CONSTRUCTION MATERIAL POTENTIAL OF THE EASTERN GEORGIA COASTAL PLAIN

AN EVALUATION

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and
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ENVIRONMENTAL PROTECTION DIVISION
GEORGIA GEOLOGIC SURVEY

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Cover: Dunes near Stillmore, Emanuel County.

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ABSTRACT

Construction costs in the Georgia Coastal Plain are theoretically higher than they could be due to the fact that most coarse construction aggregate used there (primarily crushed stone) is transported from the Piedmont Province. The first of this three-part study, Bulletin 106, covers the western third of the Coastal Plain, the area west of I-75. The purpose of this, the second part, (Fig. 1), is to evaluate the potential construction aggregate reserves in the eastern third of the Coastal Plain. The study area covers 29 counties, which is approximately 13,000 square miles.

Sites within the study area were prioritized as to their potential for aggregate production. The bases of the prioritization are the soil type present, proximity to sand or gravel pits described in both published and unpublished literature, geomorphic features indicative of aggregate deposits, and proximity to active or recently inactive commercial producers of aggregate. One hundred and forty four samples from 115 sites were evaluated in order to determine whether or not deposits of economic value are present.

INTRODUCTION

Aggregate, as defined by industry, is composed of unconsolidated rock particles. Fine aggregate ranges from 0.075 mm to 4.75 mm in size; whereas, the size range for coarse aggregate is from 4.75 mm to 3.5 inches. Sand and gravel are generally divided into two categories: construction aggregate and industrial sand. Construction aggregate uses include asphaltic concrete sand, concrete sand, mortar sand, plaster sand, and road fill. The category of industrial sand includes such products as glass sand, foundry sand, abrasive sand (sand blasting, sawing, glass grinding), filtration sand, engine or traction sand, and ground silica for filler or abrasives.

Within the area reported, hydraulic dredging (usually in man-made ponds) is utilized to mine sand and gravel and to pump the slurry to screens and classifiers which size the sand and gravel. After sizing, the products are moved by conveyor belts to stockpiles.

Three general areas are delineated as most favorable for aggregate production. These areas are flood plains; dune fields, along the major rivers; and the Fall Line Hills District. In addition to the dune fields, seven deposits were conservatively judged to have reserves in excess of 100,000 cubic yards. The flood plain deposits along the major rivers and streams of the study area offer the best possibilities for commercial development of aggregate deposit.

PURPOSE AND SCOPE

Purpose

Within the coastal plain of Georgia, construction costs are higher than necessary due to the fact that aggregate is transported great distances from the Piedmont Province to construction sites in the Coastal Plain Province. Therefore, if adequate aggregate reserves, particularly coarse aggregate, could be located in the Coastal Plain, resulting in a reduction in haulage distance from plant to job site, construction costs could be lowered.

The purpose of this study is to evaluate the aggregate potential of the eastern Coastal Plain (Fig.1) in order to locate favorable areas for aggregate production. Current aggregate producers within the study area were also evaluated as to production, acreage owned, depth of current mining, products, and market area.

Since it is not always possible to anticipate the geographic areas in which the demand for aggregate may occur, demographic divisions were avoided. This should provide a better indication of the availability of both fine and coarse aggregate deposits.

Scope

This study area is that part of the Coastal Plain Province of Georgia that lies east of a line drawn north to south along the western borders of Warren, Glascock, Jefferson, Emanuel, Toombs, Appling, Bacon, Pierce, Brantley and Charlton counties. This encompasses approximately 13,000 square miles, and includes 29 counties.

PREVIOUS WORK

The major work concerning sand and gravel exploration and evaluation in Georgia is that of Teas

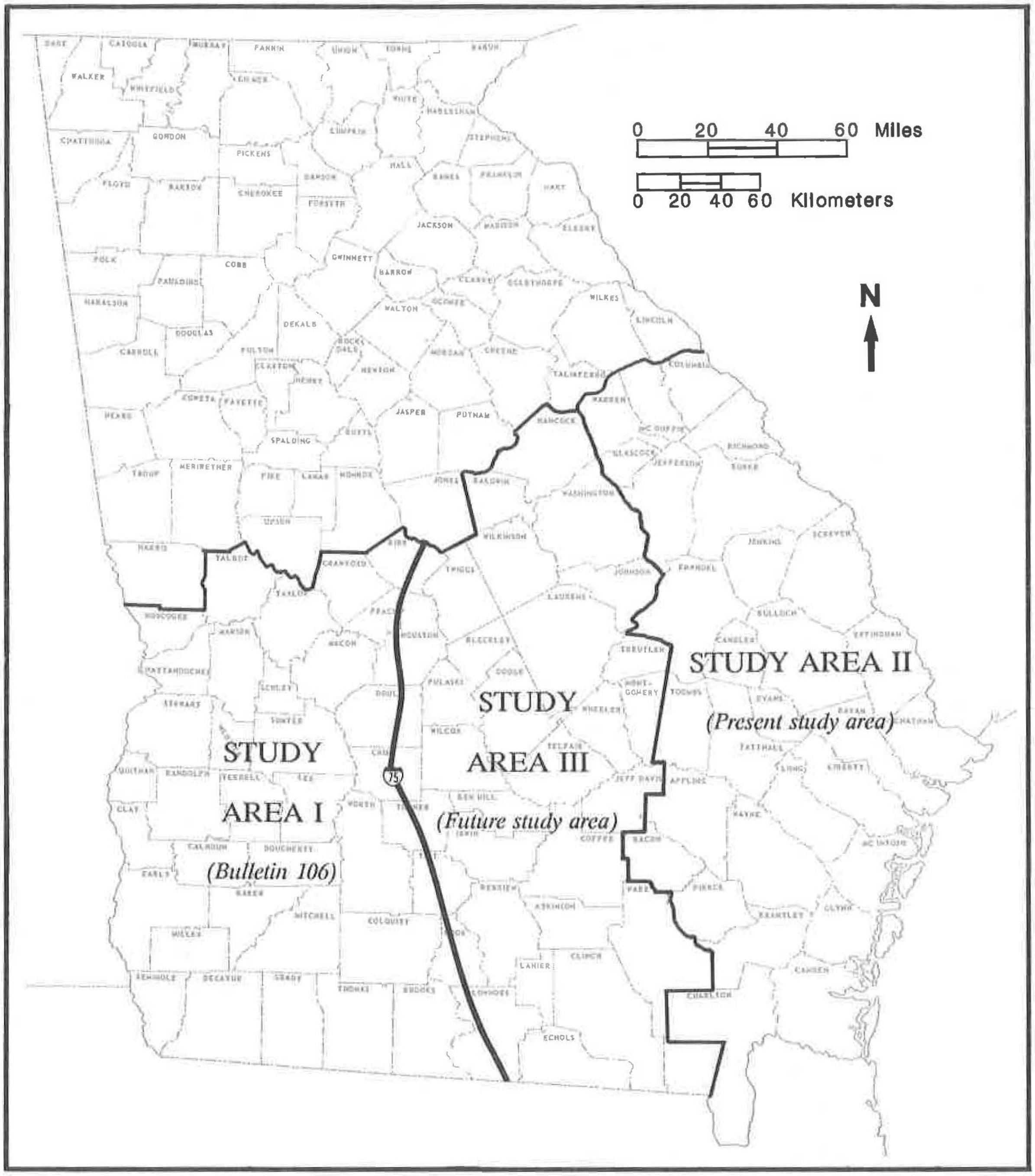


Figure 1. Location of Study Area.

(1921). In addition to canvassing and discussing classification, properties, testing, procedures, uses, transportation and production methods of sand and gravel, Teas performed a survey of sand and gravel resources of the State. These locations can be identified in this report by the notation Ts followed by a number.

The mineral resources of the Central Savannah River Area were studied by Hurst, et al. (1966). They reported on the sand and gravel resources of Burke, Columbia, Emanuel, Glascock, Jefferson, Jenkins, McDuffie, Screven and Warren Counties. Their study included a brief description of various pits and outcrops in that area. These locations can be identified in this report by the notation CSRA, followed by the location number from the report.

The Department of Natural Resources (Environmental Protection Division) of Georgia publishes a listing of surface mining and land reclamation activities yearly. This publication lists all permitted surface mining activities since January 1, 1969. Important information concerning each operator, such as, the product mined, operator, county of operation, acres permitted, acres reclaimed, and the status of the operation (whether active or inactive) is contained in this publication.

Steele and O'Connor (1987) outlined mining operations in Georgia. This publication lists mineral commodities by county, their producers, and plant locations.

PHYSIOGRAPHY OF THE STUDY AREA

The study area lies within the Coastal Plain Province of Georgia. Five districts are present in the study area: they are the Fall Line Hills, Vidalia Upland, Bacon Terraces, the Okefenokee Basin, and the Barrier Island Sequence Districts (Fig.2).

Clark and Zisa (1976) described these districts as follows:

"Fall Line Hills District - The Fall Line is the northern boundary of this district as well as the boundary between the Atlantic Plain and the Appalachian Highlands Major Divisions. Geologically, it is the contact between the Cretaceous and younger sediments of the Coastal Plain and the older, crystalline rocks of the Piedmont. Several stream characteristics change as they flow south through this area: rapids and shoals are common near the geologic contact, floodplains are considerably wider on the younger sediments and the frequency of stream meanders increases.... The southern boundary then closely follows the northernmost occurrence of the undifferentiated Neogene geologic unit which underlies the Vidalia Upland. The Fall Line Hills District is highly dissected with little level land except the marshy floodplains and their better drained, narrow stream terraces. Stream alleys lie 50 to 250 feet below the adjacent ridge tops... Relief gradually diminishes to the south and east. Maximum elevations are approximately 760 feet between Columbus and Macon and gradually diminish to a minimum elevation of 150 feet south of Augusta.

"Vidalia Upland District - The Vidalia Upland District is a moderately dissected area with a well developed dendritic stream pattern on gravelly, clayey sands. Floodplains are narrow except along the principal rivers which have a wide expanse of swamp bordering both sides of the channel. Relief varies from 100 to 150 feet. Elevations in the district range from 500 feet in the northwest to 100 feet in the southeast indicating the regional dip. The northern and northwestern boundary approximates the northernmost occurrence of the undifferentiated Neogene geologic unit. The southwestern and southern boundary is the base of the Pelham Escarpment and the southern drainage divide of the Altamaha River. The southeastern boundary follows the Orangeburg Escarpment at approximately the 150 foot elevation. The escarpment rises 50-70 feet above the Barrier Island Sequence District.

"Bacon Terraces District - Several moderately dissected terraces, generally parallel to the present coastline, are detectable on topographic maps of the Bacon Terraces District. However, they are very difficult to observe on the ground because the east facing scarps are very subtle. The terrace levels occur at elevations of 330-310 feet, 295-275 feet, 265-255 feet, 240 feet, 230 feet, 215-190 feet, and 180-160 feet. This district, on the north, west, and south, corresponds to the Satilla River drainage basin with its boundaries on the basin divide. The eastern boundary is the western base of Trail Ridge at approximately the 150 foot elevation. The southeast-trending, very extended, dendritic drainage pattern has formed on Upper Tertiary sediments...

"Okefenokee Basin District - Low relief, decreasing to the southeast, and numerous swamps are characteristic of the Okefenokee Basin District. Relief varies from approximately 50 feet to less than 5 feet. Elevations in the district range from 240 feet in the northwest on Pliocene - Pleistocene deposits to 75 feet in the southeast on Pleistocene deposits..... The northern and western boundaries of the district coincide with the northern and western drainage divides of the

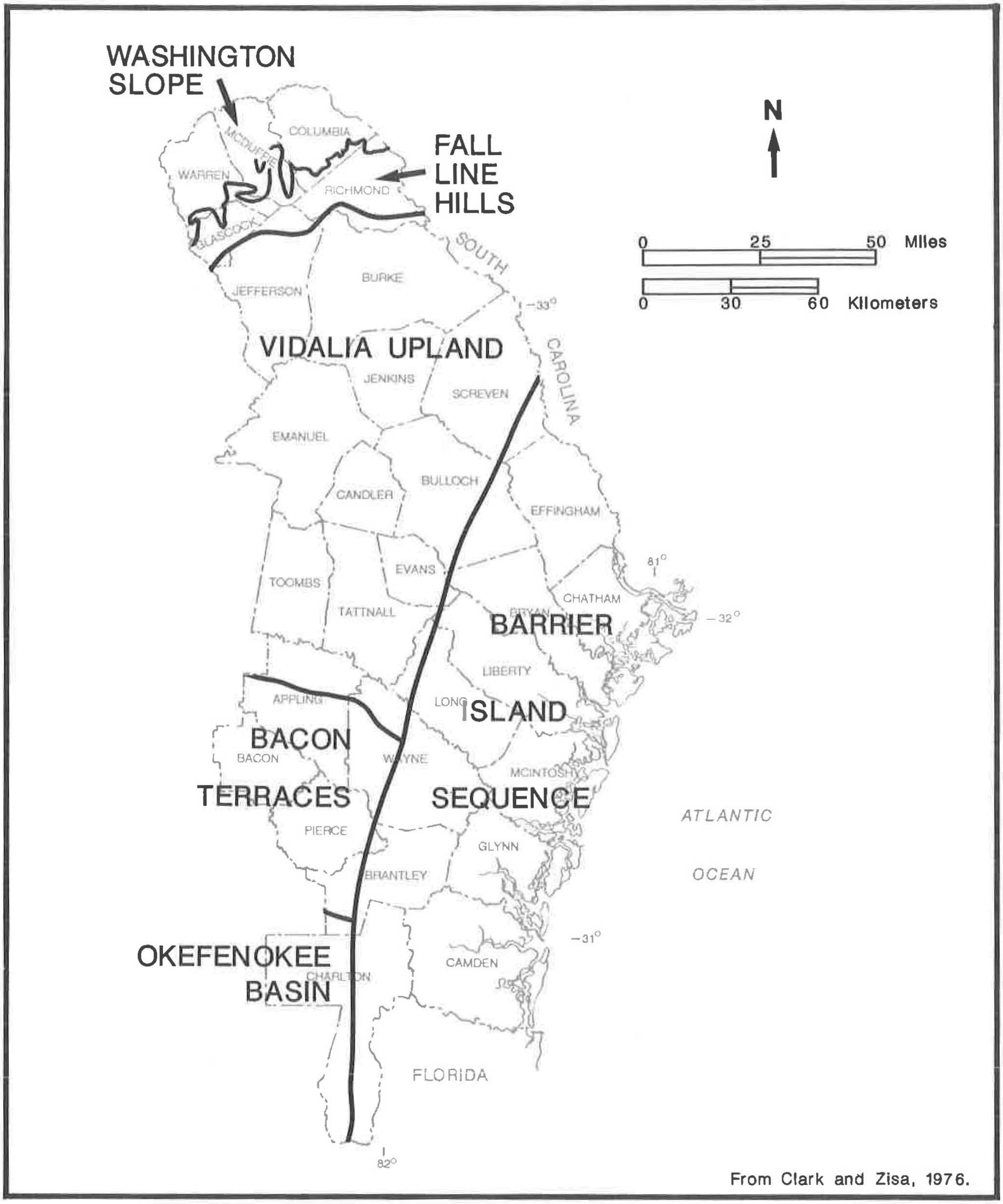


Figure 2. Physiographic Provinces of the Study Area.

Suwannee River. The eastern boundary is the western base of Trail Ridge.

"Barrier Island Sequence District - Pleistocene sea levels advanced and retreated several times over the Barrier Island Sequence District to form a step-like progression of decreasing altitudes toward the sea. These former, higher sea levels existed as barrier island-salt marsh environments similar to the present coast. The former sea levels left shoreline deposit complexes parallel to the present coastline at characteristic elevations: Wicomico, 160-95 feet; Penholoway, 70-76 feet; Talbot, 40-46 feet; Pamlico, 25 feet; Princess Anne, 13 feet; Silver Bluff, 5 feet; Holocene, the present mean sea level...

Relief varies from 50 to 75 feet on the east side of Trail Ridge to just a few feet near marshes and along the coast. Maximum elevations are approximately 160 feet on Trail Ridge. The western boundary is at the western base of Trail Ridge as far north as the Altamaha River, where the ridge becomes obscure. North of the Altamaha River the western boundary is the base of the Orangeburg Escarpment which approximates the 150 foot elevation."

GEOLOGY OF THE STUDY AREA

The study area includes Upper Cretaceous-Tertiary, Eocene, Miocene, Pleistocene and Holocene sediments as well as Quaternary Alluvium (Figs. 3,4).

Oconee Group

The Oconee Group (Huddlestun,1981) consists of light-gray to white, prominently horizontal to cross-bedded, laminated to thick bedded, finely to coarsely micaceous, kaolinitic, well- to poorly- sorted, fine- to coarse-grained sand, containing gravels and clasts to large irregularly shaped masses of kaolin especially at its base (P.F. Huddlestun, pers. comm.,1987).

These sediments cropout in McDuffie, Richmond, Glascock, Jefferson and Burke counties. The thickness varies from 0 to more than 300 feet.

Lisbon Formation

The Lisbon Formation is gray, silty, micaceous, clayey, fossiliferous marl of Middle Eocene age. It occurs in northeastern Burke County where it has, also, been termed the McBean Formation. The Lisbon averages 50 feet in thickness.

Huber Formation

Buie (1978) describes the Huber Formation as "...very diverse, ranging from beds of high-purity and sandy kaolin to thick, crossbedded members of coarse, pebbly sand, and even conglomerate composed of boulders of pisolitic kaolin..."

Barnwell Group

The Upper Eocene Barnwell Group in the study area consists of the Clinchfield Formation, Dry Branch Formation and the Tobacco Road Sand.

Clinchfield Formation

Typically, the Clinchfield is fine- to medium-grained, well sorted, generally thick-bedded, massive, fossiliferous, calcareous sand. Within the study area, the Clinchfield Formation consists of an up-dip Albion Member and a down-dip Utley Limestone Member (Huddlestun and Hetrick, 1985). Both of these members are discontinuous in areal occurrence.

The Albion Member consists of spiculite, spiculitic clay and mudstone and opal cemented, poorly bedded to massive sandy spiculite and spiculitic sandstone (Carver, 1972; Huddlestun and Hetrick, 1985). The thickness of the Albion varies from 0 to 22.5 feet.

The Utley Limestone Member of the Clinchfield Formation is a sandy, glauconitic, slightly argillaceous, fossiliferous limestone varying in thickness from 0 to greater than 36 feet (Huddlestun and Hetrick, 1985). It occurs in the Savannah River area, consistently from central Burke to central Screven counties, and is mainly found in the shallow subsurface.

Dry Branch Formation

The Dry Branch Formation consists of three members: the Twiggs Clay Member, the Irwinton Sand Member and the Griffins Landing Member. The units both interfinger with and grade into one another. The Twiggs Clay Member, generally present in the lower portion of the Dry Branch, is a pale greenish gray, locally calcareous, silty, montmorillonitic clay. In the Savannah River area it is as thin as 10 feet, and discontinuous in occurrence (Huddlestun and Hetrick, 1985). The Irwinton Sand member, which comprises the major portion of the Dry Branch present in the study area, is a fine- to medium-grained, well sorted, horizontal to undulatory to cross-bedded sand which contains noncalcareous, nonfossiliferous sand and discontinuous clay laminae. The Irwinton Sand Member is no more than 40 feet thick in the study area.

The Griffins Landing Member of the Dry Branch, which is restricted to the down-dip portion of the forma-

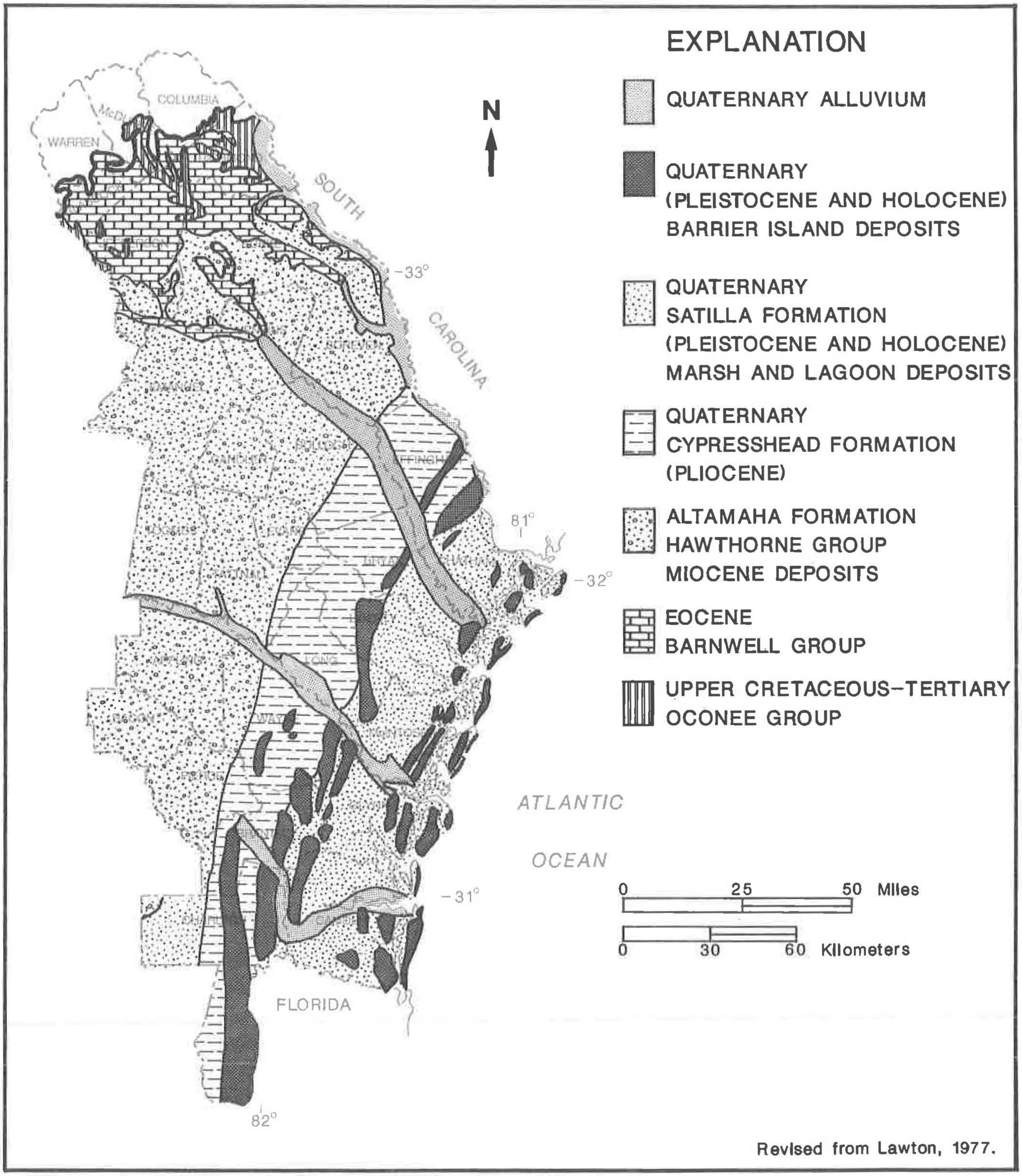


Figure 3. Geologic Map of the Study Area.

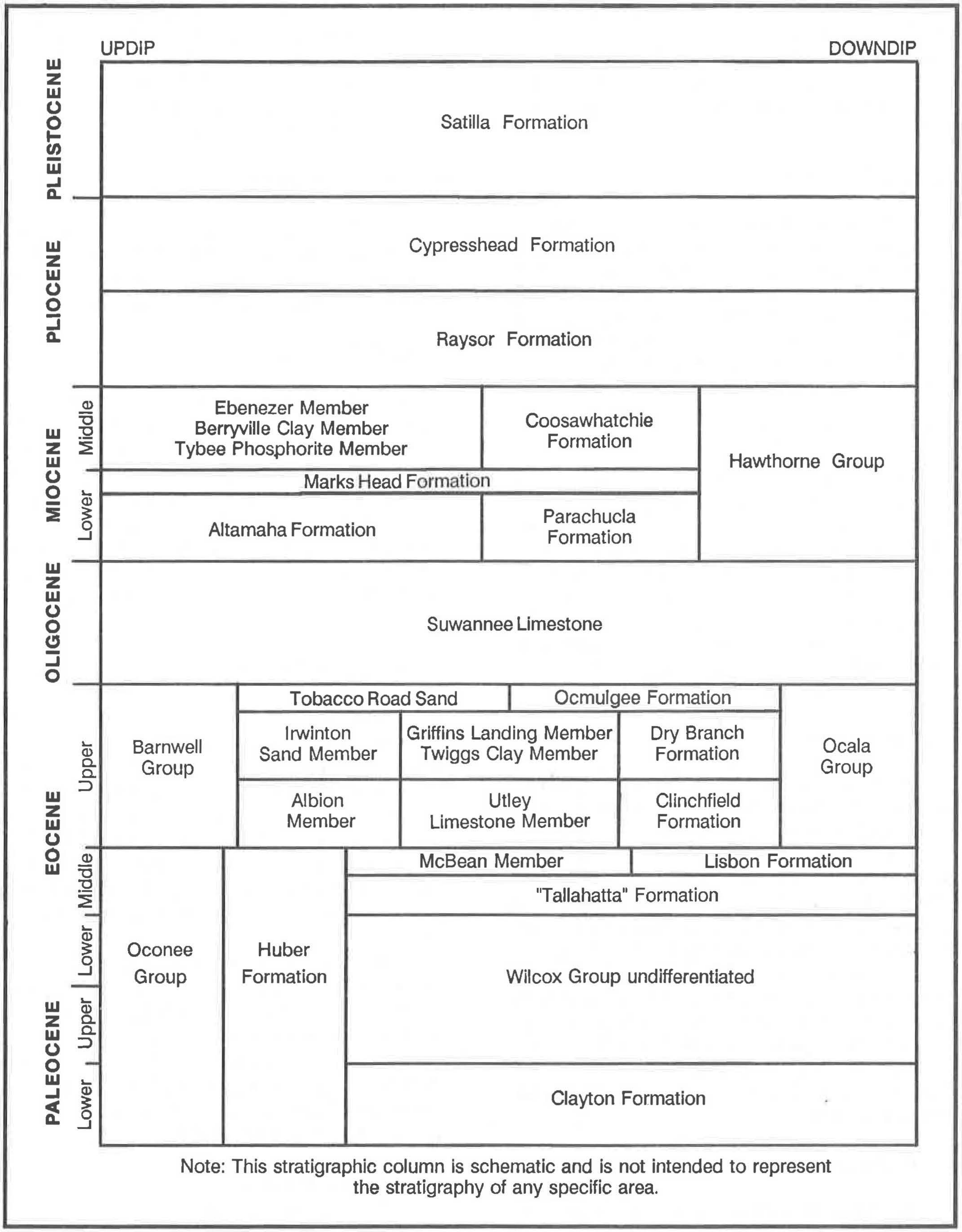


Figure 4. Generalized Stratigraphic Column of the Study Area.

tion in the study area east of the Ogeechee River, was described by Huddlestun and Hetrick, 1985 as "... a fairly well-sorted, massive to vaguely and rudely bedded, calcareous sand." The Griffins Landing Member is as much as 72 feet thick at its type locality in Burke County.

Tobacco Road Sand

The Tobacco Road Sand generally is a medium- to coarse-grained, poorly sorted, pebbly sand which is vaguely and thickly bedded and averages 20-30 feet in thickness. The Sandersville Limestone, a basal member of the formation in Washington County, Georgia, is a slightly sandy, thick-bedded, massive, fossiliferous limestone. Its maximum thickness is 19 feet (Huddlestun and Hetrick, 1985).

Suwannee Limestone

The Suwannee Limestone is a very pale orange, massive and thick-bedded fossiliferous, mealy limestone (Huddlestun, et al., in preparation). The outcropping Suwannee Limestone in the study area is restricted to the central part of northern Screven County. Elsewhere, it is a subsurface unit. The Suwannee reaches a maximum thickness of 50 feet in the study area (Huddlestun,et al., in preparation); however, according to M.E. Hartley (written communication), it is as thick as100 feet near Blue Springs,Screven County.

Altamaha Formation

Huddlestun, et al. (in preparation) described the Altamaha as follows: "The Altamaha Formation consists typically of thickly bedded, massive, argillaceous, moderately to poorly sorted, fine-to coarse-grained pebbly sand or sandstone, clayey sand, and sandy clay or claystone. There are local occurrences of prominently cross-bedded fluvial channel, cut-and-fill structures in which the bedding is thin to thick. The characteristic features of the Altamaha include very poor sorting of the sediments and wide ranging grain-size, the common occurrence of feldspar and the common but irregular induration of the sediment in outcrop." The Altamaha ranges from 100 to 150 feet thick in northern Screven County (P.F.Huddlestun, pers. comm., 1987).

Hawthorne Group

According to Huddlestun, in preparation, "The lithology of the Hawthorne Group is dominantly sand and clay. Subordinate lithic components of the Hawthorne Group include dolomite; dolostone; calcite; limestone; phosphorite; phosphate; silica in the form of claystone (opal cristobalite), chert, and siliceous microfossils; heavy minerals; carbonaceous material and lignite; zeolites; and fossils."

Parachucla Formation

The Parachucla Formation is an argillaceous sand to sandy clay with minor beds of calcareous, shelly sands and phosphatic, fossiliferous, sandy limestone or dolostone (Huddlestun, in preparation).

Marks Head Formation

According to Huddlestun, in preparation, "The Marks Head Formation consists of slightly dolomitic (rarely calcareous), phosphatic, argillaceous and sandy clay with scattered beds of dolostone, limestone, siliceous claystone. In general, quartz sand appears to be the dominant lithic component of the formation; whereas, clay is both a major and characteristic component." The clay mineral assemblage of the Marks Head is dominated by palygorskite and sepiolite.

Coosawhatchie Formation

Within the study area the exposed Coosawhatchie is represented by a lower member (Berryville Clay) and an upper member (Ebenezer) and in the coastal area by the Tybee Phosphorite Member.

The Berryville Clay is a yellowish to olive-gray silty, phosphatic, calcareous, siliceous clay (Huddlestun, in preparation). The Berryville is exposed in eastern Effingham County, where it is 9 feet thick at its type locality, but reaches 54 feet thick in the subsurface.

The Ebenezer Member is a gray to olive-gray, phosphatic, micaceous fine- to medium-grained, well-sorted clayey sand. The Ebenezer Member is exposed in eastern Effingham County where, at its type locality, it is 7 feet thick in outcrop. The Tybee Phosphorite is a commercial phosphorite in Chatham County, consisting of richly phosphatic argillaceous sand (Huddlestun, in preparation).

Cypresshead Formation

The Cypresshead Formation was described (Huddlestun, in preparation) as a "..well-sorted, fine-grained sand with thin discontinuous clay layers or laminae." Also present locally within the Cypresshead are coarse, pebbly, channel cut-and-fill sediments. Bedding in the Cypresshead is thin to massive. The Cypresshead is 23 feet thick in its type locality near Jesup, Georgia (Huddlestun, in preparation).

Satilla Formation

The Satilla Formation consists of variably fossiliferous, locally cross-bedded, fine- to medium-grained sands (Barrier Islands Deposits) and clays. The Satilla ranges up to 40 feet in thickness within the study area (Huddlestun, in preparation).

Quaternary Alluvium

The Alluvium present along the streams and rivers of the study area consists of clayey sands with some clay beds and lenses. The sands are fine- to coarse-grained and gravelly.

PROCEDURES AND METHODS

Delineation of Areas with Potential for Aggregate Production

Areas within the study area were prioritized as to their potential for production of aggregate. This prioritization was based on four factors: 1) soil type, 2) proximity to sand or gravel prospects or pits described in published literature, as well as locations obtained from unpublished material on file at the Georgia Geologic Survey, 3) proximity to active and inactive producers of sand and gravel, and 4) geomorphic features such as terrace surfaces and point bars (primarily along rivers).

Soil Type

The soil types (associations) used in targeting areas for potential aggregate production were selected from two types of county soil surveys. The two types are: (1) detailed, 1:20,000 scale, photographic base, soil surveys published by the United States Department of Agriculture (Soil Conservation Service) in cooperation with the University of Georgia (College of Agriculture) and (2) somewhat generalized, 1:63,360 scale surveys on file at the Georgia Geologic Survey, produced by the Georgia Department of Natural Resources (Office of Planning and Research). The detailed, photographic base surveys were used wherever possible; however, these are not available for all of the counties in the study area. In the counties without detailed soil surveys, the generalized soil surveys were used (see insert, Plate 1, for the survey used in each county).

The soil type or types used for targeting were selected after reviewing the sieve data of each county survey for the soil or soils which contained the coarsest sand and the least amount of fine material (<#200 mesh). The soil associations selected from the detailed soil surveys were Flomaton, Fripp, Helena, Kershaw, Klej, Kureb, Lakeland, Lakewood, Mascotte, Olustee, Paola, Tifton, and Troup. The soil associations selected from the generalized soil maps were #24 (example - Kershaw, Lakeland and Chipley), #32 (example - Kershaw, Lakeland, Lucy and Troup), #39 (example - Fuquay and Lakeland), and #41 (example - Mascotte, Alapaha and Rutledge). Following selection of the soil types, their areal extent was plotted on 1:24,000 scale topographic maps.

Sand and Gravel Prospects and Pits

The locations of gravel pits, sand pits, and prospects on file at the Georgia Geologic Survey as well as those discussed by Teas (1921) and those discussed by Hurst, et al. (1966)— which were considered to be of significance and, if they could be accurately located—were plotted on 1:24,000 scale topographic maps. The sand pits present on the 1:24,000 topographic maps were also used in prioritizing areas for aggregate production potential.

Active and Inactive Mines

The location of all active or recently inactive (since 1969) commercial aggregate mines within the study area, listed in the Department of Natural Resources (Environmental Protection Division) directory of surface mining reclamation activities and the mining directory of Georgia, published by the Georgia Geologic Survey, were plotted on 1:24,000 scale topographic maps. A telephone survey was carried out to verify and update the information contained in the directory of surface mining and in the mining directory. If the owner or former owner of a currently inactive aggregate mine could not be contacted, the information contained in the two directories was used.

Geomorphic Features

Each 1:24,000 scale topographic map within the study area was visually inspected for the presence of geomorphic features (point bars, river terraces and dune complexes) associated with sand and gravel deposits. Point bars were identified by their general lack of vegetation, flat to undulating surface, and their occurrence on the concave side of streams. Terraces (former valley floors) were identified by their generally flat topographic surface and their proximity to present day rivers and streams. Dune fields were recognized as being hills present, generally, along the north and east sides of major creeks and rivers. After these features were identified, their areal extent was outlined on the 1:24,000 scale topographic maps.

Prioritization

After plotting the four targeting variables (previously mentioned locations and features), a circle with a radius of 1 mile was circumscribed about each Teas locality, pit, and active or recently inactive aggregate mine. In order to assign a rank for aggregate potential to various sections of the study area, the area enclosed by one of the four targeting variables was assigned a rank of one (1). Where two of the targeting variable areas overlapped, the zone of overlap was assigned a rank of two (2). In a similar fashion, the overlap of three targeting variables produces a rank of three (3) and the overlap of four targeting variables produces a rank of four (4). For example, a soil body (or any of the other features or circular areas) would be assigned a value of one, but the portion of this soil body within one mile of an active aggregate mine (operation) would be assigned a value of two and; if this overlapping area was within a mile of a Teas sample locality, it would be assigned a value of three. The priority (rank) of the areas sampled is listed in the tables under the individual county descriptions.

Plate 1, which shows the potential for aggregate production within the study area, is a compilation of the prioritized 1:24,000 scale topographic maps.

Sampling

The sampling method, as discussed below, was designed to collect samples representative of actual "in place" material. The samples include fine- to coarse-grained particles. In normal commercial processing, the finer size particles are removed during washing and screening; thus, some substandard material is upgraded to a product meeting commonly accepted standards, such as those of the American Society of Testing Materials (ASTM).

Sampling was carried out to field check the information obtained from the aggregate potential map and to further evaluate the sand and gravel bodies potential for aggregate production. Areas within each county with high (two or greater) assigned values for aggregate potential, which were accessible by truck or boat, were examined. If these areas appeared to have any potential value based on field observations, they were sampled. In the event that only sites with low (one) assigned values for aggregate potential were present within the county, the sites selected for sampling were randomly selected. Sediment sampling was performed either by auger or by trenching.

Auger

At most localities, sampling was carried out using a truck-mounted Giddings' soil probe equipped with a 4.5 inch spiral auger. The depth of the auger holes varied depending on the point at which either the auger could not penetrate the sediment or the sample could not be retrieved. The inability of the auger to retrieve a sample was caused by (1) encountering the water table or (2) encountering clay or clayey sand which created a frictional resistance in excess of the auger's pulling capability.

After retrieval, sediments from each 4.5 foot auger run were examined and placed on a plastic sheet. A new sample was begun as each appreciable change in sediment grain size was noted. After completion of the hole, each separate sample was split by hand to a weight of 2 to 3 pounds (5 to 20 for gravel) and placed in a sample bag labeled with depth and locality information.

Trench

Some localities afforded a natural exposure, such as a gully, so that trenching provided an adequate sample. At these localities, the surface of the face to be sampled was cleaned to a depth of one inch, a plastic sheet placed at the base of exposure, and a trench from 3 to 6 inches wide was cut into the face to a depth sufficient to provide an adequate sample. In all cases, unless otherwise noted, the entire vertical face of the exposure with the exception of overburden (if present) was sampled. The material collected on the plastic sheet was then placed in a sample bag and labeled with height of the exposure sampled and location.

Sample Identification

Each sample of this report is identified by an abbreviation of the name of the quadrangle in which the sample was taken (Fig. 5) and is numbered consecutively (numbers are repeated for each quadrangle). In the event that more than one sample (from a different depth) was taken at a single outcrop or auger hole, an alphabetical suffix was added to each sample designation, starting with the letter "a" for the stratigraphically highest sample. Thus, Alt-1a, and Alt-1b represent samples a and b from the first auger or

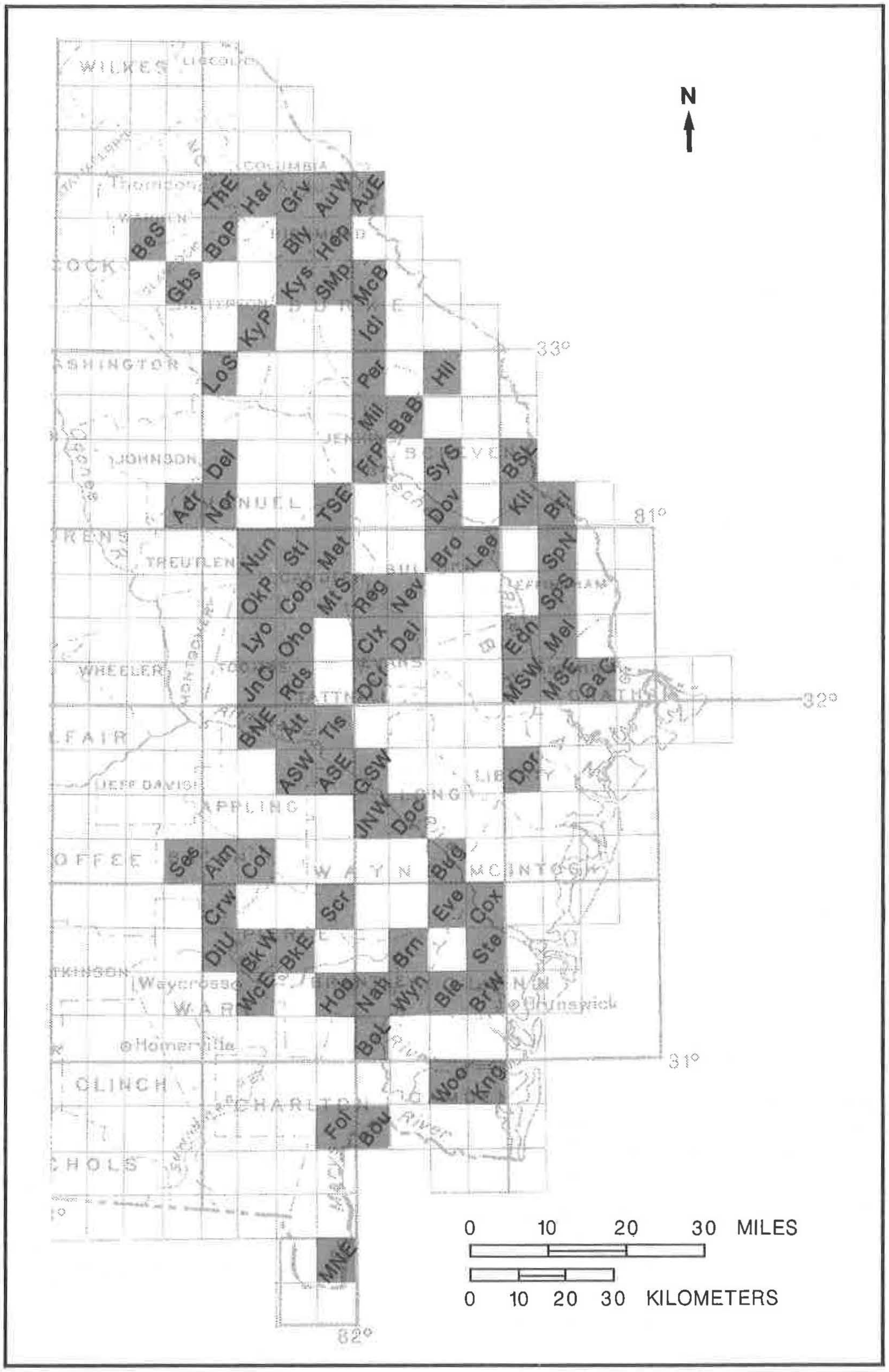


Figure 5. Index to Topographic Maps of the Study Area and Abbreviations for each Quadrangle Sampled.

trench sample in the Altamaha quadrangle.

Laboratory Procedures

In the laboratory, the samples were placed in a drying oven at 230° Fahrenheit for 24 hours. After drying and preliminary sieving (through a 3/8 inch sieve) the samples were divided into two categories, (1) those containing particles larger than 3/8 inch and, (2) those containing no particles larger than 3/8 inch.

Samples containing particles larger than 3/8 inch

For those samples which contain particles greater than 3/8 inch, the entire sample was weighed and then sieved through 1/2 inch and 3/8 inch sieves. Particles retained on the 1/2 inch and 3/8 inch sieves were brushed free of clay and fine sand. This finer-grained material was returned to the bulk sample. The nominal diameter of the particles retained on the 1/2 inch sieve was measured using calipers. Following this, the particles were divided into the categories of 3/4 inch, 1 inch and 1-1/2 inch (nominal diameter) and the weight of each category recorded. The remainder of the sample was treated in the same manner described in the section for samples containing no particles greater than 3/8 inch (see following section). Following the sieving of the finer fractions, the weight percentage for each sample was calculated using Folk's method (1974, p. 34-35).

Samples containing no particles greater than 3/8 inch

After drying, each sample was split using a mechanical splitter until a sample size of approximately 250 grams was obtained. This split was weighed and the weight recorded. The split was then washed on a #200 mesh sieve until the water from the sieve was clear. The split was then placed in a drying oven at 230° Fahrenheit and left overnight. Following drying, the sample was reweighed and the washed weight recorded. The sample was then sieved through a nest of sieves consisting of #4, #8, #16, #30, #50, #100, and #200 mesh. After dry sieving, the weight retained on each sieve was recorded. The weight of the additional material passing the #200 sieve was added to the weight of less than #200 size fraction obtained from the wet sieving. The weight percent passing for each fraction was then calculated.

Evaluation of the Sieve Data

The size distribution curves were analyzed according to ASTM standard C-33 (the standard for a fine aggregate). The ASTM C-33 grain-size requirements are as follows:

Sieve Analysis

Sieve Size (U.S. Standard)	Percentage Passing (finer than)
3/8 in. (9.50 mm)	100
#4 mesh (4.76 mm)	95 to 100
#8 mesh (2.38 mm)	80 to 100
#16 mesh (1.19 mm)	50 to 85
#30 mesh (0.59 mm)	25 to 60
#50 mesh (0.297 mm)	10 to 30
#100 mesh (0.149 mm)	2 to 10
#200 mesh (0.075 mm)	0 to 3

Some of the samples are mixtures of fine and coarse material, and , thus, do not meet ASTM standards for either coarse or fine aggregate. Because such mixtures can be processed to produce aggregate that meets ASTM standard C-33, these samples are discussed in some detail in the text. Although the major purpose of the present study is to analyze sediments of the Coastal Plain for aggregate potential, the majority of the natural materials do not meet ASTM standard C-33. In an effort to classify these materials as to which may be best for upgrading to fine or coarse aggregate, a simple rating scheme has been devised. This rating scheme and values assigned to each sample are based on whether the sample meets one or more of the following sieve analysis requirements:

Sieve Analysis Requirements

(a) > 40% of the sample is larger (nominal diameter) than #50 mesh (0.297 mm).
(b) <15% of the sample is smaller (nominal diameter) than #200 mesh (0.075 mm).
(c) > 5% of the sample is larger (nominal diameter than #4 mesh (4.76 mm).

Each of the above requirements has a value of one; therefore, the rating of the sample can vary from 0 to 3. For example, a sample with less than 15 percent material smaller than 0.075 mm (#200) and meeting neither of the other two requirements would have a value of one; whereas, a sample which has more than 40 percent by weight larger than 0.297 mm (#50) and has less than 15 percent material smaller than 0.075 mm would have a value of two. These rating values are listed in the table for each county under the heading "rating."

COUNTY REPORTS

APPLING COUNTY

Geology and Physiography

Appling County lies within two physiographic districts of the Coastal Plain Province. The northern half of this county lies within the Vidalia Upland District; the southern half lies within the Bacon Terraces District. Surficial sediments of the county are derived from the Altamaha Formation.

Previous Studies

Teas (1921, p. 152) reported that there are small deposits suitable for construction aggregate found in this county. What is available is present in the northern part of the county in the form of terrace deposits along the Altamaha River (Fig. 6, Ts-9).

Present Study

The soil series used in targeting areas of Appling County were the Troup sand, the Troup-Wicksburg complex and the Mascotte sand. These sandy soils are generally present as high ground in swampy areas throughout the county, and as dunes along the southwestern border of the county. The geomorphic features targeted were sand bars along the Altamaha River, and dunes along Big Satilla Creek. Nine samples from six sites: BNE-1, BNE-2, Alt-2a, Alt-2b, ASW-1a, ASW-1b, Cof-1a, Cof-1b, BNE-4 (Figs. 6-15, Table 1). were selected for analysis in Appling County.

Evaluation

Samples taken from point bars along the Altamaha River, BNE-1, BNE-2 (Fig. 6) show some aggregate potential. They contain very little clay, and are well sorted. Sample BNE-2 passes ASTM standard C-33, and BNE-2 could be upgraded to meet these standards. The bars have an areal extent of eight, and nine acres, respectively. Water is available for processing, but the areal extent makes these localities useful for only a small scale operation. Alt-2a is taken from that part of the bar closest to the bank. It contains more silty material than that of Alt-2b which was taken about 10 feet inland. Sample ASW-1 contains 30 percent clayey material and has very little material that can be considered coarse. The other samples taken in Appling County, Cof-1, and BNE-4, show very little potential for aggregate use.

Mining Activity

Only one sand company, F.E.J. Sand (Fig. 6, #279) has been recently active. They were permitted for four acres, and have not mined in the last 8 years.

Summary Evaluation

The point bars along the Altamaha River provide Appling County's best possibility for commercial aggregate production. Although the areas are small, the sand is well-sorted. The Altamaha River would provide water for processing. A light-duty road is present within a mile of each bar, and would provide access to the sites. The potential for fine aggregate production in Appling County is moderate.

BACON COUNTY

Geology and Physiography

This county lies within the Bacon Terraces District. Surficial sediments of this county are derived from the Altamaha Formation.

Previous Studies

Teas (1921, p. 153-154) reported that small local deposits of sand suitable for glass are found in several isolated areas of Bacon County. According to Teas (1921), sand dunes are present along the east side of Big Hurricane Creek. (Fig. 16, Ts-1).

Present Study

The soil types used in targeting sandy areas for this study were #24 and #37. These soils are present as linear bodies (oriented northwest to southeast) in interfluve areas throughout the county. The geomorphic features targeted were sand dunes along the northeastern banks of Hurricane and Little Hurricane Creeks. These dunes coincide with the targeted soil types. Nine samples from four sites were taken (Alm-1a, Alm-1b, Alm-1c, Alm-1d, Crw-1a, Crw-1b, Crw-1c, Crw-2b, Ses-1 (Figs. 16-25, Table 2).

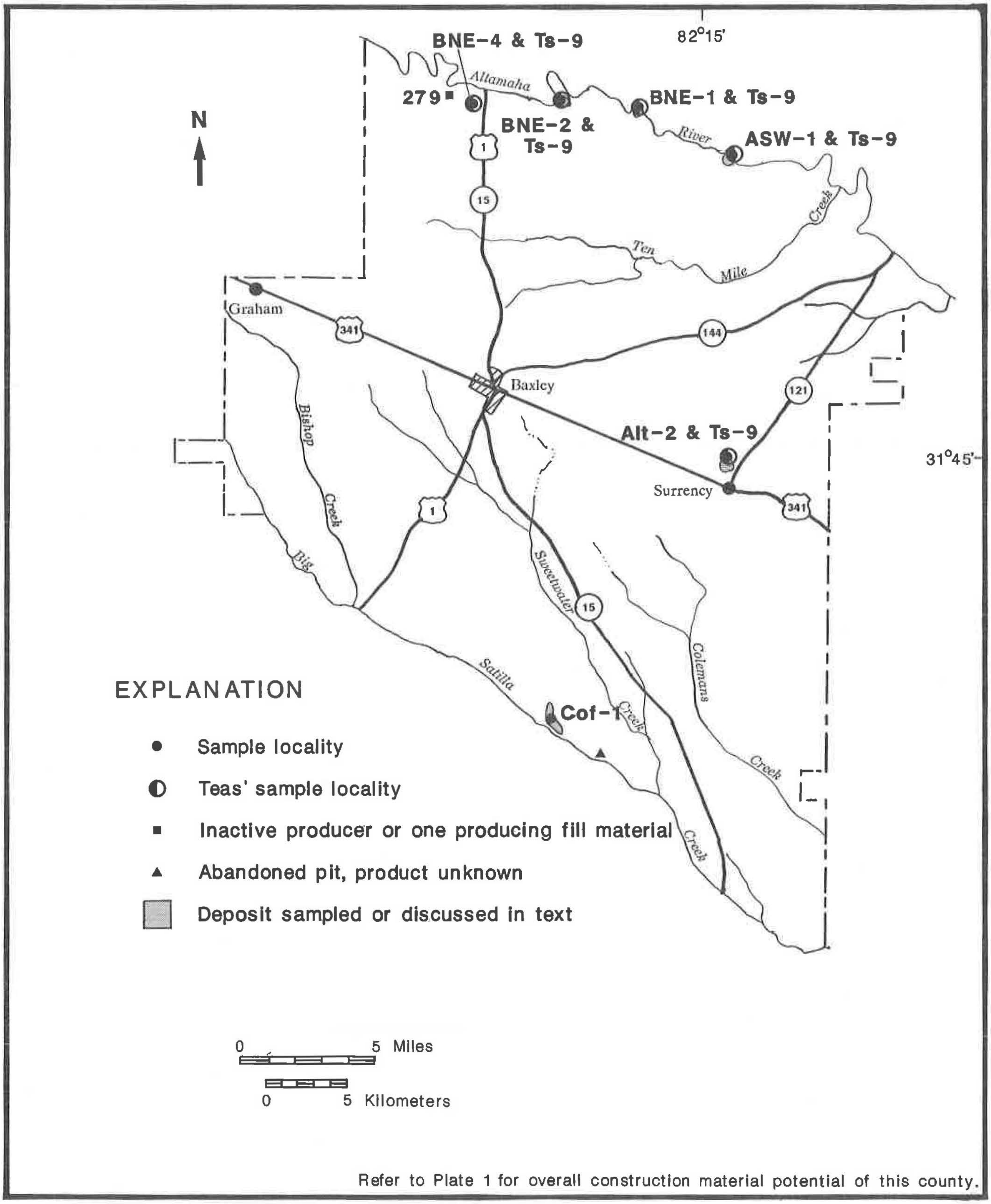


Figure 6. Map of Appling County Showing Localities and Deposits Sampled.

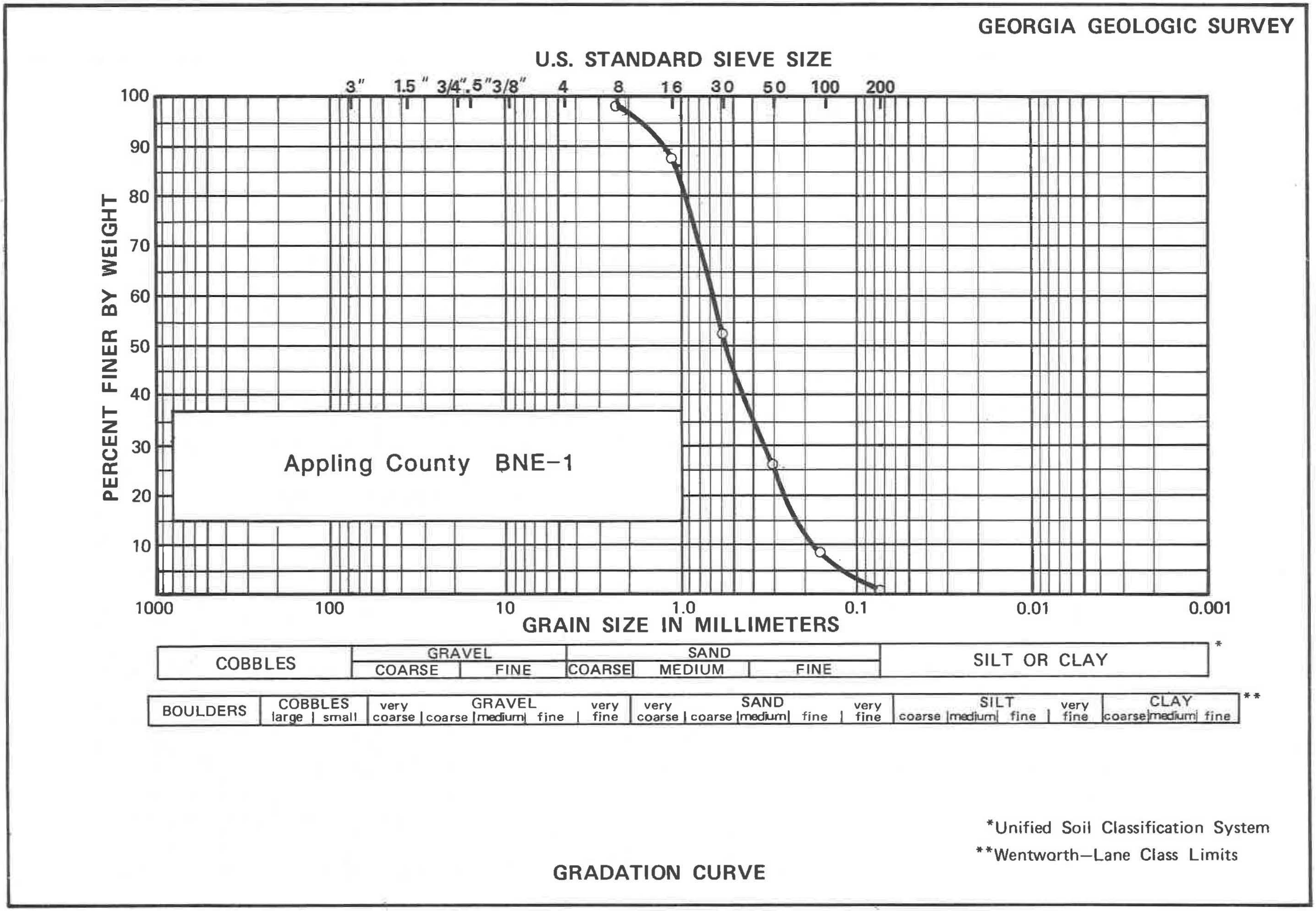


Figure 7. Size Distribution Curve of Sample BNE-1.

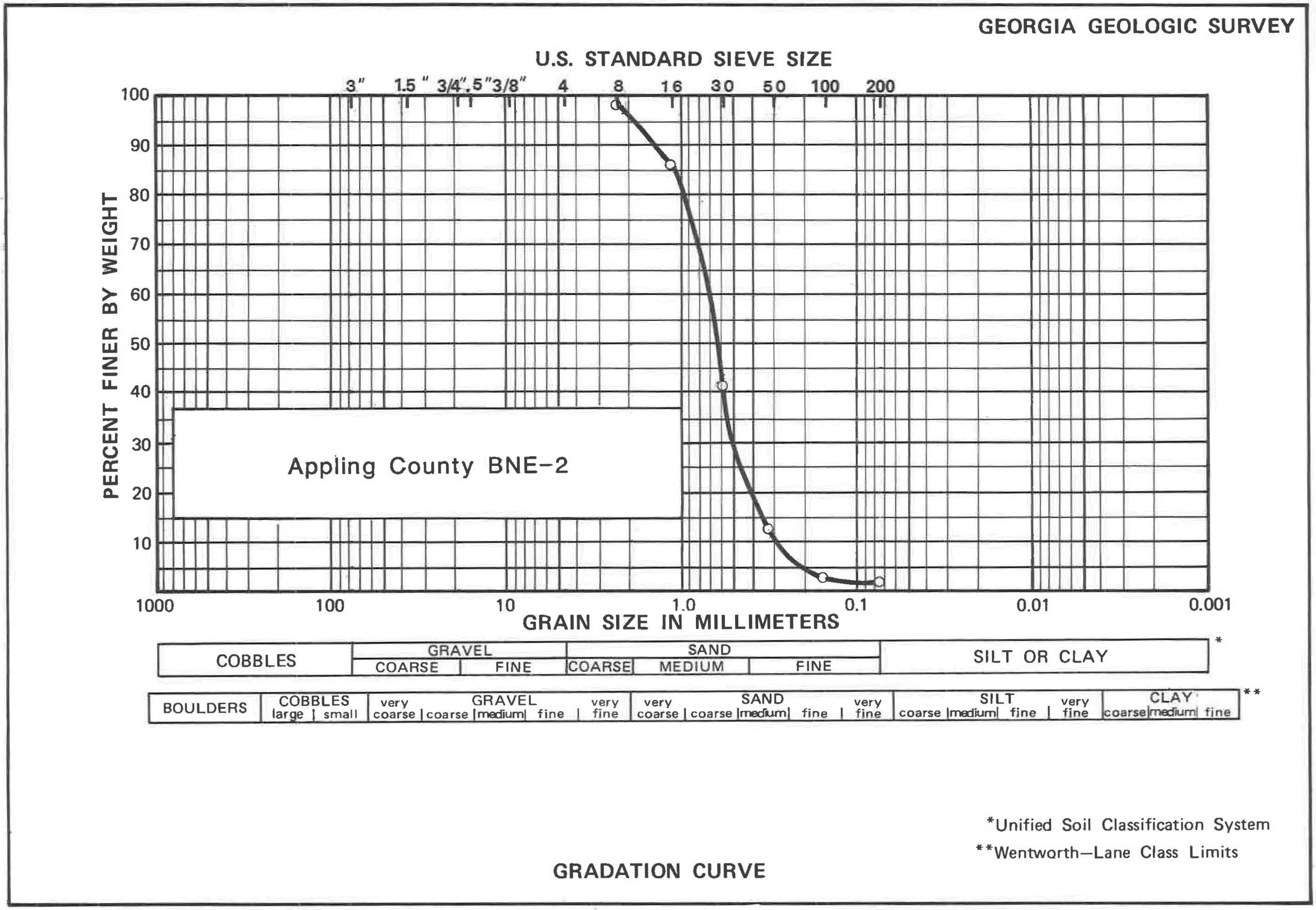


Figure 8. Size Distribution Curve of Sample BNE-2.

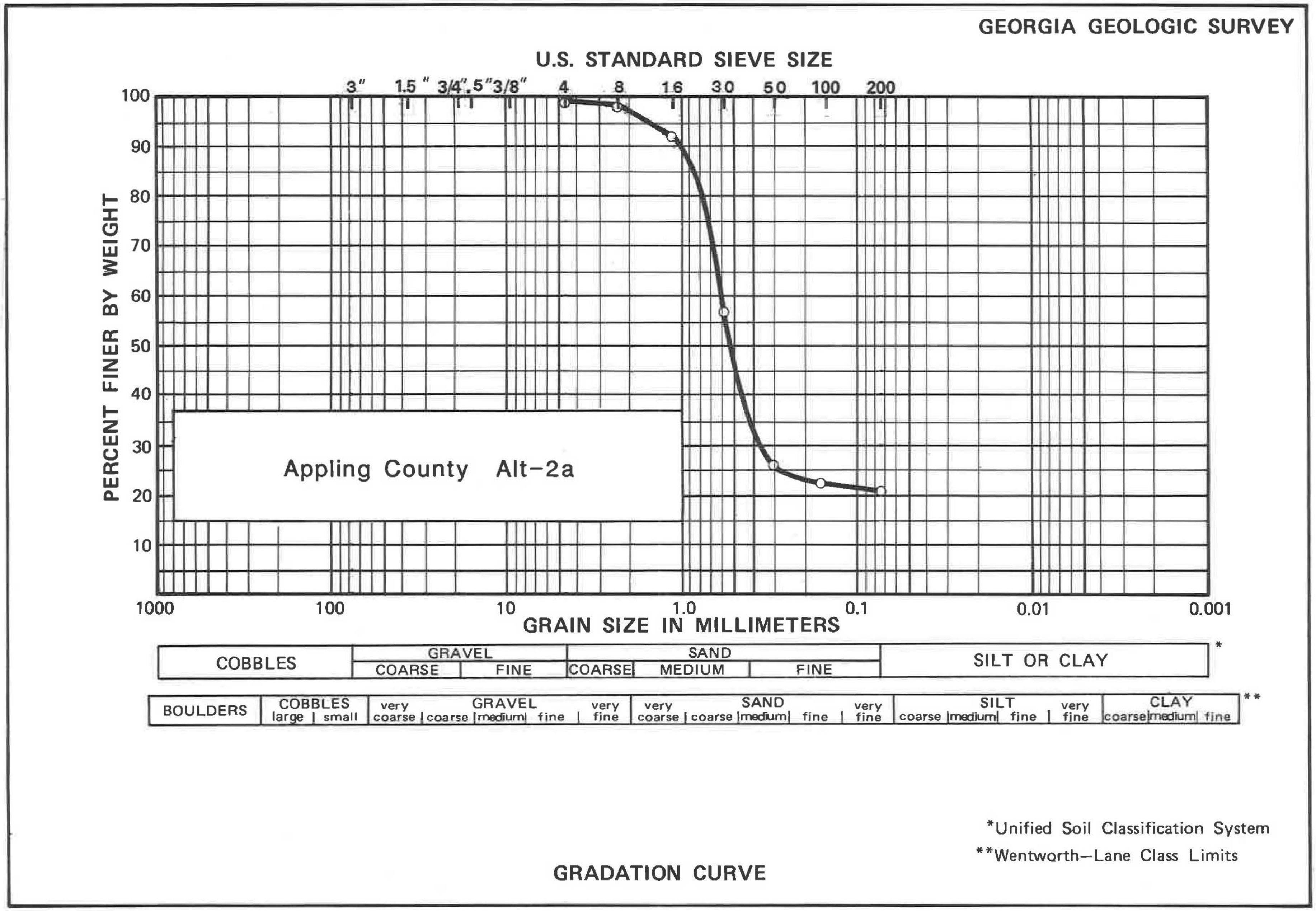


Figure 9. Size Distribution Curve of Sample Alt-2a.

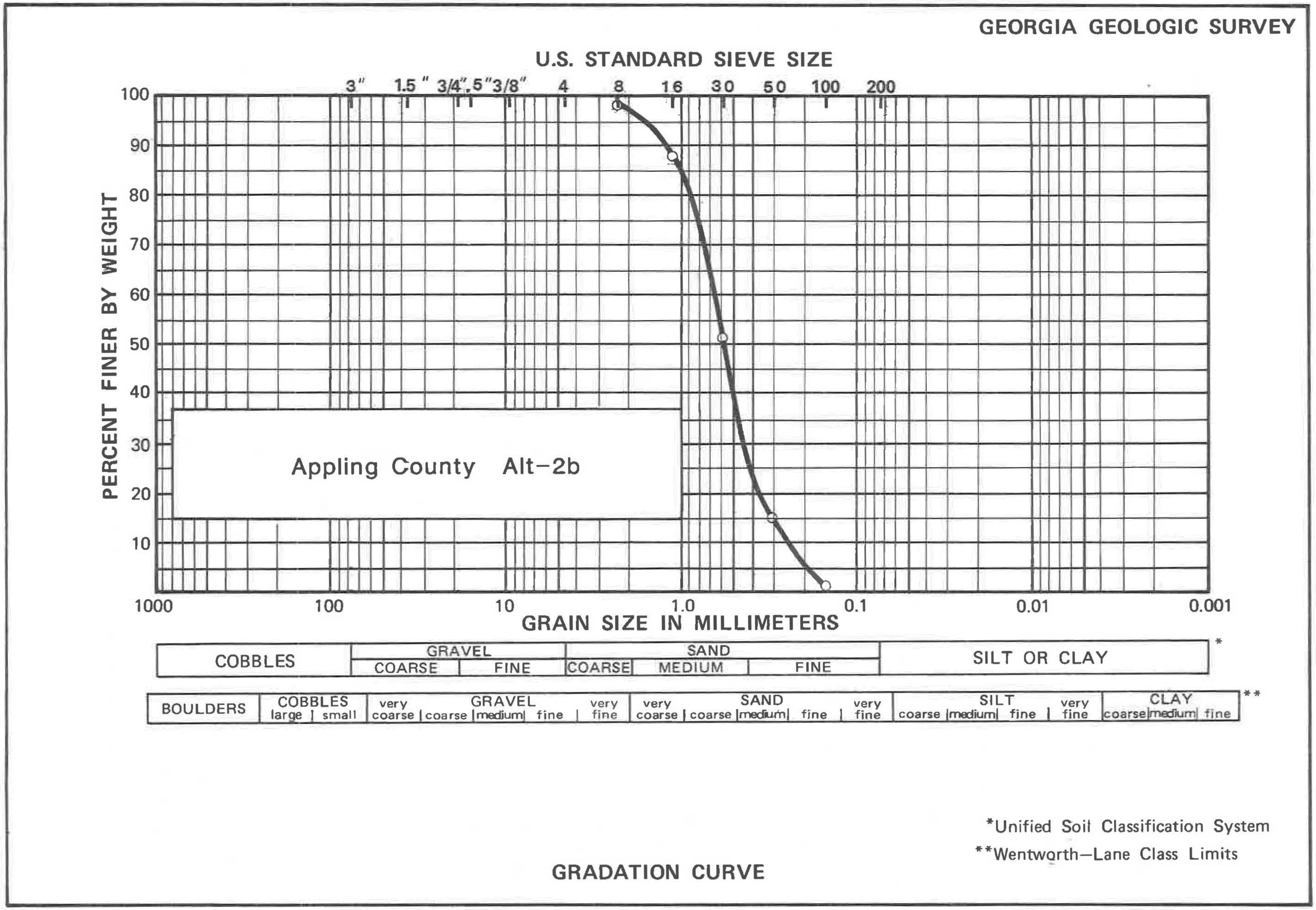


Figure 10. Size Distribution Curve of Sample Alt-2b.

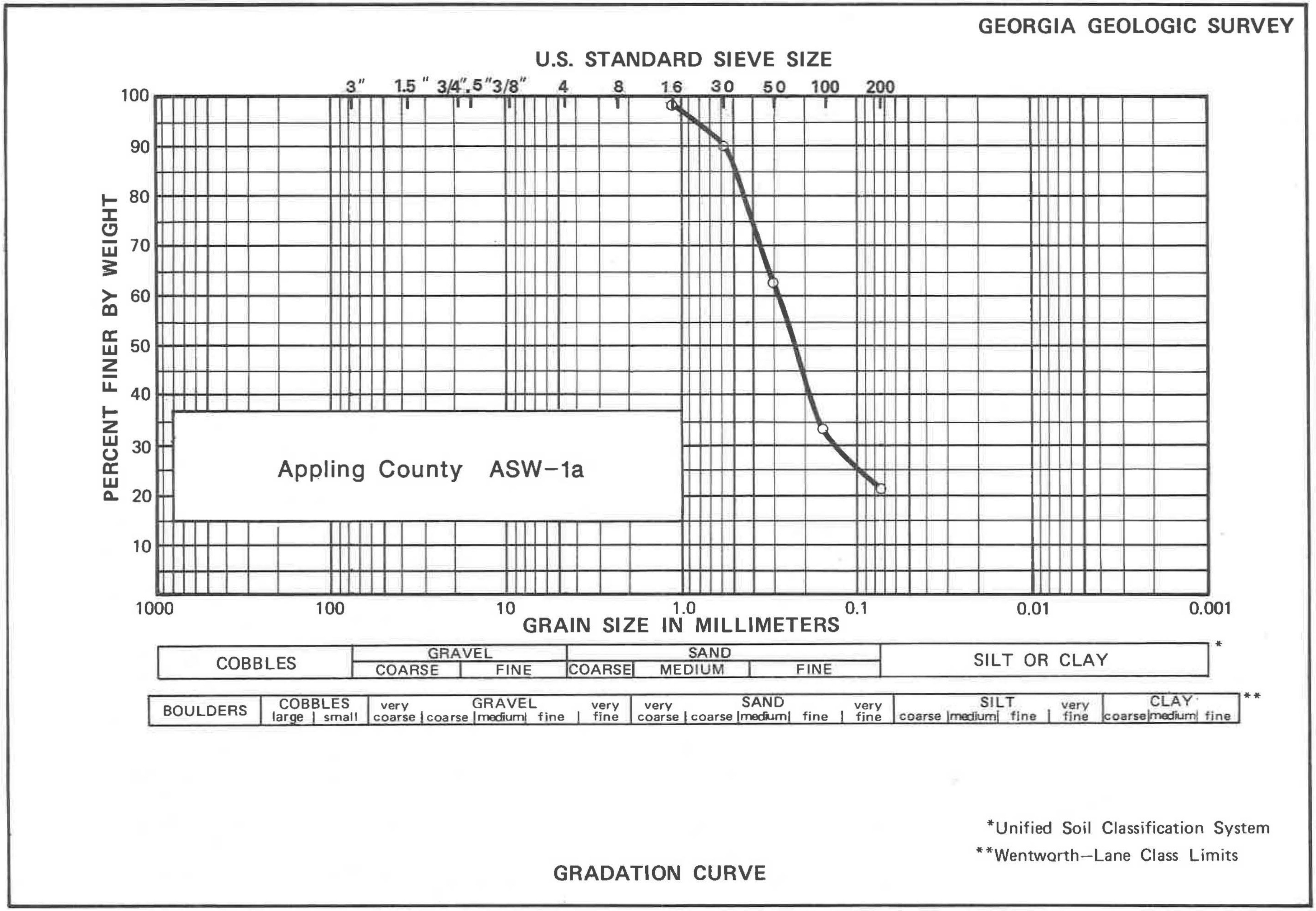


Figure 11. Size Distribution Curve of Sample ASW-1a.

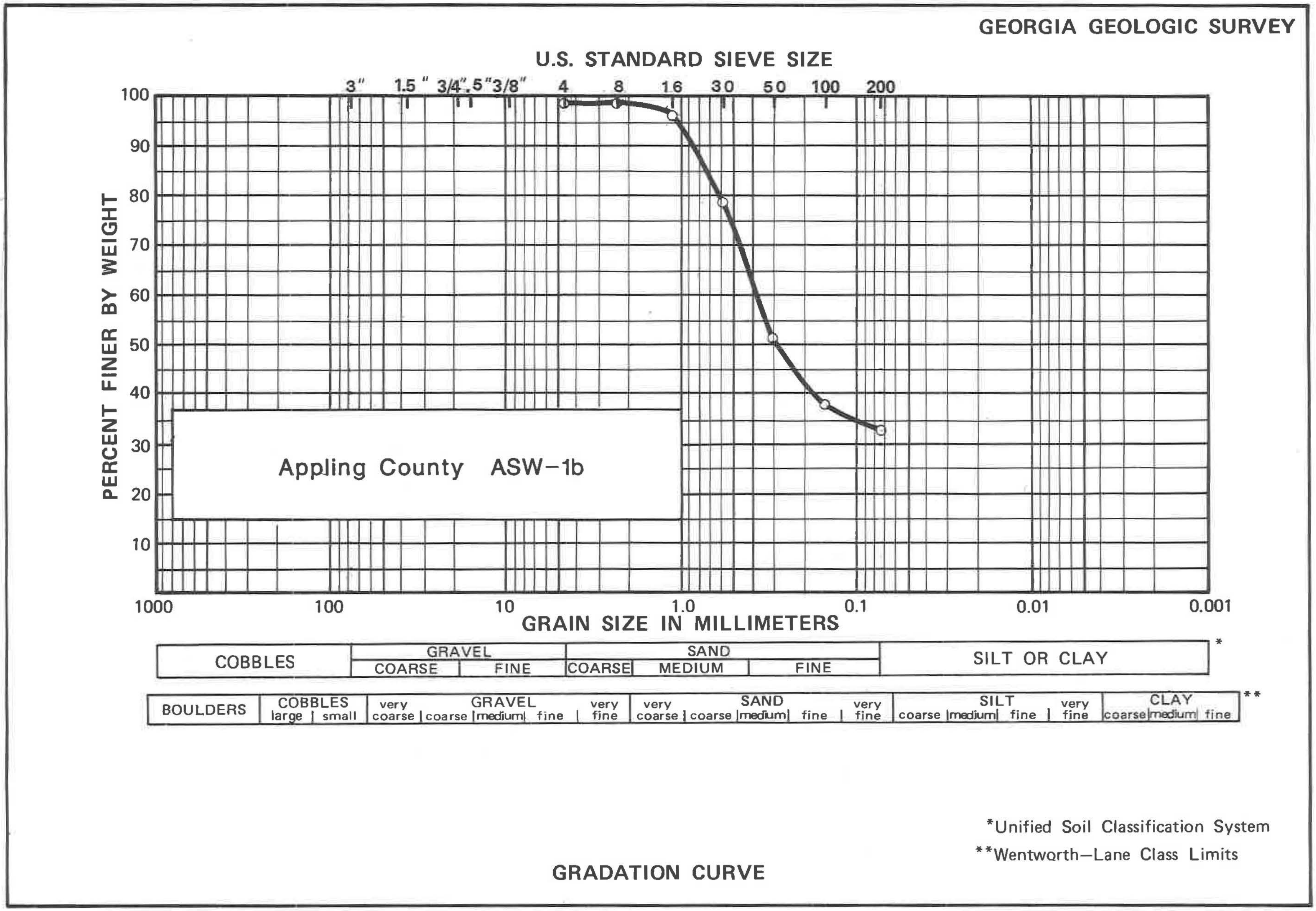


Figure 12. Size Distribution Curve of Sample ASW-1b.

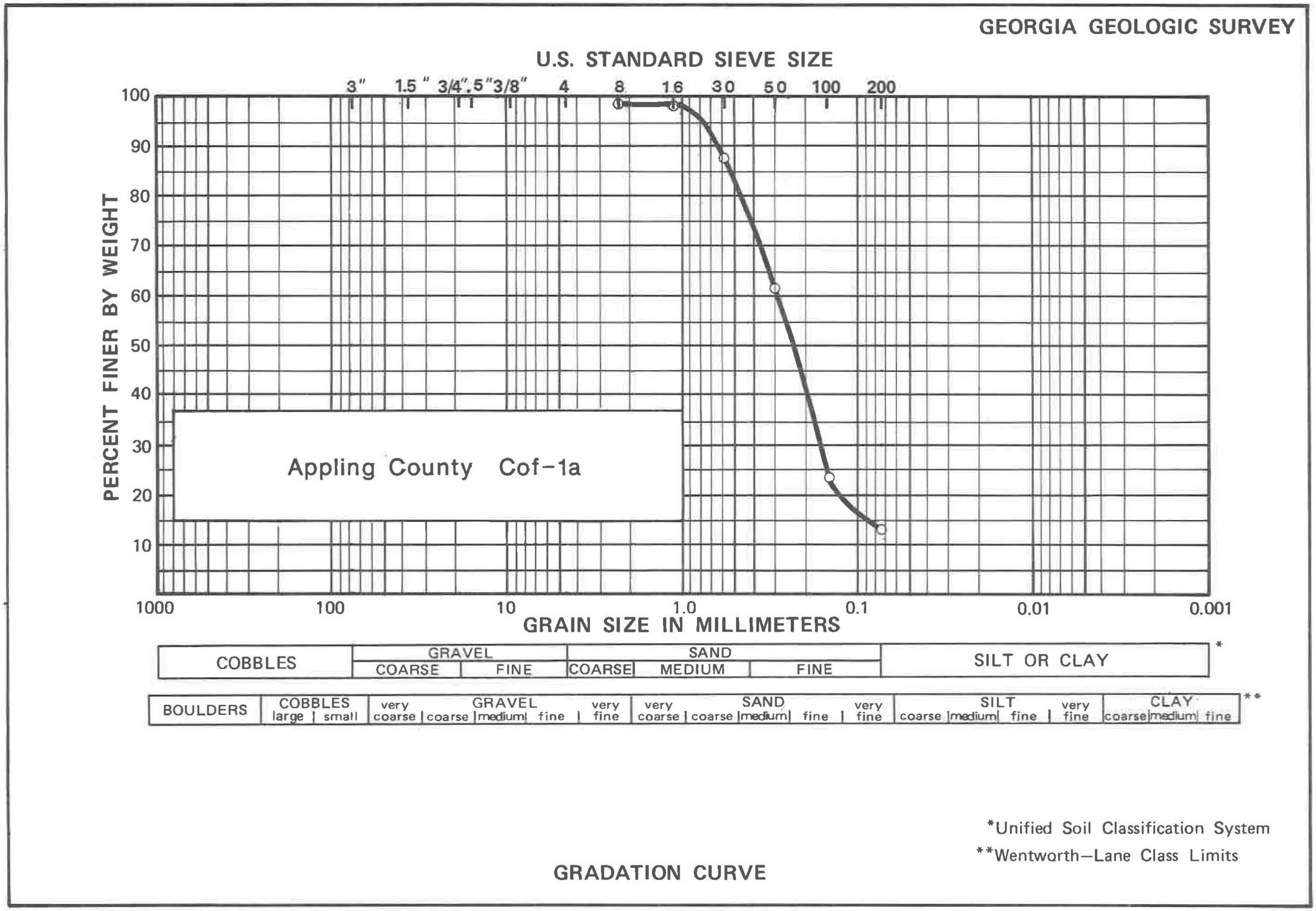


Figure 13. Size Distribution Curve of Sample Cof-1a.

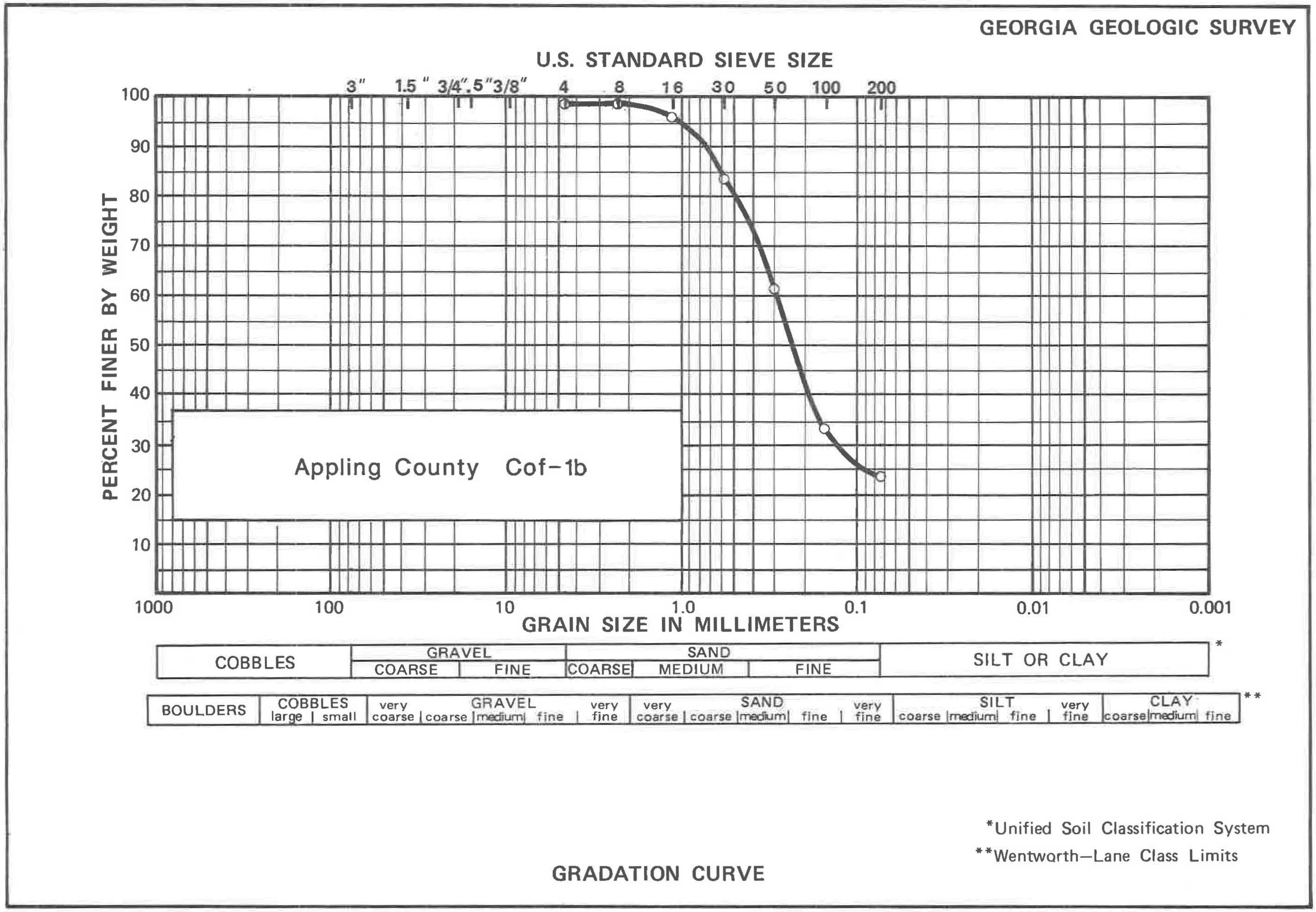


Figure 14. Size Distribution Curve of Sample Cof-1b.

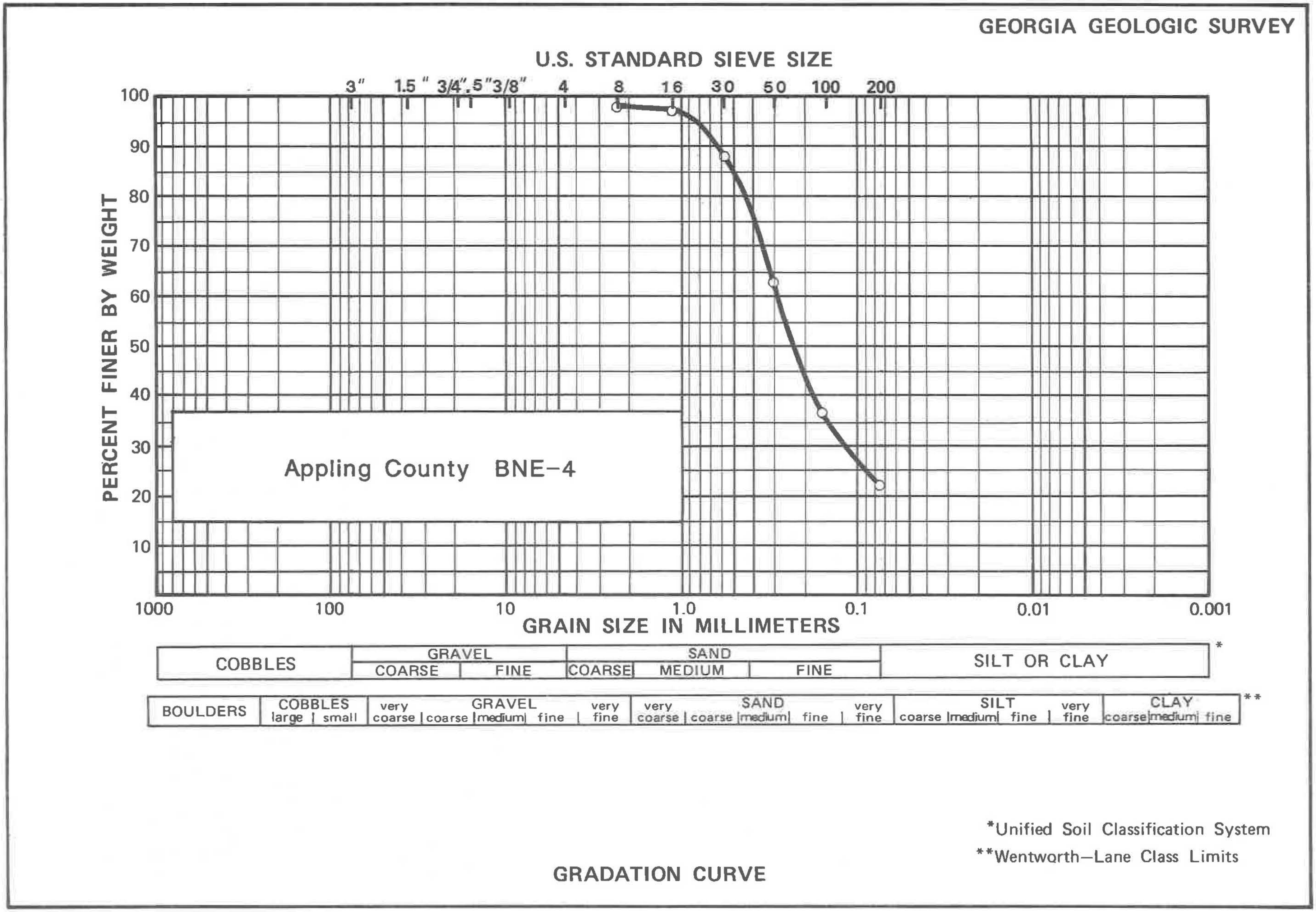


Figure 15. Size Distribution Curve of Sample BNE-4.

Table 1: Appling County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
BNE-1	3	auger	3	1	no[4]	2
BNE-2	3	trench	3	1	yes	2
Alt-2a	4	auger	6	1	no	1
Alt-2b	4	auger	6	1	no	2
ASW-1a	6-1/2	auger	6-1/2	2	no	0
ASW-1b	6-1/2 - 10	auger	3-1/2	2	no	1
Cof-1a	3-1/2	auger	3-1/2	2	no	1
Cof-1b	3-1/2 - 8-1/2	auger	5	2	no	0
BNE-4	7-1/2	auger	10	3	no	0

[1] For trench samples this figure is the vertical length of the trench.

[2] Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3] Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4] Marginally failed ASTM C-33, can be upgraded to meet specifications.

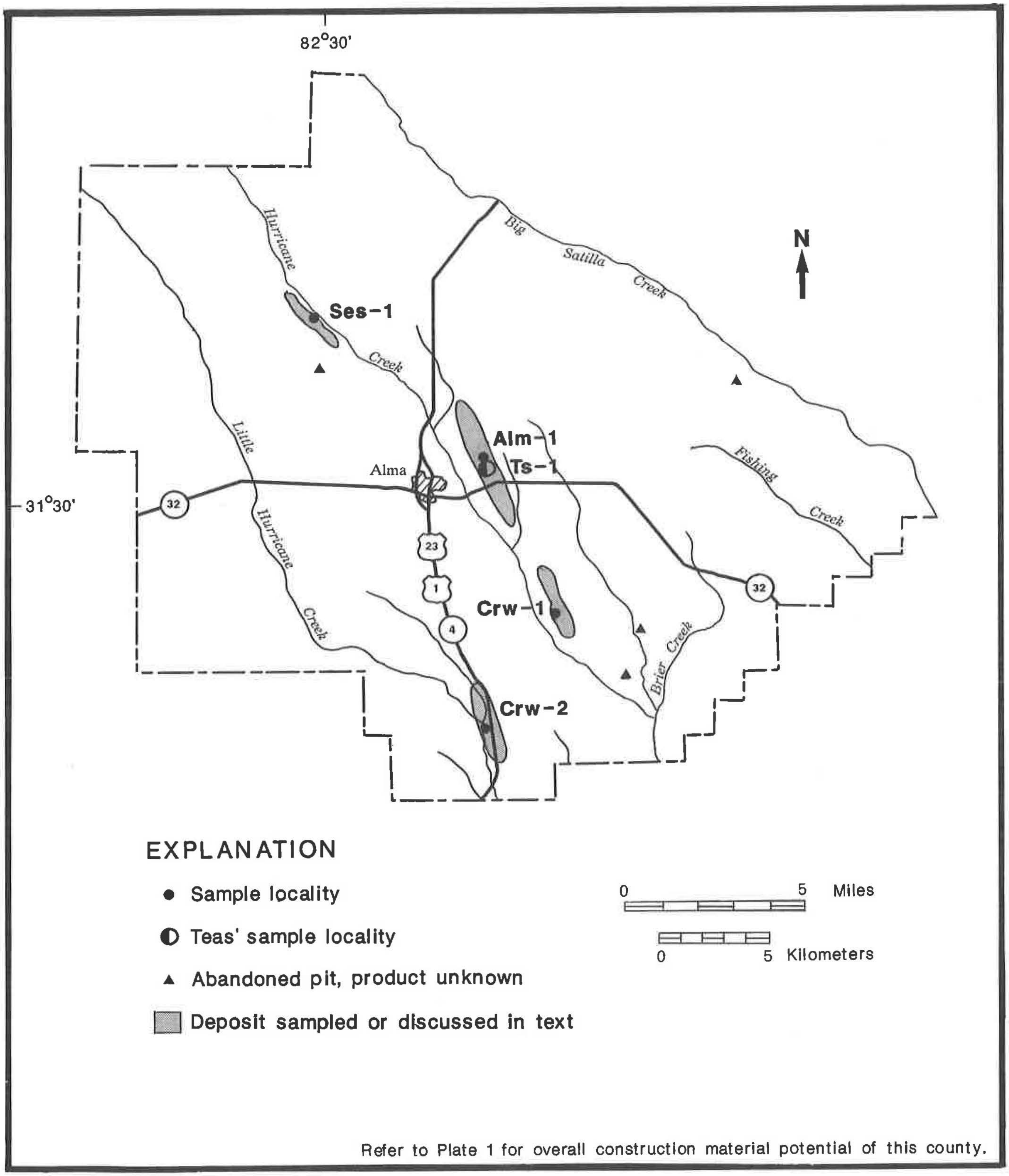


Figure 16. Map of Bacon County Showing Localities and Deposits Sampled.

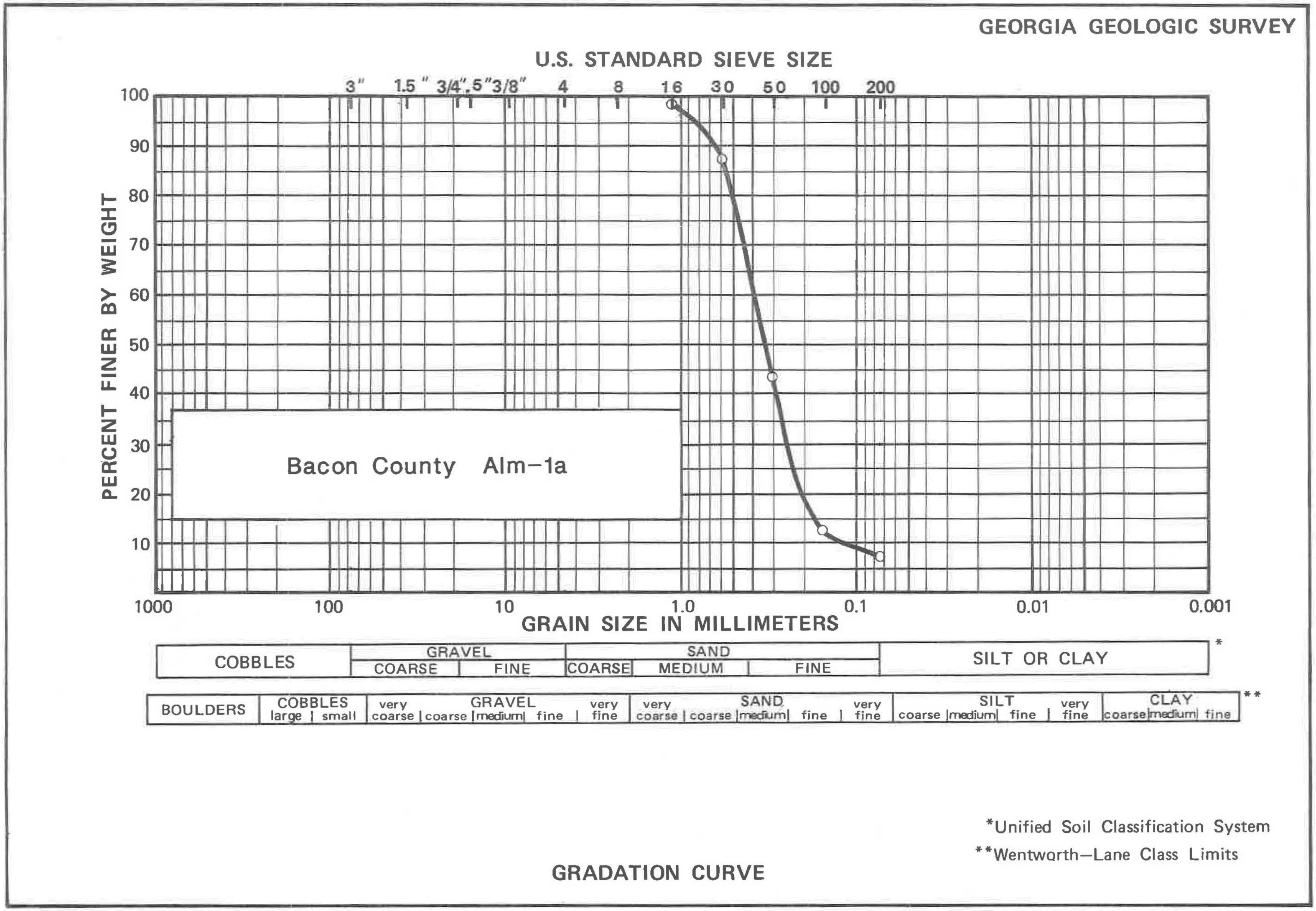


Figure 17. Size Distribution Curve of Sample Alm-1a.

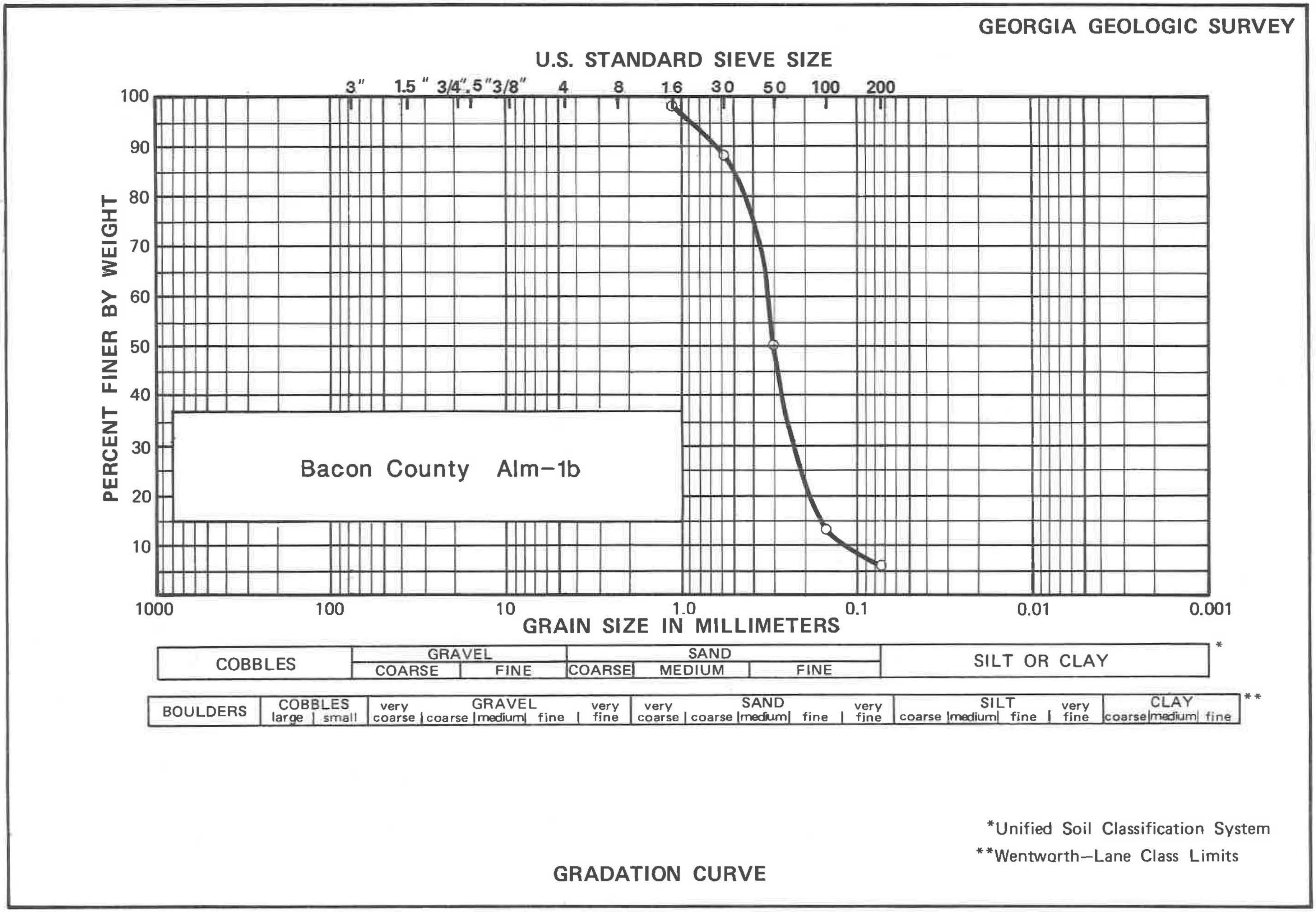


Figure 18. Size Distribution Curve of Sample Alm-1b.

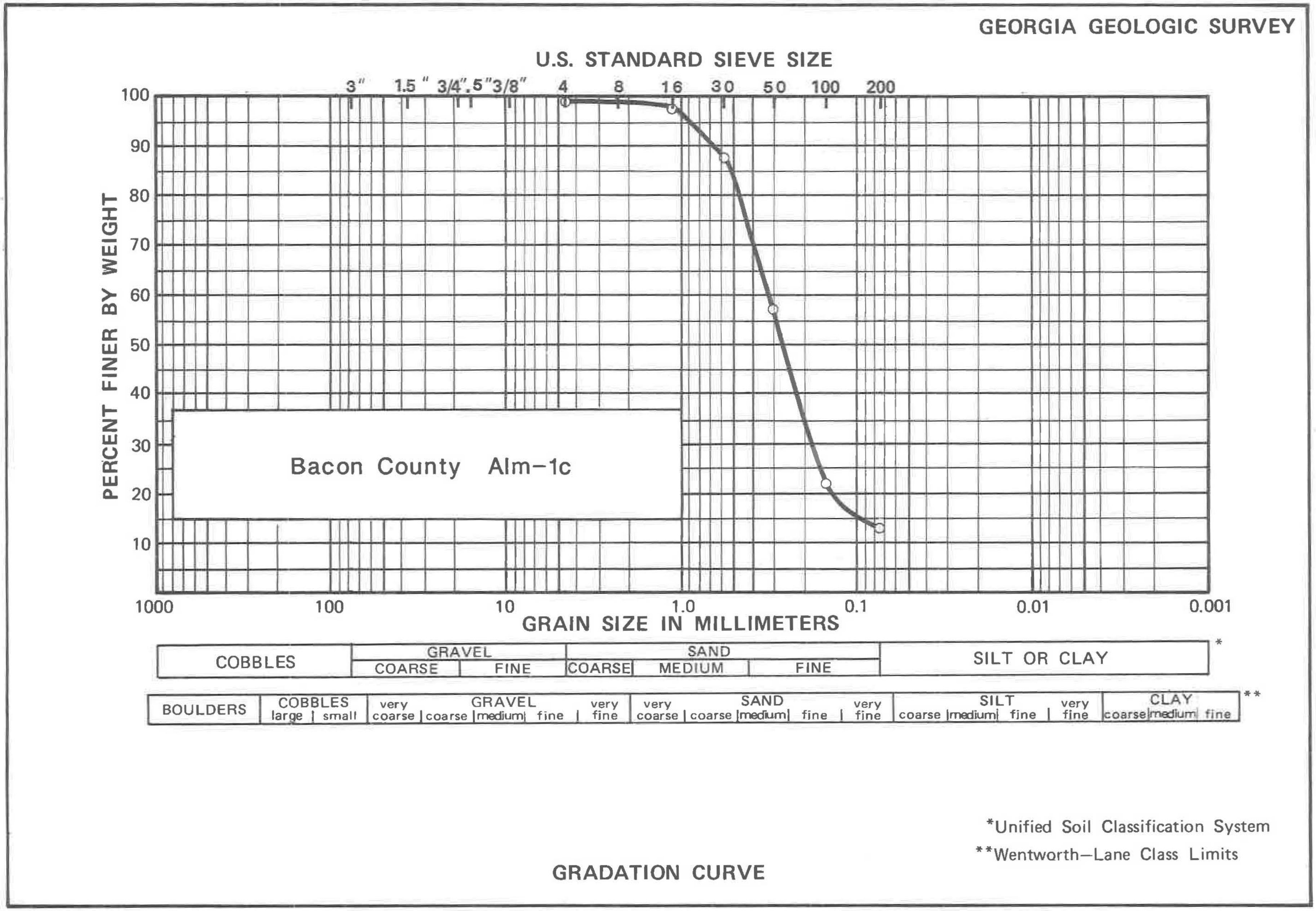


Figure 19. Size Distribution Curve of Sample Alm-1c.

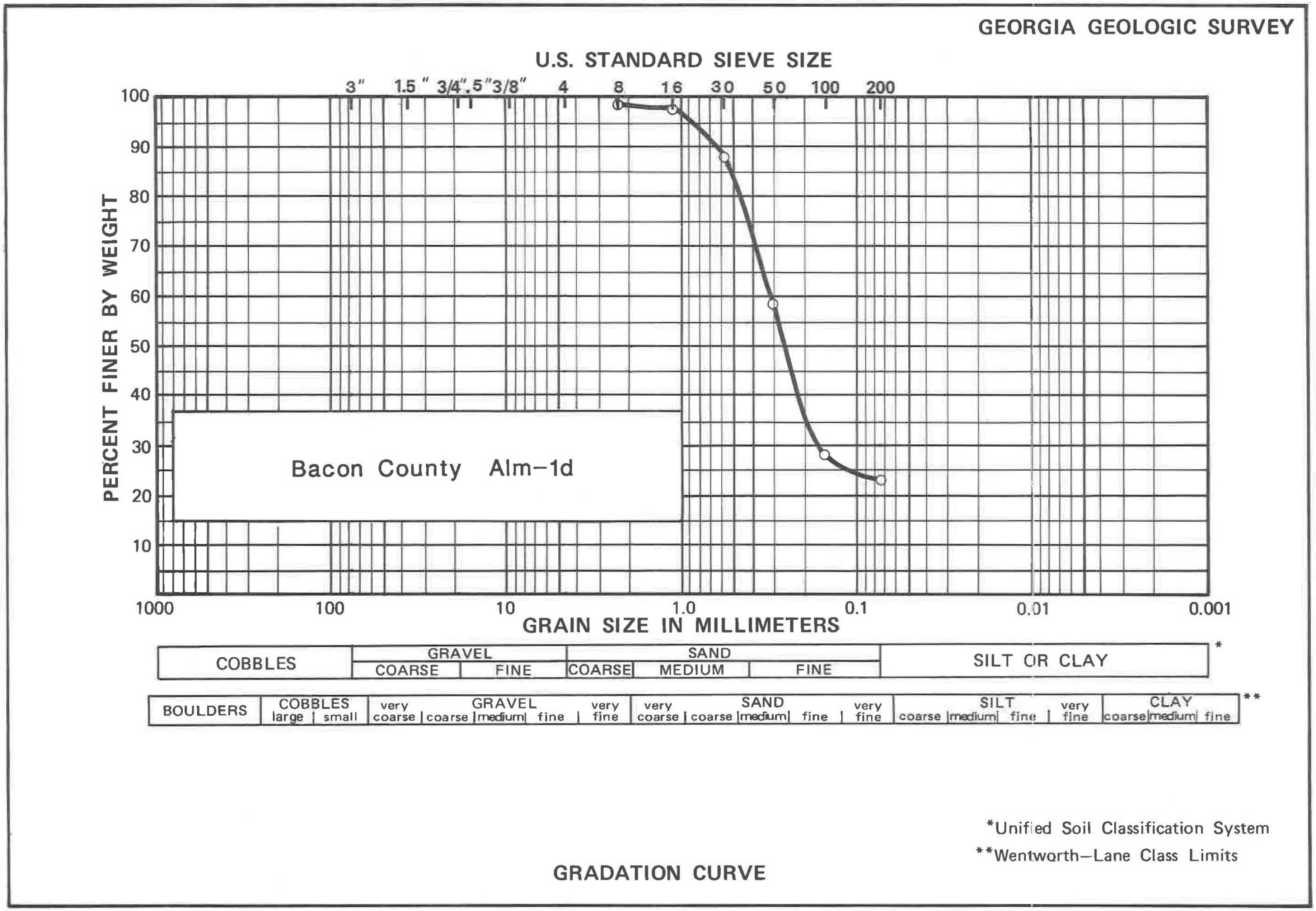


Figure 20. Size Distribution Curve of Sample Alm-1d.

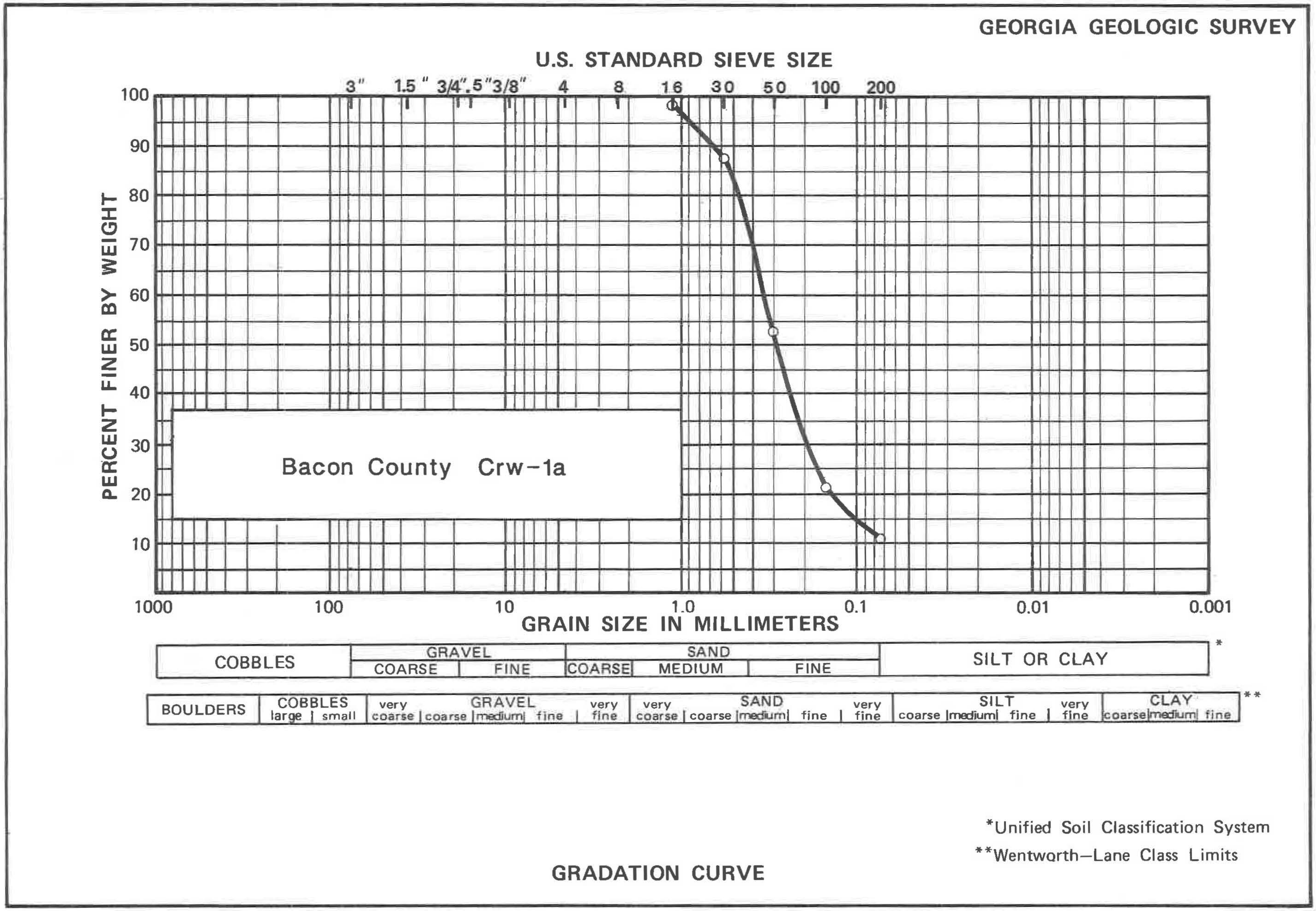


Figure 21. Size Distribution Curve of Sample Crw-1a.

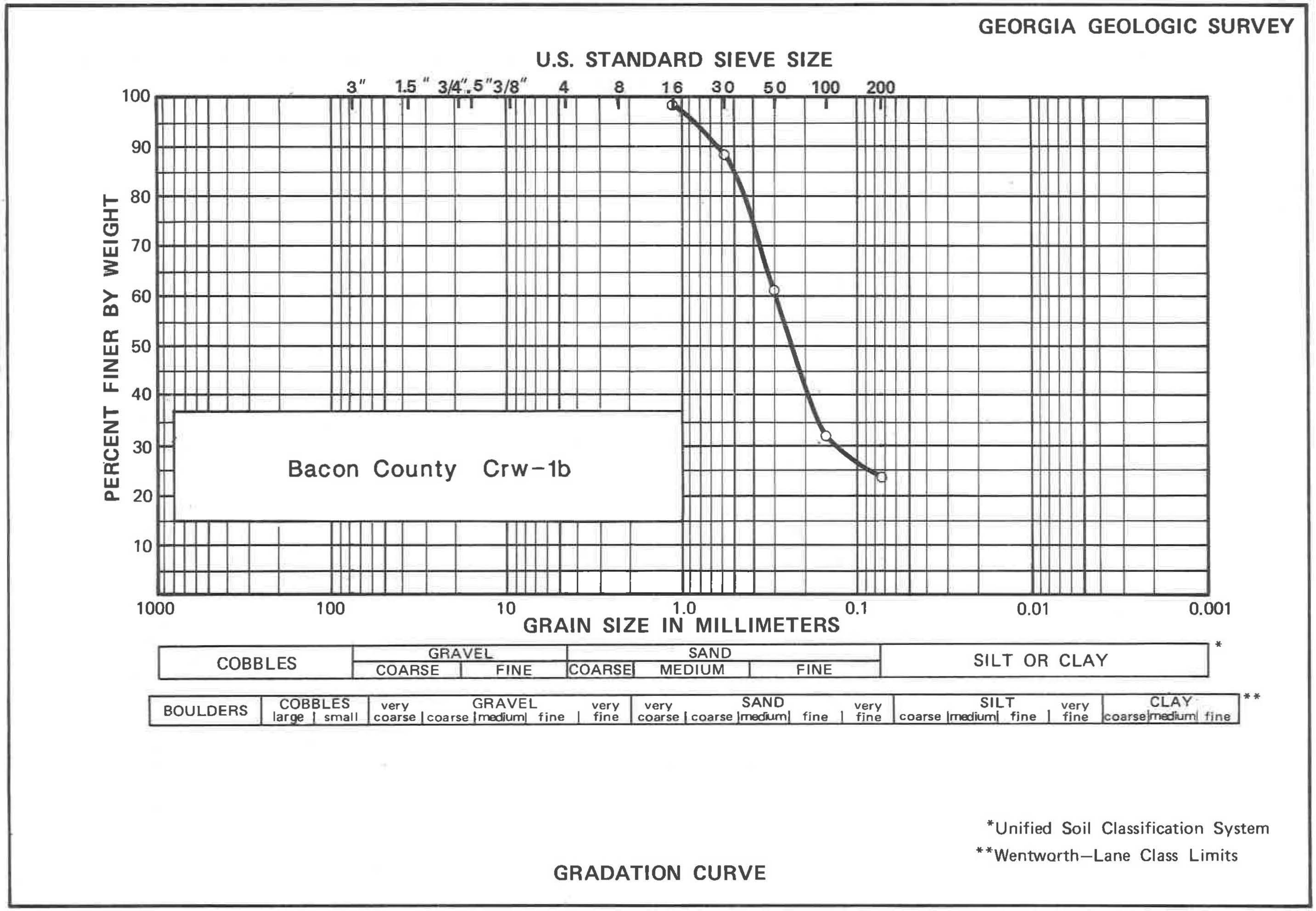


Figure 22. Size Distribution Curve of Sample Crw-1b.

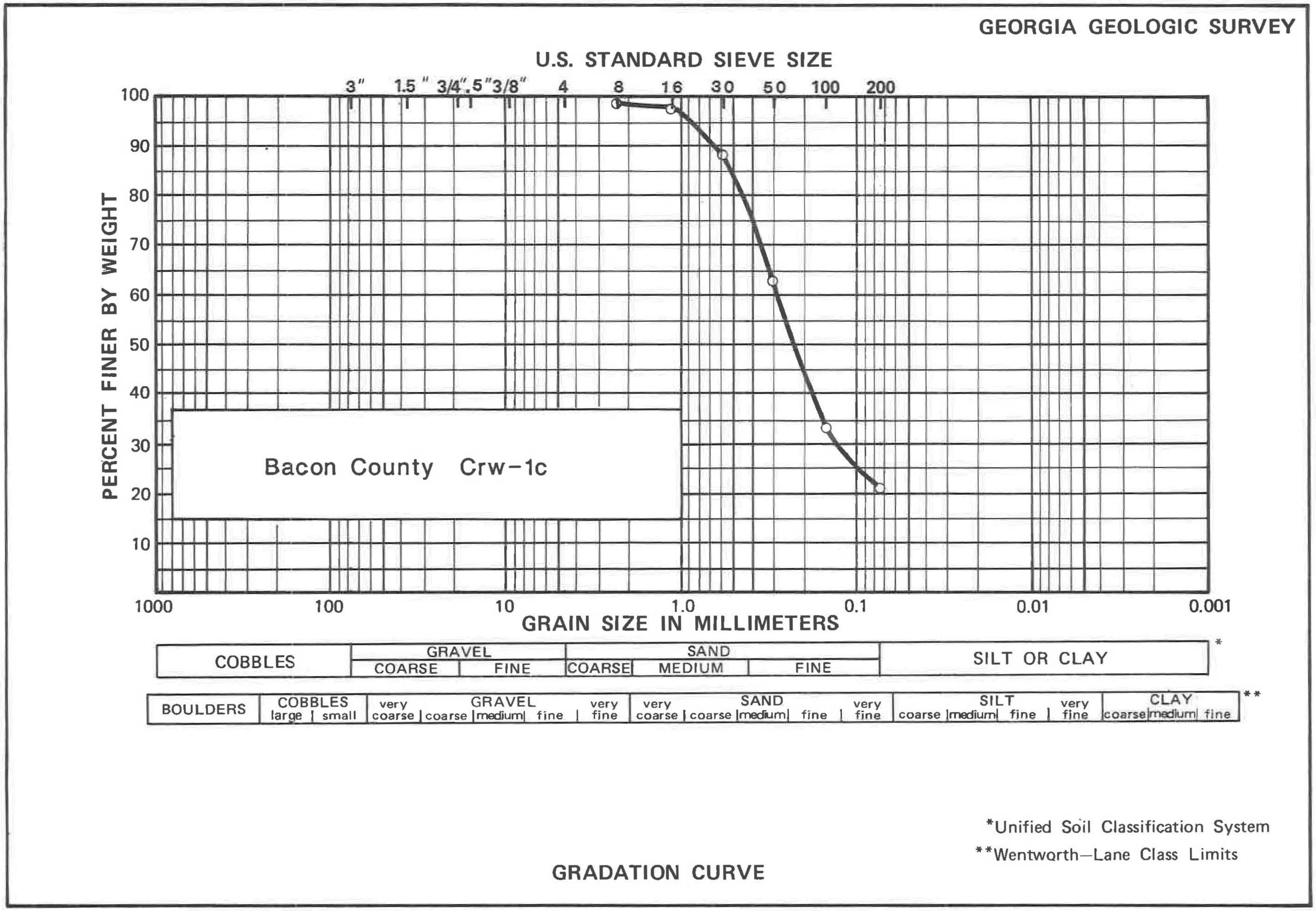


Figure 23. Size Distribution Curve of Sample Crw-1c.

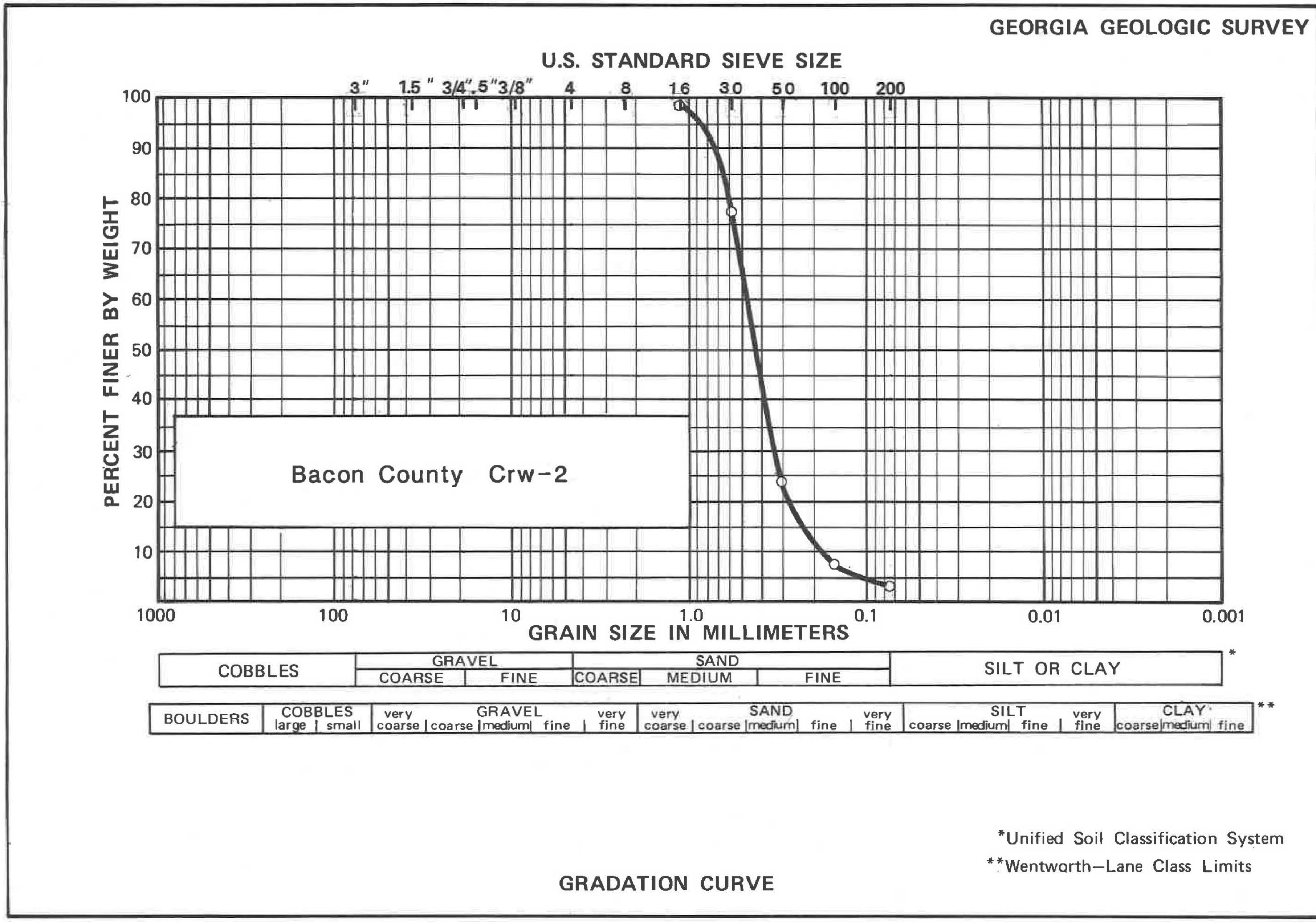


Figure 24. Size Distribution Curve of Sample Crw-2.

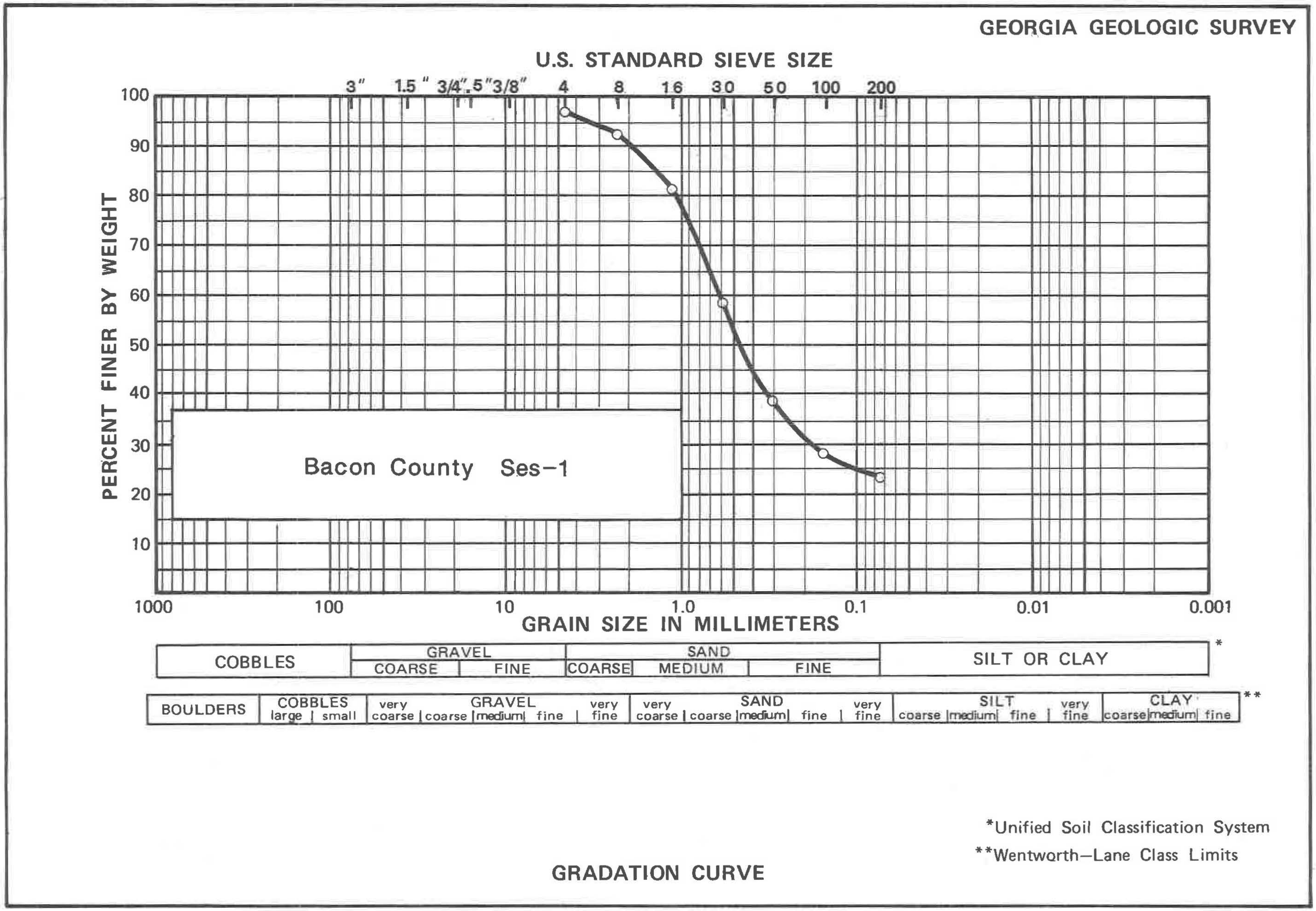


Figure 25. Size Distribution Curve of Sample Ses-1.

Table 2: Bacon County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
Alm-1a	2 1/3	auger	2-1/2	3	no	2
Alm-1b	2-1/2 - 5	auger	2-1/2	3	no	2
Alm-1c	5 - 8	auger	3	3	no	2
Alm-1d	8 - 10	auger	2	3	no	2
Crw-1a	6	auger	1	3	no	1
Crw-1b	6 - 7	auger	1	3	no	1
Crw-1c	7 - 12	auger	5	3	no	0
Crw-2	10	auger	10	2	no	2
Ses-1	9	auger	9	2	no	1

[1] For trench samples this figure is the vertical length of the trench.

[2] Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3] Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

Evaluation

None of the samples selected met ASTM Standard C-33. Sample Alm-1 (Fig. 16) was taken from an 8 foot high dune along Big Hurricane Creek. The underlying material is clay. This fairly clean and well-sorted sand is typical of dune sand in these areas and may be suitable for limited use. Samples Crw-1a, 1b and 1c are from a dune along Big Hurricane Creek (Fig. 16).

The Sample Ses-1 was taken from the south side of Hurricane Creek.

Mining Activity

There are no active or recently inactive mining operations in Bacon County.

Summary Evaluation

In Bacon County, the only sand deposits found that could be commercially mined are those represented by samples Alm-1 and Crw-1. These are both from dunes along Big Hurricane Creek. The potential for fine aggregate production in Bacon County is low.

BRANTLEY COUNTY

Geology and Physiography

Brantley County lies primarily within the Barrier Island District, but parts of the county lie within the Bacon Terraces District and the Okefenokee Basin District. The surficial material of the county is derived from the Cypresshead Formation, the barrier island deposits, and Quaternary alluvium.

Previous Studies

Teas (1921, p. 267 [at the time of Teas, Brantley County was part of Wayne County]) reported that the sand bars in the Satilla River consist of white, medium-grained sand and were most prominent where U.S. Highway 84 crosses the Satilla River (Fig. 26, Ts-42).

Present Study

The soil type used in targeting specific sites for sampling was #24 and is found along major creeks. A distinct geomorphic feature in this county is Trail Ridge (Fig. 26). Five sites were selected for sampling and evaluation: Hob-1, Nah-1, Wyn-1a, Wyn-1b, Brn-1, (Figs. 26-31, Table 3).

Evaluation

None of the samples taken passed ASTM standard C-33. Sample Hob-1 was taken from the edge of Trail Ridge near the Satilla River, and sample Nah-1 was taken just west of the Satilla River along U.S. Highway 84. These deposits have too great a percentage of fine-grained sand and clay particles to meet aggregate production standards.

The area along the east bank of the Satilla River is currently being mined for construction aggregate. An attempt was made to sample this sand, but access was not possible. The samples taken from near this area, Wyn-1 and Brn-1, were evidently not representative of the sand being mined because these samples consist of material that is too fine-grained for use as a construction aggregate.

Mining Activity

There has been a great deal of mining activity in the past in Brantley County. However, at the present time there is only one active mine operated by Florida Crushed Stone (Fig. 26, #699). The products of this mine are concrete and masonry sand. Average yearly production is about 50,000-100,000 tons. Twenty of the 68 acres permitted are being mined to a depth of 25 feet.

There are five recently inactive sand operations in the county. These were operated by Brantley Sand Co. #222, Hall Sand Co. #223 and #208, Santee Sand Co. #303, and Satilla Mining Corp. #754 (Fig. 26). No information is available on these inactive pits.

Summary Evaluation

The results from the samples taken in Brantley County suggest the fine aggregate potential of this county is low. However, as evidenced by the mining activity, there are isolated areas that are profitable to mine. Therefore, the construction material potential of Brantley County is moderate.

BRYAN COUNTY

Geology and Physiography

Bryan County lies within the Barrier Island District. Surficial sediments are derived from the Cypresshead Formation, Quaternary Alluvium and barrier island deposits.

Previous Studies

Teas (1921, p. 167) noted that there are small dunes along the Canoochee River.

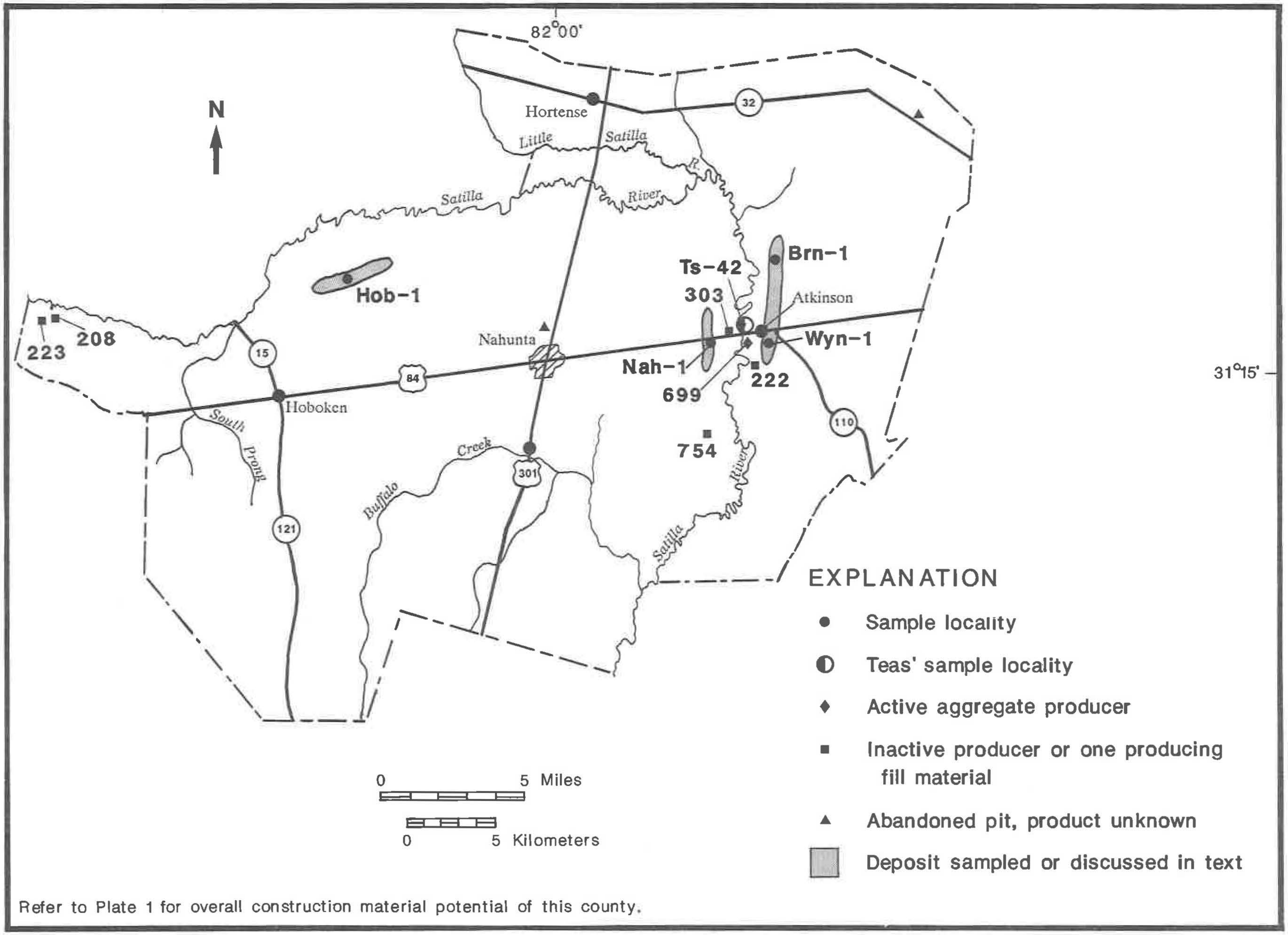


Figure 26. Map of Brantley County Showing Localities and Deposits Sampled.

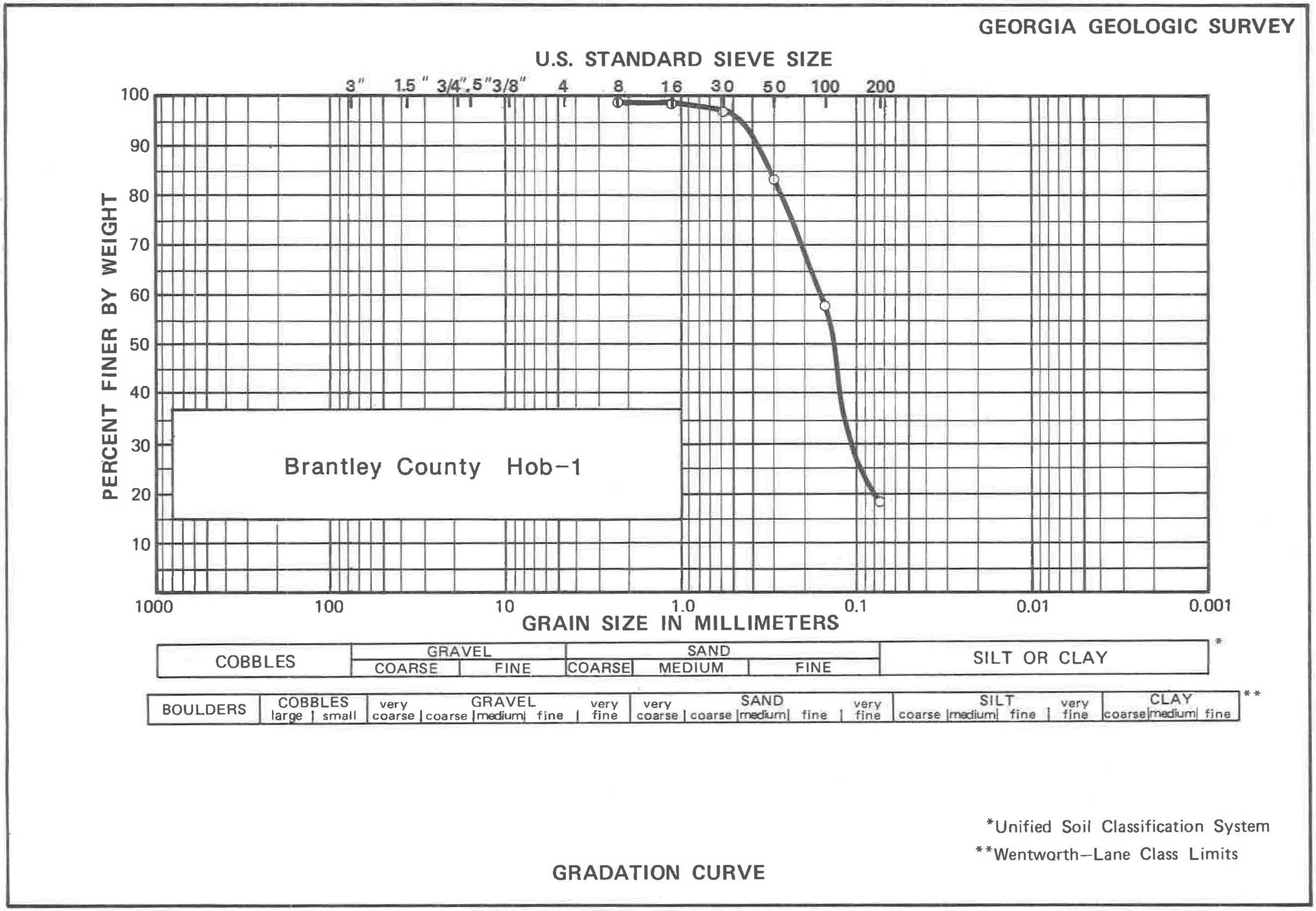


Figure 27. Size Distribution Curve of Sample Hob-1.

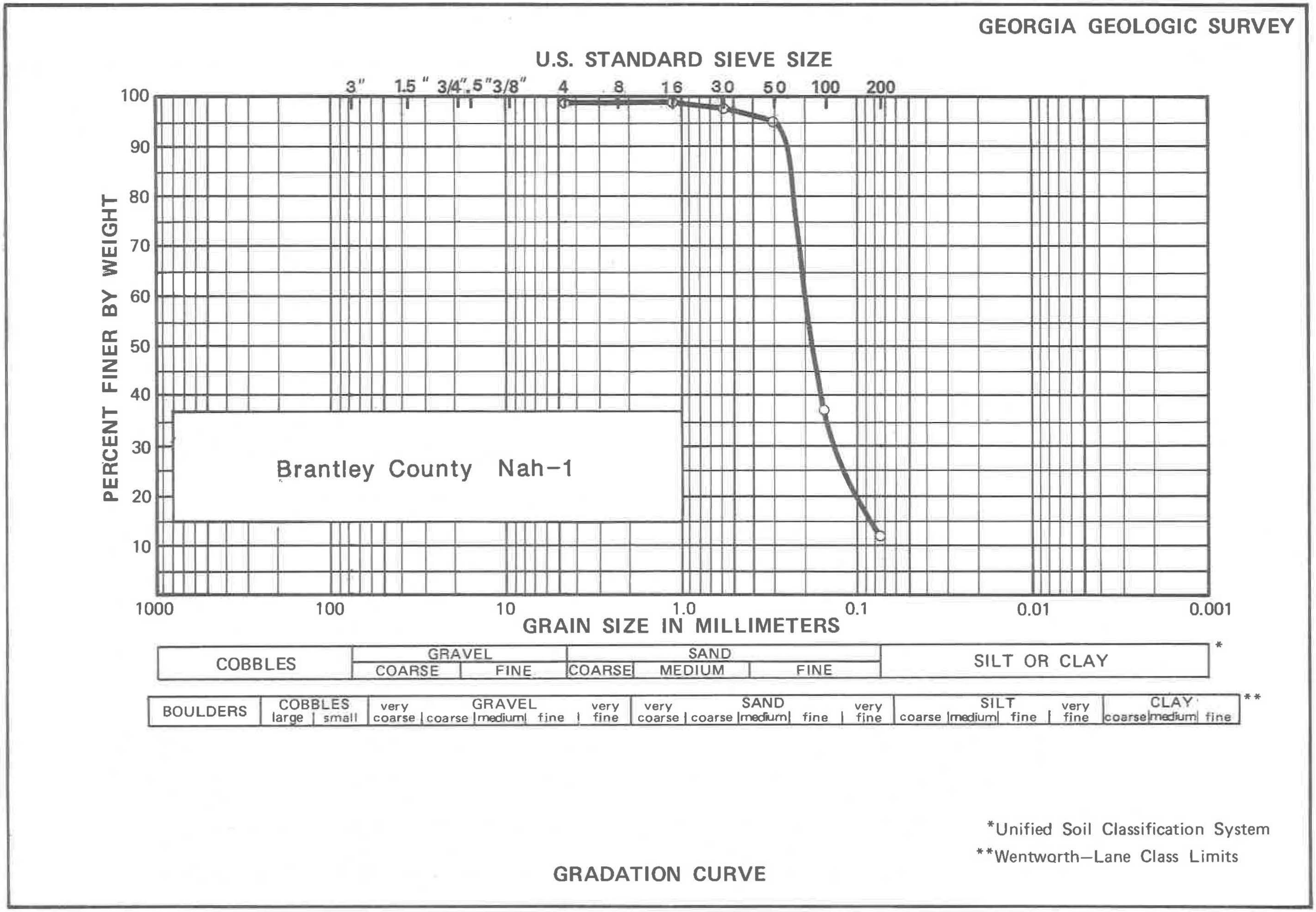


Figure 28. Size Distribution Curve of Sample Nah-1.

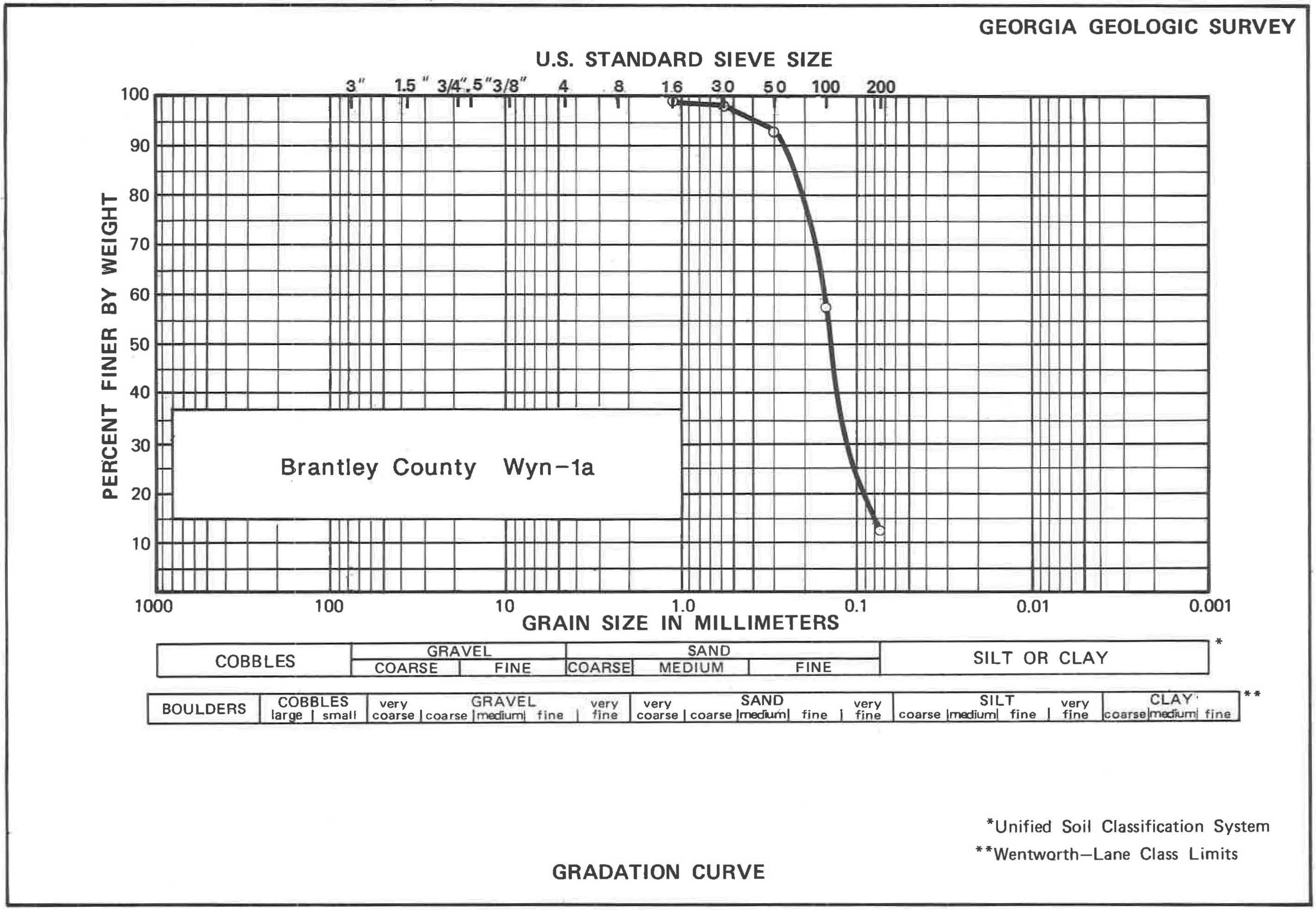


Figure 29. Size Distribution Curve of Sample Wyn-1a.

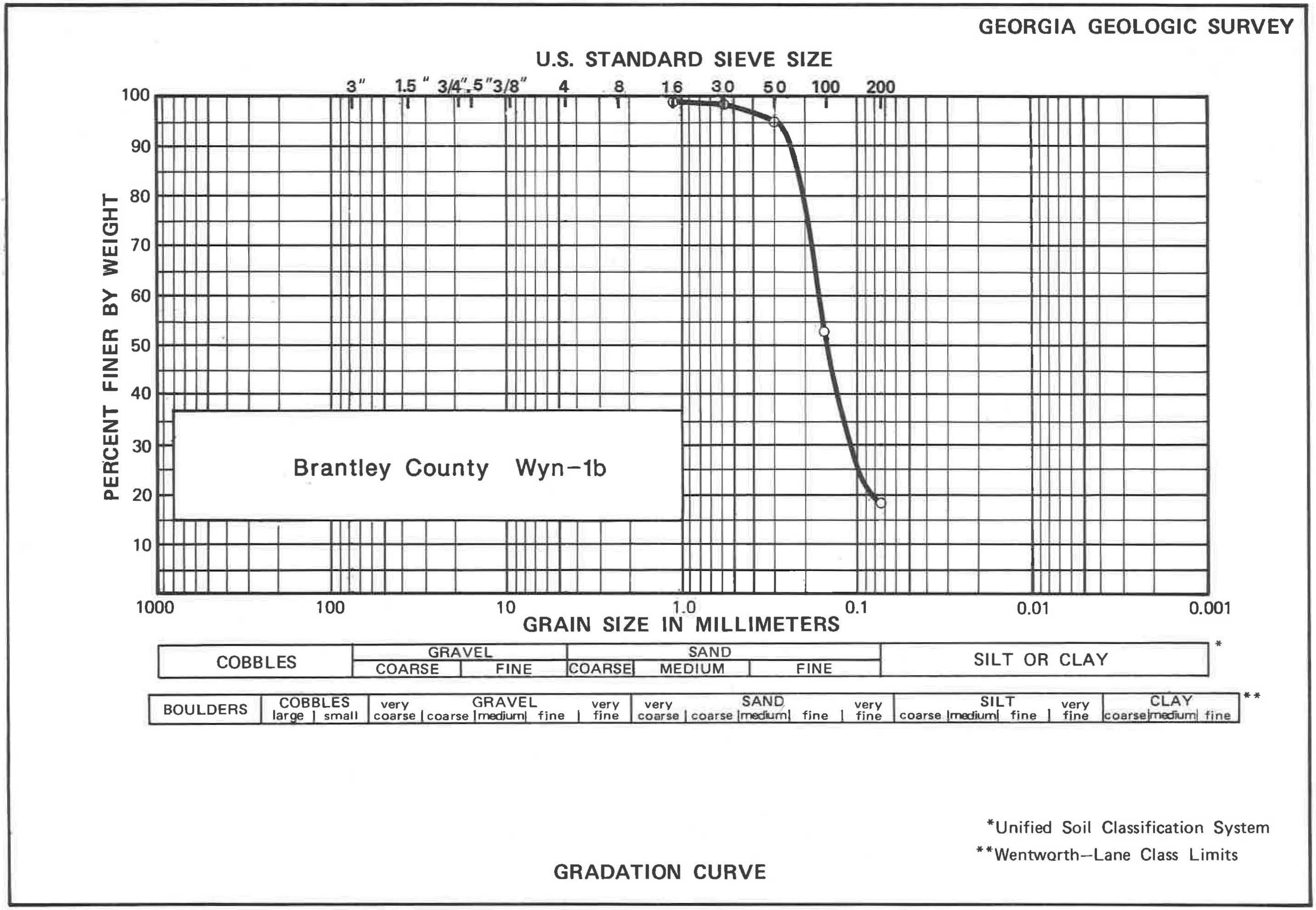


Figure 30. Size Distribution Curve of Sample Wyn-1b.

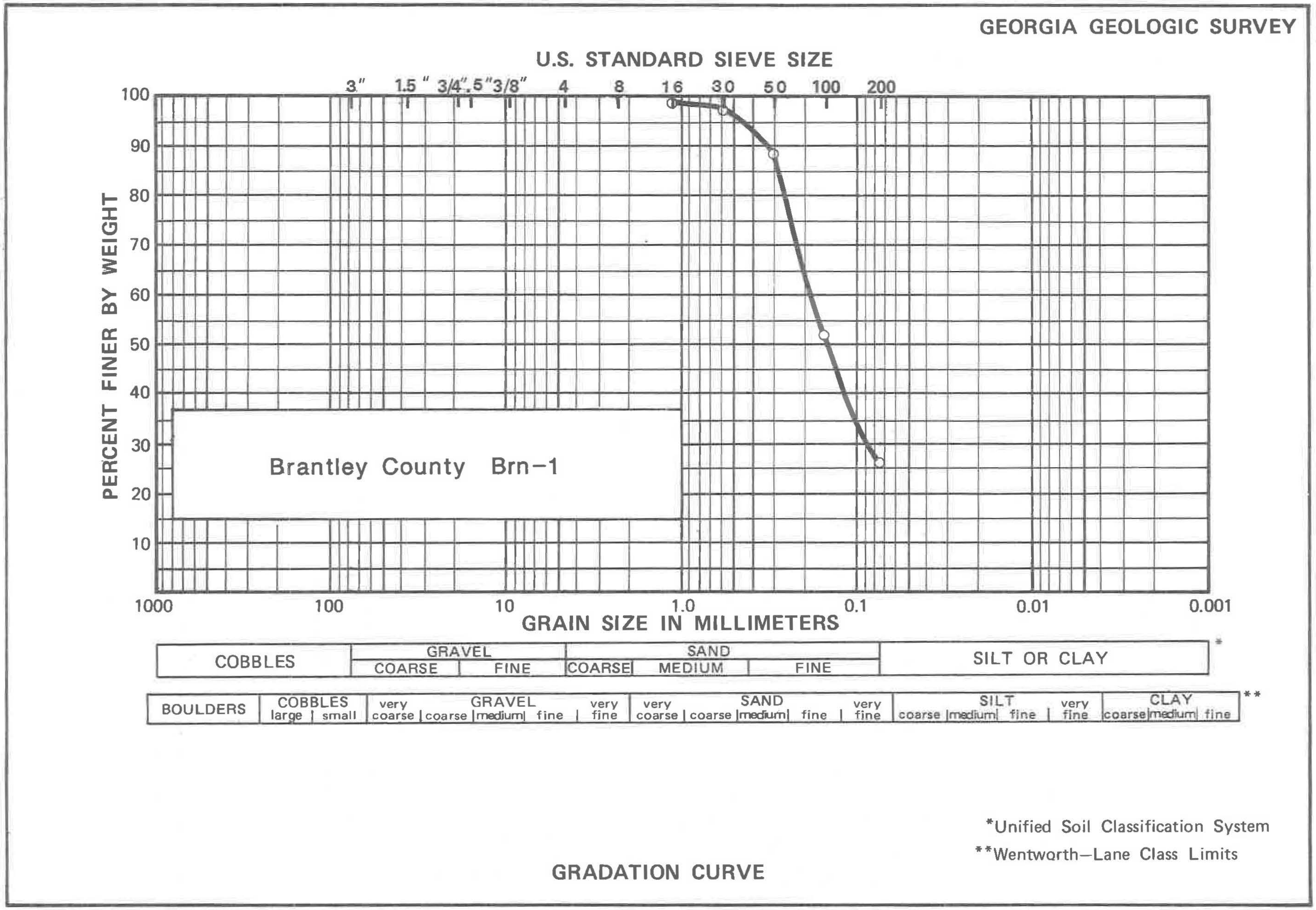


Figure 31. Size Distribution Curve of Sample Brn-1.

Table 3: Brantley County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
Hob-1a	10	auger	10	2	no	1
Nah-1	9	trench	9	2	no	1
Wyn-1a	6-1/2	auger	6-1/2	3	no	1
Wyn-1b	6-1/2 - 14	auger	7	3	no	1
Brn-1	10	auger	10	1	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

Present Study

The soil series used to target sites for sampling and analyses was Kershaw and is found in the northwestern corner of the county in interfluve areas. The geomorphic features targeted were sand bars along the Ogeechee River and sand dunes along the Canoochee River. Three samples were taken from these targeted features for analysis: MSW-1, MSW-3, Dai-2, (Figs. 32-35, Table 4).

Evaluation

None of the samples passed ASTM standard C-33. Samples MSW-1 and MSW-3 (Fig. 32) were taken from sand bars along the Ogeechee River. Both contain too high a percentage of fine-grained sand.

Sample Dai-2 was taken from an area along the Canoochee River. This sample has low percentages of silt or clay, and contains minor amounts of small gravel.

Mining Activity

There are no active or recently inactive quarries in Bryan County.

Summary Evaluation

The fine aggregate potential of Bryan County is low.

BULLOCH COUNTY

Geology and Physiography

Approximately three quarters of Bulloch County (Fig. 36) lies in the Vidalia Upland district, the remaining quarter is a part of the Barrier Island District. The same approximate line that divides this county into two physiographic districts also is the geologic contact. The larger section of the county derives its surficial sediments from the Cypresshead Formation. Surficial sediments consisting of Quaternary alluvium are found along the Ogeechee River, which forms the northeastern border of the county.

Previous Studies

Teas (1921, p. 168) reported that concrete sand for local use was mined from a small pit in Statesboro (Fig. 36, Ts-44). Teas (1921, p. 168) also reported that clean fine-grained sand is present along the north and east sides of Lotts Creek (Fig. 36, Ts-2).

Present Study

The soil type used to target areas for sampling was the Kershaw series and is found along Lotts Creek. The geomorphic features that were targeted are sand dunes along the north and east sides of Lotts Creek. Three samples were taken from these areas : Nev-1, Bro-1, Reg-1 (Figs. 36-39, Table 5).

Evaluation

None of the samples selected passed ASTM standard C-33. Sample Nev-1 (Fig. 36) was taken from an area of dune sands along the east side of Lotts Creek (see Teas, 1921, p. 168), but this sample is too clayey to make it an economical aggregate deposit.

Sample Bro-1 (Fig. 36) represents a deposit of very fine- to medium- to coarse-grained sand; however, the amount of coarse-grained material present is not sufficient to make it an economic deposit.

Sample Reg-1 is almost 30 percent clayey material, but if this were washed out, the sand may have use as an aggregate source. Most of the clayey material occurs in the upper 5 feet; from 5 to 8 feet in depth, the sand is coarser grained and less clayey.

Mining Activity

There are no active or recently inactive mining operations in Bulloch County.

Summary Evaluation

Only one of the three samples taken, Reg-1, shows any potential for aggregate production, and then only after extensive washing.

The construction aggregate potential for Bulloch County is low.

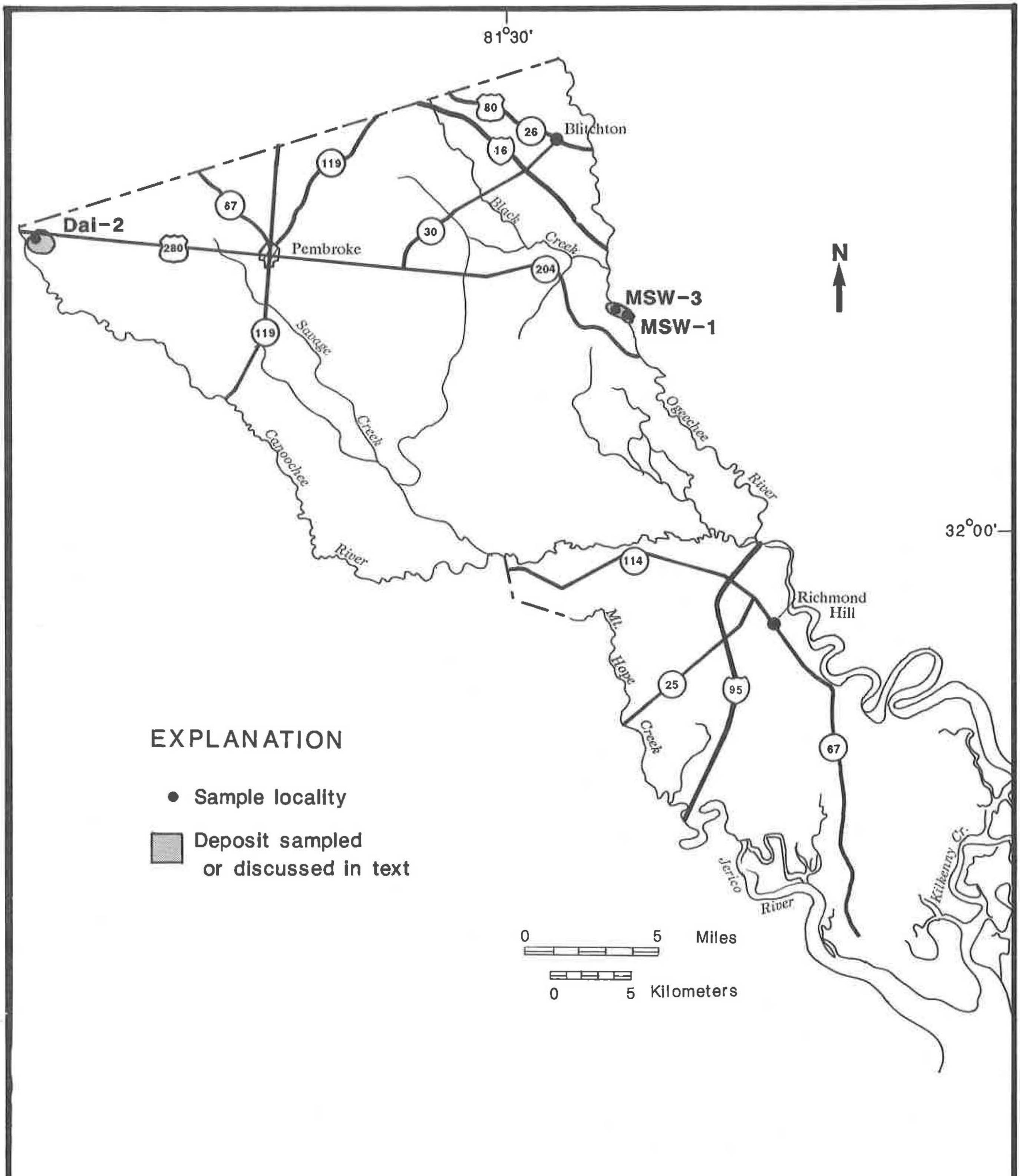
BURKE COUNTY

Geology and Physiography

Burke County lies almost entirely in the Vidalia Upland District. Only the northwestern corner lies in the Fall Line Hills District. The surficial sediments of Burke County are derived from the Oconee Group, the Barnwell Group, the Altamaha Formation and Quaternary alluvium.

Previous Studies

Teas (1921, p. 169) reported that 2 miles north of Waynesboro a small pit provided fine-grained mortar sand for use in Waynesboro (Fig. 40, Ts-3). Sand in



Refer to Plate 1 for overall construction material potential of this county.

Figure 32. Map of Bryan County Showing Localities and Deposits Sampled.

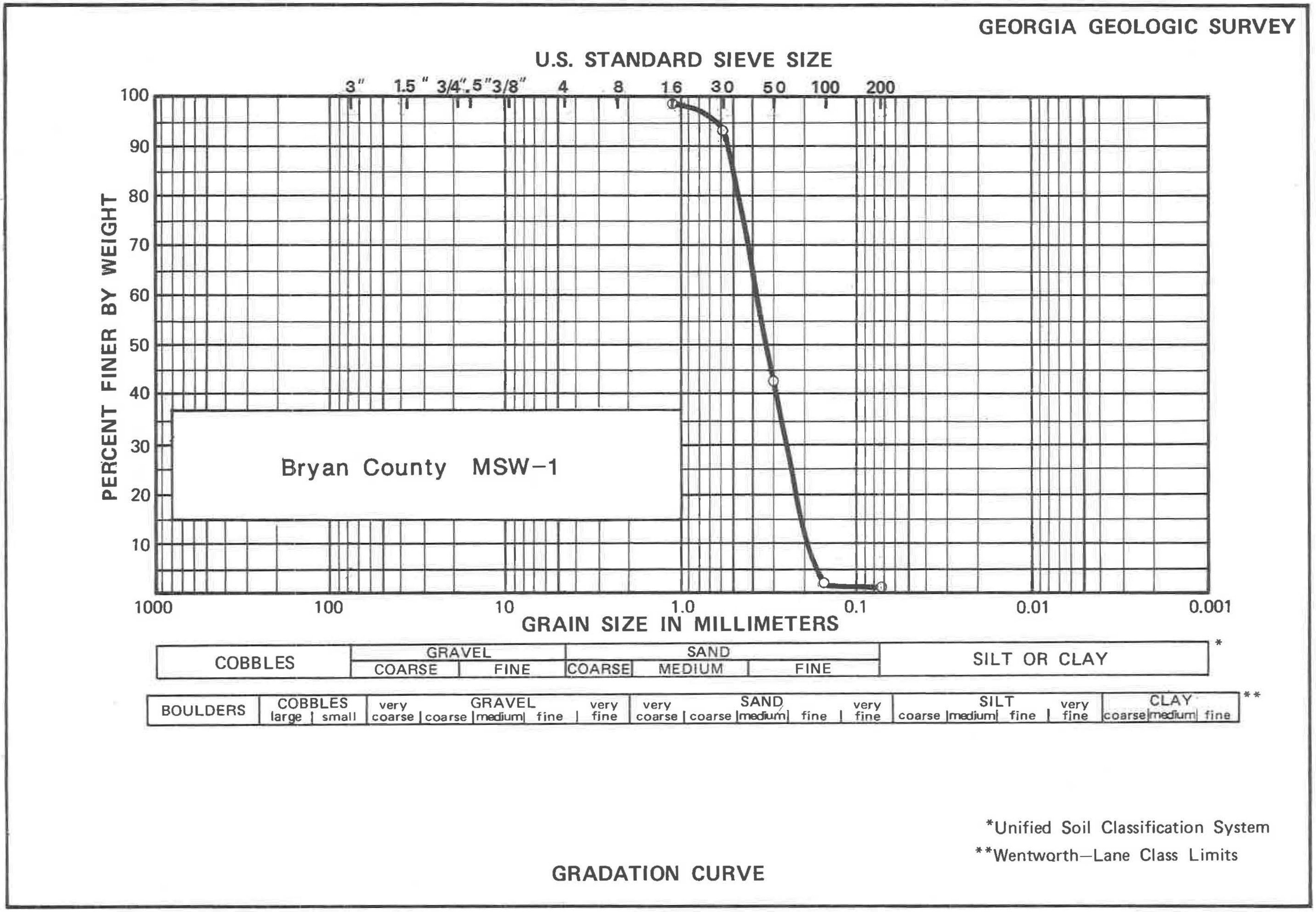


Figure 33. Size Distribution Curve for Sample MSW-1.

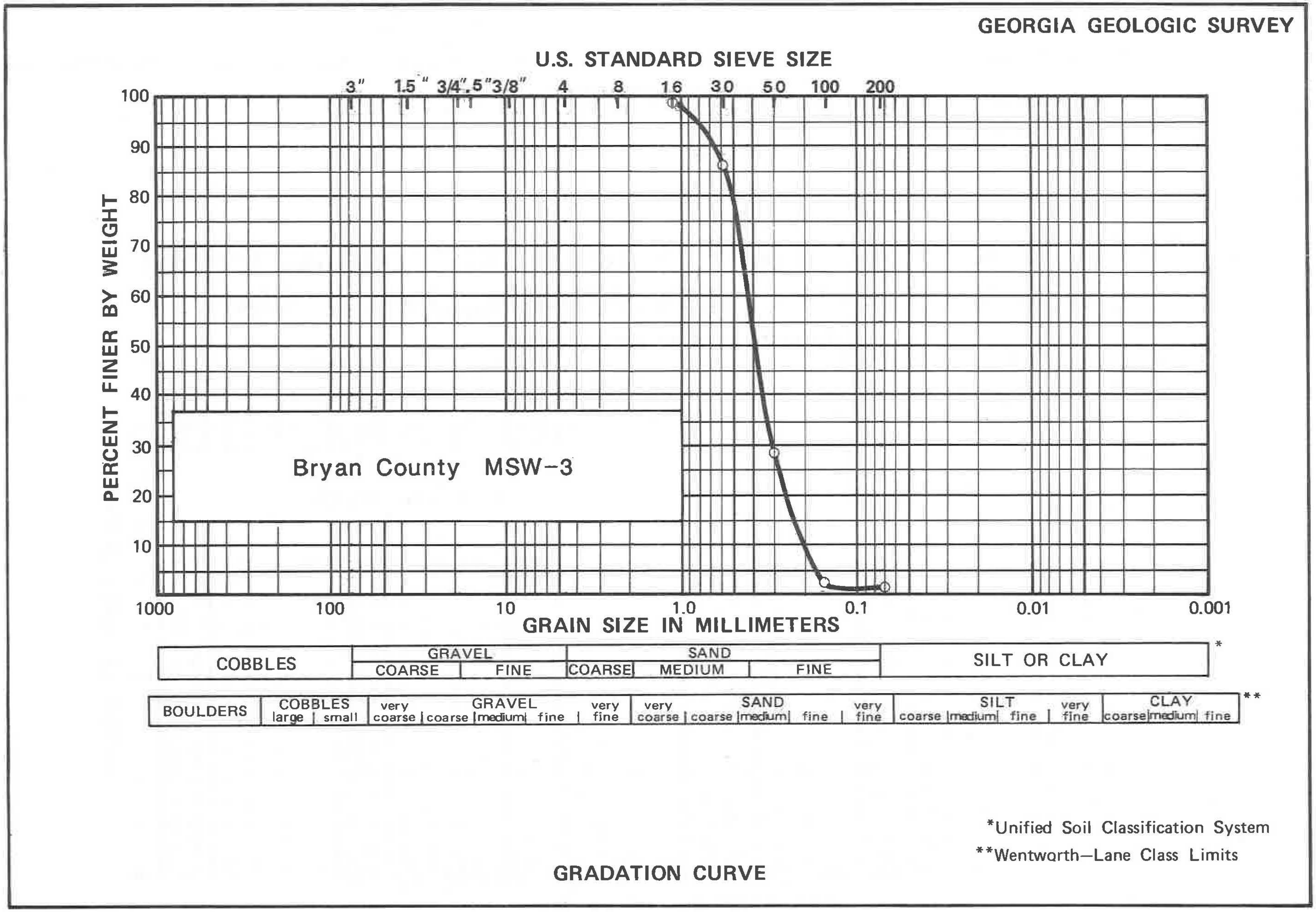


Figure 34. Size Distribution Curve for Sample MSW-3.

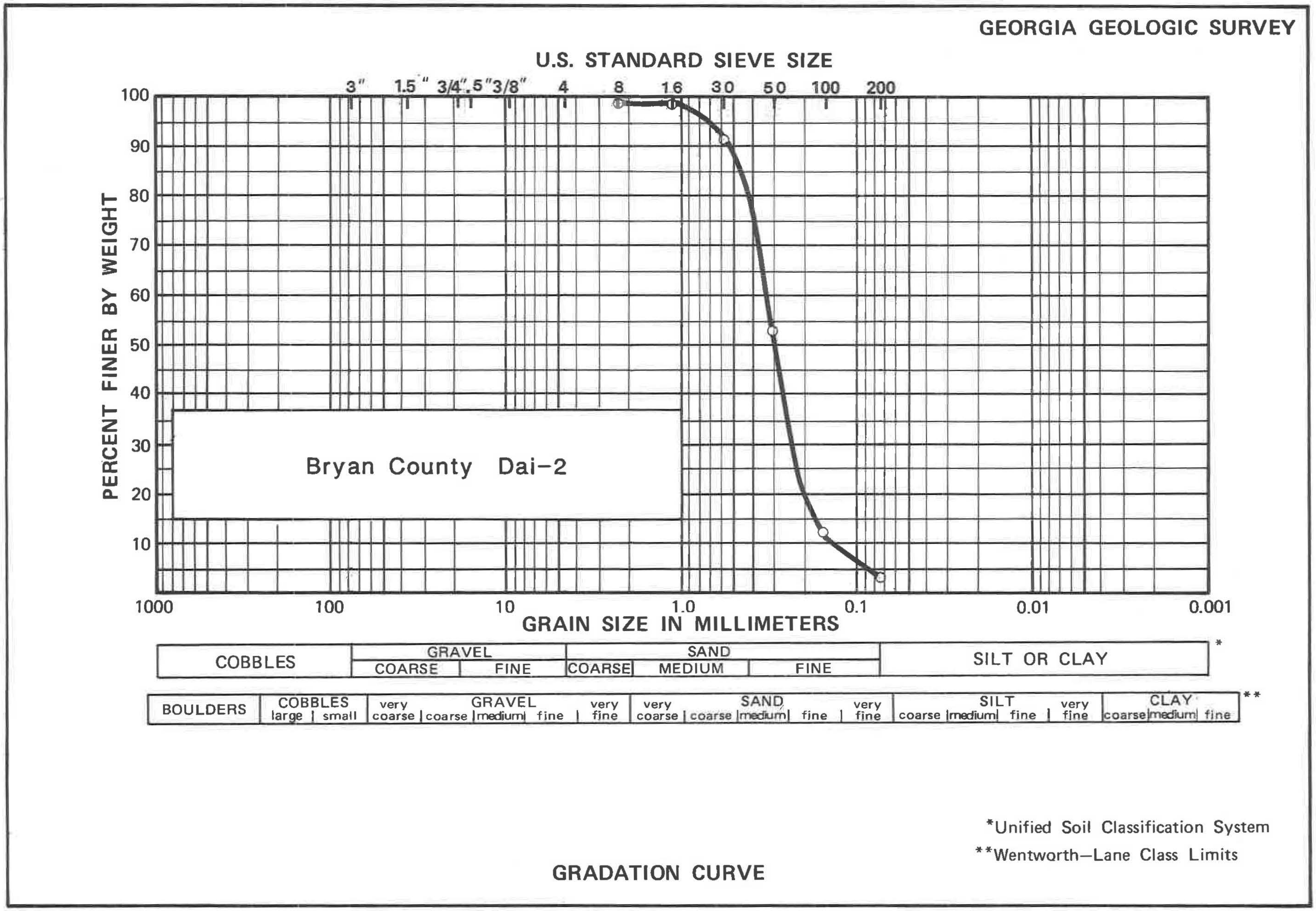


Figure 35. Size Distribution Curve for Sample Dai-2.

Table 4: Bryan County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
MSW-1a	4	auger	4	1	no	2
MSW-3	4	auger	4	1	no	2
Dai-2	13	auger	13	2	no	2

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

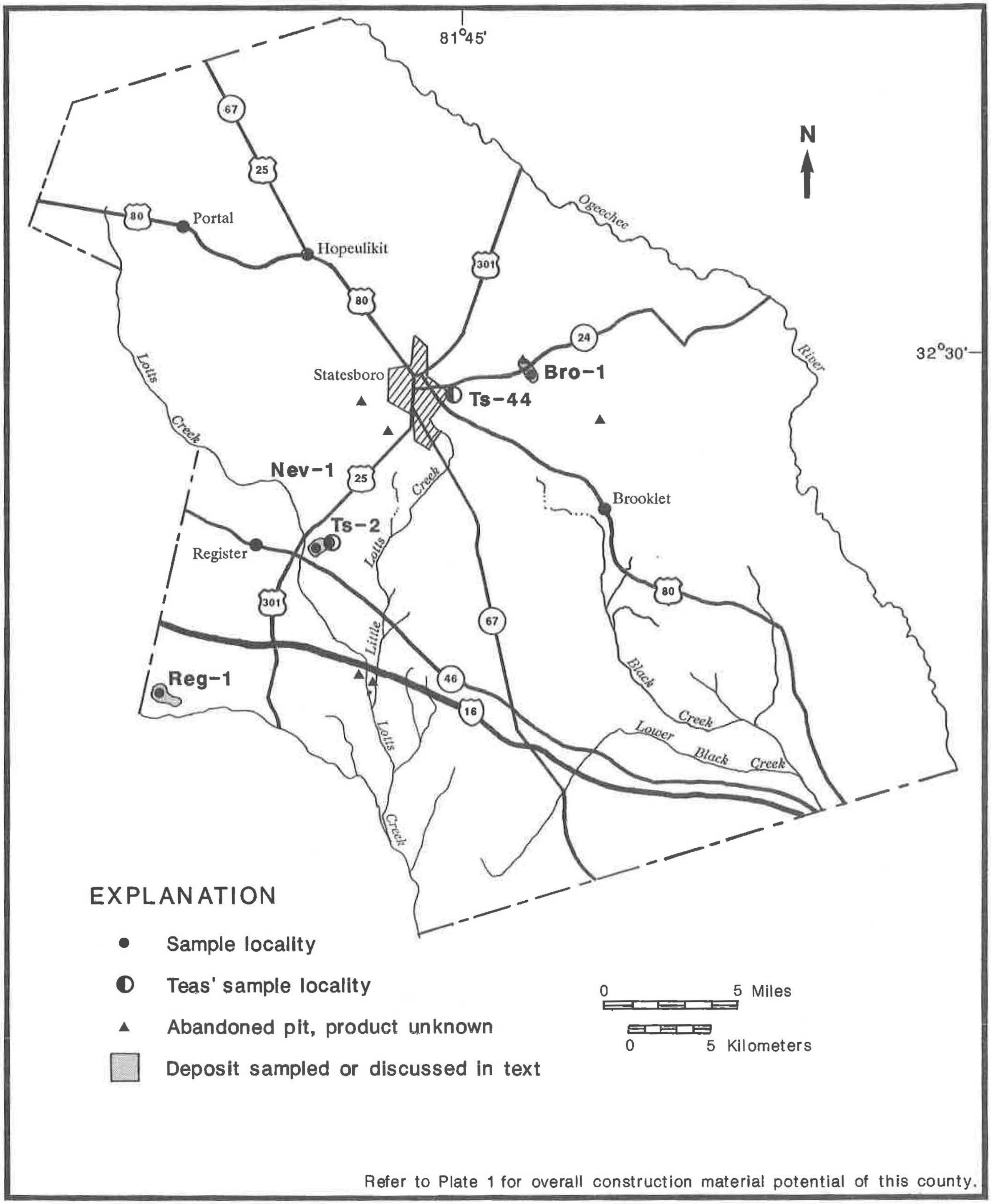


Figure 36. Map of Bulloch County Showing Localities and Deposits Sampled.

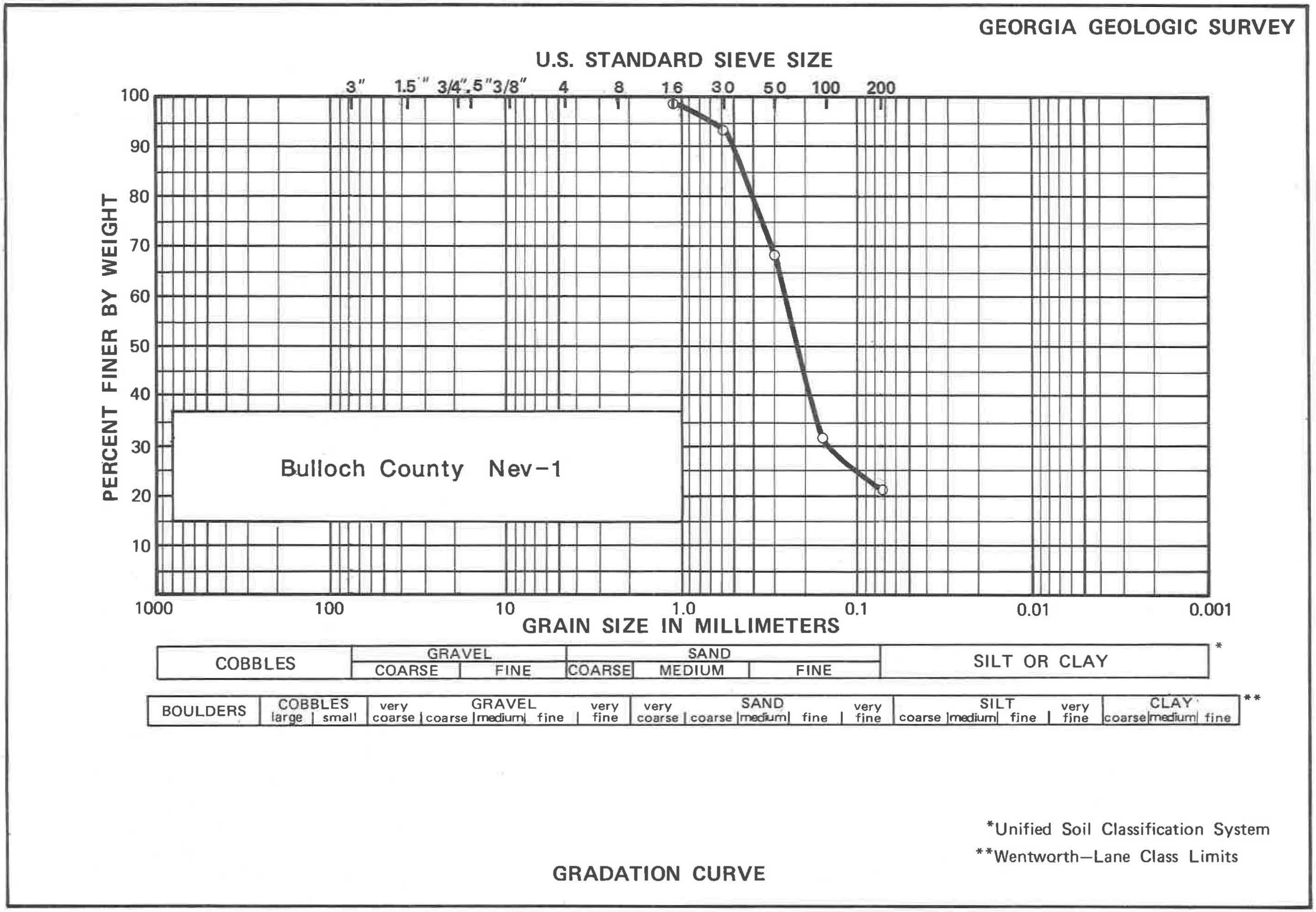


Figure 37. Size Distribution Curve for Sample Nev-1.

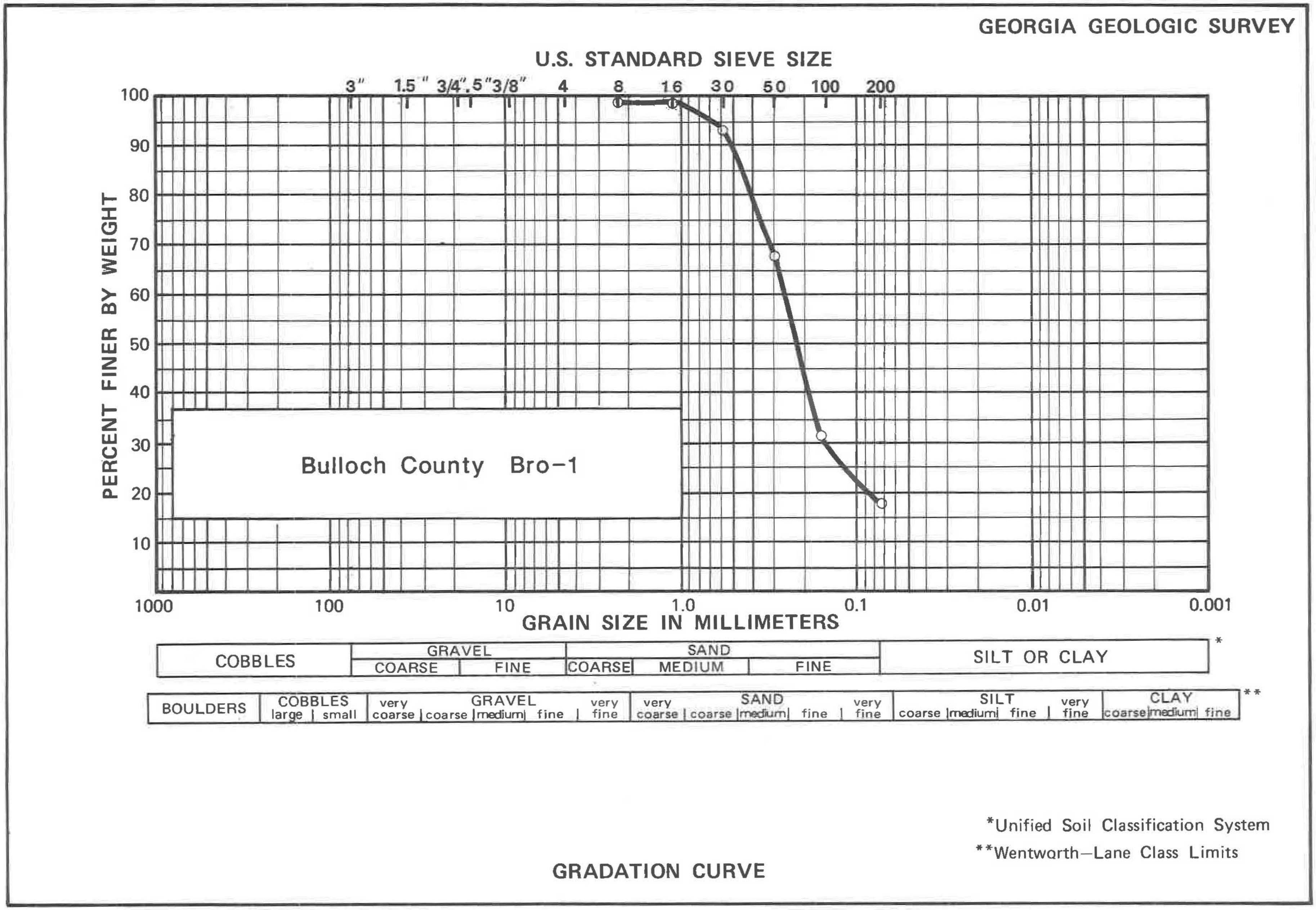


Figure 38. Size Distribution Curve for Sample Bro-1.

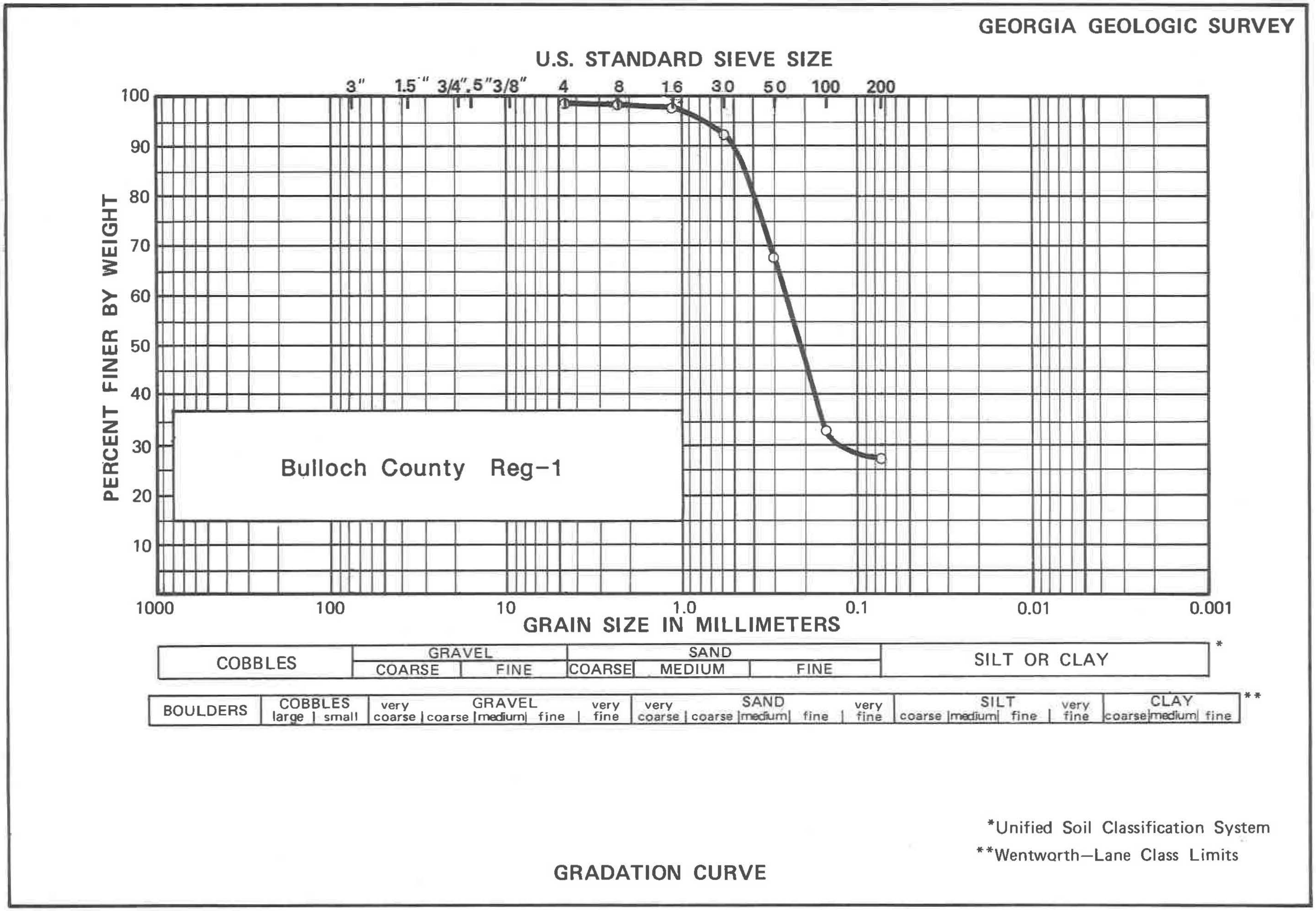


Figure 39. Size Distribution Curve for Sample Reg-1.

Table 5: Bulloch County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
Nev-1	11	auger	11	2	no	0
Bro-1	9	auger	9	2	no	0
Reg-1	8	auger	8	2	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

the vicinity of Keysville provided material for the manufacture of cement blocks (Fig. 40, Ts-4).

Hurst, et al., (1966) reported two active sand pits about 4 miles northeast of Waynesboro; and two inactive gravel pits, one approximately 2.9 miles north of Gough, and one on the Burke-Jenkins County line (Fig. 40, CSRA-1, CSRA-2, CSRA-3). These pits are now inactive.

Present Study

The soil type used for targeting sites for sampling in Burke County is #32 which is present in the northern part of the county near the streams. Seven samples were taken from five areas: SMp-1, McB-1, Kys-2, Kys-1a, Kys-1b, Idl-1a, Idl-1b (Figs., 40-47, Table 6).

Evaluation

The sample SMp-1 (Fig. 40) represents a gravelly zone approximately 6 feet thick at the location of an abandoned pit. This sample does not pass ASTM standard C-33 because this deposit is too fine-grained. However, the fact that the sample contains some coarser grained material, makes this deposit of approximately 10 acres potentially suitable for aggregate production. The material surrounding this gravelly zone is clayey, and would be considered waste. This deposit is easily accessible by way of U.S. Highway 25.

Sample McB-1 (Fig.40) represents a 25 foot thick deposit of clayey fine- to coarse-grained sand with occasional gravel. This sample does not meet ASTM standard C-33, but could be upgraded to meet it. This deposit of approximately 5 acres is easily accessible by way of Ga. Highway 56.

Sample Kys-2 was taken from a 10 foot high sand dune north of Keysville. This sand is typical of the dune sands of south Georgia, very clean and well-sorted fine- to medium-grained sand. This could be useful for glass sand. The deposit is approximately 3 acres in extent and is located on Ga. Highway 88. The deposits represented by samples Kys-1 and Idl-1 contain too high a percentage of fine-grained material, and were not considered further.

Mining Activity

There are no active quarries or pits in Burke County. Sand and gravel was mined in the past at the location of CSRA-3 and sample SMp-1 (Fig. 40).

Summary Evaluation

The deposits represented by Samples SMp-1 and McB-1 could be potential construction aggregate sources. The location of SMp-1 was mined in the past. Overall the construction material potential for fine or coarse aggregate production in Burke County is considered to be low.

CAMDEN COUNTY

Geology and Physiography

Camden County lies within the Barrier Island District of the Coastal Plain Province. The surficial sediments of Camden County are derived from the Satilla Formation, the barrier island deposits, and Quaternary alluvium.

Previous Studies

Teas (1921, p. 170) noted that, according to S.W. McCallie (personal communication.), sand from the bed of St. Marys River is loaded onto barges and shipped to St. Marys and the adjoining coastal islands for local use (Fig. 48, Ts-5).

Present Study

The soil series used in targeting areas of Camden County are Fripp-Duckston and Olustee. The Fripp-Duckston series is generally found along the coastline as well-drained dune fields. The Olustee is present as isolated pods of sand adjacent or proximal to creeks and rivers of central and southern Camden County. One geomorphic feature, an area of point bars along the Satilla River, in western Camden County, was targeted. Three samples from Camden County were sieved: Woo-1, BoL-1, Kng-1 (Figs. 48-51, Table 7).

Evaluation

None of the samples taken (Woo-1, BoL-1, and Kng-1) meet ASTM standard C-33. The deposits represented by these samples have no potential for aggregate production due to either excessive amounts of material finer than #200 (Woo-1, BoL-1) or poor grain size distribution (Kng-1).

Mining Activity

There are no active commercial aggregate operations in Camden County. A sand dredge was operated along the Satilla River in northwestern Camden County by a Mr. McDonald. No further information is available. One abandoned sand pit is located southeast of Kingsland.

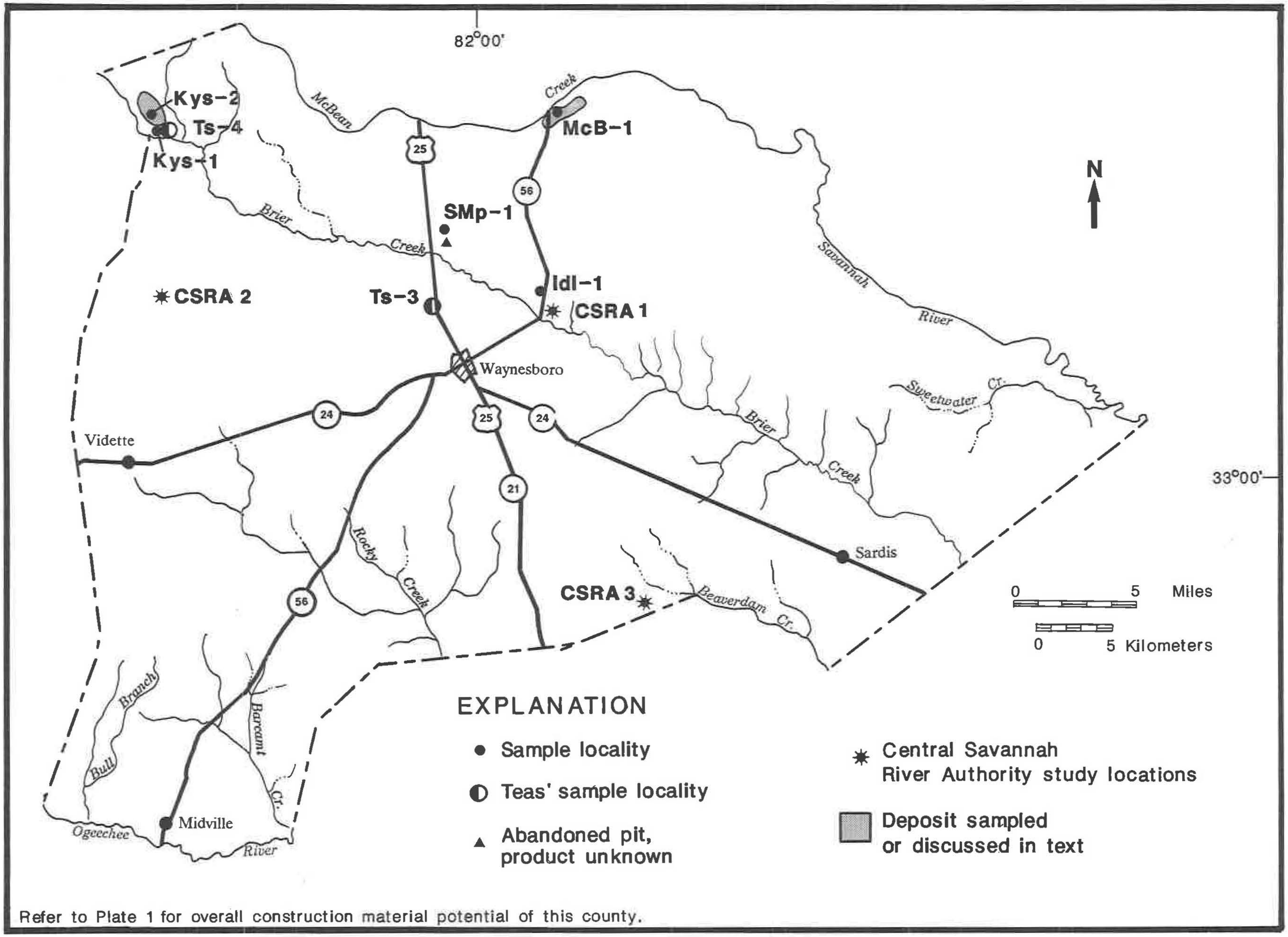


Figure 40. Map of Burke County Showing Localities and Deposits Sampled.

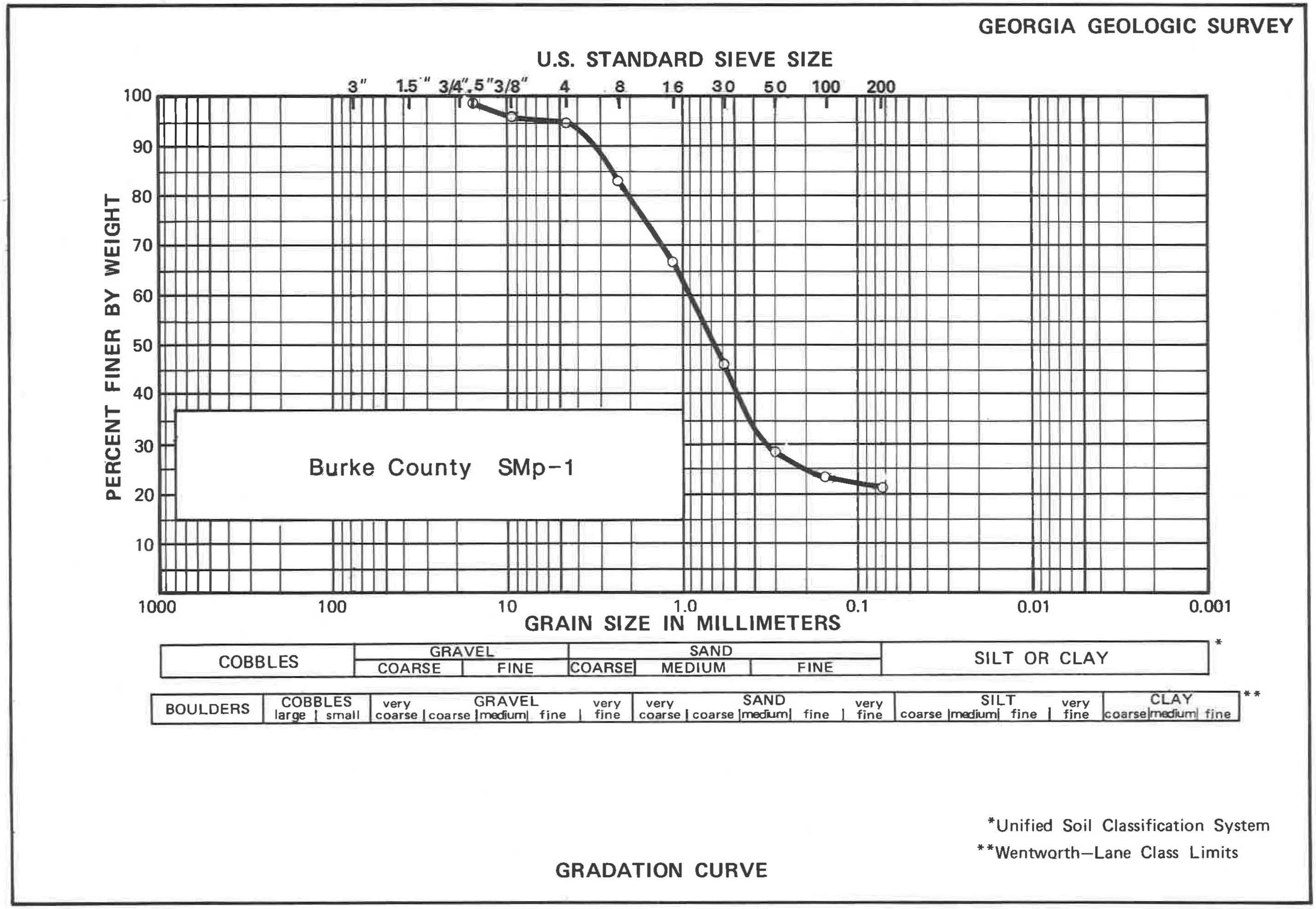


Figure 41. Size Distribution Curve for Sample SMp-1.

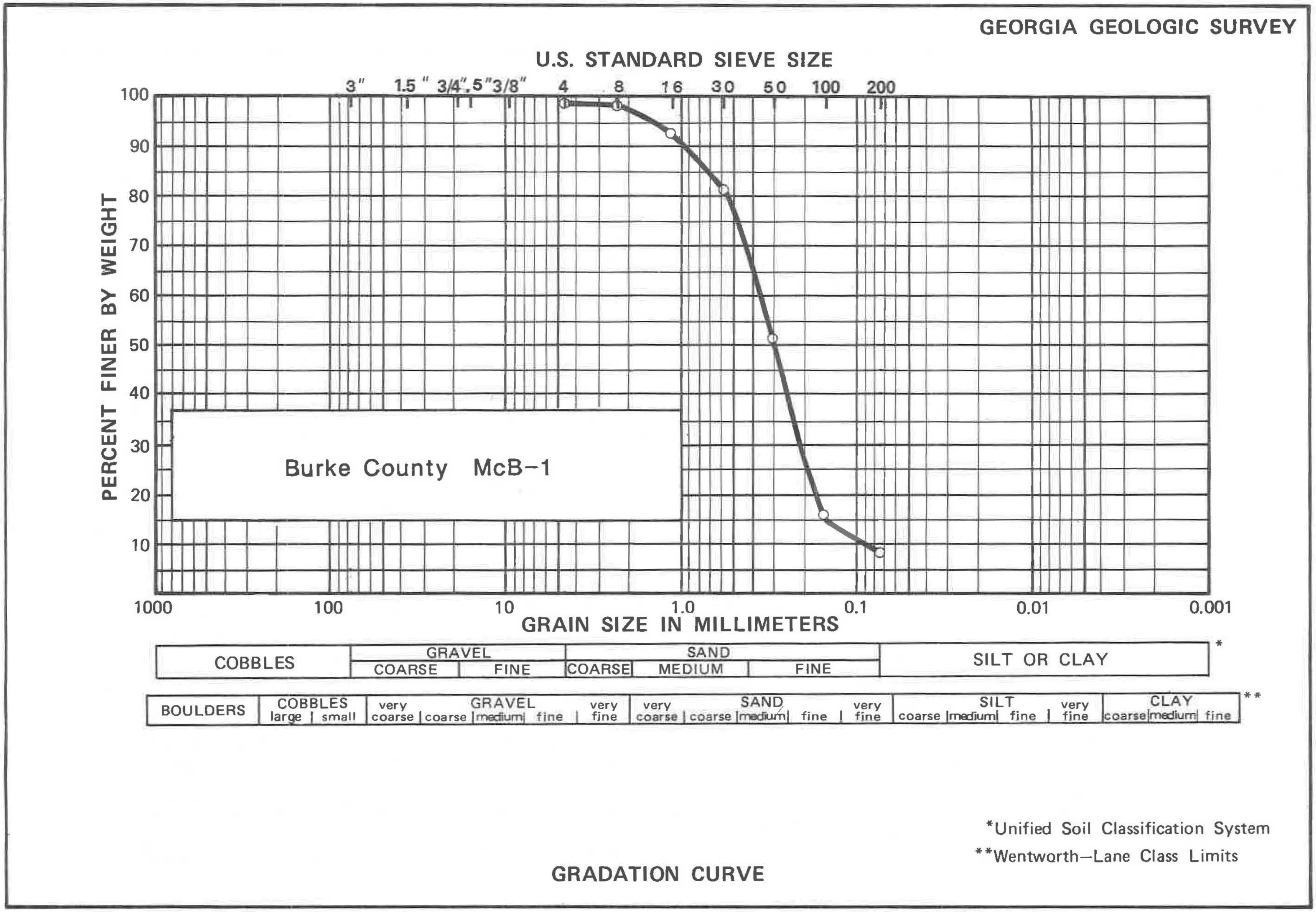


Figure 42. Size Distribution Curve for Sample McB-1.

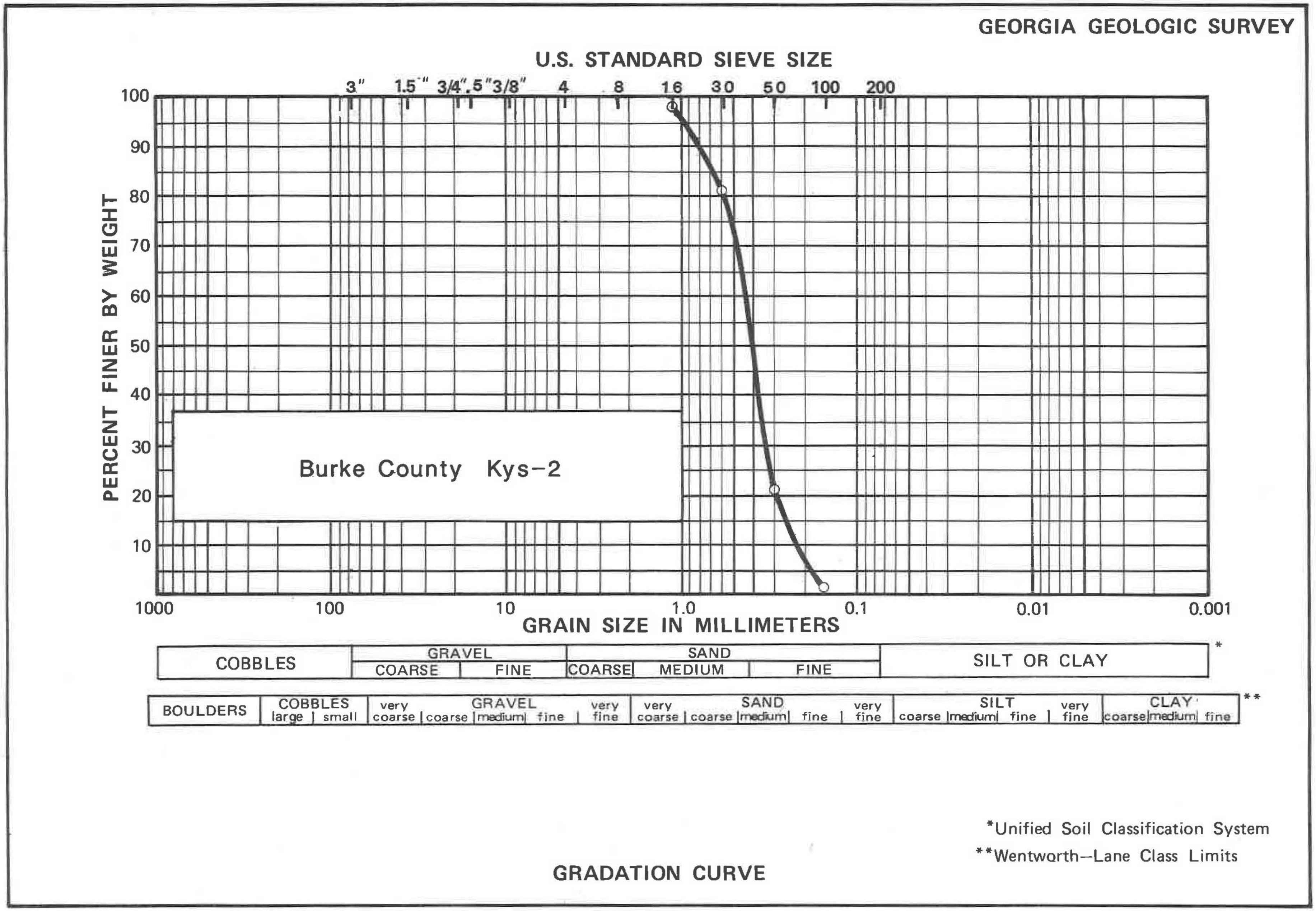


Figure 43. Size Distribution Curve for Sample Kys-2.

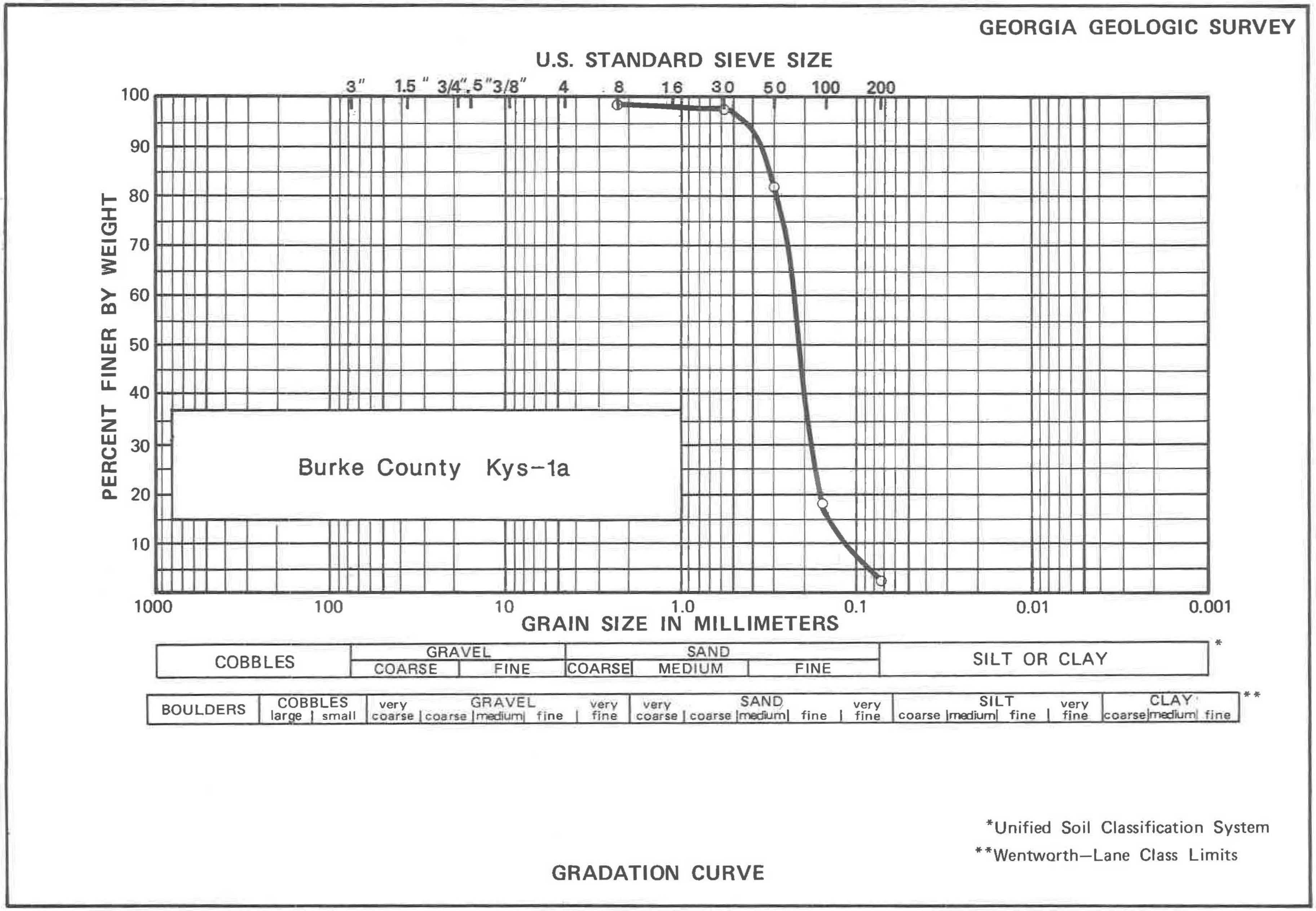
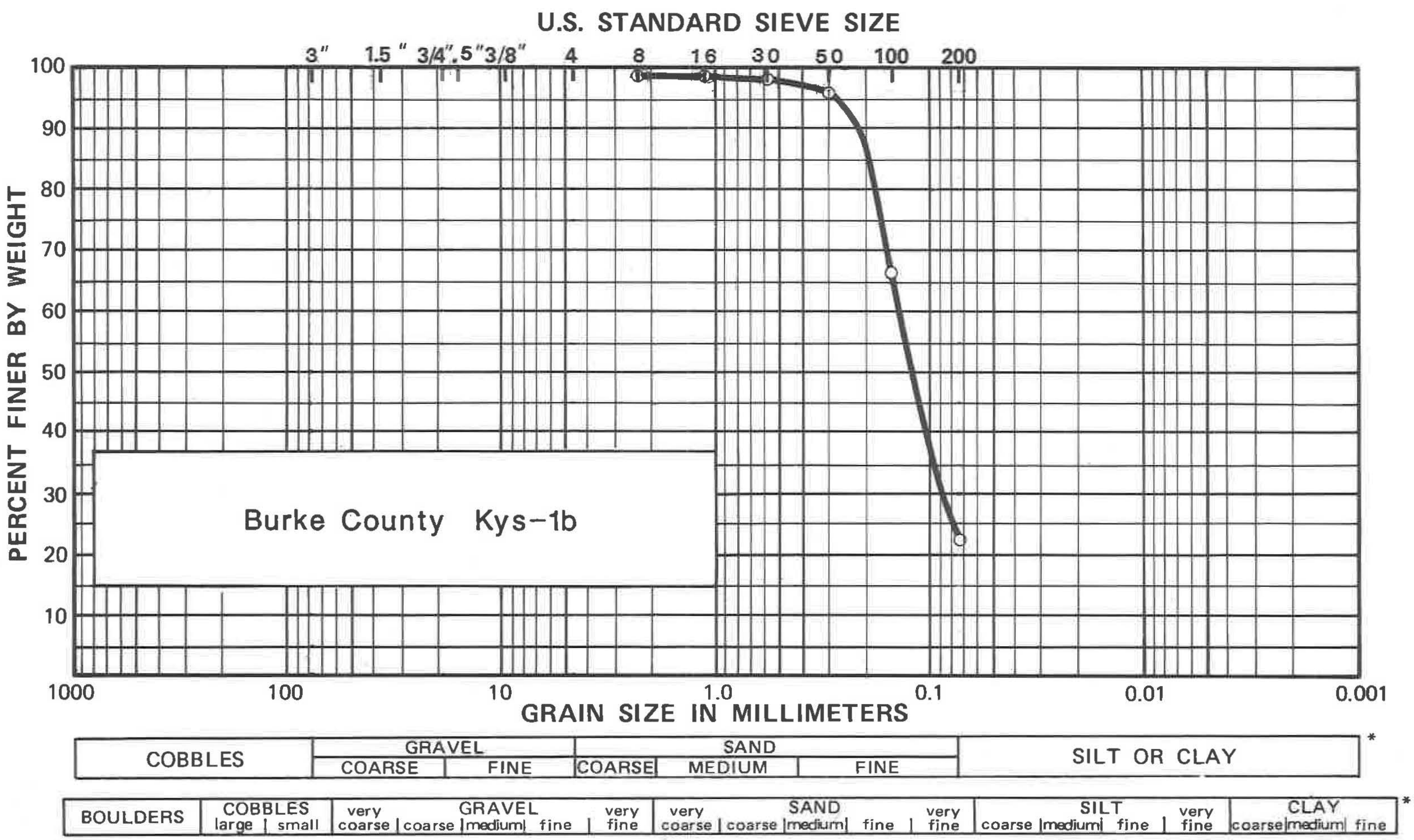


Figure 44. Size Distribution Curve for Sample Kys-1a.

GEORGIA GEOLOGIC SURVEY



*Unified Soil Classification System

**Wentworth–Lane Class Limits

GRADATION CURVE

Figure 45. Size Distribution Curve for Sample Kys-1b.

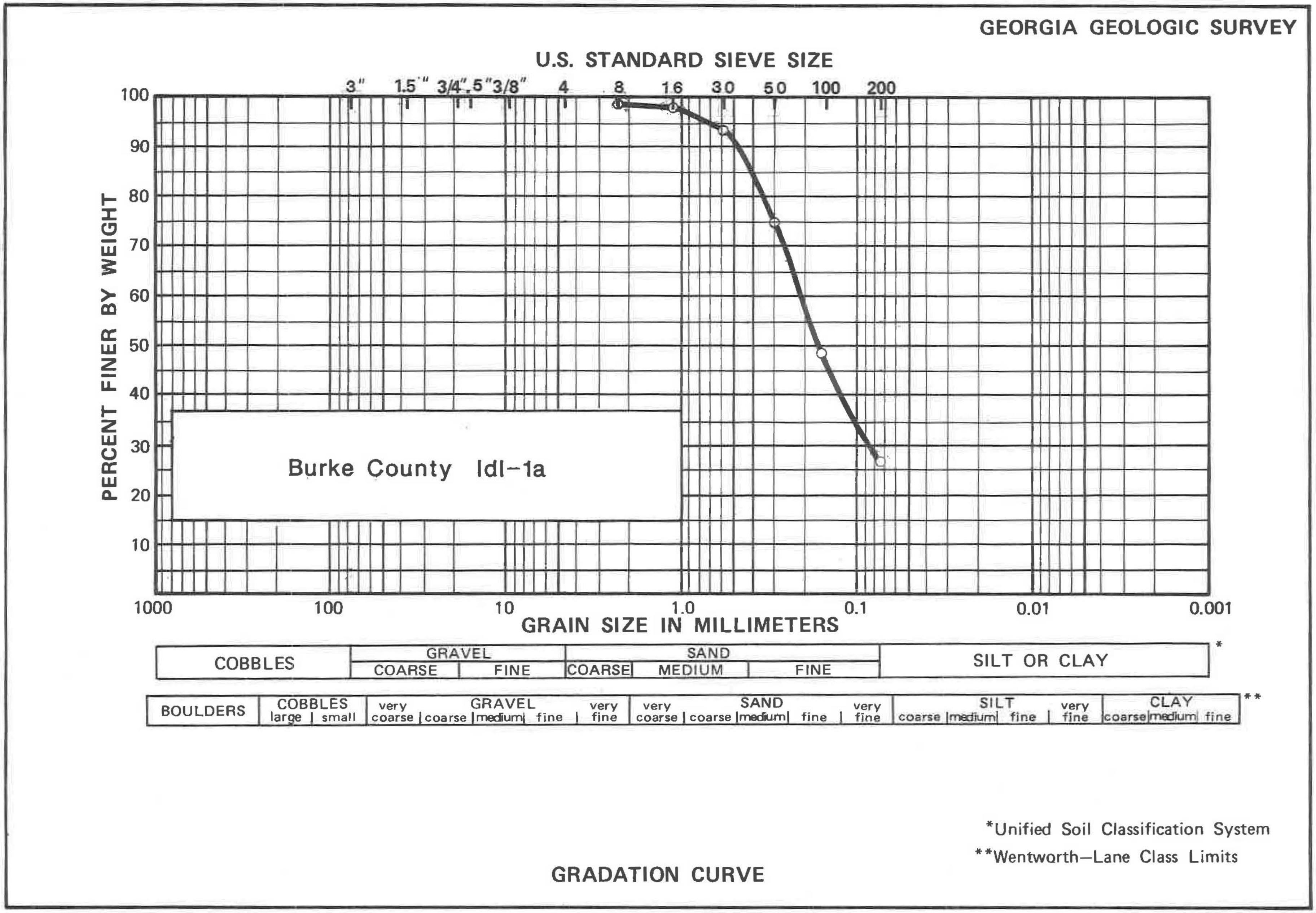


Figure 46. Size Distribution Curve for Sample Idl-1a.

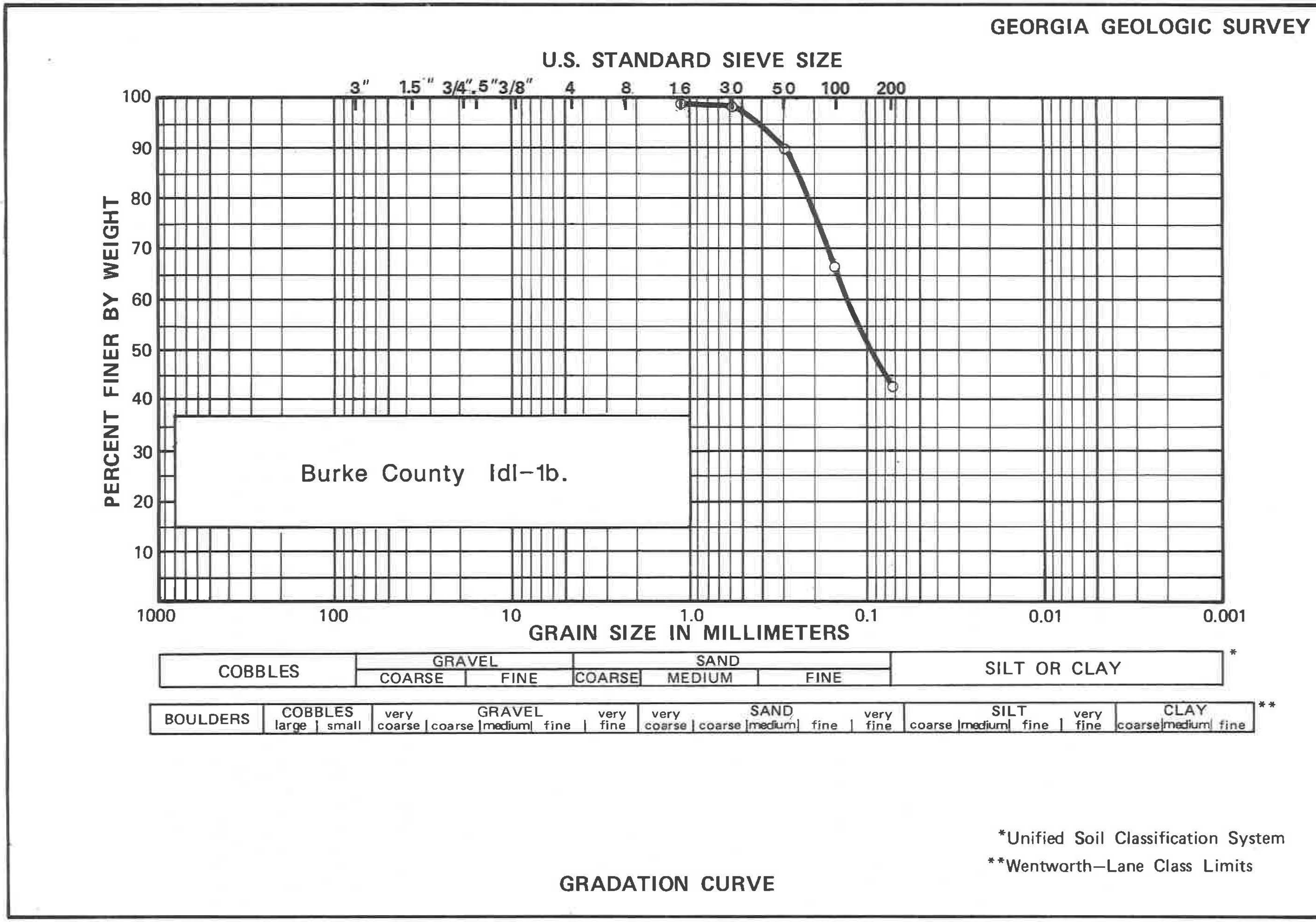


Figure 47. Size Distribution Curve for Sample Idl-1b.

Table 6: Burke County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
SMp-1	6	trench	23	1	no[4]	2
McB-1	25	trench	25	1	no[4]	2
Kys-2	10	trench	10	2	no	1
Kys-1a	5	auger	5	2	no	1
Kys-1b	5 - 9	auger	4	2	no	0
Idl-1a	3	auger	3	1	no	0
Idl-1b	3 - 11	auger	8	1	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

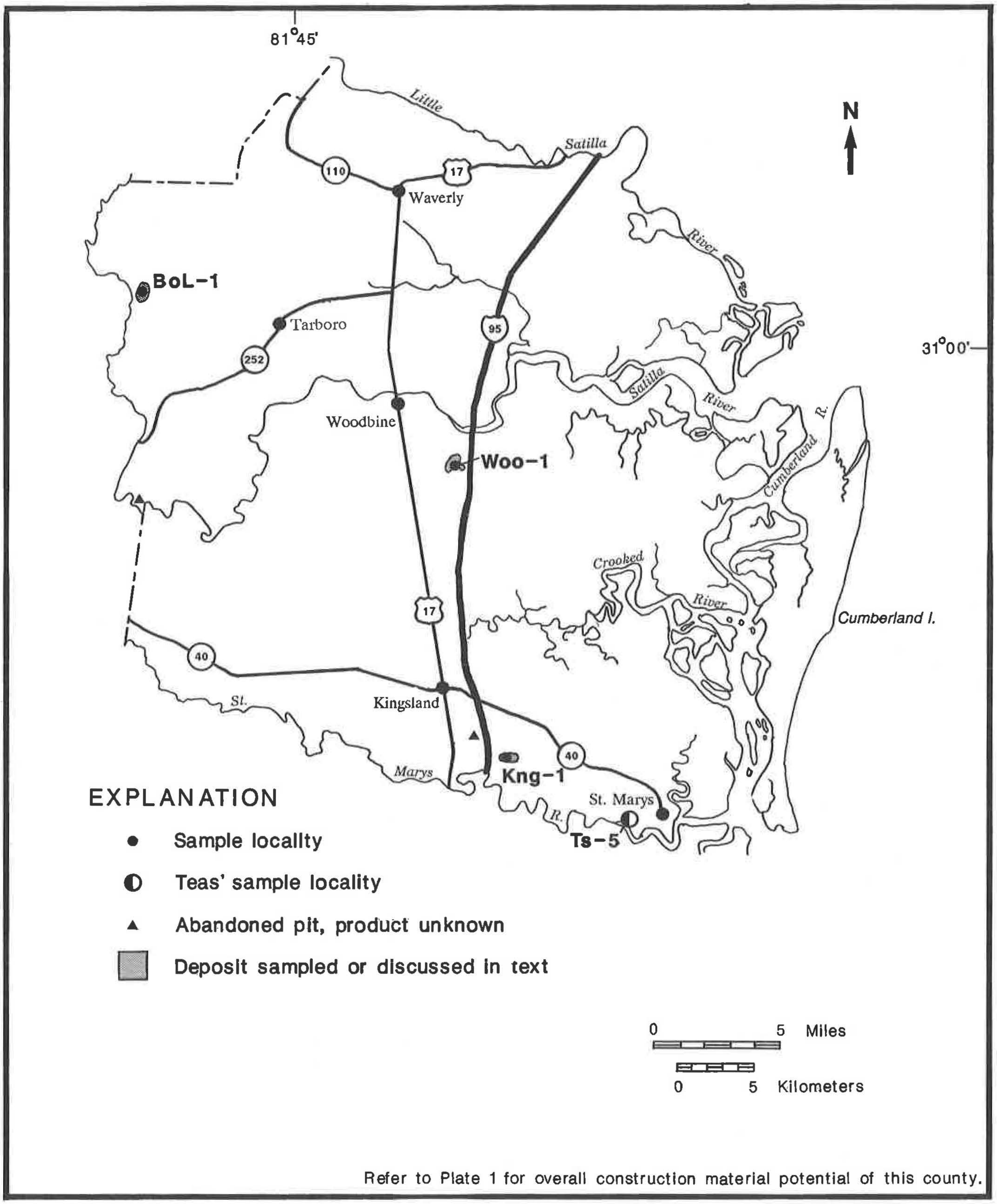


Figure 48. Map of Camden County Showing Localities and Deposits Sampled.

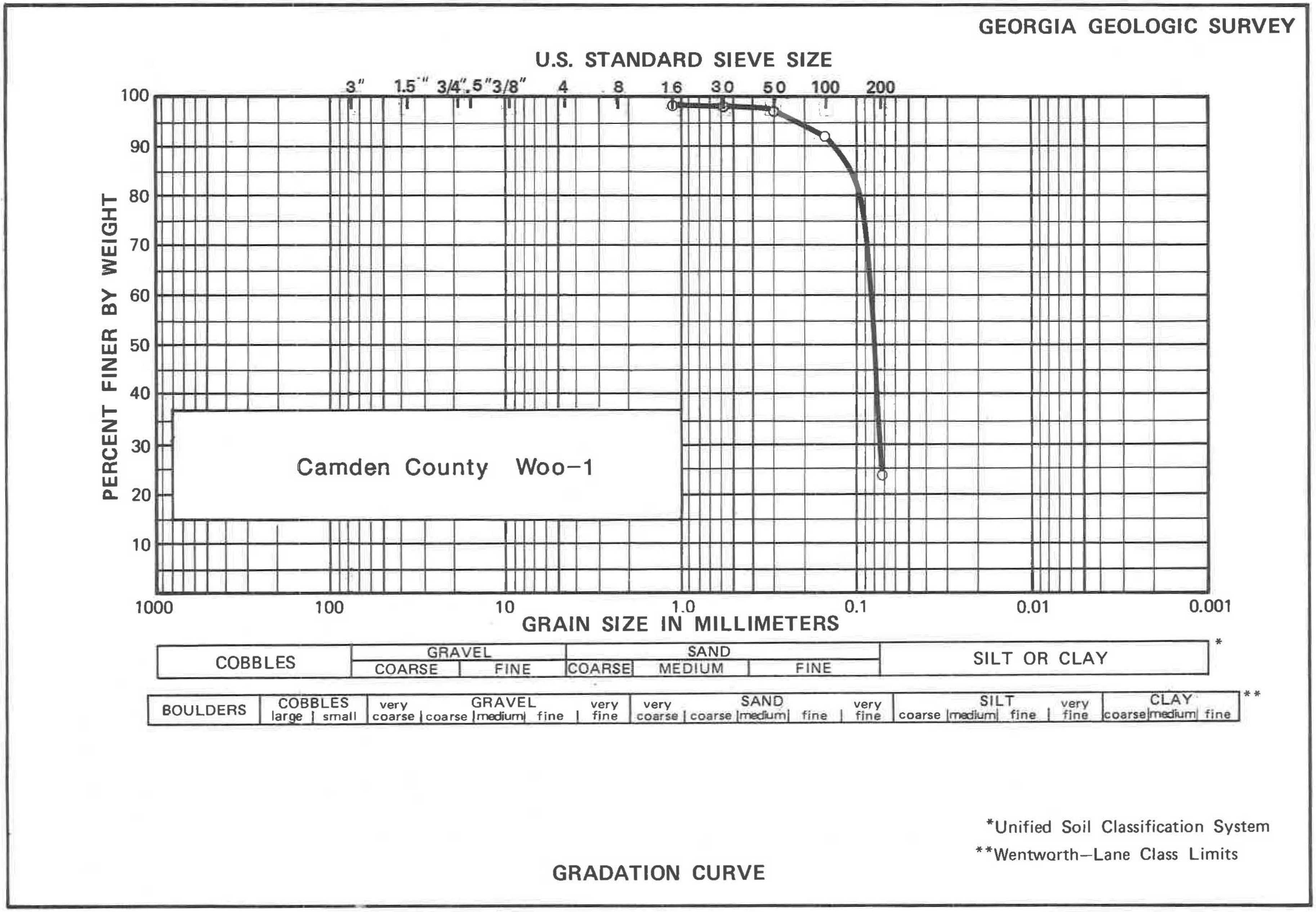


Figure 49. Size Distribution Curve of Sample Woo-1.

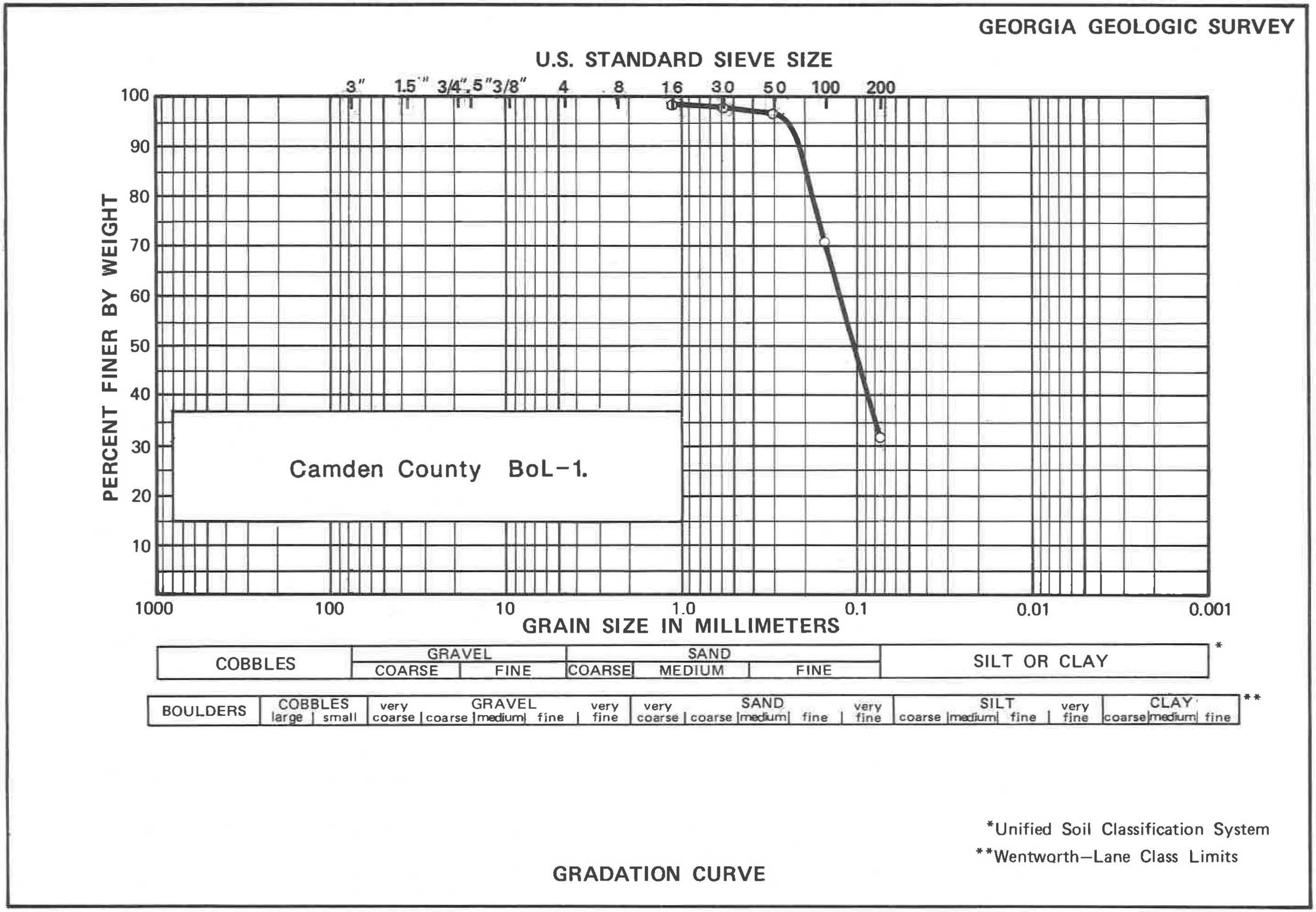


Figure 50. Size Distribution Curve of Sample BoL-1.

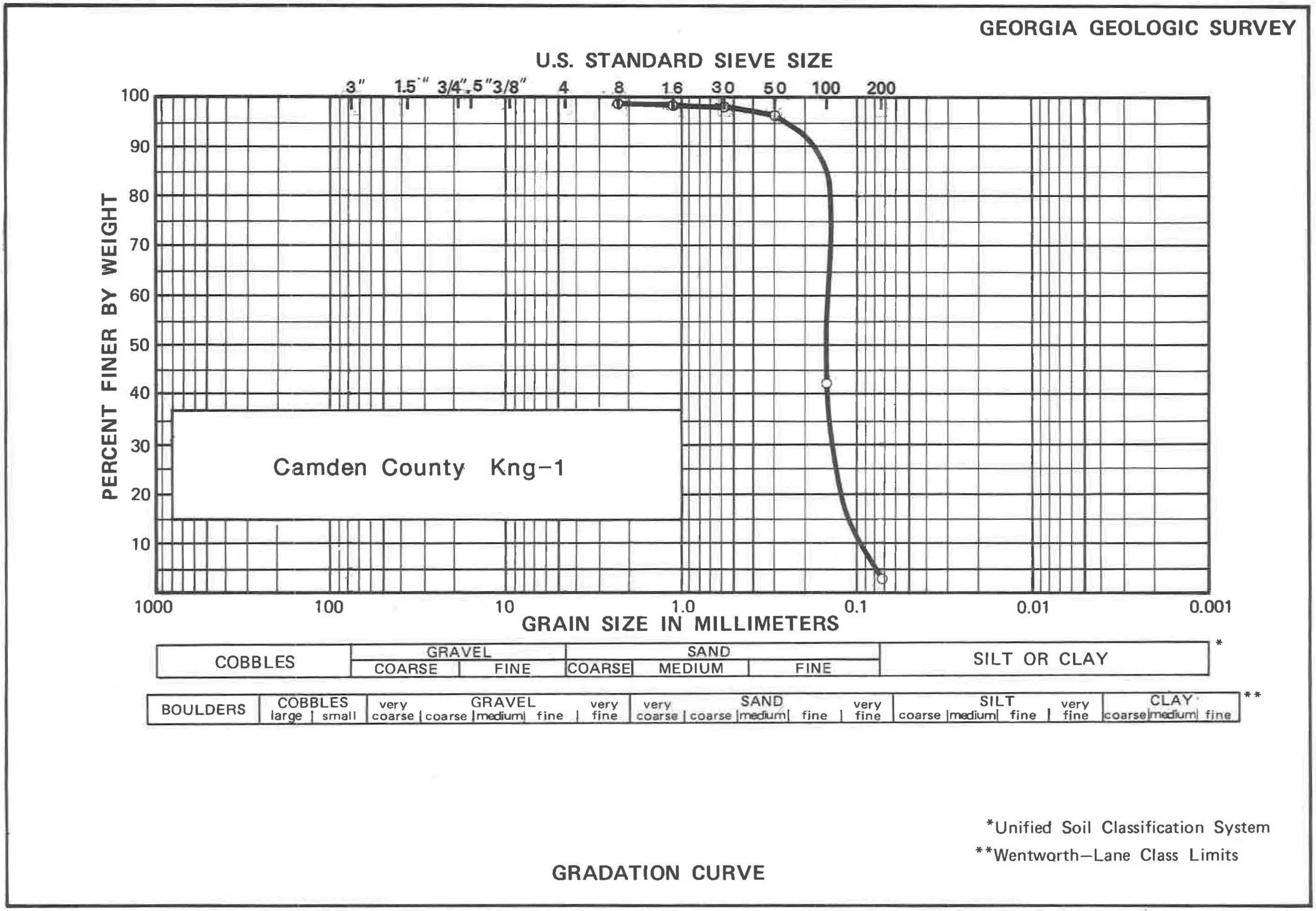


Figure 51. Size Distribution Curve of Sample Kng-1.

Table 7: Camden County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
Woo-1	12	auger	12	0	no	0
BoL-1	12-1/2	auger	12-1/2	2	no	0
Kng-1	10	auger	10	2	no	1

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

Summary Evaluation

The potential for either fine or coarse aggregate production in Camden County is considered to be low.

CANDLER COUNTY

Geology and Physiography

Candler County lies within the Vidalia Uplands District of the Coastal Plain Province. The majority of the surficial sediments of the county are derived from the Altamaha Formation.

Previous Work

Teas (1921, p. 170-171) mentioned the occurrence of coarse-grained sand near Metter (Fig. 52, Ts-6) and deposits of fine- to medium-grained sand along Fifteenmile Creek and the Canoochee River (Fig. 52, Ts-7, 8).

Present Study

The soil series used in targeting areas of Candler County were the Kureb and Kershaw series. These soil associations are generally present in conjunction with dune fields paralleling the eastern banks of the major creeks and rivers of the county, particularly the Ohoopee and Canoochee Rivers and Fifteenmile Creek. Three samples from Candler County were sieved: Met-1, MtS-1, Sti-3 (Figs. 52-55, Table 8).

Evaluation

None of the samples sieved meet ASTM standard C-33. Although all three samples contain little material finer than #200, and the dune deposits represented by the samples have very large reserves, the general grain size is too fine and too uniform for use as a concrete aggregate.

Mining Activity

There are no active or recently inactive commercial aggregate mining operations in Candler County.

Summary Evaluation

The dune sands along Fifteenmile Creek and the Canoochee River offer large reserves of easily mined sand. Unfortunately , this sand is too fine grained for use as construction aggregate; therefore, the potential for fine aggregate production is considered to be low.

CHARLTON COUNTY

Geology and Physiography

Charlton County lies within the Okefenokee Basin District and the Barrier Island District. Its surficial sediments are derived from the Satilla Formation, barrier island deposits, the Cypresshead Formation, and Quaternary alluvium (Fig. 3).

Previous Studies

Teas (1921 p. 171-172) reported that the eastern part of Charlton County has some patchy sands scattered throughout. There is sand 6 to 8 feet in thickness mentioned as being east of Folkston, and 2 to 6 feet thick along the St. Marys and Satilla Rivers.

Present Study

The soil types used in targeting areas for analyses were #24 and #41. The geomorphic features targeted are dunes along the St. Marys River near Boulogne. Four samples were taken from 3 sites: Fol-1a, Fol-1b, Bou-1, MNE-1 (Figs. 56-60, Table 9).

Evaluation

None of the samples analyzed met ASTM standard C-33. They are all too fine grained.

Mining Activity

There is one active mining operation in Charlton County. Florida Rock Industries (Fig. 56, #534) has an operation near Stokesville in southeastern Charlton County. This is an 8 acre pit in the vicinity of their old pit of 333 acres. This pit produces glass sand, mortar sand, and concrete sand. Their market area is a 50 mile radius and they use trucks and railroad for transportation. They have an average yearly production of 100,000-500,000 tons. They use a hydraulic sand pump, a front end loader and a dredge. This pit has been in operation since 1983. There was one sand dredge company working on the St. Marys River, but it is evidently not in business anymore.

Summary Evaluation

The samples taken in this county indicate the potential for fine aggregate production in this county is low, but since there is an active producer in the county, there are obviously isolated favorable areas. Therefore, the aggregate potential for Charlton

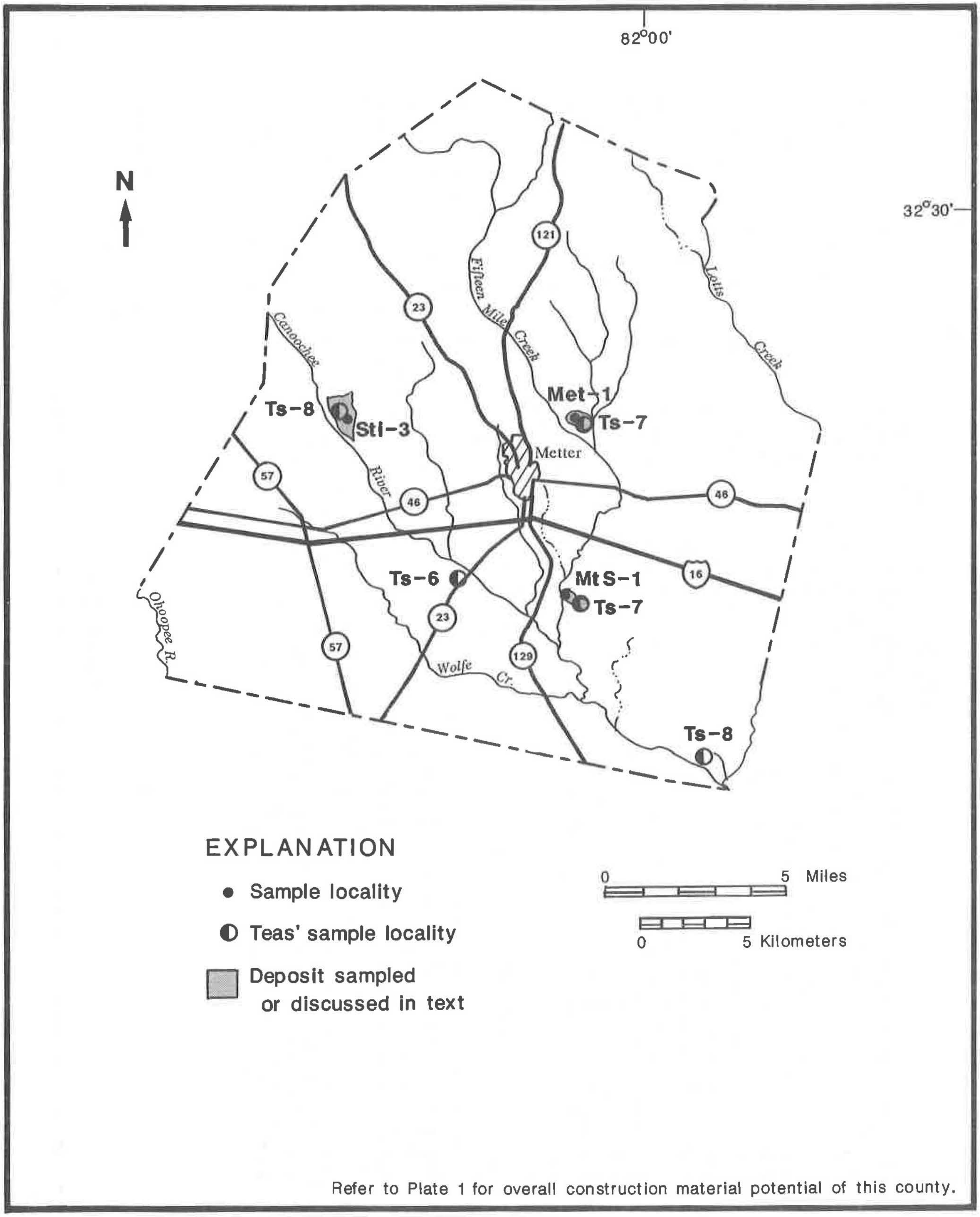


Figure 52. Map of Candler County Showing Localities and Deposits Sampled.

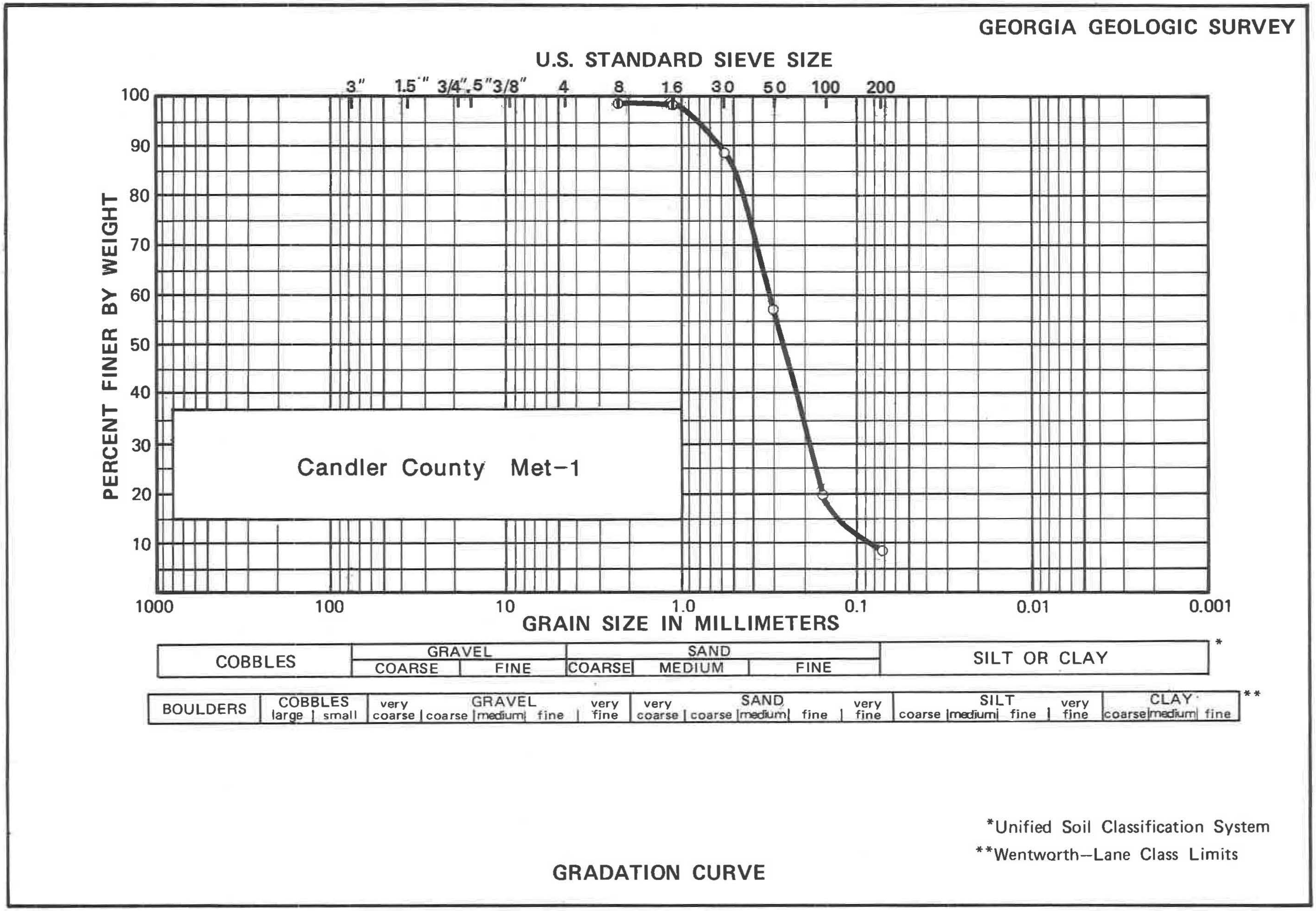


Figure 53. Size Distribution Curve of Sample Met-1.

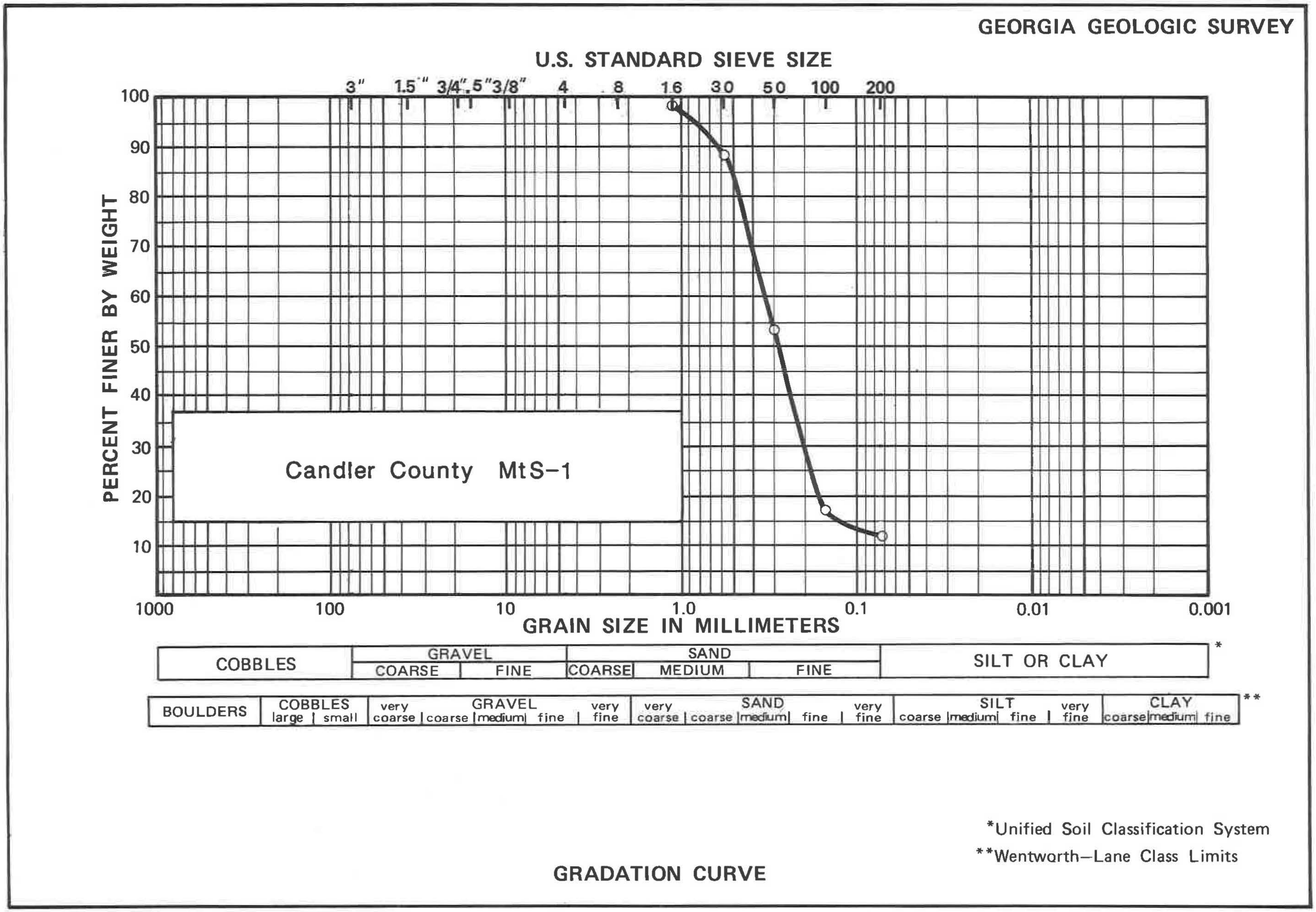


Figure 54. Size Distribution Curve of Sample MtS-1.

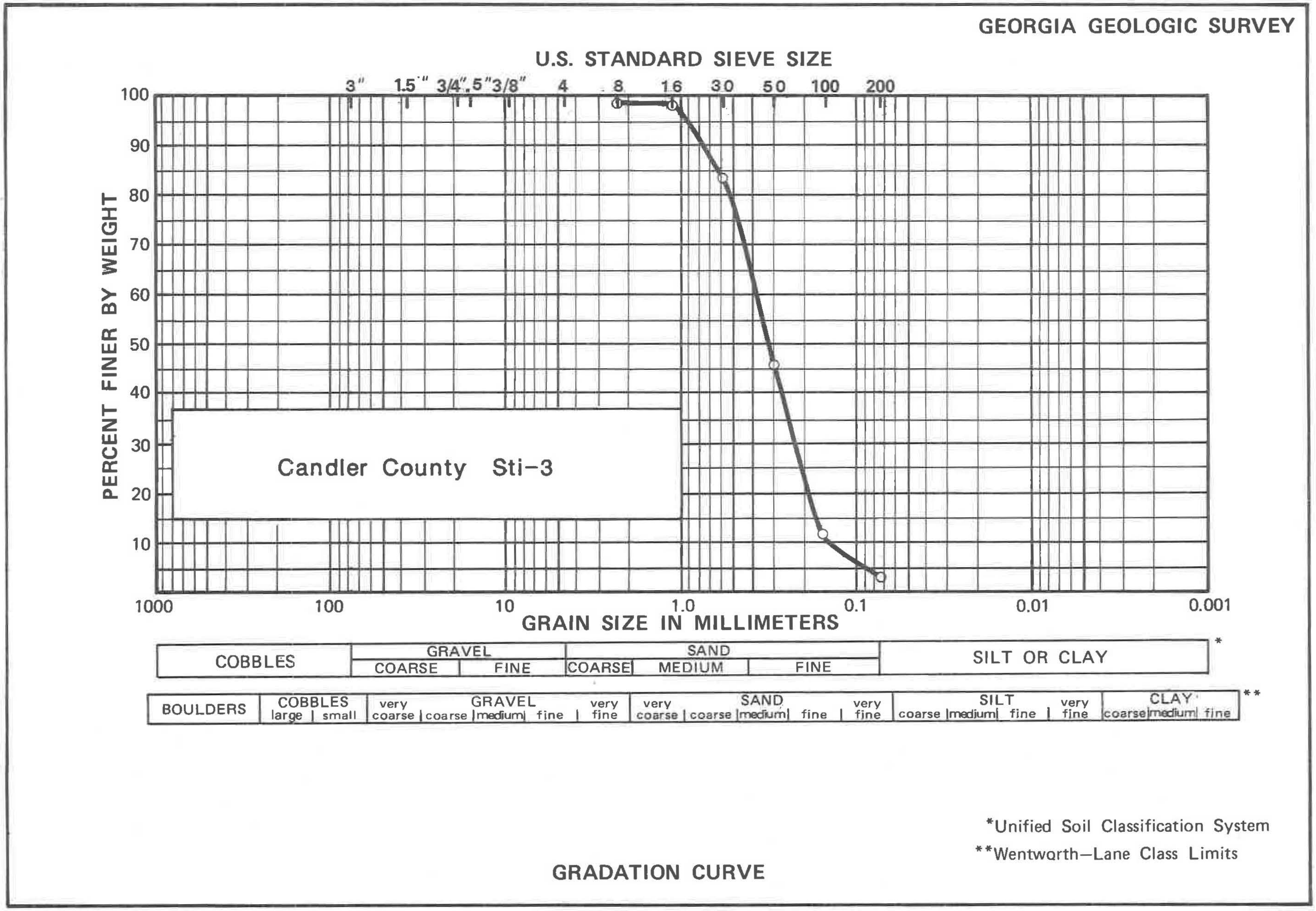


Figure 55. Size Distribution Curve of Sample Sti-3.

Table 8: Candler County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
Met-1	14	trench	14	2	no	2
MtS-1	6	auger	20	2	no	2
Sti-3	4	auger	25	3	no	2

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

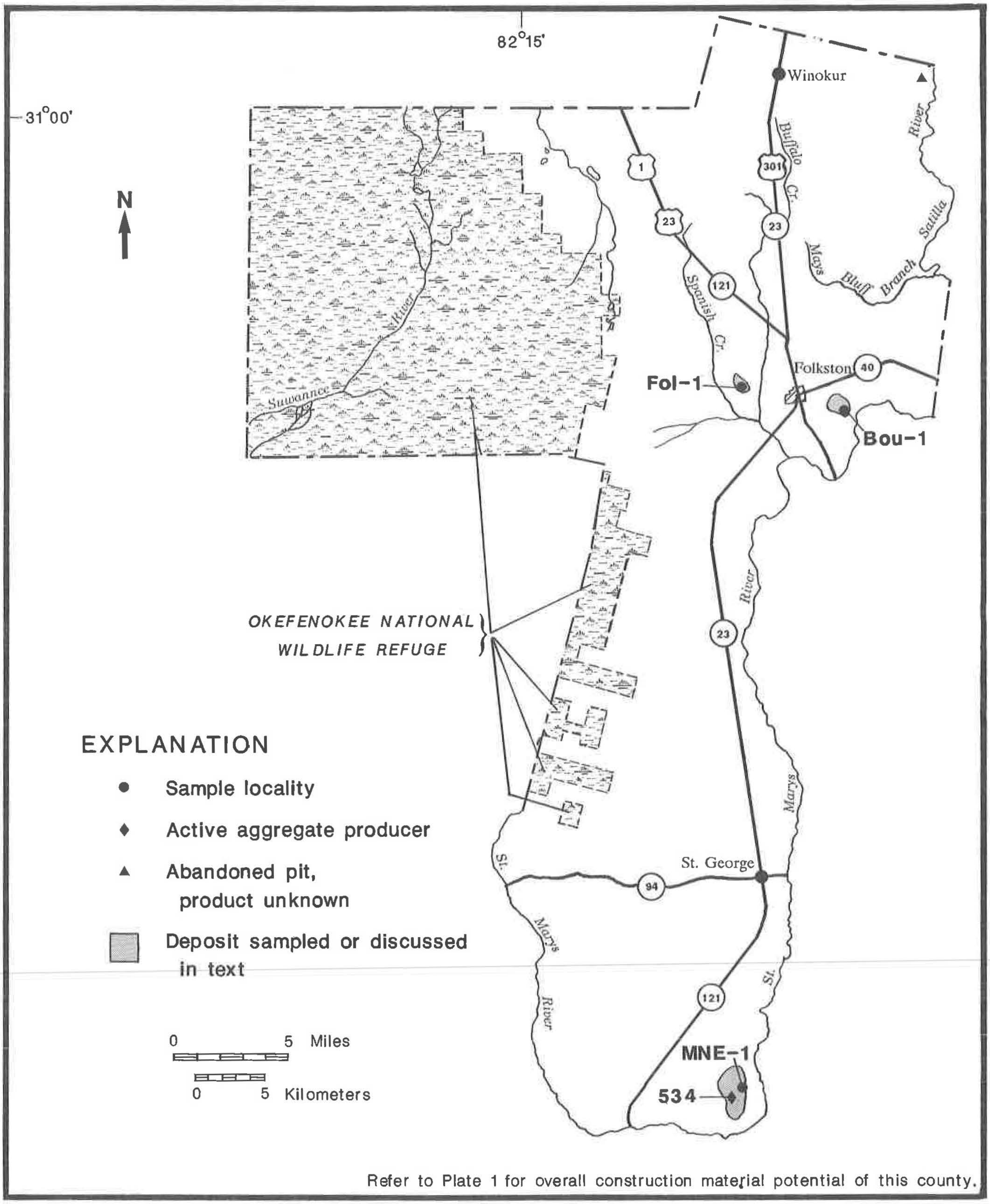


Figure 56. Map of Charlton County Showing Localities and Deposits Sampled.

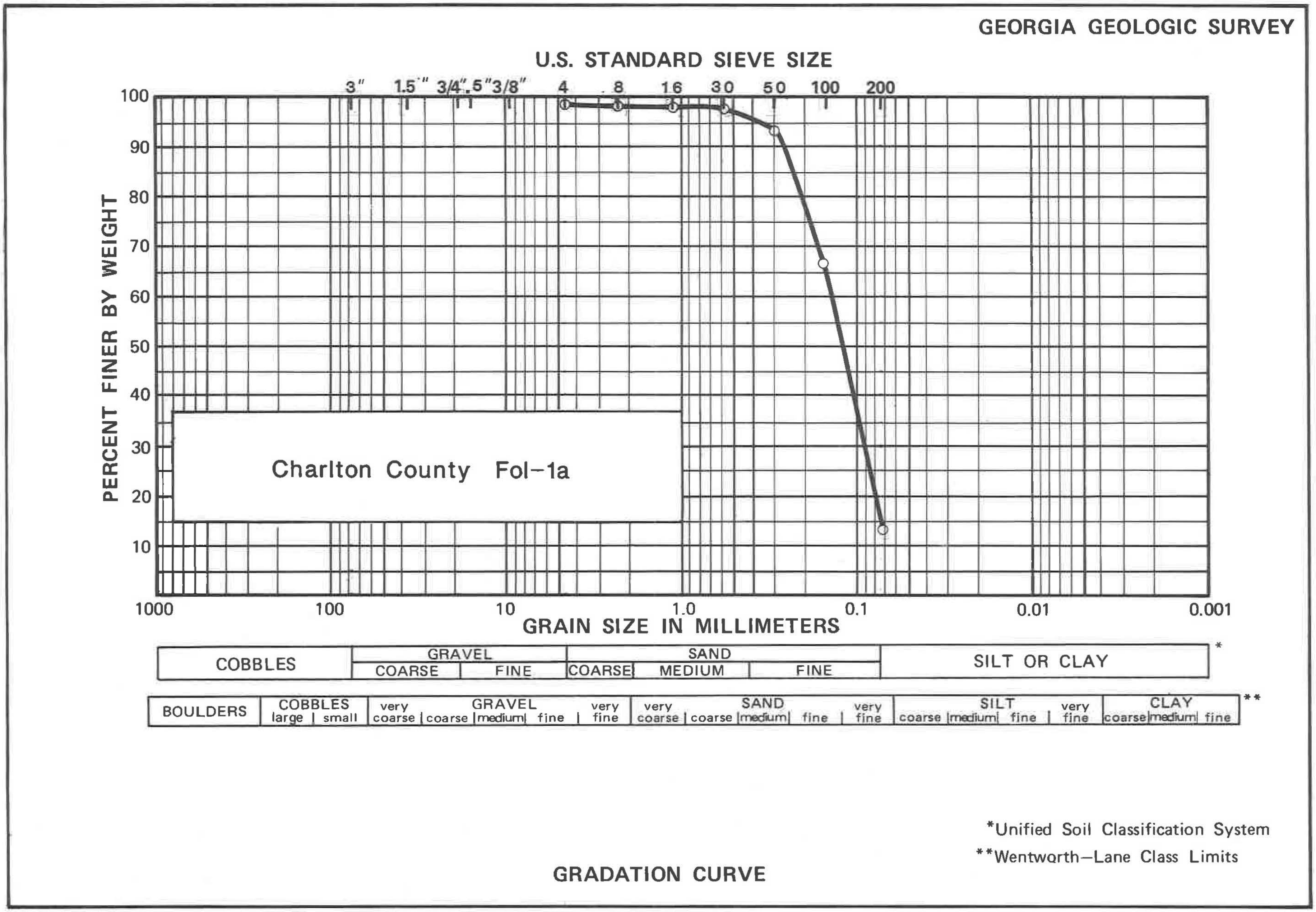


Figure 57. Size Distribution Curve of Sample Fol-1a.

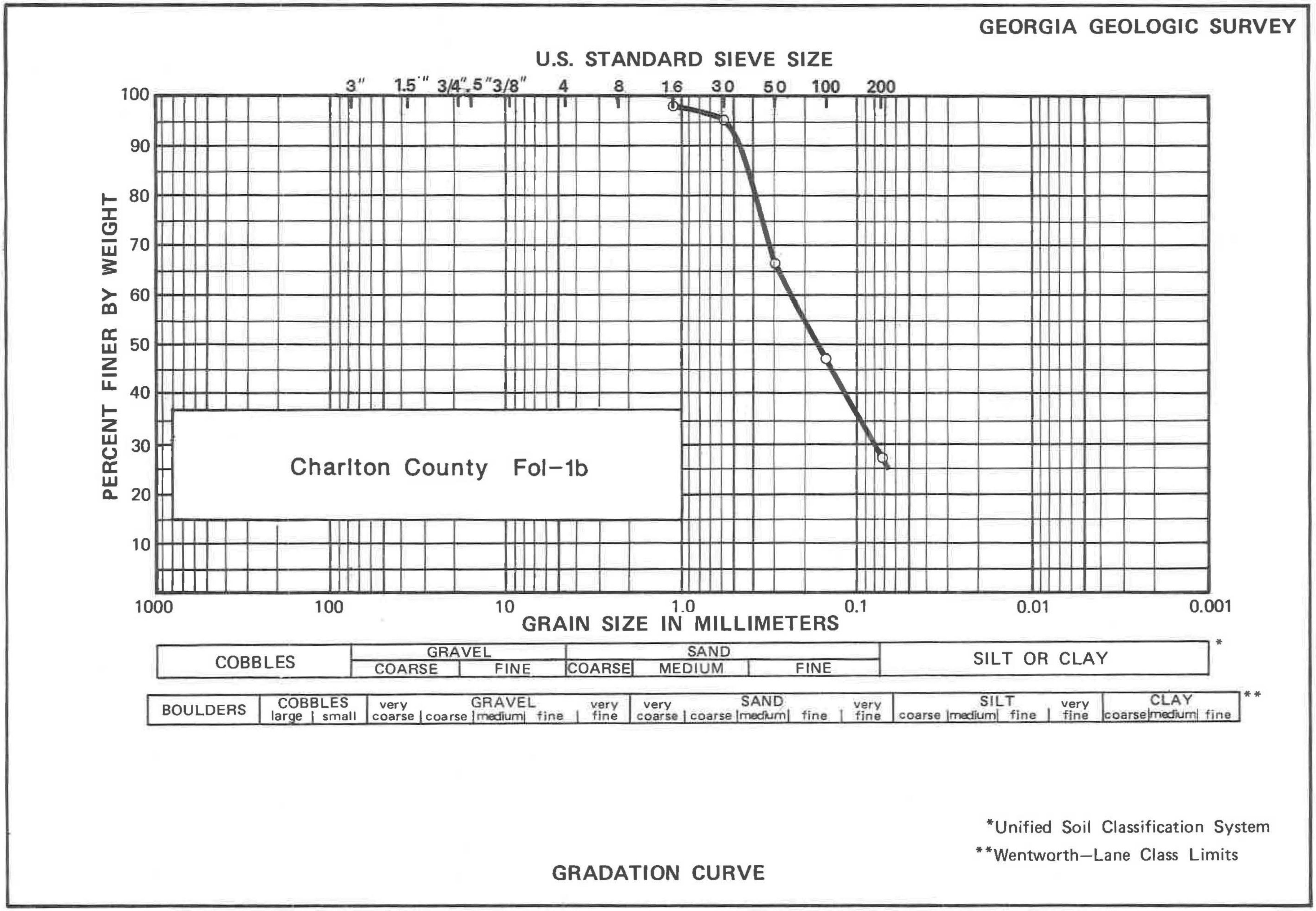


Figure 58. Size Distribution Curve of Sample Fol-1b.

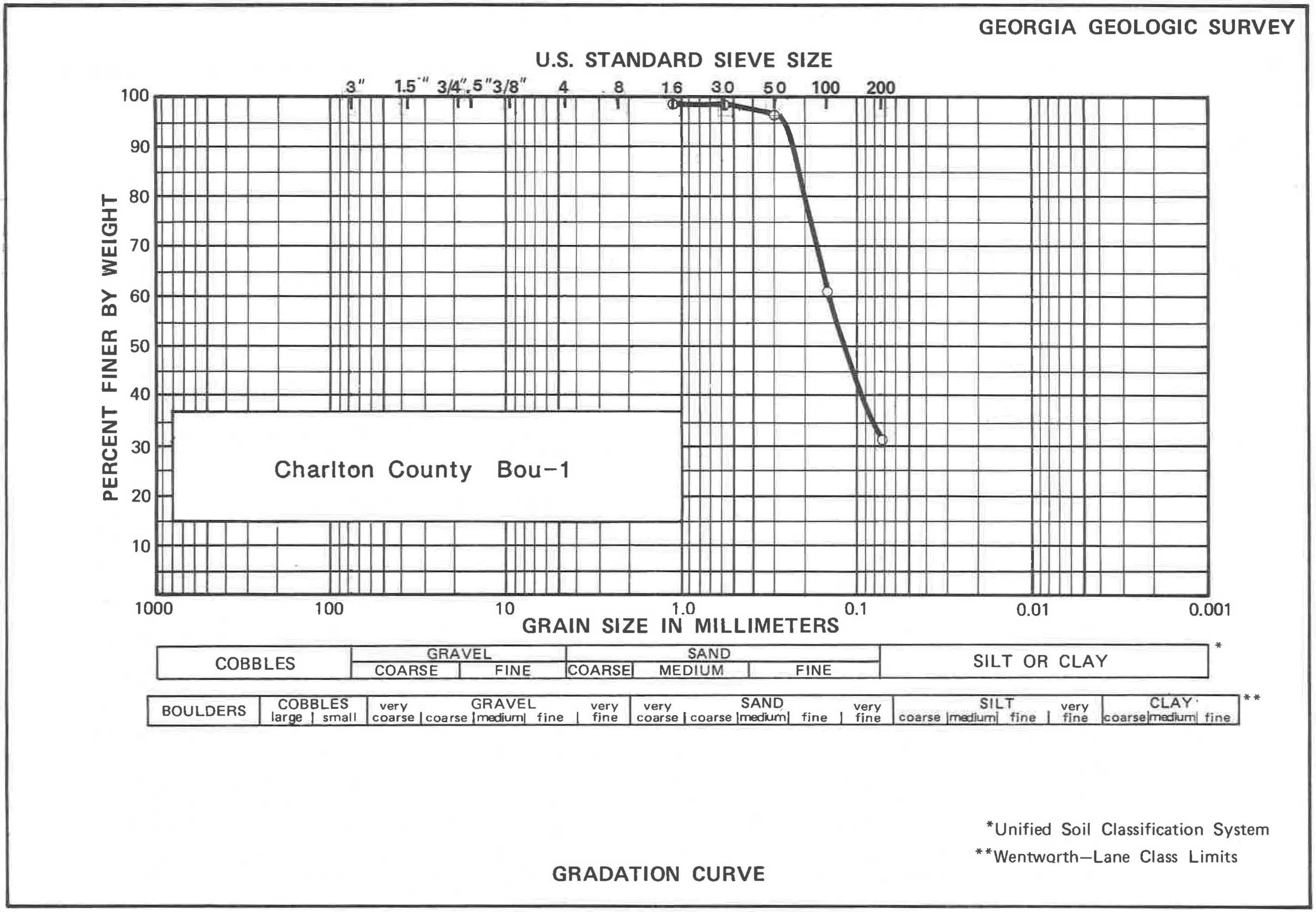


Figure 59. Size Distribution Curve of Sample Bou-1.

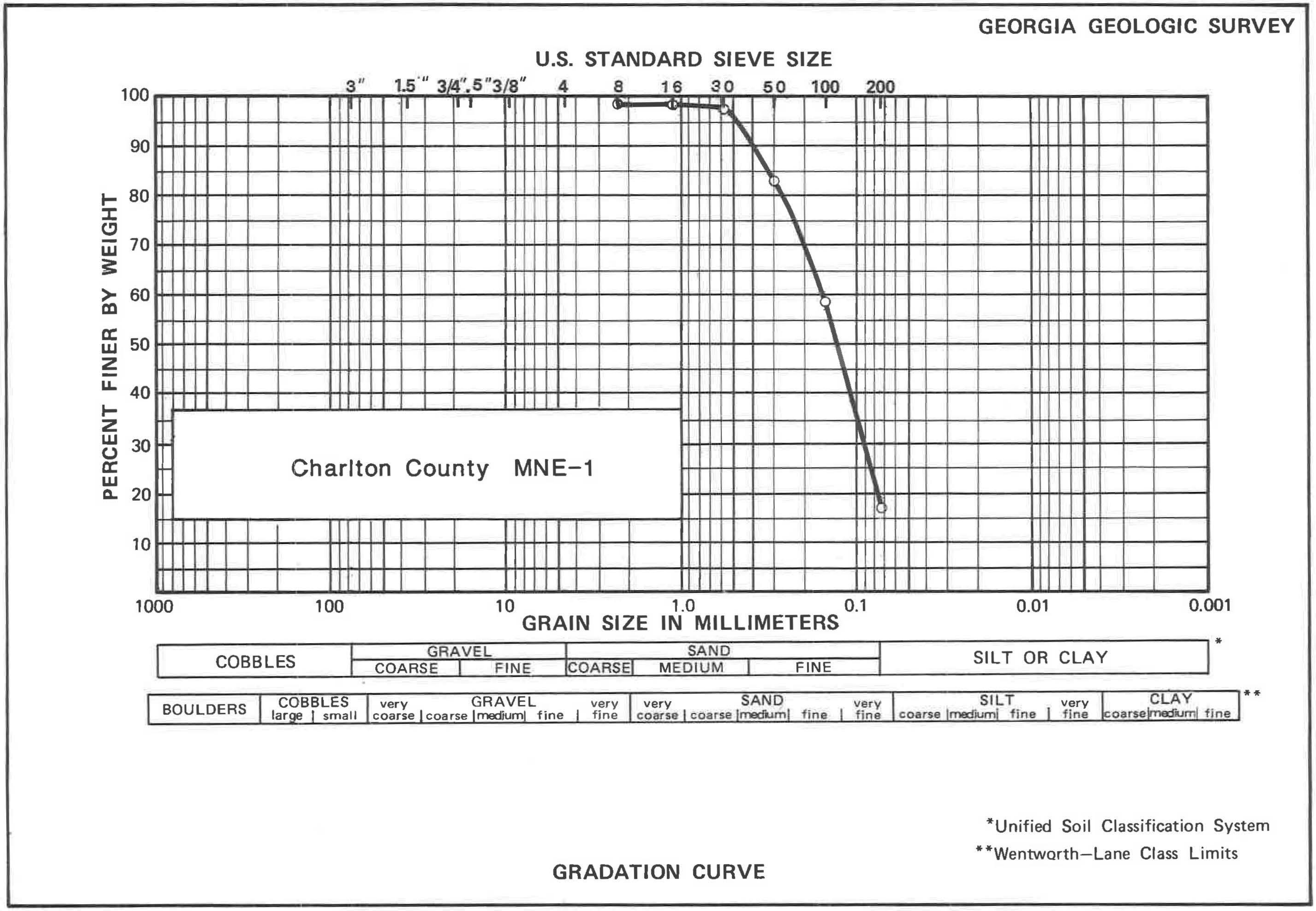


Figure 60. Size Distribution Curve of Sample MNE-1.

Table 9: Charlton County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
Fol-1a	4-1/2	trench	4-1/2	1	no	1
Fol-1b	4-1/2 - 7-1/2	auger	3	1	no	0
Bou-1a	8	auger	8	2	no	0
MNE-1	14-1/2	auger	14-1/2	3	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

County is considered to be moderate.

CHATHAM COUNTY

Geology and Physiography

Chatham County lies within the Barrier Island Sequence District of the Coastal Plain Province. Surficial sediments of the county are derived from the Satilla Formation and the barrier island deposits.

Previous Studies

Teas (1921, p. 173) noted the occurrence of gravel near Salt Creek (Fig. 61, Ts-10) and a belt of fine-grained sand north of the Ogeechee River (Fig. 61, Ts-11).

Present Study

The soil association used in targeting areas of Chatham County was Kershaw. This soil association is present in the western portion of the county along the Ogeechee River. Two samples from Chatham County were sieved: MSE-1, GaC-1 (Figs. 61-63; Table 10).

Evaluation

None of the samples meet ASTM standard C-33; however, the deposit represented by sample GaC-1 could be upgraded to meet specifications. The other sample failed because it was too fine-grained. The deposit from which sample GaC-1 was taken is exposed in an abandoned sand pit. The deposit is at least 30 feet thick and probably quite extensive (several acres). A sandy, silty, clay overburden 20 feet thick is present at this locality, probably making the deposit uneconomical to mine.

Mining Activity

Shuman Construction of Savannah produces sand from a 32 acre tract (Fig. 61, #750). The sand is transported within a 100 mile radius by truck. No information as to mining depth or production figures is available. Other pits in Chatham County are either inactive or currently producing fill material. There are several inactive pits which have been reclaimed and probably produced fill material.

Edward W. Simmons was permitted for 1 acre and 3 acres, respectively (Fig. 61, #479, #434). M.A. Banks was permitted for 1 acre (Fig. 61, #680). A 2 acre pit (Fig. 61, #385) was operated by Diamond Enterprises of Savannah. Ledbetter Construction Company of Savannah (Fig. 61, #495) was permitted for 2 acres; however, the pit has since been reclaimed. M.C. Anderson of Gordon City mined fill dirt from two pits in Chatham County (Fig. 61, #324, #253). Pit #253 was permitted for 5 acres and pit #324 was permitted for 23 acres. Both of these pits have since been reclaimed. Galbreath Clearing and Grading of Savannah Produces fill sand from a 29 acre pit; currently the sand is mined to a depth of 10 feet.

Saylor Marine operated a dredge in the Savannah River. No further information is available.

Joe Fuller is permitted to mine fill material from a 2 acre pit (Fig. 61, #35). R&R Construction has a 1 acre pit in Chatham County (Fig. 61, #898) from which they produce sand (probably used as fill material).

Summary Evaluation

Chatham County has a low potential for the production of either fine or coarse aggregate. One area of the county which does contain some coarse material is the area of floodplain of the Savannah River in the eastern portion of the county. Where exposed, the overburden is too thick to allow a profitable large scale operation; however, this overburden may be thinner elsewhere in the floodplain.

COLUMBIA COUNTY

Geology and Physiography

Columbia County lies within two districts of two physiographic provinces. These districts are the Fall Line Hills of the Coastal Plain Province and the Washington Slope of the Piedmont Province. The surficial sediments of the county are derived from the Oconee Group; the Barnwell Group; and the granites, granite gneisses, schists, and minor ultramafic rocks of the Piedmont.

Previous Studies

Teas (1921, p. 293) noted that some gravel is present east of Harlem (Fig. 64, Ts-45).

Present Study

The soil series used in targeting sites for sampling were the Tifton and Helena series. These are scattered throughout the part of the county contained in the study area. No distinct geomorphic features are evident in Columbia County. Two samples were taken for analyses: Grv-1, Har-1 (Figs. 64-66, Table 11).

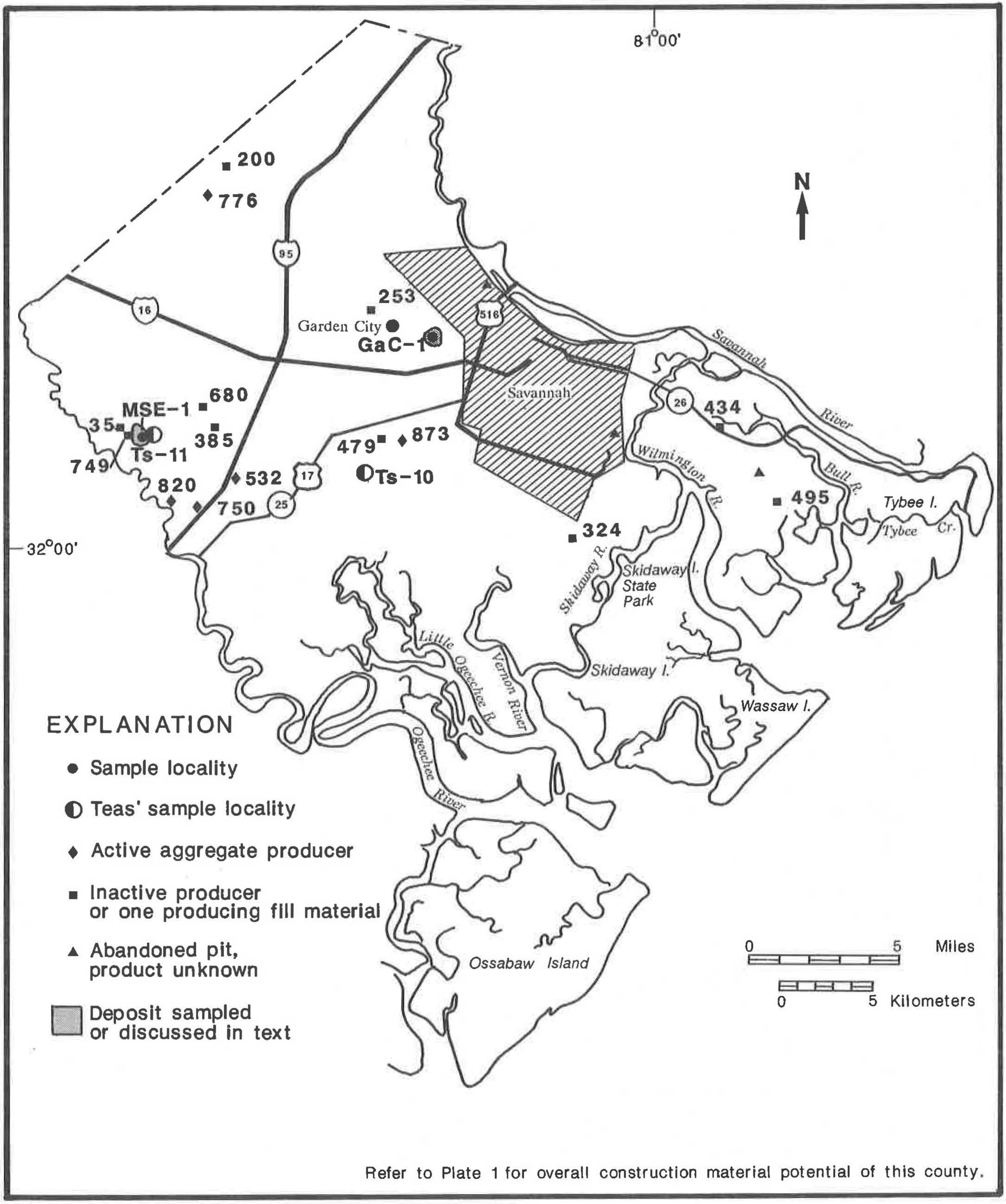


Figure 61. Map of Chatham County Showing Localities and Deposits Sampled.

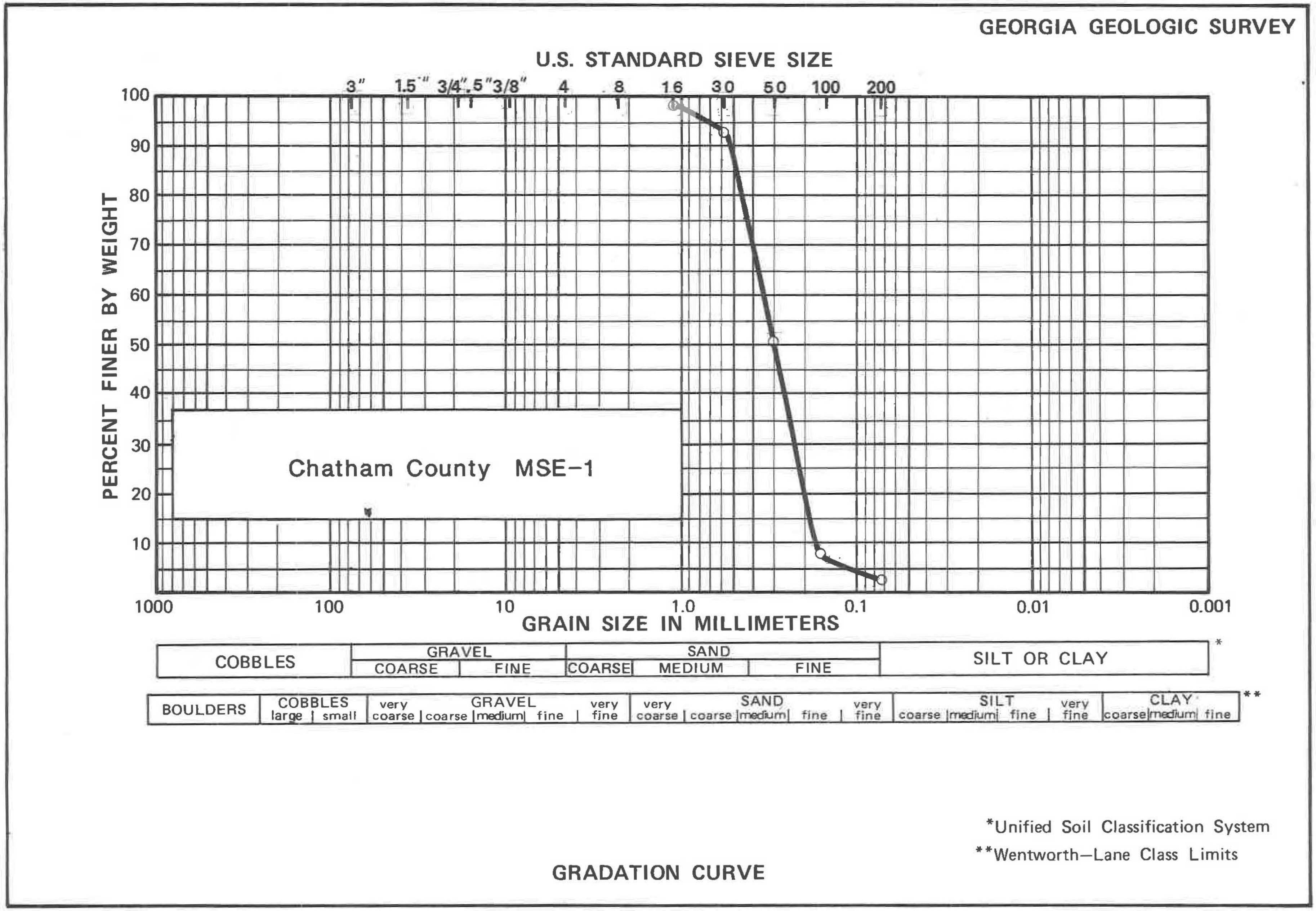


Figure 62. Size Distribution Curve of Sample MSE-1.

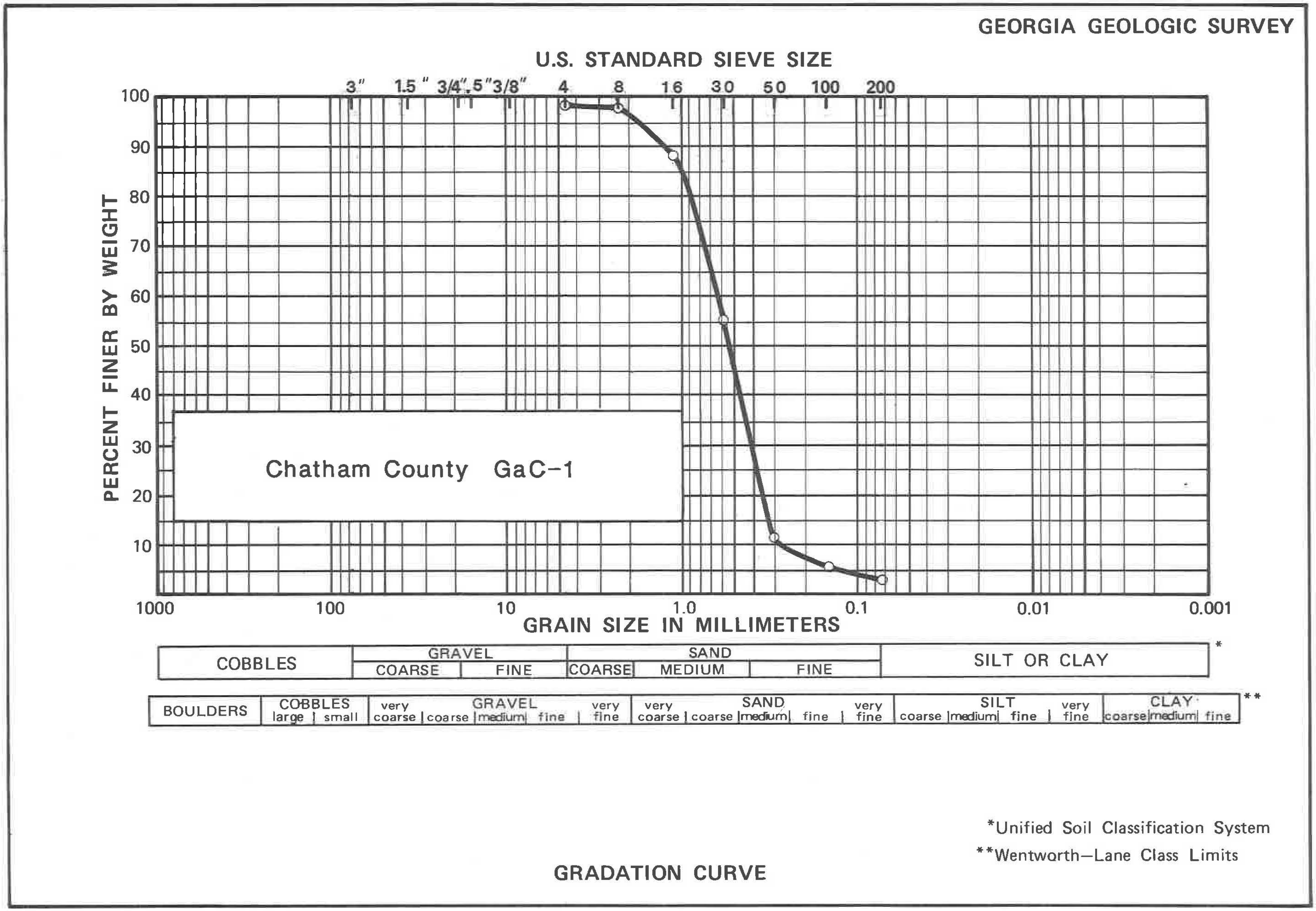


Figure 63. Size Distribution Curve of Sample GaC-1.

Table 10: Chatham County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
MSE-1	13	auger	13	3	no	2
GaC-1	4	trench	30	2	no[4]	2

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4] Marginally failed ASTM C-33, can be upgraded to meet specifications.

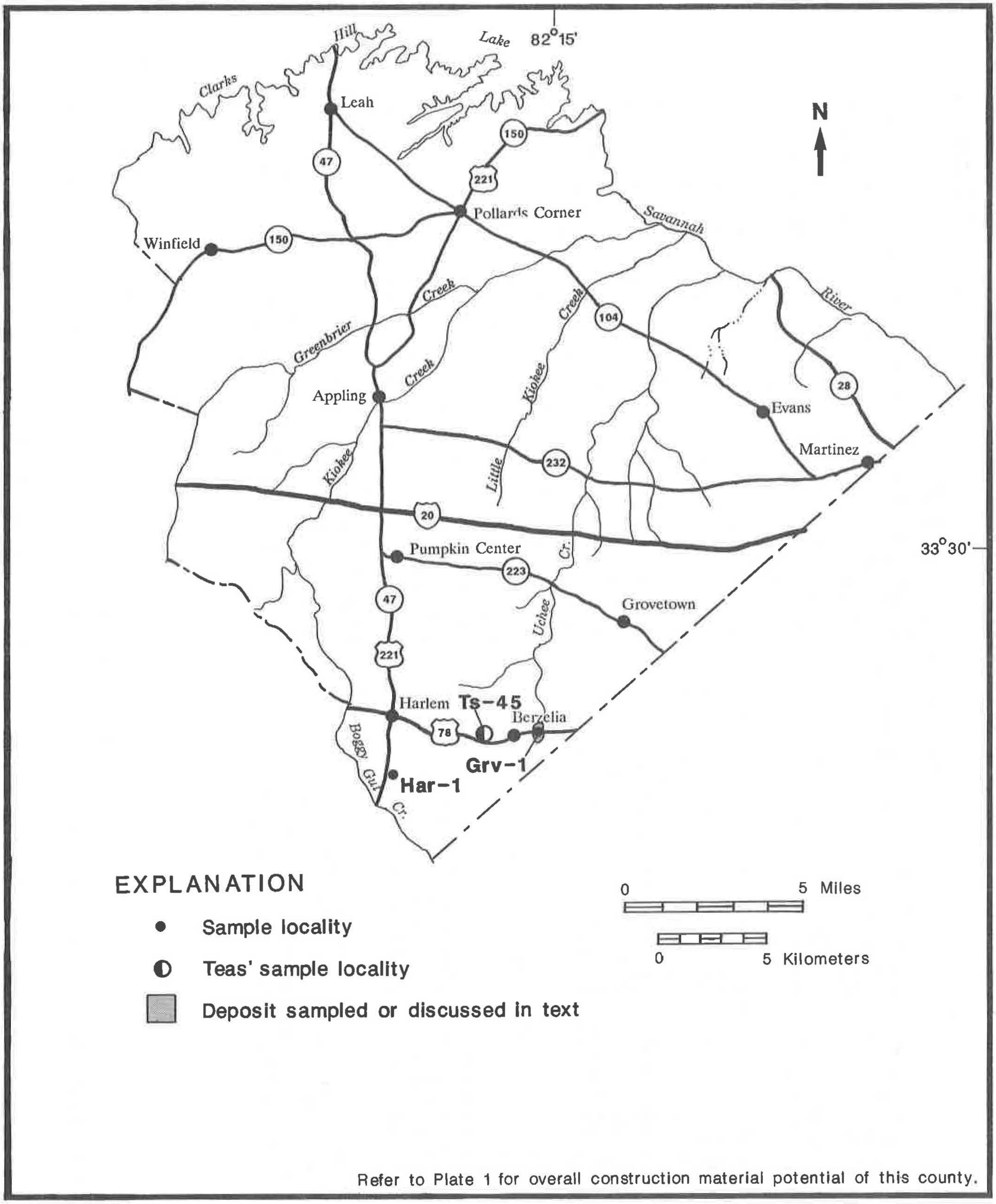


Figure 64. Map of Columbia County Showing Localities and Deposits Sampled.

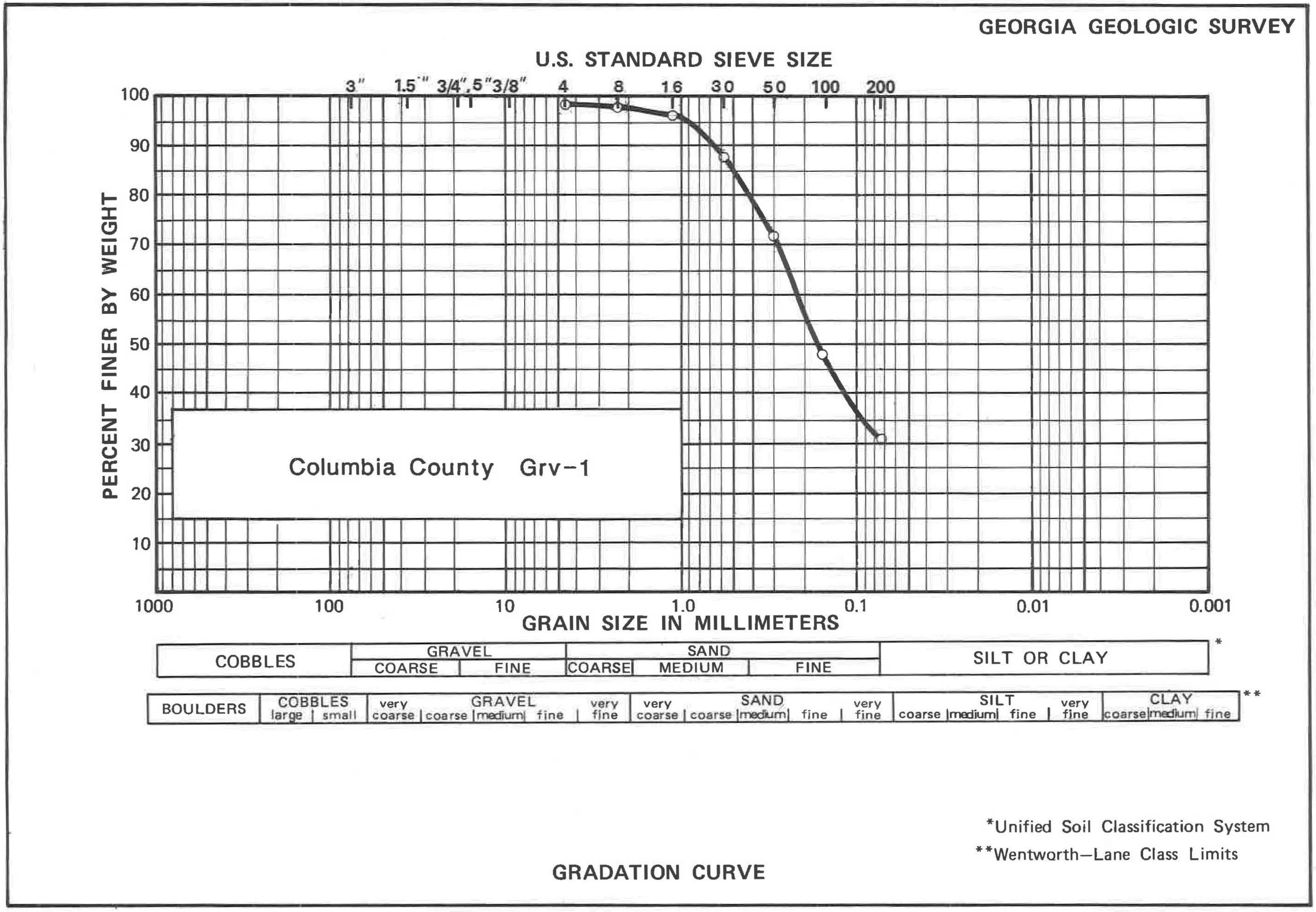
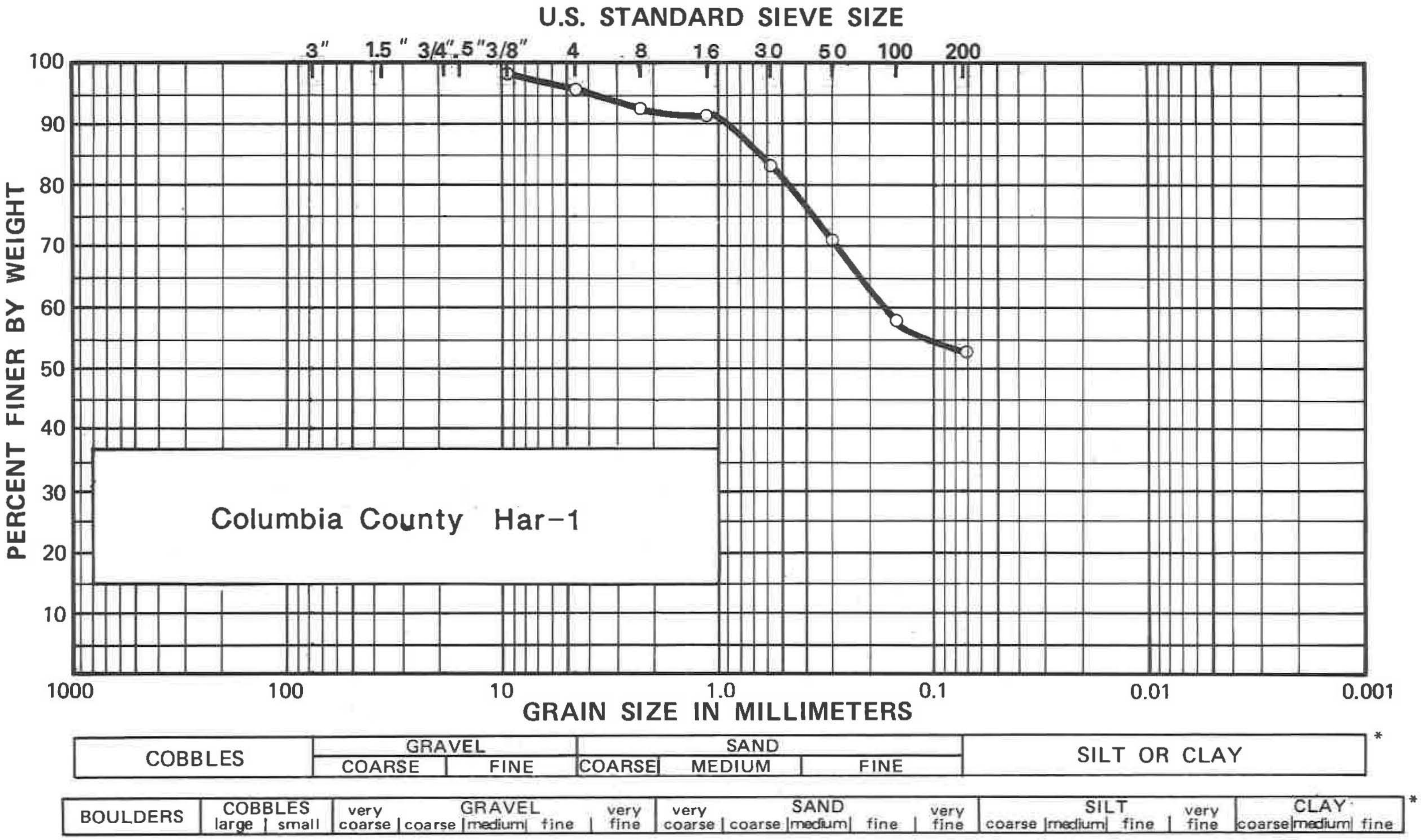


Figure 65. Size Distribution Curve of Sample Grv-1.

GEORGIA GEOLOGIC SURVEY



*Unified Soil Classification System

**Wentworth–Lane Class Limits

GRADATION CURVE

Figure 66. Size Distribution Curve of Sample Har-1.

Table 11: Columbia County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body Sampled	Natural material passing ASTM C-33	Rating[3]
Grv-1	7	auger	7	1	no	0
Har-1	7	auger	7	2	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

Evaluation

Neither of the samples passed ASTM standard C-33. Both contain some coarse grained material, but nearly 50% of Har-1 and 30% of Grv-1 are finer than #200 mesh.

Mining Activity

There are no active or recently inactive mining operations in Columbia County.

Summary Evaluation

The potential for fine aggregate production in Columbia County is low.

EFFINGHAM COUNTY

Geology and Physiography

Effingham County lies within the Barrier Island District of the Coastal Plain Province. The surficial sediments are derived from the Cypresshead Formation and the barrier island deposits.

Previous Work

Teas (1921, p. 197) noted the occurrence of large amounts of gray and pale yellow sand along the Ogeechee River as well as gravel within the river bed (Fig. 67, Ts-12). Teas also noted a thin deposit of sand in a railway cut, 2 miles south of Guyton.

Present Study

The soil types used in targeting areas of Effingham County were #24 and #25, which are present in the northern portion of the county. Geomorphic features targeted were several dune fields in southwestern Effingham County. Eleven samples representing 9 sites in Effingham County were sieved: SpN-1, SpS-1a, SpS-1b, Mel-1a, Mel-1b, Kil-1, Lee-1, Edn-1, Edn-2, Bri-1, MSW-2 (Fig. 67 and Figs. 70-80, Table 12).

Evaluation

None of the samples pass ASTM standard C-33. Generally, the samples are too fine grained and too well sorted. One sample from a point bar of the Ogeechee River (MSW-2) could be upgraded to meet specifications for a fine aggregate. This point bar, however, is too small to support a commercial operation.

Mining Activity

Atlas Sand and Gravel of Eden (Fig. 67, #614) produces concrete and masonry sand. Their products are shipped within a 90 mile radius by truck. The sand is mined using a dredge in man-made ponds. Then the material is pumped to classifiers and then to the stockpiles. Atlas Sand and Gravel owns 356 acres and has already mined 40 acres to a depth of approximately 25 feet. Annual production is between 100,000 and 500,000 tons.

Coastal Sand Company (Fig. 67, #865) is currently mining an 18 acre tract using a dredge (Fig. 68). The material is then pumped to classifiers (Fig. 69) and then stockpiled. The products of this pit, mortar and concrete sand, are transported by truck to the Savannah market area.

Bobby Murray Land Clearing (Fig. 67, #805) produces fill, concrete and masonry sand from a 2 acre pit in southwestern Effingham County. The products are shipped by truck to the Savannah market area. The sand is mined using a dredge in a man-made pond. The material is pumped to classifiers. Bobby Murray Land Clearing owns 10 acres with 8 remaining to be mined. The sand is currently mined to a depth of 15 feet. Annual production is between 10,000 and 50,000 tons.

Southern Aggregates (Fig. 67, #777) operates a 6-acre sand pit for asphalt paving material.

Sam Finley Incorporated (Fig. 67, #283) mined sand for asphalt. The mine was permitted for 34 acres, and has since been reclaimed.

Frank A. Miller Jr. (Fig. 67, #536) operated a 2 acre sand pit. The product of this pit is not known; further information is not available.

Southern Natural Resources of Wilmington, North Carolina has a permit to mine 20 acres. This pit is currently inactive and no further information is available.

Dawes Mining Company (Fig. 67, #107) mined out a 130 acre pit near Eden. This pit has been reclaimed. No further information is available.

Summary Evaluation

The potential for production of fine aggregate in Effingham County is moderate. The floodplain of the Ogeechee River in the southwestern part of the county, as with the deposit represented by sample MSW-2, has the best potential for production of fine aggregate.

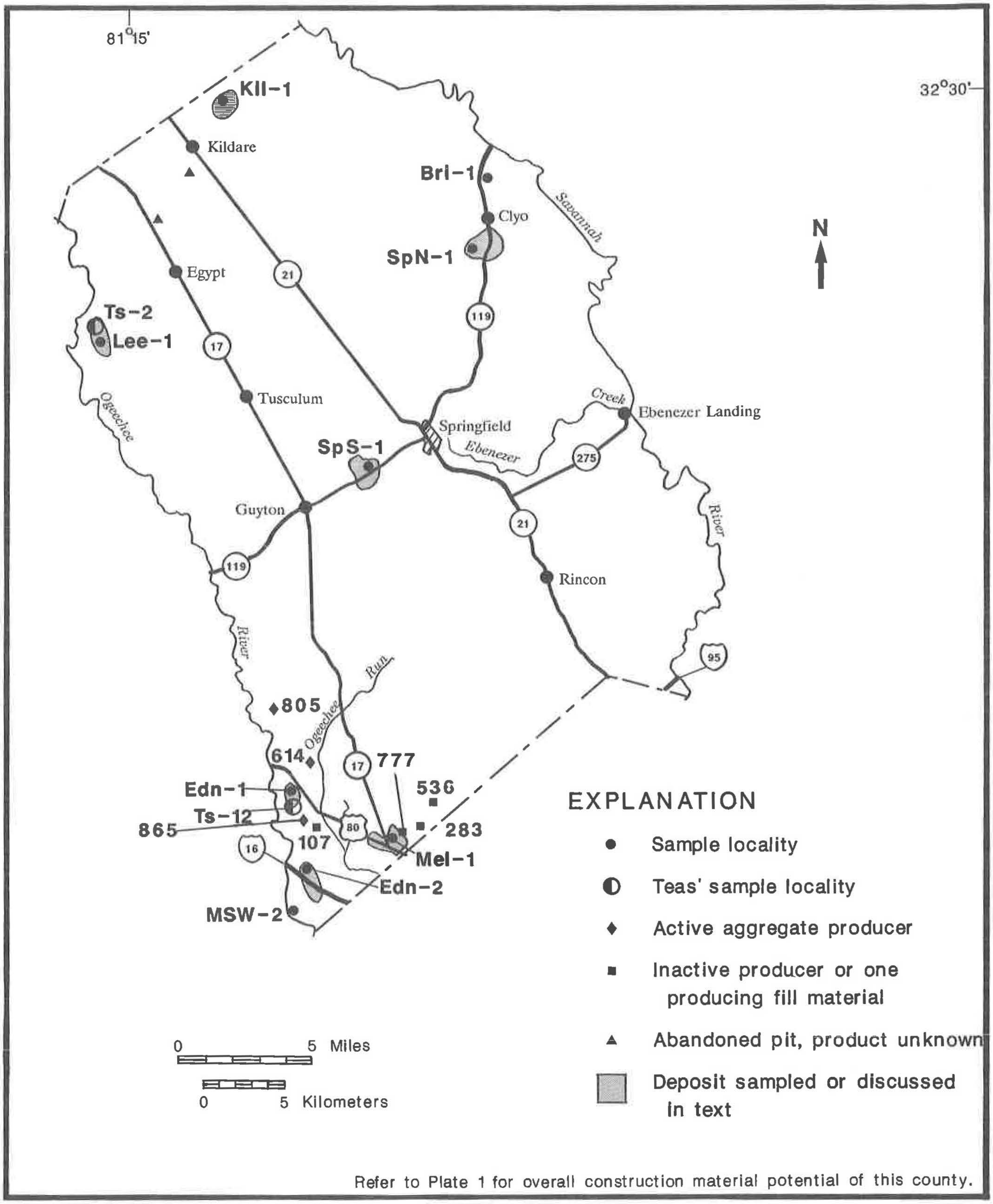


Figure 67. Map of Effingham County Showing Localities and Deposits Sampled.

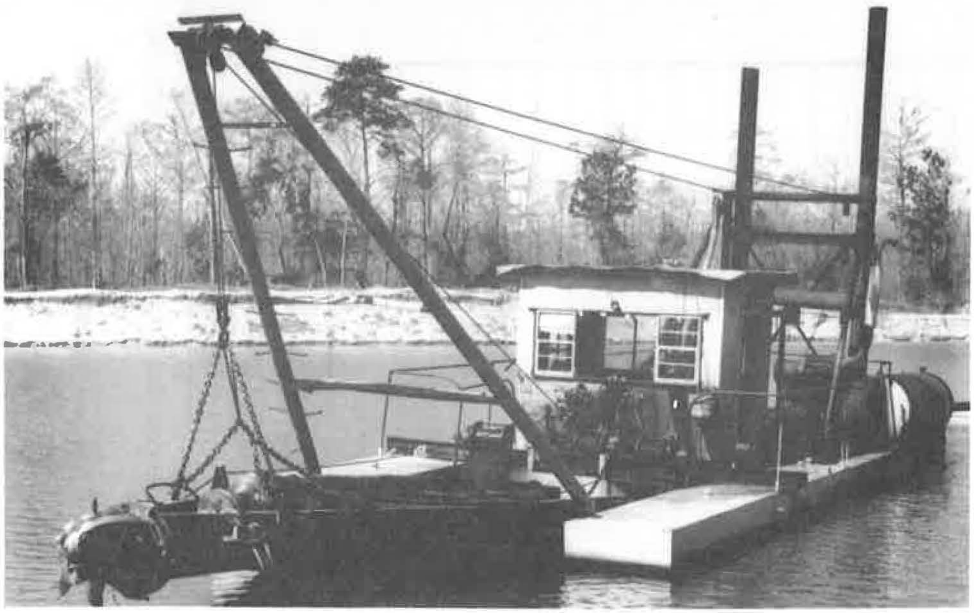


Figure 68. View of dredge at Coastal Sand Company, Eden, Georgia.

Figure 69. View of classifiers and conveyor belt at Coastal Sand Company, Eden, Georgia.

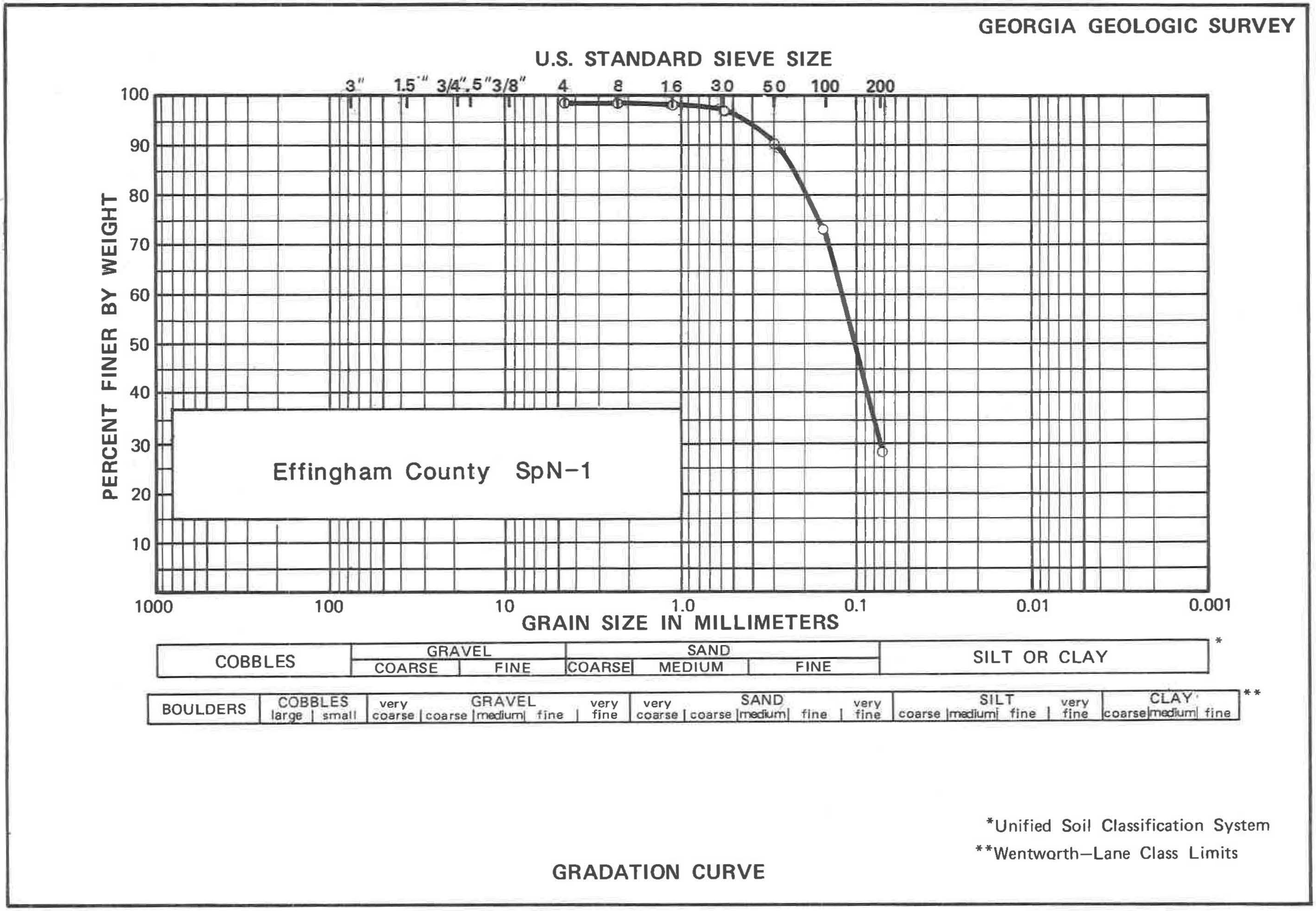


Figure 70. Size Distribution Curve of Sample SpN-1.

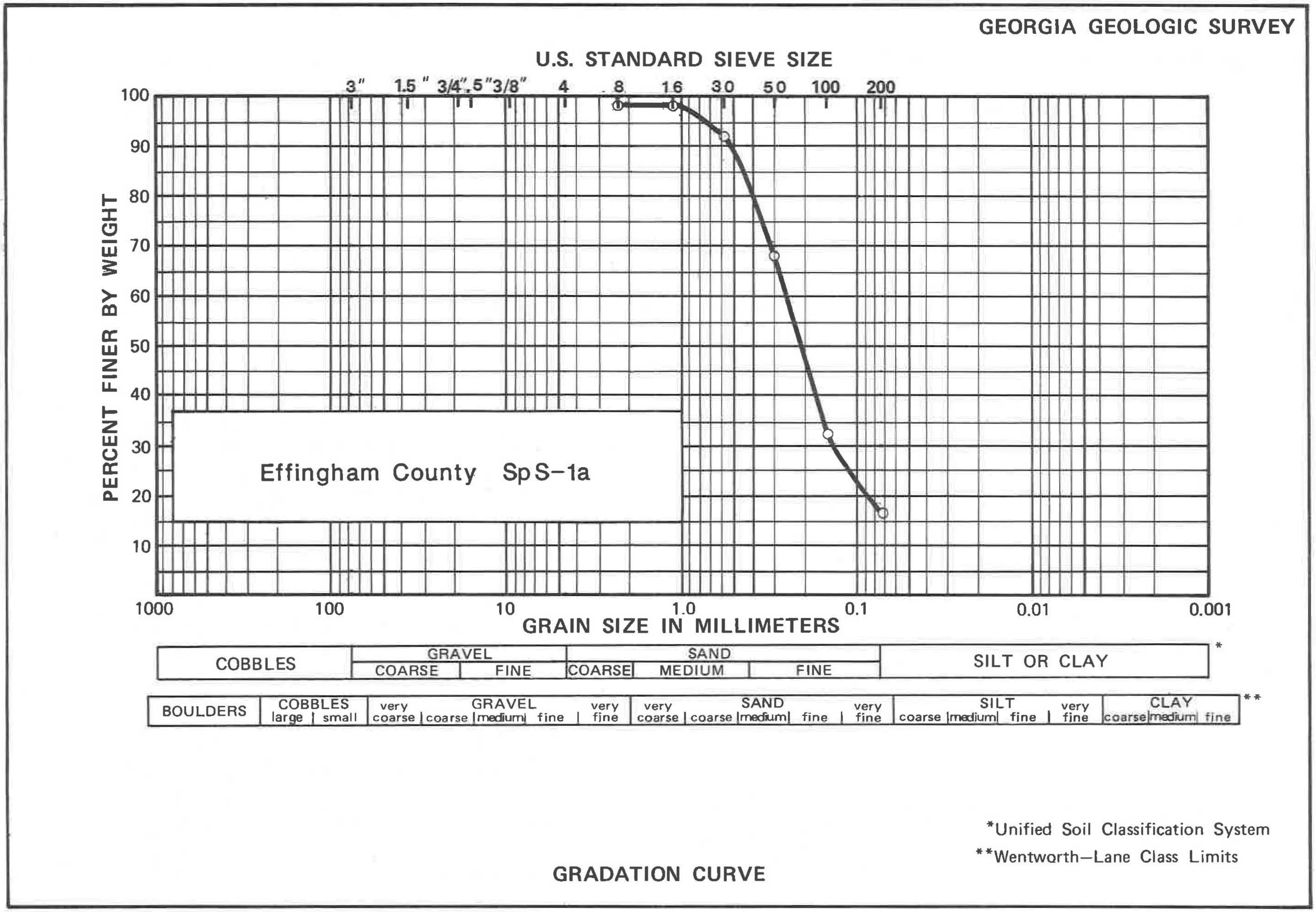


Figure 71. Size Distribution Curve of Sample SpS-1a.

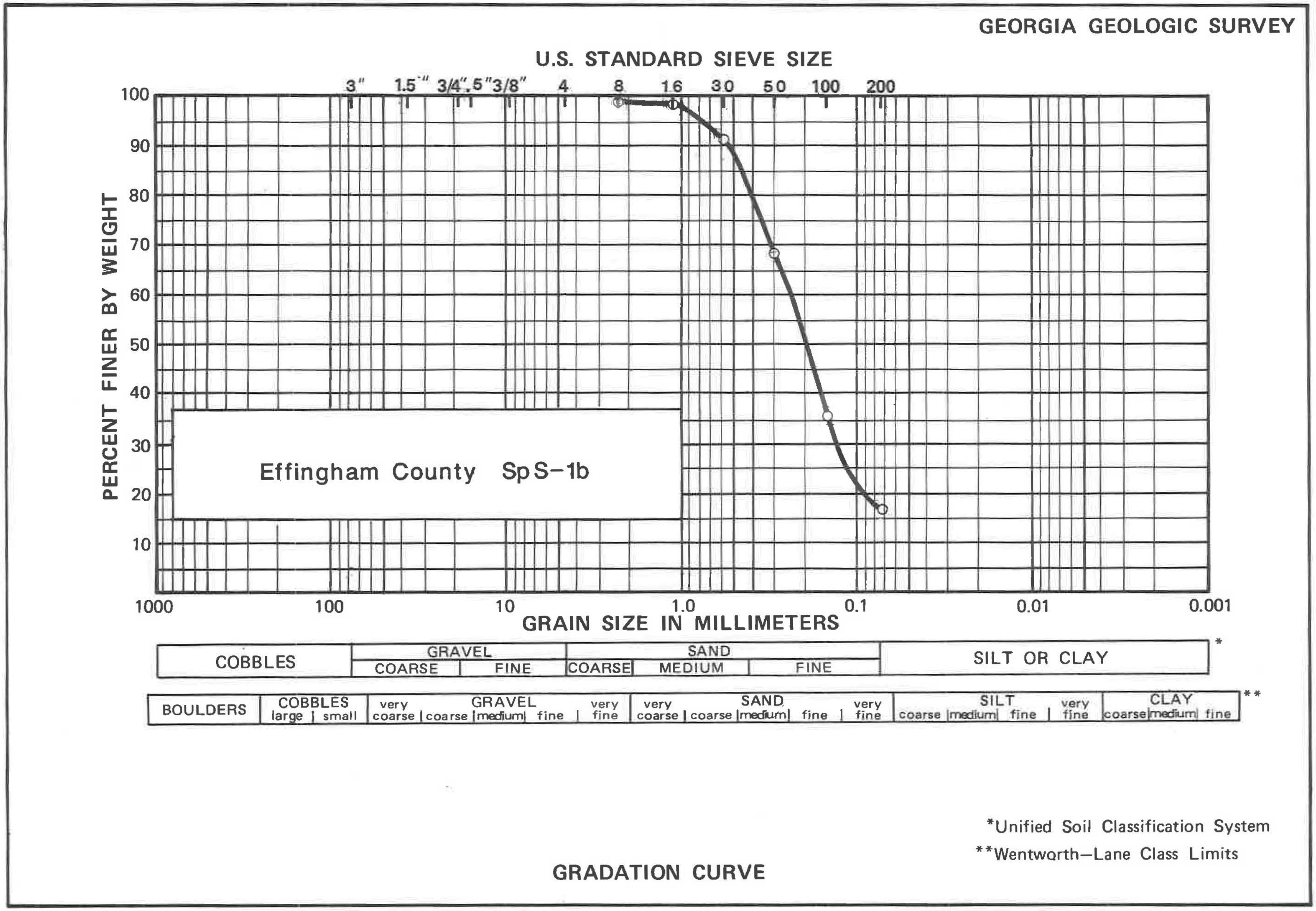


Figure 72. Size Distribution Curve of Sample SpS-1b.

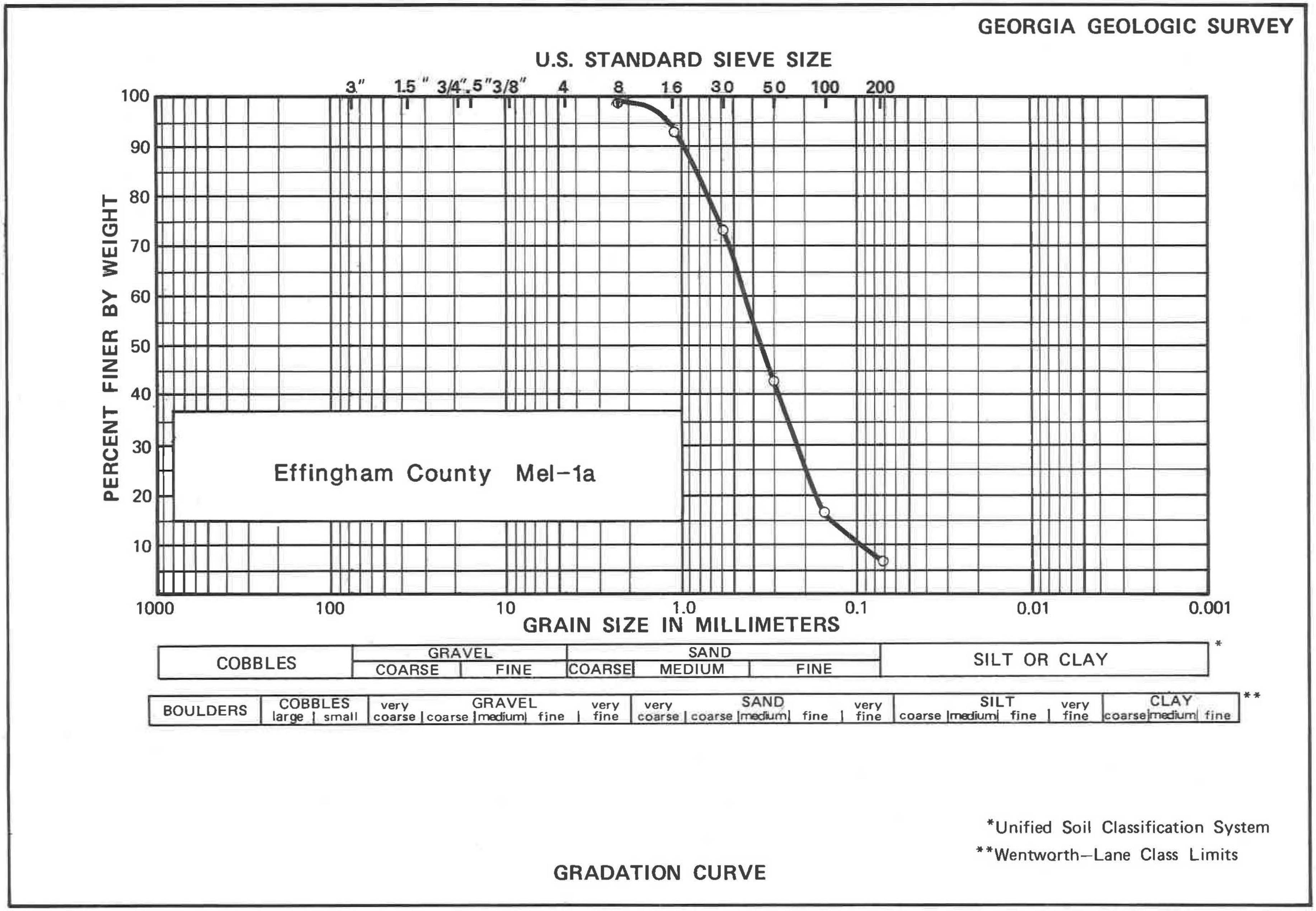


Figure 73. Size Distribution Curve of Sample Mel–1a.

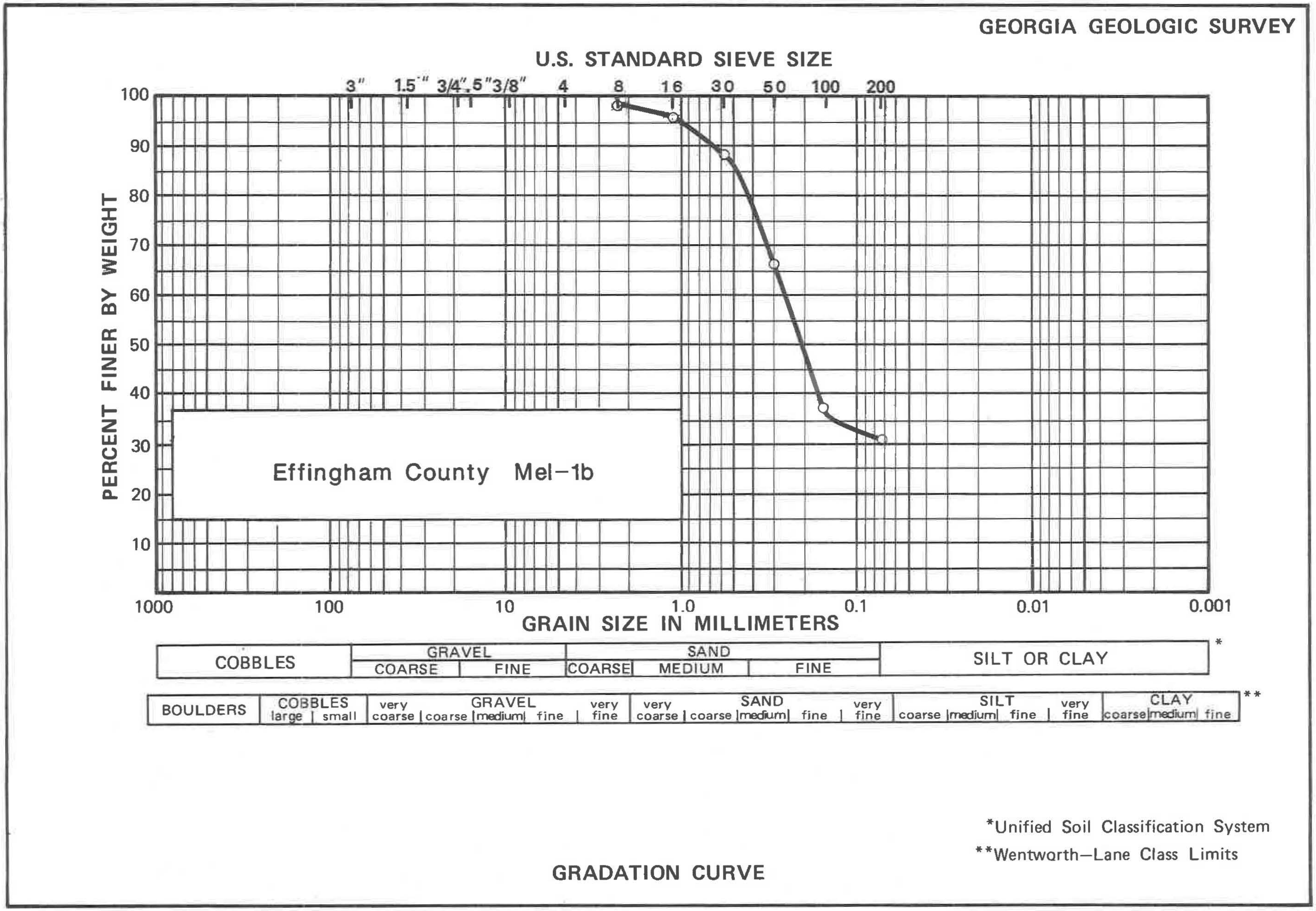


Figure 74. Size Distribution Curve of Sample Mel-1b.

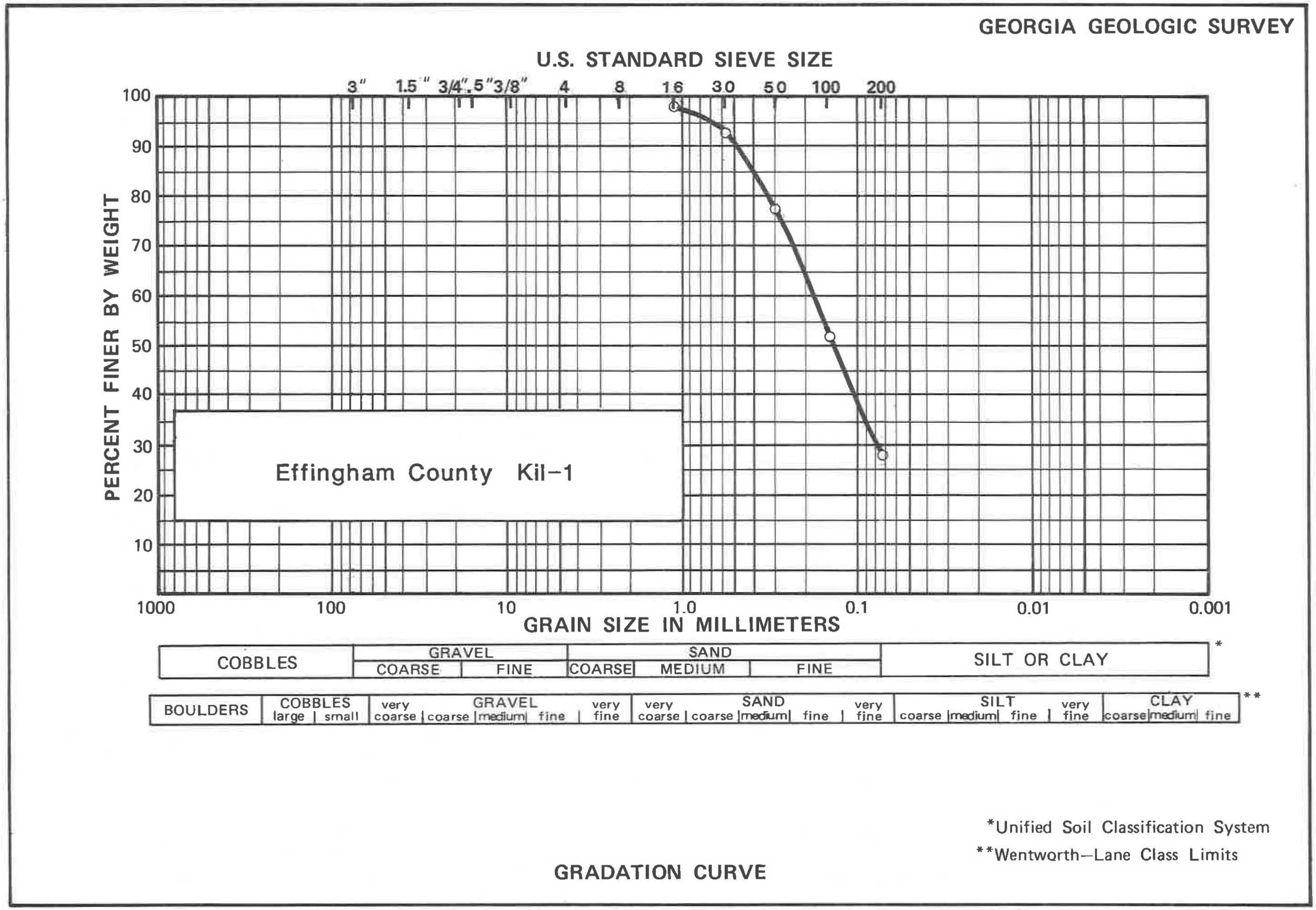


Figure 75. Size Distribution Curve of Sample Kil-1.

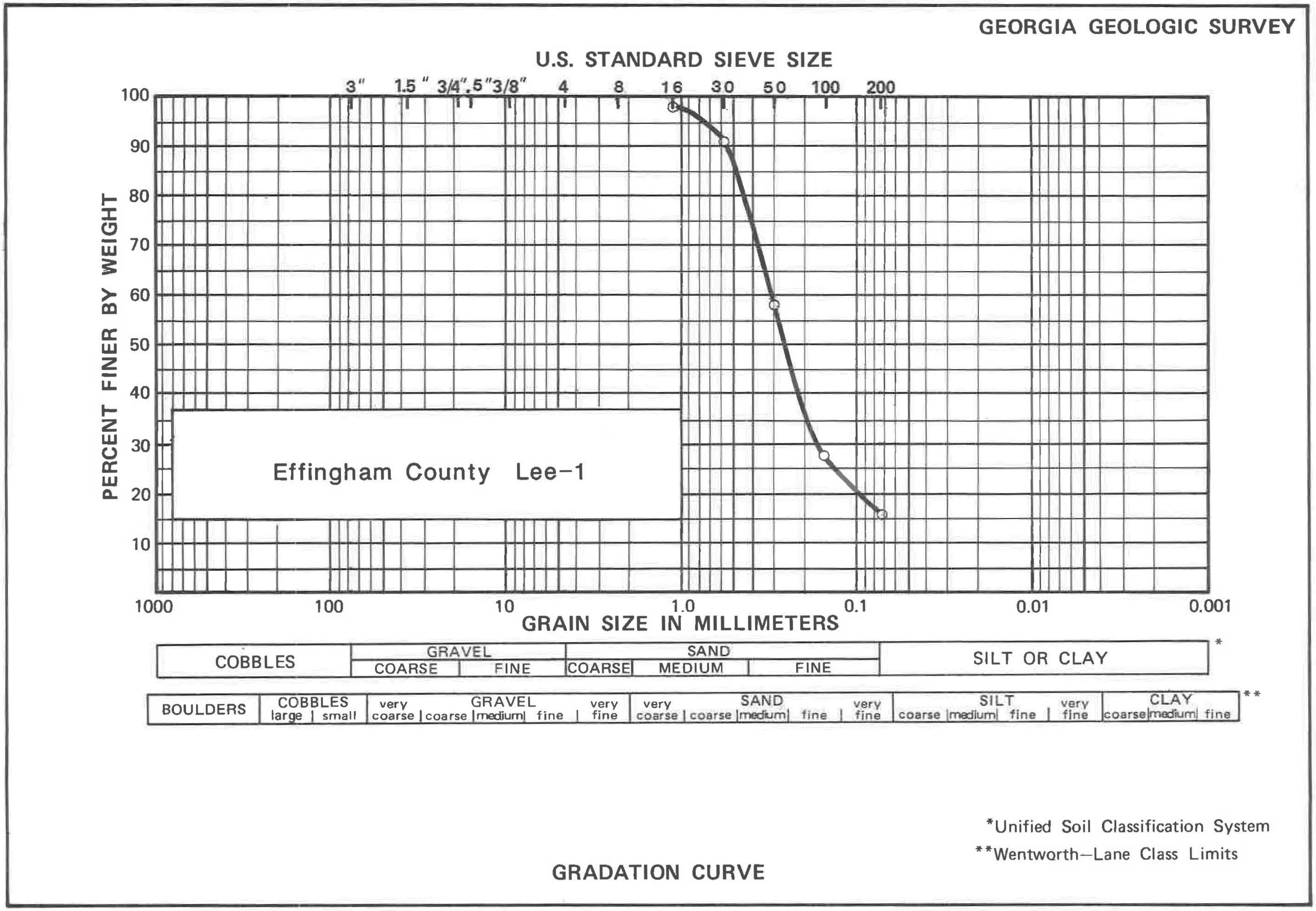


Figure 76. Size Distribution Curve of Sample Lee-1.

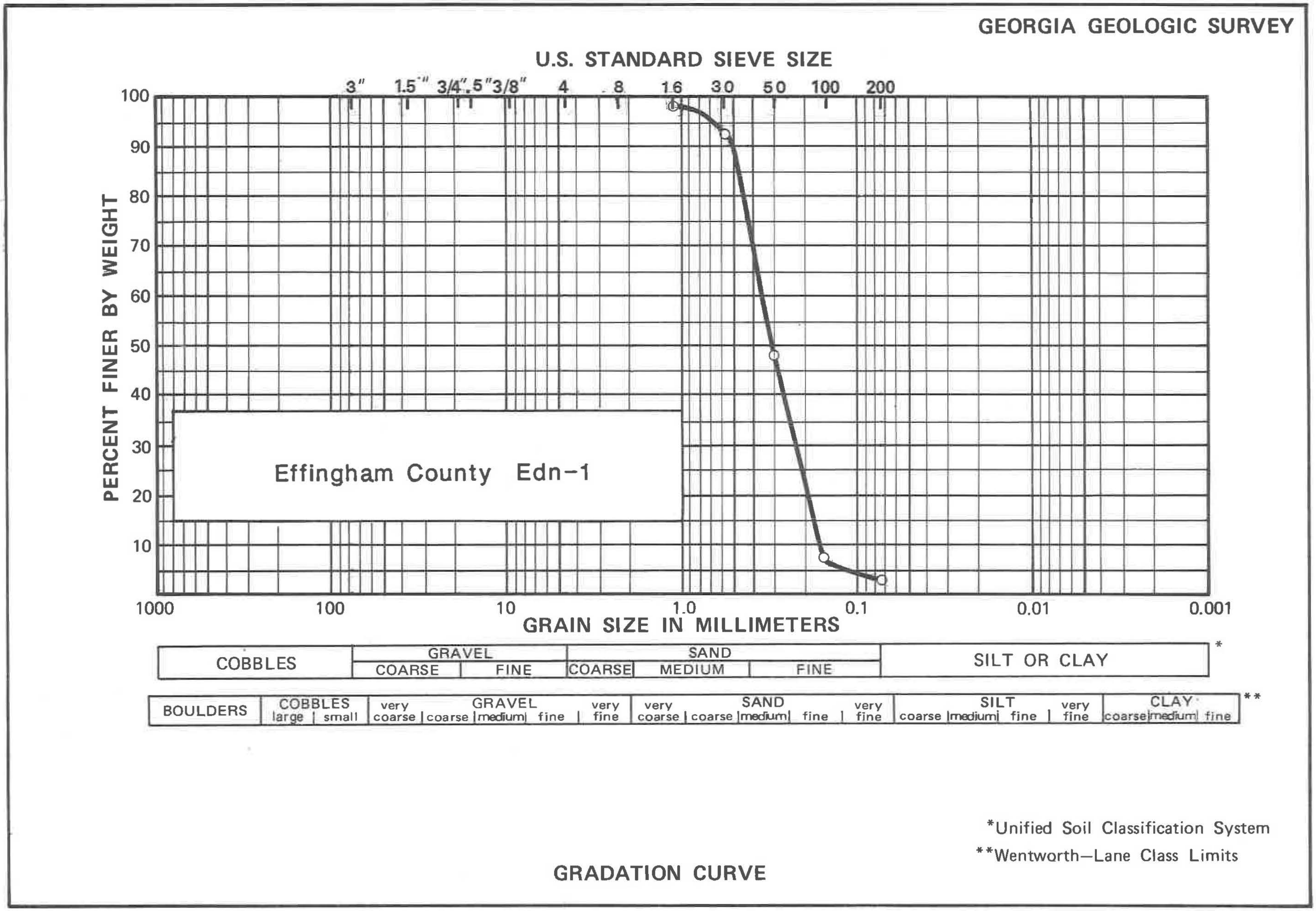


Figure 77. Size Distribution Curve of Sample Edn-1.

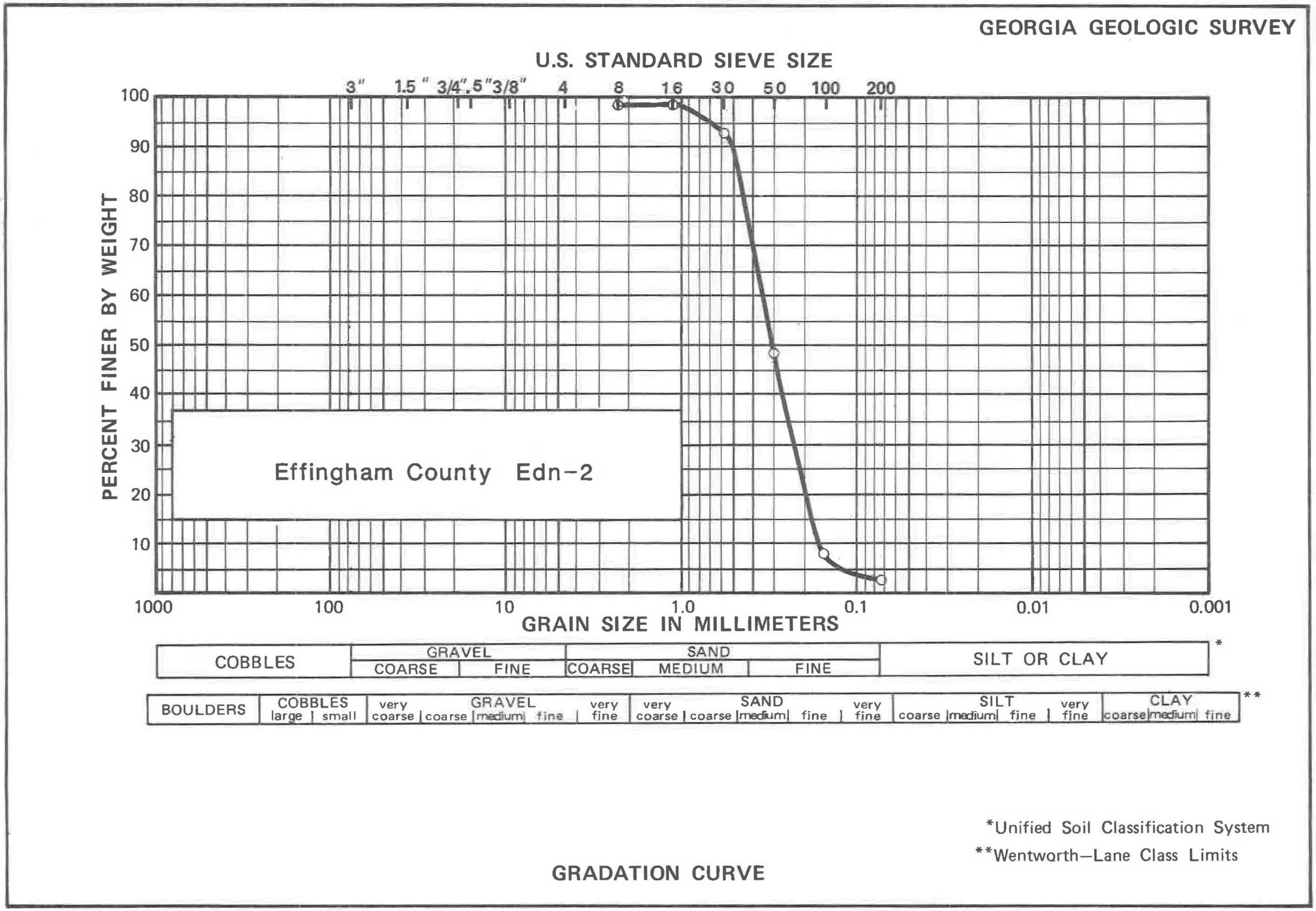


Figure 78. Size Distribution Curve of Sample Edn-2.

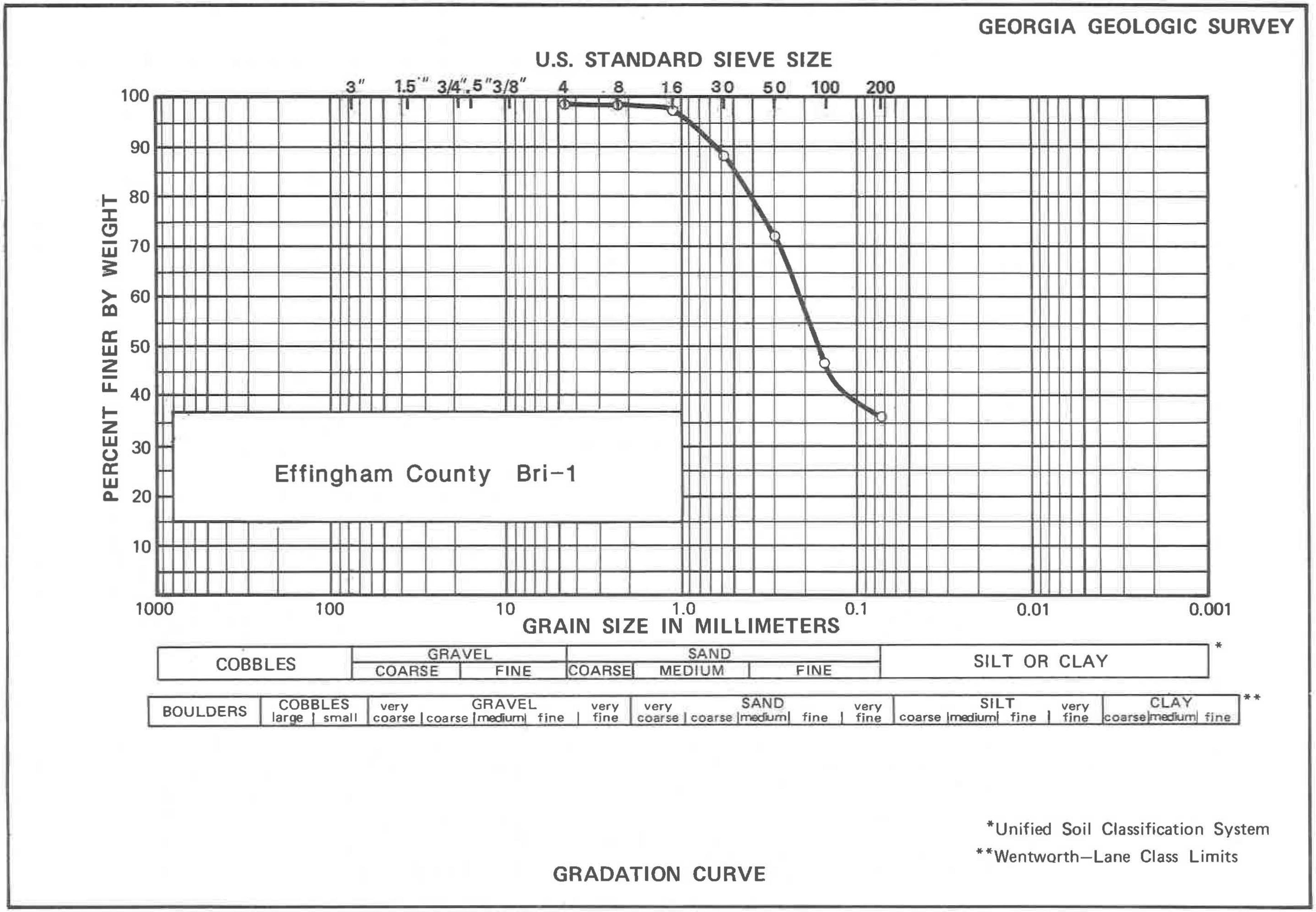


Figure 79. Size Distribution Curve of Sample Bri-1.

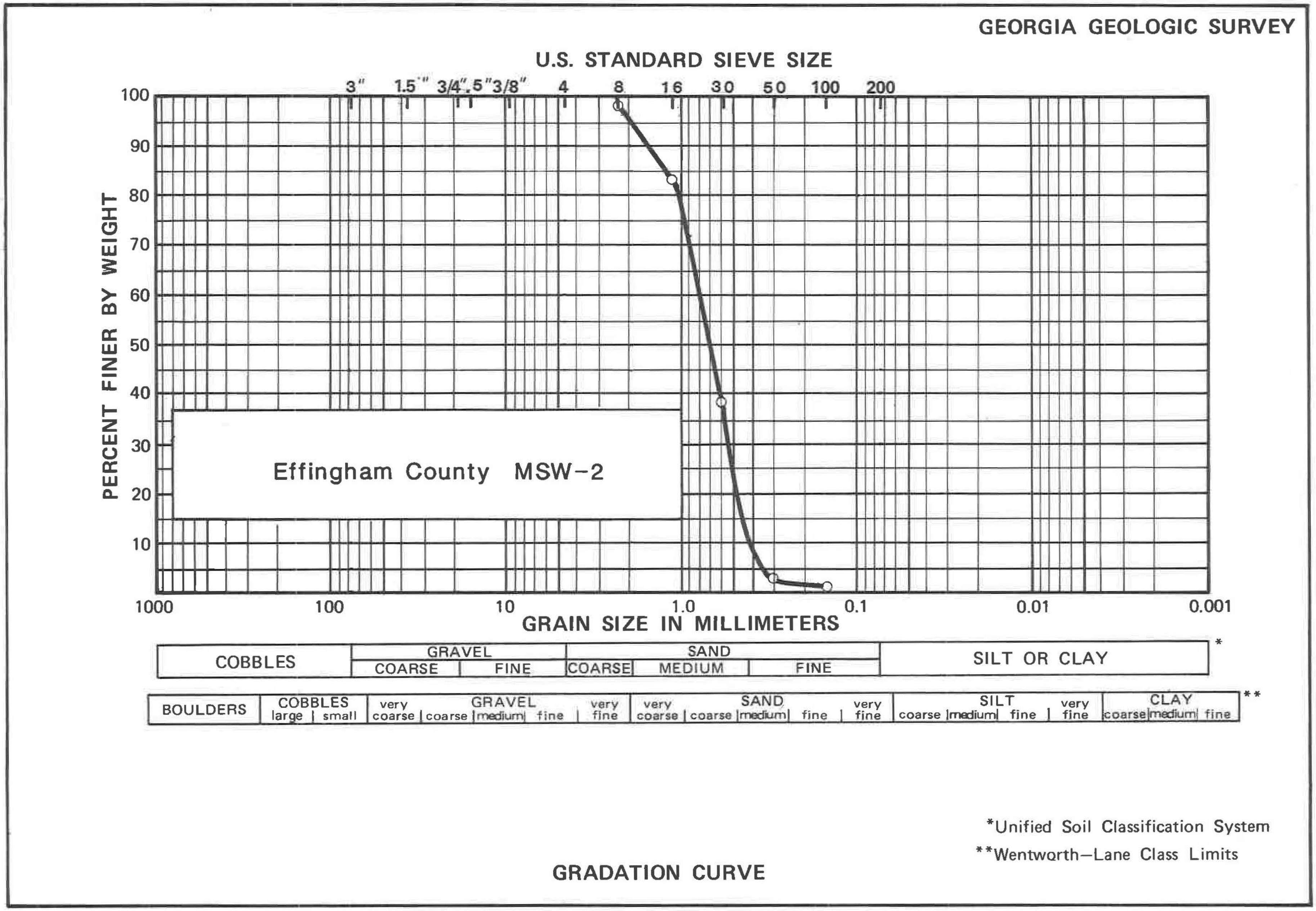


Figure 80. Size Distribution Curve of Sample MSW-2.

Table 12: Effingham County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
SpN -1	5	auger	5	1	no	0
SpS-1a	6	auger	6	1	no	0
SpS-1b	6 - 10	auger	4	1	no	0
Mel-1a	4	auger	4	2	no	2
Mel-1b	4 - 7	auger	3	2	no	0
Kil-1	7	auger	7	1	no	0
Lee-1	7	auger	7	3	no	0
Edn-1	4	trench	4	3	no	2
Edn-2	12	auger	12	3	no	2
Bri-1	6	auger	6	1	no	0
MSW-2	4	auger	4	1	no[4]	2

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.,

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

EMANUEL COUNTY

Geology and Physiography

Emanuel County lies within the Vidalia Uplands District of the Coastal Plain Province. The surficial sediments are derived mainly from the Altamaha Formation, with minor amounts of sediments being derived from the Hawthorne Group and the Barnwell Group.

Previous Studies

Teas (1921, p. 197-199) reported that gravel and coarse sand deposits are present in terrace deposits along the Ohoopee River (Fig. 81, Ts-14). Extensive deposits of fine-to medium-grained sand, ranging from 10 to 15 feet thick, are present along the east sides of the Canoochee and Little Canoochee Rivers. The sand at Pendleton Creek (Fig. 81, Ts-15) was used for traction sand in Teas's time.

Hurst, et al. (1966, p. 373-378) described five active sand pits in Emanuel County (Fig. 81, CSRA 4,9,11,12,14); all five are small and produce locally used sand. There is one small gravel pit (Fig. 81, CSRA 5). Hurst, et al. (1966, p. 373-378) also mentioned the presence of 3 inactive gravel pits (Fig. 81, CSRA 6, 7, 8) and 3 inactive sand pits (Fig. 81, CSRA 10, 13, 15). Hurst, et al. (1966, p. 386-388) noted 4 gravels prospects (Fig. 81, CSRA 35, 36,37, 38) and 2 sand prospects (Fig. 81, CSRA, 38, 39).

Present Study

The soil type used in targeting sites for sampling was #24 which is located along the eastern sides of major creeks in Emanuel County. The geomorphic areas targeted are large sand dunes along the northeast sides of the Ohoopee and Canoochee Rivers.

Nine samples were collected from eight localities: Nor-1, Adr-1. Sti-2, Nun-1, Del-1, TSE-1, TSE-2a, TSE-2b, Sti-1 (Figs. 81-90, Table 13). These samples from Emanuel County are from dune deposits with the exception of samples TSE-2a and TSE-2b, which are from a probable terrace deposit.

Evaluation

None of the samples passed ASTM standard C-33. All the samples analyzed were too well-sorted and lack enough coarse material for use as construction aggregate.

Mining Activity

There has been no recent mining activity in Emanuel County. Some small pits were described by Hurst, et al. (1966, p. 373-378).

Summary Evaluation

The construction aggregate potential for fine aggregate production in Emanuel County is low.

EVANS COUNTY

Geology and Physiography

Evans County lies within portions of two physiographic districts of the Coastal Plain Province, the Vidalia Upland District and the Barrier Island Sequence District. The surficial sediments of the county are derived from the Altamaha Formation and, to a lesser extent, the Cypresshead Formation.

Previous Studies

Teas (1921, p. 200) noted the occurrence of a medium-grained sand deposit approximately 50 acres in extent (Fig. 91, Ts-16). Teas also noted sand deposits on the east side of Canoochee Creek.

Present Study

The soil series used in targeting areas was the Kershaw series, which is present on the east side of the Canoochee River in east central and northwestern Evans County. Geomorphic features targeted in Evans County were dune fields located on the eastern side of the Canoochee River in the northwestern portion of the county. Three samples representing 3 sites in Evans County were sieved: DCr-4, Dai-1, Clx-1 (Figs. 91-94, Table 14). One sample (Clx-1) is representative of the dune sands of the area.

Evaluation

None of the samples pass ASTM standard C-33. While the samples are excellent in so far as the amount of material passing the #200 sieve, they are generally too fine grained and too well sorted to be considered as a source for fine aggregate.

Mining Activity

Currently there is only one active aggregate operator (Fig. 91, #887) in Evans County. Evans Concrete of Claxton mines concrete and masonry aggregate by dredge from man-made ponds. The material is pumped in a slurry to classifiers and is then transported by truck to markets within a 50 mile radius. The company owns 8 acres and the deposit is being mined to a depth of 27 feet. Annual production is between 10,000 and 50,000 tons.

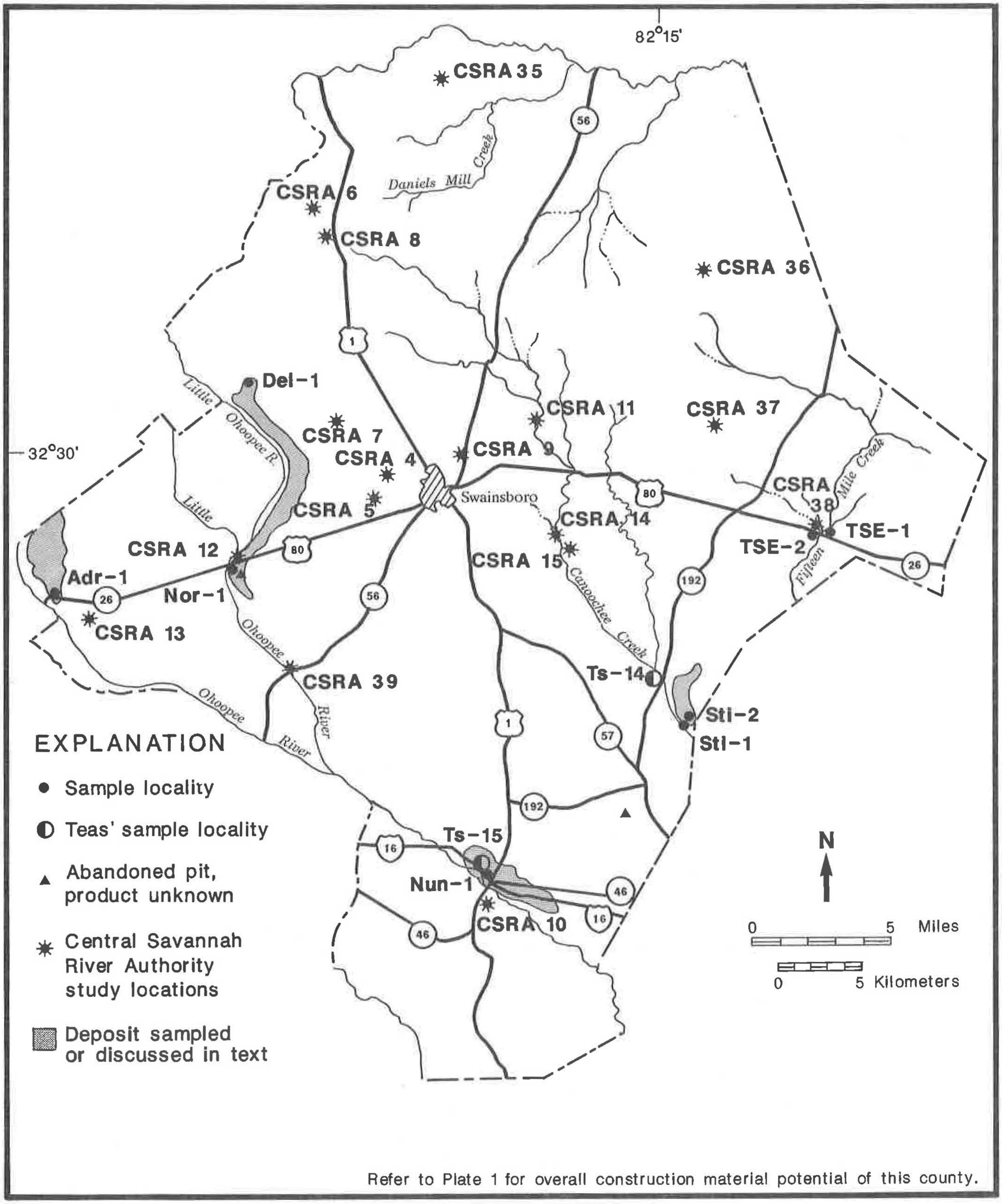


Figure 81. Map of Emanuel County Showing Localities and Deposits Sampled.

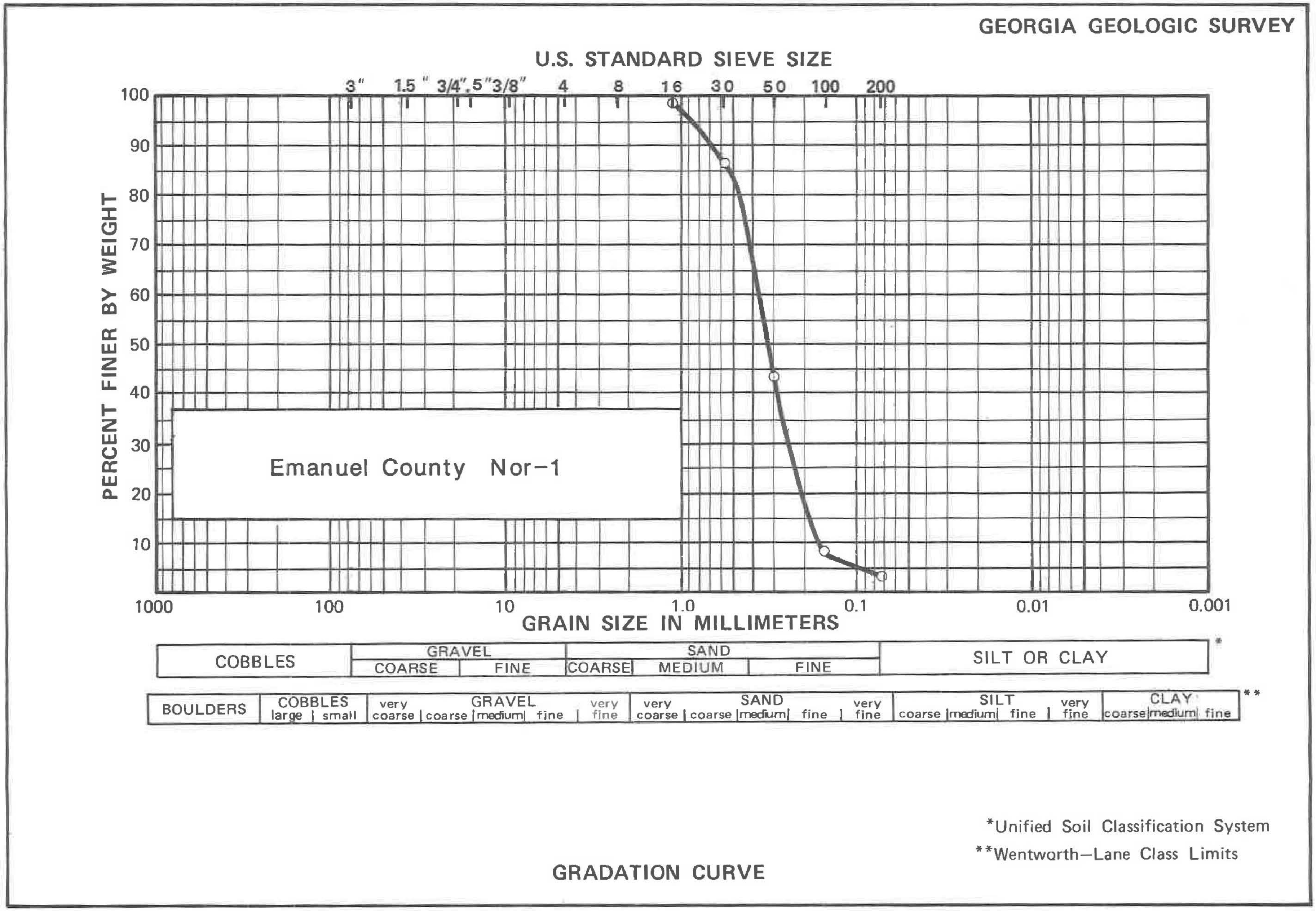


Figure 82. Size Distribution Curve of Sample Nor-1.

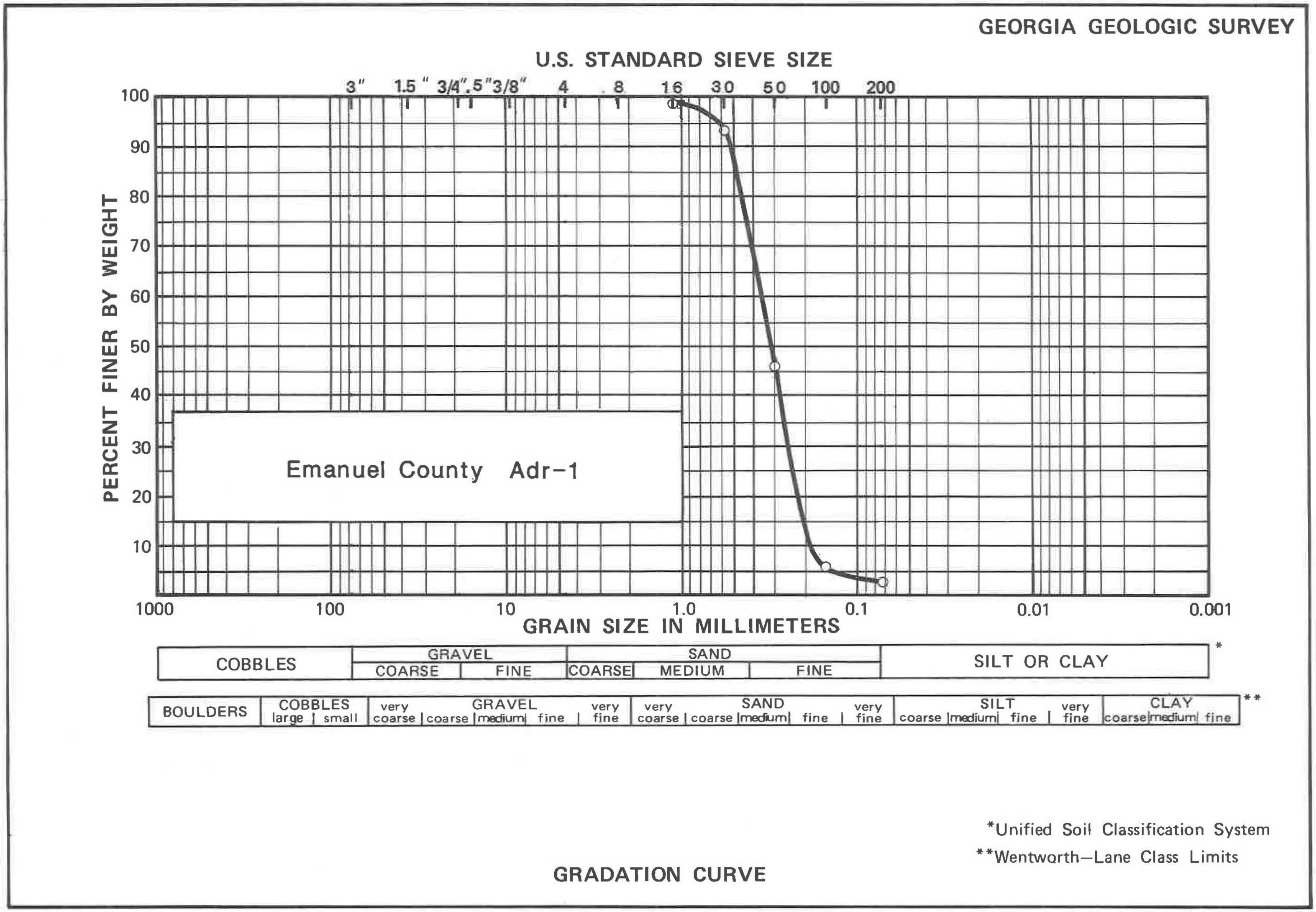


Figure 83. Size Distribution Curve of Sample Adr-1.

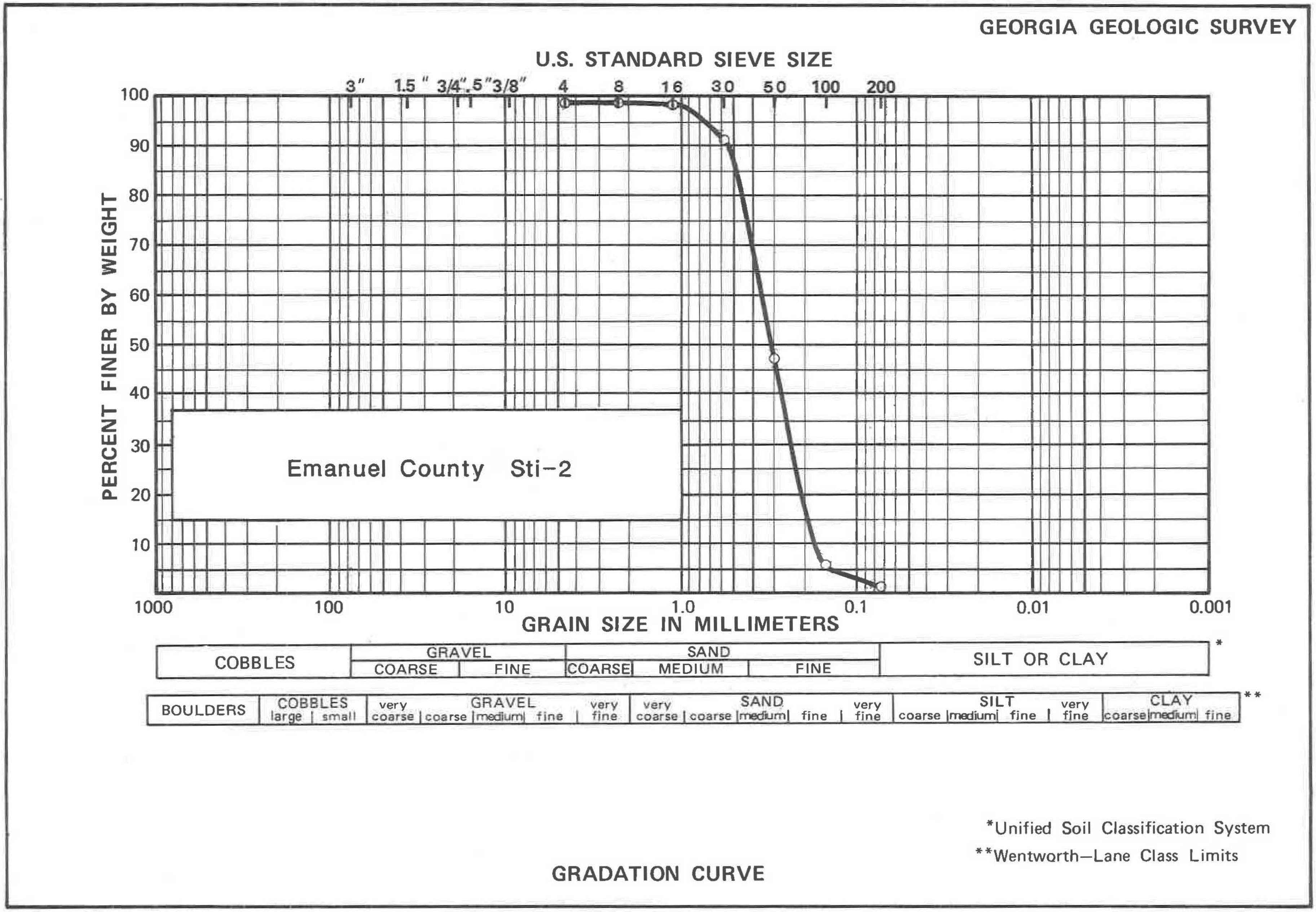


Figure 84. Size Distribution Curve of Sample Sti-2.

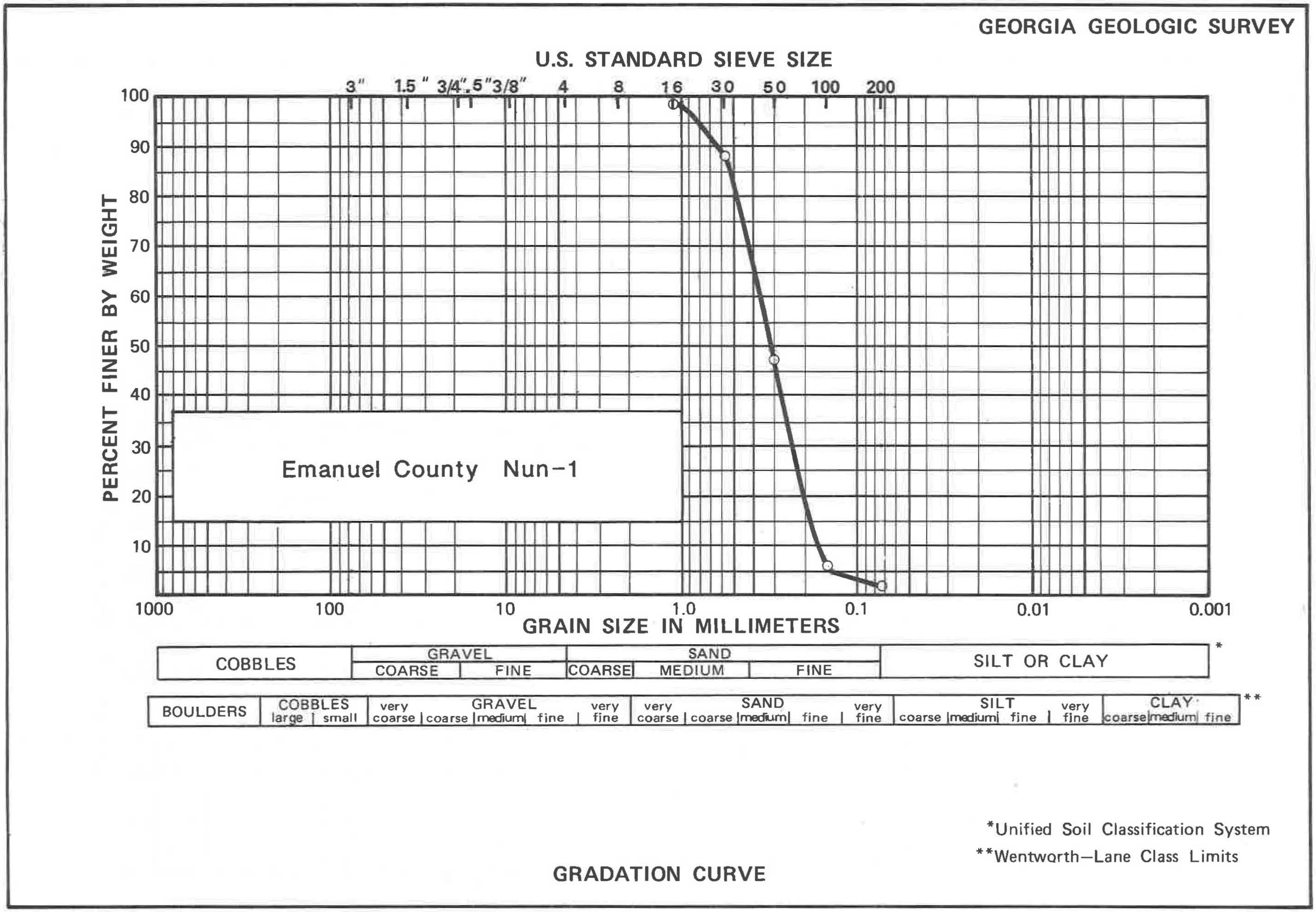


Figure 85. Size Distribution Curve of Sample Nun-1.

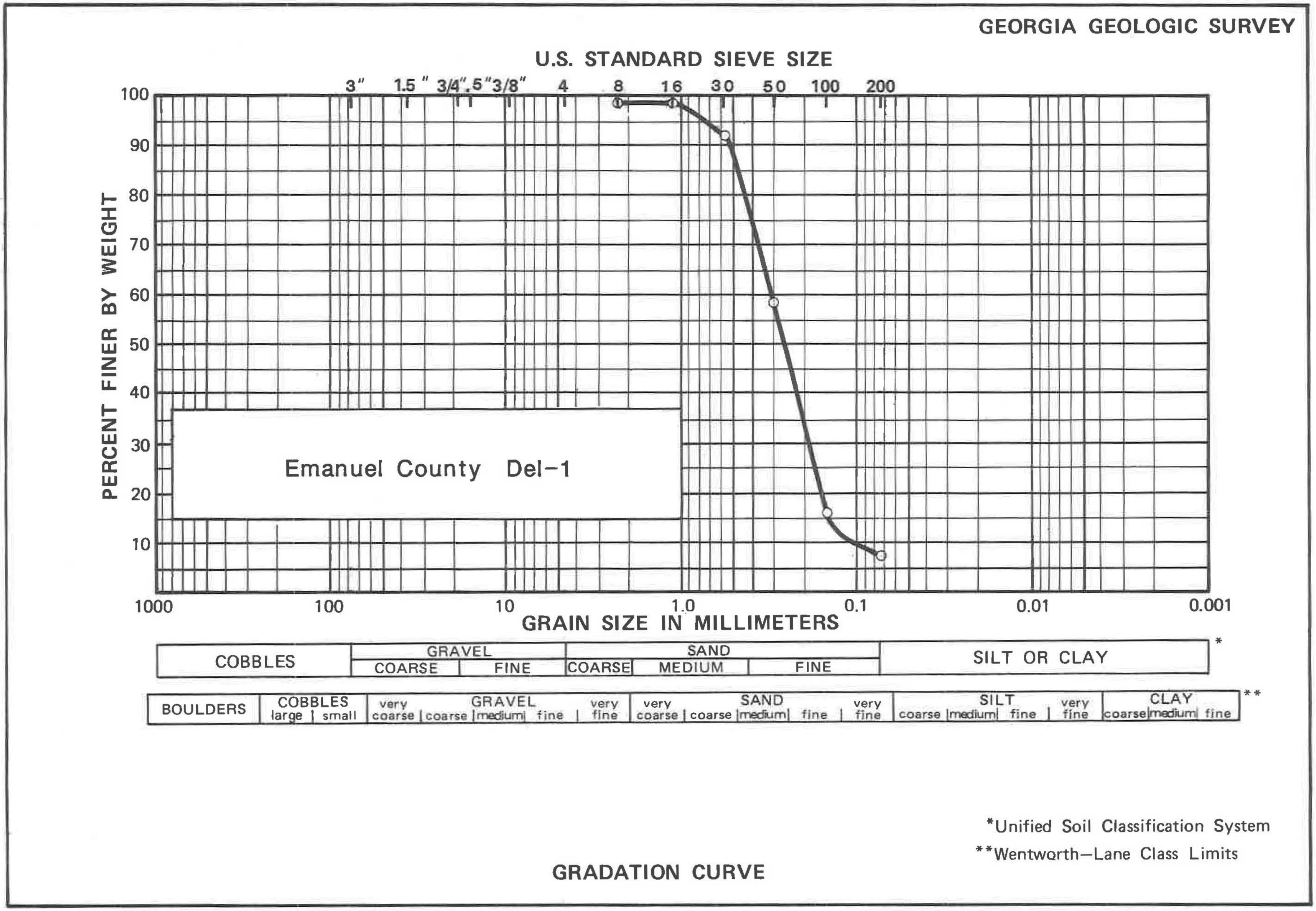


Figure 86. Size Distribution Curve of Sample Del-1.

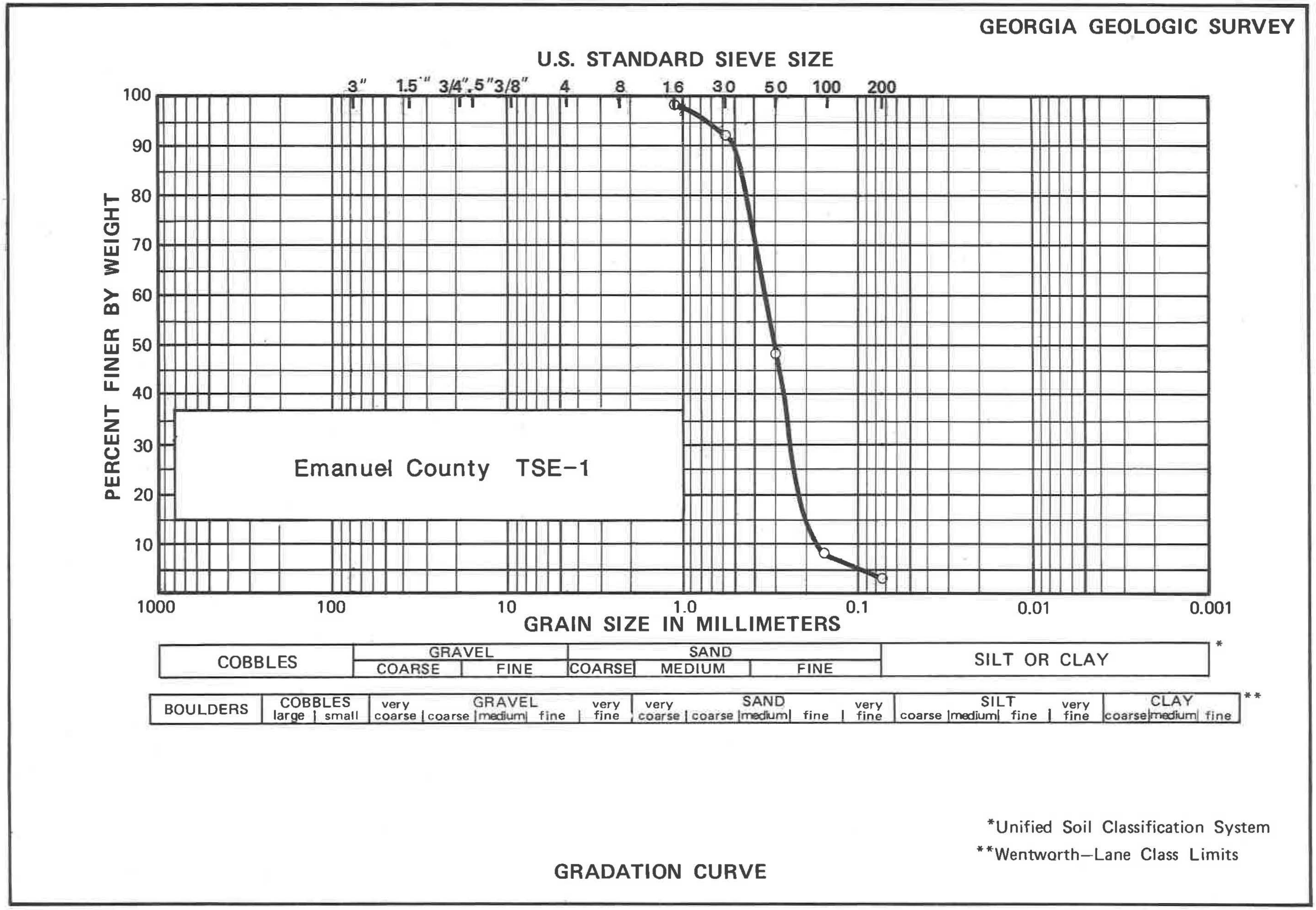


Figure 87. Size Distribution Curve of Sample TSE-1.

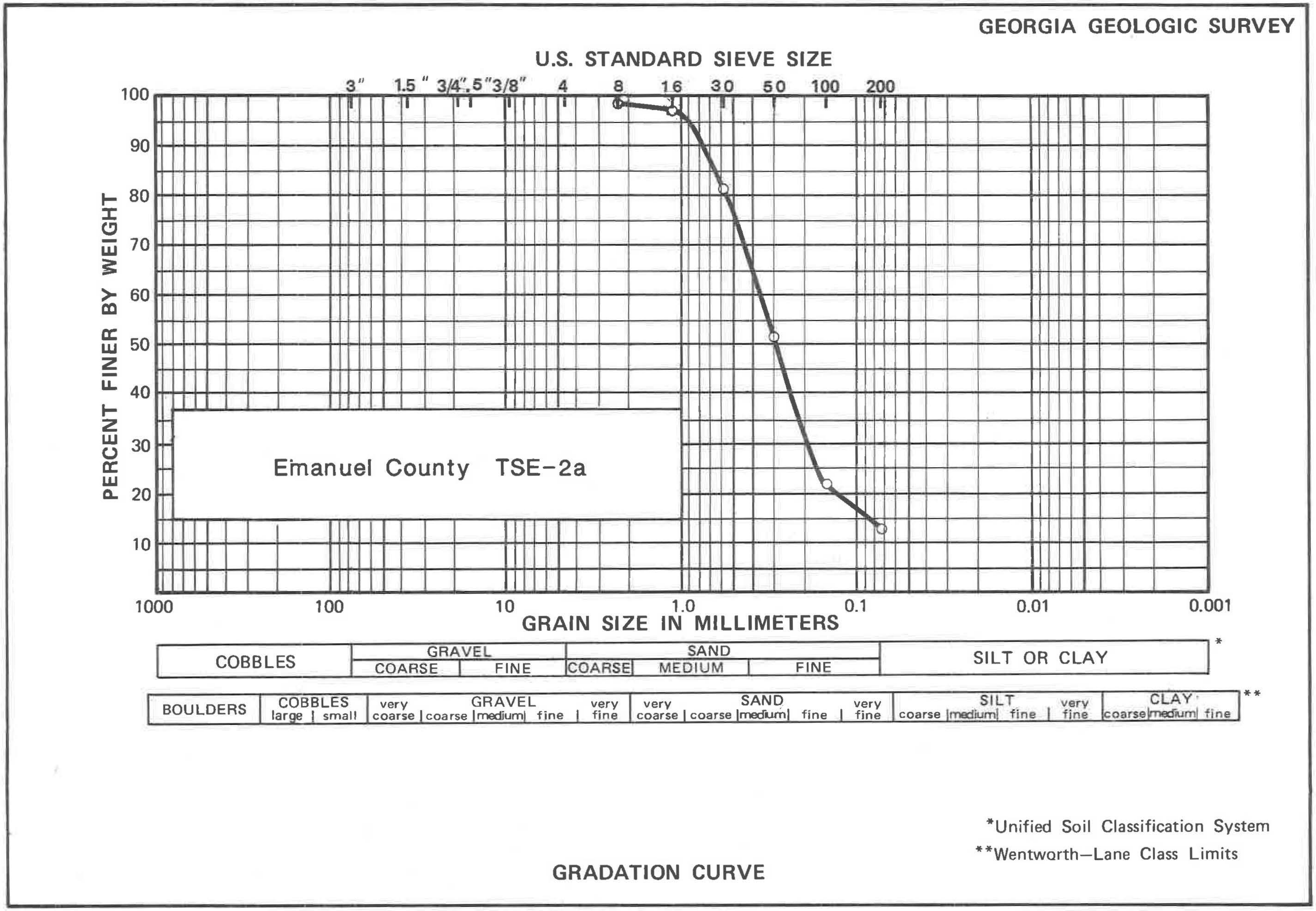


Figure 88. Size Distribution Curve of Sample TSE-2a.

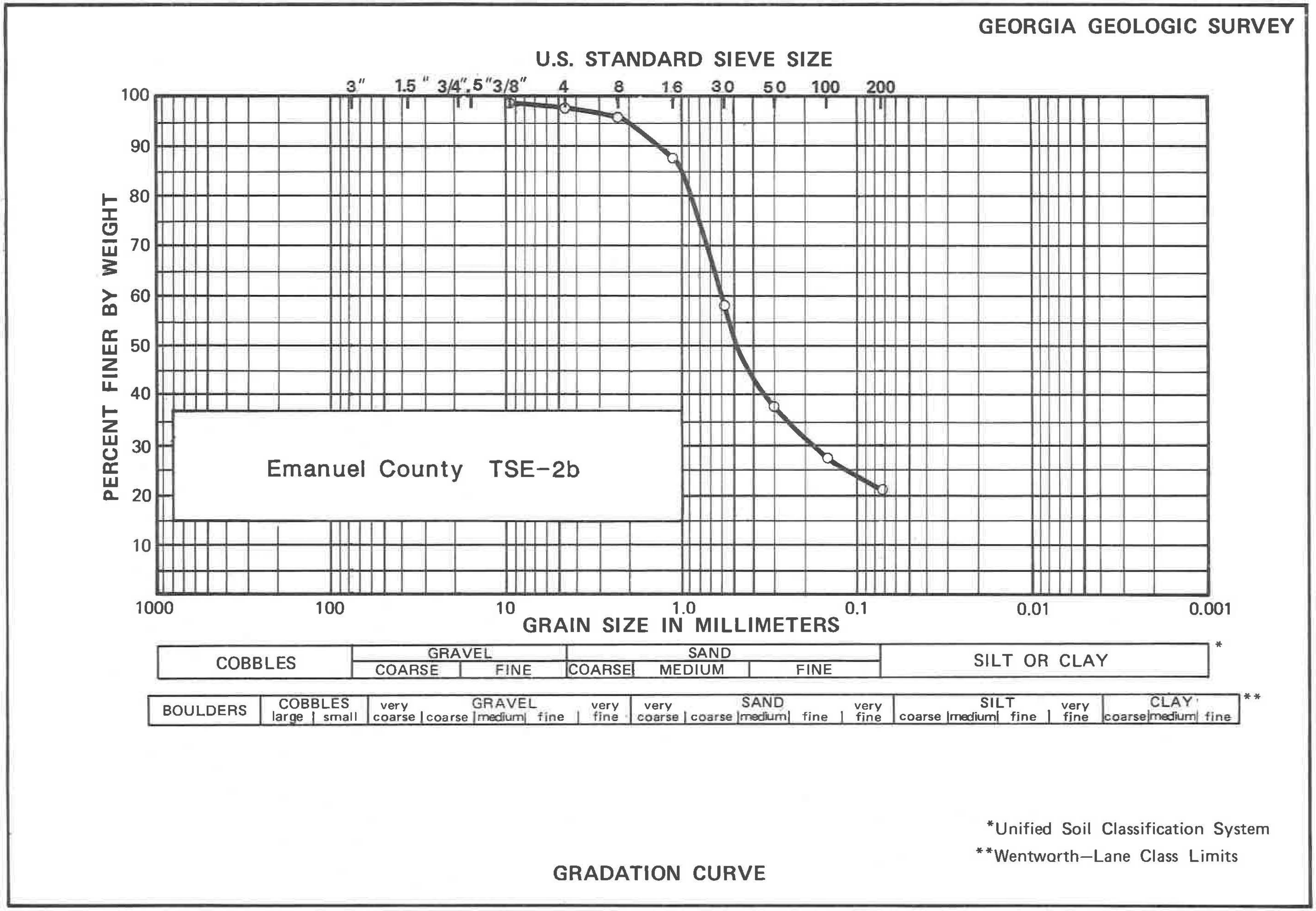


Figure 89. Size Distribution Curve of Sample TSE-2b.

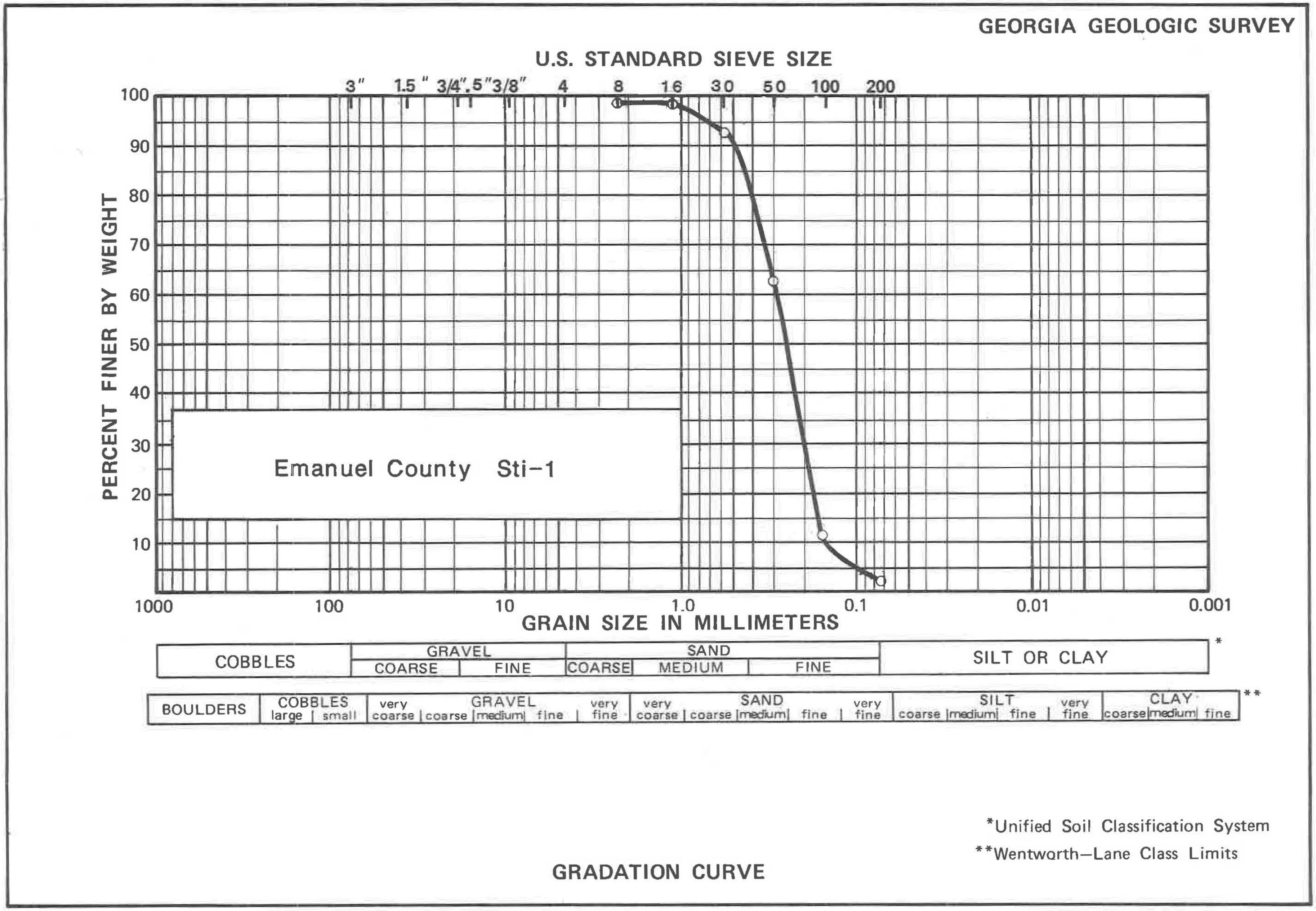


Figure 90. Size Distribution Curve of Sample Sti-1.

Table 13: Emanuel County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
Nor-1	20	trench	20	3	no	2
Adr-1	8	trench	8	2	no	2
Sti-2	4	auger	4	4	no	2
Nun-1	4	auger	20	4	no	2
Del-1	6	trench	10	2	no	2
TSE-1	4	trench	10	1	no	2
TSE-2a	6	trench	6	1	no	2
TSE-2b	6 - 13	auger	7	1	no	1
Sti-1	7-1/2	auger	7-1/2	4	no	1

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

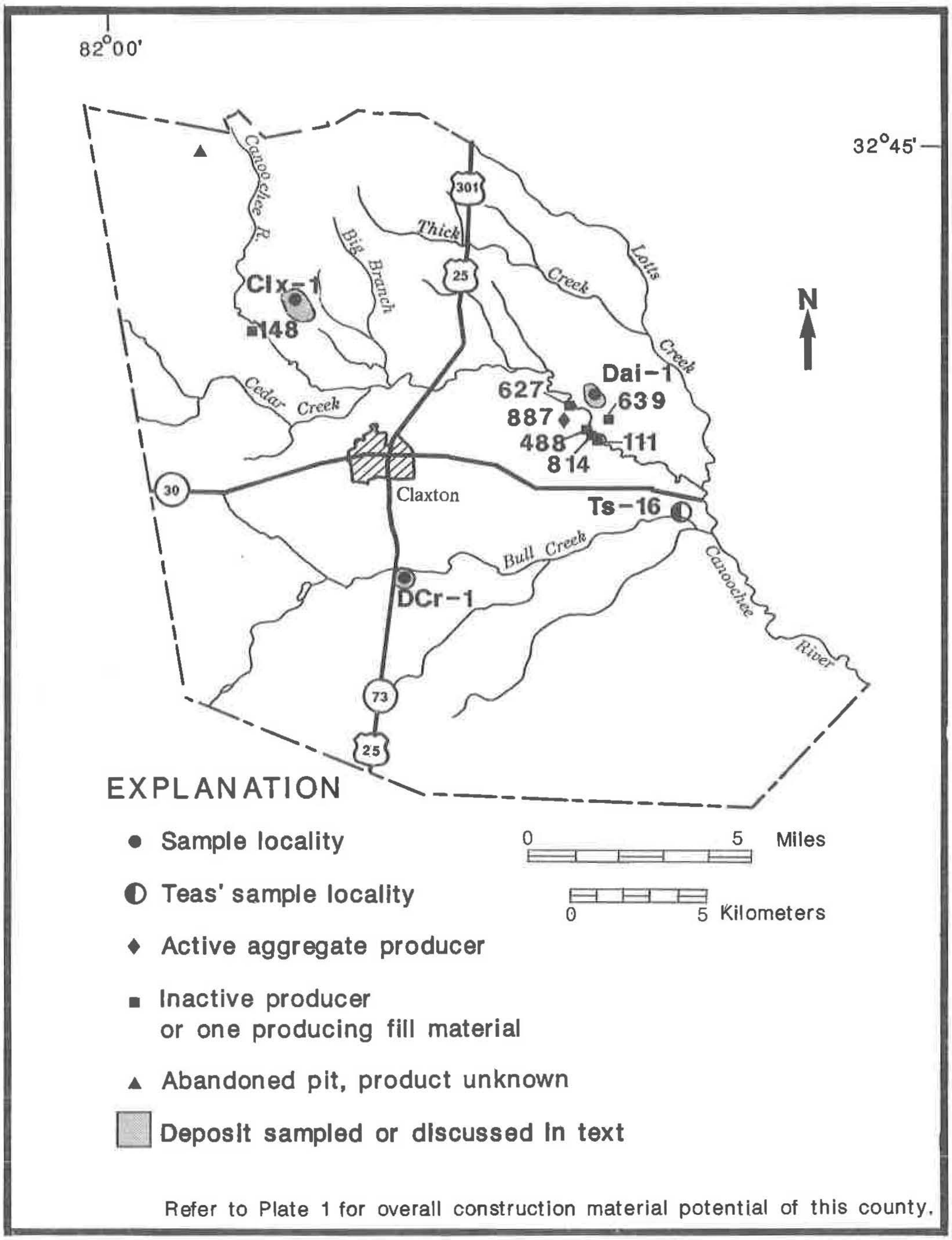


Figure 91. Map of Evans County Showing Localities and Deposits Sampled.

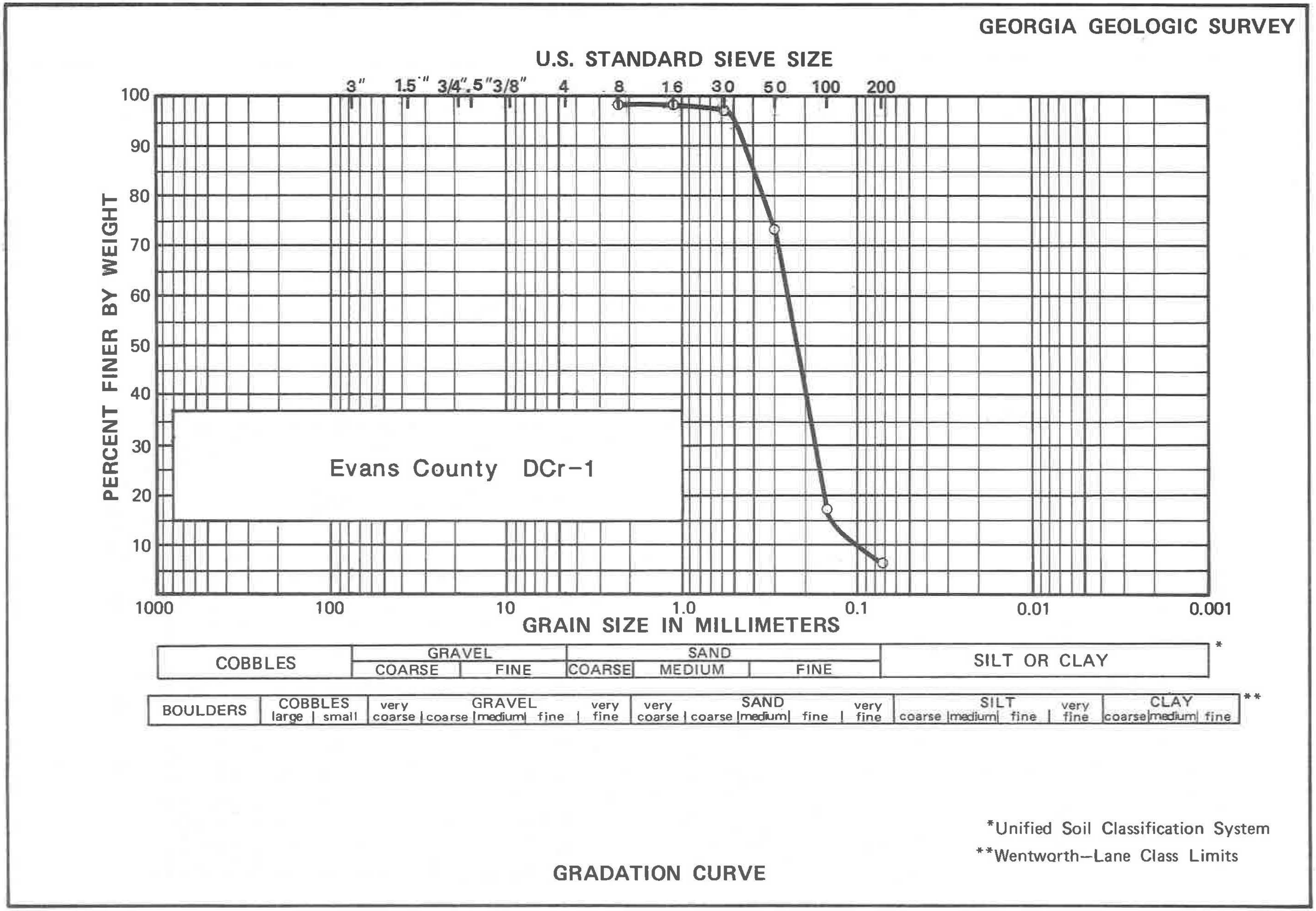


Figure 92. Size Distribution Curve of Sample DCr-1.

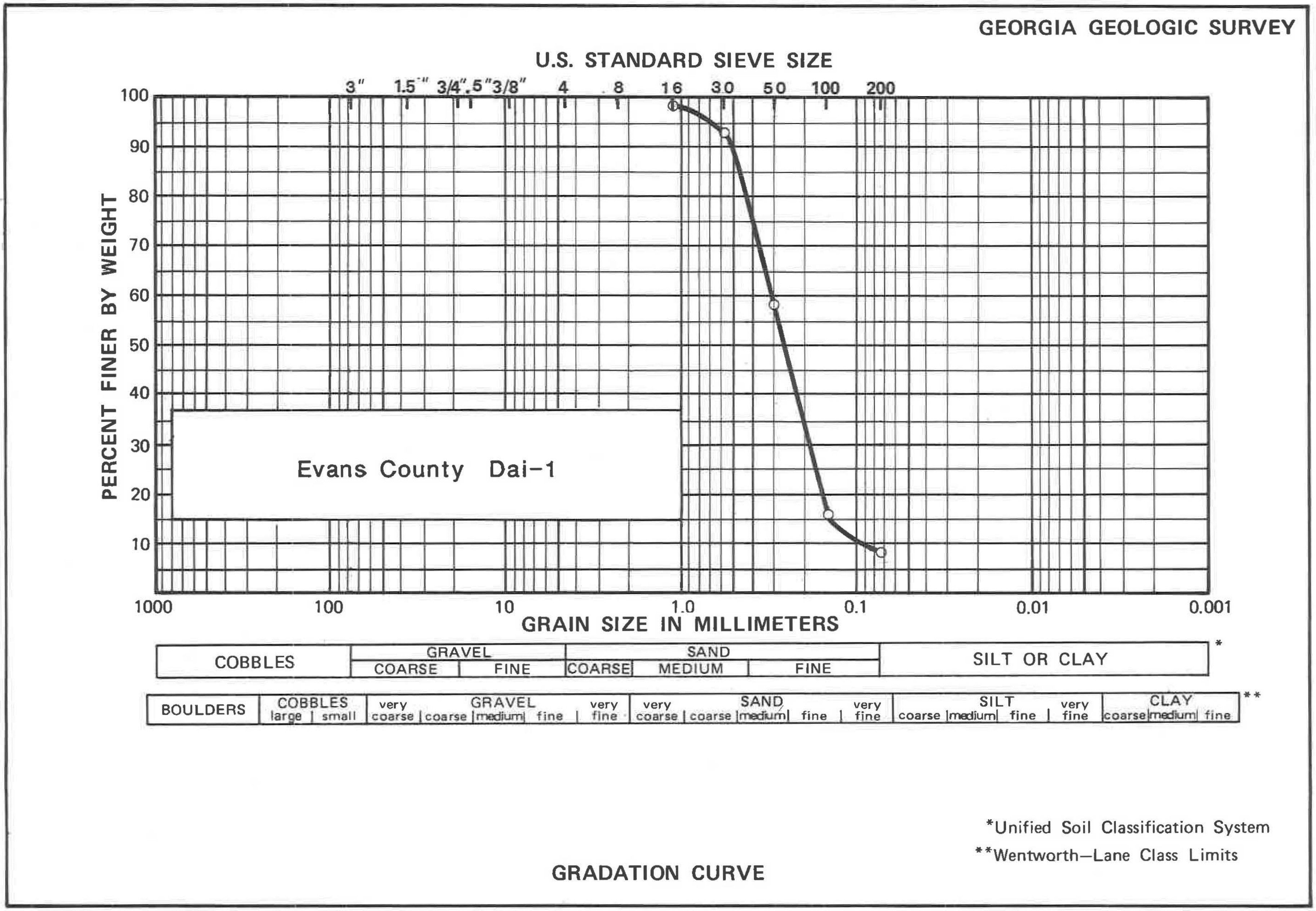


Figure 93. Size Distribution Curve of Sample Dai-1.

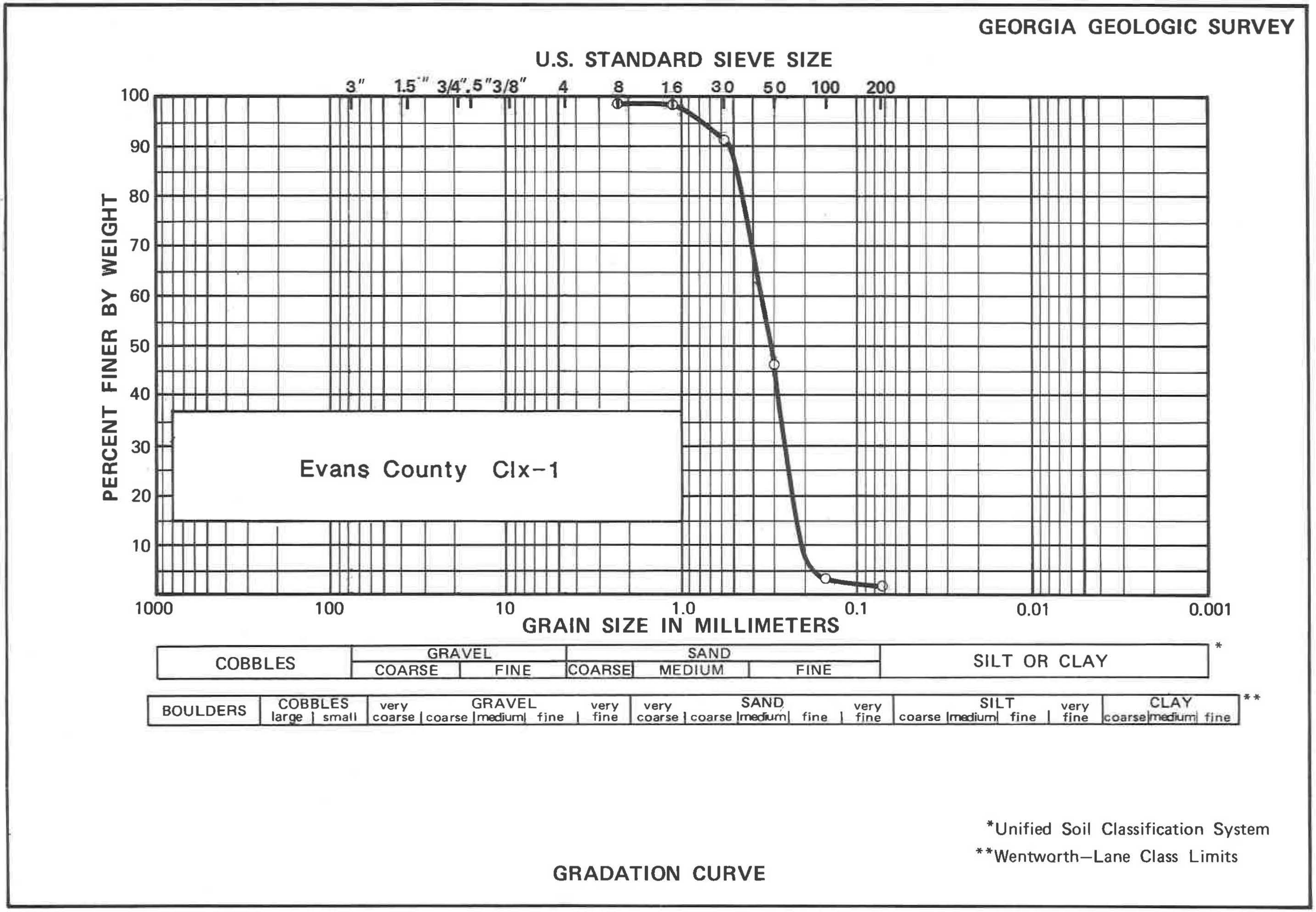


Figure 94. Size Distribution Curve of Sample Clx-1.

Table 14: Evans County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
DCr-4	10	trench	20	1	no	0
Dai-1	10	auger	10	2	no	2
Clx-1	14	auger	20	2	no	2

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

Evans Concrete has operated 4 pits in Evans County. These inactive pits are as follows: (1) Mine #111 (Fig. 91) produced concrete and masonry sand which was mined by dredge and transported by truck to markets within a 45 mile radius. This pit was mined to a depth of 27 feet, permitted for 37 acres, and production was between 50,000 and 100,000 tons per year. (2) Mine #639 (Fig. 91) produced fill and masonry sand which was mined using a front-end loader and then transported by truck to markets within a 45 mile radius. This pit was mined to a depth of 10 feet, permitted for 5 acres, and produced less than 10,000 tons annually. (3) Mine #627 (Fig. 91) produced concrete sand which was mined using a cutterhead dredge and then transported by truck to markets within a 45 mile radius. This pit was mined to a depth of 18 feet, permitted for 35 acres, and produced between 10,000 and 30,000 tons per year. (4) Mine #814 (Fig. 91) produced concrete and masonry sand which was mined using a cutterhead dredge and then transported by truck to markets within a 45 mile radius. This pit was mined to a depth of 25 feet, permitted for 11 acres, and produced between 10,000 and 50,000 tons per year.

The Daisy Sand Mine (Fig. 91, #488) of Evans County was permitted for 2 acres, reclamation is complete and no further information such as products, markets or mining data is available.

Eason Contracting Company of Statesboro operated an 8 acre sand pit in Evans County (Fig. 91, #148). The reclamation is complete but no further information such as products, markets or mining data is available.

Summary Evaluation

The dune areas east of the Canoochee River, such as the deposit represented by Clx-1, contain huge reserves, but, unfortunately, the uses for this sand are limited due to the poor size gradation.

The potential for fine aggregate production in Evans County is considered to be low to moderate. The floodplain of the Canoochee River probably has the best potential for aggregate production within the county.

GLASCOCK COUNTY

Geology and Physiography

Glascock County lies within two districts of two physiographic provinces. These districts are the Fall Line Hills of the Coastal Plain Province and the Washington Slope of the Piedmont Province. The surficial sediments of the county are derived from the Barnwell Group and the Oconee Group; and the granites of the Piedmont.

Previous Studies

Teas (1921, p. 200) noted that one small sand pit near Gibson (Fig. 95, Ts-17) provided concrete sand for local use only. Hurst, et al. (1966) also mentioned a small locally used pit near Gibson (Fig. 95, CSRA-16), but listed the primary use as fill dirt.

Present Study

The soil association used in targeting areas was #32, which is present in the interfluve areas. Four samples were taken from two sites: Gbs-1a, Gbs-1b, Gbs-2a and Gbs-2b (Figs. 95-99, Table 15).

Evaluation

None of the samples passed ASTM standard C-33; however, two samples (Gbs-1a and Gbs-2a) could be upgraded. The others, Gbs-1b and Gbs-2b, have too great a percentage of fine-grained material. Sample Gbs-1a represents a five foot thick zone of surficial sand that covers an area of approximately 10 acres. Gbs-2a represents a 3-l/2 foot thick deposit of fine-to medium-grained sand that is also the deposit mentioned by Teas (1921, p. 200).

Mining Activity

There are no active or recently inactive mining operations in Glascock County.

Summary Evaluation

The two sites represented by samples Gbs-1a and Gbs-2a are too small for any use other than local use and would require processing. Overall the potential for fine aggregate production in Glascock County is low.

GLYNN COUNTY

Geology and Physiography

Glynn County lies within the Barrier Island District of the Coastal Plain Province. The surficial sediments are derived from the Satilla Formation and the barrier island deposits.

Previous Studies

Teas (1921, p. 201) stated, "No commercial deposits of sand are operated in the county, nor were any deposits noted likely to be of commercial value."

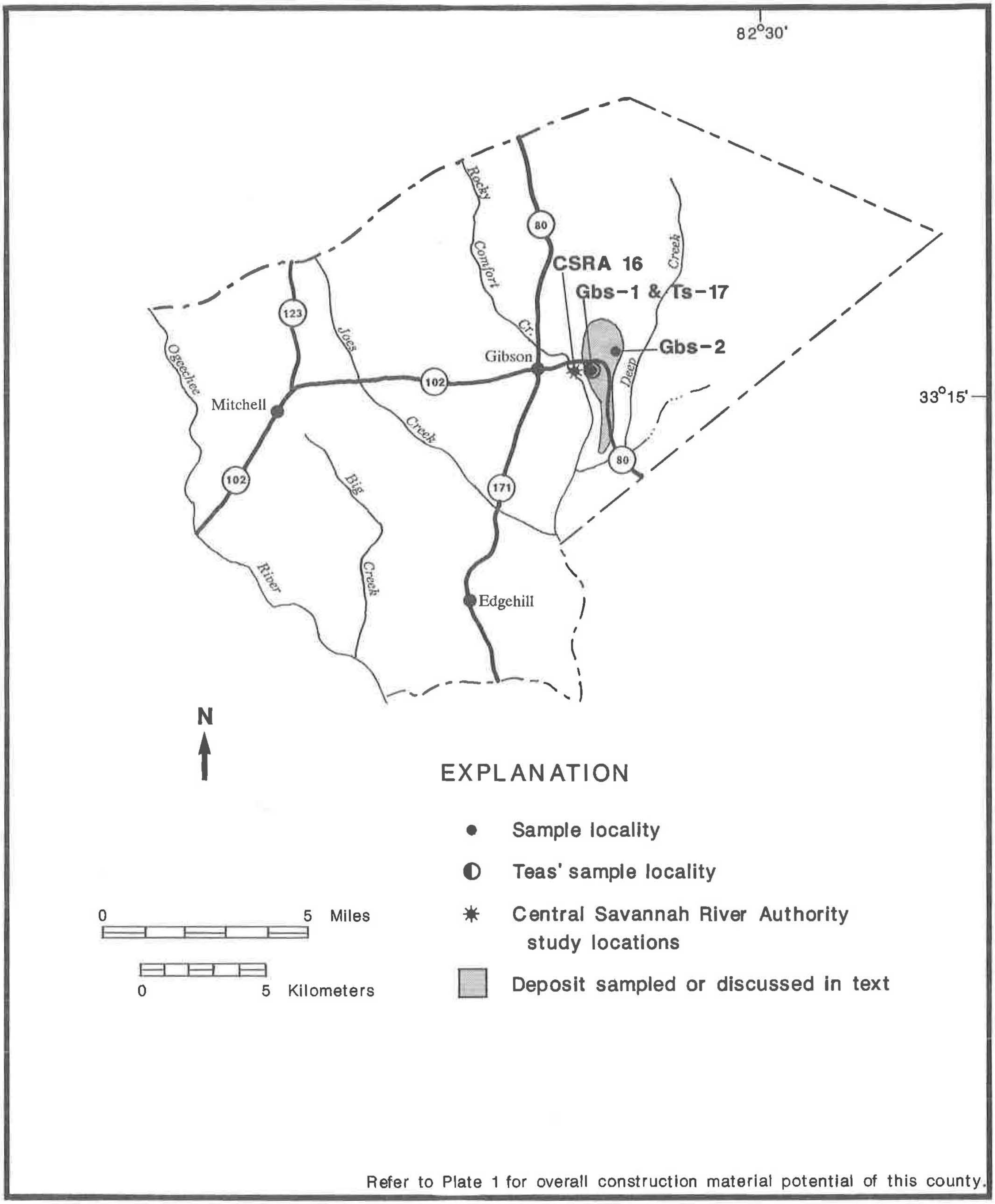


Figure 95. Map of Glascock County Showing Localities and Deposits Sampled.

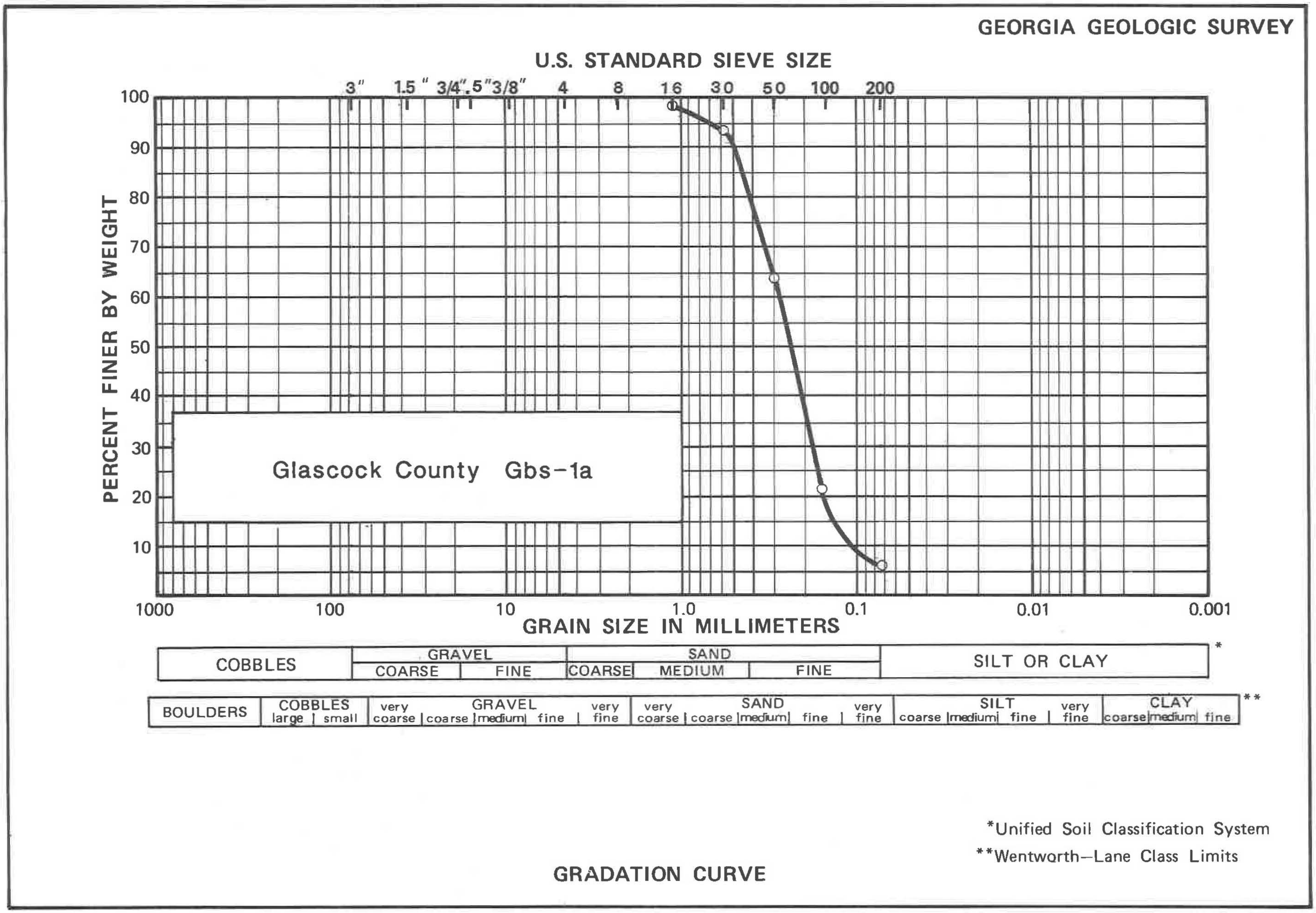


Figure 96. Size Distribution Curve of Sample Gbs-1a.

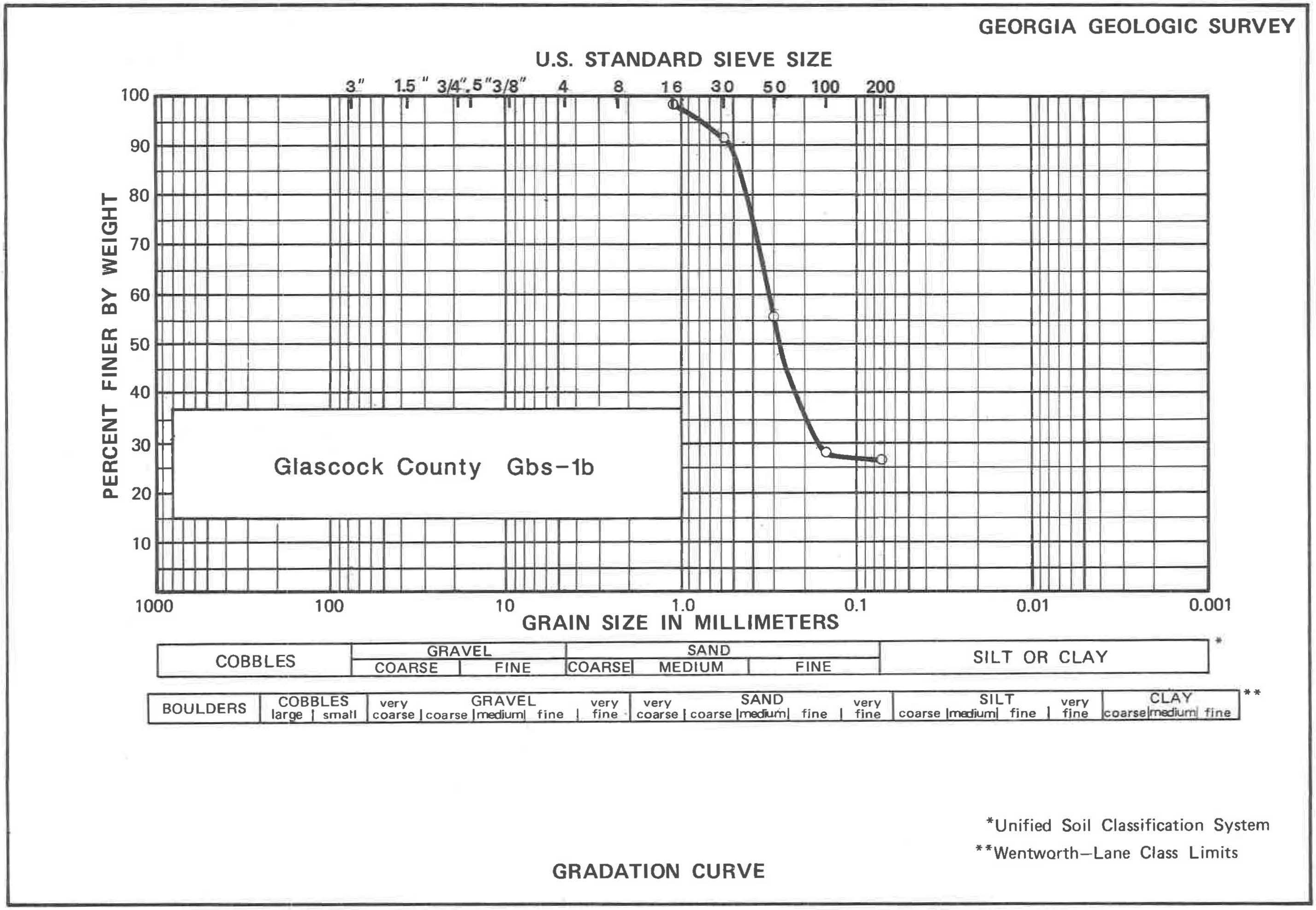


Figure 97. Size Distribution Curve of Sample Gbs-1b.

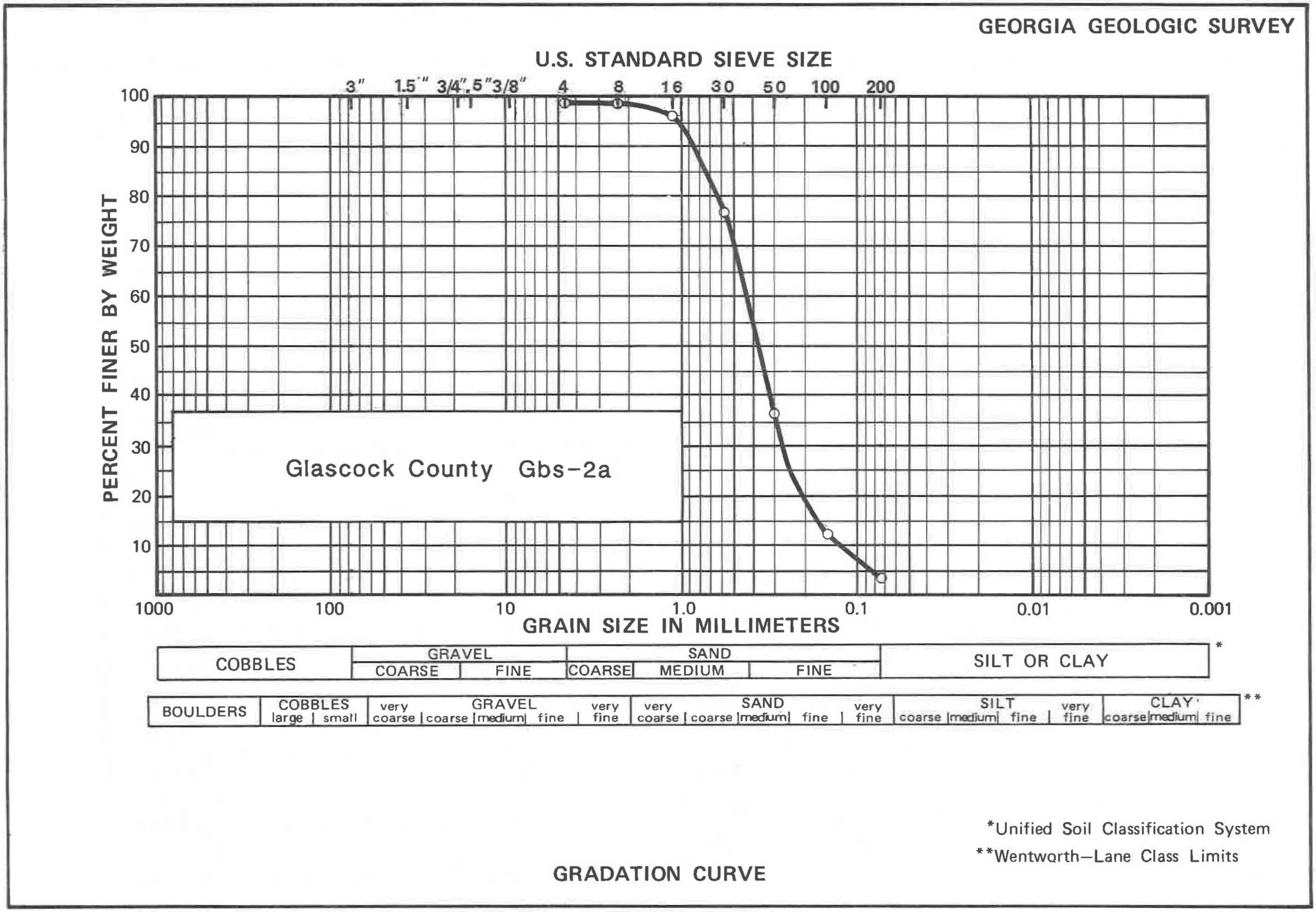


Figure 98. Size Distribution Curve of Sample Gbs-2a.

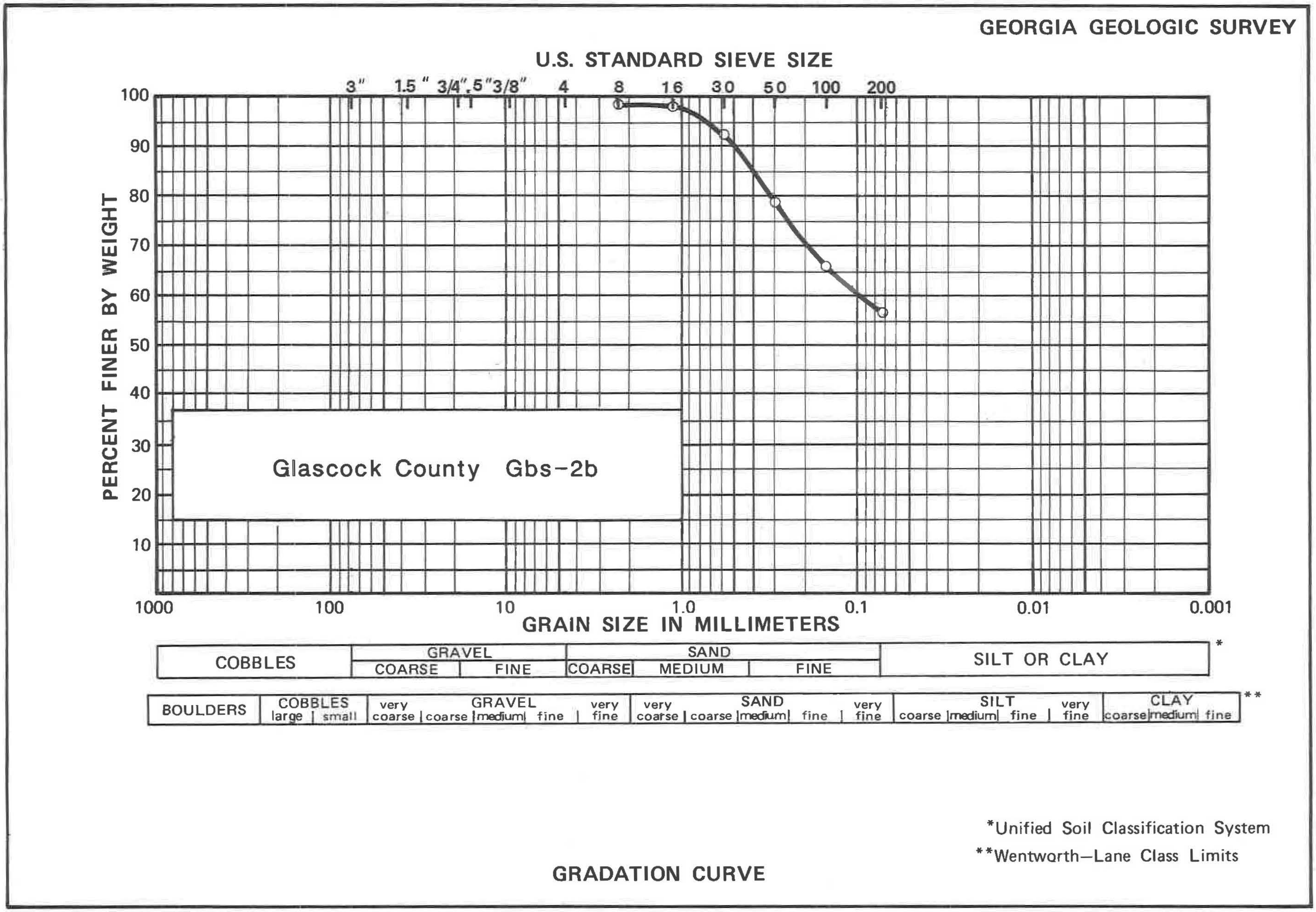


Figure 99. Size Distribution Curve of Sample Gbs-2b.

Table 15: Glascock County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
Gbs-1a	5	trench	5	3	no[4]	1
Gbs-1b	5-11	trench	6	3	no	1
Gbs-2a	3-1/2	auger	3-1/2	3	no[4]	2
Gbs-2b	3-1/2-8	auger	4-1/2	3	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

Present Study

The soil series used in targeting areas of Glynn County were the Olustee and Fripp series. Olustee is generally found adjacent to local creeks and rivers; whereas, Fripp is present along the coast as dune sand. Three samples representing 3 deposits from Glynn County were sieved : Ste-1, BrW-1, Bla-1 (Figs. 100-103, Table 16).

Evaluation

None of the samples sieved passed ASTM standard C-33. All materials tested were too fine grained or too clayey to be utilized for construction materials.

Mining Activity

Currently, there are no active pits producing sand for construction aggregate in Glynn County. The following operators once produced sand; although, currently, the sand is used for fill material or the product is unknown.

H.S. McDonald and Sons of Brunswick (Fig. 100, #141) operated a 10 acre pit in Glynn County. The reclamation of the pit has been completed and the products of the pit are unknown and no further information is available.

McDonald Materials Corporation of Lithonia at one time operated a dredge on the Altamaha River north of Brunswick. No further information as to products or mining data is available.

Road Builders, Incorporated of Lithonia (Fig. 100, #630) operated a 21 acre pit which has since been reclaimed. No further information as to products or mining data is available.

Russell Paulk (Fig. 100, #454) of Brunswick operated a 4 acre pit which has since been reclaimed. Fill sand was the material produced from this pit.

Seaboard Construction Company of Brunswick (Fig. 100, #783) operated a 4 acre pit which has since closed. The only product of this operation was fill material.

The Altamaha Sand Company operated two sand pits in Glynn County, the Mock pit and the Harlem pit. No further information is available as to products or mining data.

Summary Evaluation

The fine aggregate production potential for Glynn County is considered to be low. The only areas which offer any possibilities for fine or coarse aggregate production is the bed and floodplain of the Altamaha River.

JEFFERSON COUNTY

Geology and Physiography

Most of Jefferson County lies within the Vidalia Upland District. The northern part, and the eastern tip lie in the Fall Line Hills District. The surficial sediments in this county are derived from the Barnwell Group, the Oconee Group and the Altamaha Formation.

Previous Studies

Teas (1921, p. 206-208) reported a small locally used deposit (Fig. 104, Ts-18) of sand; a small sand deposit (Fig. 104, Ts-19) with gravels; a small deposit of gravelly sand near Stapleton, (Fig. 104, Ts-20), and a small gravel deposit between Wrens and Spread (Fig. 104, Ts-21).

Hurst, et al., (1966 p. 379) reported the presence of two inactive gravel pits (Fig. 104, CSRA 17, CSRA 18). Hurst, et al. (1966, p. 389-390) mentioned two small gravel prospects (Fig. 104, CSRA 40, CSRA-41) that have not been worked.

Present Study

The soil associations used in targeting sites for sampling were #24 and #32, which are found along the east sides of major rivers and creeks. Ten samples were taken from seven sites: LoS-3c, LoS-3b, BoP-3, LoS-1, LoS-3a, LoS-2a, LoS-2b, BoP-2, KyP-1, KyP-2, (Figs. 104-114, Table 17).

Evaluation

None of the samples passed ASTM standard C-33; however, the deposit represented by samples LoS-3a, 3b, and 3c could be economically profitable to mine. The sample LoS-3a represents 10 feet of probably unusable overburden, but the lower 8-1/2 feet (represented by samples LoS-3b and 3c) consist of a fine- to medium-grained sand that could be usable as fine aggregate. The areal extent of this deposit is approximately 15 acres. Sample BoP-3 represents an 8 foot thick deposit of fine- to medium- to coarse-grained well-sorted sand. The areal extent of this deposit is approximately 40 acres.

Mining Activity

There are no active or recently inactive mining operations in Jefferson County.

Summary Evaluation

There are two deposits in Jefferson County, (LoS-3 and BoP-3) that could be suitable for local use.

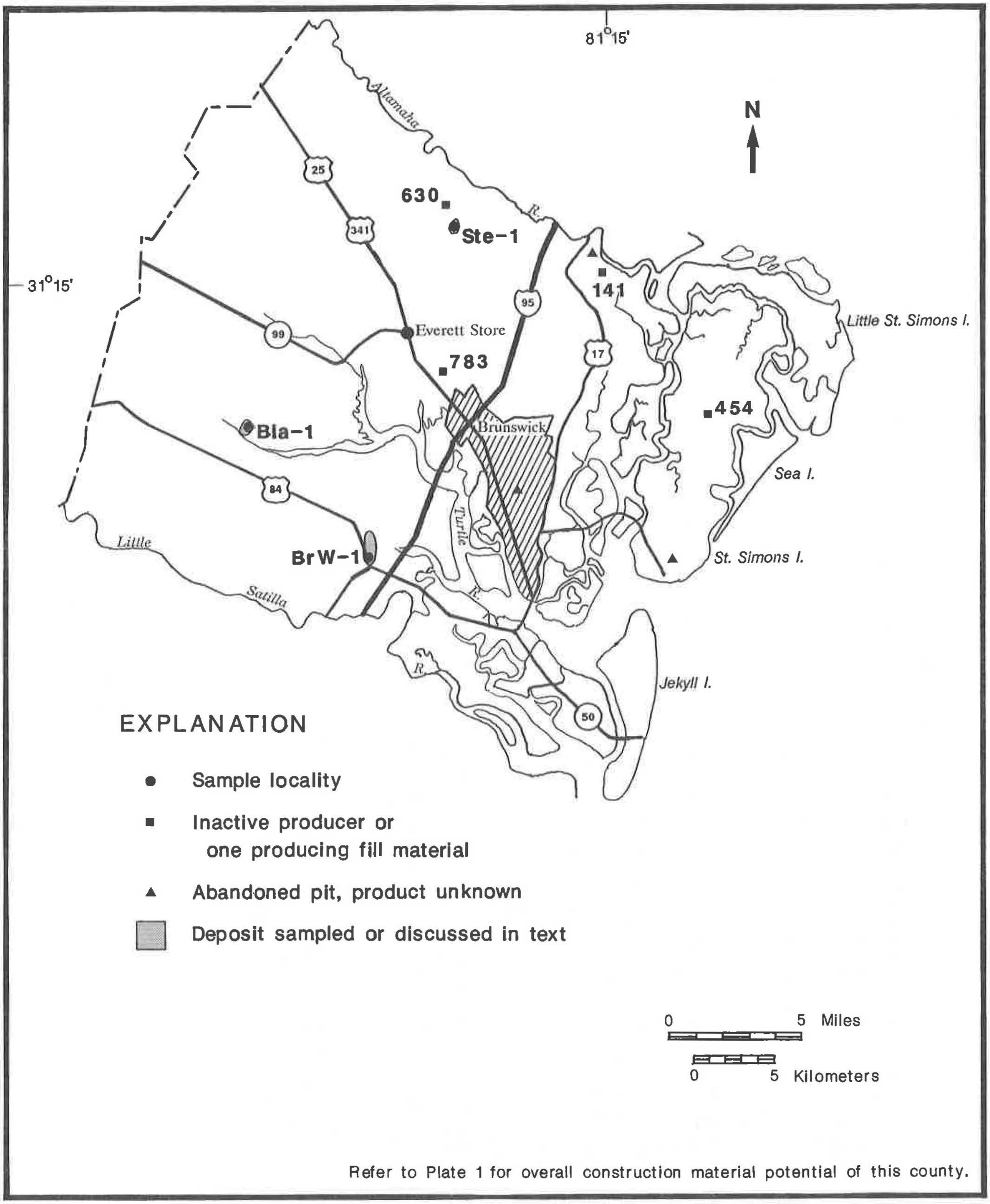


Figure 100. Map of Glynn County Showing Localities and Deposits Sampled.

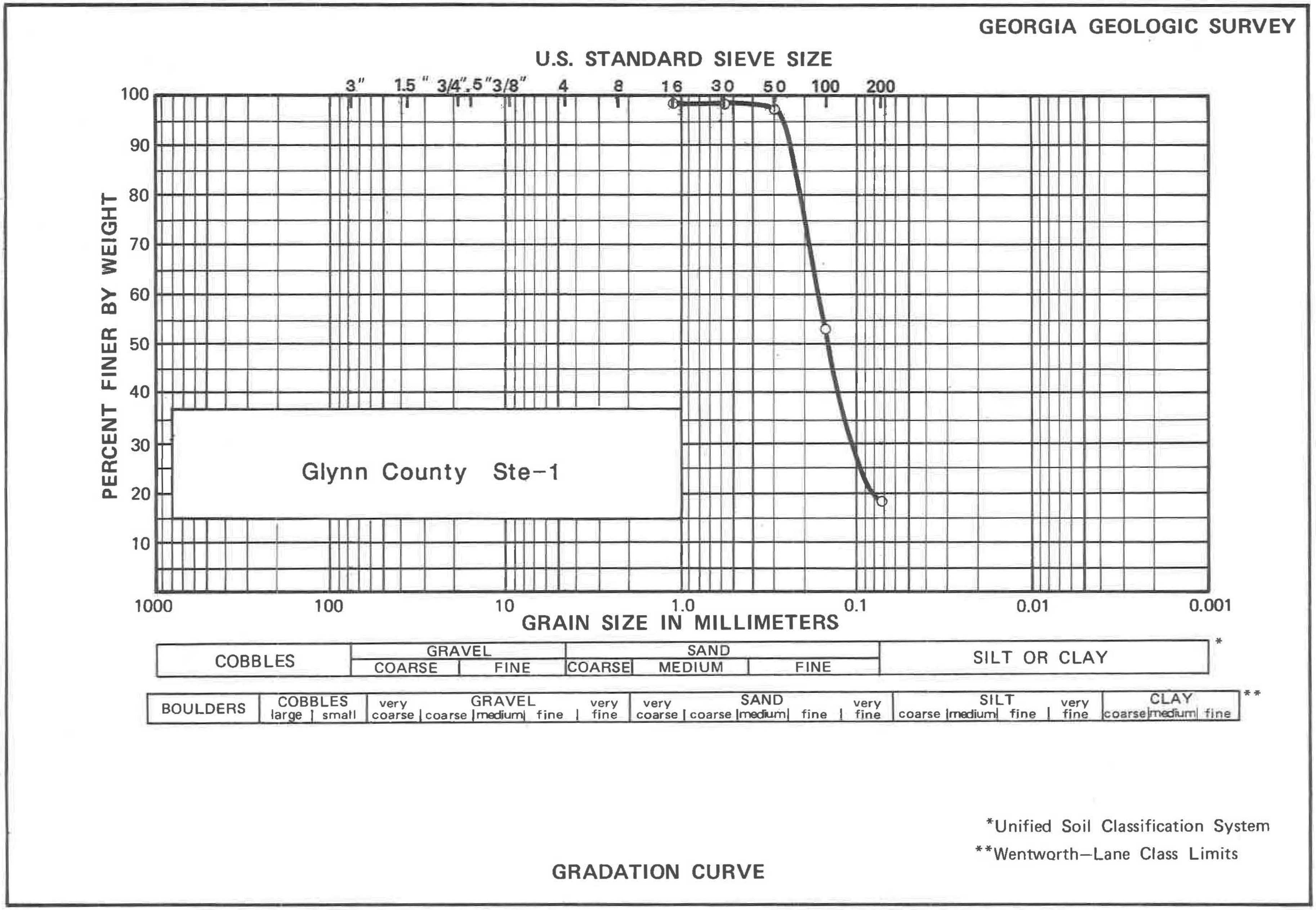


Figure 101. Size Distribution Curve of Sample Ste-1

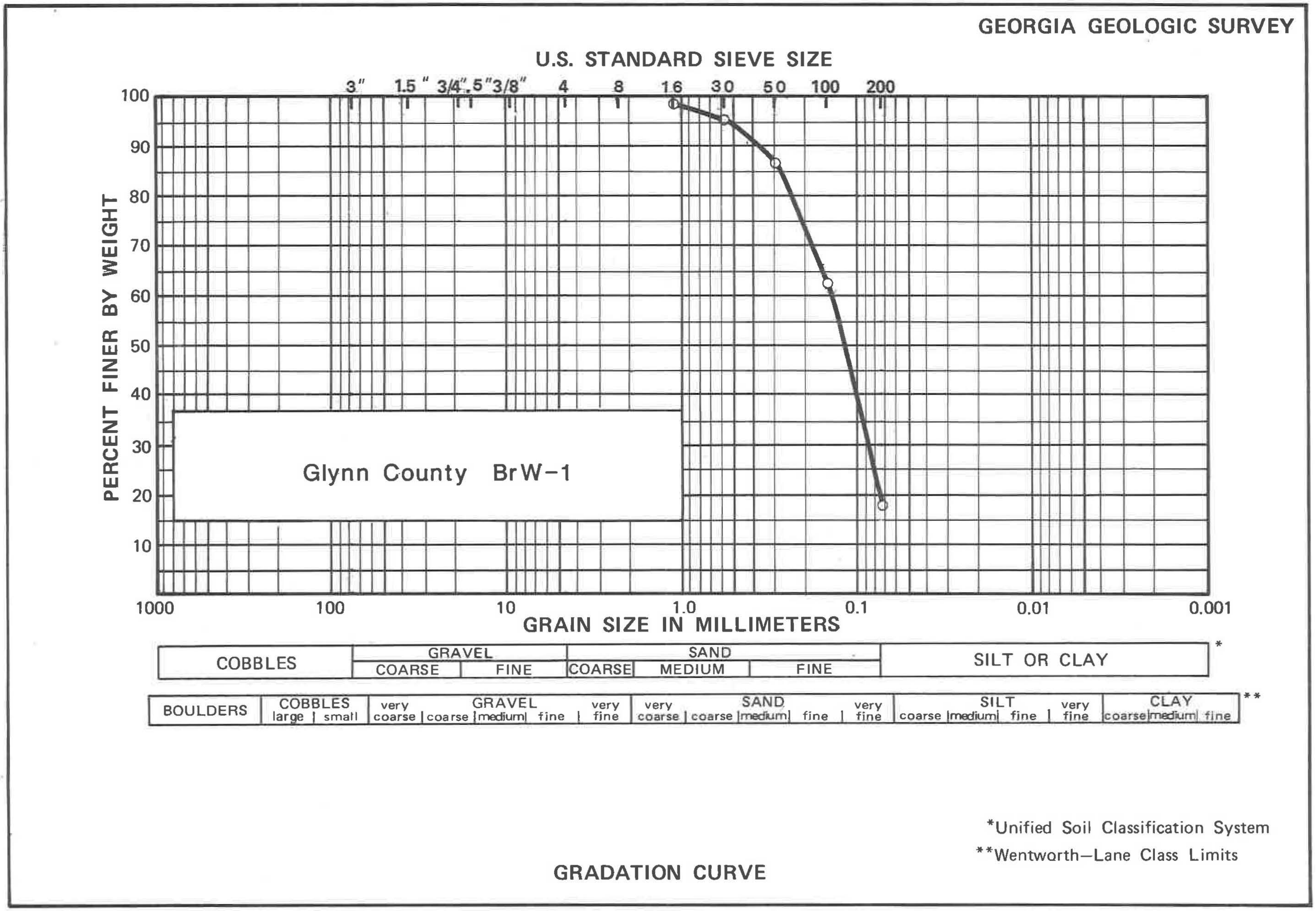


Figure 102. Size Distribution Curve of Sample BrW-1

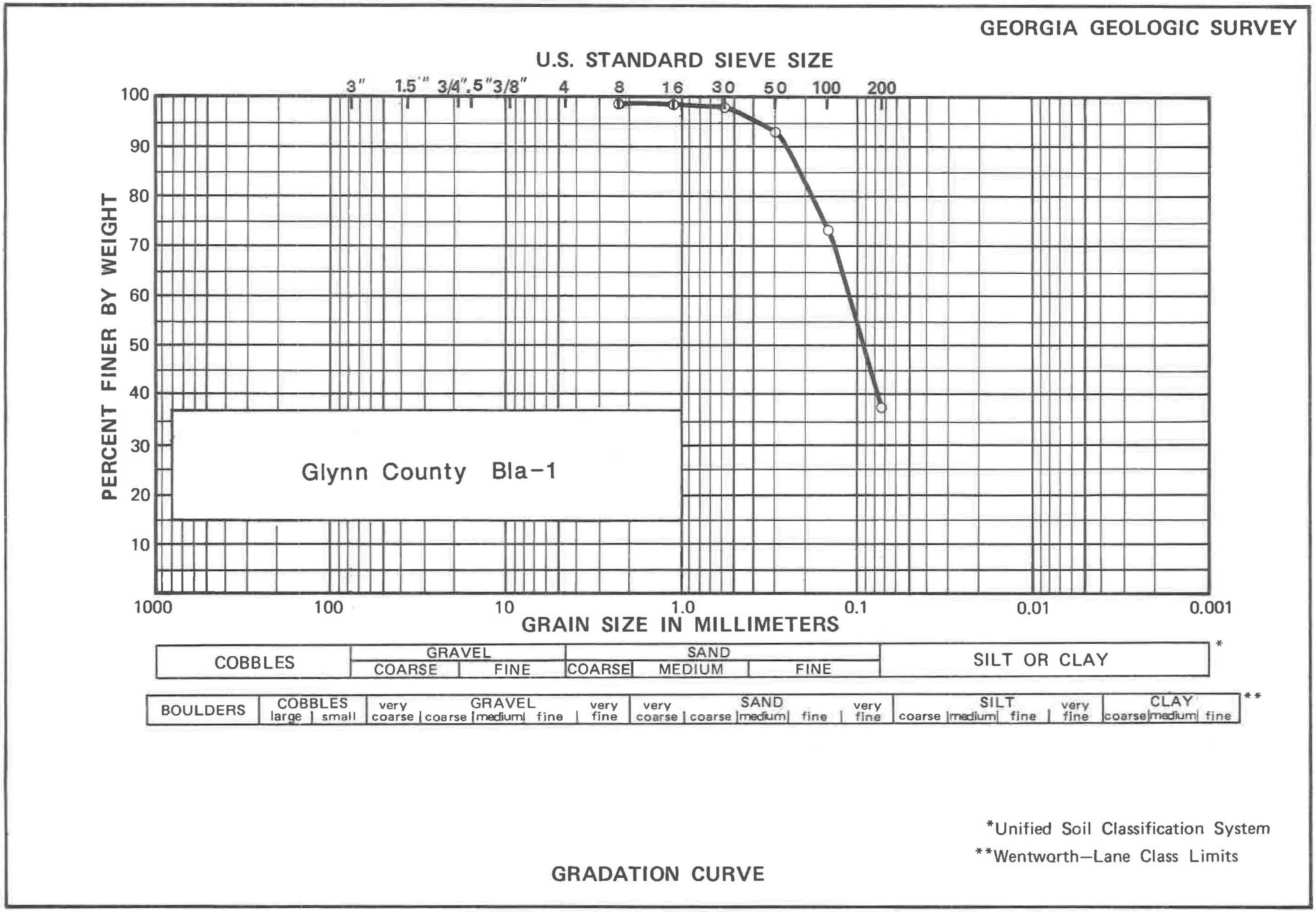


Figure 103. Size Distribution Curve of Sample Bla-1

Table 16: Glynn County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
Ste-1	8	auger	1-1/4	2	no	0
BrW-1	14-1/2	auger	14-1/2	1	no	0
Bla-1	8	auger	8	1	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

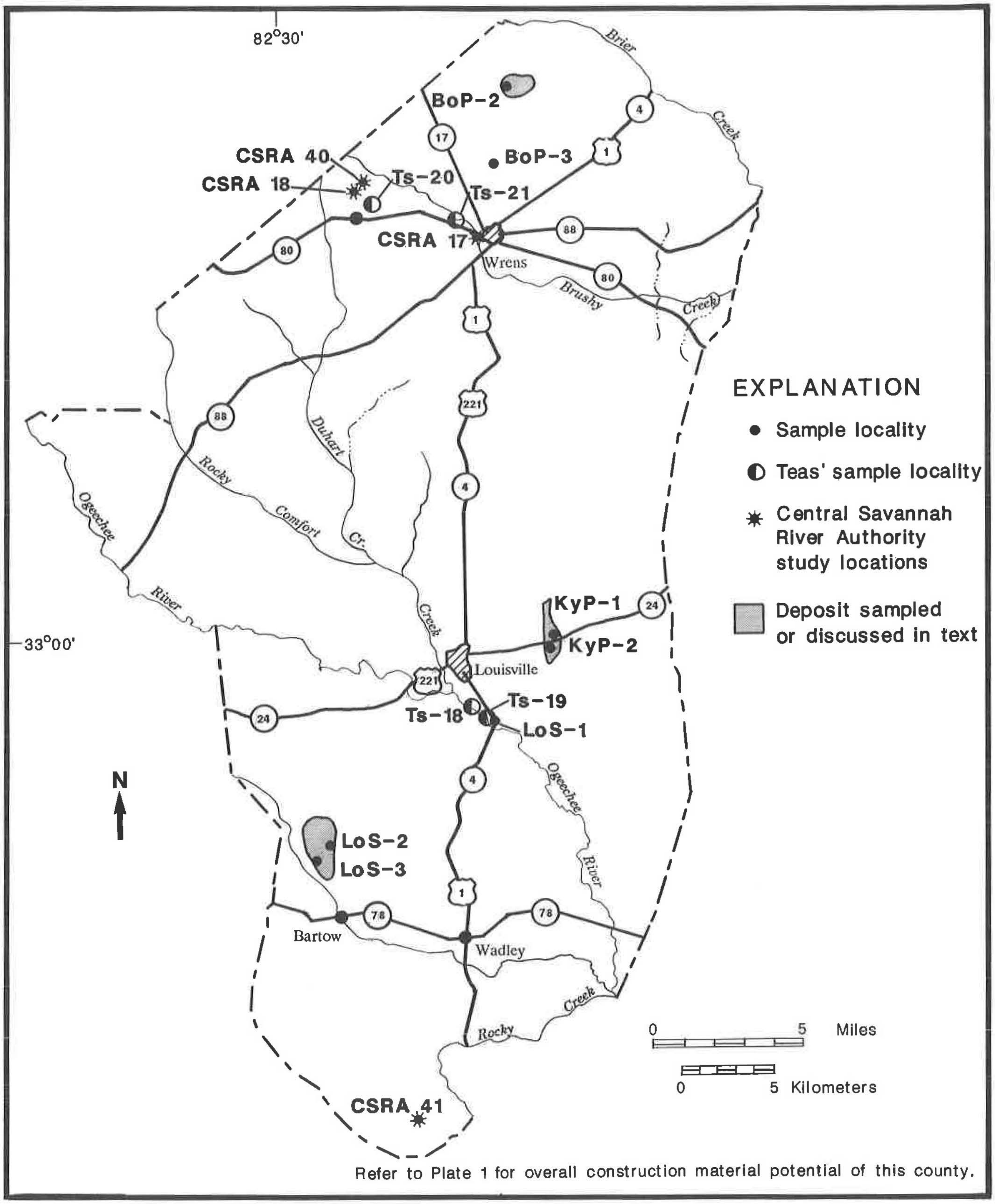


Figure 104. Map of Jefferson County Showing Localities and Deposits Sampled.

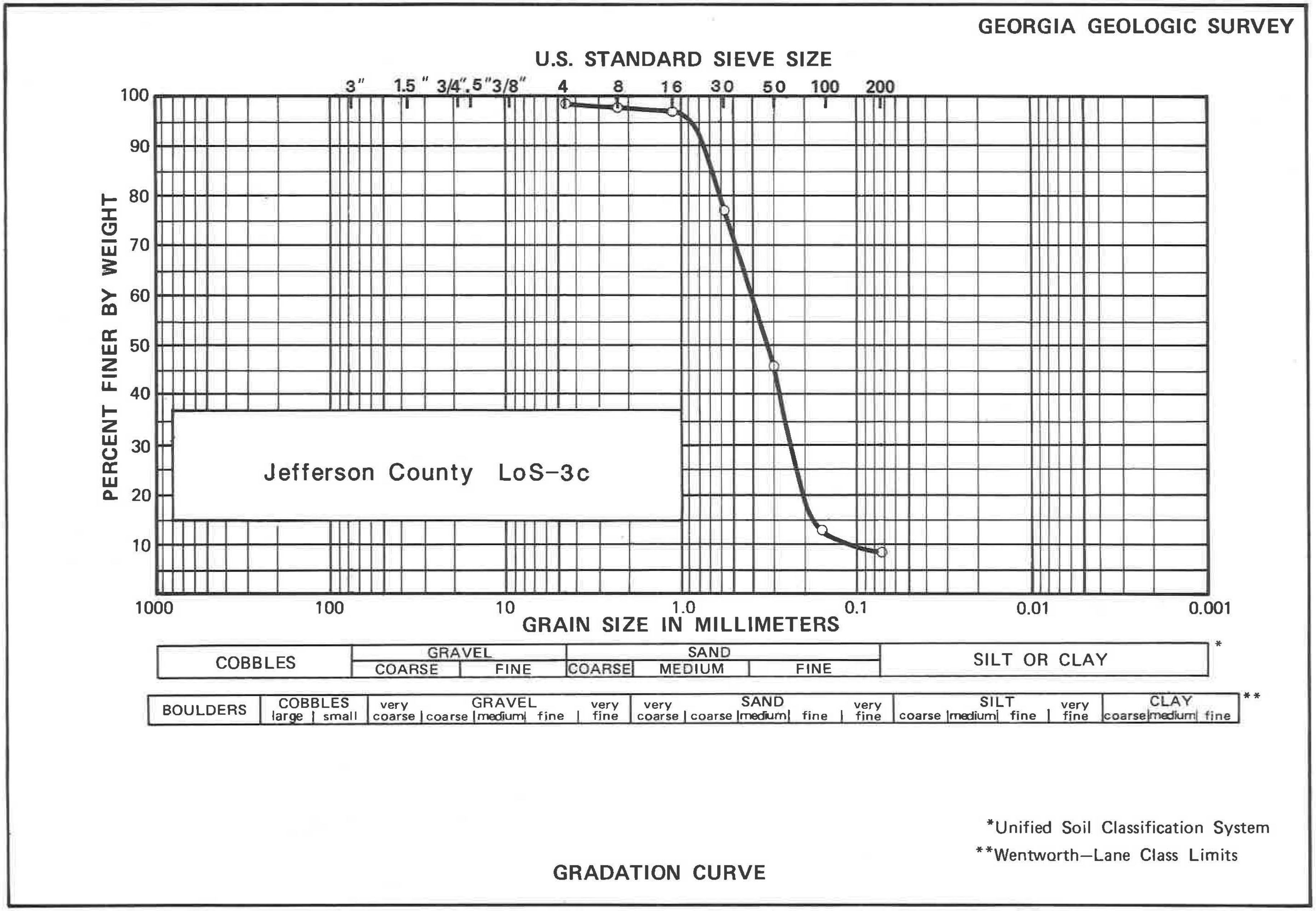


Figure 105. Size Distribution Curve of Sample LoS-3c.

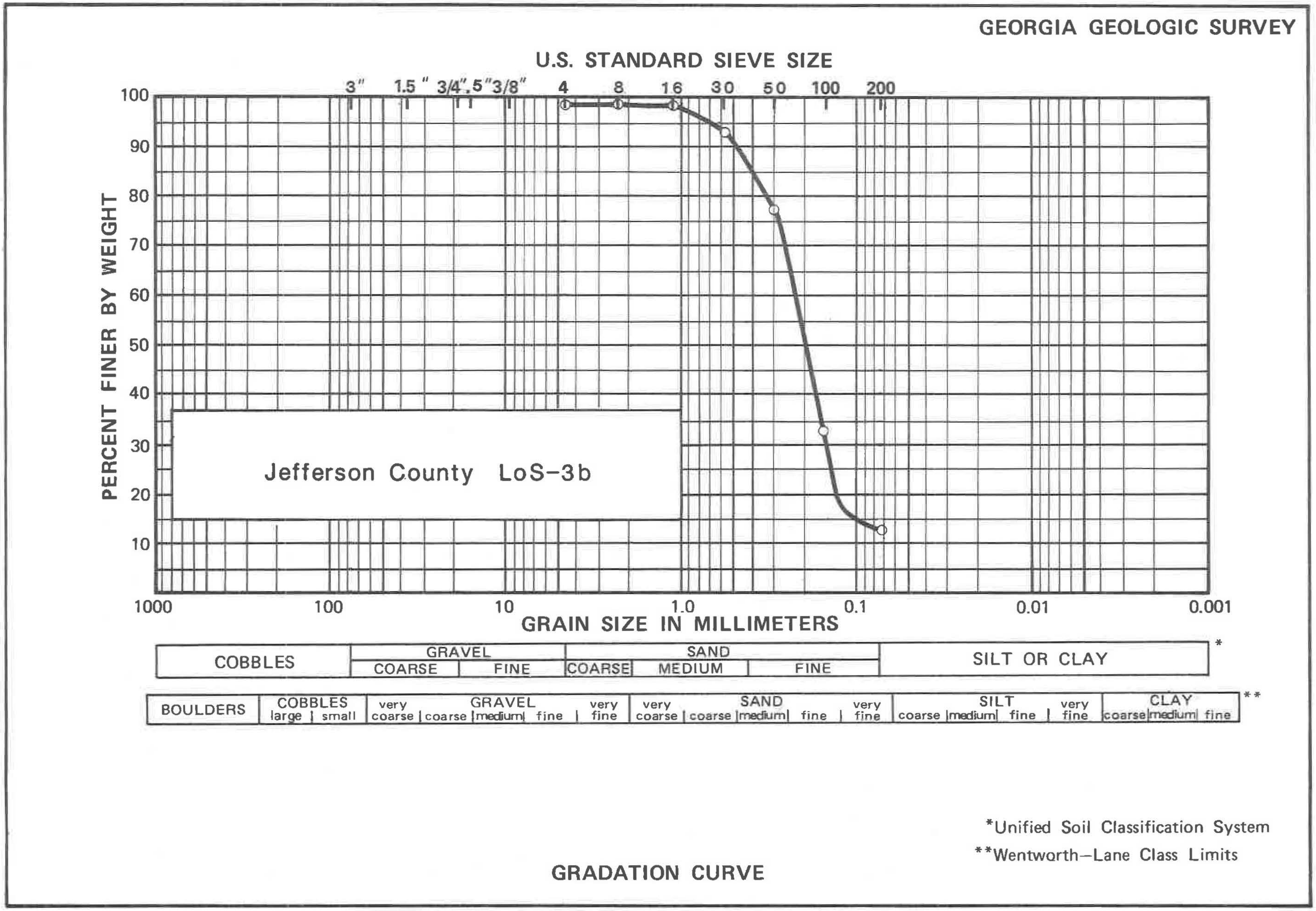


Figure 106. Size Distribution Curve of Sample LoS-3b.

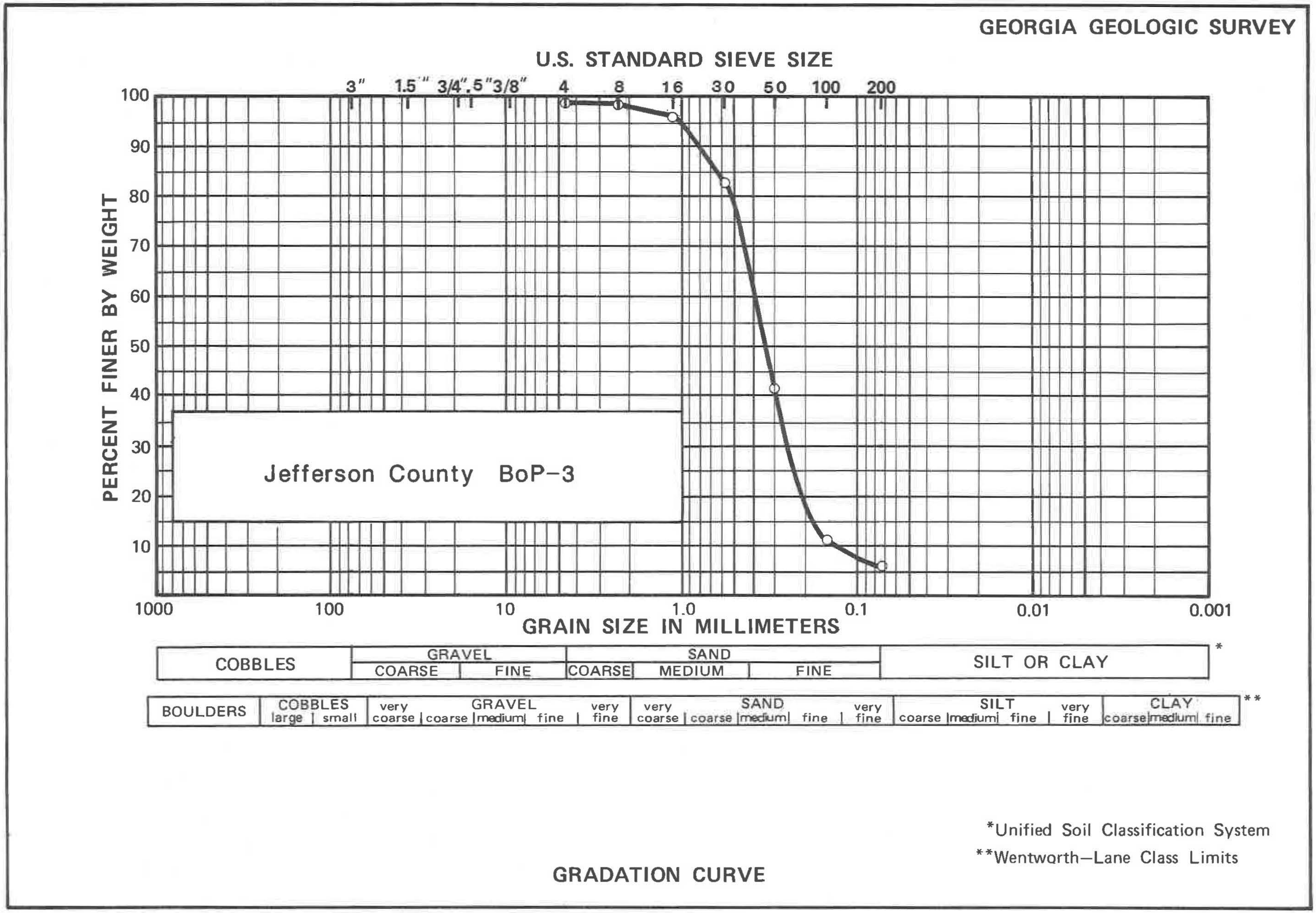


Figure 107. Size Distribution Curve of Sample BoP-3.

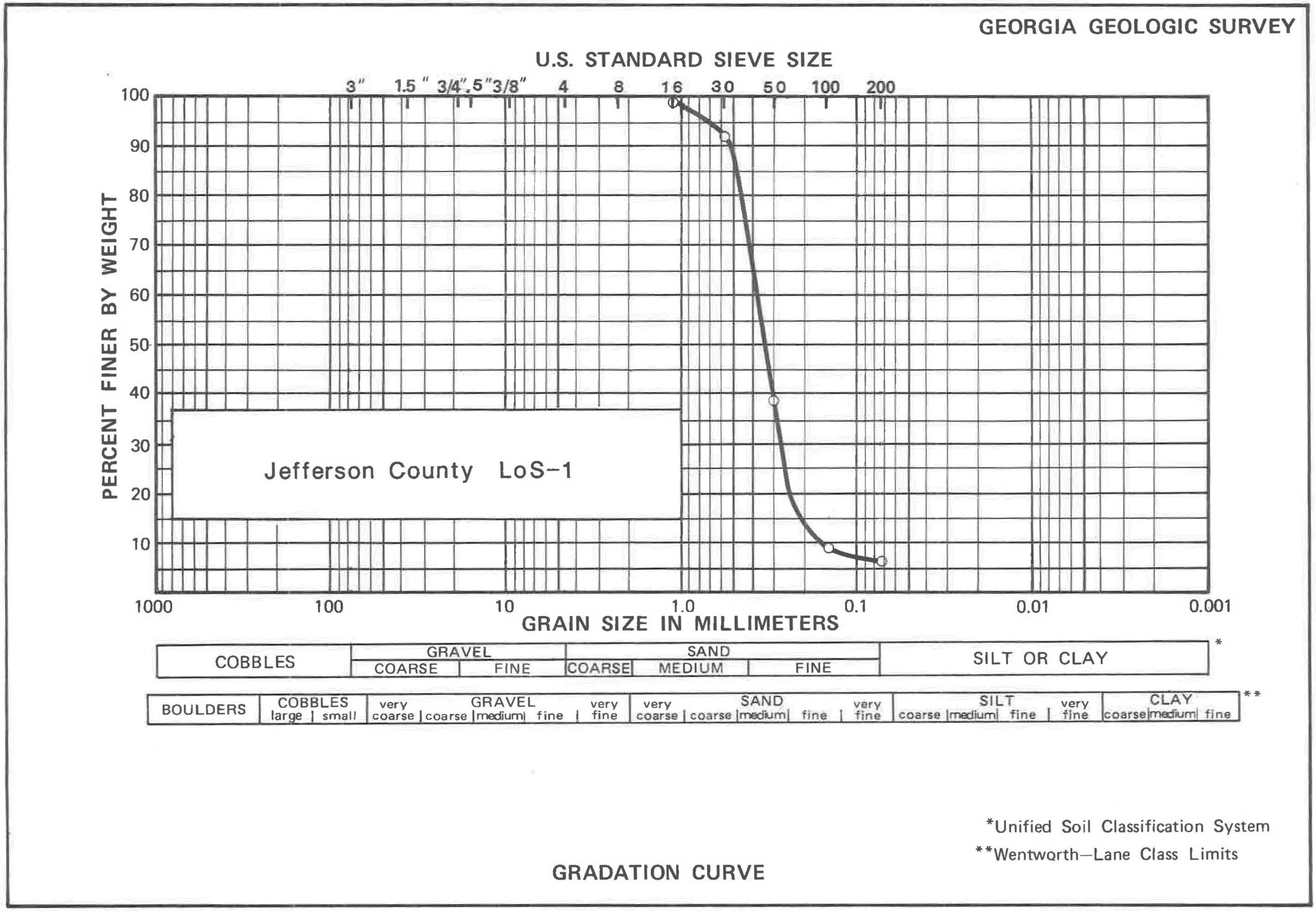


Figure 108. Size Distribution Curve of Sample LoS-1.

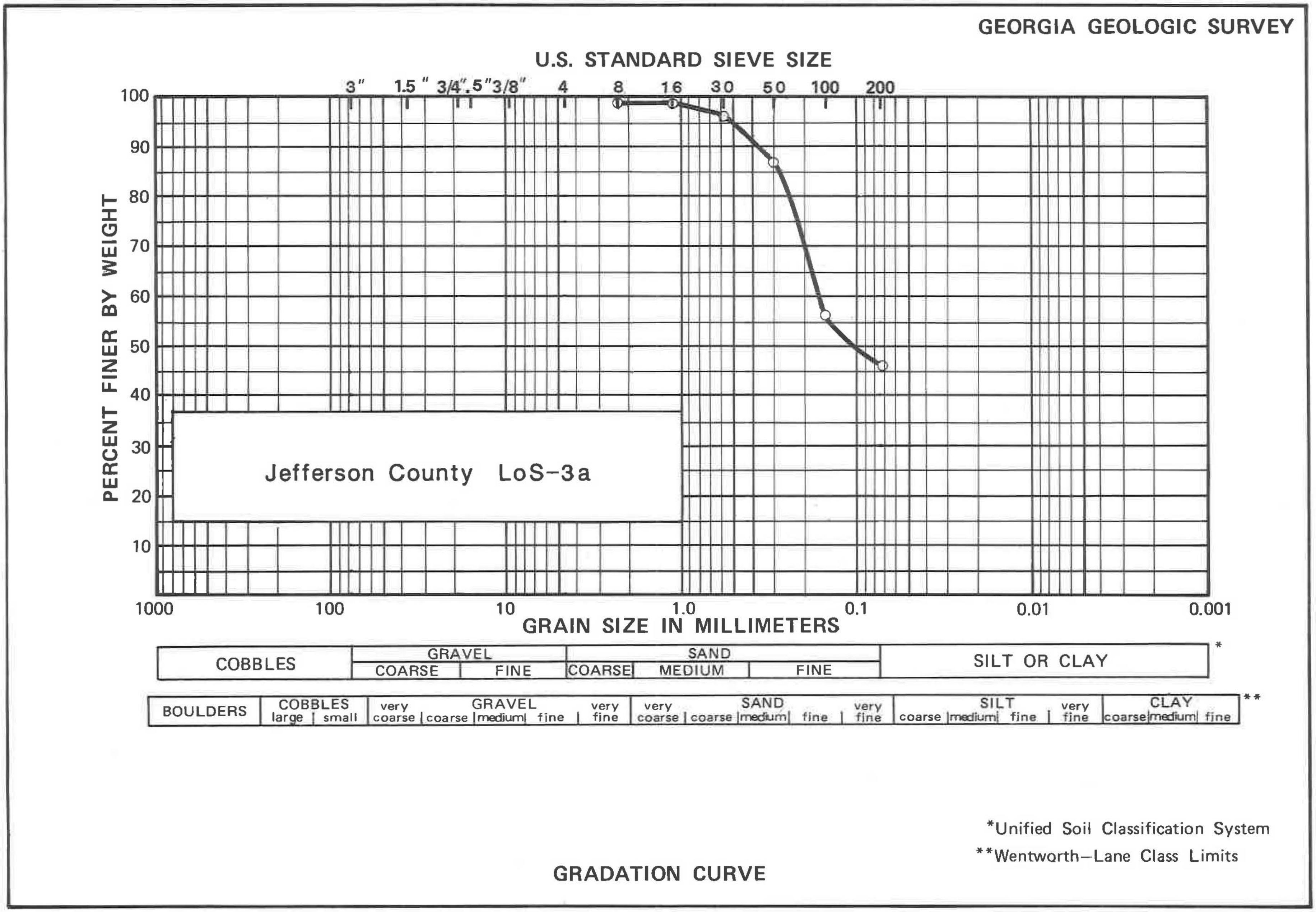


Figure 109. Size Distribution Curve of Sample LoS-3a.

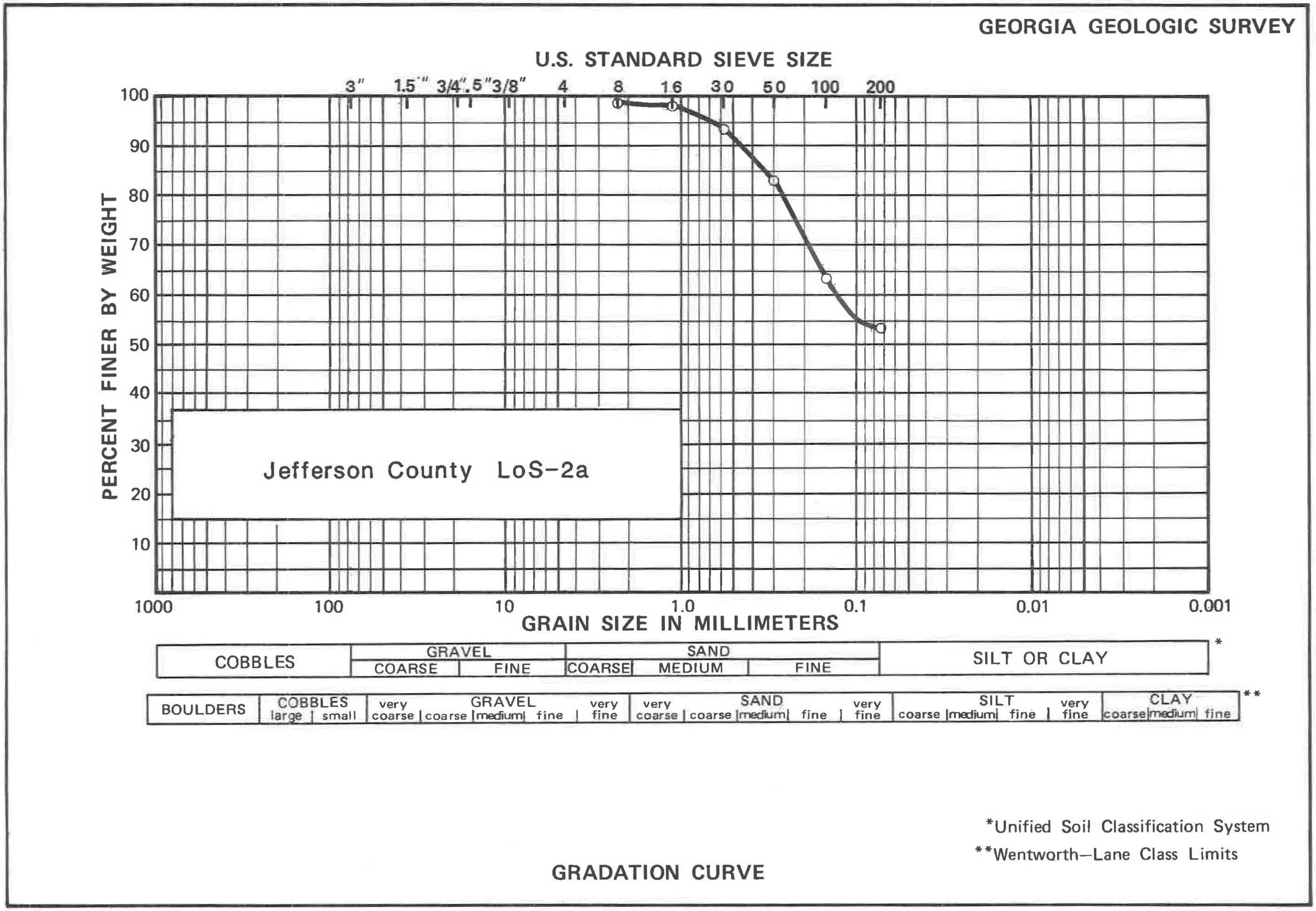


Figure 110. Size Distribution Curve of Sample LoS-2a.

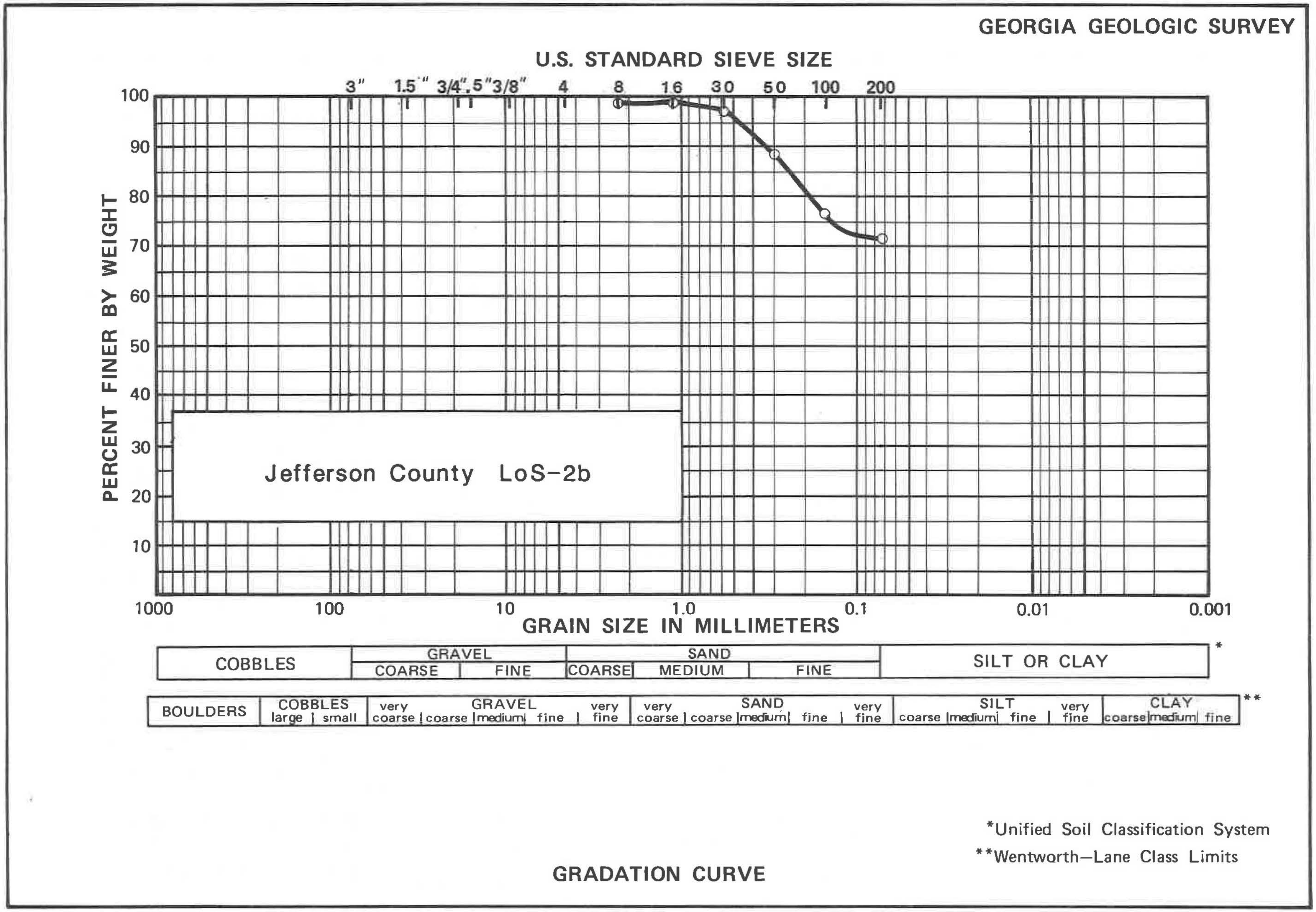


Figure 111. Size Distribution Curve of Sample LoS-2b.

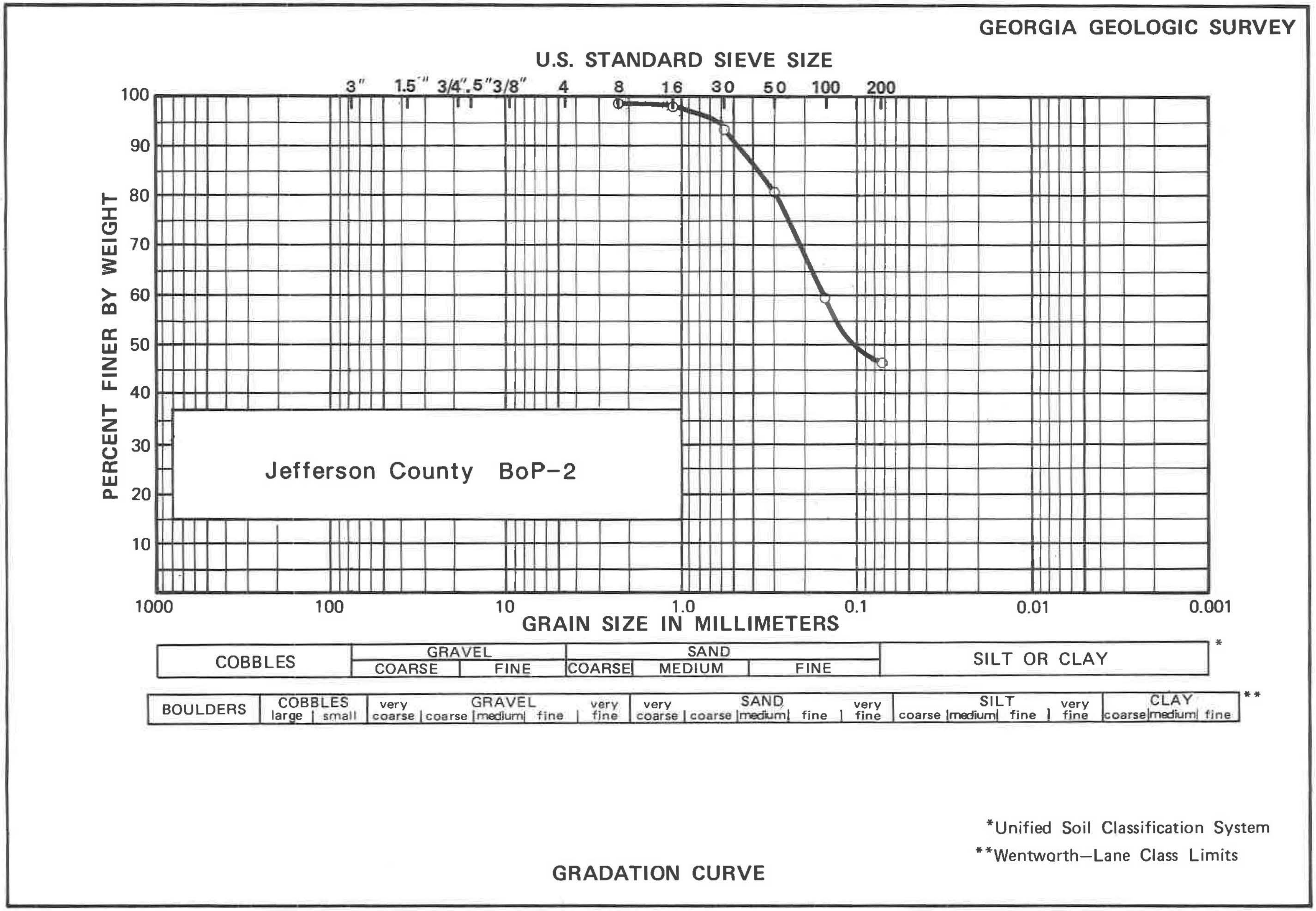


Figure 112. Size Distribution Curve of Sample BoP-2.

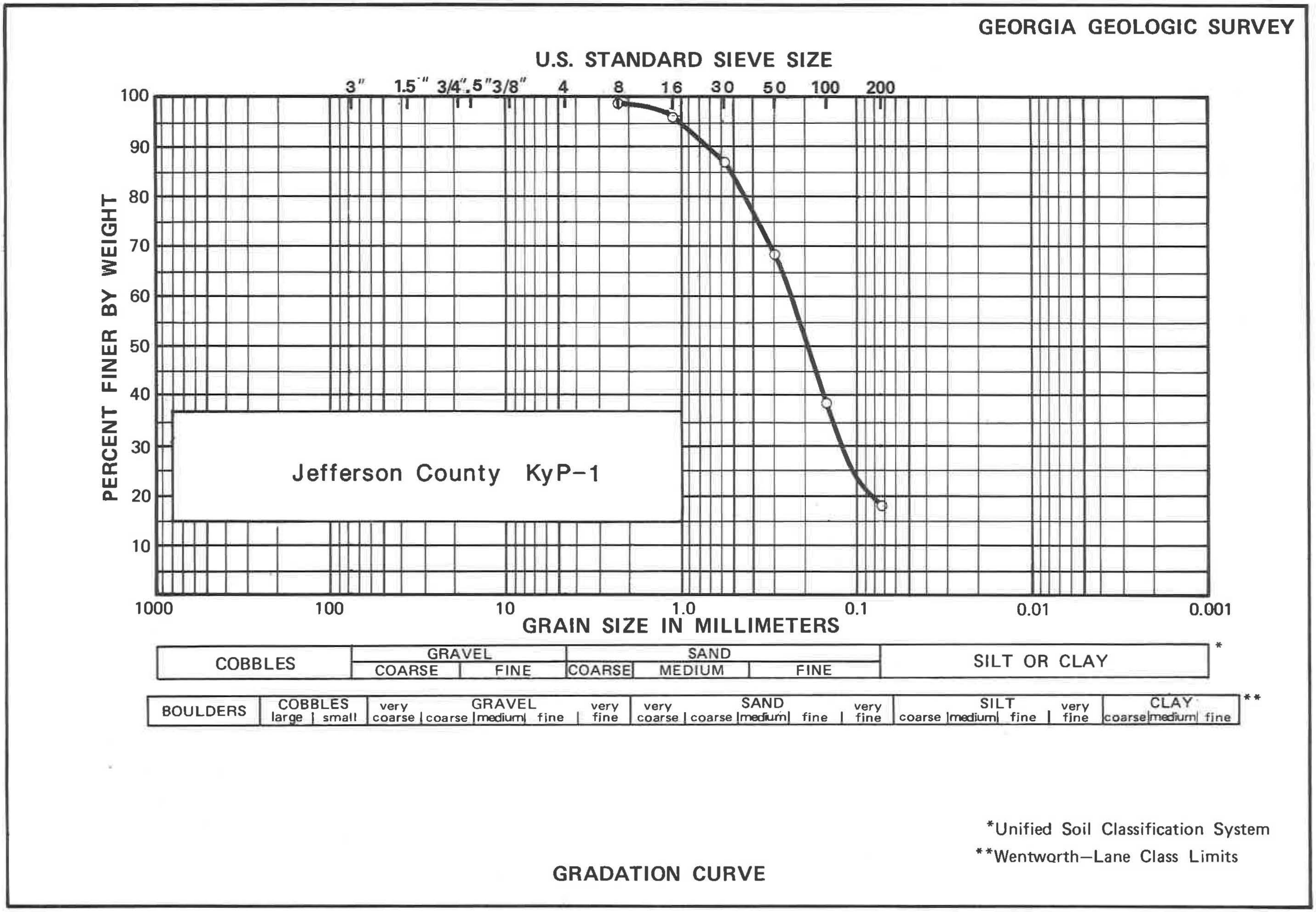


Figure 113. Size Distribution Curve of Sample KyP-1.

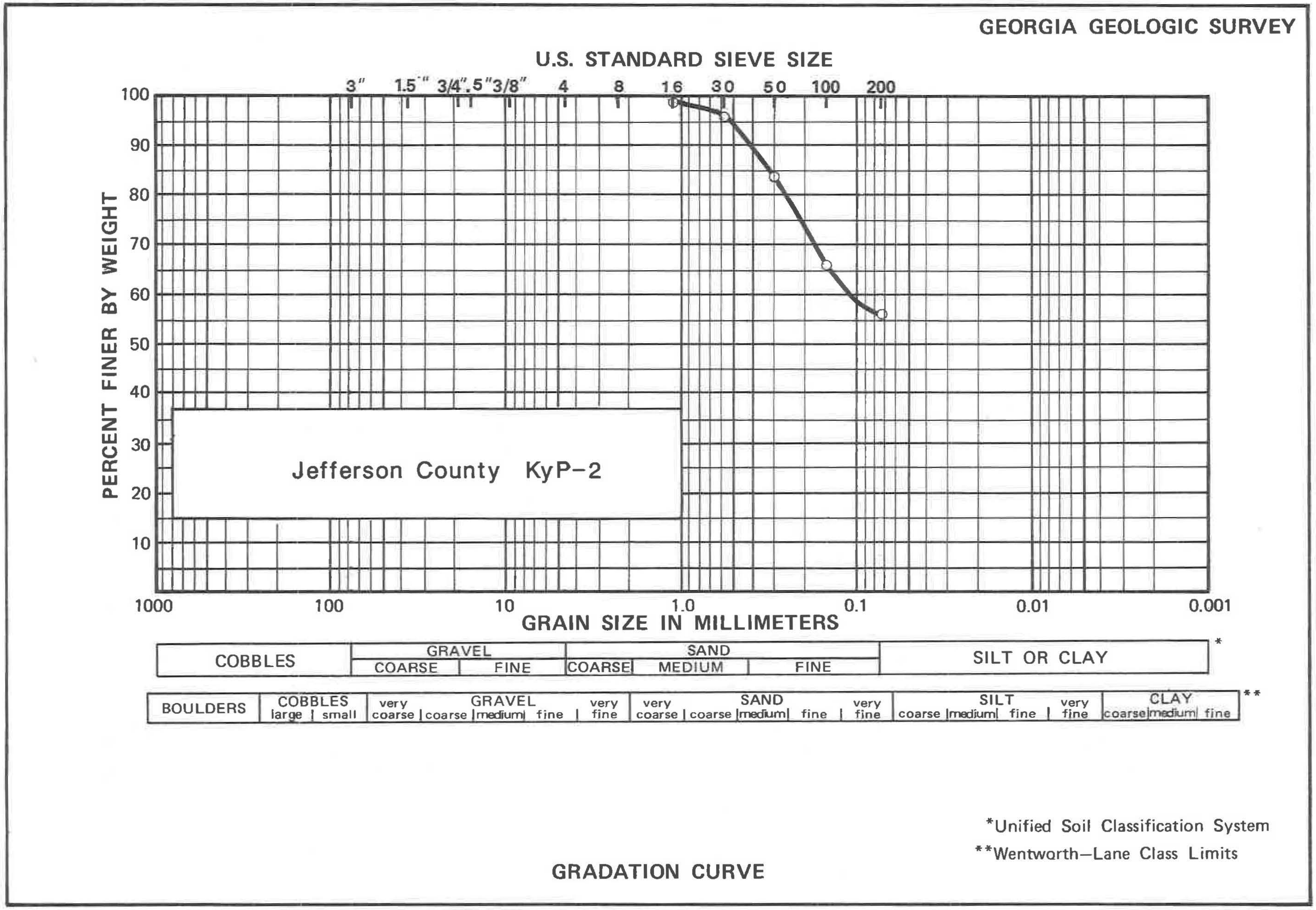


Figure 114. Size Distribution Curve of Sample KyP-2.

Table 17: Jefferson County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
LoS-3c	13 - 18-1/2	auger	5-1/2	1	no[4]	2
LoS-3b	10 - 13	auger	3	1	no[4]	1
BoP-3	8	auger	8	1	no[4]	2
LoS-1	3	auger	3	1	no	1
LoS-3a	10	auger	10	1	no	0
LoS-2a	2-1/2	auger	2-1/2	1	no	0
Los-2b	2-1/2 - 5	auger	2-1/2	1	no	0
BoP-2	7	auger	8	1	no	0
KyP-1	10	trench	10	1	no	0
KyP-2	4	trench	4	1	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

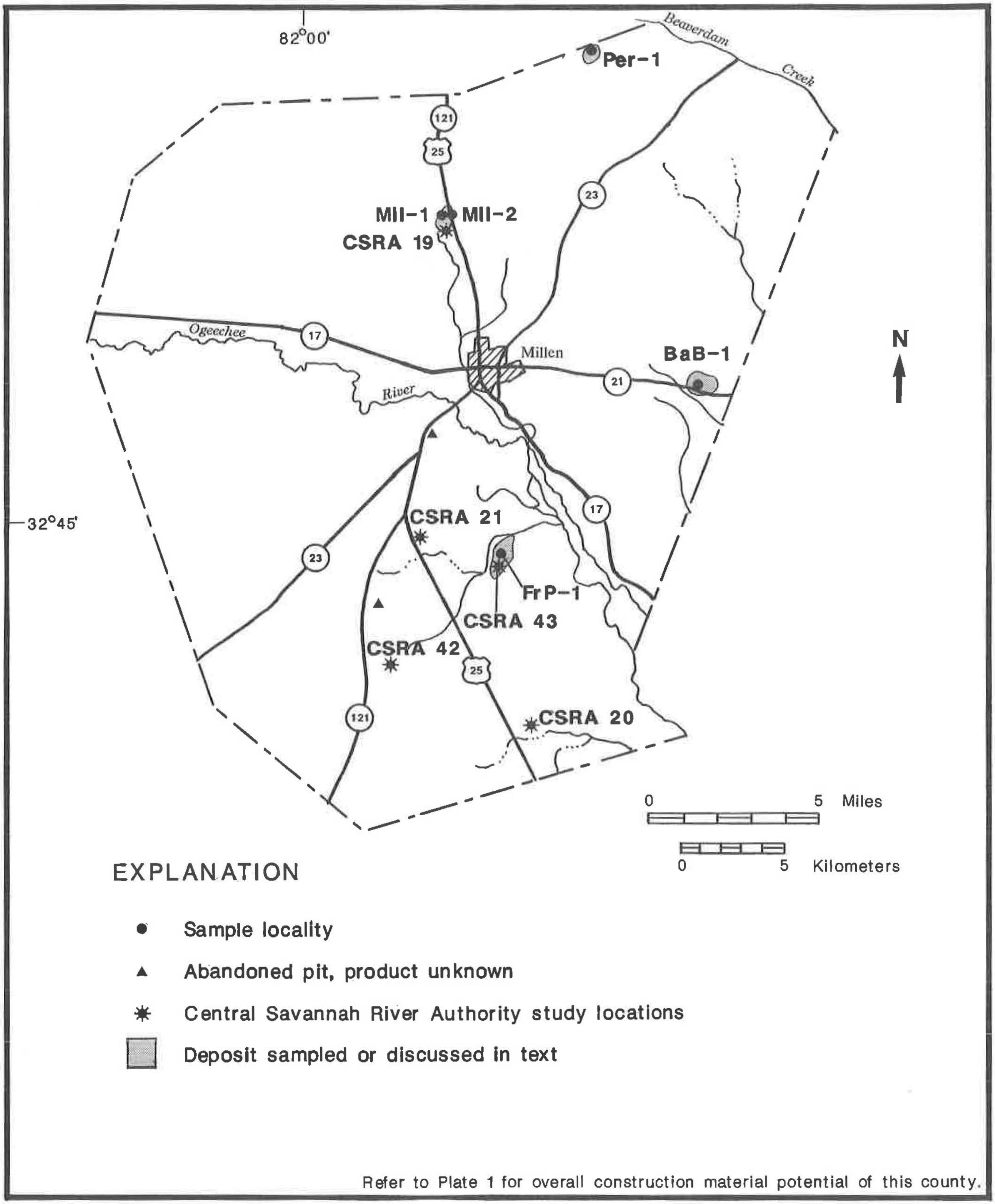


Figure 115. Map of Jenkins County Showing Localities and Deposits Sampled.

If larger deposits similar to that represented by sample LoS-3 are present elsewhere, with less overburden, they could be economical to mine. The potential for fine aggregate production in Jefferson County is low.

JENKINS COUNTY

Geology and Physiography

Jenkins County lies within the Vidalia Upland District of the Coastal Plain Province. The surficial sediments of the county are derived from the Altamaha Formation and the Barnwell Group.

Previous Studies

Teas (1921, p. 208) noted the occurrence of small gravel lenses in a cross-bedded, clayey sand near Millen (Fig. 115, Ts-22).

Hurst, et al. (1966, p. 379) noted an active sand pit south of Magnolia Springs State Park (Fig. 115, CSRA 19). The pit was reported to cover 2 acres and vary from 5 to 15 feet in depth. The section is described as an 18 foot thick bed of medium-grained sand; the lower 15 feet of which contains several bands of quartz pebbles up to 1 inch in diameter (Fig. 116).

Hurst, et al. (1966, p. 380) reported a small (300' X 100' X 7') active sand pit at Bay Gull Branch (Fig. 115, CSRA 20). A cross-section of the pit showed 10 feet of medium-grained sand overlying 6 feet of fine-grained, argillaceous, semiconsolidated sandstone.

Hurst, et al. (1966, p. 380) reported a small (300' X 150' X 4') sand pit containing fine-grained sand with approximately 10 percent hardpan pebbles (Fig. 115, CSRA 21).

Hurst, et al. (1966, p. 390) suggested two areas as possibilities for commercial development of aggregate: "(1) Along the banks and hill sides of Sand Hill Branch between U.S. Highway 25 and Georgia Highway 121. (2) East of the confluence of Sculls Creek and Richardson Creek. A 1/2 mile-wide area of dune-like sand hills, covered with oak and pine, extends to the northeast for about 3 miles."

Present Study

The soil series used were Kershaw and Troup series which are present along the local creeks and rivers throughout the county. Six samples representing five sites in Jenkins County were sieved : Per-1, Mil-1a, Mil-1b, Mil-2, FrP-1, BaB-1 (Fig. 115 and Figs. 117-122, Table 18).

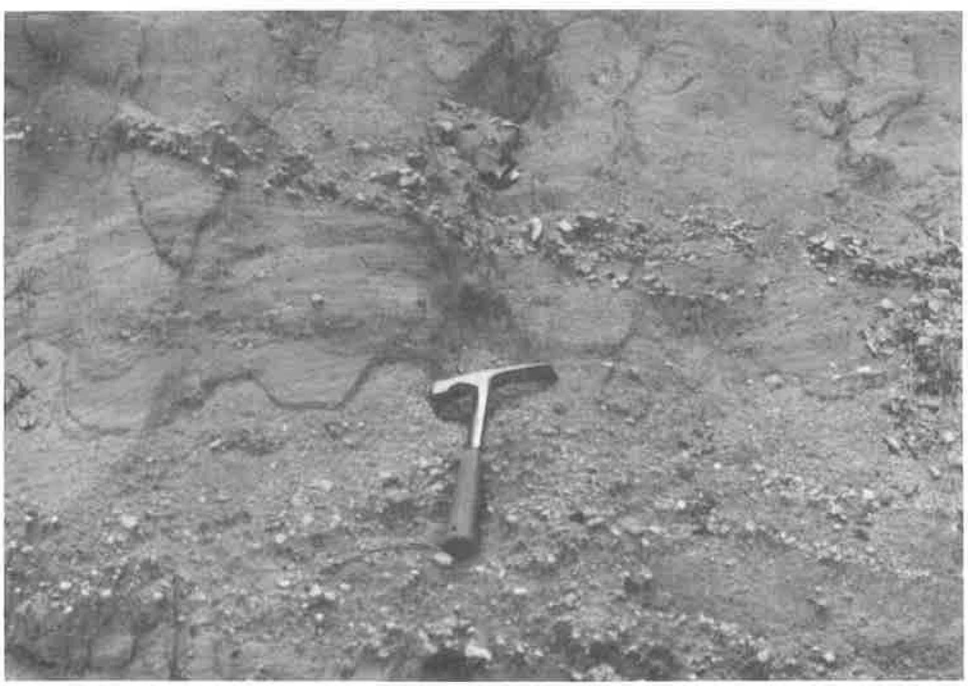


Figure 116. Gravelly zone at CSRA-19, Jenkins County

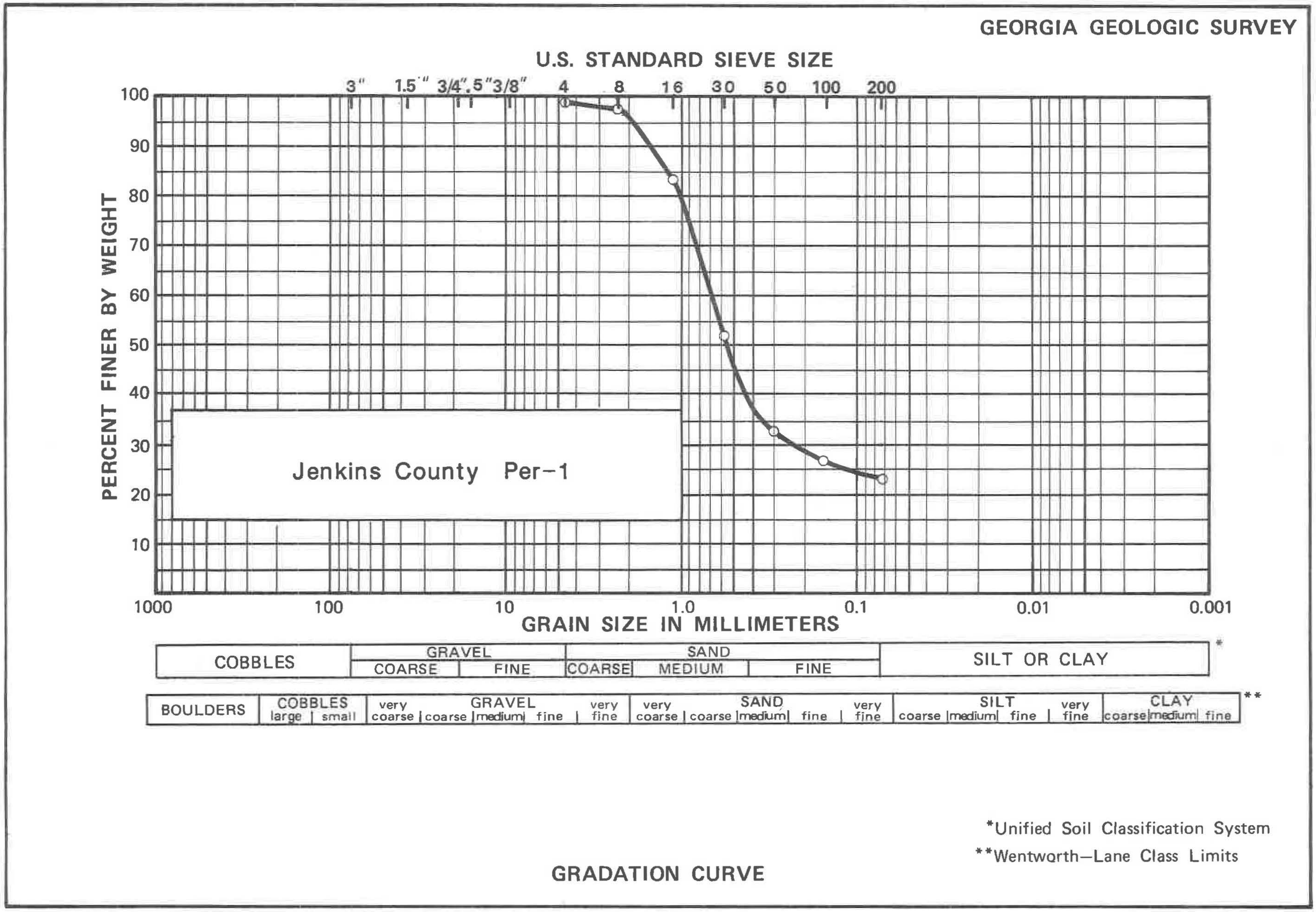


Figure 117. Size Distribution Curve of Sample Per-1.

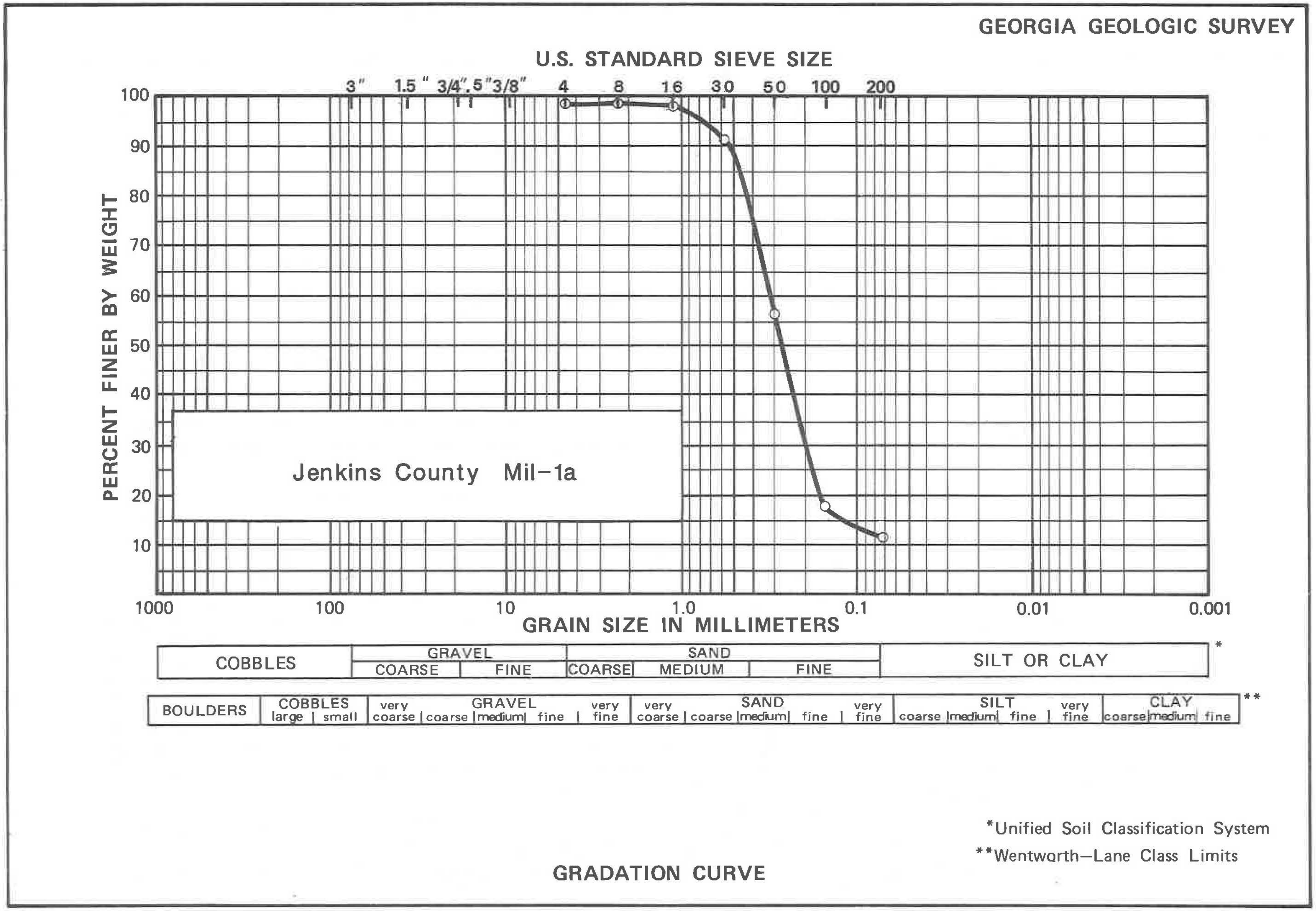


Figure 118. Size Distribution Curve of Sample Mil-1a.

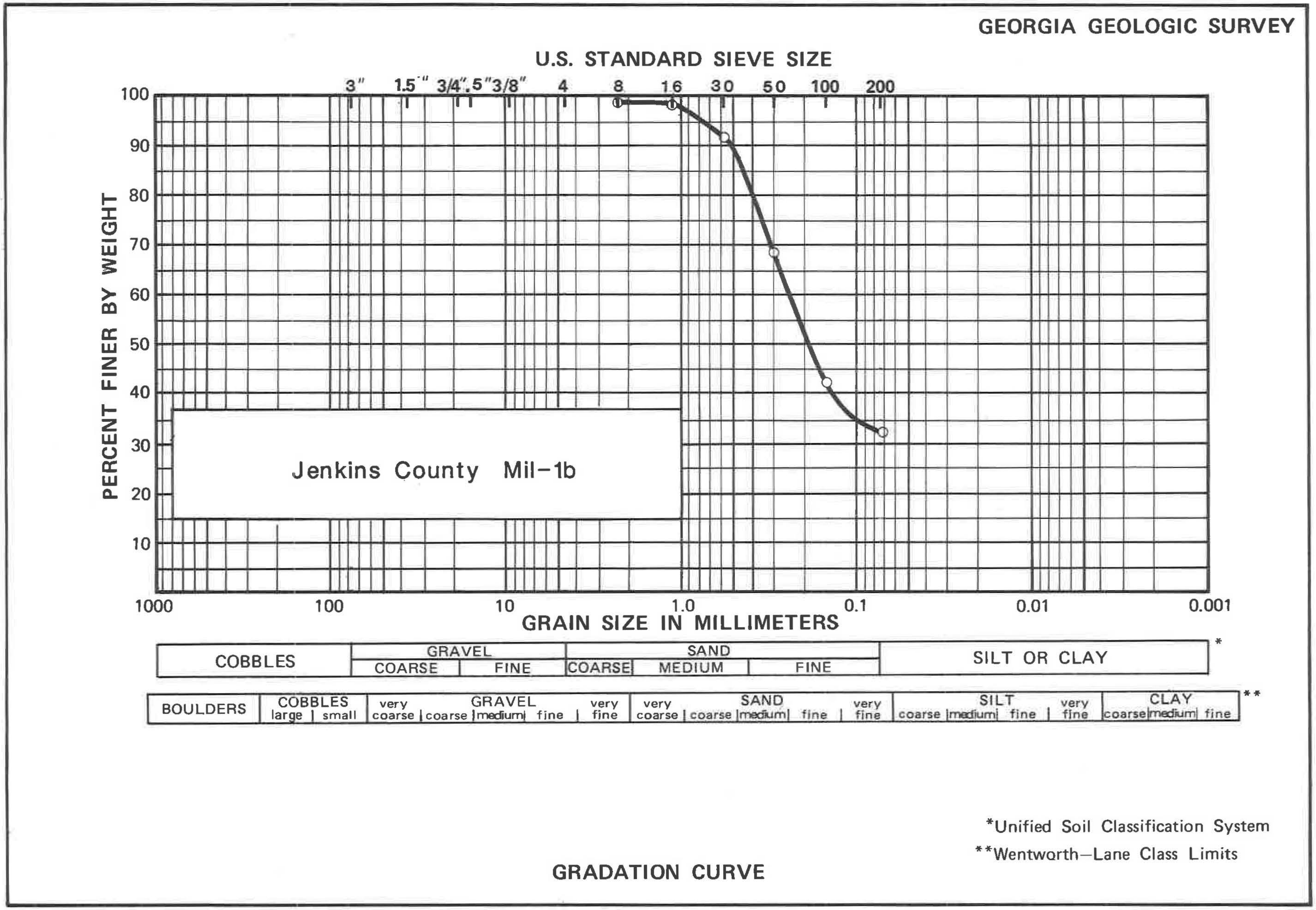


Figure 119. Size Distribution Curve of Sample Mil-1b.

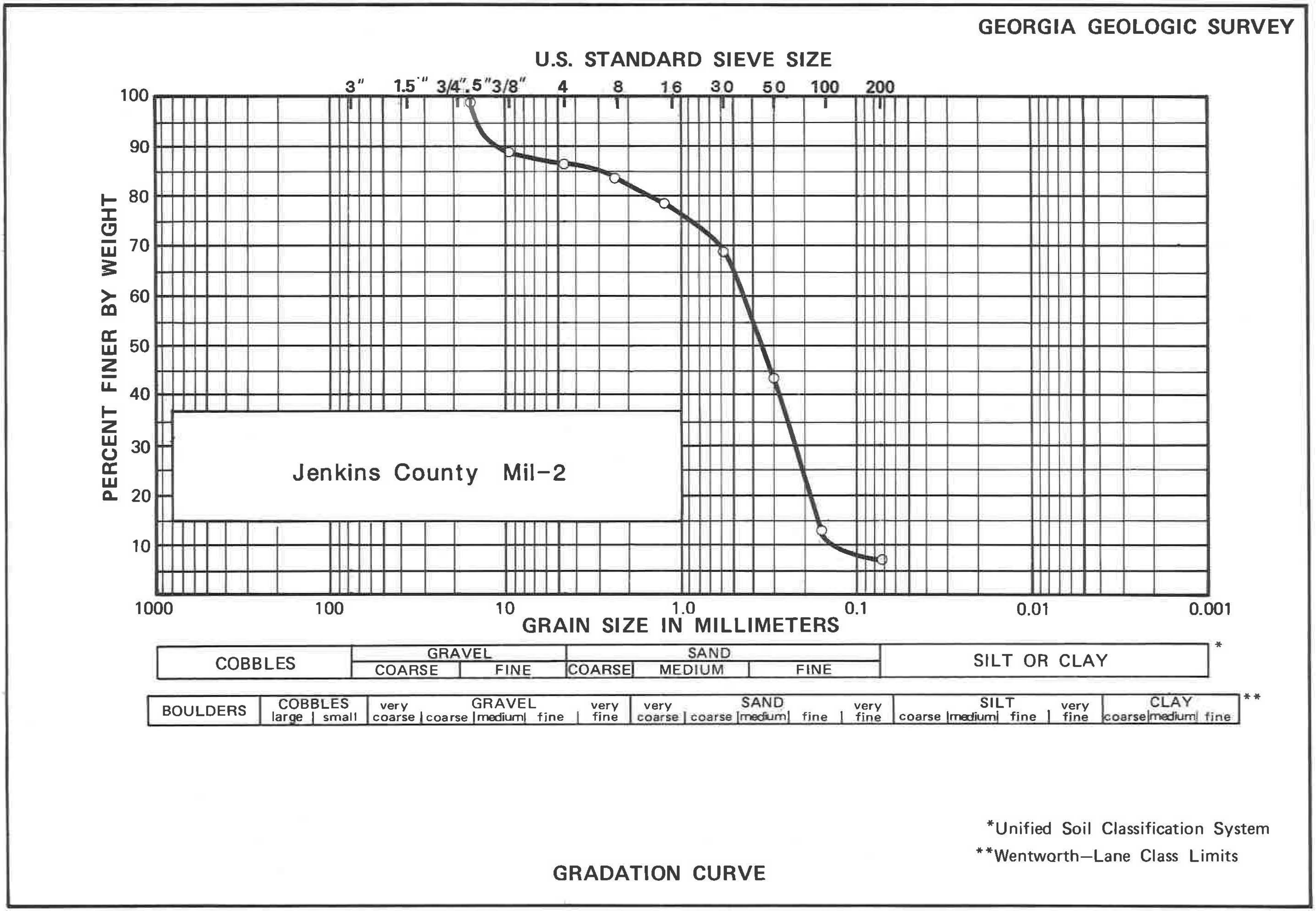


Figure 120. Size Distribution Curve of Sample Mil-2.

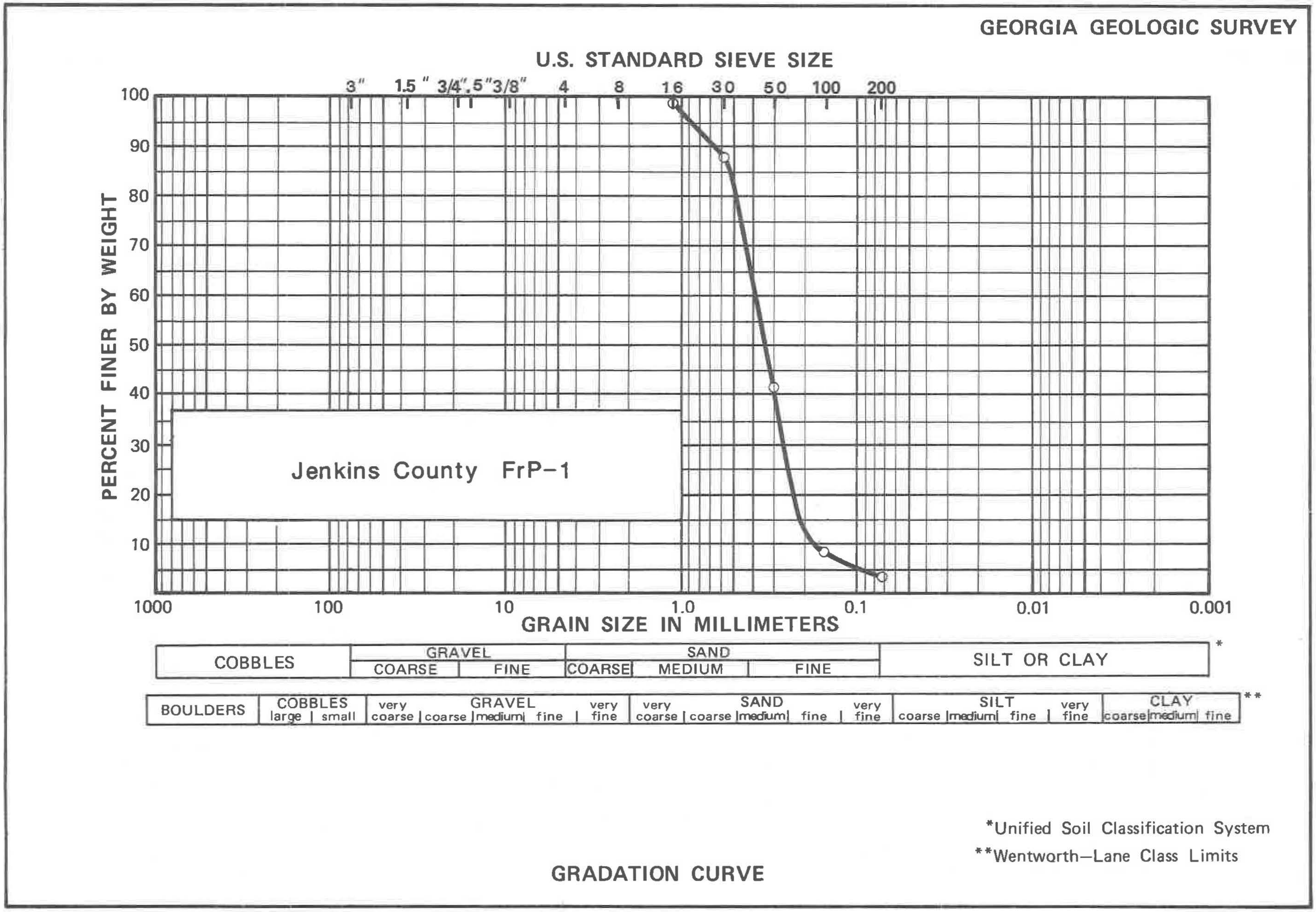


Figure 121. Size Distribution Curve of Sample FrP-1.

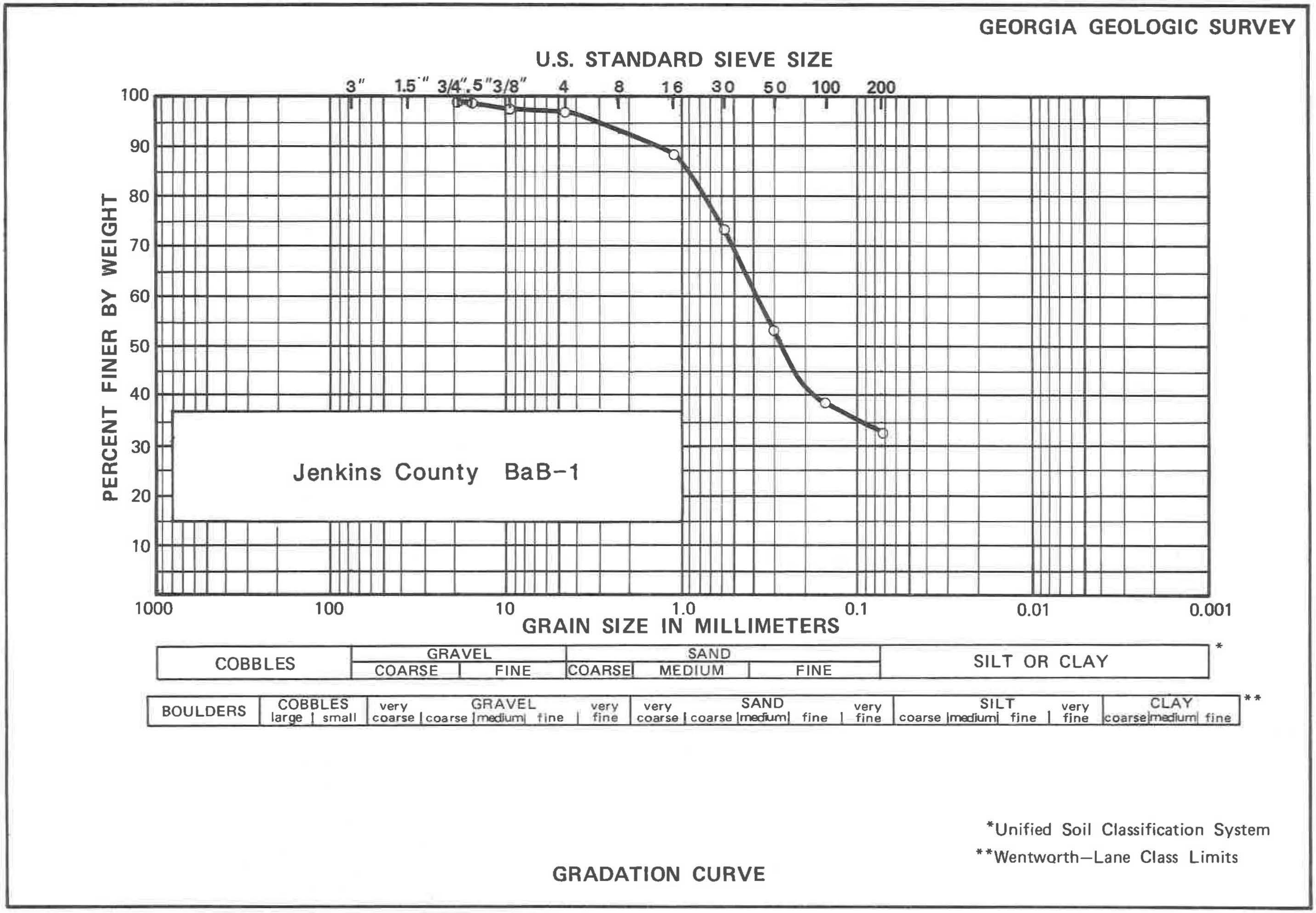


Figure 122. Size Distribution Curve of Sample BaB-1.

Table 18: Jenkins County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
Per-1	10	auger	10	2	no[4]	1
Mil-1a	9	auger	9	2	no	2
Mil-1b	9 - 10	auger	1	2	no	0
Mil-2	12	trench	14	2	no[4]	3
FrP-1	15	trench	15	3	no	2
BaB-1	9	auger	9	2	no	1

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

Evaluation

None of the samples passed ASTM standard C-33 (generally being too fine grained or too well sorted); however, two samples (Per-1, and Mil-2) marginally failed the test and could be upgraded to meet specifications. Sample Per-1 is from a hilltop, represents a deposit 10 feet thick, and has an areal extent of as much as 10 acres. The reserves of this deposit could be in excess of 161,000 cubic yards. There is a secondary road within 2 miles of the deposit; however, the availability of water at this locality is questionable.

The deposit represented by sample Mil-2 probably averages 14 feet in thickness and has an areal extent of 5 acres. Thus, the probable reserves of this deposit are in excess of 100,000 cubic yards. A primary road is within 0.5 mile of this deposit and a local stream is within 0.5 mile of the deposit, possibly affording sufficient water for processing.

Mining Activity

There are no active or recently inactive commercial aggregate mining operations in Jenkins County.

Summary Evaluation

The potential for commercial production of fine aggregate in Jenkins County is considered to be low. The deposits represented by samples Per-1 and Mil-2 would probably only supply local demand.

LIBERTY COUNTY

Geology and Physiography

Liberty County lies within the Barrier Island District of the Coastal Plain Province. The surficial sediments are derived from the Satilla Formation, the Cypresshead Formation, and the barrier island deposits.

Previous Studies

Teas (1921, p. 215; Fig. 123, Ts-24) reported a small clayey gravel deposit near Fleming. He stated that the deposit is too small and the material is of too poor quality for commercial use.

Present Study

The part of Liberty County that has desirable sandy soils is located on Fort Stewart and was not considered for study. Three samples were taken from one site : Dor-1a, Dor-1b, Dor-1c (Figs. 123-126, Table 19).

Evaluation

None of the samples passed ASTM standard C-33; however, the deposit represented by samples Dor-1b and Dor-1c could be upgraded. These samples are from the lower 9-1/2 feet of a 12 foot interval.

Mining Activity

There are no active or recently inactive mining operations in Liberty County.

Summary Evaluation

At the site represented by Dor-1, the upper two feet (sample Dor-1a) is fine-grained silty sand. The next two samples, Dor-1b and Dor-1c consist of fine- to medium- to coarse-grained clayey sand with some granules at depths of 2 feet to 7 -1/2 feet and 7-1/2 feet to 12 feet, respectively. The sample is only representative of 12 feet, but the deposit possibly extends deeper. The areal extent of this deposit is approximately 10 acres, thus, yielding reserves exceeding 160,000 cubic yards.

This deposit could possibly be of some commercial value, but is limited by its relatively small size. The construction material potential for fine aggregate production in Liberty County is low.

LONG COUNTY

Geology and Physiography

Long County lies within portions of two physiographic districts of the Coastal Plain Province, the Barrier Island Sequence and the Vidalia Upland. The surficial sediments of Long County are derived from the Cypresshead and Satilla formations and the barrier island deposits.

Previous Studies

Teas (1921, p. 214) noted the occurrence of a "sand-hill belt" east of the Altamaha River in what is now Long County (Fig. 127, Ts-23). Teas mentioned a pit in the sand hill belt which covered 8 to 10 acres, averaged 10 feet in depth, and provided a source for locomotive sand.

Present Study

The soil series used in targeting areas of Long County was the Kershaw series which is present as elongate deposits parallel to the Altamaha River in

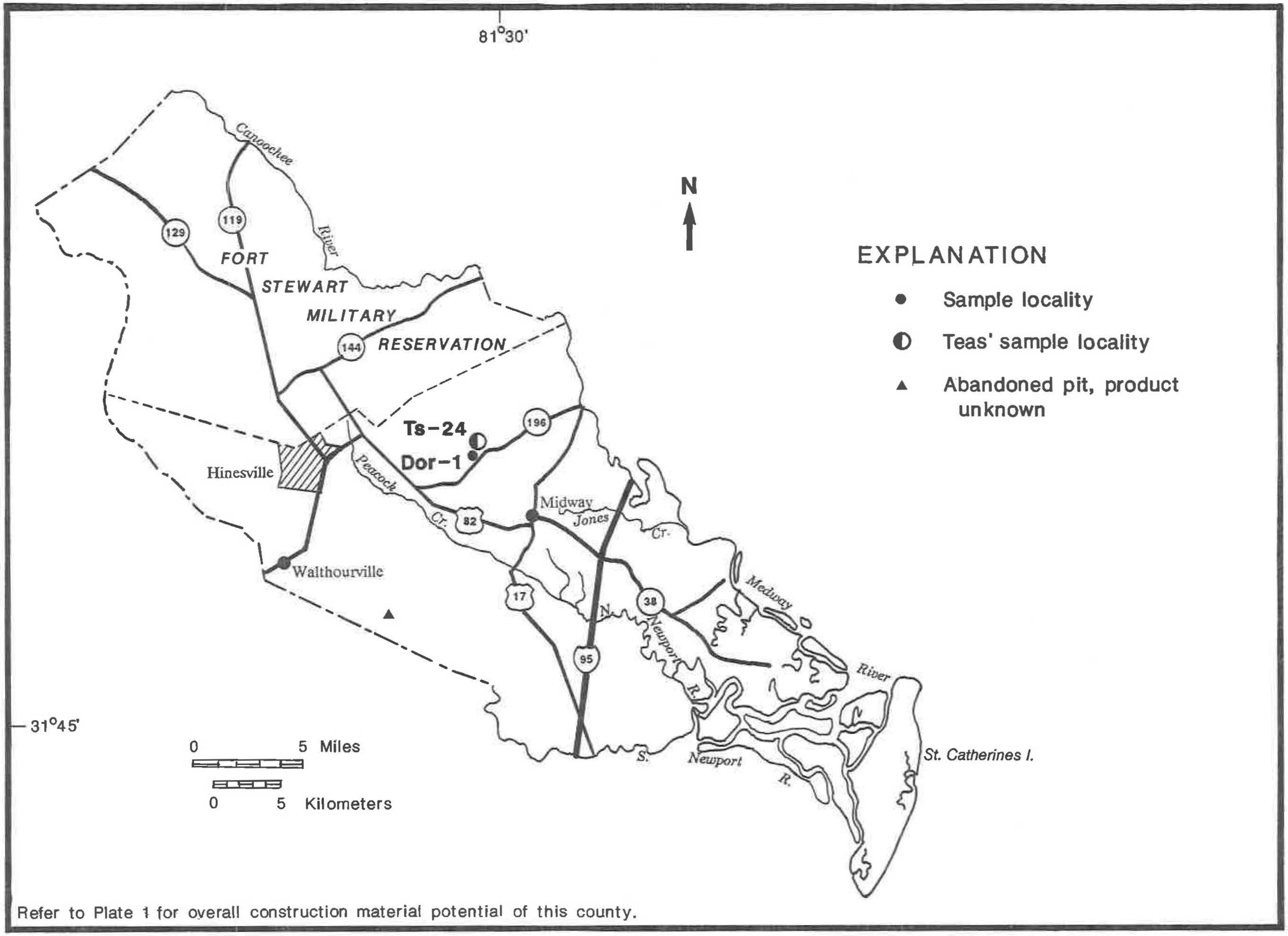


Figure 123. Map of Liberty County Showing Localities and Deposits Sampled.

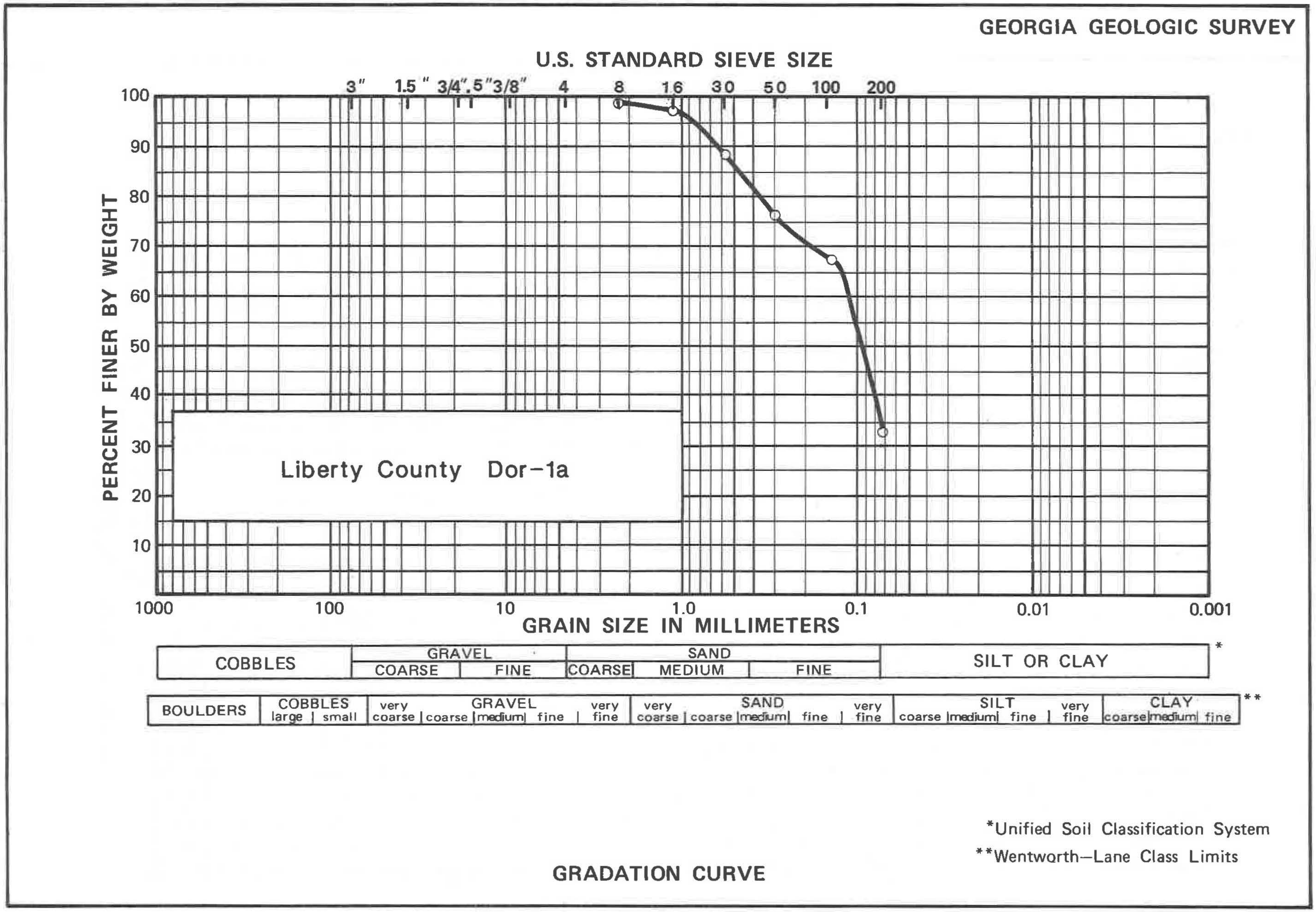


Figure 124. Size Distribution Curve of Sample Dor-1a.

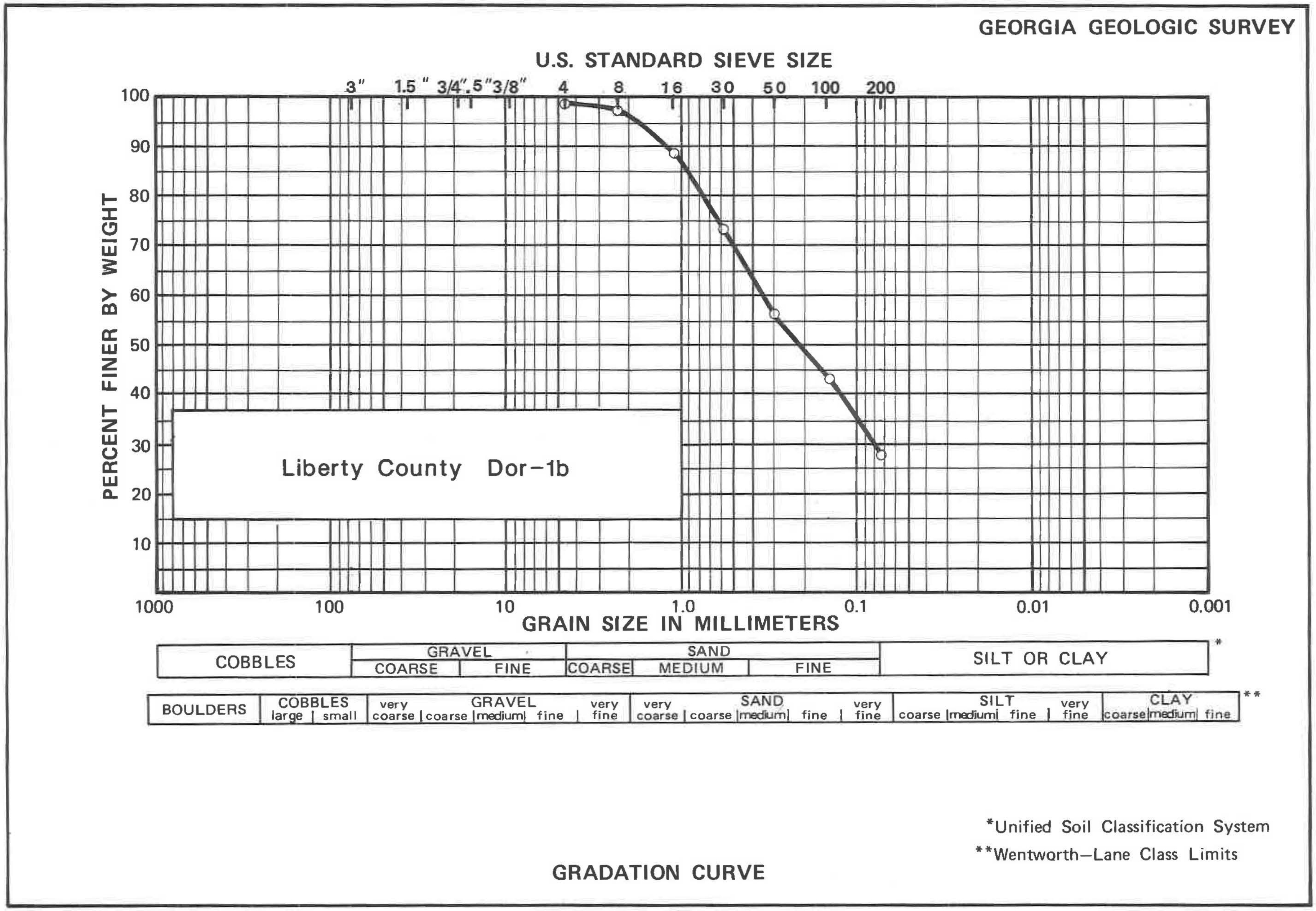


Figure 125. Size Distribution Curve of Sample Dor-1b.

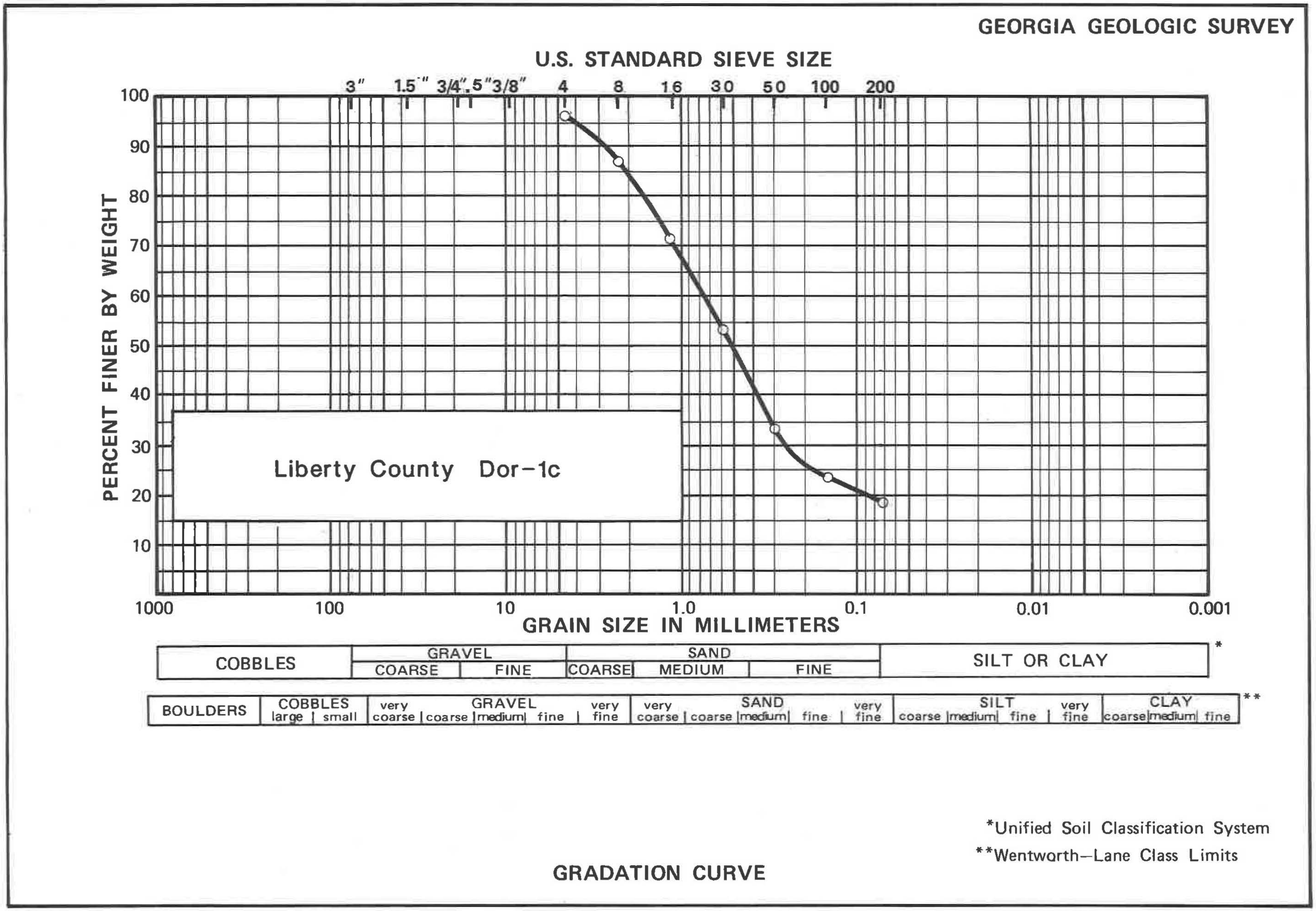


Figure 126. Size Distribution Curve of Sample Dor-1c.

Table 19: Liberty County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
Dor-1	0 - 2	auger	2	1	no	0
Dor-1b	2 - 7-1/2	auger	5	1	no[4]	1
Dor-1c	7-1/2 - 12	auger	4-1/2	1	no[4]	1

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

southwestern Long County. Geomorphic features targeted were dune fields which generally correspond to the soil bodies which were targeted. Three samples from dune deposits were sieved: GSW-1, Doc-1, Bug-1 (Fig. 127 and Figs. 130-132, Table 20).

Evaluation

None of the samples passed ASTM standard C-33 due to their fine-grain size and sorting. This is unfortunate, since the deposits represented by the samples have very little (<5%) material smaller than #200 mesh and have very large reserves.

Mining Activity

There is one active and several inactive producers of aggregate in Long County.

The Satilla Sand Company of Ludowici owns two sand pits in Long County (Fig. 127, #09l, #606). Currently, only one pit (#09l) is being mined. Pit #091, which is 11 acres in extent, produces masonry, concrete, and fill sand (Fig. 128). These products are transported within a 60 mile radius by truck. The sand is mined to a depth of 35 to 40 feet by dredge in manmade ponds (Fig. 129). Annual production is between 50,000 and 100,000 tons. Pit #606 is 30 acres in size and produces concrete and mortar sand. These products are transported within a 100 mile radius by truck and rail. The sand is mined by dredge to a depth of 55 feet in man-made ponds. No information as to annual production was available.

The Altamaha Sand Company of Ludowici (Fig. 127, #108) operated a 13 acre pit. This pit has since been reclaimed and no product information or mining data is available.

Dawes Silica Mining Company also operated a sand pit in the same general areas as the Satilla and Altamaha sand companies. No further information is available.

Summary Evaluation

The fine aggregate production potential of Long County is considered to be moderate. The areas along the floodplain of the Altamaha River have potential for aggregate production. The vast reserves of dune sand on the northeast side of the river are appealing but possible uses are somewhat limited.

McDUFFIE COUNTY

Geology and Physiography

McDuffie County lies within two districts of two physiographic provinces. These districts are the Fall Line Hills of the Coastal Plain Province and the Washington Slope of the Piedmont Province. The surficial sediments of the county are derived from the Oconee Group and the Barnwell Group; and the granites, granite gneisses, schists, and metavolcanic rocks of the Piedmont.

Previous Studies

Teas (1921, p. 313) reported surficial sand with some gravel near Boneville (Fig. 133, Ts-25).

Hurst, et al. (1966, p. 391-393) reported several small occurrences of sand and gravel deposits that are not commercially valuable.

Present Study

The soil types targeted for sampling sites were the Tifton and Helena series, and are present as isolated pods throughout the county. Two samples were taken for analysis: ThE-1, ThE-2 (Figs. 133-135, Table 2).

Evaluation

Neither sample, ThE-1 or ThE-2 passed ASTM standard C-33, but both could be upgraded to meet specifications for a fine aggregate.

Mining Activity

There is one active mining operation in McDuffie County. Knox Rivers Construction Company (Fig. 133, #179) is currently mining two acres of a 4 acre pit to a depth of 10 feet. This sand is being used for asphalt, and no processing is being done.

Thomson Construction Supply Company at one time operated a 3 acre pit. The products were mortar sand and fill dirt.

Another pit, #712, operated by D.J. James, is now being used as a landfill. They were permitted for 5 acres, but mined only 1 acre for mortar sand.

Summary Evaluation

The deposit represented by the samples ThE-1 and ThE-2 is 5 acres in areal extent. The fine- to medium- to coarse- to very coarse-grained sand extends to a depth of approximately 6 feet. This deposit contains approximately 48,000 cubic yards. This deposit could have some commercial potential, but its small size may prevent this. The potential for fine aggregate production in McDuffie County is low.

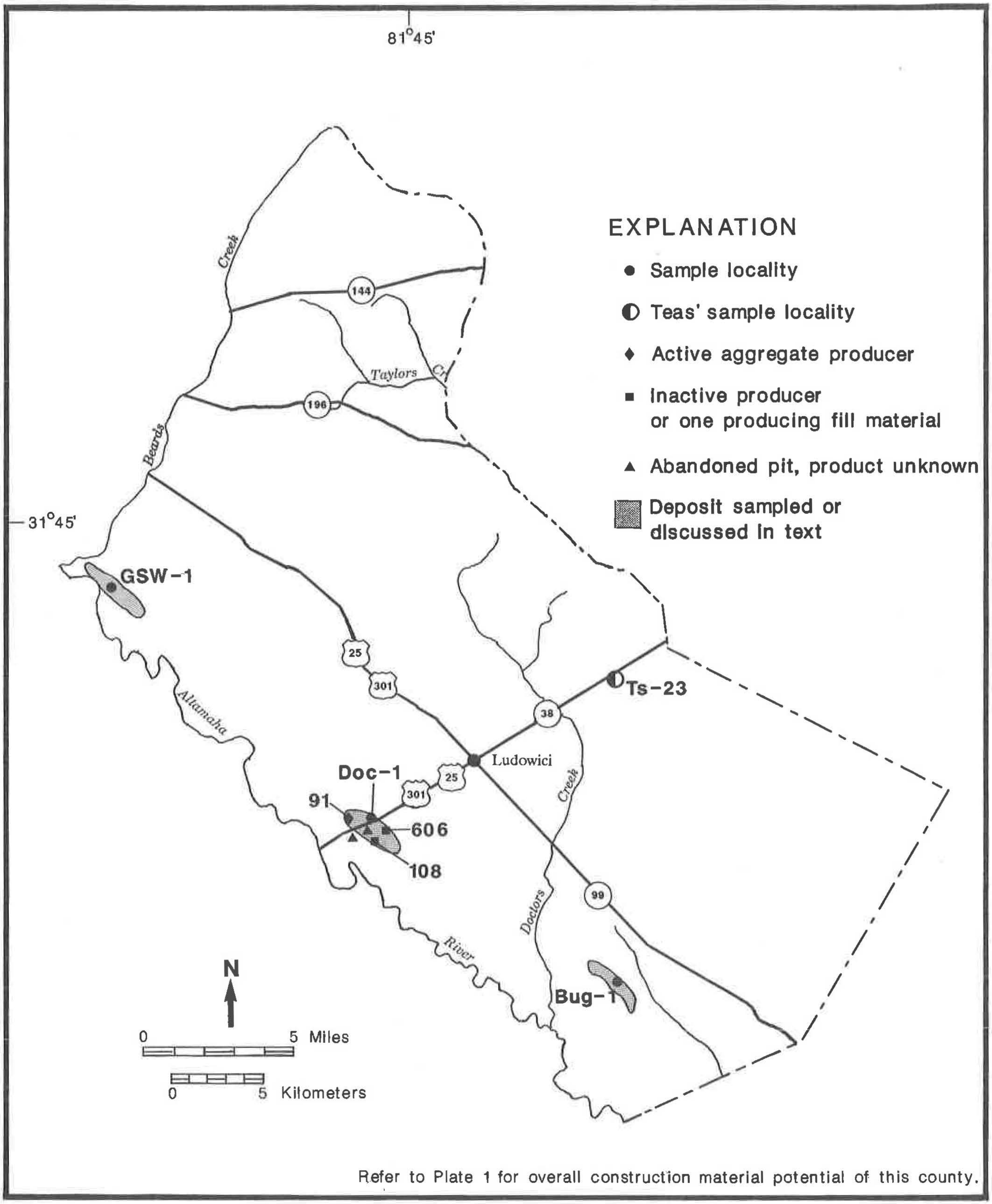


Figure 127. Map of Long County Showing Localities and Deposits Sampled.

Figure 128. Stock piles of Mortar and Concrete Sand at Satilla Sand Company, Long County.

Figure 129. Dredge at Satilla Sand Company, Long County.

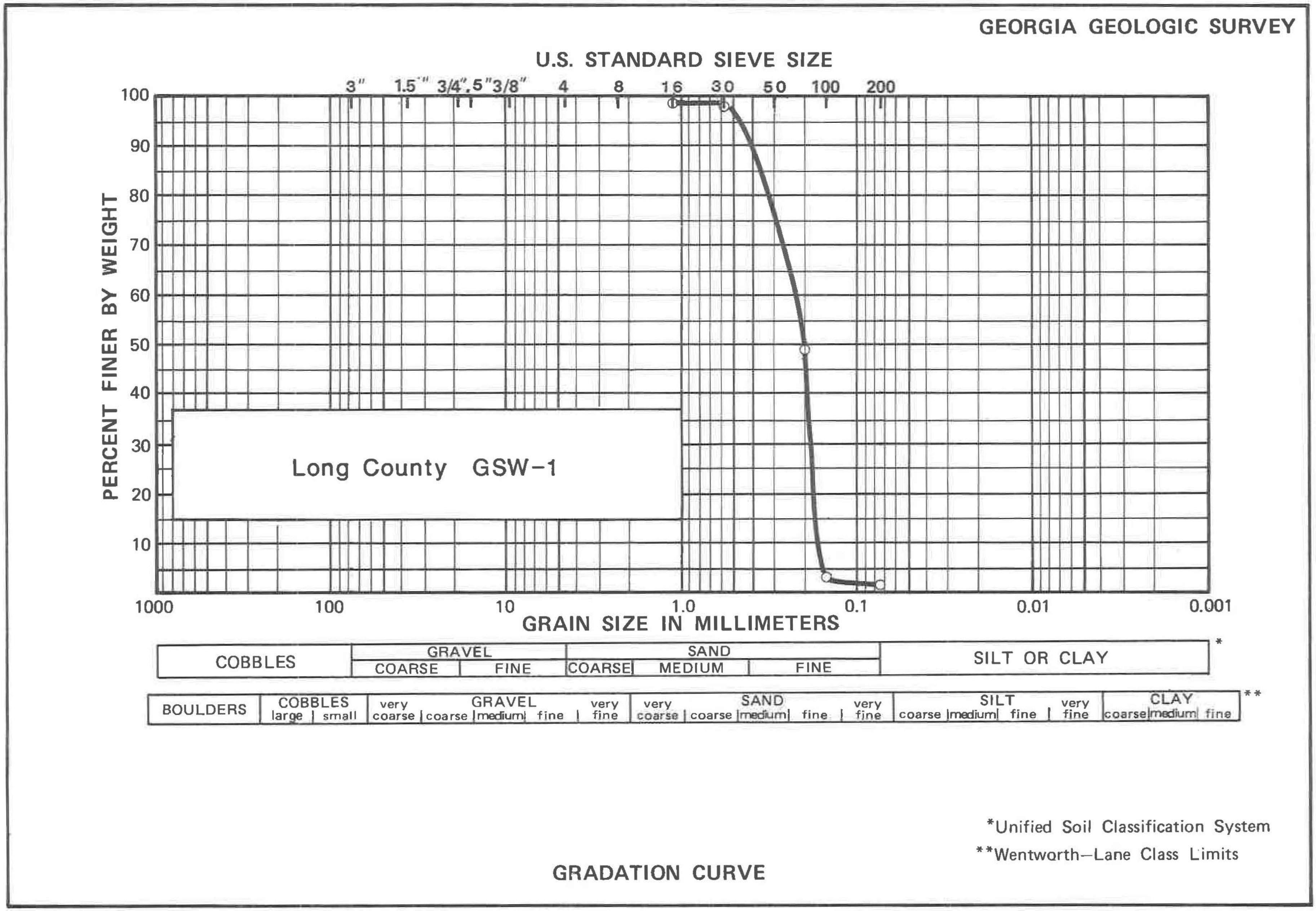


Figure 130. Size Distribution Curve of Sample GSW-1.

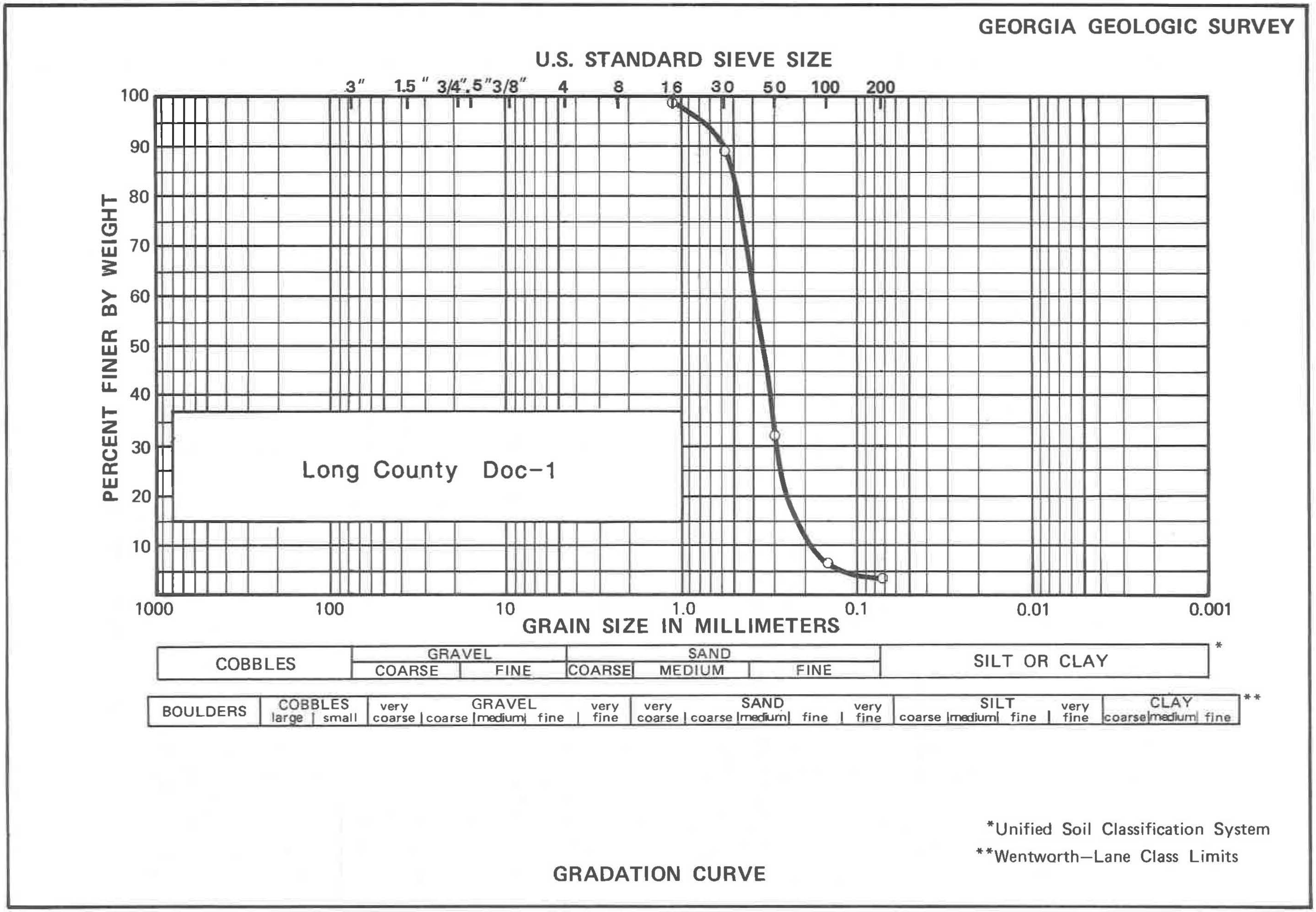


Figure 131. Size Distribution Curve of Sample Doc-1.

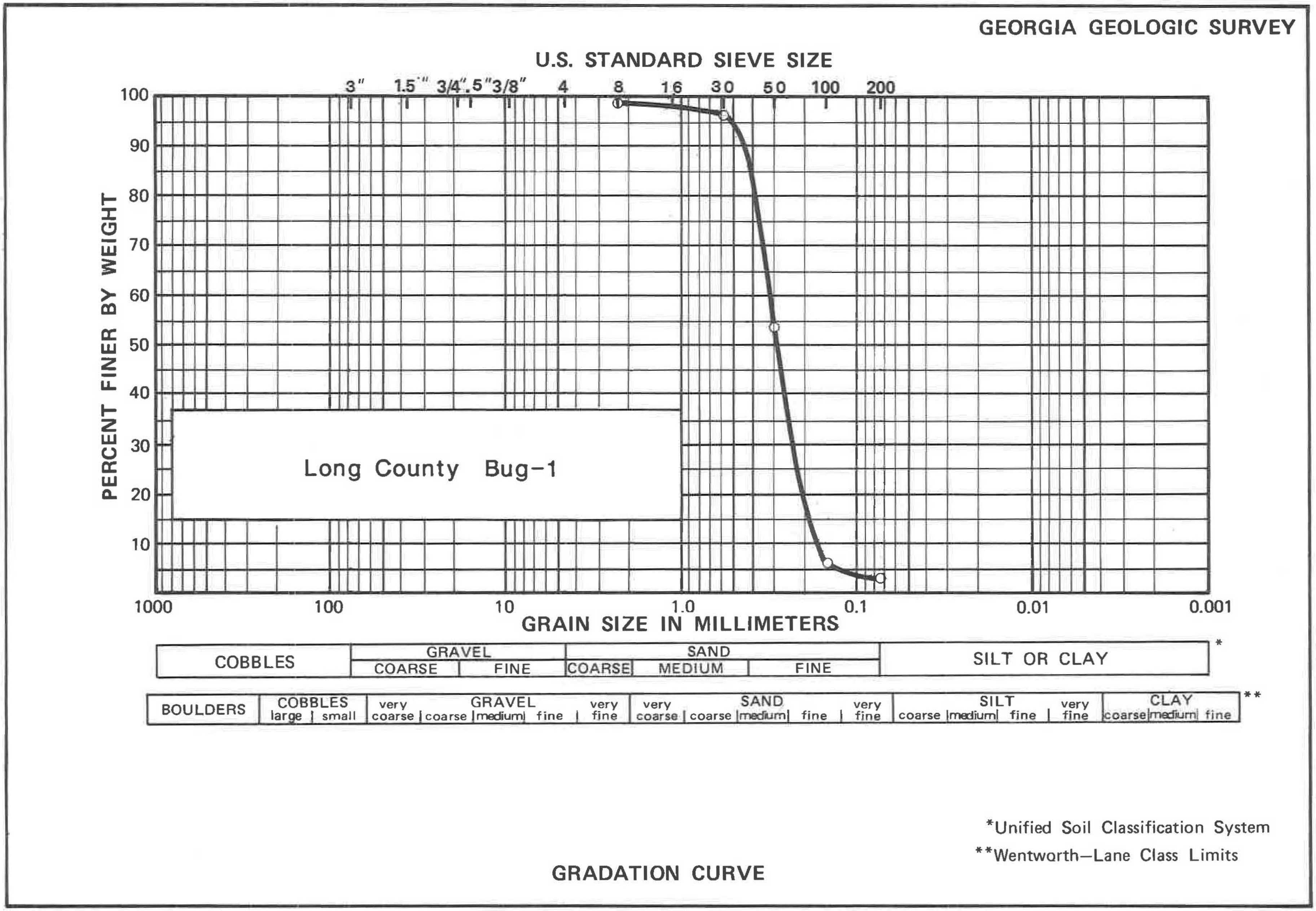


Figure 132. Size Distribution Curve of Sample Bug-1.

Table 20: Long County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
GSW-1	9	auger	9	2	no	2
Doc-1	3	auger	10	3	no	2
Bug-1	9	auger	9	2	no	1

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

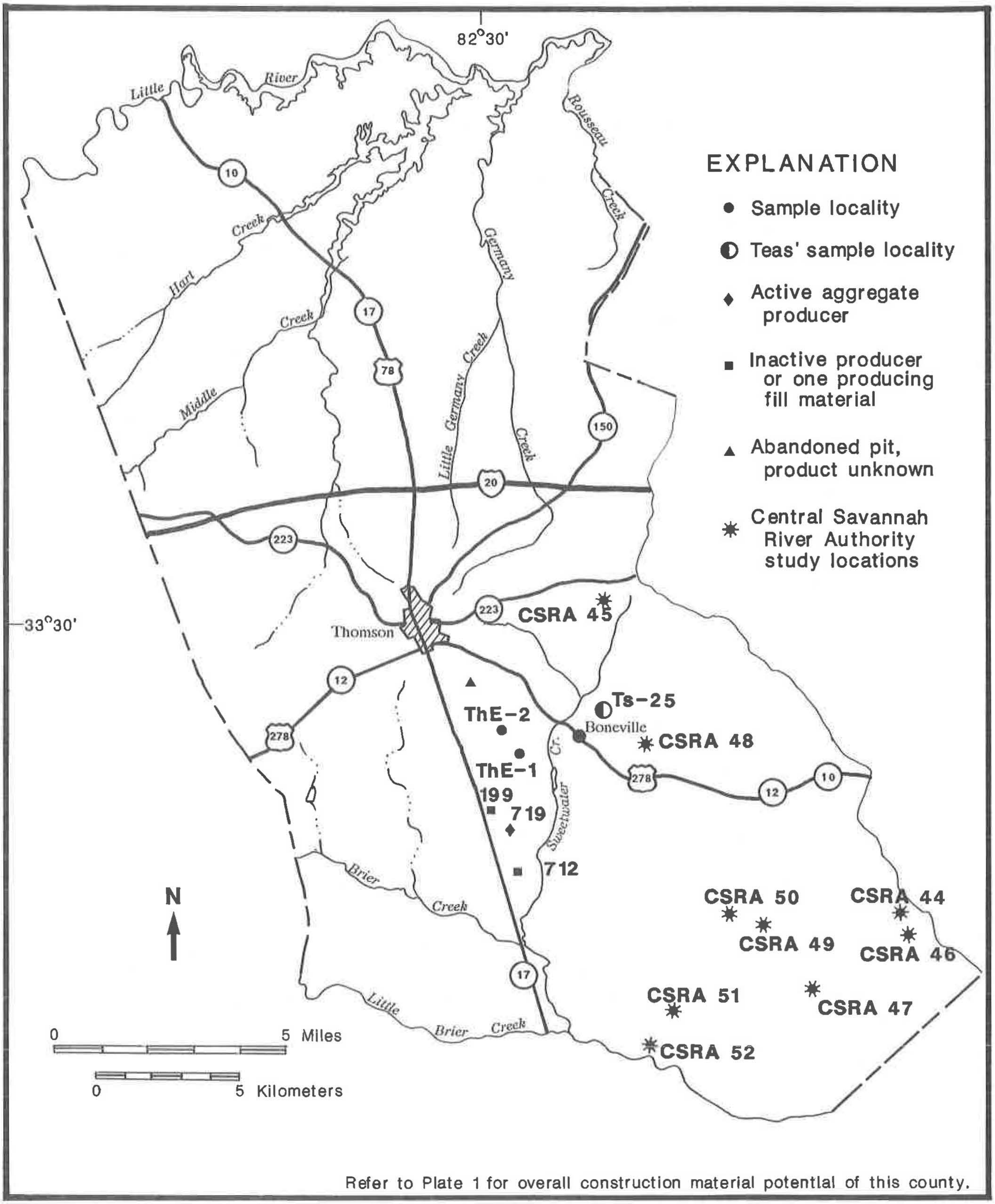


Figure 133. Map of McDuffie County Showing Localities and Deposits Sampled.

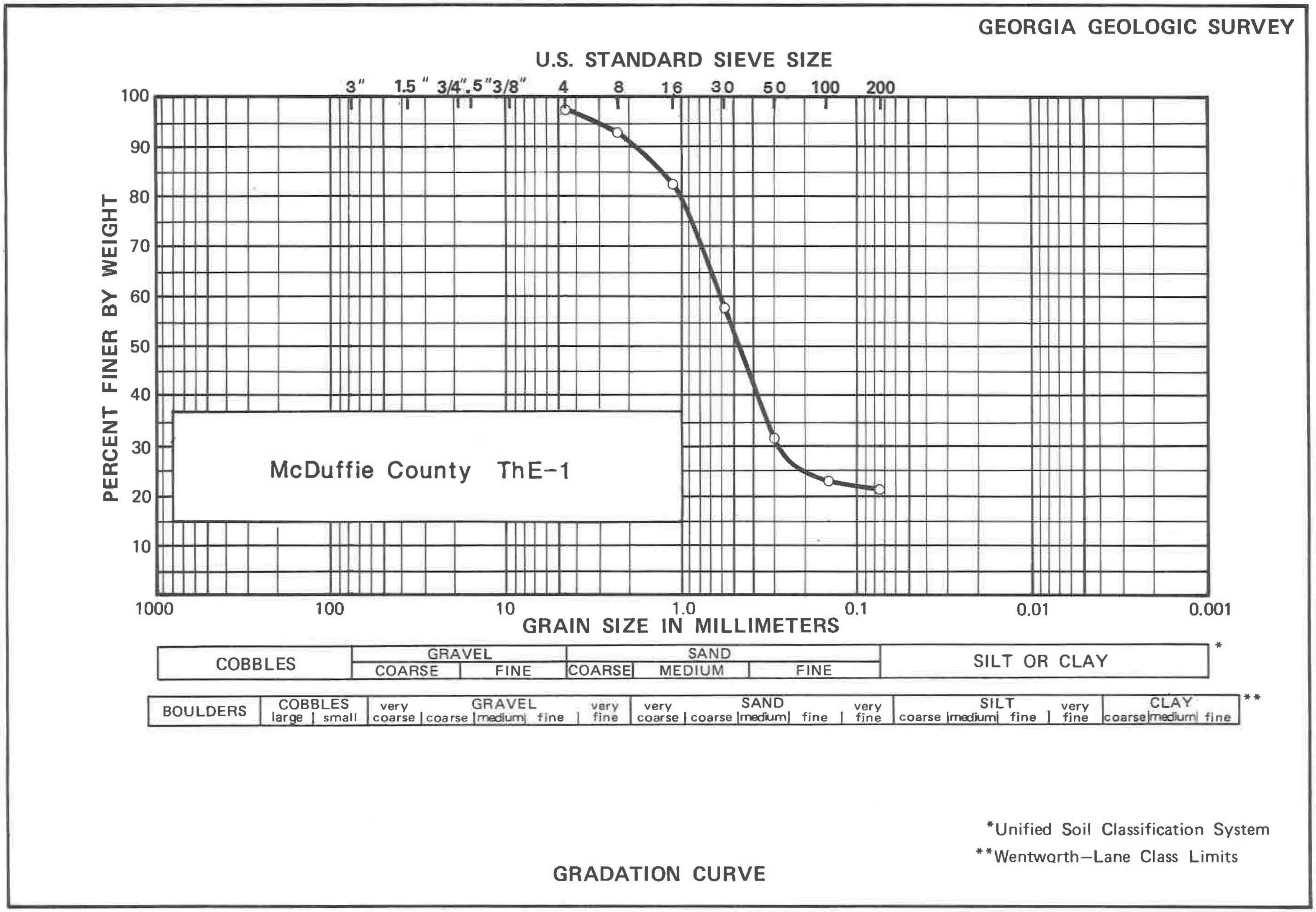


Figure 134. Size Distribution Curve of Sample ThE-1.

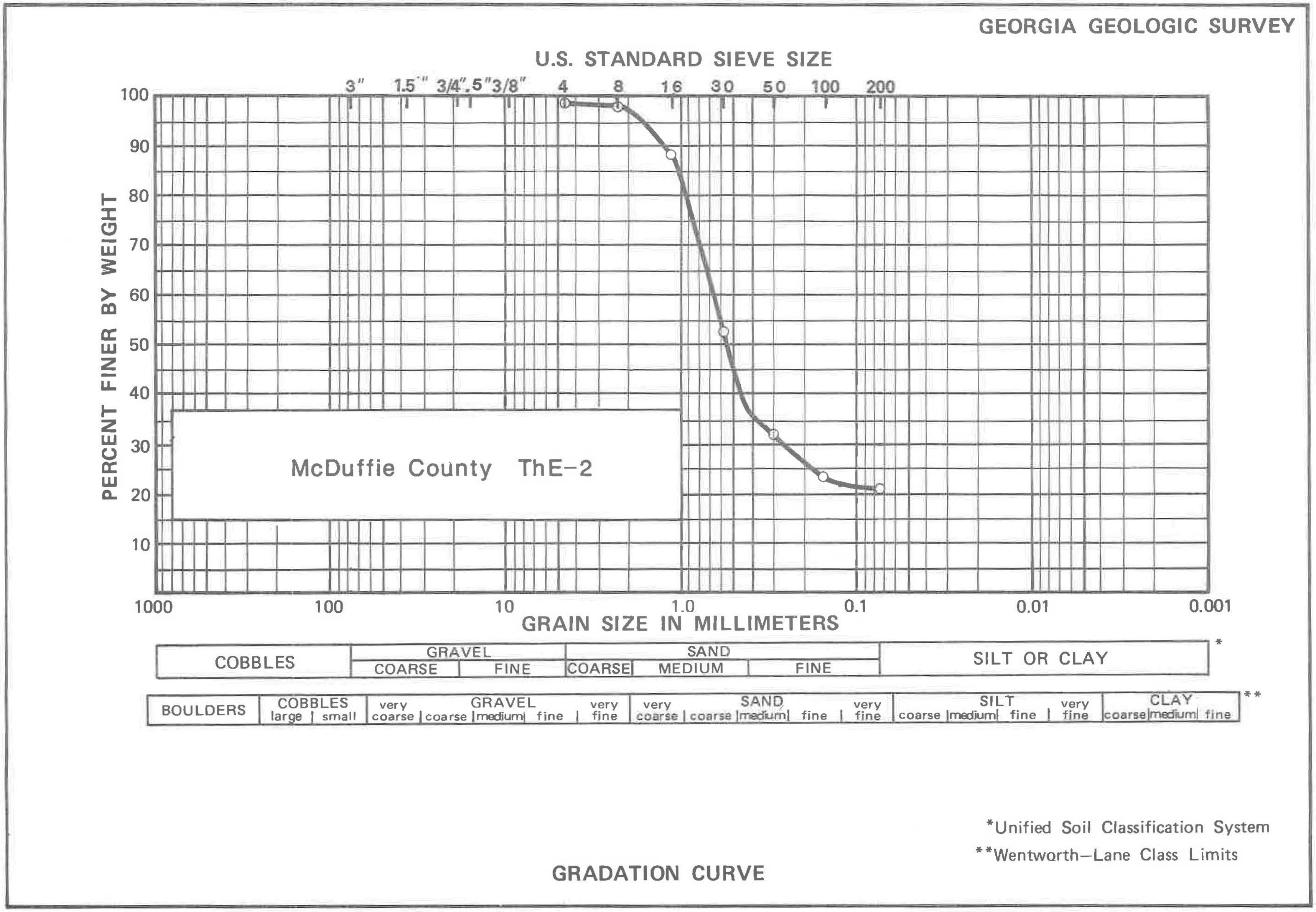


Figure 135. Size Distribution Curve of Sample ThE-2.

Table 21: McDuffie County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
ThE-1	5	trench	5	1	no[4]	1
ThE-2	6	auger	6	1	no[4]	1

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

McINTOSH COUNTY

Geology and Physiography

McIntosh County lies within the Barrier Island District of the Coastal Plain Province. The surficial sediments are derived from the Satilla Formation and the barrier island deposits.

Previous Studies

Teas (1921, p. 217) noted the occurrence of sand hills paralleling the Altamaha River (Fig. 136, Ts-26). These hills, along the southwestern border of the county, reach a height of some 60 feet and contain enormous reserves of sand.

Teas (1921, p. 217-218) mentioned a 10 acre pit operated by the Altamaha Supply Company near the Seaboard Air Line Railway in these same sand hills (Fig. 136, Ts-26).

Present Study

The soil series used in targeting areas of McIntosh County was the Lakeland series, which is present as dune fields in the southwestern part of the county, east of and parallel to the Altamaha River. Geomorphic features targeted are the dune fields along the Altamaha River. Two samples from the area of dunes: Cox-1, Bug-2 (Figs. 136-138, Table 22) were sieved.

Evaluation

Neither of the samples passed ASTM standard C-33. The samples are generally too fine-grained and too well sorted. The deposits represented by these samples have very large reserves but limited uses.

Mining Activity

There are no active commercial aggregate mining operations in McIntosh County. There were two operations in the past: Santee Sand Company and McDonald Sand.

Santee Sand of Cocoa Beach, Florida operated an 8 acre pit which has since been reclaimed, (Fig. 136, #277). No further information on products or mining data is available.

The McDonald Sand Company operated a dredge along the Altamaha River. No further information is available.

Summary Evaluation

The potential for fine aggregate production in McIntosh County is considered to be low. Although there are extremely large deposits of sand in the southwestern portion of the county, their use is limited.

PIERCE COUNTY

Geology and Physiography

Most of Pierce County lies within the Bacon Terraces District. The far eastern corner lies within the Barrier Island District. The surficial sediments of Pierce County are derived from the Altamaha Formation, and the Cypresshead Formation.

Previous Studies

Teas (1921, p. 227-229) reported an extensive sand deposit on the north side of the Satilla River (Fig. 139, Ts-28). An old pit (Fig. 139, Ts-29) was worked in this large sand dune, and was abandoned prior to Teas investigation. Teas also reported extensive sand deposits north and east of Hurricane and Little Hurricane Creeks (Fig. 139, Ts-30).

Present Study

The soil series used in targeting sites for sampling is the Kershaw series, which is present along the north side of the Satilla River, and along the north side of Hurricane Creek. The geomorphic features targeted were dunes along the north sides of Hurricane Creek and the Satilla River. These features correspond to the soil series targeted. Eight samples were taken from five sites in Pierce County: WcE-1, BkW-2, BkE-1a, BkE-1b, DiU-1a, DiU-1b, BkW-1a, BkW-1b (Figs. 139-147, Table 23).

Evaluation

None of the samples passed ASTM standard C-33, but several could be upgraded. Samples WcE-1, Bkw-2, DiU-1 and Diu-2 represent an extensive dune along the north side of the Satilla River. The samples show that the material is somewhat fine-grained, but the dune field is extensive, and there are several small abandoned pits in the area. The entire dune area represented by these samples covers approximately 2500 acres and, therefore, about 61 million cubic yards of sand. Sample BkW-1a and 1b are from the periphery of the same dune, and size analyses (Figs. 146-147) show that this area is probably not useable for construction aggregate. Samples BkE-1a and BkE-1b represent the dune field north and east of Alabaha Creek. There are abandoned sand pits near

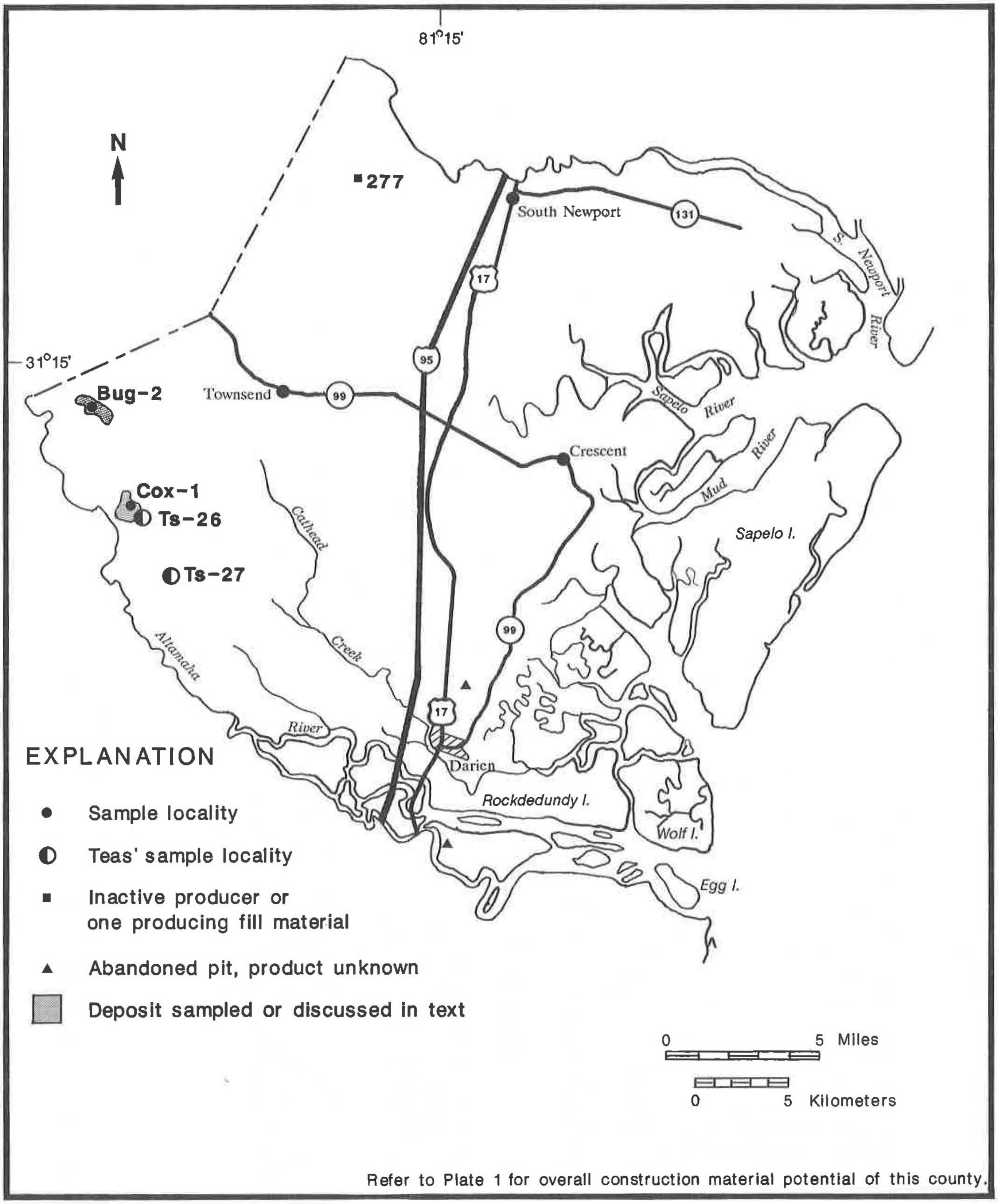


Figure 136. Map of McIntosh County Showing Localities and Deposits Sampled.

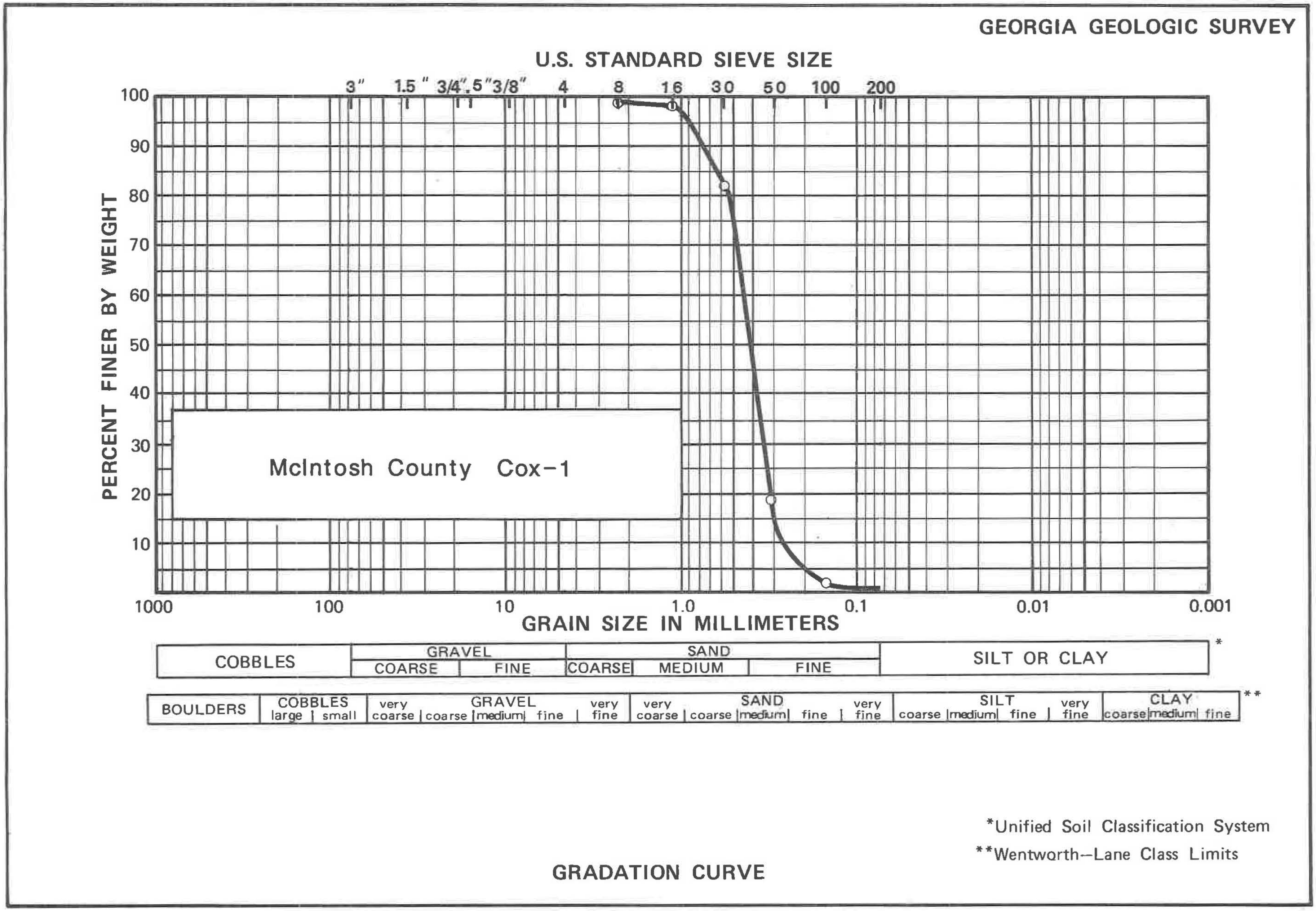


Figure 137. Size Distribution Curve of Sample Cox-1.

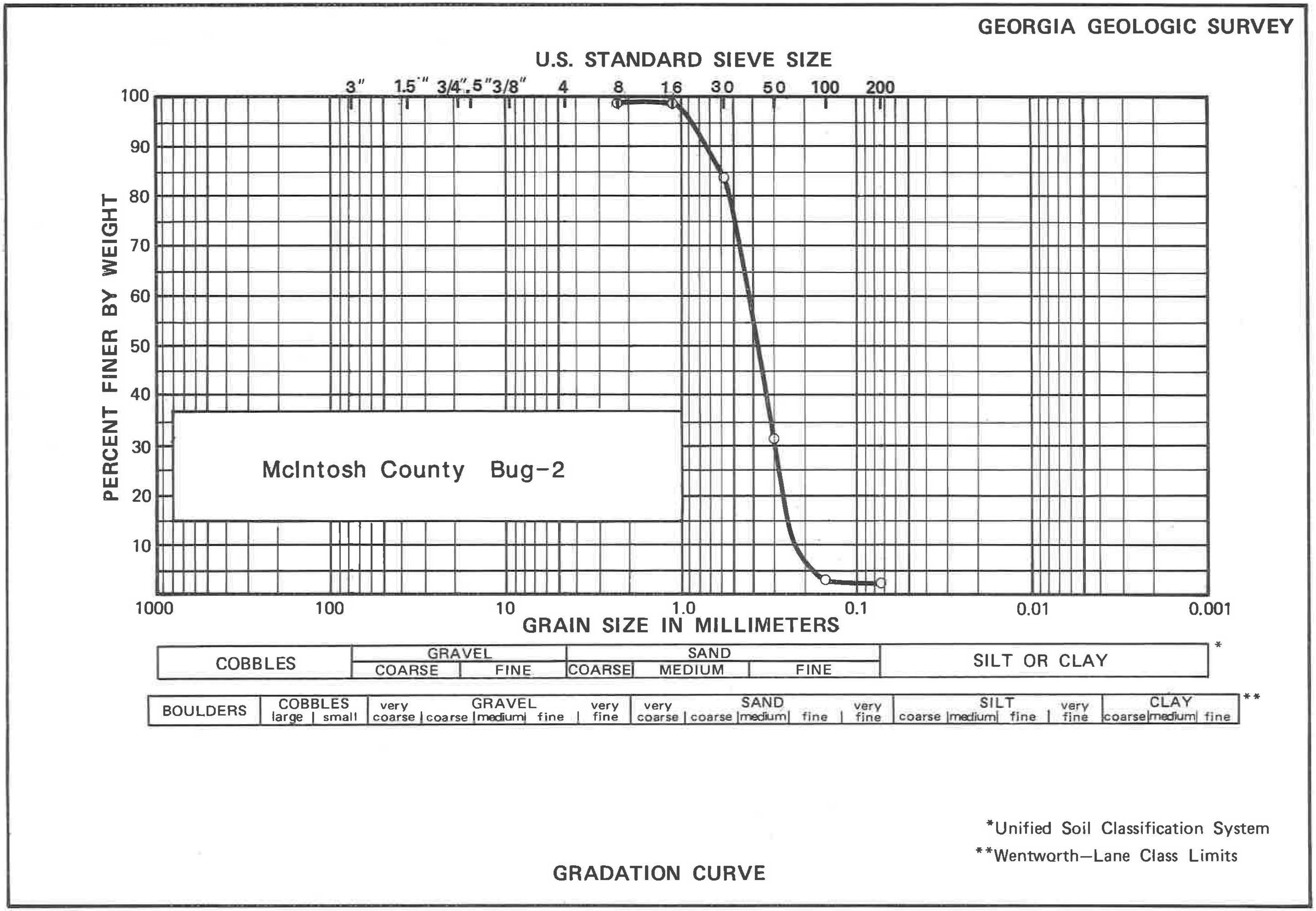


Figure 138. Size Distribution Curve of Sample Bug-2.

Table 22: McIntosh County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
Cox-1	10	auger	10	3	no[4]	2
Bug-2	7-1/2	auger	7-1/2	2	no	2

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

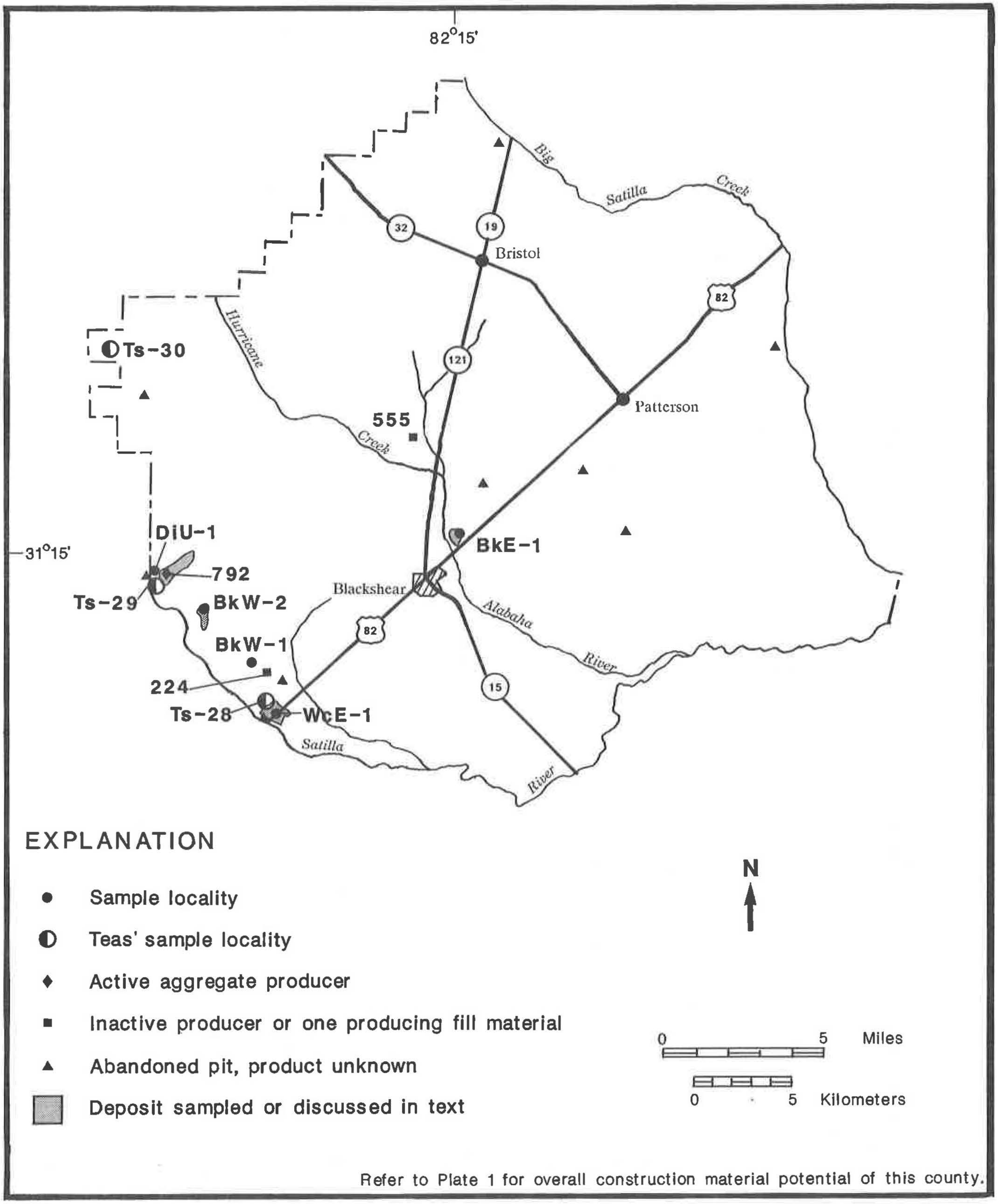


Figure 139. Map of Pierce County Showing Localities and Deposits Sampled.

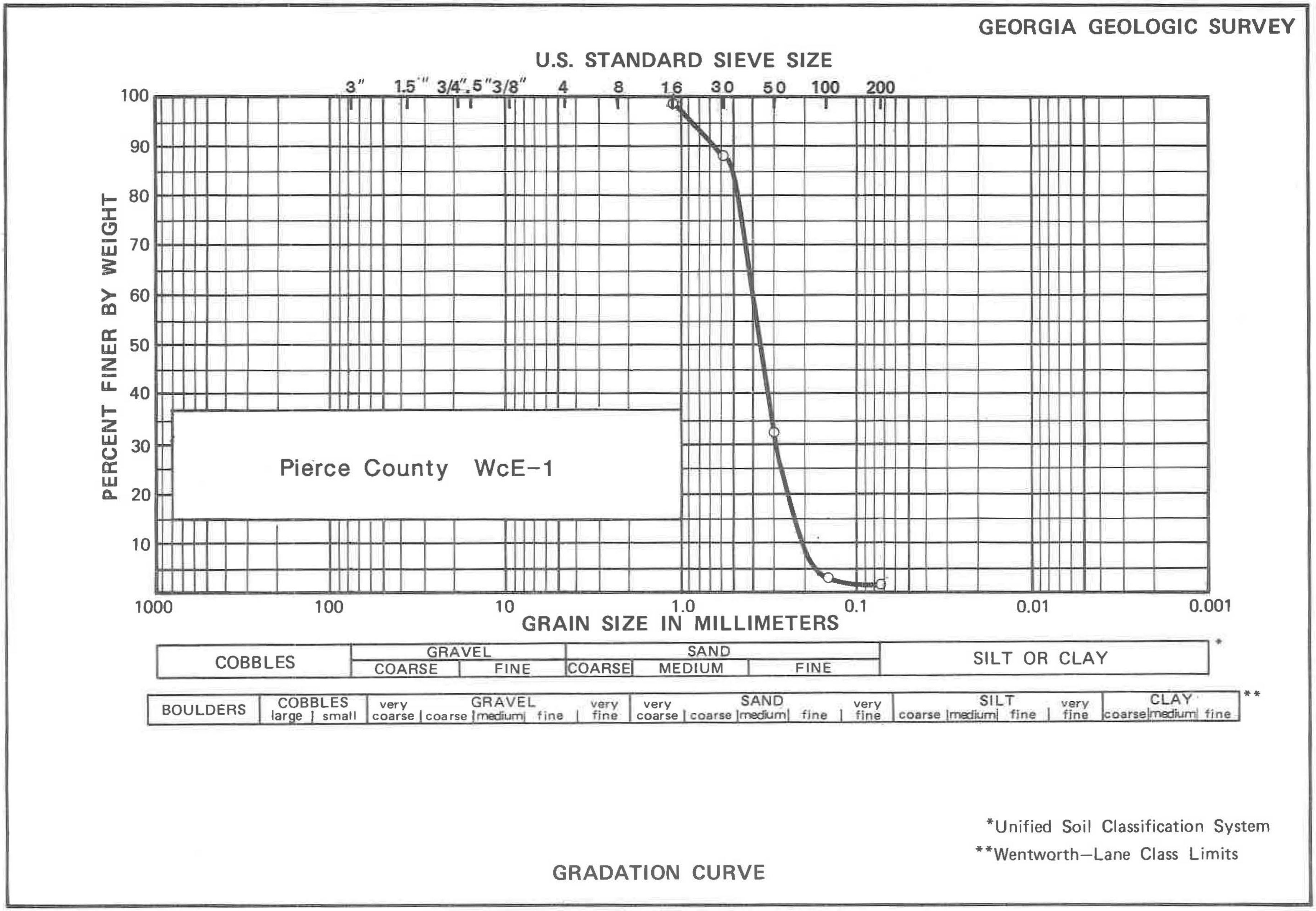


Figure 140. Size Distribution Curve of Sample WcE-1.

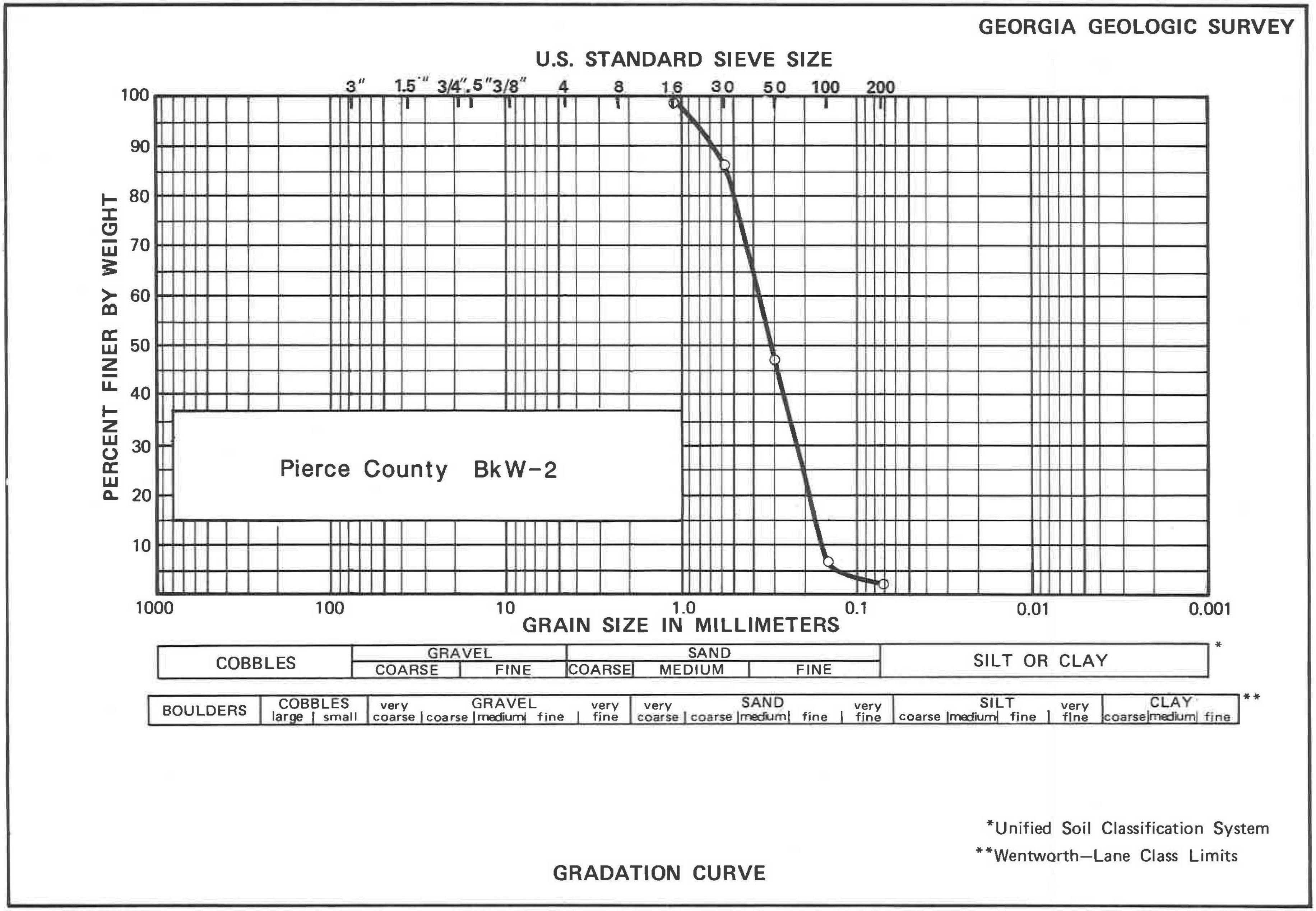
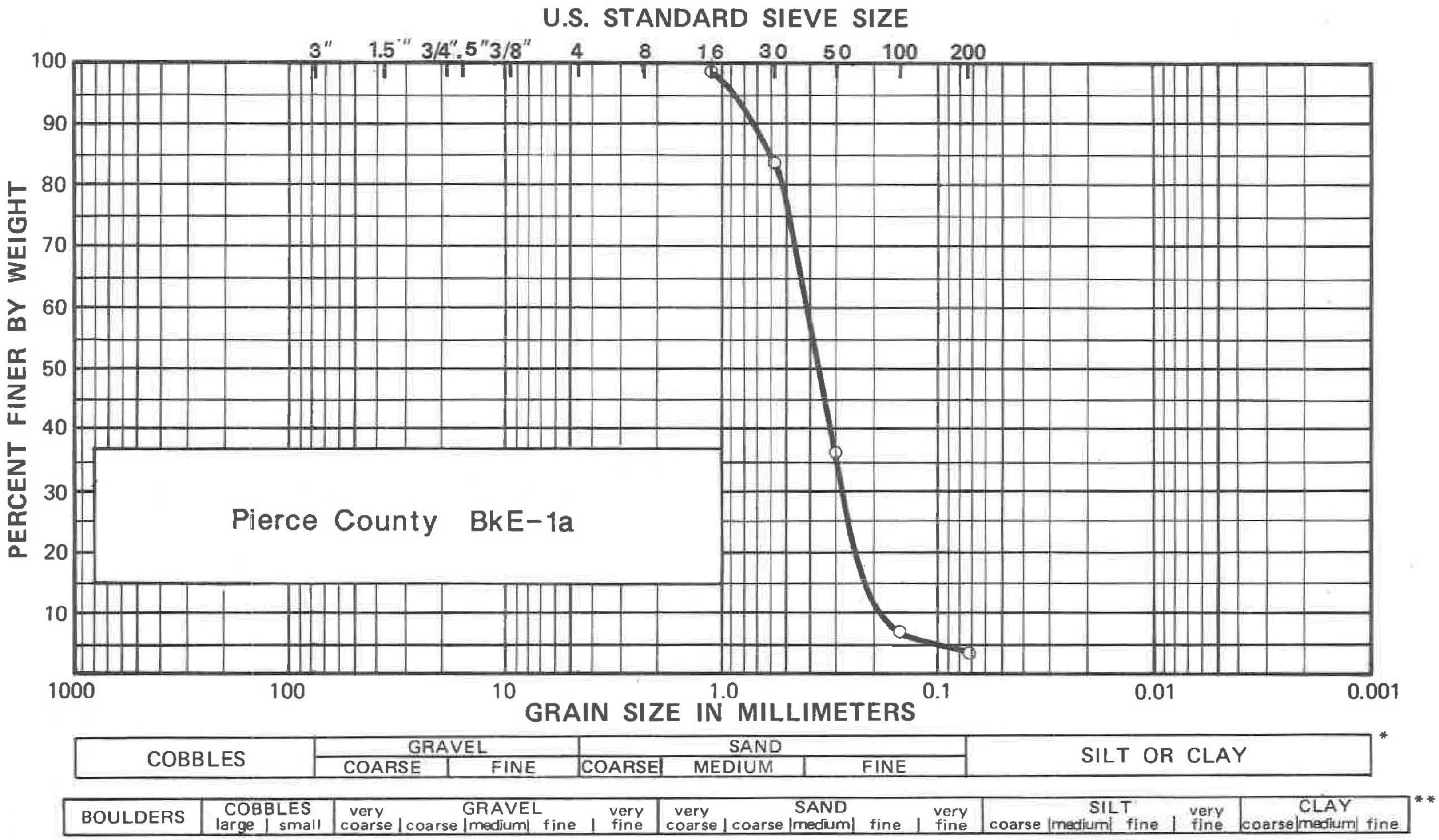


Figure 141. Size Distribution Curve of Sample BkW-2.

GEORGIA GEOLOGIC SURVEY



*Unified Soil Classification System

**Wentworth–Lane Class Limits

GRADATION CURVE

Figure 142. Size Distribution Curve of Sample BkE-1a.

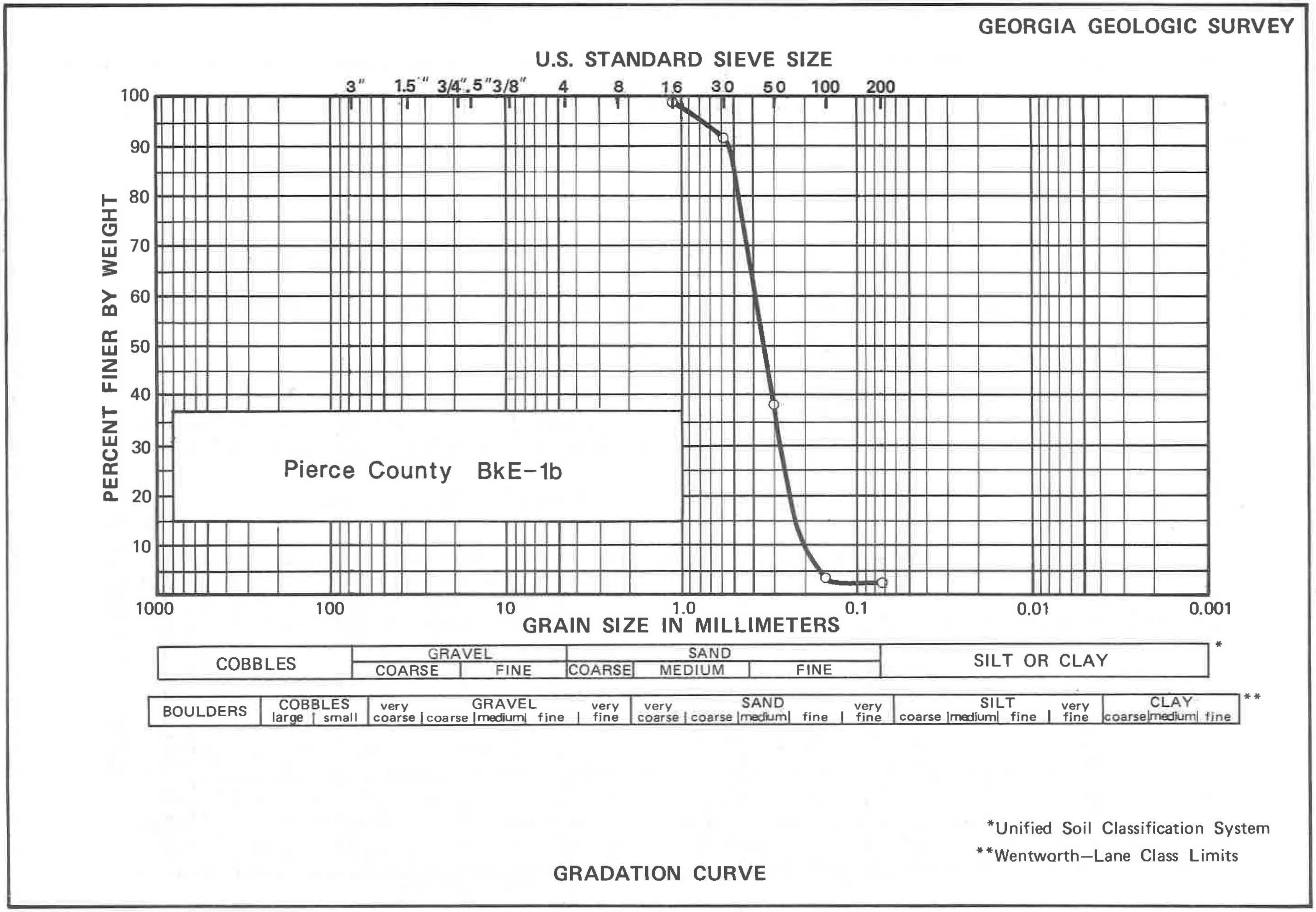


Figure 143. Size Distribution Curve of Sample BkE-1b.

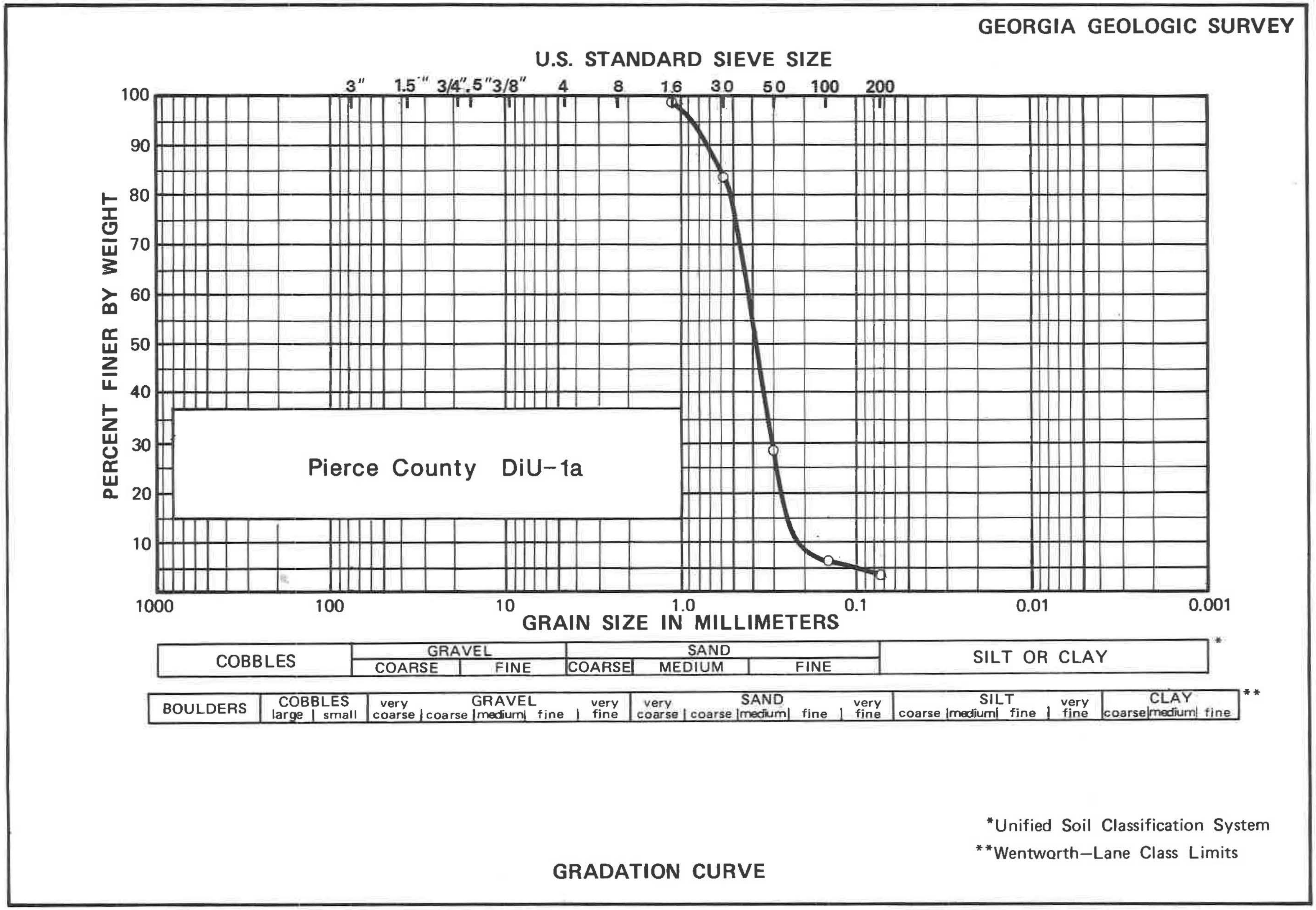


Figure 144. Size Distribution Curve of Sample DiU-1a.

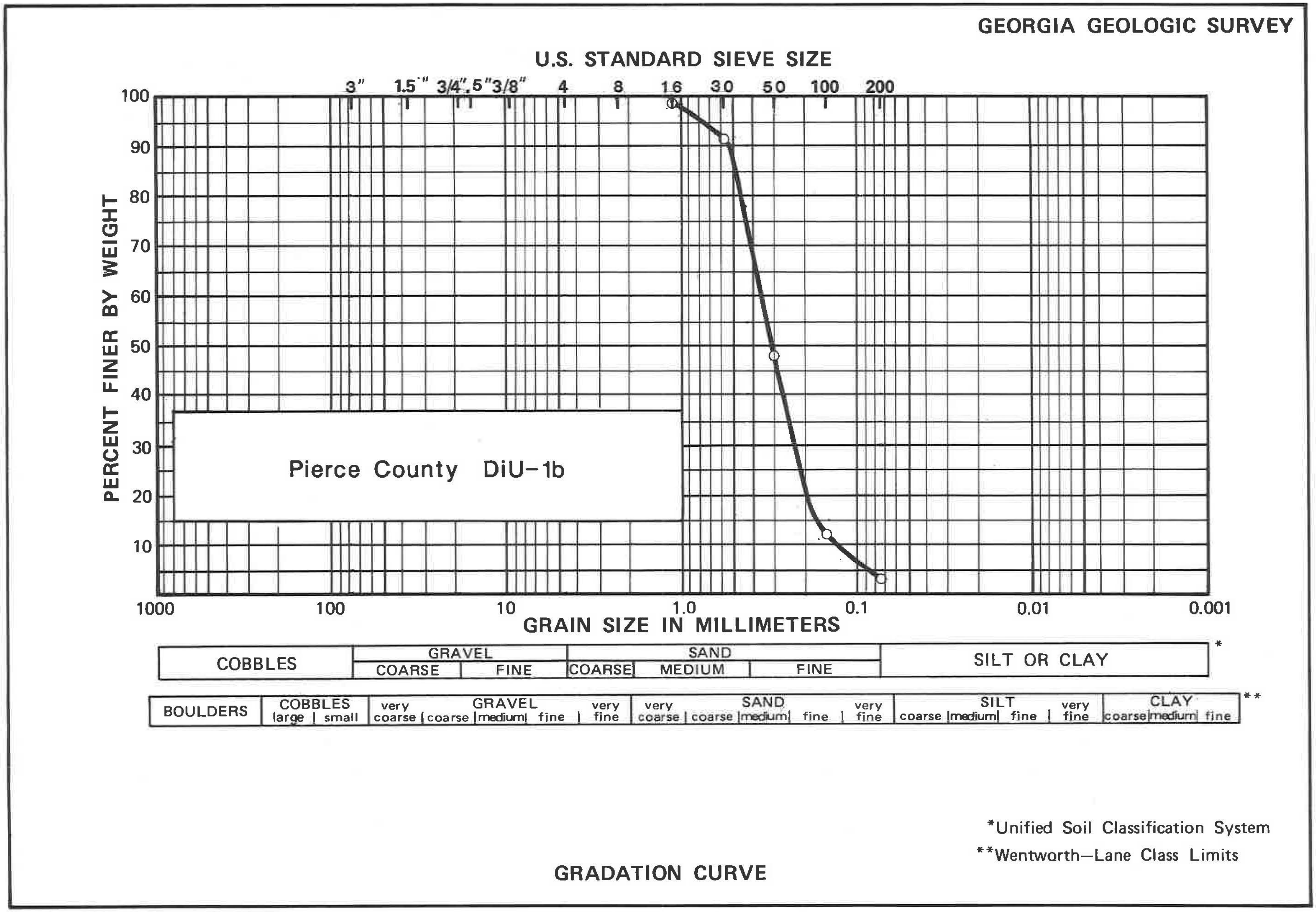


Figure 145. Size Distribution Curve of Sample DiU-1b.

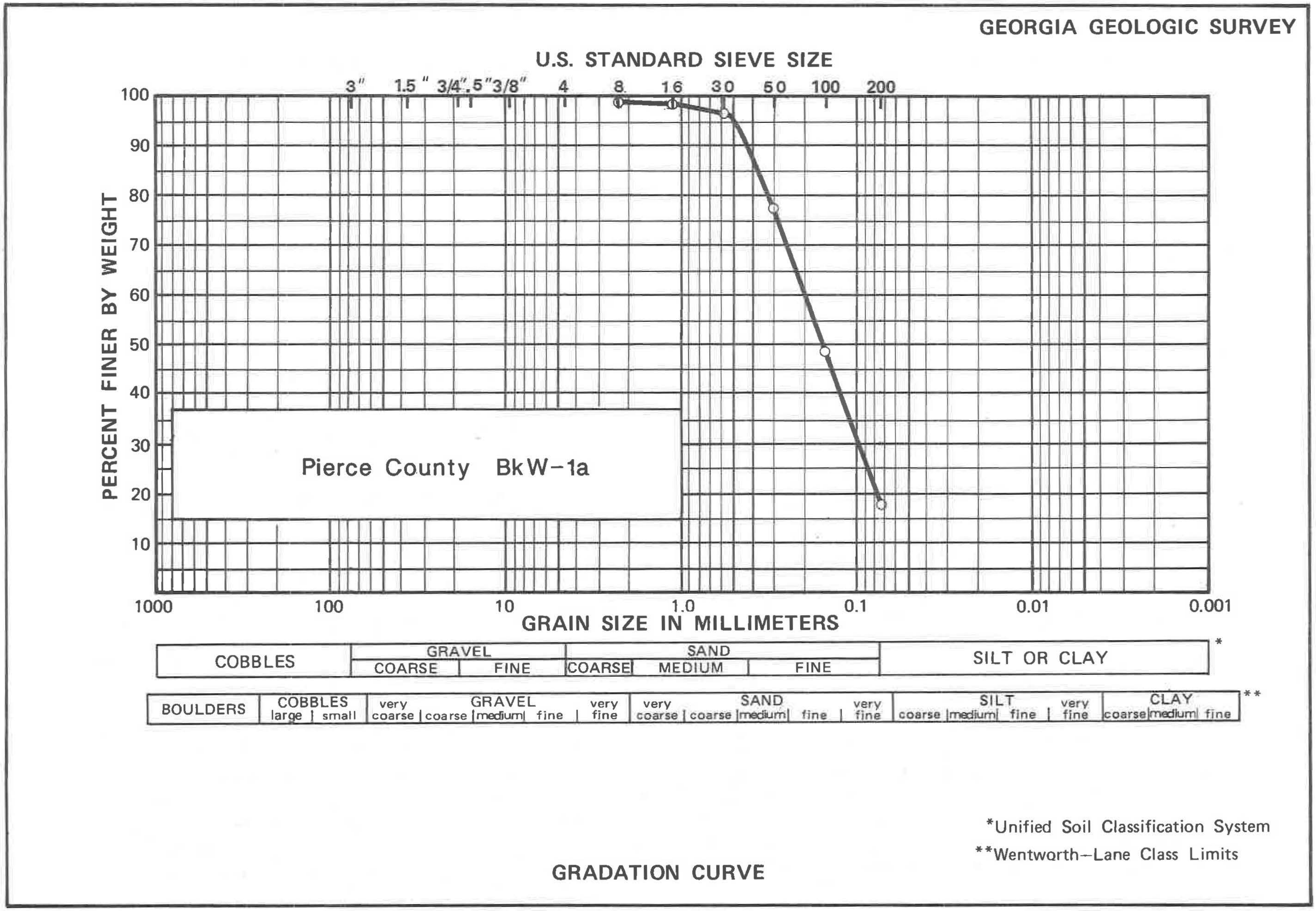


Figure 146. Size Distribution Curve of Sample BkW-1a.

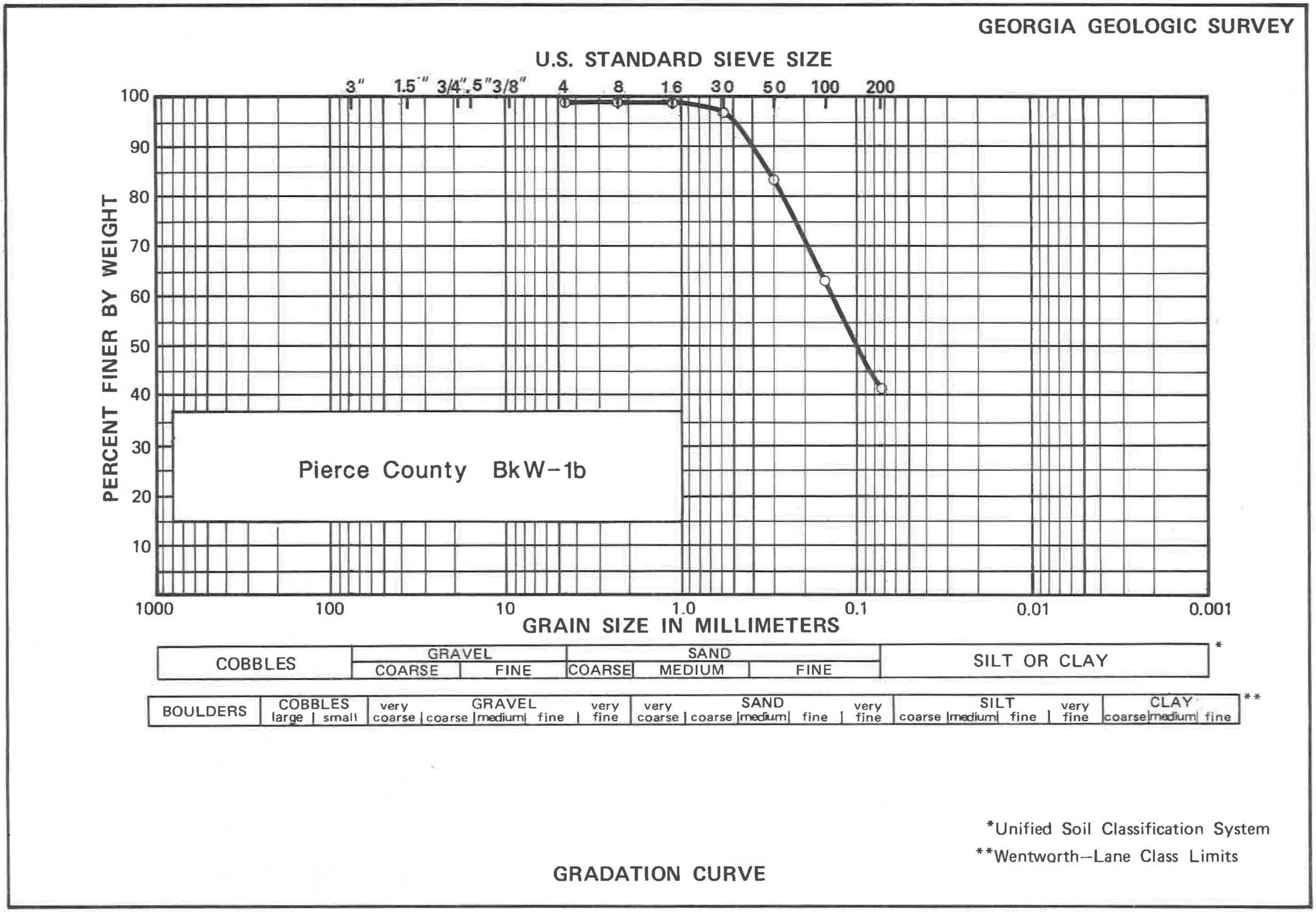


Figure 147. Size Distribution Curve of Sample BkW-1b.

Table 23: Pierce County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
WcE-1	12	trench	22	4	no[4]	2
BkW-2	12	auger	12	2	no[4]	2
BkE-1a	7	auger	7	3	no[4]	2
BkE-1b	7 - 10-1/2	auger	3-1/2	3	no[4]	2
DiU-1a	10	auger	10	4	no[4]	2
DiU-1b	10 - 14	auger	4	4	no	2
BkW-1a	6	auger	6	1	no	1
BkW-1b	6-10	auger	4	1	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

the location of the sample, which suggest that this sand may be useable. The deposit covers approximately 45 acres, thus, yielding reserves of approximately 73,000 cubic yards.

Mining Activity

There is one small mining operation in Pierce County. Pope Concrete Products has a 1 acre pit (Fig. 134) in the large dune field along the Satilla River. Their market radius is 25 miles, and the current mining depth is 6 feet.

There are several inactive aggregate pits in Pierce County. Ellis McNeal (Figs. 139, #224) formerly operated an 18 acre sand pit in this same dune field. Dixie Concrete Service operated a 6 acre pit for self use; this pit was in the Alabaha Creek dune field.

Summary Evaluation

The extensive dune fields along the Satilla River and Alabaha Creek have provided aggregate sand in the past, and now have one active producer. The potential for fine aggregate production in Pierce County is moderate.

RICHMOND COUNTY

Geology and Physiography

Richmond County lies within three districts of two provinces. These districts are the Fall Line Hills and Vidalia Upland of the Coastal Plain Province and the Washington Slope of the Piedmont Province. The surficial sediments of the county are derived from the Oconee Group and the Barnwell Group and granite gneisses of the Piedmont.

Previous Studies

Teas (1921, p. 233-236) noted two active pits and two properties of interest in Richmond County.

The Richmond County pit (Fig. 148, Ts-31) owned by the county covered 10 acres and provided sand and gravel for road building concrete aggregate. The depth of the pit varied from 10 to 28 feet.

The Georgia Sand and Gravel Company (Fig. 148, Ts-32) produced washed sand and gravel for concrete aggregate and other uses from a pit adjacent to the "county pit." The depth of the pit was approximately 26 feet.

The Oats property (Fig. 148, Ts-33) mentioned by Teas, was 1 acre in extent and contained a gravel bed 5 to 10 feet thick in a sandy clay matrix.

Three to ten feet of coarse-grained, slightly clayey sand is exposed in a sand pit at Wheless Station (Fig. 148, Ts-34). Teas noted that the pit covered one-third of an acre and that the sand produced was used for local work.

Hurst, et al. (1966, p. 380-383) described seven sand pits or prospects in Richmond County:

(1) The A & M Sand and Gravel Company (Fig. 148, CSRA 22) operated a 10 acre pit in a massive, thickly bedded, fine-to medium-grained sand. This sand was mined to a depth of 10 feet.

(2) The Richmond County Sand Pit (Fig. 148, CSRA 23) was 2 acres in extent and contained massive, thickly bedded sand. This pit was approximately 20 feet deep.

(3) The Speer Sand and Gravel Company operated a 2 acre pit on a 20 acre tract of land from which they produced washed sand and gravel (Fig. 148, CSRA 24). A cross-section of the pit shows 2 feet of overburden and 6 to 8 feet of fine-to medium-grained sands containing clay clasts which overlie 30 feet of gravelly (10%) sand.

(4) A small (450' X 200') sand pit containing medium-to very coarse-grained sand was mined to a depth of 15 feet (Fig. 148, CSRA 25).

(5) The R.J. Gaines pit (Fig. 148, CSRA 26) produced fill dirt for the county and state. The pit was 2 acres in extent and was mined to an average depth of 20 feet. The material being mined is a coarse-grained clayey, silty sand.

(6) Augusta Sand and Gravel operated a sand pit which covered several acres and was mined to a depth of 40 feet (Fig. 148, CSRA 27).

(7) Richmond County operated a 4 acre sand pit along the Savannah River (Fig., 148, CSRA 28). A cross-section showed 18 feet of medium-grained sand overlying 10 feet of gravelly (10%) coarse-grained sand.

Hurst, et al. (1966, p. 393-394) also reported five localities as gravel prospects:

(1) At the intersection of the Georgia Railroad and the Columbia-Richmond line there are beds of gravelly (20%) sand 3 feet thick, which extend for 0.5 miles in a NE-SW direction (Fig. 148, CSRA 53).

(2) Road and stream cuts at Belair on the Gordon Highway (Fig. 148, CSRA 54) expose a foot or more of subangular pea gravel. This gravel, however, is laterally discontinuous.

(3) Outcrops and ditch exposures indicate that the floodplain of the Savannah River between Butler-

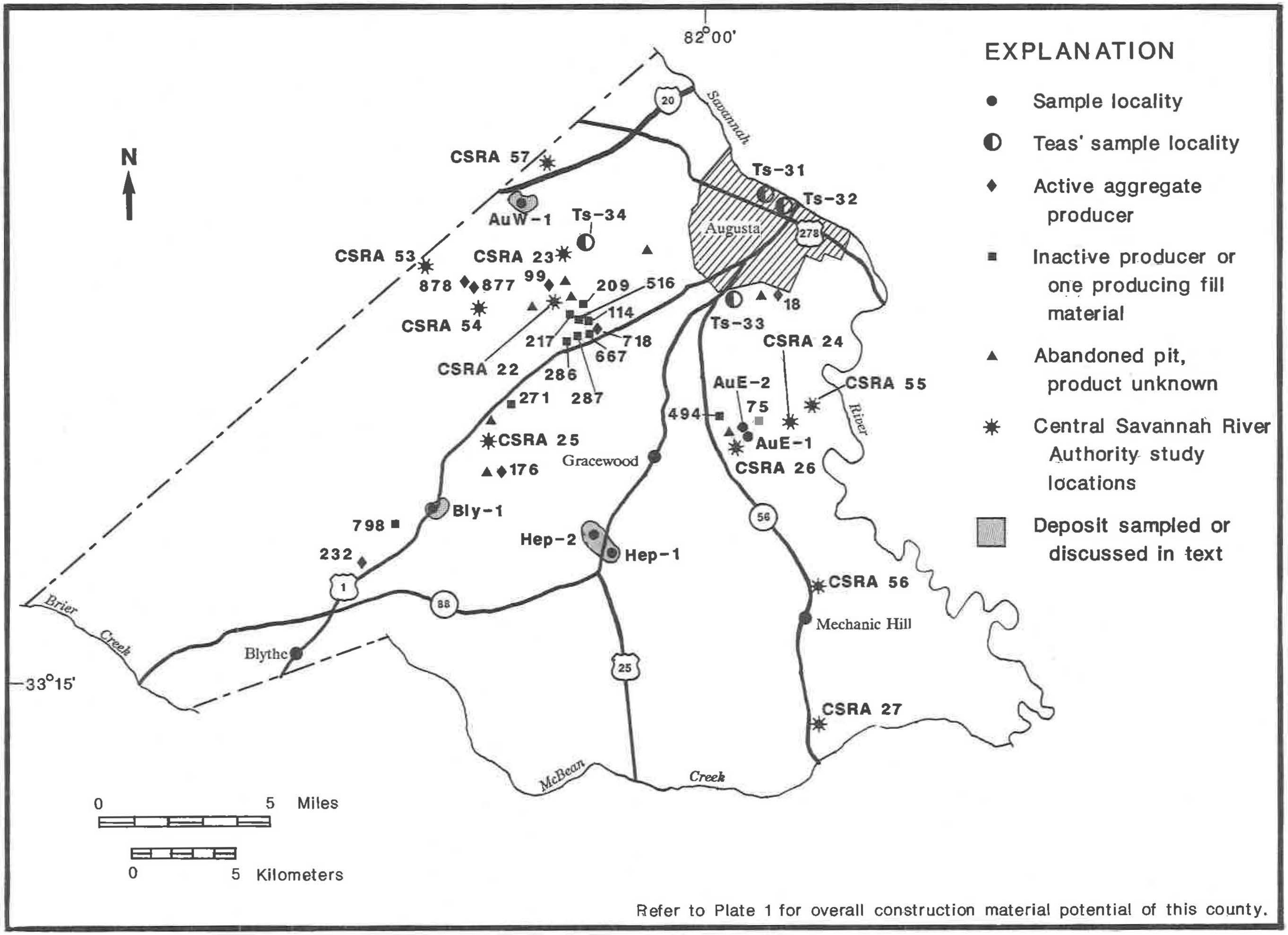


Figure 148. Map of Richmond County Showing Localities and Deposits Sampled.

Creek and the levee (Fig. 148, CSRA 55) has potential for containing gravel deposits.

(4) Over 6 feet of kaolinitic sand containing layers of pebbles up to 2 inches in diameter, averaging under 1 inch in diameter, is exposed in a road cut at the intersection of Ga. Highway 56 and Bennoch Mill Road (Fig. 148, CSRA 56).

(5) A gravel and sand pit west of Interstate 20 and 1 mile south of Skinner Road has produced very coarse sand and gravel up to 0.5 inch in diameter, and in a ratio of 1 part gravel to 5 parts sand.

Present Study

The soil series used in targeting areas of Richmond County was Troup. This soil series is found in interfluve areas in southeastern and north central Richmond County. Geomorphic features targeted were point bars found along the Savannah River. Seven samples representing six sites from Richmond County: AuW-1, Bly-1, Hep-1, Hep-2, AuE-1a, AuE-1b, AuE-2, (Figs. 148-155, Table 24) were sieved. Although none of the samples meet ASTM standard C-33, two samples (Hep-2, AuE-2) could be upgraded to meet those standards even though they have considerable amounts of fine material.

Evaluation

The deposit represented by Hep-2 may be as large as 5 acres. Assuming a tabular deposit 5 feet in thickness, reserves are in excess of 40,000 cubic yards.

The deposit represented by AuE-2 could be as large as 10 acres. Assuming a tabular deposit 7.5 feet thick, reserves could be as large as 121,000 cubic yards.

Mining Activity

There are 16 inactive and 11 active sand pits in Richmond County. Active pits include:

Southern Aggregate Company of Augusta operates two pits (Fig. 148, #108, #494). Pit #018 is permitted for 89 acres. The product of this pit is concrete sand which is transported within a radius of 50 miles by truck. The sand is mined by a cutter head dredge and pumped to classifiers. Current mining depth is 35 to 40 feet, and annual production is between 100,000 and 500,000 tons. No information was available on Pit #494.

Knox River Construction Company of Thomson (Fig. 148, #718) is permitted for 15 acres. The sand pit is mined for asphalt sand which is transported by truck to their plant. Mining is currently to a depth of 8 feet, and annual production is between 10,000 and 50,000 tons.

H.G. James of Augusta operates a sand pit which is permitted for 5 acres (Fig.148, #232). The product of this pit is fill sand which is transported within a 10 mile radius by truck. Sand is mined to a depth of 10 feet, and annual production is less than 10,000 tons.

A. J. Harrison of Martinez is currently permitted to mine a 20 acre tract (Fig. 148, #176). The product of this pit is mortar sand and fill sand which is transported within a 20 mile radius by truck. Current mining depth is 20 feet with annual production being between 10,000 and 50,000 tons.

U.S. Duffie Sand Company of Augusta (Fig. 148, #99) is permitted for 2 acres. The product of this pit is masonry sand. The major market for this product is the Augusta area. Annual production is between 10,000 and 50,000 tons.

Duffie Construction Company of Martinez mines fill sand which is transported within a 10 mile radius by truck (Fig. 148, #271). The company owns 10 acres of land, and 2.5 acres remain to be mined.

Davis Aggregate Corporation of Augusta is permitted to mine 10 acres (Fig. 148, #217). The product is fill sand which is transported within a 25 mile radius by truck. The sand is currently mined to a depth of 10 feet.

Bellamy Sand and Gravel of Beech Island, South Carolina, is currently permitted to mine 4 acres (Fig. 148, #798). The company produces mortar sand which is transported within a 25 mile radius by truck. The sand is mined by a front-end loader. The current depth of mining is approximately 15 feet. No information is available as to production figures.

Georgia Vitrified Brick of Harlem is permitted to mine two 15 acre tracts of sand. The sand is used generally for fill material and is mined by front-end loader. No further information is available as to depth of mining or production figures.

Inactive pits include:

S.A. Hauling Company of Augusta which mined a 2 acre pit that has since been reclaimed (Fig. 148, #209). No further information is available as to products or mining data.

Speer Sand and Gravel of Augusta mined a 6 acre tract of land for sand and gravel (Fig. 248, #075). Annual production was between 50,000 and 100,000 tons. No further information is available.

Richmond Paving Company of Augusta mined sand from a 4 acre pit which has since been reclaimed (Fig. 148, #286).

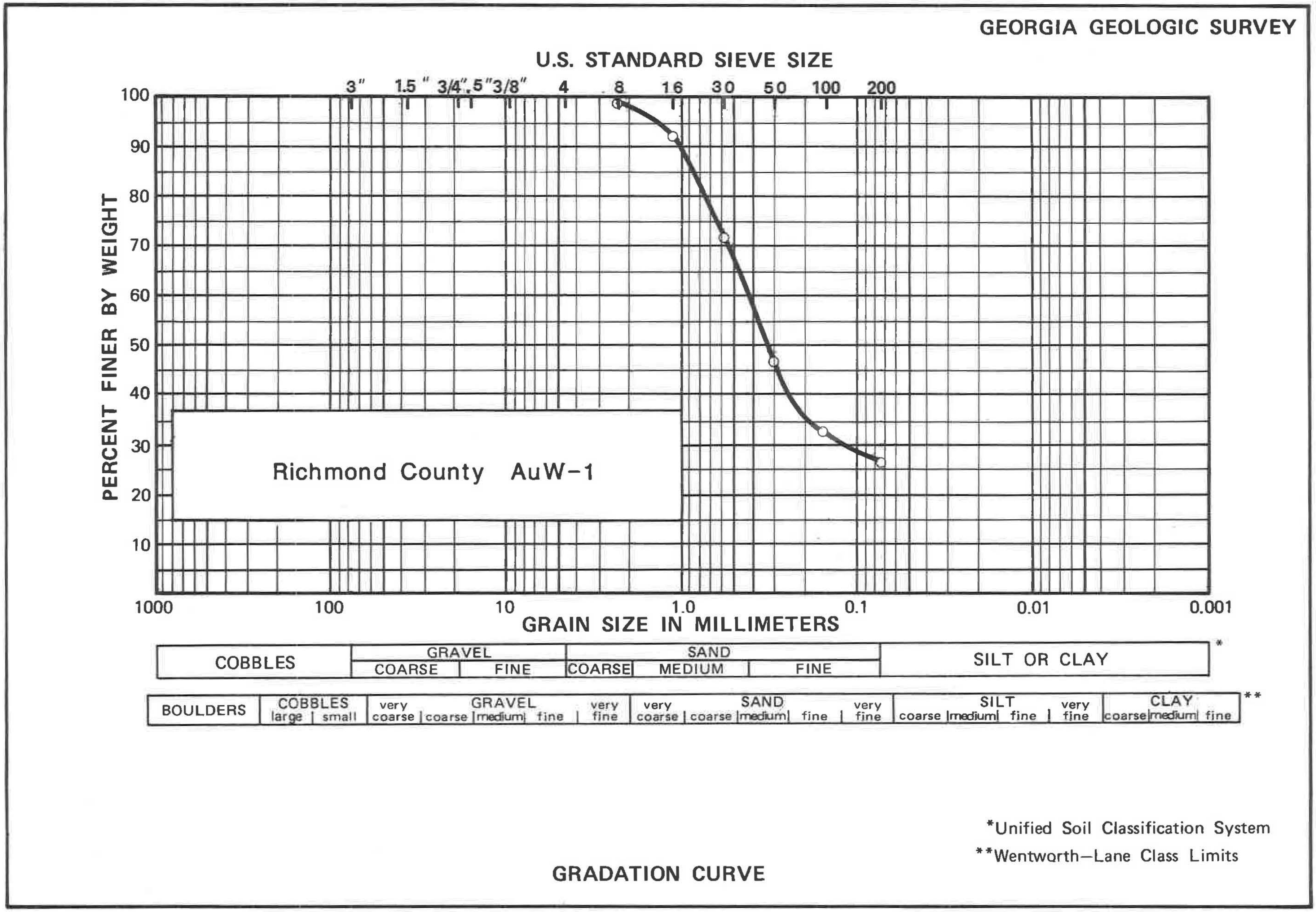


Figure 149. Size Distribution Curve of Sample AuW-1.

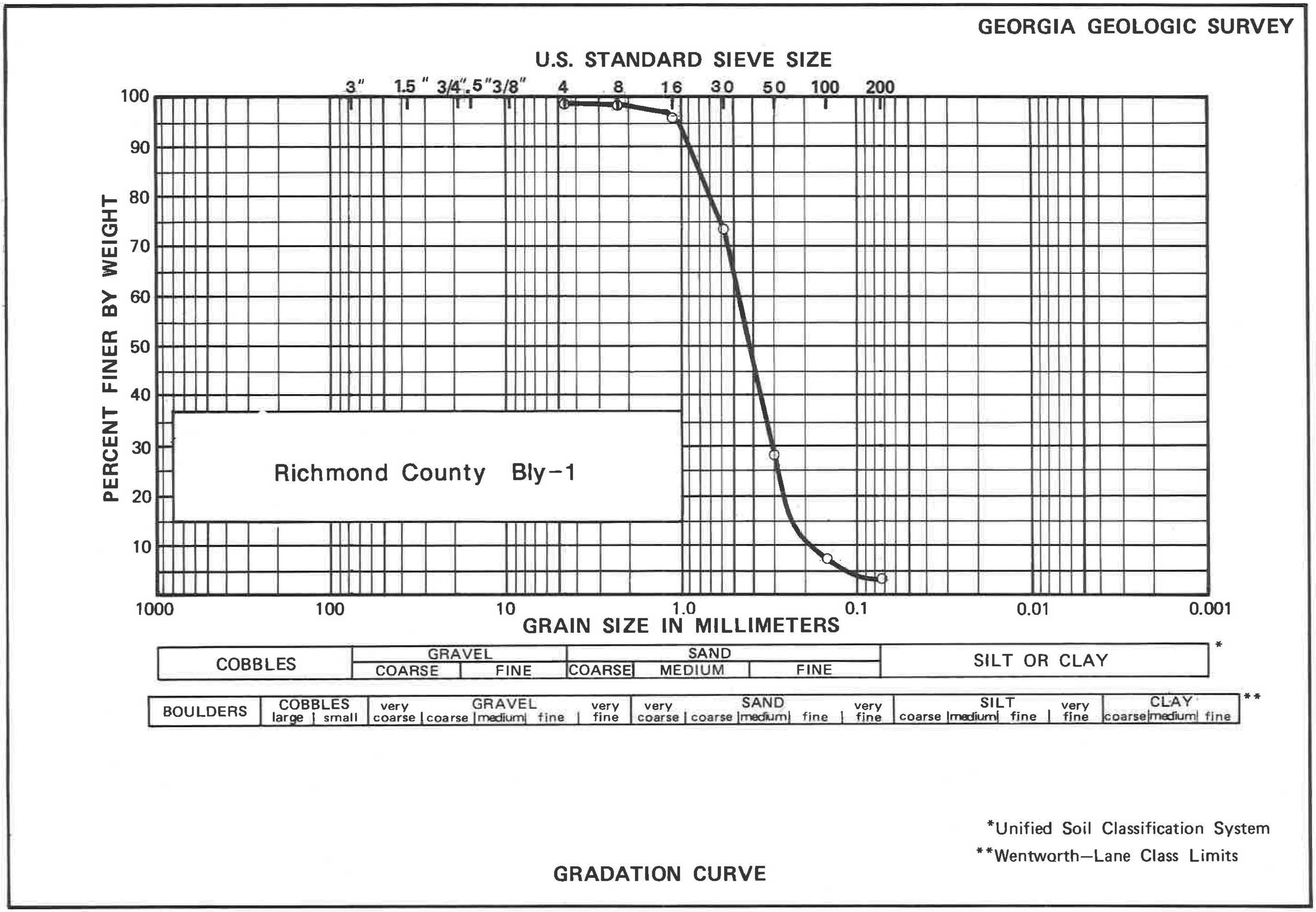


Figure 150. Size Distribution Curve of Sample Bly-1.

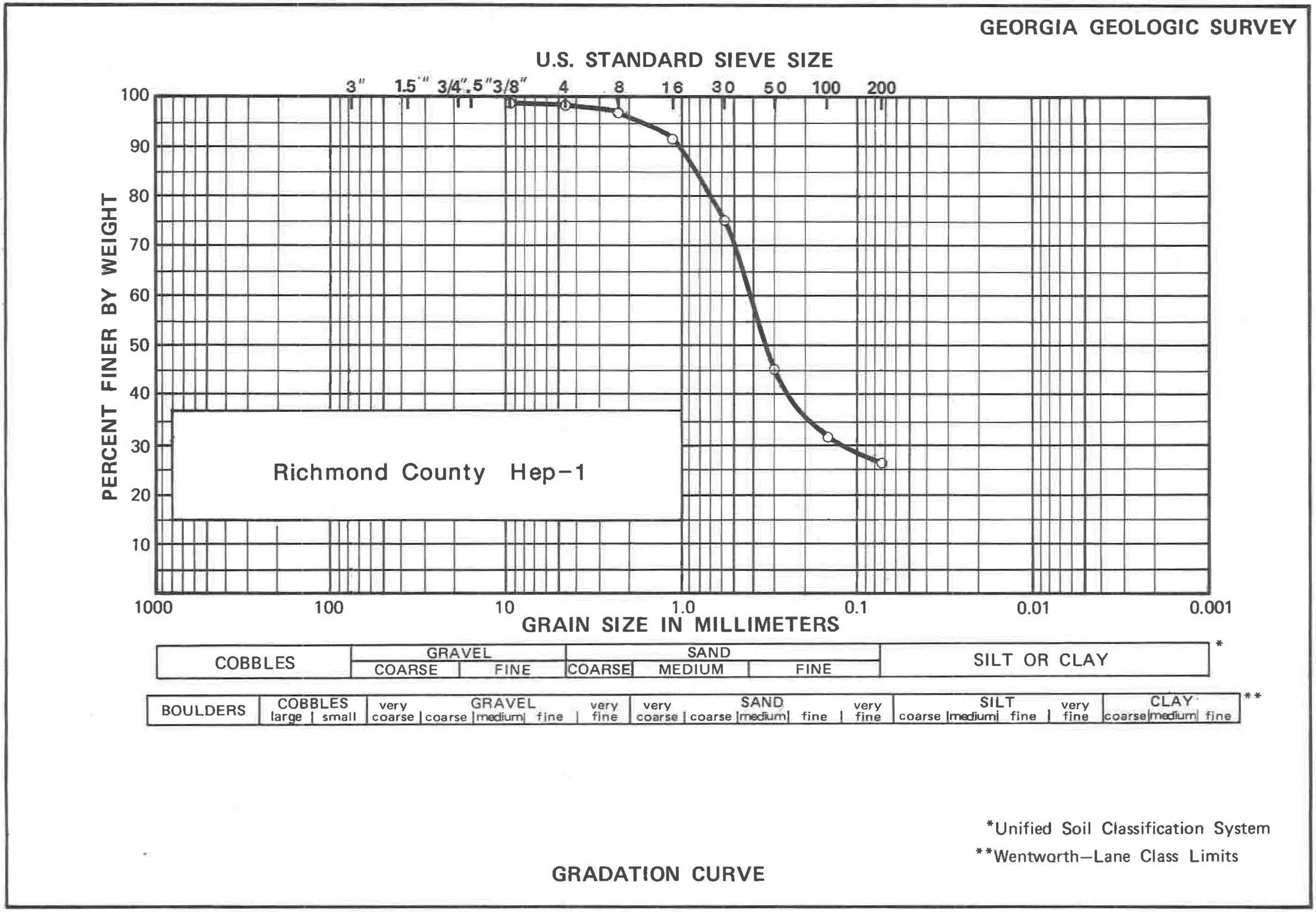


Figure 151. Size Distribution Curve of Sample Hep-1.

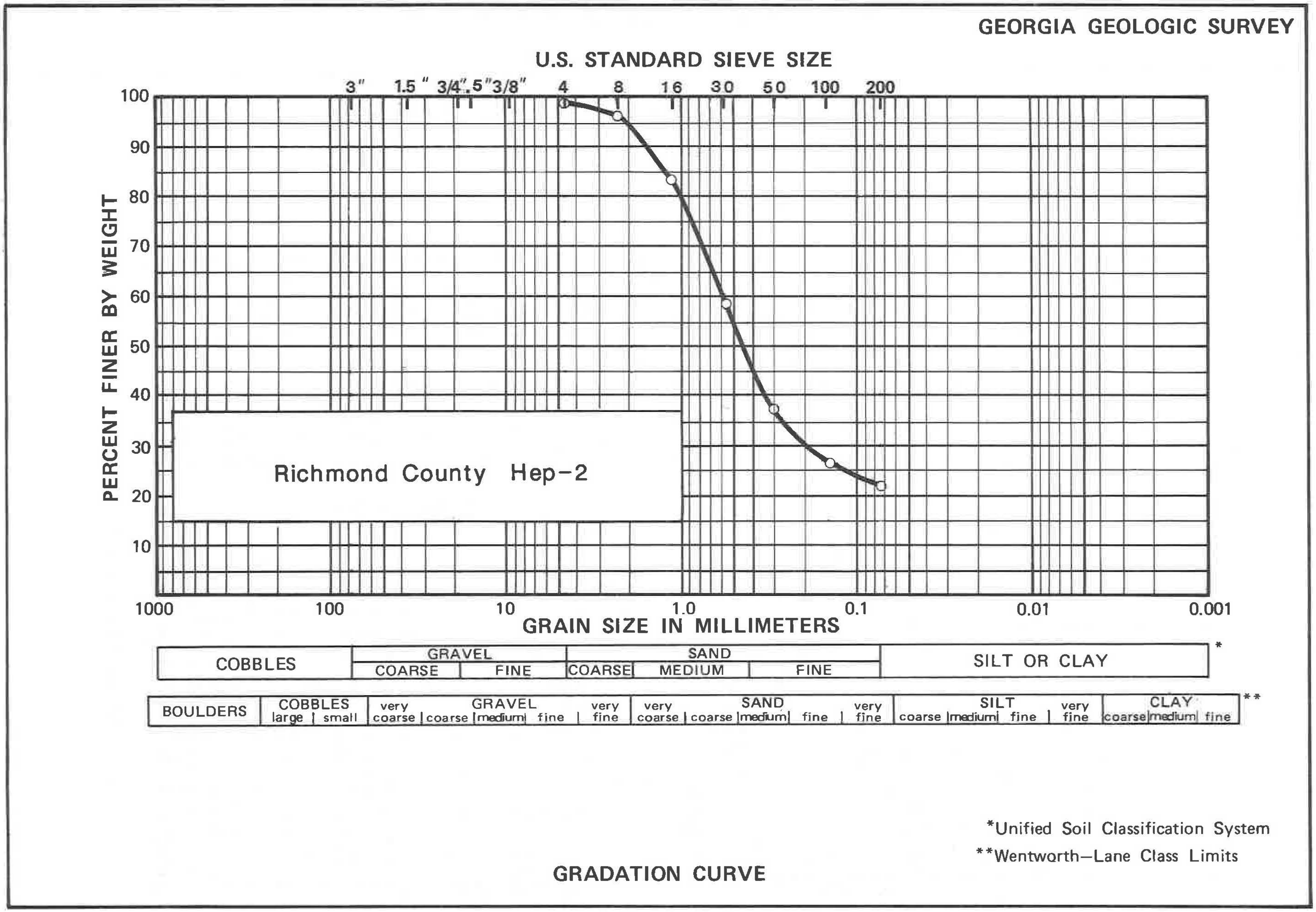


Figure 152. Size Distribution Curve of Sample Hep-2.

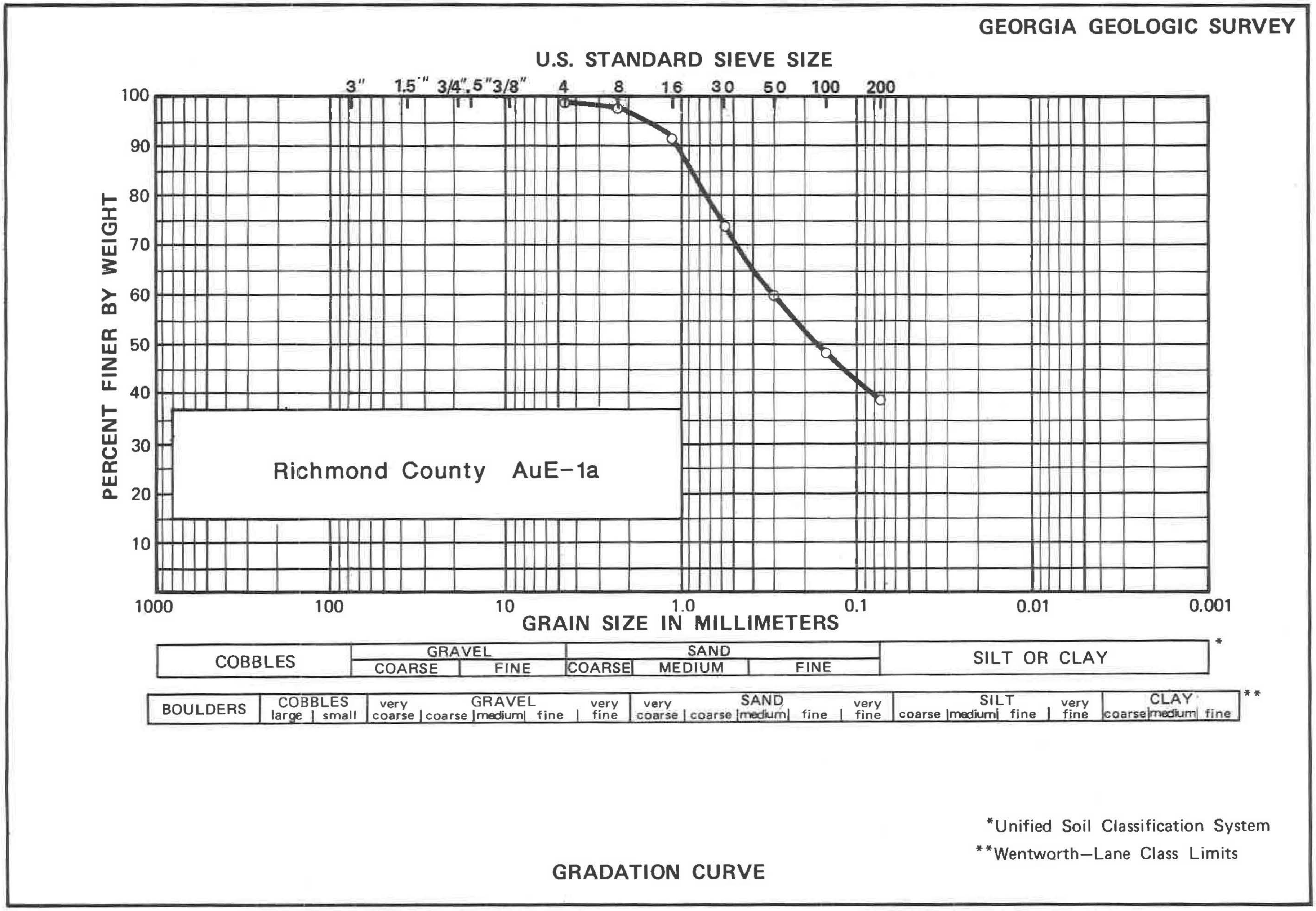


Figure 153. Size Distribution Curve of Sample AuE-1a.

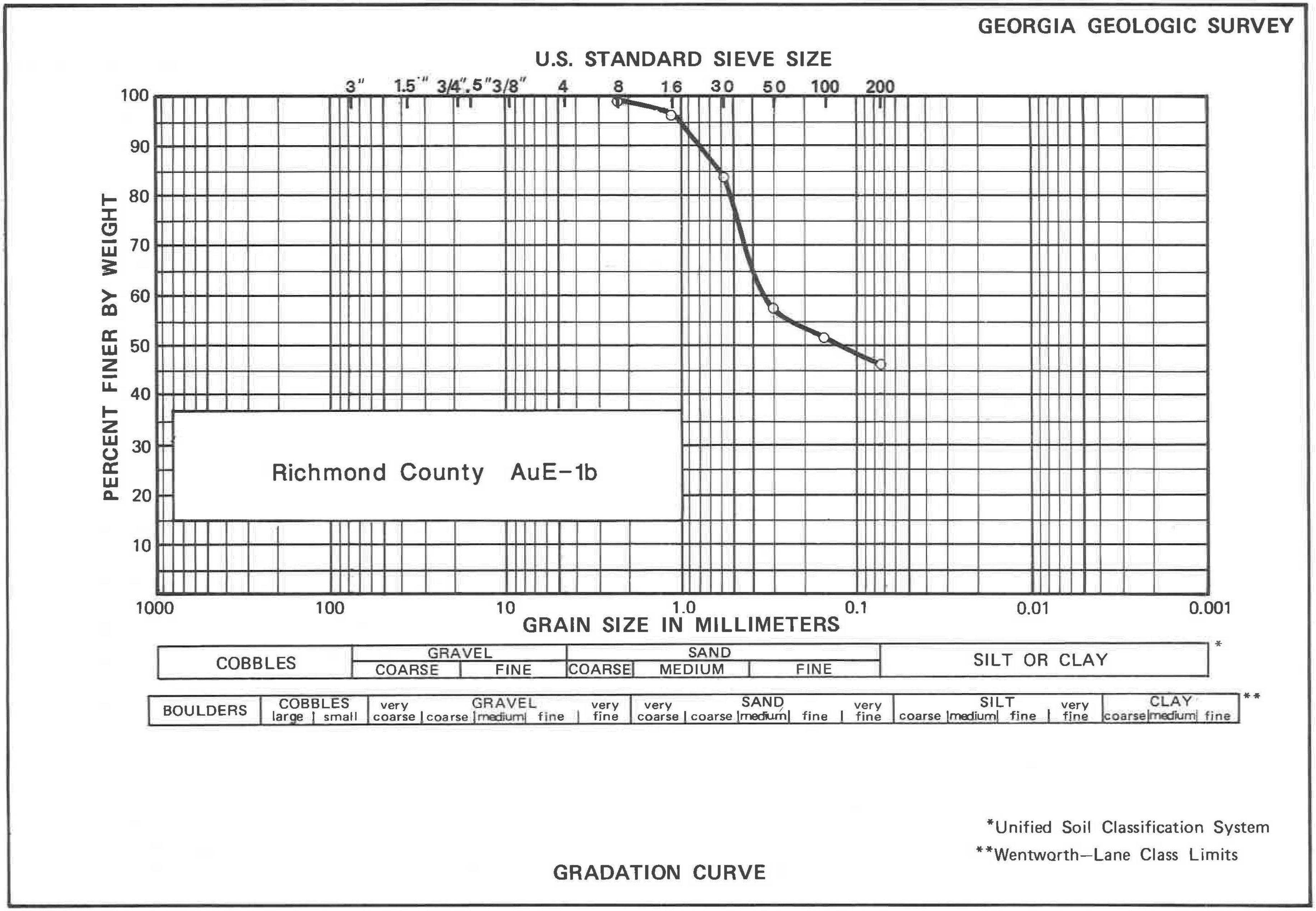


Figure 154. Size Distribution Curve of Sample AuE-1b.

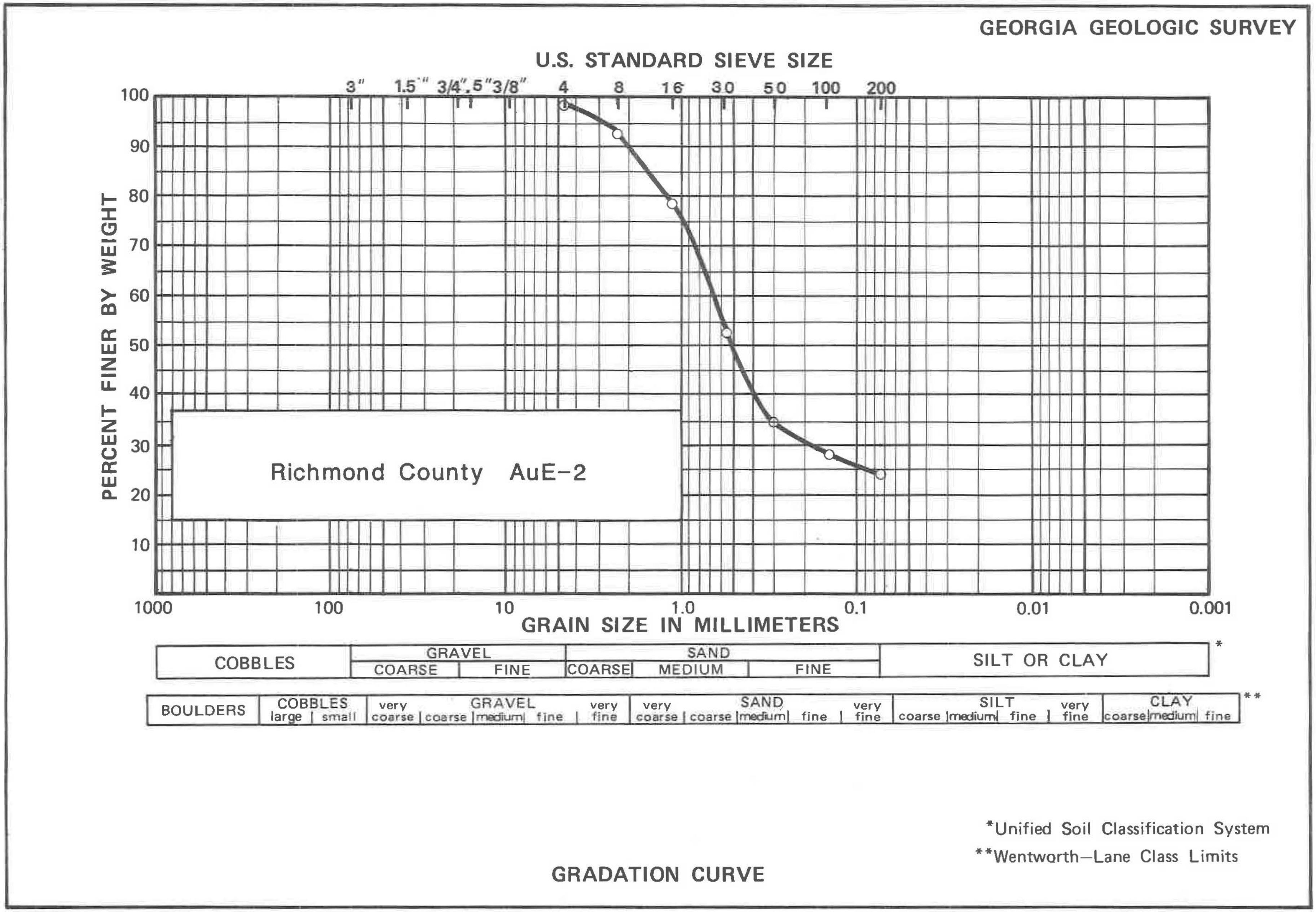


Figure 155. Size Distribution Curve of Sample AuE-2.

Table 24: Richmond County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
AuW-1	4-1/2	trench	4-1/2	2	no	1
Bly-1	10	auger	10	2	no	2
Hep-1	7-1/2	auger	20	1	no	1
Hep-2	5	trench	5	1	no[4]	1
AuE-1a	2-1/2	auger	2-1/2	2	no	1
AuE-1b	2-1/2	auger	2-1/2	2	no	1
AuE-2	7-1/2	auger	7-1/2	2	no[4]	1

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

Payton-Wren Sand Company of Augusta mined and has since reclaimed three 4 acre pits (Fig. 148, #287, #516, #667) and one 1 acre pit (Fig. 148, #114). No further information concerning these pits is available.

V.B. James Sand and Gravel Company of Augusta was permitted to mine a 20 acre tract. The product of this pit was fill sand with the mining depth being 12 feet and production less than 10,000 tons annually.

Other pits, about which there is no information include: Hutchinson Sand, James Pit, Kellas Pit, Clausson Lawrence Construction Pit, and the Simmons Septic Tank Pit.

Summary Evaluation

The fine aggregate production potential for Richmond County is considered to be moderate to high. The area of the county most likely to contain coarse aggregate is the floodplain of the Savannah River.

The deposits represented by samples Hep-2 and AuE-1 are too small for all but local use; however, it is possible that these deposits could be larger than expected.

SCREVEN COUNTY

Geology and Physiography

Screven County lies almost entirely within the Vidalia Upland District. The extreme southeastern part of the county lies within the Barrier Island District. The surficial sediments are derived primarily from the Altamaha Formation and the Cypresshead Formation. The remainder is comprised of Quaternary alluvium, Oligocene residuum, and Barnwell Group.

Previous Studies

Teas (1921, p. 237-238) reported that the Savannah and Ogeechee Rivers have extensive sand bars that could be useful for commercial aggregate (Fig. 156, Ts-35).

Hurst, et al. (1966, p. 383-385) reported several active sand pits in Screven County. CSRA 29 (Fig. 156) is the site of a sand pit on the east bank of Brier Creek, sporadically mined for glass sand. CSRA 30 (Fig. 156) is a fill dirt operation. Several small inactive pits are also reported (CSRA 31, CSRA 32, CSRA 33, and CSRA 34, Fig. 156).

Hurst, et al. (1966, p. 395) also noted some alluvial sand in Screven County. A sand dune east of Beaver Dam Creek is several miles long and 200-300 feet wide (Fig. 156, CSRA-58). The Ogeechee Creek bed near U.S. Highway 301 and Sylvania also contains possible aggregate sand (Fig. 156, CSRA 59). Gravel is reported near the western border on Ga. Highway 21 (Fig. 156, CSRA 60).

Present Study

The soil types used for targeting sites for sampling were #24 and #30 and are present in the southern and western third of the county.

Four samples were taken from four sites in Screven County : BSL-1, SyS-1, Hil-1, and Dov-1, (Figs. 156-160, Table 25).

Evaluation

None of the samples passed ASTM standard C-33 but two of the samples (BSL-1, SyS-1) represent deposits that could be upgraded. Samples Hil-1 and Dov-1 have too much fine-grained sand and silty material to be considered further.

Sample BSL-1 was taken from a sand bar on the Savannah River. The areal extent is approximately 1 acre and the estimated reserve is approximately 10,000 cubic yards. Sample SyS-1 represents a fine- to medium- to coarse-grained sand. The areal extent is approximately 2 acres, and has reserves probably exceeding 10,000 cubic yards.

Mining Activity

There are five inactive pits in Screven County. The products from these pits are unknown.

Summary Evaluation

Despite the fact that two of the samples show usable grain size, the small extent of these deposits severely limits their potential. The construction material potential for fine aggregate production in Screven County is considered to be low.

TATTNALL COUNTY

Geology and Physiography

Tattnall County lies within the Vidalia Upland District of the Coastal Plain Province except for the extreme eastern tip which lies within the Barrier Island District. The surficial sediments of the county are

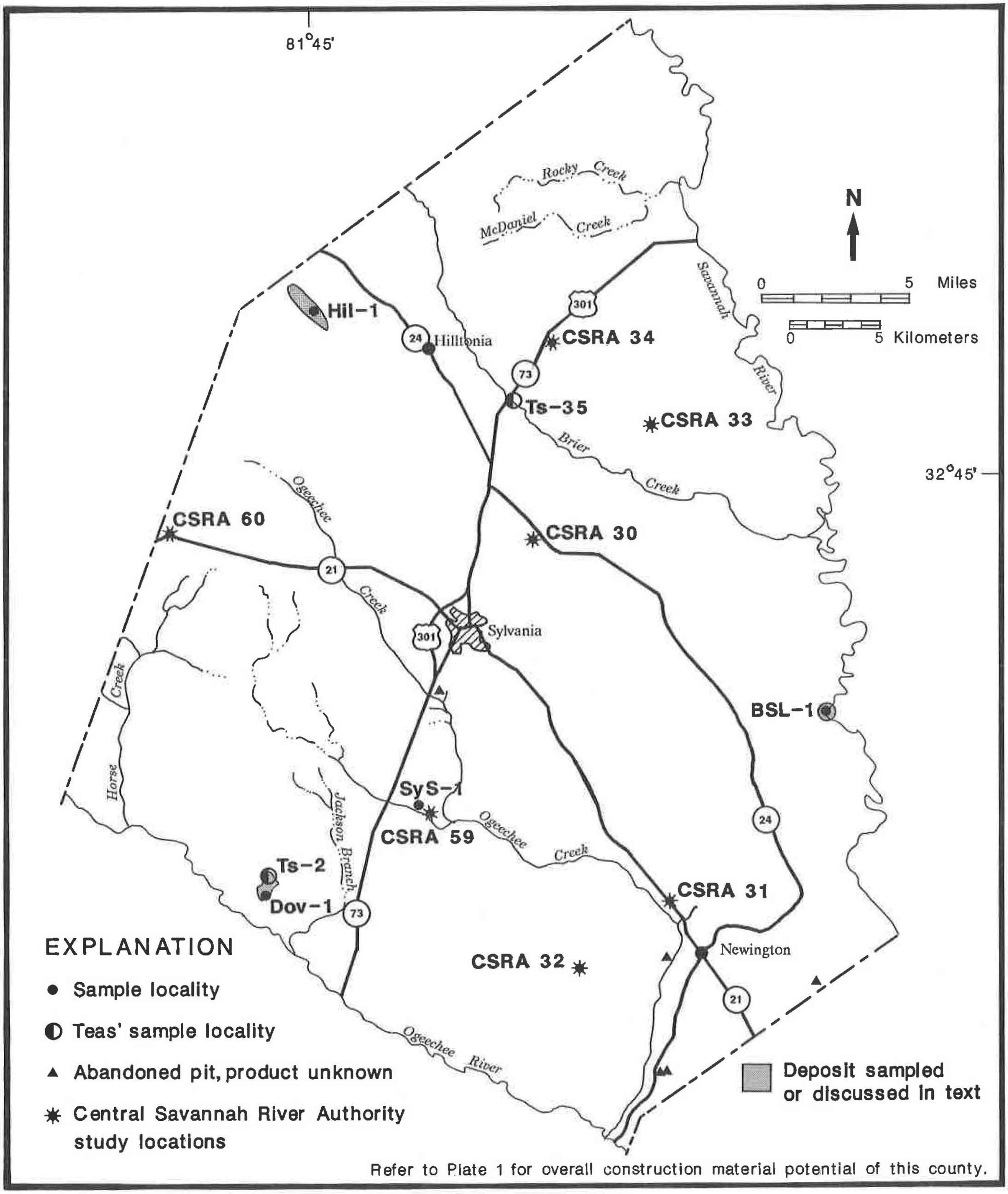


Figure 156. Map of Screven County Showing Localities and Deposits Sampled.

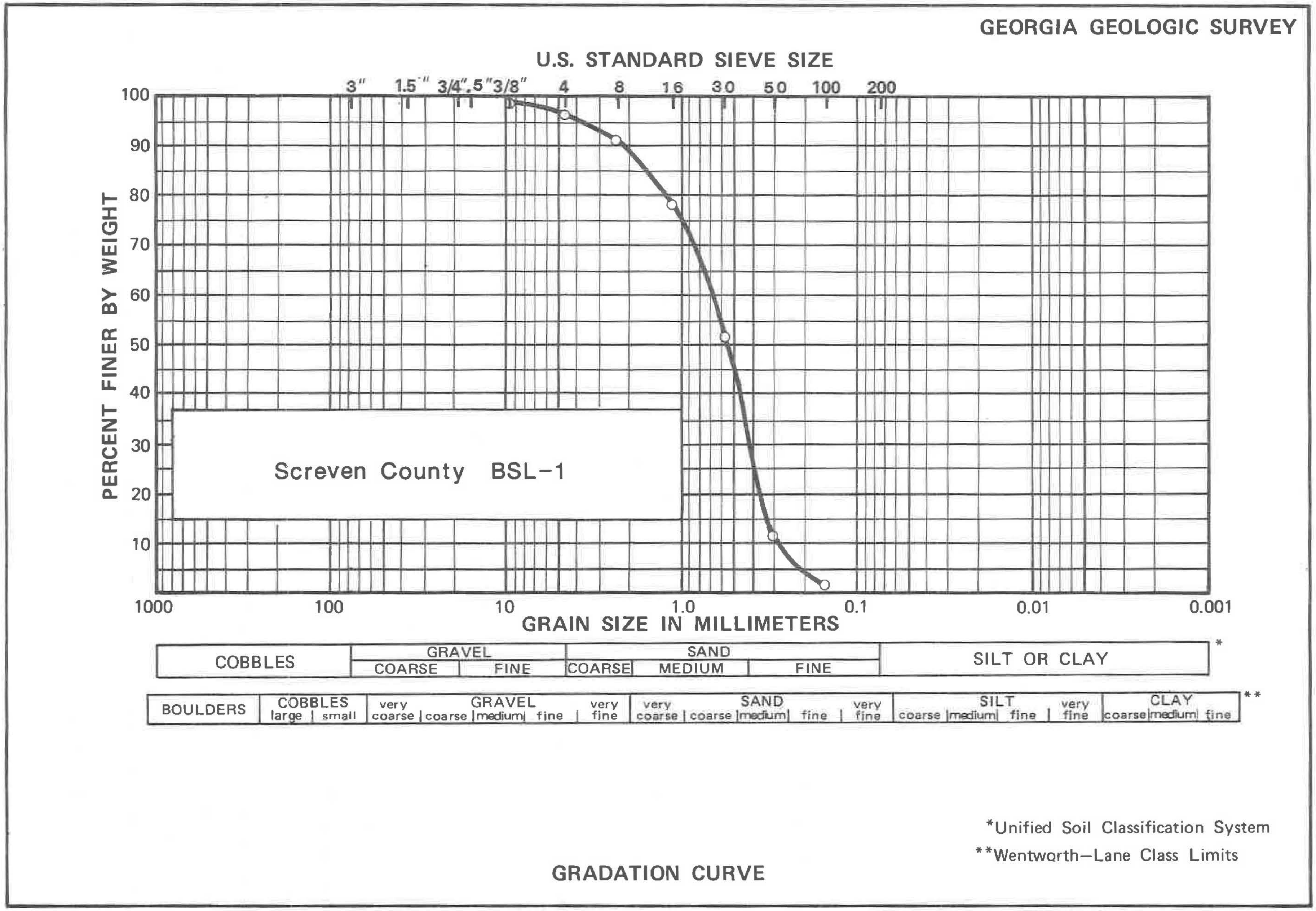


Figure 157. Size Distribution Curve of Sample BSL-1.

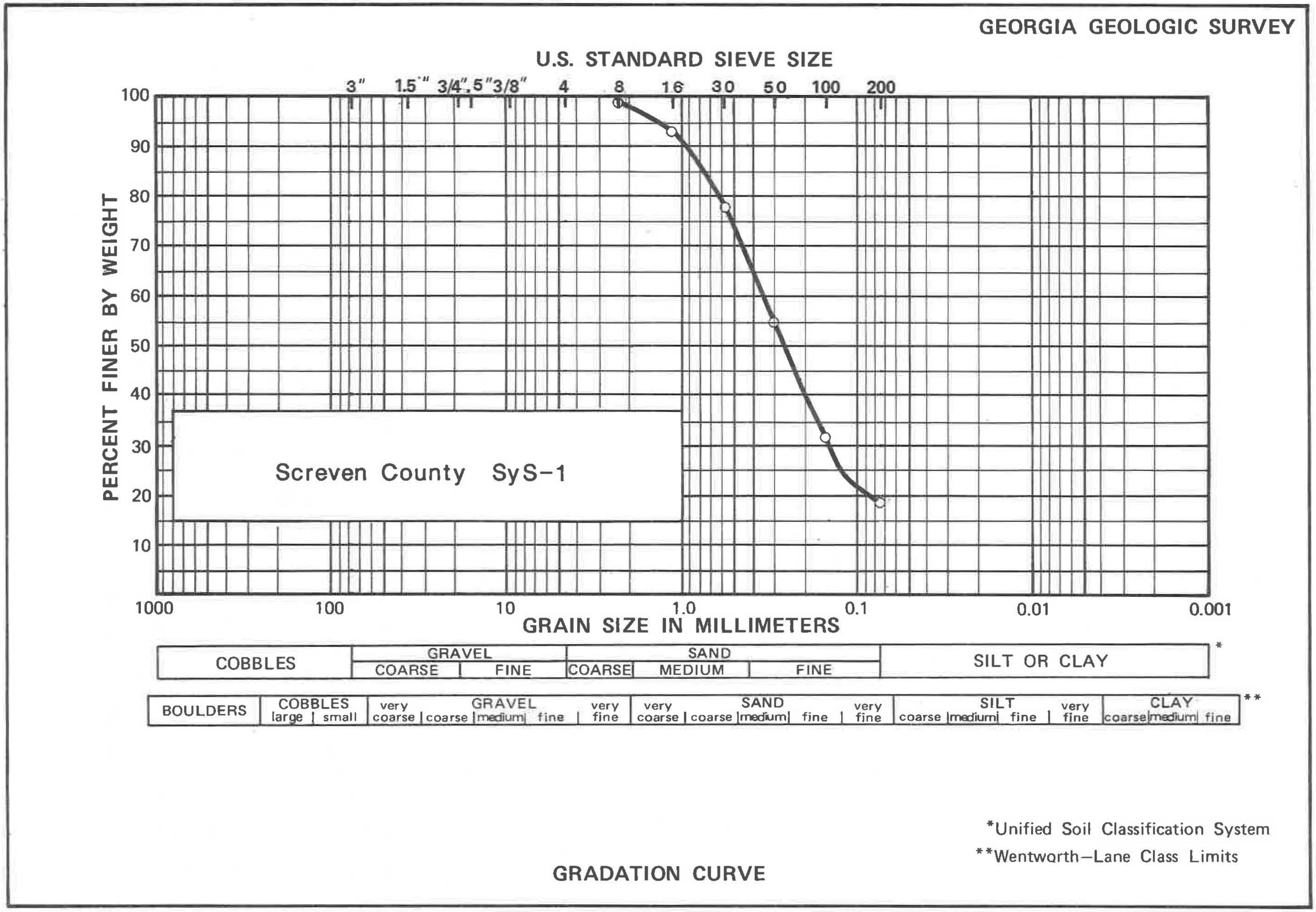


Figure 158. Size Distribution Curve of Sample SyS-1.

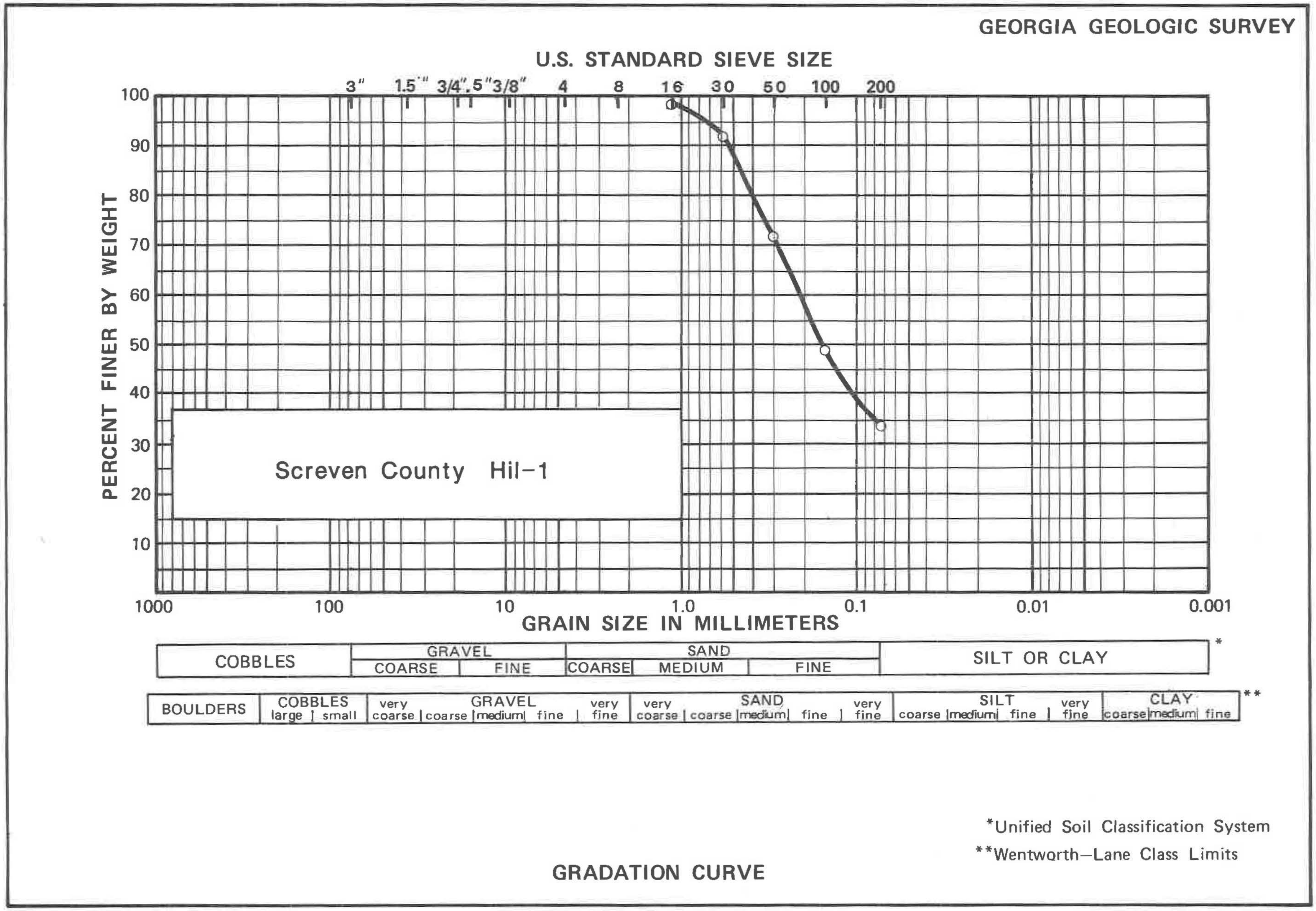


Figure 159. Size Distribution Curve of Sample Hil-1.

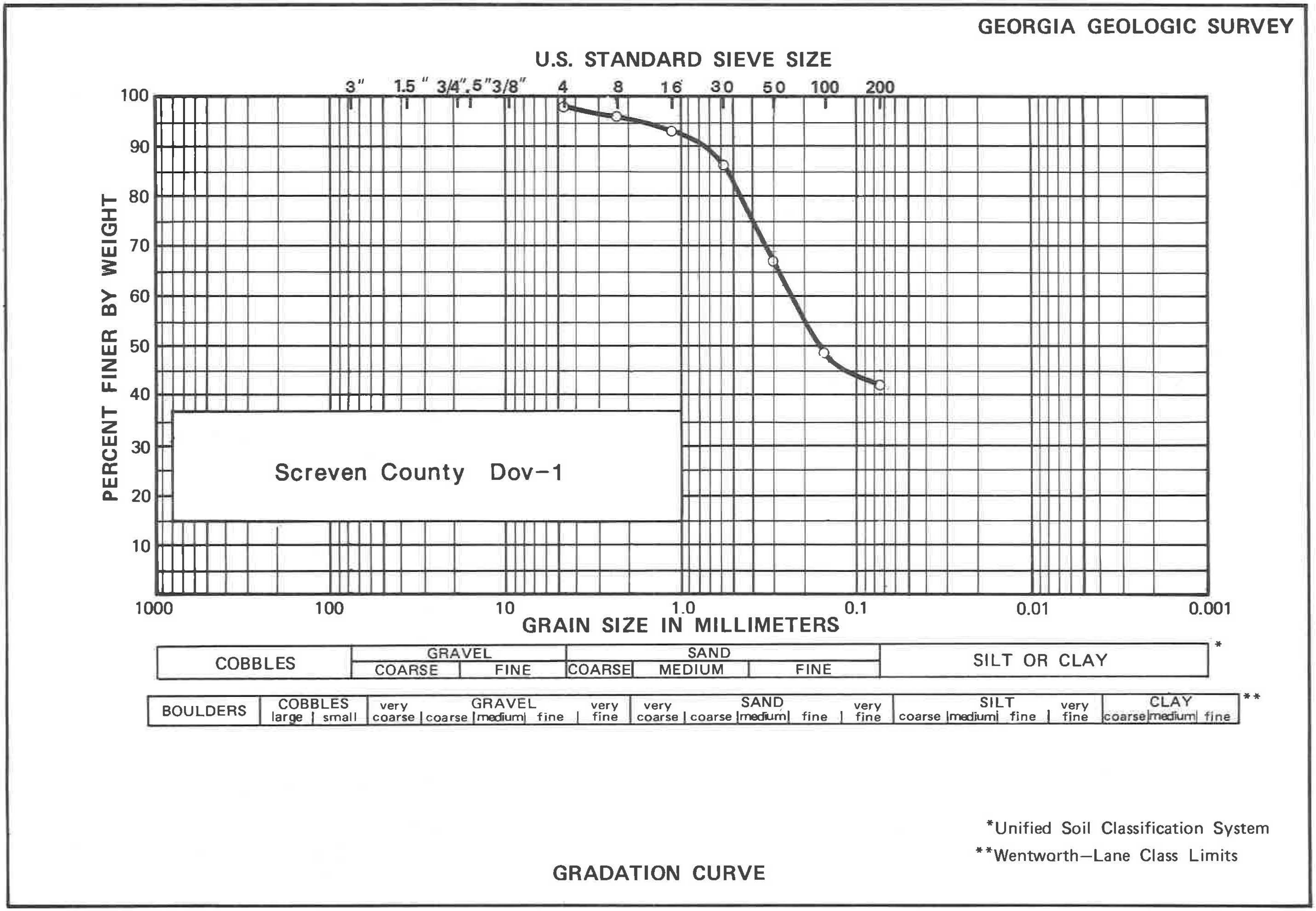


Figure 160. Size Distribution Curve of Sample Dov-1.

Table 25: Screven County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
BSL-1	4	auger	6	1	no[4]	2
SyS-1	9	auger	9	2	no[4]	1
Hil-1	2	trench	2	1	no	0
Dov-1	7-1/2	auger	7-1/2	2	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

derived from the Altamaha and Cypresshead Formations.

Previous Studies

Teas (1921, p. 250) noted that a belt of sand from 1 to 4 miles wide, varying from 4 to 25 feet in thickness, was present along the east side of the Ohoopee River from Battle Creek north to the county line (Fig, 161, Ts-36). Teas attributed the upper part of this sand to an aeolian origin, and the lower part to a flood-plain deposit.

Present Study

The soil series used in targeting areas of Tattnall County were the Kureb and Kershaw series which are present as dunes along the major streams of the county, particularly the eastern side of the Ohoopee River. Geomorphic features targeted were the dune fields along the Ohoopee River in western Tattnall County. Ten samples representing nine sites in Tattnall County were sieved: Tis-1, Tis-2, Oho-1, ASE-1, ASE-2, ASE-3, Alt-1a, Alt-1b, Cob-1, Rds-1, (Figs.161-171, Table 26). Samples ASE-3, Alt-1a, and Alt-1b are from point bars. The remaining seven samples are from the dune fields.

Evaluation

None of the samples meet ASTM standard C-33 for fine aggregate. The deposits represented by the dune samples contain tremendous reserves; however, due to their fine grain size and excellent sorting, their use as aggregate is quite limited. The two deposits represented by samples ASE-3 and Alt-1a and Alt-1b marginally failed to meet standard C-33 and could be upgraded to meet specifications.

The deposit represented by sample ASE-3 probably has an areal extent of 10 acres and a minimal thickness of 4 feet. Reserves, assuming a 10 acre tabular body 4 feet thick, are approximately 64,000 cubic yards.

The deposit represented by samples Alt-1a and Alt-1b is relatively small with minimal reserves of approximately 6,000 cubic yards.

Mining Activity

Currently, there are two inactive sand pits in Tattnall County. The Satilla Sand Company was permitted to mine 5 acres (Fig. 161, #698). This pit has since been reclaimed and no further information is available. Tattnall County operated a 1 acre pit for road- building material for the county (Fig. 161, #815). No further information is available.

Summery Evaluation

The potential for fine aggregate production in Tattnall County is considered to be low to moderate. The deposits represented by samples ASE-3 and Alt-1a and Alt-1b are relatively small and not readily accessible. Commercial size deposits may exist within the county. The most promising areas are within the flood plain of the Altamaha River.

TOOMBS COUNTY

Geology and Physiography

Toombs County lies entirely within the Vidalia Uplands District. The surficial sediments of Toombs County are derived primarily from the Altamaha Formation and the Hawthorne Group, with some Quaternary alluvium.

Previous Studies

Teas (1921, p. 264) reported that a fine- to medium-grained sand belt is present along Pendleton Creek throughout the county (Fig. 172, Ts-37).

Present Study

The soil series used in targeting areas for sampling were the Paola and Kershaw series. These are present in interfluve areas throughout the county. Four samples were taken in Toombs County: OkP-1, Lyo-1, BNE-3, JnC-1 (Figs. 172-176, Table 27).

Evaluation

None of the samples passed ASTM standard C-33, but some of them represent deposits that could be upgraded. The deposit represented by OkP-1 is an extensive dune along Pendleton Creek. The sand is approximately 7-1/2 feet thick, fine- to medium-grained, and has some pebbles present. The areal extent of the deposit is approximately 300 acres, with possible reserves of 3 million cubic yards of sand.

The deposit represented by sample Lyo-1, which marginally failed ASTM standard C-33, is a sixteen-foot high sand dune. This deposit is composed of very fine-to medium-grained sand with minor amounts of coarse material. The areal extent is approximately 20 acres, and has possible reserves in excess of 200,000 cubic yards of sand.

Sample JnC-1 contains too great a percentage of fine grained material to be considered further.

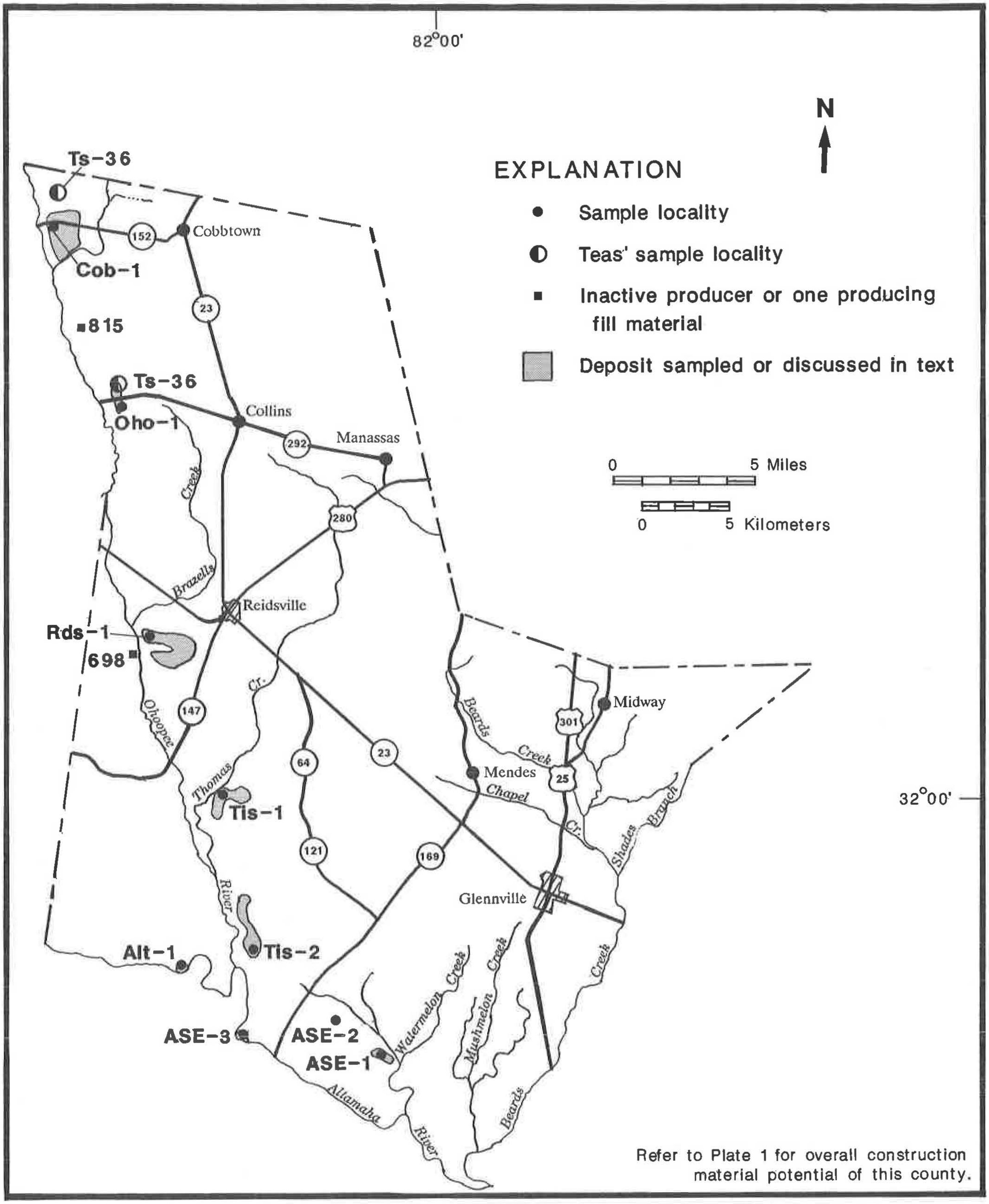


Figure 161. Map of Tattnall County Showing Localities and Deposits Sampled.

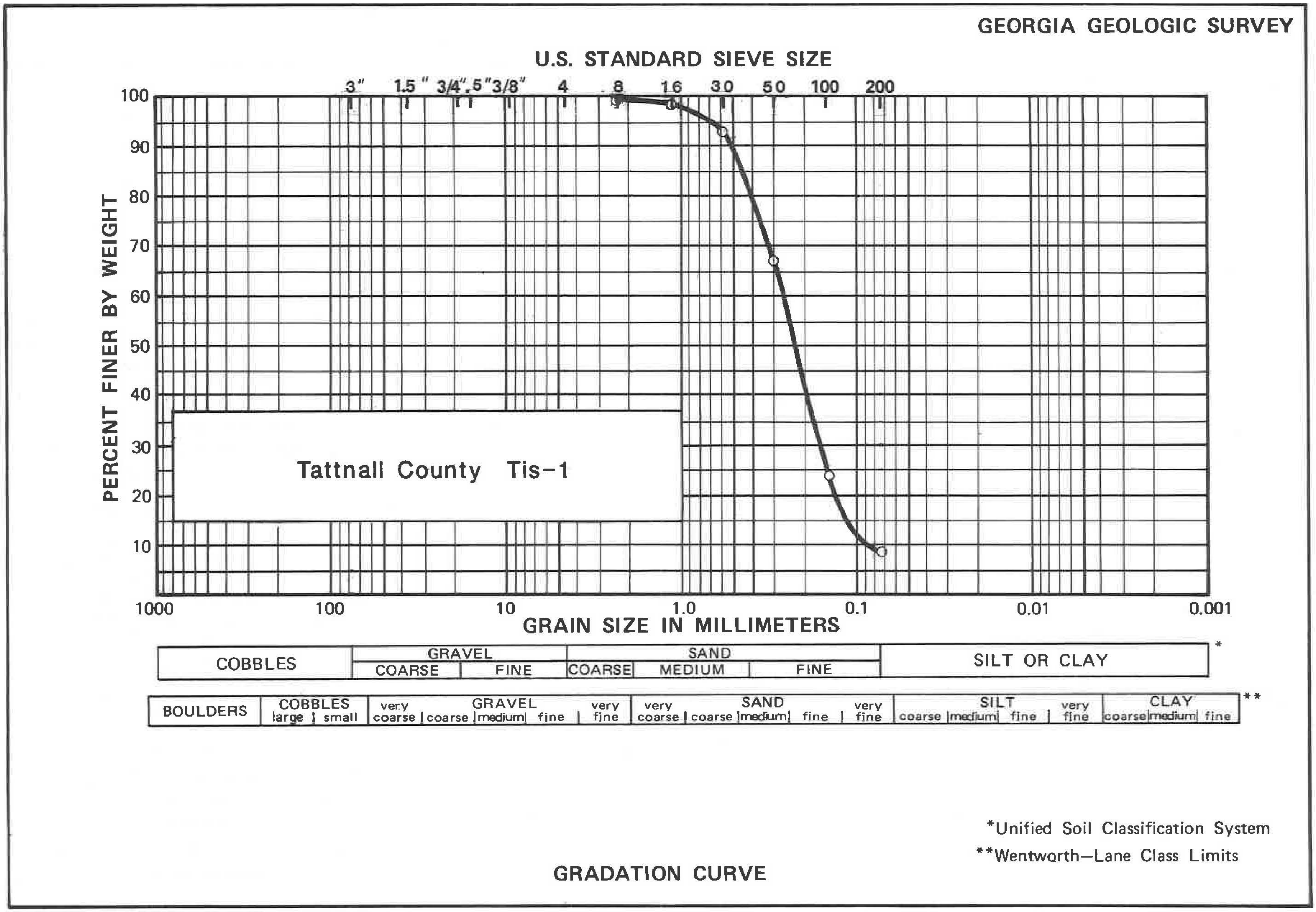


Figure 162. Size Distribution Curve of Sample Tis-1.

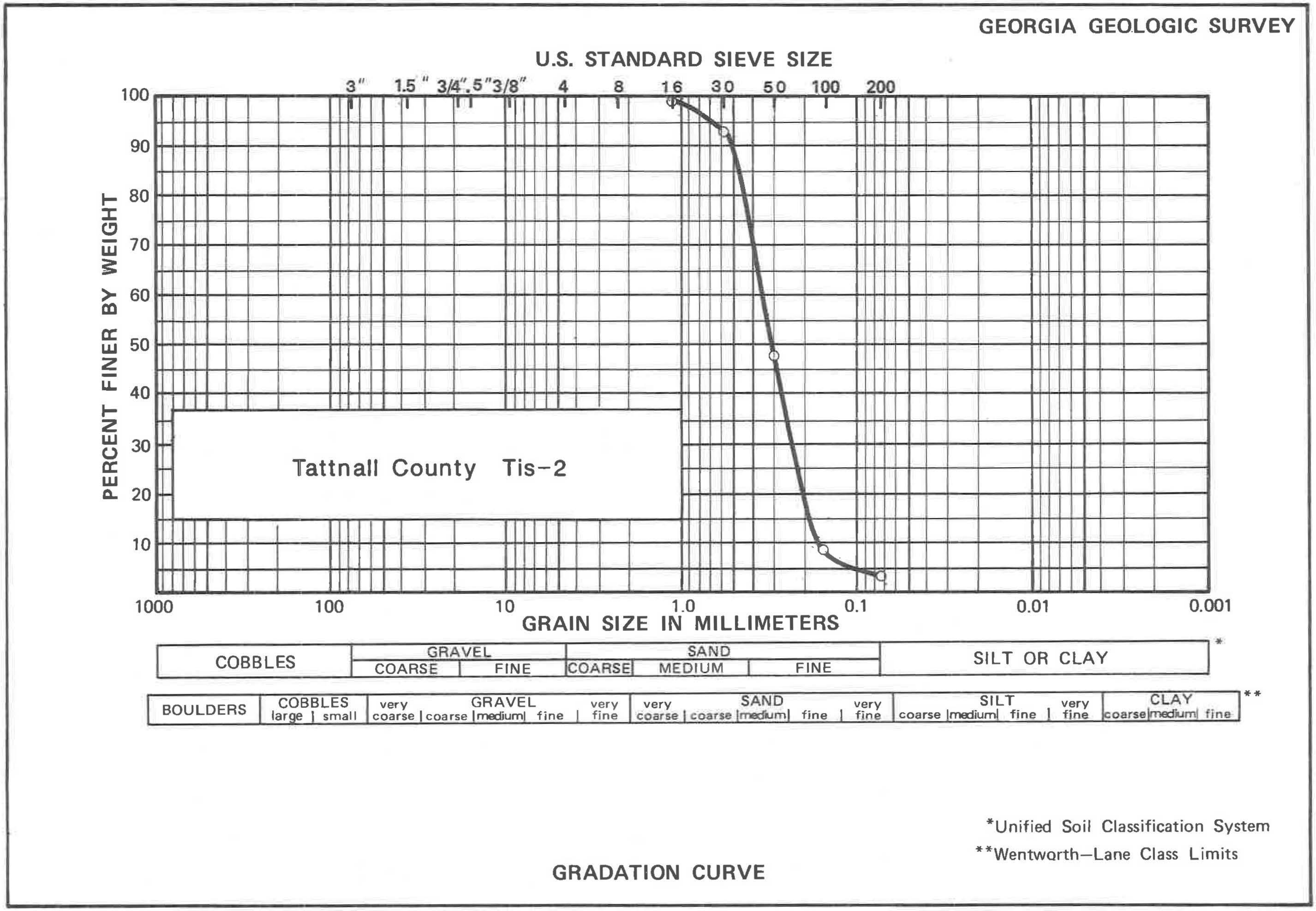


Figure 163. Size Distribution Curve of Sample Tis-2.

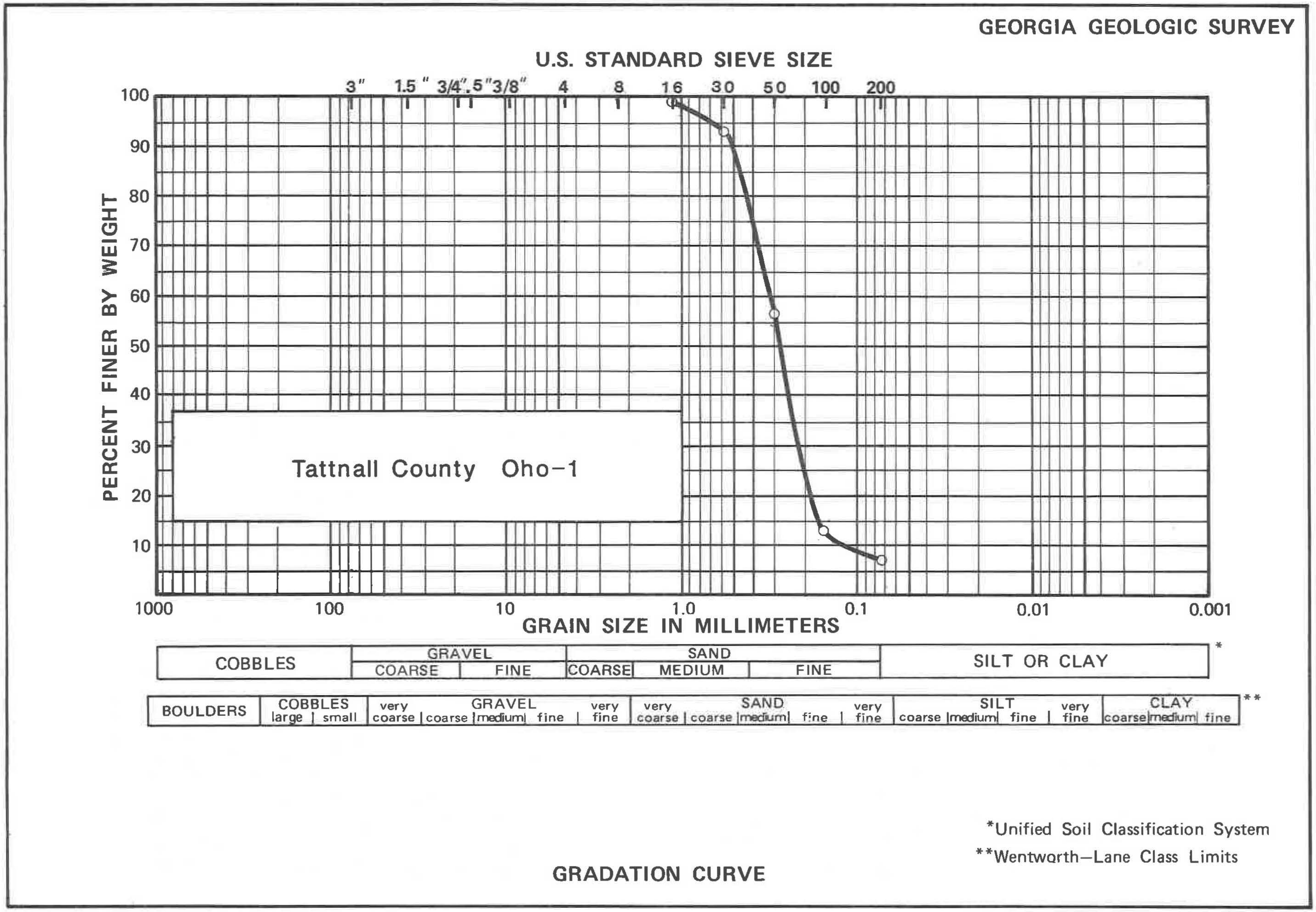


Figure 164. Size Distribution Curve of Sample Oho-1.

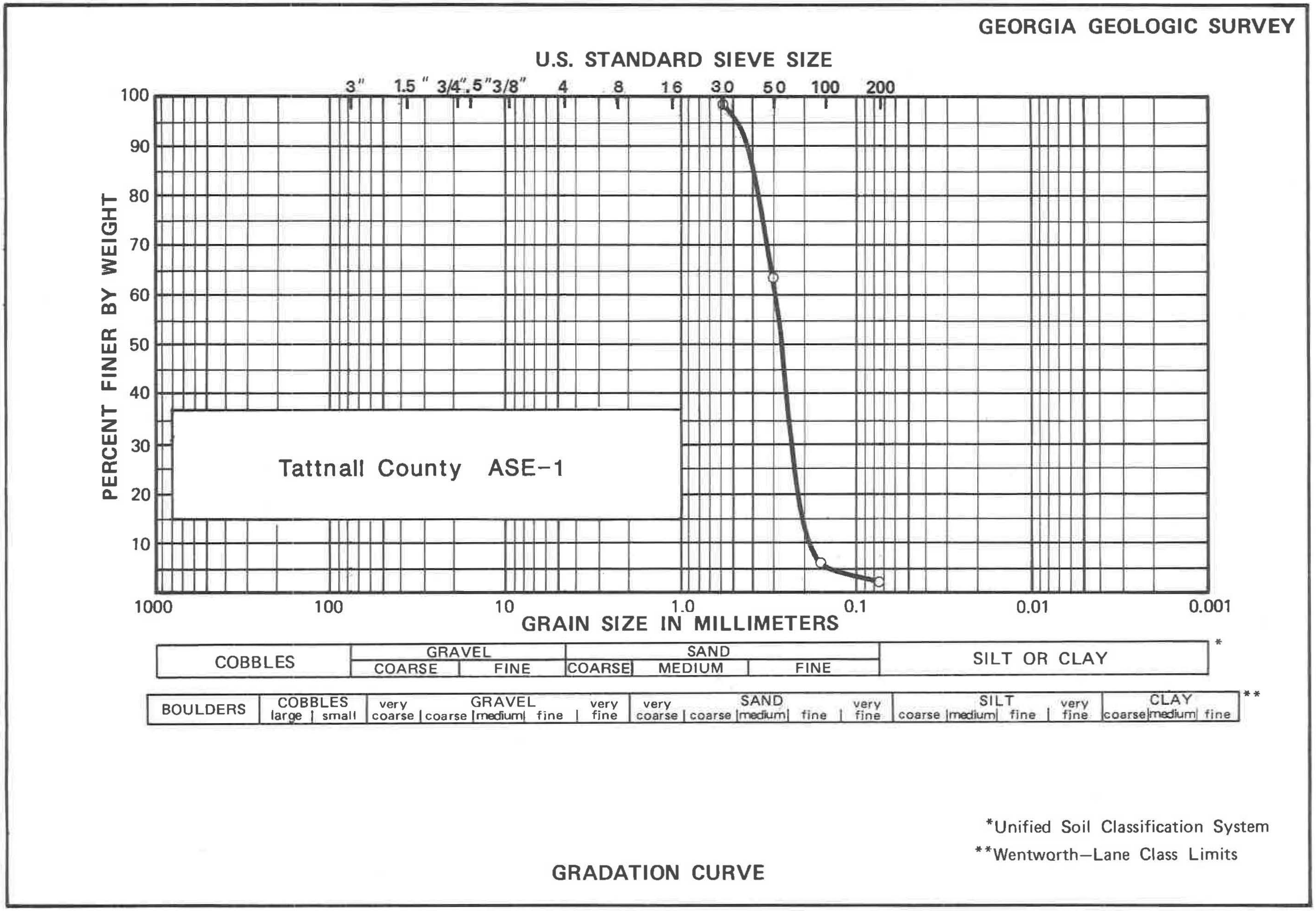


Figure 165. Size Distribution Curve of Sample ASE-1.

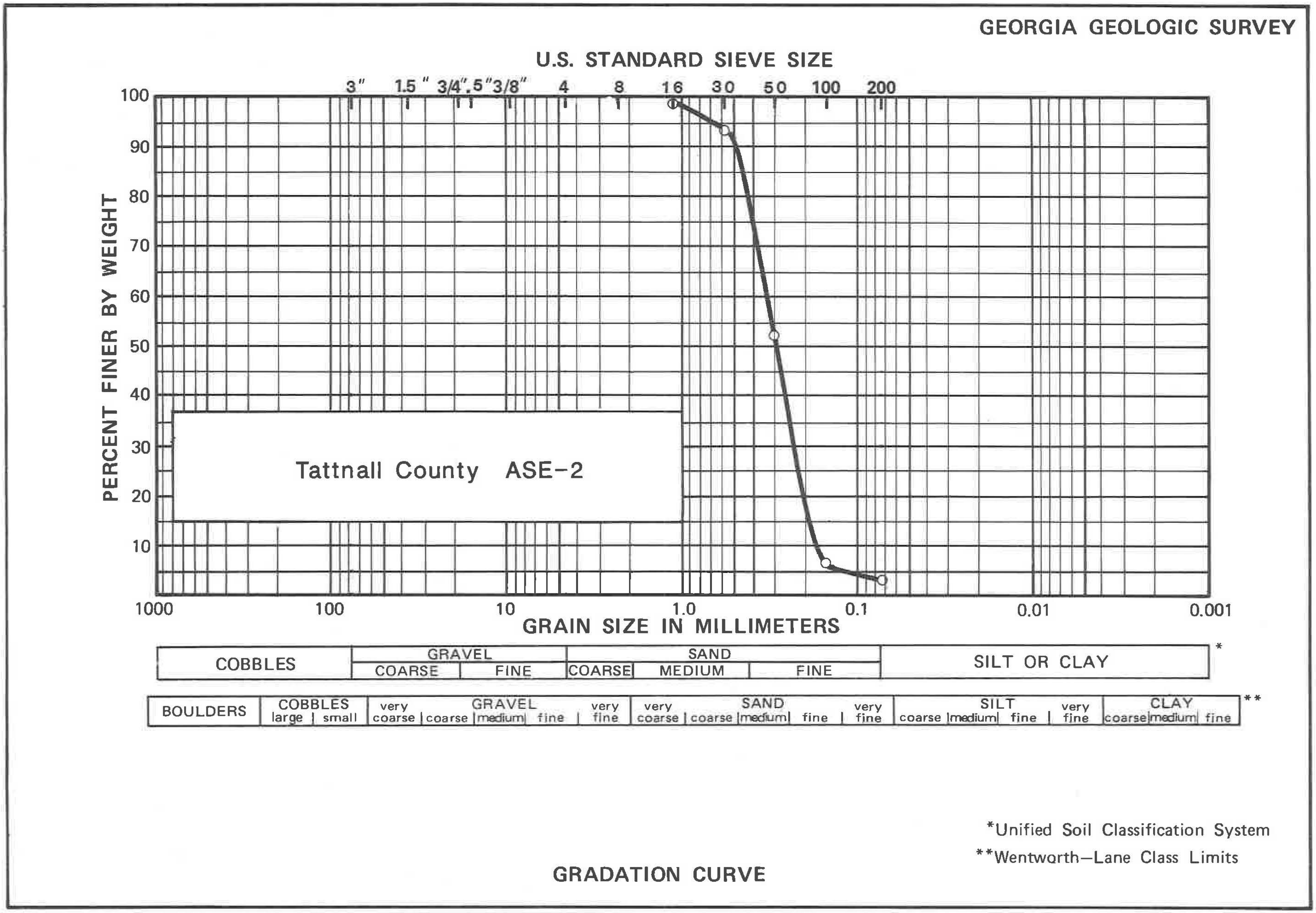


Figure 166. Size Distribution Curve of Sample ASE-2.

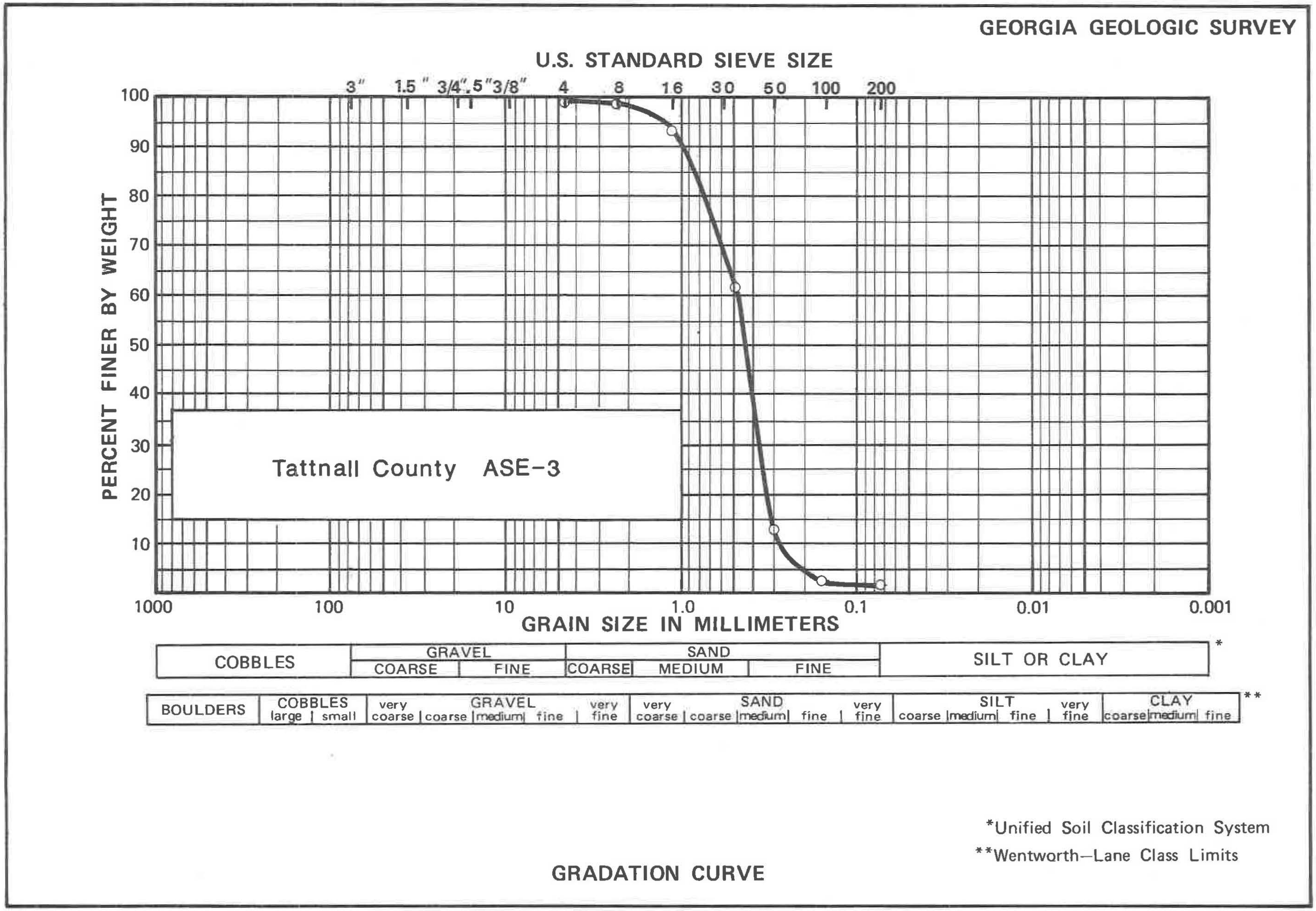


Figure 167. Size Distribution Curve of Sample ASE-3.

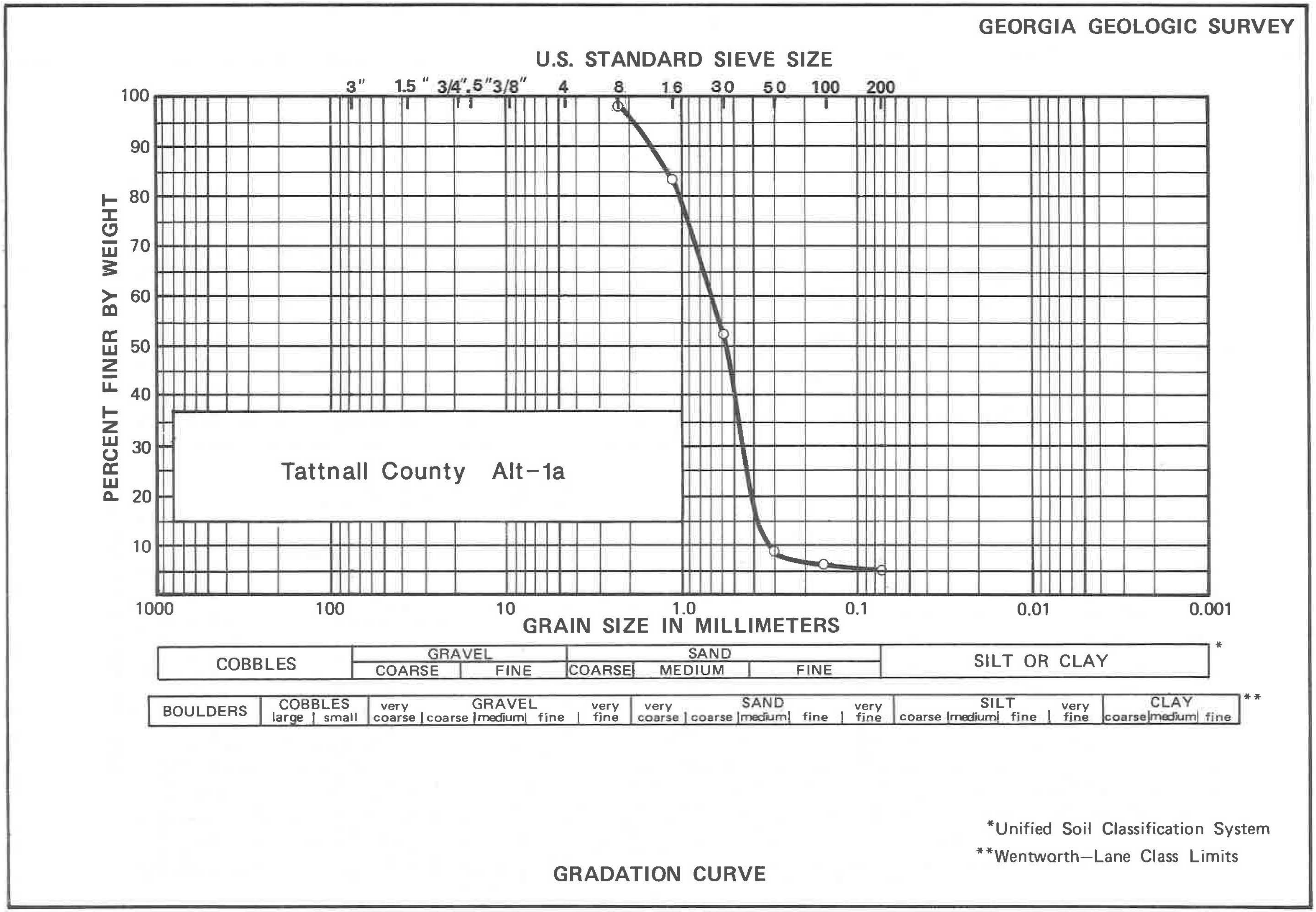


Figure 168. Size Distribution Curve of Sample Alt-1a.

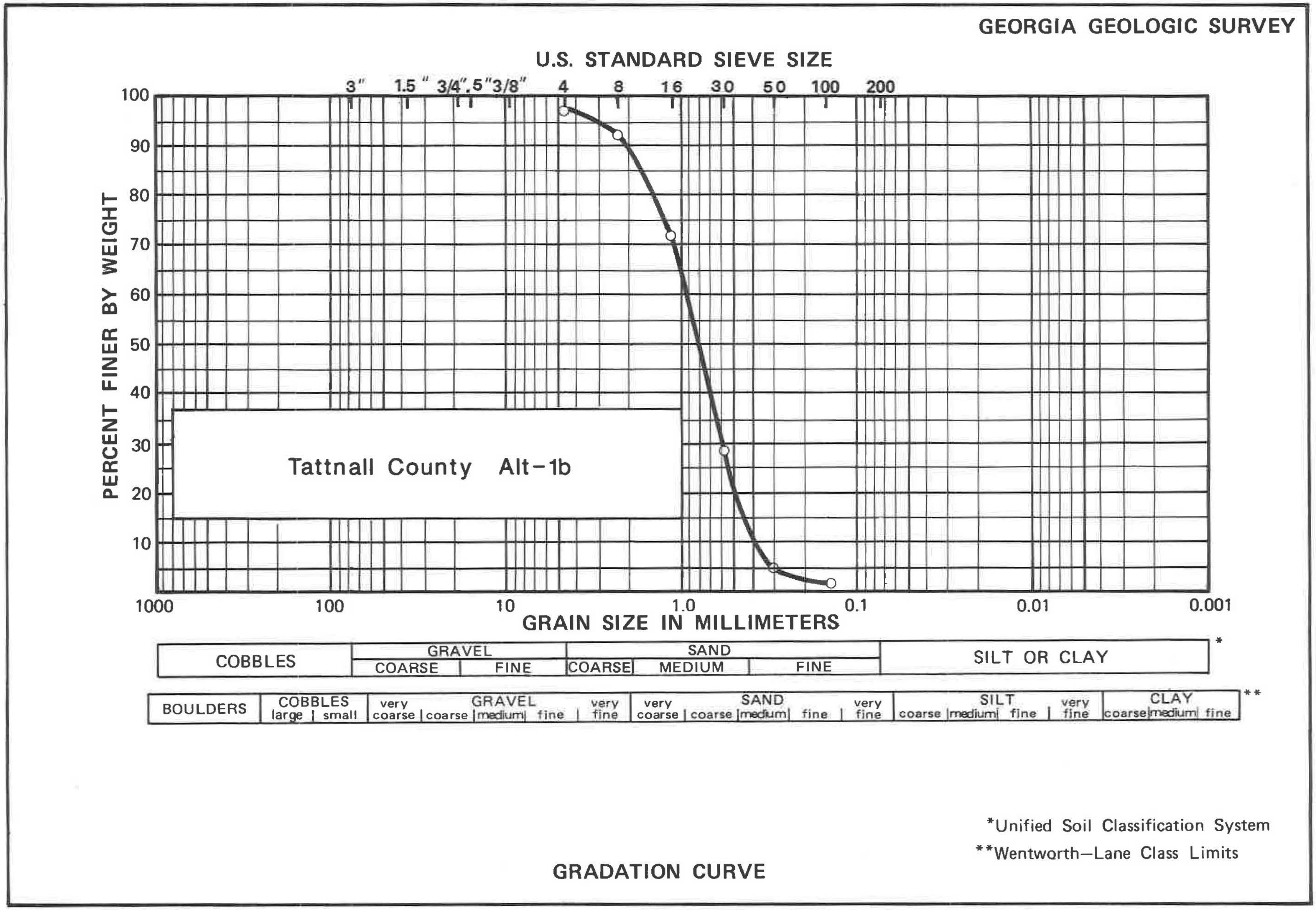


Figure 169. Size Distribution Curve of Sample Alt-1b.

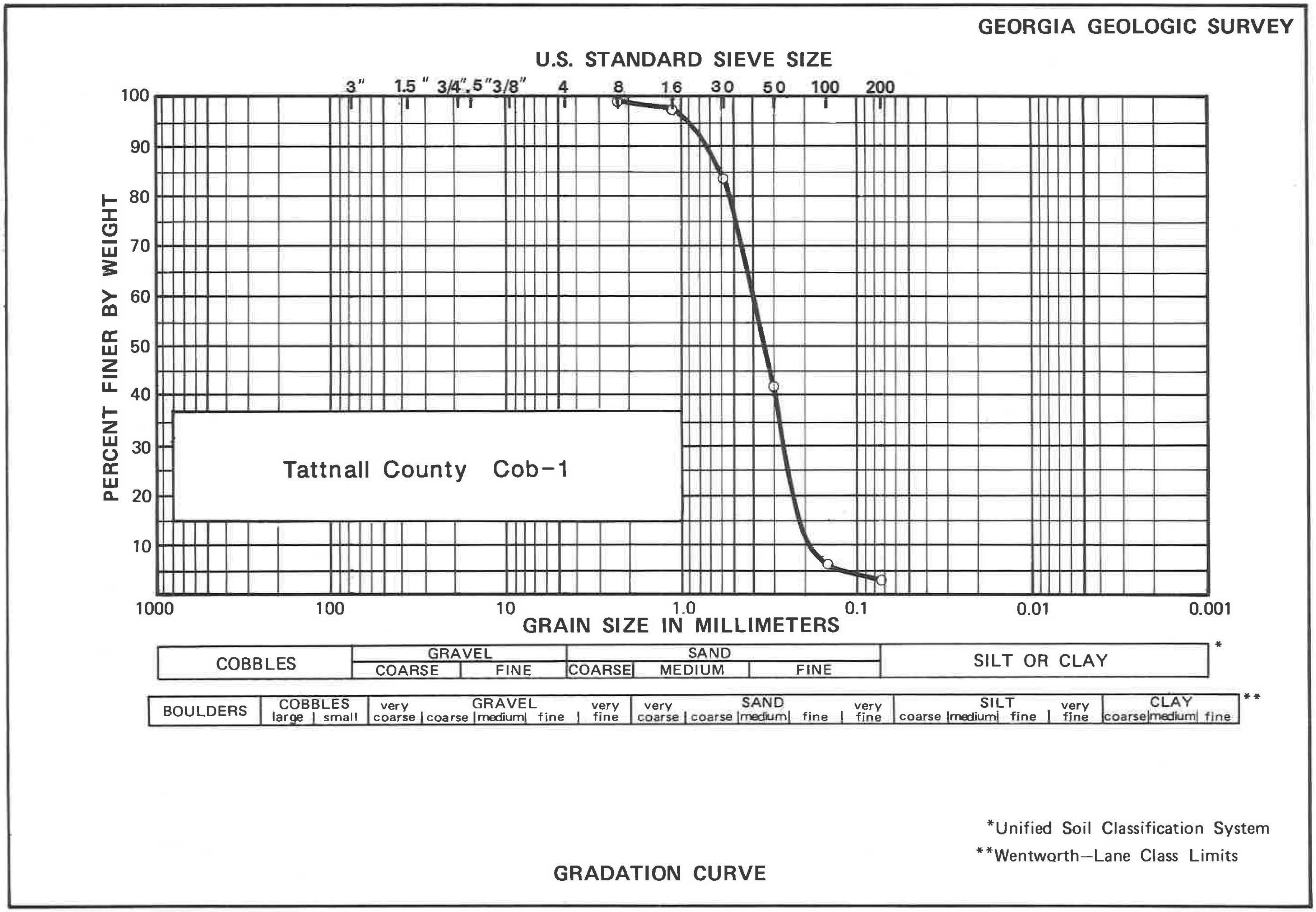


Figure 170. Size Distribution Curve of Sample Cob-1.

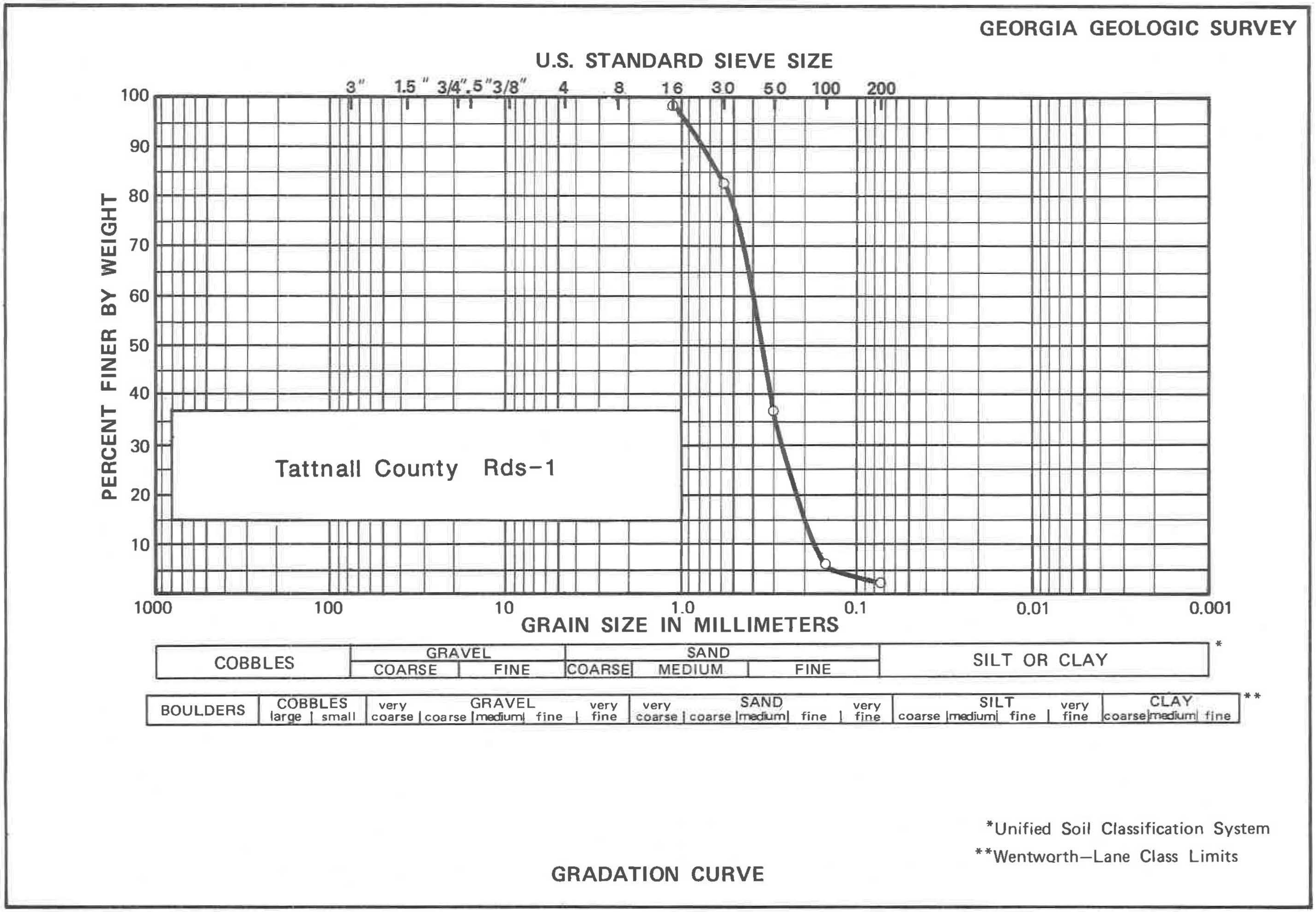


Figure 171. Size Distribution Curve of Sample Rds-1.

Table 26: Tattnall County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
Tis-1	10	auger	10	1	no	2
Tis-2	12	auger	12	2	no	2
Oho-1	20	trench	20	2	no	2
ASE-1	4	trench	8	2	no	1
ASE-2	16	trench	16	1	no	2
ASE-3	4	auger	4	1	no[4]	2
Alt-1a	4	auger	4	1	no[4]	2
Alt-1b	4	auger	4	1	no[4]	2
Cob-1	25	trench	25	3	no	2
Rds-1	8	trench	8	3	no	2

[1] For trench samples this figure is the vertical length of the trench.

[2] Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3] Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4] Marginally failed ASTM C-33, can be upgraded to meet specifications.

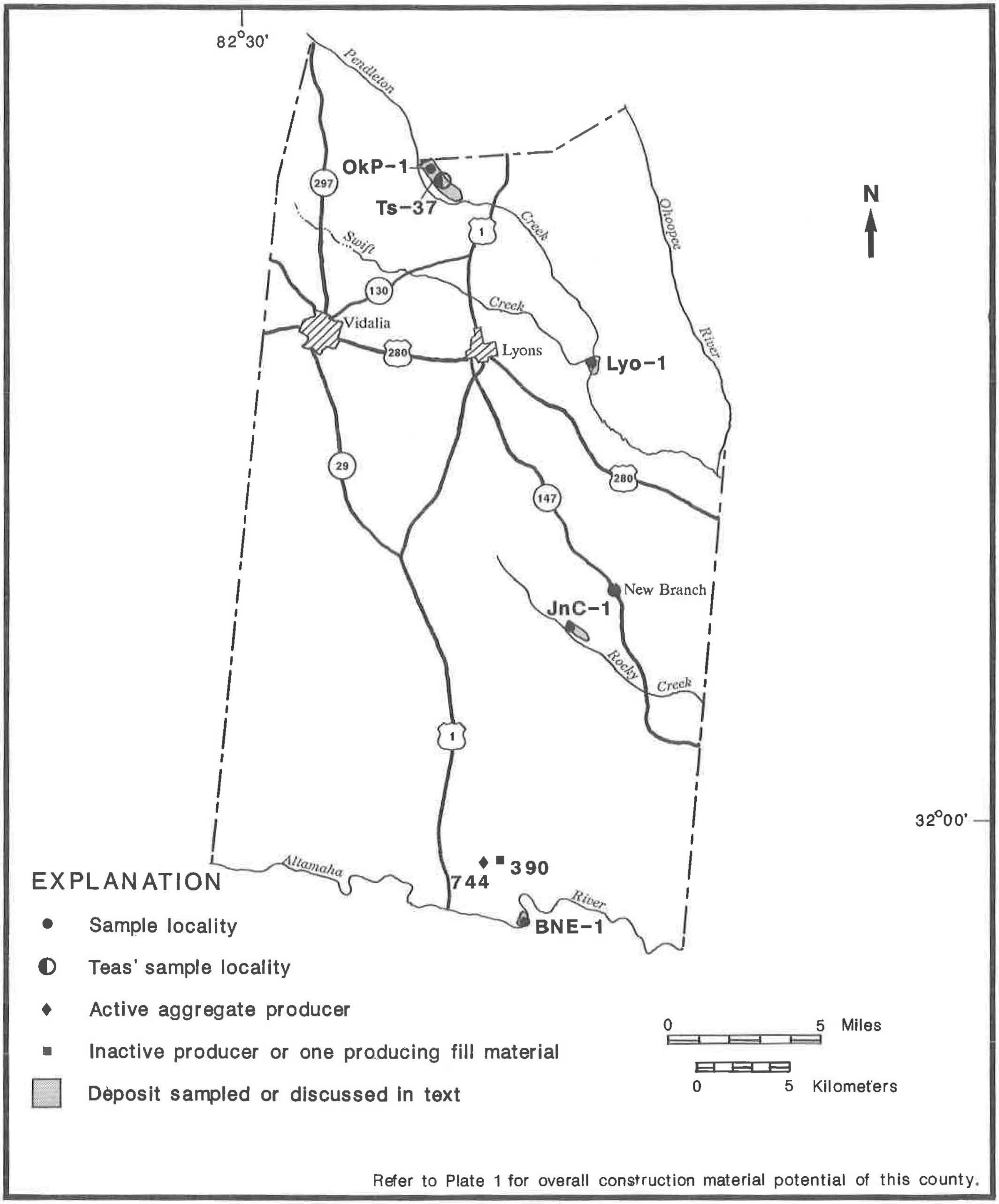


Figure 172. Map of Toombs County Showing Localities and Deposits Sampled.

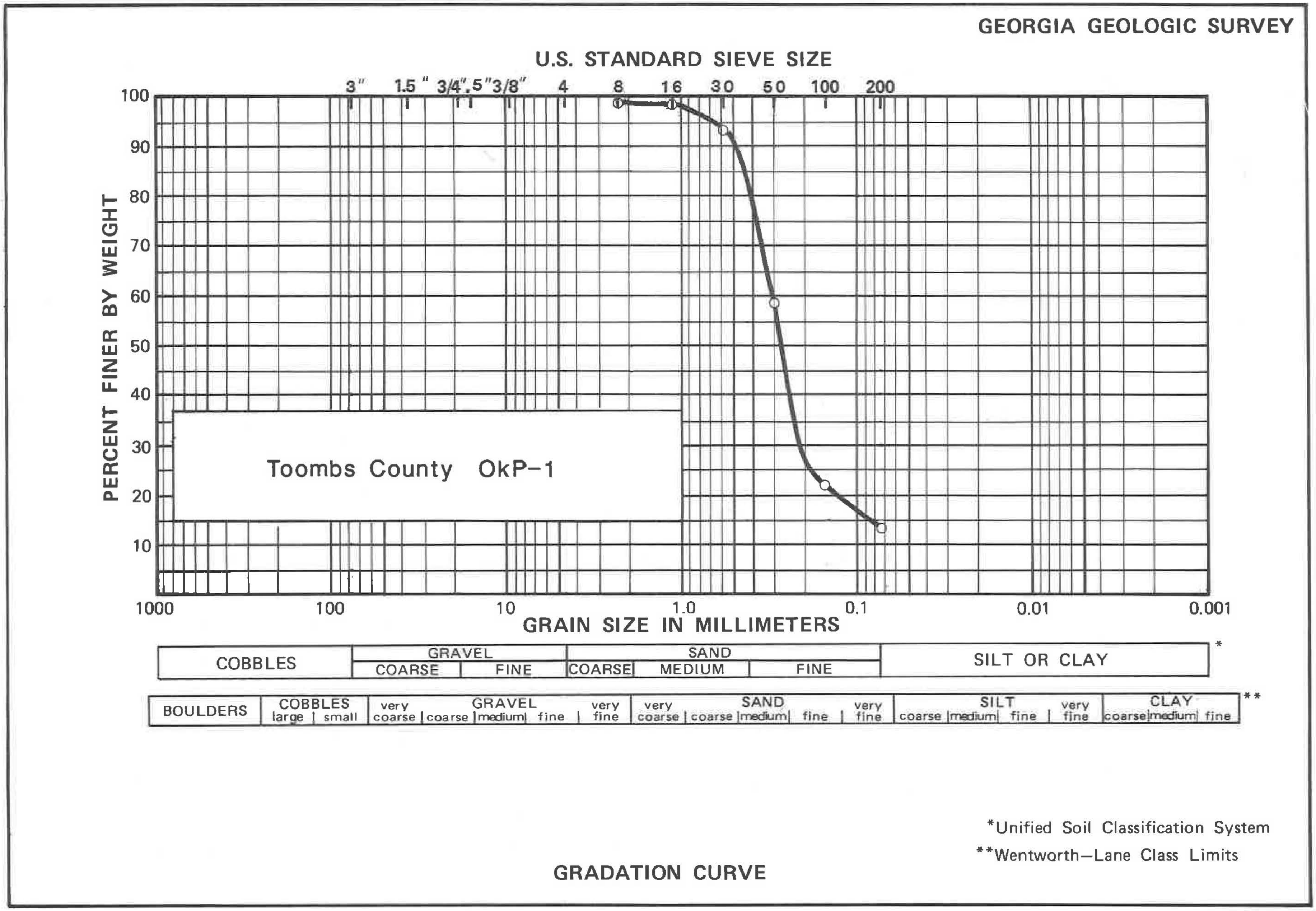


Figure 173. Size Distribution Curve of Sample OkP-1.

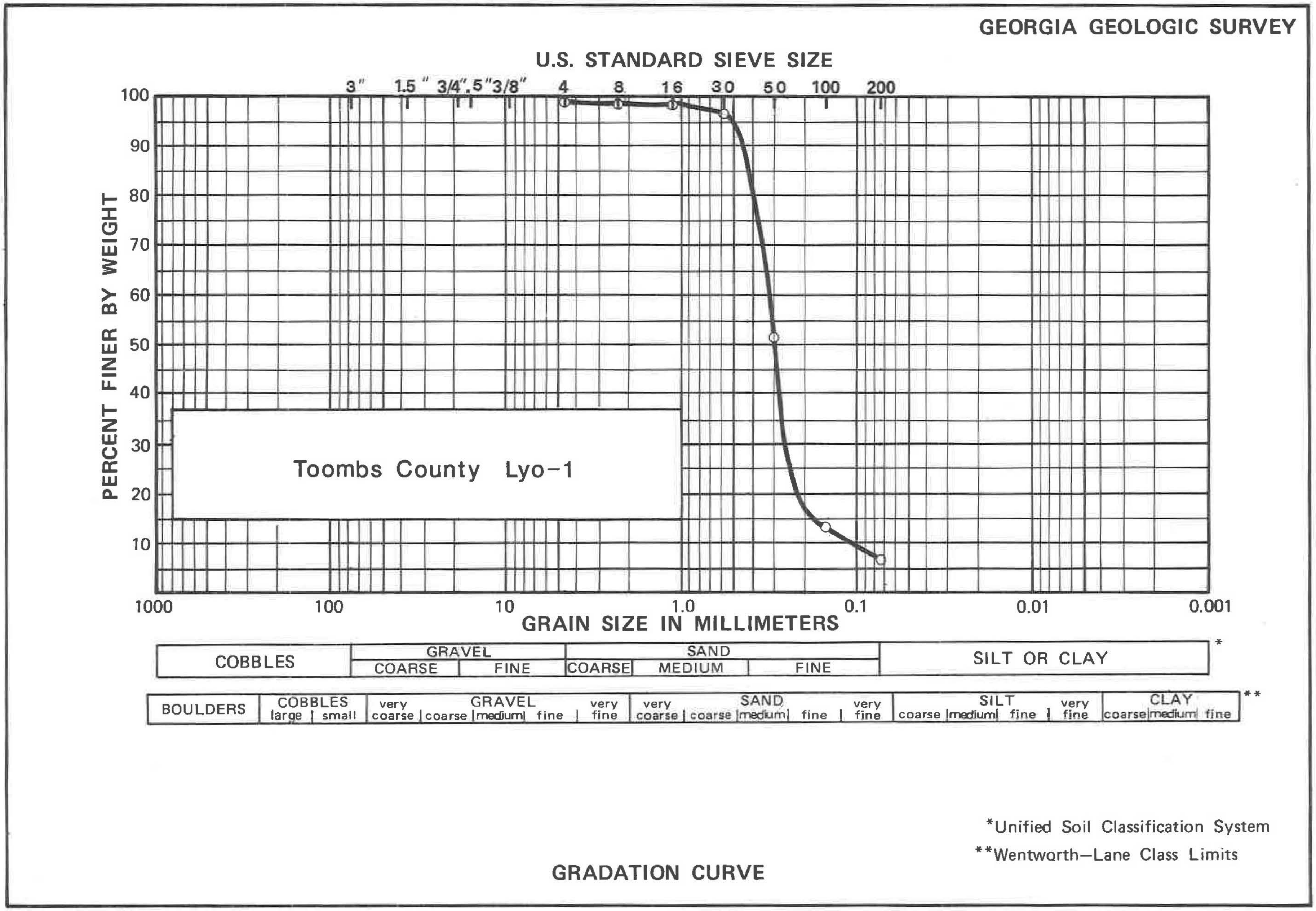


Figure 174. Size Distribution Curve of Sample Lyo-1.

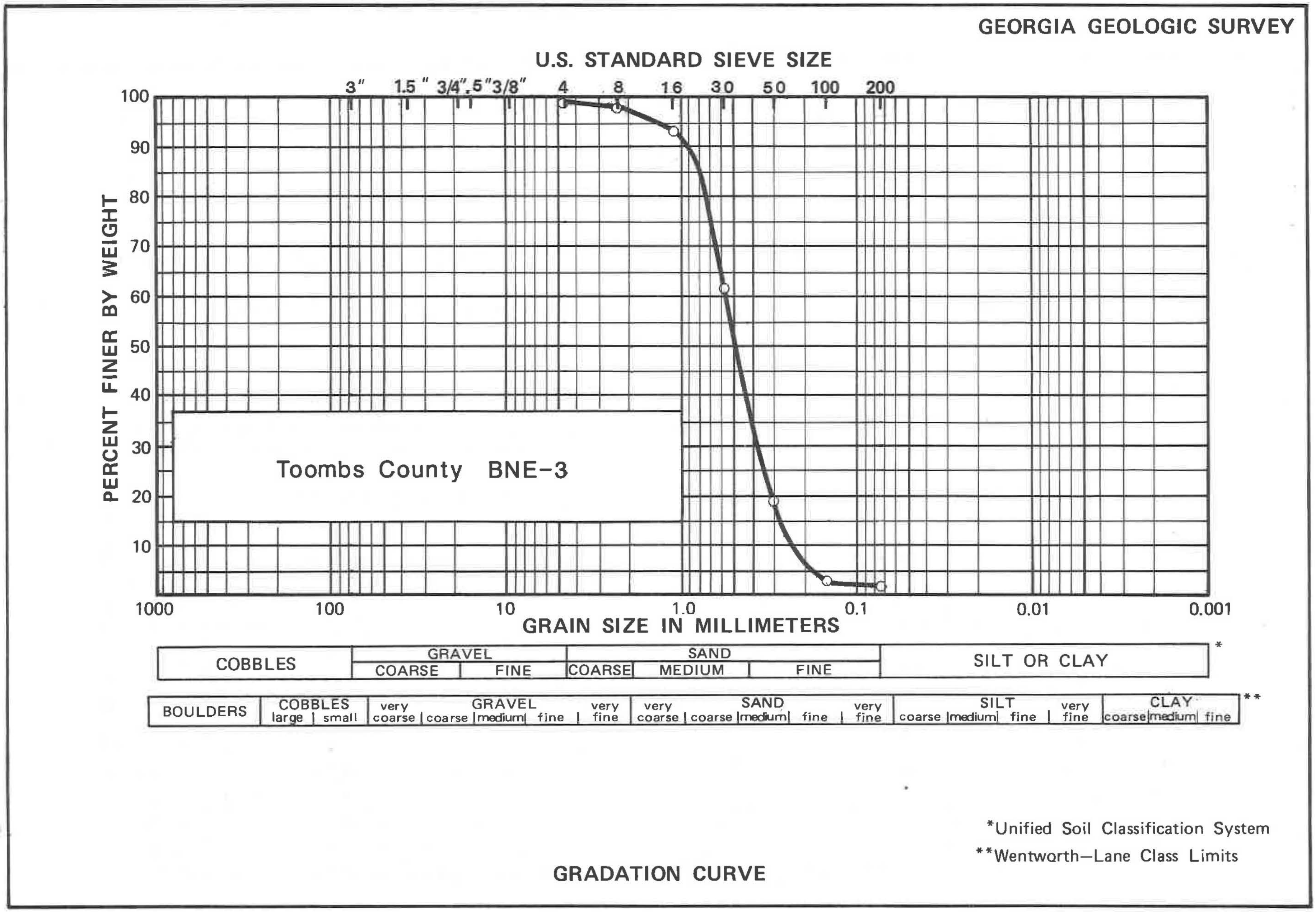


Figure 175. Size Distribution Curve of Sample BNE-3.

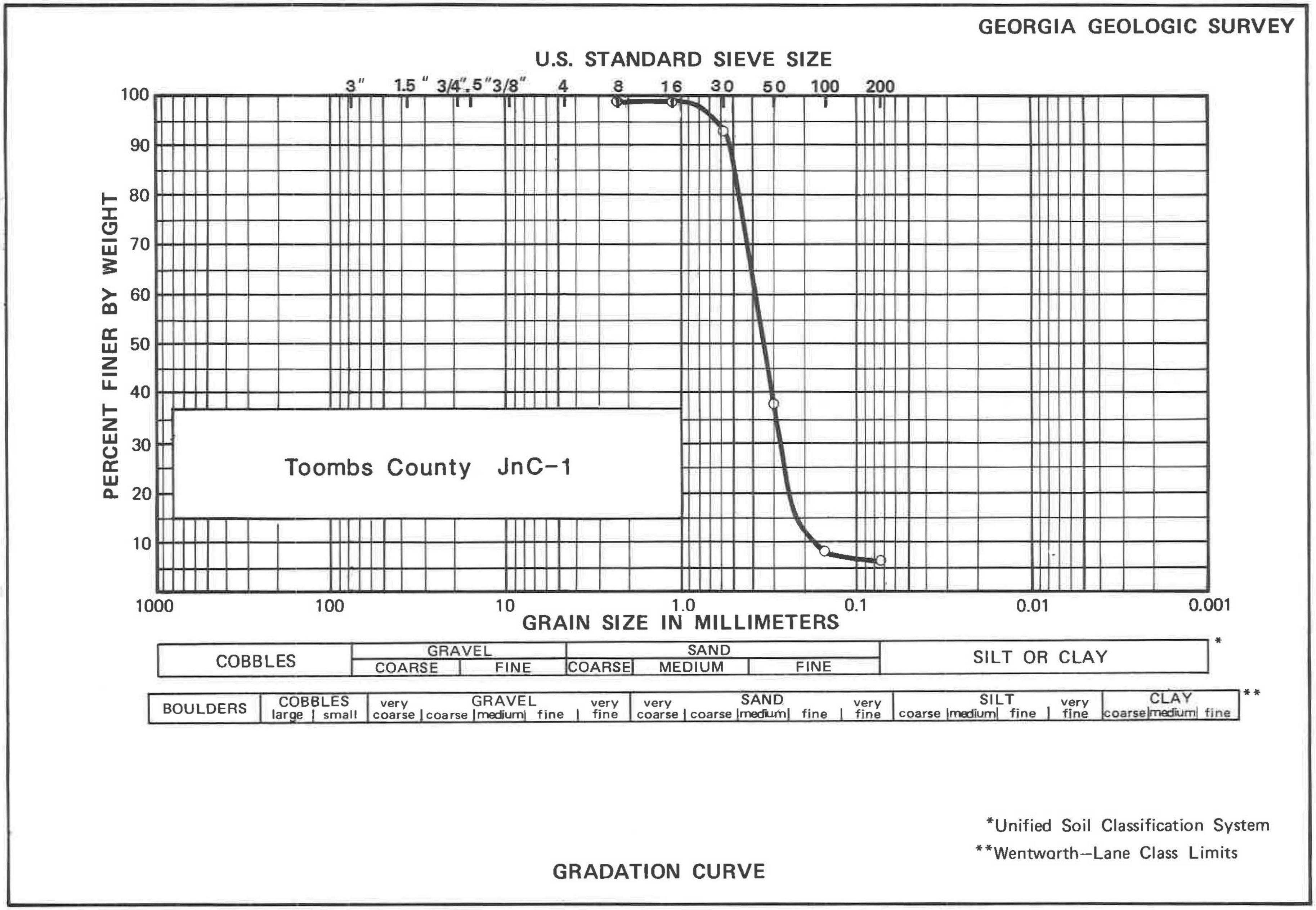


Figure 176. Size Distribution Curve of Sample JnC-1.

Table 27: Toombs County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
OkP-1	8	auger	7-1/2	2	no[4]	2
Lyo-1	16	trench	16	2	no[4]	2
BNE-3	3	auger	3	1	no[4]	1
JnC-1	9	trench	9	1	no	2

[1] For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

Mining Activity

There is one active aggregate producer in Toombs County. For the past three years, Cato's Sand and Gravel Company (Fig. 172, #744) has been mining masonry and concrete sand from a 3-1/2 acre pit of a 10 acre tract in southern Toombs County. The mining depth is 10 to 20 feet, and average yearly production is approximately 74,000 tons.

Toombs-Altamaha Sand Company operated a 4 acre pit (Fig. 172, #390) that has since been reclaimed.

Summary Evaluation

The deposit represented by OkP-1 has sufficient reserves to be considered for aggregate production, but the sand is too well sorted. The deposits represented by Lyo-1 and BNE-3 have insufficient reserves to be considered for possible aggregate production and are also too well sorted.

The potential for fine aggregate production in Toombs County is considered to be low to moderate.

WARREN COUNTY

Geology and Physiography

Warren County lies within three districts of two physiographic provinces. These districts are the Fall Line Hills and Vidalia Uplands of the Coastal Plain Province and the Washington Slope of the Piedmont Province. Surficial sediments are derived from the Barnwell Group of the Coastal Plain and granites, granite gneisses, schists and quartzites of the Piedmont Province.

Previous Studies

Teas (1921, p. 334) noted a pit on the Old Carr property (Fig. 177, Ts-38) which was mined for gravel until 1912. The worked face of the pit was approximately 1500 feet by 100 to 200 feet wide. The gravel present was badly decomposed. Also Teas noted clayey gravel in a well at Norris Crossing and at a nearby railroad cut.

Teas (1921, p. 336) noted 5 miles from Warrenton surficial gravel covering approximately 30 acres (Fig. 177, Ts-39). Teas also noted wells showing from 4 to 15 feet of gravel in the same general area. He noted gravel beds from 5 to 8 feet thick in the wells belonging to Henry Tucker, 5 feet thick in a well at the Dotson Place, and 10 feet thick in a well on the Lynn Tucker property (Fig. 177, Ts-40). A gravel bed 8 feet thick was also penetrated by a well on the Spense property (Fig. 177, Ts-41).

Teas (1921, p. 335) described coarse "clay gravel" and "sand gravel" from 10 to 18 feet thick being present in wells in the general area, 4-1/2 miles west of Warrenton on the Warrenton-Powelton road (Fig. 177, Ts-46).

Teas (1921, p. 336) described a 700 foot long cut exposing 4 to 10 feet of "medium-to coarse-pebbled gravel" (Fig. 177, Ts-47). Teas (1921, p. 336) also described a pit containing 4 to 7 feet of clayey coarse sand.

Hurst, et al. (1966, p. 396) described an exposure of 3 to 10 feet of sand and gravel (Fig. 177, CSRA-61). The upper 2 to 4 feet of this exposure is a clayey sand which overlies a 1 to 6 foot thick bed of gravel within a coarse-grained sand matrix.

Hurst, et al. (1966, p. 396) noted an outlier estimated to be 15 to 18 acres in extent which contained 2 to 5 feet of gravel (Fig. 177, CSRA-62). A second outlier (Fig. 177, CSRA-64), approximately 1 mile by 0.25 miles in areal extent and containing gravel from 5 to 15 feet thick, was also described by Hurst ,et al. (1966, p. 396). The occurrence of gravels near Andrews Church (Fig. 177, CSRA-65) was also reported by Hurst, et al. (1966, p. 396).

Hurst, et al. (1966, p. 397) described the Baker property of Teas (1921) as a deposit up to 10 feet thick and extending for one mile (Fig. 177, CSRA-66). Hurst, et al. (1966, p. 397) also described a deposit near Norris Crossroads (Fig. 177, Ts-38, CSRA-67) and the Henry Tucker, Lynn Tucker and Dotson properties (Fig. 177, Ts-40, CSRA-69).

Hurst, et al. described an active operation mining an 8 foot thick gravel layer. This layer is contained within an outlier 1 mile long by 0.25 to 0.5 mile wide.

Present Study

The soil series used in targeting areas of Warren County were the Flomaton Variant, Tifton, and Helena series. These soils are present as isolated pods in the southern portion of the county. Two samples from Warren County: BoP-1, BeS-1 (Fig. 177 and Figs. 180-181, Table 28) were sieved.

Evaluation

Neither sample passed ASTM standard C-33; however, the deposit represented by BoP-1 could be upgraded to meet specifications and the deposit represented by BeS-1 (Fig. 178 and 179) could produce fine and coarse aggregate.

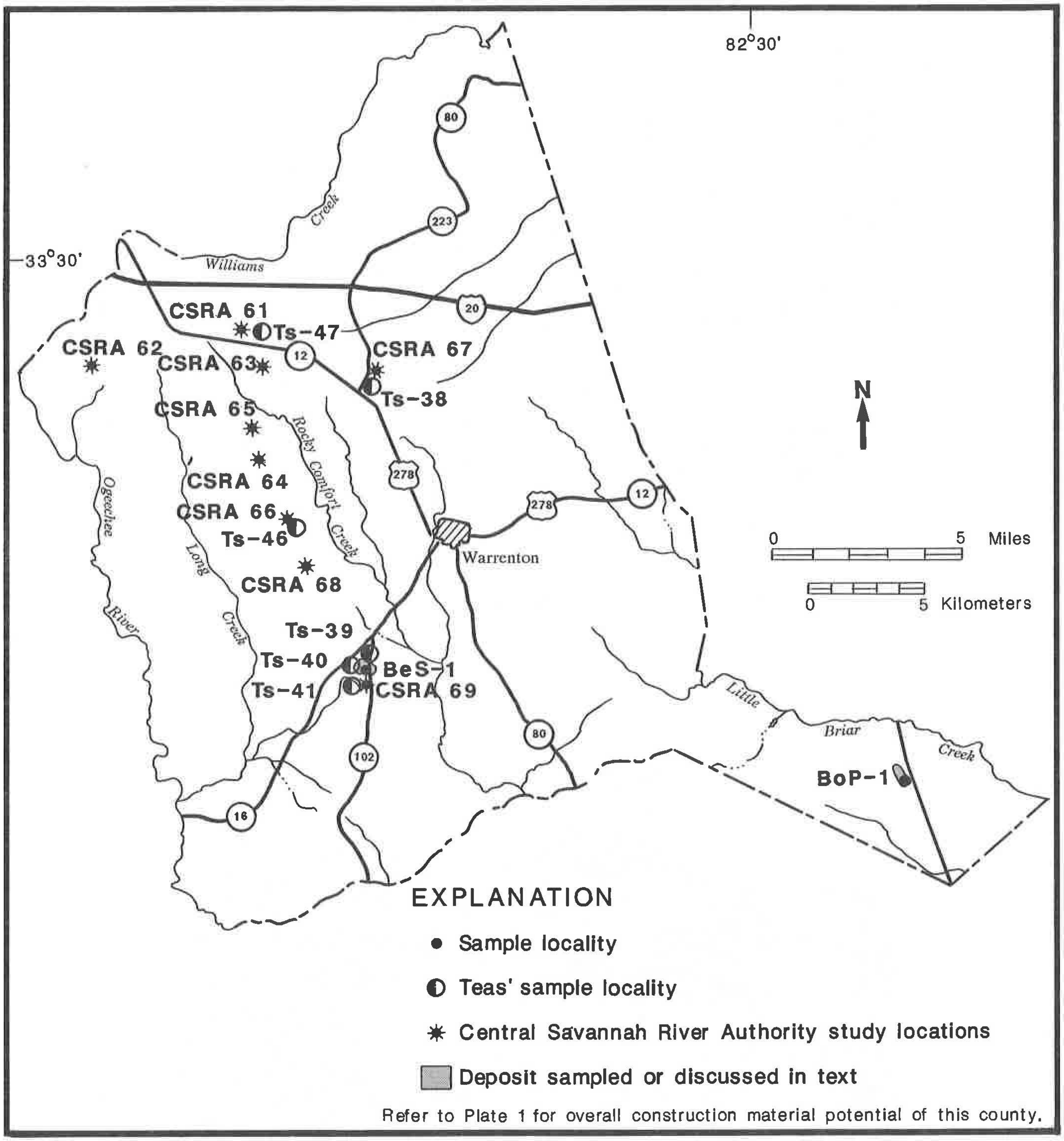


Figure 177. Map of Warren County Showing Localities and Deposits Sampled.

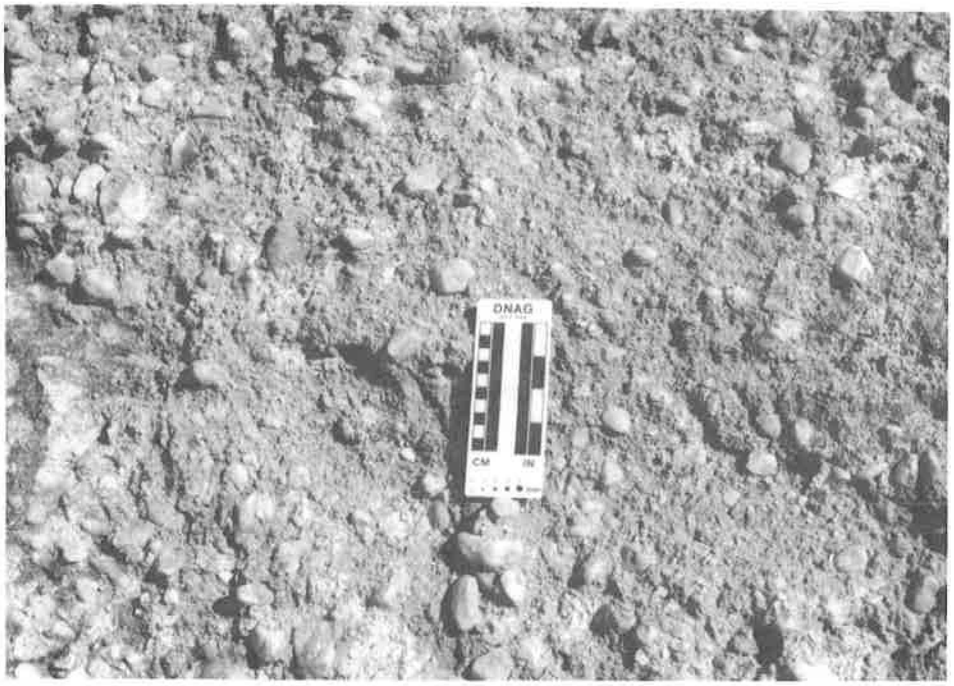


Figure 178. Gravelly zone at BeS-1, Warren County.

Figure 179. View of inactive pit at BeS-1, Warren County.

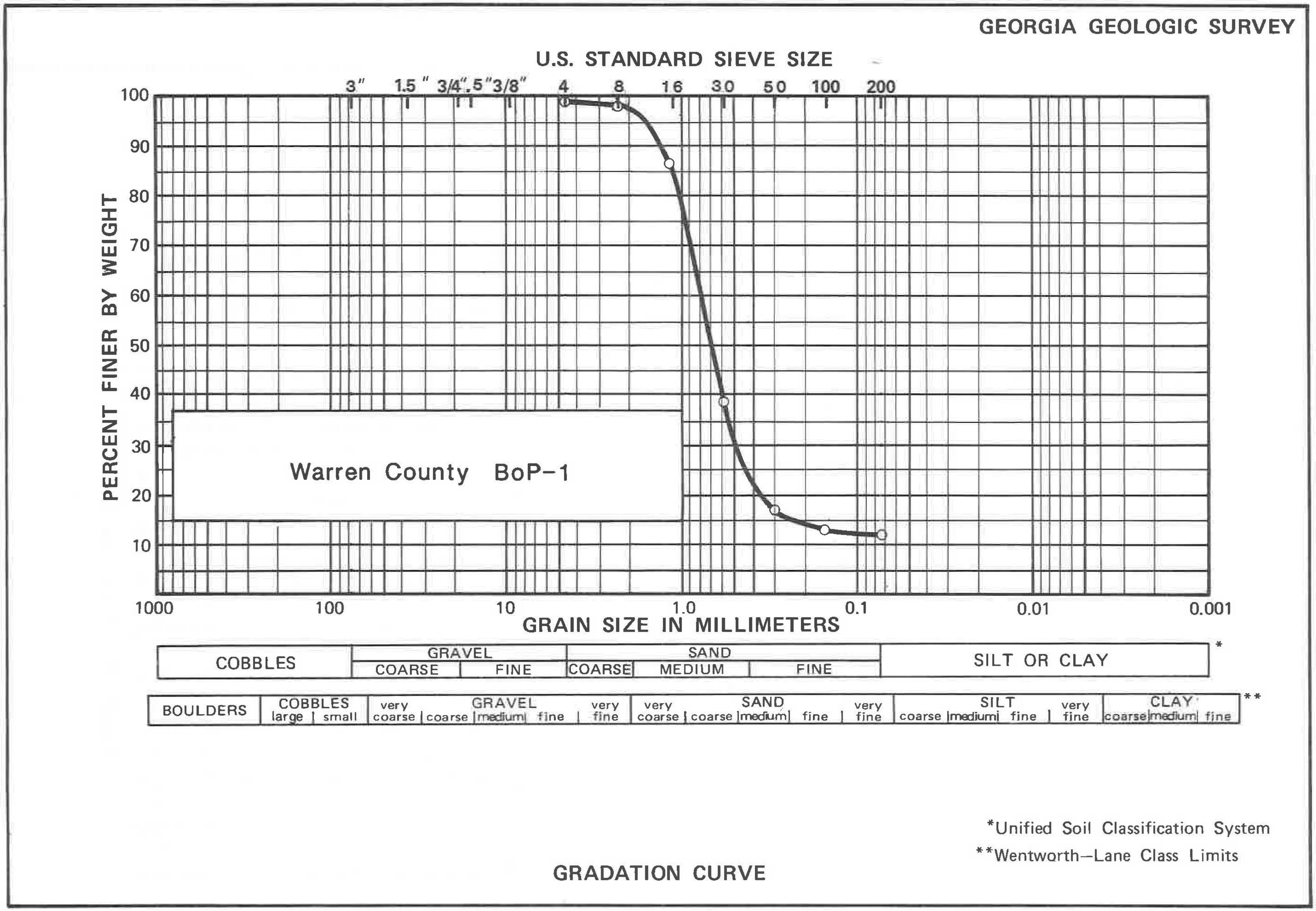


Figure 180. Size Distribution Curve of Sample BoP-1.

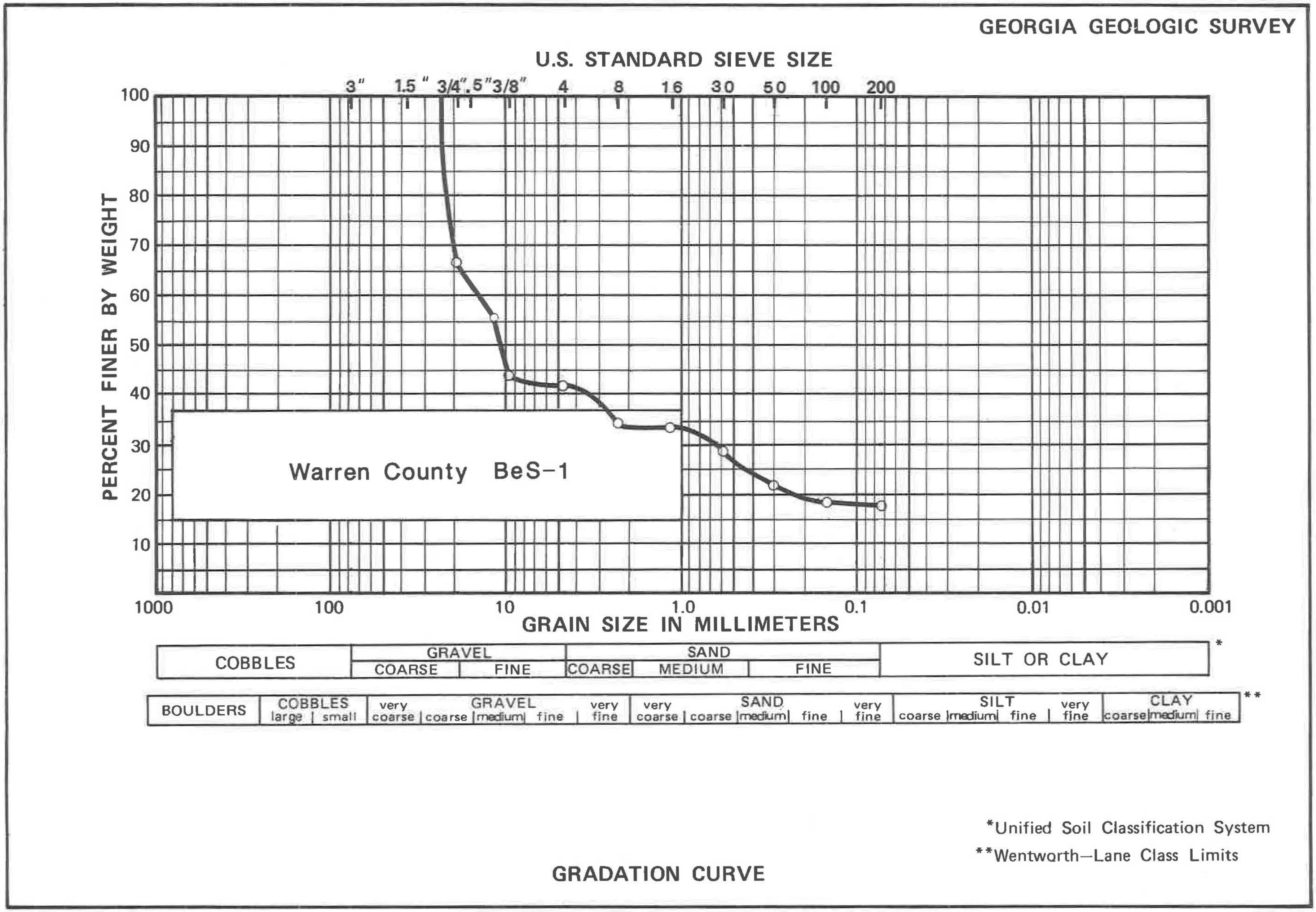


Figure 181. Size Distribution Curve of Sample BeS-1.

Table 28: Warren County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
BoP-1	12	trench	12	1	no[4]	2
BeS-1	14	trench	14	2	no[4]	2

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed discussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

The deposit from which sample Bop-1 was taken could have an areal extent as large as 3 acres. Assuming a tabular body 12 feet thick, reserves would be only 58,000 cubic yards.

The deposit represented by sample BeS-1 could have an areal extent of as much as 5 acres; thereby having reserves in excess of 100,000 cubic yards.

Mining Activity

There are no active or recently inactive commercial aggregate mining operations within the Coastal Plain portion of Warren County.

Summary Evaluation

The potential for production of fine aggregate in Warren County is considered to be low to moderate. Although the two deposits samples are probably too small for commerical aggregate production, other larger deposits may be present within these areas.

WAYNE COUNTY

Geology and Physiography

Wayne County lies within the Vidalia Upland District, the Bacon Terraces District, and the Barrier Island District. The surficial sediments of Wayne County are derived from the Altamaha Formation, the Cypresshead Formation, and barrier island deposits with minor amounts of Quaternary alluvium.

Previous Studies

Teas (1921, p. 268) reported surficial and residual sand bordering the Altamaha River in Wayne County (Fig. 182, Ts-43).

Present Study

The soil series used in targeting areas for sampling were the Lakeland, Lakewood and Klej series. These are sparsely present in interfluve areas near the borders of the county. Three samples were taken in Wayne County: JNW-1, Scr-1, Eve-1 (Figs. 182-185, Table 29).

Evaluation

None of the samples passed ASTM standard C-33. Sample JNW-1, however, marginally failed and could be upgraded to meet specifications. This sample, taken at the site of a 15 acre inactive sand and gravel pit, represents a 50 acre deposit with reserves in excess of 1.7 million cubic yard. The other samples represent deposits containing too great a percentage of fine grained material to be considered further.

Mining Activity

There are 11 inactive sand pits in Wayne County. Shepard Construction Company operated an 11 acre pit (Fig. 182, #520) and produced sand, gravel and fill material, primarily for road use. Seaboard Construction Company operated a 23 acre pit (Fig. 182, #493) which produced asphalt sand.

Summary Evaluation

Considering the number of inactive sand and gravel pits in Wayne County, and the potential of the particular pit represented by sample JNW-1, the potential for fine aggregate production in Wayne County is considered to be moderate.

SUMMARY

Favorable Areas

There are three general areas within the study area which are the most favorable for sand production. These are: (1) The flood plains of the Altamaha, Ohoopee, Ogeechee, and Savannah Rivers, (2) the Fall Line Hills area, and (3) the dune fields along the Altamaha, Ohoopee, and Ogeechee Rivers.

Favorable Deposits

The floodplain deposits along the major rivers of the study area offer the best possibilities for commercial development of aggregate deposits. This is partly due to the ready availability of a water supply for washing and sizing the sand.

Very few deposits within the study area were identified as being economic for aggregate production due to either inadequate estimated reserves or generally poor grain-size distributions. Deposits of economic size and quality could exist within the general areas sampled. For this reason, the users of this publication are encouraged to concentrate on the favorable areas as mentioned above but to, also, use the information within each county section to narrow the areas of search for a deposit within a specific geographic area.

Only 7 deposits (with the exception of the dune deposits) were conservatively judged to have reserves in excess of 100,000 cubic yards. These depos-

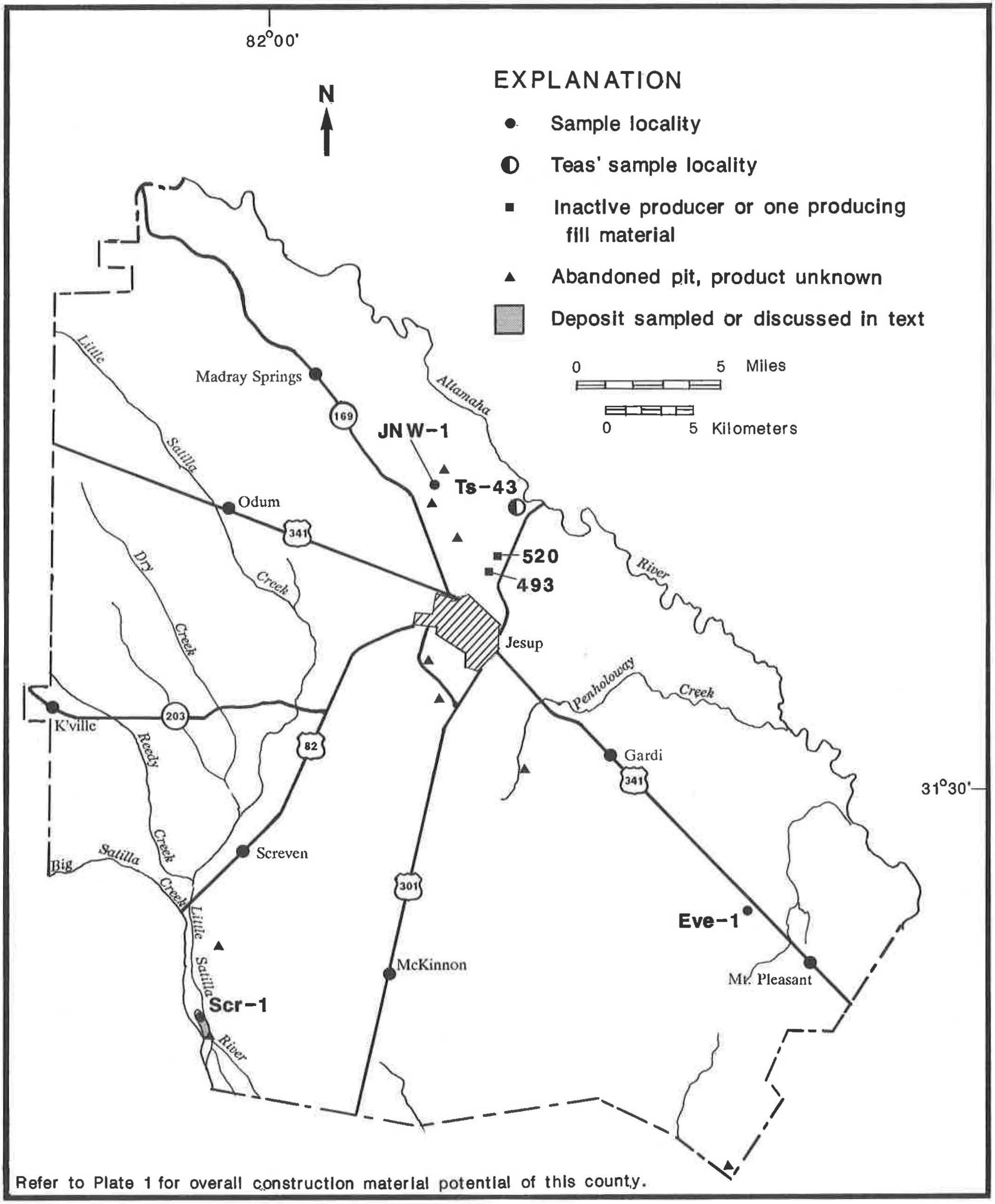


Figure 182. Map of Wayne County Showing Localities and Deposits Sampled.

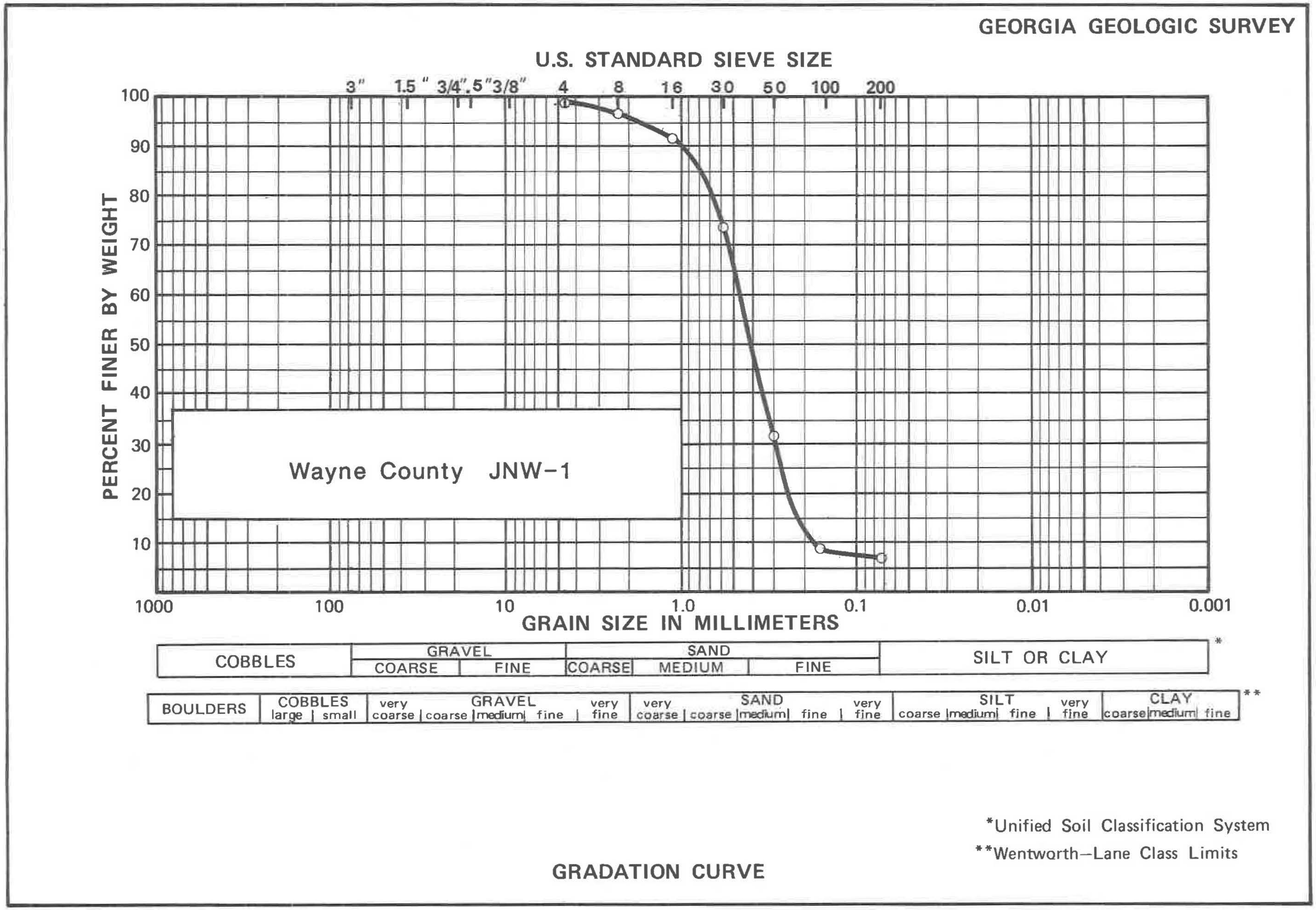


Figure 183. Size Distribution Curve of Sample JNW-1.

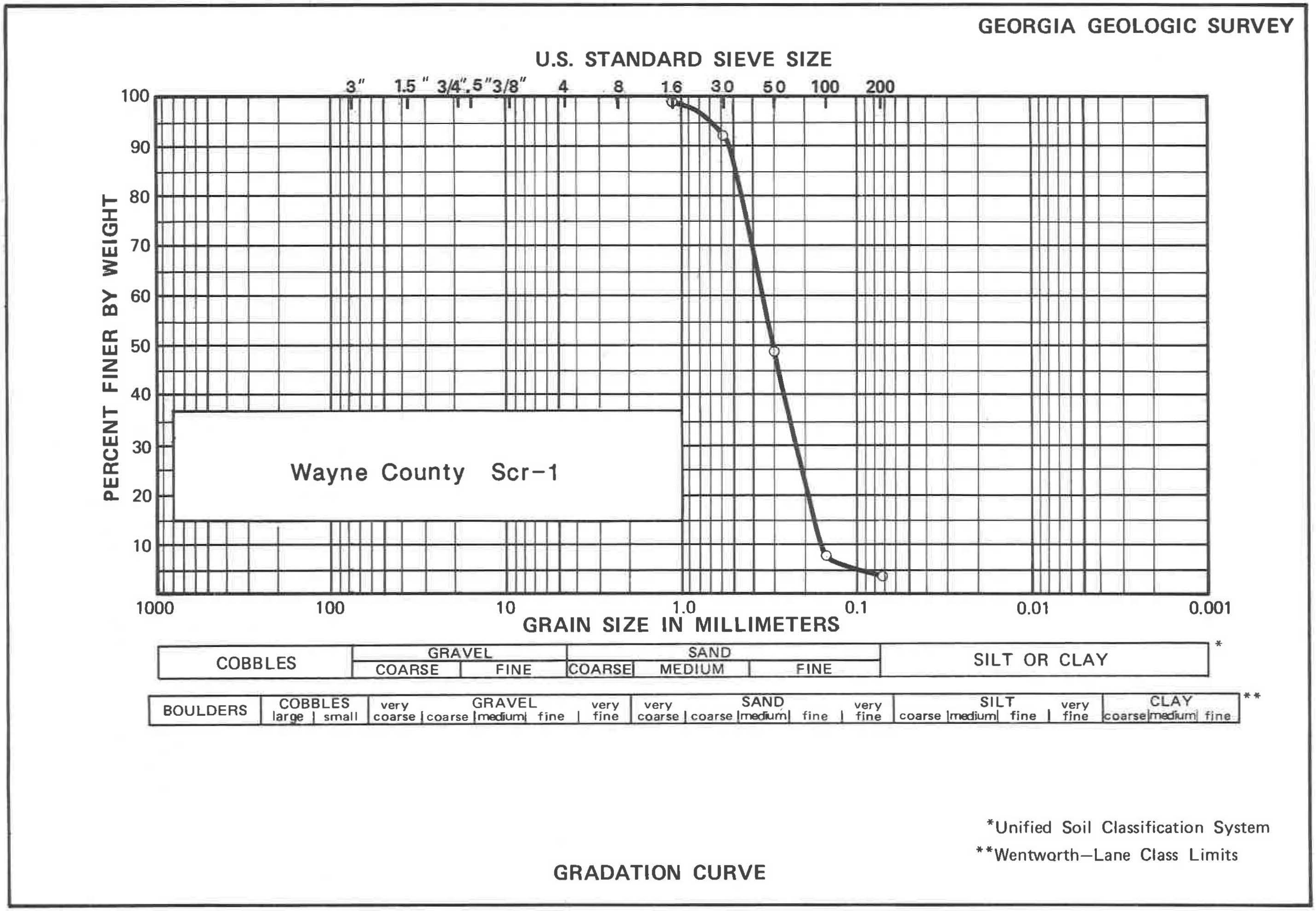


Figure 184. Size Distribution Curve of Sample Scr-1.

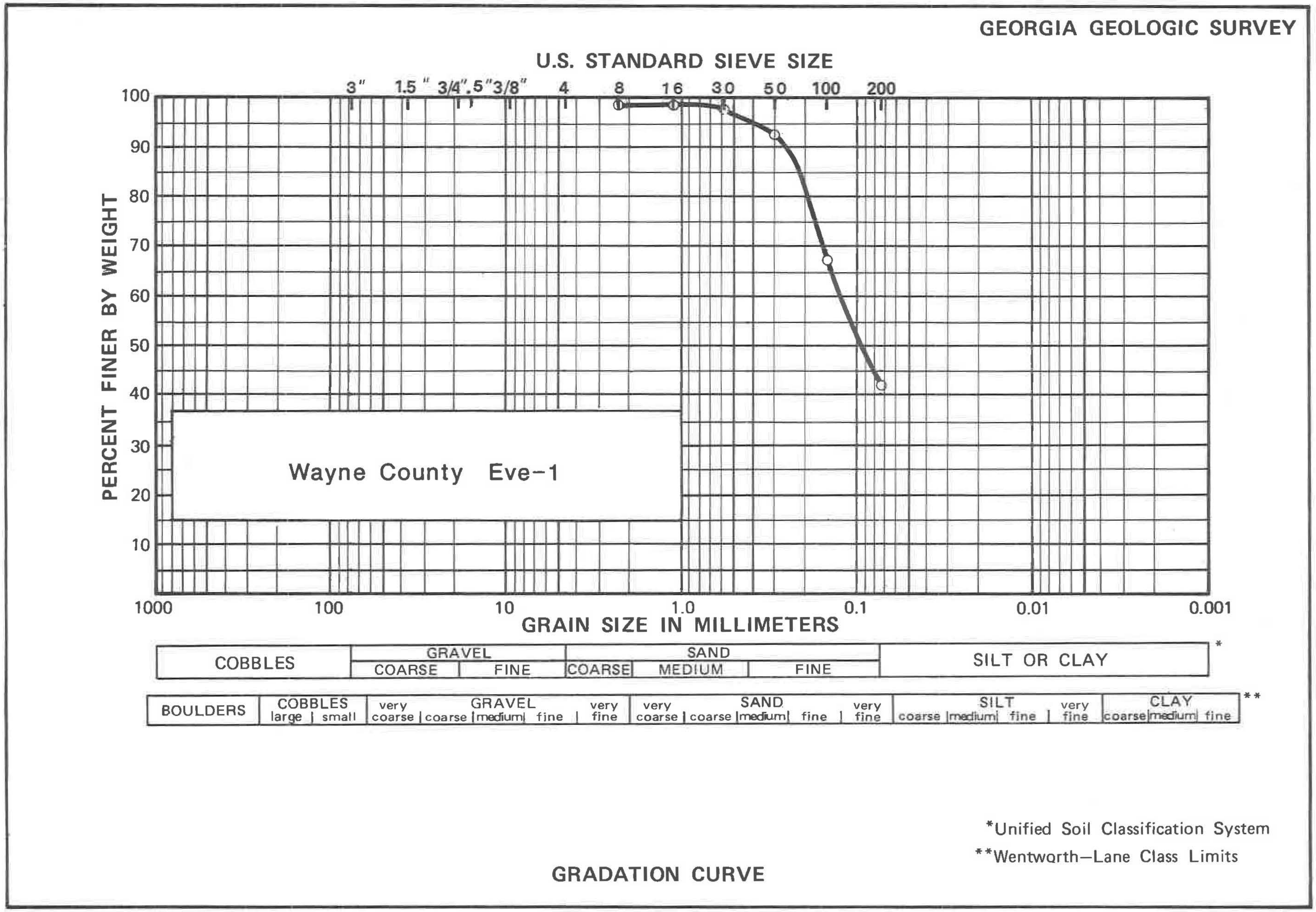


Figure 185. Size Distribution Curve of Sample Eve-1.

Table 29: Wayne County Sample Data

Sample designation	Depth[1] (Feet)	Sample type	Minimum[2] thickness of the deposit (Feet)	Priority[3] of body sampled	Natural material passing ASTM C-33	Rating[3]
JNW-1	24	trench	24	1	no[4]	2
Scr-1	9-1/2	auger	9-1/2	3	no	2
Eve-1	7	auger	7	1	no	0

[1]For trench samples this figure is the vertical length of the trench.

[2]Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the trench samples are estimated from field observations.

[3]Increasing numerical values represent higher priority (potential for containing aggregate deposits) or rating (Potential for uses of the sands other than construction aggregate). For a more detailed dis cussion of the methods used, see the laboratory procedures section of the text.

[4]Marginally failed ASTM C-33, can be upgraded to meet specifications.

its are as follows: The deposit represented by sample Per-1 (Figs. 115 and 117) is from a hillside in northern Jenkins County. The material from the deposit does not meet ASTM standard C-33 but it can be upgraded to meet these standards. This deposit is 10 feet thick and may have an areal extent of as much as 100 acres; reserves could be in excess of 160,000 cubic yards; thus, meeting local demand for fine aggregate. A local creek which may provide a sufficient water supply is within 2 miles of this deposit. A secondary road is within 2.5 miles of the deposit.

Sample Mil-2 (Figs. 115 and 120), located in Jenkins County, represents a deposit that probably averages 14 feet in thickness and has an areal extent of 5 acres; thus, reserves probably exceed 100,000 cubic yards. This deposit could produce fine aggregate with minor amounts (<15%) of fine gravel. There is a small, local stream within 0.5 miles and a primary road is within 0.5 miles of the deposit.

The deposit represented by sample Dor-1 (Figs. 123-126), located in Liberty County, could provide a source of fine aggregate. This deposit, which could be upgraded to meet ASTM standard C-33, is 10 feet thick and covers as much as 10 acres; thus, the calculated reserves exceed 160,000 cubic yards. This deposit is within 0.25 miles of a secondary road; however, the water supply for processing is somewhat questionable.

The deposit represented by sample AuE-2, (Figs. 148 and 155), located in eastern Richmond County, could be as large as 10 acres with a minimal thickness of 7.5 feet. Assuming a tabular body of these dimensions, the reserves would be in excess of 120,000 cubic yards. This deposit is within 0.5 miles of a primary road and within 0.5 miles of a local stream which may provide an adequate water supply for processing.

Sample BeS-1 (Figs. 177-179 and 181) represents a deposit from a probable terrace deposit in Warren County, with a possible areal extent of 5 acres and a thickness of 14 feet. Assuming a tabular body of these dimensions, the reserves of this deposit may be in excess of 122,000 cubic yards. A small creek within 1 mile of this deposit may provide sufficient water for processing, and a primary road within 2 miles could provide access.

Sample JNW-1 (Figs. 172 and 183) represents a deposit in Wayne County, which has an areal extent of 50 acres and a thickness of 24 feet. Thus, possible reserves exceed 1.75 million cubic yards. Both a local water supply and a secondary highway are within 0.5 miles of this deposit.

Sample BNE-3 (Figs. 172 and 175) is from a point bar of the Altamaha River in Toombs County. This point bar may be as large as 35 acres with a minimum thickness of 3 feet; thus, there are reserves in excess of 170,000 cubic yards. The availability of water for this deposit is not a problem since it adjoins the river; however, the nearest secondary road is slightly over 2.5 miles from the deposit.

Dune Sands

The areas north and east of major streams such as the Altamaha, Ohoopee and Ogeechee Rivers, as well as local creeks, contain hugh reserves of fine-grained aeolian sands. For example, one dune deposit, represented by sample OkP-1 (Figs. 172 and 172) in Toombs County, has an estimated reserve in excess of 3 million cubic yards. Unfortunately, these sands, which are fine-grained and well-sorted, have limited use in the construction industry. Given the tremendous reserves available, other uses for these sands should be explored.

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NOTES

NOTES

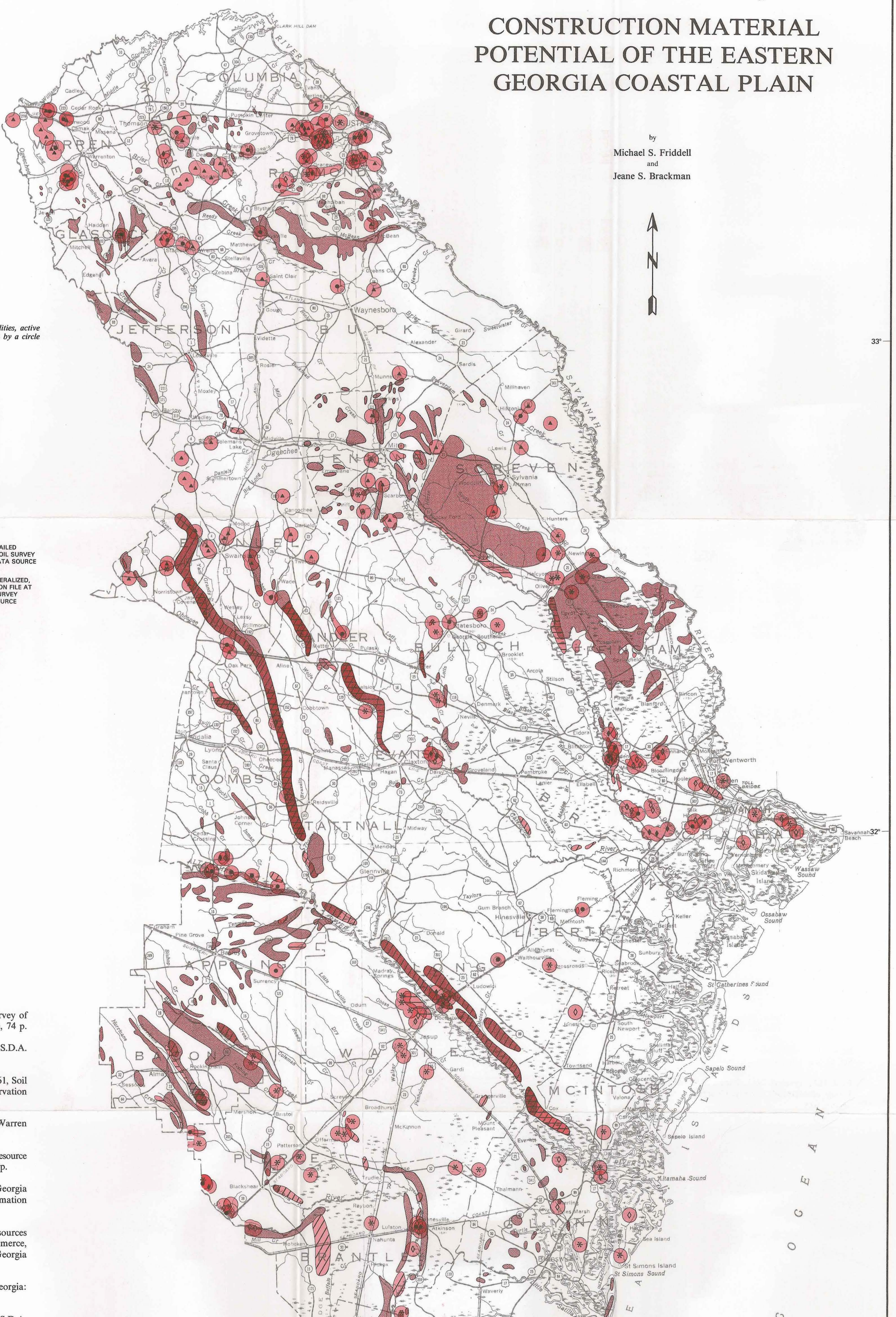
CONSTRUCTION MATERIAL POTENTIAL OF THE EASTERN GEORGIA COASTAL PLAIN

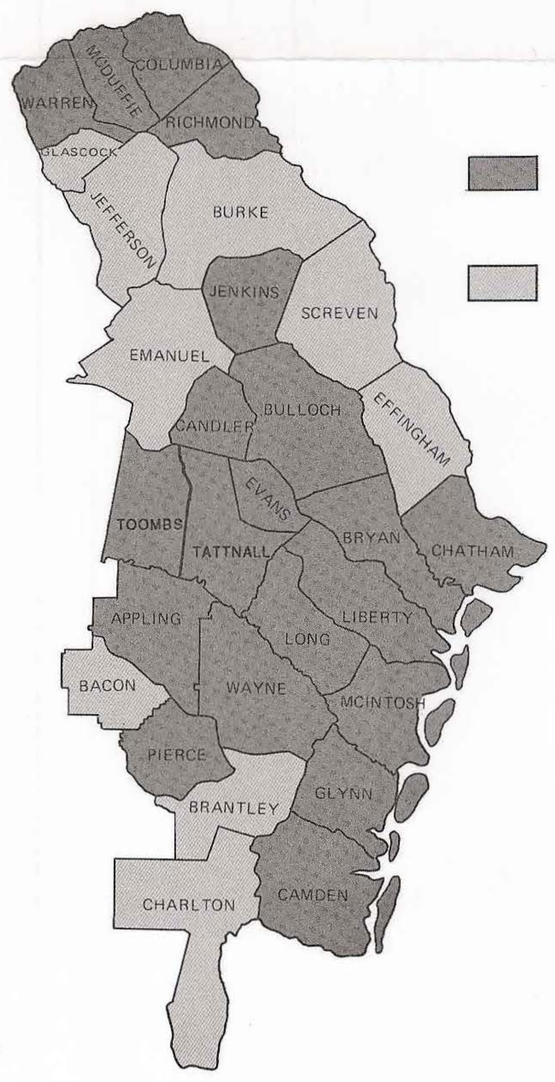
by
Michael S. Friddell
and
Jeane S. Brackman

EXPLANATION

- Teas' specific sample locality
- Teas' sample areas
- Active aggregate producer
- Inactive producer, or one producing fill material
- Abandoned pit, product unknown
- CSRA Localities
- Soil type indicative of a sandy soil
- Geomorphic feature indicative of a sand or gravel deposit
- Low potential for aggregate production
- Moderate potential for aggregate production
- High potential for aggregate production

Potential areas for aggregate production surrounding Teas' sample localities, active aggregate producers, inactive producers, and abandoned pits are shown by a circle (radius = 1 mile).





COUNTIES FOR WHICH DETAILED PUBLISHED PHOTO BASE SOIL SURVEY MAPS WERE USED AS A DATA SOURCE

COUNTIES FOR WHICH GENERALIZED, UNPUBLISHED SOIL MAPS ON FILE AT THE GEORGIA GEOLOGIC SURVEY WERE USED AS A DATA SOURCE

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