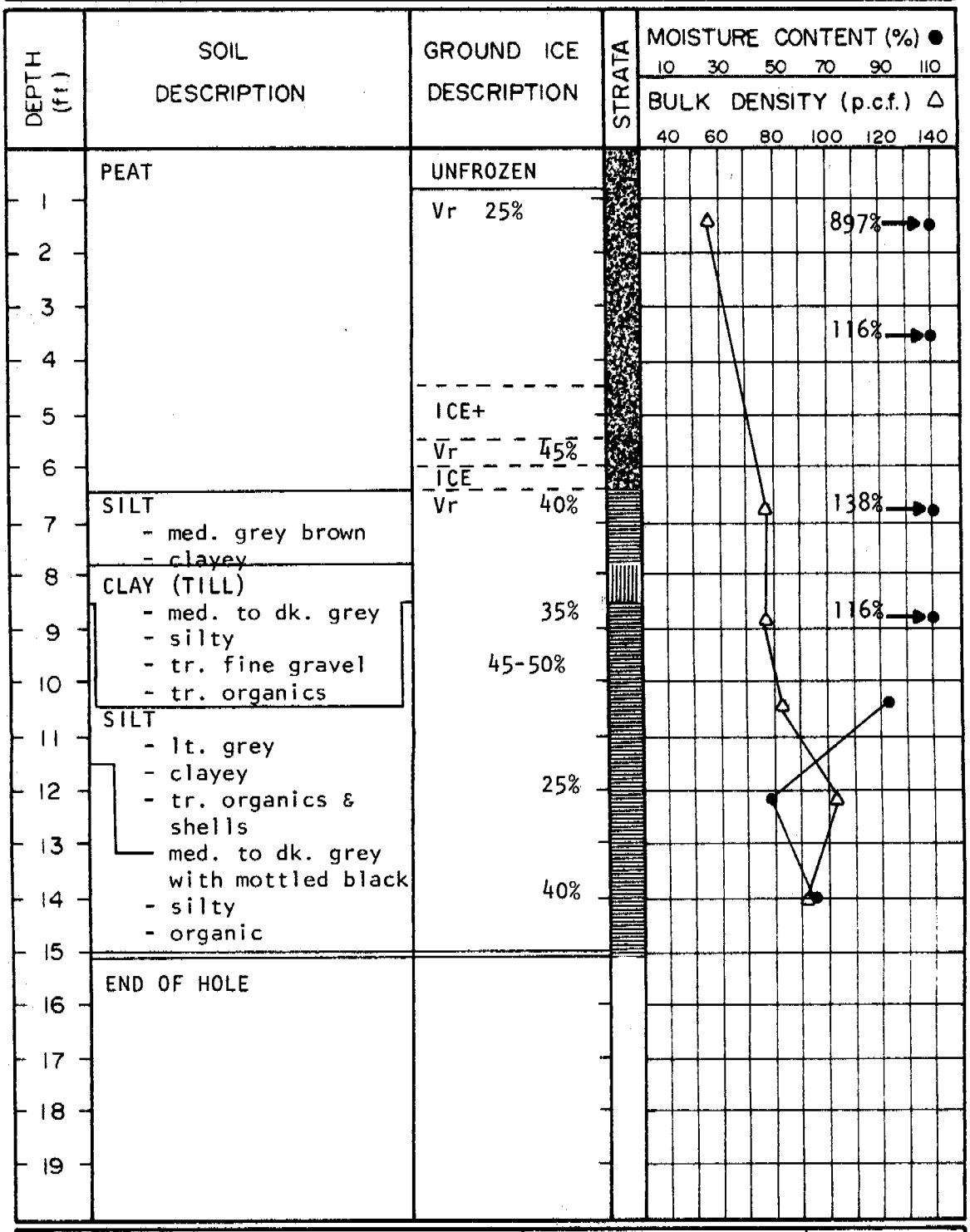
eba	UTM 25 074 940 ft. N.	DATE 2/8/75	HOLE NO. AS9
	COORDINATES 1 846 525 Ft.E	TECHNICIAN TH	
	COMPLETION DEPTH (ft) 15	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



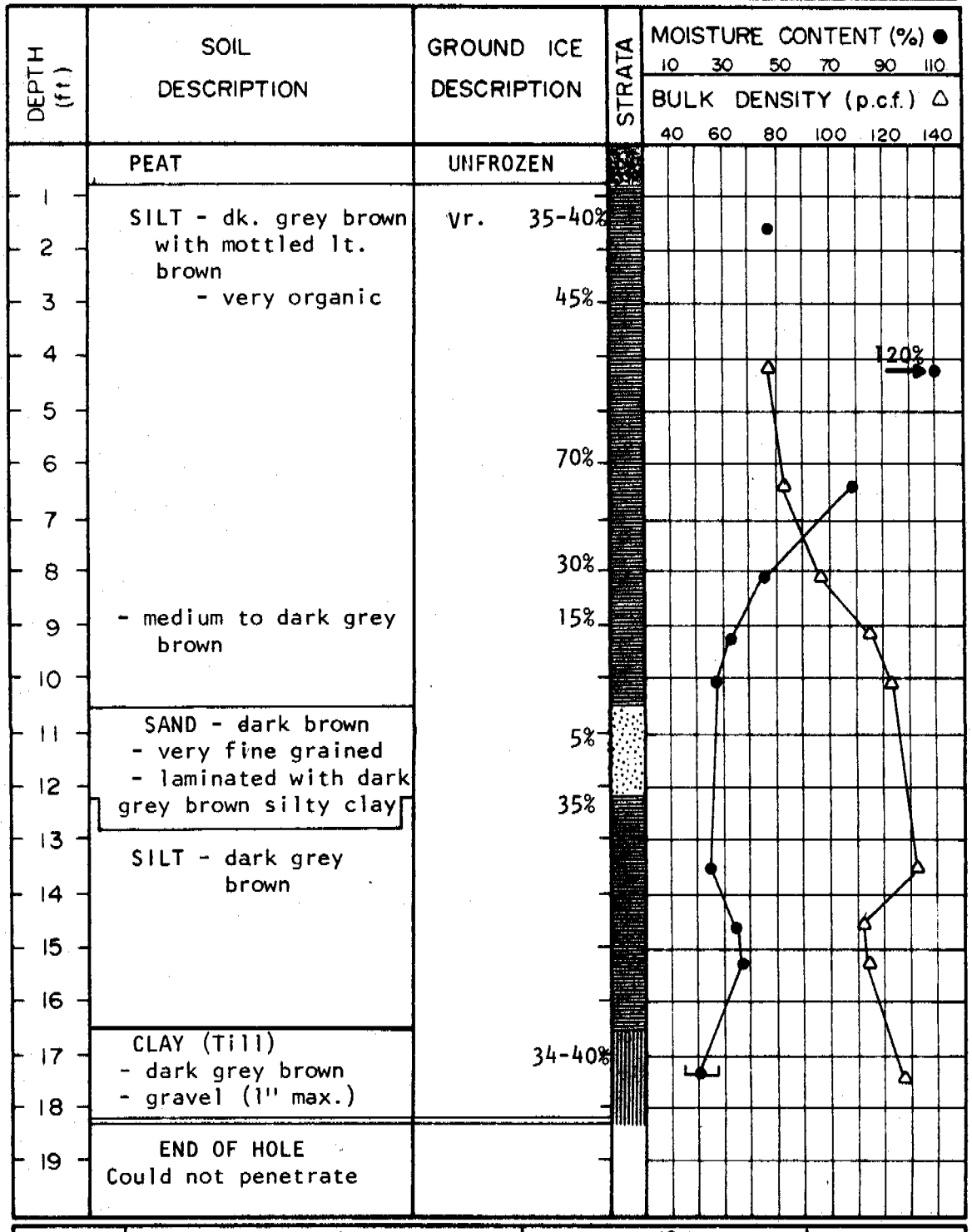
eba	UTM 25 075 810 ft.N.	DATE 2/8/75	HOLE NO. AS10
	COORDINATES 1 846 300 ft.E.	TECHNICIAN TH	
	COMPLETION DEPTH (ft) 14	REGION Site A	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 096 930 Ft. N.	DATE 3/8/75	HOLE NO.
	COORDINATES 1 849 200 Ft.E.	TECHNICIAN TH	A3
	COMPLETION DEPTH (ft) 11.5	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



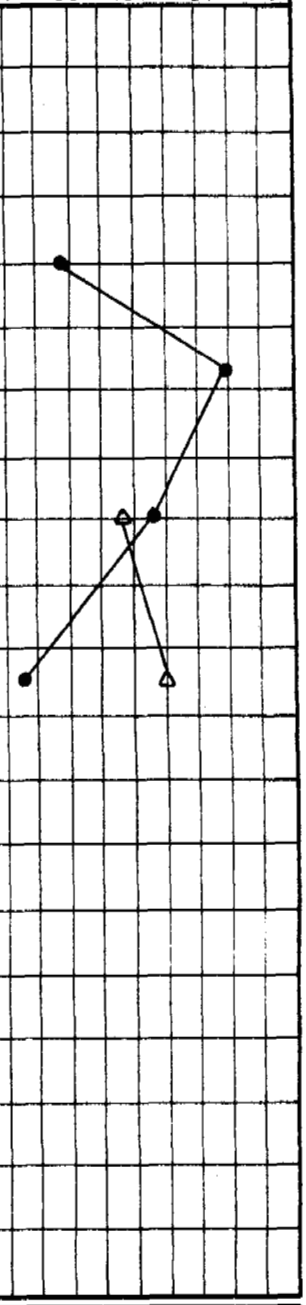
eba	UTM 25, 096, 375, ft.N COORDINATES 1, 849 380ft.E	DATE 5/8/75 TECHNICIAN TH	HOLE NO. A4
	COMPLETION DEPTH (ft)	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
0	PEAT	UNFROZEN
1	SILT	
2	- med. brown - tr. clay & organics	Vs 40%
3		
4		
5	- tr. orange brown sand lenses	
6	- med. to dark brown mottled with reddish bn.	15-20%
7		
8	- clayey	
9		
10	- dk. grey to black - clayey	Nbn, Vs 5%
11	- thin laminations of reddish brown fine sand	
12	END OF HOLE	
13		
14		
15		
16		
17		
18		
19		

STRATA

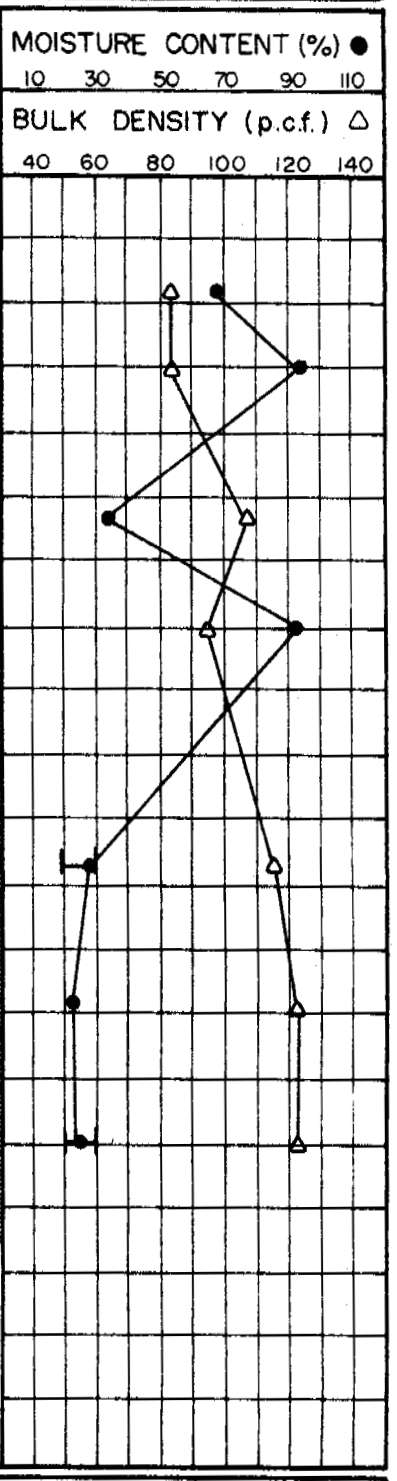
MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM 25 097 730 ft.N. COORDINATES 1 848 570 ft.E.	DATE 2/8/75 TECHNICIAN TH	HOLE NO. B1
	COMPLETION DEPTH (ft) 11.5	REGION Site B	1 OF 1

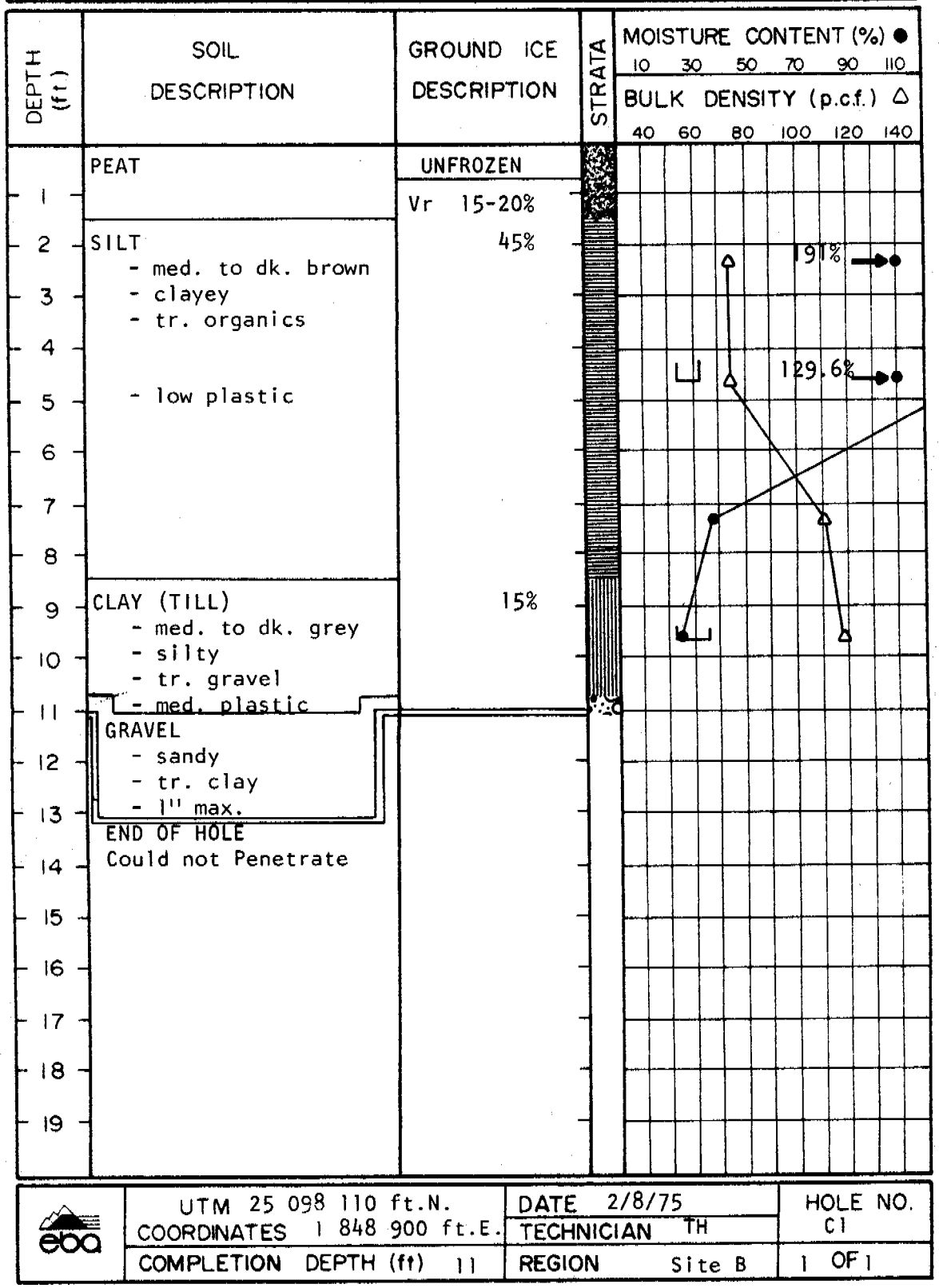
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	SILT - med. brown - some organics - clayey	ICE+	
3			
4			
5	- med. brown - some clay - tr. of fine sand - thickly laminated with med. grey silt-clay	Vs-Vr 30-40% Vs 60-70% 30-40% 40-50%	
6			
7			
8	- med. brown - clayey - fine sand pockets - tr. iron oxide - laminated	30-40% Nbn Vs 5-7%	
9			
10			
11	- low plastic - some small shells	Nbn, Vs 1-5%	
12			
13			
14			
15			
16			
17	END OF HOLE Lost Core Barrel Tooth		
18			
19			



eba	UTM 25 097 405 ft.N. COORDINATES 1 848 950 ft.E.	DATE 18/7/75 TECHNICIAN JK	HOLE NO. B2
	COMPLETION DEPTH (ft) 16.7	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 098 110 ft.N.	DATE 2/8/75	HOLE NO.
	COORDINATES 1 848 900 ft.E.	TECHNICIAN TH	C1
	COMPLETION DEPTH (ft) 11	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA	MOISTURE CONTENT (%) ● 10 30 50 70 90 110 / BULK DENSITY (p.c.f.) △ 40 60 80 100 120 140
1	PEAT	UNFROZEN		
2	CLAY (TILL)	FROZEN		
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13	- dk. grey			
14				
15	SAND			
16	- some gravel 1/8 - 1/2" size			
17				
18				
19				

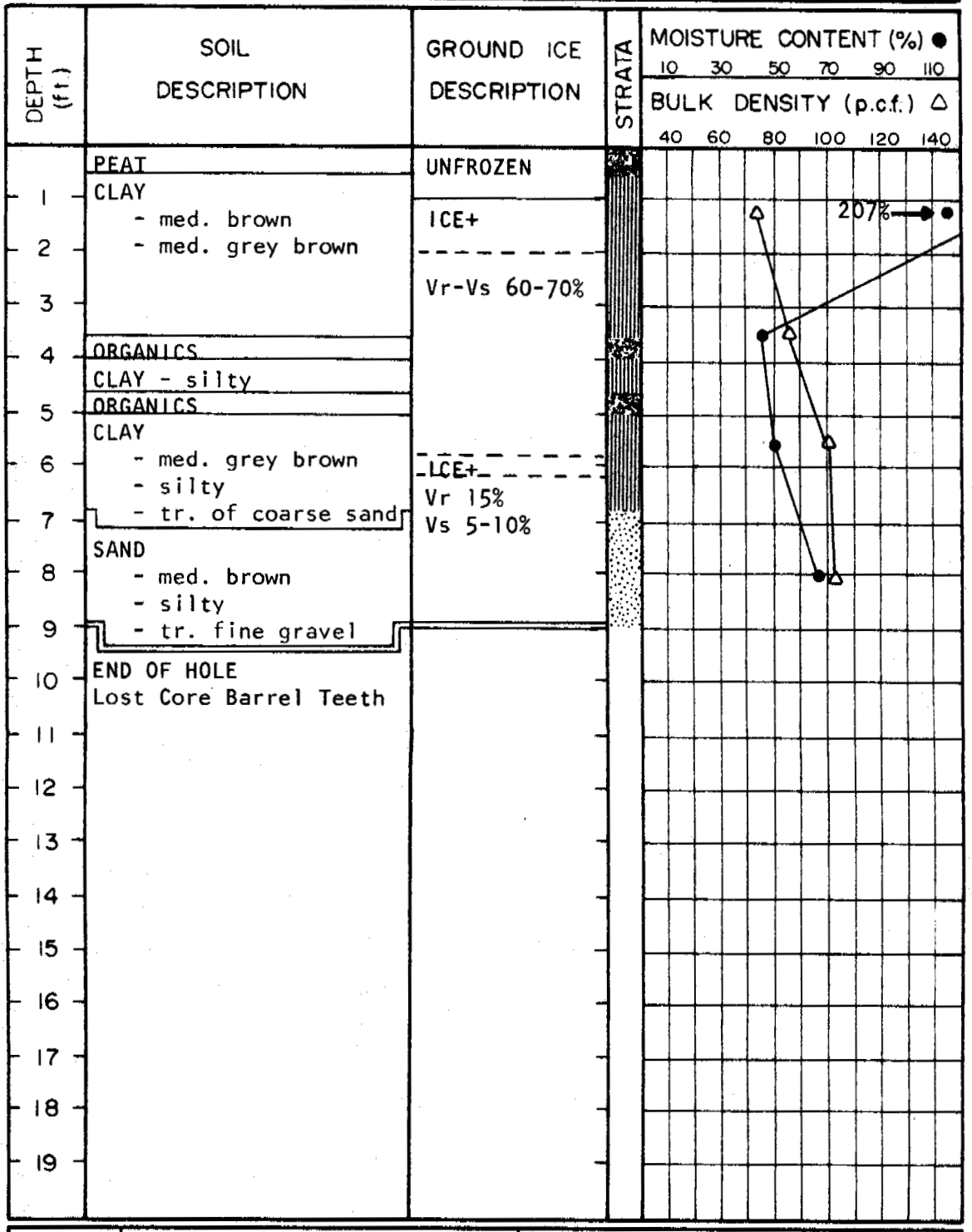
eba	UTM 25 098 110 ft.N.	DATE 15/8/75	HOLE NO.
	COORDINATES 1 848 900 ft.E	TECHNICIAN DK	C1-Winki
	COMPLETION DEPTH (ft) 22	REGION Area B	1 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA	MOISTURE CONTENT (%) ● 10 30 50 70 90 110 / BULK DENSITY (p.c.f.) △ 40 60 80 100 120 140
21	SAND (cont'd)			
22				
23	END OF HOLE			

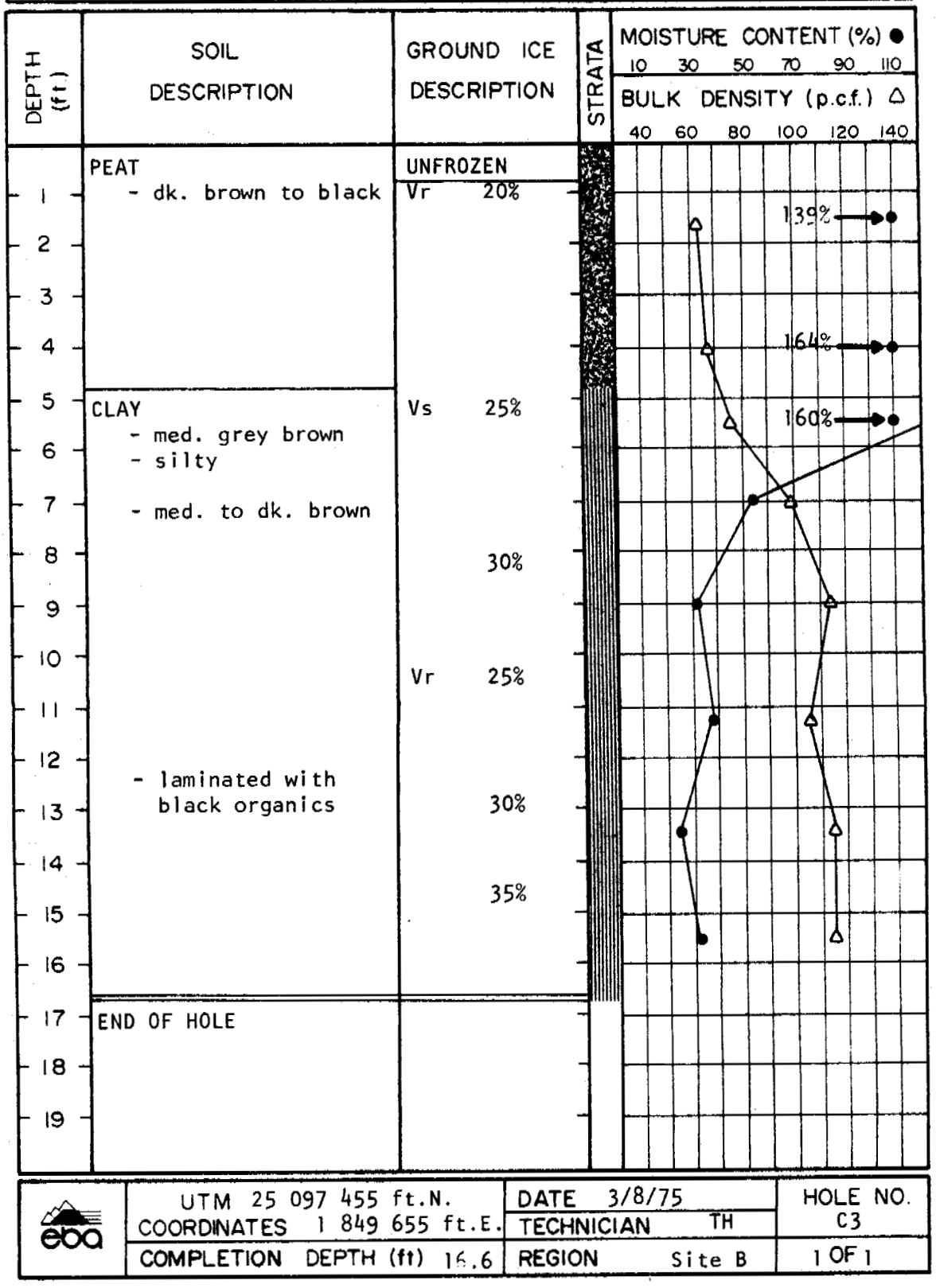
eba	UTM 25 098 110 ft.N.	DATE 15/8/75	HOLE NO. C1-Winki
	COORDINATES 1 848 900 ft.E.	TECHNICIAN DK	
	COMPLETION DEPTH (ft) 22	REGION Area B	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 097 700 ft.N.	DATE 18/7/75	HOLE NO.
	COORDINATES 1 849 275 ft.E.	TECHNICIAN JK	C2
	COMPLETION DEPTH (ft) 8.9	REGION Site B	1 OF 1

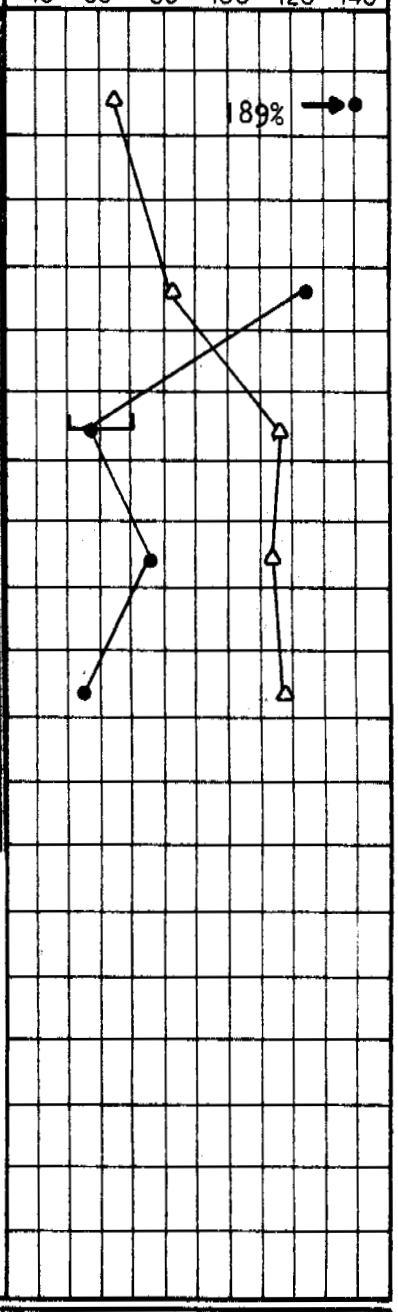
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 097 455 ft.N.	DATE 3/8/75	HOLE NO.
	COORDINATES 1 849 655 ft.E.	TECHNICIAN TH	C3
	COMPLETION DEPTH (ft) 16.6	REGION Site B	1 OF 1

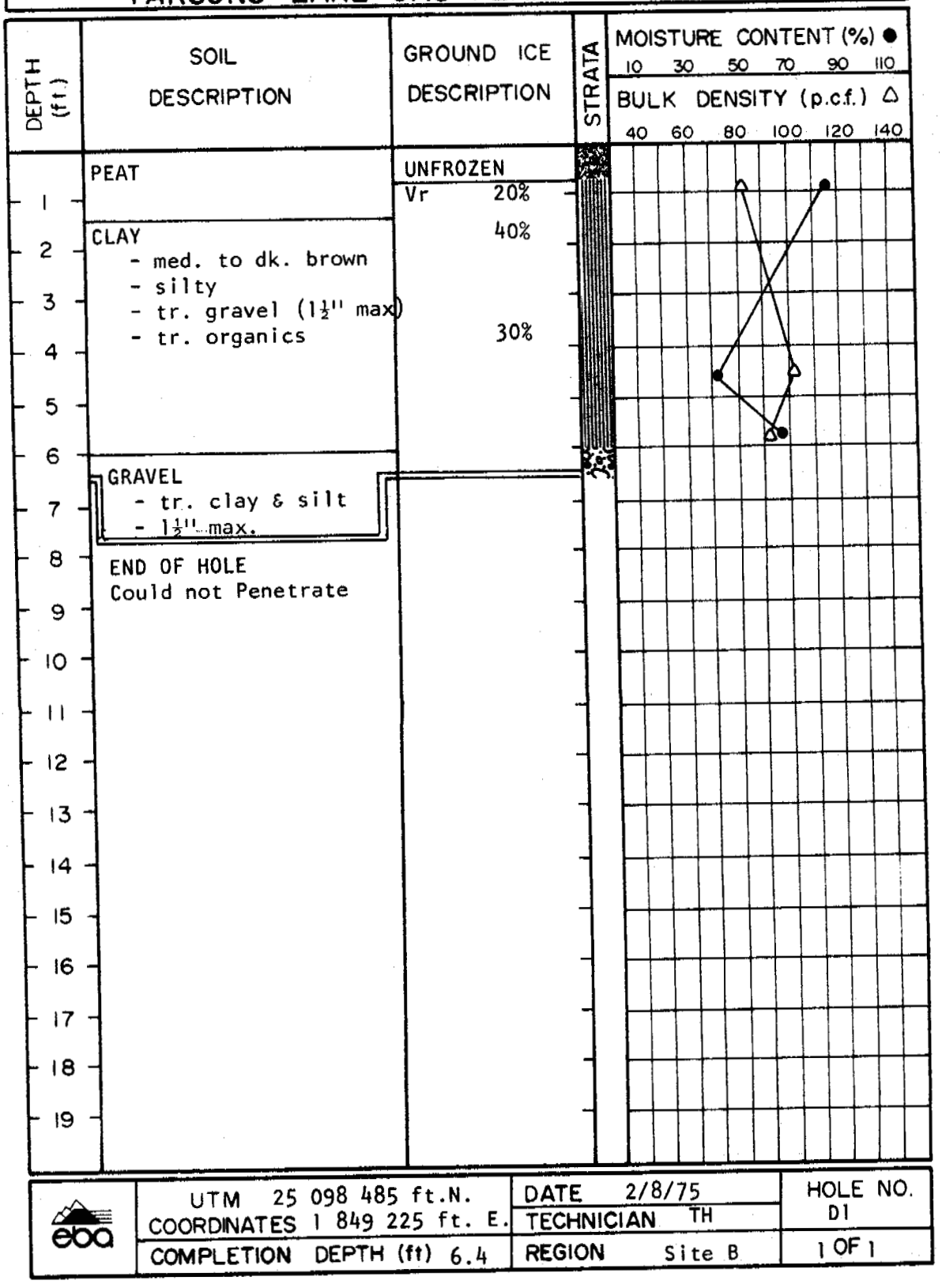
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	CLAY - med. brown - tr. silt - very organic	Vr 20% 40%	
3			
4			
5	CLAY (TILL) - med. brown mottled with reddish brown & black - silty - tr. fine gravel - tr. oxides & organics	50% 25%	
6			
7			
8			
9	CLAY - med. brown - silty		
10			
11	- med. to dk. grey - silty - tr. organics	35%	
12			
13			
14	END OF HOLE Losing Core		
15			
16			
17			
18			
19			



eba	UTM COORDINATES 25 097 130 ft. N. 1 850 035 ft. E.	DATE 3/8/75	HOLE NO.
		TECHNICIAN TH	C4
	COMPLETION DEPTH (ft) 13'	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



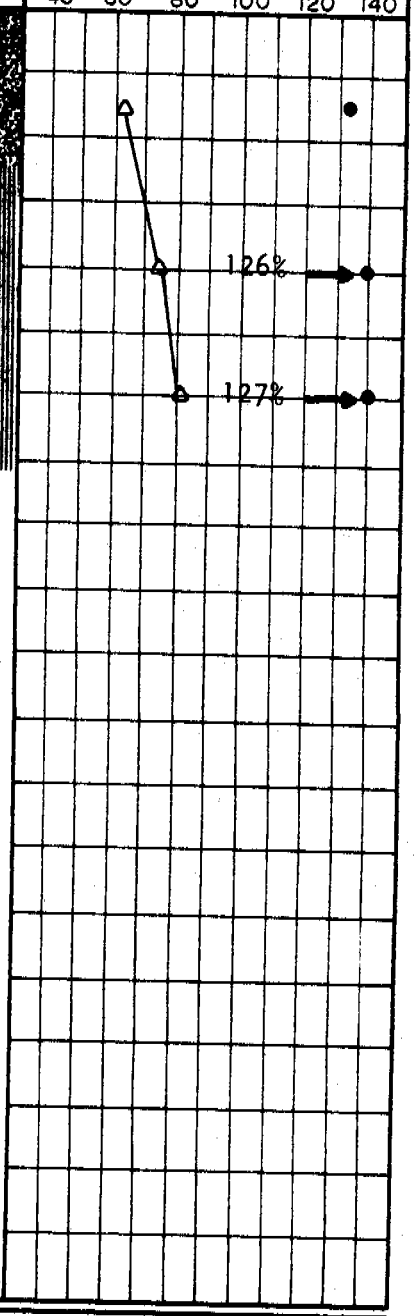
eba	UTM 25 098 485 ft.N. COORDINATES 1 849 225 ft. E.	DATE 2/8/75 TECHNICIAN TH	HOLE NO. D1
	COMPLETION DEPTH (ft) 6.4	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - dk. brown to black	UNFROZEN Vr 20%	
2			
3	CLAY (TILL) - med. to dk. brown - gravelly (1½" max) - very organic	35% 40%	
4			
5	CLAY - black - tr. silt - very organic	Vs 35-40%	
6			
7			
8	END OF HOLE Gravel - No Penetration		
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

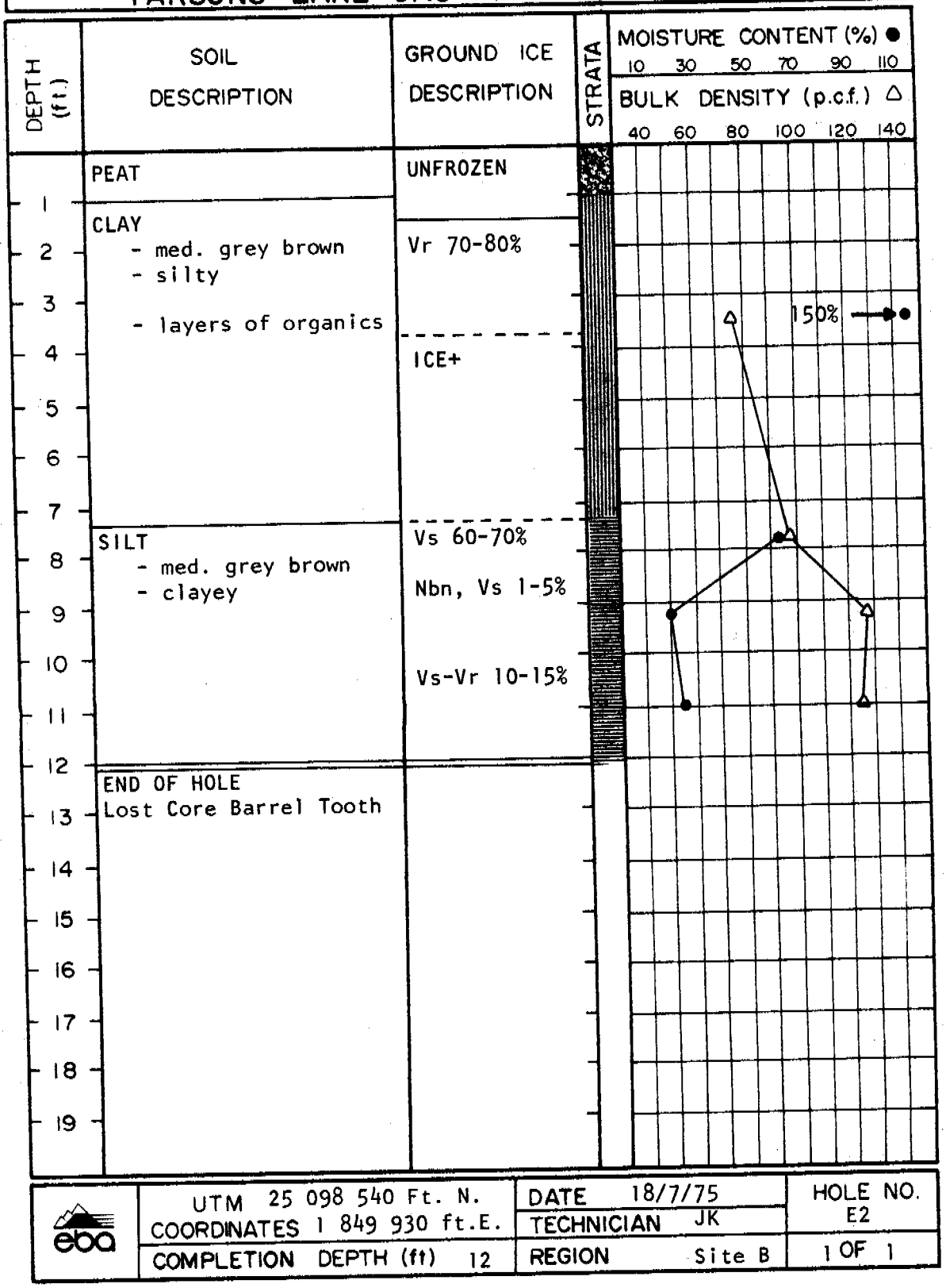
MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM 25 098 160 Ft. N. COORDINATES 1 849 600 ft.E.	DATE 3/8/75 TECHNICIAN TH	HOLE NO. D2
	COMPLETION DEPTH (ft) 7.0	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 098 540 Ft. N.	DATE 18/7/75	HOLE NO. E2
	COORDINATES 1 849 930 ft.E.	TECHNICIAN JK	
	COMPLETION DEPTH (ft) 12	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	CLAY - med. grey - med. plastic	FROZEN	
10	- med. grey brown		

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

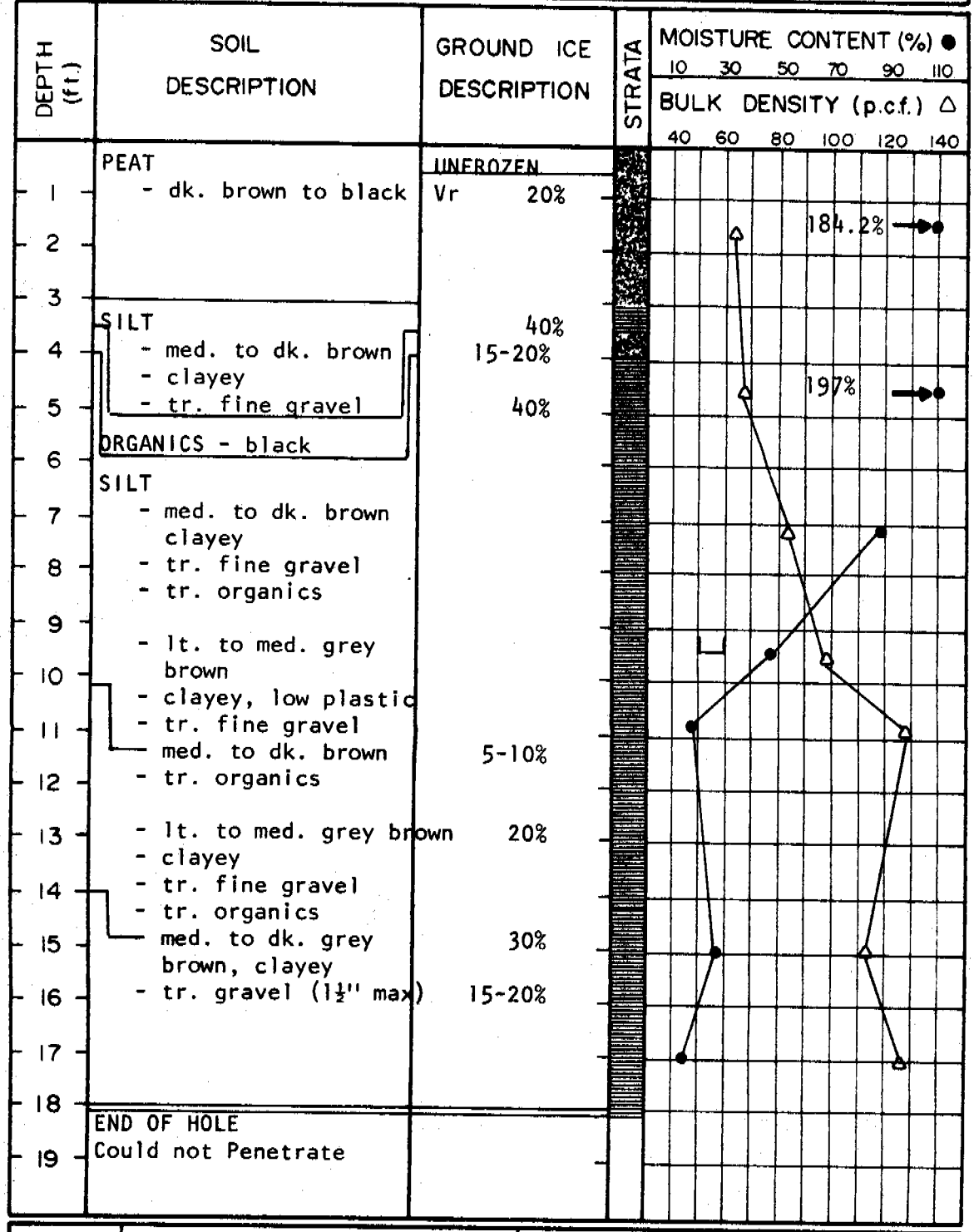
eba	UTM 25 098 540 ft.N.	DATE 16/8/75	HOLE NO.
	COORDINATES 1 849 930 ft.E.	TECHNICIAN DK	E2-Winki
	COMPLETION DEPTH (ft) 41	REGION Area B	1 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA	MOISTURE CONTENT (%) ● 10 30 50 70 90 110 / BULK DENSITY (p.c.f.) △ 40 60 80 100 120 140
21	-SANDY			
22				
23				
24				
25				
26				
27	..			
28				
29				
30				
31				
32				
33				
34				
35				
39	CLAY (TILL) - dk. grey - sandy			
40	END OF HOLE			

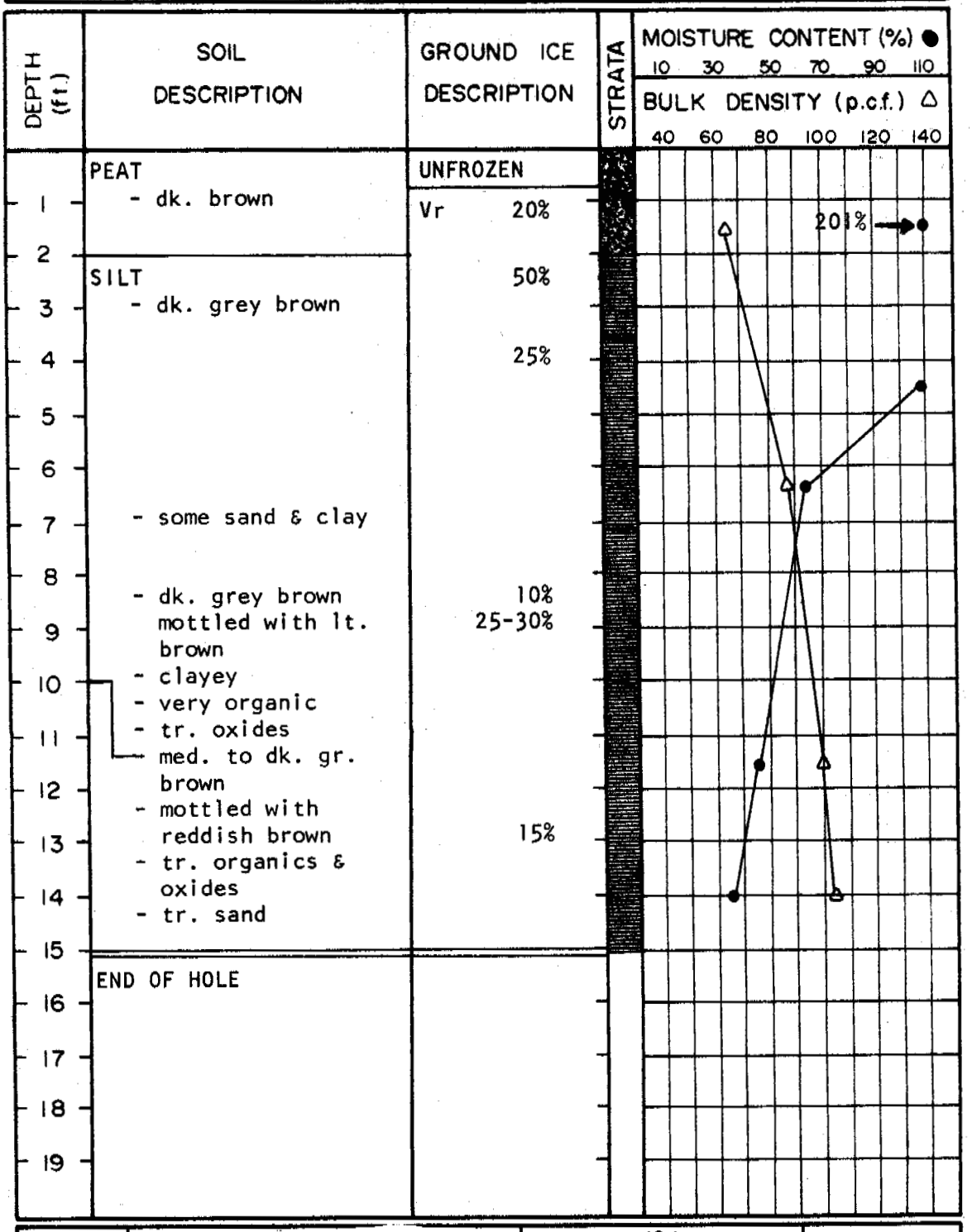
eba	UTM 25 098 540 ft.N. COORDINATES 1 849 930 ft.E.	DATE 16/8/75 TECHNICIAN DK	HOLE NO. E2-Winki
	COMPLETION DEPTH (ft) 41	REGION Area B	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



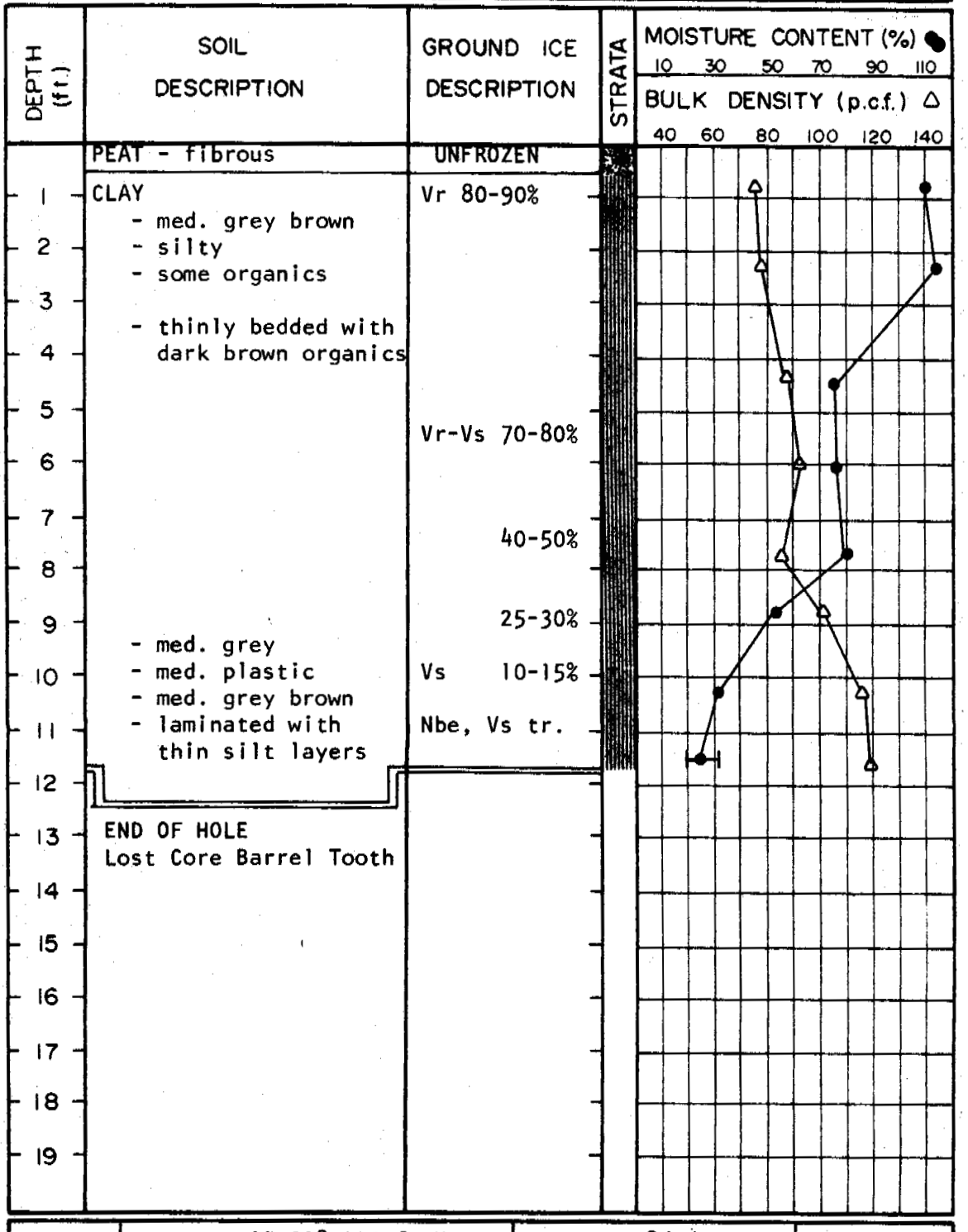
eba	UTM 25 098 215 ft. N.	DATE 3/8/75	HOLE NO.
	COORDINATES 1 850 310 ft.E.	TECHNICIAN TH	E3
	COMPLETION DEPTH (ft) 18	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



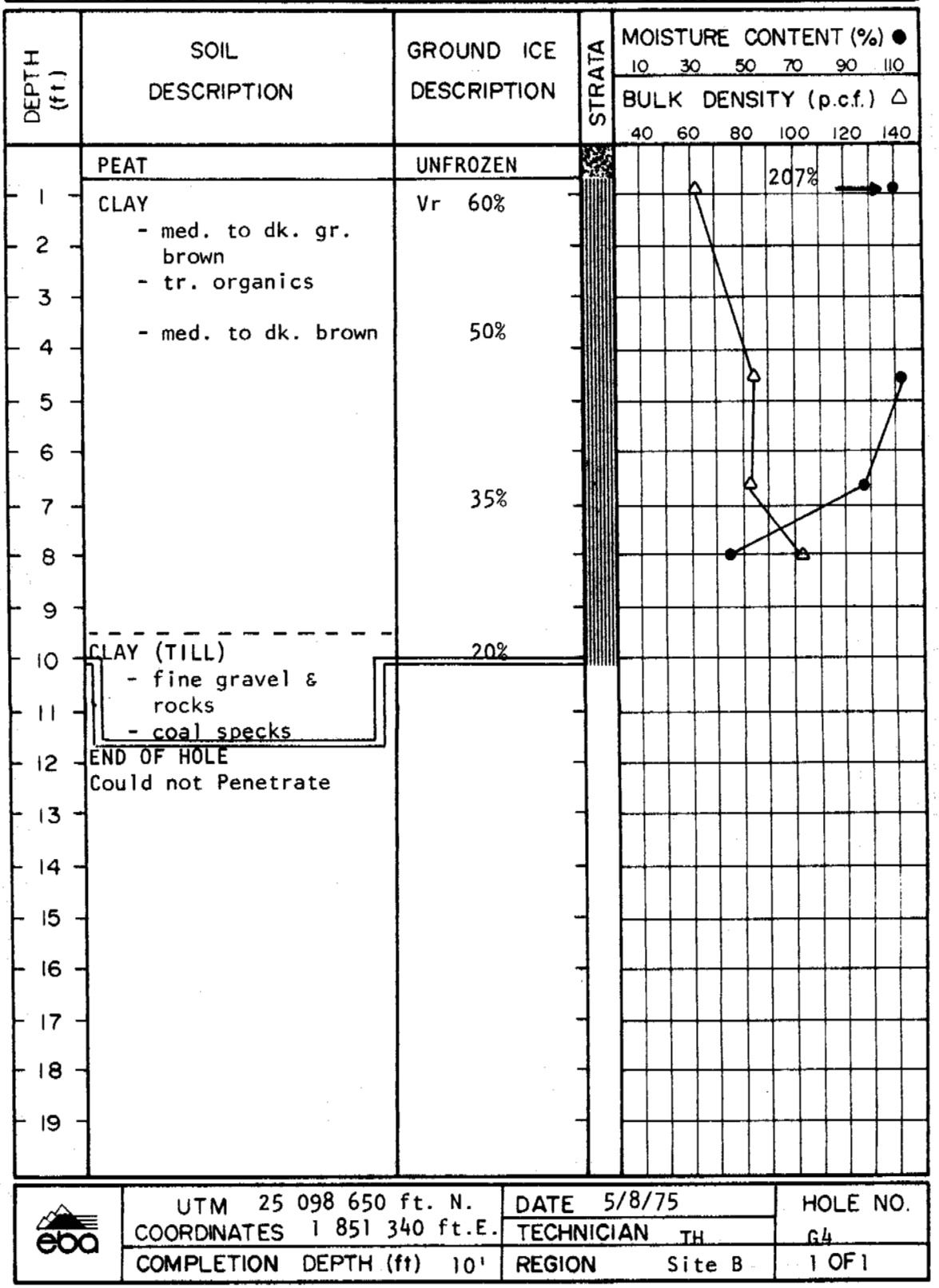
eba	UTM 25 097 890 Ft. N.	DATE 5/8/75	HOLE NO.
	COORDINATES 1 850 690 ft. E	TECHNICIAN TH	E4
	COMPLETION DEPTH (ft) 15	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



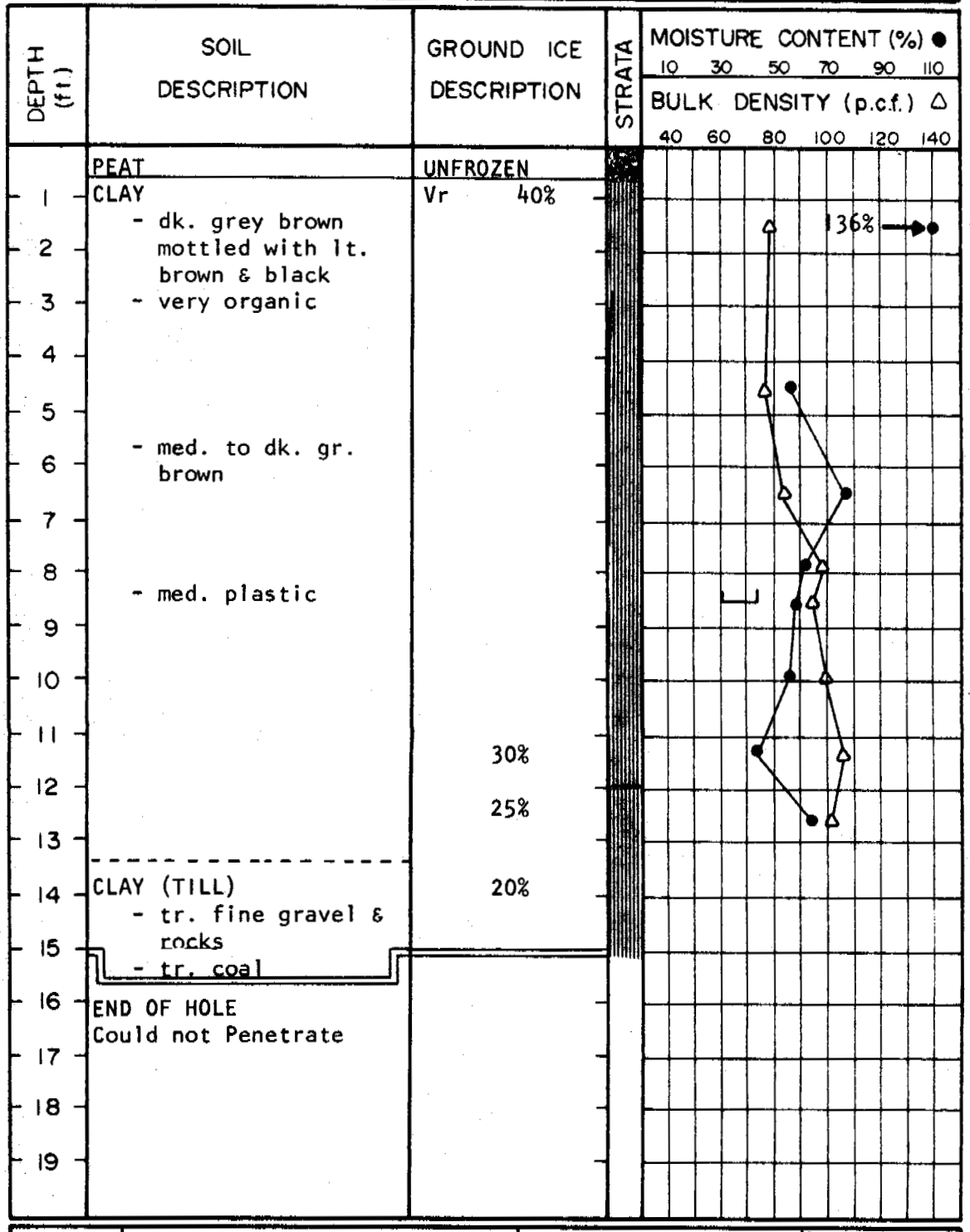
eba	UTM 25 098 920 ft.N.	DATE 18/7/75	HOLE NO.
	COORDINATES 1 850 260 ft.E.	TECHNICIAN JK	F2
	COMPLETION DEPTH (ft) 11.7	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 098 650 ft. N.	DATE 5/8/75	HOLE NO.
	COORDINATES 1 851 340 ft.E.	TECHNICIAN TH	G4
	COMPLETION DEPTH (ft) 10'	REGION Site B	1 OF 1

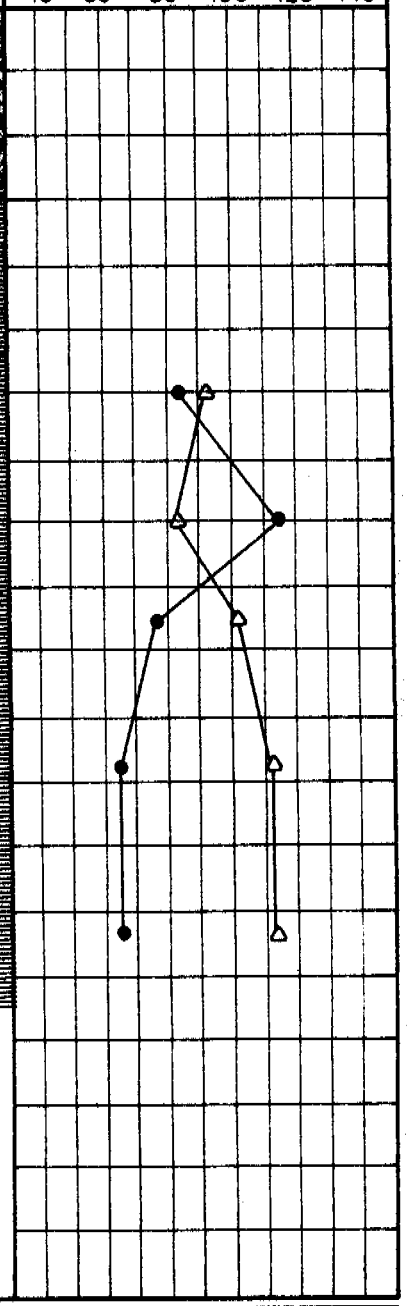
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 099 030 ft. N.	DATE 5/8/75	HOLE NO.
	COORDINATES 1 851 670 ft.E.	TECHNICIAN TH	H4
	COMPLETION DEPTH (ft) 15'	REGION Site B	1 OF 1

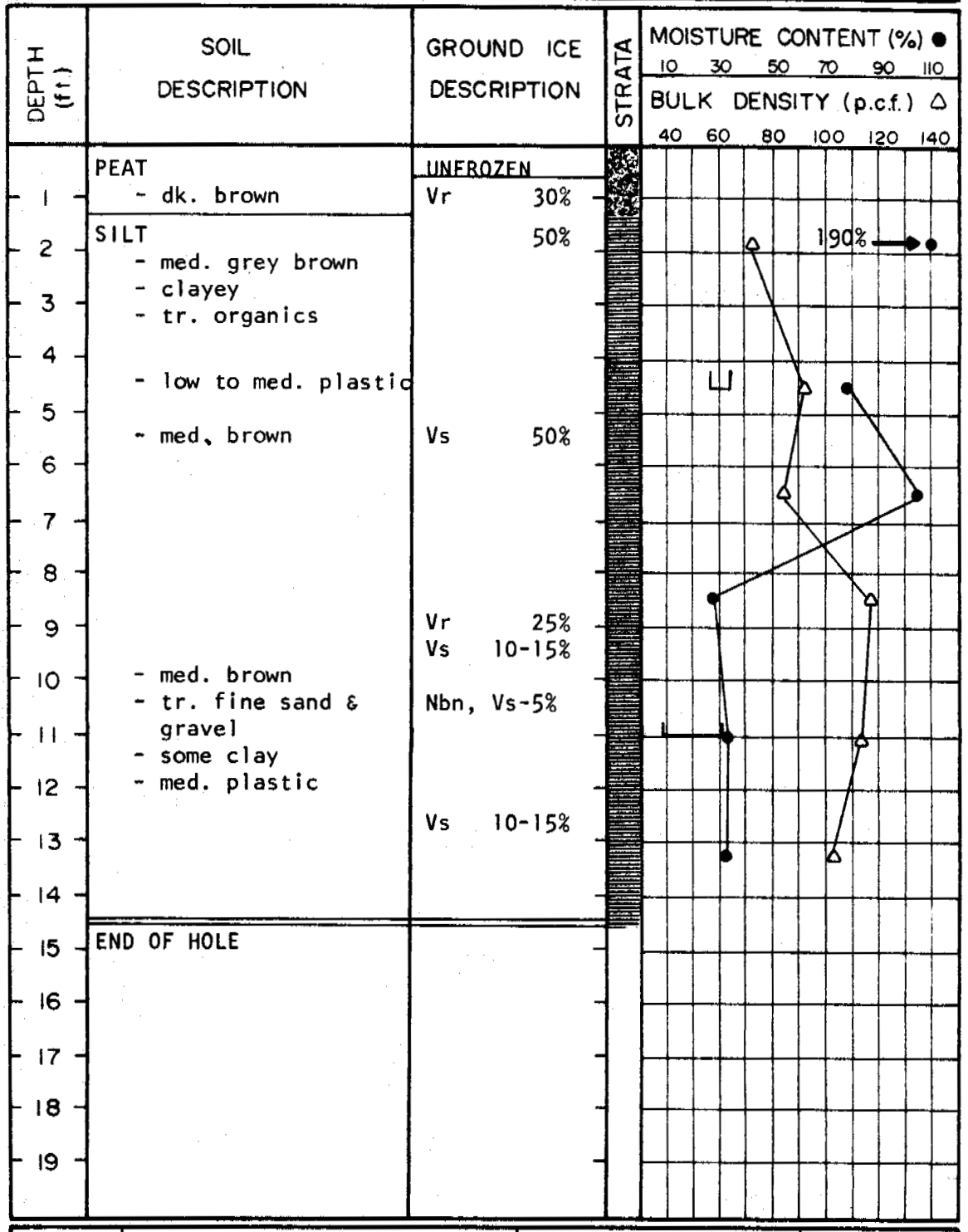
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - dark brown to black	UNFROZEN ICE+	
2			
3			
4	SILT - med. brown - clayey	Vr 35%	
5			
6		25%	
7			
8		35%	
9	- med. brown mottled with reddish brown	Vs 20%	
10			
11	- med. brown with mottled grey brown	Nbn-Vs 5%	
12	- very sandy - stratified		
13	- tr. oxides		
14	- dark grey	Vr 5-10%	
15			
16	END OF HOLE		
17			
18			
19			



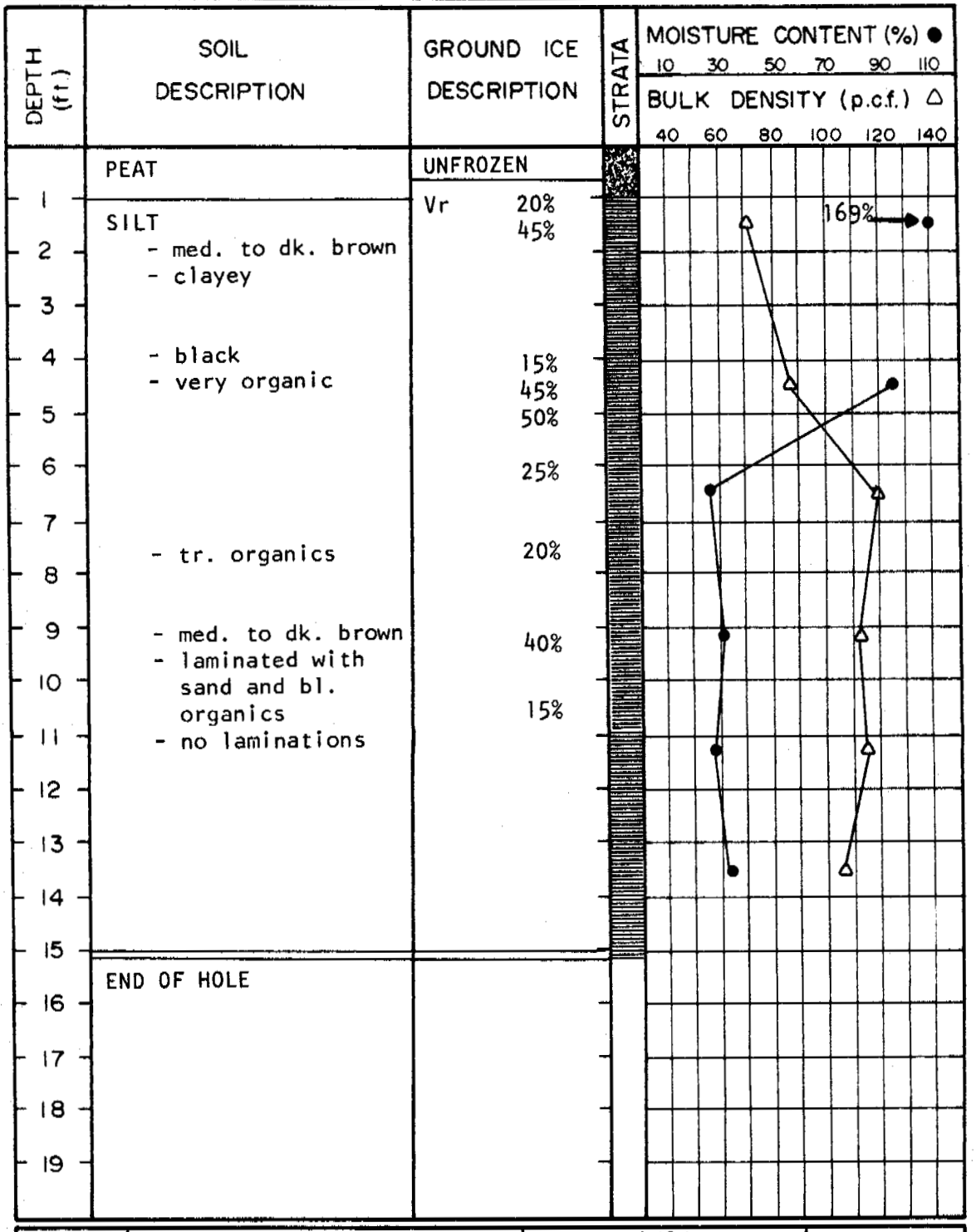
eba	UTM 25 099 590 ft.N.	DATE 4/8/75	HOLE NO.
	COORDINATES 1 853 690 ft.E	TECHNICIAN TH	AS1
	COMPLETION DEPTH (ft) 15.4	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



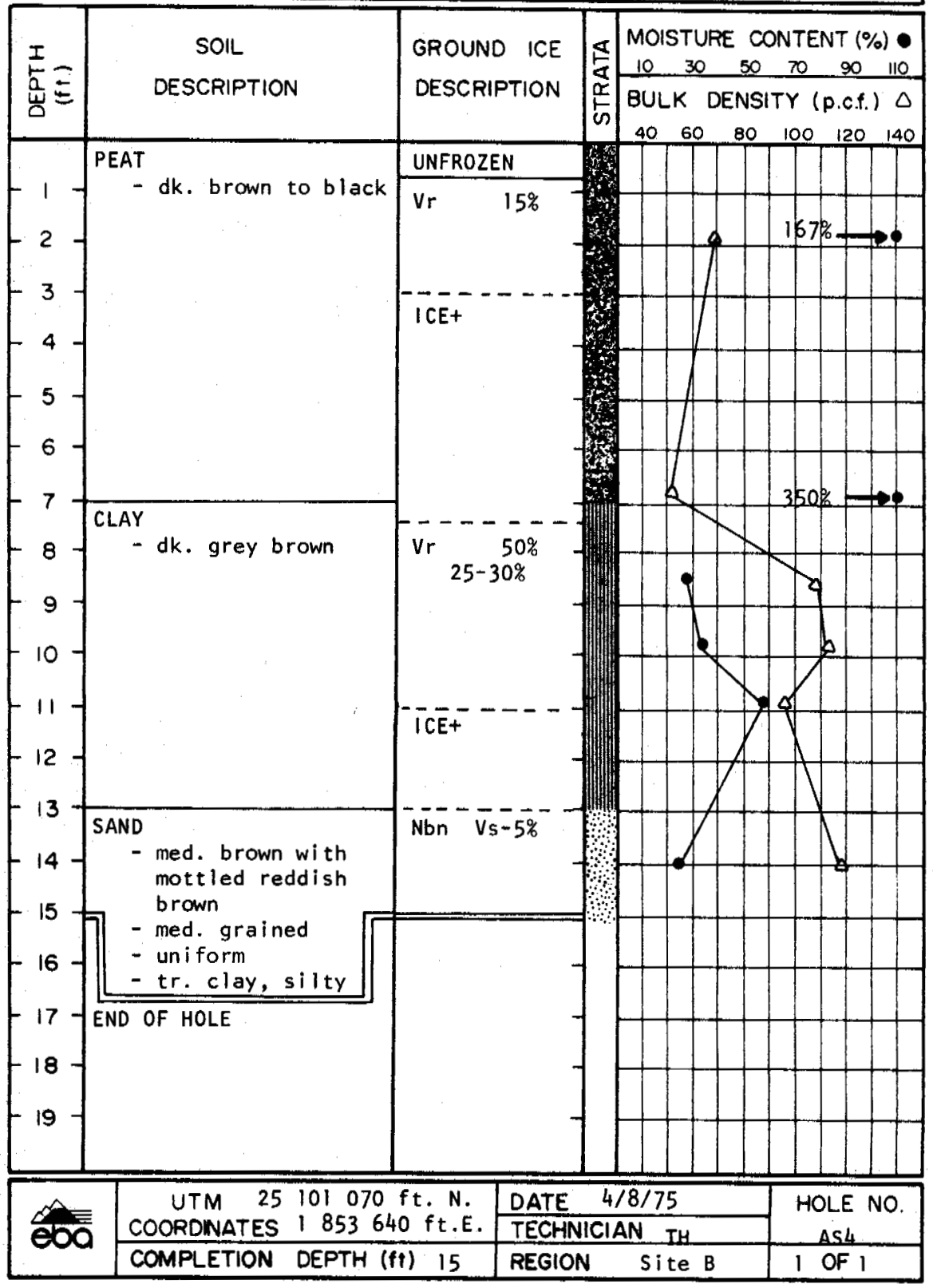
eba	UTM 25 100 090 ft. N.	DATE 4/8/75	HOLE NO.
	COORDINATES 1 853 690 ft.E	TECHNICIAN TH	AS2
	COMPLETION DEPTH (ft) 14.4	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



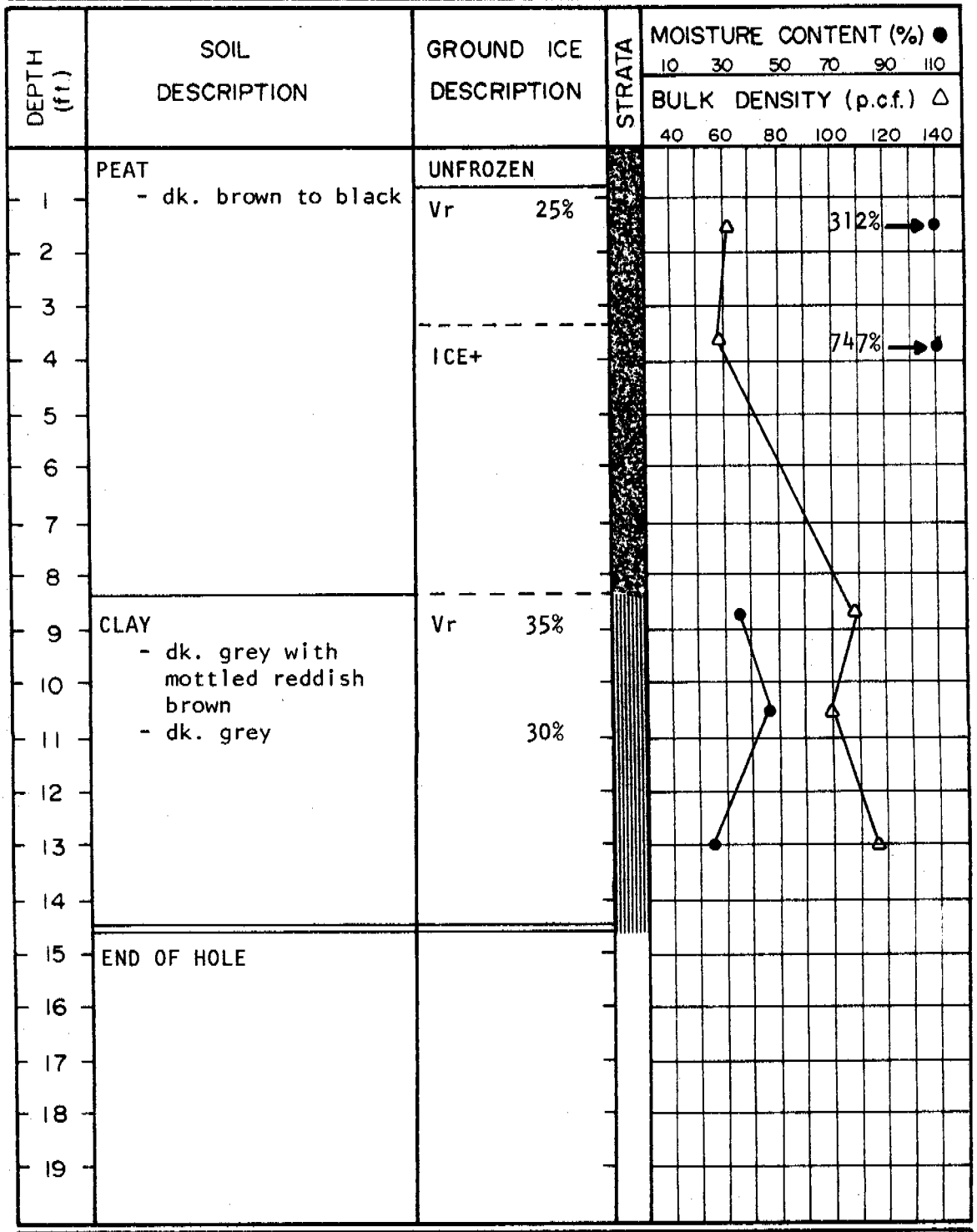
eba	UTM COORDINATES 25 100 590 Ft. N 1 853 660 ft.E.	DATE 4/8/75	HOLE NO. AS3
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 15	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM 25 101 070 ft. N.	DATE 4/8/75	HOLE NO.
	COORDINATES 1 853 640 ft.E.	TECHNICIAN TH	AS4
	COMPLETION DEPTH (ft) 15	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

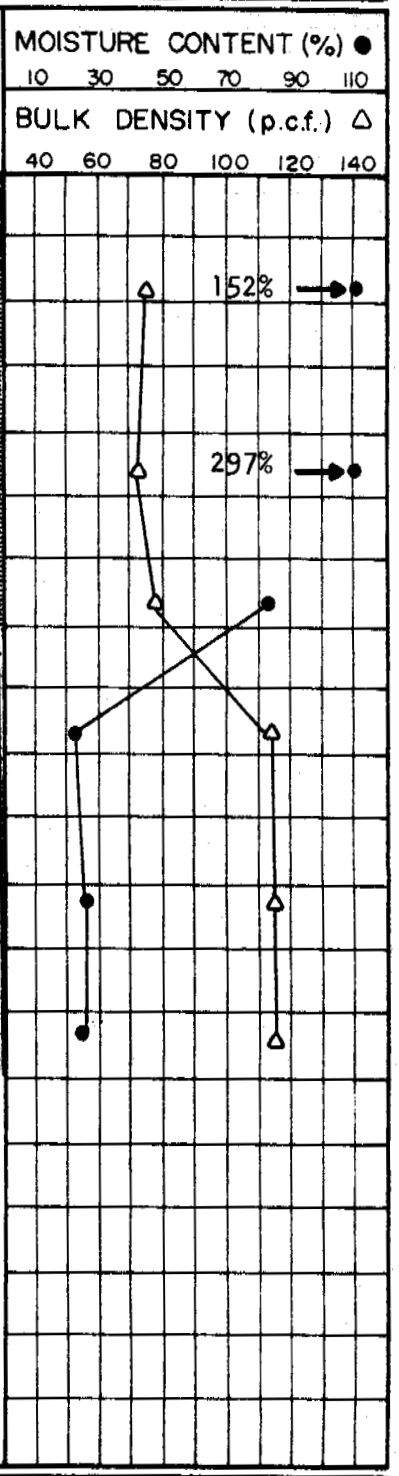


eba	UTM 25 101 570 ft.N.	DATE 4/8/75	HOLE NO. AS5
	COORDINATES 1 853 620 ft.E	TECHNICIAN TH	
	COMPLETION DEPTH (ft) 14.4	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

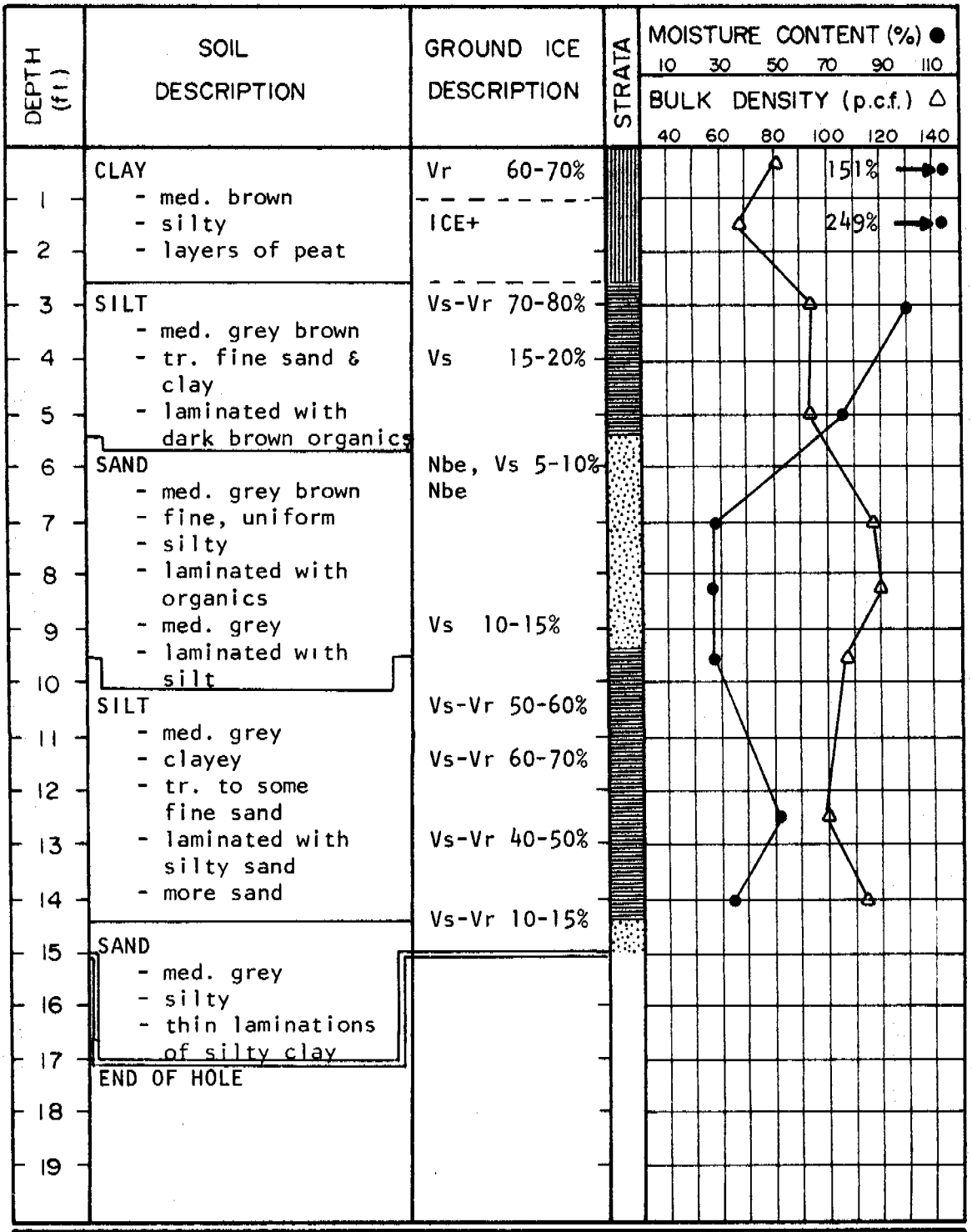
DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN Vr 25%
2	SILT - med. grey brown - clayey	45%
3		
4	- laminated with dk. brown organics	
5		
6		
7		
8	SAND - reddish brown - tr. silt - med. grained - uniform	Nbn Vr 30-40%
9		
10	CLAY (TILL - med. brown - silty - tr. fine gravel & coal	
11		
12		
13		
14		
15	END OF HOLE Could not Penetrate	
16		
17		
18		
19		

STRATA



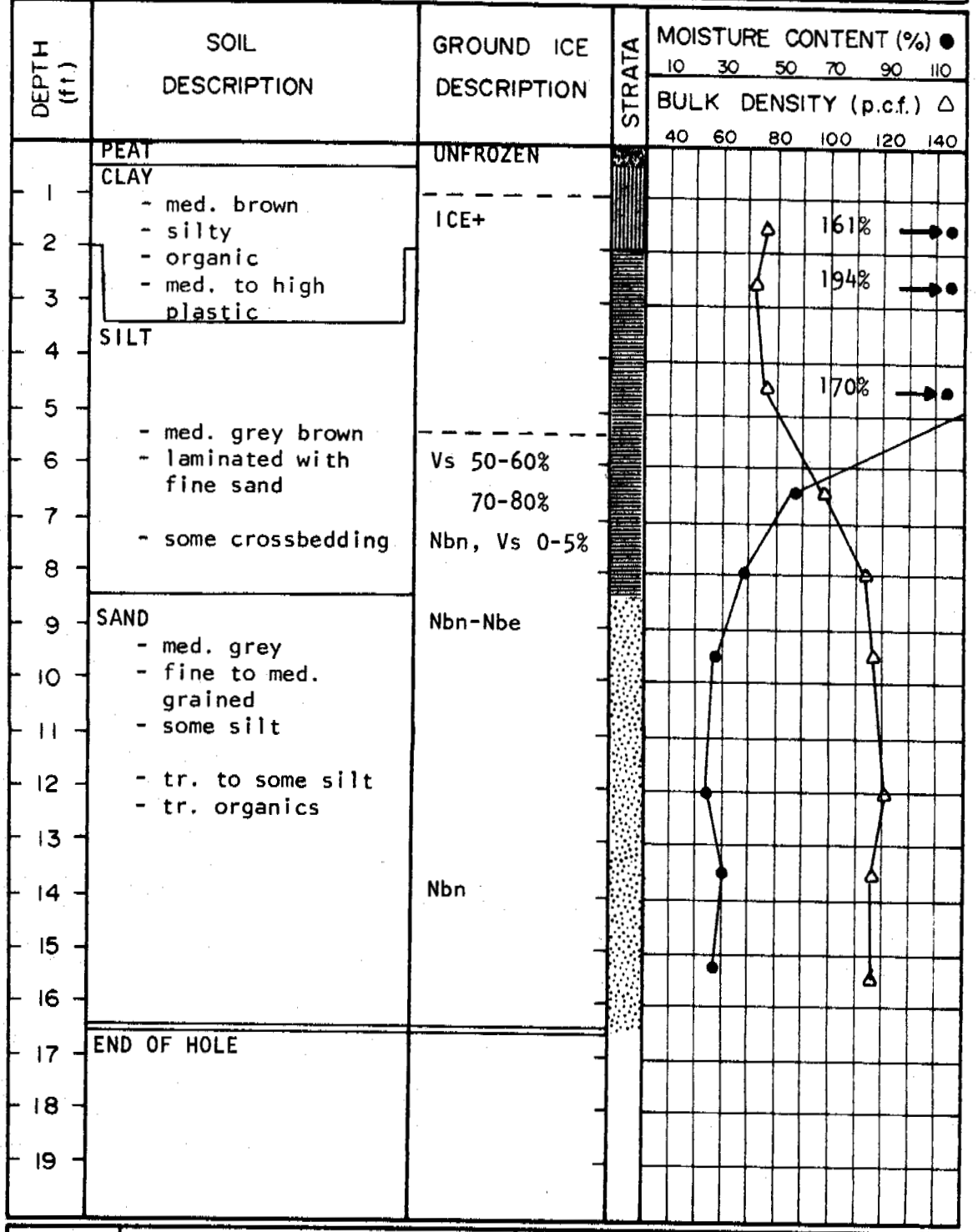
eba	UTM 25 103 380 ft.N. COORDINATES 1 853 440 ft.E.	DATE 4/8/75 TECHNICIAN TH	HOLE NO. AS6
	COMPLETION DEPTH (ft) 14'	REGION Site B	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



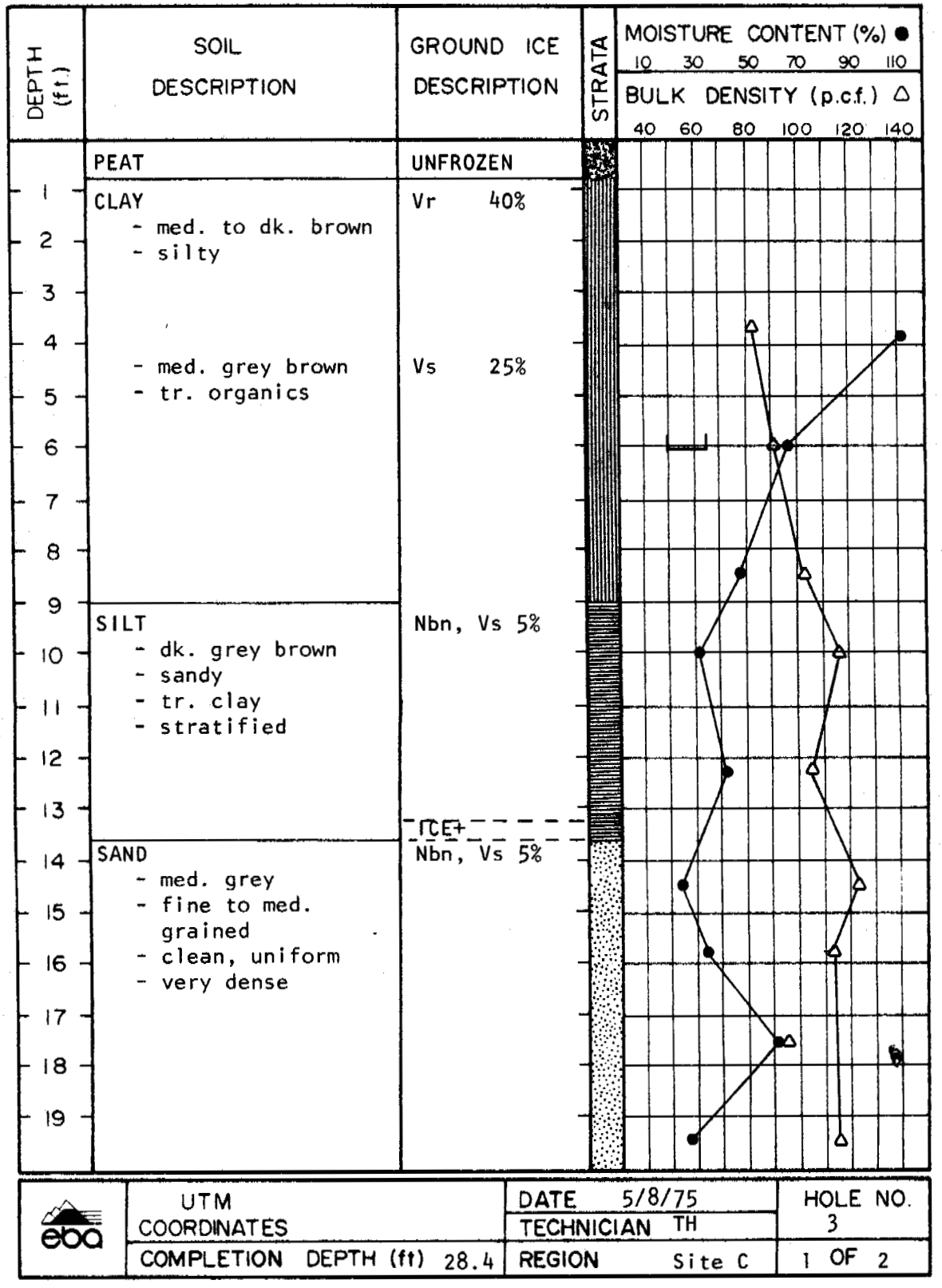
eba	UTM COORDINATES	DATE 17/7/75	HOLE NO. 1
		TECHNICIAN JK	
	COMPLETION DEPTH (ft) 15	REGION Site C	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM COORDINATES	DATE 17/7/75	HOLE NO. 2
		TECHNICIAN JK	
	COMPLETION DEPTH (ft) 16.5	REGION Site C	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

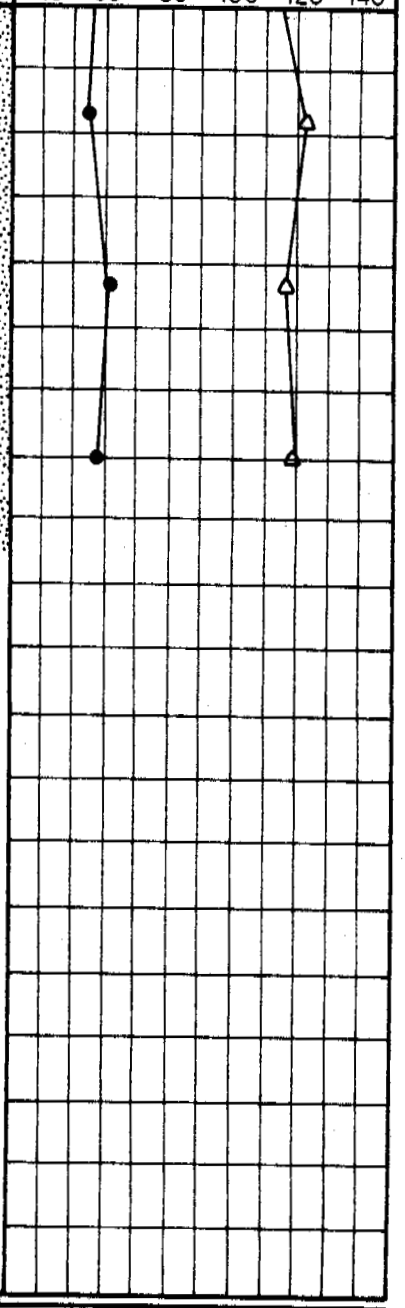


eba	UTM COORDINATES	DATE 5/8/75	HOLE NO. 3
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 28.4	REGION Site C	1 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
21	SAND (cont'd)		
22			
23			
24			
25	- coarser		
26			
27			
28			
29	END OF HOLE Could not Penetrate		

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM COORDINATES	DATE 5/8/75	HOLE NO. 3
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 28.4	REGION Site C	2 OF 2

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT - black	UNFROZEN Vr 25%
2	CLAY - med. to dk. brown - tr. organics	Vs 35%
6	- med. grey brown	Vr 35%
8	SAND - dk. brown, mottled with grey brown - fine to med. grained - tr. silt & clay	Nbn, Vs 5% Vr 50% ICE+
12	- dark grey - tr. silt - med. grained - tr. organics - tr. coal	Nbn, Vs-5%
16	END OF HOLE	

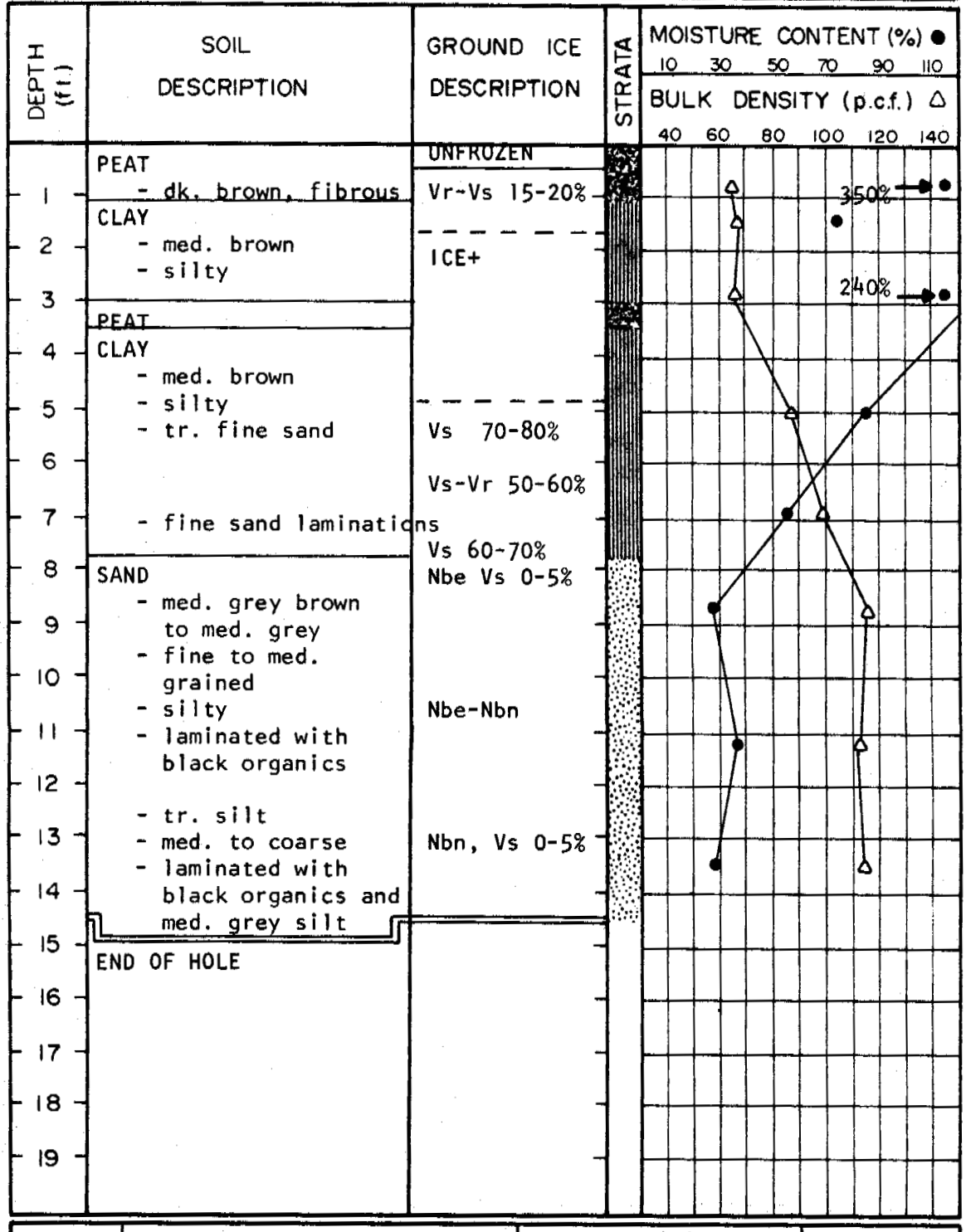
STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

163%

eba	UTM COORDINATES	DATE 6/8/75	HOLE NO. 4
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 15.3	REGION Site C	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM COORDINATES	DATE 17/7/75	HOLE NO. 5
		TECHNICIAN JK	
	COMPLETION DEPTH (ft) 14.5	REGION Site C	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT - dk. brown	UNFROZEN Vr 20%
2		
3	CLAY - dk. brown	Vr 50% 80%
4		
5		
6	SILT - med. brown mottled with dk. grey - very sandy	Vs 20%
7		
8	- some clay	Nbn, Vs 5%
9	SAND - med. brown with mottled dk. grey - silty - fine grained	
10		
11		
12	- med. to dk. grey - fine to med. grained	
13	- uniform - very silty	
14	SILT - dk. brown	Vr 25%
15	- some sand	
16	END OF HOLE	
17		
18		
19		

STRATA

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

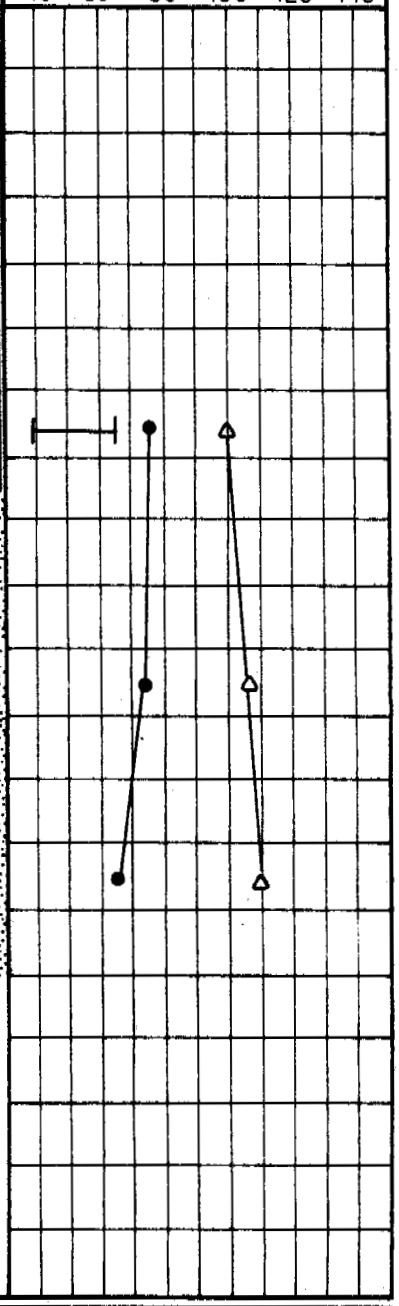
185%

eba	UTM COORDINATES	DATE 6/8/75	HOLE NO. 6
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 15.2	REGION Site C	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

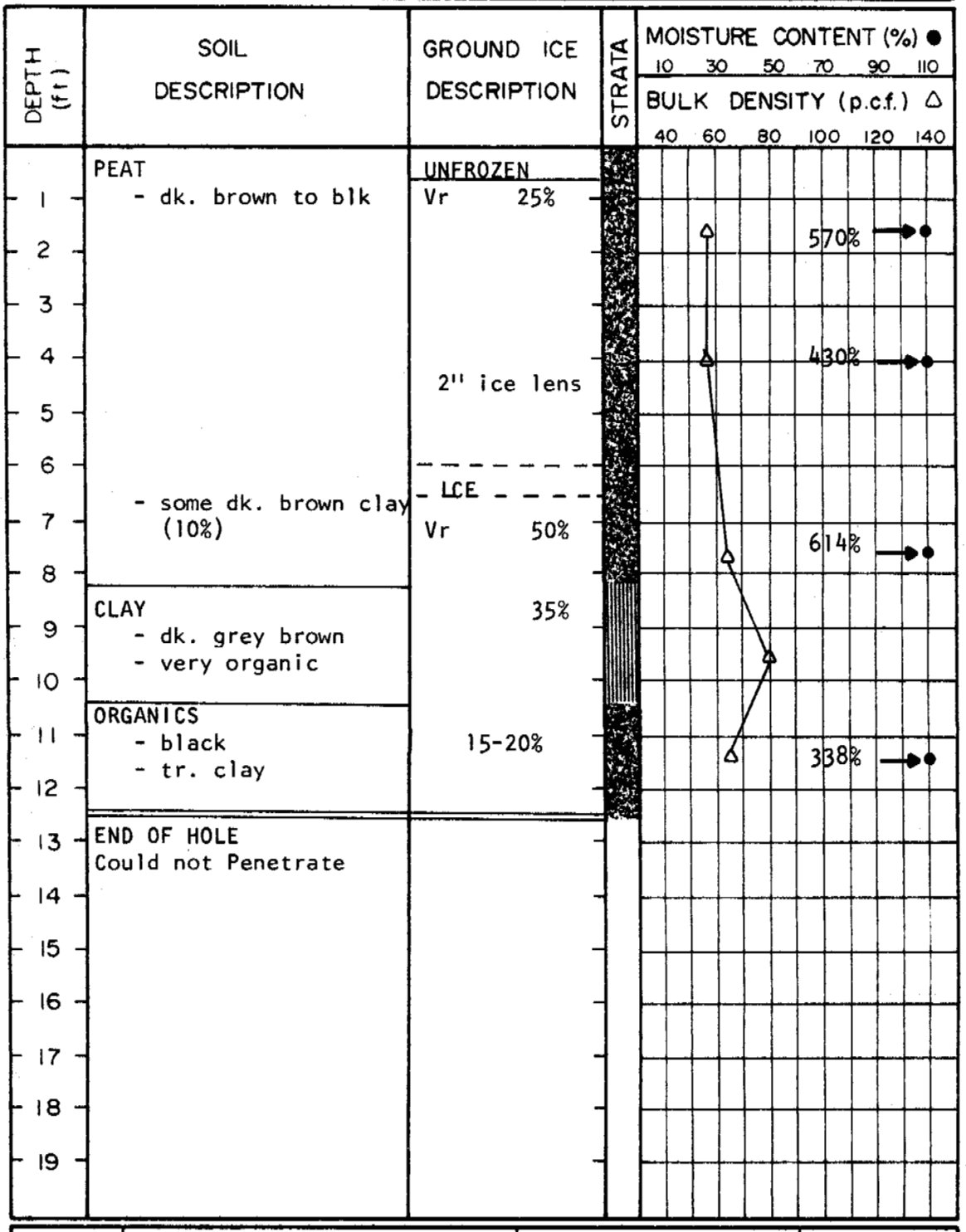
DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN
2	CLAY - dk. brown	Vr 50%
3		
4		35%
5		
6	- sandy (fine) - tr. organics	25%
7		
8	SAND - med. brown with mottled dk. grey - very silty - some clay - fine to med. grained - stratified	Nbn, Vs-5%
9		
10		
11		
12	- dark grey	
13		
14		
15		
16	END OF HOLE	
17		
18		
19		

STRATA



eba	UTM COORDINATES	DATE 6/8/75	HOLE NO. 7
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 15	REGION Site C	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT



eba	UTM COORDINATES	DATE 6/8/75	HOLE NO. R1
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 12.5	REGION Roadways	1 OF 1

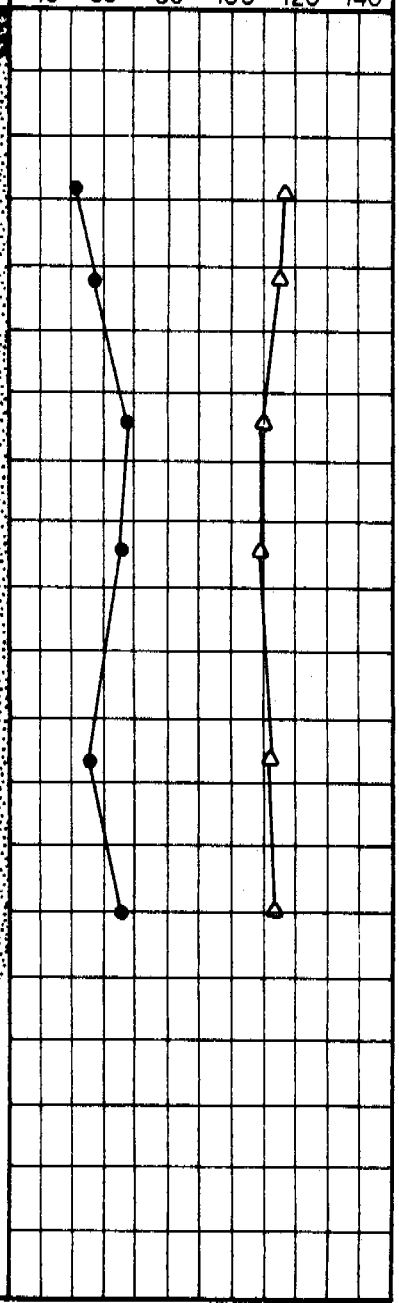
GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION
1	PEAT	UNFROZEN
2	SAND - med. reddish brown - med. grained - clean, uniform	
3		Nbn
4	- tr. coal	
5	- some coal	Vs 1-5%
6	- laminated with dark grey brown clay - tr. organics	Vr 35% Nbn, Vs 5%
7	- fine	Vr 50%
8	- med. brown - med. grained - uniform	Nbn, Vx-5%
9		
10	- laminated with coal - mottled with grey	
11		
12		
13	- med. grey with mottled reddish brown	
14	- tr. coal	
15	- crossbedded	
16	END OF HOLE	
17		
18		
19		

STRATA

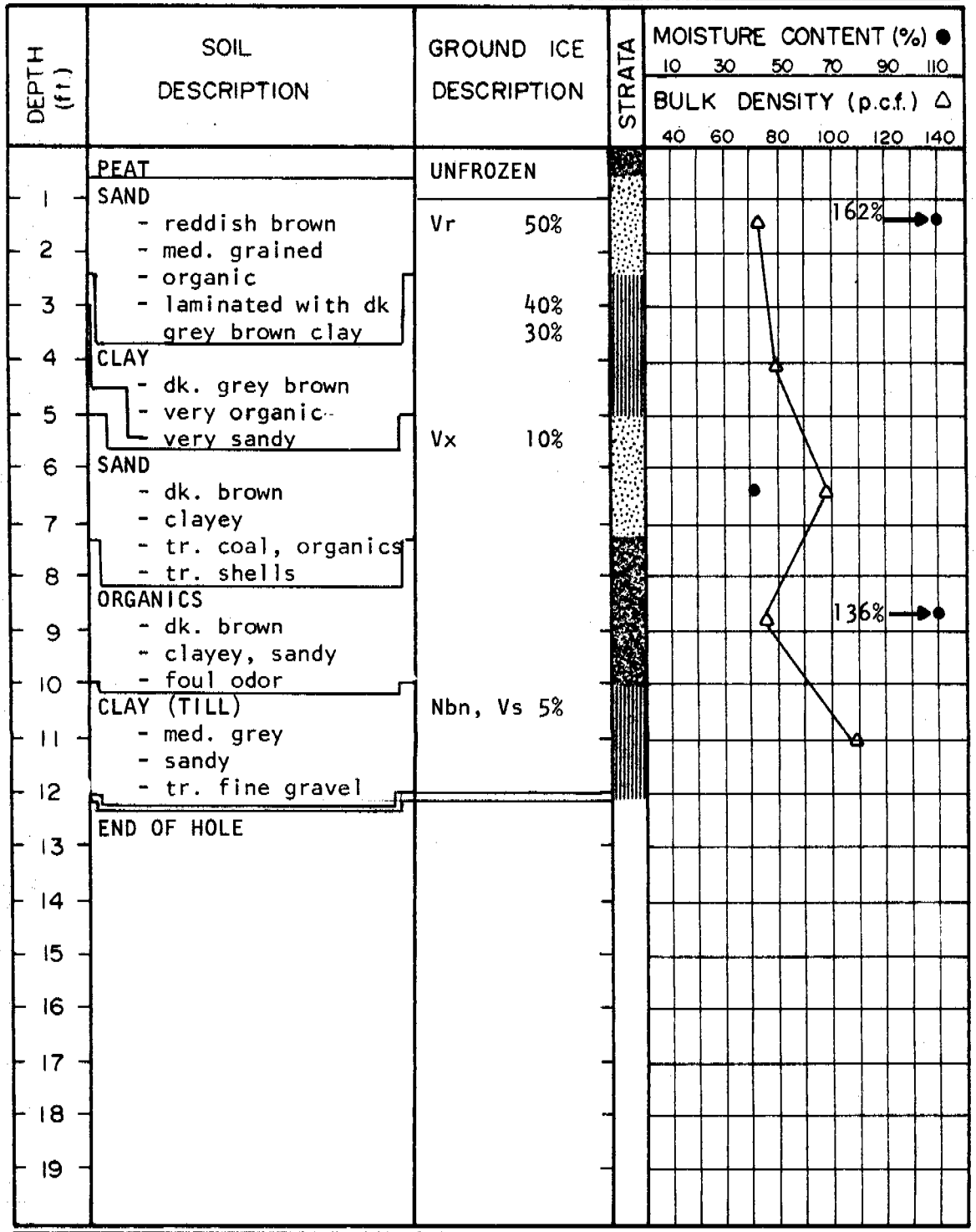
MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM COORDINATES	DATE 7/8/75 TECHNICIAN TH	HOLE NO. R2
	COMPLETION DEPTH (ft) 13	REGION Roadways	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

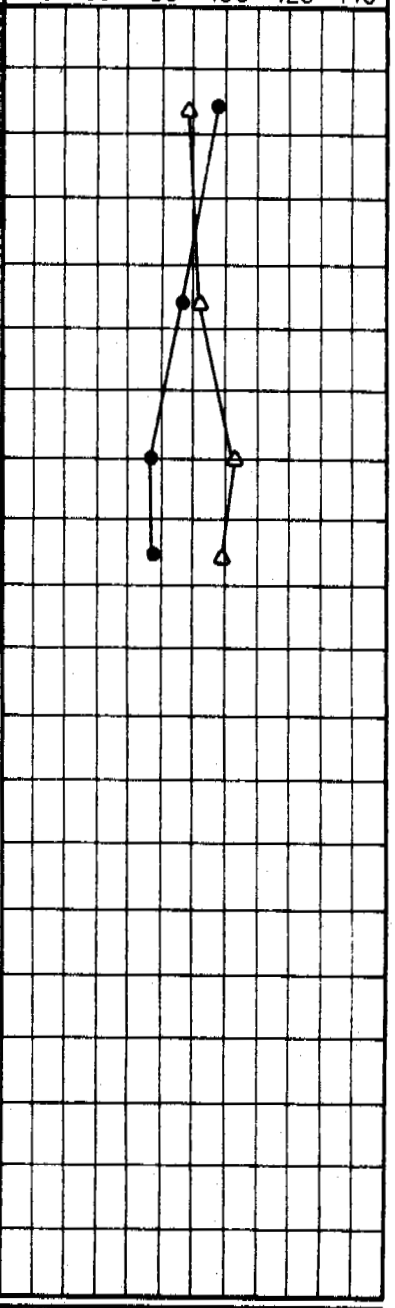


eba	UTM COORDINATES	DATE 7/8/75	HOLE NO. R3
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 12	REGION Roadways	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT - dk. brown	UNFROZEN Vr 20%	
2	CLAY - dk. brown - some sand	45%	
3			
4	SAND - fine grained - very clayey	25%	
5			
6	CLAY - dk. brown - sandy - med. brown with mottled dk. grey - tr. silt	35%	
7			
8			
9			
10	CLAY (TILL) - med. to dk. grey brown - sandy - tr. gravel (1" max) - tr. organics & coal		
11			
12			
13	END OF HOLE Could not Penetrate		
14			
15			
16			
17			
18			
19			

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140



eba	UTM COORDINATES	DATE 6/8/75	HOLE NO. R 4
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 10	REGION Roadways	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
1	PEAT	UNFROZEN	
2	CLAY - dk. brown - some coarse gravel		
3	- gravelly (½" max)	FROZEN	
4			
5			
6	GRAVEL		
7	END OF HOLE Could not Penetrate		
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

MOISTURE CONTENT (%) ●
10 30 50 70 90 110

BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

eba	UTM COORDINATES	DATE 6/8/75	HOLE NO. R 5
		TECHNICIAN TH	
	COMPLETION DEPTH (ft) 5.4	REGION Roadways	1 OF 1

GULF OIL CANADA LIMITED
PARSONS LAKE GAS PLANT DEVELOPMENT

DEPTH (ft.)	SOIL DESCRIPTION	GROUND ICE DESCRIPTION	STRATA
0	PEAT	UNFROZEN	
1	CLAY		
2			
3			
4			
4	GRAVEL - coarse	Some Ice	
5	END OF HOLE Could not Penetrate		
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			

MOISTURE CONTENT (%) ●
10 30 50 70 90 110
BULK DENSITY (p.c.f.) △
40 60 80 100 120 140

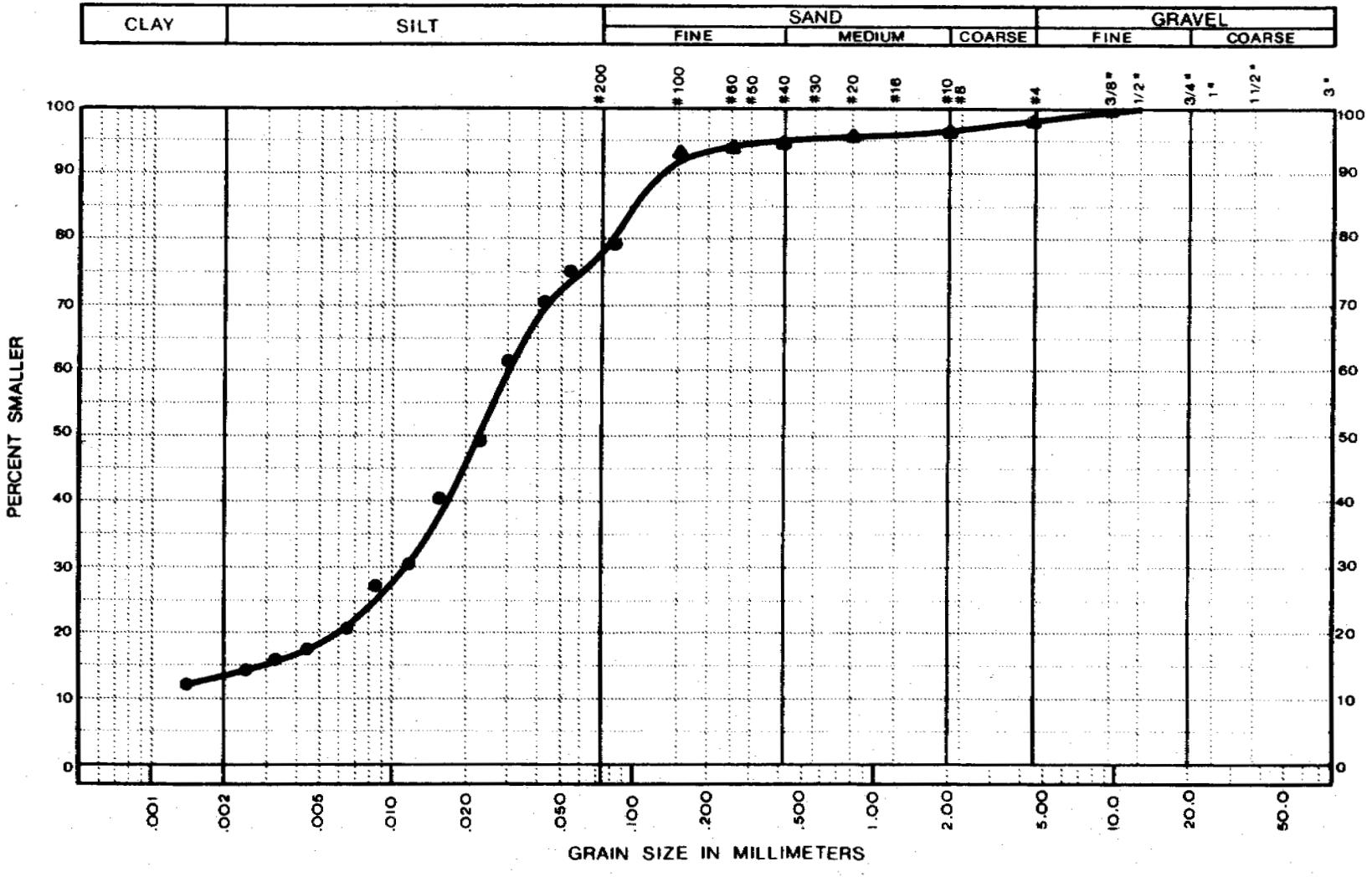
eba	UTM COORDINATES	DATE 6/8/75	HOLE NO.
		TECHNICIAN TH	B 6
	COMPLETION DEPTH (ft) 5'	REGION Roadways	1 OF 1

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 22/75

HOLE NO.: B3-A
SAMPLE NO.:
DEPTH: 3.5 - 5.0

SAMPLE DESCRIPTION:
Silt
- clayey
- some sand



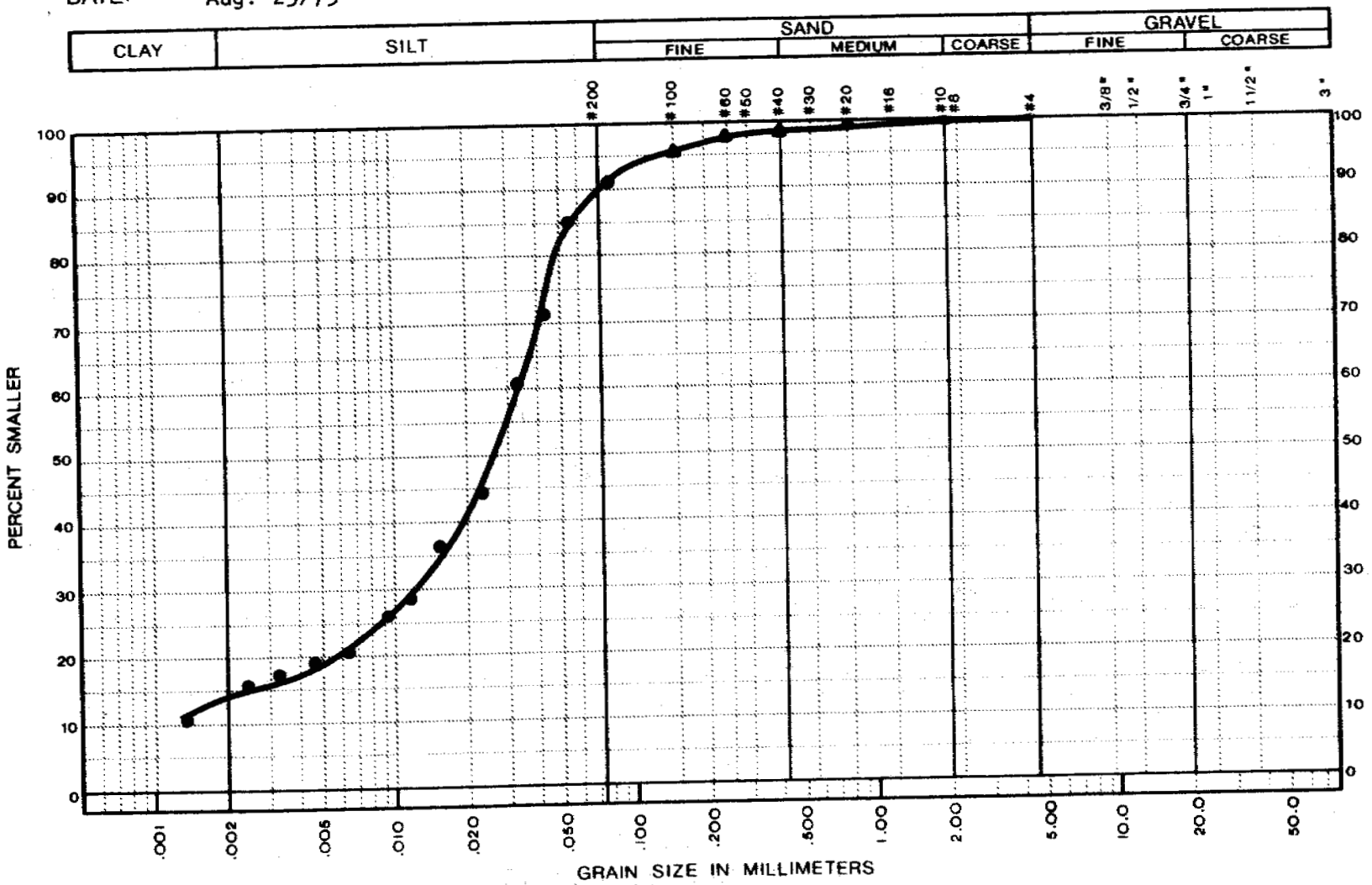
C2

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 29/75

HOLE NO.: B5-A
SAMPLE NO.:
DEPTH: 7.6 - 10.5

SAMPLE DESCRIPTION:
SILT
- some sand
- clayey

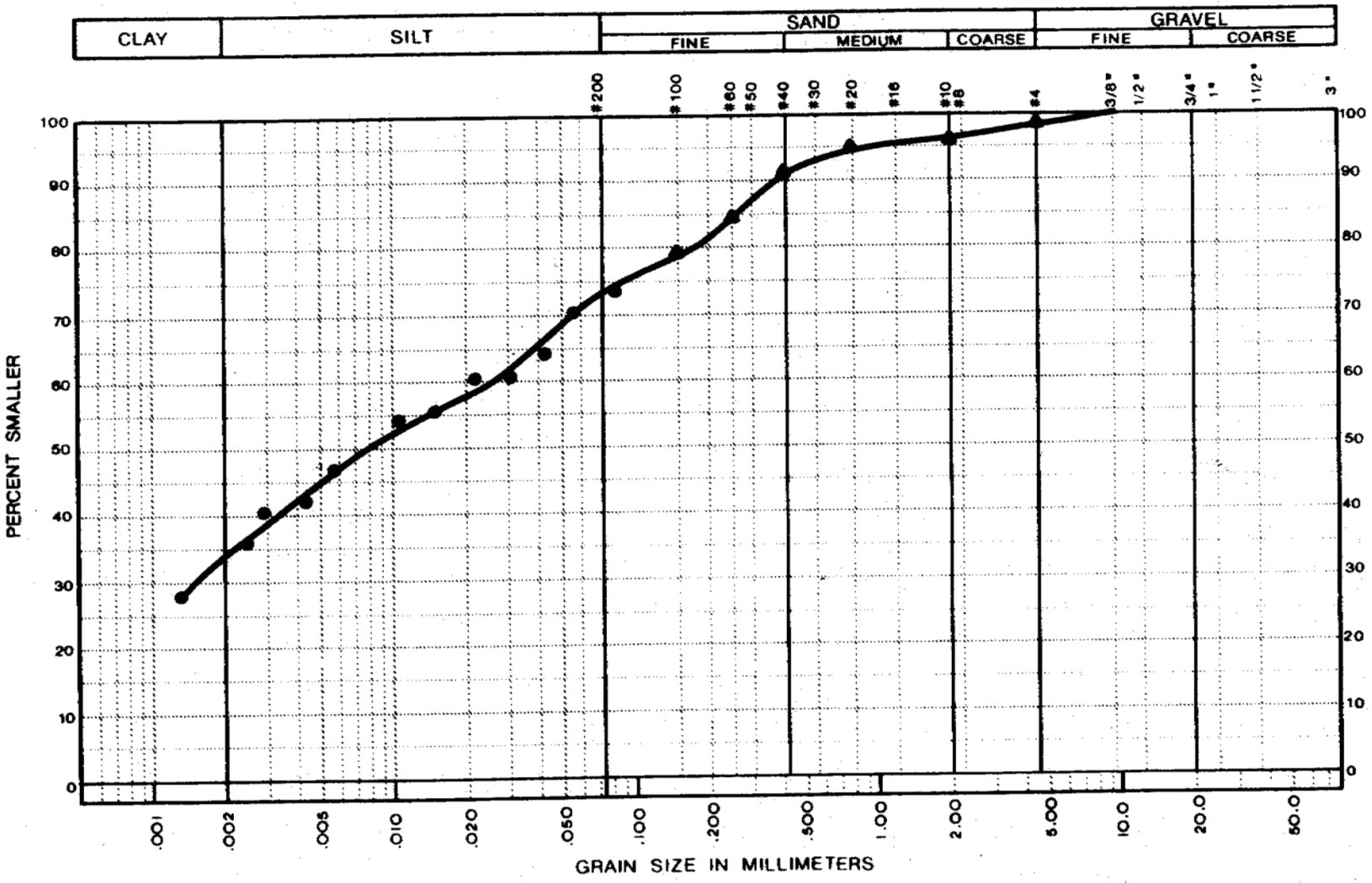


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 22/75

HOLE NO.: C1-A
SAMPLE NO.:
DEPTH: 0 - 3.5

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy



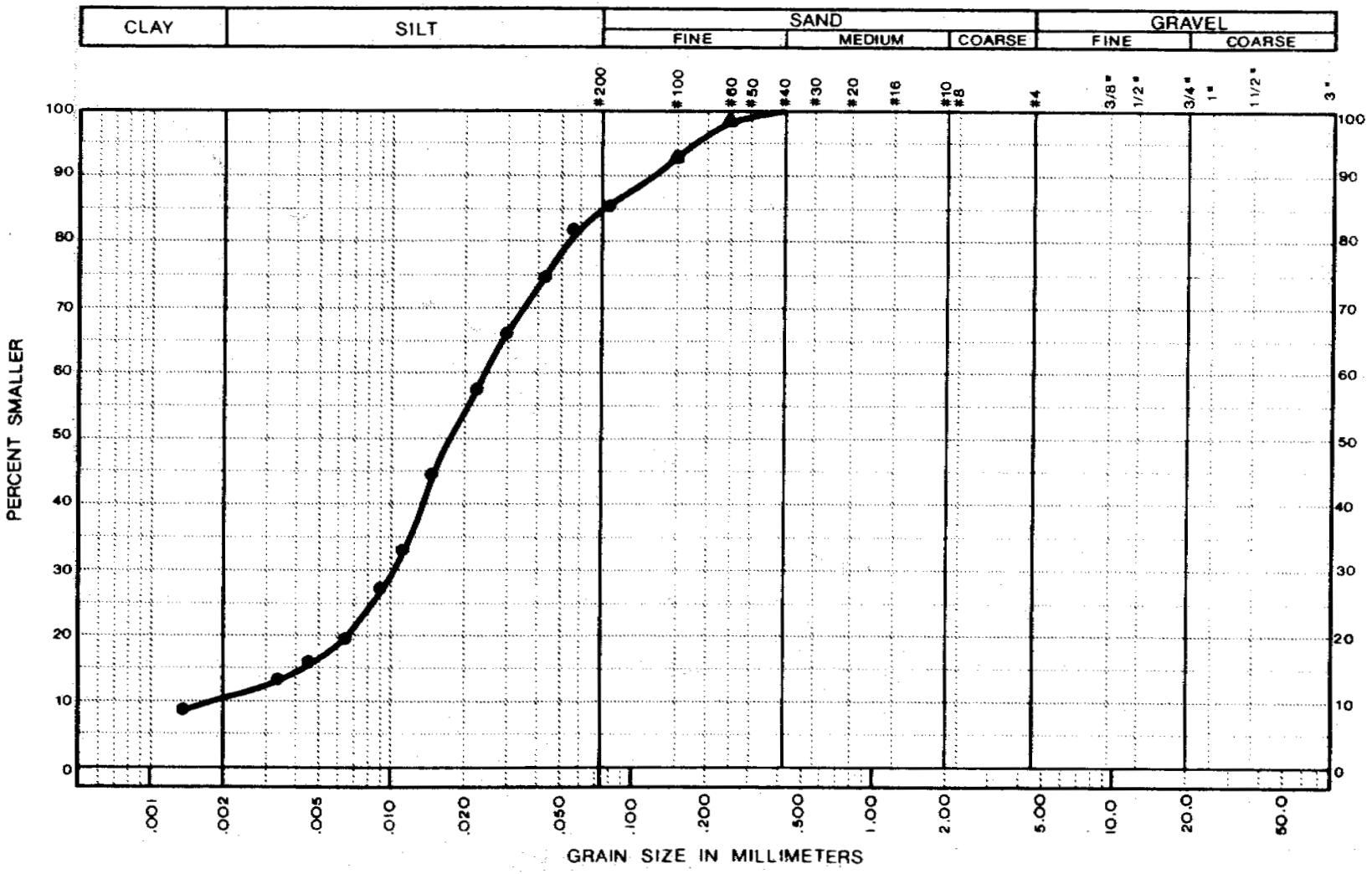
C.4

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE:

HOLE NO.: C3-A
SAMPLE NO.:
DEPTH: 8.2 - 10.6

SAMPLE DESCRIPTION:
SILT
- sandy
- some clay



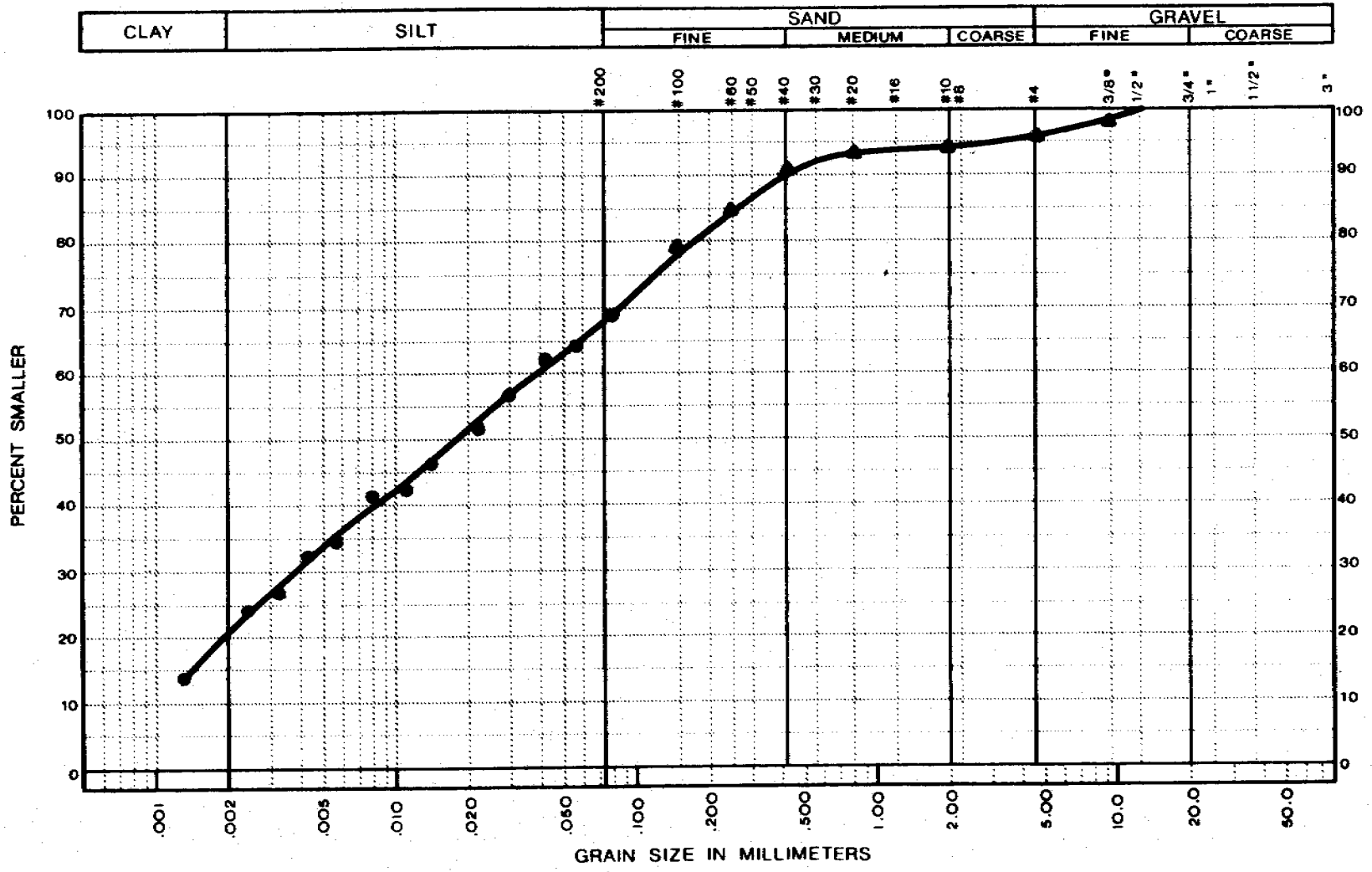
C.5

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE:

HOLE NO.: C3-A
SAMPLE NO.:
DEPTH: 12 - 13

SAMPLE DESCRIPTION:
SILT (TILL)
- clayey



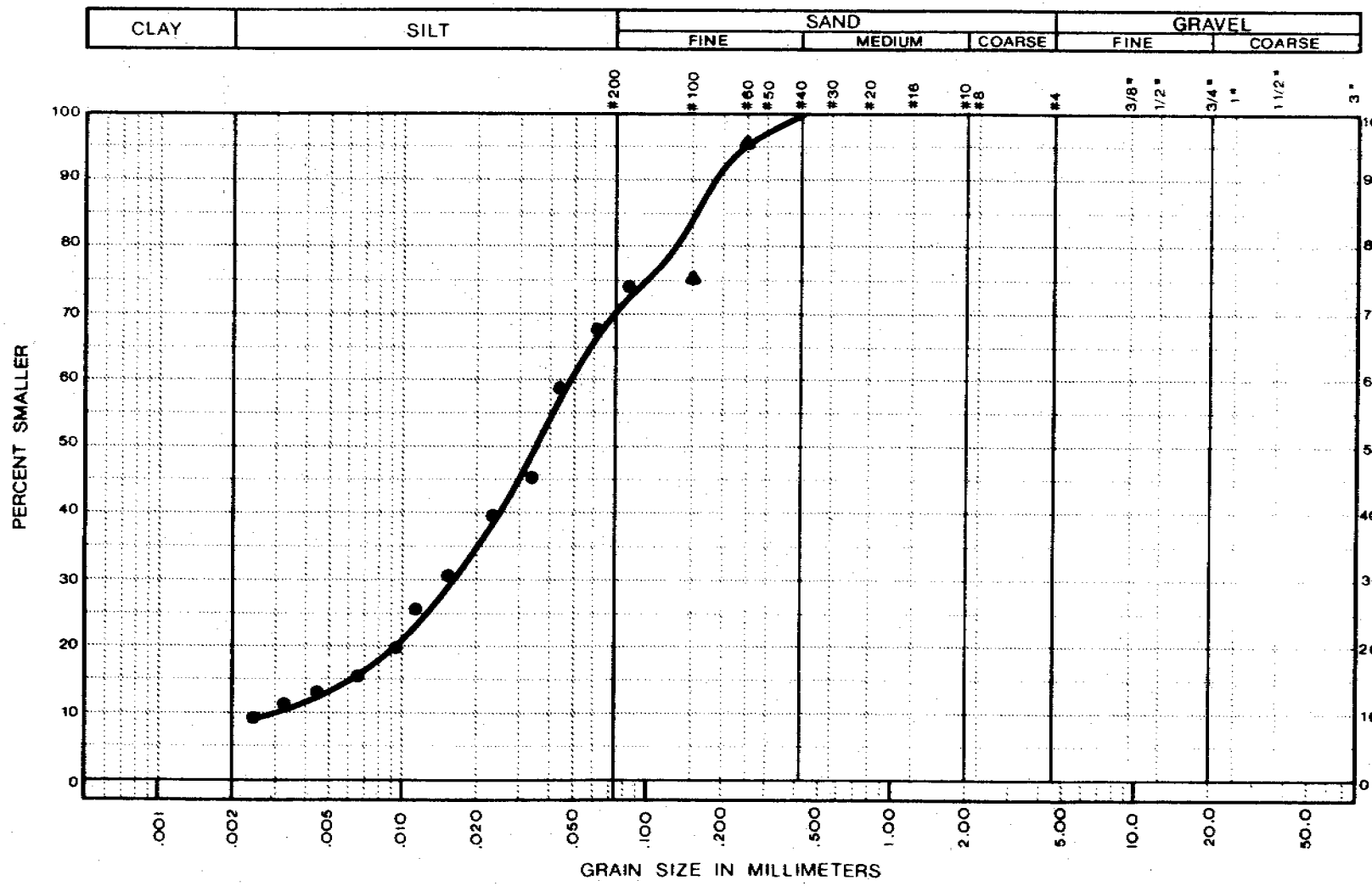
C.6

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: C4-A
SAMPLE NO.:
DEPTH: 10.3 - 13.0

SAMPLE DESCRIPTION:
SILT
- very sandy
- some clay



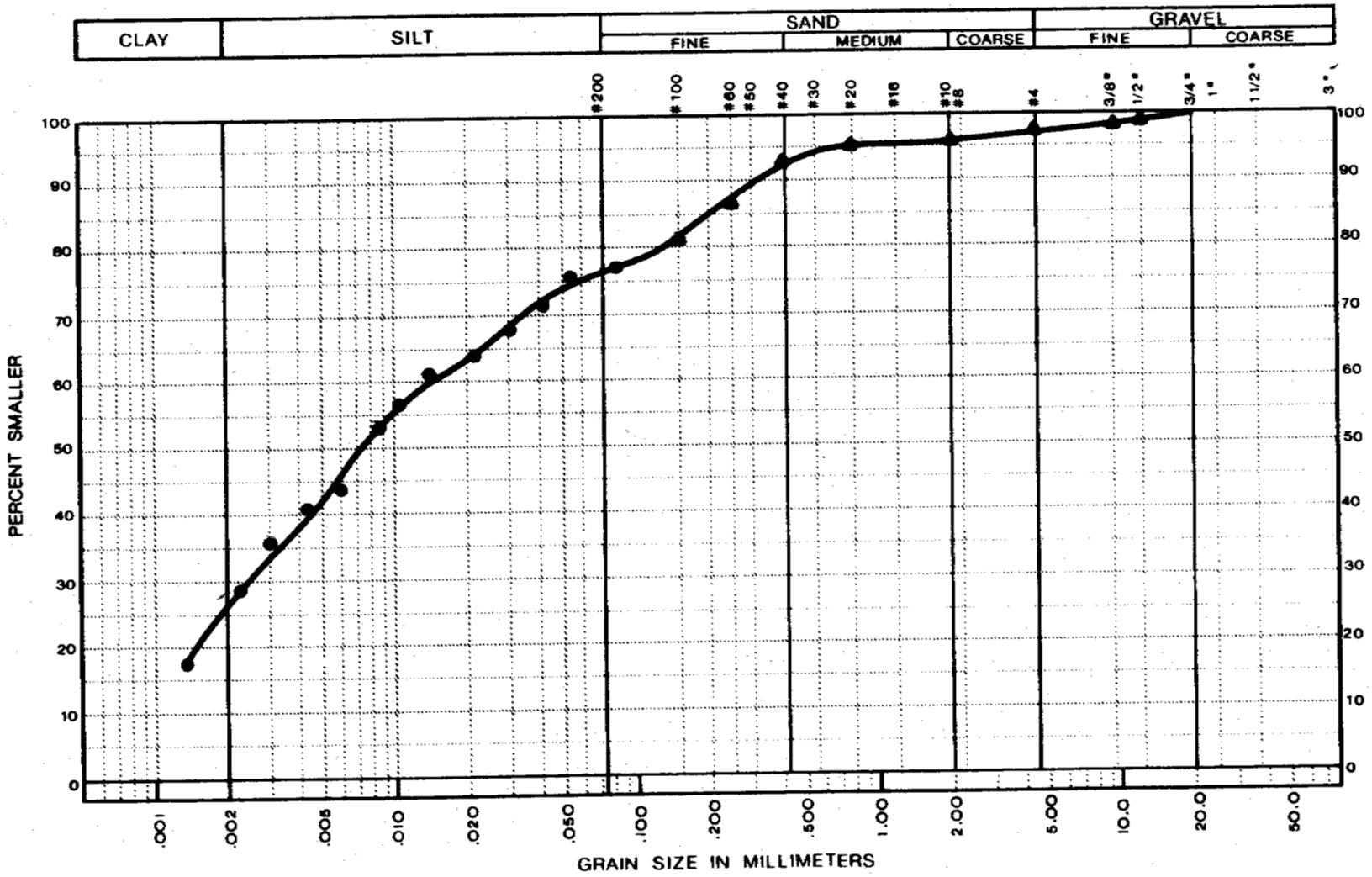
C.7

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE:

HOLE NO.: C5-A
SAMPLE NO.:
DEPTH: 13.2-15

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty

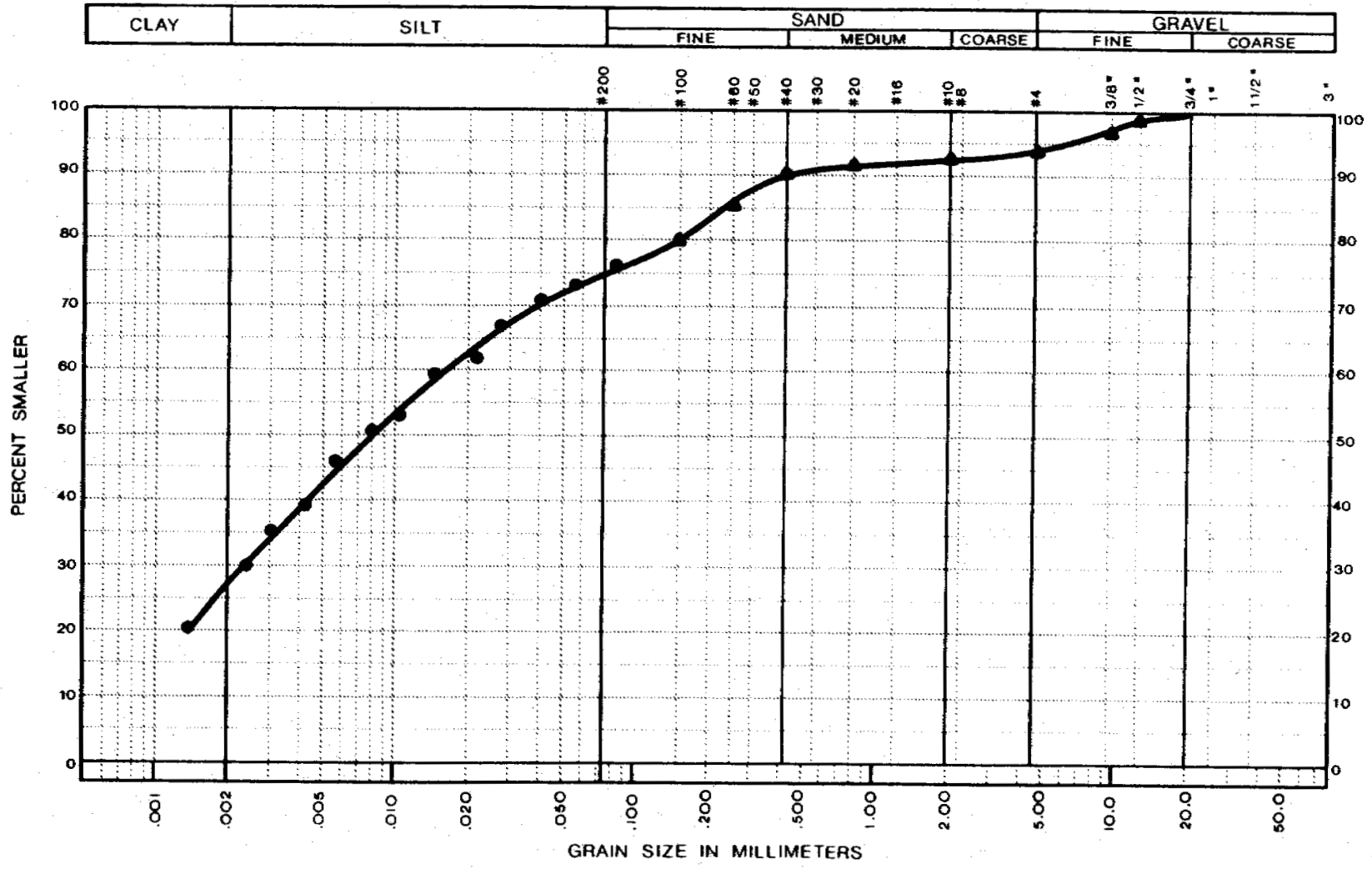


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: C5-A
SAMPLE NO.:
DEPTH: 17.4 - 18.9

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy



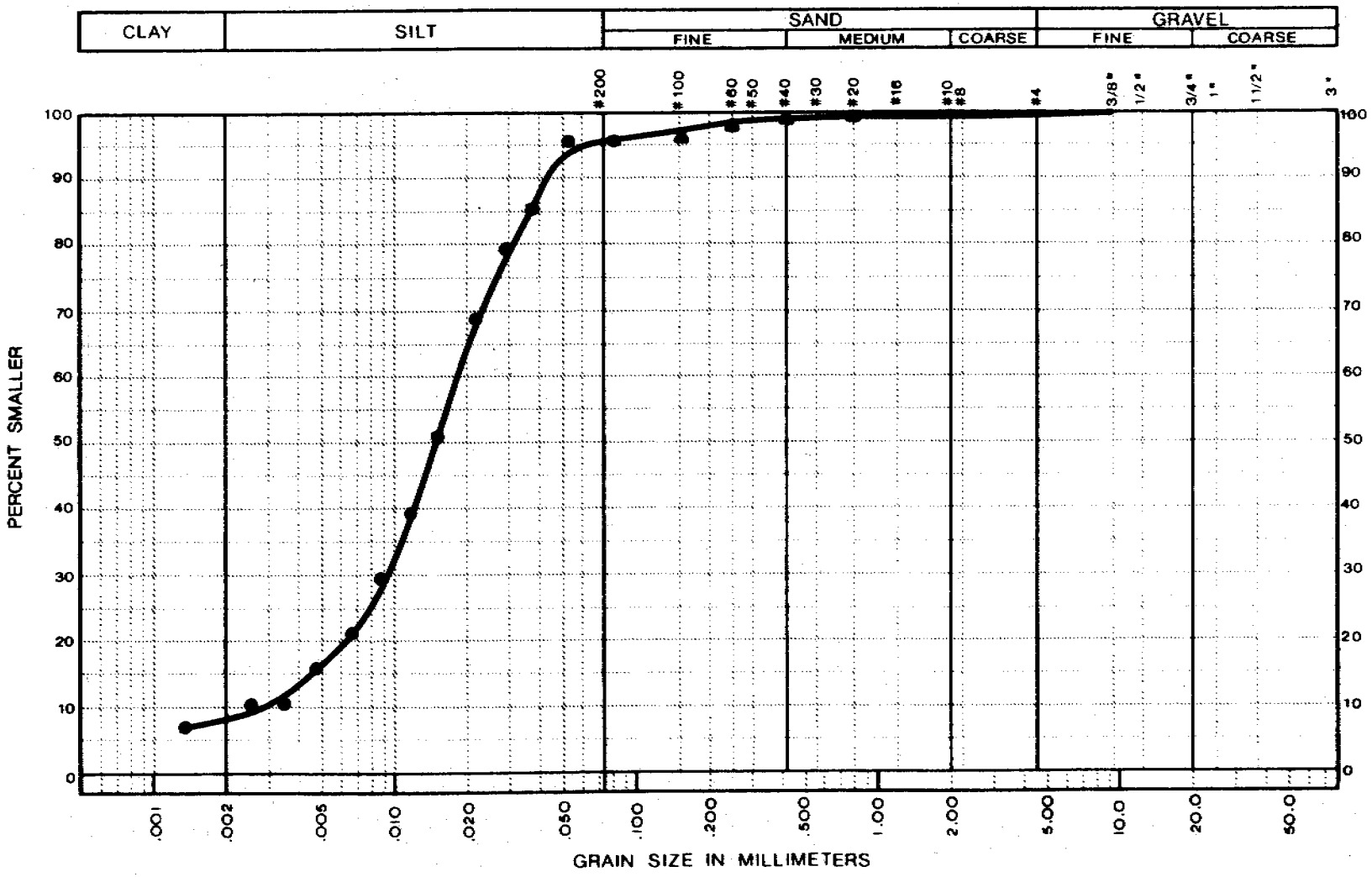
C.9

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: D2-A
SAMPLE NO.:
DEPTH: 3.8 - 6.5

SAMPLE DESCRIPTION:
SILT
- some clay

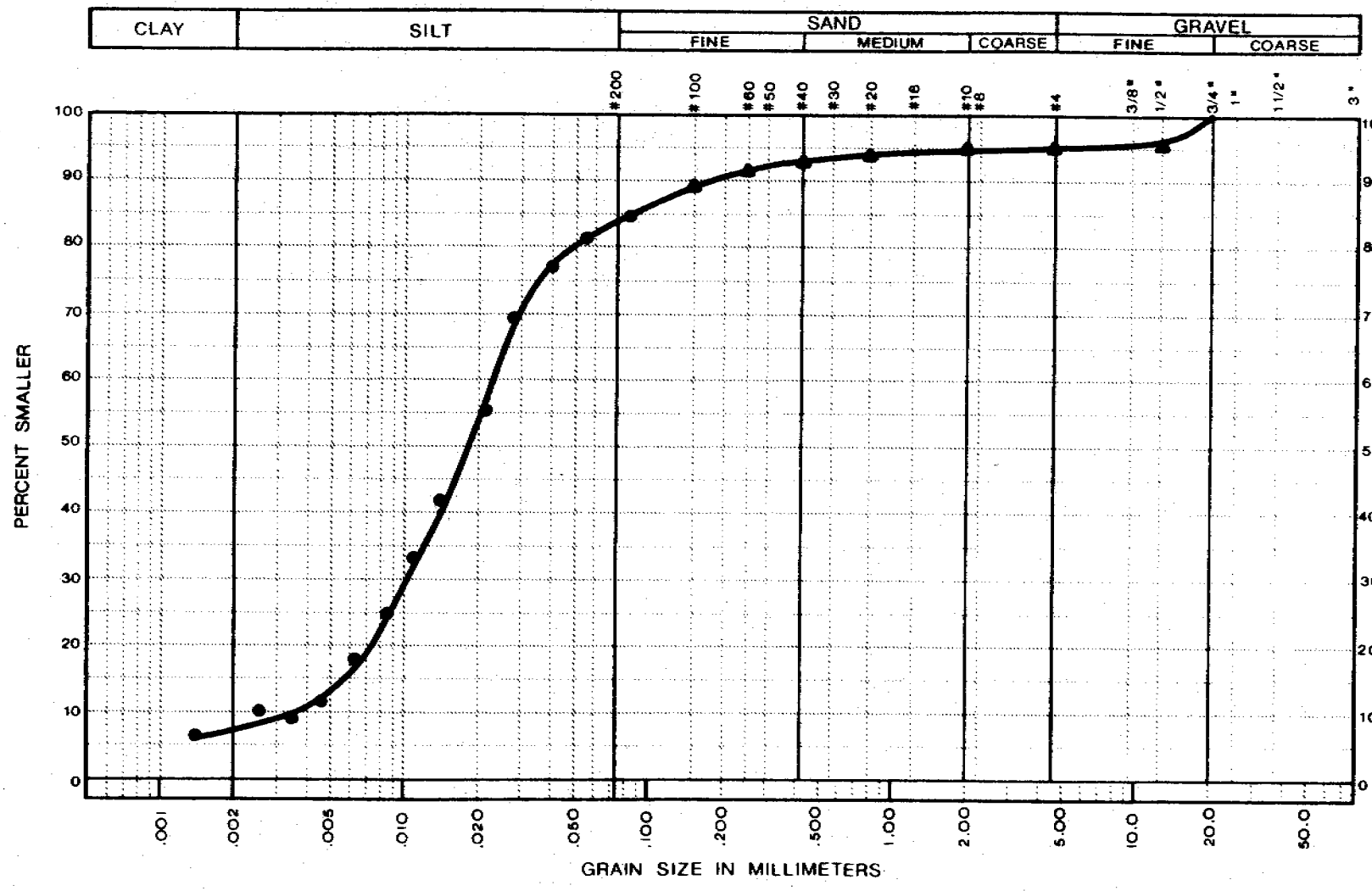


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: D2-A
SAMPLE NO.:
DEPTH: 6.5 - 8.5

SAMPLE DESCRIPTION:
SILT
- some clay



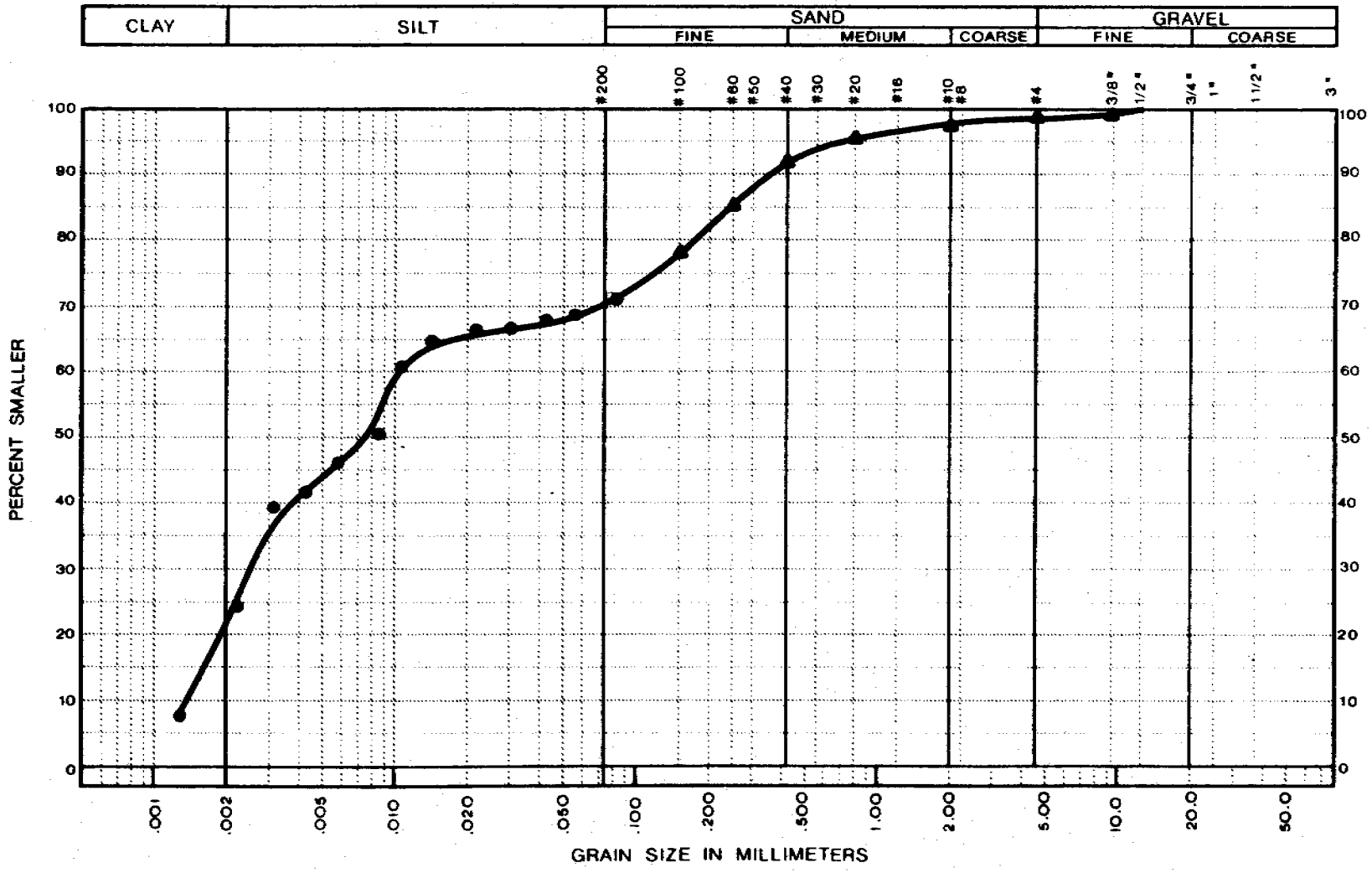
C.11

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 29/75

HOLE NO.: D3-A
SAMPLE NO.:
DEPTH: 6.5 - 8.3

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy

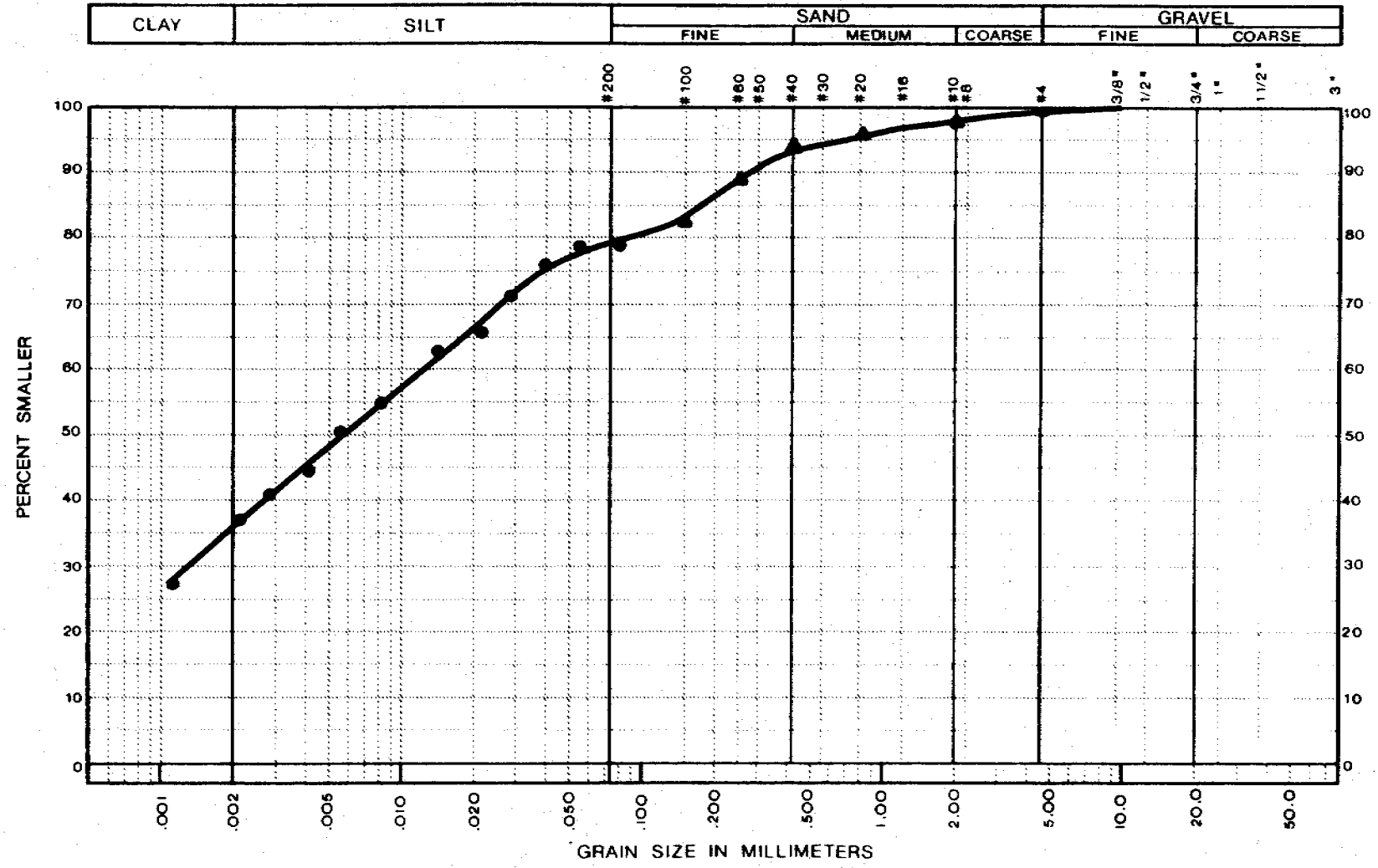


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: D5-A
SAMPLE NO.:
DEPTH: 3 - 4.8

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy



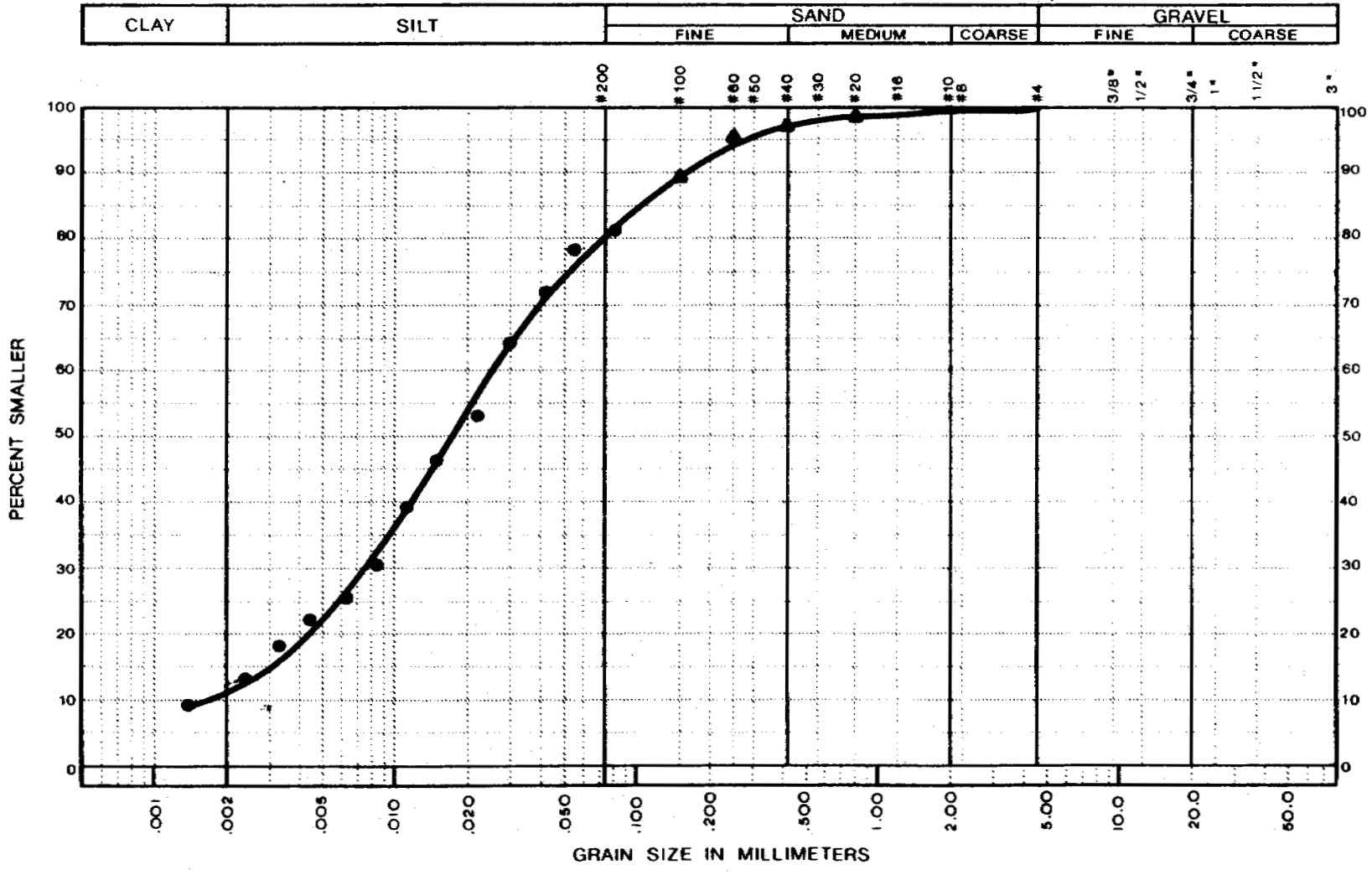
GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: E2-A
SAMPLE NO.:
DEPTH: 3.3 - 5.0

SAMPLE DESCRIPTION:

SILT
- clayey
- sandy

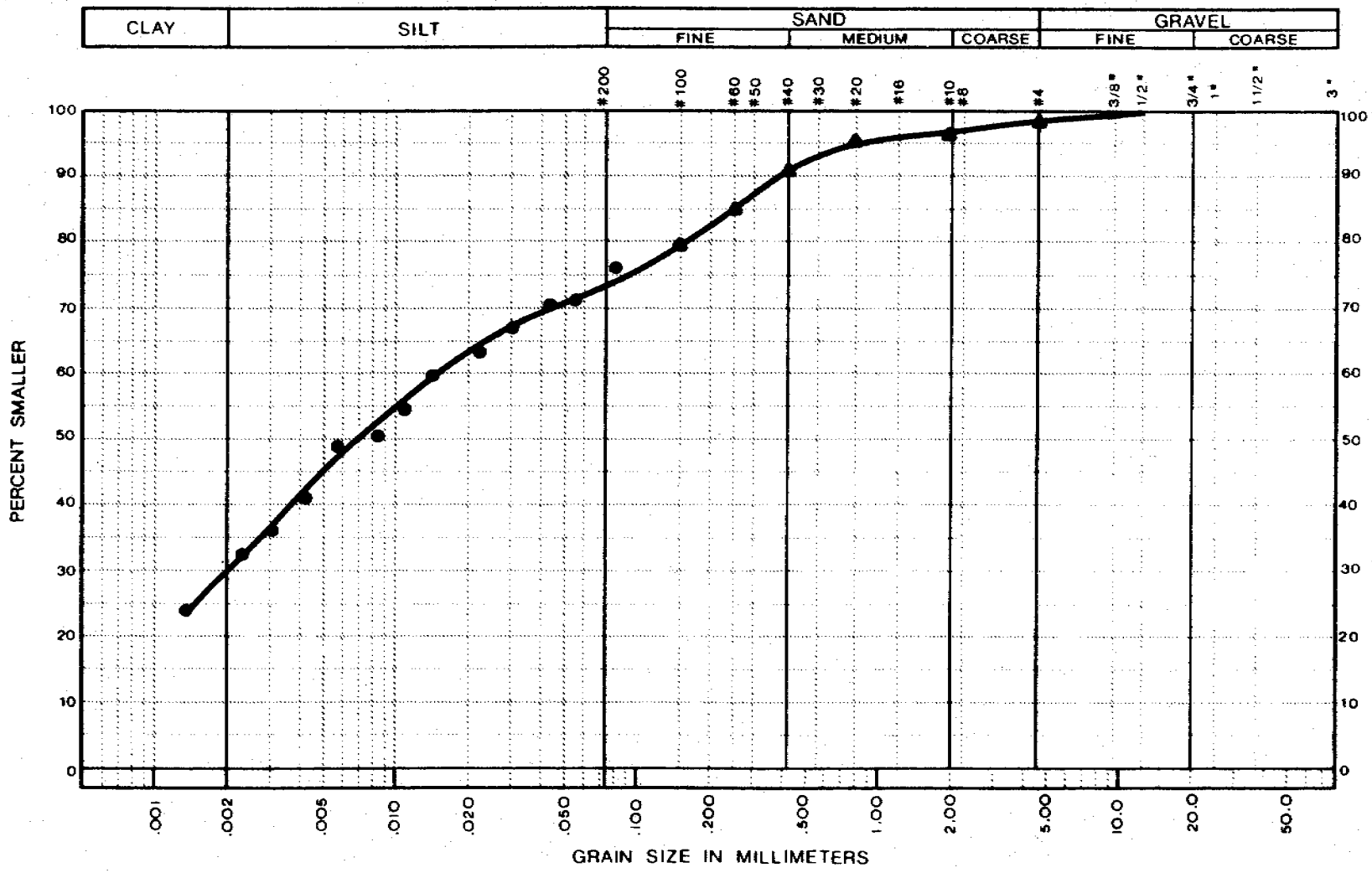


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: E3-A
SAMPLE NO.:
DEPTH: 6.0 - 8.2

SAMPLE DESCRIPTION:
CLAY (TILL)
- sandy
- silty



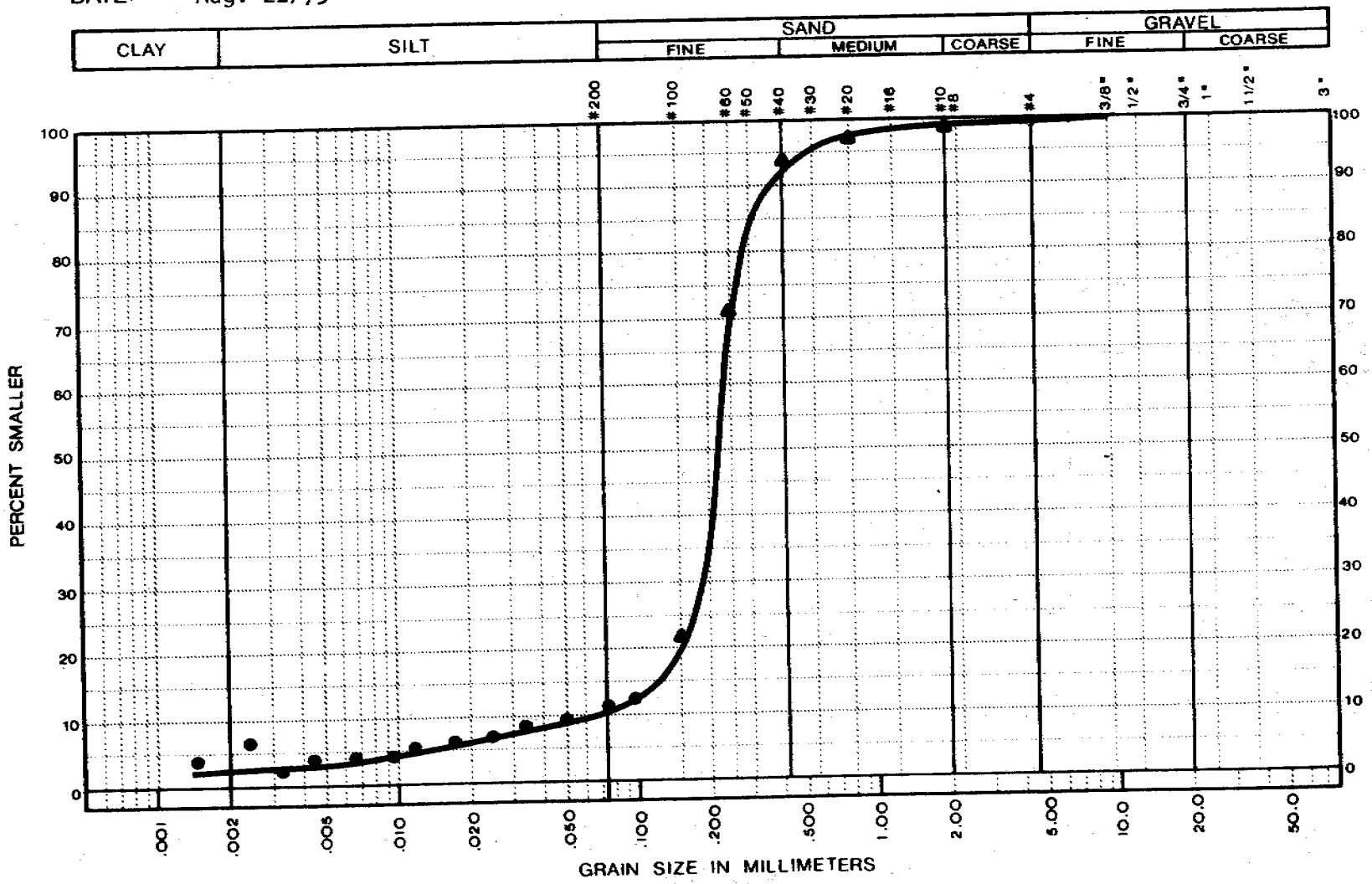
C.15

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 22/75

HOLE NO.: E3-A
SAMPLE NO.:
DEPTH: 14 - 16

SAMPLE DESCRIPTION:
SAND
- fine, uniform



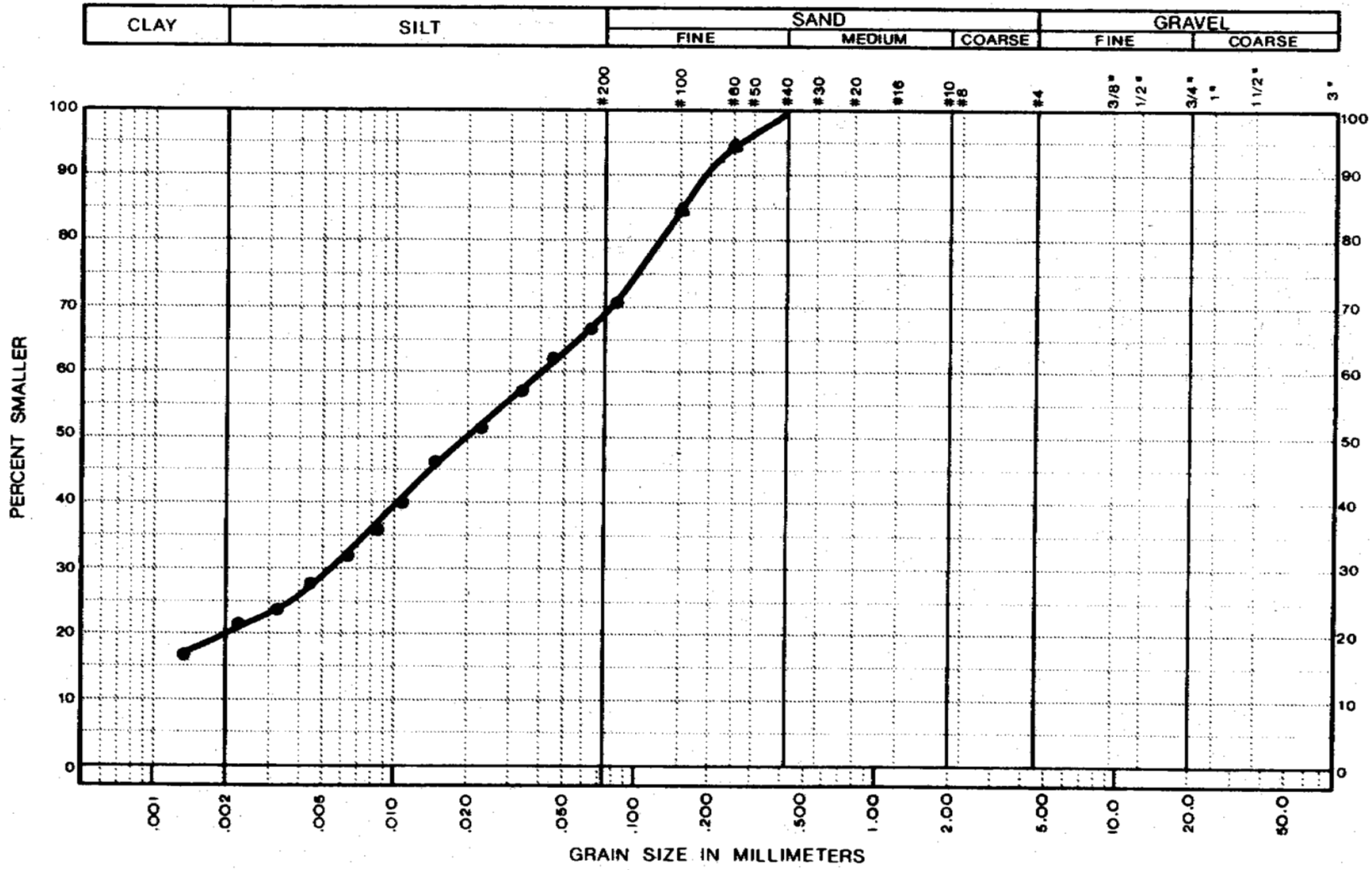
C.16

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 29/75

HOLE NO.: E3-A
SAMPLE NO.:
DEPTH: 4.4 - 27.2

SAMPLE DESCRIPTION:
CLAY
- sandy
- silty



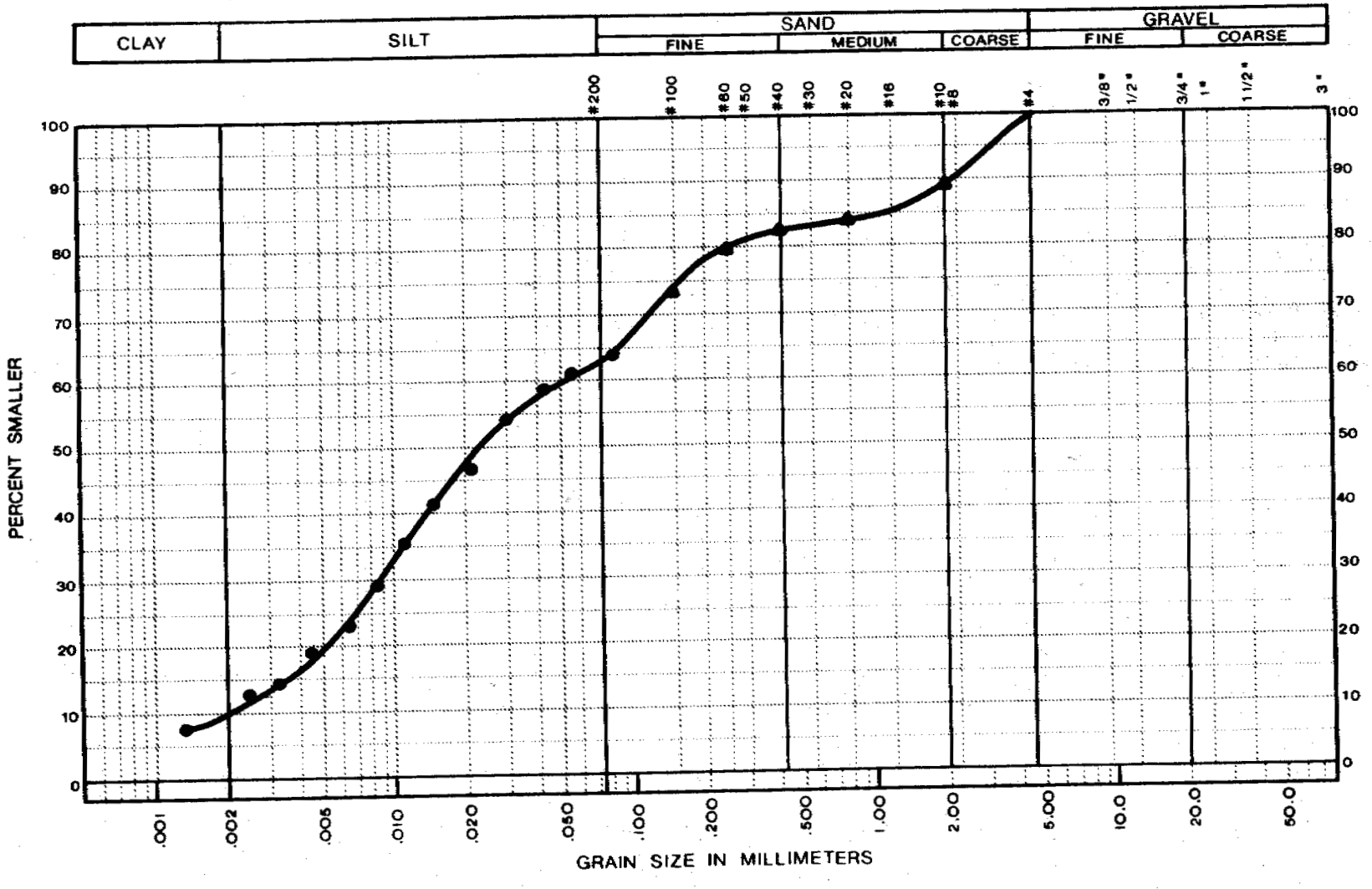
C.17

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept. 5/75

HOLE NO.: E4-A
SAMPLE NO.:
DEPTH: 3.5-6.4

SAMPLE DESCRIPTION:
SILT
- laminated

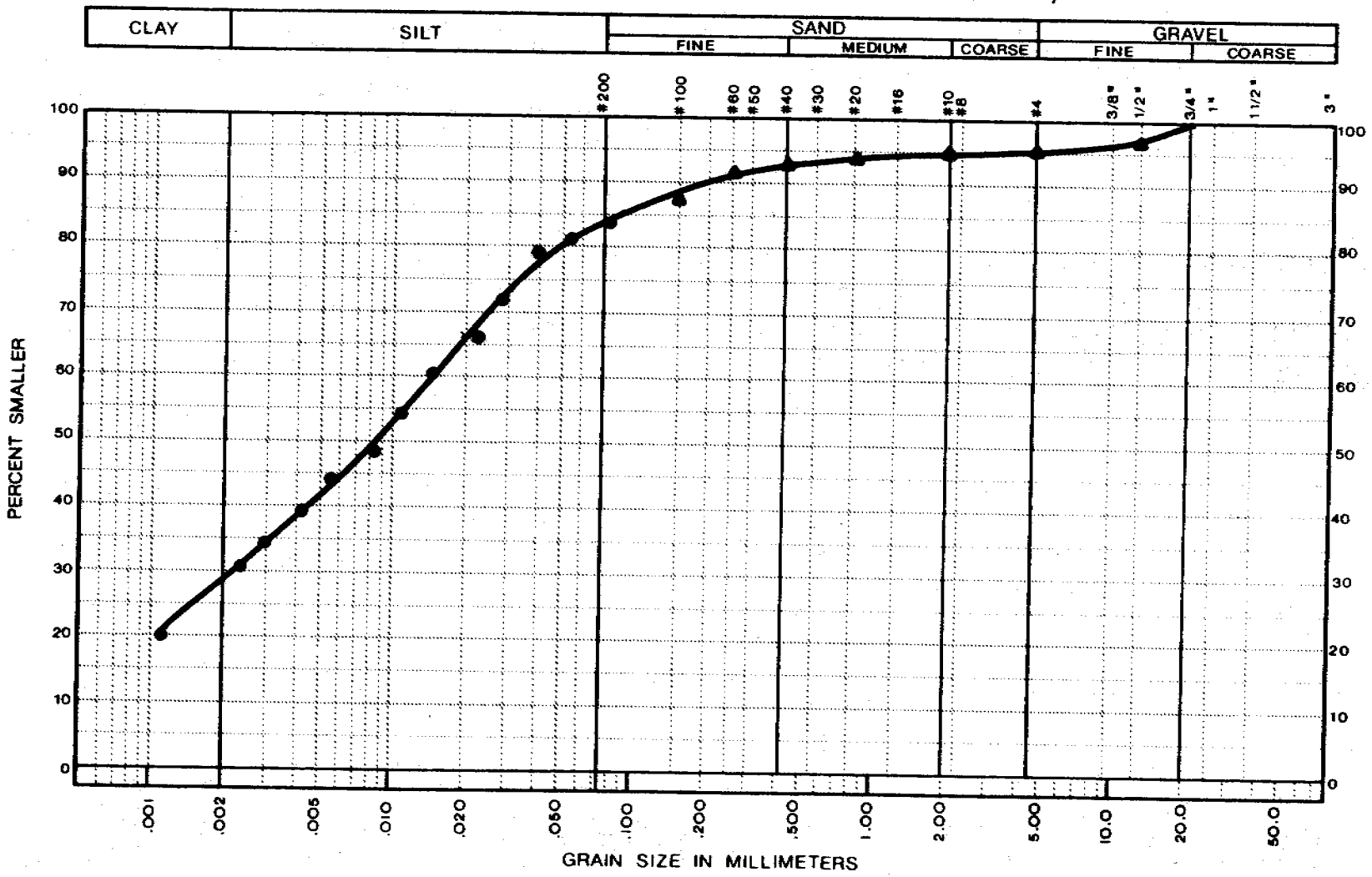


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: E4-A
SAMPLE NO.:
DEPTH: 8.2 - 11.0

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy

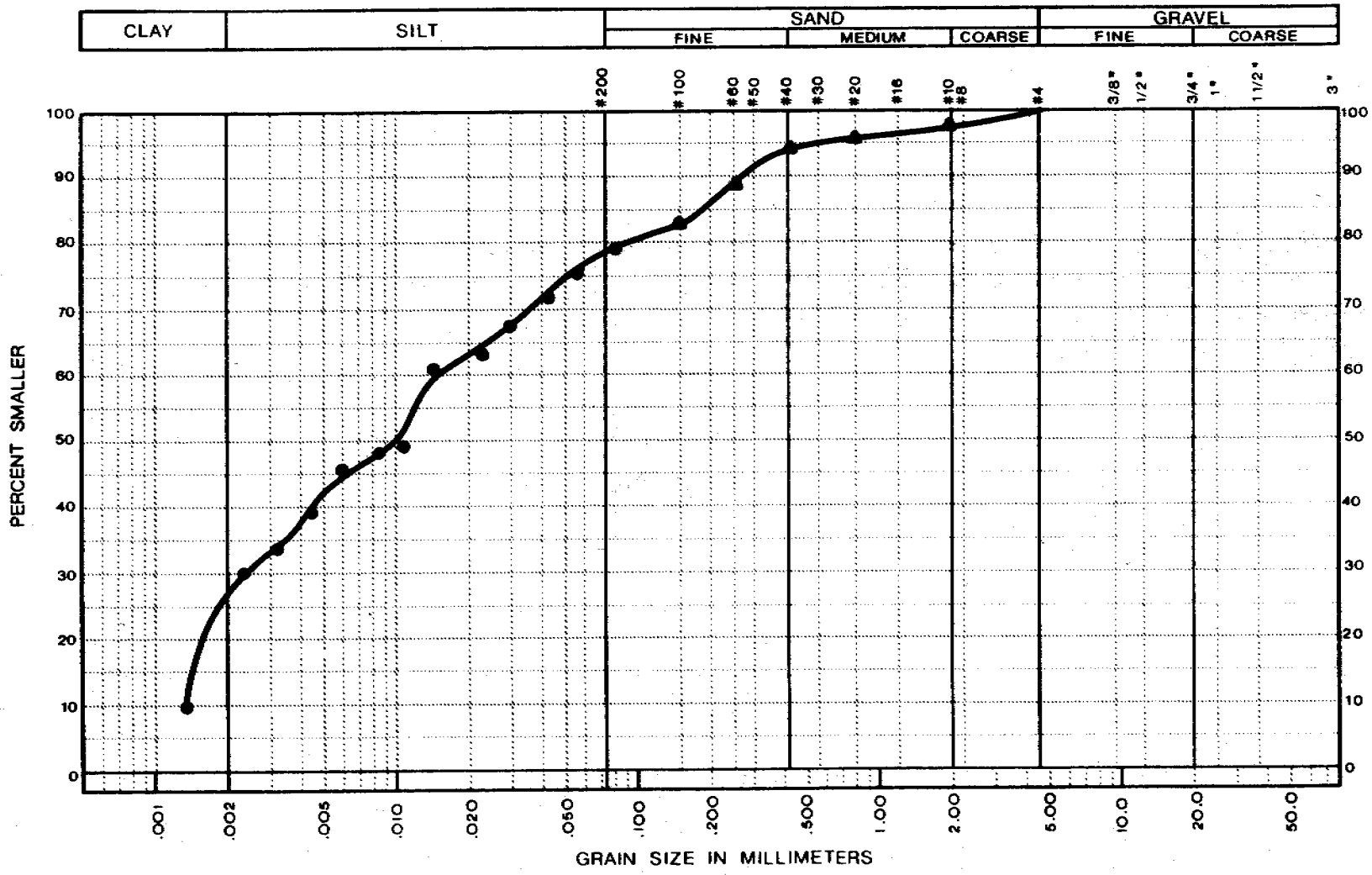


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept/75

HOLE NO.: E4-A
SAMPLE NO.:
DEPTH: 12.8 - 15.5

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy



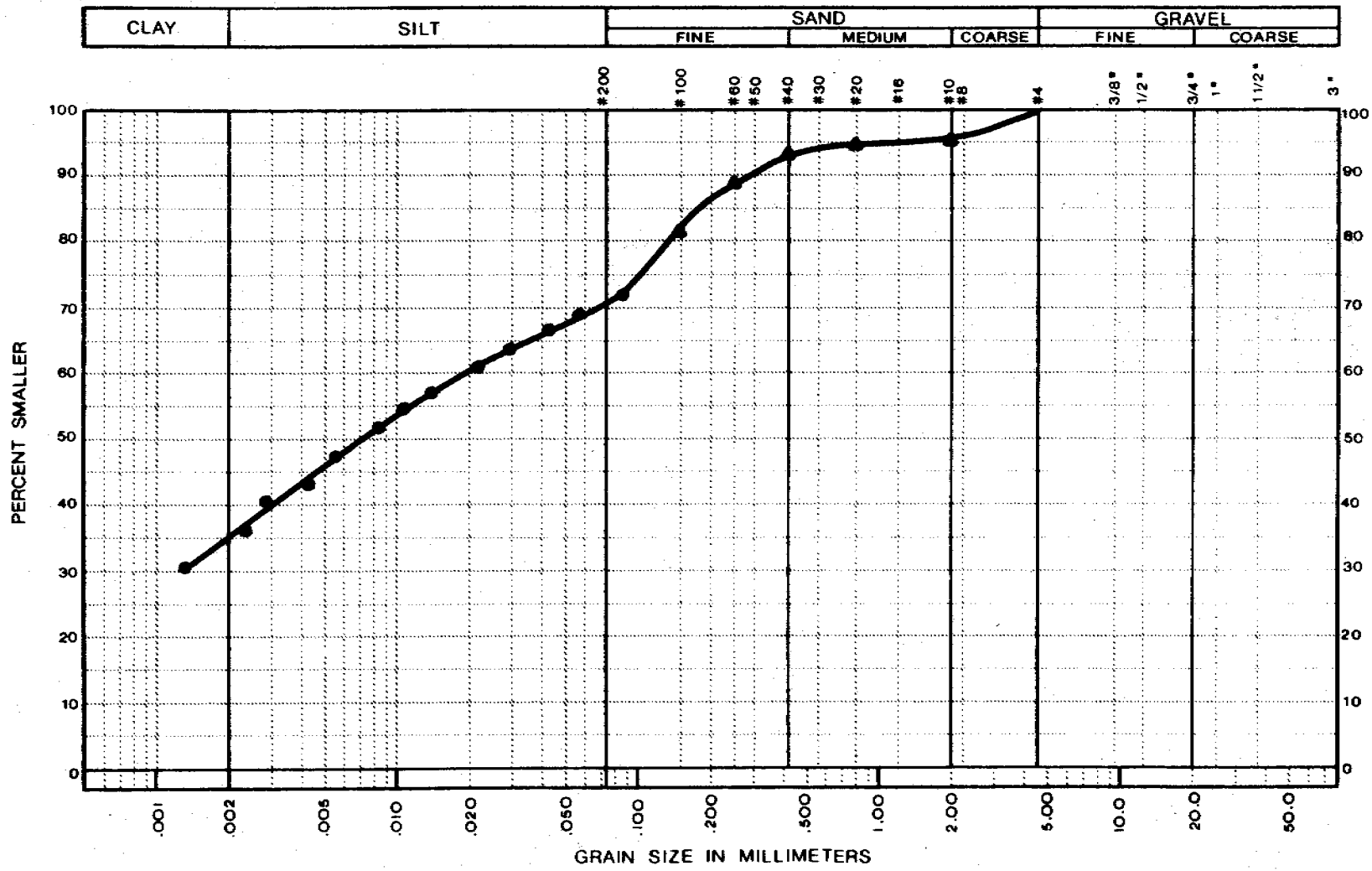
C.20

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 18/75

HOLE NO.: E4-A
SAMPLE NO.:
DEPTH: 18 - 18.3

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy



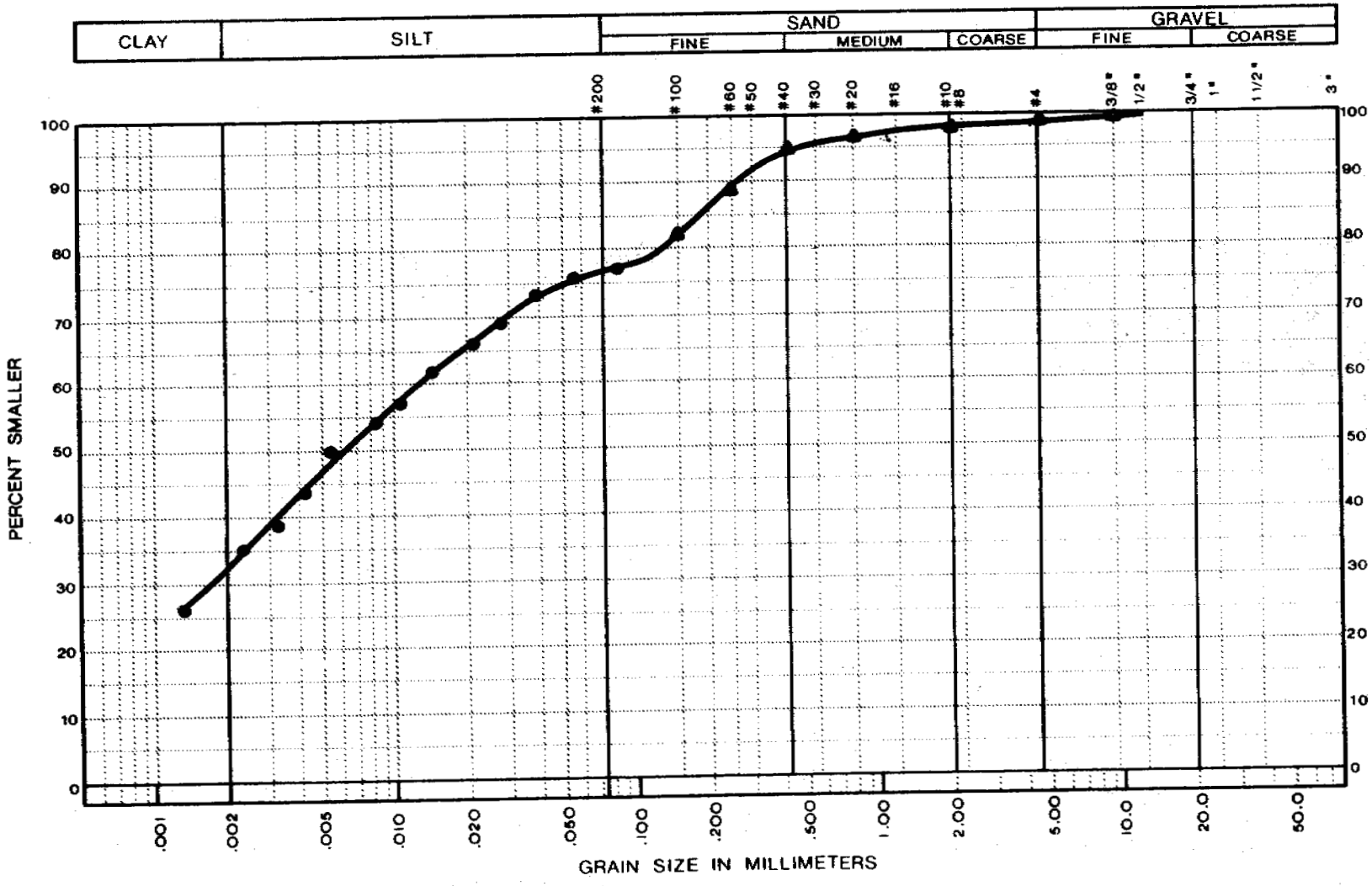
C.21

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 8/75

HOLE NO.: E5-A
SAMPLE NO.:
DEPTH: 10.2 - 11.2

SAMPLE DESCRIPTION:
SILT
- laminated with sandy silt
- clayey

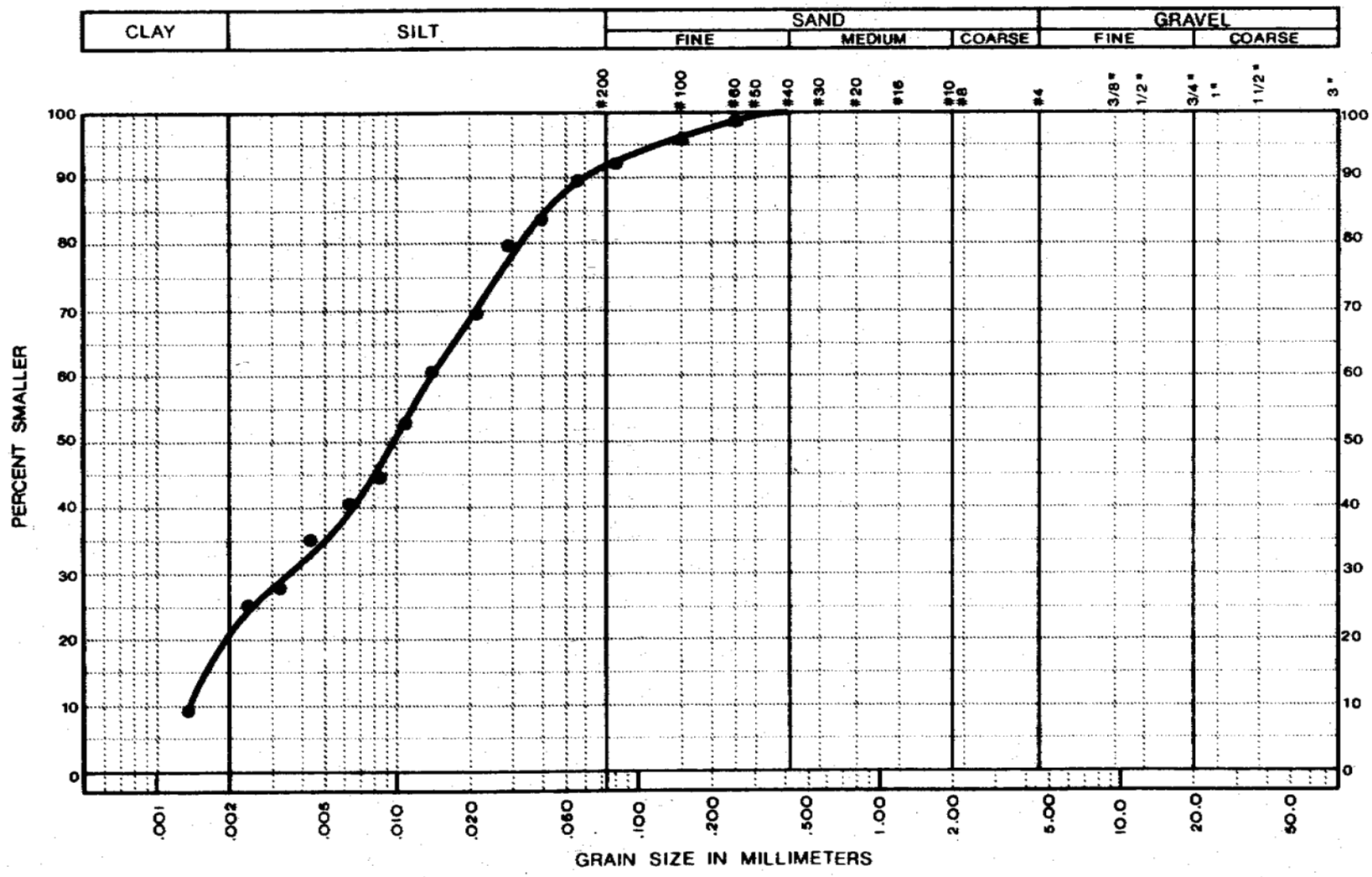


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug 29/75

HOLE NO.: F3-A
SAMPLE NO.:
DEPTH: 6.5 - 7.9

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty

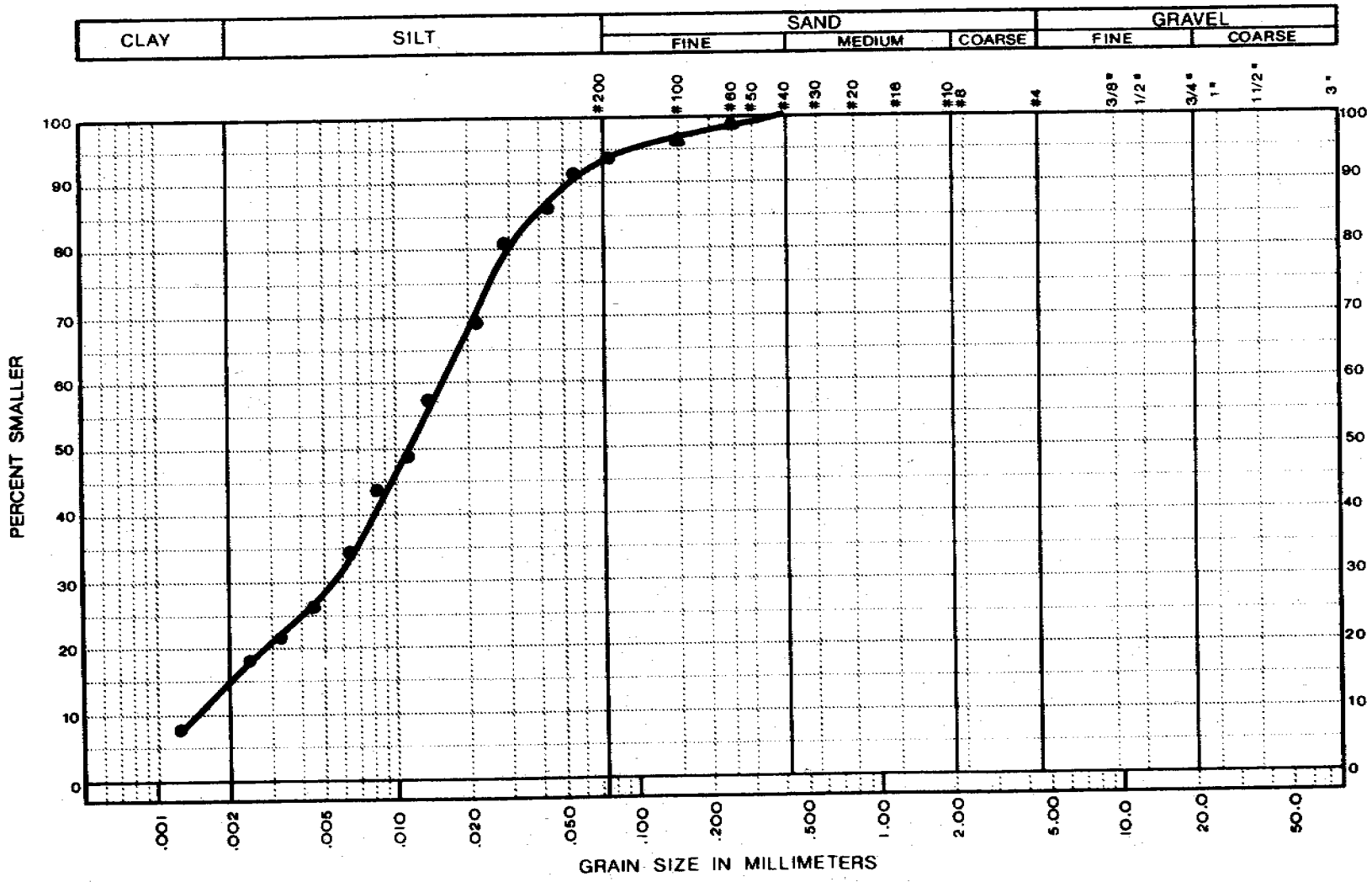


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 22/75

HOLE NO.: F5-A
SAMPLE NO.:
DEPTH: 8 - 11

SAMPLE DESCRIPTION:
SILT
- clayey

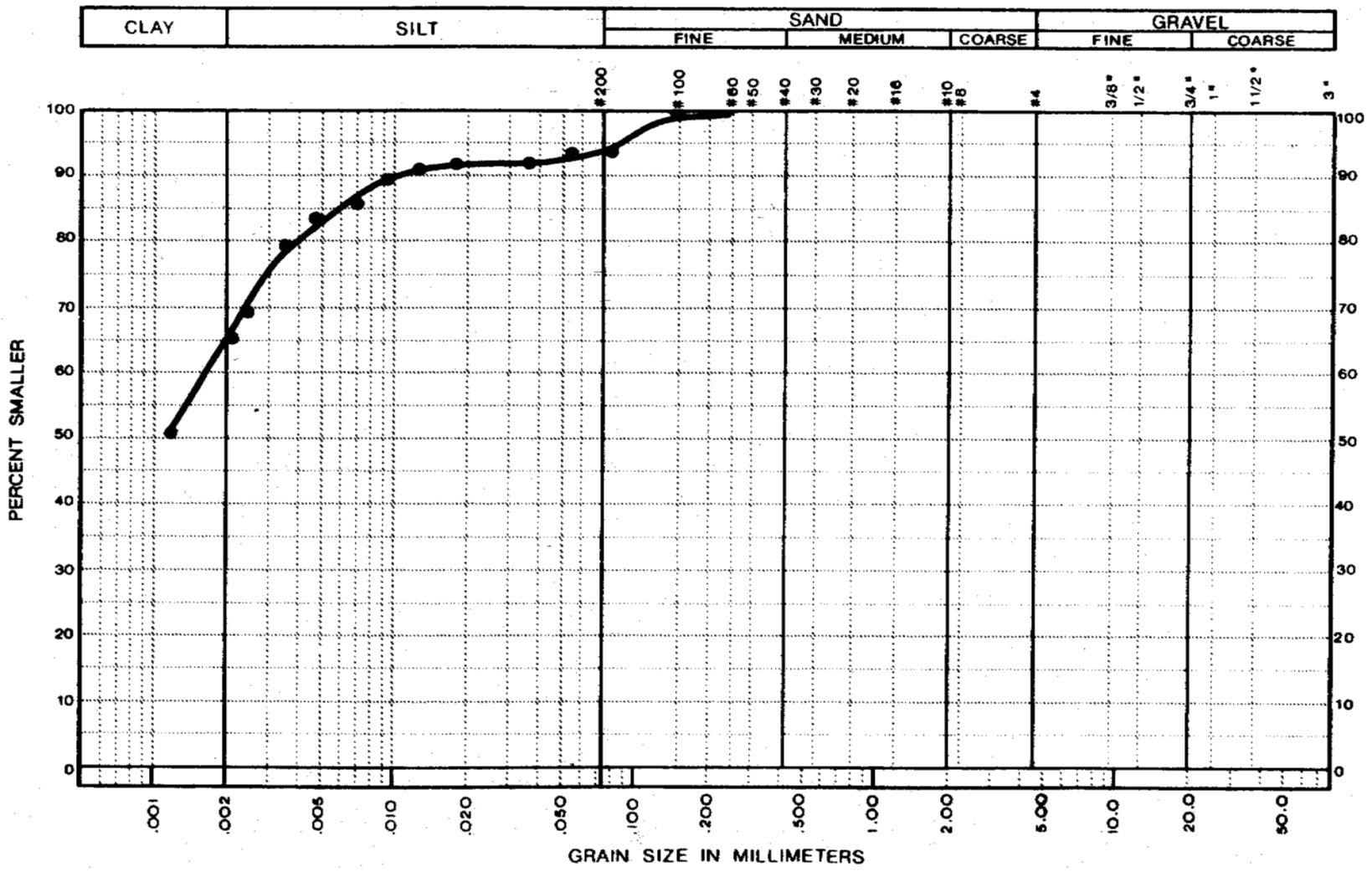


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: G1-A
SAMPLE NO.:
DEPTH: 6.3 - 9.1

SAMPLE DESCRIPTION:
CLAY



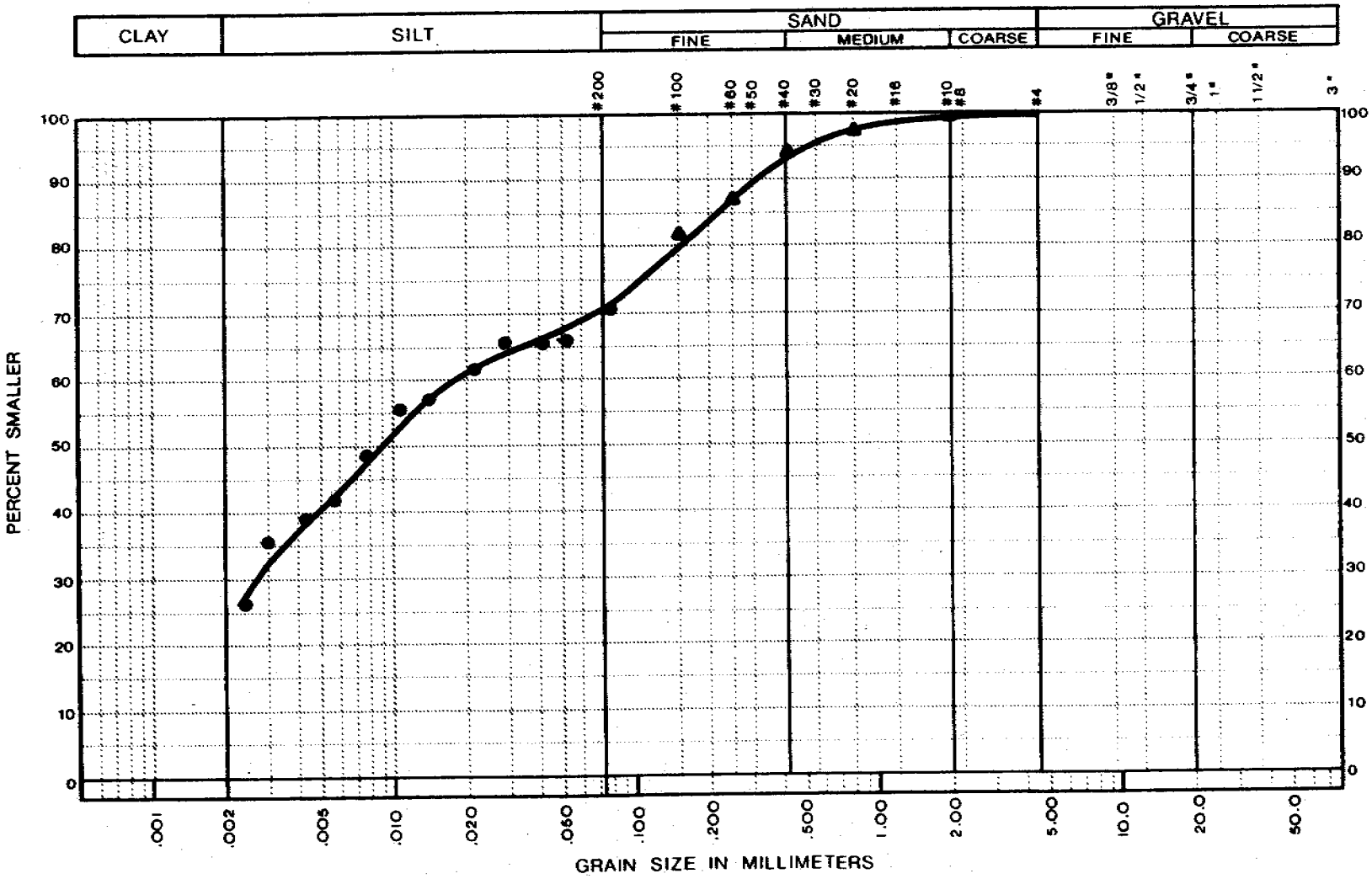
C.25

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE:

HOLE NO.: G2-A
SAMPLE NO.:
DEPTH: 3.6 - 6.8

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy

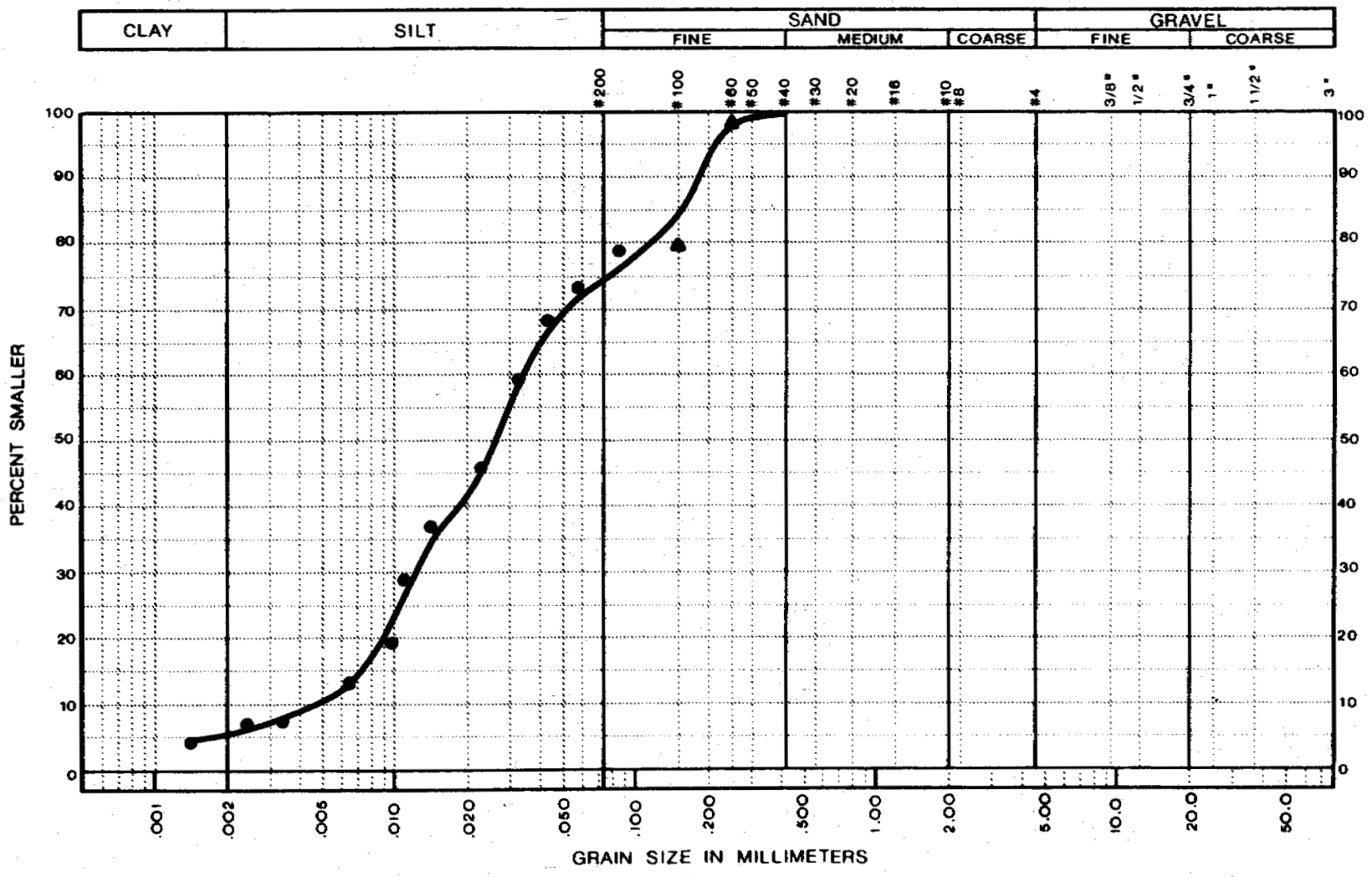


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 20/75

HOLE NO.: G4-A
SAMPLE NO.:
DEPTH: 6.3 - 8.8

SAMPLE DESCRIPTION:
SILT
- very sandy

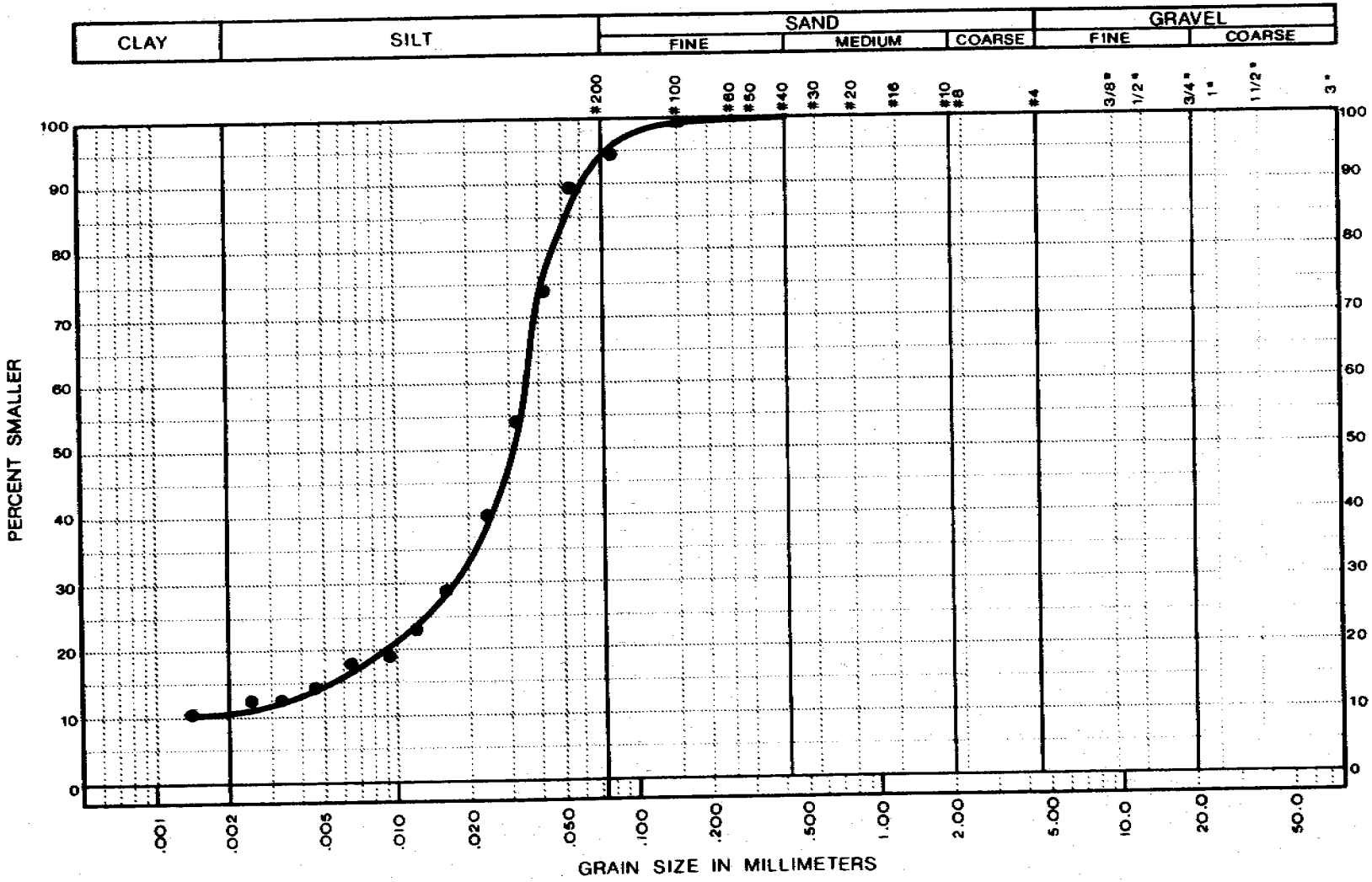


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: G6-A
SAMPLE NO.:
DEPTH: 1.2 - 3.6

SAMPLE DESCRIPTION:
SILT
- clayey

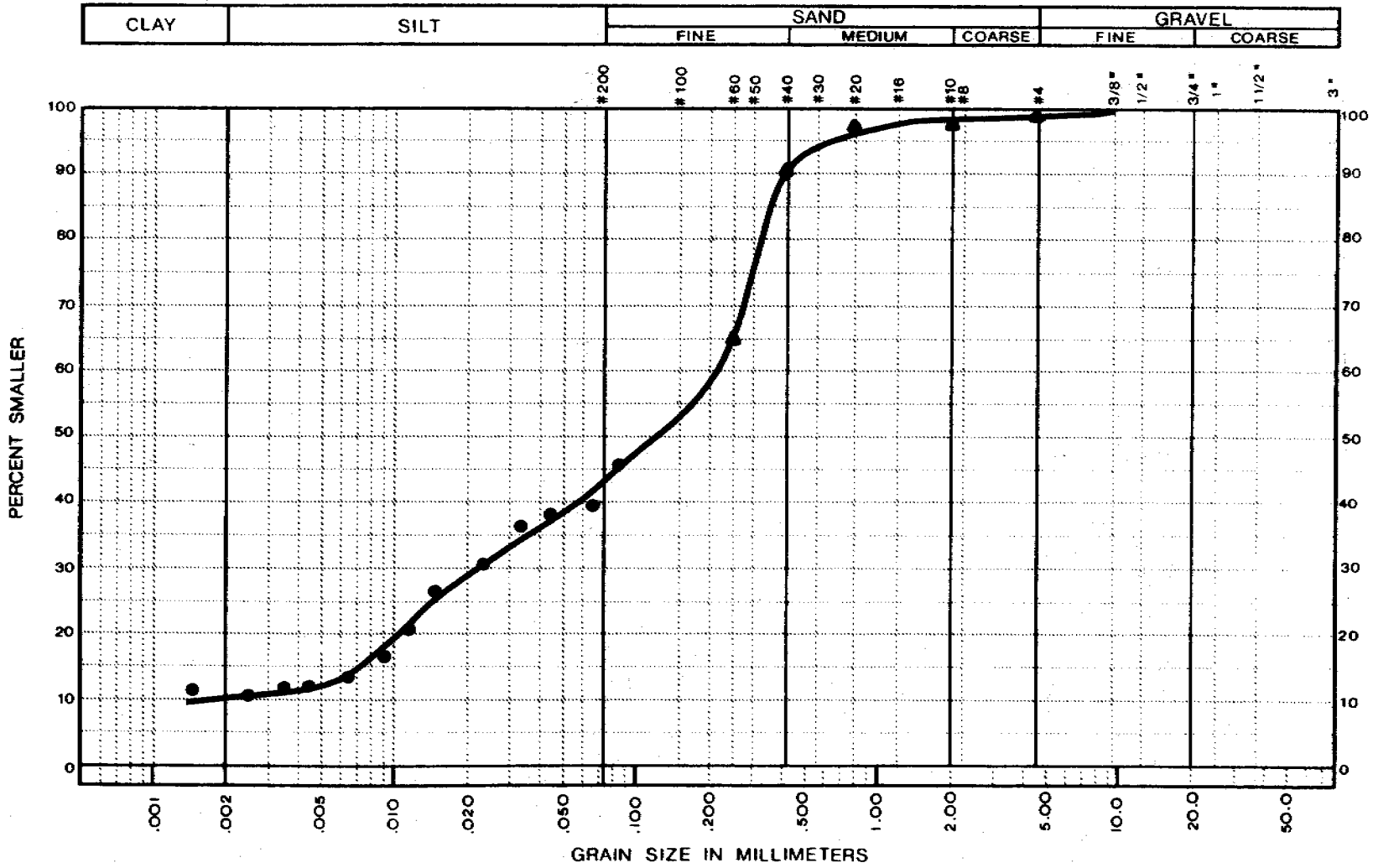


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: A9-A
SAMPLE NO.:
DEPTH: 3.3 - 6.0

SAMPLE DESCRIPTION:
SILT
- very sandy

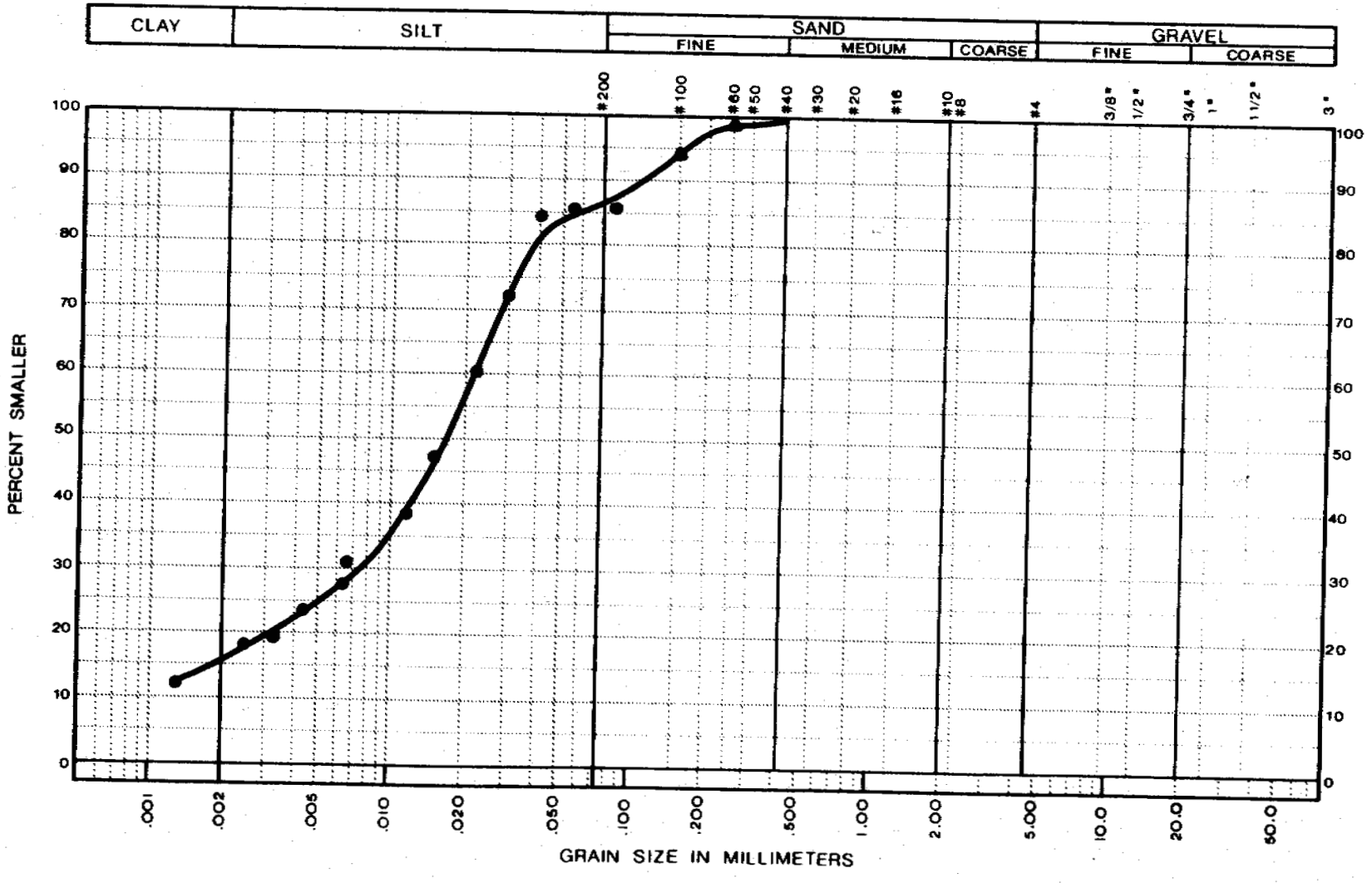


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 29/75

HOLE NO.: B9-A
SAMPLE NO.:
DEPTH: 3.5 - 5.8

SAMPLE DESCRIPTION:
SILT
- clayey

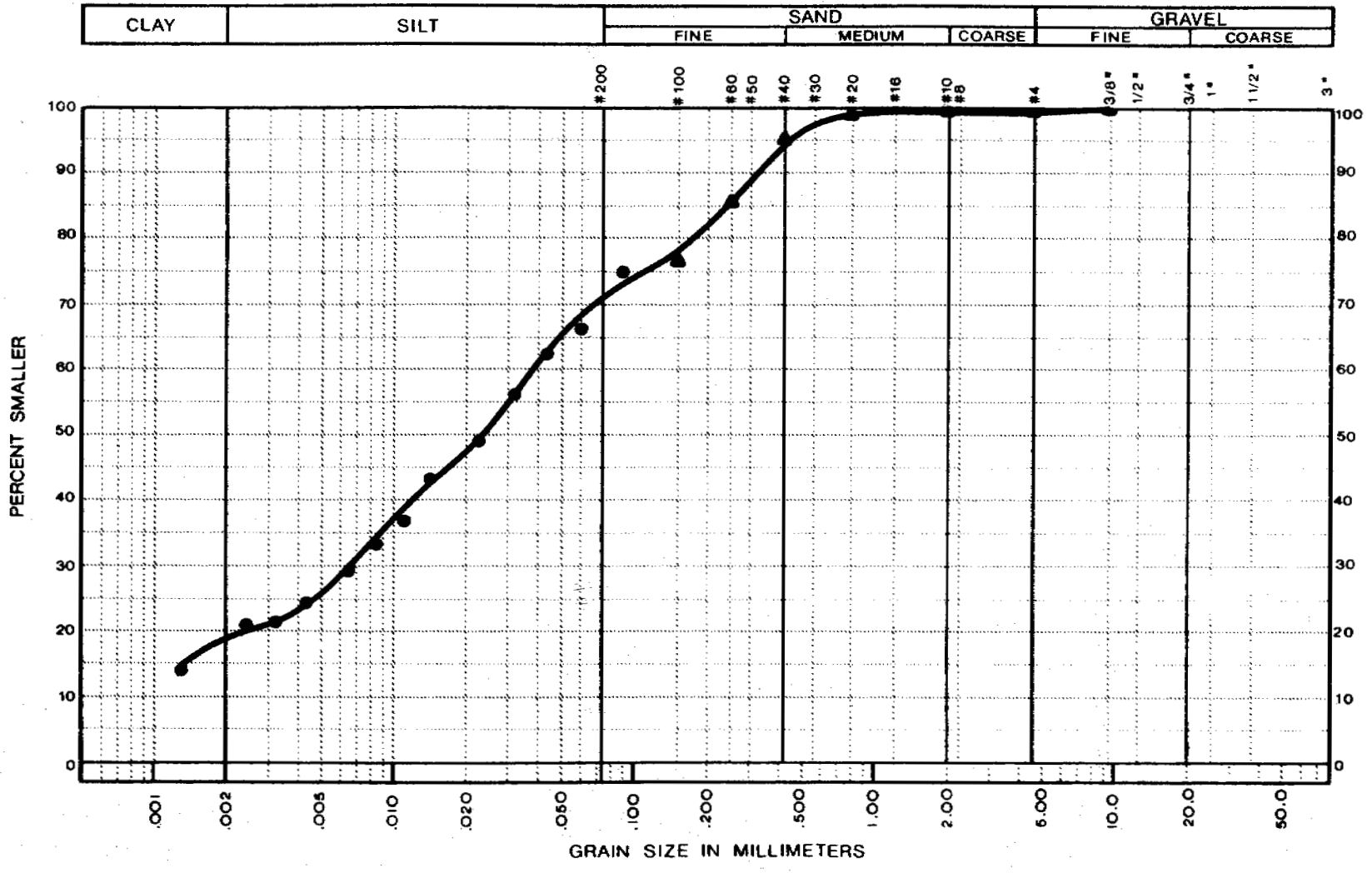


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 22/75

HOLE NO.: B9-A
SAMPLE NO.:
DEPTH: 10 - 12.5

SAMPLE DESCRIPTION:
SILT (TILL)
- clayey

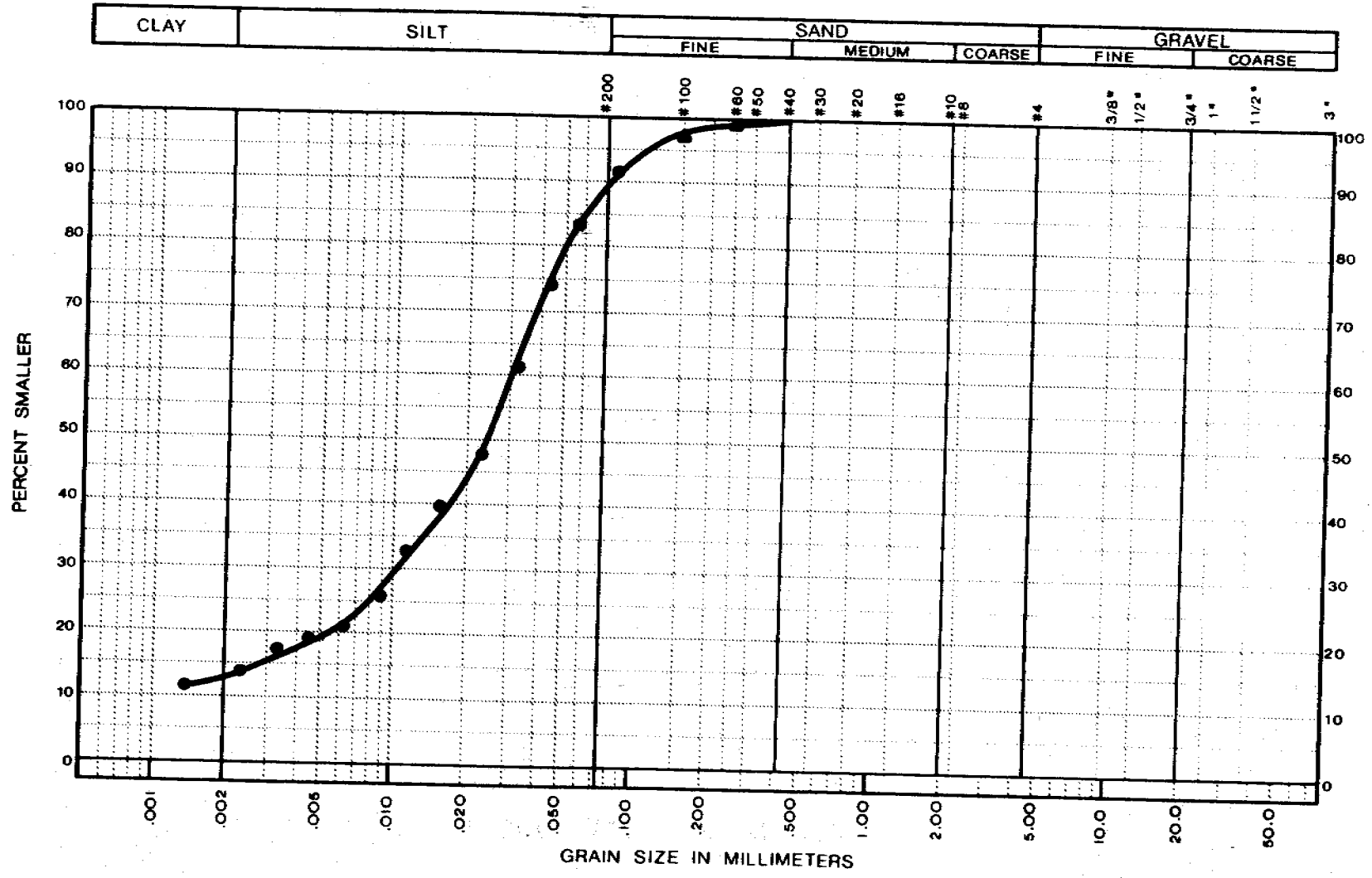


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: B11-A
SAMPLE NO.:
DEPTH: 3.2 - 6.0

SAMPLE DESCRIPTION:
SILT
- clayey

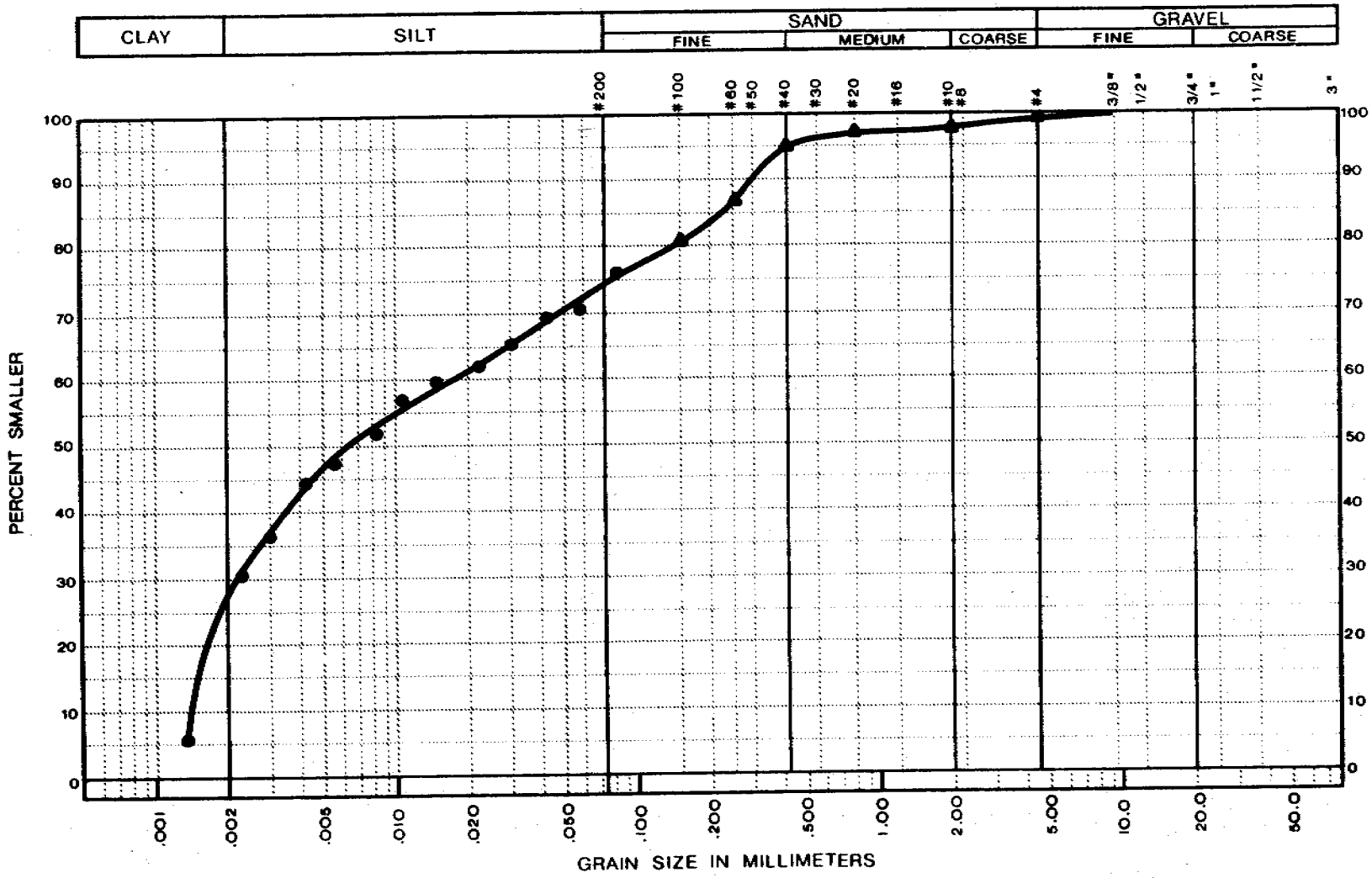


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug 29/75

HOLE NO.: C7-A
SAMPLE NO.:
DEPTH: 13.5 - 15.8

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy

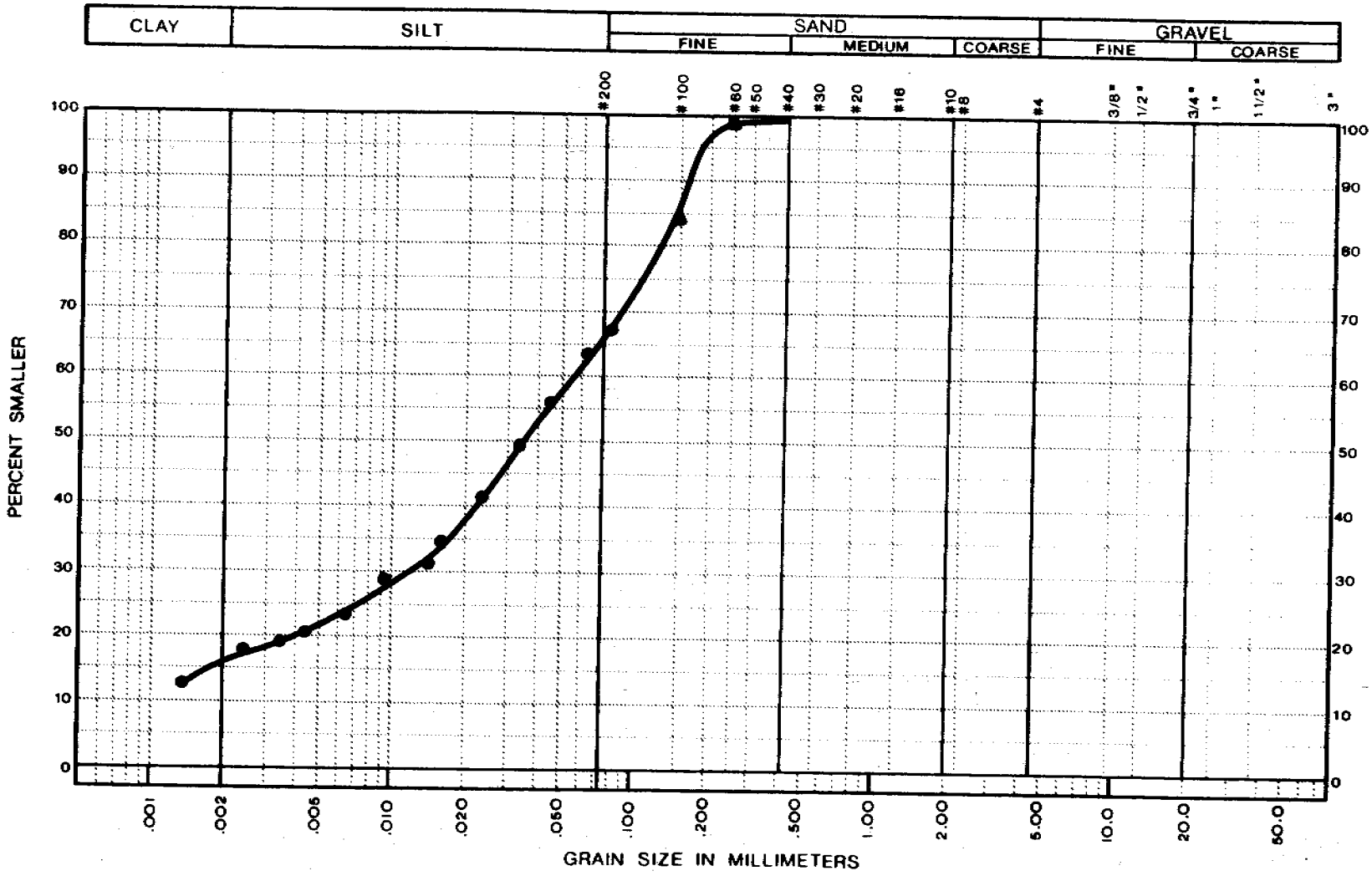


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 5/75

HOLE NO.: C9-A
SAMPLE NO.:
DEPTH: 14.5 - 16.2

SAMPLE DESCRIPTION:
SILT
- clayey

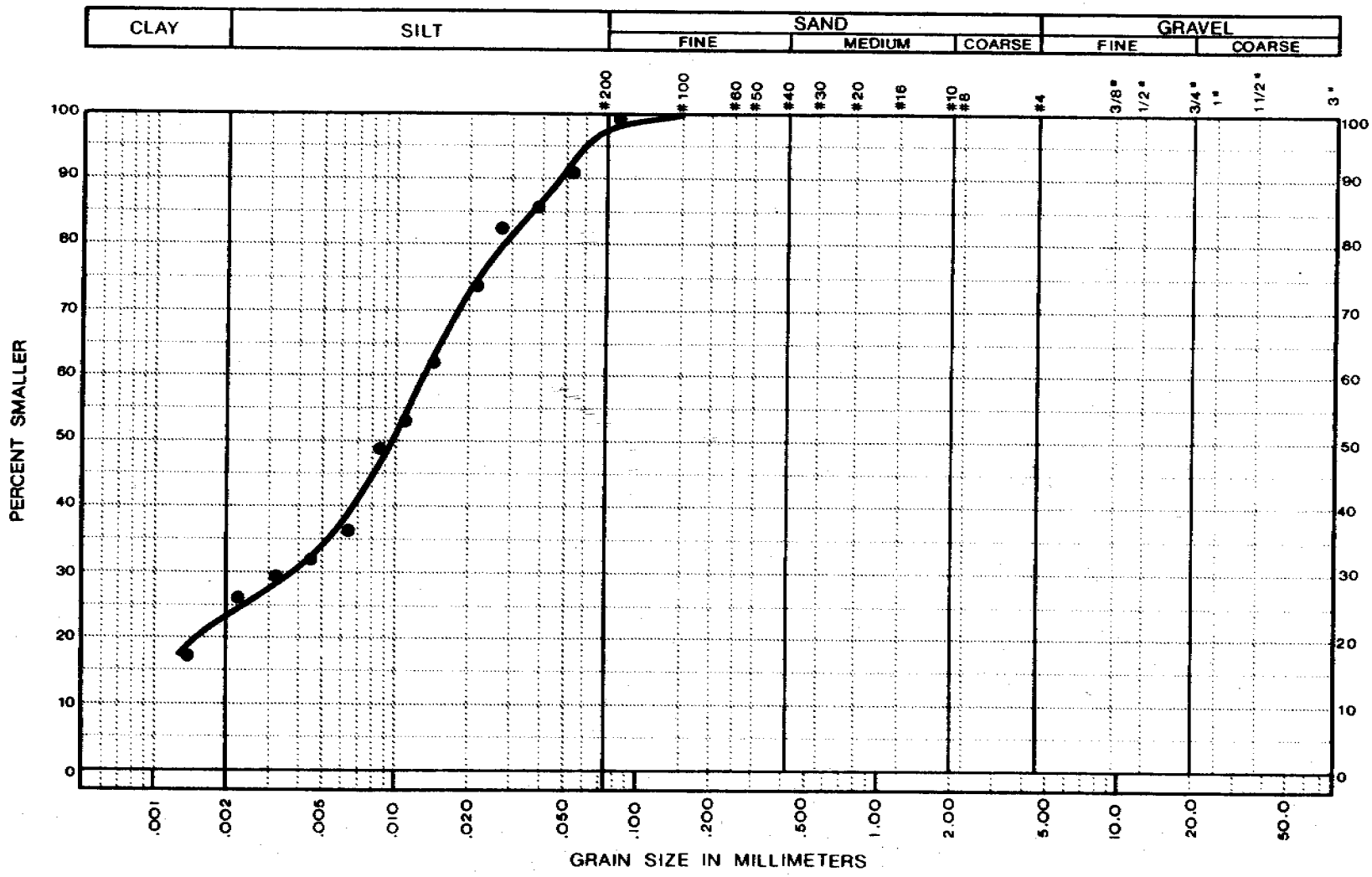


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug 22/75

HOLE NO.: D8-A
SAMPLE NO.:
DEPTH: 5.1 - 7

SAMPLE DESCRIPTION:
SILT
- clayey

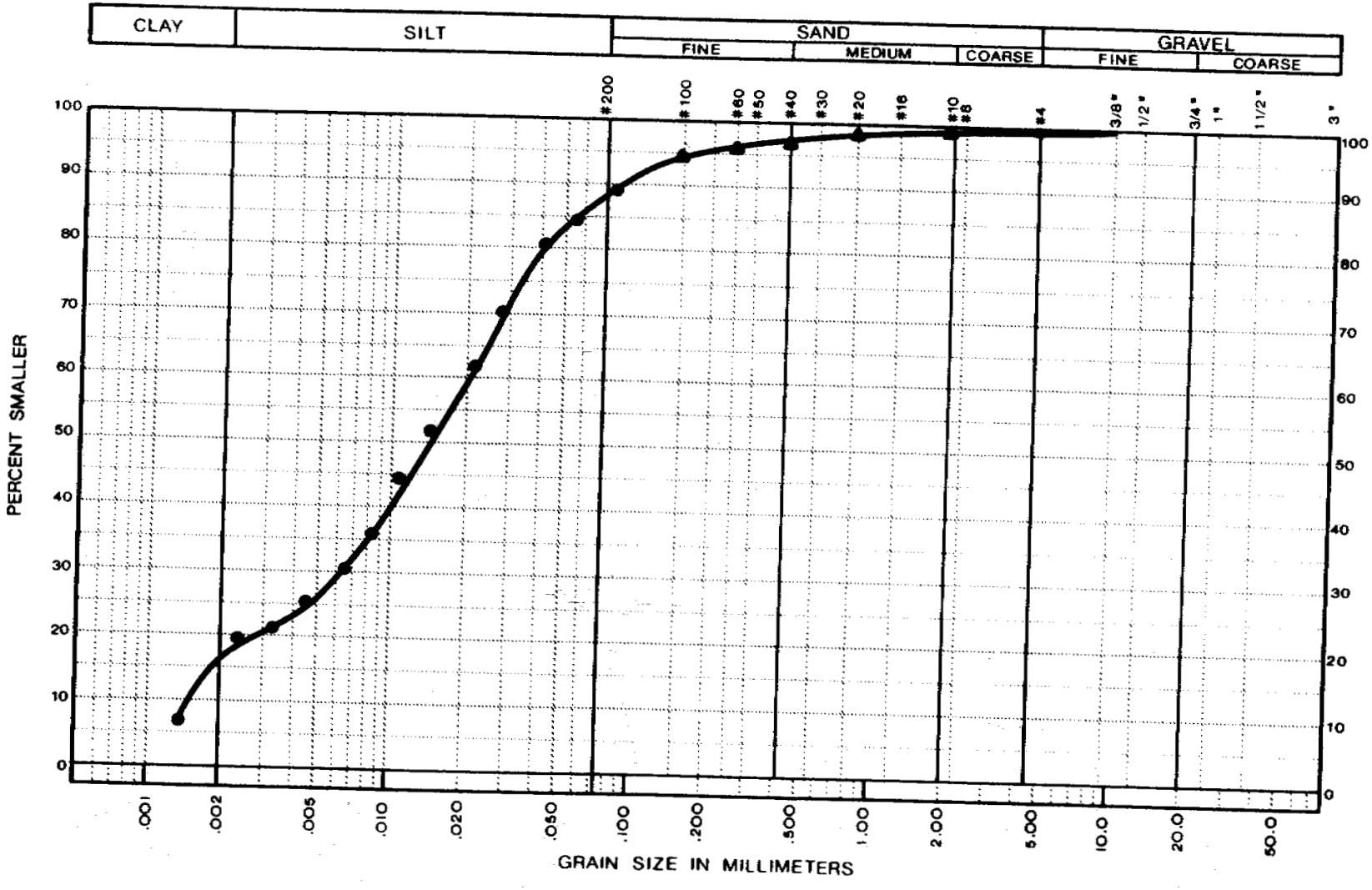


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 22/75

HOLE NO.: D8-A
SAMPLE NO.:
DEPTH: 9 - 10.5

SAMPLE DESCRIPTION:
SILT
- clayey



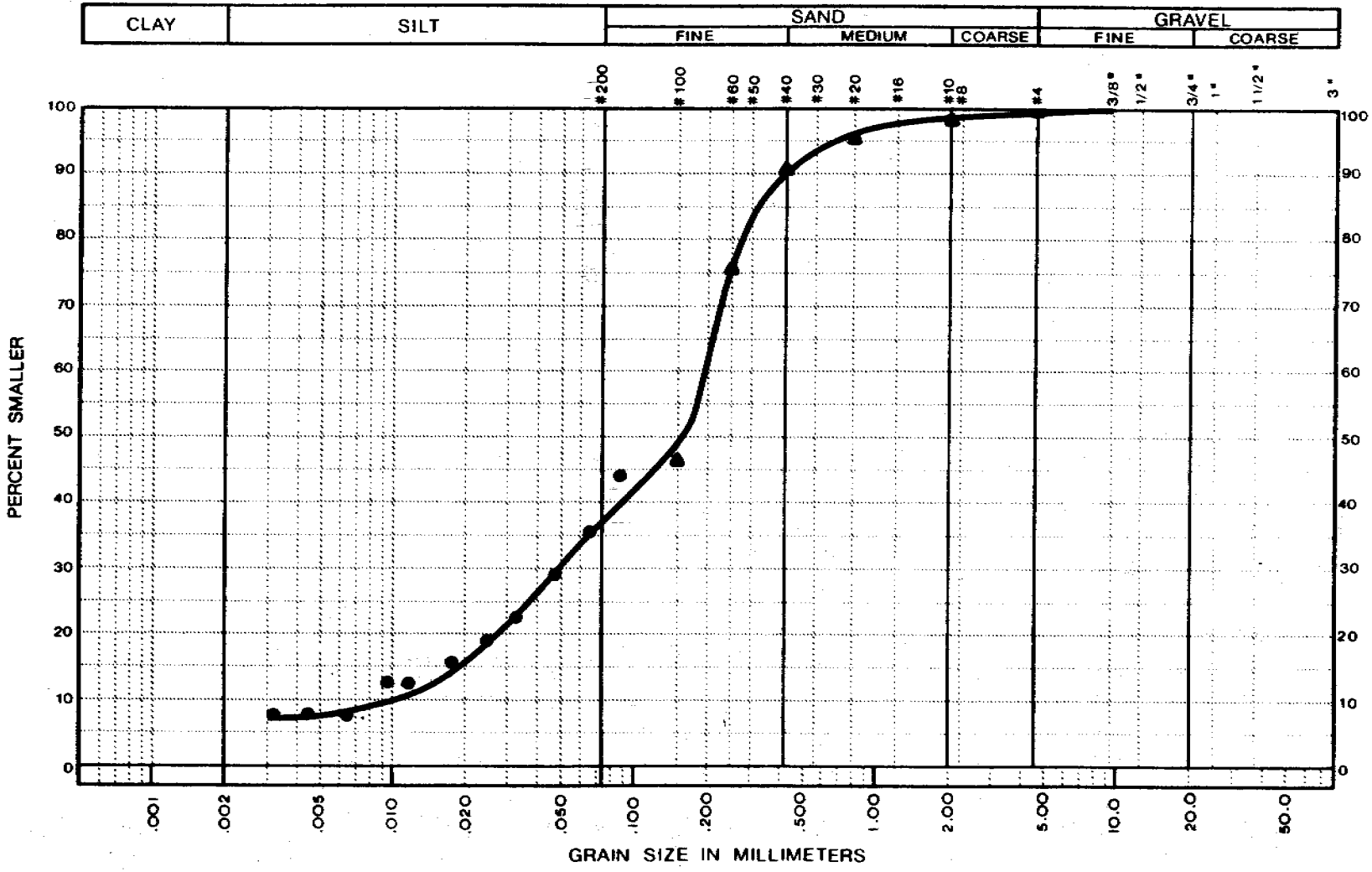
C.37

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: D10-A
SAMPLE NO.:
DEPTH: 3.3 - 5.7

SAMPLE DESCRIPTION:
SAND
- silty

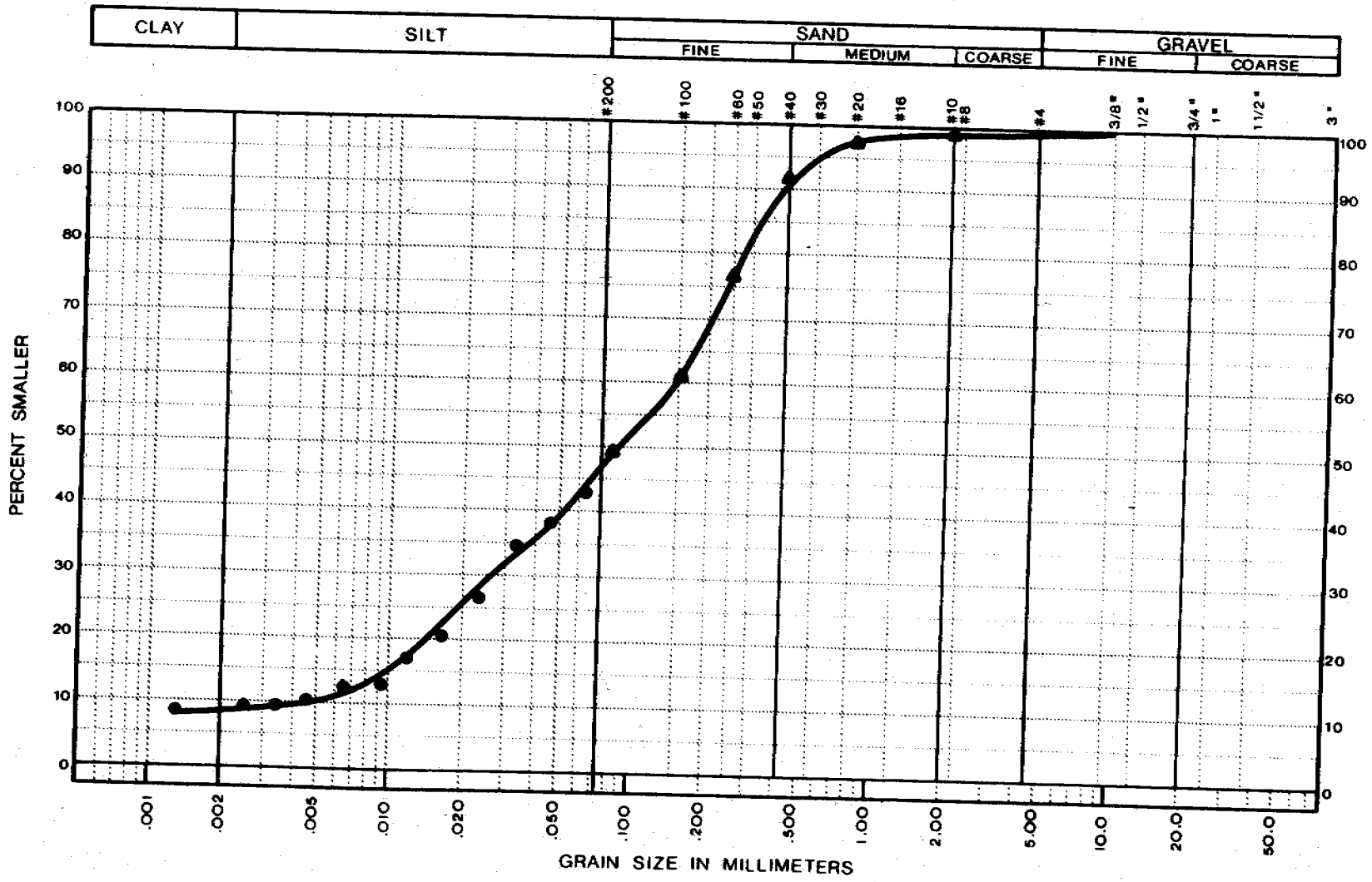


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 29/75

HOLE NO.: D10-A
SAMPLE NO.:
DEPTH: 5.7 - 6.4

SAMPLE DESCRIPTION:
SAND
- very silty

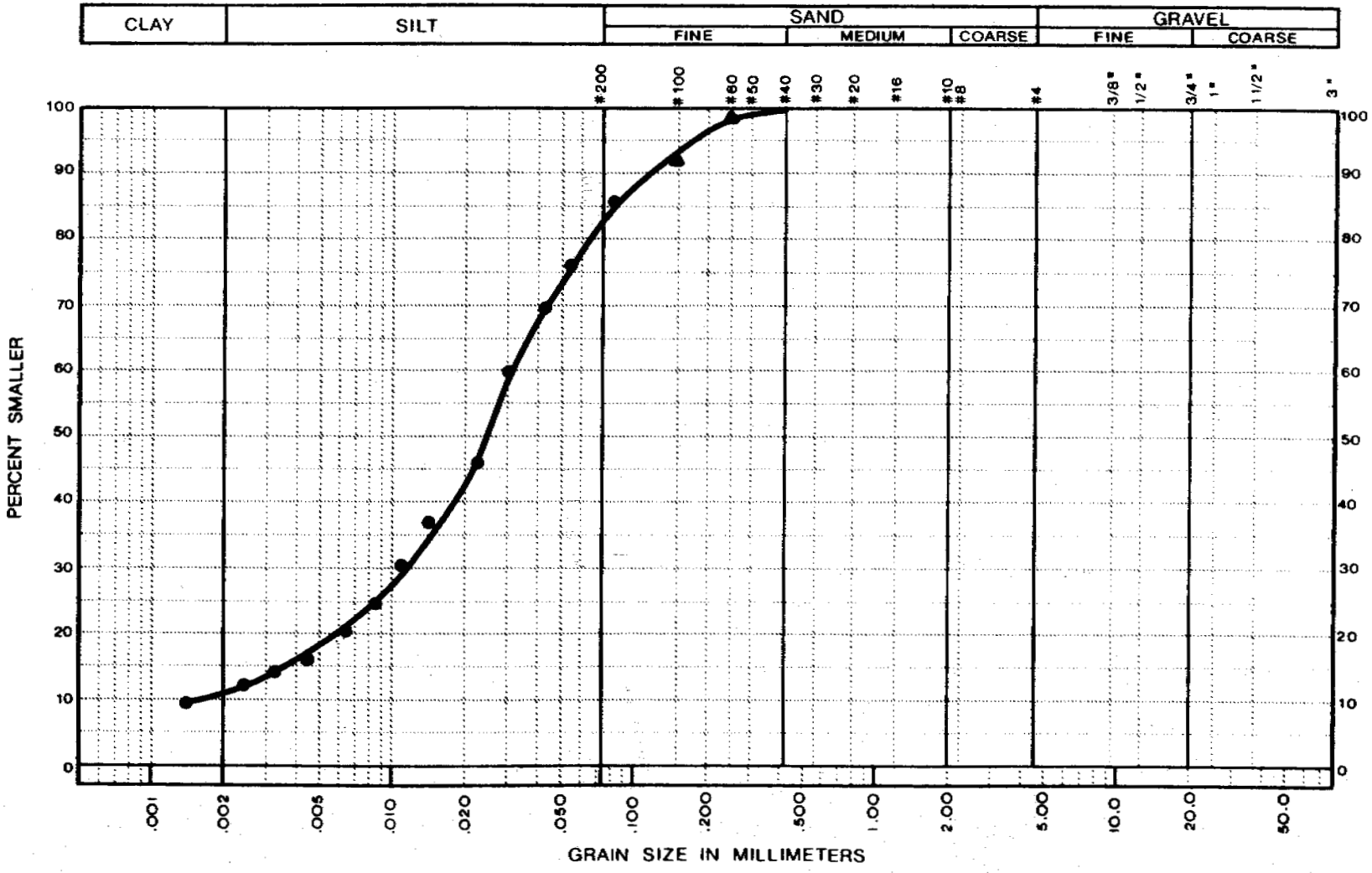


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 25/75

HOLE NO.: D12-A
SAMPLE NO.:
DEPTH: 3.8 - 6.6

SAMPLE DESCRIPTION:
SILT
- some clay



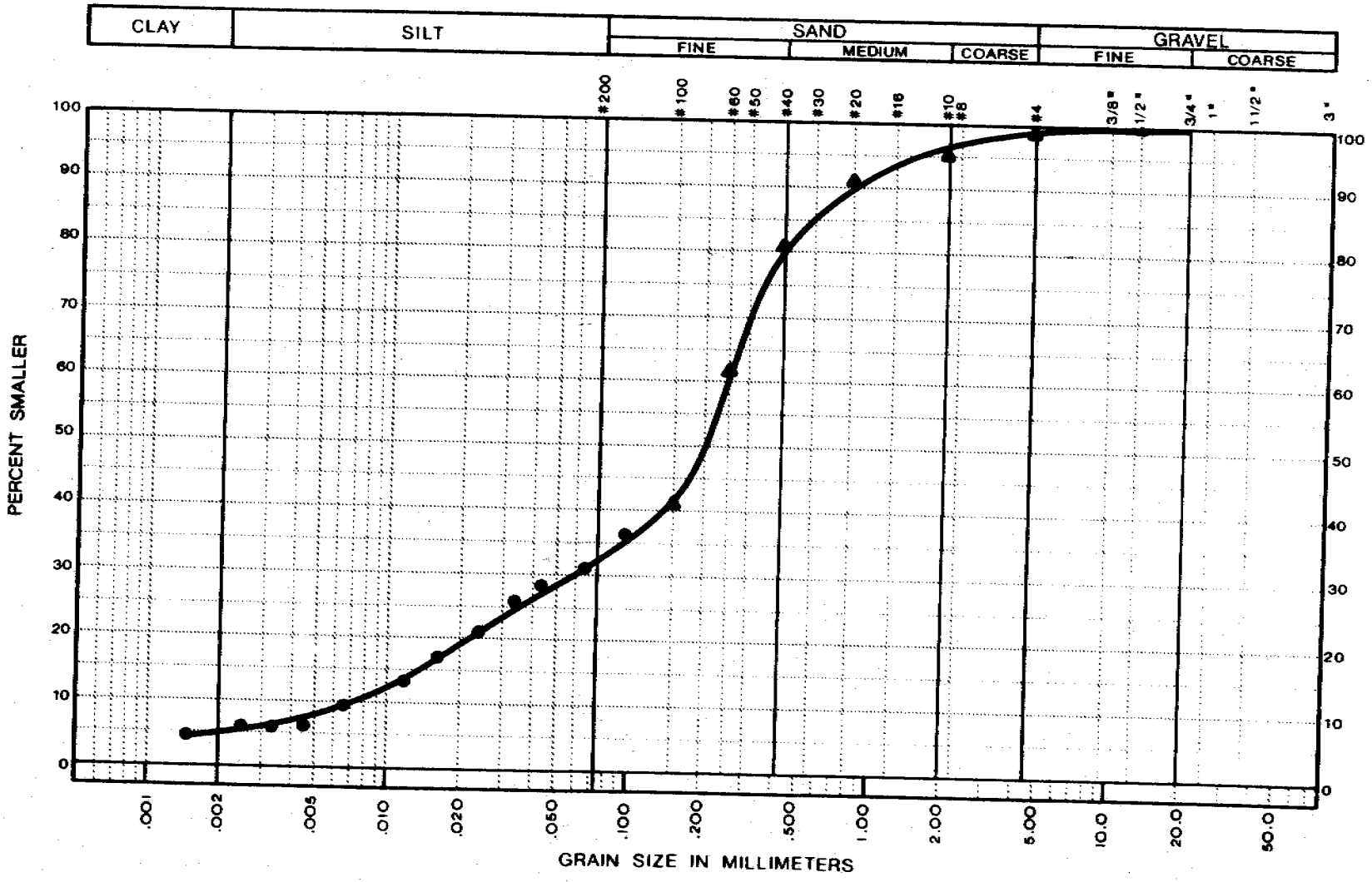
C.40

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 22/75

HOLE NO.: D13-A
SAMPLE NO.:
DEPTH: 10.2 - 12.0

SAMPLE DESCRIPTION:
SAND
- some silt



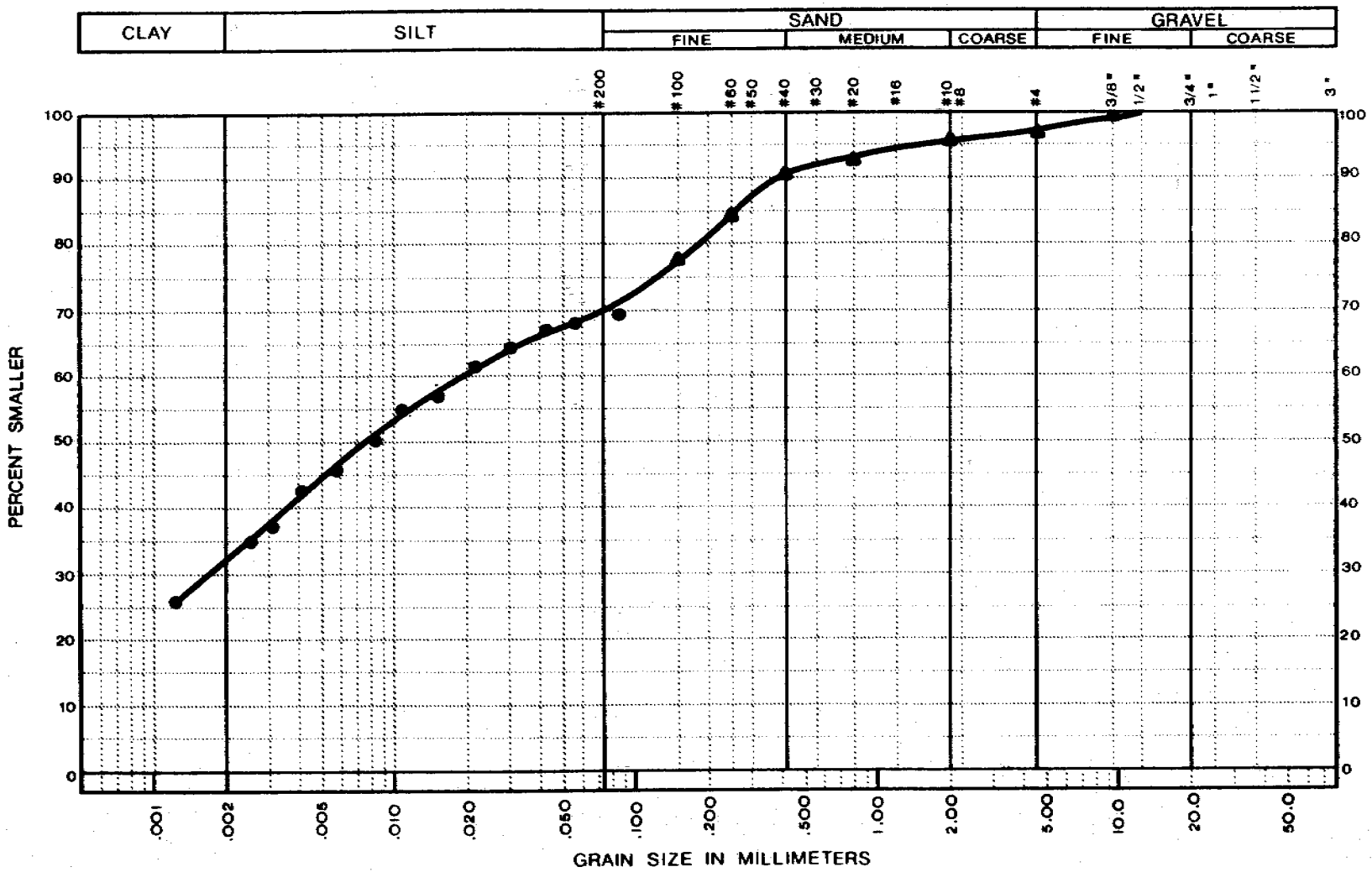
C.41

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 29/75

HOLE NO.: D13-A
SAMPLE NO.:
DEPTH: 26.8 - 28

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy



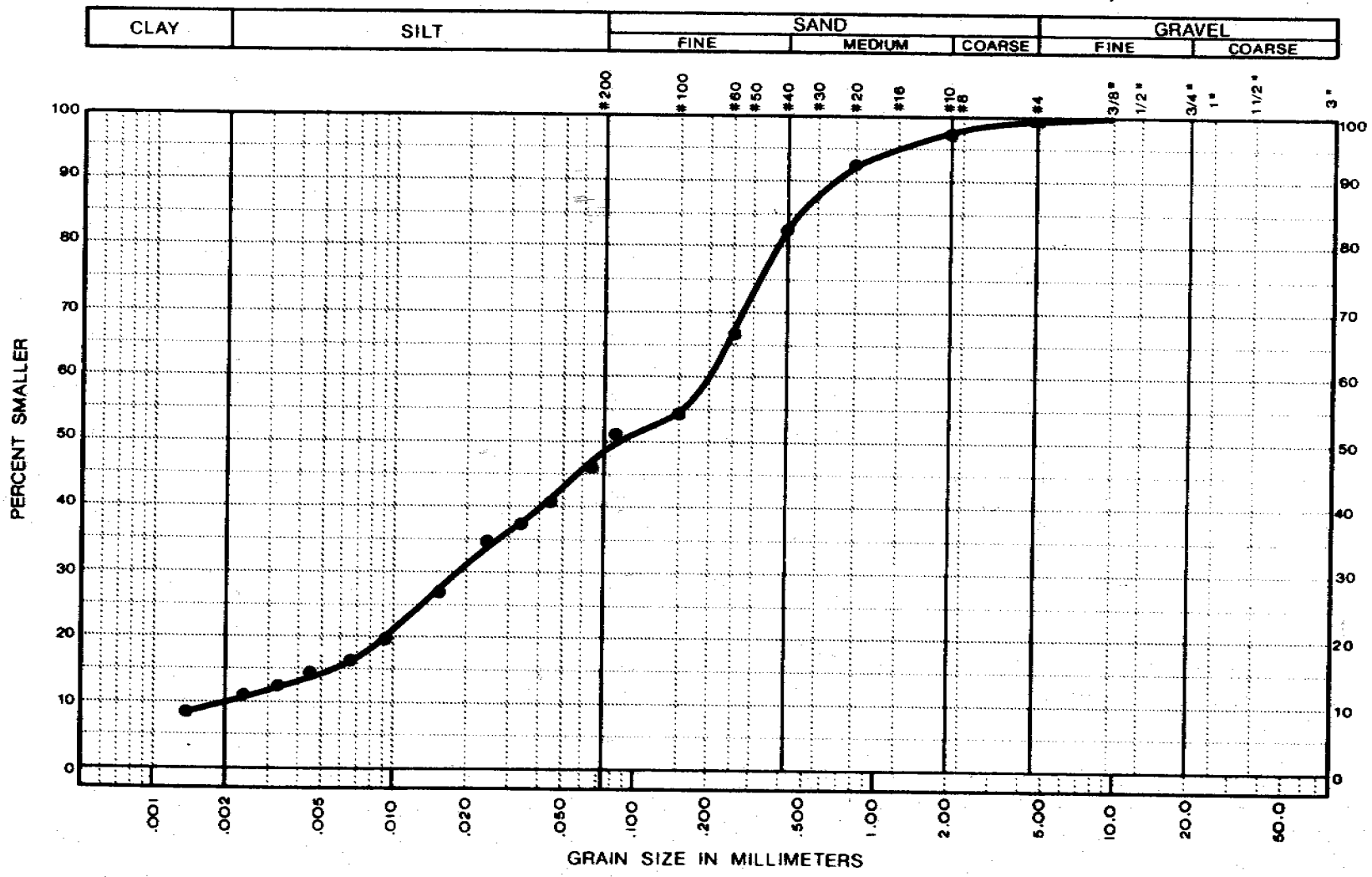
C.42

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: E9-A
SAMPLE NO.:
DEPTH: 8-10

SAMPLE DESCRIPTION:
SILT (TILL)
- sandy
- some clay

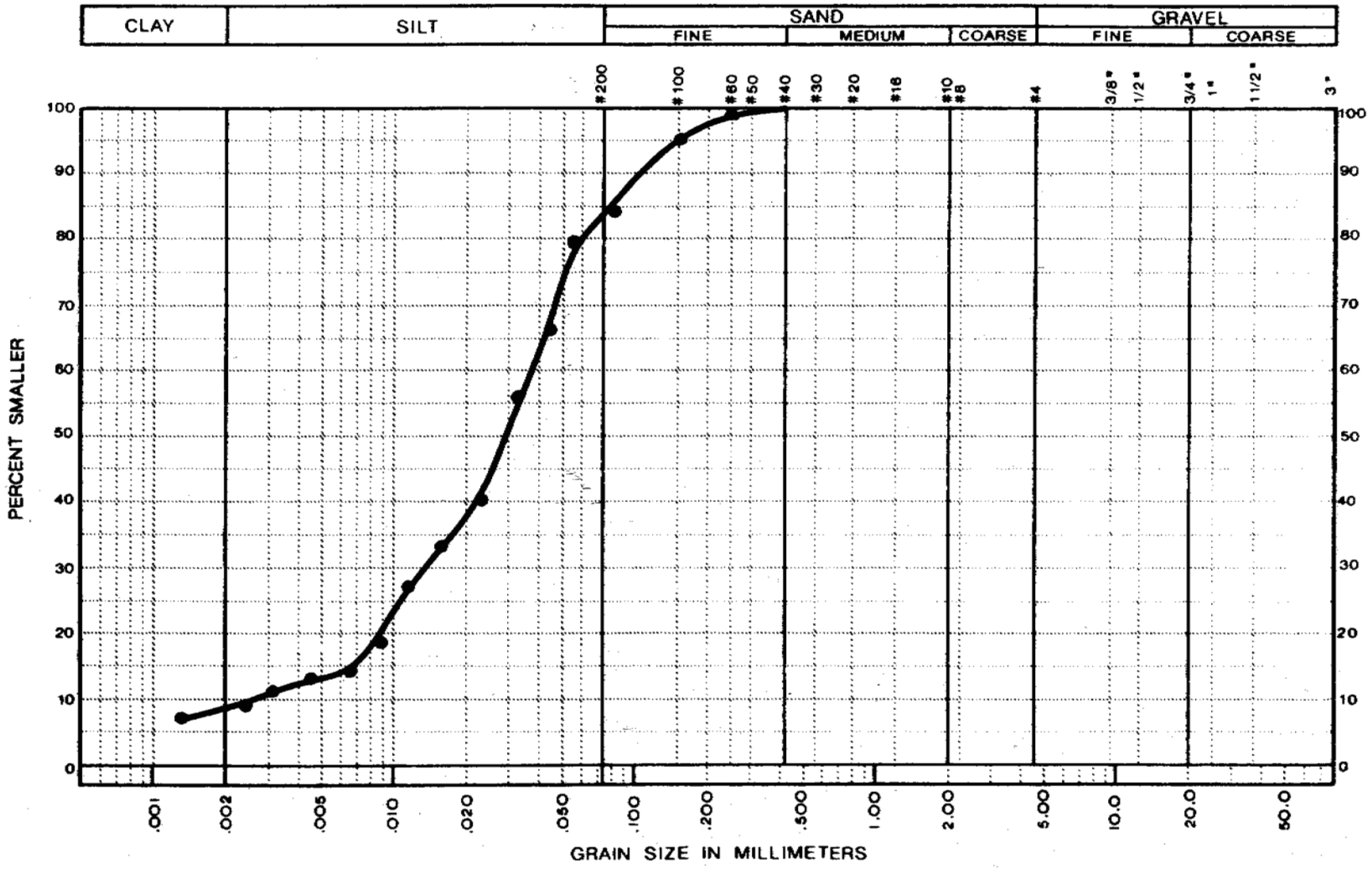


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: E9-A
SAMPLE NO.:
DEPTH: 10½

SAMPLE DESCRIPTION:
SILT
- some clay



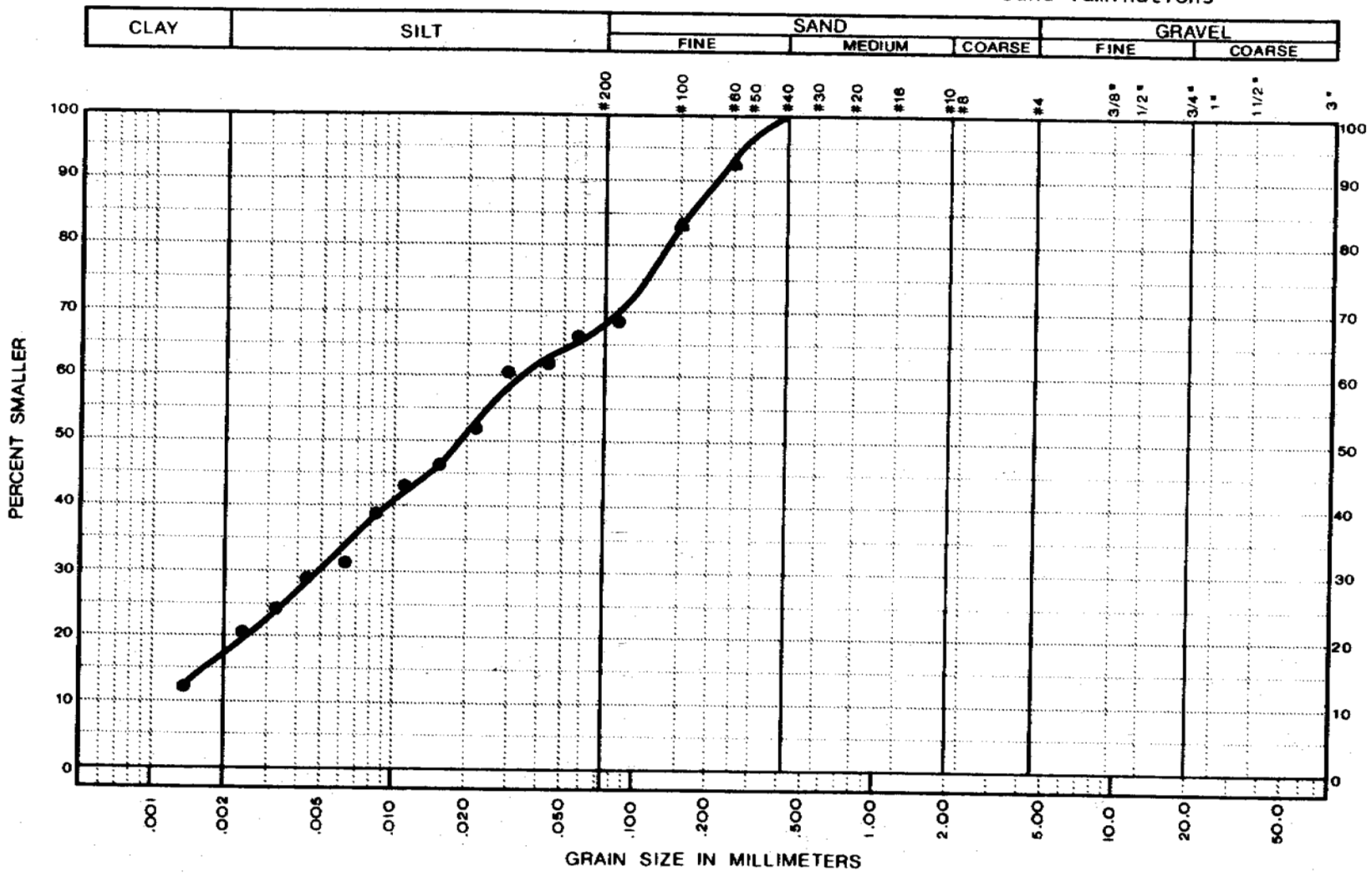
C.44

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 29/75

HOLE NO.: G14-A
SAMPLE NO.:
DEPTH: 3.2 - 5

SAMPLE DESCRIPTION:
SILT
- clayey
- sand laminations



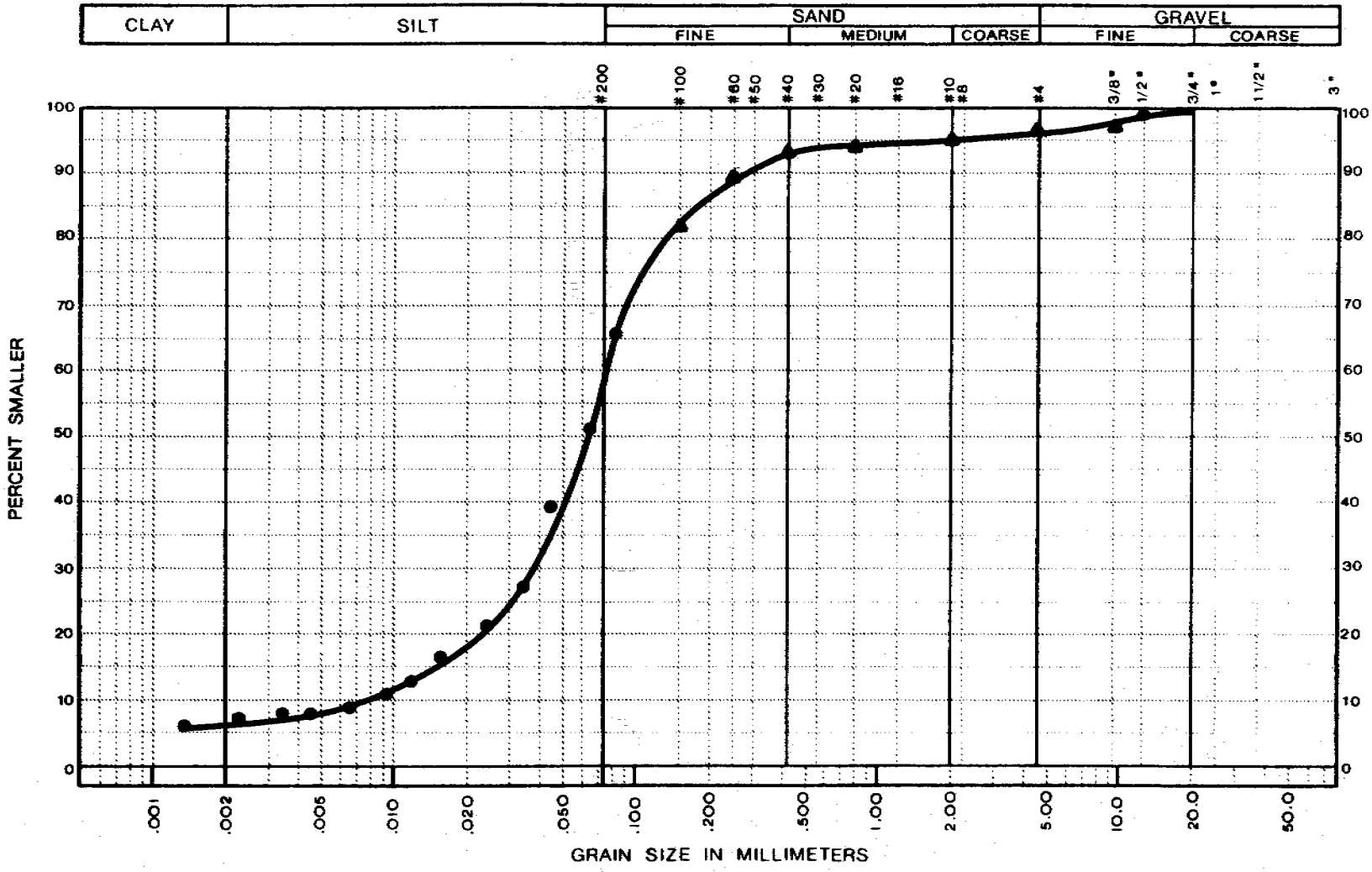
C.45

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: H7-A
SAMPLE NO.:
DEPTH: 3.2 - 5.5

SAMPLE DESCRIPTION:
SAND
- very silty



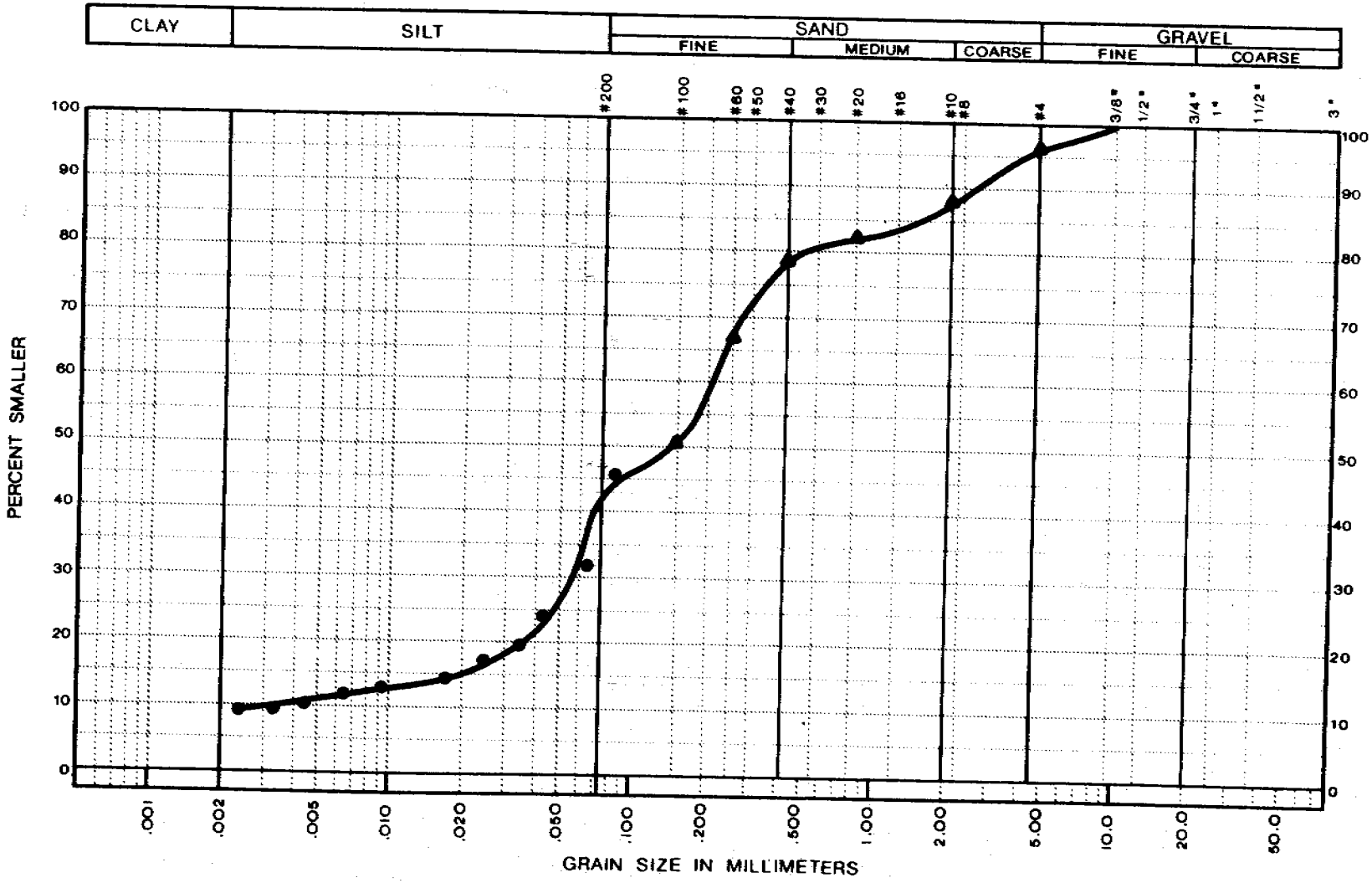
C.146

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug 29/75

HOLE NO.: H7-A
SAMPLE NO.:
DEPTH: 5.5 - 8.4

SAMPLE DESCRIPTION: SAND - silty



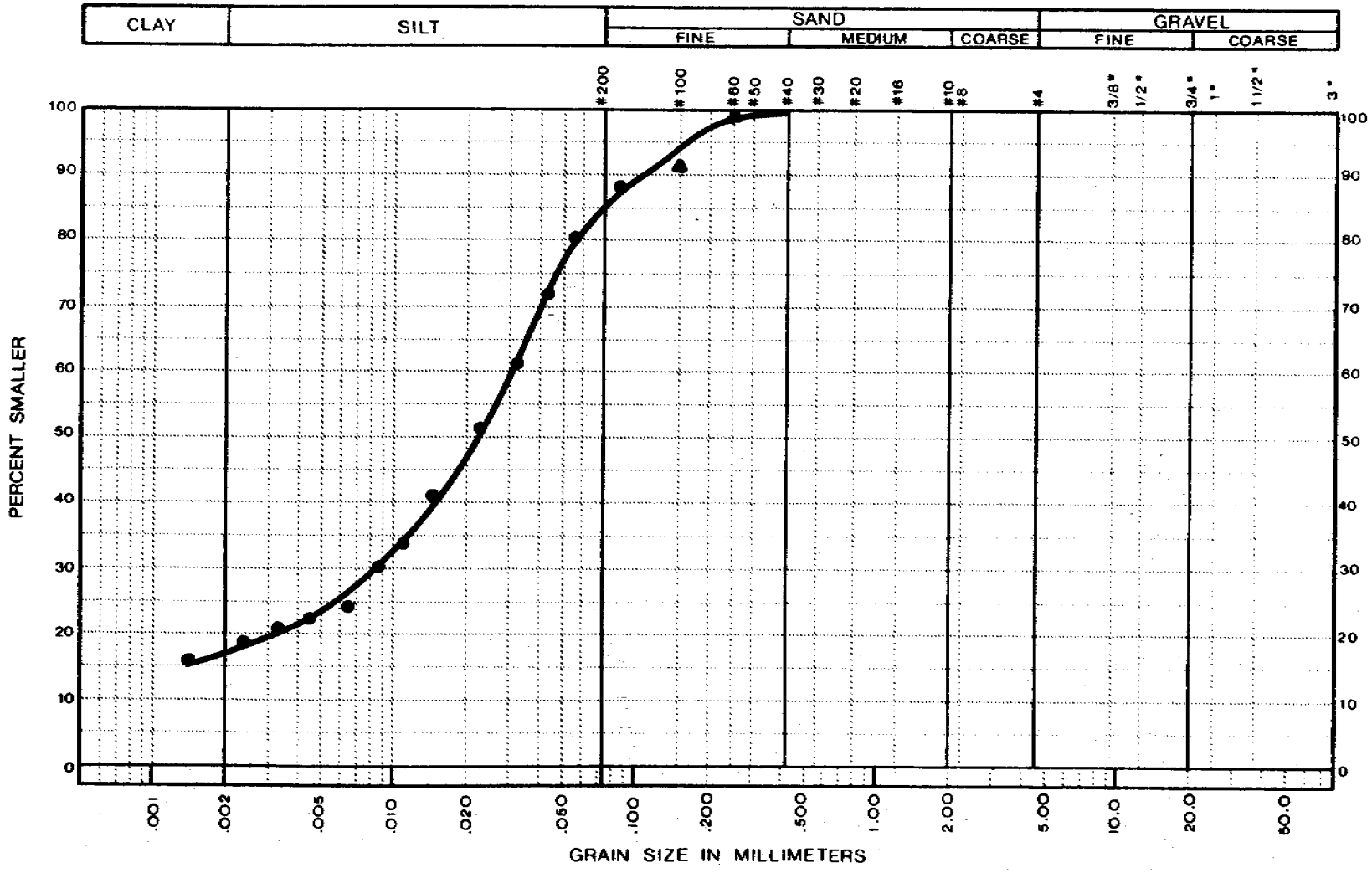
C.47

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 28/75

HOLE NO.: H7-A
SAMPLE NO.:
DEPTH: 10.2 - 12.8

SAMPLE DESCRIPTION:
SILT
- clayey



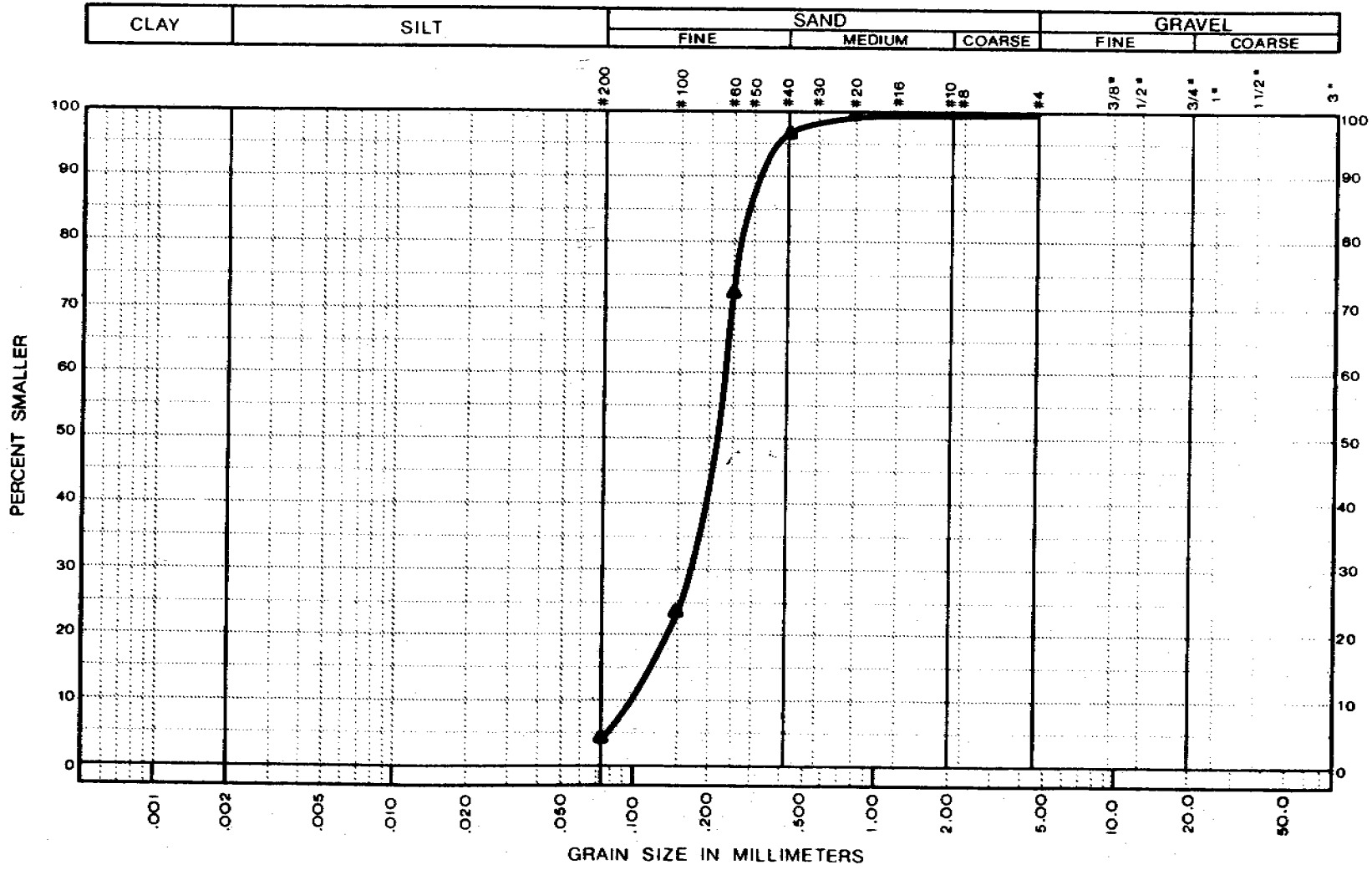
C.48

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 19/75

HOLE NO.: AS2-A
SAMPLE NO.:
DEPTH: 4.3 - 9.1

SAMPLE DESCRIPTION:
SAND
- fine



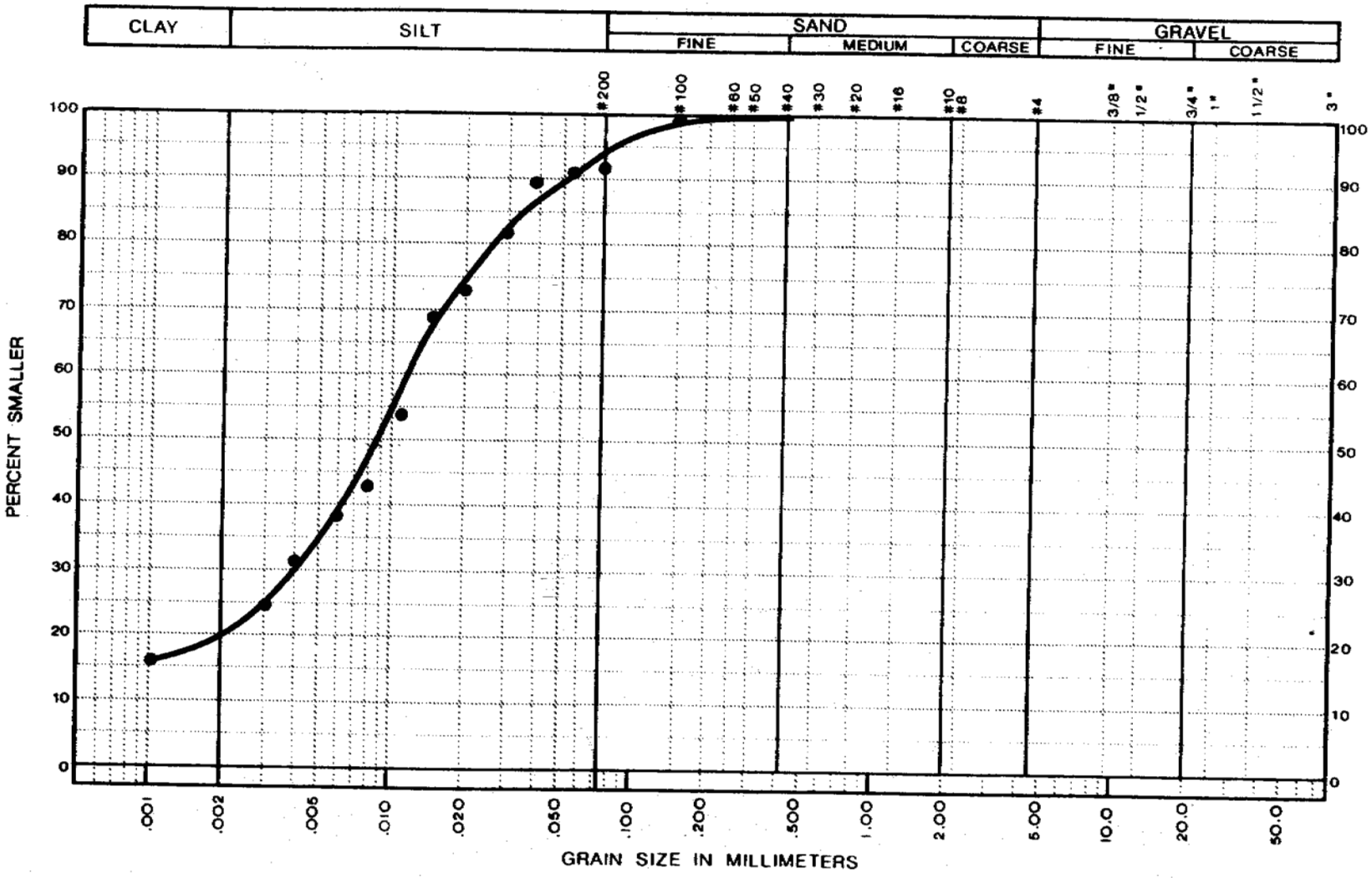
C.50

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept. 22/75

HOLE NO.: A3-B
SAMPLE NO.:
DEPTH: 9.8 - 11.0

SAMPLE DESCRIPTION:
SILT
- clayey



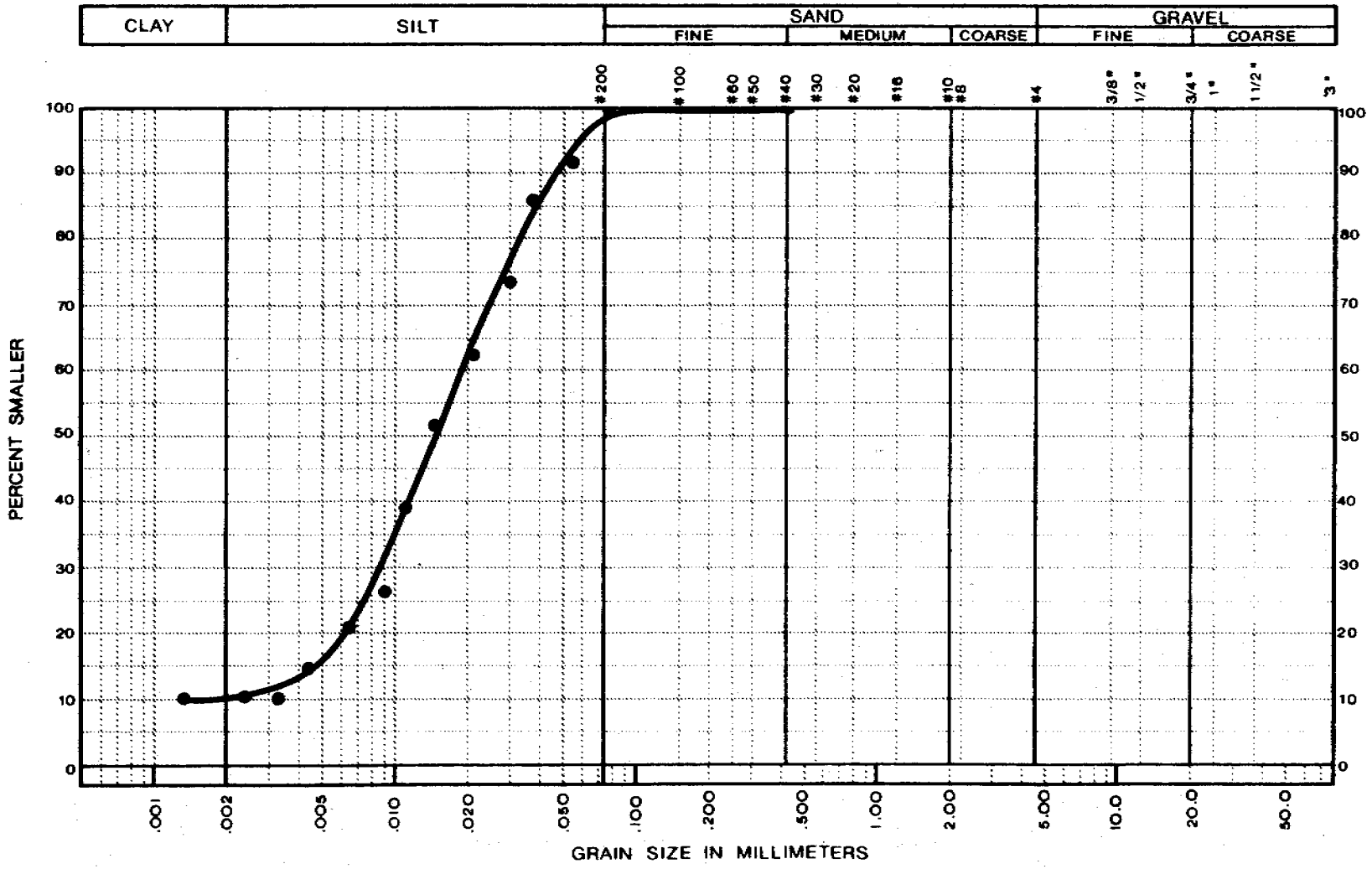
C.52

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 26/75

HOLE NO.: A4-B
SAMPLE NO.:
DEPTH: 8.8 - 10.3

SAMPLE DESCRIPTION:
SILT
- clayey

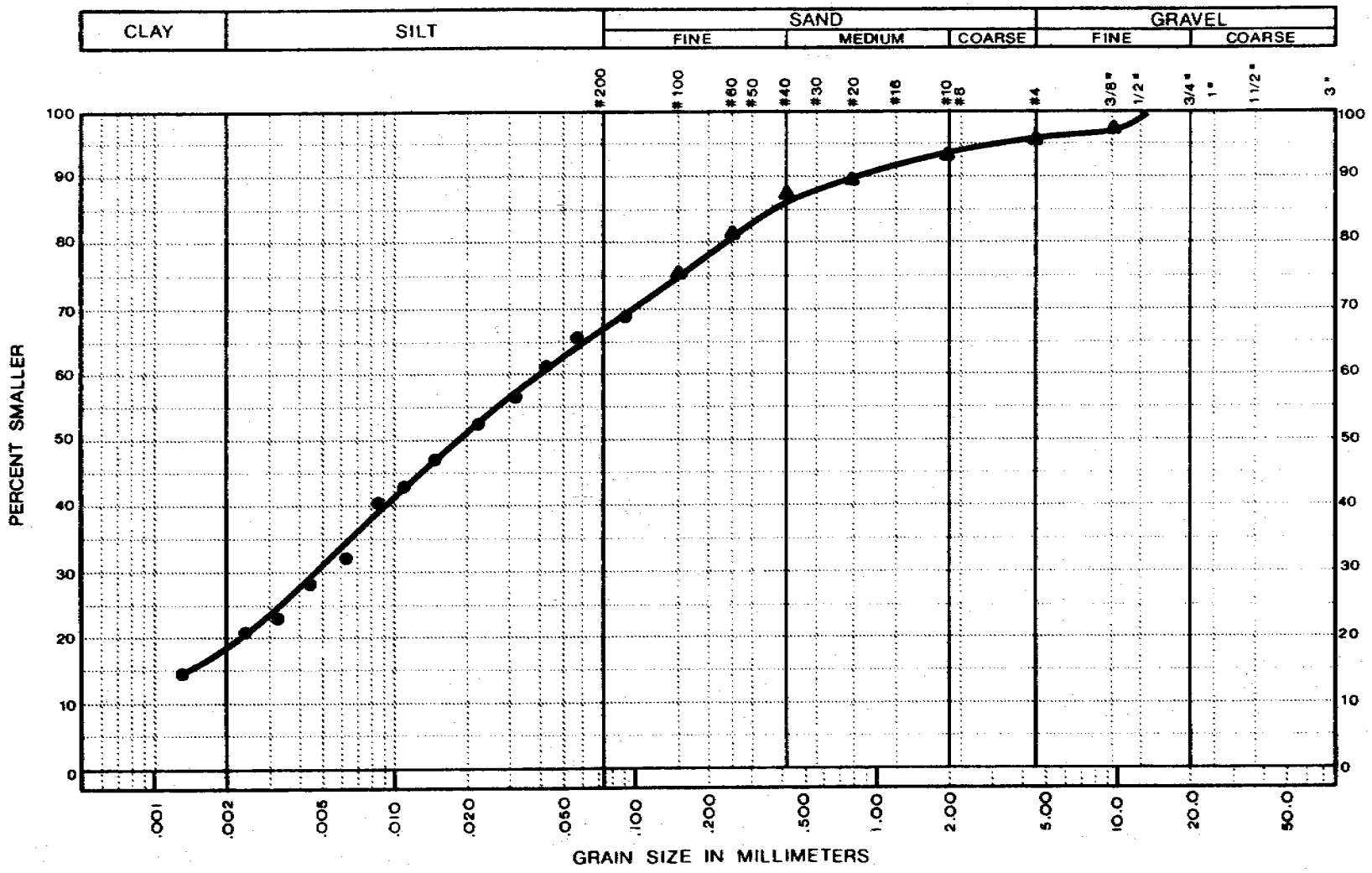


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept. 2/75

HOLE NO.: A4-B
SAMPLE NO.:
DEPTH: 16 - 18½

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty

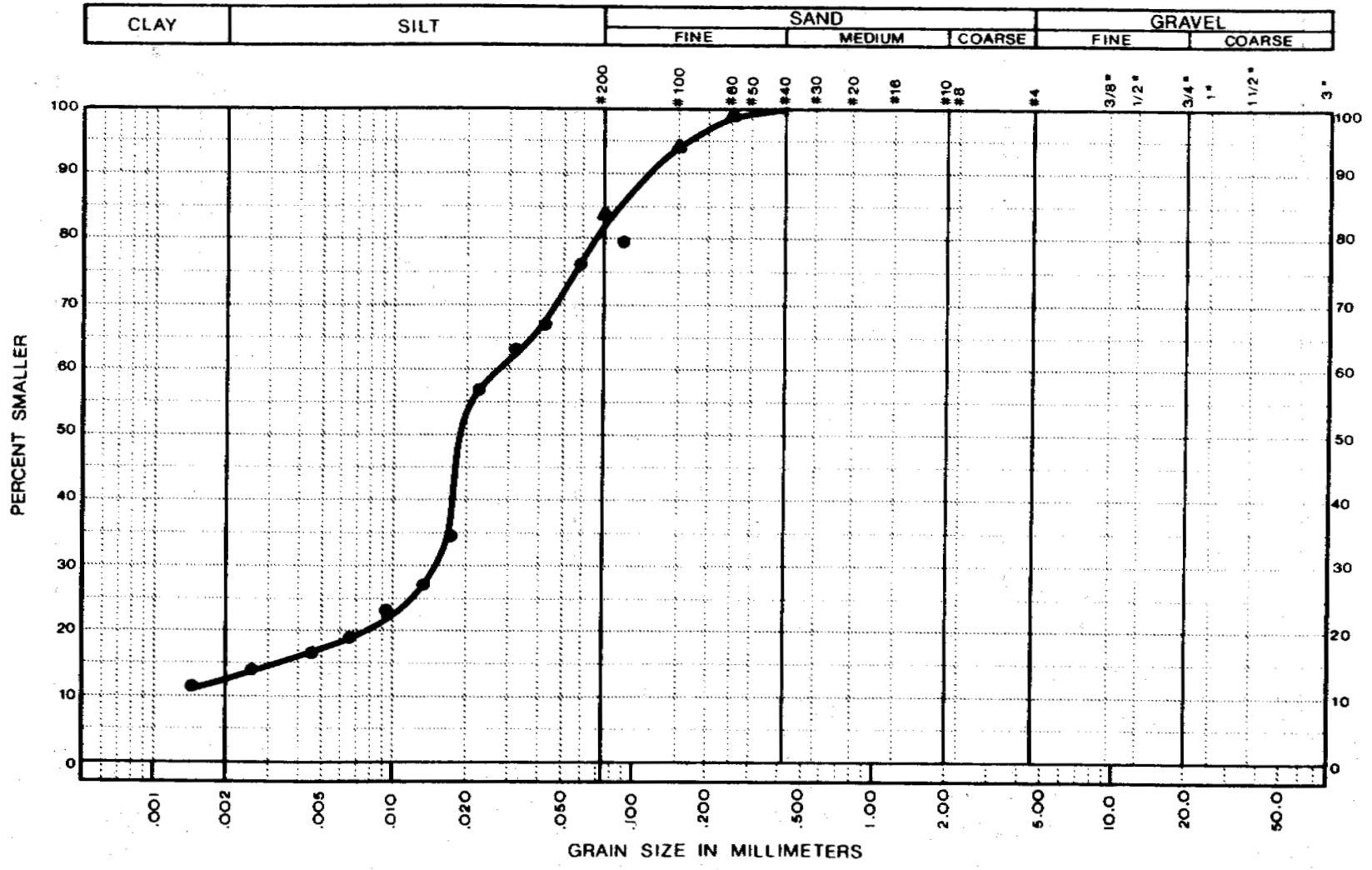


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: B1-B
SAMPLE NO.:
DEPTH: 3.5

SAMPLE DESCRIPTION:
SILT
- clayey

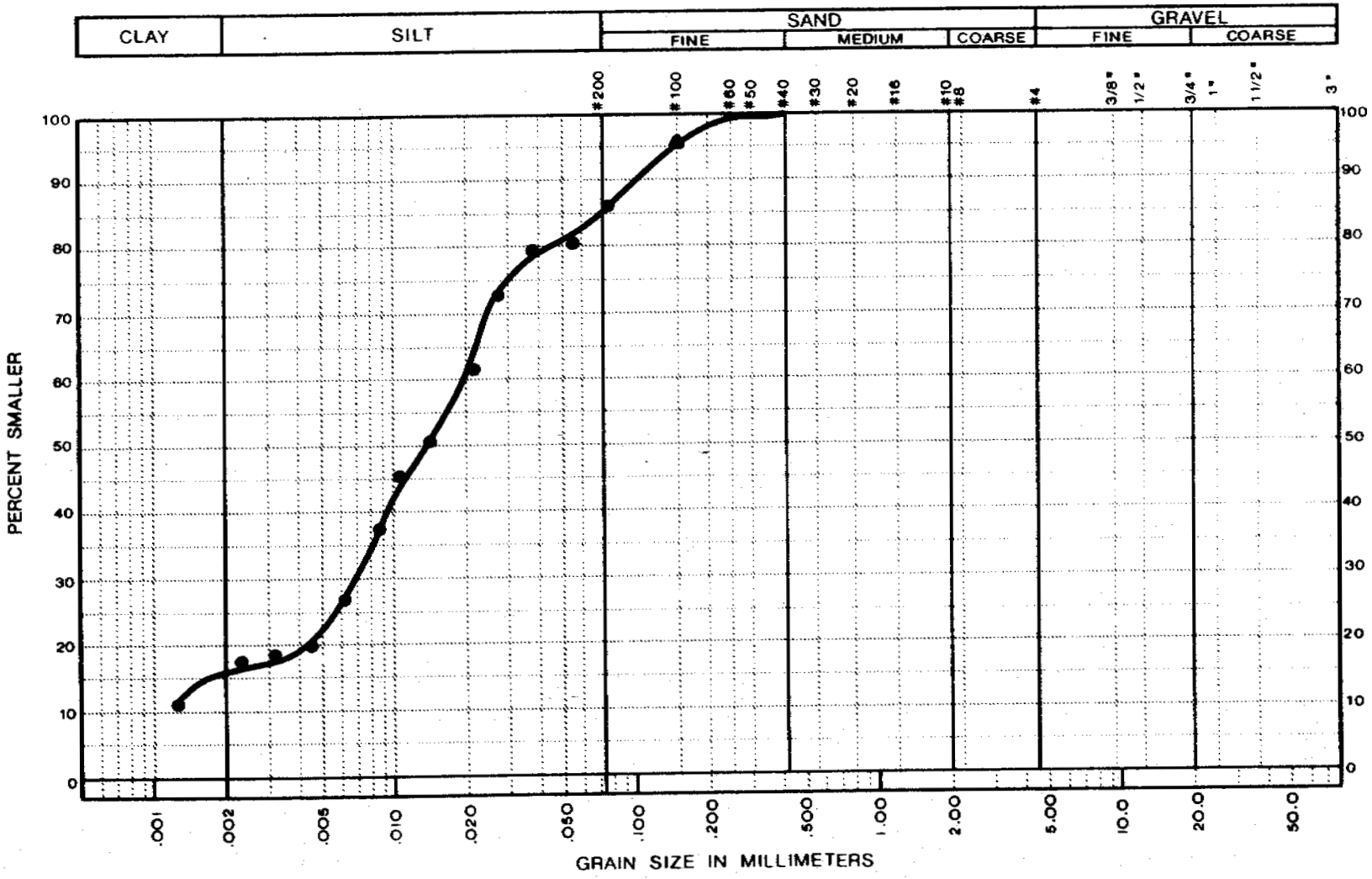


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: B2-B
SAMPLE NO.:
DEPTH: 8.9 - 11.6

SAMPLE DESCRIPTION
SILT
- clayey



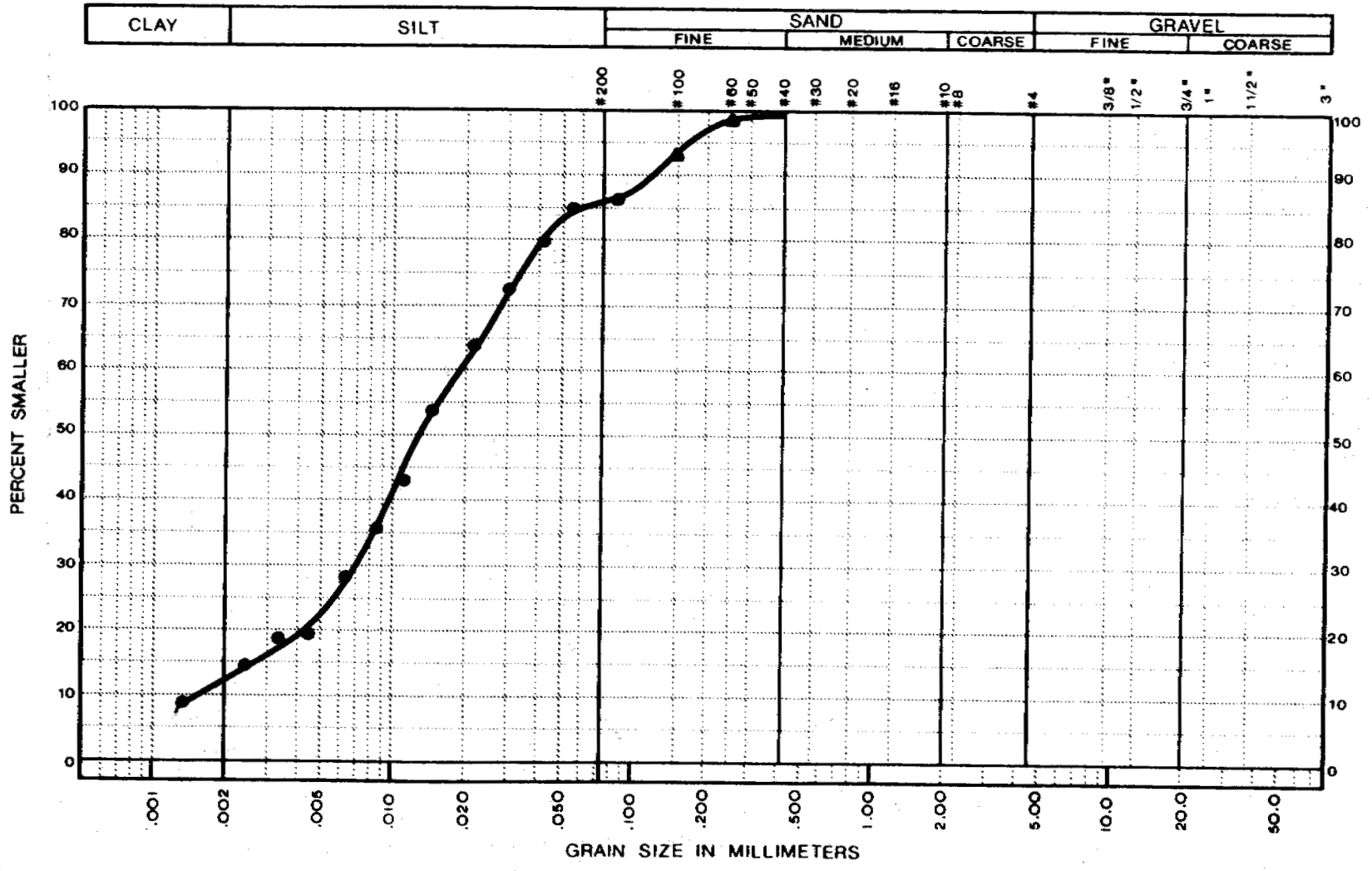
C.56

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: C1-D
SAMPLE NO.:
DEPTH: 3.6 - 6.0

SAMPLE DESCRIPTION:
SILT
- some clay

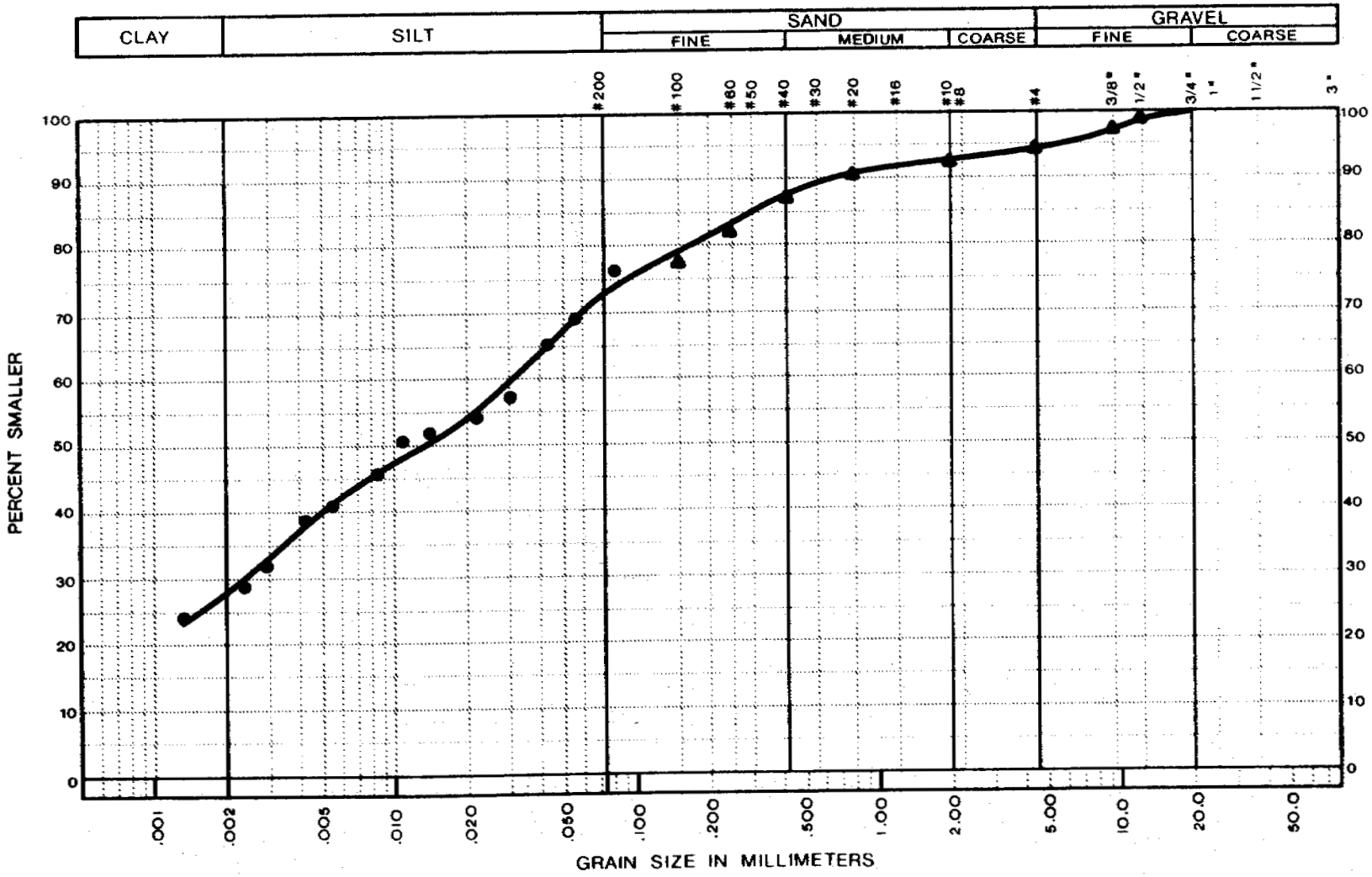


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: C1-B
SAMPLE NO.:
DEPTH: 8.6 - 11.0

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty



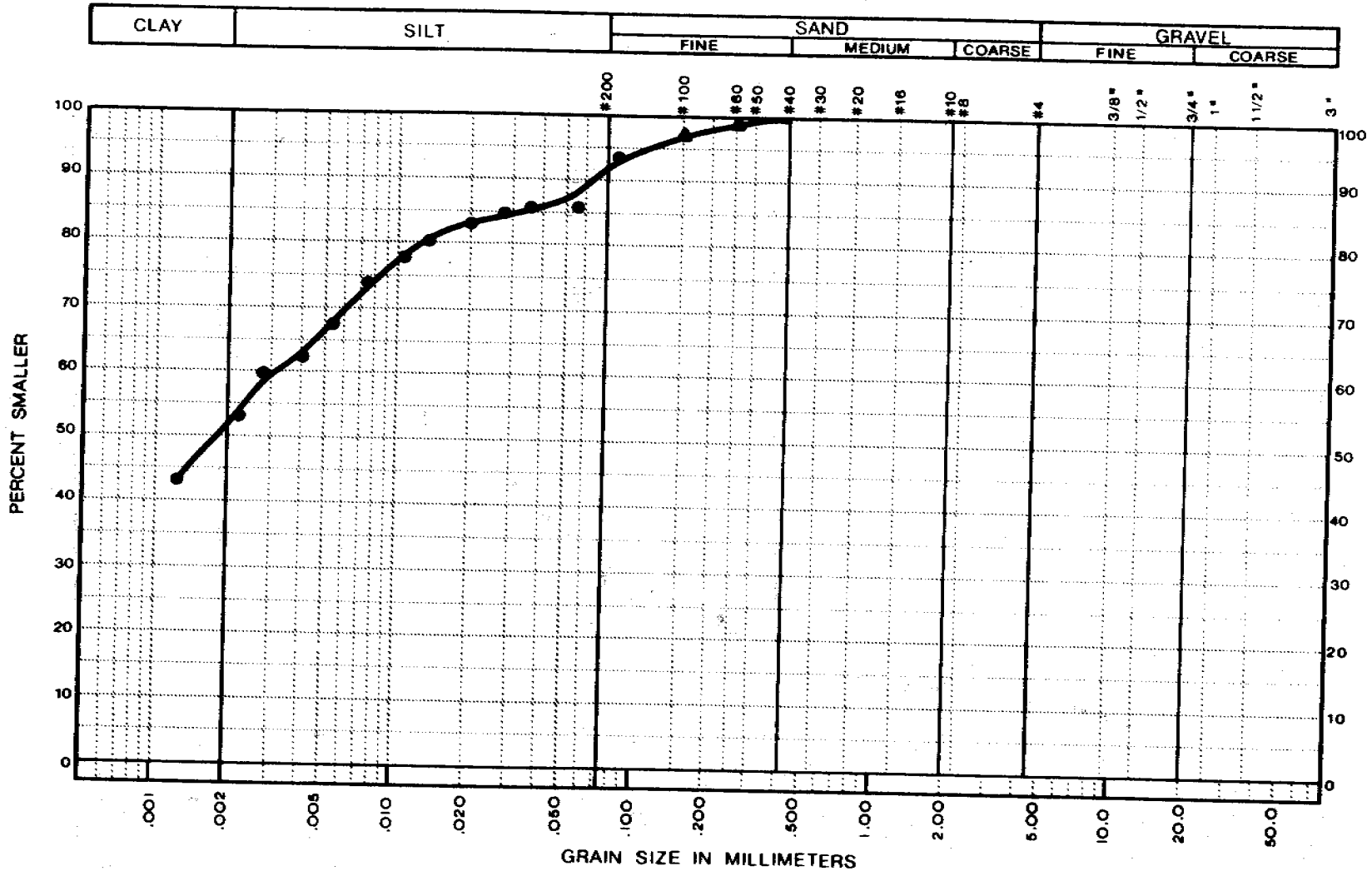
C.58

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug 26/75

HOLE NO.: C2-B
SAMPLE NO.:
DEPTH: 6.8 - 8.9

SAMPLE DESCRIPTION:
CLAY
- silty



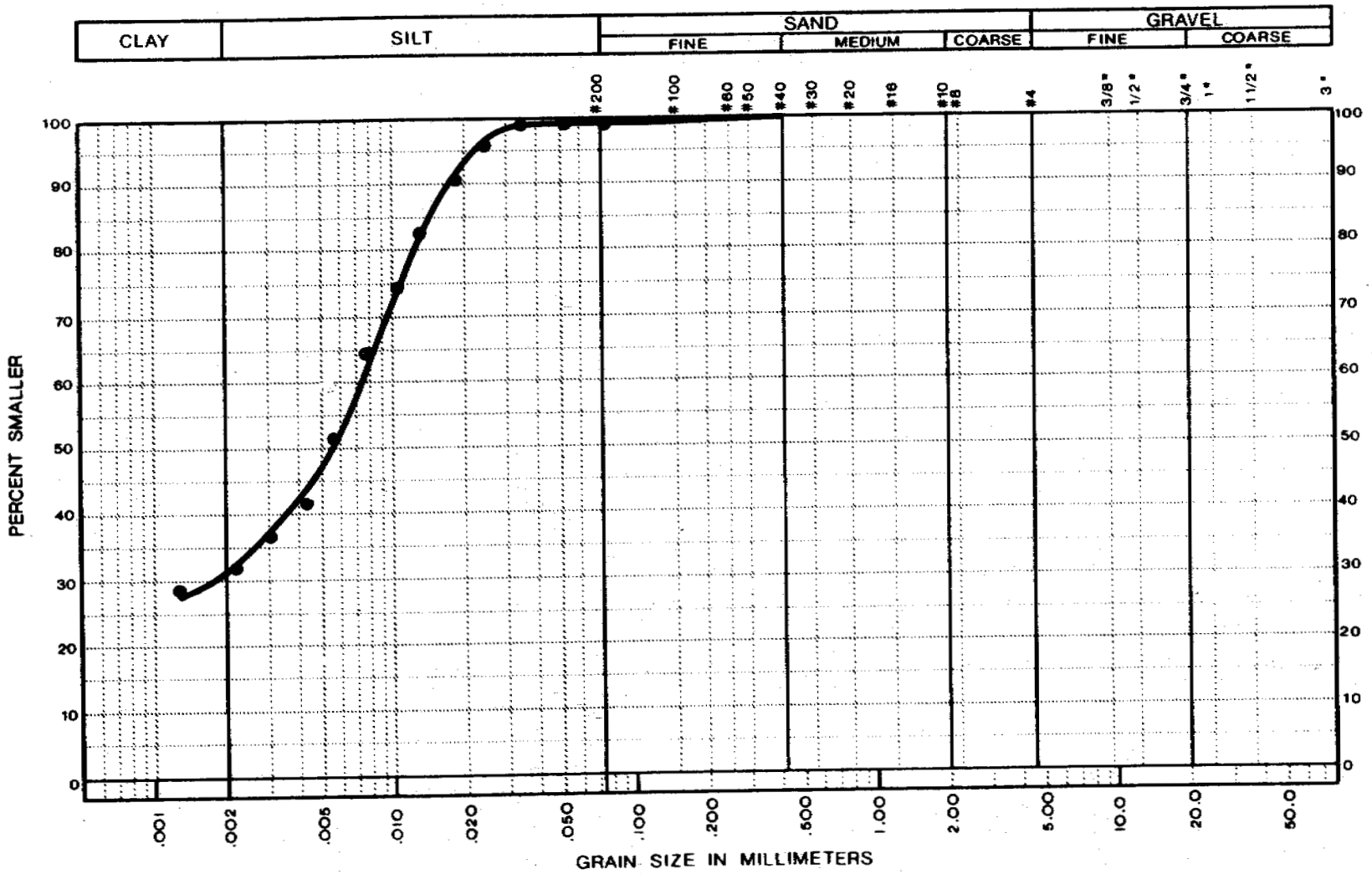
C.59

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 21/75

HOLE NO.: C3-B
SAMPLE NO.:
DEPTH: 8 - 10

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty



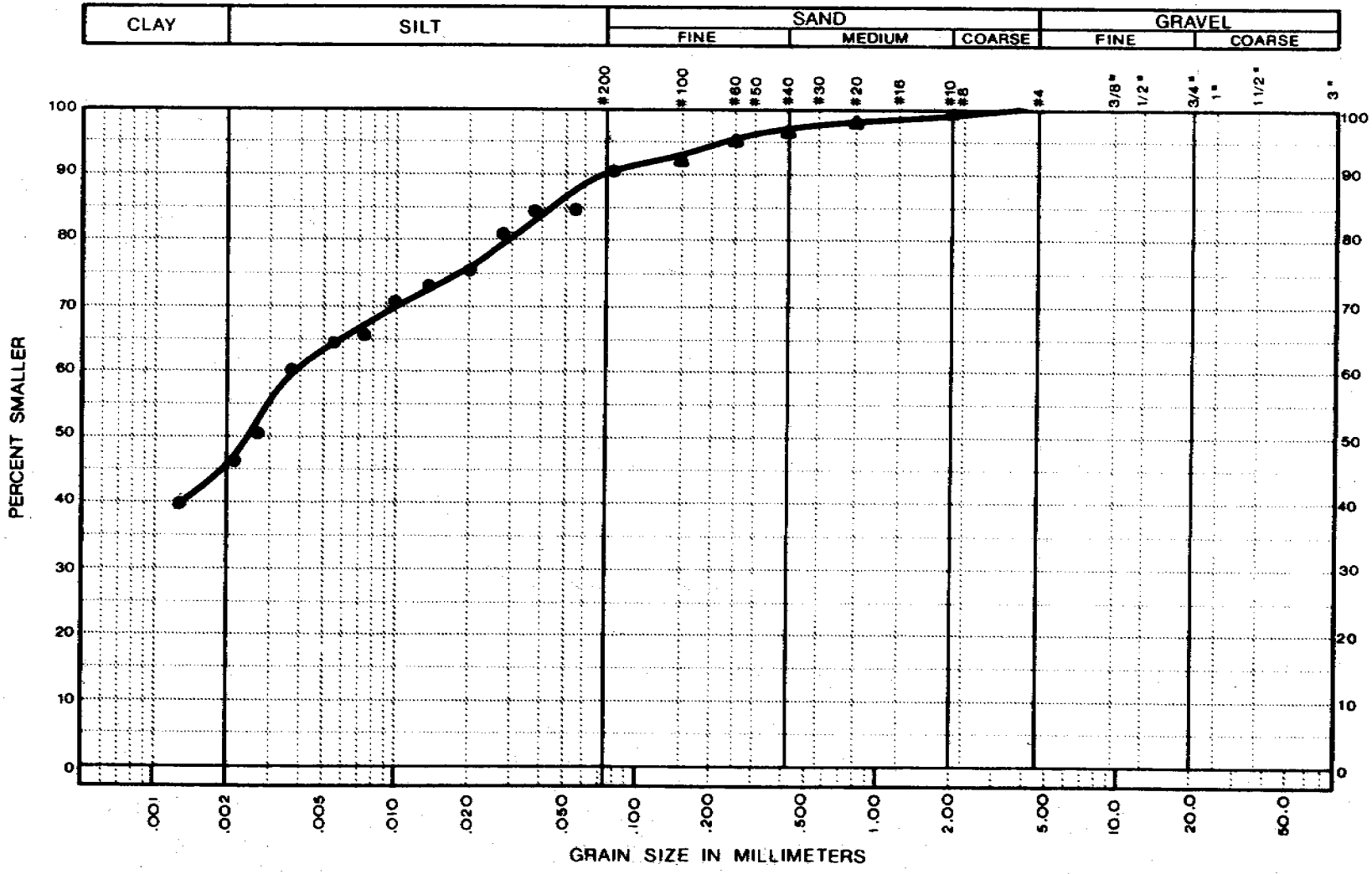
C.60

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 2/75

HOLE NO.: D1-B
SAMPLE NO.:
DEPTH: 3.8 - 5.7

SAMPLE DESCRIPTION:
CLAY
- silty



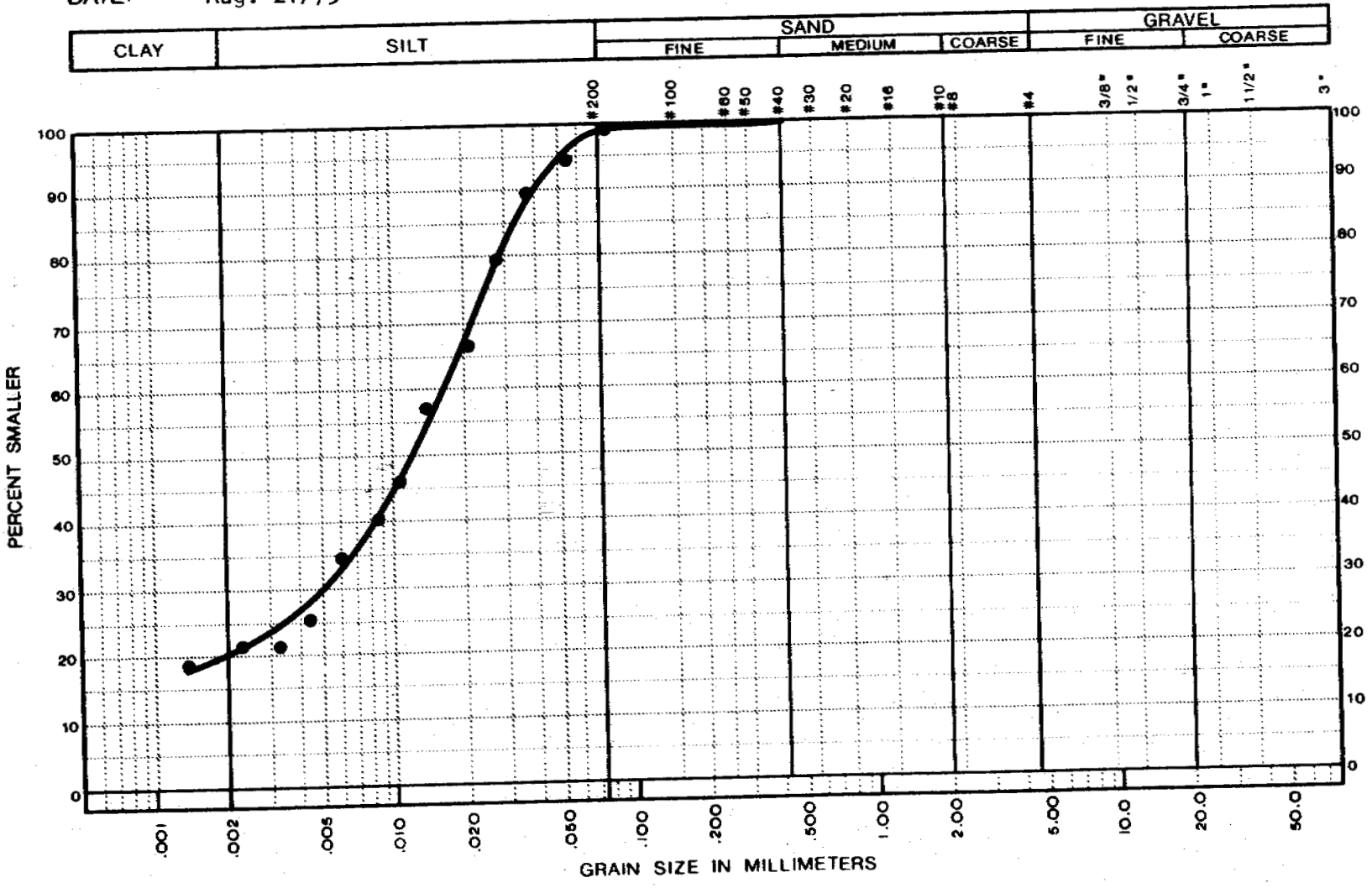
C.61

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 21/75

HOLE NO.: E2-B
SAMPLE NO.:
DEPTH: 8.4 - 9.9

SAMPLE DESCRIPTION:
SILT
- clayey

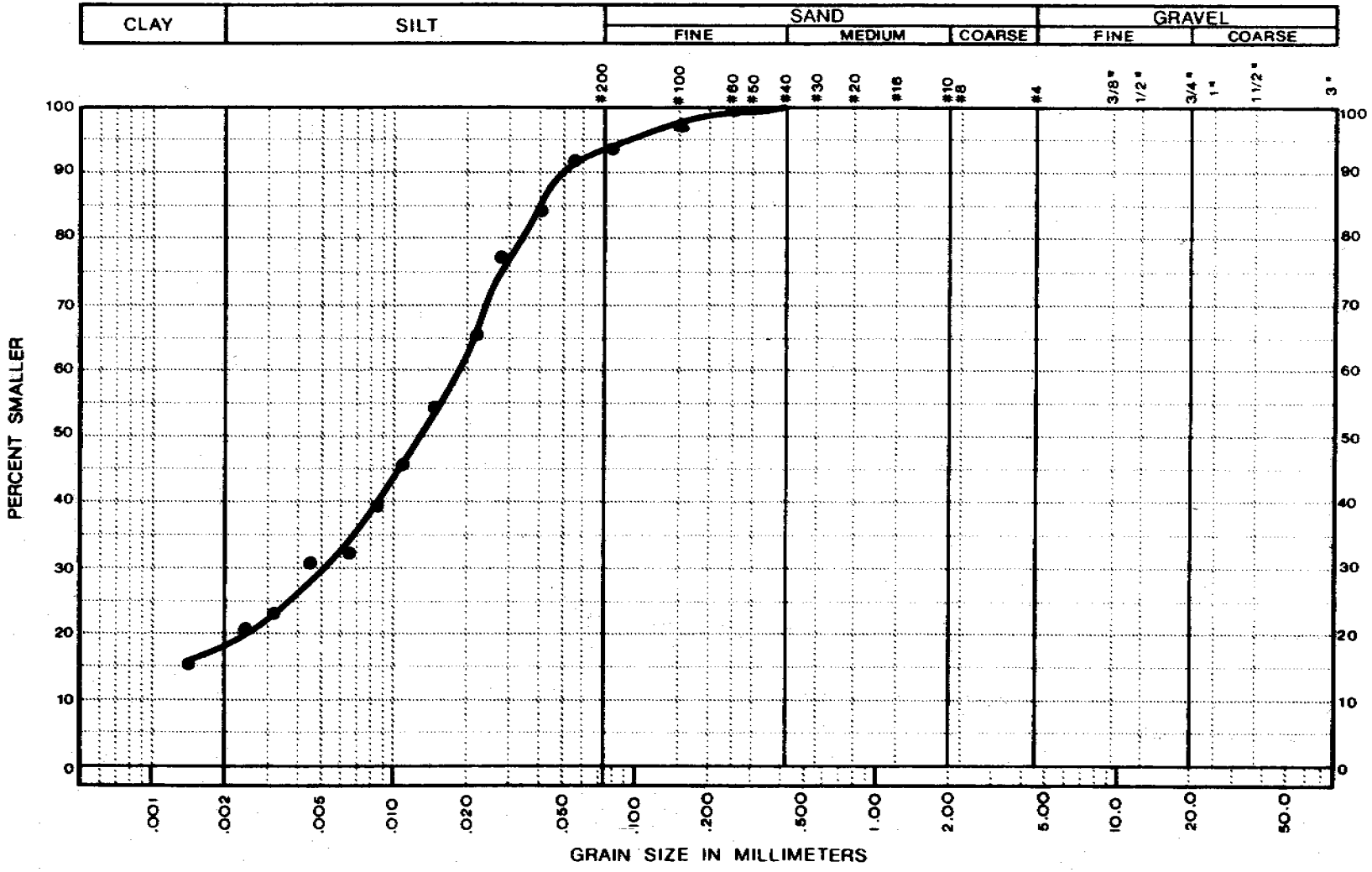


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: E3-B
SAMPLE NO.:
DEPTH: 8.3 - 10.4

SAMPLE DESCRIPTION:
SILT
- clayey

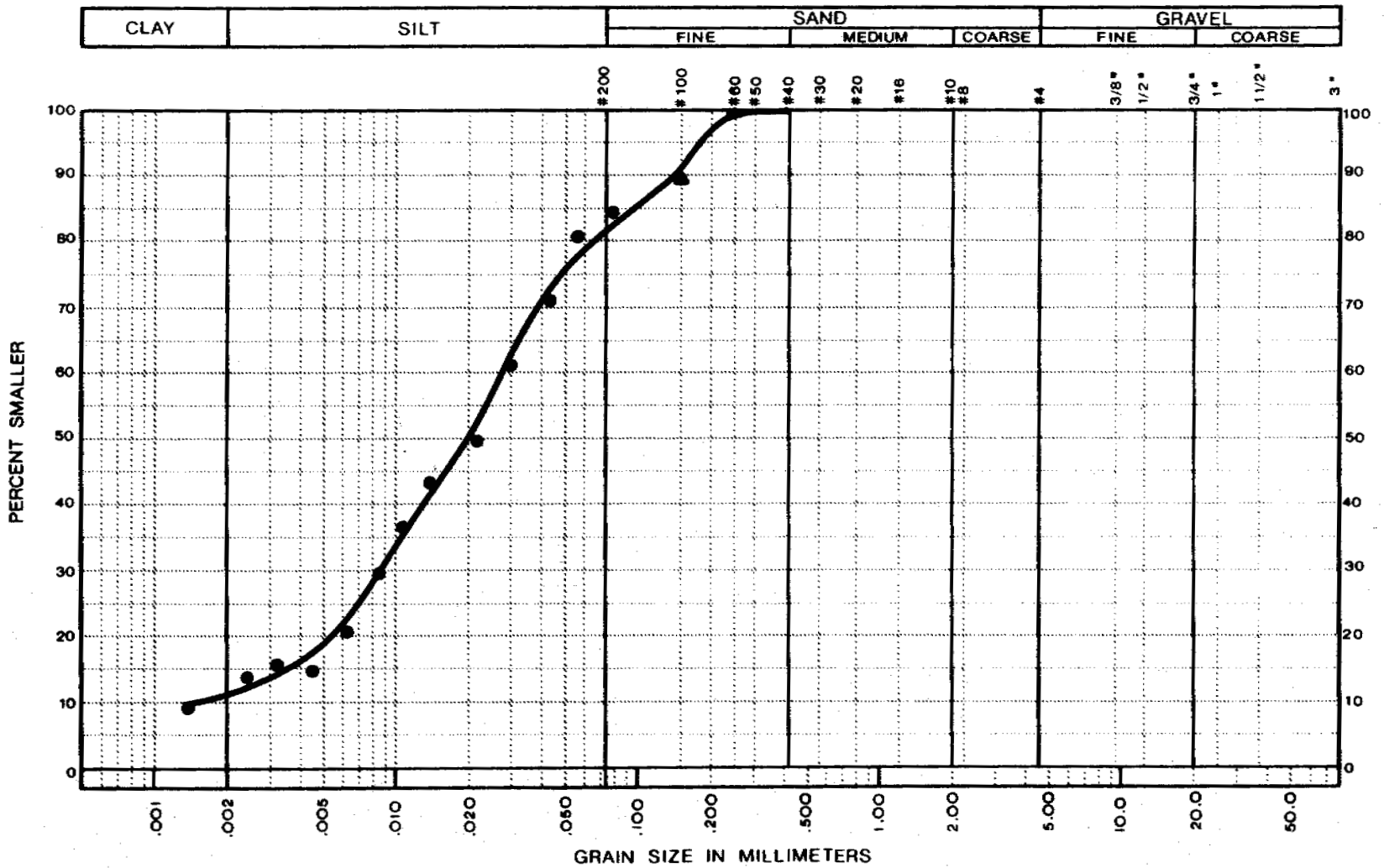


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 20/75

HOLE NO.: E4-B
SAMPLE NO.:
DEPTH: 7 - 10

SAMPLE DESCRIPTION:
SILT
- some sand
- some clay



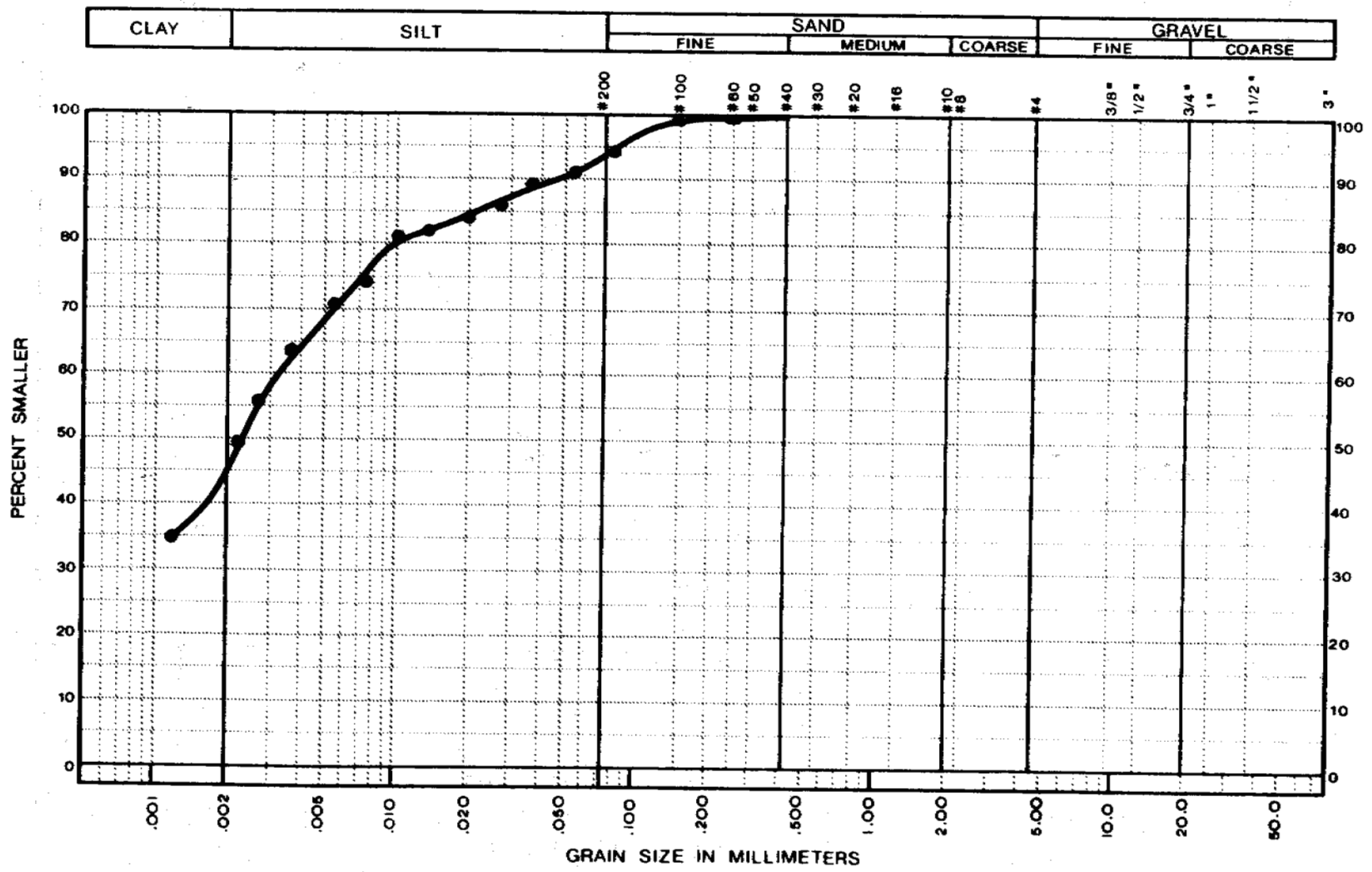
C.64

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE:

HOLE NO.: G4-B
SAMPLE NO.:
DEPTH: 6 - 7.4

SAMPLE DESCRIPTION:
CLAY
- silty



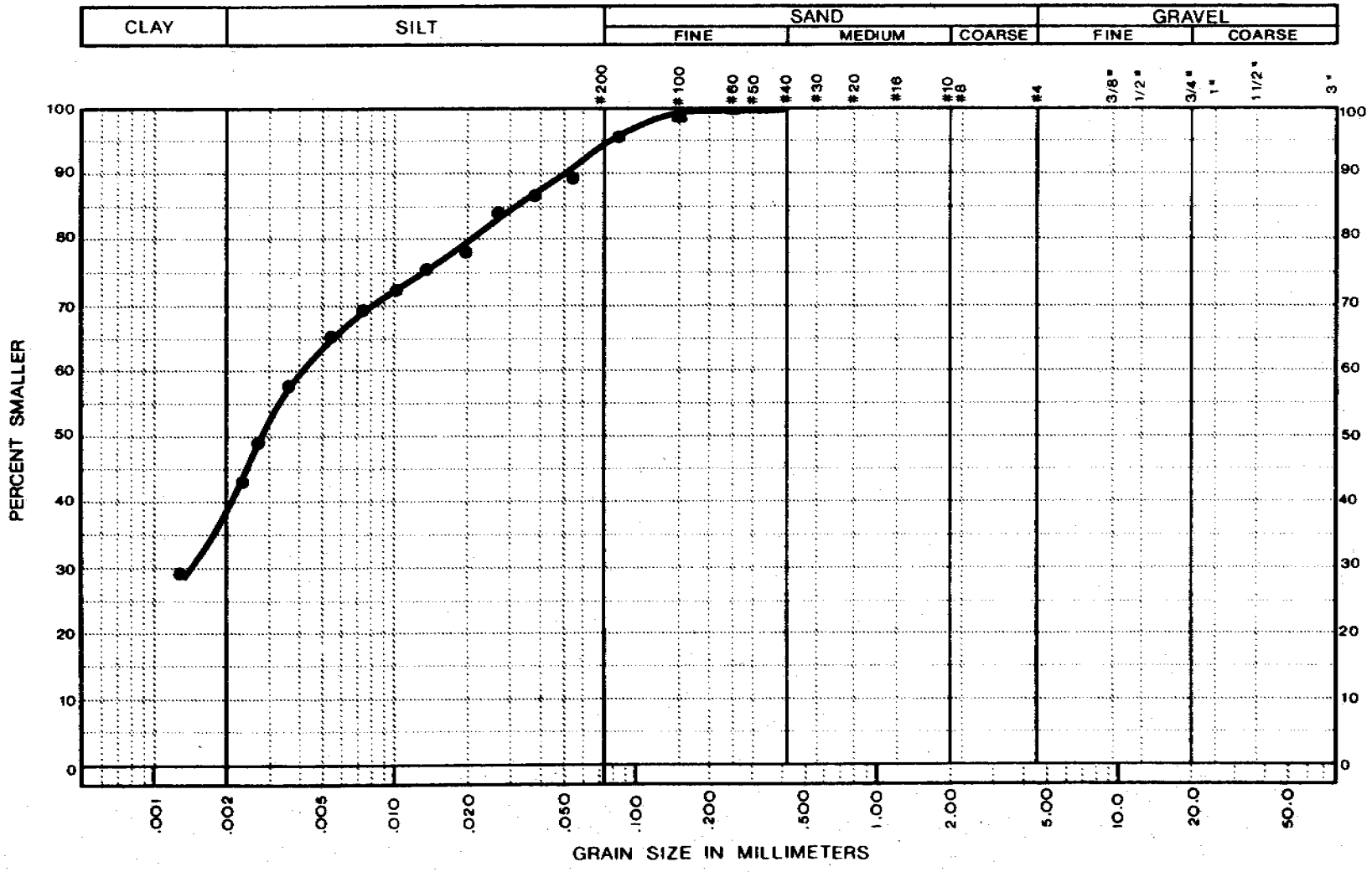
C.65

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: H4-B
SAMPLE NO.:
DEPTH: 7 - 9.5

SAMPLE DESCRIPTION:
CLAY
- silty



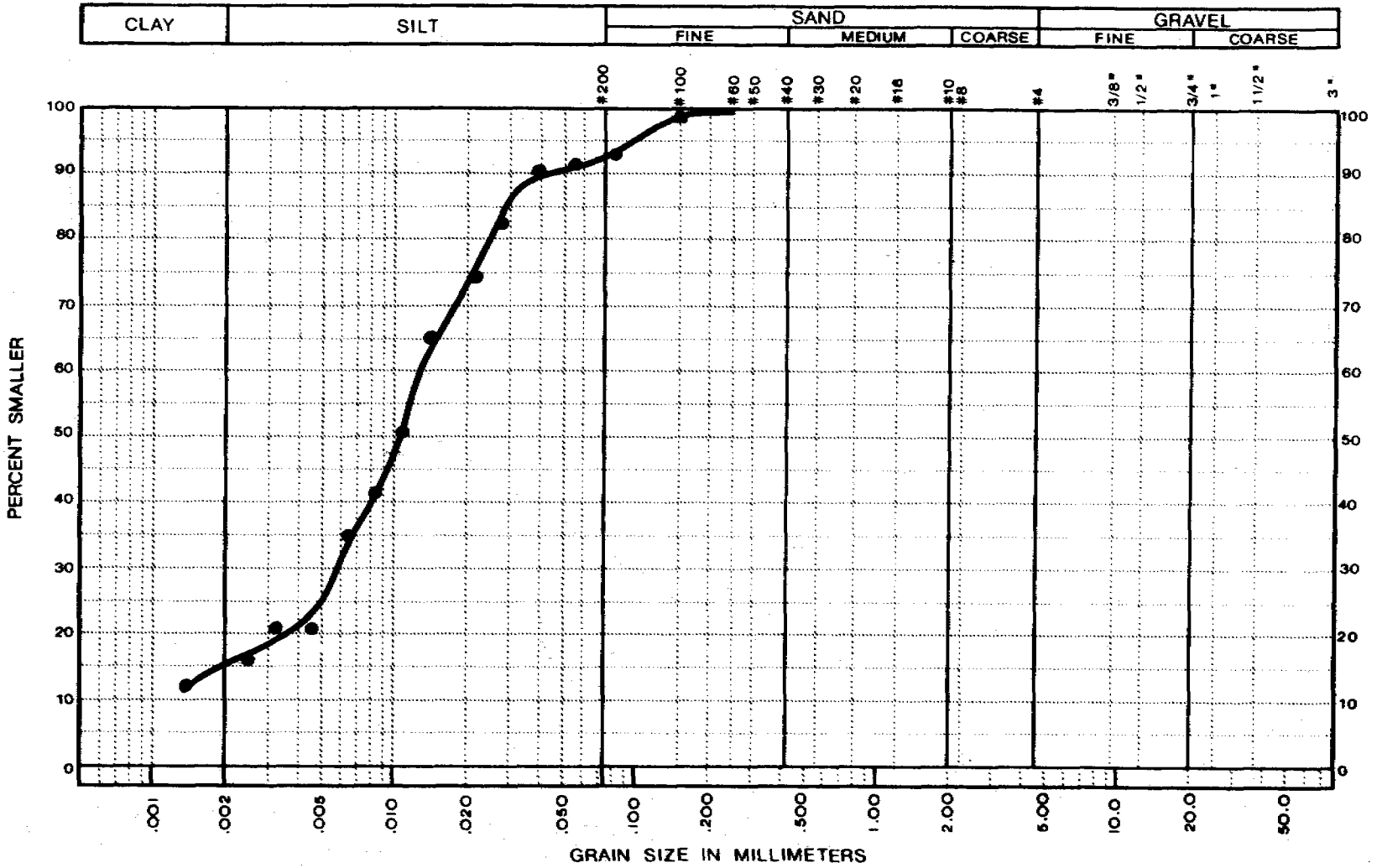
C.66

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 7/75

HOLE NO.: AS2-B
SAMPLE NO.:
DEPTH: 3.5 - 5.5

SAMPLE DESCRIPTION:
SILT
- clayey



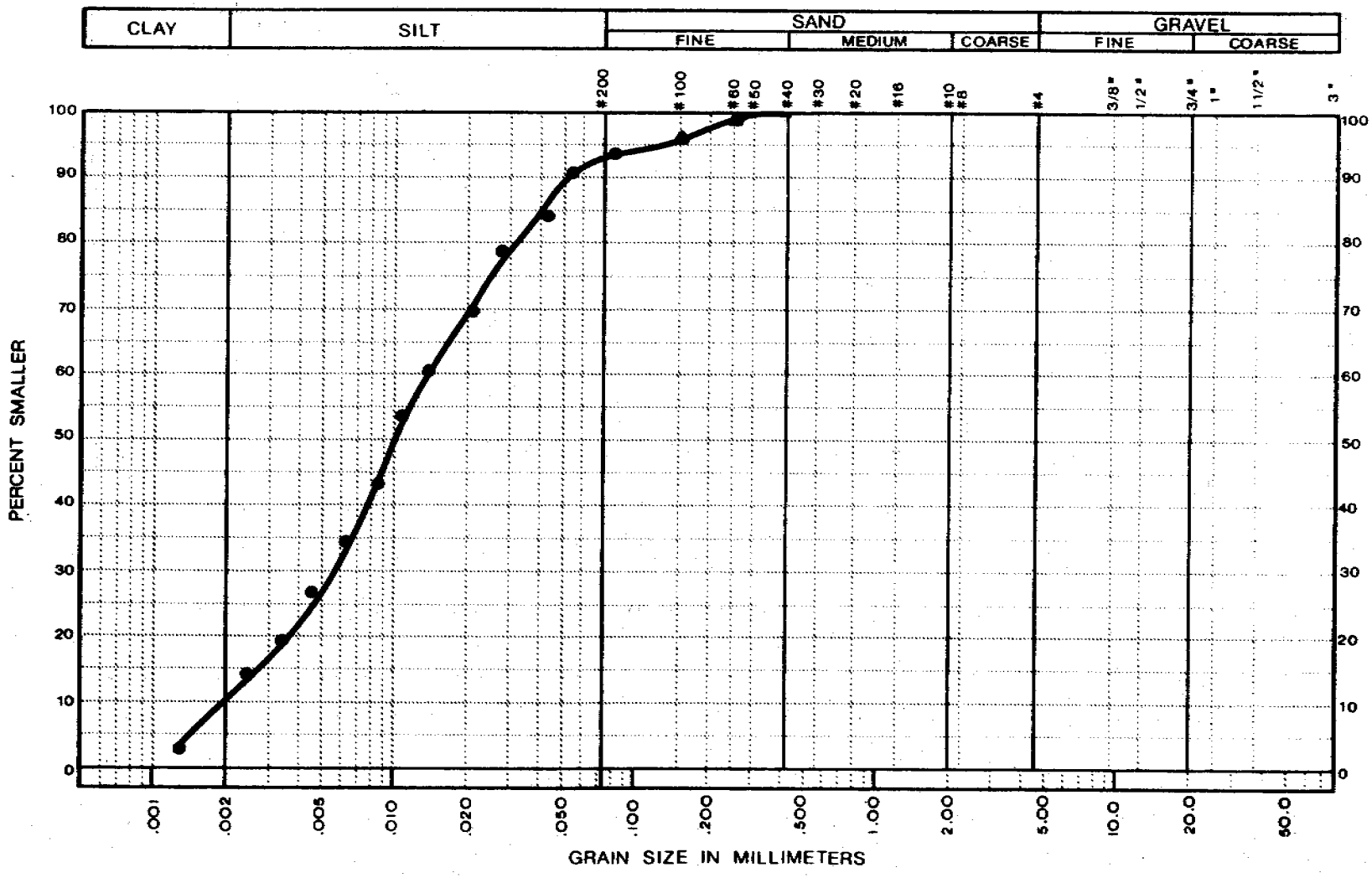
C.67

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 5/75

HOLE NO.: AS2-B
SAMPLE NO.:
DEPTH: 10 - 12

SAMPLE DESCRIPTION:
SILT



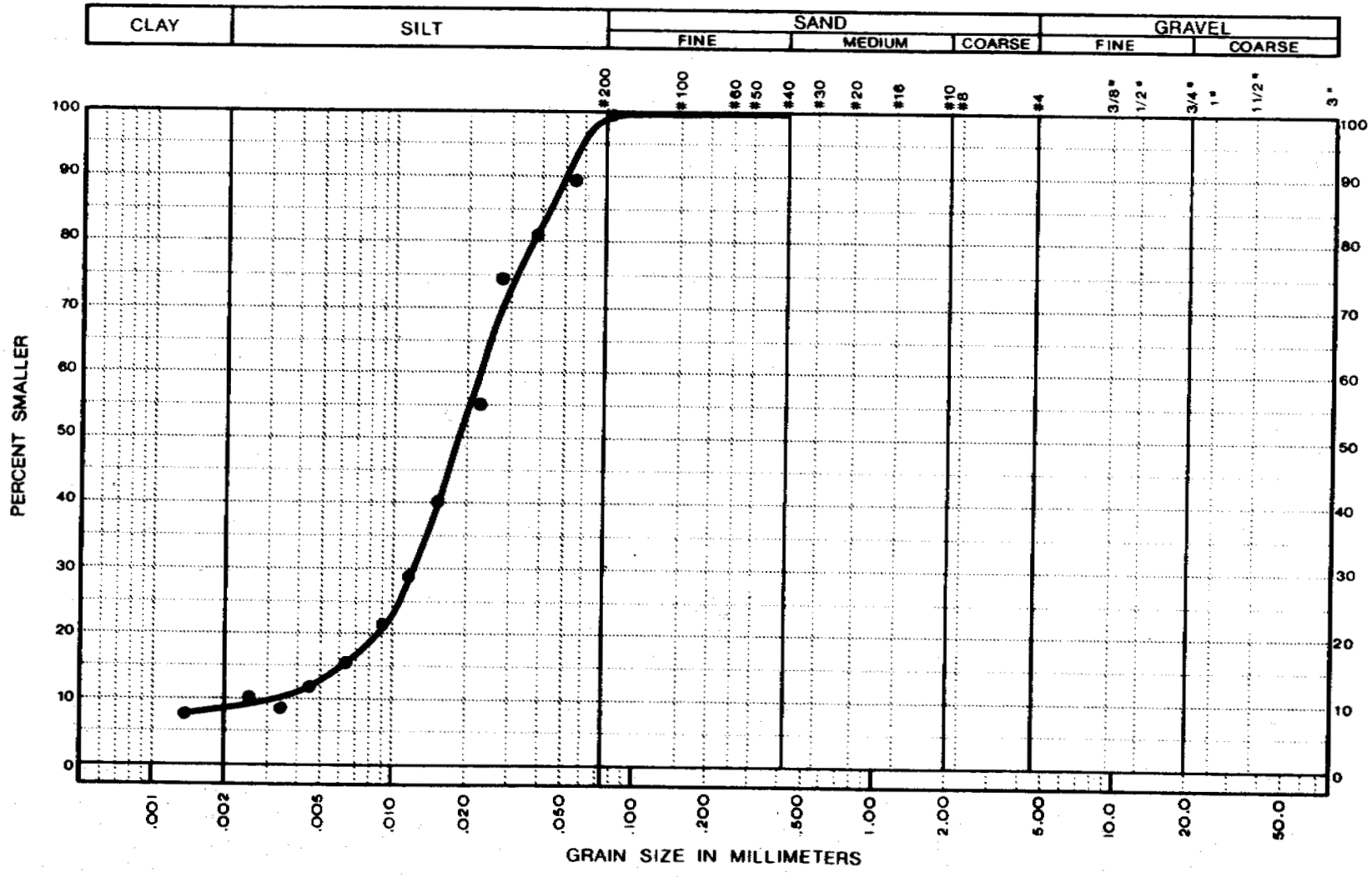
C.68

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 21/75

HOLE NO.: AS2-B
SAMPLE NO.:
DEPTH: 12 - 14½

SAMPLE DESCRIPTION:
SILT
- some clay



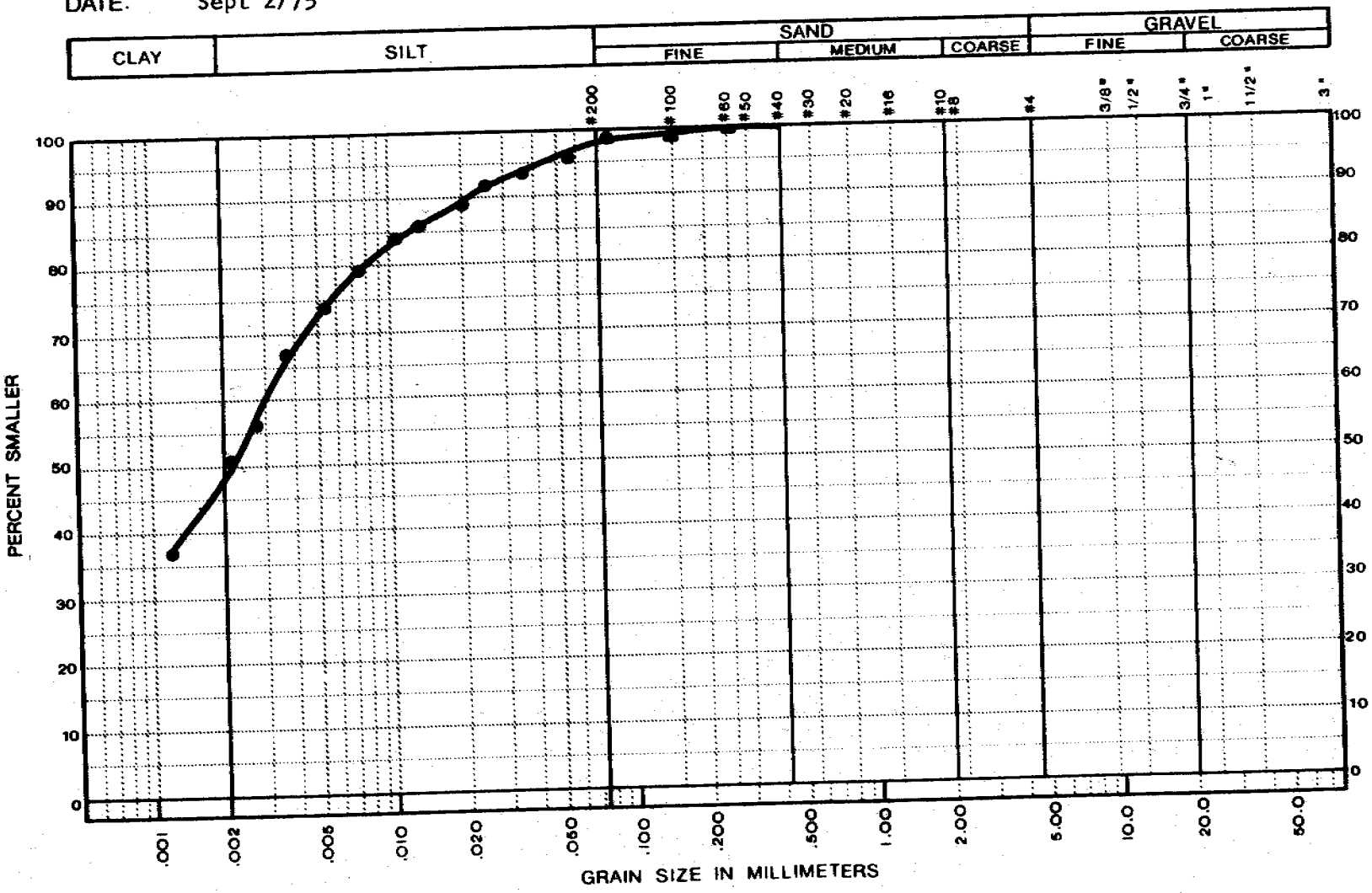
c.69

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 2/75

HOLE NO.: AS4-B
SAMPLE NO.:
DEPTH: 9 - 10½

SAMPLE DESCRIPTION:
CLAY
- silty



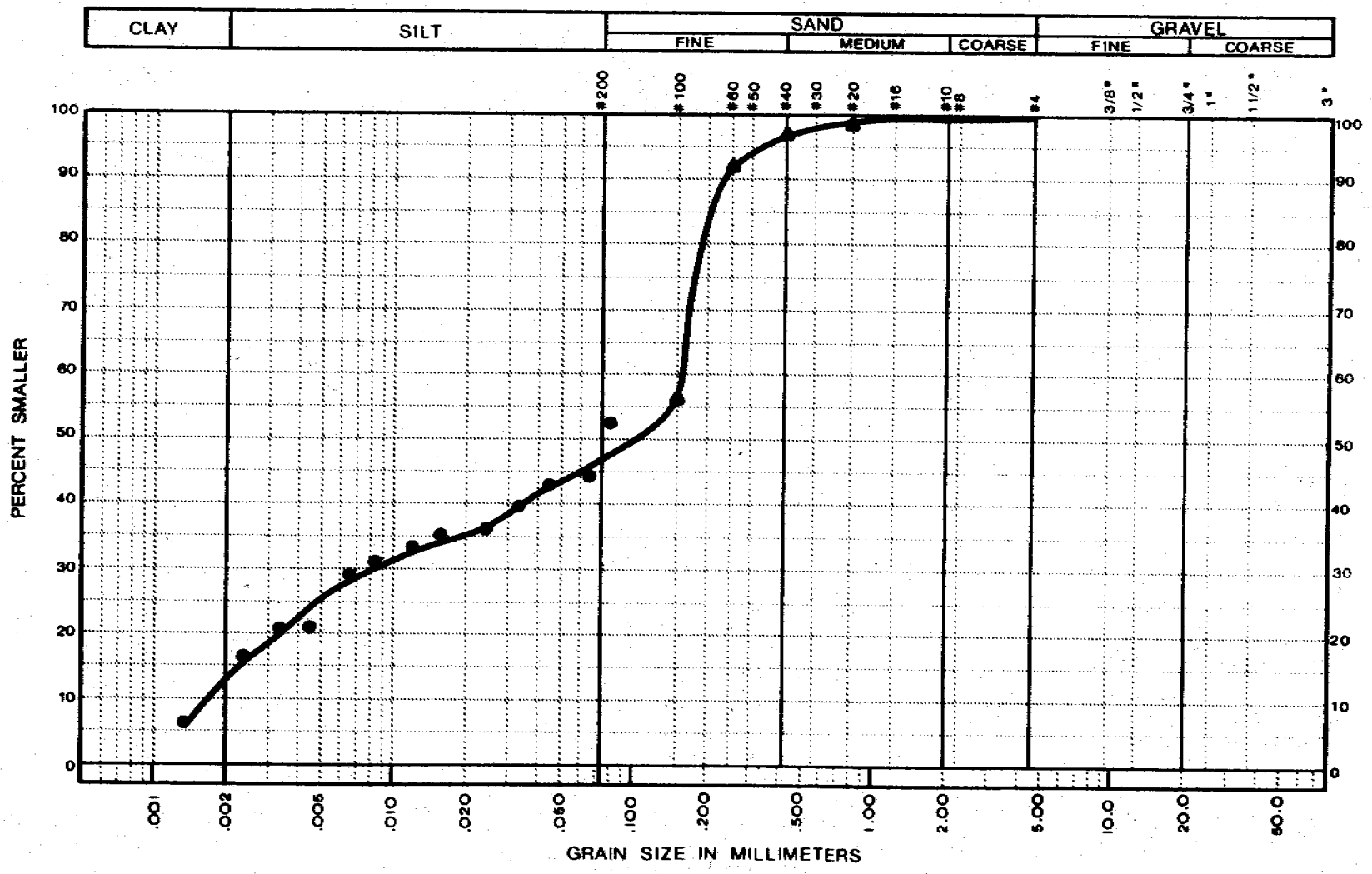
C.70

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept. 5/75

HOLE NO.: AS4-B
SAMPLE NO.:
DEPTH: 13 - 15

SAMPLE DESCRIPTION:
SAND
- very silty



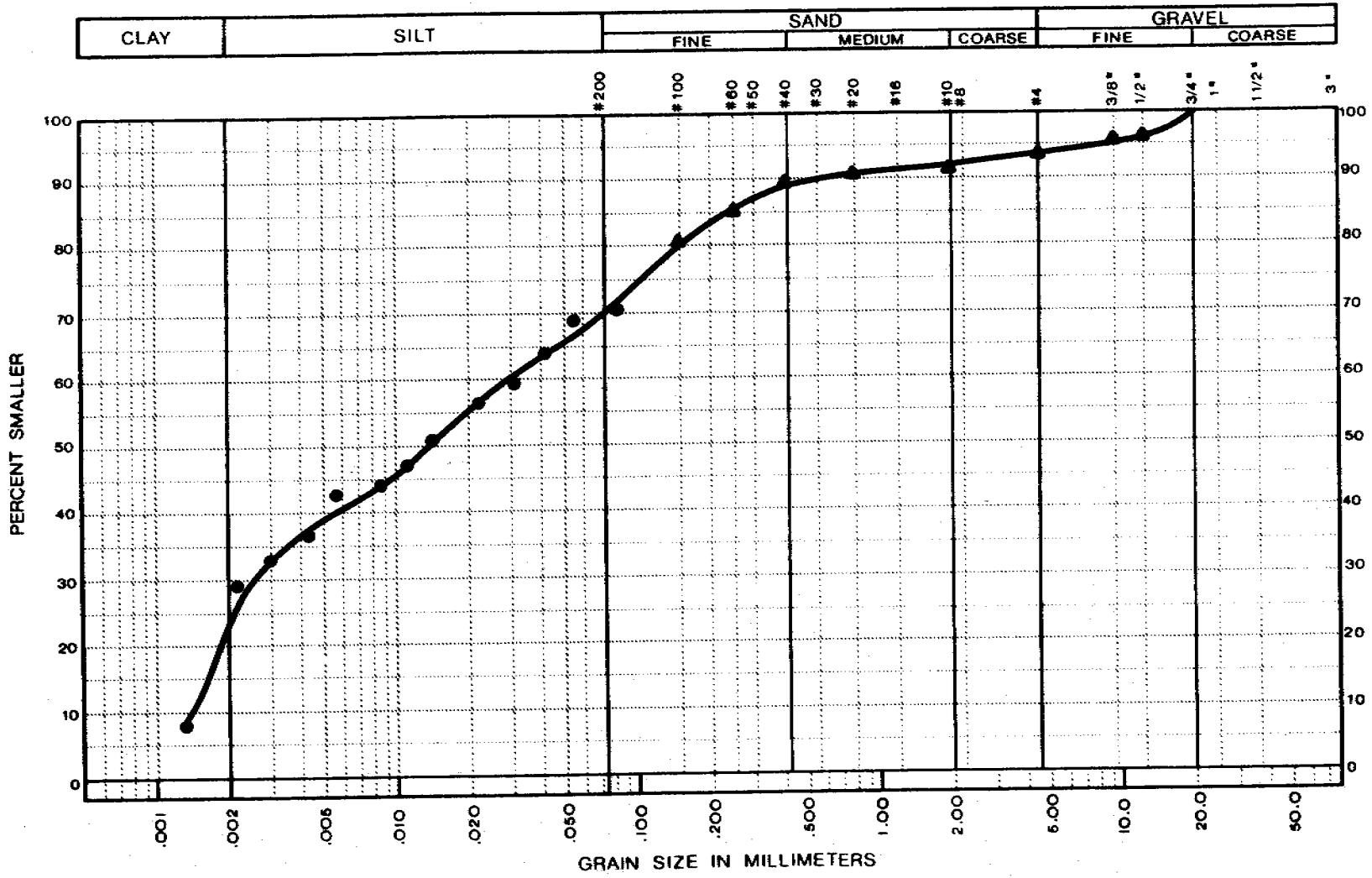
C.71

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE:

HOLE NO.: AS6-B
SAMPLE NO.:
DEPTH: 10 - 12½

SAMPLE DESCRIPTION:
CLAY (TILL)
- silty
- sandy

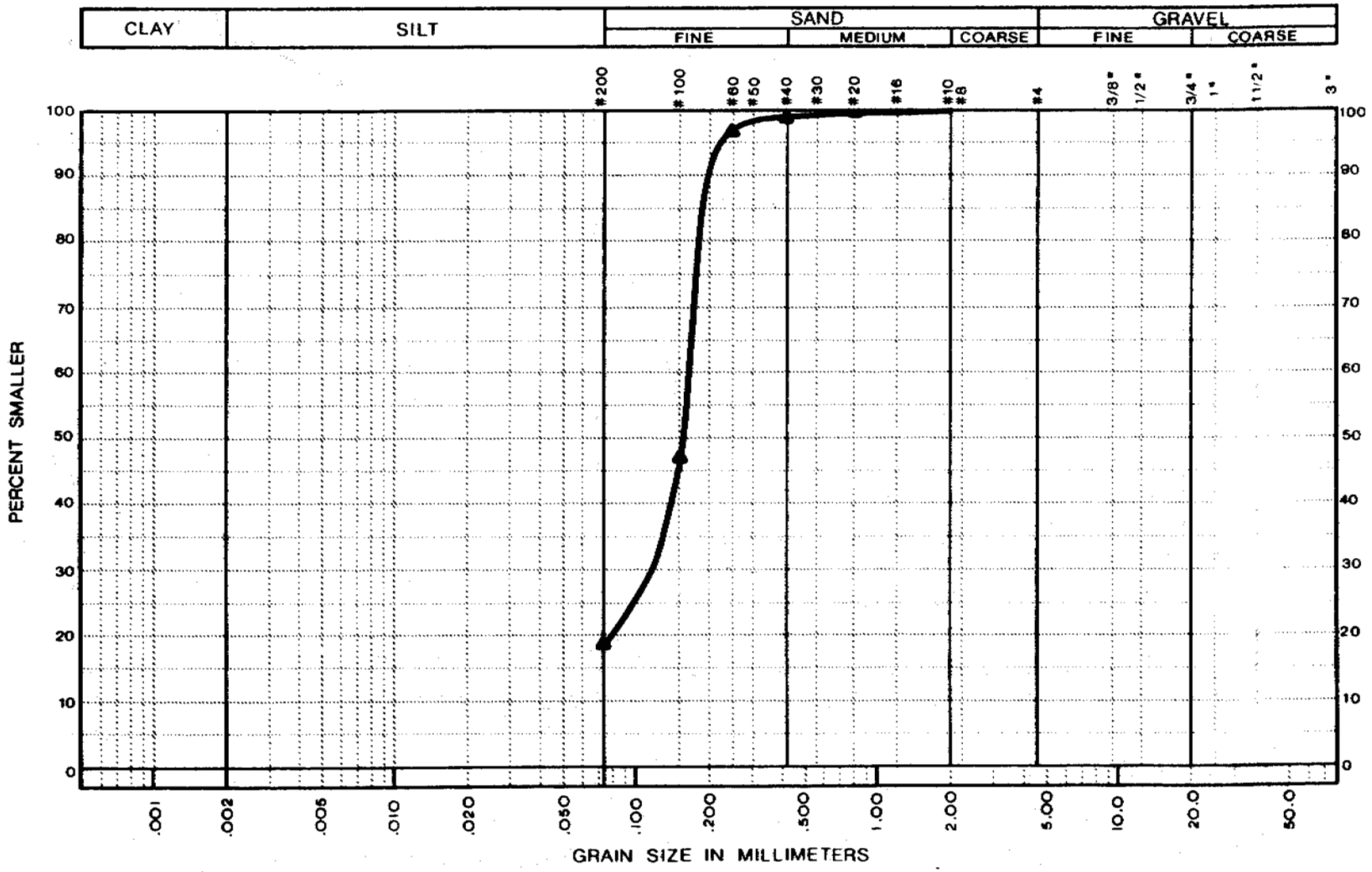


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 20/75

HOLE NO.: 1-C
SAMPLE NO.:
DEPTH: 6.0 - 8.0

SAMPLE DESCRIPTION:
SAND
- fine, uniform
- some silt



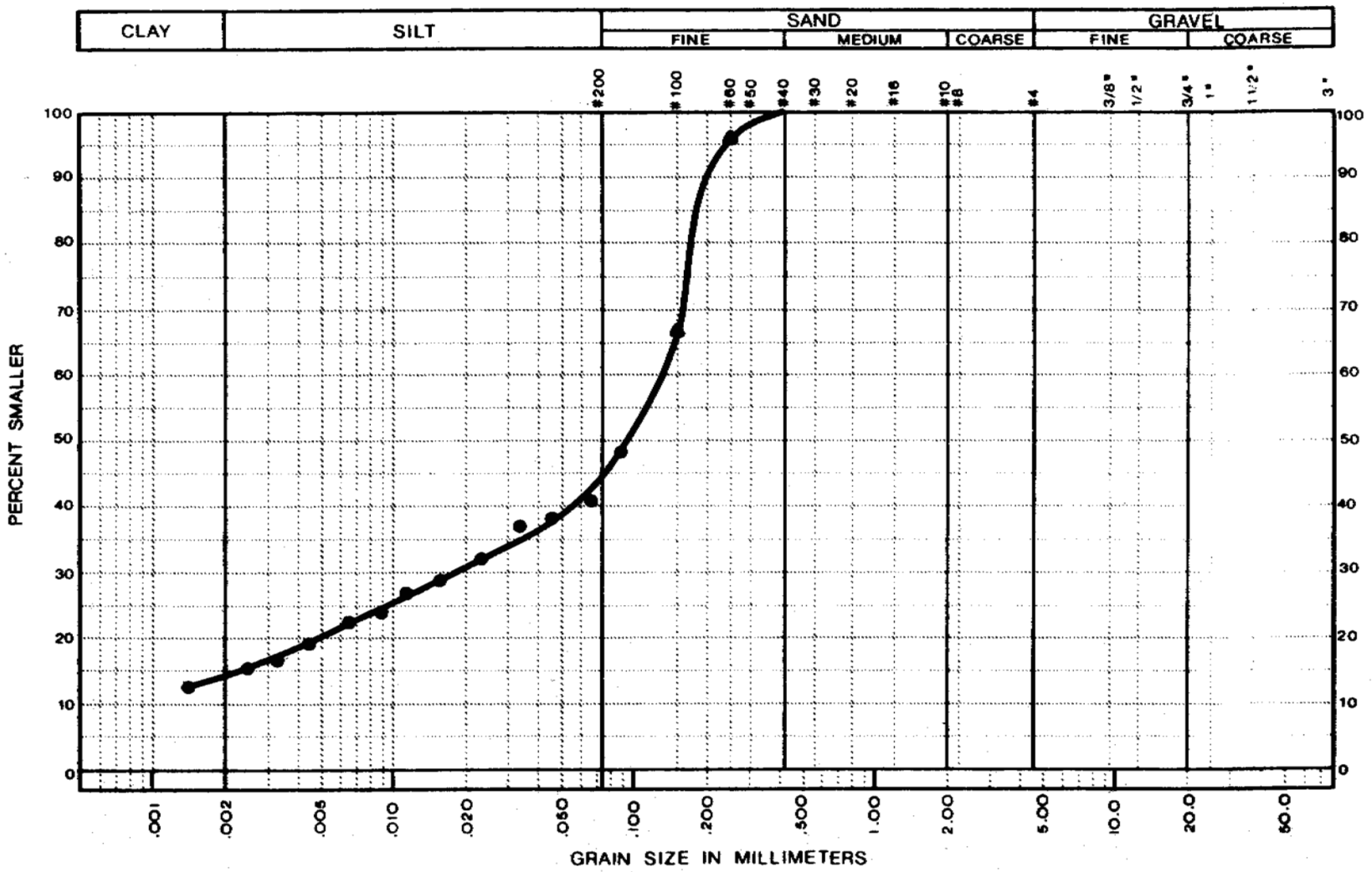
C.74

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: 1-C
SAMPLE NO.:
DEPTH: 11.5 - 13.5

SAMPLE DESCRIPTION:
SILT and SAND



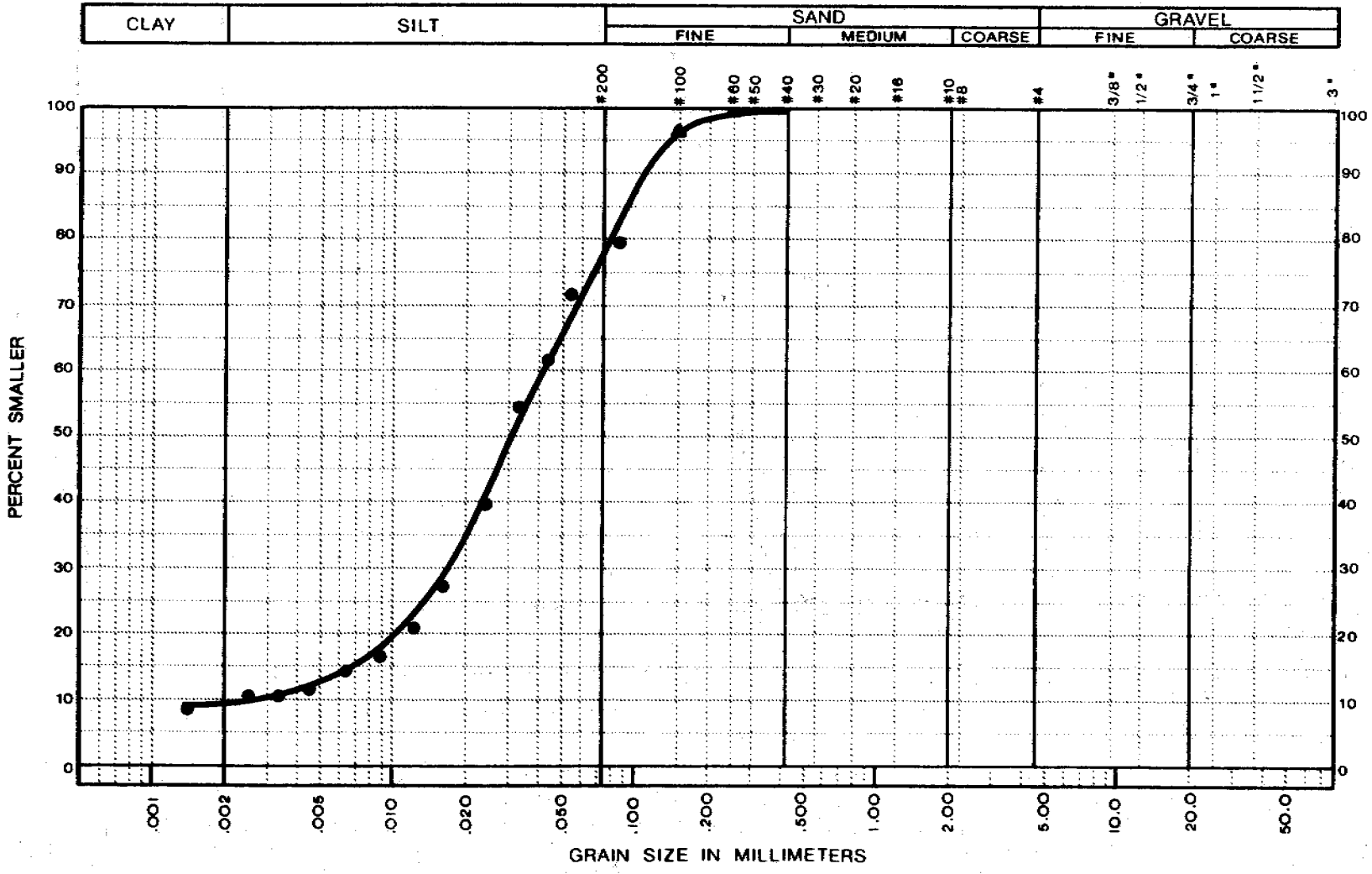
C.75

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: 2-C
SAMPLE NO.:
DEPTH: 5.6 - 7.6

SAMPLE DESCRIPTION:
SILT
- some clay



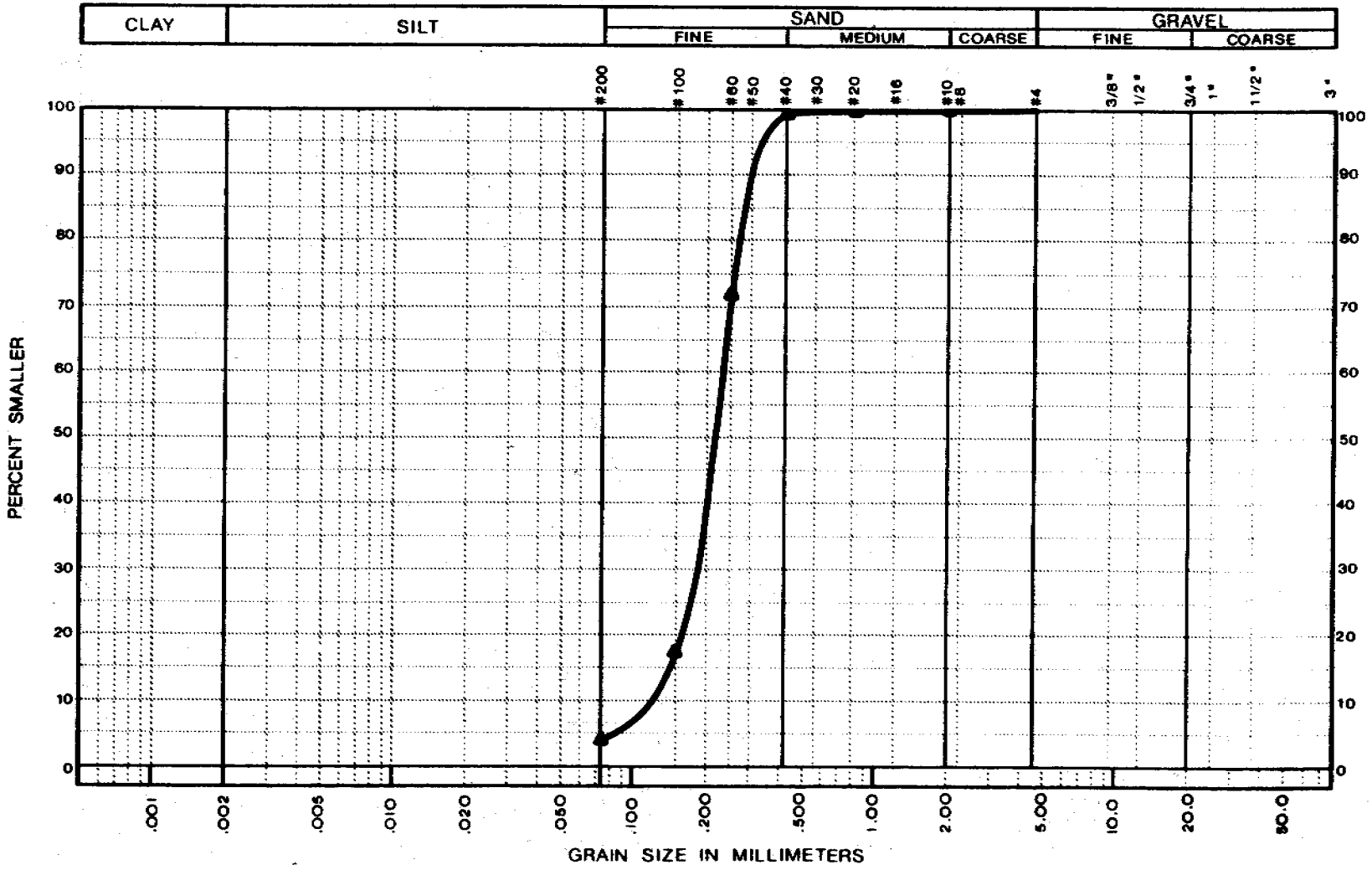
C.76

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 20/75

HOLE NO.: 2-C
SAMPLE NO.:
DEPTH: 11.0 - 13.2

SAMPLE DESCRIPTION:
SAND
- fine, uniform
- tr. of silt



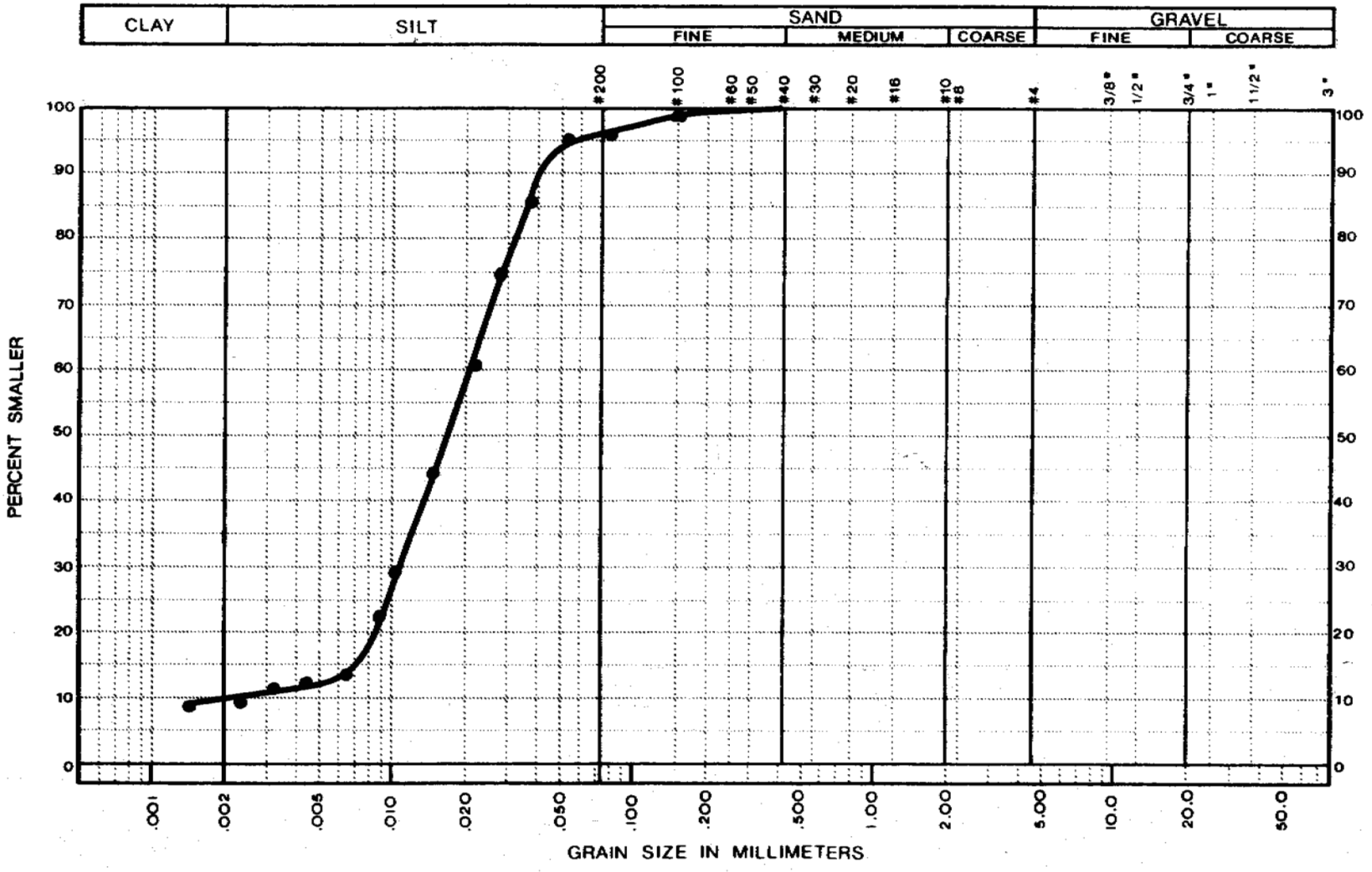
C.77

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept. 5/75

HOLE NO.: 3-C
SAMPLE NO.:
DEPTH: 9 - 11

SAMPLE DESCRIPTION:
SILT

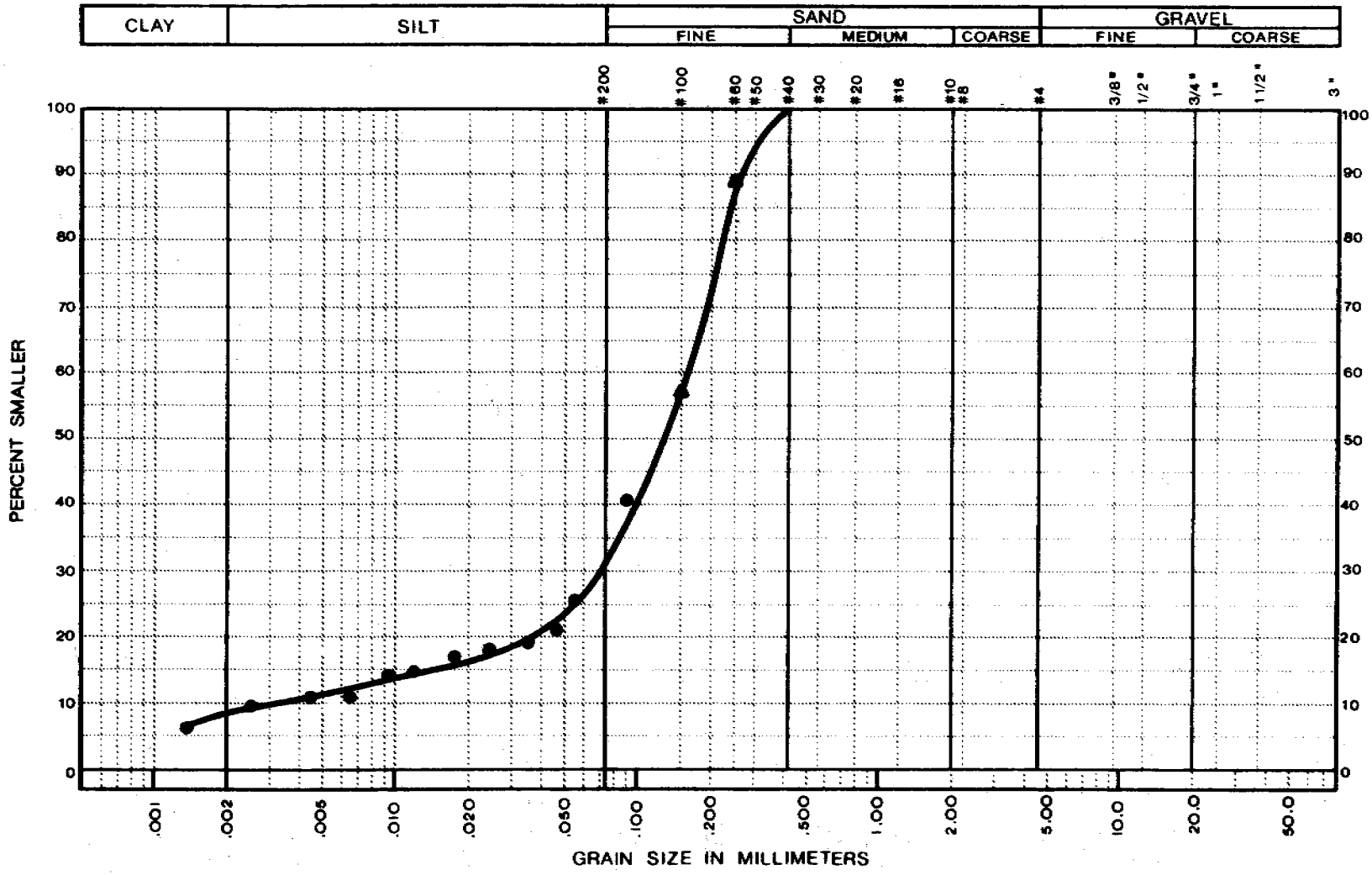


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 27/75

HOLE NO.: 3-C
SAMPLE NO.:
DEPTH: 16.5 - 18.5

SAMPLE DESCRIPTION:
SAND
- silty

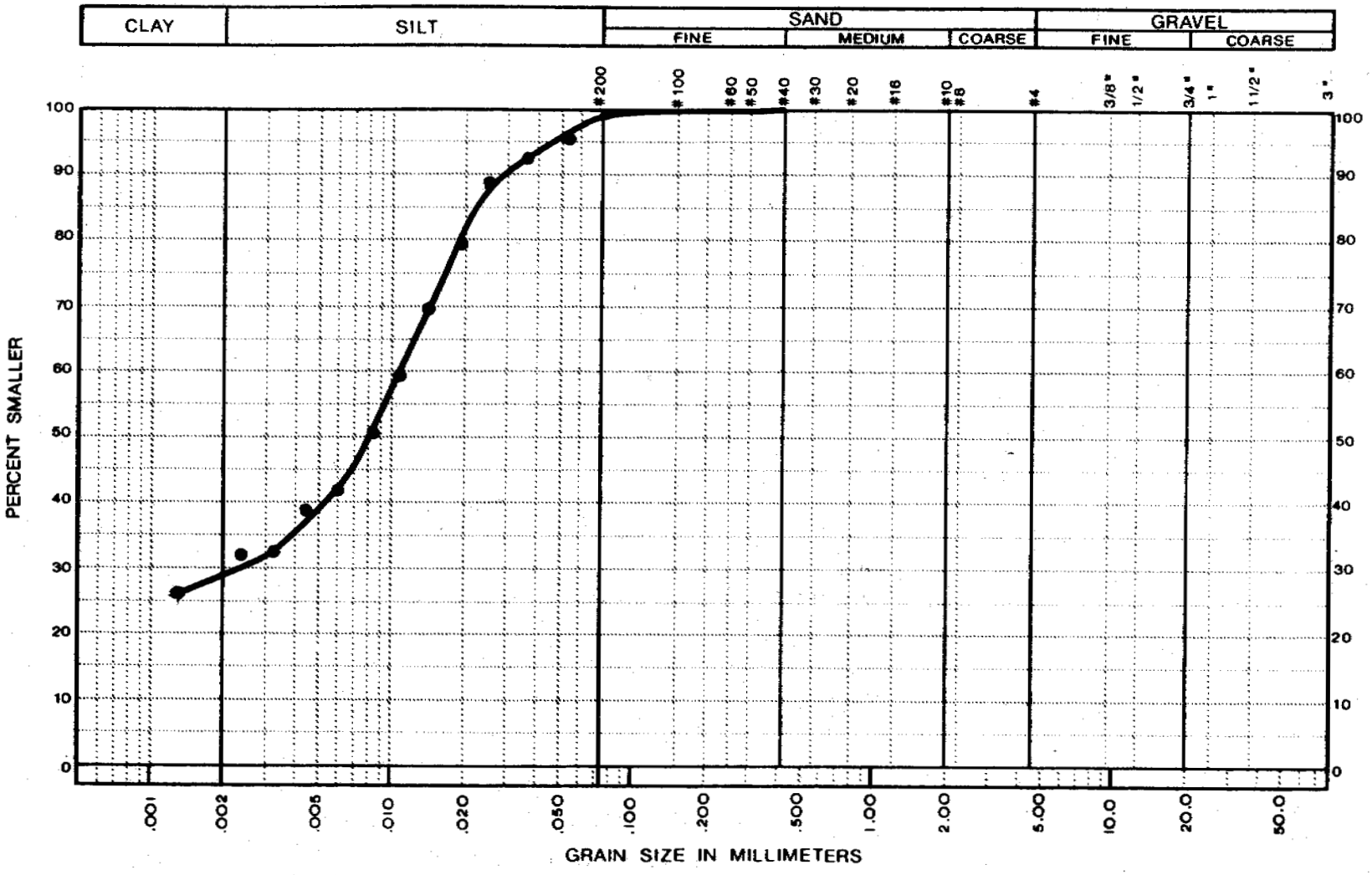


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 26/75

HOLE NO.: 3.C
SAMPLE NO.:
DEPTH: 4.8 - 7.5

SAMPLE DESCRIPTION:
CLAY
- silty



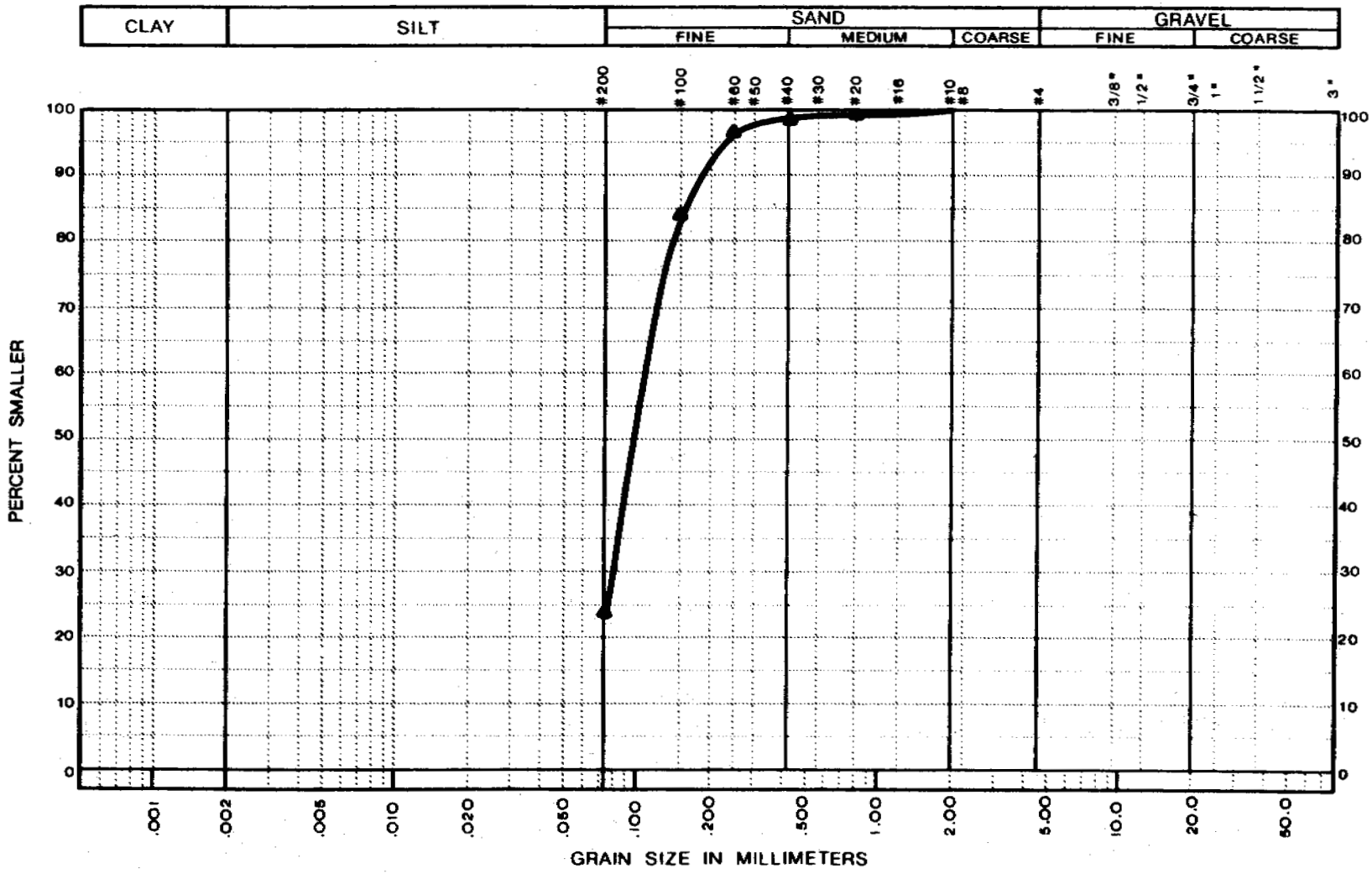
C.80

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: I-1140
DATE: Aug. 20/75

HOLE NO.: 5-C
SAMPLE NO.:
DEPTH: 10.2 - 12.2

SAMPLE DESCRIPTION:
SAND
- fine
- silty



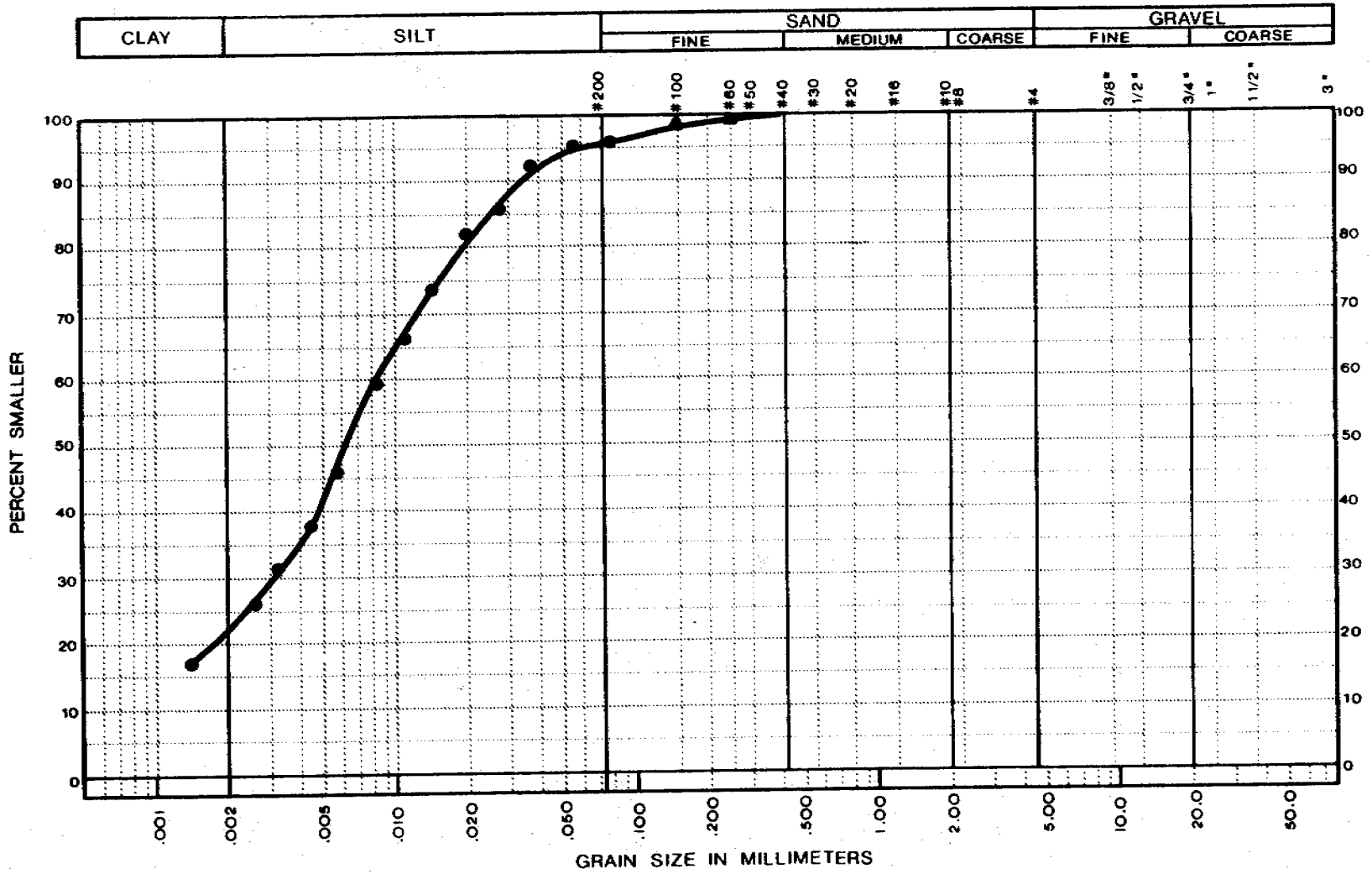
C.81

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept. 12/75

HOLE NO.: 6-C
SAMPLE NO.:
DEPTH: 3.4 - 5.6

SAMPLE DESCRIPTION:
SILT
- clayey



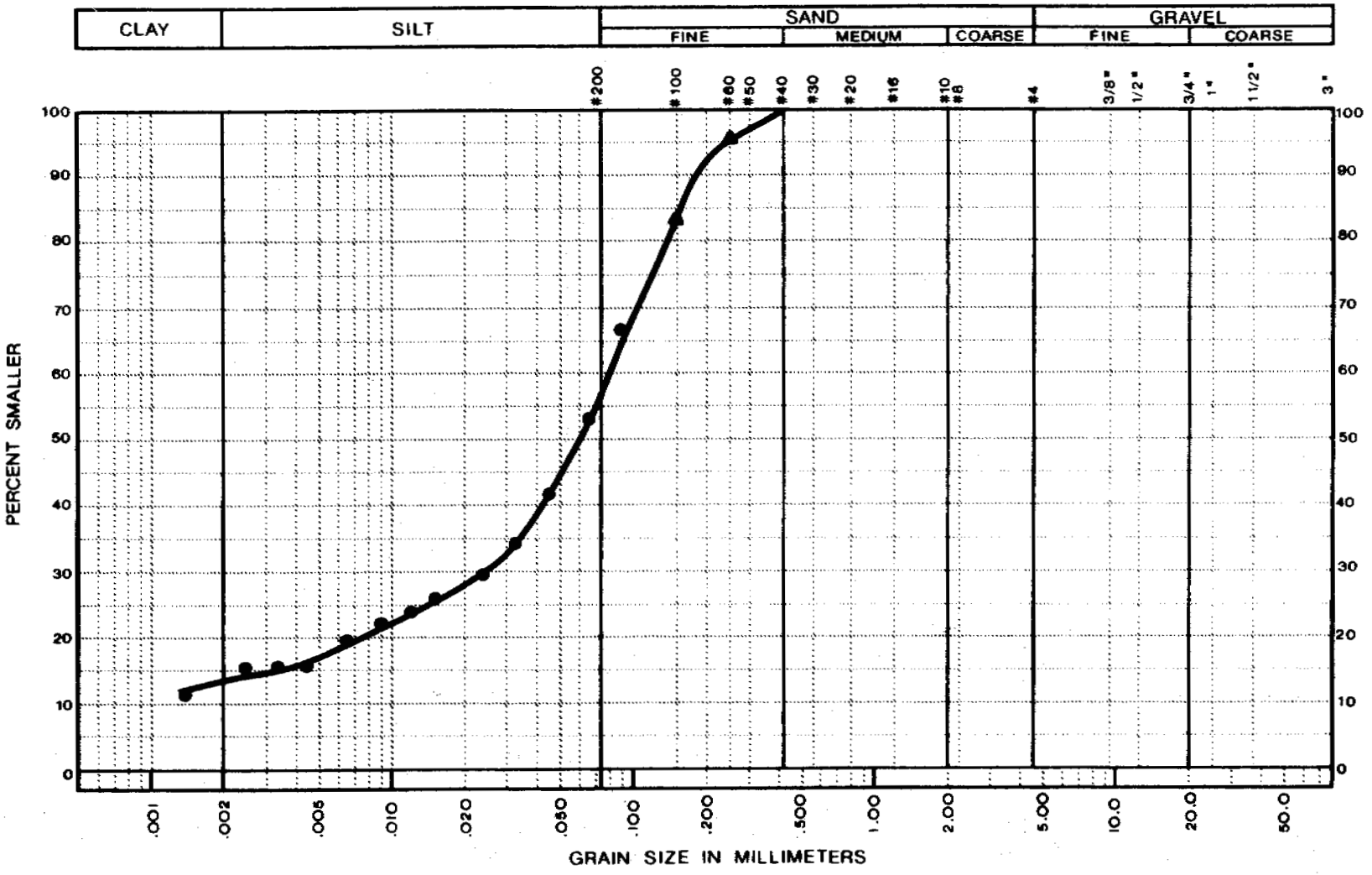
C.82

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 20/75

HOLE NO.: 6-C
SAMPLE NO.:
DEPTH: 10.4 - 12.5

SAMPLE DESCRIPTION:
SILT-SAND

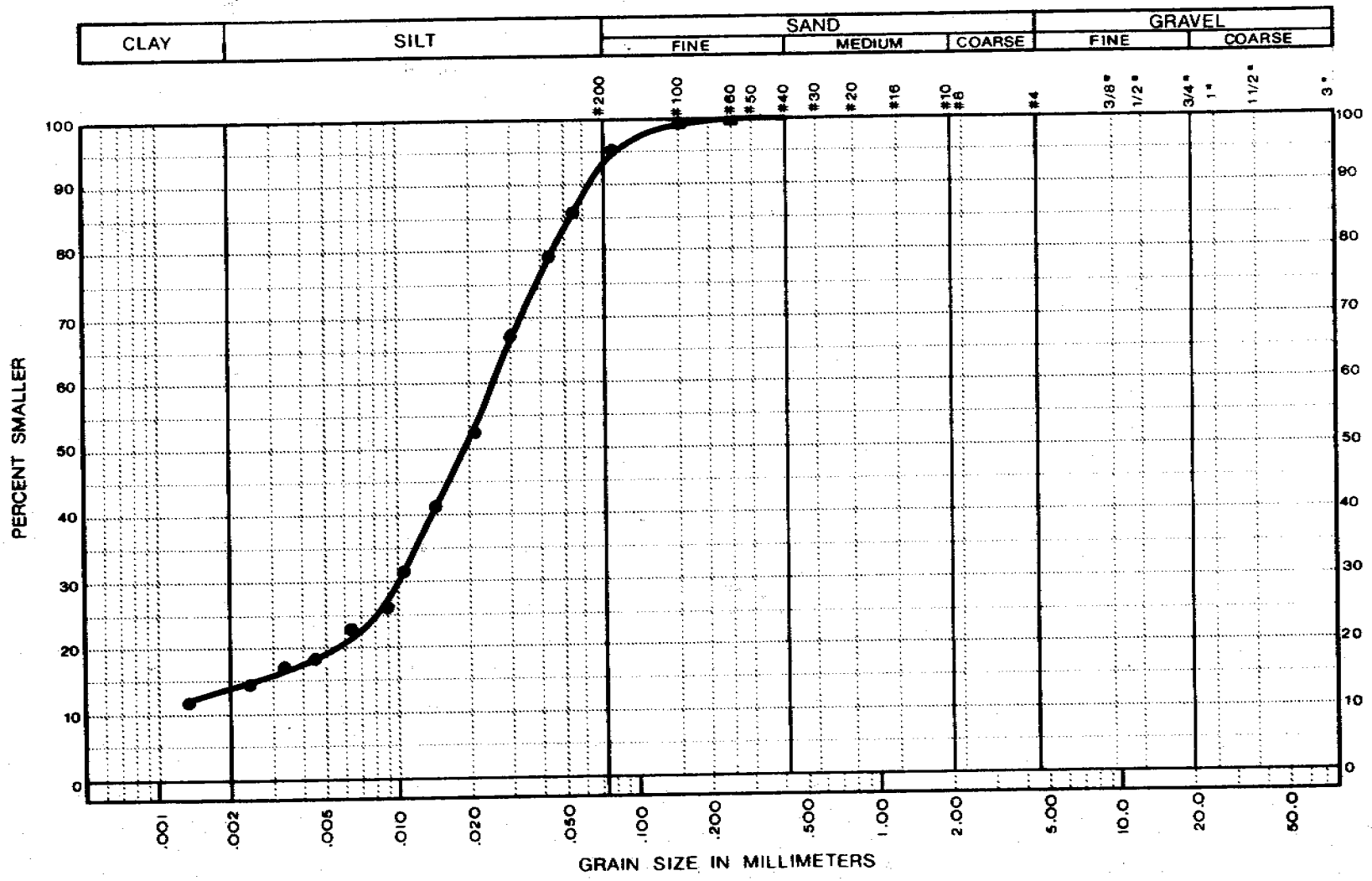


GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept 12/75

HOLE NO.: 7-C
SAMPLE NO.:
DEPTH: 5.6 - 7.5

SAMPLE DESCRIPTION:
SILT
- clayey



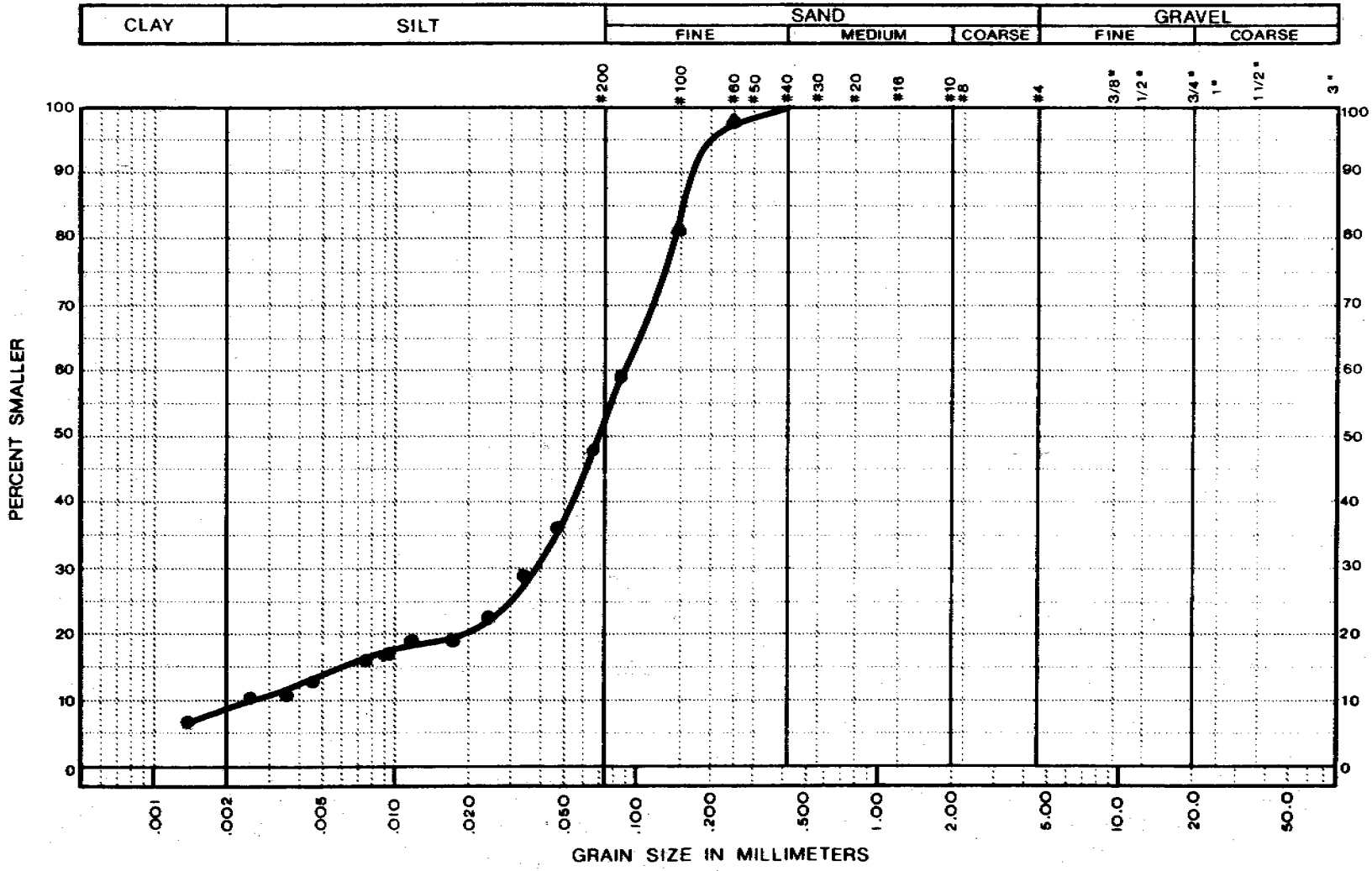
C.84

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Sept. 12/75

HOLE NO.: 7-C
SAMPLE NO.:
DEPTH: 9 - 12

SAMPLE DESCRIPTION:
SAND
- very silty



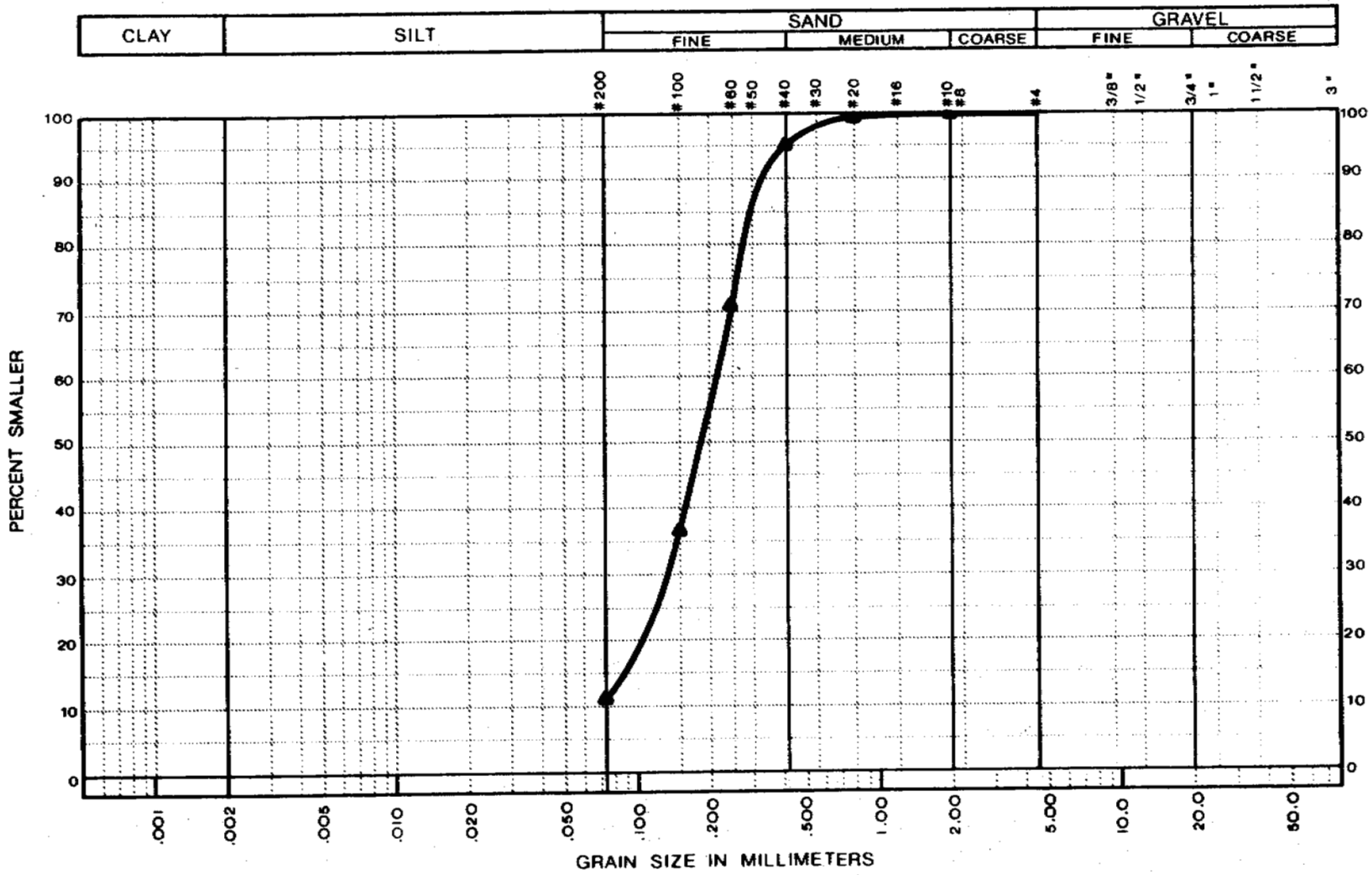
C.85

GRAIN SIZE DISTRIBUTION

PROJECT: Parsons Lake Gas Plant
JOB NO.: 1-1140
DATE: Aug. 20/75

HOLE NO.: R-2
SAMPLE NO.:
DEPTH: 5.4 - 7.5

SAMPLE DESCRIPTION:
SAND
- fine



C.86

SUMMARY OF TEST RESULTS

JOB No. 1-1140

TEST HOLE	DEPTH	NATURAL WATER CONTENT	Atterberg Limits			MECHANICAL ANALYSIS				SPECIFIC GRAVITY	ORGANIC CONTENT %	DRY DENSITY PCF	STRATA CLASSIFICATION
			W_L	W_P	PI								
	feet	%	%	%	%	% CLAY	% SILT	% SAND	%GRAVEL				
SITE A													
A9	3.3 - 6	59				11	31	58	0				
B3	3.5 - 5	76				13	71	14	2				
B5	7.5 -10.3	58				13	78	9	0				
B9	3.5 - 5.8	122				16	74	10	0				
	10 - 12.5	21	24.2	16.7	7.5	18	52	30	0				
B11	3.2 - 6.0	83				14	76	10	0				
C1	0 - 3.5	38	38.8	20.9	17.9	32	42	26	0				
C3	8.4 -10.6					10	76	14	0				
	12-13.2	68	38.5	17.1	21.3	21	47	28	4				
C4	10.3-13	81				8	59	33	0				
C5	13.2-15	22	37.4	19.7	17.7	27	50	20	3				
	17.4-18.9	26				30	46	24	0				
C7	13.5-15.8	28				24	51	25	0				
C9	13.5-16.2	31				15	51	34	0				
D2	3.8 - 6.5	97	N/P			9	84	7	0				
	6.5 - 8.5					8	77	15	0				

C.88

EBA Engineering Consultants Ltd.

Drwg. No. _____

SUMMARY OF TEST RESULTS

JOB No. 1-1140

TEST HOLE	DEPTH	NATURAL WATER CONTENT	Atterberg Limits			MECHANICAL ANALYSIS				SPECIFIC GRAVITY	ORGANIC CONTENT %	DRY DENSITY PCF	STRATA CLASSIFICATION
			W_L	W_P	PI								
	feet	%	%	%	%	% CLAY	% SILT	% SAND	%GRAVEL				
SITE A													
D3	6.5-8.3	77	36.5	20.4	16.1	22	50	26	2				
D5	3-4.8	66				35	43	21	1				
D8	5.1-7	100	30.6	22.9	7.7	22	74	4	0				
	9-10.5	54				17	73	10	0				
D10	3.3-5.7	33				8	28	64	0				
	5.7-6.4	26				9	48	53	0				
D12	3.8-6.6	83		N/P		10	75	15	0				
D13	10.2-12	22				4	26	69	1				
	26.8-28	16	34.4	18.4	16.0	31	41	26	2				
E2	3.3-5	102	32.2	23.5	8.7	12	70	18	0				
E3	6-8.2	101				30	47	22	1				
	8.2-11.3	15	40.6	20.2	20.4								
	14-16	7				0	10	90	0				
	24.4-27.2	8				20	52	28	0				

C.89

EBA Engineering Consultants Ltd.

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SUMMARY OF TEST RESULTS

JOB No. 1-1140

TEST HOLE	DEPTH	NATURAL WATER CONTENT	Atterberg Limits			MECHANICAL ANALYSIS				SPECIFIC GRAVITY	ORGANIC CONTENT %	DRY DENSITY PCF	STRATA CLASSIFICATION
			W_L	W_P	PI								
	feet	%	%	%	%	% CLAY	% SILT	% SAND	%GRAVEL				
SITE A													
E4	3.5-6.4	105	40.5	29.7	10.8	10	56	34	0				
	8.2-11	79				30	49	17	4				
	12.8-15.5	27	38.3	19.5	18.9	22	45	23	0				
	18-18.3	20				34	41	25	0				
E5	4.2-6.8	30	41.9	21.2	20.7	30	42	23	5				
	10 -11.2	25	37.5	20.4	17.1	32	46	22	0				
E9	8 - 10	17				11	36	53	0				
F3	6.5-7.9	133				19	73	8	0				
F5	8.5-11.4	25	34.7	20.5	14.2	14	80	6	0				
F9	8-10.5	76				8	76	16	0				
G1	6.3-9.1	39				67	33	0	0				
G2	3.6-6.8	83	37.6	21.5	16.1	31	45	24	0				
G4	6.3-8.8	153		N/P		6	60	34	0				
G6	1.2-3.6	102				12	84	4	0				
G14	3.2-5	47				19	55	26	0				

C.90

EBA Engineering Consultants Ltd.

Drwg. No. _____

SUMMARY OF TEST RESULTS

JOB No. 1-1140

TEST HOLE	DEPTH	NATURAL WATER CONTENT	Atterberg Limits			MECHANICAL ANALYSIS				SPECIFIC GRAVITY	ORGANIC CONTENT	DRY DENSITY PCF	STRATA CLASSIFICATION
			W_L	W_P	PI								
	feet	%	%	%	%	% CLAY	% SILT	% SAND	%GRAVEL		%		
SITE A													
H7	3.2-5.5	39				8	30	57	5				
	5.5-8.4	52				9	23	64	4				
	10.8-12.8	24				17	67	16	0				
AS2	6.3-9.1	25				0	6	94	0				
SITE B													
A3	9.8-11	122				20	75	5	0				
A4	8.8-10.3	32				19	49	28	4				
	16-18.2	21	28.2	16.4	11.8	10	86	4	0				
B1	3-5	48				13	68	19	0				
B2	8.9-11.6	30	29.9	19.8	10.1	12	76	12	0				
	14-16.7	25	30.7	20.9	9.8								
C1	3.6-6	130	33.5	24.6	8.9	11	77	12	0				
	8.6-11	26	37.8	23.0	14.8	28	39	28	5				
C2	6.2-8.9	87				53	39	8	0				

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C.91

SUMMARY OF TEST RESULTS

JOB No. 1-1140

TEST HOLE	DEPTH	NATURAL WATER CONTENT	Atterberg Limits			MECHANICAL ANALYSIS				SPECIFIC GRAVITY	ORGANIC CONTENT %	DRY DENSITY PCF	STRATA CLASSIFICATION
			W_L	W_P	PI								
	feet	%	%	%	%	% CLAY	% SILT	% SAND	%GRAVEL				
SITE B													
C3	8-10	42				32	67	1	0				
C4	5.5-8	55	31.0	21.2	9.8								
D1	3.8-5.7	41				46	44	10	0				
E2	8.4-9.9	20				20	78	2	0				
E3	8.3-10.4	48	29.9	20.3	9.6	19	75	6	0				
E4	7-10					11	71	18	0				
F2	11-11.7	25	32.0	19.8	12.2								
G4	6-7.4					47	47	6	0				
H4	7-9.5	89	44.2	30.3	13.9	40	52	8	0				
AS2	3.5-5.5	109	35.3	28.4	6.9	14	81	5	0				
	10-12		21.2	21.9	9.3	12	81	7	0				
	12-14.5	32		N/P		8	84	8	0				
AS4	9-10.5	34				48	48	4	0				
	13-15	26				12	36	52	0				
AS6	10-12.5	27				23	49	21	7				

C.92

EBA Engineering Consultants Ltd.

Drwg. No. _____

SUMMARY OF TEST RESULTS

JOB No. 1-1140

TEST HOLE	DEPTH	NATURAL WATER CONTENT	Atterberg Limits			MECHANICAL ANALYSIS				SPECIFIC GRAVITY	ORGANIC CONTENT	DRY DENSITY PCF	STRATA CLASSIFICATION
			W_L	W_P	PI								
	feet	%	%	%	%	% CLAY	% SILT	% SAND	%GRAVEL		%		
SITE C													
1	6-8	28					18	82	0				
	11.5-13	24					5	95	0				
2	5.6-7.6	88				10	77	13	0				
	11-13.2	24					5	95	0				
3	4.8-7.5	67	34.1	20	14.1	29	68	3	0				
	9-11	32				9	86	5	0				
	16.5-18.5	62				8	19	73	0				
5	10.2-12.5	38					25	75	0				
6	3.4-5.6					23	75	2	0				
	10.4-12.5					13	46	41	0				
7	5.6-7.5	46	28.5	23.0	5.5	14	79	7	0				
	9-12					9	40	51	0				
ROADWAYS													
R2	5.4-7.5	39					40	90	0				

C.93

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