

CONSTRUCTION MATERIAL POTENTIAL
OF THE
COASTAL PLAIN
OF
SOUTHWESTERN GEORGIA

AN EVALUATION

Michael S. Friddell



COVER: The Flint River, Baker County, Georgia (Sample Locality BaS-1).

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ABSTRACT

The transportation of aggregate, especially coarse aggregate (generally crushed), from the Piedmont Province to construction sites in the Coastal Plain is a major cost factor in such construction. Therefore, any reduction in the haulage distance from the aggregate source to the construction site would result in decreased construction costs. The purpose of this report, the first of a three part study covering the Coastal Plain of Georgia, is to evaluate the potential of southwestern Georgia for the production of both fine and coarse aggregate. The area of this report encompasses the Coastal Plain of Georgia west of Interstate 75, comprising approximately 12,000 square miles, and including the entirety of 25 counties and portions of 13 other counties.

Sites within the study area were prioritized as to their potential for aggregate production based on the soil type present; proximity to sand prospects, gravel prospects, and pits described in both the published and unpublished literature; geomorphic features that suggest the presence of aggregate deposits; and proximity to active or recently inactive commercial producers of aggregate. One hundred and twenty-eight samples representing 113 sites were assessed to evaluate whether or not deposits of economic value are present.

Seven major areas are delineated as having low to high potential for the production of coarse aggregate and fine aggregate. Eight deposits within or proximal to these areas are considered to have high potential for the commercial-scale production of aggregate.

The area with the highest potential for the production of fine aggregate is within the outcrop area of the Upper Cretaceous sediments in the northeastern portion of the study area. The deposits with the best potential for the production of coarse aggregate are within and adjacent to the Chattahoochee River Valley in the western portion of the study area.

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INTRODUCTION

In 1982, 3.7 million tons of sand and gravel were sold or used in Georgia. Approximately 70 percent of the sand and gravel produced or sold was mined from the 13 commercial pits owned by 12 aggregate producers within the study area of this report.

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 in. 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 (filler).

Mining of sand and gravel within the area of this report is done by one of two methods: open pit hydraulic, or dredging. Open pit hydraulic mining involves the use of a high pressure water gun which washes the sand and other material from the pit face. The resultant slurry is pumped either to holding bins for cleaning or to a screening tower, separator and cyclones for sizing. Hydraulic dredging (usually in man-made ponds) utilizes a dredge to mine sand and gravel and to pump the slurry to screens and classifiers to size the sand and gravel. After sizing, the products are moved by conveyor belts to stockpiles.

PURPOSE AND SCOPE

Purpose

Transportation involved in aggregate production is a major cost factor for construction in the Coastal Plain of Georgia. This is particularly true regarding large size (crushed) aggregate because it generally has to be hauled from the Piedmont. It is apparent that any appreciable reduction in haulage distance from plant to job site or market area would result in increased profits for the producer and reduced cost to the consumer. With this in mind, the purpose of this report, the first of three parts (fig. 1), is to evaluate the aggregate (both coarse and fine) potential of the Coastal Plain of Georgia west of Interstate 75 in order to delineate favorable areas for aggregate production. The current aggregate producers within the study area are also discussed as to production, acreage owned, current mining depth, and products produced.

Because it is not possible to anticipate the geographic areas in which the demand for aggregate may occur, the study was not limited to areas of mid- to large-size cities. By not limiting the areas investigated to particular geographic areas a clearer picture of the availability of both fine and coarse aggregate is obtained.

Scope

The current study area is the Coastal Plain of Georgia west of Interstate 75 (see fig. 1). This area encompasses approximately 12,000 square miles and includes 25 counties and portions of 13 others.

PREVIOUS WORK

Several publications briefly mention minor occurrences of sand and gravel deposits; however, the major work on sand and gravel exploration and evaluation in Georgia is that of Teas (1921). In addition to discussing classification, properties, testing procedures, uses, transportation and production methods for sand and gravel, Teas performed a survey of sand and gravel resources of the state.

McCallie (1901) briefly reviewed the available resources used in road building and road repair for each county in Georgia.

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

The Department of Natural Resources, Georgia Geologic Survey, published a circular which outlines mining operations in Georgia (Kline and O'Connor, 1981). This

publication lists mineral commodities by county and provides information on mine owners, and plant locations.

PHYSIOGRAPHY

The study area of this report lies within the Coastal Plain Province of Georgia. Four distinct physiographic districts are present in this study area; they are the Fall Line Hills, Fort Valley Plateau, Dougherty Plain and the Tifton Upland (see fig. 2).

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

Fall Line Hills District

"The Fall Line Hills District is highly dissected with little level land except the marshy floodplains and their better drained, narrow stream terraces. Stream valleys lie 50 to 250 feet below the adjacent ridge tops. Stream dissection seems to be greatest in the East Gulf portion of this district [the study area of this report]. Relief gradually diminishes to the south and east. Maximum elevations are approximately 760 feet between Columbus and Macon . . ."

Fort Valley Plateau District

"An anomalous area within the Fall Line Hills is known as the Fort Valley Plateau. It is characterized by flat-topped interfluvial valleys with narrow, 50-150 feet deep, steep-walled valleys. This area is distinct from the Fall Line Hills in that the broad, flat-topped interfluvial valleys are the dominant feature, there are fewer streams, and there is less local relief. The area is less dissected than the Fall Line Hills because it is underlain by the more clayey units of undifferentiated Eocene, Paleocene and possibly Cretaceous age sediments. Elevations range from 550 feet in the north to 250 feet in the southeast, indicating a southeast regional dip."

Dougherty Plain District

"The Dougherty Plain is a northeast-trending, wedge-shaped, level to gently rolling lowland that pinches out where the Fall Line Hills and the Tifton Upland meet. The northwestern boundary is gradational from the Fall Line Hills and occurs where the slopes become more gentle and the relief is low; the 250 foot elevation approximates this boundary. The southeastern boundary is the base of the Pelham Escarpment which separates this district from the Tifton Upland. The region slopes southwestward with maximum elevations of 300 feet in the northeast to a minimum elevation of 77 feet at Lake Seminole. The flat to very gently rolling topography is interrupted by numerous sinkholes. Karst topography prevails in this district, and many sinkholes, still actively forming, are the sites of numerous ponds and marshes."

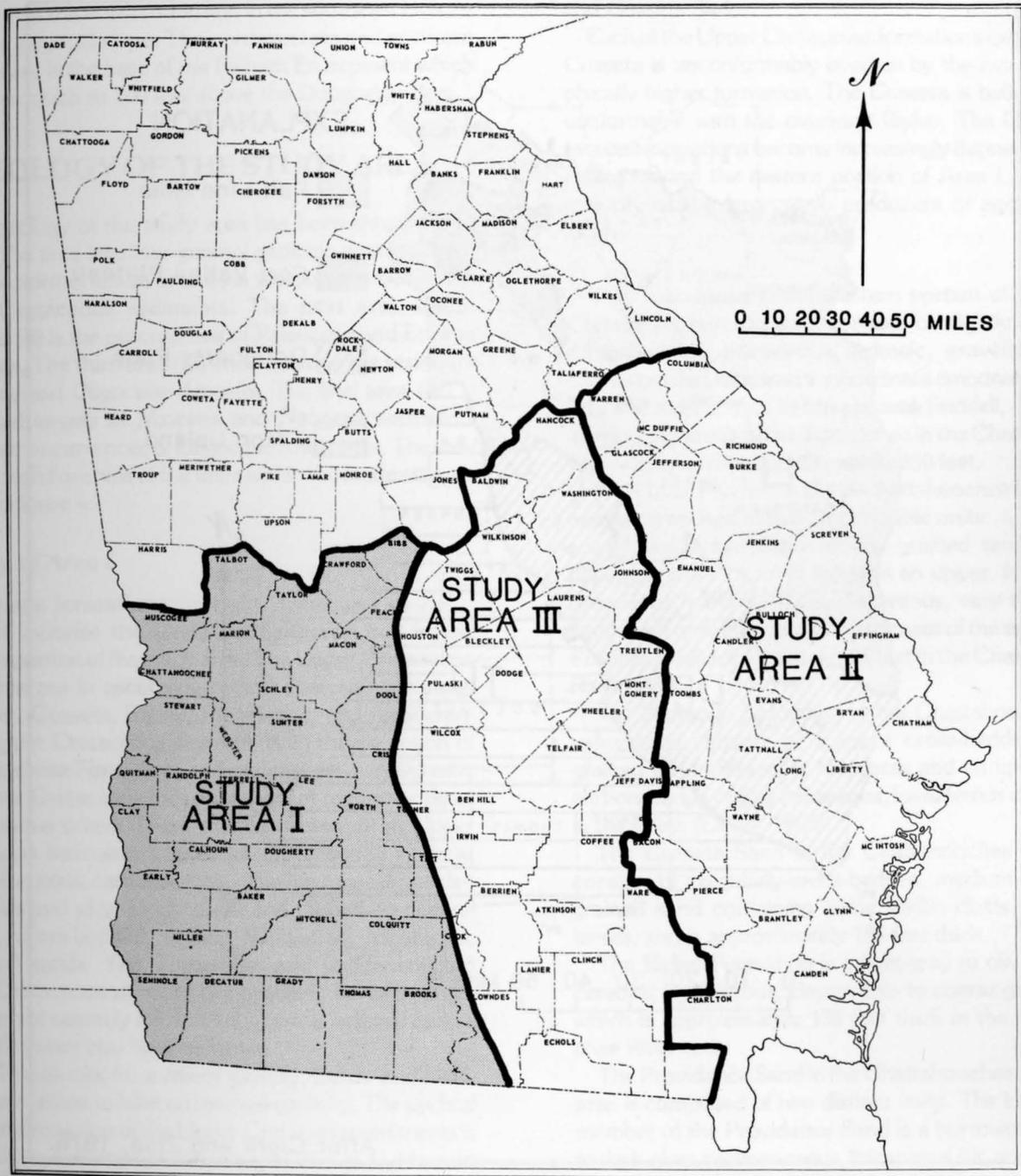


Figure 1. Study Area for Parts I, II, and III of the Construction Materials Study.

PURPOSE AND SCOPE

PHYSIOGRAPHY

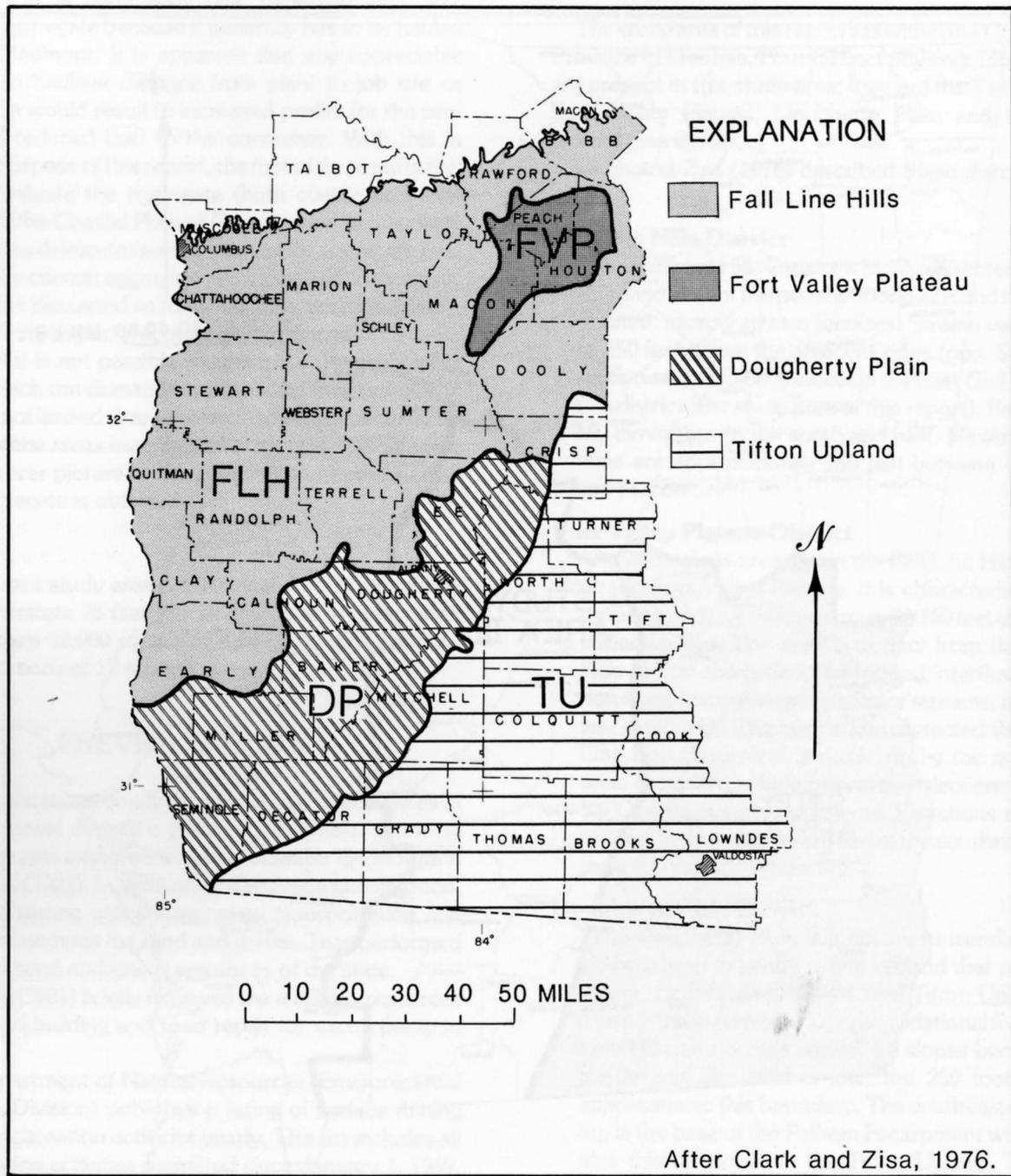


Figure 2. Physiographic Districts within the Current Study Area.

Tifton Upland District

"A well developed, extended, dendritic drainage pattern is formed on the undifferentiated Neogene sediments in the Tifton Upland District. Characteristically, the interfluvies are narrow and rounded, rising 50 to 200 feet above the narrow valley floors. Elevations range from 480 feet in the north to 150 feet in the southeast indicating the regional slope. The northwestern and northern boundary is the base of the Pelham Escarpment which rises as much as 200 feet above the Dougherty Plain."

GEOLOGY OF THE STUDY AREA

The geology of the study area has been simplified by dividing the area into four general geologic areas (see fig. 3). In the northernmost area (I) is the outcrop belt of the Upper Cretaceous sediments. The next area south-eastward (II) is the outcrop belt of Paleocene and Eocene sediments. The third area (III) encompasses the residuum of Eocene and Oligocene deposits. The final area (IV) is comprised largely of Miocene and Neogene sediments with minor occurrences of Oligocene limestones. The stratigraphic relationships of the units within the study area are shown in figure 4.

Geology of Area I

Cretaceous formations

Area I includes the Cretaceous outcrop belt in the northern portion of the study area. The Upper Cretaceous formations are in ascending order: Tuscaloosa, Eutaw, Blufftown, Cusseta, Ripley, Providence, and undifferentiated Upper Cretaceous deposits. With the exception of the Tuscaloosa Formation, and undifferentiated deposits, the Upper Cretaceous formations are of marine or near-shore marine origin. These marine to nearshore Upper Cretaceous sediments consist of: (1) light-gray to dark-gray¹, micaceous, carbonaceous, fossiliferous, silty sands², sandy silts and silty, sandy clays; and (2) fine- to coarse-grained, cross-bedded, slightly feldspathic, micaceous, burrowed sands. The Tuscaloosa and undifferentiated Upper Cretaceous deposits are probably fluvial in origin consisting of coarsely micaceous, gravelly, arkosic coarse sand with minor clay beds or lenses.

The Tuscaloosa (to a minor extent), Eutaw and Blufftown Formations exhibit an internal cyclicity. The cyclical nature of deposition of the Upper Cretaceous sediments is quite striking and was noted by Eargle (1955, p. 5), Marsalis and Friddell (1975) and subsequent workers. The cycles consist of a fine- to coarse-grained, sandy basal portion

¹ The colors referred to by the author correspond to those of the Munsell rock color chart distributed by the Geological Society of America, New York, New York.

² The grain size descriptions given by the author are those of Folk, R.L., 1974.

grading upward into silts and clays. The Cusseta, Ripley, and Providence Formations probably represent arrested or disrupted cycles as they either lack the lower sand unit (as in the case of the Ripley), or lack an upper more marine silty clay, clayey silt unit as in the case of the Providence and Cusseta Sand.

Each of the Upper Cretaceous formations except for the Cusseta is unconformably overlain by the next stratigraphically higher formation. The Cusseta is believed to be conformable with the overlying Ripley. The Upper Cretaceous formations become increasingly thinner and more sandy toward the eastern portion of Area I, where the majority of the large scale producers of aggregate are located.

The Tuscaloosa in the western portion of the Upper Cretaceous outcrop area consists of slightly indurated, cross-bedded, micaceous, arkosic, gravelly, fine- to coarse-grained sands with subordinate amounts of mottled silts and sandy clays (Marsalis and Friddell, 1975). The average thickness of the Tuscaloosa in the Chattahoochee River valley area is approximately 250 feet.

The Eutaw Formation in the Chattahoochee River valley area is composed of two conformable units: a lower, burrowed, slightly feldspathic, coarse-grained sand varying in thickness from 18 to 40 feet and an upper, fossiliferous, micaceous, carbonaceous, calcareous, very fine-grained sand to silt or sandy clay. The thickness of the entire Eutaw Formation is approximately 125 feet in the Chattahoochee River valley.

The Blufftown Formation in the Chattahoochee River valley area consists of a lower cross-bedded, coarse-grained sand 150 feet in thickness and an upper sandy, carbonaceous, highly micaceous, fossiliferous clay 260 feet in thickness (Eargle, 1955).

The Cusseta Sand in the Chattahoochee River area consists of irregularly cross-bedded, medium- to coarse-grained sand containing some kaolin clasts and kaolin lenses, and is approximately 185 feet thick.

The Ripley Formation is a light-gray to olive-gray, calcareous, fossiliferous, clayey, fine- to coarse-grained sand which is approximately 135 feet thick in the Chattahoochee River area.

The Providence Sand in the Chattahoochee River valley area is composed of two distinct units. The lower Perote member of the Providence Sand is a burrowed olive-gray to dark-gray, carbonaceous, micaceous silt, and is approximately 29 feet thick. The upper sand is a cross-bedded, feldspathic, micaceous, medium- to very coarse-grained sand which is approximately 120 feet thick.

Due to the lithologic similarity of all of the Upper Cretaceous deposits in the central Georgia area (Crawford, Bibb, Peach and Houston Counties), these deposits are referred to as Upper Cretaceous undifferentiated.

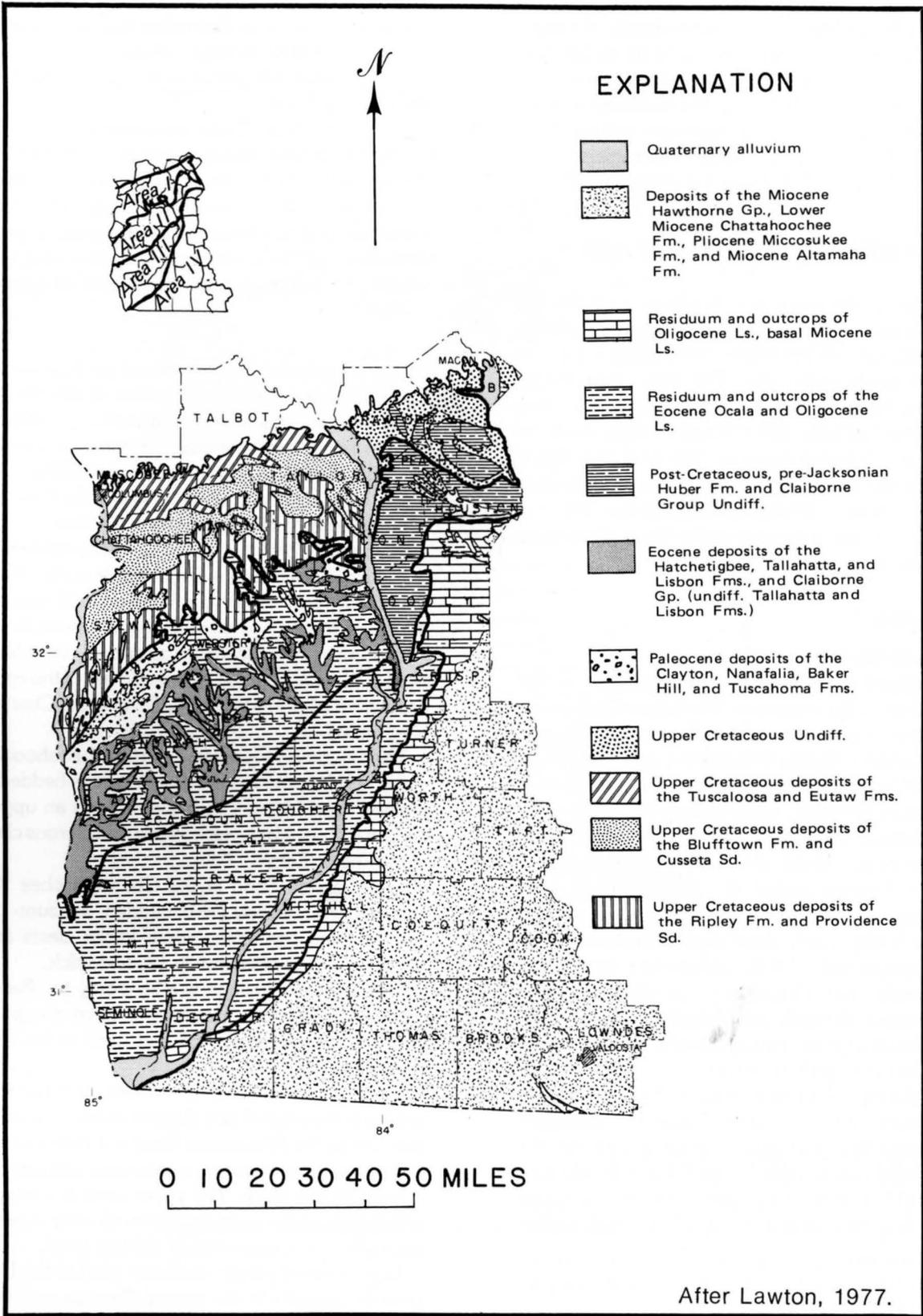


Figure 3. Geologic Map of the Study Area.

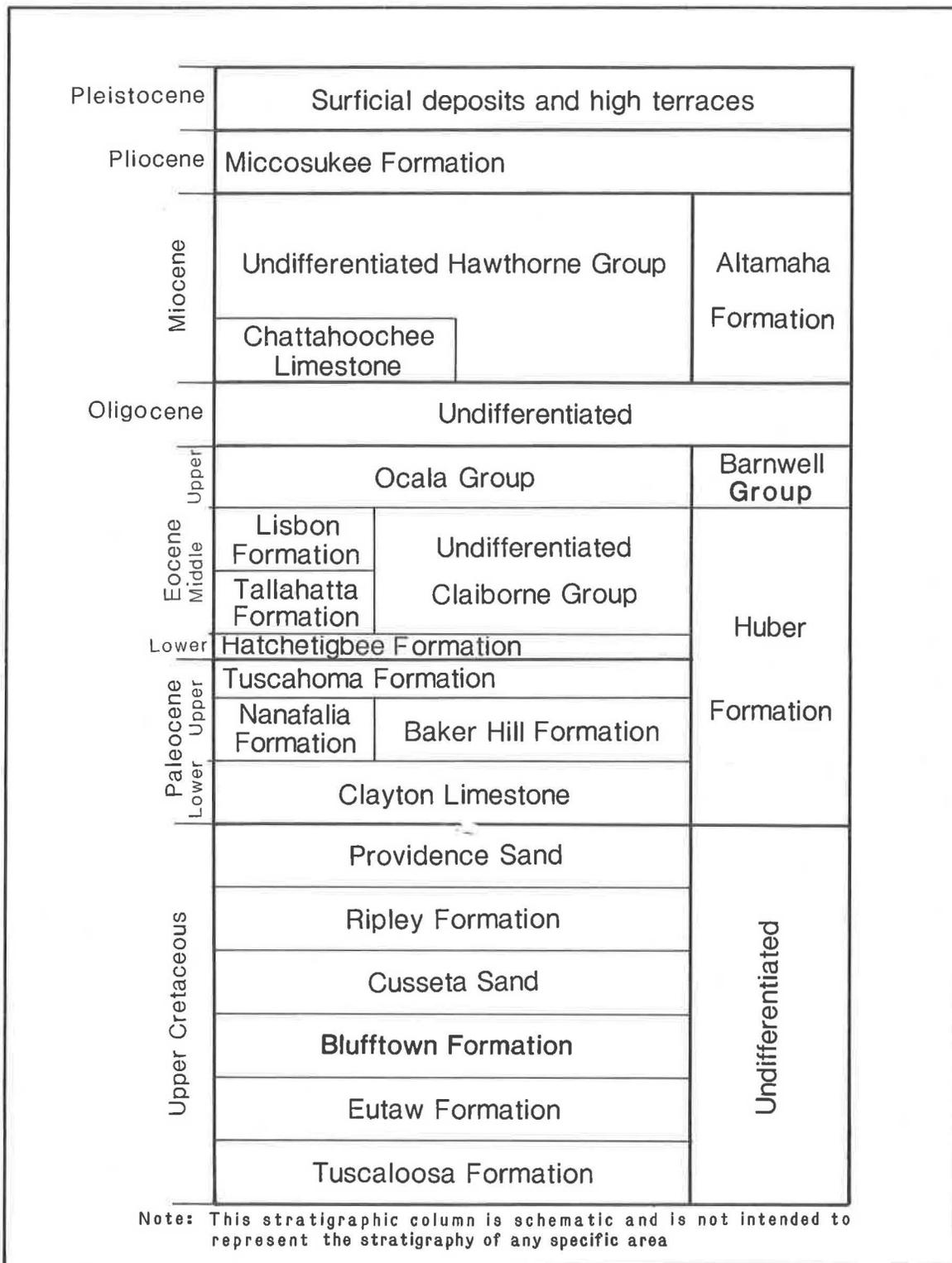


Figure 4. Generalized Stratigraphic Column for the Study Area.

Geology of Area II

Area II includes, in ascending order, the Clayton, Nanafalia, Baker Hill, and Tusahoma Formations which are Paleocene in age, the Tallahatta and Lisbon Formations and their up-dip equivalent, the undifferentiated Claiborne Group (all of middle Eocene age), and the Huber Formation (post Cretaceous pre-Jacksonian in age). Up-dip remnants and "fingers" of Eocene and Oligocene residuum are also included in this area. As a general rule, in the southern portion of this area, the up-dip upper Eocene and Oligocene residuum occupies the interfluves and broad flat areas, and the Paleocene and middle Eocene sediments are present in the valleys. The Paleocene and middle Eocene sediments form low hills and valleys in the northern portion of this area.

Clayton Formation

Outcrops of the Clayton Formation, which unconformably overlie the Upper Cretaceous Providence Sand, are restricted as a distinct formation to three areas: (1) southern Quitman and northern Clay Counties, (2) southern Macon County, northeastern Sumter and (3) Randolph Counties. Between these two areas, through the central portion of Area II, the Paleocene, Clayton, and Nanafalia (Baker Hill) Formations are quite difficult to distinguish (in outcrop) from each other and as a result they were mapped (Georgia Geologic Survey, 1976) as Paleocene Nanafalia, Porters Creek and Clayton Formations undifferentiated.

The Clayton Formation along the Chattahoochee River is composed of two members: (1) an upper zone of interbedded, sandy, fossiliferous, crystalline limestones and sands, 120 feet thick and (2) a basal conglomerate, 35 feet thick. In northern Randolph County the Clayton Formation is a fossiliferous limestone of varying hardness with minor beds of very fine-grained sand and beds of Fuller's earth. From exposures near Grier's Cave and at Wade quarry, north of Cuthbert, the thickness of the Clayton is estimated to be more than 100 feet (Clark, 1965, p. 6). In the Lee and Sumter County area, the eastern portion of the present study area, the Clayton Formation is a permeable light-gray, fossiliferous limestone containing clay layers in its upper portion, and is approximately 40 feet thick. The combined thickness of the Clayton and Nanafalia Formations varies from 70 to 160 feet (Owen, 1963, p. 25).

Nanafalia Formation

In the Chattahoochee River Valley area the upper Paleocene Nanafalia Formation unconformably overlies the Clayton Formation and consists of three members (Marsalis and Friddell, 1975): (1) the basal Gravel Creek Member, (2) an unnamed middle member or "Ostrea Thirsae zone" and (3) the uppermost Grampian Hills Member. The total thickness of the Nanafalia in this area is approxi-

mately 160 feet. In central Sumter and northern Lee Counties the Nanafalia is a light-gray, very fine- to fine-grained, silty calcareous, glauconitic sand (Clark, 1965). Up-dip of this area (central Sumter and northern Lee Counties), the Baker Hill Formation, the up-dip continental equivalent of the Nanafalia Formation, is a variegated white to brown, highly micaceous sand and clay.

In the vicinity of Quitman and Randolph Counties the thickness of the Baker Hill Formation varies from 3 to 80 feet (Clark, 1965, p. 8-9) and consists of unconsolidated, cross-bedded, micaceous, fine- to coarse-grained, kaolinitic sands and kaolins. In extreme northeastern Sumter County the Baker Hill Formation is approximately 70 feet thick and is a fine- to coarse-grained, cross-bedded sand containing lenses of kaolin and bauxite.

Tusahoma Formation

In the vicinity of Fort Gaines, Clay County, the upper Paleocene Tusahoma Formation consists of an upper zone of laminated clays and fine sands and a lower zone which is a thin bed of fossiliferous, coarse-grained sand. In the Quitman-Randolph County area the Tusahoma Formation is composed of 3 units (Clark, 1965, p. 10-11); they are (1) a lower glauconitic, coarse-grained sand which contains clay clasts and unconformably overlies the Nanafalia Formation, (2) a middle unit consisting of gray, laminated clays and fine-grained sands and (3) an upper unit of massive, micaceous, fine-grained sand.

In the Lee-Sumter County area the Tusahoma Formation averages 70 feet in thickness and is composed of an upper 40 foot thick light olive-gray, sandy, glauconitic silt to silty sand and a lower 30 feet of poorly-sorted, gravelly, glauconitic, fine- to coarse-grained, sand (Owen, 1963a, p. 27). The Tusahoma pinches out in the northern Sumter-southern Macon and Schley County area.

Hatchetigbee Formation

The lower Eocene Hatchetigbee Formation in the western portion of the study area is an olive-gray, fossiliferous, glauconitic, calcareous sand varying from 7 to 23 feet in thickness. The Hatchetigbee Formation is restricted in outcrop to Early, Clay and Randolph Counties.

Tallahatta Formation

Outcrops of the middle Eocene Tallahatta Formation are restricted to the Chattahoochee River Valley area. In this area (Chattahoochee Valley) the Tallahatta is a light-gray, fossiliferous, calcareous, glauconitic sand which varies in thickness from 40 to 70 feet (Marsalis and Friddell, 1975). Up-dip of this area in the vicinity of Fort Gaines and extending to western Sumter County, the Tallahatta Formation is represented by a locally cross-bedded, burrowed, gravelly, fine- to coarse-grained sand which contains lenses and beds of claystone.

Lisbon Formation

The middle Eocene Lisbon Formation, which unconformably overlies the Tallahatta Formation, is composed of calcareous, fossiliferous limestone; and calcareous, glauconitic sands and locally indurated clayey sands. The Lisbon is 110 feet thick at the Chattahoochee River (Marshall and Friddell, 1975).

Claiborne Group Undifferentiated

East of the Chattahoochee River valley, the up-dip equivalent of the Lisbon and Tallahatta Formations is the middle Eocene Claiborne Group undifferentiated. In the areas where the Claiborne Group undifferentiated crops out, it is a brick red to white to yellow (where unweathered), unconsolidated, massive to cross-bedded micaceous, fine- to medium-grained sand. In the vicinity of Quitman and Randolph Counties, the thickness in outcrop of the Claiborne is approximately 50 feet (Clark, 1965). In the eastern portion of the study area (Lee and Sumter Counties) drill holes indicate the subsurface thickness of the undifferentiated Claiborne Group varies from 115 to 340 feet (Owen, 1963a, p. 16). In this same area the outcrop thickness of the Claiborne rarely exceeds 40 feet.

Huber Formation

The Huber Formation was first proposed by Buie (1978, p. 1-7) for sediments of post-Cretaceous pre-Jacksonian age extending from the Ocmulgee River eastward to the Savannah River. Within the study area, outcrops of the Huber are restricted to the northeastern portions of Areas I and II (fig. 3).

The Huber Formation is quite diverse lithologically, varying from "... beds of high-purity and sandy kaolin to thick, cross-bedded members of coarse, pebbly sand, and even conglomerate composed of boulders of pisolitic kaolin..." (Buie, 1978, p. 3). The upper portion of the Huber Formation contains "hard" kaolin characterized by a hackly fracture, and contains trace fossils and minor beds of moderately- to well-sorted, fine- to medium-grained sands, whereas, the lower portion contains cross-bedded, coarsely micaceous, gravelly, poorly sorted, coarse-grained sands and "soft" kaolins which have a conchoidal to subconchoidal fracture (Huddleston, in review).

The Huber Formation is 33.4 feet thick in its type locality, J.M. Huber mine 30 (5.8 miles northeast of the railroad crossing at the Huber Post Office, Twiggs County). The maximum thicknesses in other areas vary from 50 to 100 feet (Huddleston, in review).

Eocene and Oligocene Residuum

Residuum of the Eocene Ocala Limestone and Oligocene limestone crop out in the southern portion of Area II; in this area the residuum is a brick-red, sandy clay to clayey sand containing silicified limestone fragments from pebble

to boulder size. The residuum varies in thickness from 100 feet in the southwestern portion of the study area (Sever, 1965, p. 10) to 0 to 40 feet in the eastern portion (Lee County) of the study area (Owen, 1963a, p. 16).

Geology of Area III

The surficial geology of Area III is relatively simple, consisting almost exclusively of residuum of the Eocene Ocala Limestone. This residuum is a brick-red to light yellow sandy (fine- to coarse-grained) clay to clayey sand which contains fragments (pebble to boulder size) of silicified Eocene limestone.

At depth the Ocala Limestone is a white to light pink fossiliferous, porous limestone. The Ocala Limestone within Area III is approximately 250 feet thick at its maximum. The residuum of the Ocala varies from 0 to 100 in thickness.

Surficial exposures of the Ocala Limestone are relatively rare within Area III. Most of the natural exposures of the Ocala are along the Flint River from the Decatur-Mitchell county line to just north of the city of Albany and along Kinchafoonee and Muckaloochee Creeks, north and west of Albany. Even at these localities the limestone is somewhat silicified or case hardened.

Geology of Area IV

The sediments present at the surface in Area IV are an Oligocene limestone; the Miocene Chattahoochee Formation, Hawthorne Group, and Altamaha Formation undifferentiated; and the Pliocene Miccosukee Formation.

Oligocene limestone

An Oligocene limestone, referred to as Suwannee on the Georgia Geologic Survey map (1976), crops out along the western edge of Area IV. Where unweathered this limestone is variable, but can be generalized as a dense, white, dolomitic, fossiliferous limestone. In Mitchell County this limestone is 100 feet thick (Owen, 1963b, p. 13). Toward the eastern portion of the study area in Thomas County, this same limestone unit reaches 210 feet in thickness (Sever, 1966, p. 4).

Chattahoochee Formation

The Chattahoochee Formation referred to by earlier workers as the Tampa Limestone, is a finely sandy to silty dolomite which has beds of fuller's earth associated with it. The Chattahoochee Formation, which is lower Miocene in age, crops out along the Pelham Escarpment, at Climax Cave in southwest Decatur County and in sinks in Thomas and Brooks Counties. The thickness of the Chattahoochee Formation varies from 24.5 feet at Climax Cave to 90 feet at Chattahoochee, Florida.

Hawthorne Group

The outcrops of the Hawthorne Group within Area IV are generally restricted to the extreme western edge of the area and to the major valleys within the southern part of the area. The Hawthorne Group in these areas consists of interbedded sands, silts, fuller's earth clays (sepiolite, attapulgitite, montmorillonite) and discontinuous silicified limestones. In the southern portion of Area IV, the Hawthorne generally varies in thickness from 0 to 300 feet (Zimmerman, 1977, p. 19) in the Colquitt County area. The Hawthorne reaches its maximum thickness of 700 feet in central Colquitt County (within the Gulf Trough) and thins to the north.

Altamaha Formation undifferentiated

The Altamaha Formation undifferentiated crops out within Area IV from central Colquitt County northward to northern Crisp County and extends eastward across the study area. The Altamaha Formation is early to middle Miocene in age and consists of thin- to thick-bedded, locally cross-bedded, variably indurated, well- to poorly-sorted, feldspathic, argillaceous, locally gravelly, fine- to coarse-grained sand to clay. The general thickness of the Altamaha varies from 100 to 200 feet.

Miccosukee Formation

The Miocene Miccosukee Formation crops out in Area IV south of Moultrie, Colquitt County. Lithologically the Miccosukee is composed of reddish brown to gray sandy clays, and clayey, cross-bedded, fine- to coarse-grained sands. In Area IV, the Miccosukee varies in thickness from 0 to 60 feet.

River Deposits

Within the study area, the two river systems with the greatest potential for large deposits of sand and gravel are the Chattahoochee and Flint Rivers. Therefore, the majority of the sediment samples taken from areas adjacent to streams were collected from the terrace and point bar deposits along these rivers.

The two major types of sand deposits associated with rivers and streams of the study area are: (1) high terrace deposits and (2) point bar deposits of the modern floodplain.

Terrace Deposits

The terraces of the Chattahoochee and Flint Rivers appear to be cyclical in nature; that is, their terraces were formed when the deepening of the valleys had ceased and lateral erosion took place. Rejuvenation of the rivers resulted in a down-cutting which in turn resulted in paired terraces. These paired terraces are characterized by upper surfaces having approximately equal elevations on both sides of the rivers (see figure 5).

Carver and Waters recognized six fluvial terraces and correlated them with marine terraces as follows: 10-20 feet (Pamlico), 30-50 feet (Talbot), 60-80 feet (Penholoway), 110-130 feet (Wicomico), 140-160 feet (Okefenokee), 170-190 feet (Sunderland) (Carver and Waters, 1984, p. 117-122).

River terraces are quite difficult to correlate with each other, much less with coastal marine terraces. Thornbury (1969, p. 160) states "The only positive method of correlating terraces in different valleys is to trace them until they join a similar terrace in a trunk valley to which the two valleys are tributary. If valleys are so widely separated that neither of these methods is possible, extreme caution should be exerted in correlating valley terraces on the basis of similarity in altitudes." Reasonable methods have been used by the previously mentioned workers in correlating along river valleys; however, their correlation of river terraces with coastal terraces seems tenuous.

During the present study no attempt was made to map out any of the terrace deposits in detail. Portions of several terrace deposits were investigated during this study and the coarsest gravels present were found along the Chattahoochee River.

Point bar deposits

Point bar deposits form by accretion on the convex sides of river banks. These deposits of the modern floodplain vary greatly in grain size and areal extent, depending

The two basic types of river terraces as defined by Thornbury (1969, p. 156) are (1) bedrock terraces, with little or no sand, gravel, and fine alluvium, which are indicative of erosion dominated regimes, and (2) alluvial terraces blanketed by sandy gravels and fine alluvium which are indicative of a deposition dominated regime. Both types of terraces occur in the study area.

There are four major studies which provide information concerning the elevations of fluvial terraces along the Chattahoochee River.

Veatch and Stephenson (1911) identified two fluvial terraces along the Chattahoochee River, one at 50 feet above river level and a second 100-125 feet above river level. The authors correlated these fluvial terraces with the Satilla and Okefenokee marine terraces respectively (Veatch and Stephenson, 1911, p. 431, 444).

Cook (1925) recognized three fluvial terraces which he reported corresponded to marine coastal terraces. These terraces are at elevations above river level of 50-60 feet, 130 feet, and 160-170 feet (Cook, 1925, p. 36).

Roberts (1958) reported that there are four fluvial terraces along the Chattahoochee River and further, that these terraces have marine terrace equivalents. The four fluvial terraces (in feet above the modern floodplain) and their marine terrace equivalents are: 10-20 feet (Pamlico), 30-50 feet (Wicomico), 70-110 feet (Sunderland), 135-160 feet (Coharie) (Roberts, 1958, p. ii).

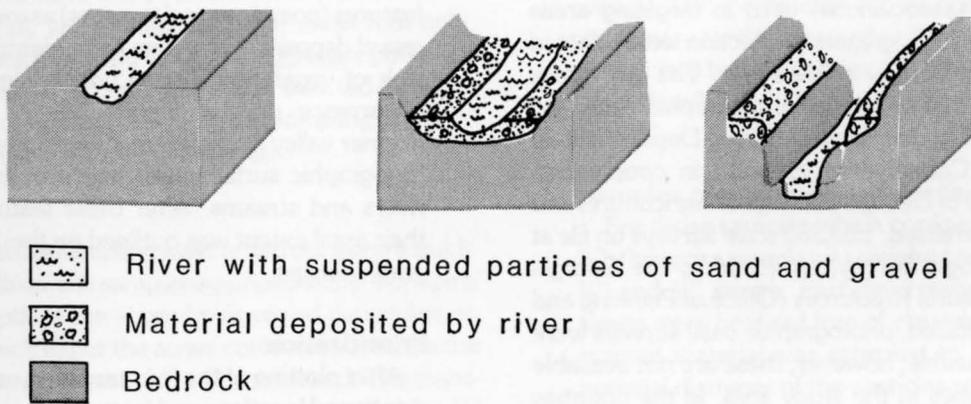


Figure 5. Cross-sectional View of a River Valley Illustrating the Formation of Paired Terraces; (a) Early Stage, (b) Lateral Erosion and Deposition, (c) Rejuvenation of the River.

on the sediment source and flow regime. Point bar deposits are generally coarser grained and larger in areal extent along the Chattahoochee River than point bar deposits along the Flint River.

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 based on four factors: soil type, 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, proximity to active and inactive producers of sand and gravel, and geomorphic features such as terrace surfaces and point bars (primarily along rivers).

Soil Type

The soil types (associations) used in targeting areas regarding potential for 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 whenever 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 inset, Plate I, 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 Americus, Chipley, Kershaw, Lakeland, and Troup. The soil associations selected from the generalized soil maps were #24 (example — Kershaw, Lakeland, Chipley and Ellebelle), #32 (example — Kershaw, Lakeland, Lucy and Troup), and #39 (example — Fuquay and Lakeland). 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), 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, 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 and terraces) 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 convex side of streams. Terraces (former valley floors) were identified by their generally flat topographic surface and their proximity to present day rivers and streams. After these features were identified their areal extent was outlined on the 1:24,000 scale topographic maps.

Prioritization

After plotting of 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 areas enclosed by one of the four targeting variables were 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 are listed in the table under the individual county descriptions. In Dooly County, it was found that based on the soil survey, no suitable soil type was present; therefore, in an effort to maximize use of field time, only one sample was taken.

Plate I, 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. It should be recognized that in normal materials processing, the finer size particles are removed during washing and screening; thus, the material is upgraded to a product meeting commonly accepted standards, such as those of the American Society of Testing Materials (A.S.T.M.).

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 sampler equipped with a 4.5" 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 sample were examined and placed on a plastic sheet. A new sample was begun each time an appreciable change in sediment grain size was noted. The aforementioned process was repeated for each appreciable change in grain size encountered during the sampling. 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 the 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 (see fig. 6) and is numbered consecutively (numbers are repeated for each quadrangle). In the event that more than one sample (from different horizons or depths) 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, TzN-1a, and TzN-1b represent samples a and b from the first auger or trench sample in the Tazwell North 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 $\frac{3}{8}$ " sieve) the samples were divided into two categories, (1) those containing particles larger than $\frac{3}{8}$ " and, (2) those containing no particles larger than $\frac{3}{8}$ ".

Samples containing particles larger than $\frac{3}{8}$ "

For those samples which contain particles greater than $\frac{3}{8}$ ", the entire sample was weighed and then sieved through $\frac{1}{2}$ " and $\frac{3}{8}$ " sieves. Particles retained on the $\frac{1}{2}$ " and $\frac{3}{8}$ " 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 $\frac{1}{2}$ " sieve was measured using calipers. Following this, the particles were divided into the categories of $\frac{3}{4}$ ", 1", and $1\frac{1}{2}$ " (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 $\frac{3}{8}$ " (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 $\frac{3}{8}$ "

After drying, each sample was split using a mechanical splitter until a sample size of approximately 150 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 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 the 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 (0.075mm)	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 (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 DESCRIPTIONS

Baker County

Geology and Physiography

Baker County lies within the Dougherty Plain District of the Coastal Plain Province. The surficial sediments are derived primarily from the residuum of the Eocene Ocala Limestone.

Previous Studies

Teas (1921, p. 154) noted that thin surficial sands cover most of Baker County and that stream deposits of sand are present along the Flint River and Ichawaynochaway and Chickasawhatchee Creeks. The local supply of fine aggregate (mortar sand) at the time of Teas' study was obtained from the banks of the Cooleewahee Creek, one-half mile north of Newton (fig. 7, Ts-7).

Present Study

The four areas sampled in Baker County are flood plain deposits (point bars) along the Flint River. The soil association used in targeting areas of Baker County was #39, which is present in interfluvial areas in central, southern, and central western Baker County. Geomorphic features targeted are point bars along the Flint River and Chickasawhatchee and Ichawaynochaway Creeks in western Baker County.

Evaluation

Four point bars (fig. 7, Hop-1, Nwt-2, Nwt-3, BaS-1) varying in thickness (above river level) from 6 feet at Nwt-2 to 15 feet at BaS-1 (figs. 8, 9) were sampled. Size distribution curves (figs. 10-13) show that the grain size of these point bars are similar, with predominantly well-sorted, fine-grained sands. None of the natural materials in the point bars sampled pass ASTM standard C-33 (Table 1) and are probably suited only for mortar sand.

Based on field observations, the area from which BaS-1 was obtained is the largest deposit. The material in this point bar is estimated at 2.5 million cubic yards, based on a tabular sand body 20 feet thick and an areal extent of 80 acres.

Factors limiting development of this deposit are lack of a nearby primary or secondary road and the limited number of products that could be derived from this deposit.

Mining activity

There are no active or recently inactive commercial aggregate mining operation in Baker County.

Summary evaluation

None of the natural materials sieved passed ASTM standard C-33, and the use of the deposits represented by these samples is probably restricted to mortar sand. Due to the thinness of the surficial deposits of Baker County, the areas with the highest potential for aggregate production are the point bars along the Flint River.

The fine aggregate producing potential of Baker County is considered to be low.

Table 1. Baker County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Hop-1	4 feet	auger	8 feet	2	no	1
Nwt-2	6 feet	auger	6 feet	1	no	1
Nwt-3	4 feet	auger	5 feet	1	no	2
BaS-1	4 feet	auger	20 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

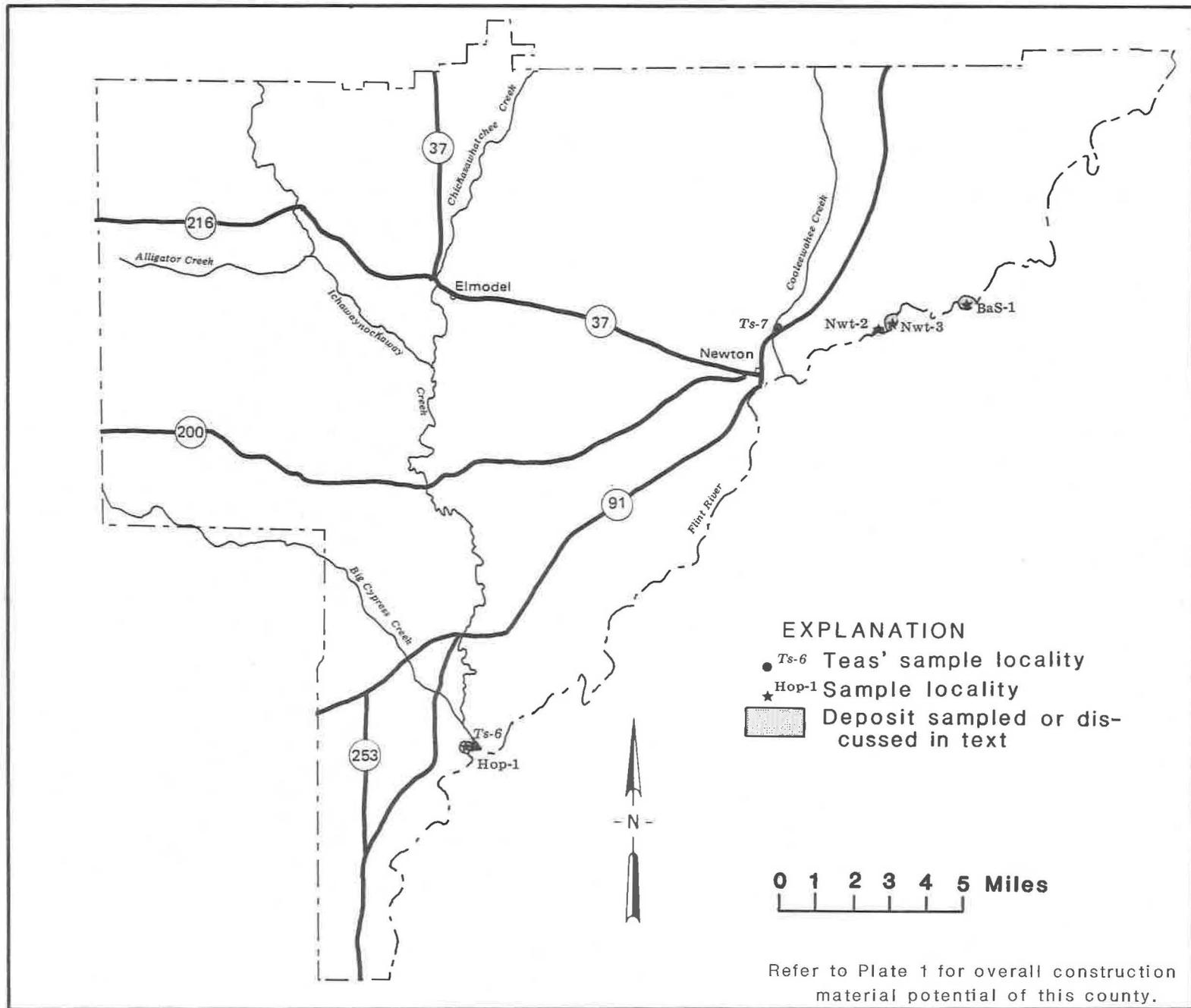


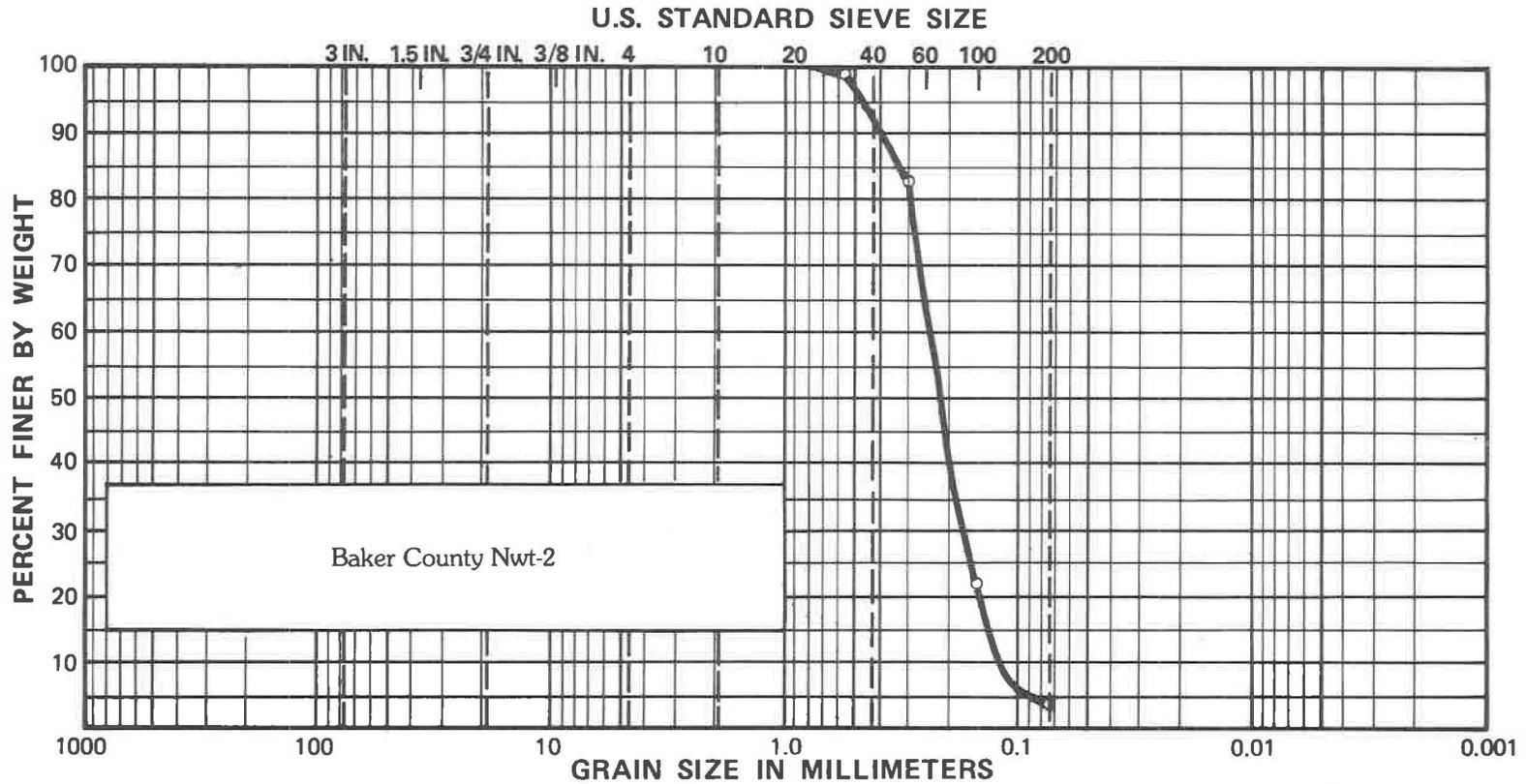
Figure 7. Map of Baker County Showing Sample Localities, Teas' Sample Localities and Deposits Sampled as Part of this Study.



Figure 8. Point Bar Deposit on the Flint River at Sample Locality Nwt-2, Baker County.



Figure 9. Point Bar Deposit on the Flint River at Sample Locality BaS-1, Baker County.



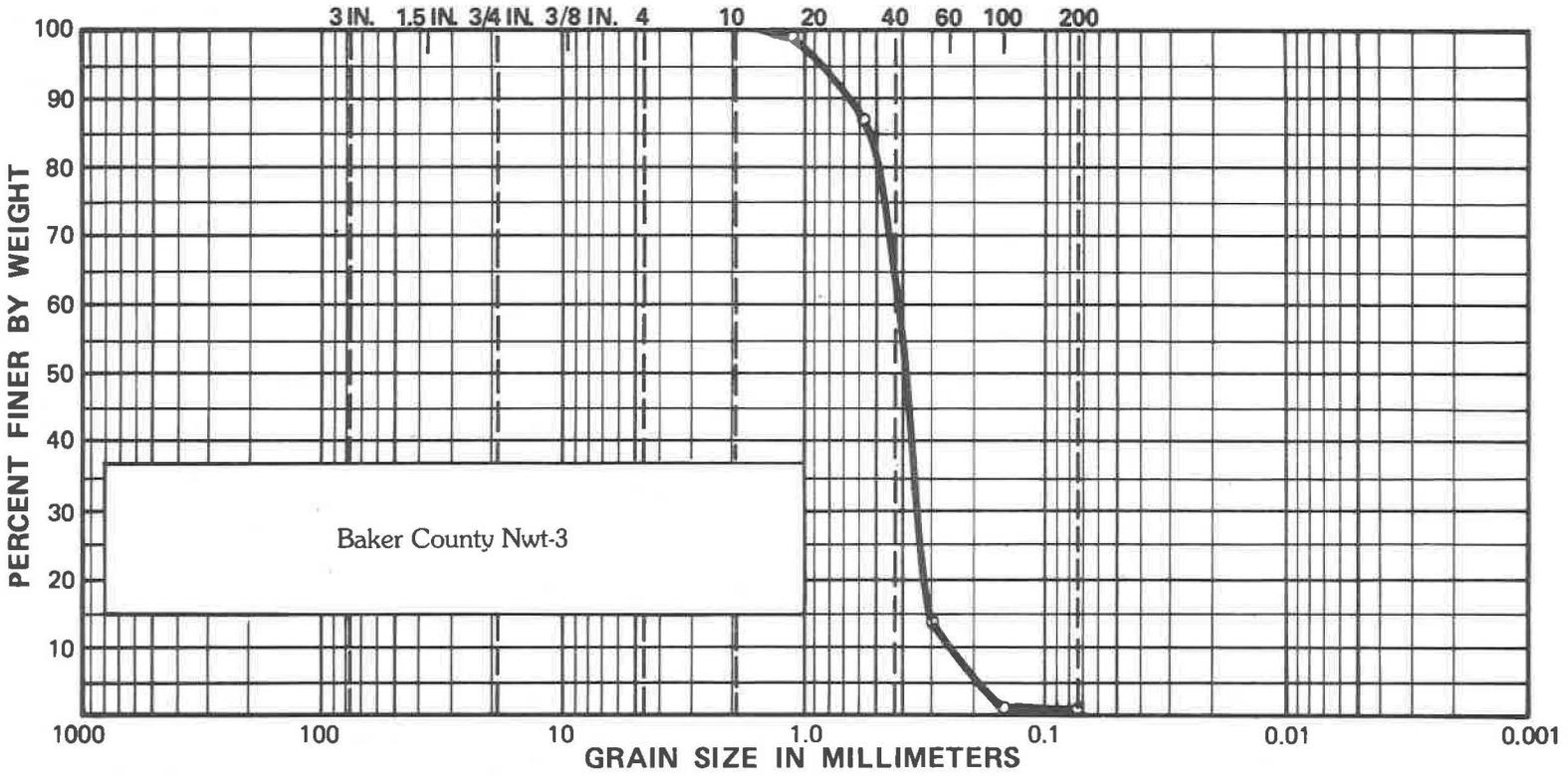
COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

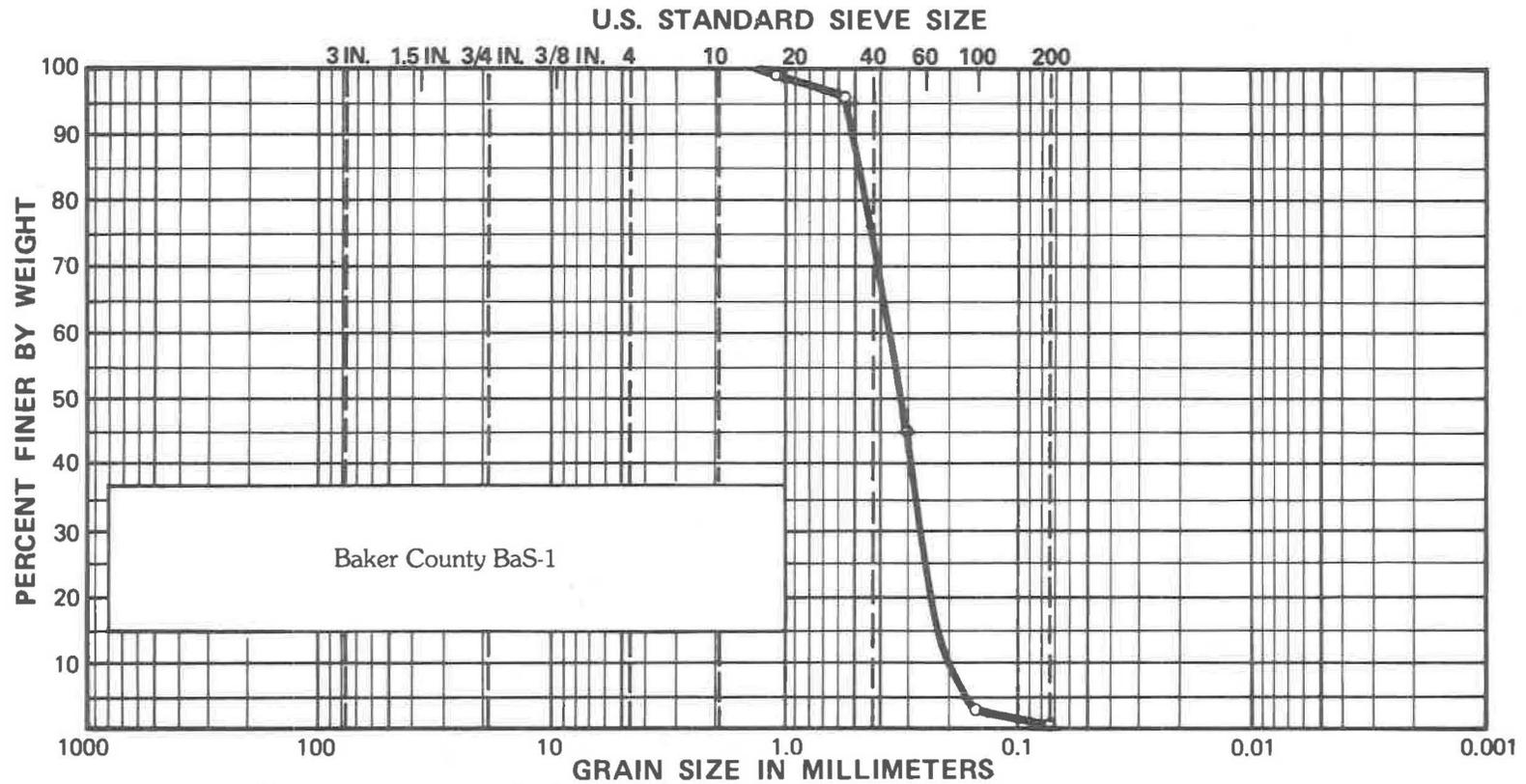
*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 11. Size Distribution Curve of Sample Nwt-2.

U.S. STANDARD SIEVE SIZE





Bibb County

Geology and Physiography

Bibb County lies within two physiographic provinces, the Piedmont Province and the Coastal Plain Province. The Coastal Plain Province is represented by the Fall Line Hills District in Bibb County. The sediments of the Fall Line Hills District west of Interstate 75 are Upper Cretaceous undifferentiated and consist of fine- to coarse-grained sands with subordinate amounts of clay.

Previous Studies

Teas described a very sandy belt existing two or three miles southeast of Lizella (fig. 14, Ts-1), which he considered to be an extension of the commercial sand belt of Taylor and Crawford Counties. In addition, Teas noted gravels along the Fall Line near Lizella (fig. 14, Ts-2, Ts-3 [Saunders' property]; fig. 15).

Present Study

The soil association used in targeting areas of Bibb County was Lakeland, which is present in interfluvial areas in southwestern Bibb County. Geomorphic features targeted are terrace surfaces present in southwestern Bibb County. Two samples (figs. 16, 17; Table 2) were taken from a single auger hole in Cretaceous surficial, loose, fine- to coarse-grained sand in Bibb County. Sample Liz-1a represents the finer grained, less clayey upper 1.5 foot interval, whereas Liz-1b represents the coarser grained, more clayey 5.5 foot interval of the sample. Neither sample from this hole meets ASTM standard C-33.

The gravel deposits mentioned by Teas (p. 164) were field checked and found to be too thin to be of commercial value. In addition a high terrace deposit (figs. 18-19), found while conducting reconnaissance work, was investigated. This terrace is too small in areal extent and too thin to be of commercial value as an aggregate source.

Evaluation

Although the samples Liz-1a and Liz-1b do contain some coarse material, the bulk of the material sampled contains an excessive amount of < #200 mesh material (fig. 17).

Mining activity

There are no active or recently inactive mining operations within the study area of Bibb County.

Summary evaluation

The study area within Bibb County has low or no potential for commercial production of either fine or coarse aggregate.

Table 2. Bibb County sample data

Sample designation	Depth ¹	Sample type	Minimum ³ thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Liz-1a	0-1.5 feet	auger	1.5 feet	2	no	2
Liz-1b	1.5-7 feet	auger	5.5 feet	2	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

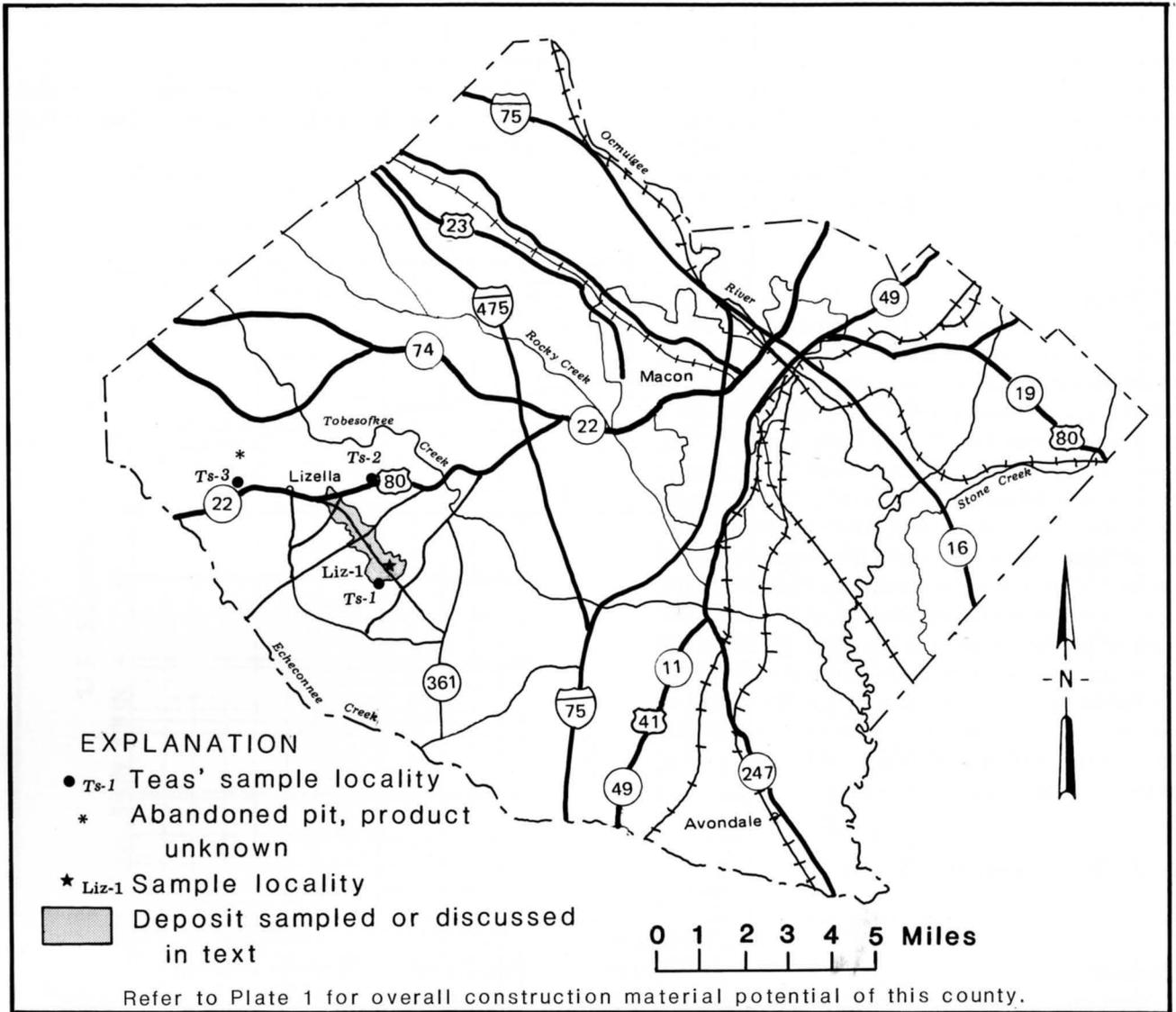
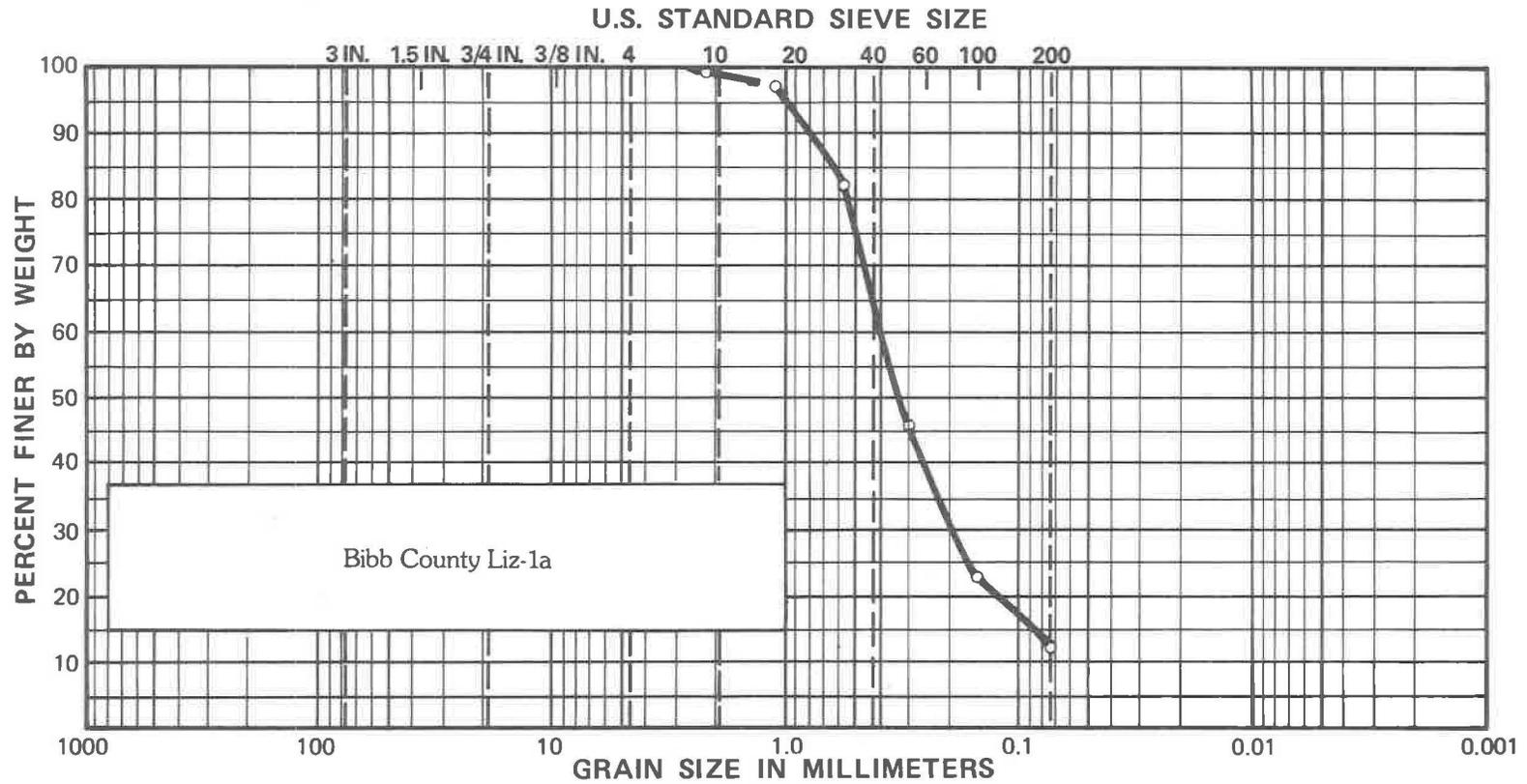


Figure 14. Map of Bibb County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled as Part of this Study.



Figure 15. Sands and Coarse Gravels of the Coastal Plain Overlying Weathered Gneiss near Lizella, Bibb County.

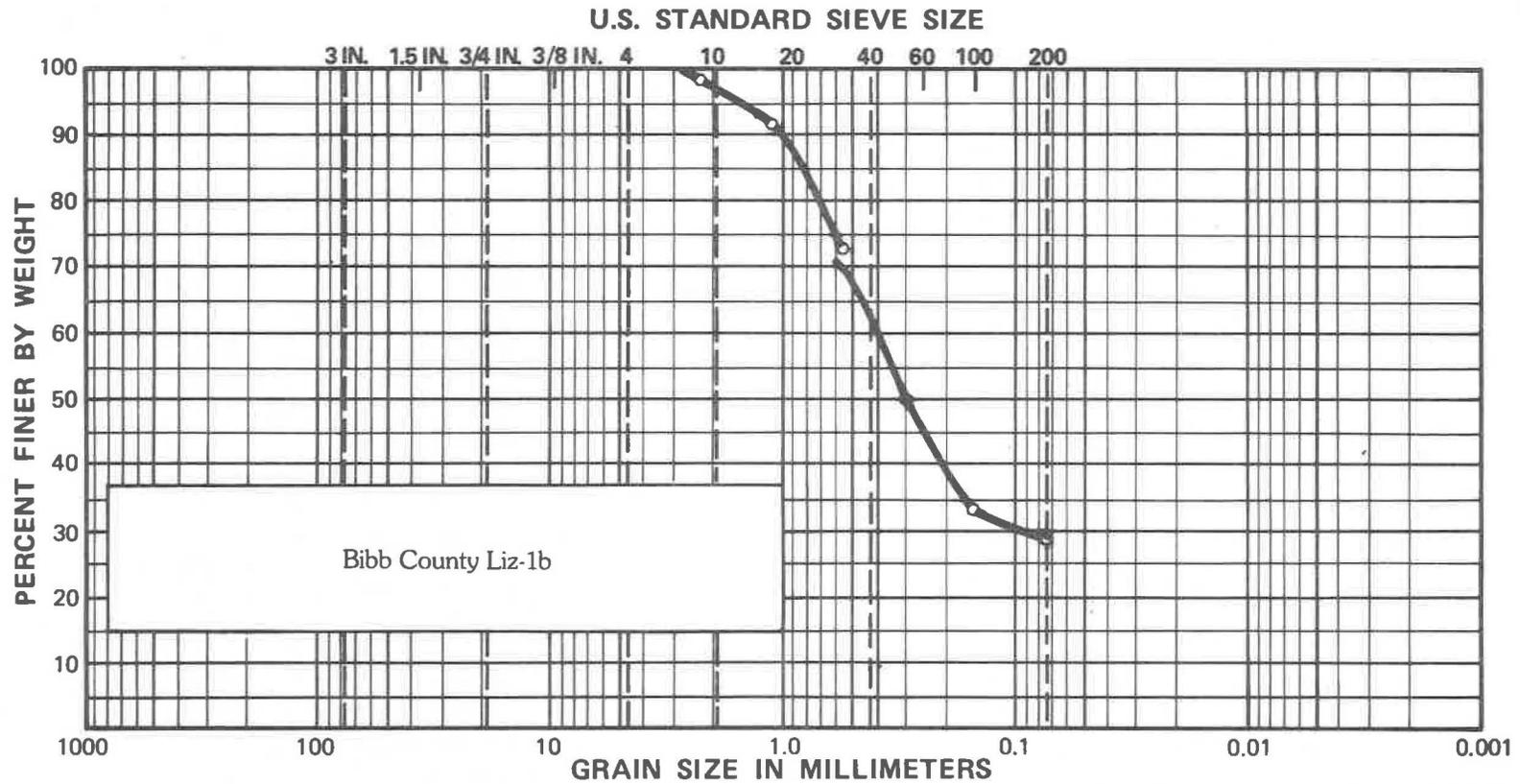


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 16. Size Distribution Curve of Sample Liz-1a.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 17. Size Distribution Curve of Sample Liz-1b.



Figure 18. High Terrace Exposed near Intersection of I-75 and U.S. Highway 80, Bibb County.

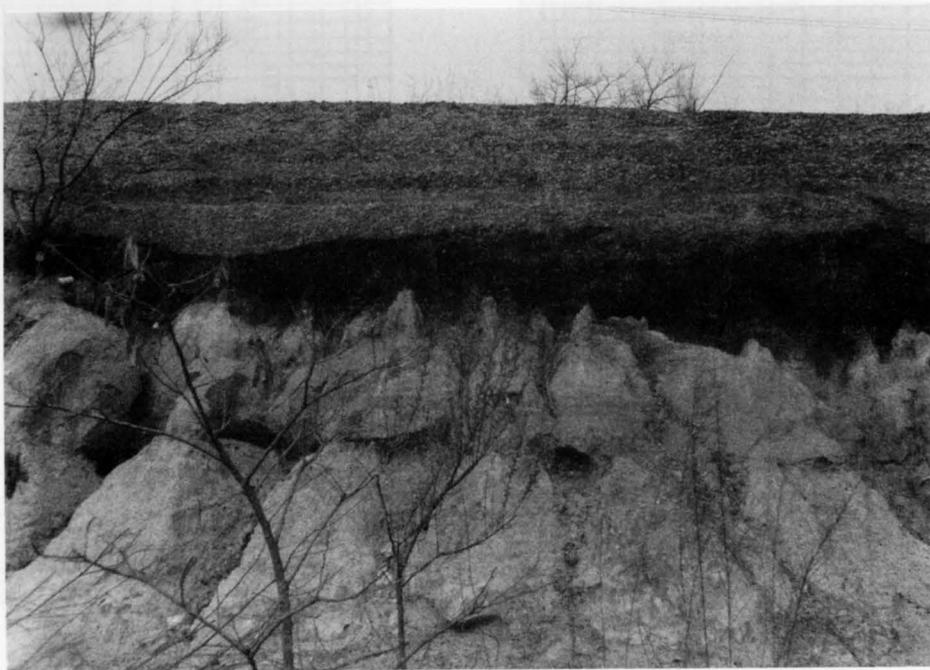


Figure 19. Close-up of High Terrace Exposed near Intersection of I-75 and U.S. Highway 80, Bibb County.

Brooks County

Geology and Physiography

Brooks County lies within the Tifton Upland District of the Coastal Plain Province. The surficial sediments of the county are derived from the Miccosukee Formation and the Hawthorne Group.

Previous Studies

Teas (1921), p. 165-166) noted that Brooks County has considerable surficial sand but that commercial deposits are meager. Deposits of coarse sand were noted along Okapilco Creek (A.S. Perry property) and along bars of the Withlacoochee River (Teas, 1921, p. 166).

Present Study

The soil association used in targeting areas of Brooks County was Lakeland, which is present along the Withlacoochee River in the eastern portion of the county, and as isolated pod-shaped bodies in the central southern portion of the county. Two sites in the extreme northern portion of Brooks County were sampled (fig. 20, Cec-1, Cec-2; Table 3).

Evaluation

Although neither of the natural materials met ASTM standard C-33 (figs. 21, 22), sample Cec-1 marginally failed and could be upgraded through processing to meet the ASTM requirements. The deposit represented by sample Cec-1 probably has an areal extent in excess of 25 acres. Assuming a tabular body 8 feet thick and 25 acres in area, the reserves would be in excess of 300,000 cubic yards. A primary road is adjacent to this area and could provide access to the deposit. The Little River, also adjacent to this site, could provide an adequate water supply for processing.

Mining activity

There is no active commercial aggregate mining in Brooks County. Scruggs Company of Valdosta operated a sand pit (fig. 20, D-339-F); however, the major product was fill material. This pit was permitted for 2 acres and has been reclaimed. No further information is available on production figures or products.

Summary evaluation

Brooks County has little potential for either fine or coarse aggregate production with the possible exception of the areas adjacent to the Little River, where some fine aggregate may be obtained.

Table 3. Brooks County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Cec-1	9 feet	auger	8 feet	2	no ⁴	2
Cec-2	9 feet	auger	6 feet	2	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

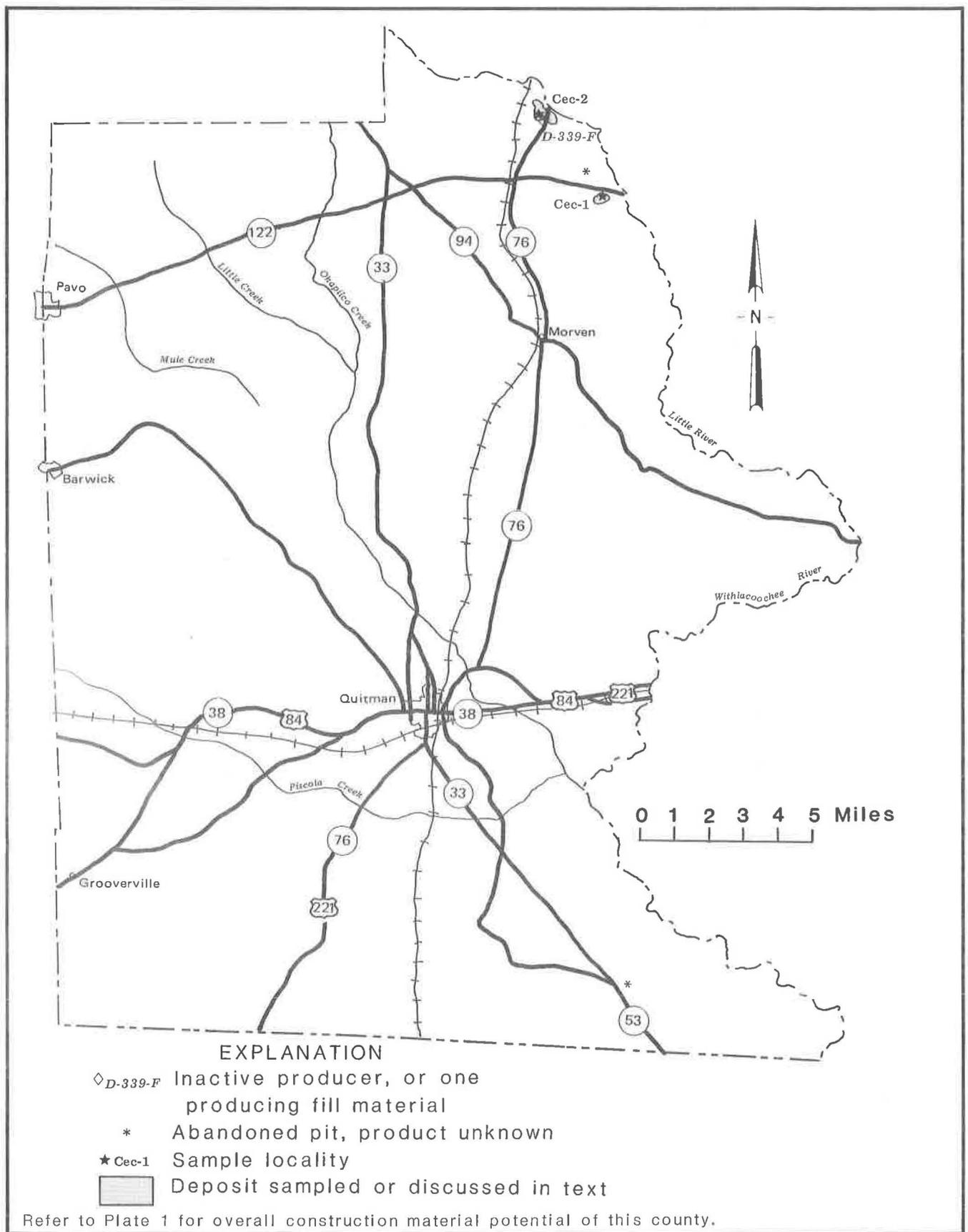
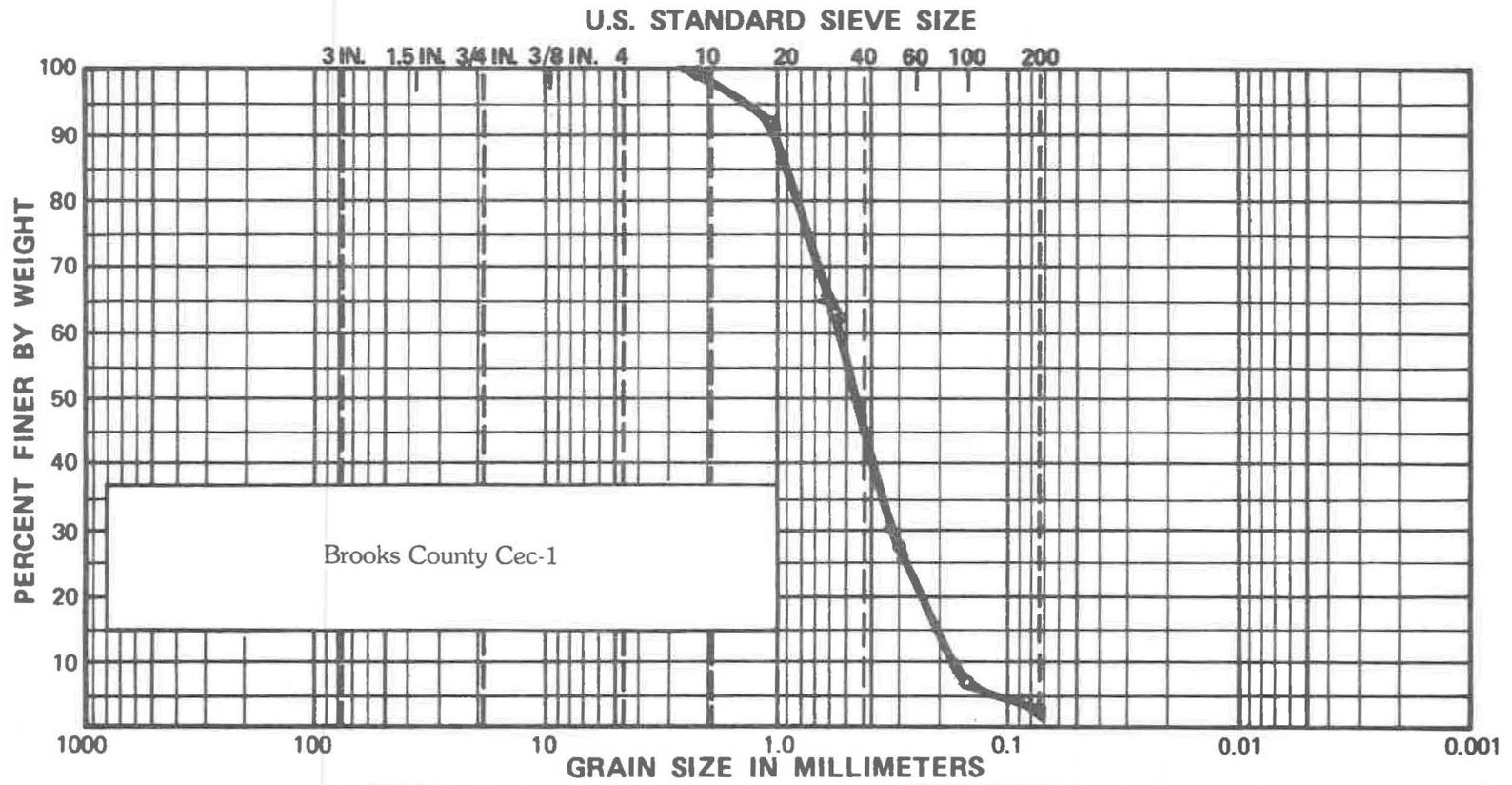


Figure 20. Map of Brooks County Showing Sample Localities, Teas' Sample Localities, and Deposits Sampled as Part of this Study.

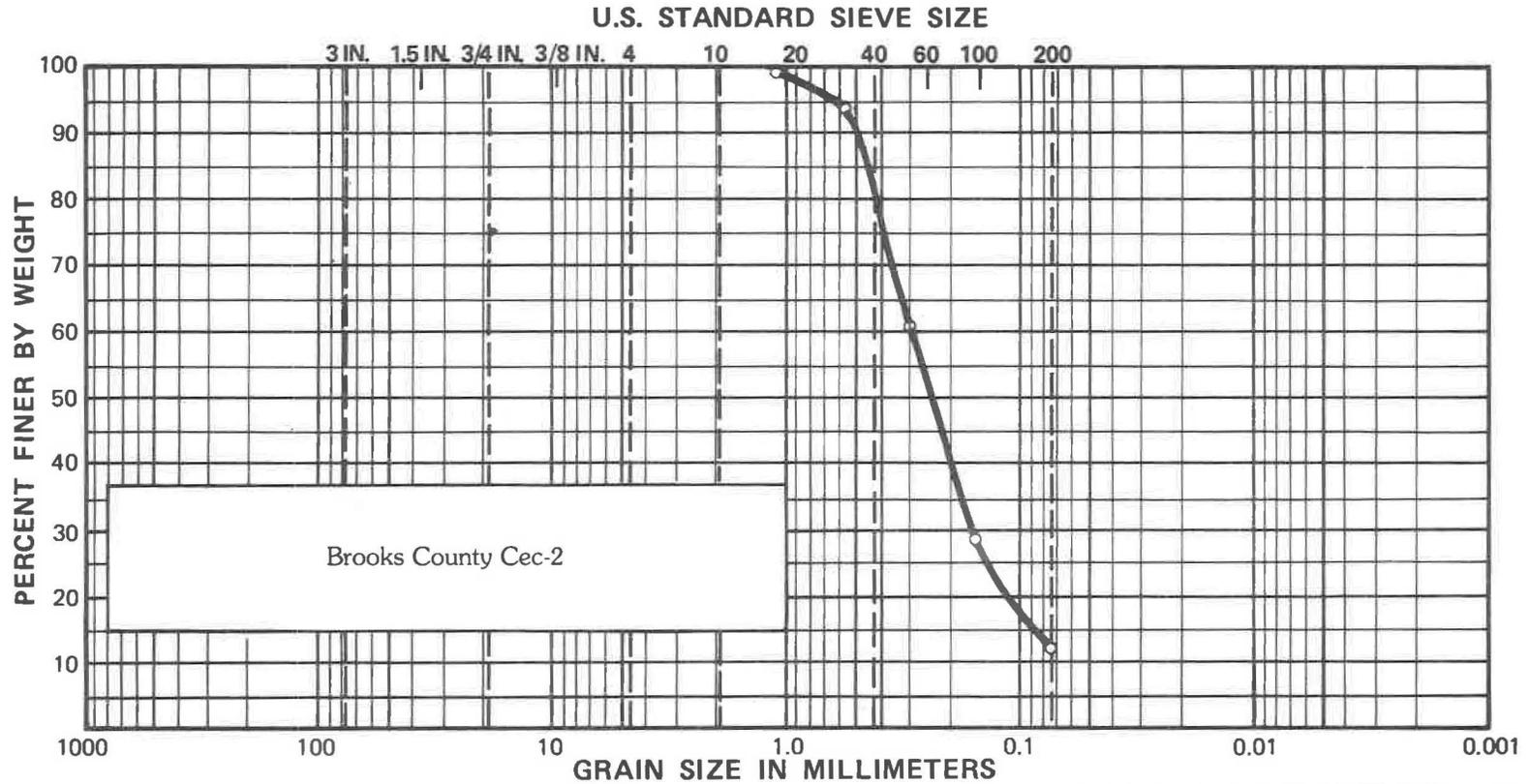


COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE		FINE		COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 21. Size Distribution Curve of Sample Cec-1.



Brooks County Cec-2

COBBLES	GRAVEL				SAND			SILT OR CLAY *						
	COARSE		FINE		COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL		very fine	very coarse	SAND		very fine	SILT		very fine	CLAY **	
			coarse	medium			fine	coarse		medium	fine		coarse	medium

*Unified Soil Classification System

**Wentworth-Lane Class Limits

GRADATION CURVE

Figure 22. Size Distribution Curve of Sample Cec-2.

Calhoun County

Geology and Physiography

Calhoun County lies within portions of two physiographic districts of the Coastal Plain Province, the Fall Line Hills and the Dougherty Plain. The surficial deposits of the county are derived from the undifferentiated Claiborne Group and residuum of the Eocene Ocala and Oligocene limestones.

Previous Studies

Teas (1921, p. 170) noted that generally small areas of inferior sands are present along Pachitla Creek and other streams of the county (fig. 23, Ts-4).

Present Study

The soil association used in targeting areas of Calhoun County was #39, which is present in small areas along Carter and Pachitla Creeks in the extreme northern portion of the county. Geomorphic features targeted are point bars along Pachitla and Ichawanochaway Creeks west of Leary. Two sites in Calhoun County were sampled. The samples retrieved were too fine-grained and too clayey to be considered for sieving.

Evaluation

No samples from Calhoun County were sieved.

Mining activity

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

Summary evaluation

The only areas of Calhoun County that have any potential for aggregate production are those along Pachitla and Ichawanochaway Creeks where the undifferentiated Claiborne Group crops out. Even in the above mentioned areas, there is a clayey overburden which would probably preclude their development on a commercial scale. Calhoun County has a very low potential for either fine or coarse aggregate production.

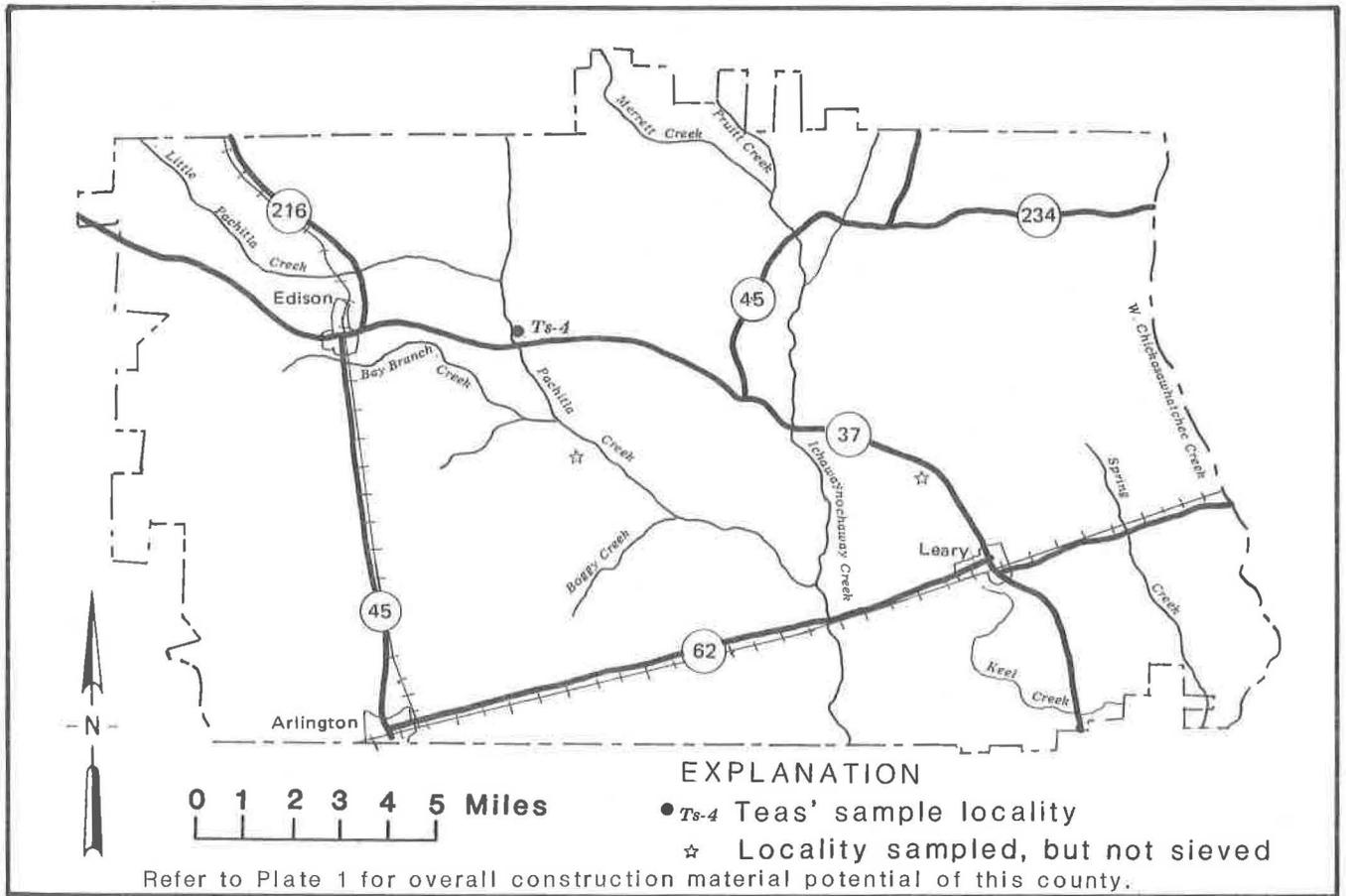


Figure 23. Map of Calhoun County Showing Teas' Sample Localities and Localities Sampled but not Sieved as Part of this Study

Chattahoochee County

Geology and Physiography

Chattahoochee County lies within the Fall Line Hills District of the Coastal Plain Province. Sediments exposed in the county include those of the Eutaw, Blufftown, Cusseta and Ripley Formations.

Previous Studies

Teas (1921, p. 174-175) reported excellent deposits of coarse-grained sand and gravel to be present along Upatoi Creek (fig. 24, Ts-8) and a small gravel deposit (fig. 24, Ts-5) within Fort Benning Military Reservation.

Present Study

The soil association used in targeting areas of Chattahoochee County was #24, which is present in interfluvial areas in southeastern Chattahoochee County. The geomorphic feature targeted is a point bar along the Chattahoochee River. Several auger samples were taken in Chattahoochee County but the material was too clayey and fine-grained to be considered for sieving. One sample (Un-2) from a point bar along the Chattahoochee River was sieved (fig. 25, Table 4). The sample Un-2 did not pass ASTM standard C-33; however, this material could be upgraded to meet specifications.

Evaluation

The area represented by Un-2 is a point bar of the Chattahoochee River. It is evident from the grain-size curve (fig. 25) that this sample contains a small amount of coarse aggregate which could increase with depth.

The deposit represented by sample Un-2 has commercial potential for production of aggregate. The grain-size distribution is adequate for fine aggregate production (with processing) even though it marginally failed the ASTM standard C-33 requirements. The deposit may cover an area as large as 40 acres thus providing on the order of 650,000 cubic yards of sand and gravel. Only light duty roads are present near the deposit. Proximity to the Chattahoochee River would permit barging. The Chattahoochee River could provide an adequate water supply for the processing of the material.

Mining activity

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

Summary evaluation

Considering that Fort Benning Military Reservation occupies the majority of Chattahoochee County, the prospects of a commercial aggregate operation (with the exception of the deposit represented by Sample Un-2) are low. Some medium- to coarse-grained sands are present within the county, but they generally are either too thin or too small in areal extent to support a commercial aggregate plant.

The only deposit of Chattahoochee County considered to have potential for commercial-scale production of aggregate is the point bar represented by Un-2. The reserves as calculated are on the order of 650,000 cubic yards.

Table 4. Chattahoochee County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Un-2	4 feet	trench	10 feet	1	no ⁴	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

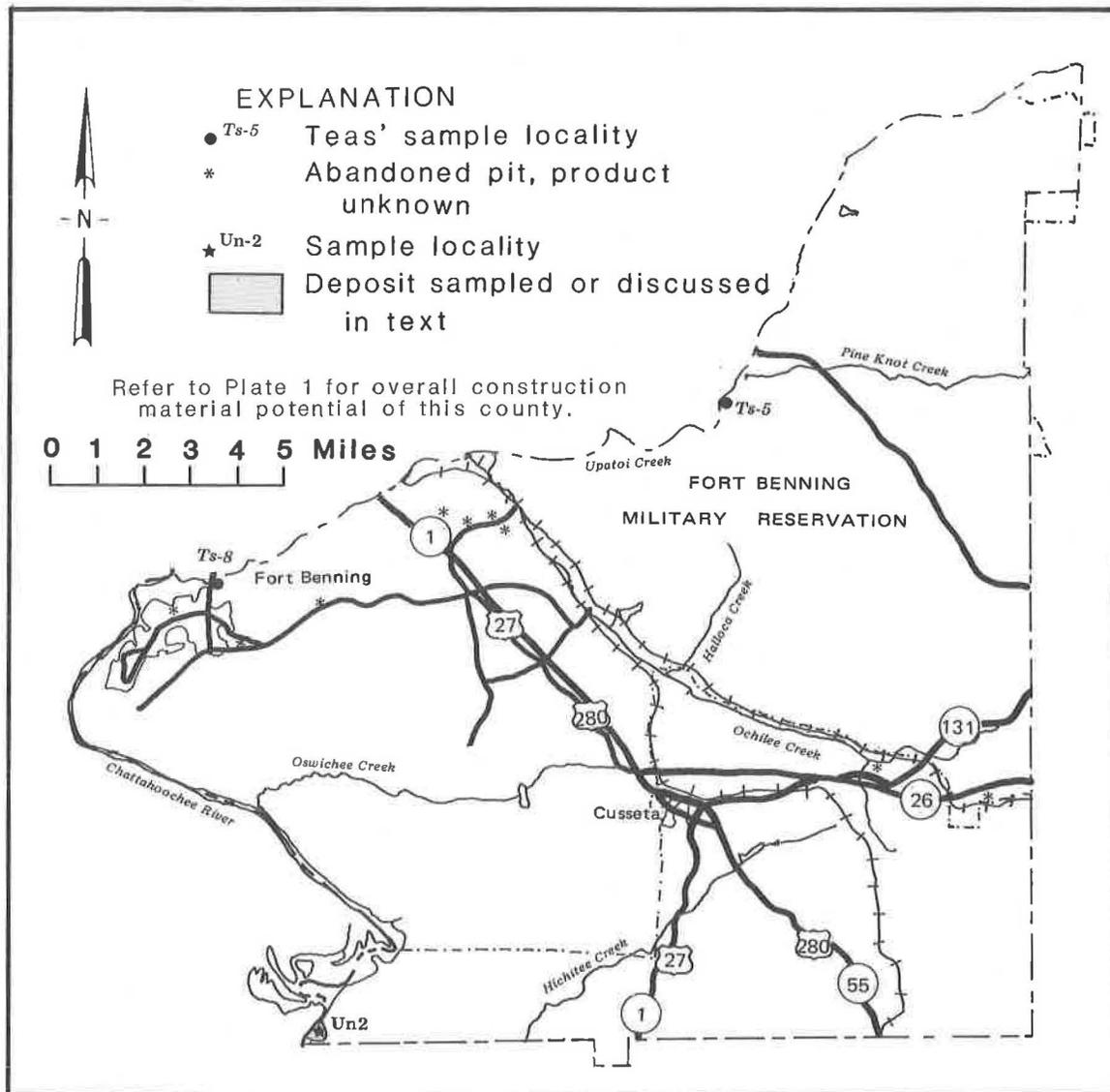
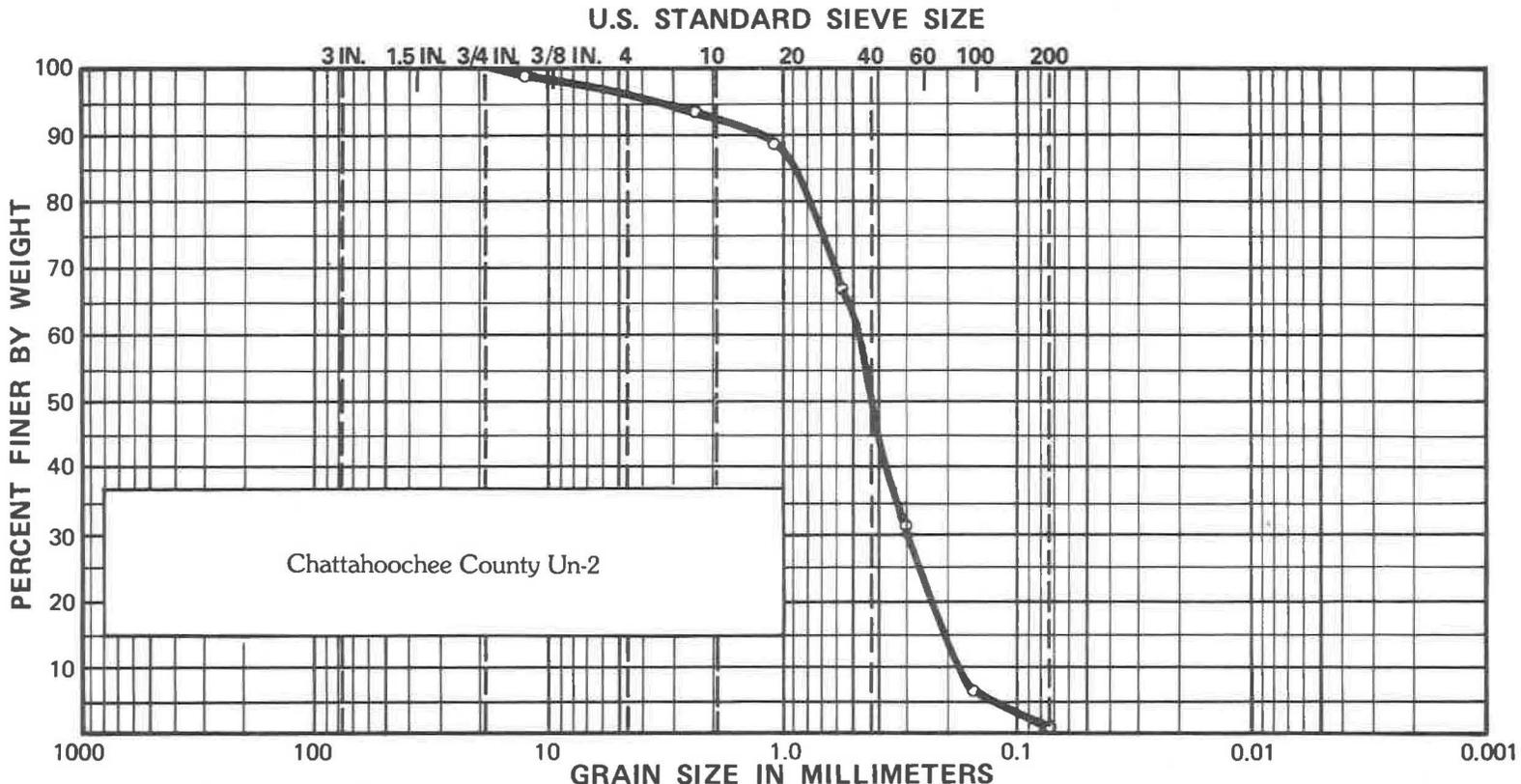


Figure 24. Map of Chattahoochee County showing Sample Localities, Teas' Sample Localities, Pits and Deposits Sampled as Part of this Study.



COBBLES	GRAVEL				SAND			SILT OR CLAY *											
	COARSE	FINE			COARSE	MEDIUM	FINE												
BOULDERS	COBBLES large small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium	fine	CLAY **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 25. Size Distribution Curve of Sample Un-2.

Clay County

Geology and Physiography

Clay County lies within the Fall Line Hills District of the Coastal Plain Province. The surficial sediments of the county are derived from the Providence Sand, the Clayton, Nanafalia, and Baker Hill Formations, the undifferentiated Claiborne Group, and residuum of the Ocala and Oligocene limestones.

Previous Studies

Teas (1921, p. 175-177) described gravelly terrace deposits in several areas of Clay County. Included in these terrace deposits was a pit approximately 1.8 miles north of Fort Gaines which exposed 2 to 5 feet of gravelly sand (Teas, 1921, p. 175). Teas (1921, p. 176) noted that these terrace deposits are generally thin discontinuous veneers. A larger deposit that Teas noted is along Magruder Creek (now Drag Nasty Creek?) on the Fort Gaines-Eufala Road (neither of the two previous deposits could be located accurately enough to be plotted on figure 26). Other minor deposits of sand and gravel (fig. 26, Ts-9 [Reeves property], Ts-10 [Edward King property]) were described in Teas' report (1921, p. 177).

Present Study

The soil associations used in targeting areas of Clay County were #24 and #39, which are present in interfluvial areas in the southern, eastern, and western portions of Clay County. Geomorphic features targeted included terrace surfaces and point bars along the Chattahoochee River in the eastern and southern portions of the county. Six samples (fig. 26, FtG-1,2,3; FNE-1,2; Zet-1) were taken in Clay County. None of the natural materials meet ASTM standard C-33 for a fine aggregate (figs. 27-32, Table 5) and are not considered further. Samples FtG-2 and FNE-2, however, have good grain-size distributions adequate for aggregate production (with processing) and contain coarse particles.

Evaluation

Sample FtG-2 is from a high terrace of the Chattahoochee River (figs. 33,34). Within this deposit 5 feet of pea-gravelly, slightly clayey fine- to coarse-grained sand (fig. 28) was drilled before the auger encountered a gravelly zone. It was not possible to estimate the thickness of this lower gravelly zone. The deposit represented by this sample covers an area of approximately 5 acres. Based on a tabular body five feet thick, the deposit contains in excess of 40,000 cubic yards of sand and gravel.

Sample FNE-2 is from a terrace deposit of the Chattahoochee River and represents a deposit seven feet thick of slightly gravelly, clayey, fine- to very coarse grained sand (fig. 31). The gravel in this outcrop is present as discontinuous stringers. However, very little gravel is present in exposures in an abandoned pit behind and slightly south of this outcrop. A clay bed several feet thick is also present in the abandoned pit.

Mining activity

According to Teas (1921, p. 175), "No large deposits of commercial sand or gravel have been opened in Clay County, although small pits near Fort Gaines (figs. 35,36) supply most of the local demand."

The only recently active aggregate plant was that owned by Anderson Construction Company of Fort Gaines (fig. 26, D-146-F). The only information available concerning this pit indicates that sand was produced from a 1 acre pit which has since been reclaimed.

Summary evaluation

Only sample FtG-2 indicates a potential for aggregate production. The reserves as calculated (< 40,000 cubic yards) would not be sufficient to support a large-scale commercial plant, but could serve as a local aggregate source. Based on field observations, the deposit represented by FNE-1 does not contain a sufficient amount of sand and gravel to serve even as a local source of aggregate.

Clay County does contain sand and gravel deposits; however, they are too thin and or too small in areal extent to support a commercial aggregate operation. Based upon this, Clay County has a low potential for commercial fine or coarse aggregate production.

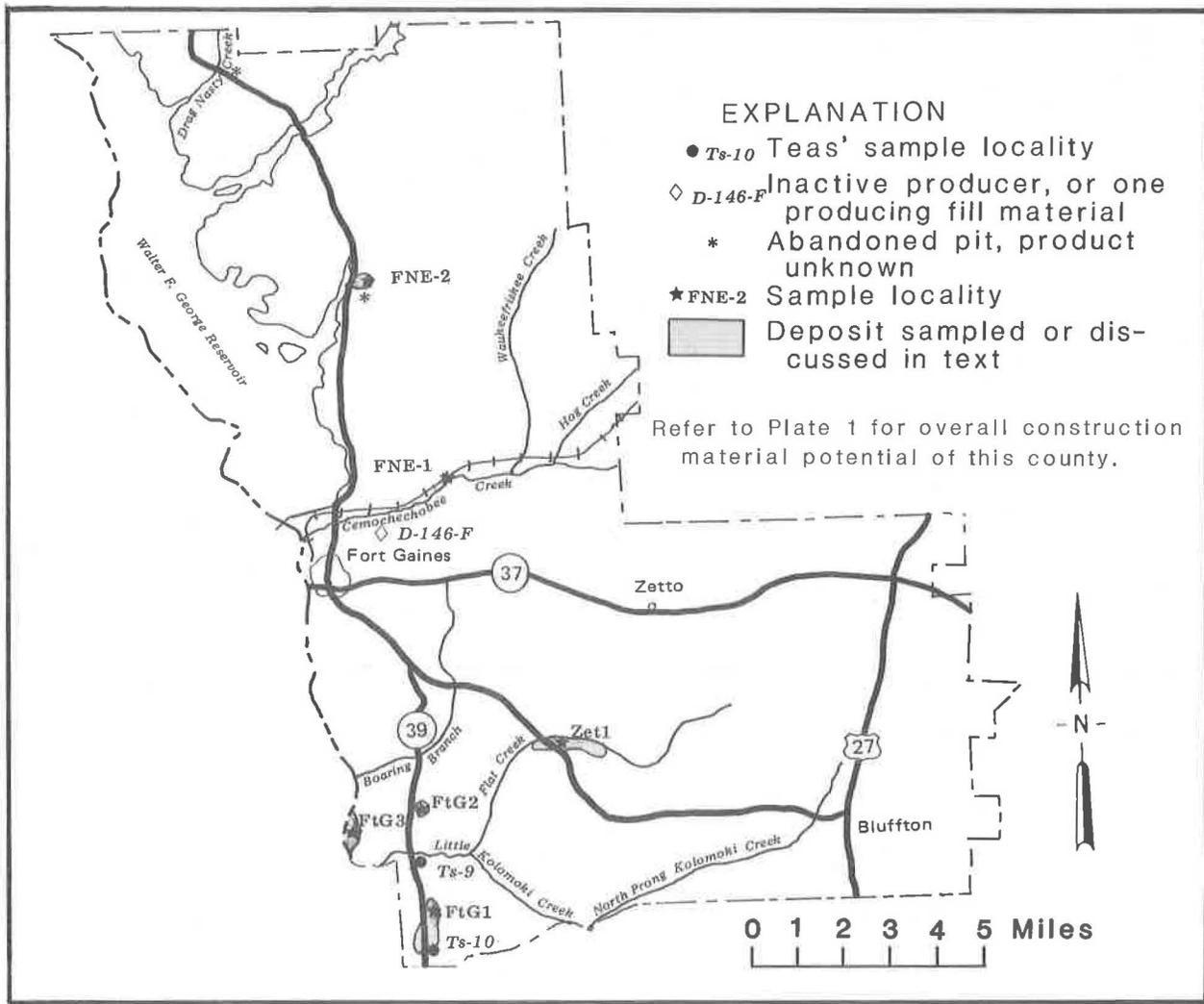
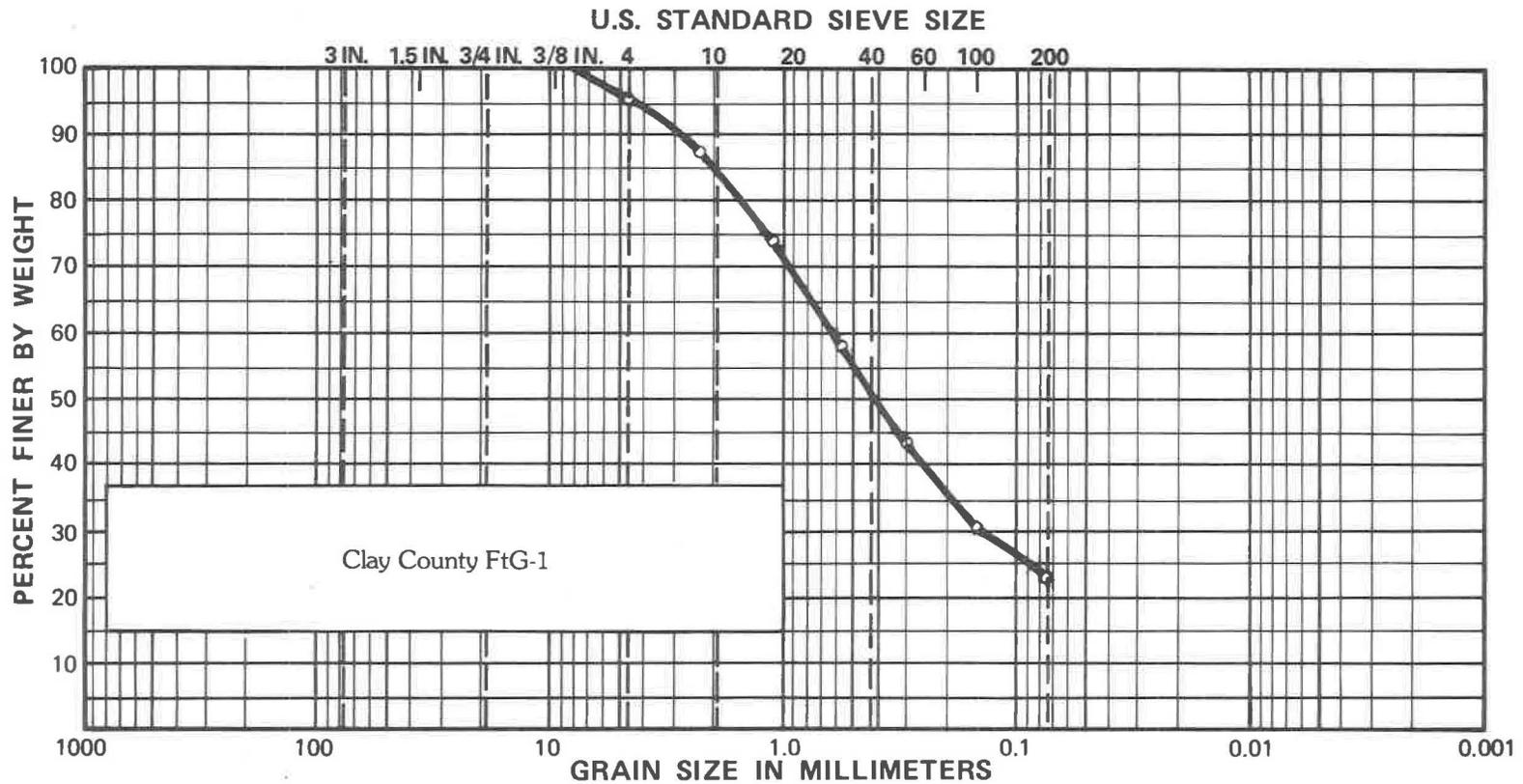


Figure 26. Map of Clay County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled as Part of this Study.



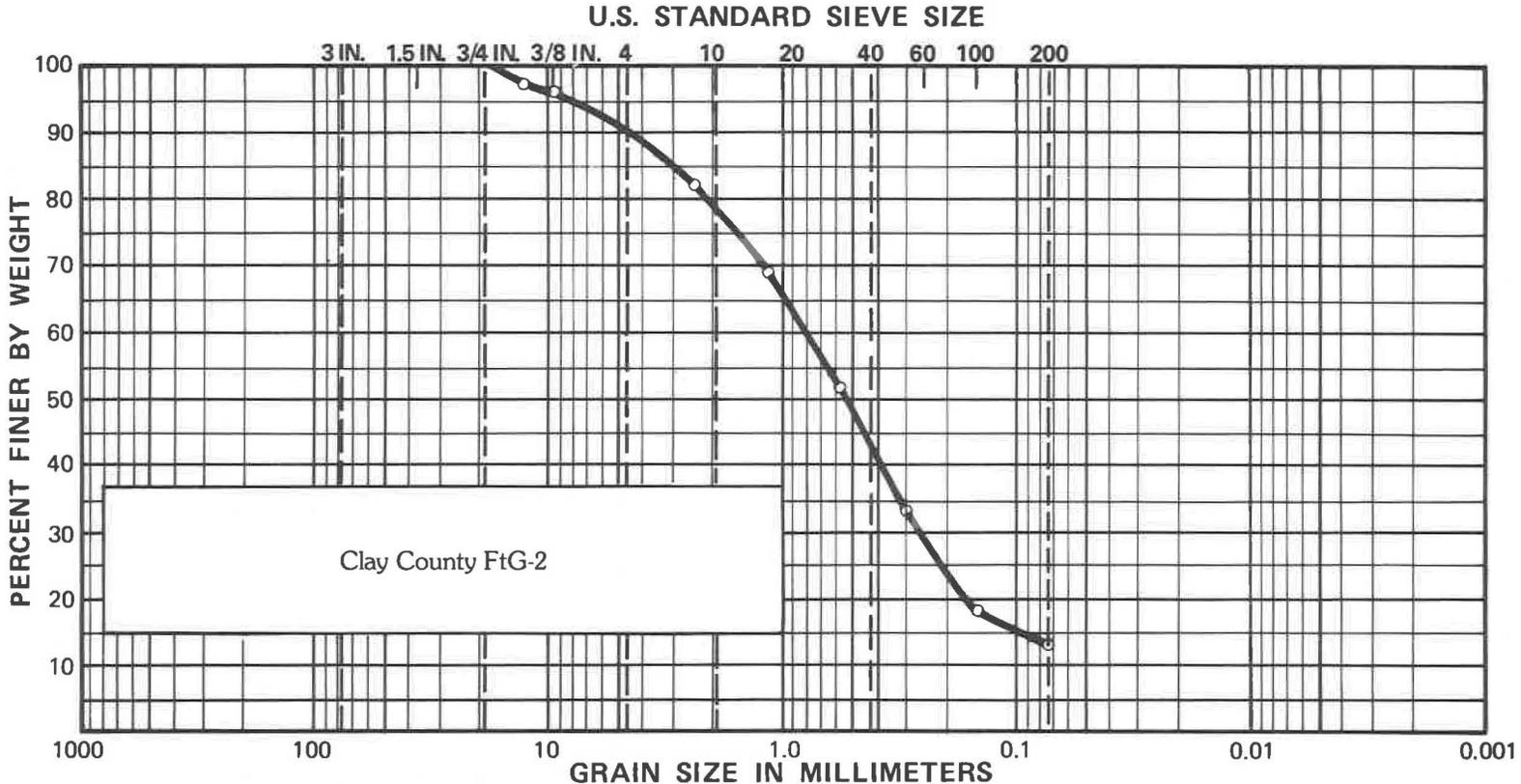
COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE	FINE	COARSE	MEDIUM	FINE								
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System

**Wentworth--Lane Class Limits

GRADATION CURVE

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

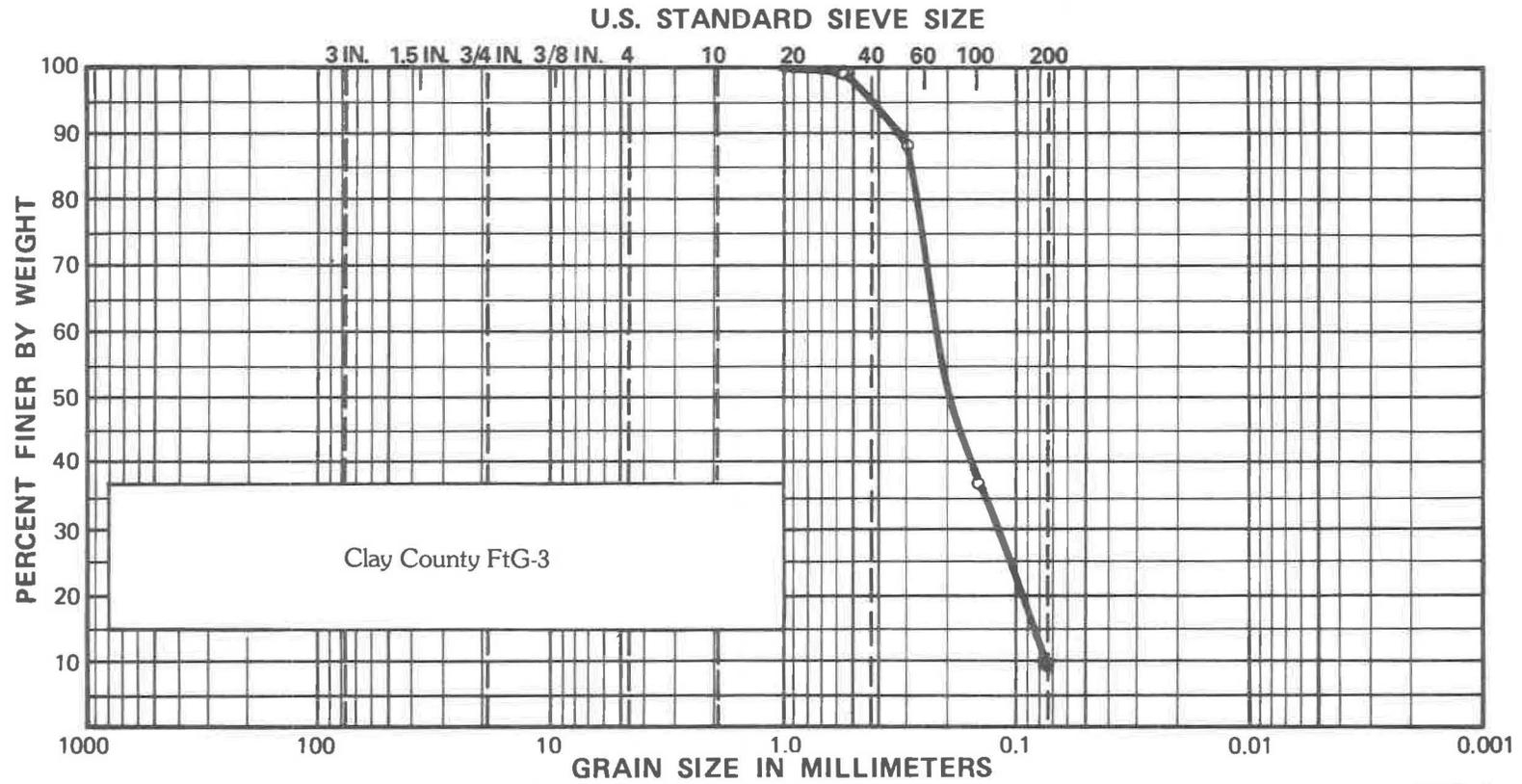


COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE		COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 28. Size Distribution Curve of Sample FtG-2.



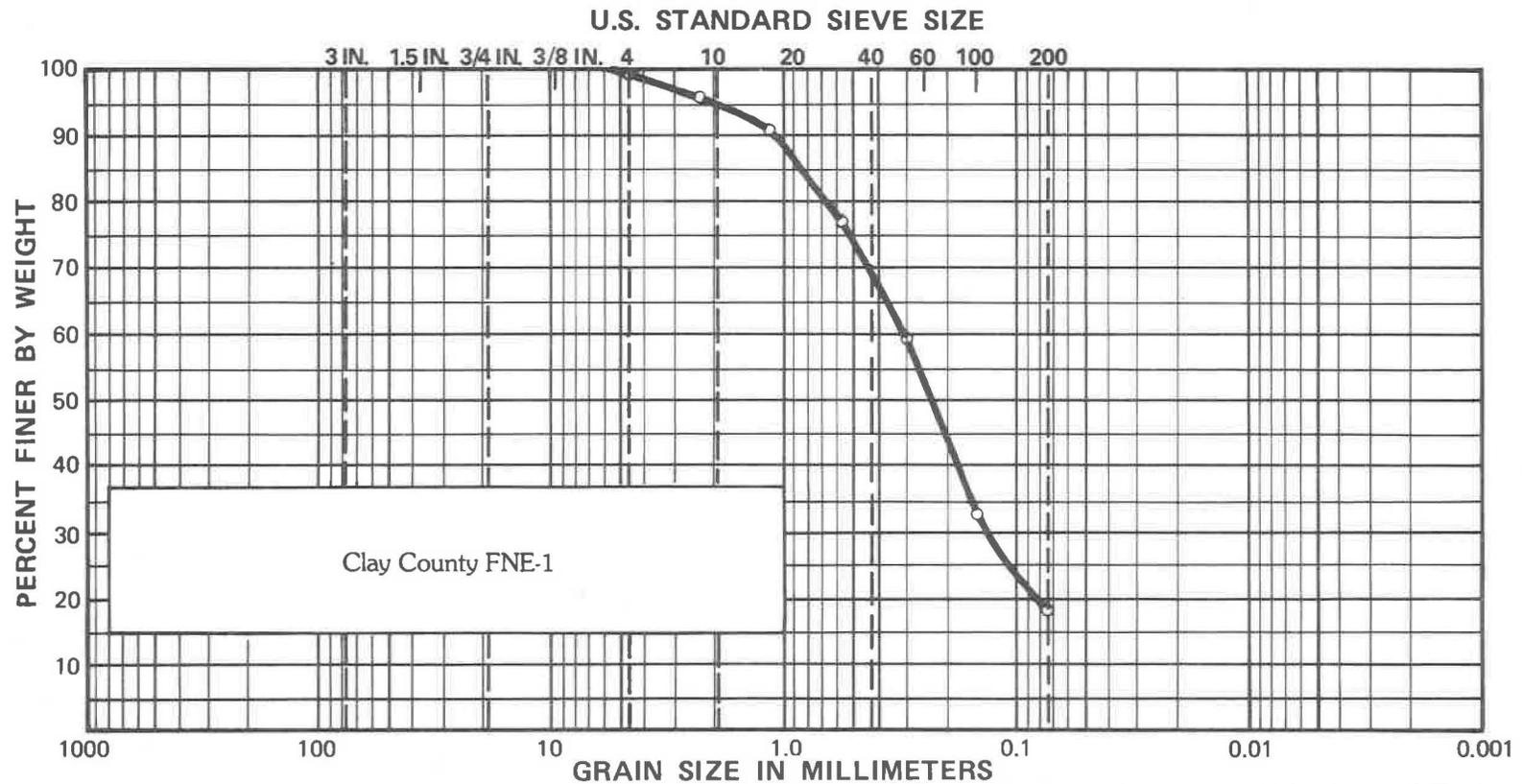
COBBLES	GRAVEL				SAND			SILT OR CLAY *			
	COARSE	FINE		COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System

**Wentworth-Lane Class Limits

GRADATION CURVE

Figure 29. Size Distribution Curve of Sample FtG-3.

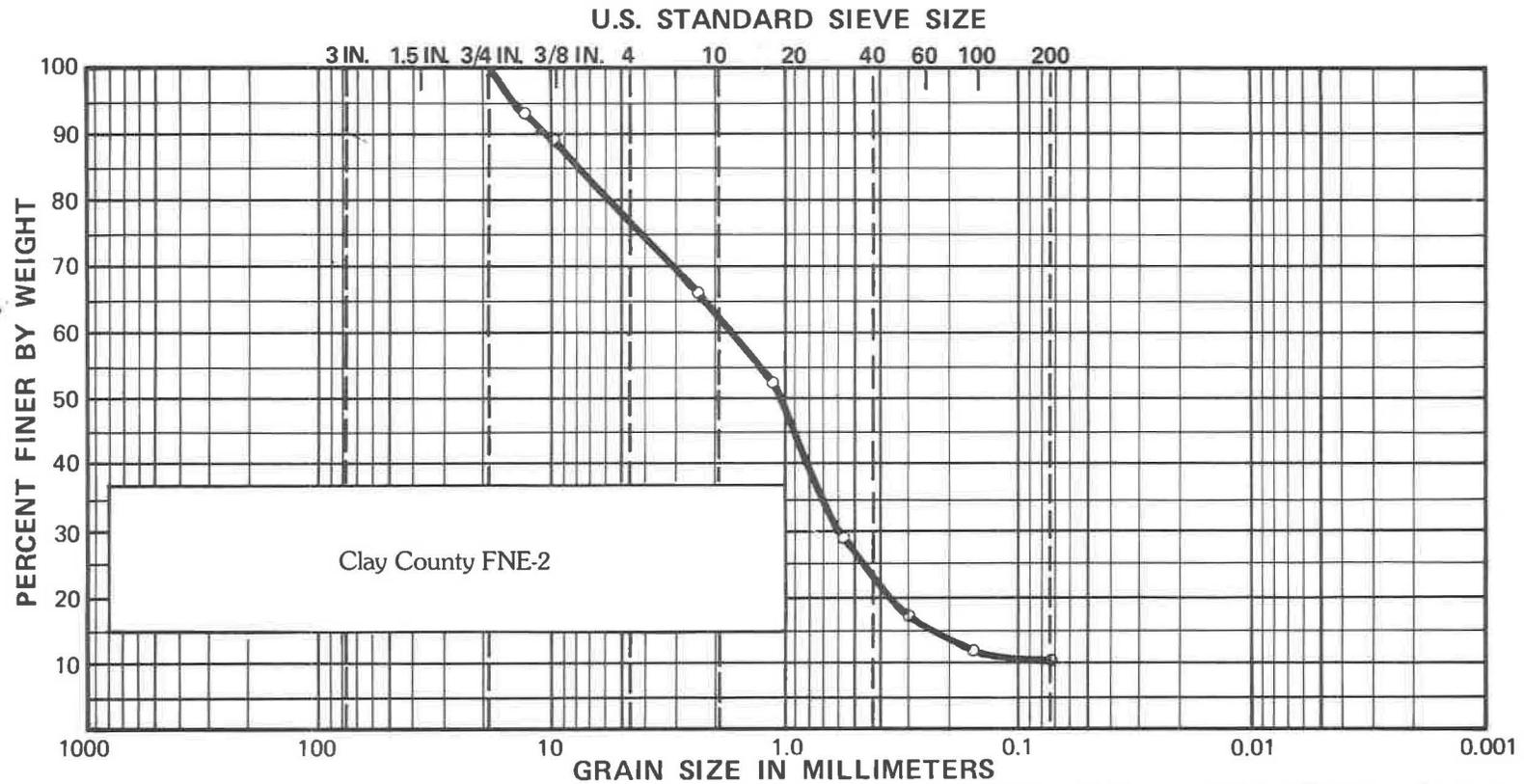


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 30. Size Distribution Curve of Sample FNE-1.



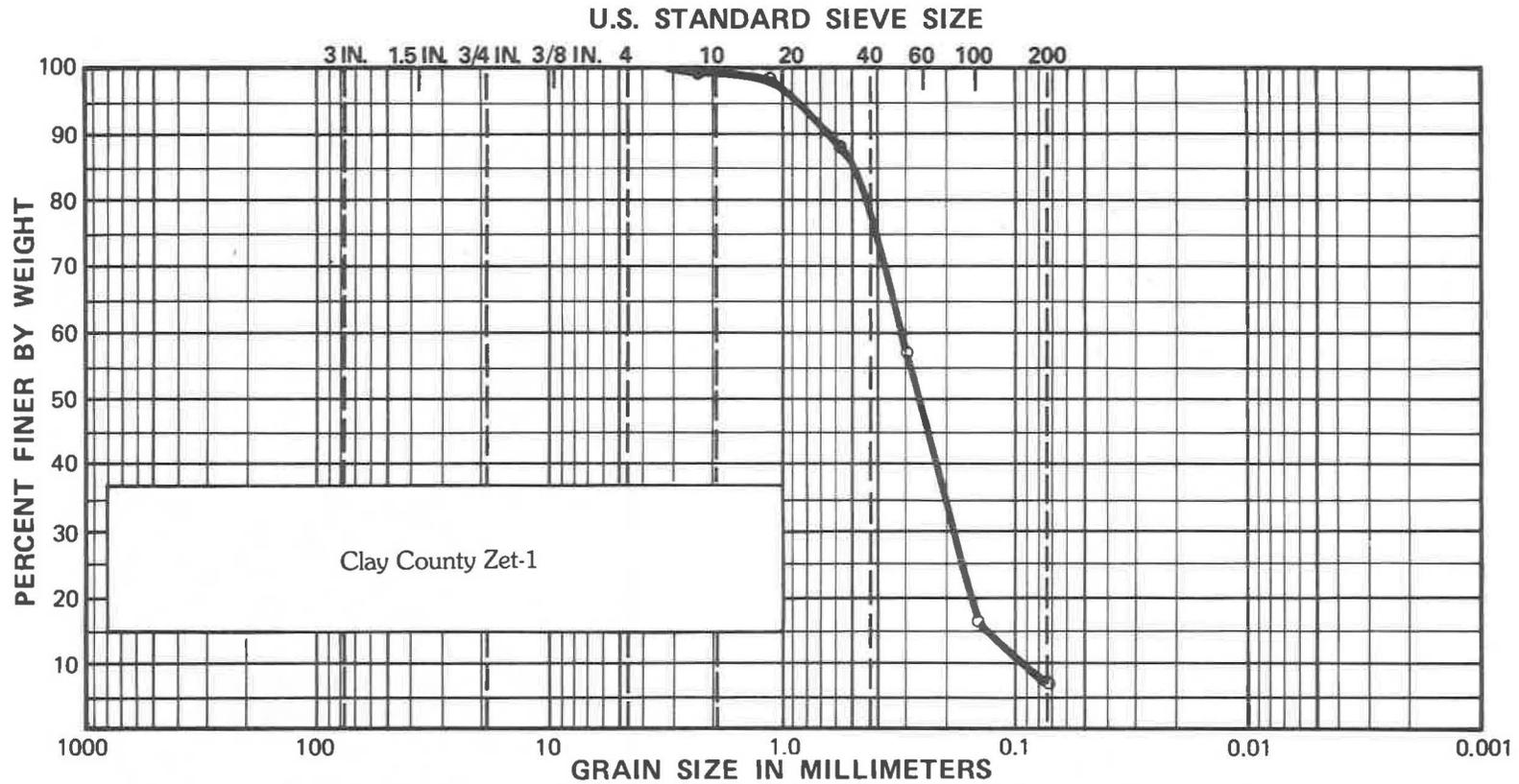
COBBLES		GRAVEL				SAND			SILT OR CLAY *									
		COARSE		FINE		COARSE	MEDIUM		FINE									
BOULDERS	COBBLES	very	GRAVEL		very	very	SAND			very	SILT			very	CLAY		**	
	large small	coarse	coarse	medium	fine	fine	coarse	coarse	medium	fine	fine	coarse	medium	fine	fine	coarse	medium	fine

*Unified Soil Classification System

**Wentworth-Lane Class Limits

GRADATION CURVE

Figure 31. Size Distribution Curve of Sample FNE-2.



COBBLES	GRAVEL				SAND			SILT OR CLAY *
	COARSE	FINE	COARSE	MEDIUM	FINE			
BOULDERS	COBBLES large small	GRAVEL very coarse coarse medium fine	very fine	very coarse	SAND coarse medium fine very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 32. Size Distribution Curve of Sample Zet-1.



Figure 33. High Level Terrace Deposit Exposed South of Kolomoki Creek along Georgia Highway 39, Clay County.



Figure 34. Close-up of Gravel Lens Exposed South of Kolomoki Creek along Georgia Highway 39, Clay County.



Figure 35. Abandoned Gravel Pit Four Miles North of Fort Gaines on Georgia Highway 39, Clay County.



Figure 36. Close-up of Gravels Exposed in Abandoned Gravel Pit Four Miles North of Fort Gaines on Georgia Highway 39, Clay County.

Table 5. Clay County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
FtG-1	8 feet	auger	8 feet	2	no	1
FtG-2	5 feet	auger	5 feet	1	no ⁴	3
FtG-3	4 feet	auger	12 feet	1	no	1
FNE-1	11 feet	auger	5.5 feet	1	no	1
FNE-2	7 feet	trench	7 feet	3	no ⁴	3
Zet-1	15 feet	trench	30 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

Colquitt County

Geology and Physiography

Colquitt County lies within the Tifton Upland District of the Coastal Plain Province. The surficial sediments of the county are derived from the Hawthorne Group, Altamaha Formation, and Miccosukee Formation.

Previous Studies

Teas (1921, p. 179-180) noted deposits of poor quality sand on the east bank of the Ochlocknee River (fig. 37, Ts-11) and along Okapilco Creek (fig. 37, Ts-12). Teas (1921, p. 180) also noted silty sands present on the west bank of the Little River.

Present Study

The soil associations used in targeting areas of Colquitt County were Chipley and Kershaw, which are present in interfluvial areas throughout the county. Geomorphic features targeted are point bars along the Little River in central eastern Colquitt County. Two sites in Colquitt County were sampled; only one sample was sieved (fig. 37, Ell-1).

Evaluation

The sample Ell-1 does not meet ASTM standard C-33 and is too fine-grained to be of commercial value (fig. 38, Table 6).

Mining activity

Two recently inactive pits (fig. 37, D-212-F, D-420-F) were operated by Great Southern Aggregates of Norman Park. Concrete and mortar sands were produced from both of these pits. Only 2 acres were mined at each site, probably due to the sporadic occurrence and inconsistent quality of the sands. No mining depths or production figures are available for either of these operations.

Summary evaluation

Most of the past commercial mining in Colquitt County was adjacent to the Little River. From the past mining activity and the samples collected for this study, the entire area along the Little River in Colquitt County has the best potential for fine aggregate production. Colquitt County is considered to have low potential for commercial production of either fine or coarse construction aggregate.

Table 6. Colquitt County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Ell-1	9 feet	auger	9 feet	3	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

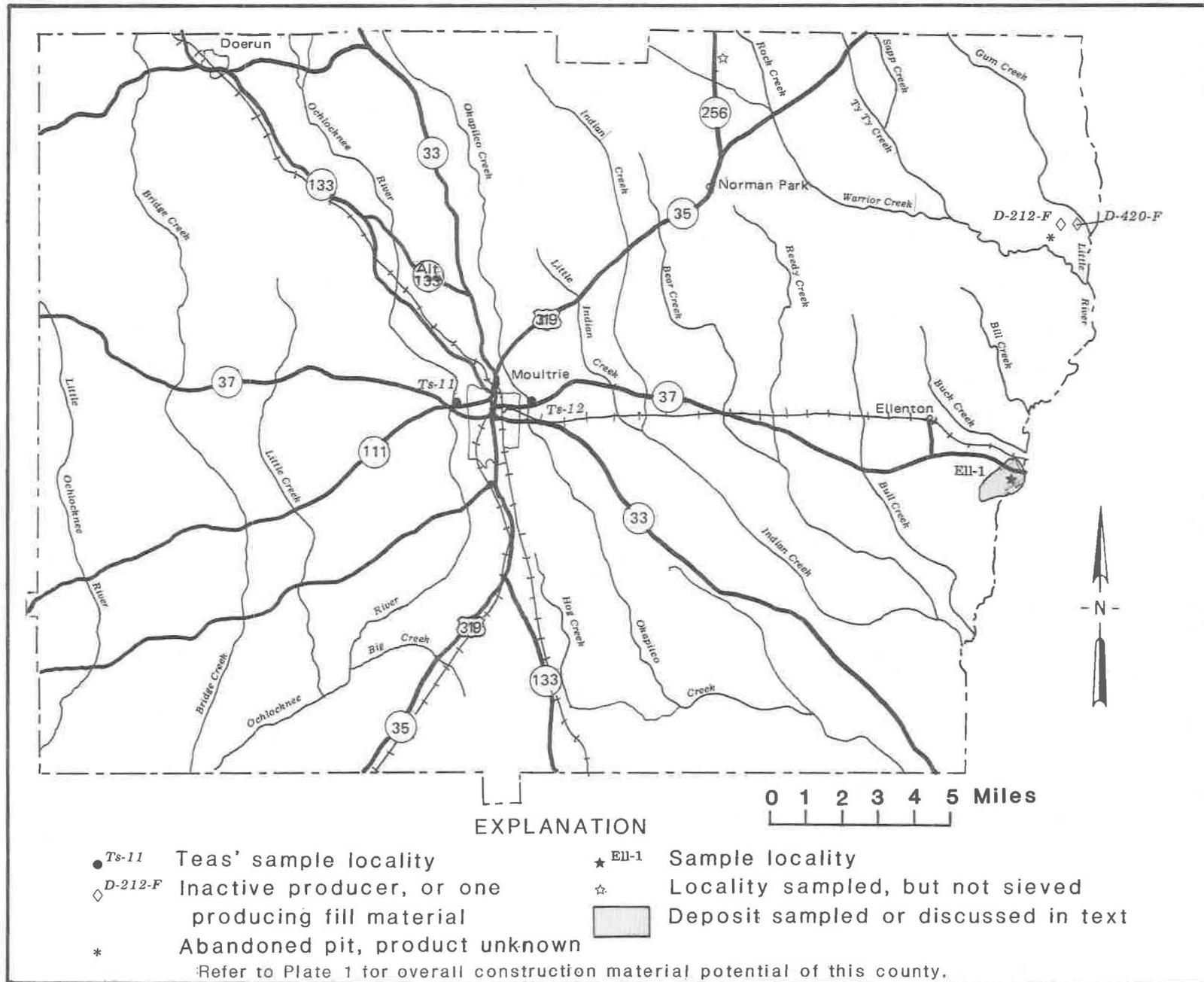
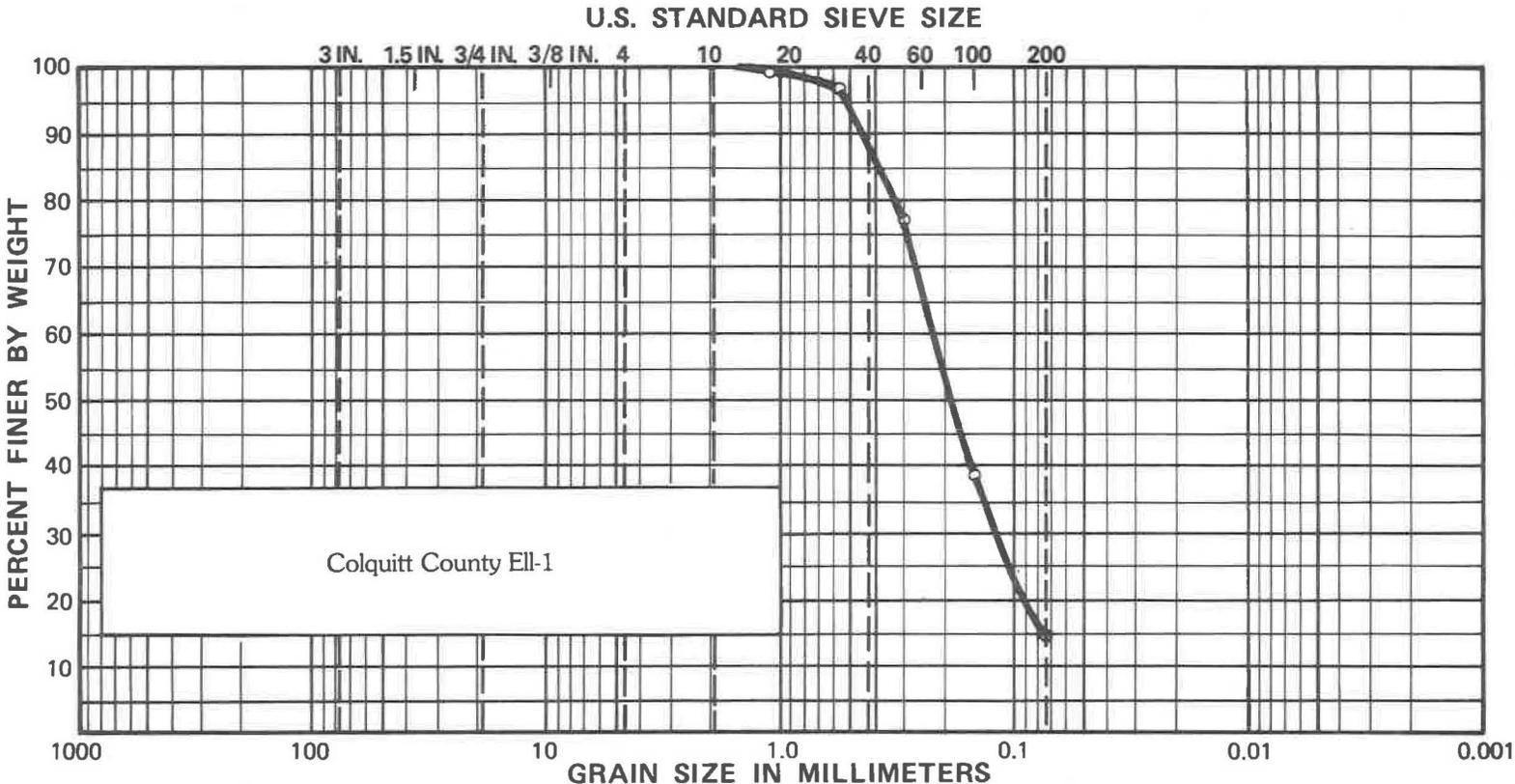


Figure 37. Map of Colquitt County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposit Sampled.



COBBLES	GRAVEL		SAND			SILT OR CLAY	*			
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	GRAVEL very coarse coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 38. Size Distribution Curve of Sample Ell-1

Cook County

Geology and Physiography

Cook County lies within the Tifton Upland District of the Coastal Plain Province. The surficial sediments of the county are those derived from the Miccosukee Formation, the Hawthorne Group, and the Altamaha Formation.

Previous Studies

Teas (1921, p. 180-181) reported that the surface of Cook County is sandy to depths "of from a few inches to several feet" (Teas, 1921, p. 180) but generally the sand is not thick enough or does not occur consistently enough to be of commercial value.

Present Study

The soil associations used in targeting areas of Cook County were Chipley and Kershaw, which are present in interfluvial areas along the Little River in the western portion of the county. Geomorphic features targeted are point bars along the Little River in western Cook County. One site in Cook County was sampled (fig. 39, Ber-1; Table 7).

Evaluation

The deposit represented by the sample Ber-1 has a minimum thickness of 8 feet and could be as much as 200 acres in extent; however, due to the fine grain size of this deposit (fig. 40), it was not considered further.

Mining activity

There are two active and one recently inactive aggregate mining operations in Cook County (fig. 39).

Scruggs Company of Valdosta operated a pit (D-073-F) along the Little River in the western portion of the county. The major product from this plant was fill material. Three acres were permitted and have been reclaimed.

The Scruggs Company also owns an active aggregate plant (D-789) in southwestern Cook County. The products of this plant are concrete and mortar sand, and fill material. These products are transported by truck to sites within a 50 mile radius. The hydraulic method is used in the mining and processing of the products. The Scruggs Company owns 200 acres and has 195 acres remaining to be mined. Currently the sand is mined to a depth of 20 feet. Annual production of all three products is between 100,000 and 500,000 tons.

Great Southern Aggregates of Norman Park operates an aggregate pit (D-245) in western Cook County near the Little River. The products of this pit are concrete and mortar sands. These products are transported by truck within a 50 mile radius. The hydraulic mining method is used at the mine site. The material is pumped in a slurry to classifiers and then stockpiled. Approximately 40 acres are owned by the company and 25 acres remain to be mined. The sand is currently being mined to a depth of 20 feet. No production figures are available.

Summary evaluation

The material within the area represented by Ber-1 is too fine grained to be of economic value for concrete aggregate. The area along the Little River have the best potential for aggregate production. Cook County has a low to moderate potential for either fine or coarse aggregate production.

Table 7. Cook County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Ber-1	8 feet	auger	8 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

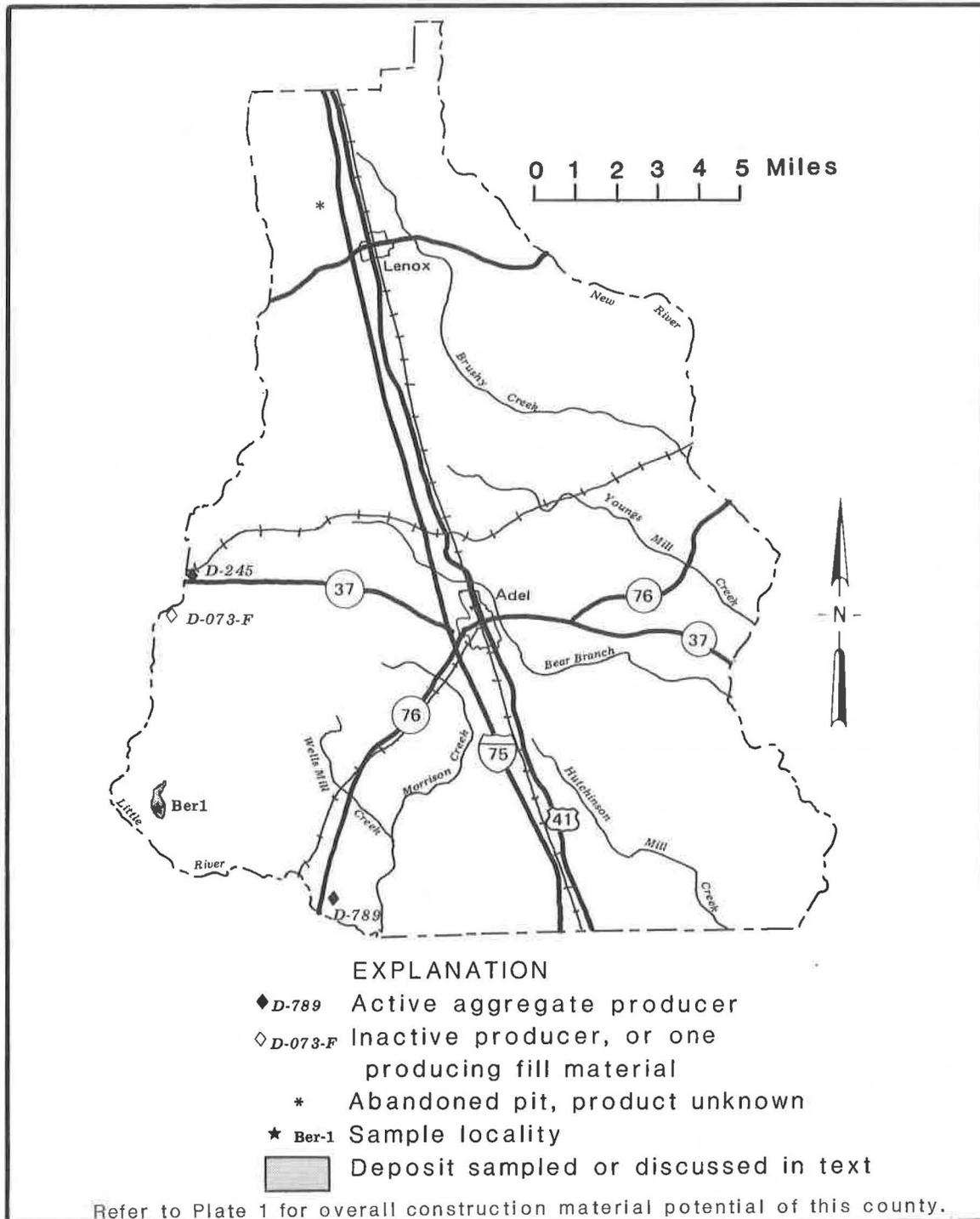


Figure 39. Map of Cook County Showing Sample Localities, Pits, and Deposit Sampled.

Crawford County

Geology and Physiography

Crawford County lies within portions of two physiographic provinces, the Piedmont Province and the Coastal Plain Province. The Coastal Plain Province is further subdivided into two districts, the Fort Valley Plateau and the Fall Line Hills District. The southern half of the Coastal Plain portion of Crawford County contains undifferentiated Cretaceous fine- to coarse-grained sands with subordinate amounts of clays. The southeastern portion of the county contains outcrops of the Huber Formation.

Previous Studies

Teas (1921, p. 181) noted that the sand area of Crawford County is part of a belt 2 to 6 miles wide, 5 to 30 feet deep, and extends with interruptions from Augusta to near Columbus. Teas (1921, p. 181) states "Immense quantities of commercial sand are produced from a number of pits along the Southern Railway and shipped to every part of the State as well as to points in adjoining states." (see fig. 41, Ts-13a [McCarty Pits], Ts-13b [Allon Pit], Ts-14 [Atlanta Sand and Supply Pit], Ts-15 [Smiley Sand Pit]).

Thin discontinuous layers of gravel mentioned by Teas are present along the Flint River and along U.S. Highway 80 (fig. 41, Ts-16 [Harrison property]).

Present Study

The soil association used in targeting areas of Crawford County was #24, which is present in interfluvial areas throughout the central and southern portions of Crawford County. Geomorphic features targeted are terrace surfaces in the southwestern portion of Crawford County. Five sites (figs. 42-46, Table 8) within Crawford County were sampled.

Evaluation

None of the natural materials analyzed meet ASTM standard C-33 for a fine aggregate (figs. 42-46). The samples with the best grain-size distribution are Rey-1, Kno-1 and Kno-2. The sample Rey-1 has a moderate grain-size distribution, but the deposit that it represents is not considered to be economic due to the six feet of overburden present. Samples Kno-1 and Kno-2 have similar grain-size distribution curves (figs. 45,46) and, inasmuch as sample Kno-2 was taken from a producing aggregate pit, the deposit from which Kno-1 was obtained should be considered to have economic potential for production of aggregate.

Even though sample Kno-1 does contain large amounts of material smaller than 0.075 mm (#200), the possible reserves were calculated. The reserves of this deposit were based on outcrops at Kno-1 and another similar outcrop 0.25 miles north of Kno-1. A homogeneous tabular body 10 feet thick is assumed to exist in the outcrop area; the areal

extent of the deposit is 135 acres. The calculated reserve of the deposit is in excess of 2 million cubic yards. Factors limiting development of this deposit are its lack of readily available water supply for processing, and the fact that there are several private residences within the calculated reserve area.

Mining activity

The current mining activity in Crawford County is limited to the Crawford Mining Company Incorporated (fig. 41, D-006). This company owns three pits; two are currently producing. The three products are concrete sand, mortar sand and sand used in sand-blasting. All three products are shipped to the Atlanta area by rail. For local usage the sand is hauled by truck. The hydraulic mining method is used in both pits. Hydraulic mining involves the use of a high pressure water gun used to blast the sand and other materials from the pit face (fig. 47). The resultant slurry is pumped either to holding bins for further cleaning or to a screening tower, separators and cyclones for sizing (fig. 48). The products are then stockpiled. Approximately 5,000 acres are owned by the company and the depth of current mining is 100 feet. Current annual production is in the range of 100,000 to 500,000 tons for each of the two operating pits.

Summary evaluation

The two areas with the greatest potential for aggregate production are those in the southern and eastern portions of the county. The sample Kno-1 just south of Georgia Highway 42 has a size distribution similar to that of Kno-2, which is from a pit currently mined by the Crawford Mining Company.

The potential for commercial production of either fine or coarse construction aggregate within Crawford County is considered to be moderate to high.

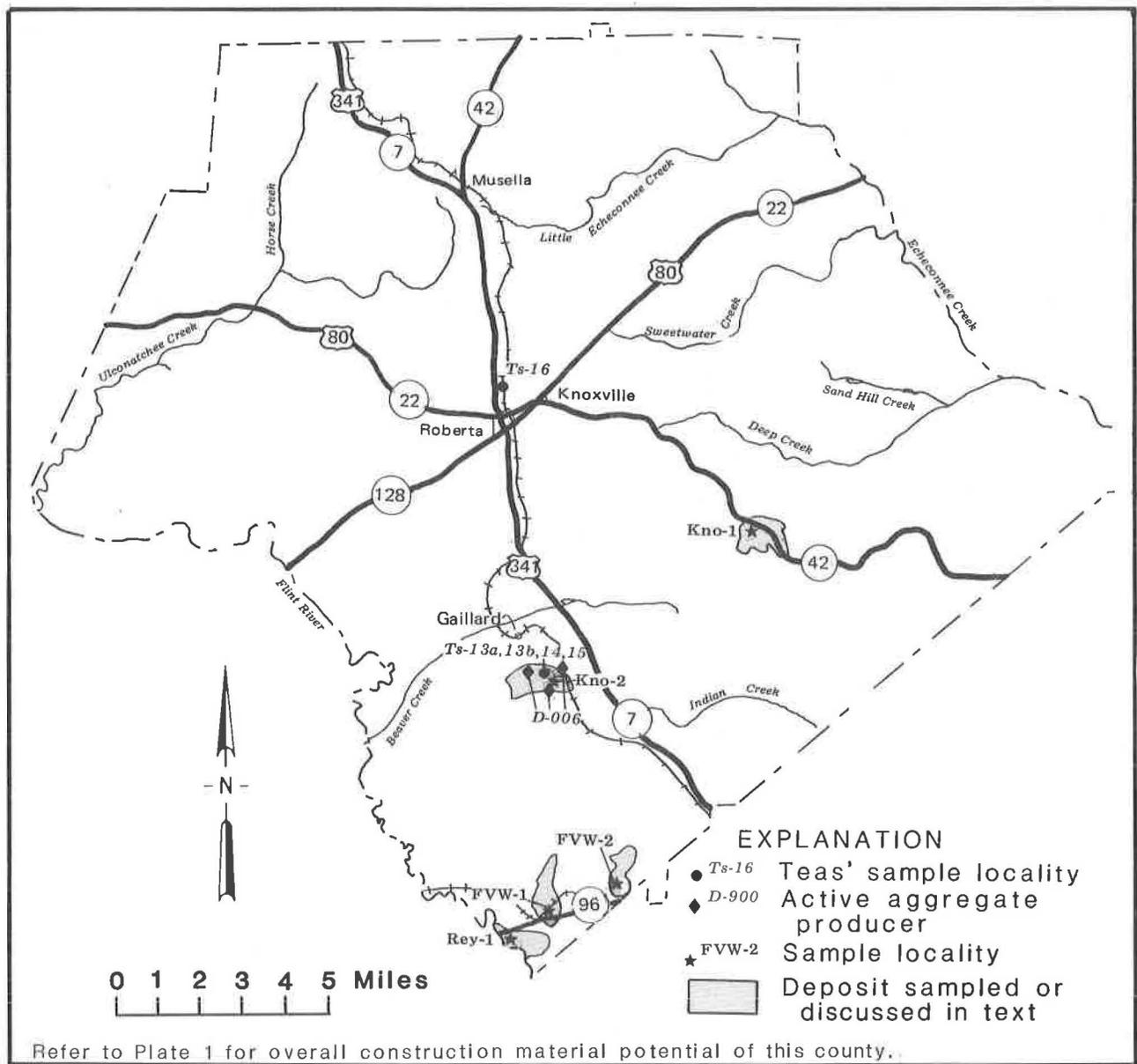
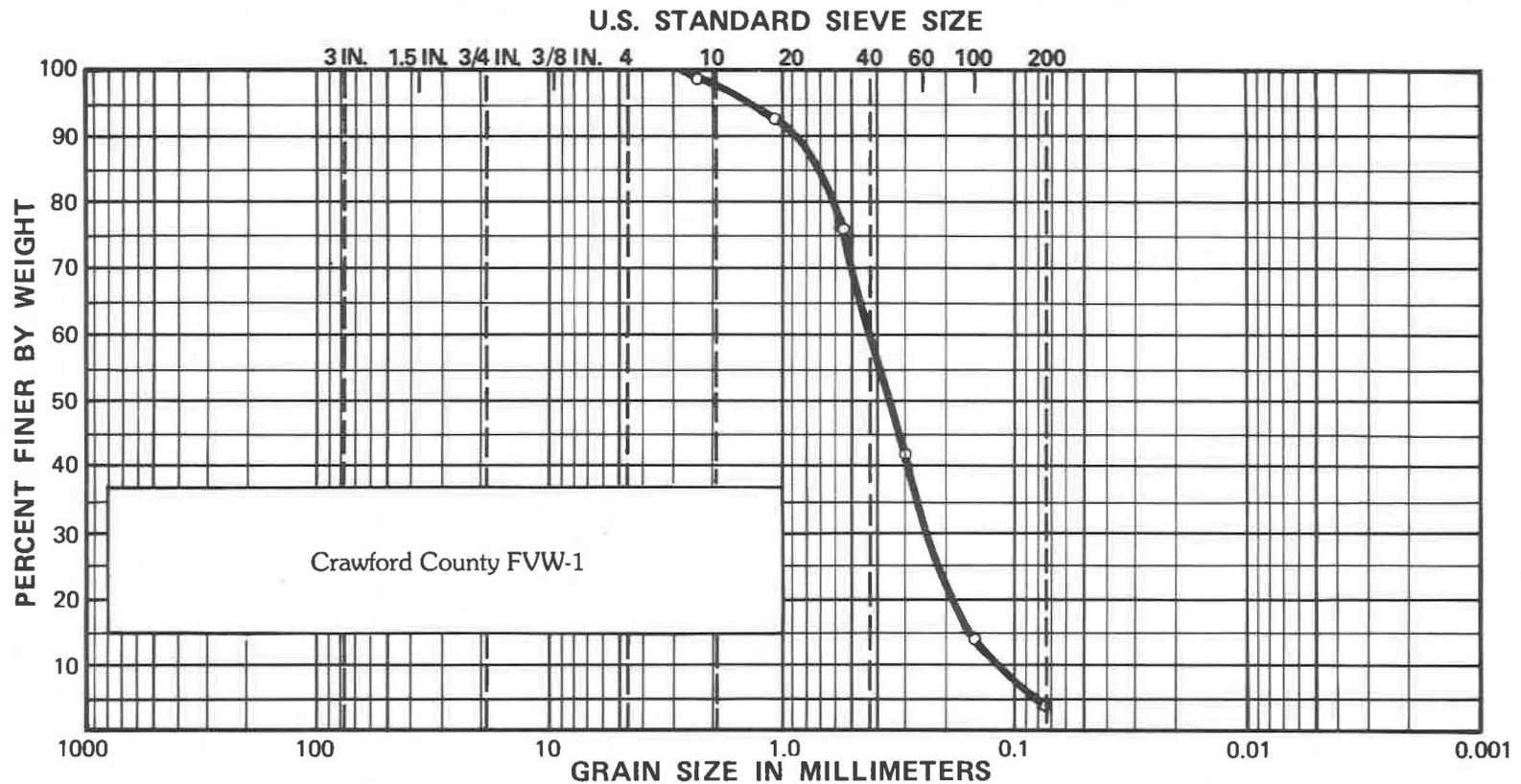


Figure 41. Map of Crawford County Showing Sample Localities, Pits, and Deposits Sampled.



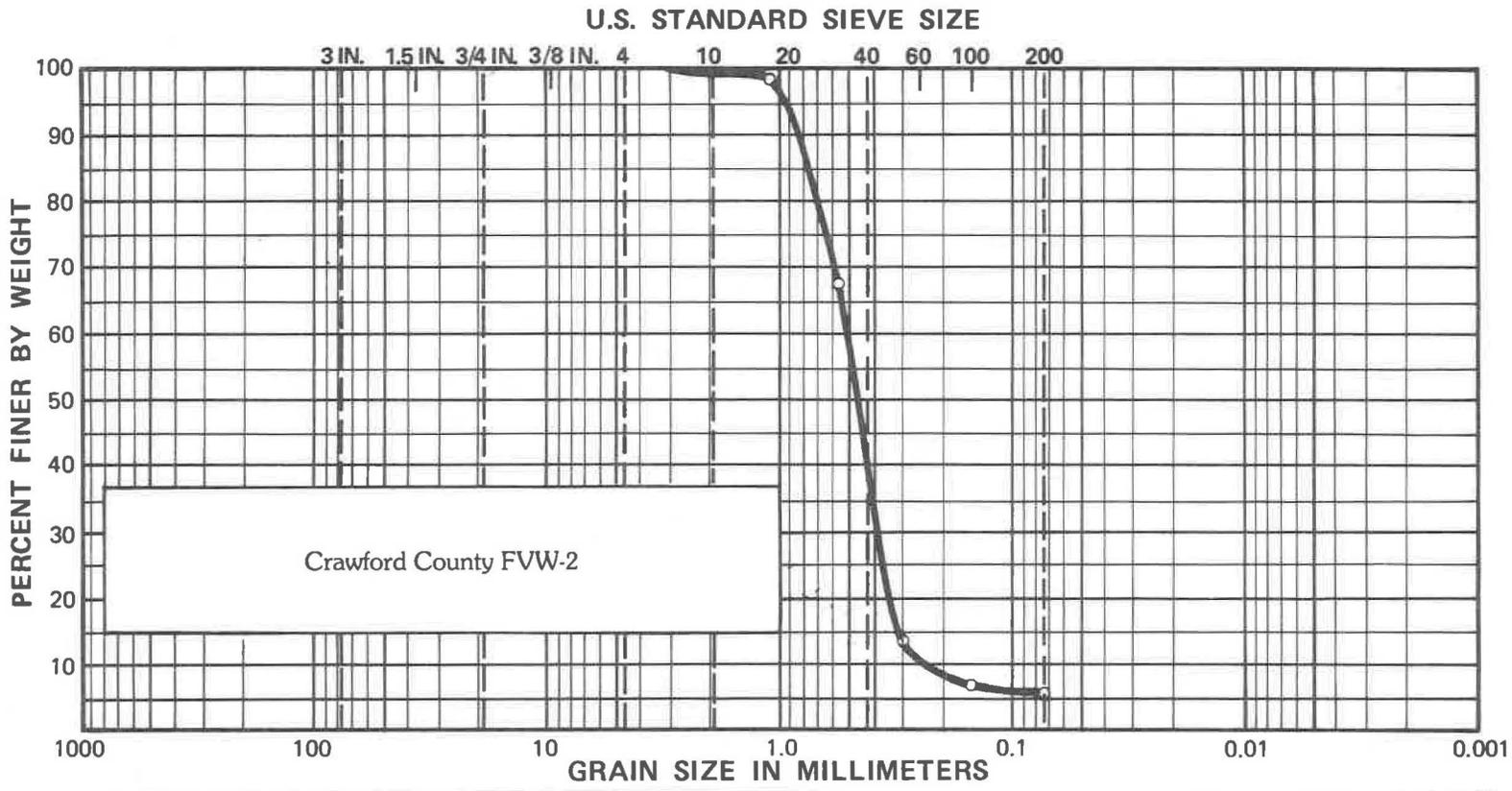
COBBLES	GRAVEL				SAND			SILT OR CLAY *
	COARSE	FINE		COARSE	MEDIUM	FINE		

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY **				
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 42. Size Distribution Curve of Sample FVW-1.

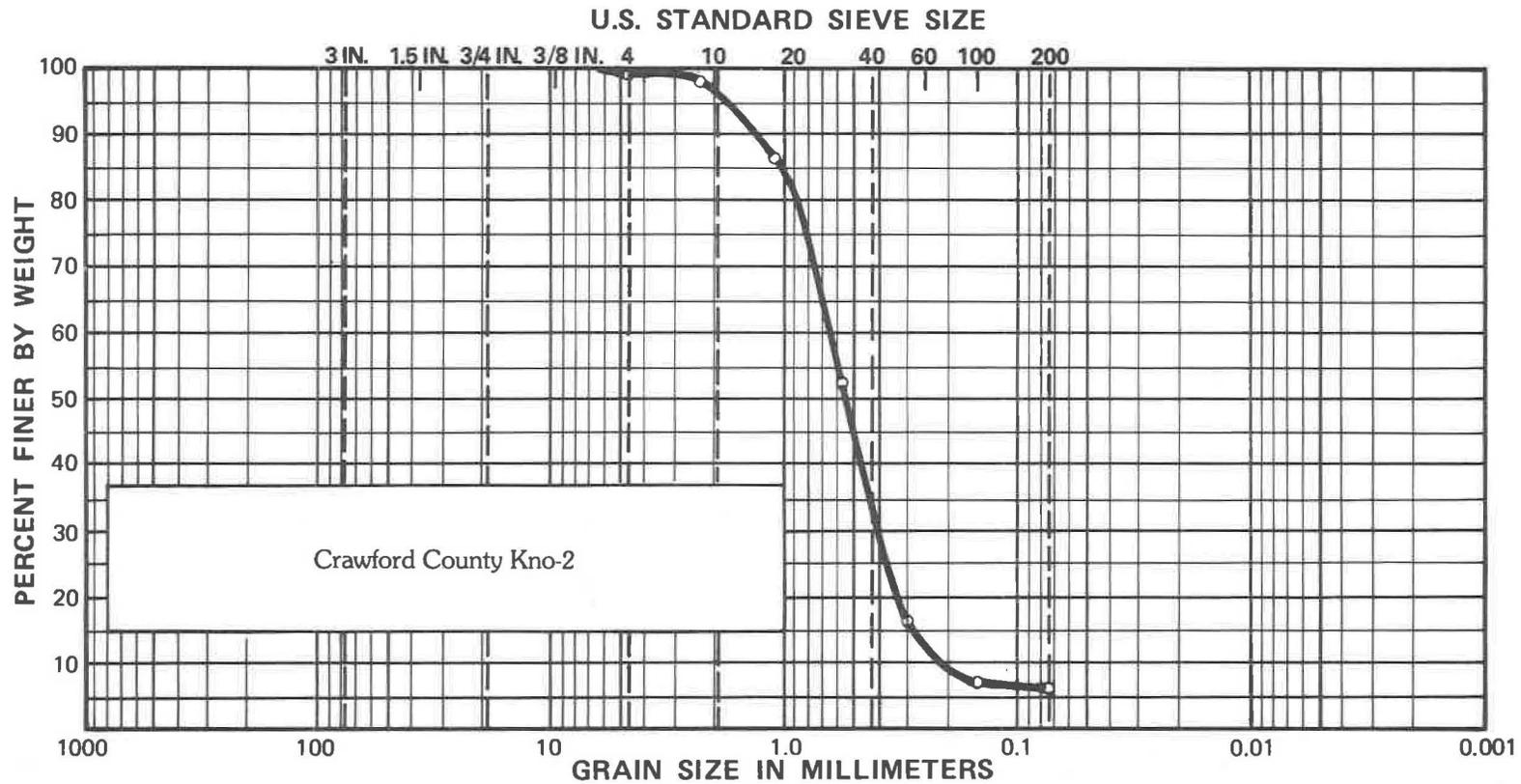


COBBLES	GRAVEL				SAND			SILT OR CLAY					
	COARSE	FINE			COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 44. Size Distribution Curve of Sample FVW-2.



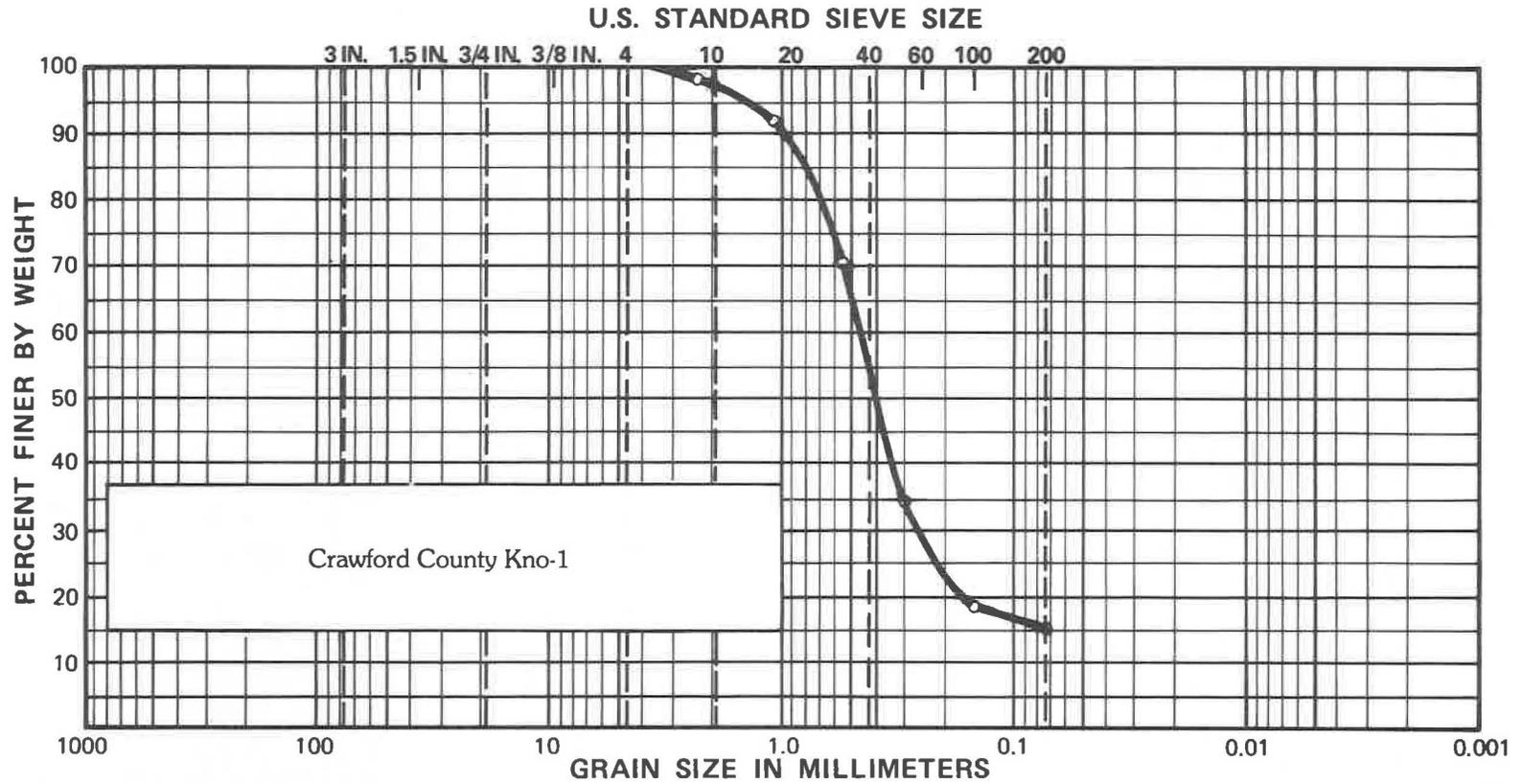
COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

09

Figure 45. Size Distribution Curve of Sample Kno-2.



COBBLES	GRAVEL				SAND			SILT OR CLAY *
	COARSE	FINE		COARSE	MEDIUM	FINE		

BOULDERS	COBBLES		very coarse	GRAVEL			very fine	very coarse	SAND			very fine	SILT			very fine	CLAY **		
	large	small		coarse	coarse	medium			fine	coarse	medium		fine	coarse	medium		fine	coarse	medium

*Unified Soil Classification System

**Wentworth-Lane Class Limits

GRADATION CURVE

Figure 46. Size Distribution Curve of Sample Kno-1.



Figure 47. Hydraulic Mining Operation, Crawford County Mining Company; note Hydraulic Gun Mining Face in Center of Photo.



Figure 48. General View of Surficial Sands, Crawford County Mining Company.

Table 8. Crawford County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
FVW-1	4 feet	trench	4 feet	1	no	2
Rey-1	12 feet	auger	6 feet	0	no	2
FVW-2	6 feet	trench	6 feet	0	no	2
Kno-2	4 feet	trench	4 feet	3	no	1
Kno-1	10 feet	trench	10 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

Crisp County

Geology and Physiography

Crisp County lies within the Coastal Plain Province and contains portions of three physiographic districts: the Fall Line Hills, the Dougherty Plain, and the Tifton Upland. The surficial deposits present in Crisp County are derived from the residuum of the Ocala and Oligocene limestones and from the Altamaha Formation.

Previous Studies

Teas (1921, p. 187-188) noted that the Flint River, which forms the western border of Crisp County, contains large deposits of medium- to coarse-grained sand. The surficial deposits of the rest of the county consist of very fine-grained loamy sand of little value for commercial scale aggregate production.

Present Study

The soil associations used in targeting areas of Crisp County were Lakeland and Kershaw, which are present in interfluvial areas in the western, northwestern, and central southern portions of the county. Geomorphic features targeted are terrace surfaces present along the Flint River in southwestern Crisp County. A reconnaissance of the county confirmed Teas' conclusions (1921) that only very thin fine-grained silty sands exist over most of the county. Three sites were sampled in Crisp County; only material from Cob-1 was deemed suitable to be sieved (figs. 49-50, Table 9). This natural material did not pass ASTM standard C-33.

Evaluation

The sample Cob-1 is from a Georgia Veterans State Park and therefore is not considered further. The majority of the sand bars of the Flint River described by Teas (1921, p. 188) have been covered by the waters of Lake Blackshear.

Mining activity

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

Summary evaluation

Based on field observations and auger holes drilled within Crisp County, the potential for either fine or coarse aggregate production in the county is considered to be very low.

Table 9. Crisp County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Cob-1	6 feet	trench	6 feet	0	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

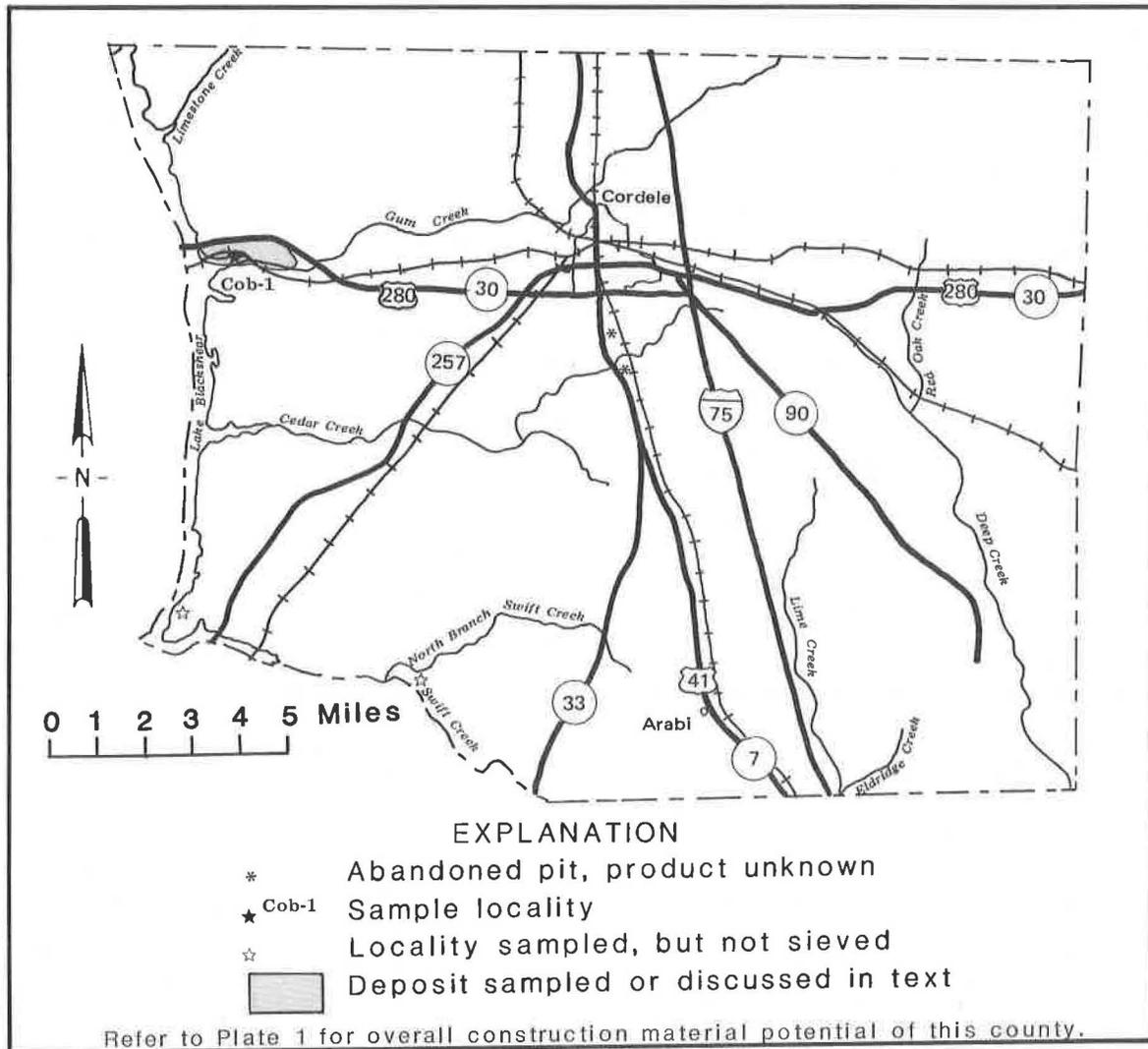
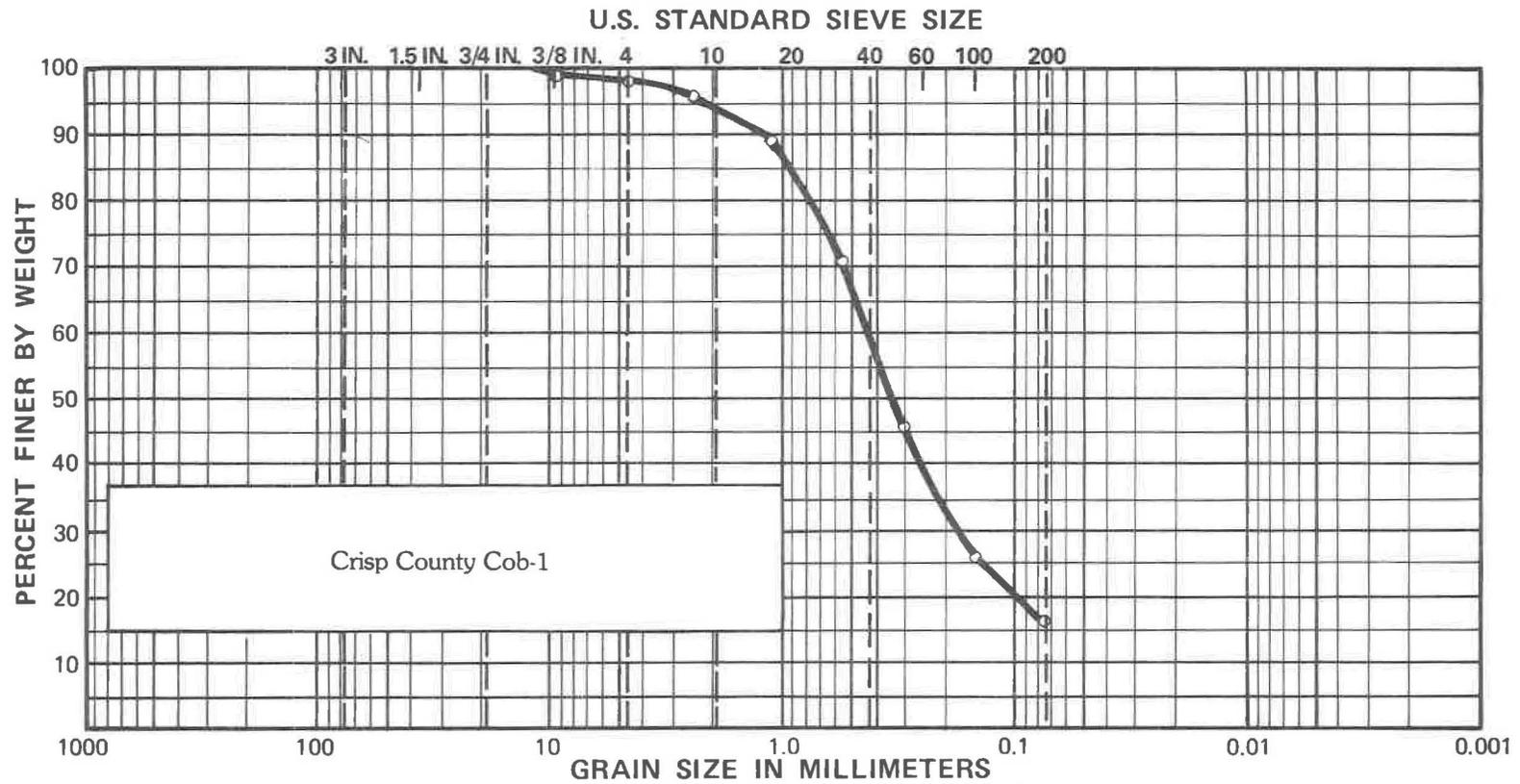


Figure 49. Map of Crisp County Showing Sample Localities, Pits, Deposit Sampled, and Localities Sampled but not Sieved.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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

Decatur County

Geology and Physiography

Decatur County lies within portions of two physiographic districts of the Coastal Plain Province, the Dougherty Plain and the Tifton Upland. The sediments of the county are derived from the residuum of the Ocala and Oligocene limestones, the Hawthorne Group, and the Miccosukee Formation.

Previous Studies

Teas (1921, p. 188) reported fine- to medium-grained sand in Spring Creek and at Brinson. Teas (1921, p. 188) noted that large quantities of the fine-grained sand occur in the Flint River (fig. 51, Ts-17) and at Faceville. A fine-grained sand deposit mined by the Decatur Concrete Works (fig. 51, Ts-18) was also described by Teas (1921, p. 188).

Present Study

The soil association used in targeting areas of Decatur County was #39, which is present in interfluvial areas in the northern portion of the county. Geomorphic features targeted are point bars along the Flint River in the central portion of the county, and the braided flood plain of Willacoochee Creek in central southern Decatur County. Six sites in Decatur County were sampled (figs. 52-58, Table 10). None of these natural materials pass ASTM standard C-33. Three of the samples, however, have some potential for construction aggregate: Brn-1, Bai-1, and Boy-1.

Evaluation

Sample Boy-1 has a grain-size distribution adequate for aggregate production, except that it contains approximately 11 percent < #200 material (figs. 57,58) in the upper 6.5 feet and nearly 30 percent < #200 material in the lower 2.5 feet. Thus, the sand deposit represented by Boy-1 could, with processing, meet ASTM standard C-33. The sample from Brn-1 has an adequate grain-size distribution but contains more than 15 percent < #200 material (fig. 55).

The sample Bai-1, taken from floodplain deposits of the Flint River, is probably from the same deposit that is mined by the active aggregate producers of Decatur County. Sample Bai-1 contains less than 5 percent < #200 material and has more than 25 percent > #50 material. The area being mined, west of the Flint River, is 200 acres in extent and, assuming a tabular body 13 feet thick, contains approximately 4.2 million cubic yards of sand.

Mining activity

There are three active aggregate commercial mining operations in Decatur County; they are Floyd Brothers Asphalt Company, Z.A. Adams Company, and Flint Concrete Products (fig. 51, D-198, D-472, D-185). There is one recently inactive pit in Decatur County owned by Columbus Company (fig. 51, D-553-F).

Floyd Brothers Asphalt (D-198) produces sand for their asphalt operation. The sand is mined using a front-end loader and is hauled by truck to their plant. There is no washing or sizing of the sand at the pit site. The sand is mined to a depth of 10 feet, and the size of the current mining area is 3 to 4 acres.

A 3 acre pit within a 5 acre tract owned by Z.A. Adams (D-472) is mined for concrete aggregate. The material is mined to a depth of 15 feet utilizing a front end loader. No sizing or washing of the material is required. The haulage radius (by truck) is approximately 40 miles.

Flint Concrete Products (D-185) produces concrete and mortar sand. The products are transported to points within a 60 mile radius by truck. The sand is mined by a front-end loader and processed through a washer, sized and stockpiled. Thirty acres of land are owned by the company, and 15 acres remain to be mined. The sand is mined to a depth of 10 feet, and annual production is between 50,000 and 100,000 tons.

The one inactive pit (D-553-F) is owned by the Columbus Company of Columbus, Georgia. The product of this operation was aggregate used in the production of asphalt. The method of mining was the same as that of D-178. The Columbus Company owns 28 acres, and the sand was mined to a depth of 10 to 12 feet.

Summary evaluation

The area of Decatur County with the highest potential for production of fine aggregate is that represented by sample Bai-1. The potential for fine aggregate production in Decatur County is considered to be low to high.

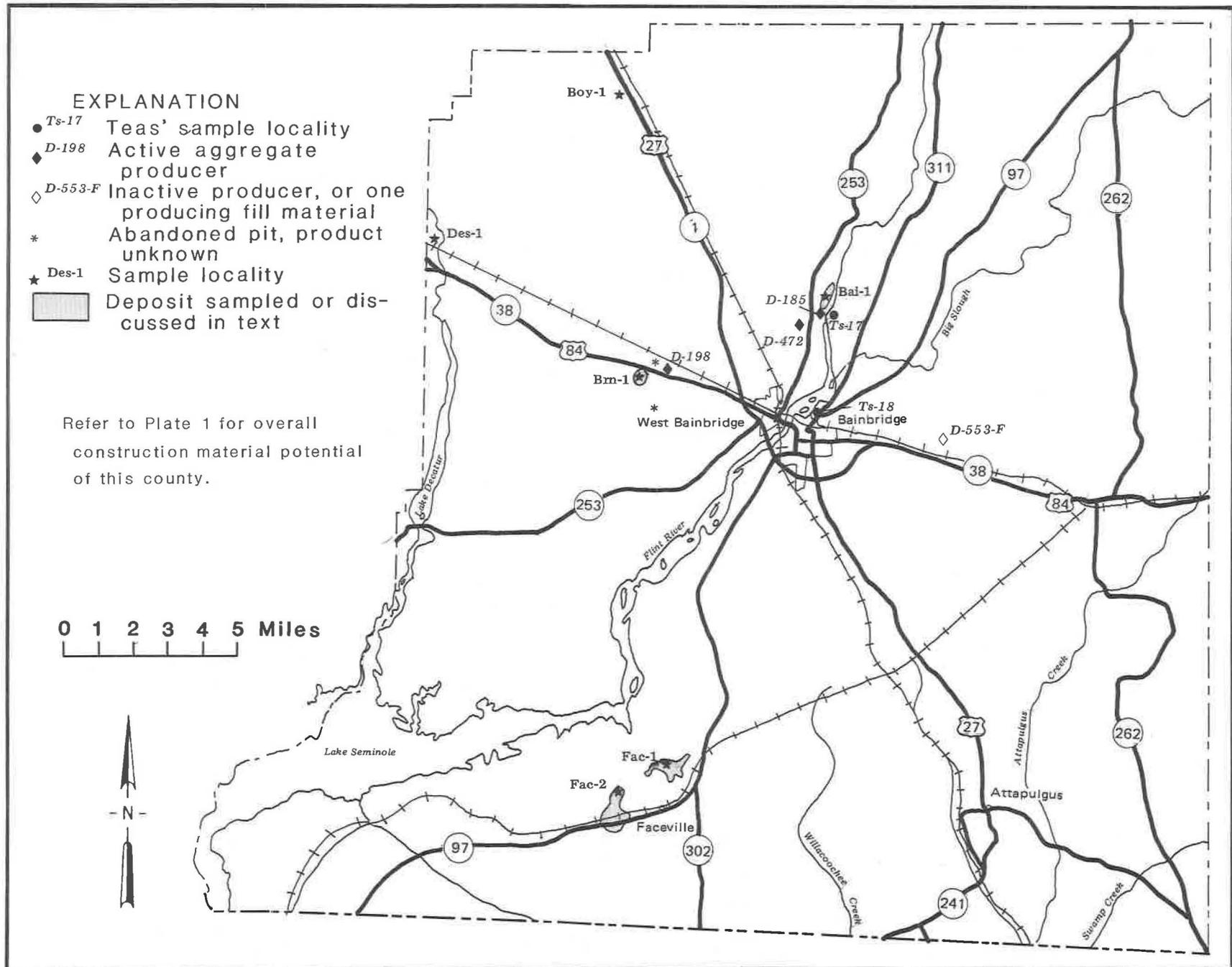
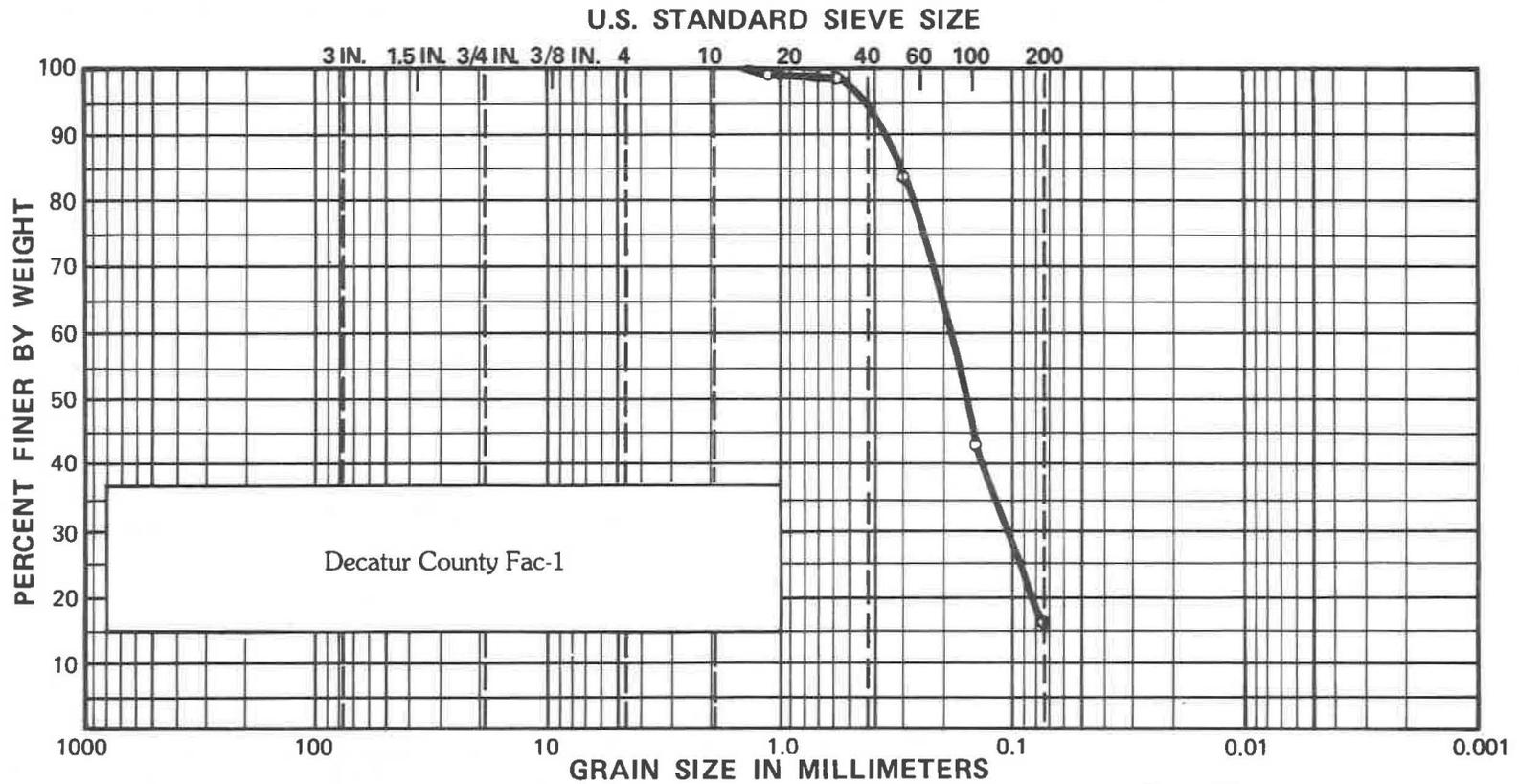


Figure 51. Map of Decatur County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.



Decatur County Fac-1

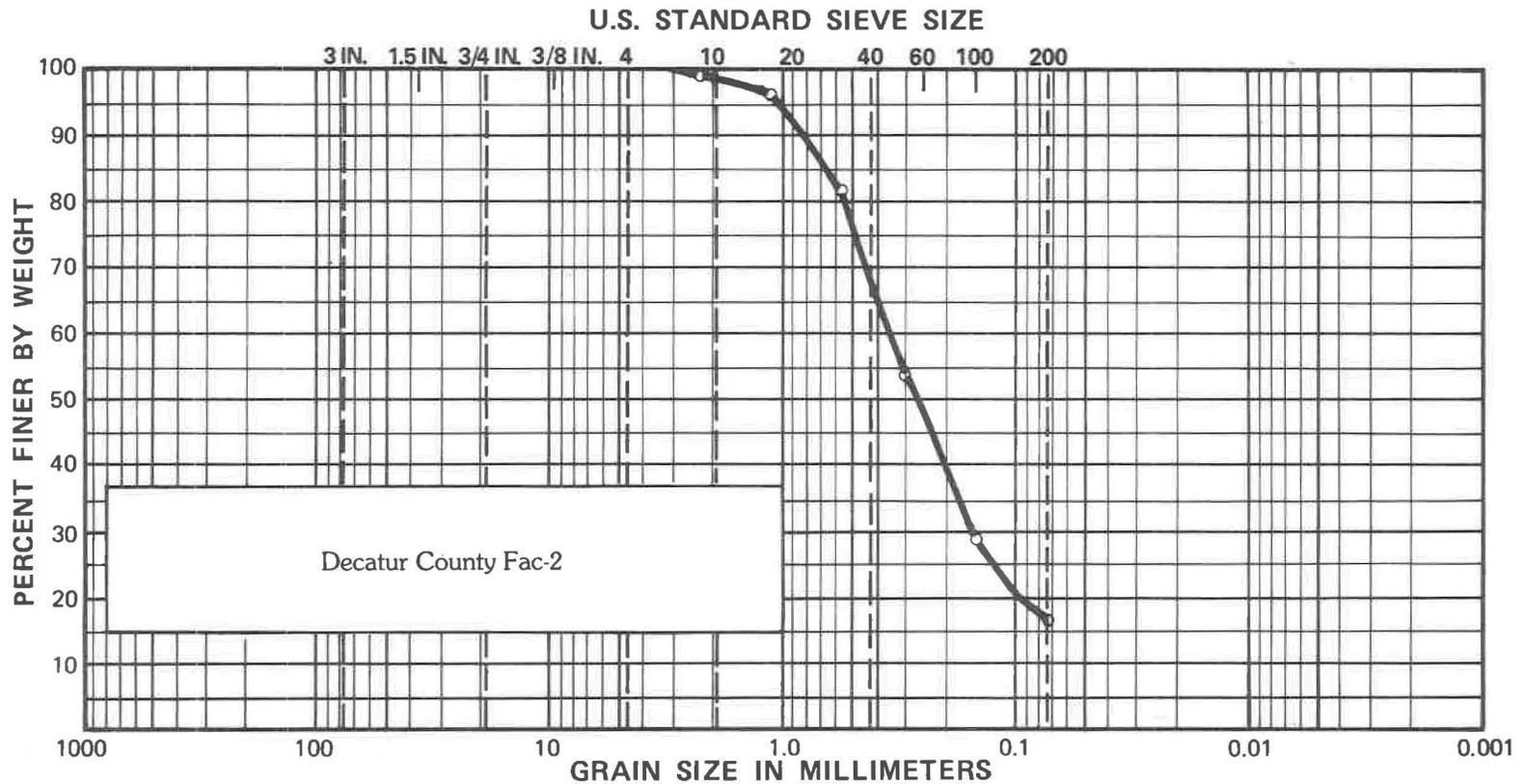
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY					
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 52. Size Distribution Curve of Sample Fac-1.



COBBLES	GRAVEL				SAND			SILT OR CLAY *
	COARSE	FINE		COARSE	MEDIUM	FINE		

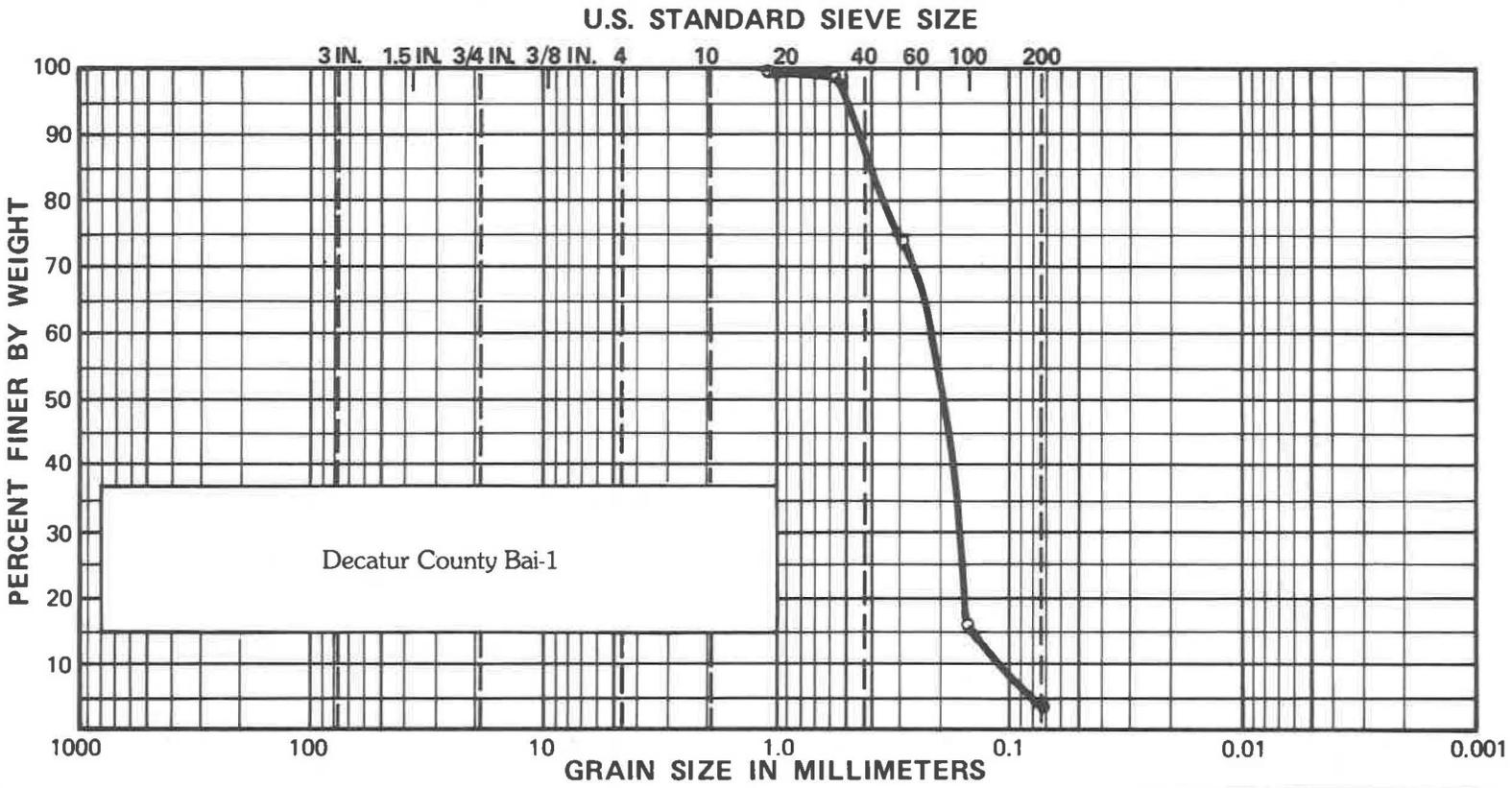
BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY **					
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

70

Figure 53. Size Distribution Curve of Sample Fac-2.

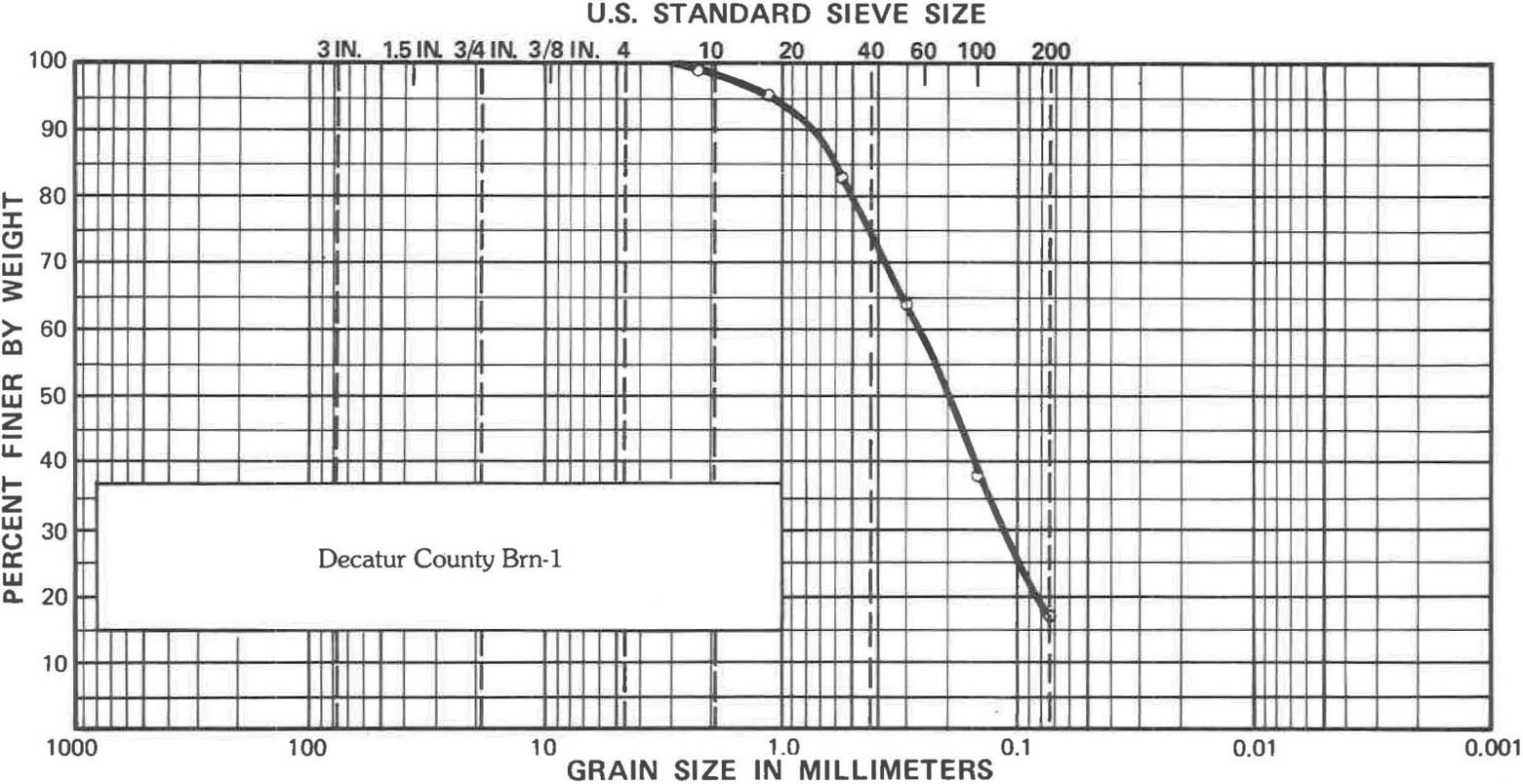


COBBLES	GRAVEL				SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse coarse	GRAVEL medium fine	very fine	very coarse coarse	SAND medium fine	very fine	SILT coarse medium fine	very fine	CLAY - coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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

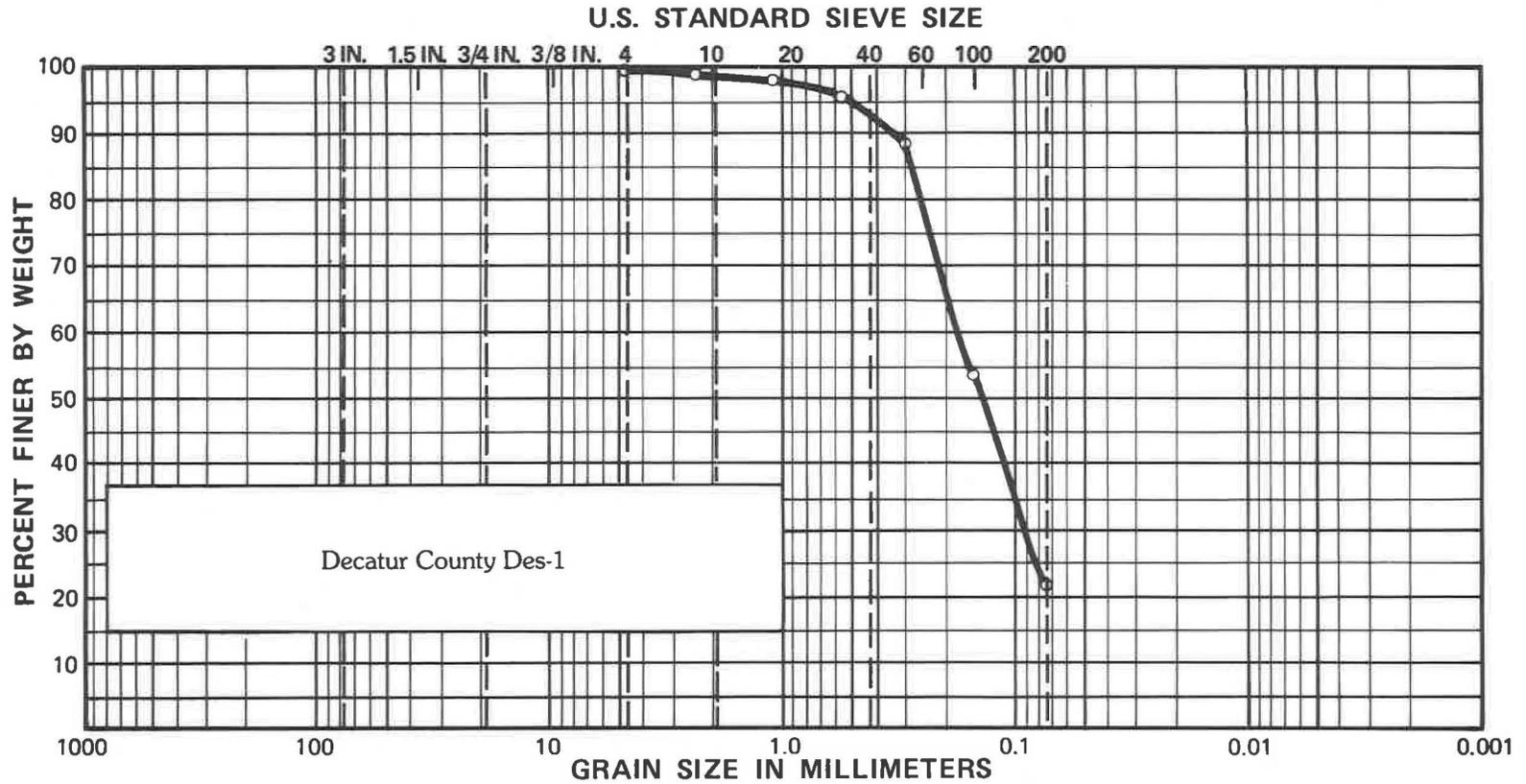


COBBLES	GRAVEL				SAND			SILT OR CLAY *											
	COARSE		FINE		COARSE	MEDIUM	FINE												
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium	fine	very fine	very coarse	coarse	SAND medium	fine	very fine	coarse	SILT medium	fine	very fine	coarse	CLAY medium	fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 55. Size Distribution Curve of Sample Brn-1.



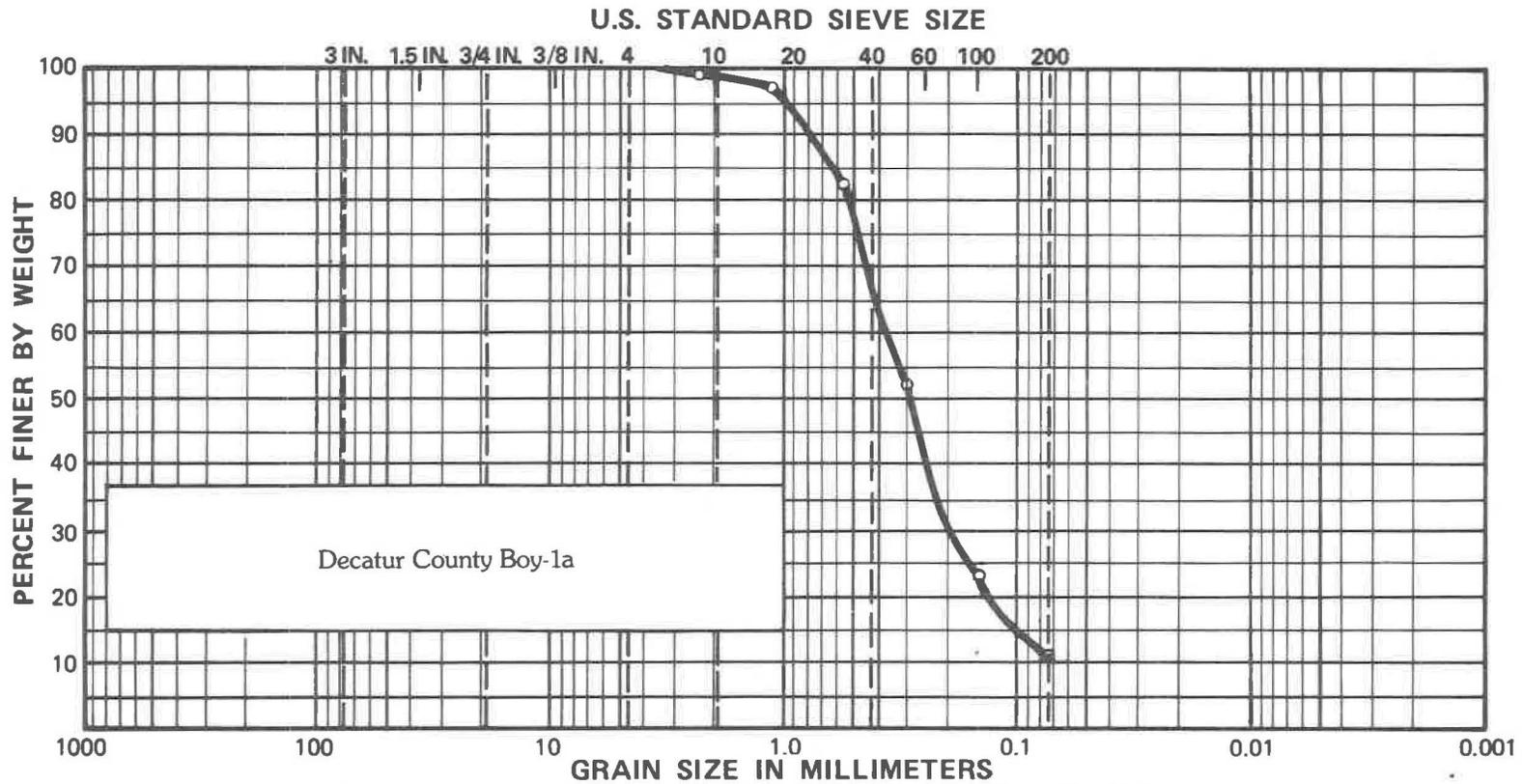
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY					
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 56. Size Distribution Curve of Sample Des-1.

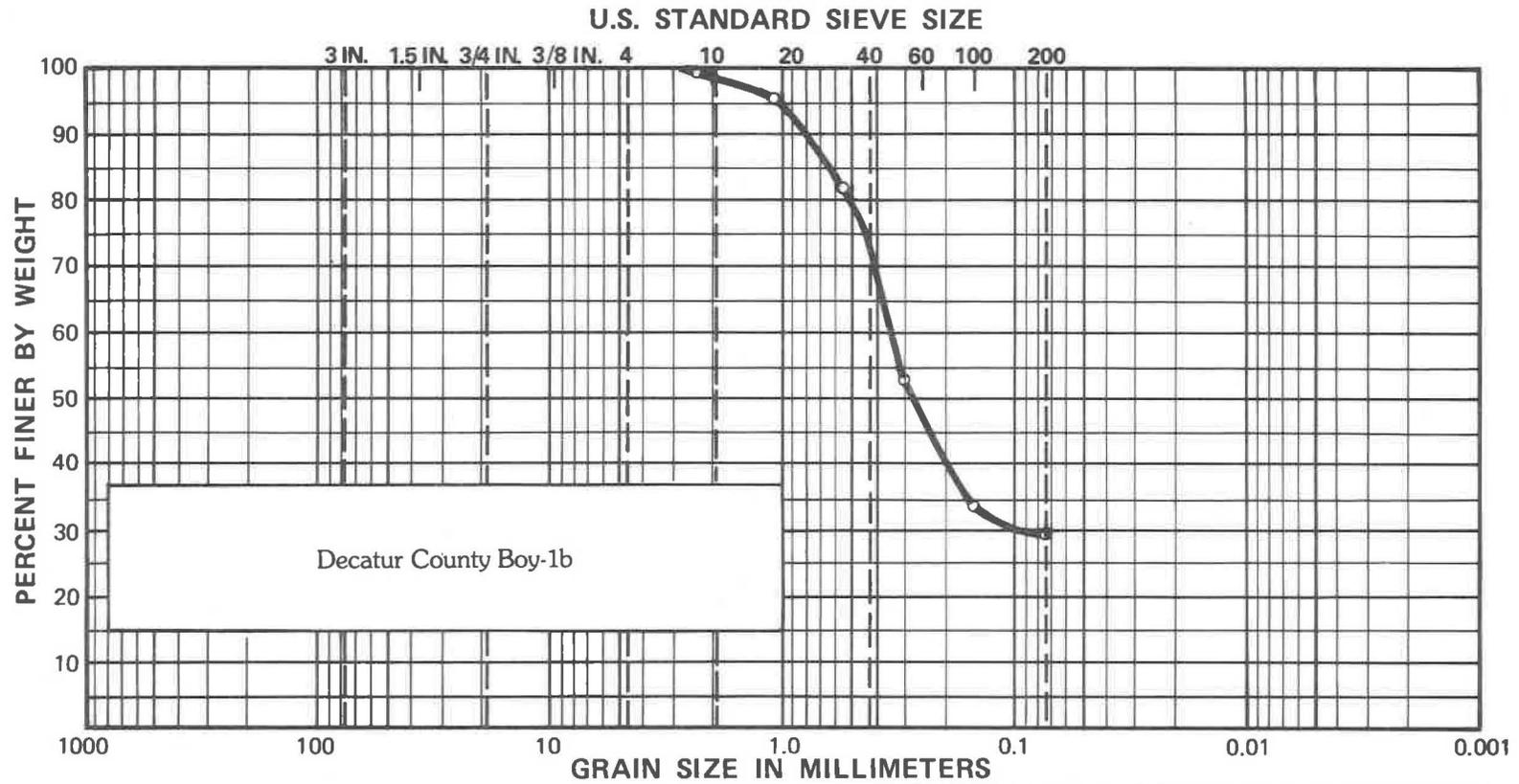


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

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



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

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

Table 10. Decatur County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
Fac-1	4 feet	trench	10 feet	0	no	0
Fac-2	7 feet	auger	7 feet	1	no	1
Bai-1	15 feet	auger	13 feet	2	no	1
Brn-1	6 feet	auger	5 feet	2	no	0
Des-1	9 feet	auger	9 feet	0	no	0
Boy-1a	6.5 feet	auger	6.5 feet	1	no	2
Boy-1b	2.5 feet	auger	2.5 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

Dooly County

Geology and Physiography

Dooly County (fig. 59) lies within portions of three physiographic districts of the Coastal Plain Province, the Fort Valley Plateau, the Fall Line Hills and the Tifton Upland. The surficial sediments of Dooly County are derived from the residuum of the Ocala and Oligocene limestones and, to a minor extent, from undifferentiated Eocene deposits and the Altamaha Formation.

Previous Studies

Teas (1921, p. 190-191) observed that few sand deposits even for local use exist in Dooly County and that the areas containing fine-grained sands along the Flint River were generally inaccessible.

Present Study

No natural materials from Dooly County were sieved due to the paucity of soil types indicative of coarse-grained surficial material. However, a sample (Dra-1) from a point bar on the Sumter County side of the Flint River probably is representative of the point bars along the Dooly County side of the river.

Evaluation

The areas with the highest potential for fine aggregate production in Dooly County are the point bars along the Flint River.

Mining activity

There are no active or recently inactive commercial aggregate mining operations within Dooly County.

Summary evaluation

The only areas with any potential for production of aggregate in Dooly County are the point bars along the Flint River. As mentioned by Teas (1921, p. 190), these deposits were and are relatively inaccessible. The potential of fine aggregate production in Dooly County is very low.

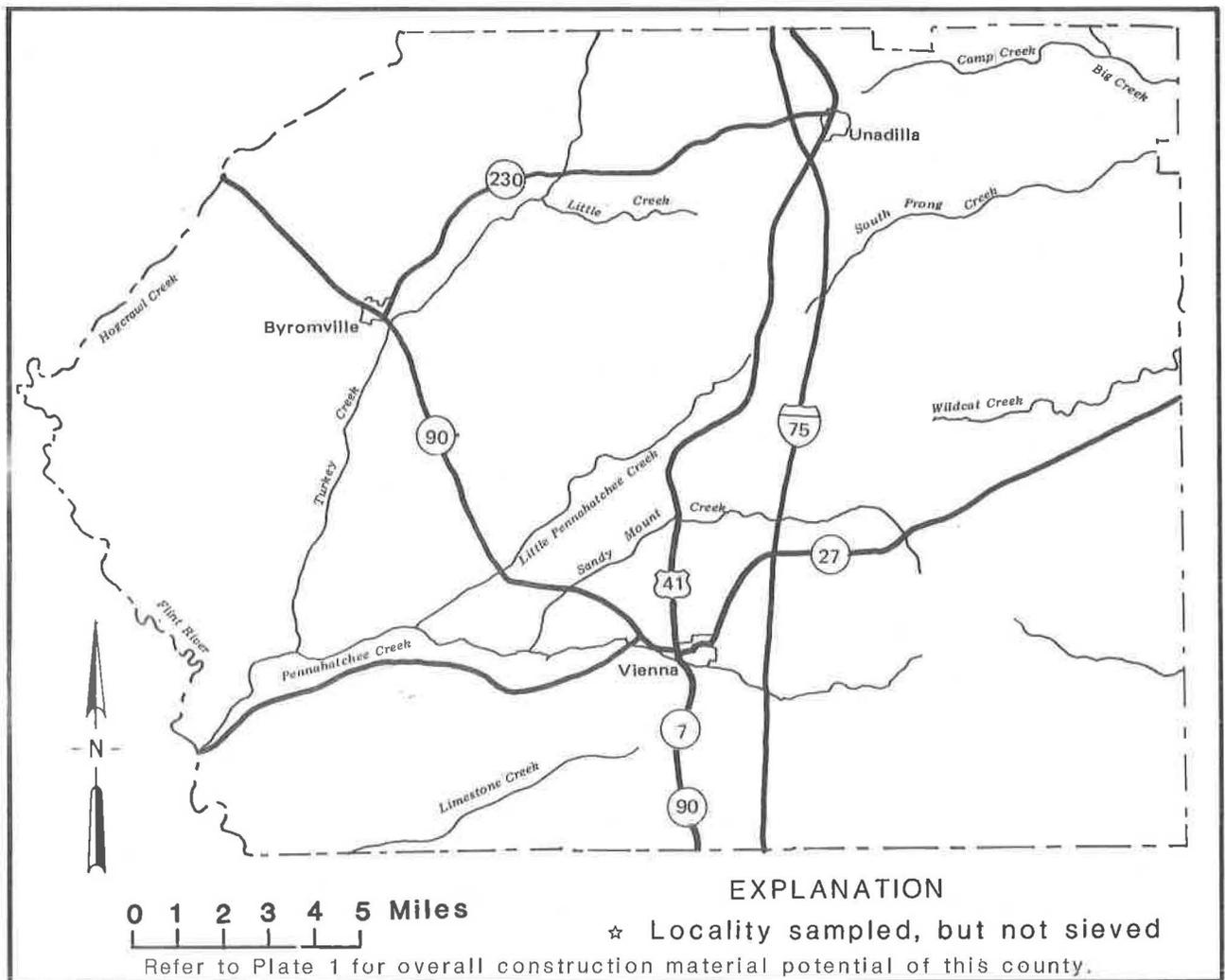


Figure 59. Map of Dooly County Showing Localities Sampled but not Sieved.

Dougherty County

Geology and Physiography

Dougherty County lies within three physiographic districts of the Coastal Plain Province, the Fall Line Hills, the Dougherty Plain, and the Tifton Upland. The surficial sediments of Dougherty County are derived from residuum of the Ocala and Oligocene limestones and, to a very minor extent, the Altamaha Formation.

Previous Studies

Teas (1921, p. 191-194) noted the sand dunes (sand hills) east of the Flint River at Albany (fig. 60, Ts-19 [Tift Silica Brick], Ts-20 [Albany Lime and Cement]) and a deposit of coarse sand 1 or 2 feet thick on the west bank of Muckafoonee Creek (fig. 60, T-21).

Present Study

The soil association used in targeting areas of Dougherty County was Lakeland, which is present as isolated bodies in the western, south central and north central portions of the county. Geomorphic features targeted are point bars along the Flint River, and the area of sand dunes east of Albany. Five samples from Dougherty County (fig. 60, AIW-1,2,3,4,5) were sieved (figs. 61-65, Table 11). None of the natural materials pass ASTM standard C-33; however, two samples, AIW-2 and AIW-5, are marginal and could be upgraded to meet specifications. AIW-2 is located within a state park and, therefore, is not considered further.

Evaluation

Sample AIW-5, from the east bank of Kinchafoonee Creek, is the only sample with any economic potential for fine aggregate. The deposit represented by AIW-5 has a proven thickness of only 3 feet and a maximum areal extent of 20 acres. On this basis the reserves would be 96,000 cubic yards, an insufficient amount for a commercial operation. It is possible however that this general area could contain a deposit of commercial size. Drilling would be required to establish the existence of such a deposit.

Mining activity

The majority of the mining activity of Dougherty County is within the sand dune area east of the Flint River. The major product of the sand dune area is fill material.

Albany Lime and Cement Company of Albany (fig. 60, D-210) mines dune sand for traction sand and as a filler in fertilizer. The filler material is transported to Albany, Cordele and Moultrie by truck and the traction sand is shipped by rail for use by the railroad. A front end loader is used to move the sand to a conveyer belt which feeds the sand into the drier. No further processing is required. Albany Lime and Cement owns 25 acres but is presently mining only 2 acres to a depth of 25 feet and produces less than 10,000 tons per year.

Wright Contracting (fig. 60, D-215) mines dune sand for their asphalt plant. A front-end loader is used to mine the sand which is transported by dump trucks to the plant. The company owns 15 acres and the sand is mined to a depth of 10 feet. Annual production is less than 10,000 tons.

Southern Concrete Construction Company of Albany mines concrete aggregate by dredging a bank deposit along the Flint River. The material is washed and sized on site and hauled by truck to the company's plants in Albany and Camilla. The company owns approximately 50 acres and the deposit has been mined to a depth of 20 feet. Annual production is less than 10,000 tons.

Summary evaluation

The dune area east of the Flint River encompasses approximately 350 acres of sand which averages 20 feet in thickness, and contains reserves in excess of 11 million cubic yards. Unfortunately the uses for this sand are limited due to the poor size gradation.

A 120 acre tract of land adjacent and physiographically similar to the area being mined by Southern Concrete (D-106) has potential reserves slightly less than 4 million cubic yards. The Flint River is adjacent to this unproven deposit and could provide an adequate supply of water for processing. A medium duty road is within half a mile of the tract, so only a relatively short haulage road would be required.

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

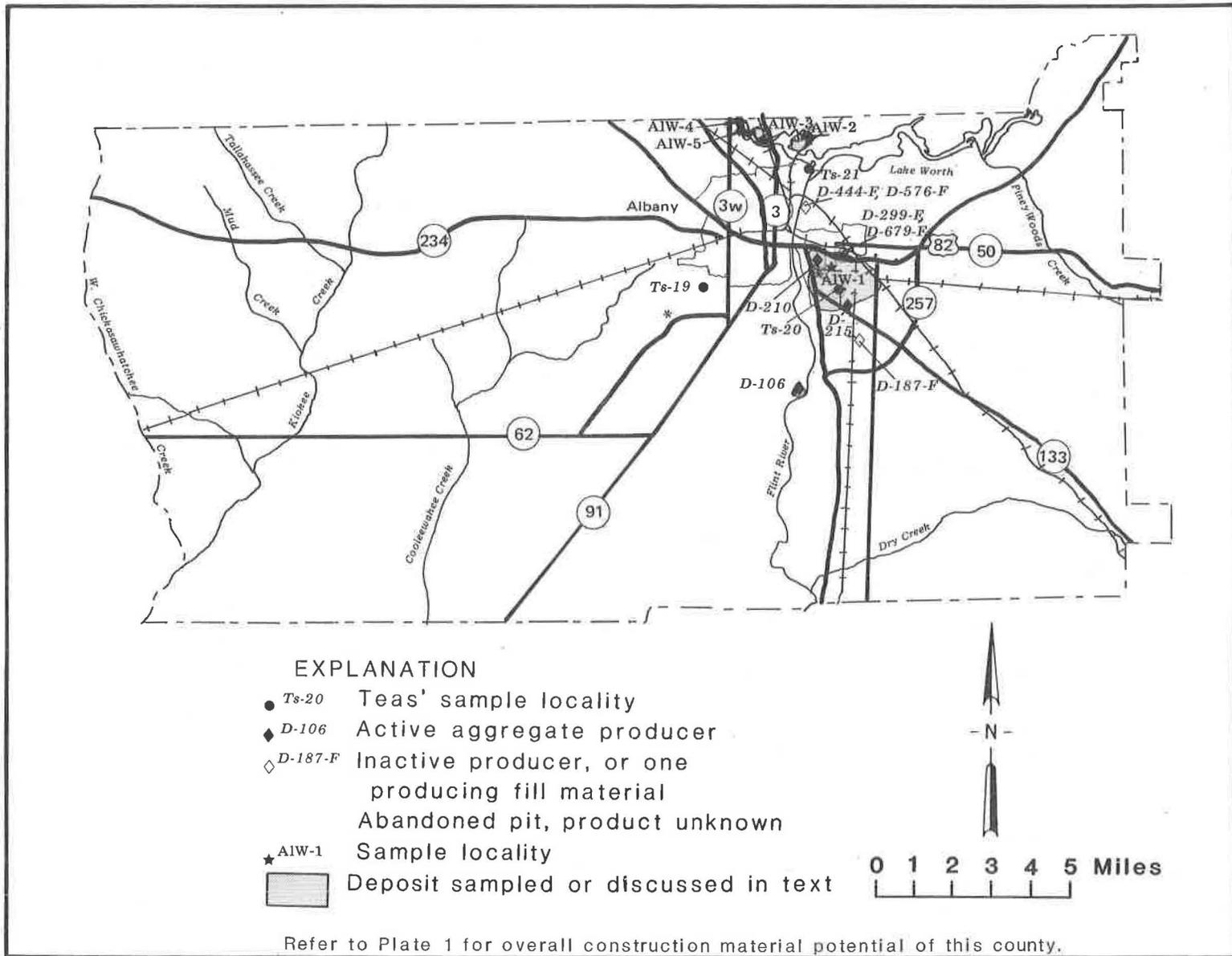
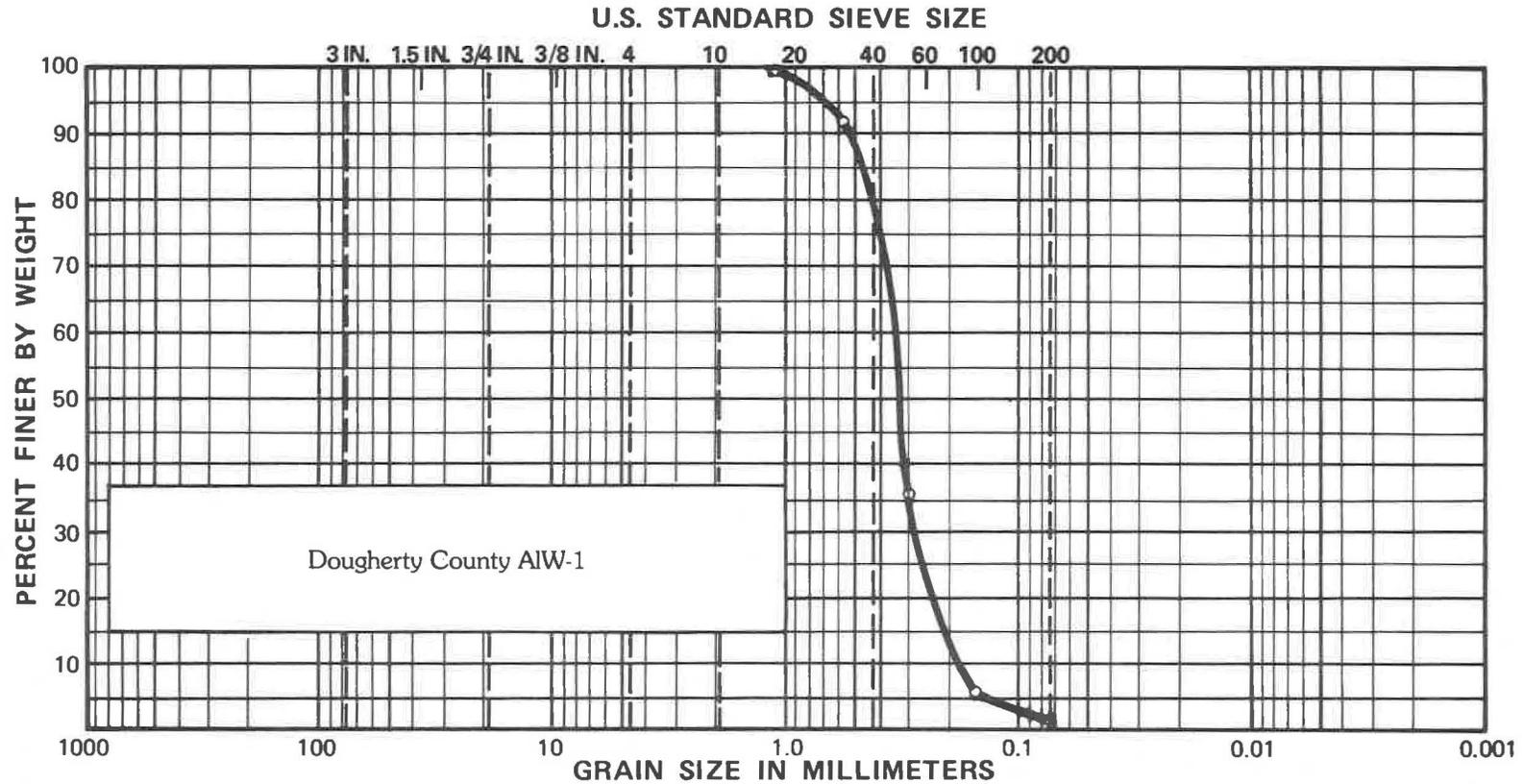


Figure 60. Map of Dougherty County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.

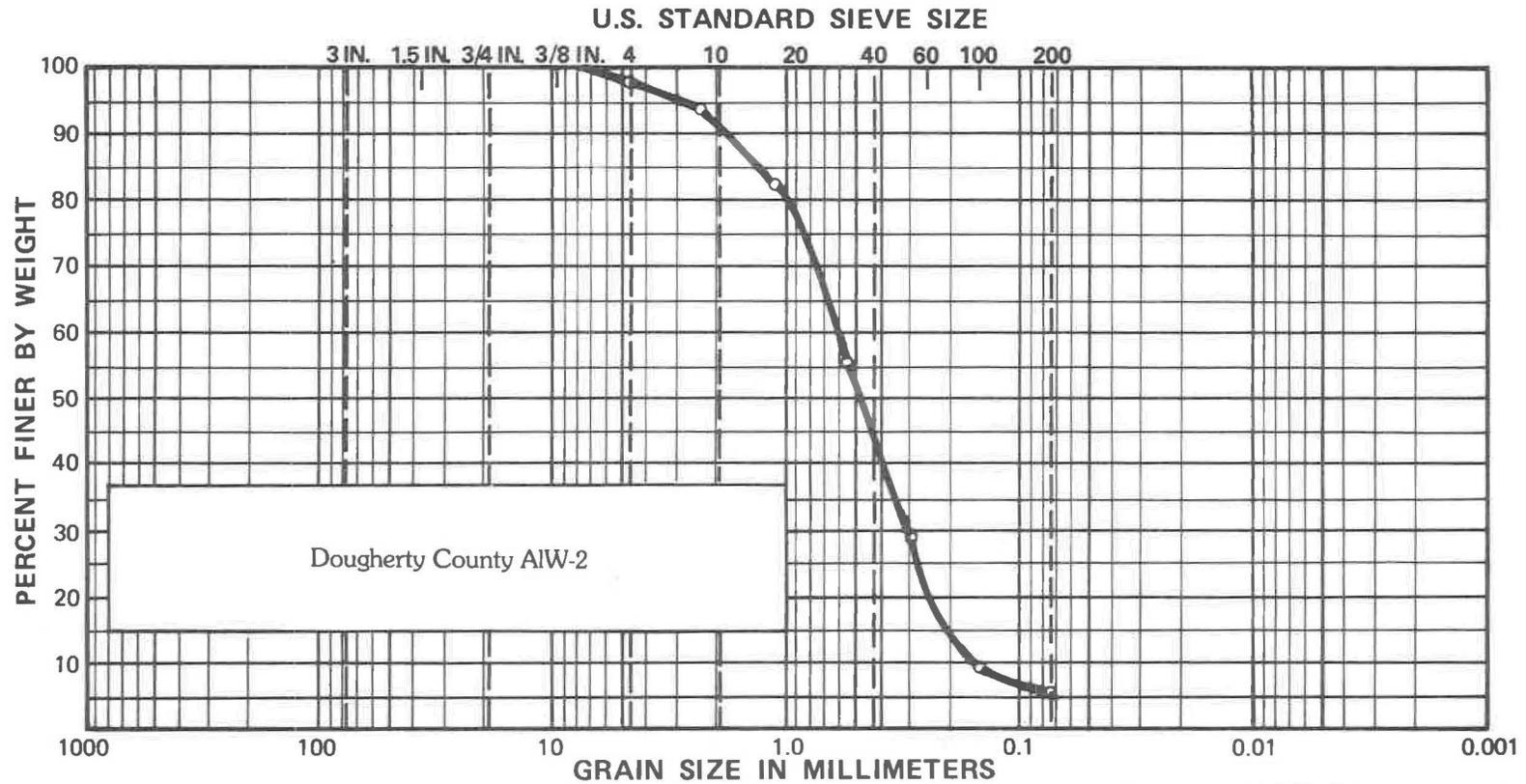


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 61. Size Distribution Curve of Sample AIW-1.

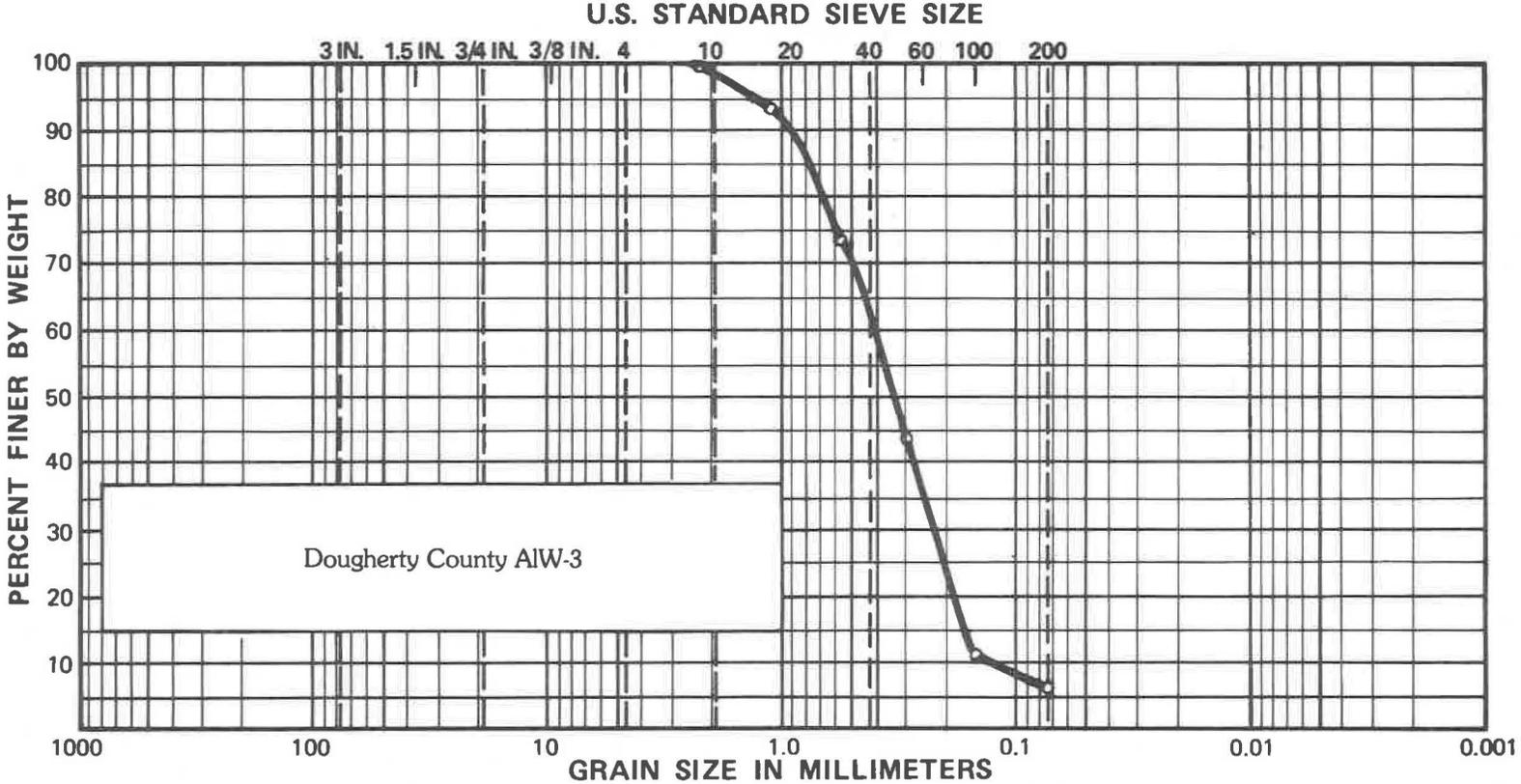


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 62. Size Distribution Curve of Sample AIW-2.



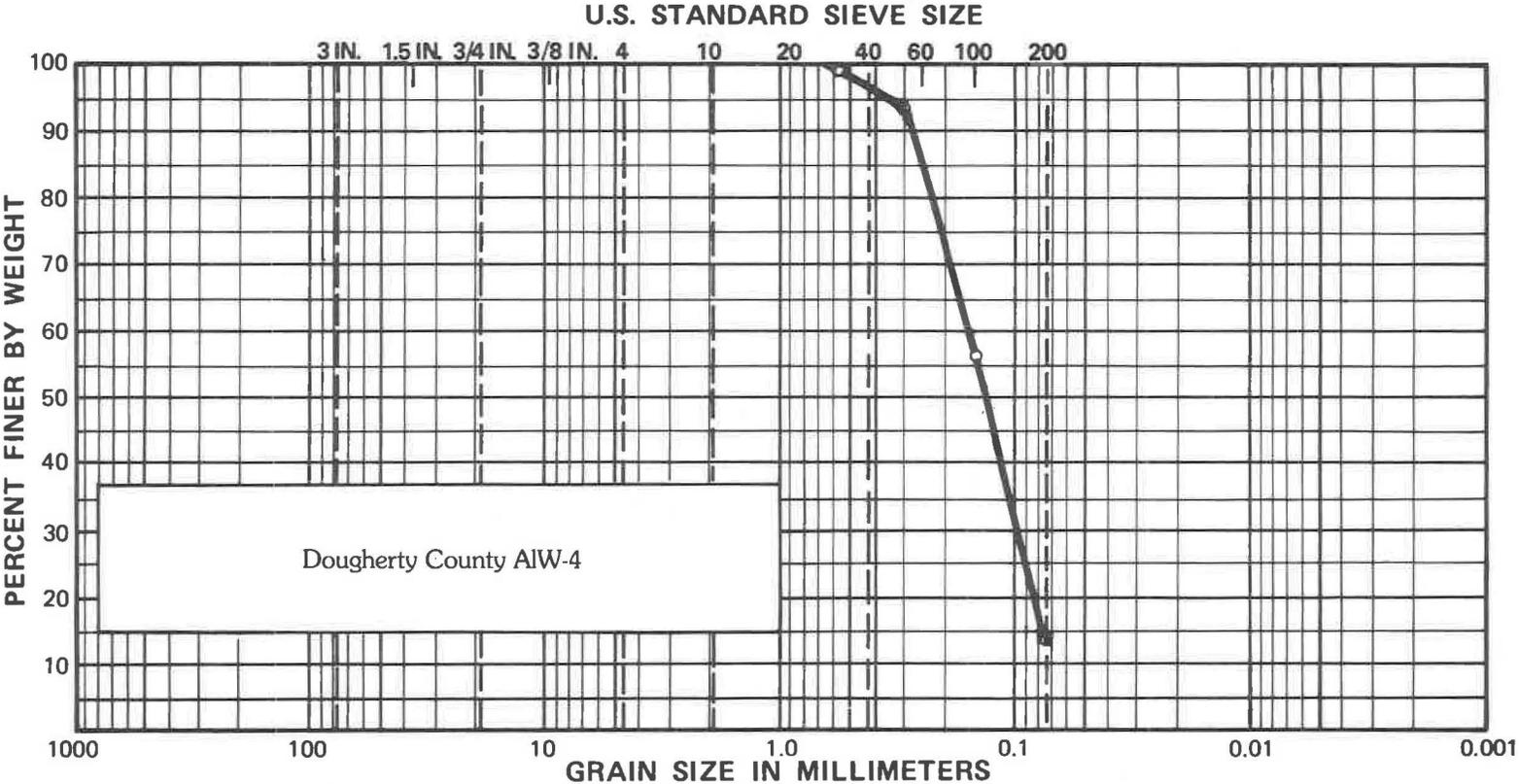
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES large small	very coarse	GRAVEL			very fine	very coarse	SAND			very fine	SILT			very fine	CLAY		
			coarse	medium	fine			coarse	medium	fine		coarse	medium	fine		coarse	medium	fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 63. Size Distribution Curve of Sample AIW-3.

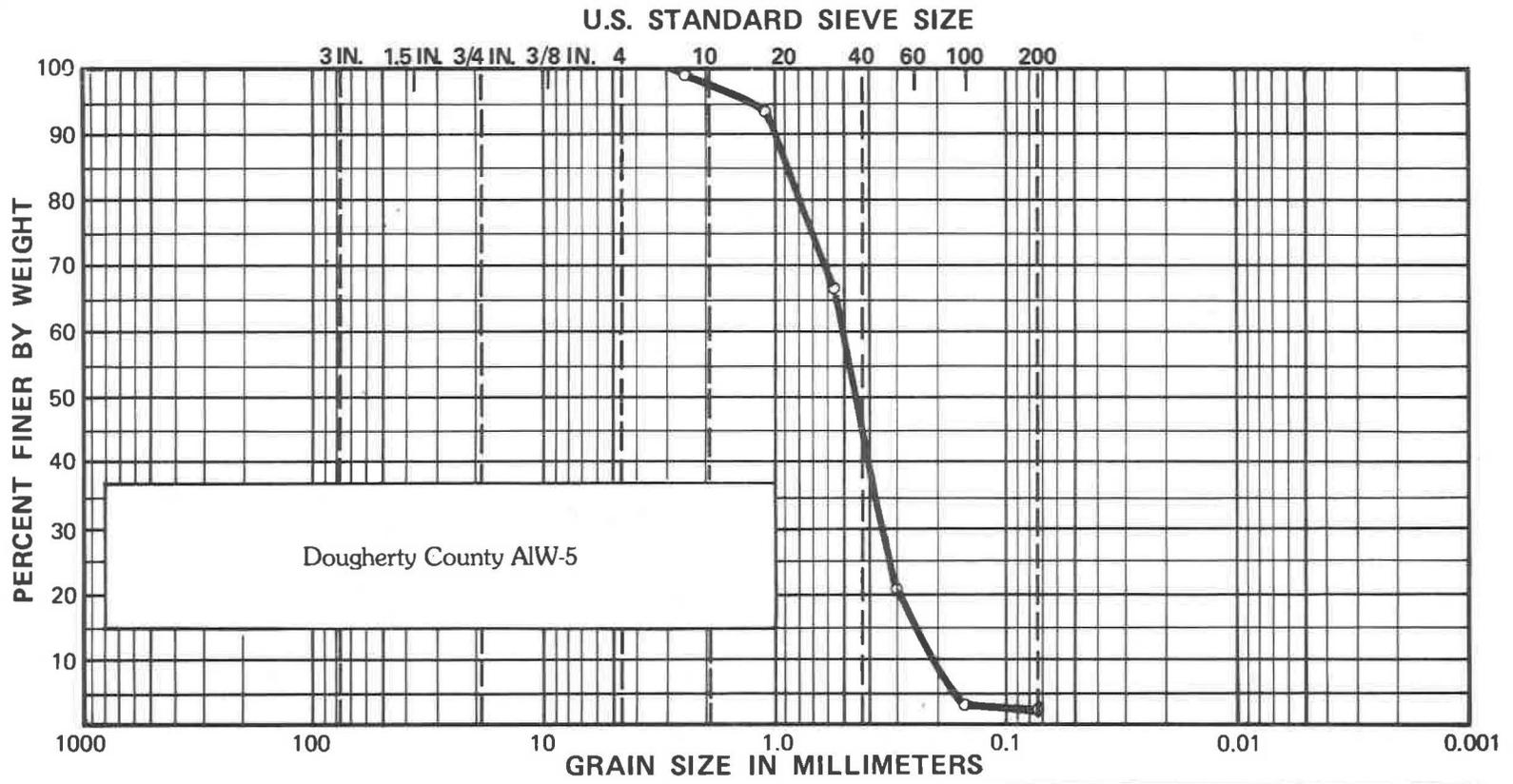


COBBLES		GRAVEL				SAND			SILT OR CLAY *										
		COARSE		FINE		COARSE	MEDIUM		FINE										
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium	fine	very fine	very coarse	coarse	SAND medium	fine	very fine	coarse	SILT medium	fine	very fine	CLAY coarse	medium	fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 64. Size Distribution Curve of Sample AIW-4.



Dougherty County AIW-5

COBBLES	GRAVEL				SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 65. Size Distribution Curve of Sample AIW-5.

Table 11. Dougherty County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
AIW-1	15 feet	trench	25 feet	3	no	2
AIW-2	9 feet	auger	6 feet	1	no ⁴	2
AIW-3	11 feet	auger	8 feet	1	no	2
AIW-4	4 feet	trench	4 feet	1	no	1
AIW-5	3 feet	trench	3 feet	1	no ⁴	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

Early County

Geology and Physiography

Early County lies within portions of two physiographic districts of the Coastal Plain Province, the Fall Line Hills and the Dougherty Plain. The surficial sediments of the county are derived from the Tusahoma, Tallahatta and Lisbon Formations, undifferentiated Claiborne Group and residuum of the Ocala and Oligocene limestones.

Previous Studies

Teas (1921, p. 194) described deposits (Underwood and Buchannon properties) of medium-grained sands, 5 to 6 feet thick, in a creek valley approximately one mile north of Blakely. Teas (1921, p. 194) also noted that a red sandy clay overlies these deposits, thereby hindering their commercial development.

Present Study

The soil associations used in targeting areas of Early County were #24 and #39, which border the streams along the western border of the county. Geomorphic features targeted are point bars and terrace surfaces in the western and southern portions of Early County. Six samples from Early County were sieved (fig. 66, CNE-1, BIN-1, Col-1, Col-2, Gor-1, Gor-2; figs. 67-72; Table 12).

Evaluation

One sample (Col-2) passed ASTM standard C-33; two other samples (CNE-1 and Gor-2) marginally failed ASTM standard C-33. Sample CNE-1, which marginally failed ASTM standard C-33, is a mixture of fine and coarse aggregate (figs. 67,73). This sample represents the more gravelly, lower 4.5 feet of a 20 foot exposure of gravelly fine-to coarse-grained sand from a point bar of the Chattahoochee River floodplain. Forty-six percent of the particles of this sample are 4.76 mm or greater. The gravelly zone is exposed for a distance of approximately 20 feet along the face of a point bar. The deposit represented by this sample could cover as much as 200 acres, thus having a potential reserve in excess of 6 million cubic yards, assuming a tabular body 20 feet thick. The entire deposit probably does not contain as much gravel as the zone sampled, but the deposit could provide concrete and mortar sand with the gravel as a by-product. The Chattahoochee River could provide a source of water.

Sample Col-2 meets ASTM standard C-33 and represents a point bar deposit five feet in thickness. This deposit has a possible areal extent of 10 acres thus having an unproven reserve in excess of 80,000 cubic yards. Water is readily available from the Chattahoochee River. The most economic means of transportation would probably be by barge, as no roads are within 2 miles of the deposit. Considering the size of this deposit, it probably would be suitable only for local use.

Sample Gor-2 (fig. 72), which marginally failed ASTM standard C-33, is from an abandoned pit. Based on field data and analysis of the sample obtained, this deposit is probably 10 acres in areal extent, thus providing an unproven reserve in excess of 170,000 cubic yards. This deposit is rather small, the gravels stained, and the availability of water for processing questionable, thereby restricting the economic feasibility of the deposit as a source of commercial aggregate.

Mining activity

There are no active or recently inactive commercial aggregate mining operations within Early County.

Summary evaluation

The point bar deposit represented by CNE-1 is the most economically feasible deposit within Early County. The point bars along the Chattahoochee River offer the best possibilities for further exploration. The fine aggregate production potential of Early County is considered to be moderate.

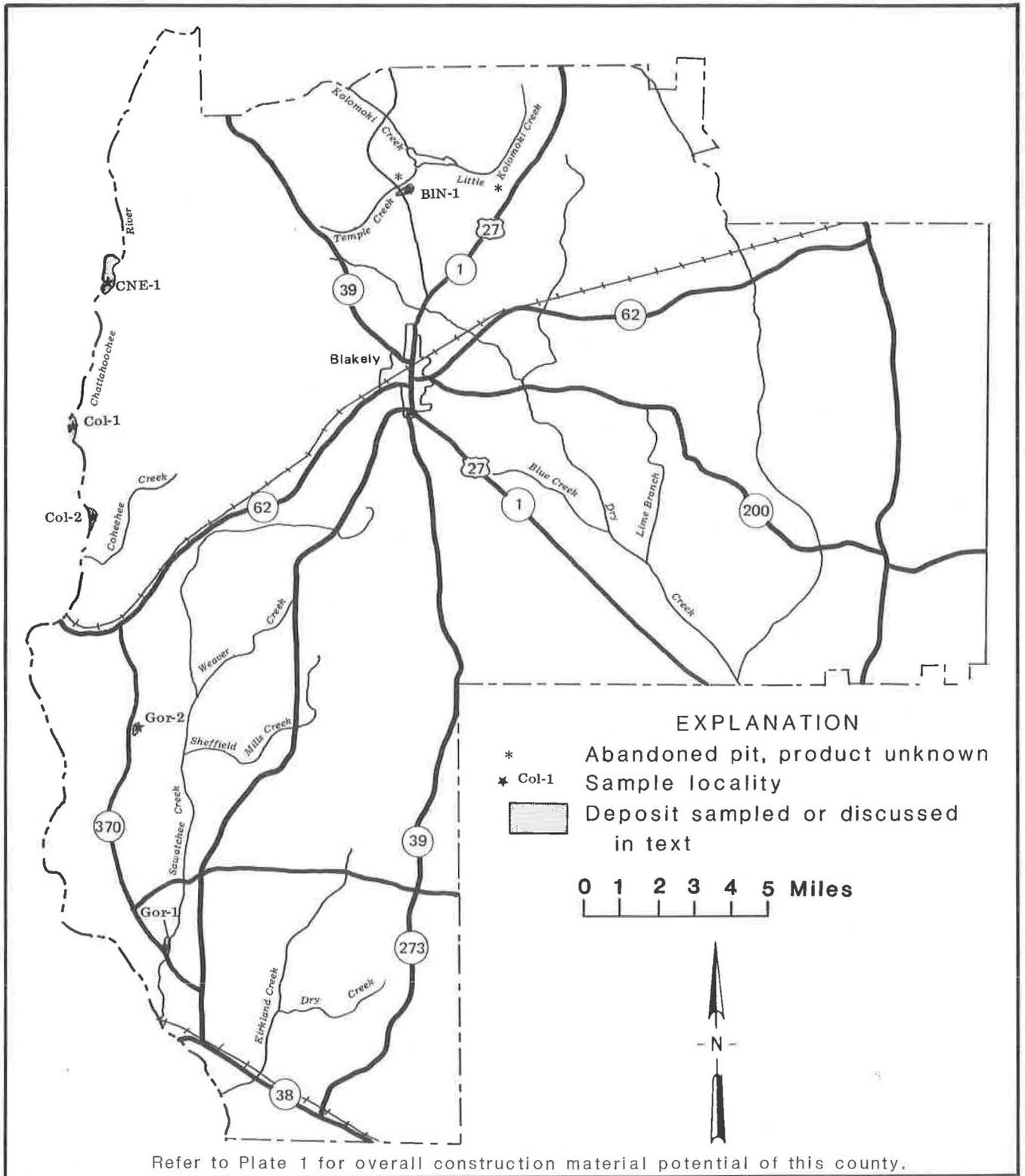
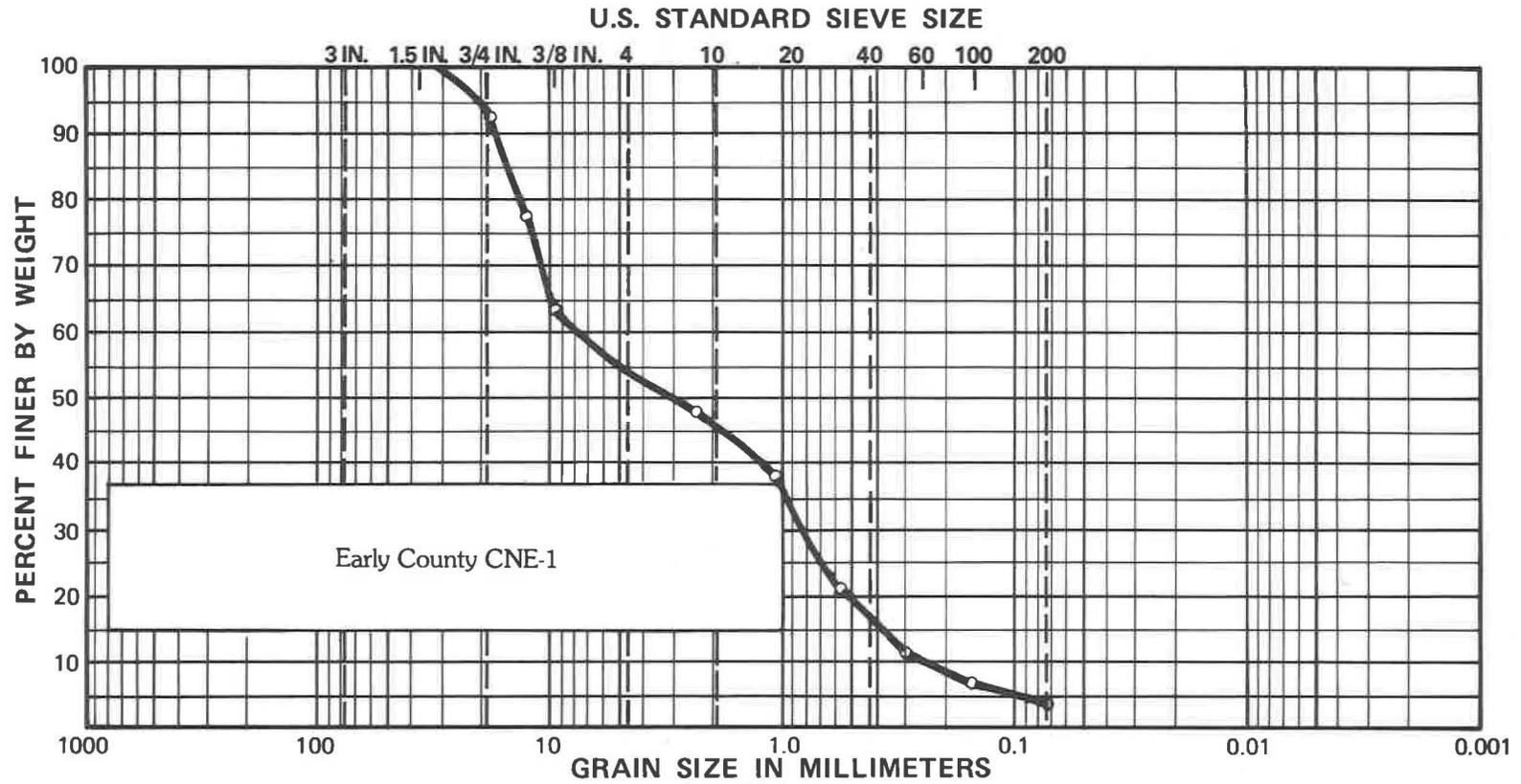


Figure 66. Map of Early County Sample Localities, Pits, and Deposits Sampled.

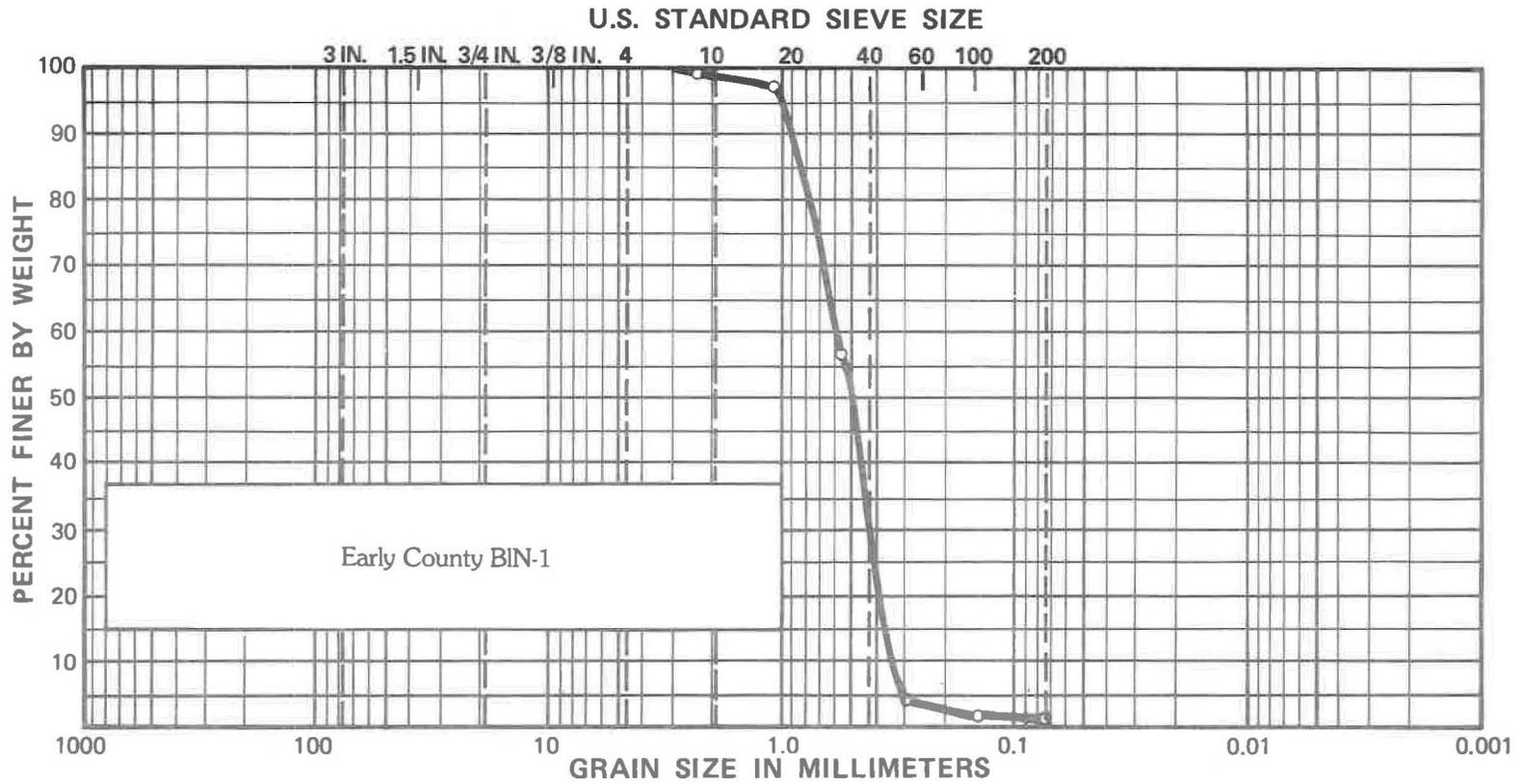


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE		FINE		COARSE	MEDIUM	FINE			
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 67. Size Distribution Curve of Sample CNE-1.



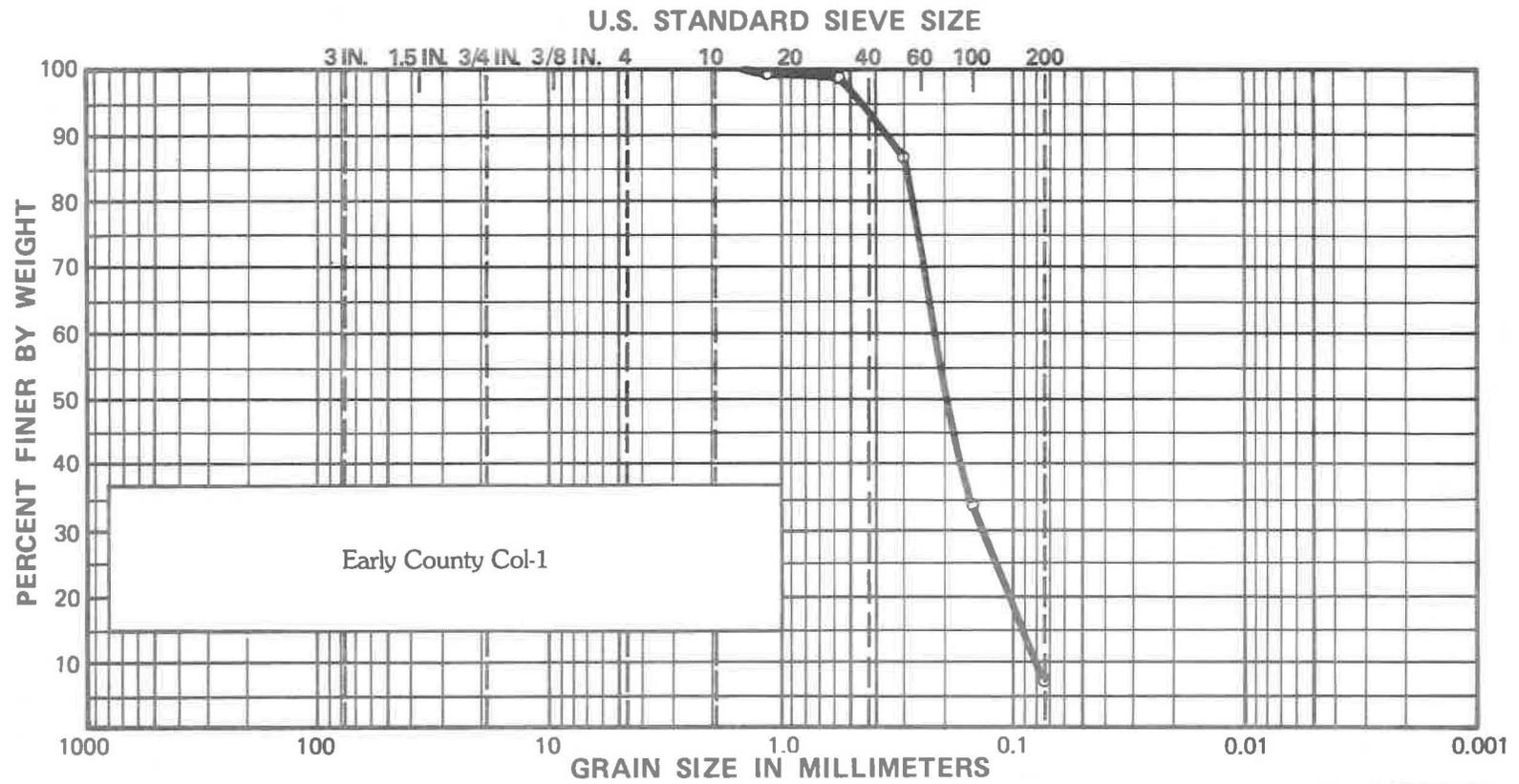
COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE	COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine		very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 68. Size Distribution Curve of Sample BIN-1.

06



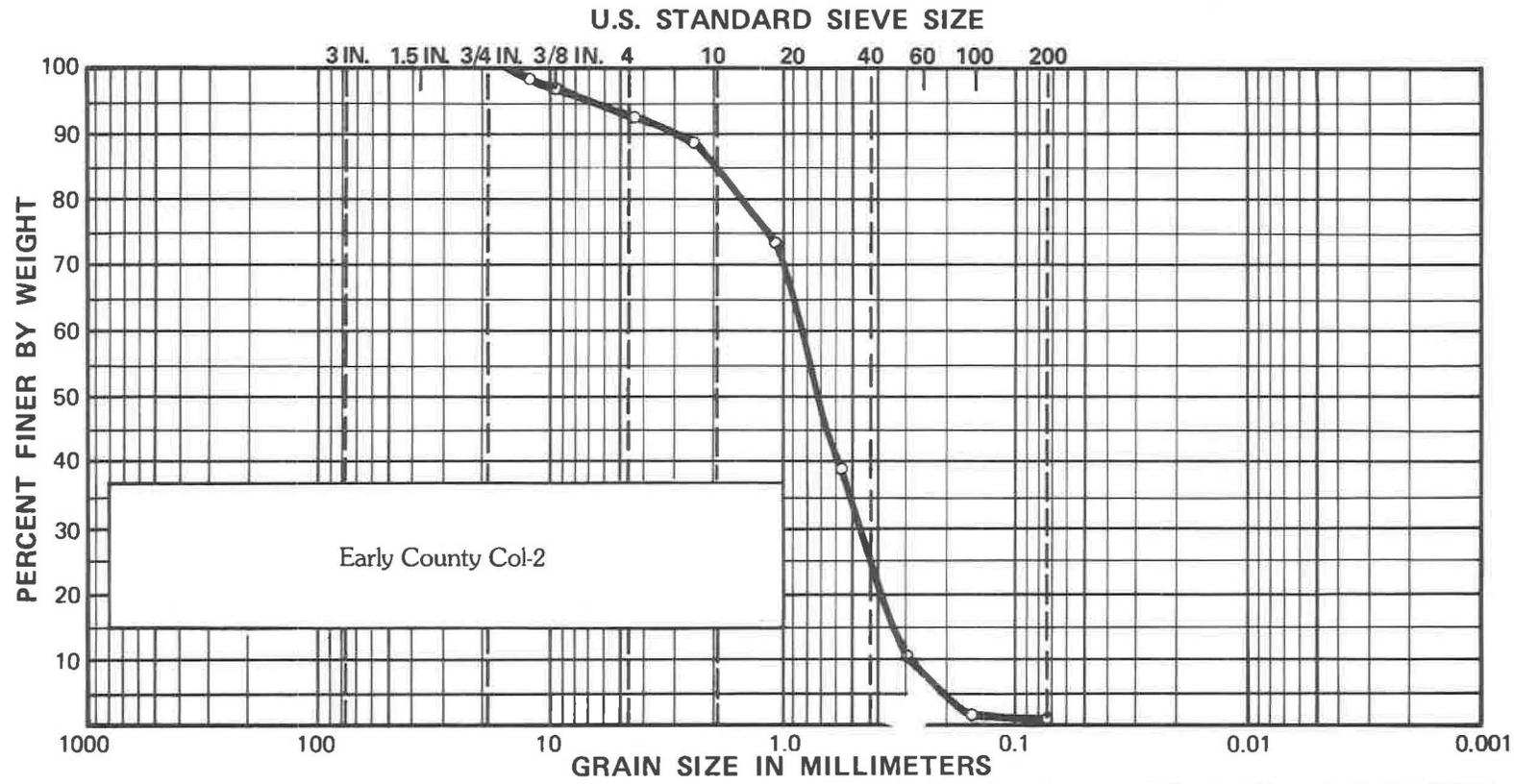
Early County Col-1

COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE		FINE		COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse coarse	GRAVEL medium fine	very fine	very coarse coarse	SAND medium fine	very fine	SILT coarse medium fine		very fine	CLAY coarse medium fine **	

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 69. Size Distribution Curve of Sample Col-1.

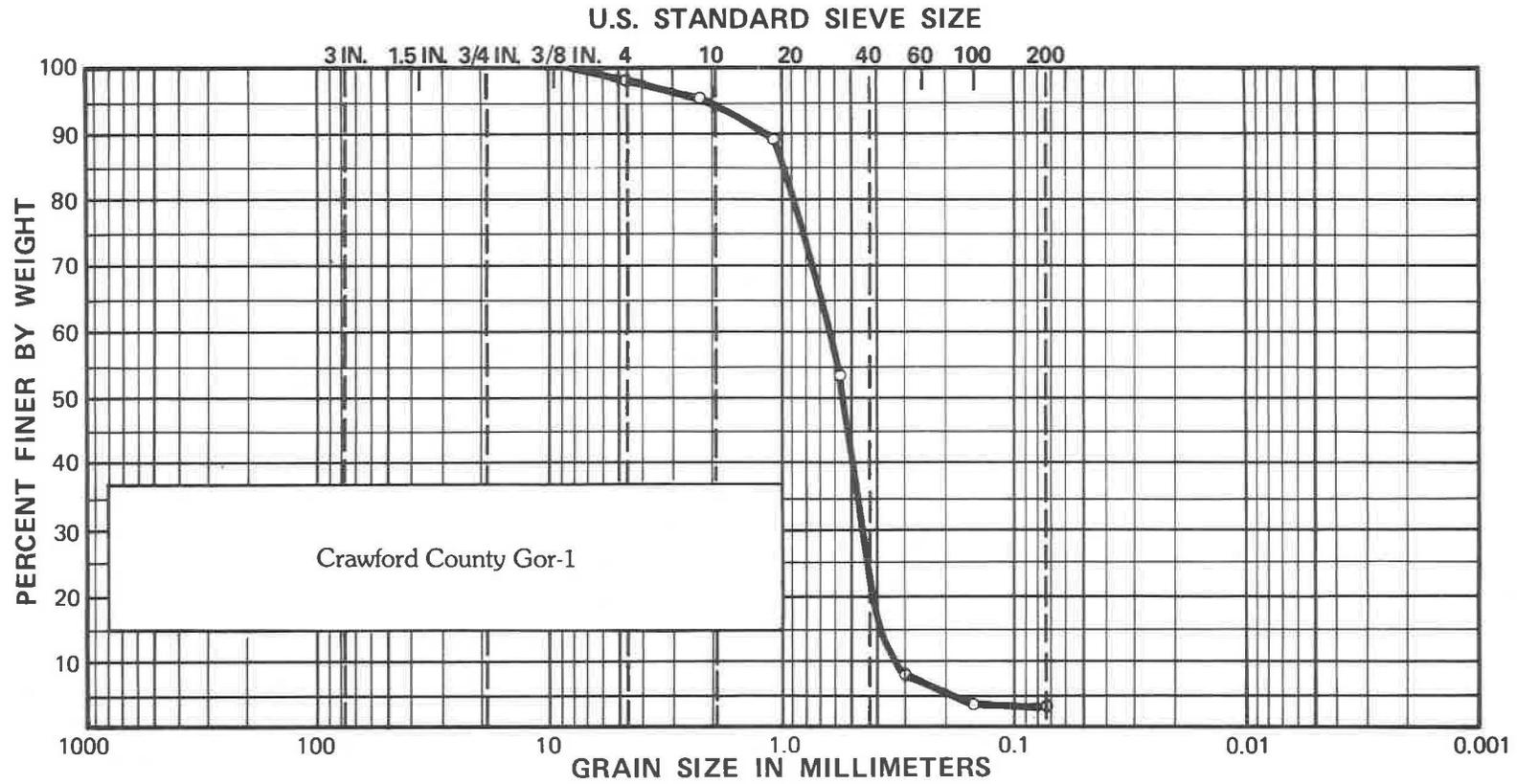


COBBLES	GRAVEL				SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 70. Size Distribution Curve of Sample Col-2.

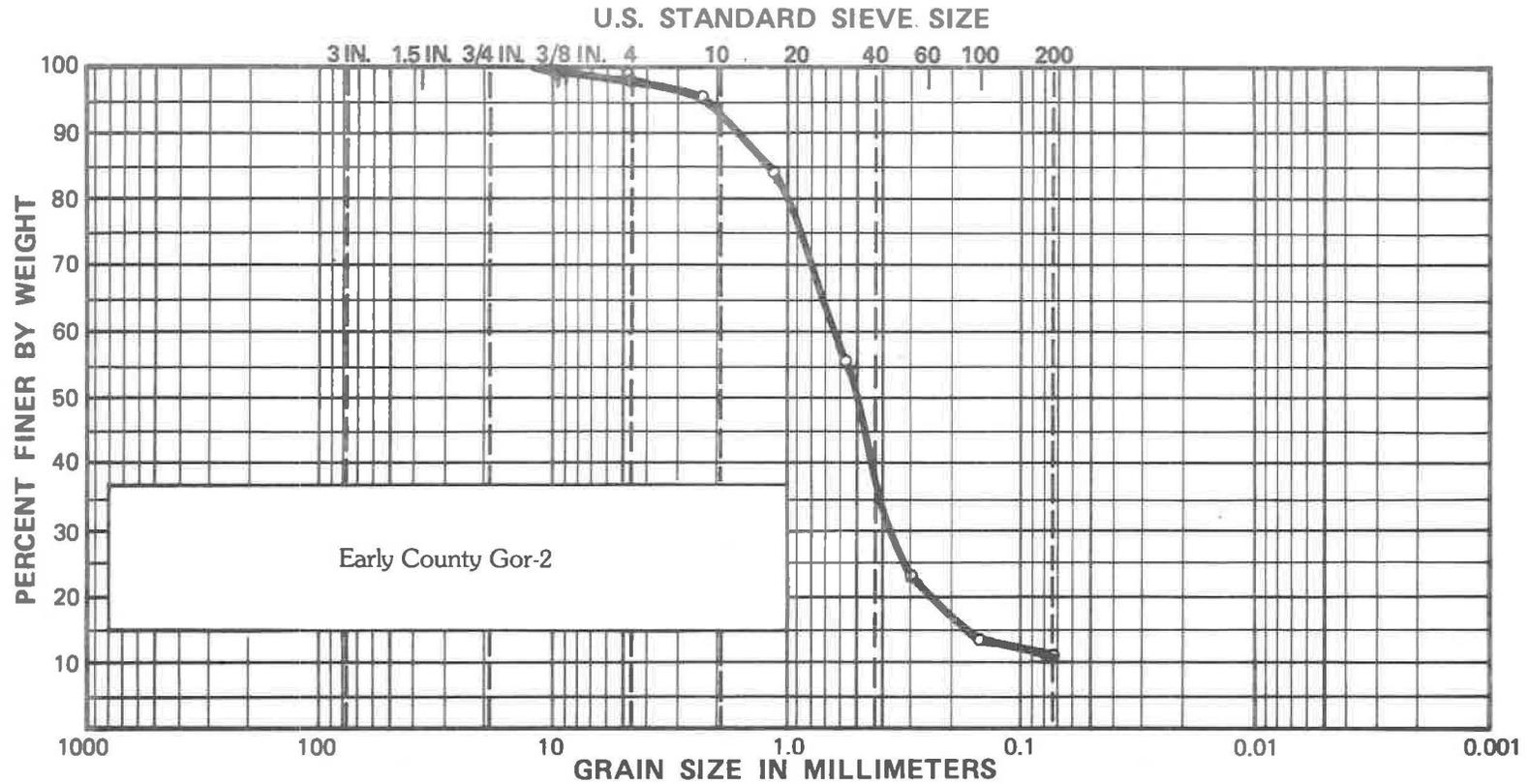


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 71. Size Distribution Curve of Sample Gor-1.



COBBLES	GRAVEL				SAND			SILT OR CLAY *			
	COARSE	FINE	COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine	**

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 72. Size Distribution Curve of Sample Gor-2.

Table 12. Early County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
CNE-1	4.5 feet	trench	20 feet	1	no ⁴	3
BIN-1	10 feet	trench	10 feet	1	no	0
Col-1	3 feet	trench	8 feet	1	no	1
Col-2	5 feet	trench	5 feet	1	yes	3
Gor-1	12 feet	trench	12 feet	0	no	2
Gor-2	11 feet	auger	14 feet	1	no ⁴	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

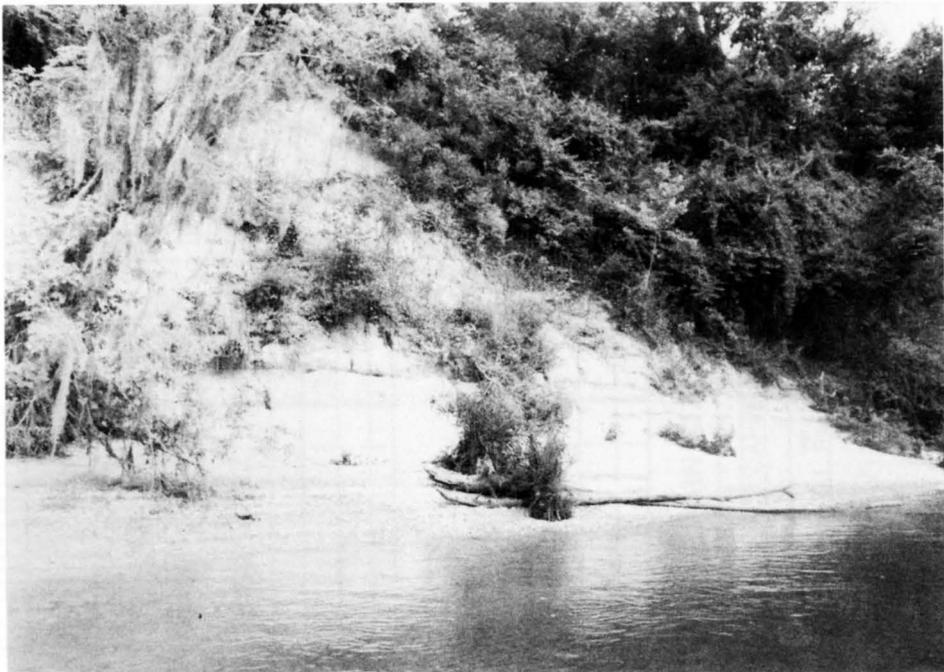


Figure 73. Point Bar Exposed at Sample Locality CNE-1, Chattahoochee River, Early County

Grady County

Geology and Physiography

Grady County lies within portions of two physiographic districts of the Coastal Plain Province, the Dougherty Plain, and the Tifton Upland. The surficial sediments of Grady County are derived from the residuum of the Ocala and Oligocene limestones, the Hawthorne Group and the Miccosukee Formation.

Previous Studies

Teas (1921, p. 201-202) described one small (quarter acre) pit (J.A. Parrish) being mined in Grady County (fig. 74, Ts-22) and the presence of a somewhat clayey sand along Little Tired Creek (Ts-23). Teas (1921, p. 202) also noted white sand suitable for glass or construction aggregate along the Ochlocknee River and inferior sand deposits along Barnett Creek and in the "Big Slough" area (northwest Grady County).

Present Study

The soil association used in targeting areas of Grady County was #39, which is present in interfluvial areas in the northwestern and central southern Grady County. Geomorphic features targeted are point bars present along the Ochlocknee River in southeast Grady County. One site in Grady County was sampled, but the sample was too fine-grained and the deposit too thin (4 feet) to be considered for sieving. A second site along Barnett's Creek was sampled and showed the area to be underlain by five feet of white, very fine- to fine-grained sand.

Evaluation

The 2 sites sampled in Grady County are indicative of the general nature of the surficial materials of the county. Generally, the deposits are fine-grained and thin (less than 4 feet thick).

Mining activity

There is one active aggregate (asphalt) operation in Grady County (fig. 74, D-643). Wright Contracting of Columbus mines sand for their asphalt plant from a 43 acre tract of land in the county. The sand is for self-use and is loaded on trucks by a front-end loader and transported to their plant where it is washed before being mixed with asphalt. Thirty-four acres remain to be mined; currently mining is to a depth of 3 feet.

Summary evaluation

The potential of production of either fine or coarse construction aggregate in Grady County is considered to be low. Although thin localized deposits are present, they are generally too fine-grained for use as construction aggregate.

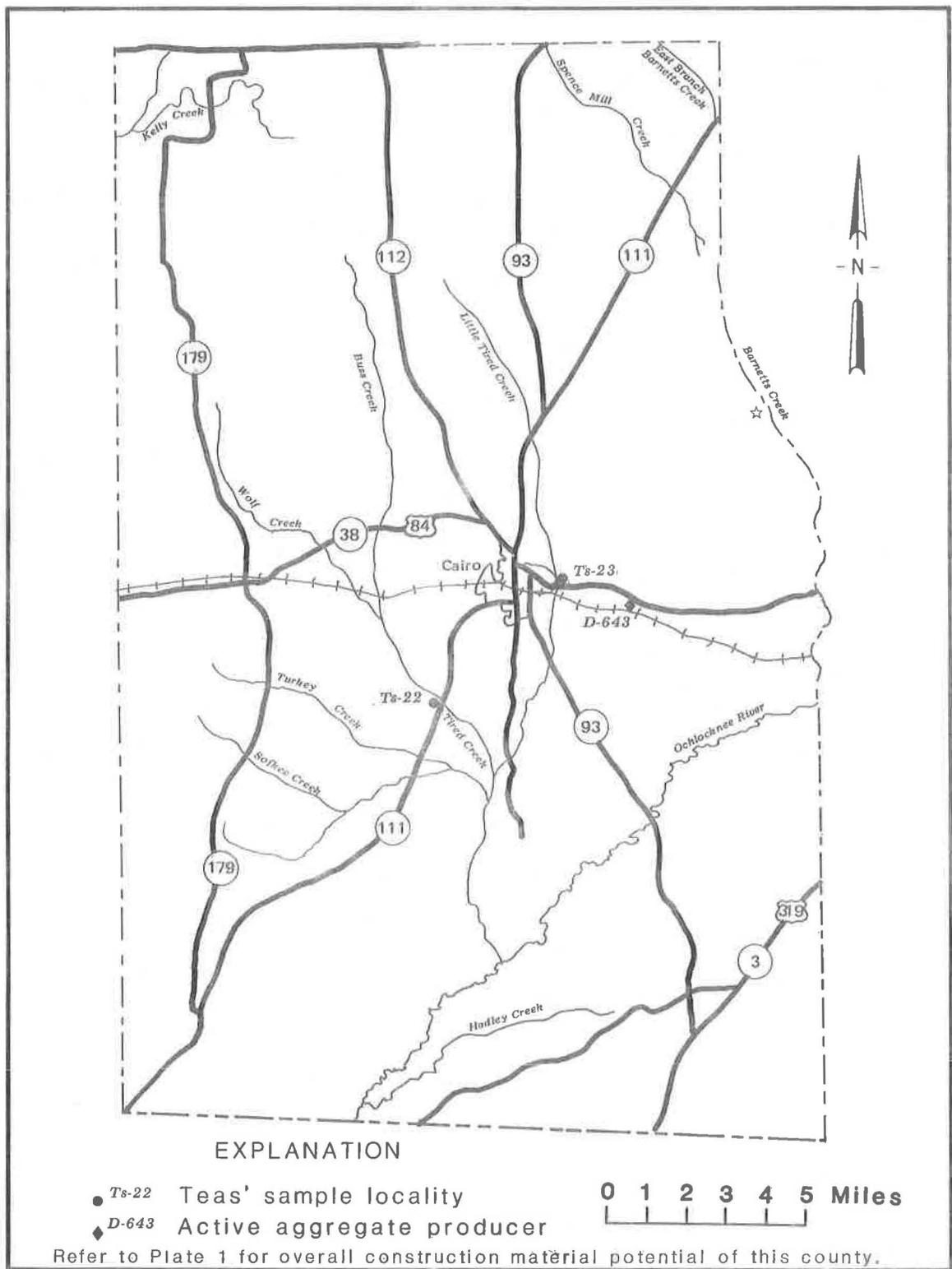


Figure 74. Map of Grady County Showing Teas' Sample Localities, Pits, and Localities Sampled but not Sieved.

Houston County

Geology and Physiography

Portions of two physiographic districts of the Coastal Plain Province are present in Houston County, the Fall Line Hills and the Fort Valley Plateau. Surficial sediments of Houston County are derived from the Cretaceous undifferentiated, Huber Formation, undifferentiated Claiborne Group, Lisbon Formation, the Barnwell Group, Ocala Group, and residuum of Oligocene limestones.

Previous Studies

Teas (1921) did not describe any sand or gravel deposits of any consequence within the study area of Houston County.

Present Study

The soil association used in targeting areas of Houston County was Lakeland, which is present in interfluvial areas and valley slopes of the streams in northwestern Houston County. Three samples from Houston County (fig. 75, PrW-1,2,3) were sieved (figs. 76-78, Table 13). None of the natural materials passed ASTM standard C-33, but one sample (PrW-1) has a grain-size distribution adequate for aggregate production (with processing) (fig. 76).

Evaluation

The sample PrW-1 is from a probable stream channel deposit. Field examination suggests that the deposit is sporadic in distribution and probably not extensive enough to warrant further consideration.

Sample PrW-3 is from a fill material pit. The area represented by this sample is probably at least 5 acres in areal extent but the only probable product from the material of this pit would be mortar sand. Mortar sand by itself would not warrant commercial development.

Mining activity

There are no commercial aggregate operations within the study area of Houston County.

Summary evaluation

Based on the samples analyzed and field observations, Houston County is considered to have low potential for either fine or coarse aggregate production with the possible exception of mortar sand.

Table 13. Houston County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
PrW-1	6 feet	trench	6 feet	1	no ⁴	2
PrW-2	2 feet	trench	2 feet	1	no	0
PrW-3	10 feet	trench	10 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

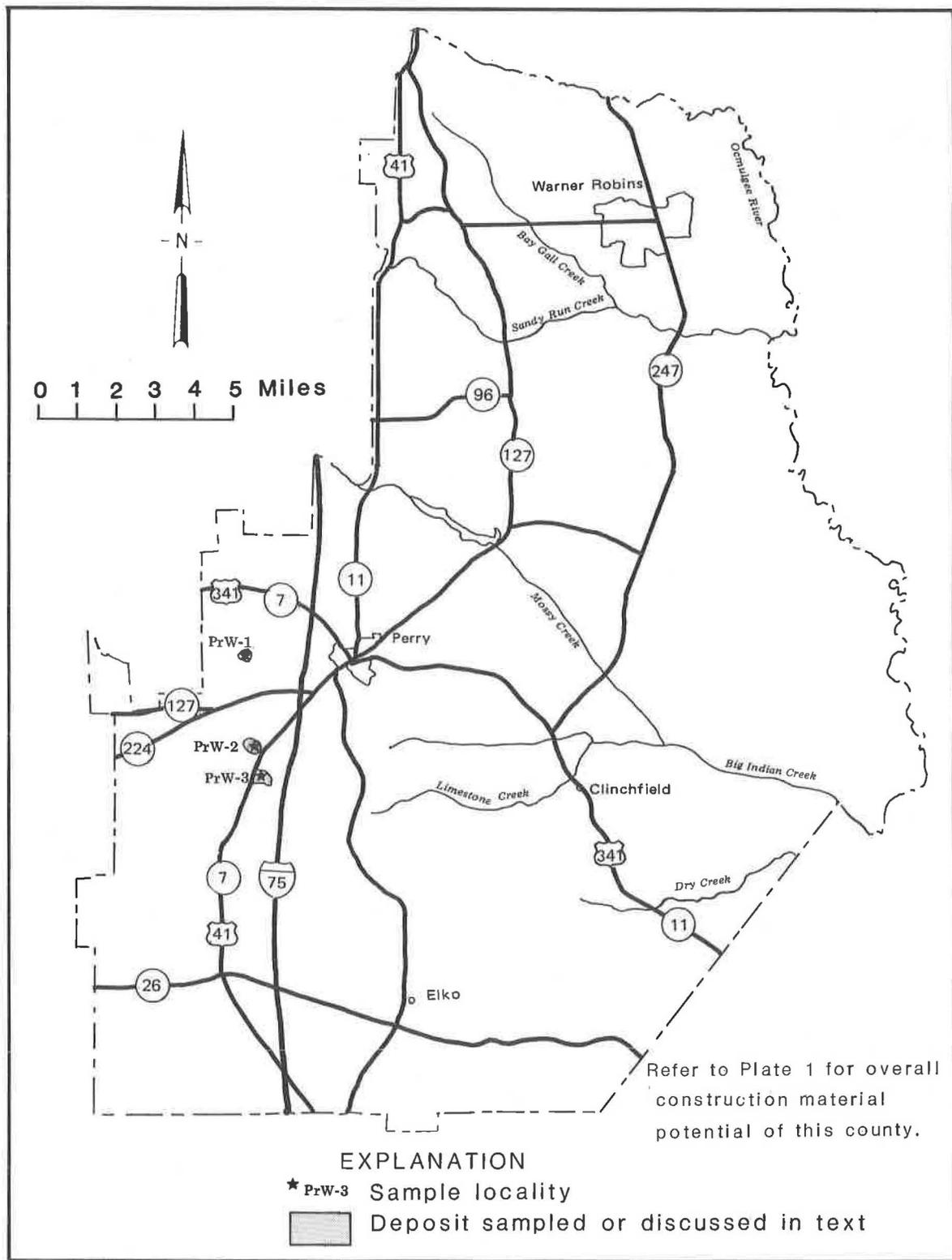
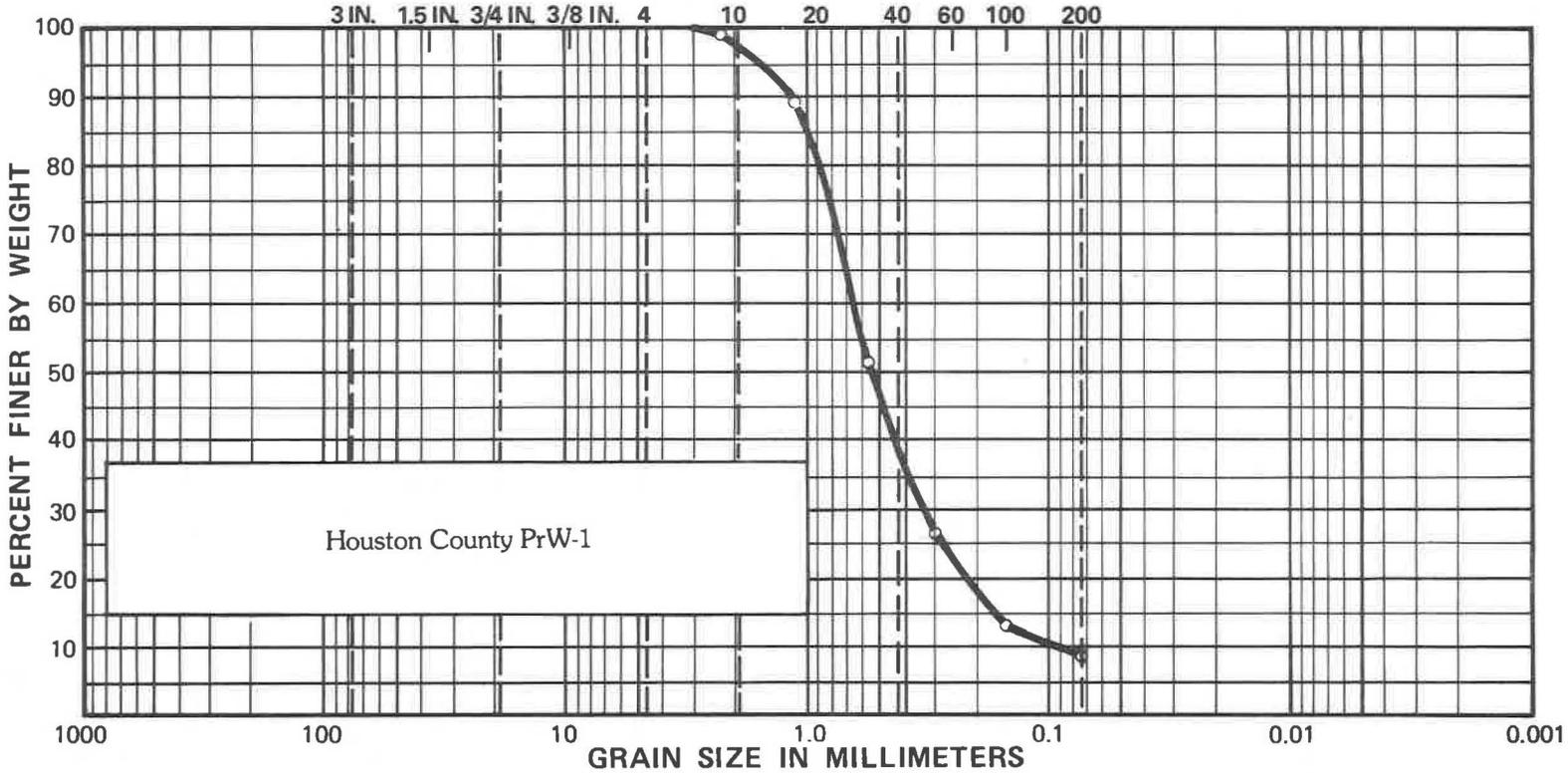


Figure 75. Map of Houston County Showing Sample Localities and Pits.

U.S. STANDARD SIEVE SIZE



COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES large small	very coarse	GRAVEL				very fine	very coarse	very coarse	SAND			very fine	SILT			very fine	CLAY		
			coarse	coarse	medium	fine				medium	fine	fine		coarse	medium	fine		coarse	medium	fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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

Lee County

Geology and Physiography

Lee County lies within portions of two physiographic districts of the Coastal Plain Province, the Fall Line Hills and the Dougherty Plain. The surficial sediments of Lee County are derived from the undifferentiated Claiborne Group and the residuum of the Ocala and Oligocene limestones.

Previous Work

Teas (1921, p. 213-214) noted that no sand of commercial value was found in Lee County, although he described four deposits of sandy material: (1) A small deposit of medium-grained sand along Muckalee Creek (fig. 79, Ts-24) (2) small point bars along Kinchafoonee Creek containing sand of poor quality (fig. 79, Ts-25) (3) a loamy medium- to coarse-grained sand exposed in a road cut (fig. 79, Ts-26) and (4) a gravelly (limonite) clayey sand (fig. 79, Ts-27).

Present Study

The soil association used in targeting areas of Lee County was Americus, which is present in interfluvial areas and areas adjacent to stream valleys in central Lee County. Geomorphic features targeted are point bars and terrace surfaces along the Flint River and Chokey Creek in central Lee County. One sample, Lee-1 (fig. 80, Table 14), from Lee County was sieved.

Evaluation

The sample (Lee-1) does not meet ASTM standard C-33; it does, however, contain some coarse material, and may be suitable for mortar sand.

Mining activity

There is one active and one recently inactive aggregate operation in Lee County (fig. 76, D-235, D-668-F).

The Leesburg Sand Company of Leesburg (D-235) produces concrete and mortar sand from a pit located on the west bank of Kinchafoonee Creek. The sand is shipped by truck within a 50 mile radius. The major market for the sand is the Albany area. The sand is mined using a dredge. The sand is washed and size fractionated using classifiers. The Leesburg Sand Company owns 120 acres of which 80 acres remain to be mined. The sand is currently mined to a depth of 40 feet. No production figures are available; however, production capacity is 100 tons per hour.

W.E. Ross and Sons mined 37 acres (D-668-F) of sand for use in their asphalt plant. The sand was loaded into trucks by a front-end loader and transported to the plant. No information on depth of mining, annual production, or processing is available.

Summary evaluation

Based on the sample Lee-1, and current and past mining activity, the deposits adjacent to Kinchafoonee Creek south and west of Leesburg have a relatively high potential for production of fine aggregate. Although not sampled, the stream deposits along Kinchafoonee and Muckalee Creeks within the outcrop area of the Claiborne Group could provide appreciable amounts of mortar and possibly concrete sand. The fine aggregate production potential for Lee County is moderate.

Table 14. Lee County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Lee-1	9 feet	auger	9 feet	2	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

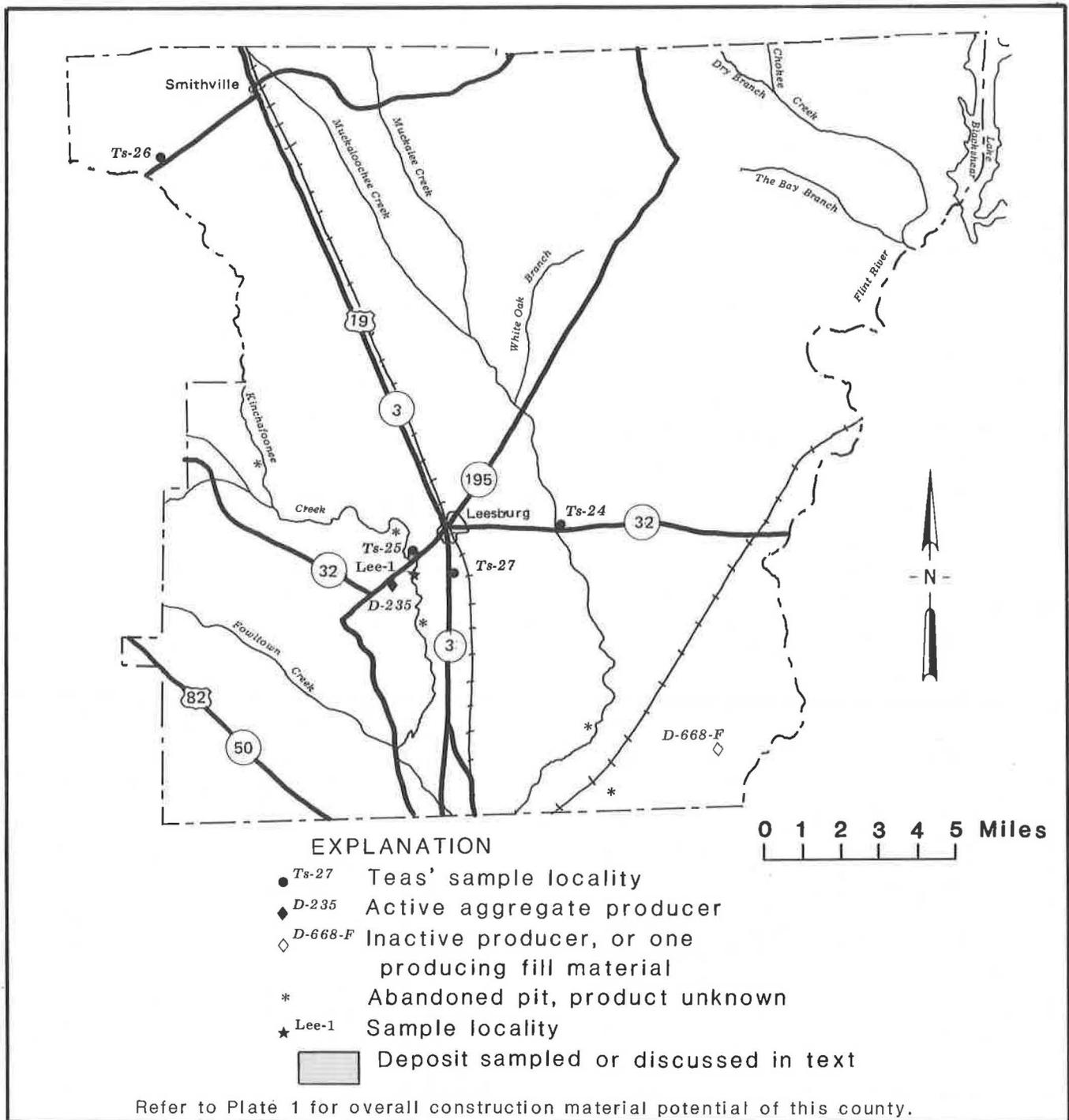
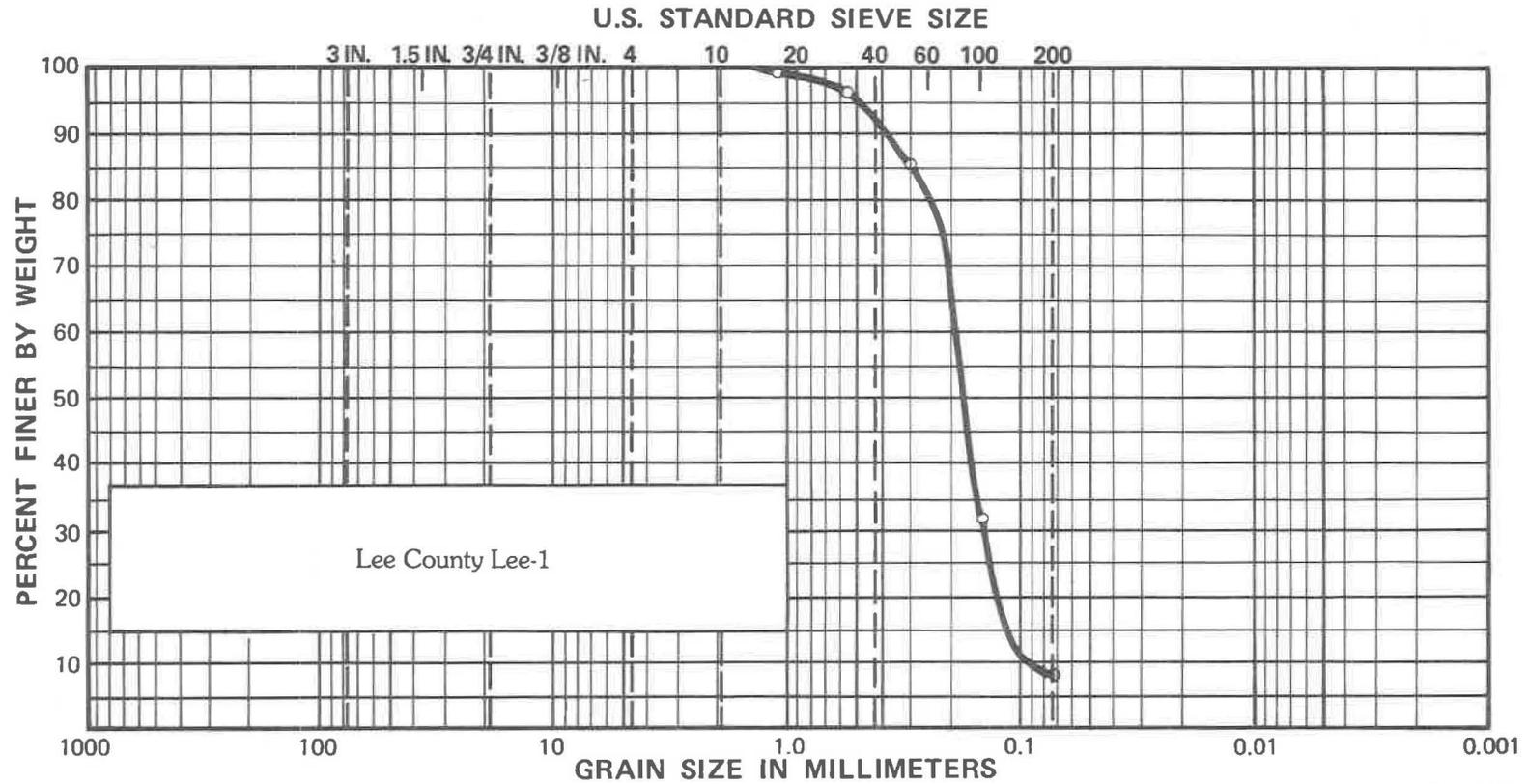


Figure 79. Map of Lee County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposit Sampled.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 80. Size Distribution Curve of Sample Lee-1.

Lowndes County

Geology and Physiography

Lowndes County lies within the Tifton Upland District of the Coastal Plain Province. The surficial sediments of the county are derived from the Hawthorne Group and the Miccosukee Formation.

Previous Study

Teas (1921, p. 216) reported that sand suitable for use in concrete is present in stream deposits of the Withlacoochee River.

Present Study

The soil association used in targeting areas of Lowndes was Lakeland, which is present in interfluvial areas along the Withlacoochee River in western Lowndes County. Geomorphic features targeted are point bars along the Withlacoochee and Little Rivers in western and northwestern Lowndes County. Three sites in Lowndes County were sampled (figs. 81-85, Table 15). The natural material which has the best overall grain-size distribution is Na-1a, which represents the upper 10 feet of sediment from an auger hole located approximately half a mile east of the Withlacoochee River.

Evaluation

The sample Na-1a has little potential for concrete aggregate but may be suitable for mortar sand.

Mining activity

There are no commercial aggregate operations in Lowndes County; however, there has been activity in the recent past.

The Little River Sand Company of Valdosta (fig. 81, D-127-F) produced concrete and mortar sand from a 20 acre pit. No information is available as to annual production or market areas.

The Scruggs Company of Valdosta has mined 4 areas within the county (fig. 81, D-272-F, D-564-F, D-620-F, D-696-F). Two of these pits (D-564-F, D-620-F) are inactive and have been reclaimed. The major product of these two pits was fill material. The pits D-564-F and D-620-F were 6 and 18 acres in extent, respectively. No depth of mining or annual production figures are available. The remaining two pits, D-272-F and D-696-F, are currently mined primarily for fill material. The permitted acreages of these pits are 121 and 14 acres respectively. No information on depth of current mining or annual production is available.

Summary evaluation

Based on auger hole data and field observations, the deposits adjacent to the Withlacoochee and Little Rivers have the highest potential for aggregate production in Lowndes County. The potential for commercial fine aggregate production in Lowndes County is considered to be low to moderate.

Table 15. Lowndes County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Nan-1a	10 feet	auger	10 feet	1	no	2
Nan-1b	4 feet	auger	4 feet	1	no	0
Ous-1	9.0 feet	auger	6.5 feet	1	no	1
HaW-1	8.5 feet	auger	8.5 feet	2	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

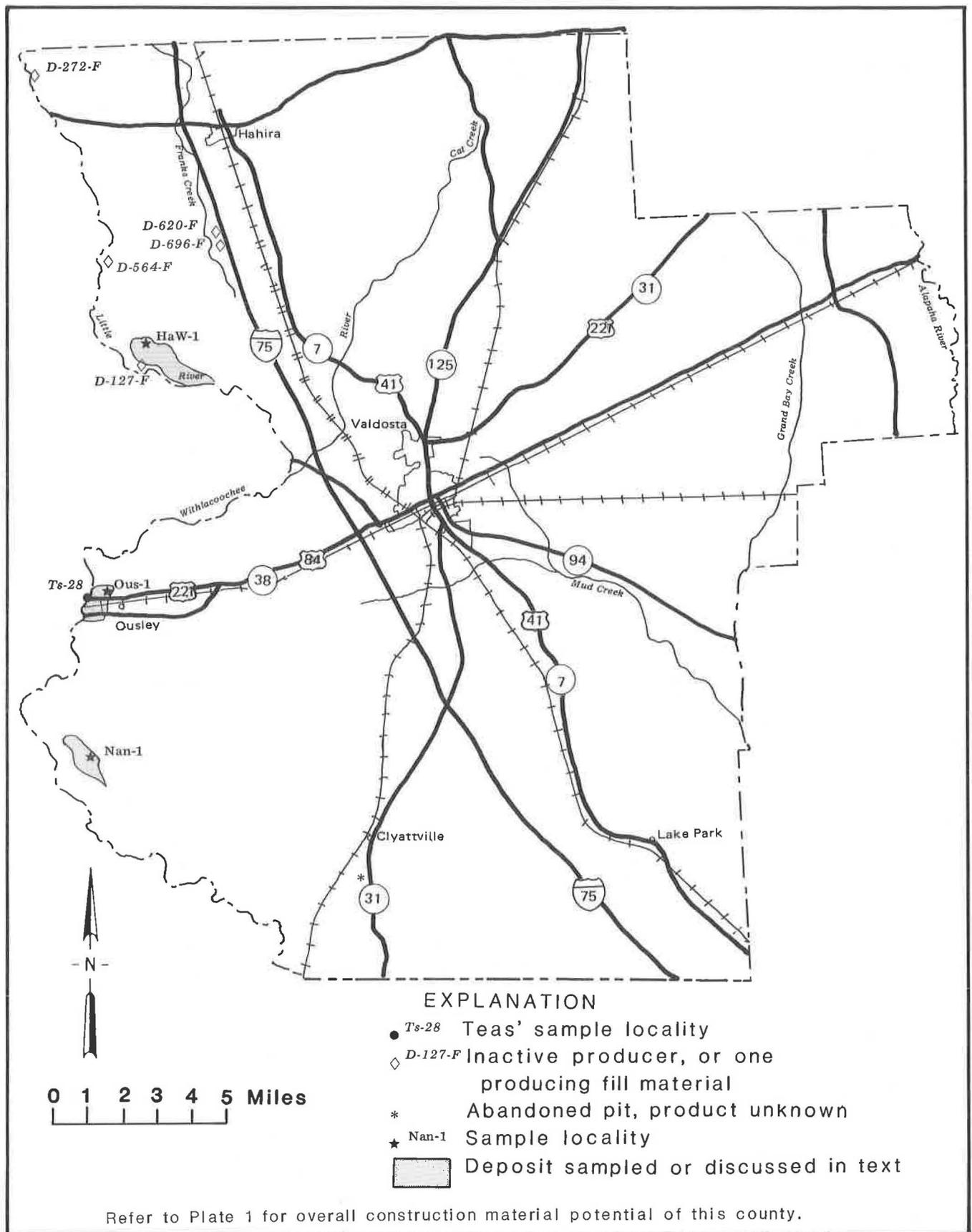
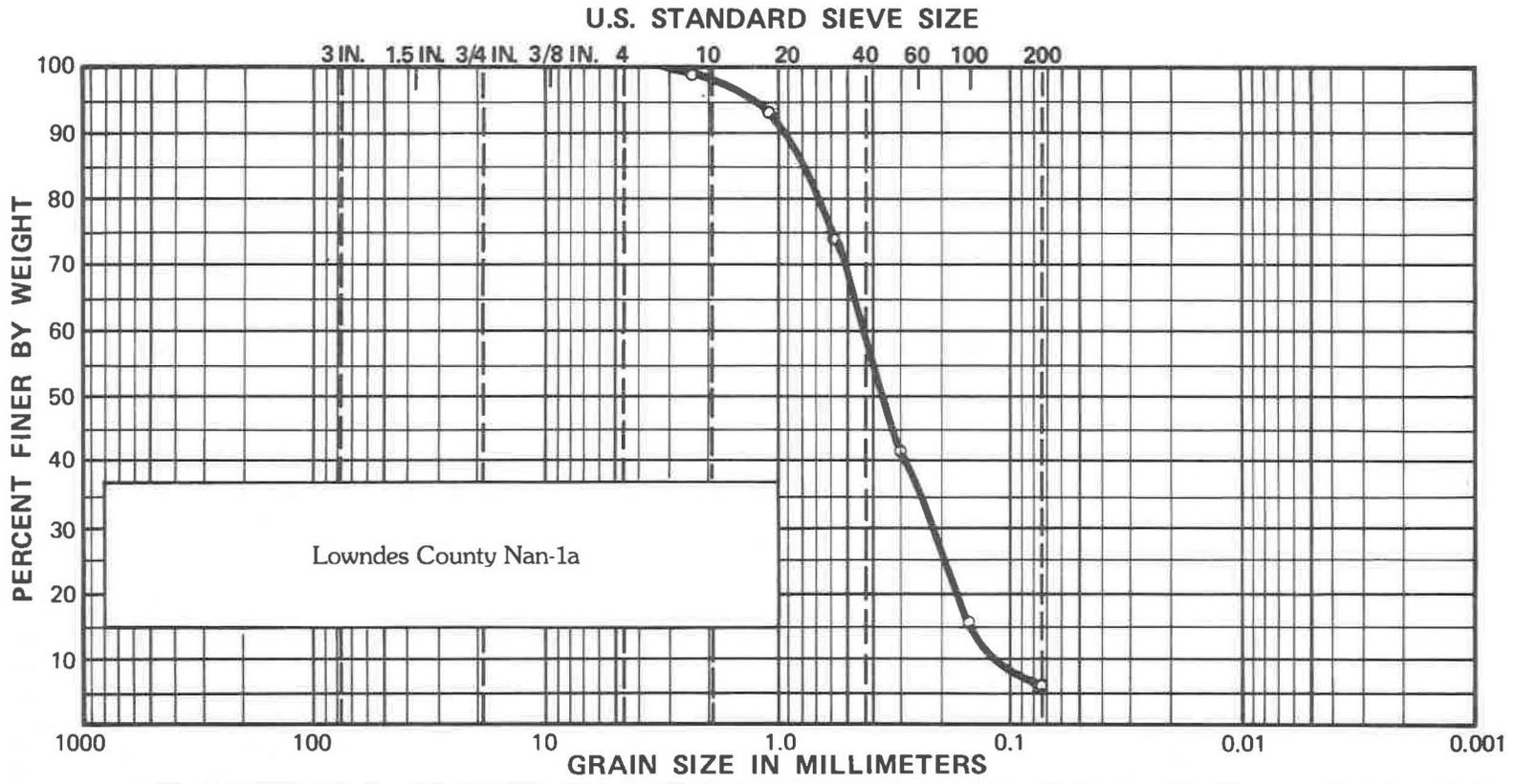


Figure 81. Map of Lowndes County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.

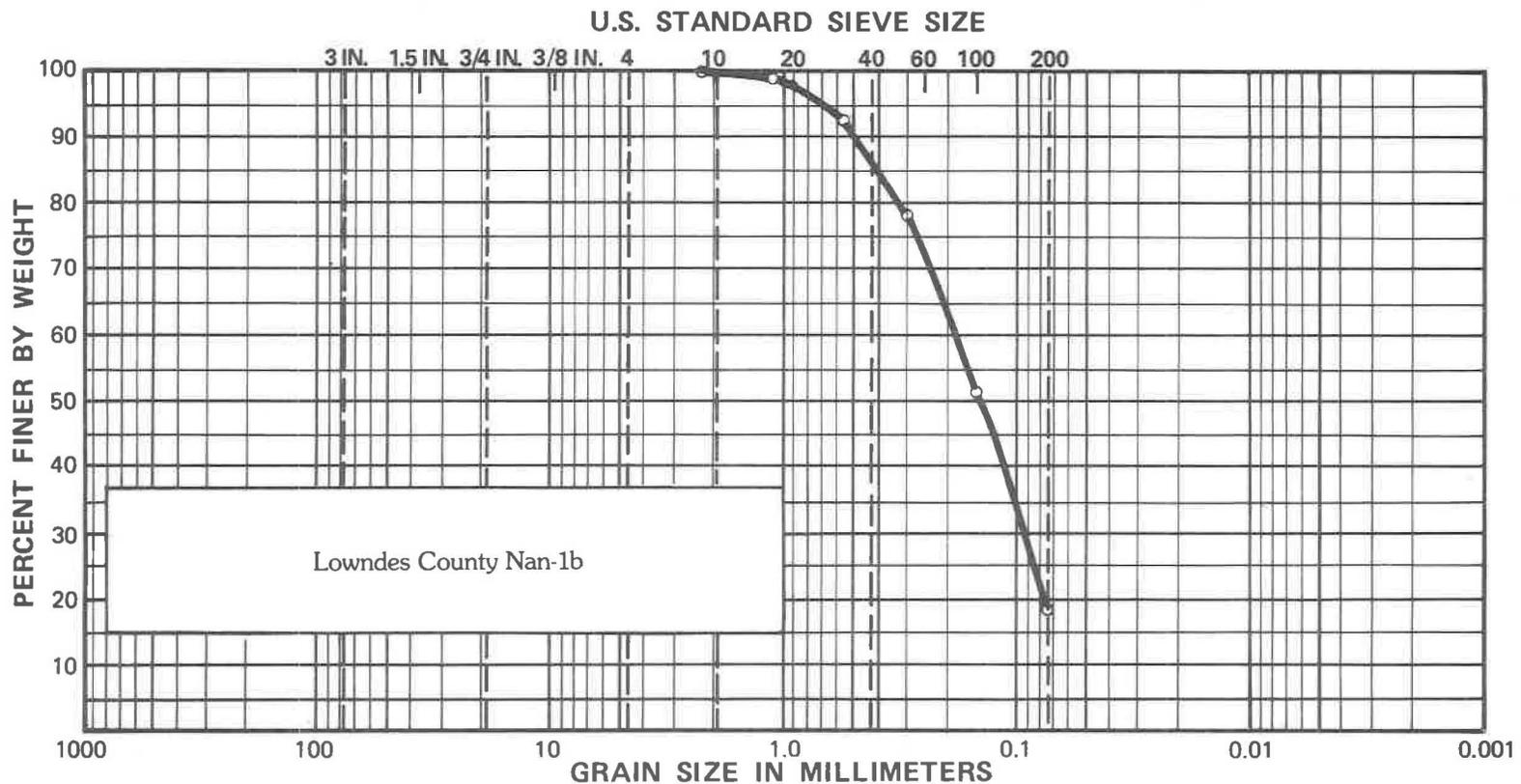


COBBLES	GRAVEL				SAND			SILT OR CLAY *			
	COARSE	FINE		COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 82. Size Distribution Curve of Sample Nan-1a.



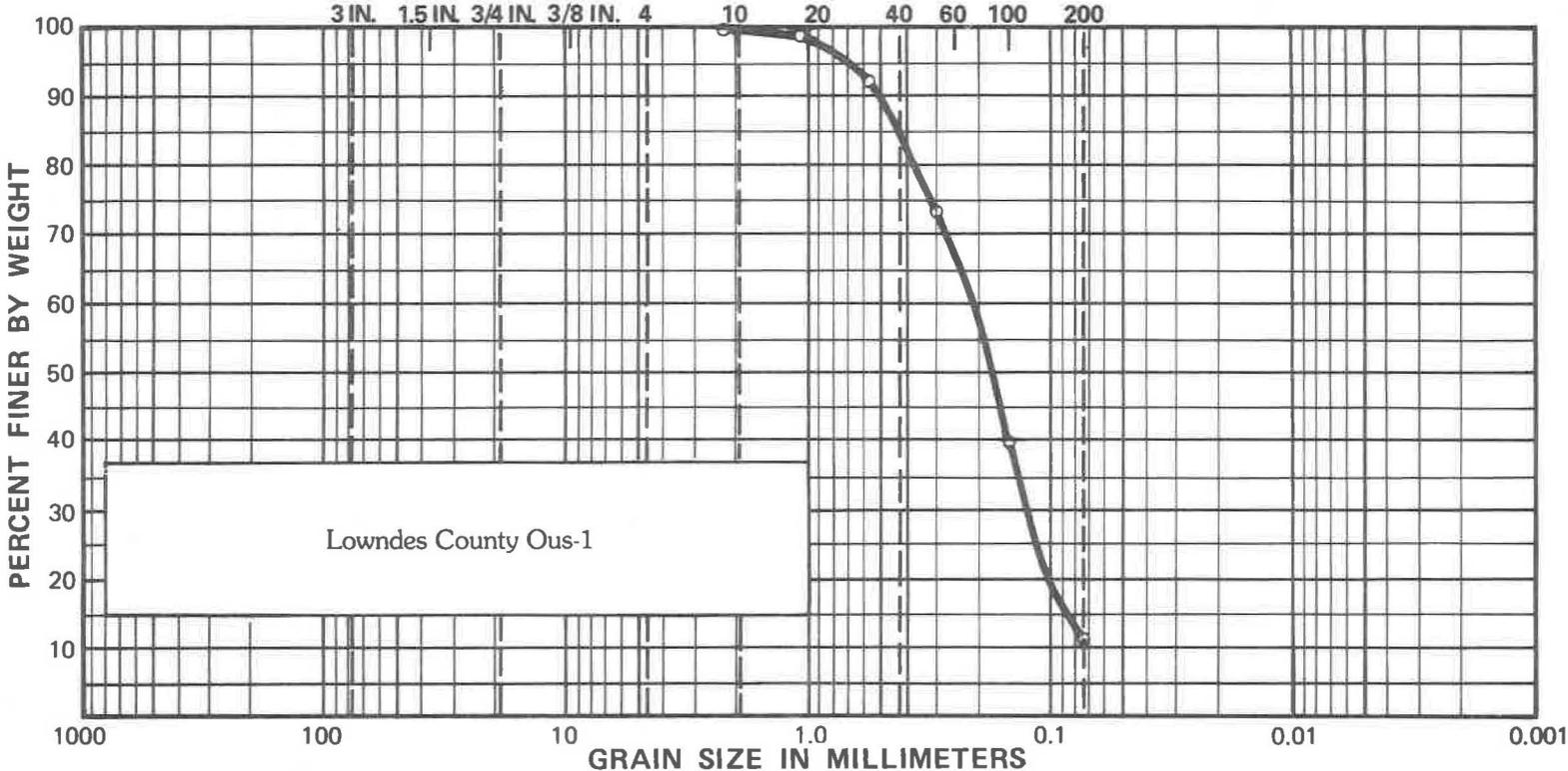
COBBLES	GRAVEL				SAND			SILT OR CLAY *						
	COARSE	FINE		COARSE	MEDIUM	FINE								
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	coarse	CLAY medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 83. Size Distribution Curve of Sample Nan-1b.

U.S. STANDARD SIEVE SIZE



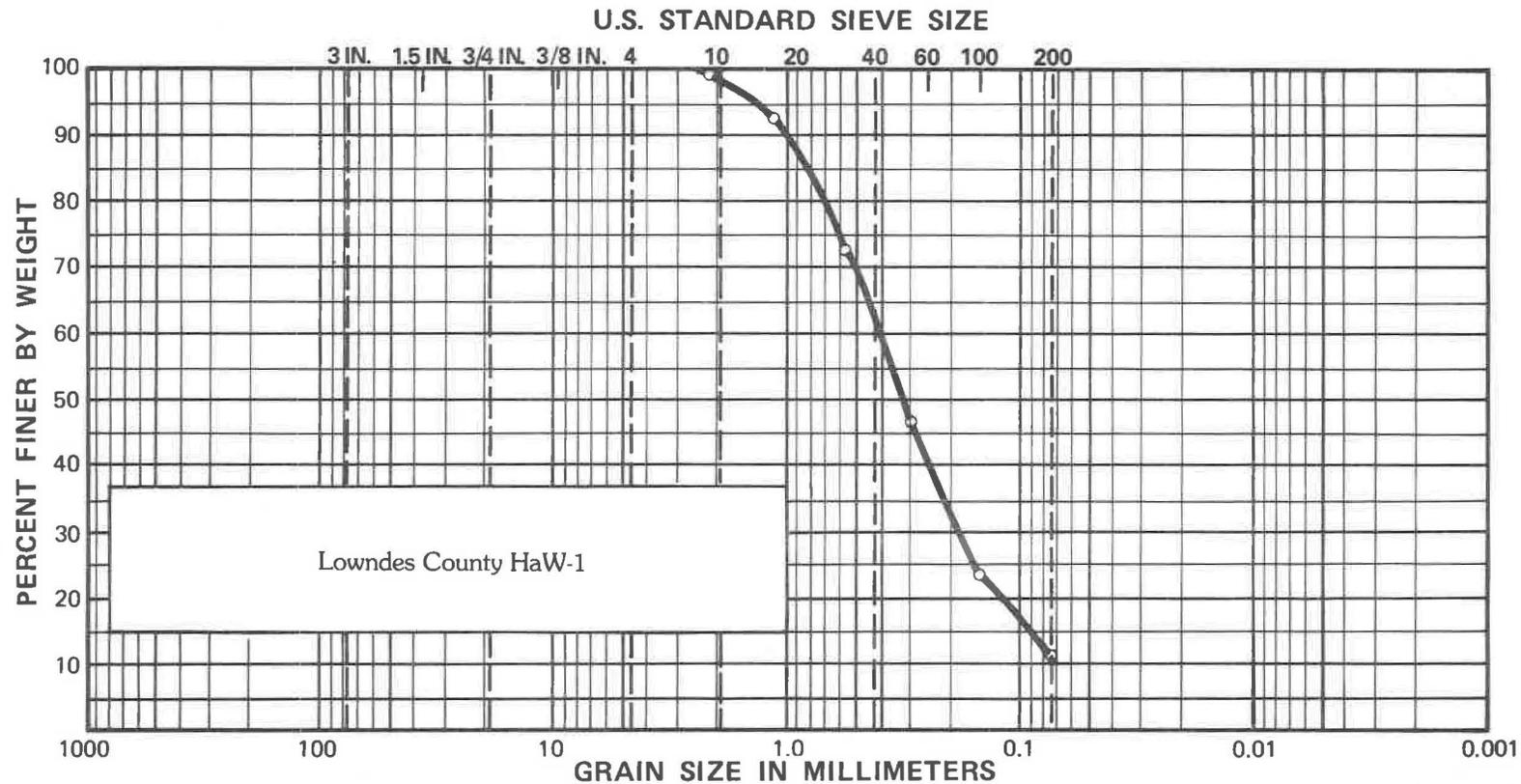
Lowndes County Ous-1

COBBLES	GRAVEL				SAND			SILT OR CLAY *						
	COARSE	FINE			COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
**Wentworth-Lane Class Limits

GRADATION CURVE

Figure 84. Size Distribution Curve of Sample Ous-1.



COBBLES	GRAVEL				SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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

Macon County

Geology and Physiography

Macon County lies within two physiographic districts of the Coastal Plain Province, the Fort Valley Plateau and the Fall Line Hills. Surficial sediments of Macon County are derived from the Ripley, Providence, Clayton, Baker Hill, Tuscaloosa and Huber Formations as well as the undifferentiated Claiborne Group.

Previous Studies

Teas (1921, p. 216-217) noted three areas containing appreciable amounts of sand and/or gravel within Macon County. These areas are: (1) a point bar along the Flint River (fig. 86, Ts-29), (2) medium- to coarse-grained sand on the east side of the Flint River near Montezuma (fig. 86, Ts-30) and (3) a road cut located southeast of Montezuma (Lewis Mill) (fig. 86, Ts-31).

Present Study

The soil associations used in targeting areas of Macon County were #32 and #39, which are present adjacent to streams in the central, southern, and western portions of Macon County. Geomorphic features targeted are point bars and terrace surfaces along the Flint River in central Macon County. Eight samples representing six sites from Macon County (fig. 86, Moz-1a,b,c; Moz-2, IdN-2, IdS-1, Mar-1, Mar-2) were sieved (figs. 87-94, Table 16). Although none of the natural materials meet ASTM standard C-33 requirements, two samples (Moz-1a,1b) (figs. 87,88) could be upgraded to meet those standards.

Evaluation

The deposit represented by Mar-1 is 15 feet thick and probably has an areal extent of as much as 15 acres. A clayey fine-grained over-burden overlies much of this area and probably limits the feasibility of developing this deposit.

The deposit represented by samples Moz-1a,1b,1c is within an older flood plain of the Flint River. The upper 7 feet of this deposit is a very clayey fine- to medium-grained sand and thus was not sampled. This deposit has the highest potential for aggregate production in Macon County. The samples (Moz-1a,1b,1c) represent the lower 6 feet of a 13 foot hole. Assuming a tabular body six feet thick and an areal extent of 120 acres, the reserves are 1.2 million cubic yards. Assuming that the upper 7 feet has some potential use, such as mortar sand, this deposit (represented by samples Moz-1a,1b,1c) could be of economic value.

The deposit (represented by samples Moz-1a,1b,1c) is within 0.3 mile of a rail line and is within 0.5 mile of a primary highway. The water table in the area of the deposit is fairly high (within 10 feet of the ground surface) thus water for processing is readily available.

Mining activity

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

Summary evaluation

The potential for fine aggregate production in Macon County is low to moderate. The Huber Formation undifferentiated offers a source for mortar sand within the County, whereas the areas along the Flint River similar to the Moz-1 sample areas have moderate potential for production of concrete sand.

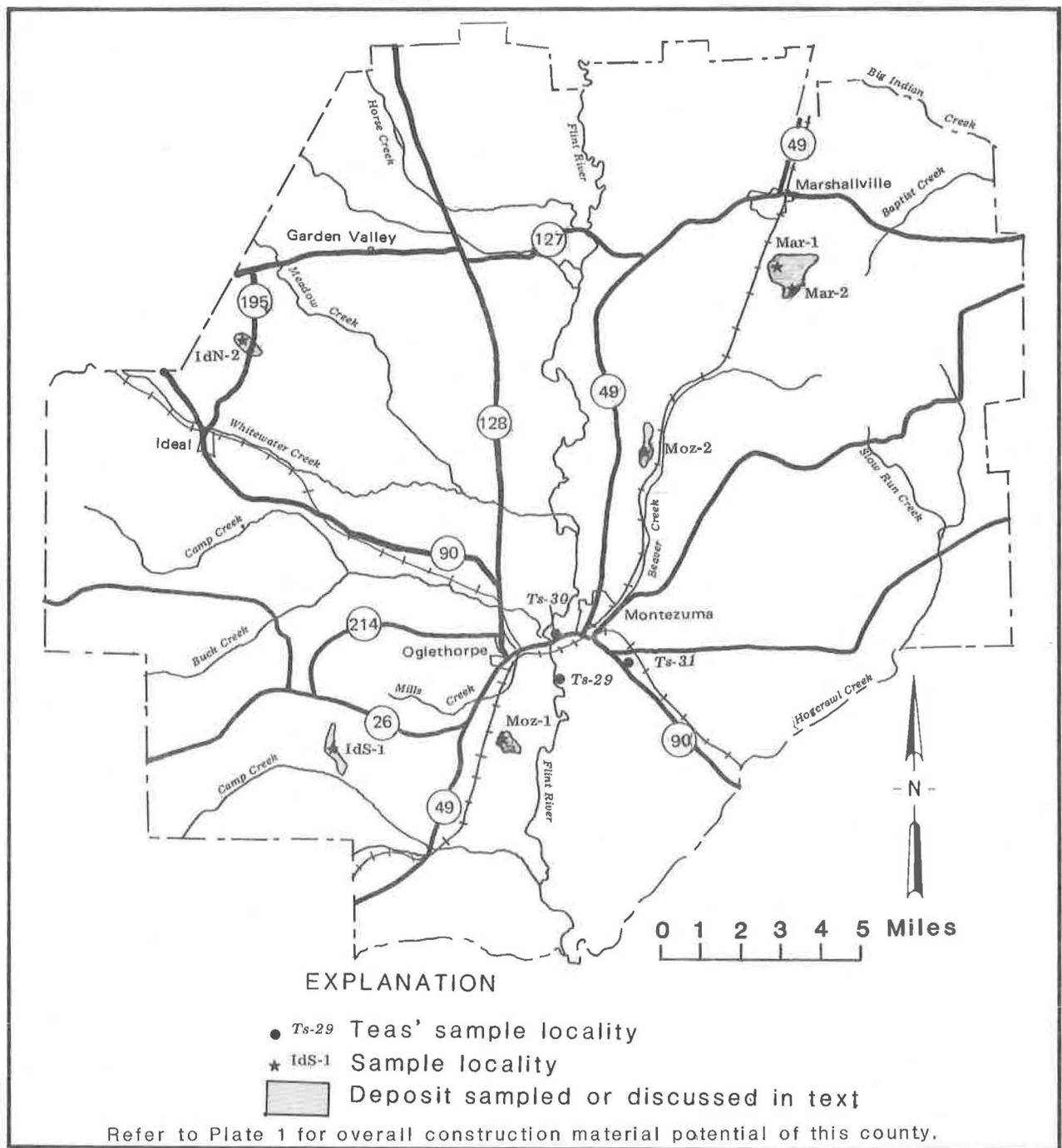
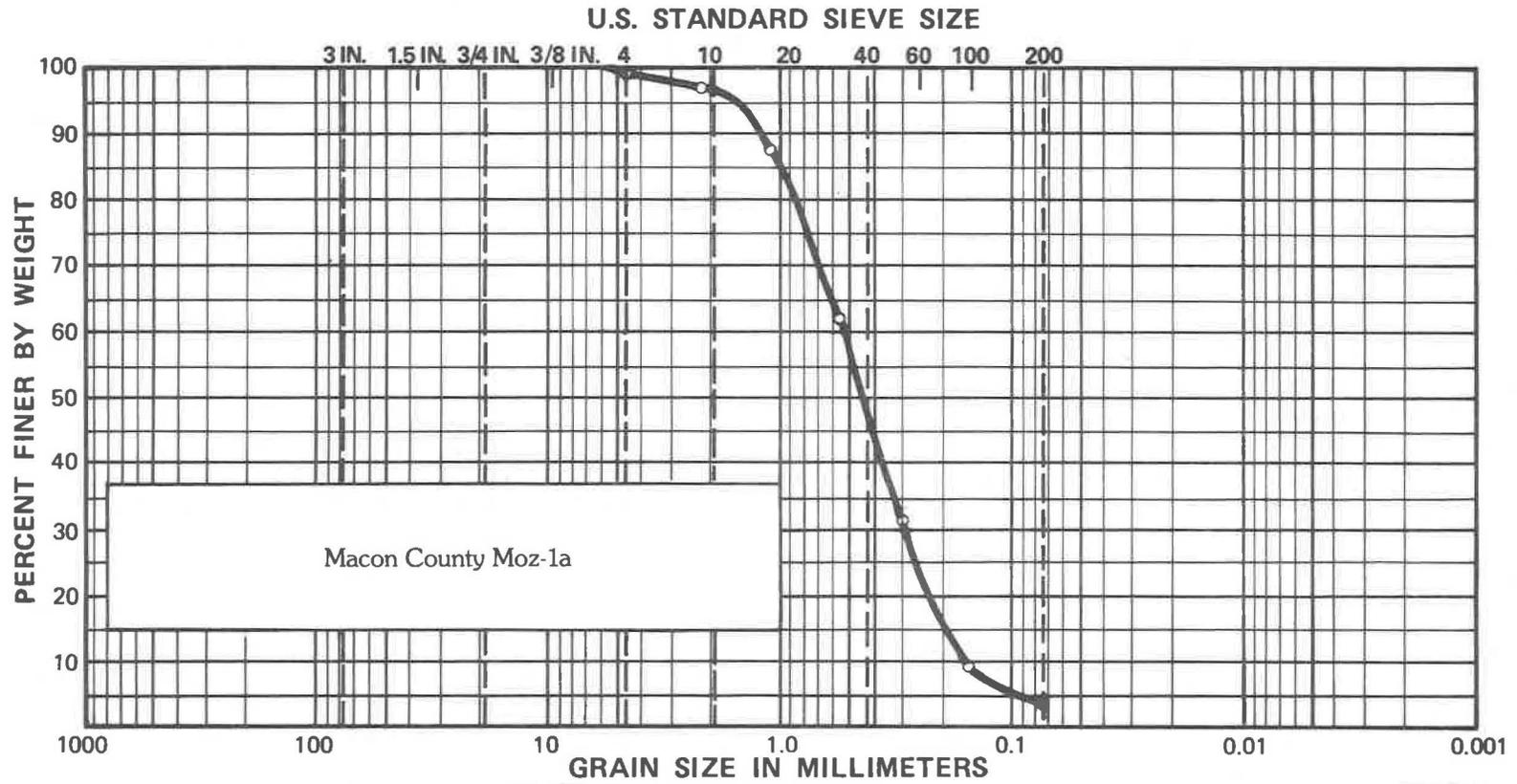


Figure 86. Map of Macon County Showing Sample Localities, Teas' Sample Localities, and Deposits Sampled.



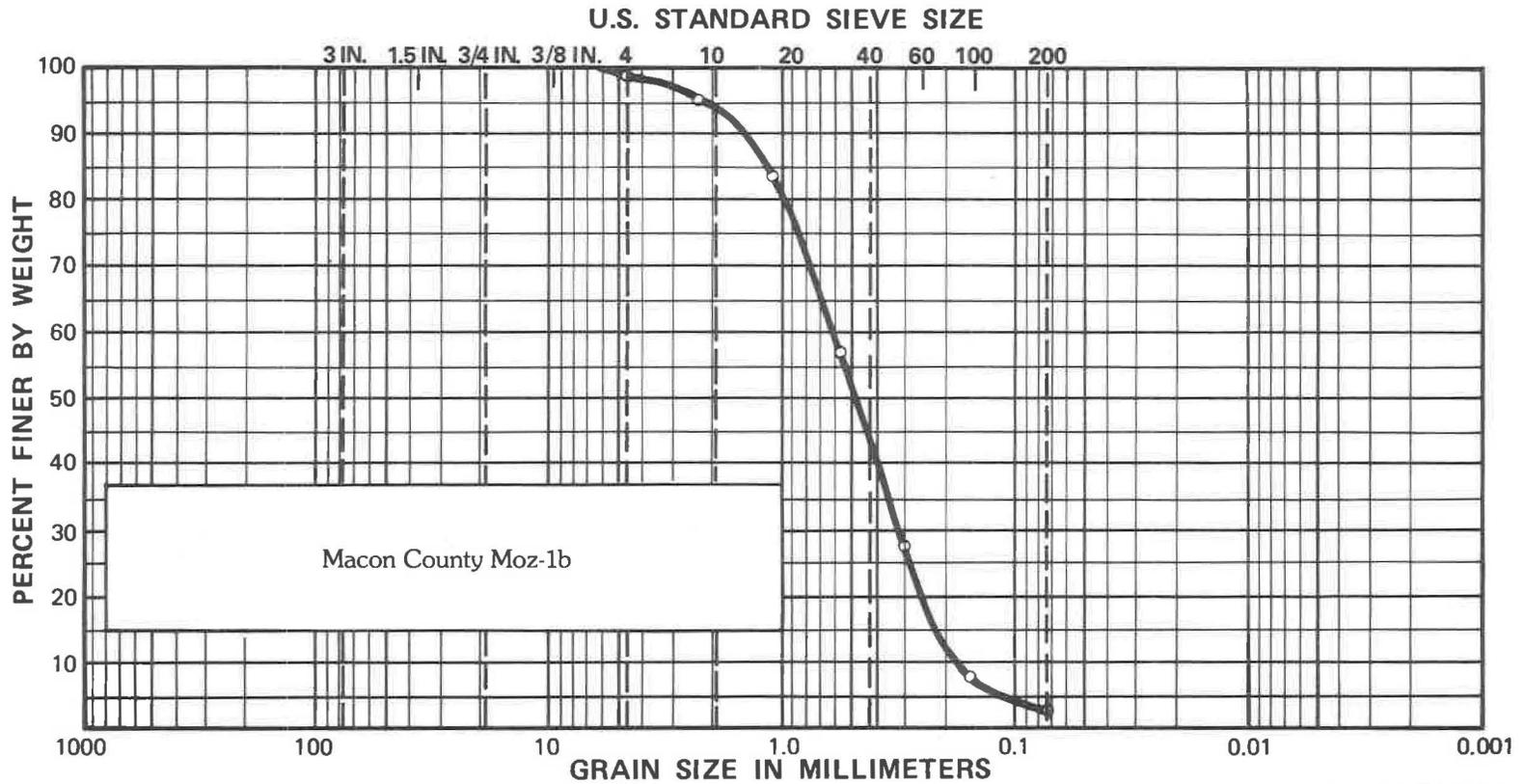
Macon County Moz-1a

COBBLES	GRAVEL				SAND			SILT OR CLAY	*		
	COARSE	FINE	COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	coarse	SAND medium fine very fine	coarse	SILT medium fine very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 87. Size Distribution Curve of Sample Moz-1a.

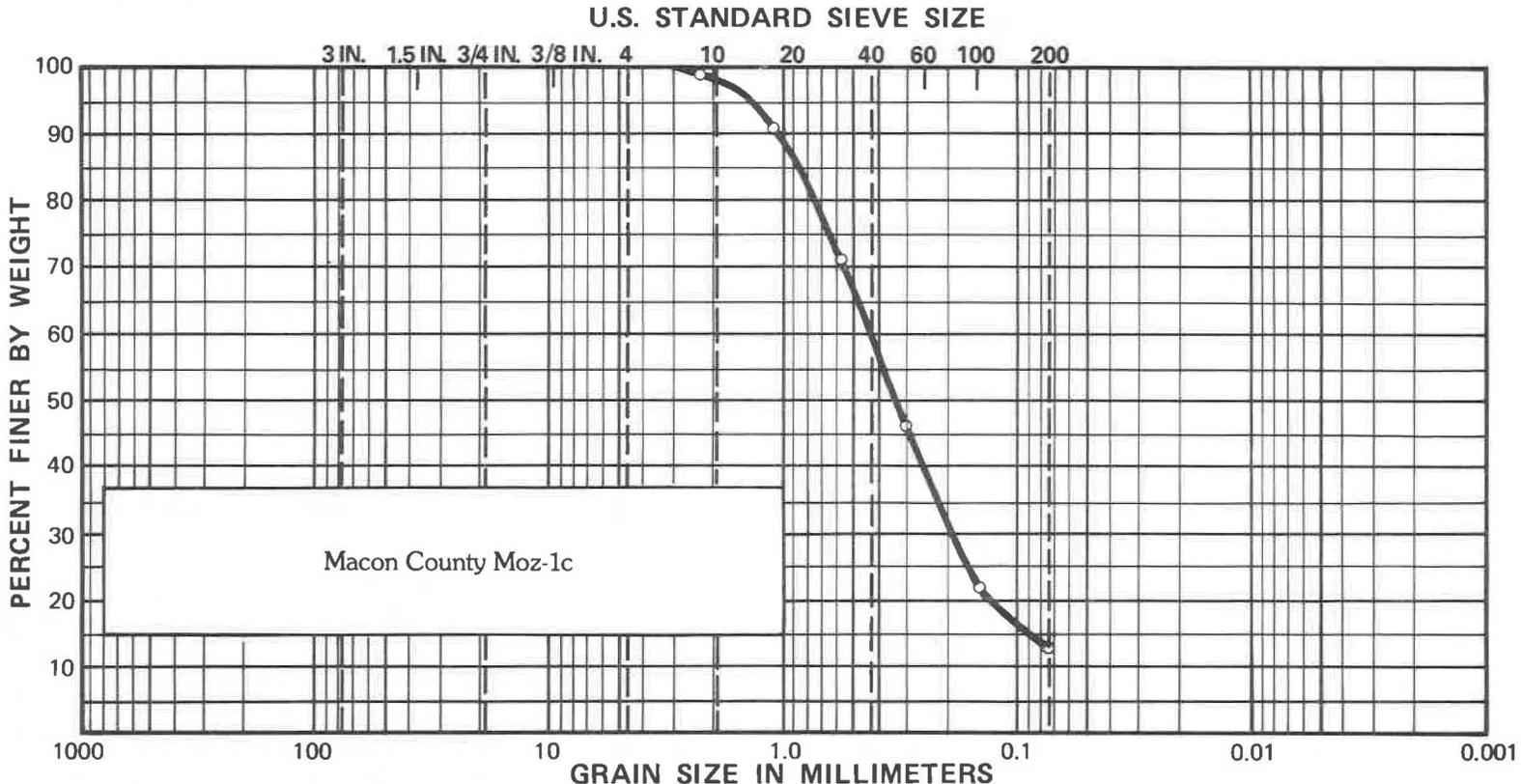


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 88. Size Distribution Curve of Sample Moz-1b.

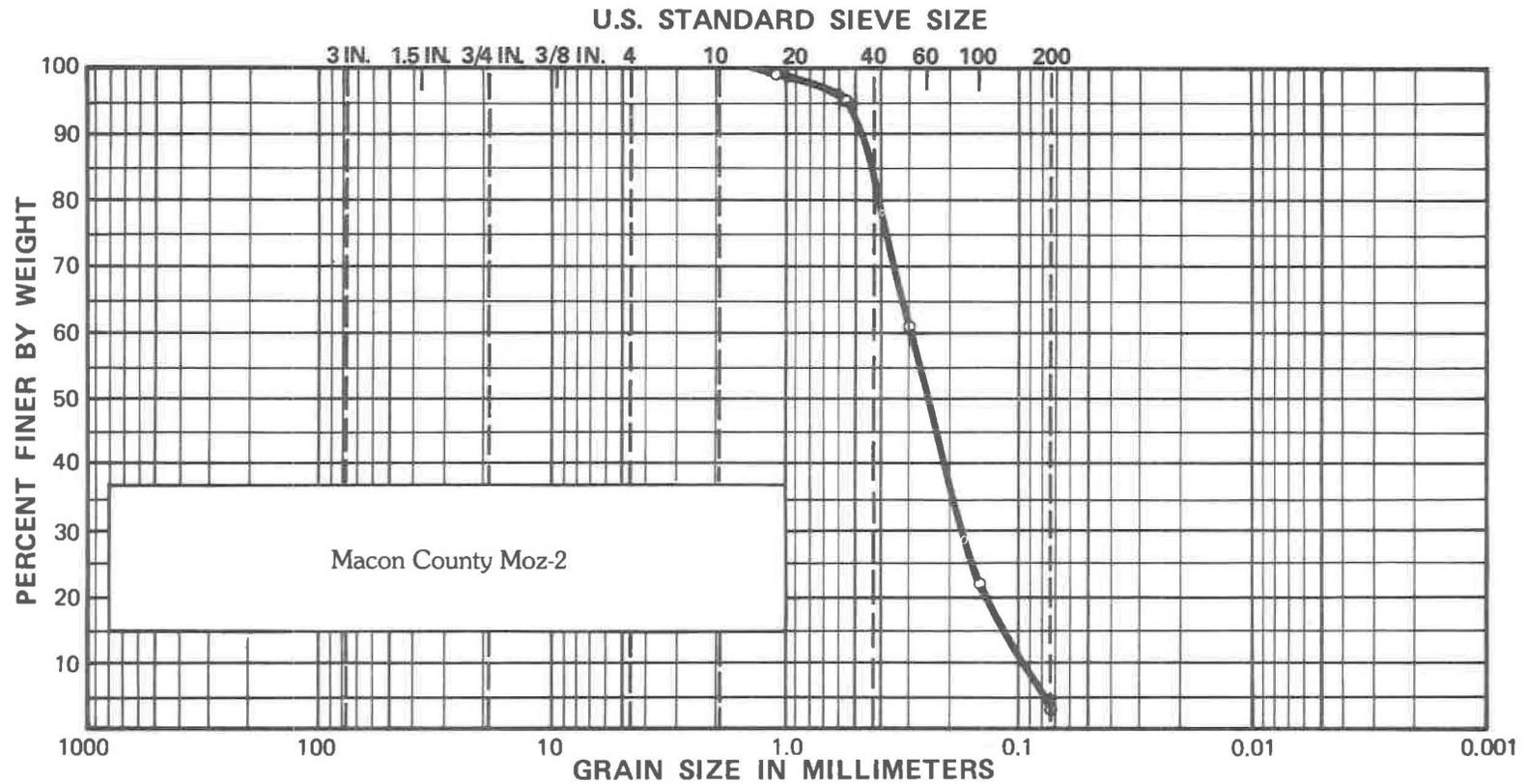


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse coarse medium fine	GRAVEL	very fine	very coarse coarse medium fine	SAND	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 89. Size Distribution Curve of Sample Moz-1c.

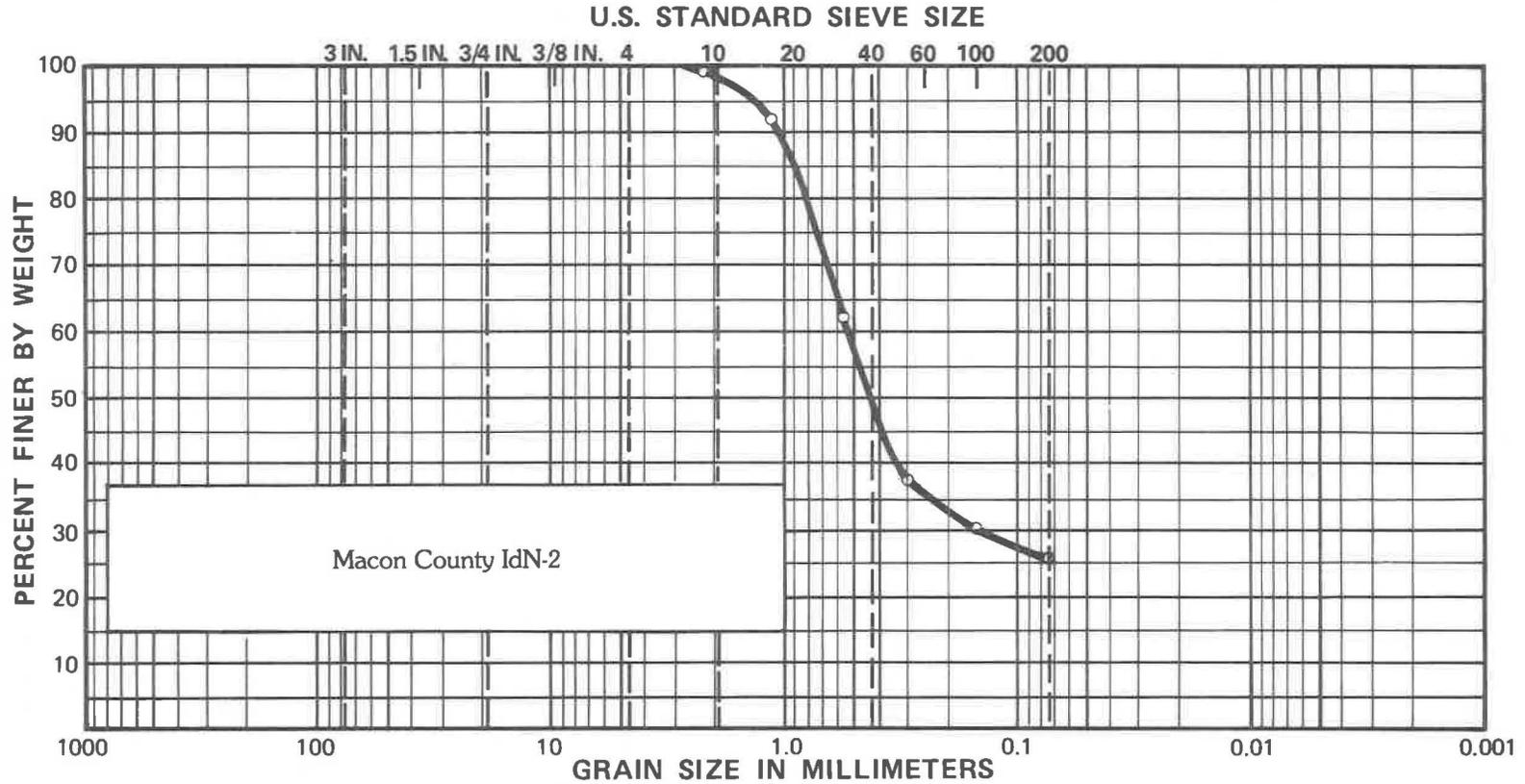


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 90. Size Distribution Curve of Sample Moz-2.



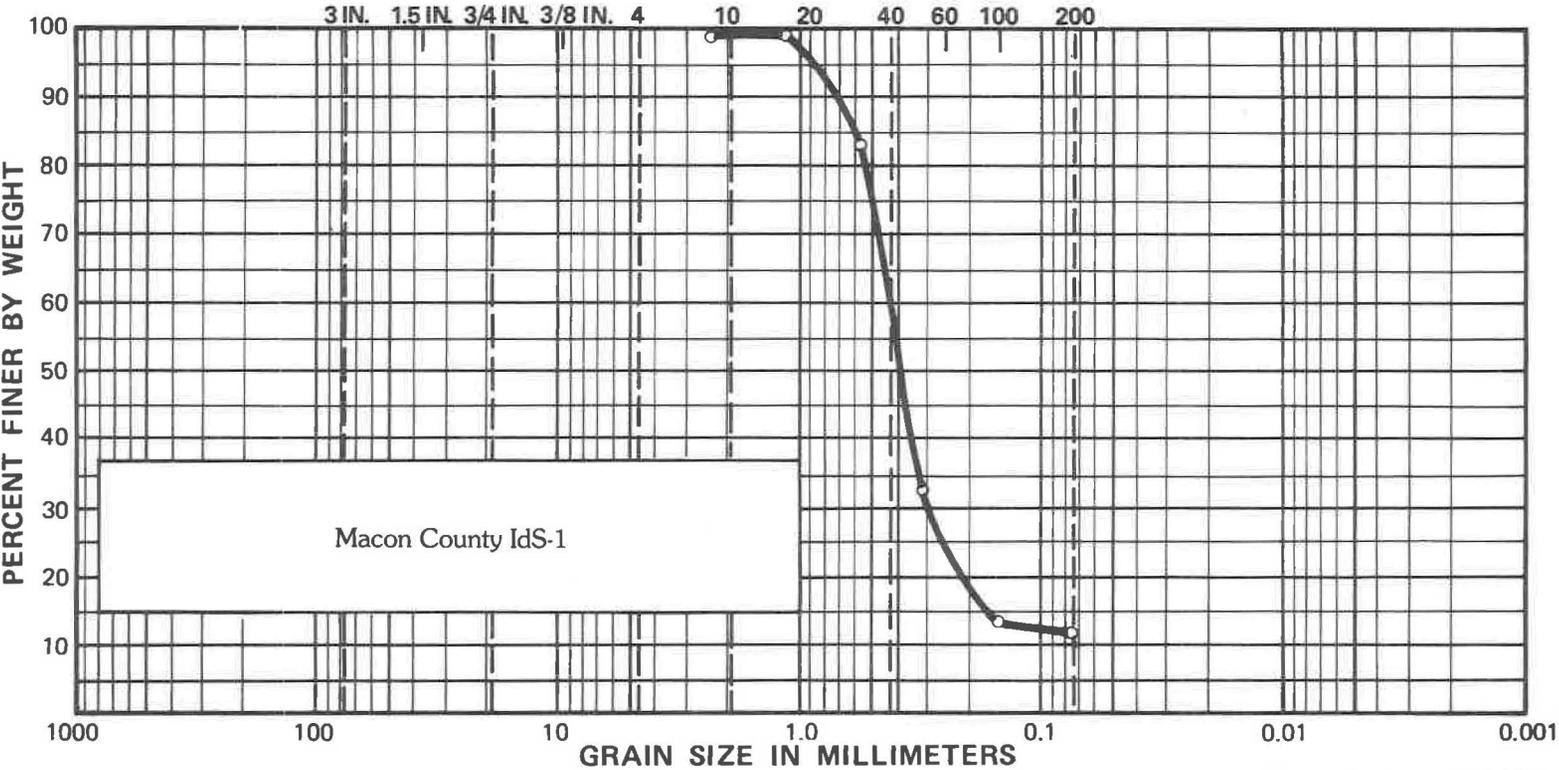
COBBLES	GRAVEL				SAND			SILT OR CLAY *			
	COARSE	FINE		COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 91. Size Distribution Curve of Sample IdN-2.

U.S. STANDARD SIEVE SIZE



Macon County IdS-1

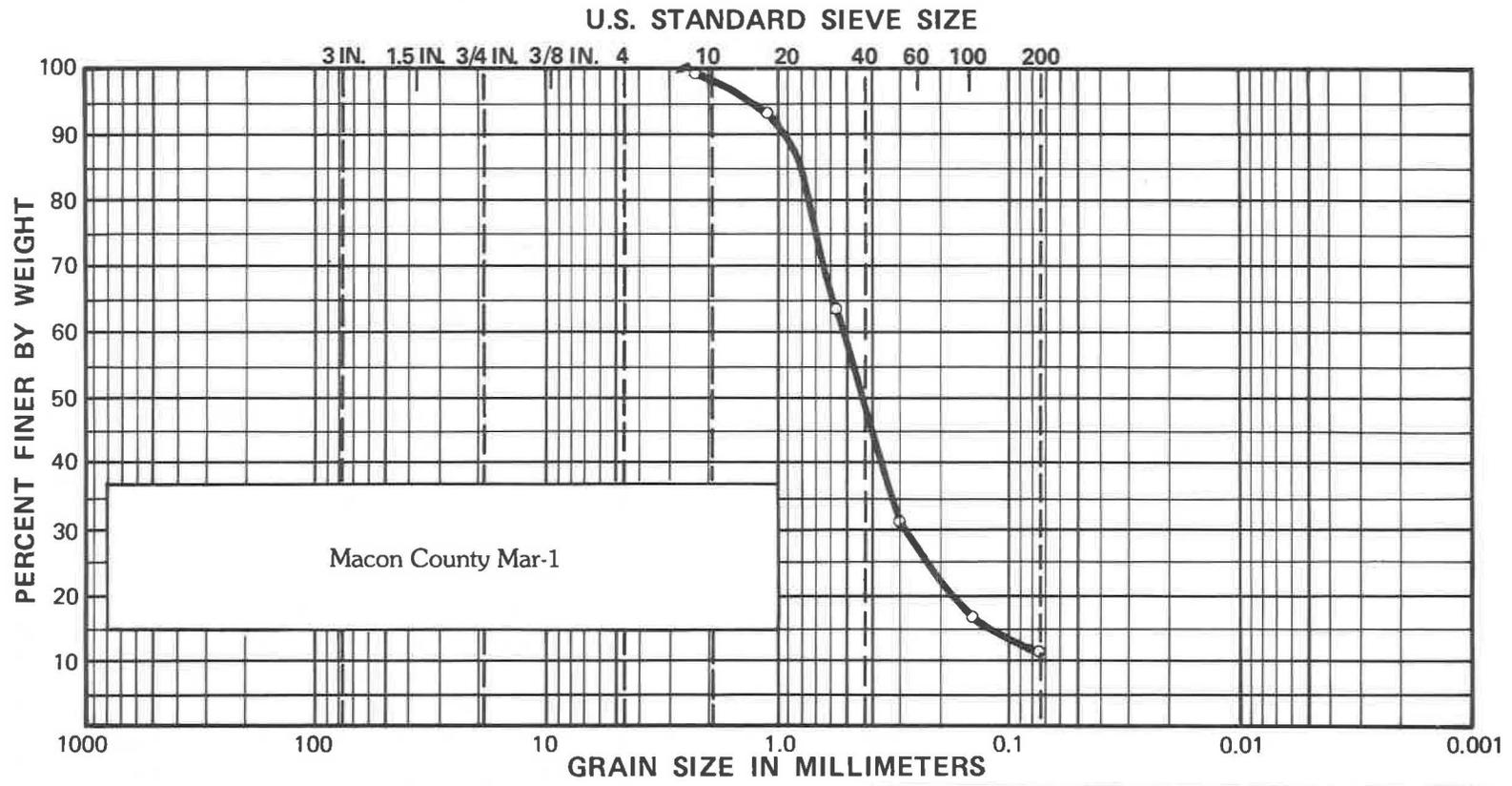
COBBLES	GRAVEL		SAND			SILT OR CLAY *
	COARSE	FINE	COARSE	MEDIUM	FINE	
BOULDERS	COBBLES large small	very coarse coarse GRAVEL medium fine	very fine	very coarse coarse SAND medium fine	very fine	coarse SILT medium fine very fine CLAY coarse medium fine **

*Unified Soil Classification System

**Wentworth-Lane Class Limits

GRADATION CURVE

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

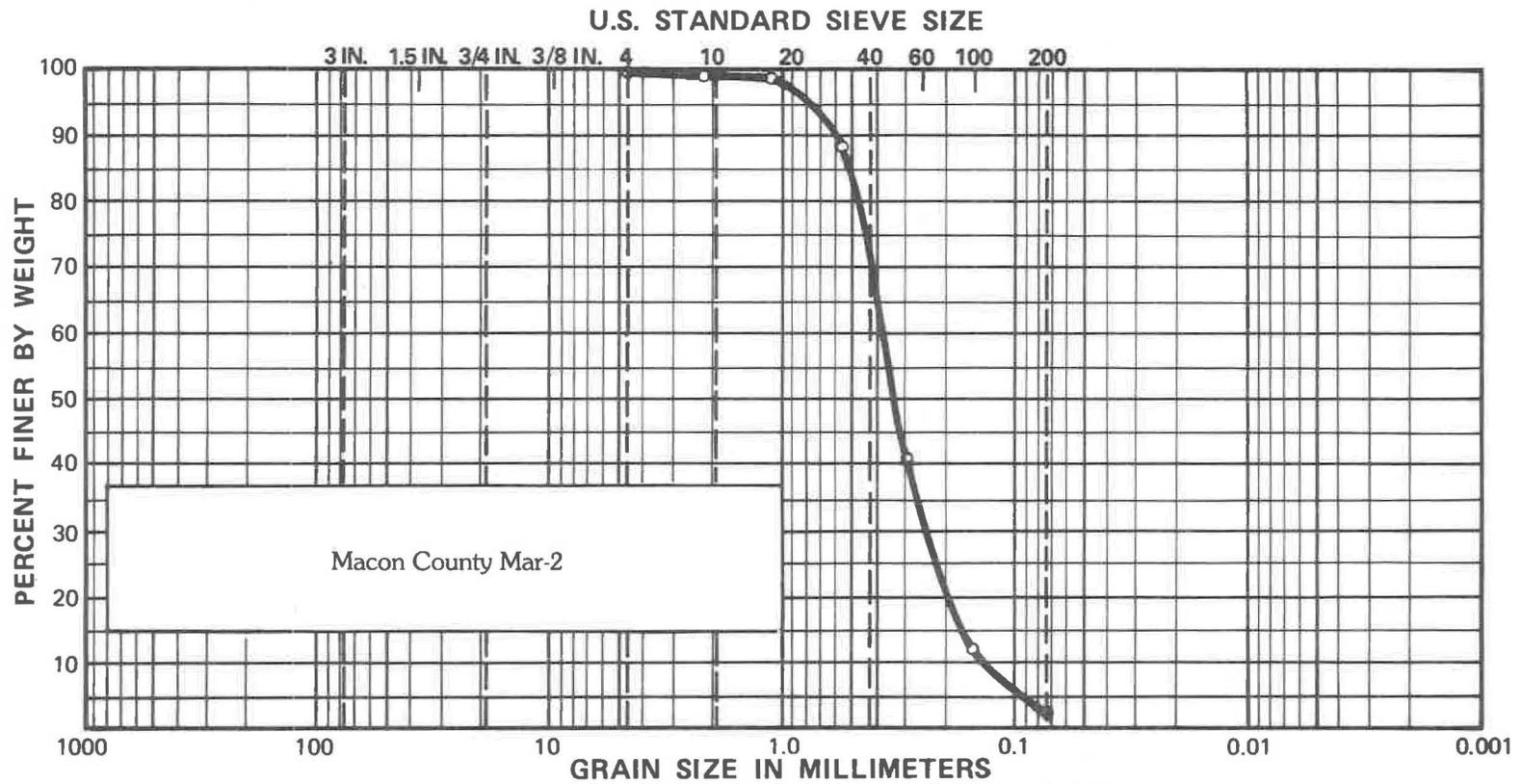


COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE	FINE		COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine			very fine	CLAY ** coarse medium fine	

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

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



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 94. Size Distribution Curve of Sample Mar-2.

Table 16. Macon County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
Moz-1a	7-9 feet	auger	2 feet	2	no ⁴	2
Moz-1b	9-11 feet	auger	2 feet	2	no ⁴	2
Moz-1c	11-13 feet	auger	2 feet	2	yes	2
Moz-2	10 feet	trench	25 feet	1	no	1
IdN-2	9 feet	auger	10 feet	1	no	1
IdS-1	4 feet	trench	25 feet	1	no	2
Mar-1	7 feet	trench	15 feet	1	no ⁴	2
Mar-2	8 feet	trench	20 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

Marion County

Geology and Physiography

Marion County lies within the Fall Line Hills District of the Coastal Plain Province. The surficial sediments of the county are derived from the Tuscaloosa, Eutaw, Blufftown, Cusseta, Ripley and Providence Formations as well as the residuum of the Ocala and Oligocene limestones.

Previous Studies

Teas (1926, p. 219) noted that "large quantities of fine-grained sand are found in northern Marion County within a mile or so of the Atlanta, Birmingham and Atlantic Railway," Teas (1921, p. 219) also noted that large thicknesses of fine-grained sand of the Providence and Ripley Formations and coarse-grained sand of the Providence and Ripley Formations and coarse-grained sand of the Cusseta Sand are exposed in the gullies and road cuts in the central portion of Marion County near Buena Vista.

Present Study

The soil association used in targeting areas of Marion County was #39, which is present in the interfluvial areas in northern, eastern, and southern Marion County. Seven samples from five sites within Marion County were sieved (figs. 95-102, Table 17). None of the samples pass ASTM standard C-33 for a fine-grained aggregate; however, four samples (TzN-2b, TzS-2, TzS-3a, TzS-3b) representing three sites marginally failed the C-33 requirements (figs. 98,101,102).

Evaluation

Samples TzN-2a and TzN-2b were sampled from an exposure 20 feet thick in a road cut. Sample TzN-2a represents the upper 8 feet of the outcrop and TzN-2b represents the lower 8 feet. The deposit represented by samples TzN-2a and TzN-2b may be as large as 40 acres; however, this deposit has little potential for aggregate production due to the fact that the upper 8 feet of the deposit fails ASTM standard C-33 and would be considered in part as unusable overburden.

Sample TzS-2, which marginally failed ASTM standard C-33, is from an exposure of sediments ten feet thick; the deposit represented by this sample is possibly as much as 10 acres in extent, thus having unproven reserves in excess of 160,000 cubic yards.

Samples TzS-3a and TzS-3b marginally failed ASTM standard C-33 (figs. 101,102), but this deposit has some potential for aggregate production. These samples are from an exposure of sediments 16 feet thick. The deposit represented by TzS-3a and TzS-3b probably covers 20 acres, yielding an estimated 500,000 cubic yards of sand, based on the assumption of a tabular body 16 feet thick. Muckalee Creek is within 0.2 mile of the deposit and could furnish sufficient amounts of water for processing the sand.

Mining activity

The present mining activity in Marion County is limited to one plant (fig. 95, D-435), Jessie Morrie and Sons of Mauricetown, New Jersey. The products of this plant are glass sand, sand blasting sand, filter sand, trap sand, play-box sand and traction sand. These products are transported by rail throughout the southeast. The major market areas for the glass sand, generally used in the manufacture of bottles, are Birmingham, Alabama and Atlanta. The hydraulic method is used to mine the sand from this pit and classifiers and cyclones are used to size the sand. Sixty-five acres are permitted, and 15 acres are currently being mined to a depth of 100 feet. Annual production for both glass sand and the remainder of the sand products is 100,000 to 500,000 tons.

Summary evaluation

Based on field and laboratory data as well as the mining activity within the county, the potential for fine aggregate production in Marion County is considered to be moderate to high, particularly in the northern portion of the county.

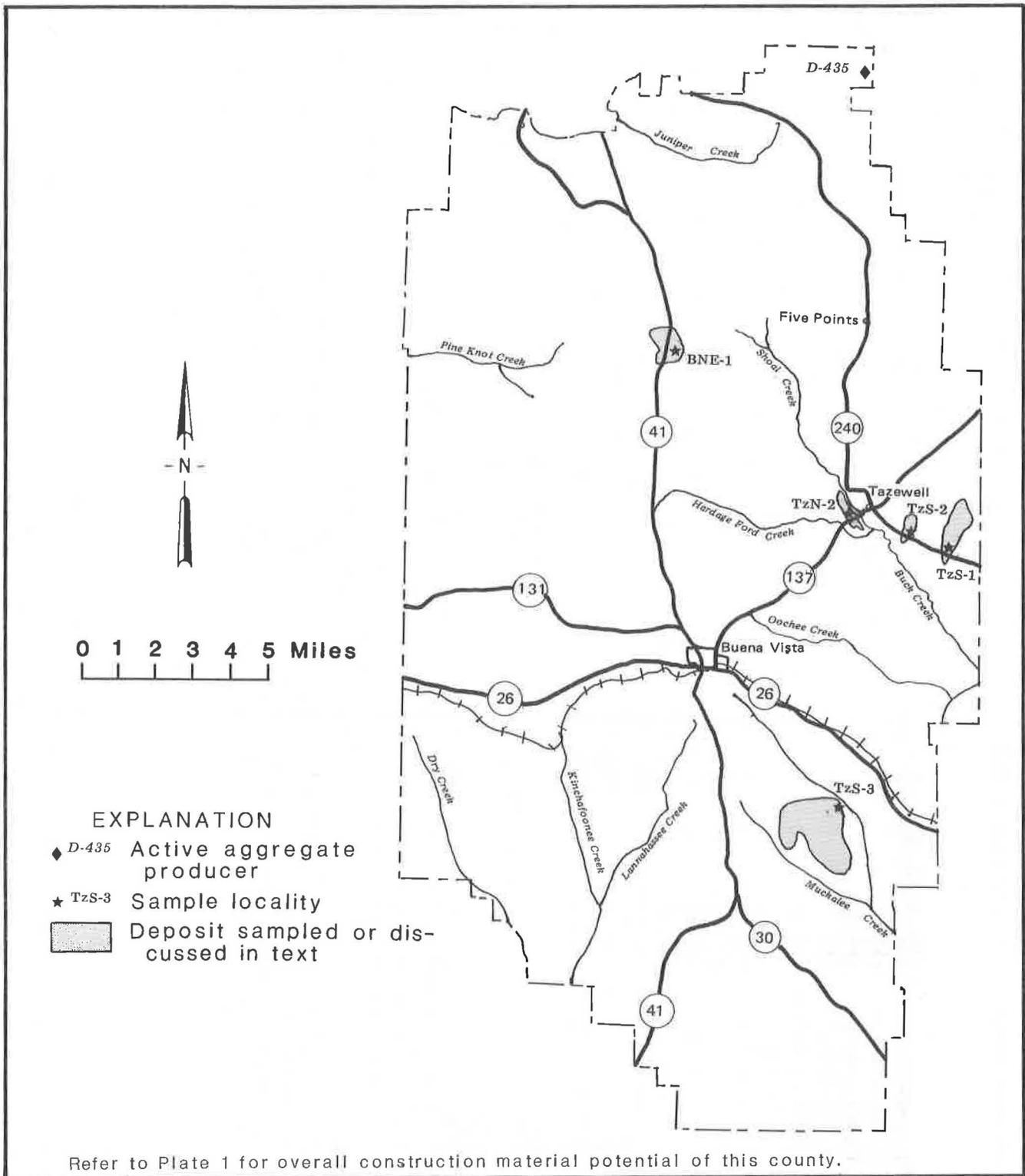
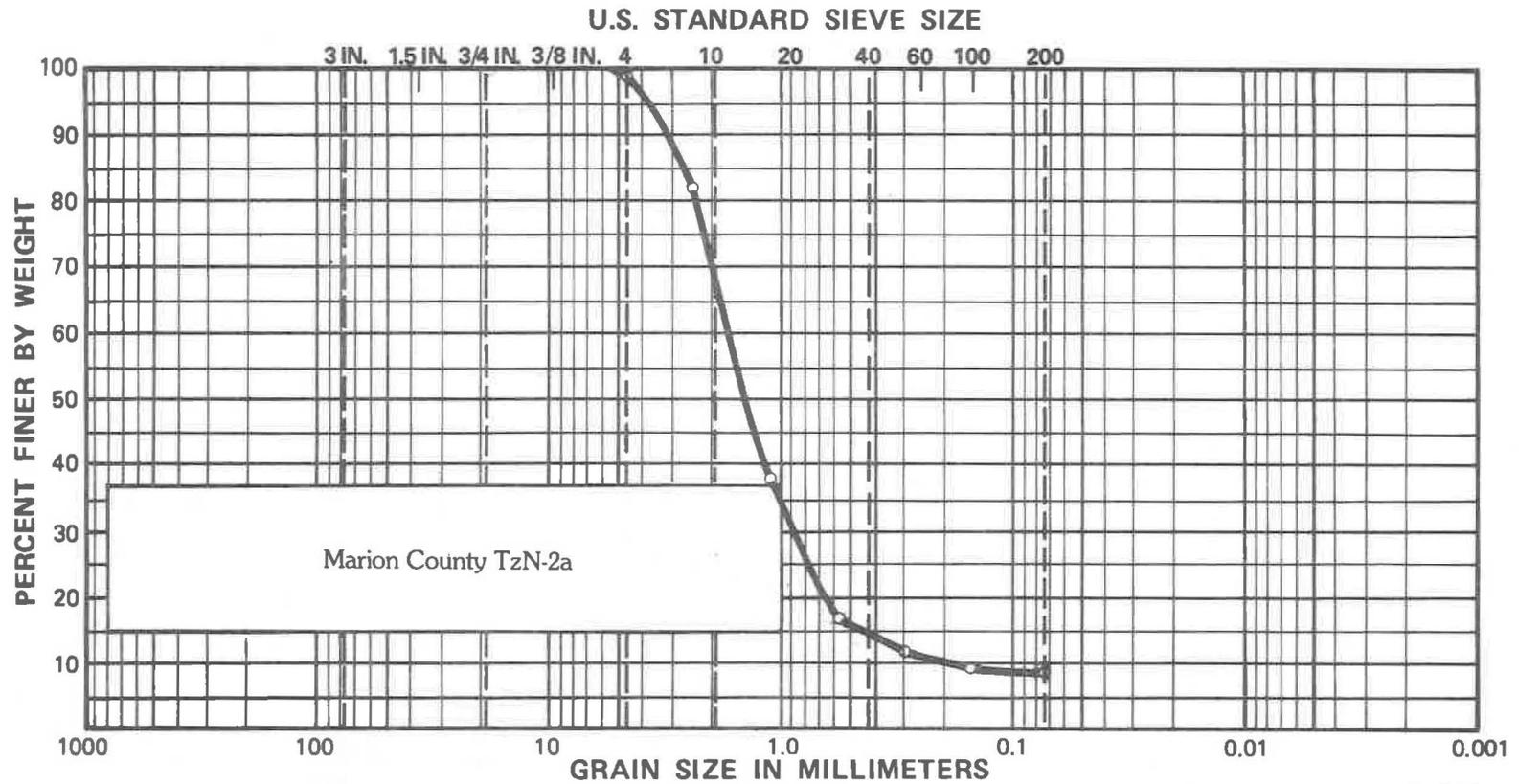


Figure 95. Map of Marion County Showing Sample Localities, Pits, and Deposits Sampled.

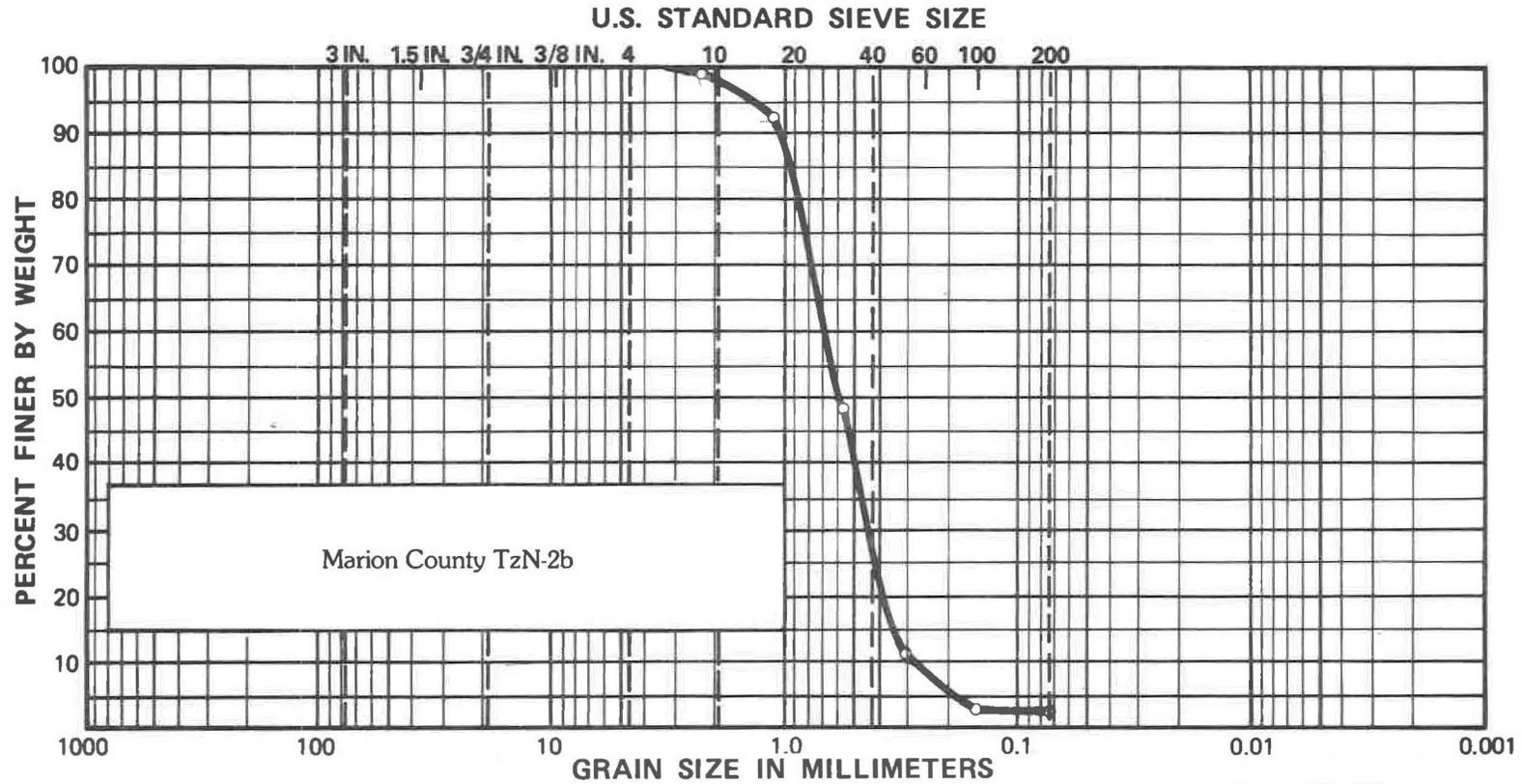


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse coarse	GRAVEL medium fine	very fine	very coarse coarse	SAND medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 97. Size Distribution Curve of Sample TzN-2a.

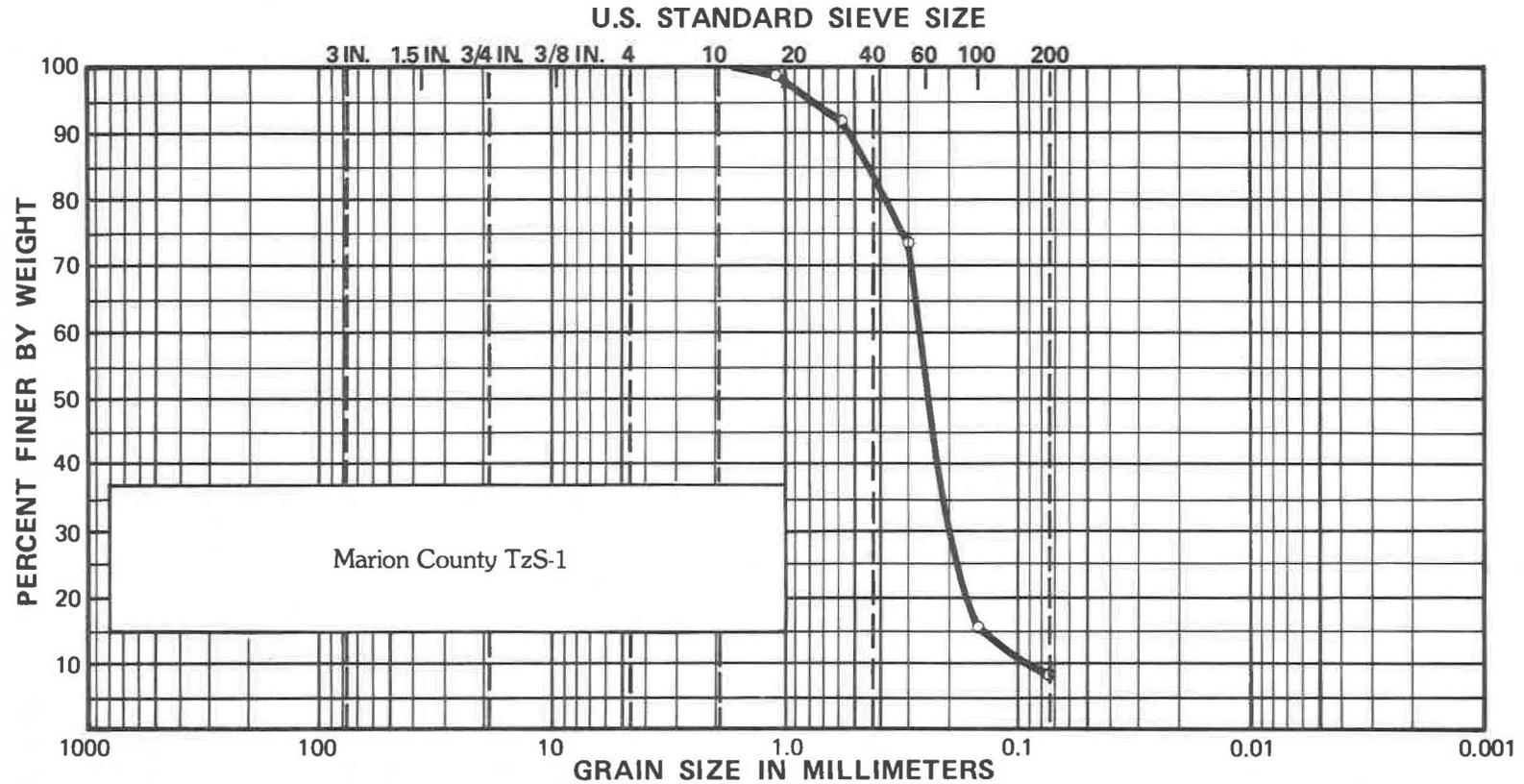


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 98. Size Distribution Curve of Sample TzN-2b.

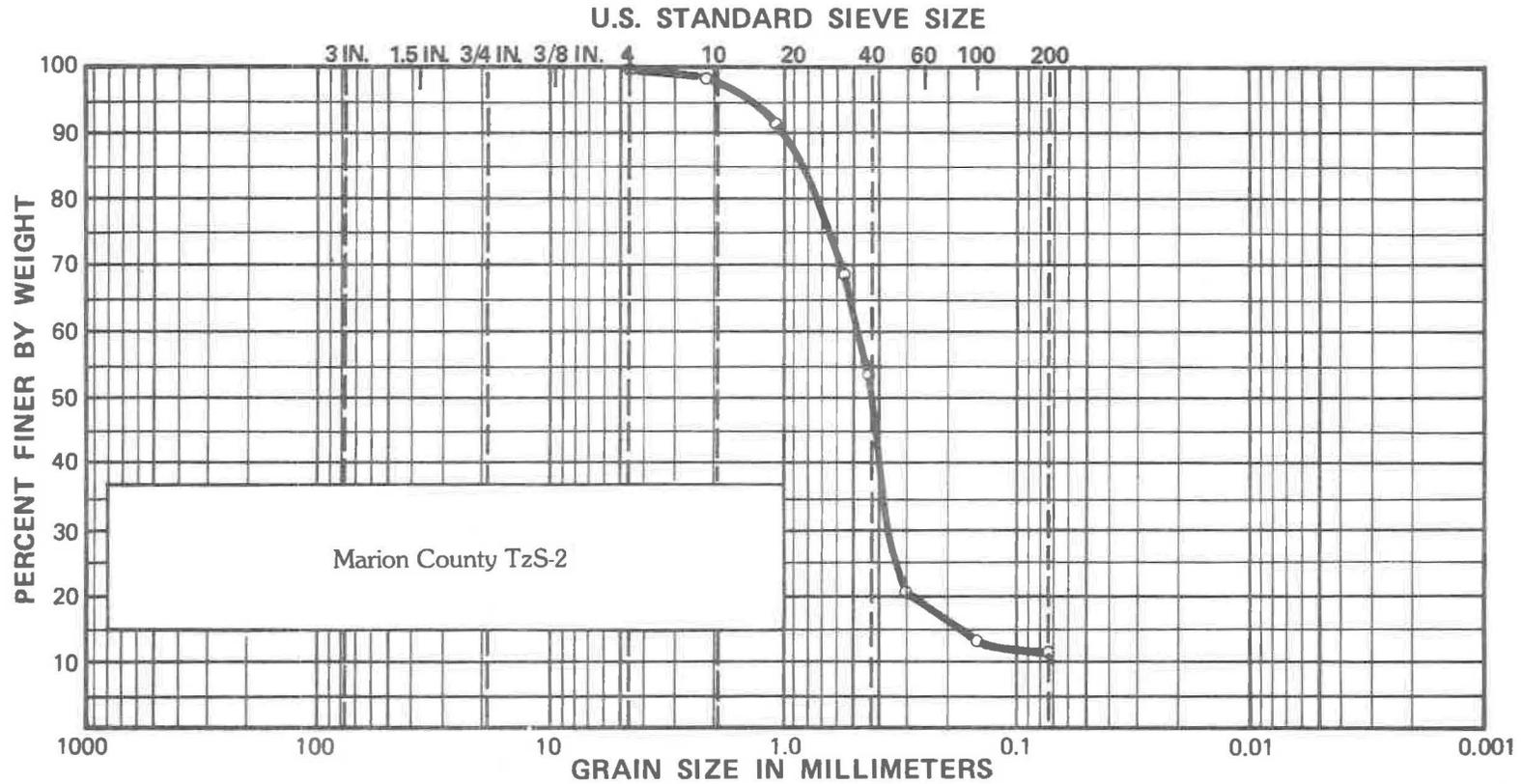


COBBLES	GRAVEL				SAND			SILT OR CLAY	*					
	COARSE	FINE			COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 99. Size Distribution Curve of Sample TzS-1.

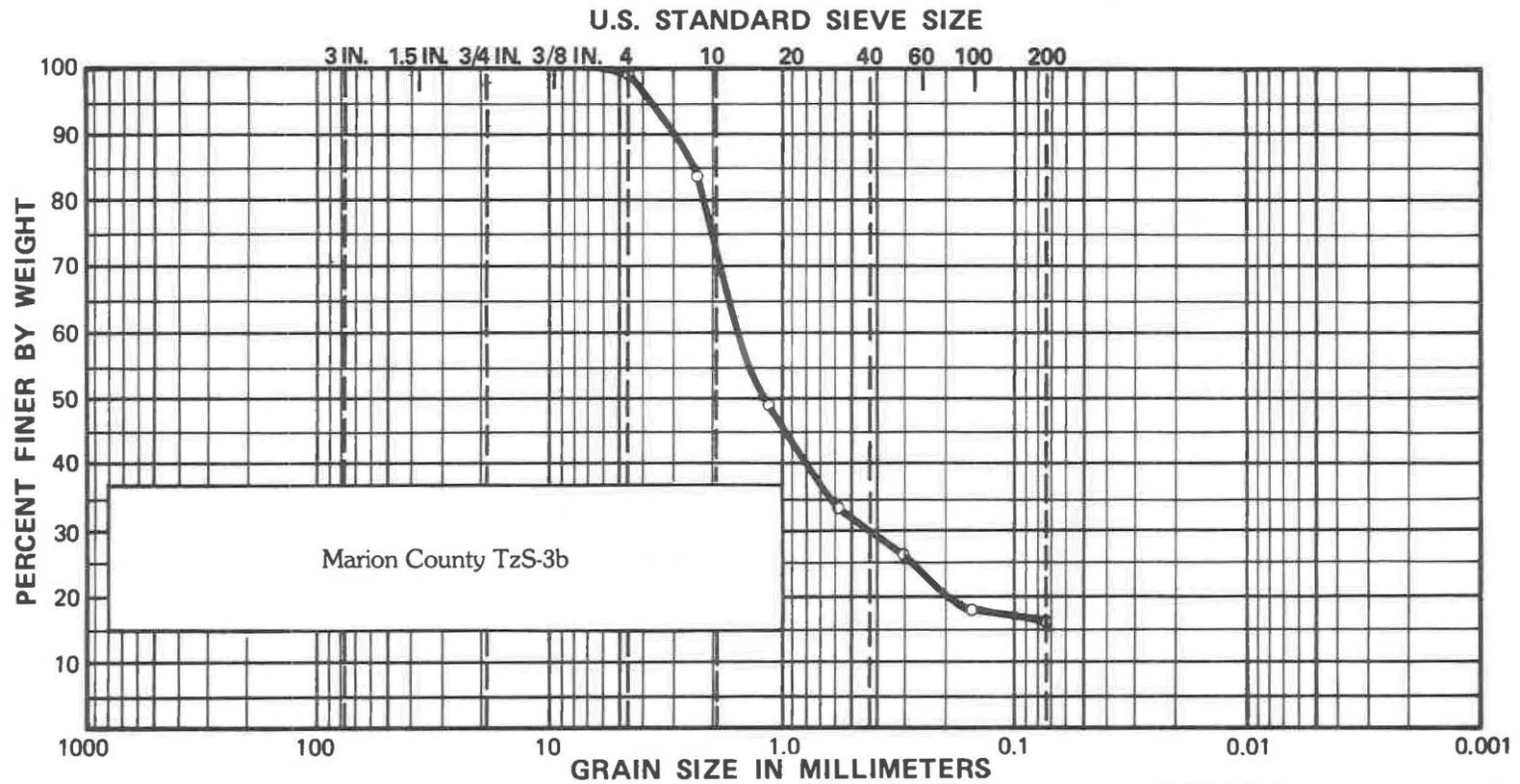


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 100. Size Distribution Curve of Sample TzS-2.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 102. Size Distribution Curve of Sample TzS-3b.

Table 17. Marion County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
BNE-1	9 feet	auger	9 feet	1	no	2
TzN-2a	8 feet	trench	8 feet	0	no	2
TzN-2b	8 feet	trench	8 feet	0	no ⁴	2
TzS-1	11 feet	auger	11 feet	1	no	1
TzS-2	10 feet	trench	14 feet	1	no ⁴	2
TzS-3a	12 feet	trench	12 feet	1	no ⁴	1
TzS-3b	4 feet	trench	4 feet	1	no ⁴	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

Miller County

Geology and Physiography

Miller County lies within portions of two physiographic districts of the Coastal Plain Province, the Fall Line Hills and the Dougherty Plain. Residuum of the Ocala Limestone provides the surficial sediments present in Miller County.

Previous Studies

Teas (1921, p. 219) noted that no commercial sand or gravel deposits were known to exist in Miller County at the time of his report. Teas (1921, p. 219) described small deposits of poor quality sands that are present along some of the streams of the county.

Present Study

The soil associations used in targeting areas of Miller County were Pelham and Troup, which are present in interfluvial areas in central and southern Miller County. One site in Miller County was sampled (figs. 103, 104, Table 18).

Evaluation

The deposit represented by sample DNE-1 fails to meet ASTM standard C-33 and has no economic potential for commercial aggregate production.

Mining activity

There are no active or recently inactive commercial aggregate mining operations within Miller County.

Summary evaluation

Based upon the information from the sieving of the sample of auger hole DNE-1 and field reconnaissance of Miller County, the potential for economic production of either fine or coarse construction aggregate is considered to be low.

Table 18. Miller County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
DNE-1	9 feet	auger	9 feet	1	no	0

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

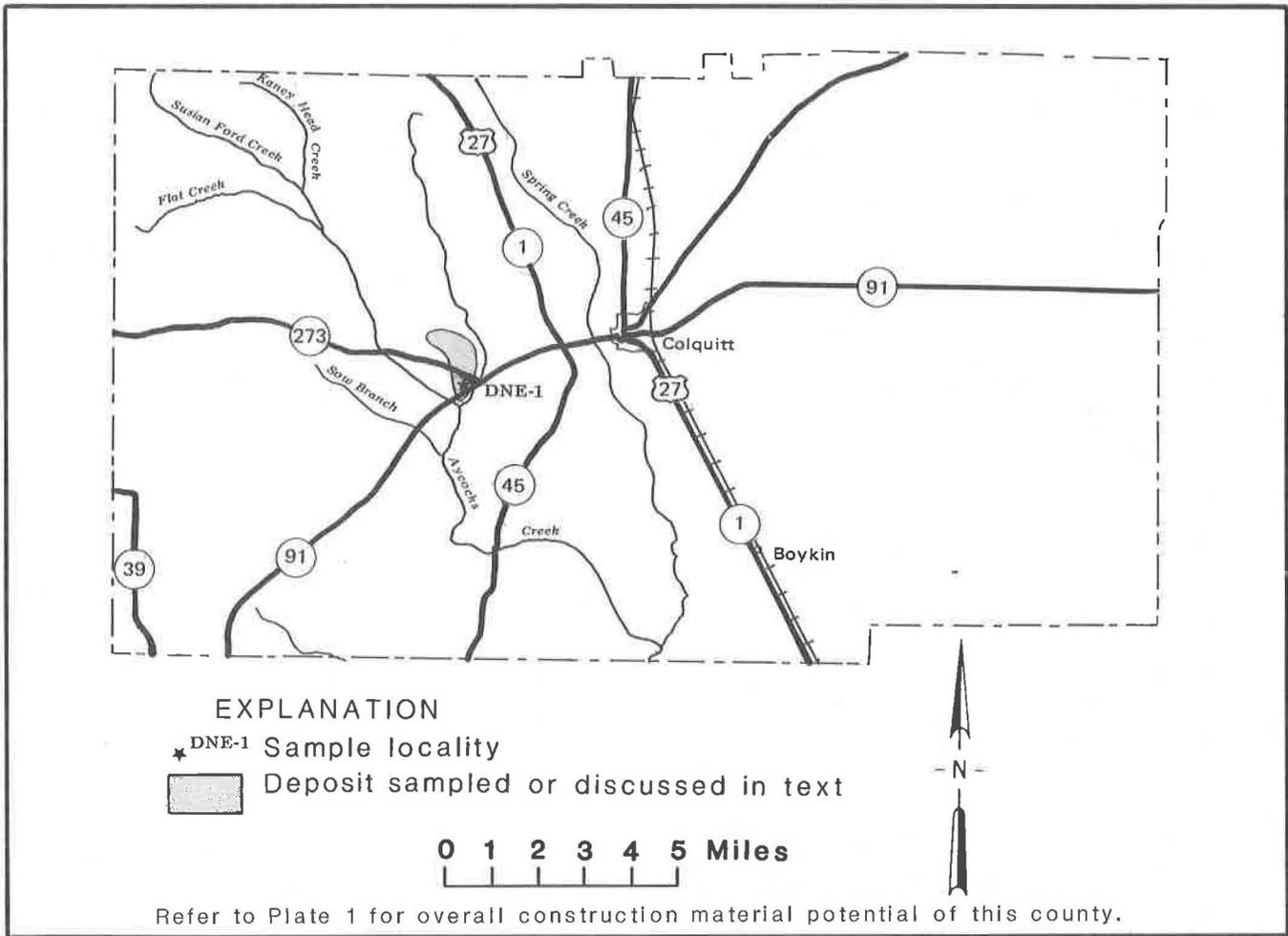
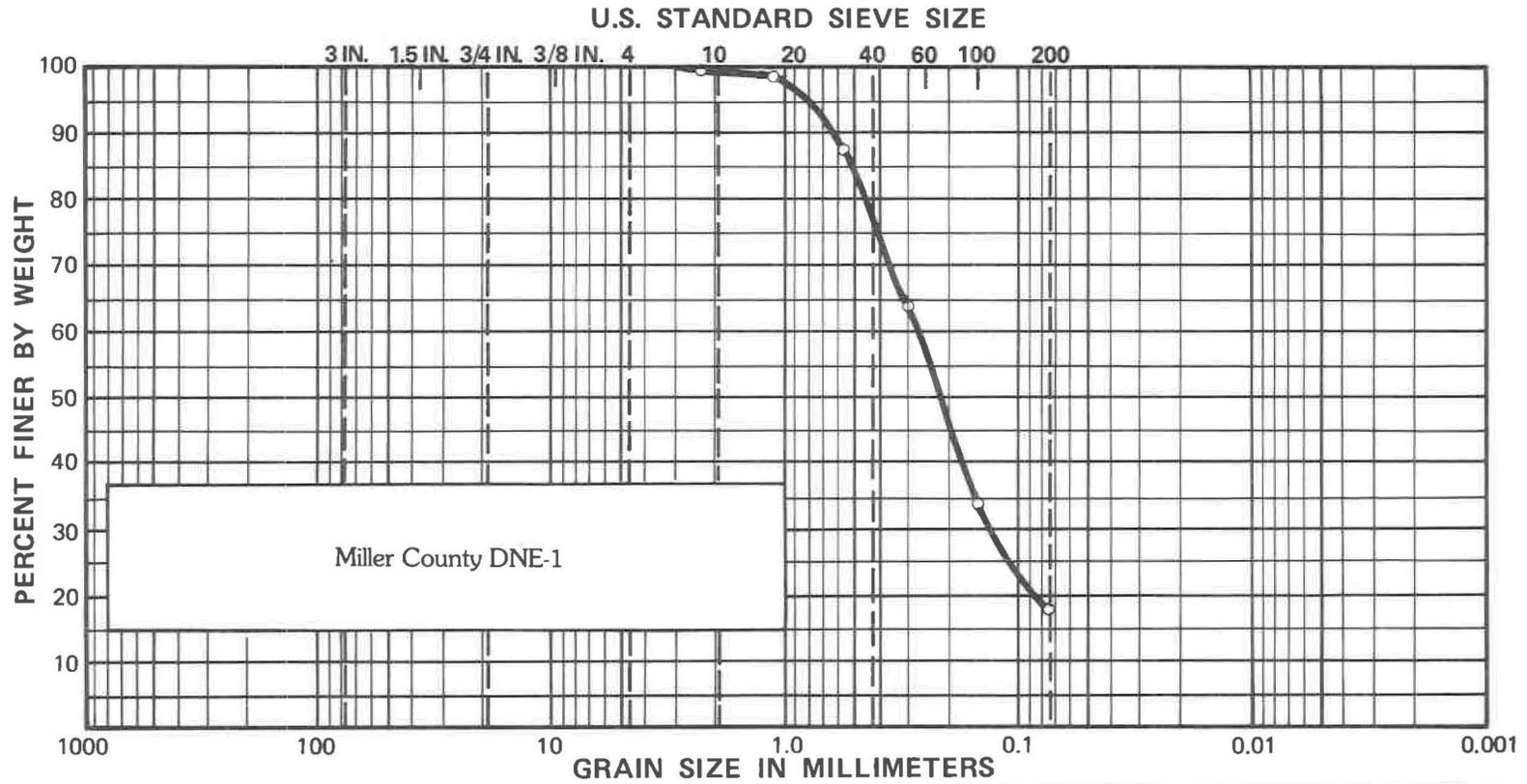


Figure 103. Map of Miller County Showing Sample Locality and Deposit Sampled.



COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE		FINE		COARSE	MEDIUM	FINE	

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY					
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 104. Size Distribution Curve of Sample DNE-1.

Mitchell County

Geology and Physiography

Mitchell County lies within portions of two physiographic districts of the Coastal Plain Province, the Dougherty Plain and Tifton Upland. Surficial sediments present in Mitchell County are derived from residuum of the Ocala and Oligocene limestones, the Altamaha Formation, the Hawthorne Group, and the Miccosukee Formation.

Previous Work

Teas (1921, p. 219-221) noted that outcrops of clay are common in Mitchell County and are near the surface in the sandy areas of the county. Further, Teas mentioned a local deposit of fine- to medium-grained sand 5 feet in thickness (fig. 105, Ts-32) and an extensive deposit of fine- to medium-grained sand (fig. 105, Ts-33) 1000 feet east of the Flint River, east of Newton. This deposit is 10 to 30 feet thick, 500 feet wide and 2.5 miles long. Occurrences of minor gravel deposits (Coward and Hand properties) south of Camilla (fig. 105, Ts-34) are also mentioned.

Present Study

The soil association used in targeting areas of Mitchell County was #39, which is present in the southwestern portion of Mitchell County. Geomorphic features targeted are point bars of the Flint River and a dune field located along the Flint River near Newton, Baker County. Three samples from Mitchell County were sieved, Hop-2, Nwt-1 and BaN-1 (figs. 105-109, Table 19). Two of these samples, Hop-2 and BaN-1 are from point bars and the third, Nwt-1, is located south of Georgia Highway 37 approximately 600 feet east of the Flint River in a dune field. The two samples from point bars (fig. 107,109) are quite similar in that they are fine-grained and well sorted.

Evaluation

None of the natural materials meet ASTM standard C-33; however, Nwt-1 which is from an area containing sand dunes is marginally acceptable, failing the < #200 mesh qualification (6 percent was < #200). The deposit represented by Nwt-1 is approximately 60 acres in areal extent, but is only 8.5 feet thick. Based on these figures and assuming a tabular body, the estimated reserve is 820,000 cubic yards.

Mining activity

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

Summary evaluation

The point bar deposits, while of moderate size and thickness are of limited economic value due to their fine grain size. The potential for commercial-scale production of fine aggregate within Mitchell County is considered to be low to moderate.

Table 19. Mitchell County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Hop-2	6 feet	auger	30 feet	1	no	1
Nwt-1	8.5 feet	auger	8.5 feet	2	no ⁴	2
BaN-1	8 feet	auger	15 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

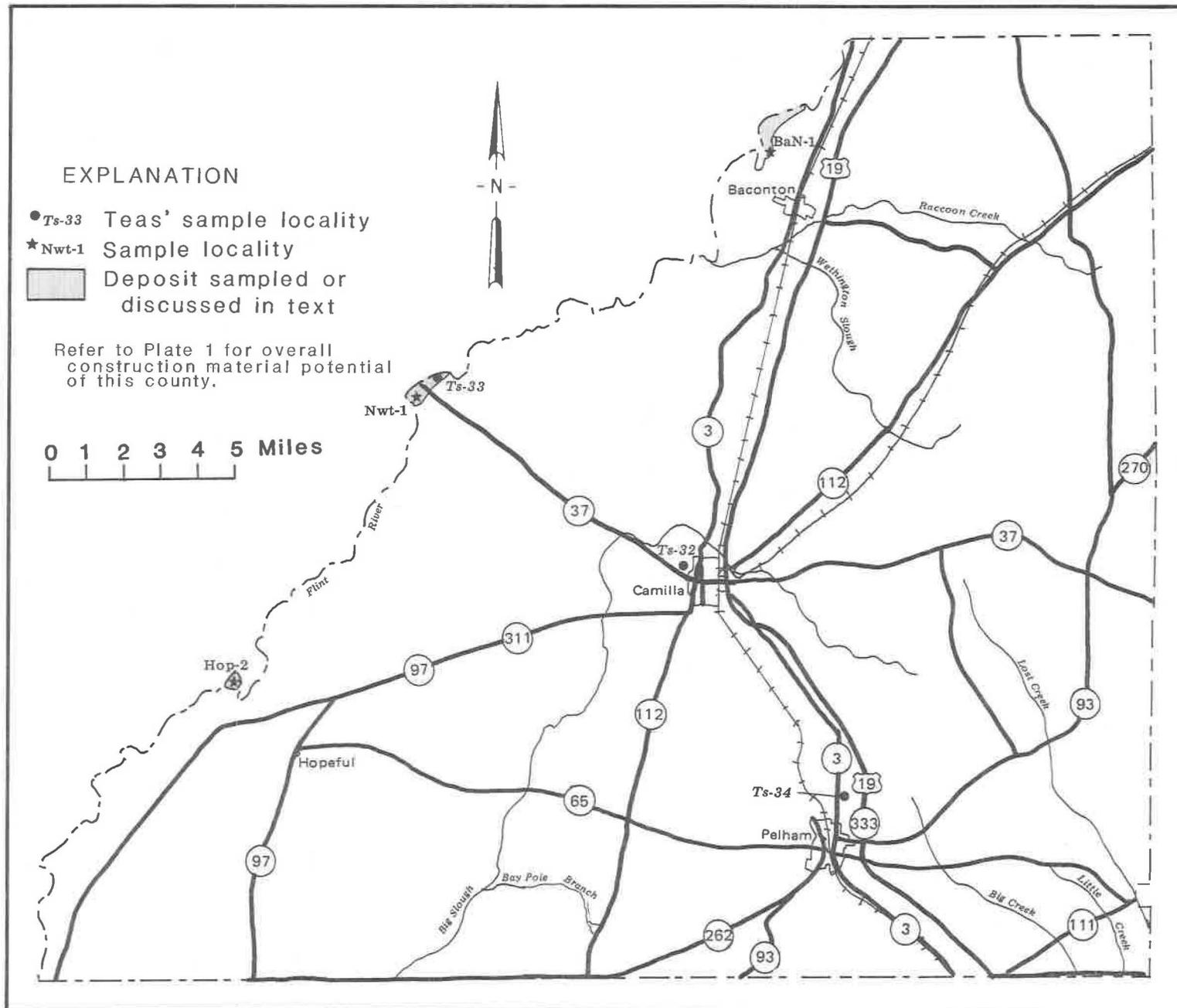
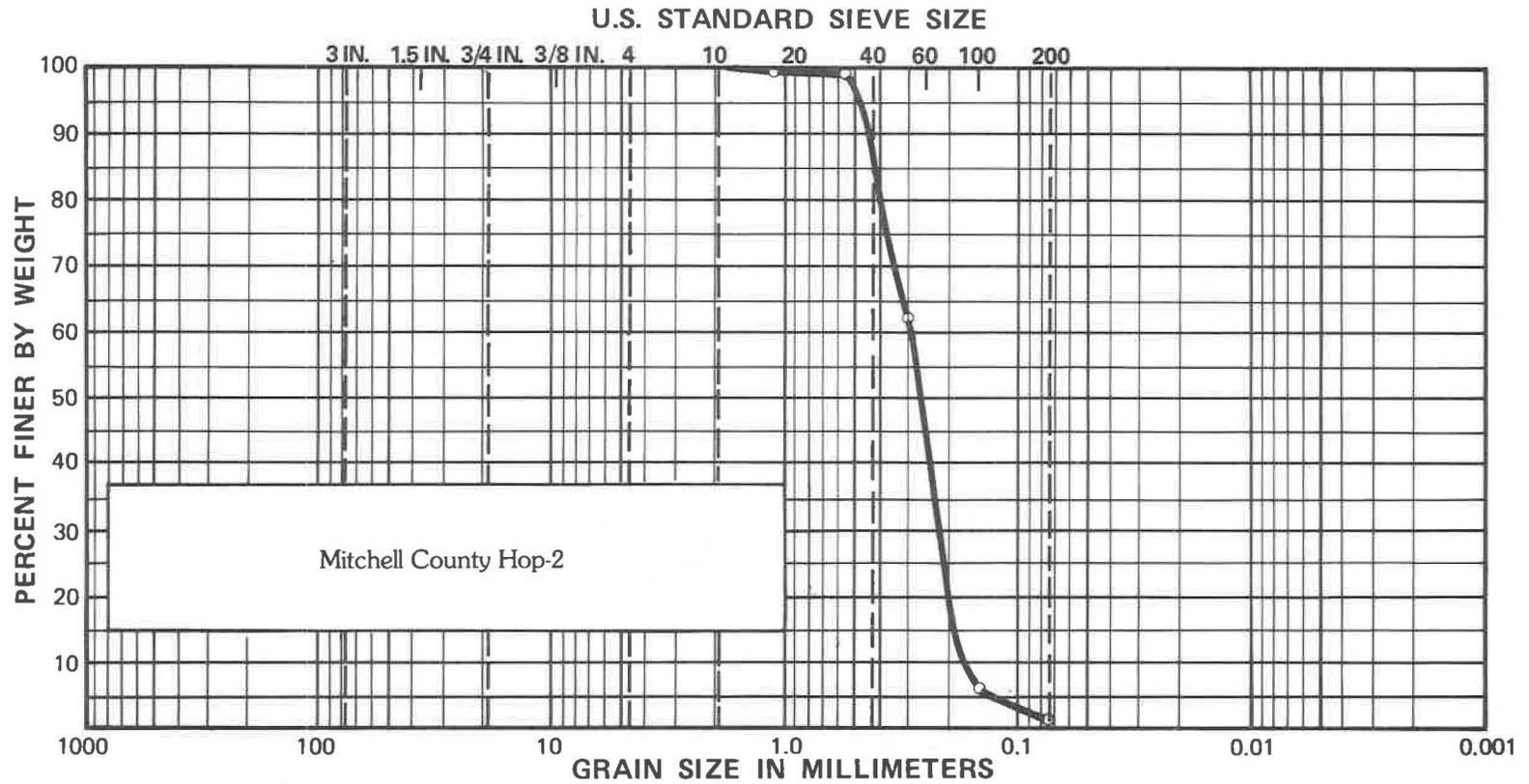


Figure 105. Map of Mitchell County Showing Sample Localities, Teas' Sample Localities, and Deposits Sampled.



Figure 106. Sample Locality Hop-2 Located on a Point Bar Deposit on the Flint River, Mitchell County.

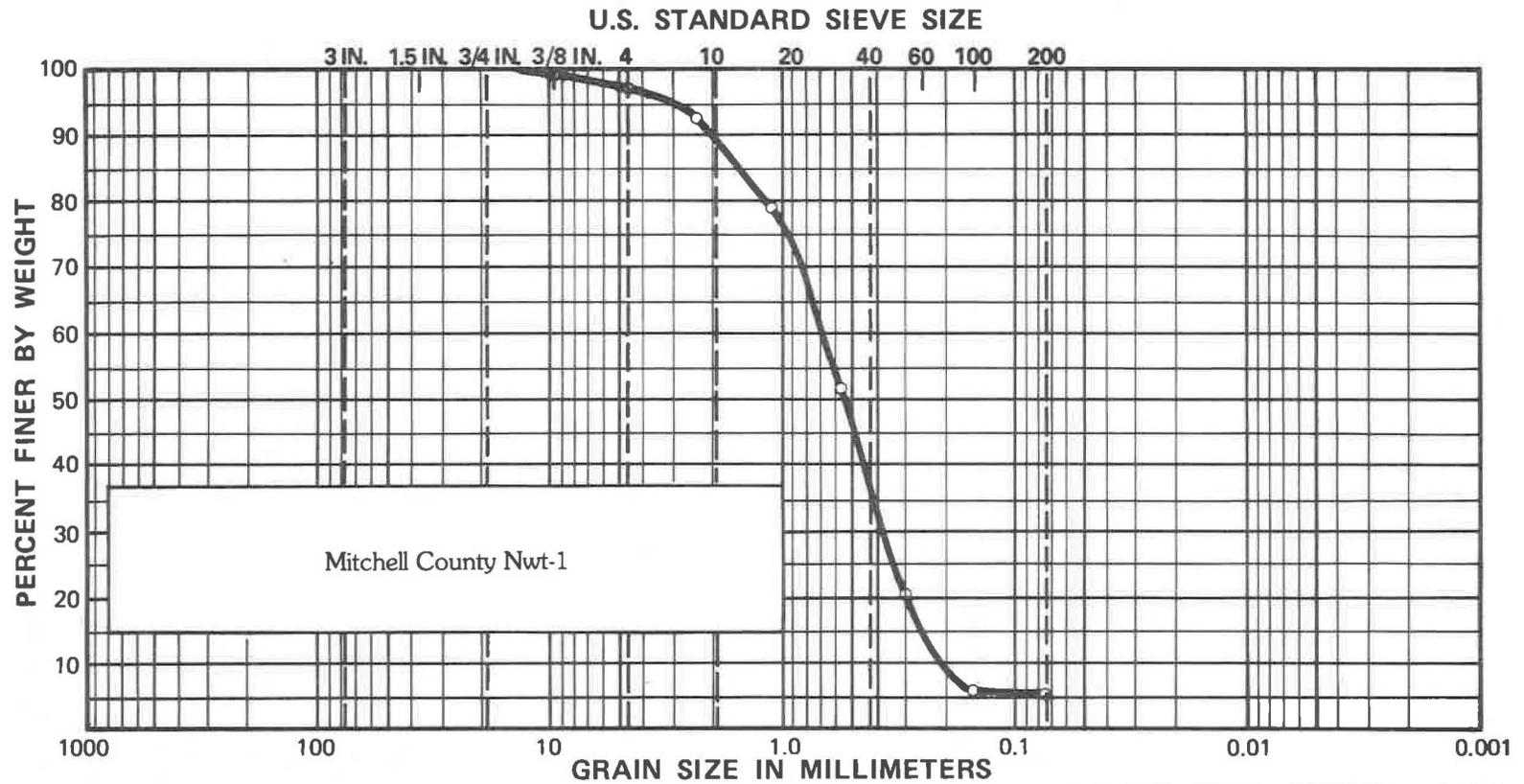


COBBLES		GRAVEL				SAND			SILT OR CLAY *									
		COARSE	FINE			COARSE	MEDIUM	FINE										
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium	fine	very fine	very coarse	coarse	SAND medium	fine	very fine	coarse	SILT medium	fine	very fine	coarse	CLAY medium	fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 107. Size Distribution Curve of Sample Hop-2.

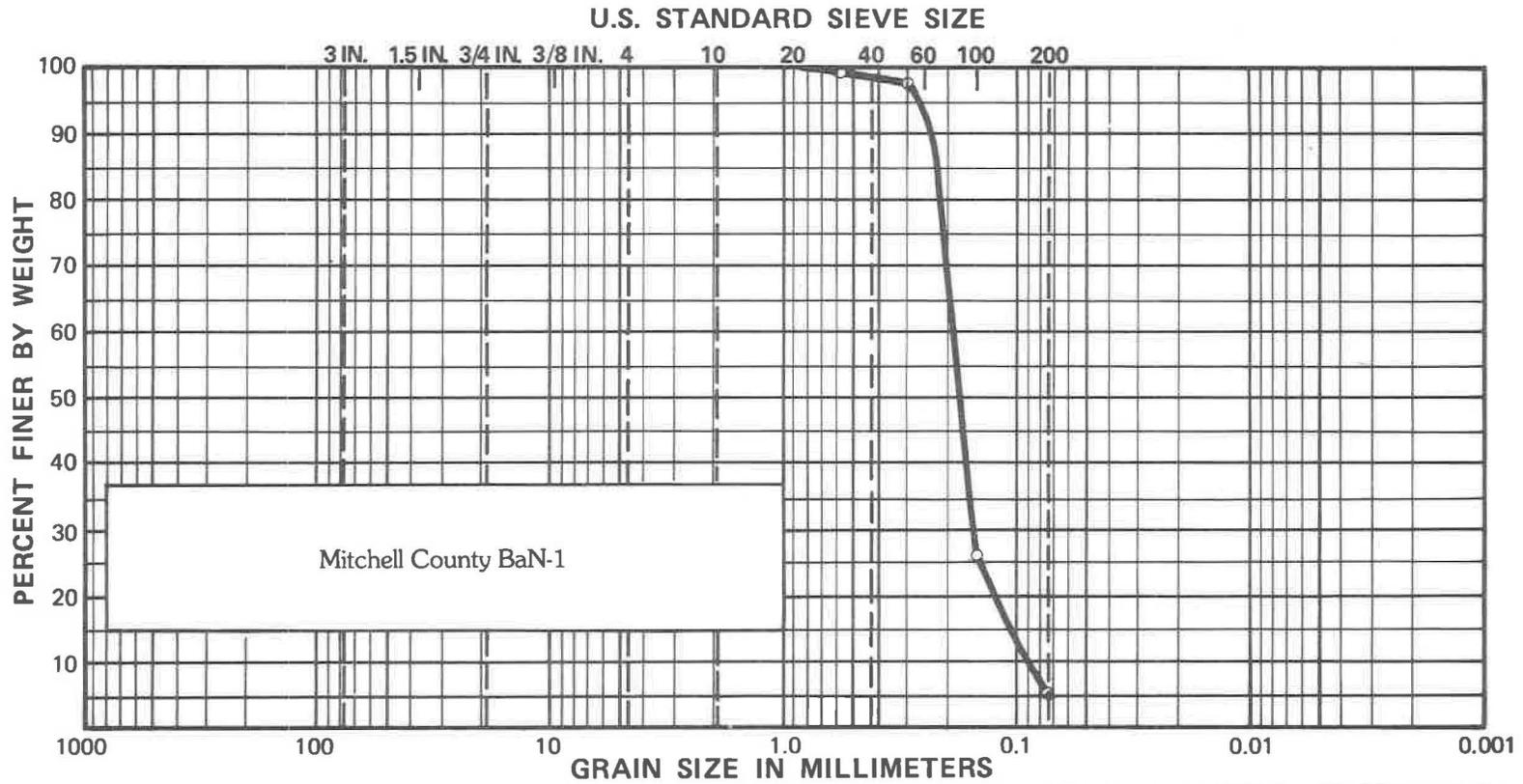


COBBLES	GRAVEL				SAND			SILT OR CLAY *
	COARSE	FINE	COARSE	MEDIUM	FINE			
BOULDERS	COBBLES large small	GRAVEL very coarse coarse medium fine	very fine	very coarse	SAND coarse medium fine very fine	SILT coarse medium fine very fine	CLAY ** coarse medium fine	

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE		FINE		COARSE	MEDIUM	FINE			
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 109. Size Distribution Curve of Sample BaN-1.

Muscogee County

Geology and Physiography

Portions of two provinces are present in Muscogee County, the Piedmont Province and the Coastal Plain Province. The Coastal Plain Province (Fall Line Hills District) occupies the southern half of the county and consists of gravelly sands and silty clays of the Upper Cretaceous Tuscaloosa and Eutaw Formations.

Previous Studies

Teas (1921, p. 222-227) discussed the occurrence of sands and gravels along Bull, Randolph and Upatoi Creeks in Muscogee County (fig. 110, Ts-35 [Flournoy property], Ts-37, Ts-40). Teas (1921, p. 223) also described a gravel pit (Muscogee County gravel pit) north of Saint Mary's Road (fig. 110, Ts-41), and probable high terraces of both the Chattahoochee River and lesser streams of the county (fig. 110, Ts-36, Ts-38, Ts-39). A 20 foot exposure of clayey, silty, fine- to medium-grained sand (fig. 110, Ts-43) near Tiger Creek was also described by Teas (1921, p. 226-227).

Present Study

The soil associations used in targeting areas of Muscogee County were Lakeland and Troup, which are present in interfluvial areas in southwestern and northeastern Muscogee County. Geomorphic features targeted are large point bars along the Chattahoochee River in extreme southwestern Muscogee County. Three samples from Muscogee County (figs. 110-113, Table 20), Cmb-1a and Cmb-1b and Cmb-2, were sieved.

Evaluation

None of the samples pass ASTM standard C-33 for a fine aggregate. Sample Cmb-2 marginally failed the ASTM requirements (fig. 113). Samples Cmb-1a (0-10 feet) and Cmb-1b (10-16 feet) are from an auger hole drilled in a deposit currently producing coarse aggregate.

The samples Cmb-1a (0-10 feet) and Cmb-1b (10-16 feet) show a trend of increasing grain size with depth (figs. 111, 112). Very little gravel was encountered while augering this hole, although this is not surprising in that the auger hole was only 16 feet deep and the deposit is mined to a depth of 30 feet.

The deposit represented by Cmb-2 averages 20 feet in thickness over an area of approximately 10 acres; assuming a tabular body of these dimensions, the reserves are 323,000 cubic yards. A primary road is located just to the north and could afford access to this deposit. Factors limiting the development of this deposit are: water for processing the sand is not readily available, and the area immediately surrounding the deposit is fairly densely populated and commercialized. Based on these facts this deposit is considered to have limited potential for commercial production of aggregate.

Mining activity

The Consolidated Gravel Company of Columbus (D-182-F) produced gravel from a 2 acre tract of land which has since been reclaimed. No production figures are available.

The Calhoun Sand and Gravel Company of Columbus (D-181-F) produced sand and gravel from a 19 acre tract that the company owned. All 19 acres have been reclaimed and no production figures are available.

Camp Concrete Industries of Columbus (D-010) produces gravel, concrete sand and mortar sand. All three products are shipped by truck within a 30 mile radius of the mine. The products are mined using a 14-inch hydraulic dredge (fig. 114). After mining, the material is pumped to a screening tower (fig. 115) and cyclones for sizing. Camp Concrete owns 579 acres with approximately 389 acres yet to be mined. The deposit is currently mined to a depth of 30 feet and annual production for all three products is between 10,000 and 50,000 tons.

Summary Evaluation

Muscogee County has low potential for new aggregate production. This is based on the following: (1) Camp Concrete Industries owns or has under lease virtually all of the high potential areas of the county. (2) The sample Cmb-2 is from the (southwardly thinning) coarse lower sand member of the Eutaw Formation. (3) The area of moderate to high potential, Upatoi Creek, is within the boundaries of Fort Benning Military Reservation. (4) The terrace deposits mentioned by Teas (1921, p. 224) are too thin to be economically feasible.

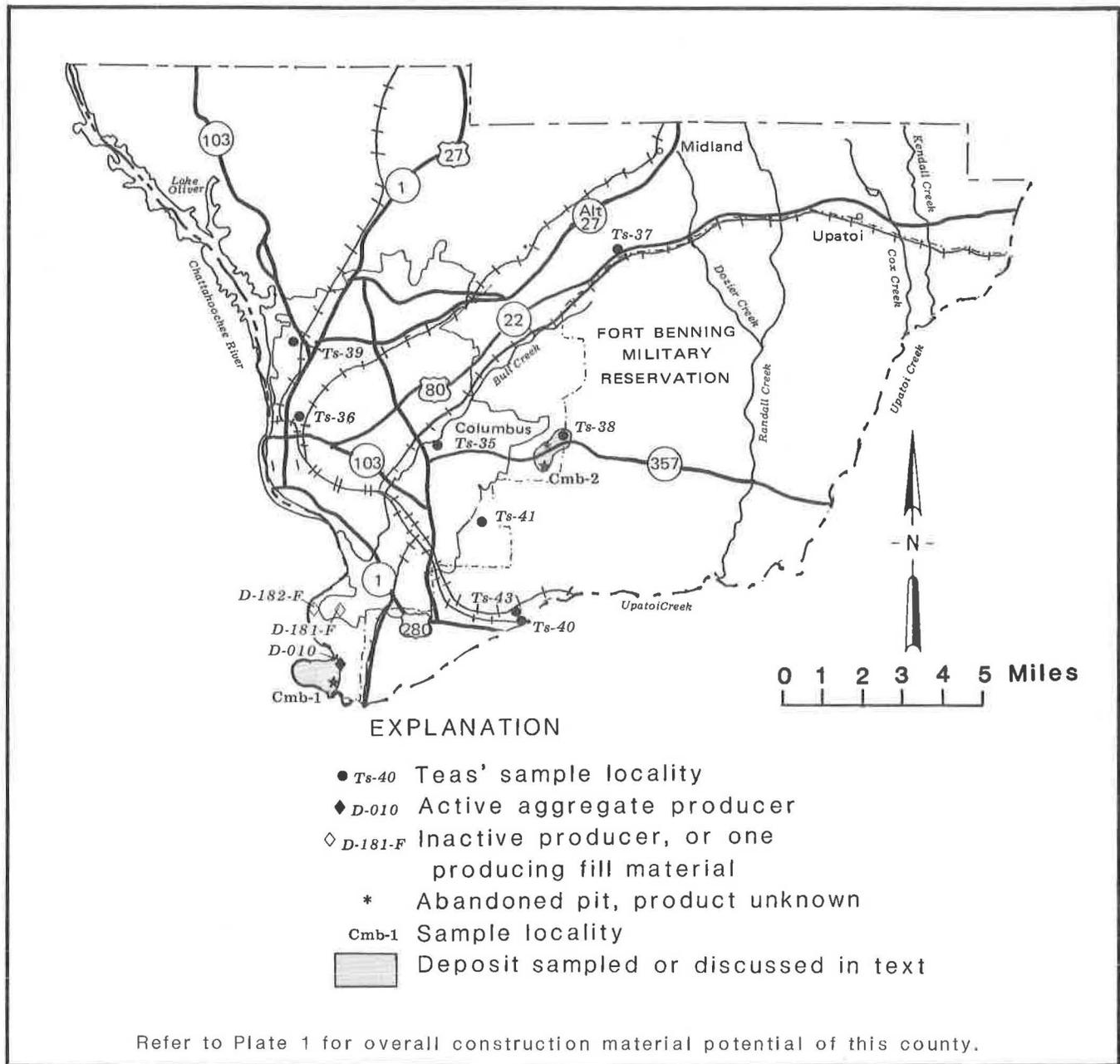
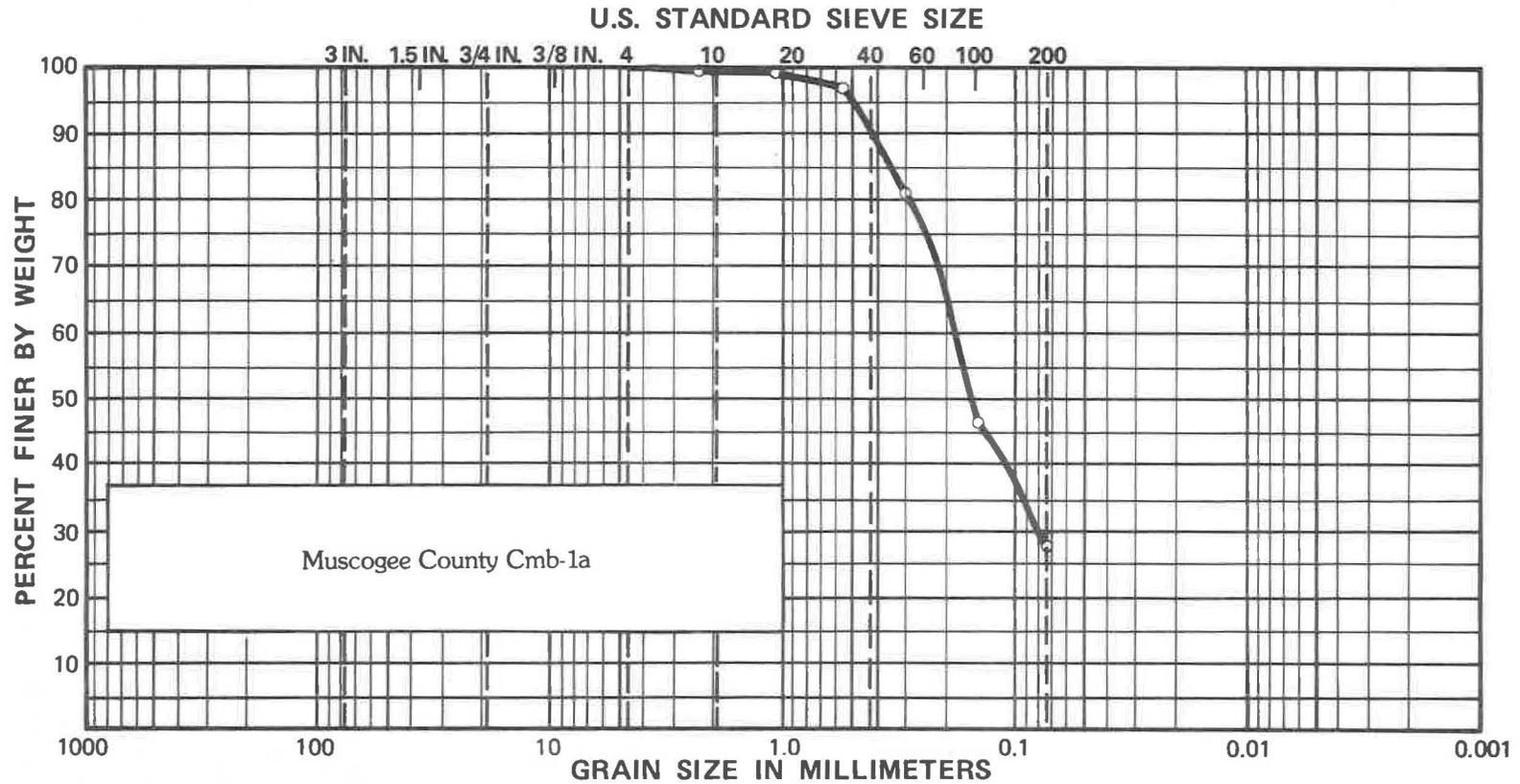


Figure 110. Map of Muscogee County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.



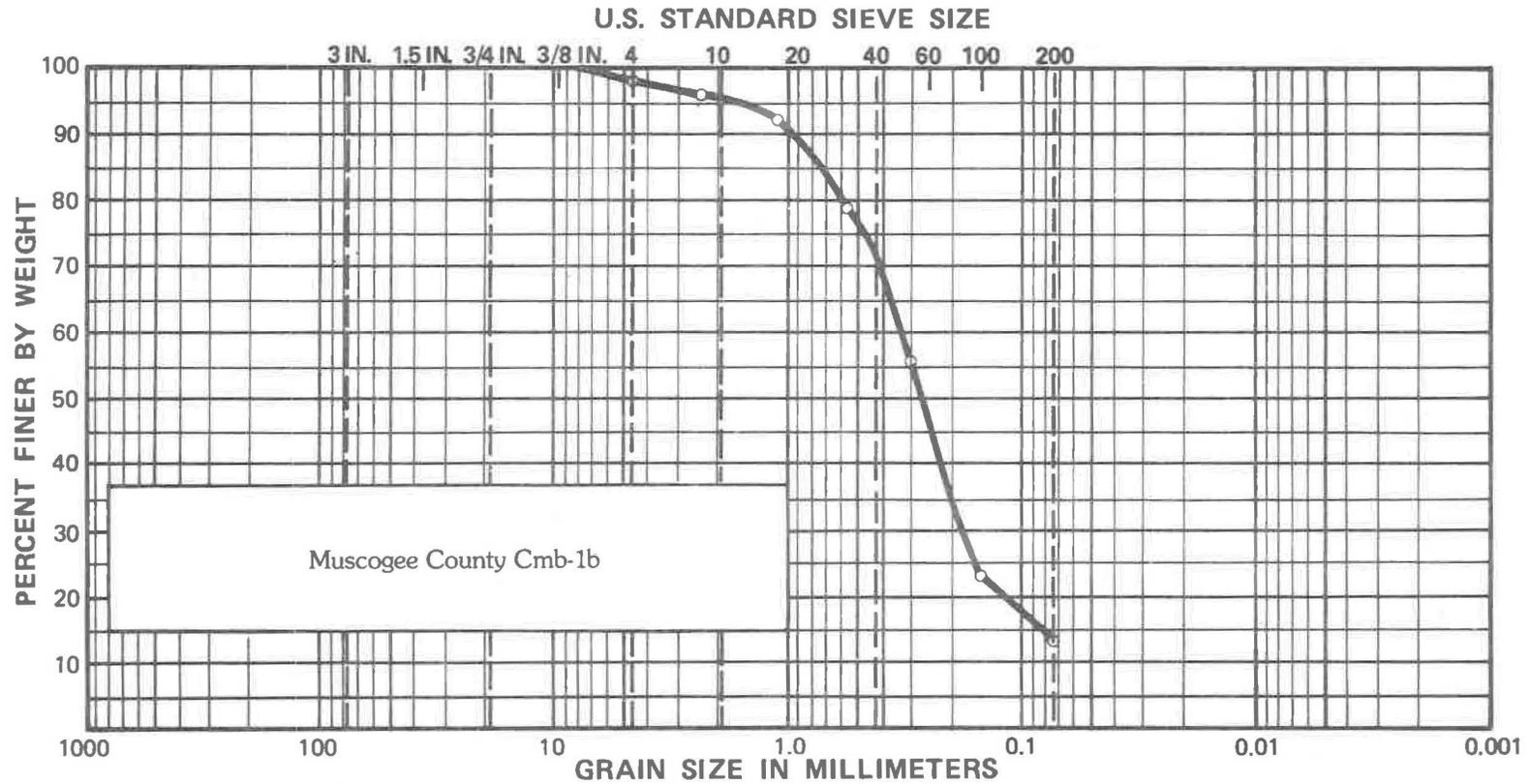
COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System

**Wentworth-Lane Class Limits

Figure 111. Size Distribution Curve of Sample Cmb-1a.

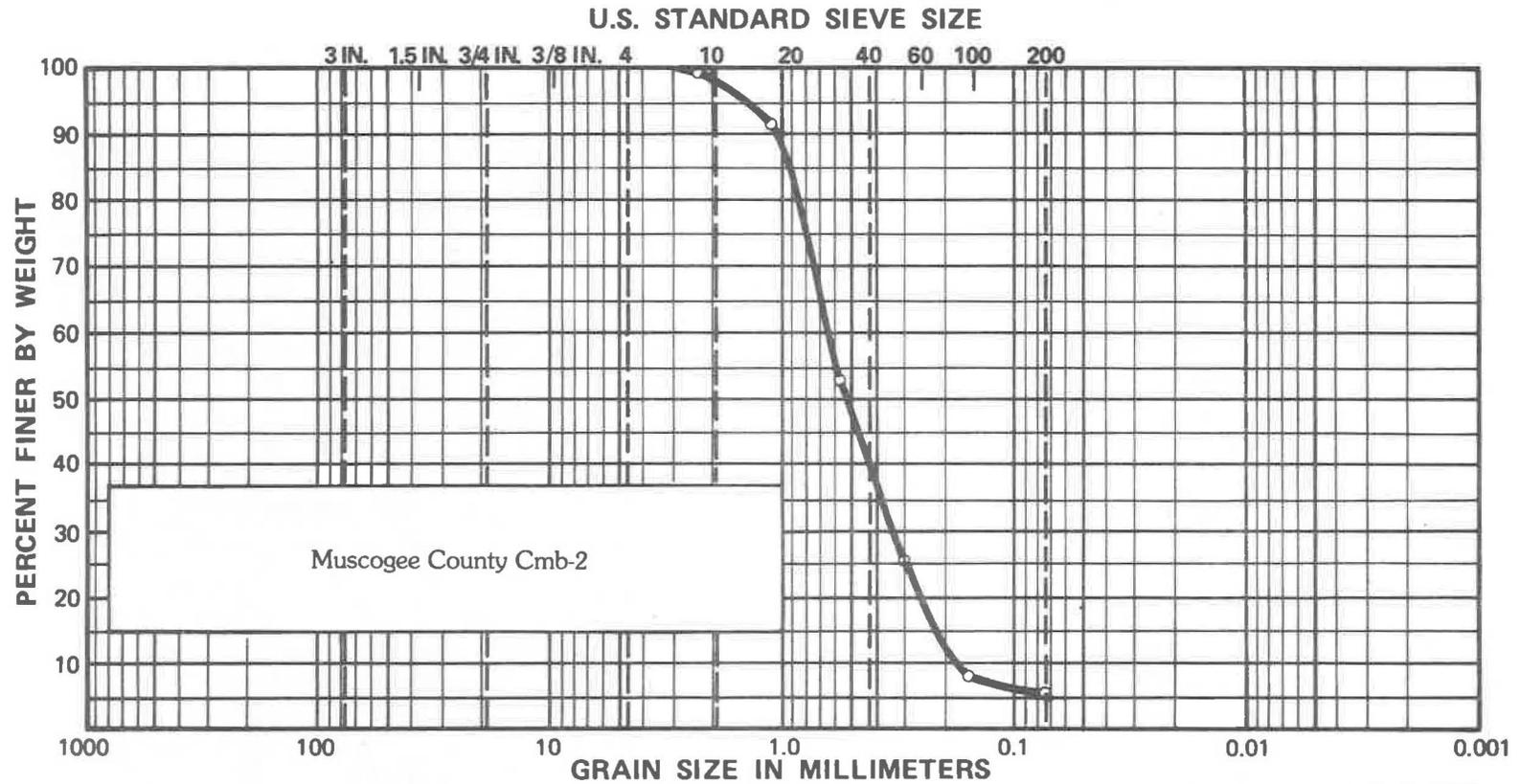


COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE	FINE	COARSE	MEDIUM	FINE								
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine			very fine	CLAY coarse medium fine	**

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 112. Size Distribution Curve of Sample Cmb-1b.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 113. Size Distribution Curve of Sample Cmb-2.



Figure 114. Hydraulic Dredge and Pipeline Operating in Man-made Pond, Camp Concrete Industries, Muscogee County



Figure 115. Coarse Aggregate Produced by Camp Concrete Industries, Muscogee County

Table 20. Muscogee County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
Cmb-1a	10 feet	auger	10 feet	2	no	0
Cmb-1b	6 feet	auger	6 feet	2	no	2
Cmb-2	20 feet	trench	20 feet	3	no ⁴	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

Peach County

Geology and Physiography

Peach County lies within portions of two physiographic districts of the Coastal Plain Province, the Fall Line Hills and the Fort Valley Plateau. The surficial sediments of the county are derived from undifferentiated Upper Cretaceous deposits, Huber Formation and undifferentiated Neogene fluvial or alluvial deposits.

Previous Studies

Teas (1921) did not describe any deposits from Peach County, then a part of Houston County.

Present Study

The soil association used in targeting areas of Peach County was Lakeland, which is present in interfluvial areas throughout the county. The geomorphic feature targeted is a section of braided stream deposits of Mossy Creek in the central eastern portion of the county. Eight samples from seven sites in Peach County were sieved (figs. 116-124; FVE-1,2,3,4; FVW-3a,3b; PrW-4, PrW-5, Table 21).

Evaluation

None of the natural materials from Peach County met ASTM standard C-33; however, two samples (FVE-1, FVE-3) marginally failed ASTM standard C-33. Sample FVE-3 (fig. 119) has a good grain-size distribution; however, sample FVE-3 represents a deposit which is quite thin, localized and sporadic in distribution. Therefore, the deposit represented by this sample is not considered further.

Sample FVE-1 represents a 2 foot thick medium- to coarse-grained sand which is overlain by 3 to 8 feet of clayey, medium-grained sand. The overlying clayey sand limits the feasibility of commercial development of the deposit. It is possible that a sufficiently large deposit of sand of this quality, without the overburden, may be present within the general area of sample FVE-1.

Mining activity

There are no active or recently inactive commercial aggregate mining operations within the study area of Peach County.

Summary evaluation

The deposit represented by sample FVE-1 is probably not of economic value due to the presence of a clayey sand overburden. The most promising areas of Peach County for aggregate production are those areas in which the Huber Formation and Upper Cretaceous deposits are present. The potential for either fine or coarse aggregate production in Peach County is low.

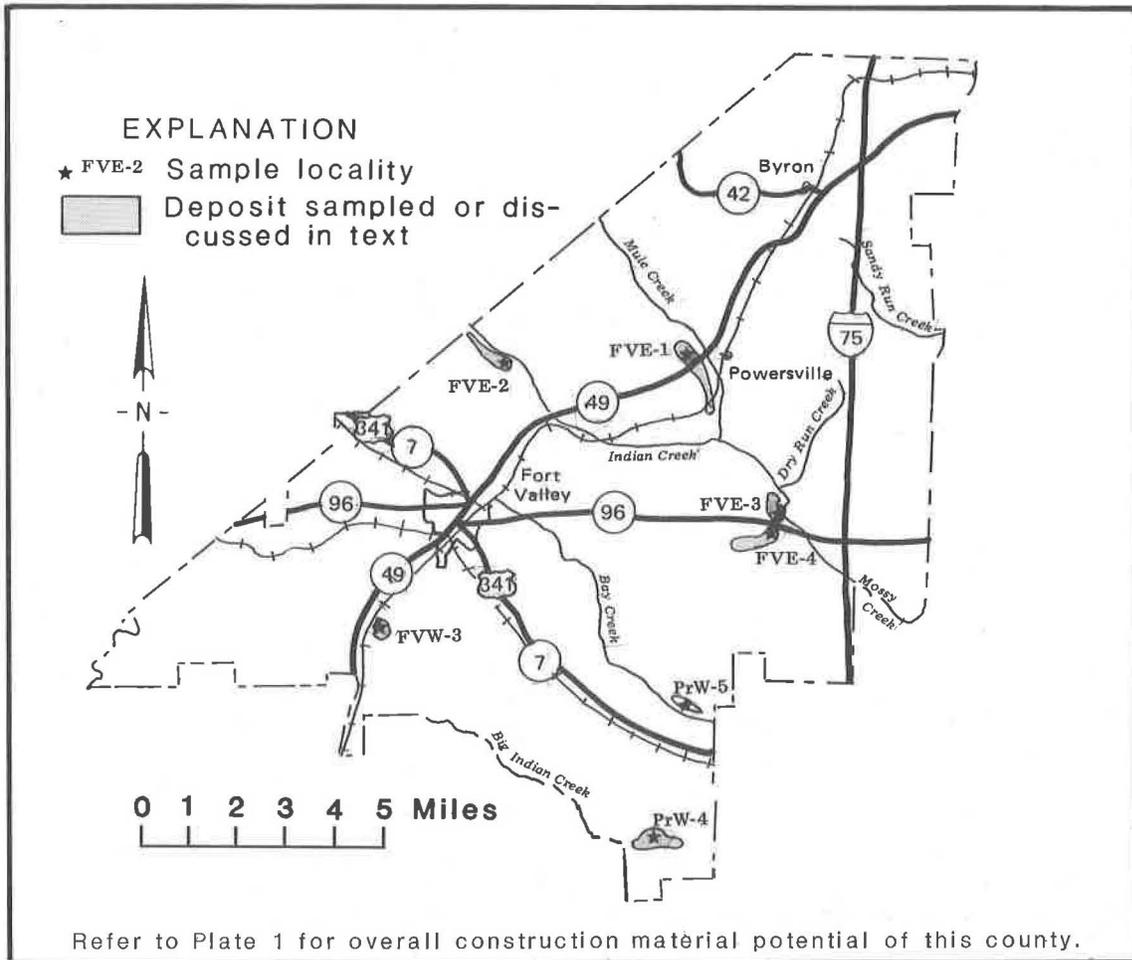
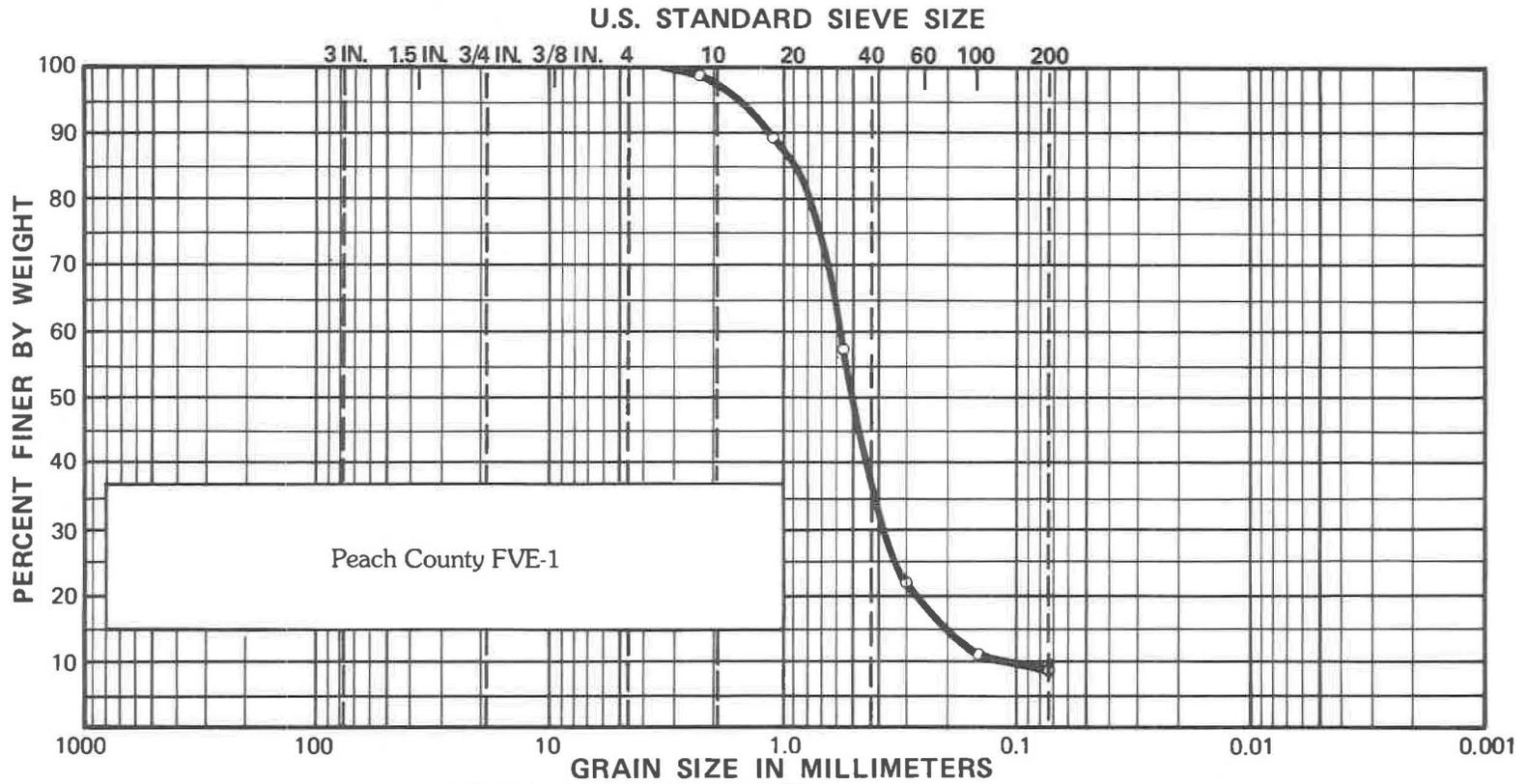


Figure 116. Map of Peach County Showing Sample Localities, and Deposits Sampled.

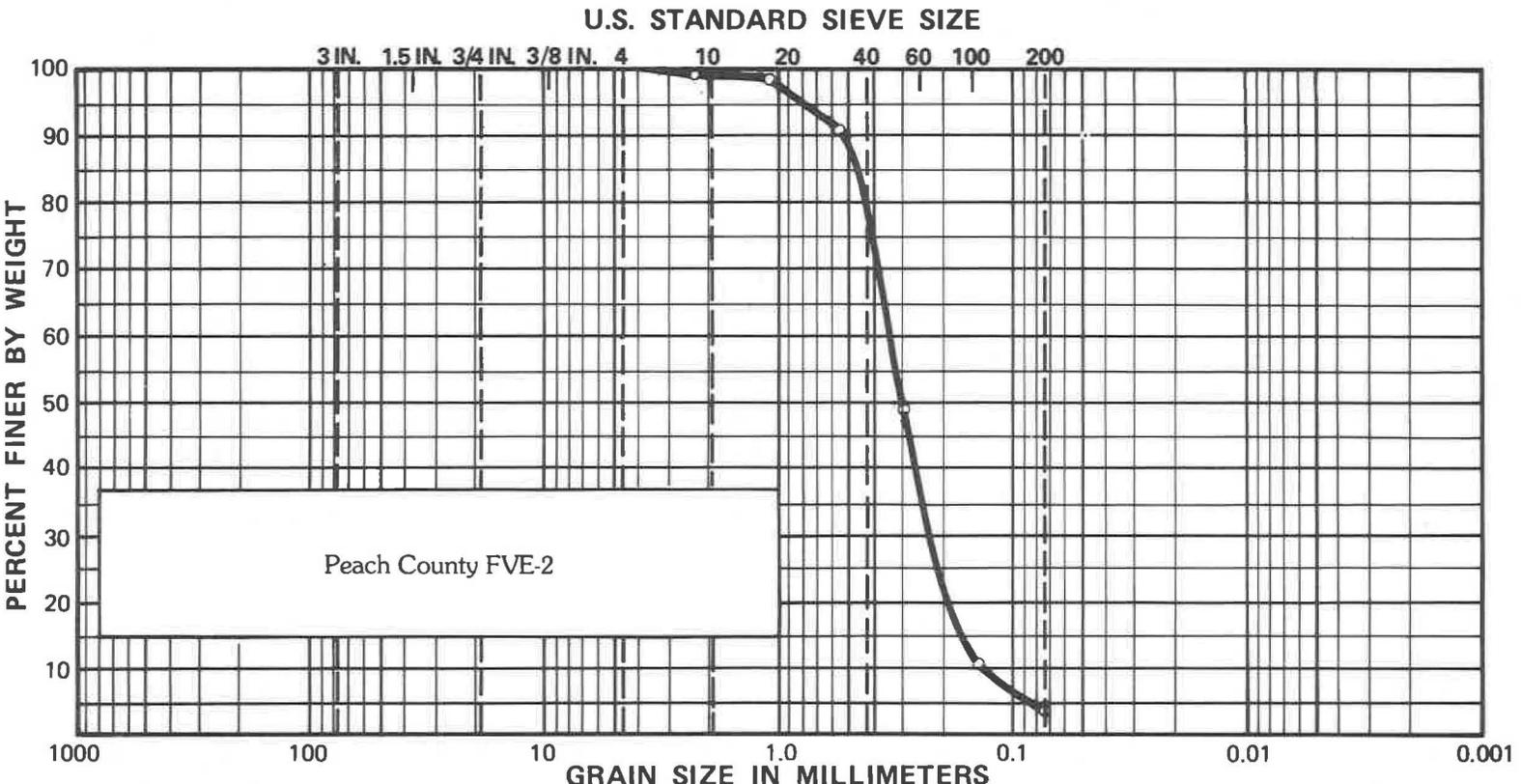


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE		FINE		COARSE	MEDIUM	FINE			
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

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

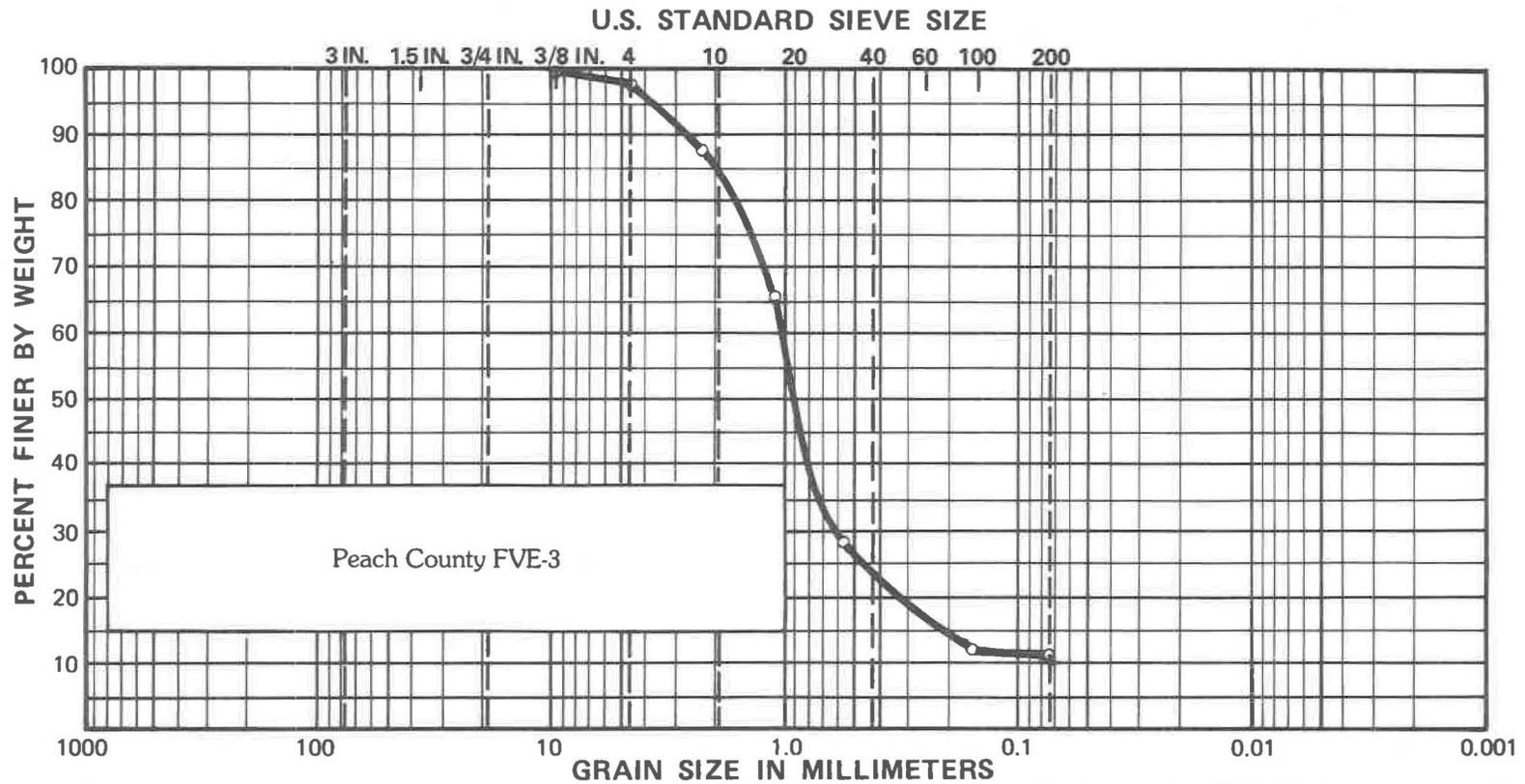


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 118. Size Distribution Curve of Sample FVE-2.

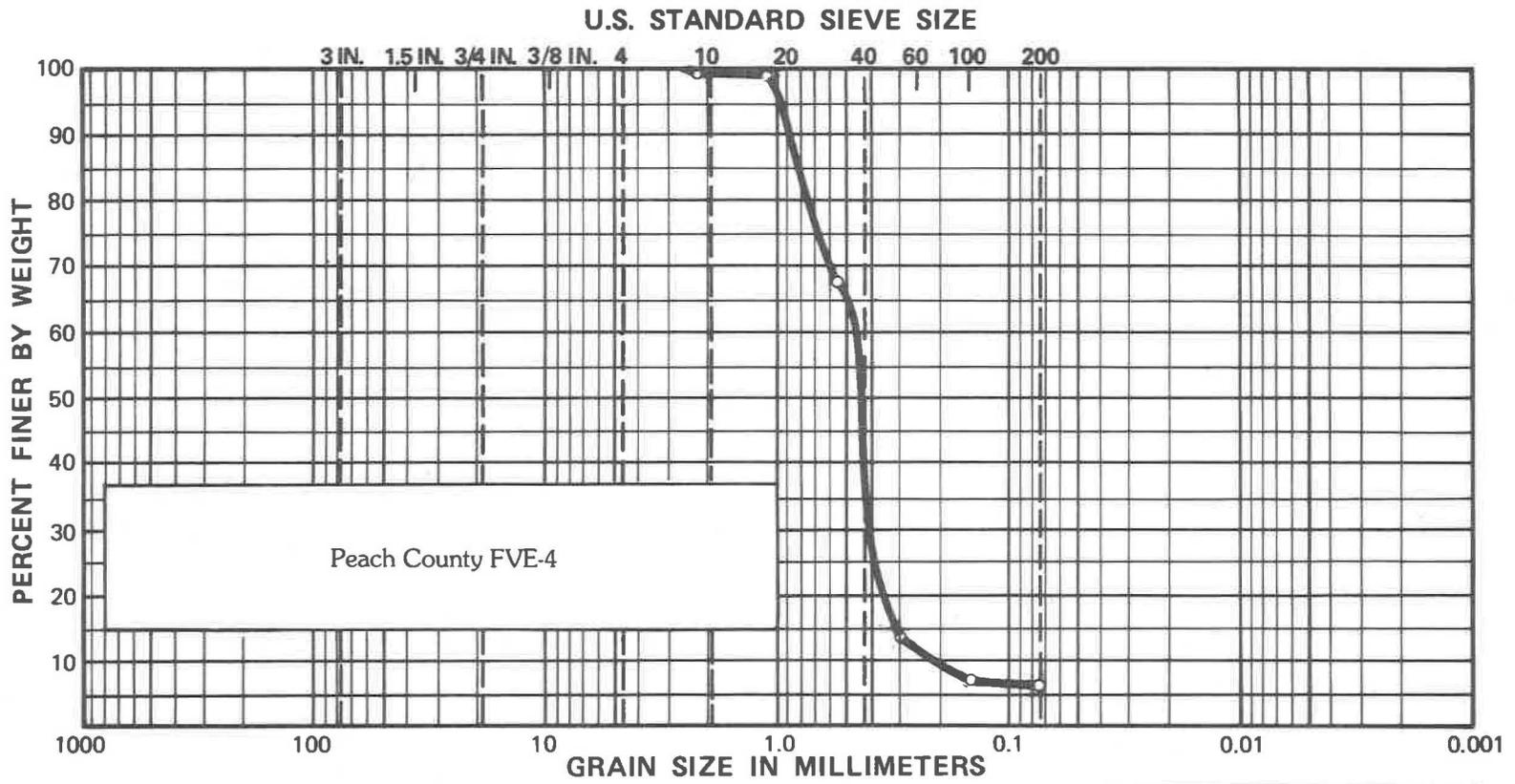


COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE	COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 119. Size Distribution Curve of Sample FVE-3.



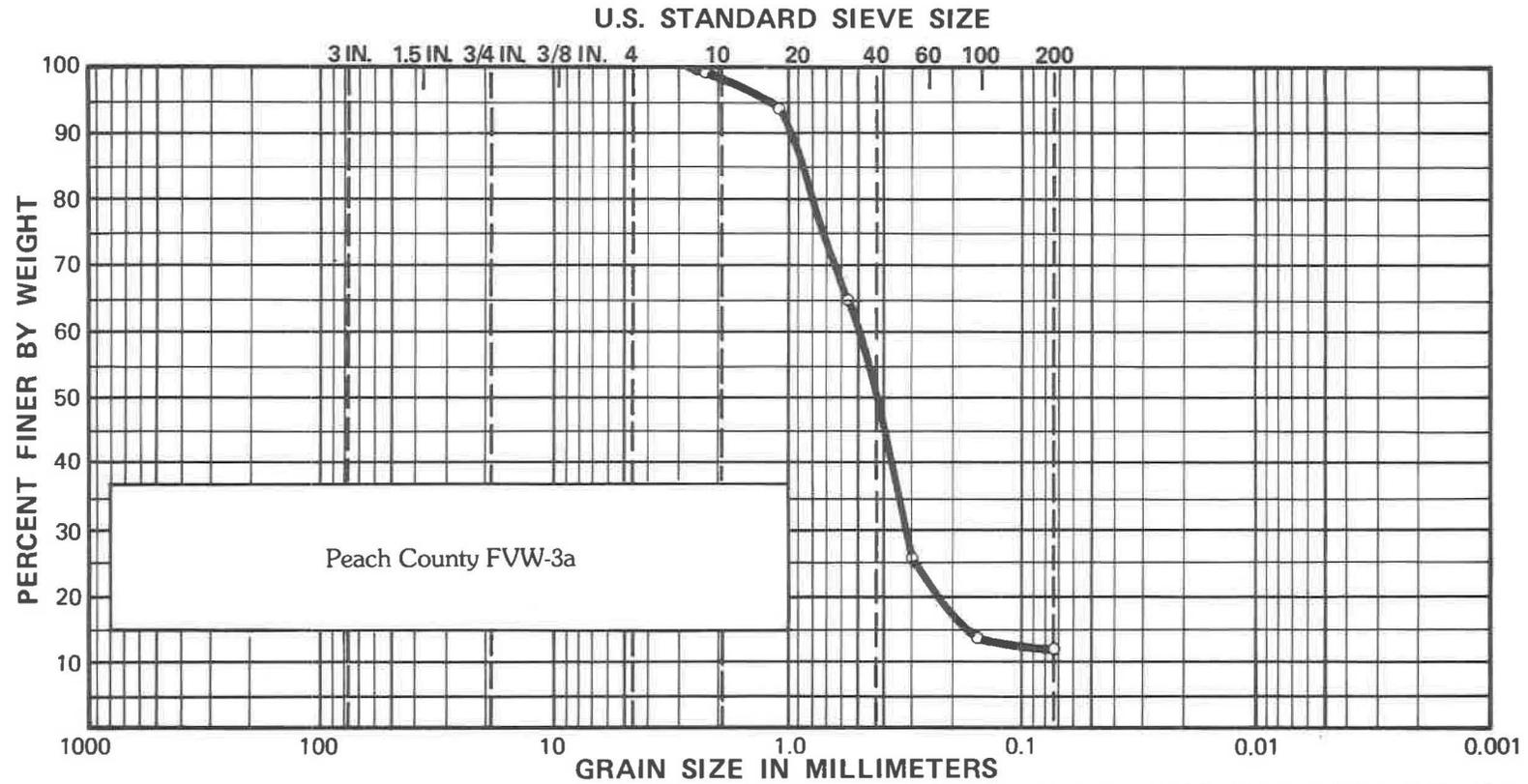
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY		
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 120. Size Distribution Curve of Sample FVE-4.

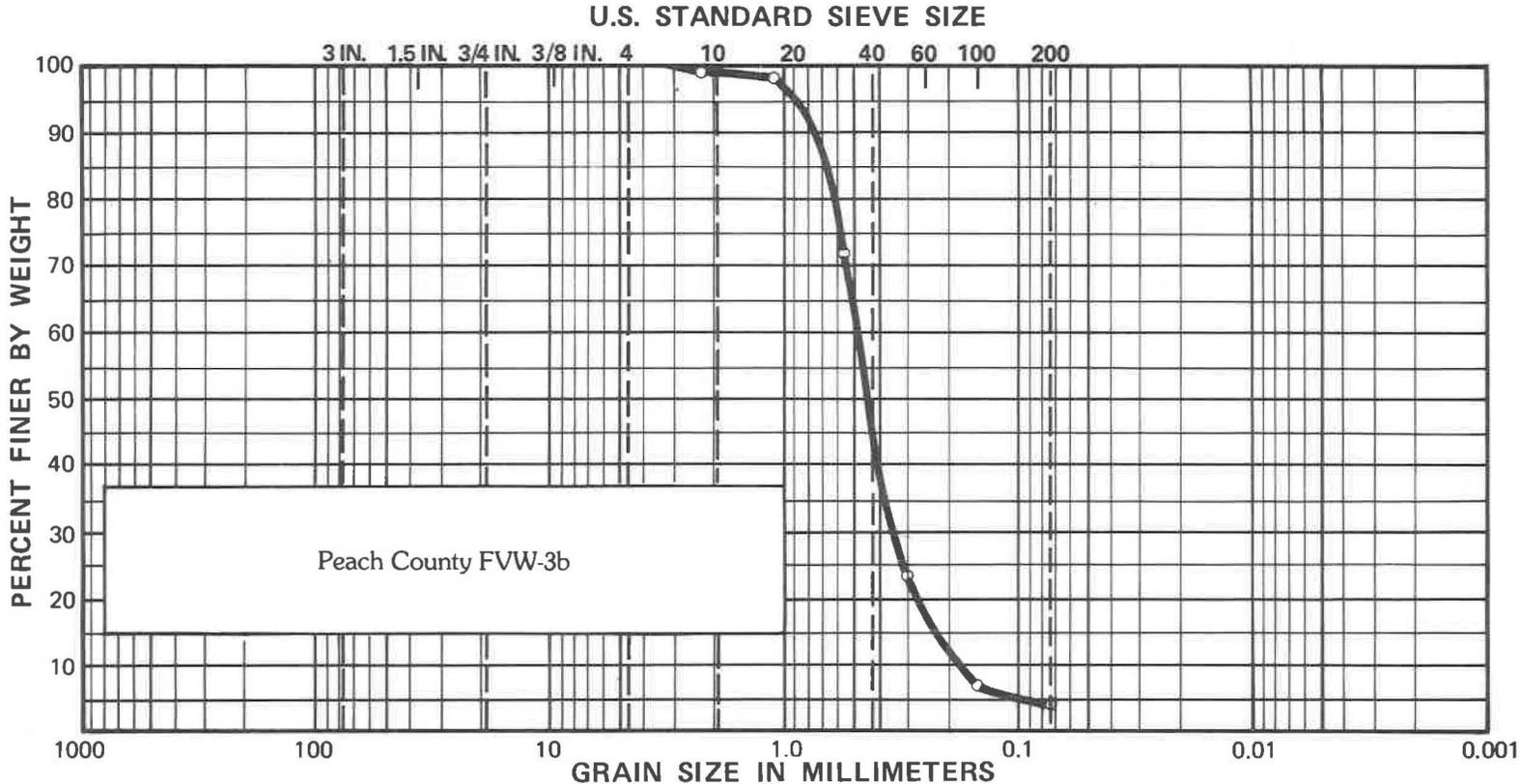


GRADATION CURVE

*Unified Soil Classification System

**Wentworth-Lane Class Limits

Figure 121. Size Distribution Curve of Sample FVW-3a.

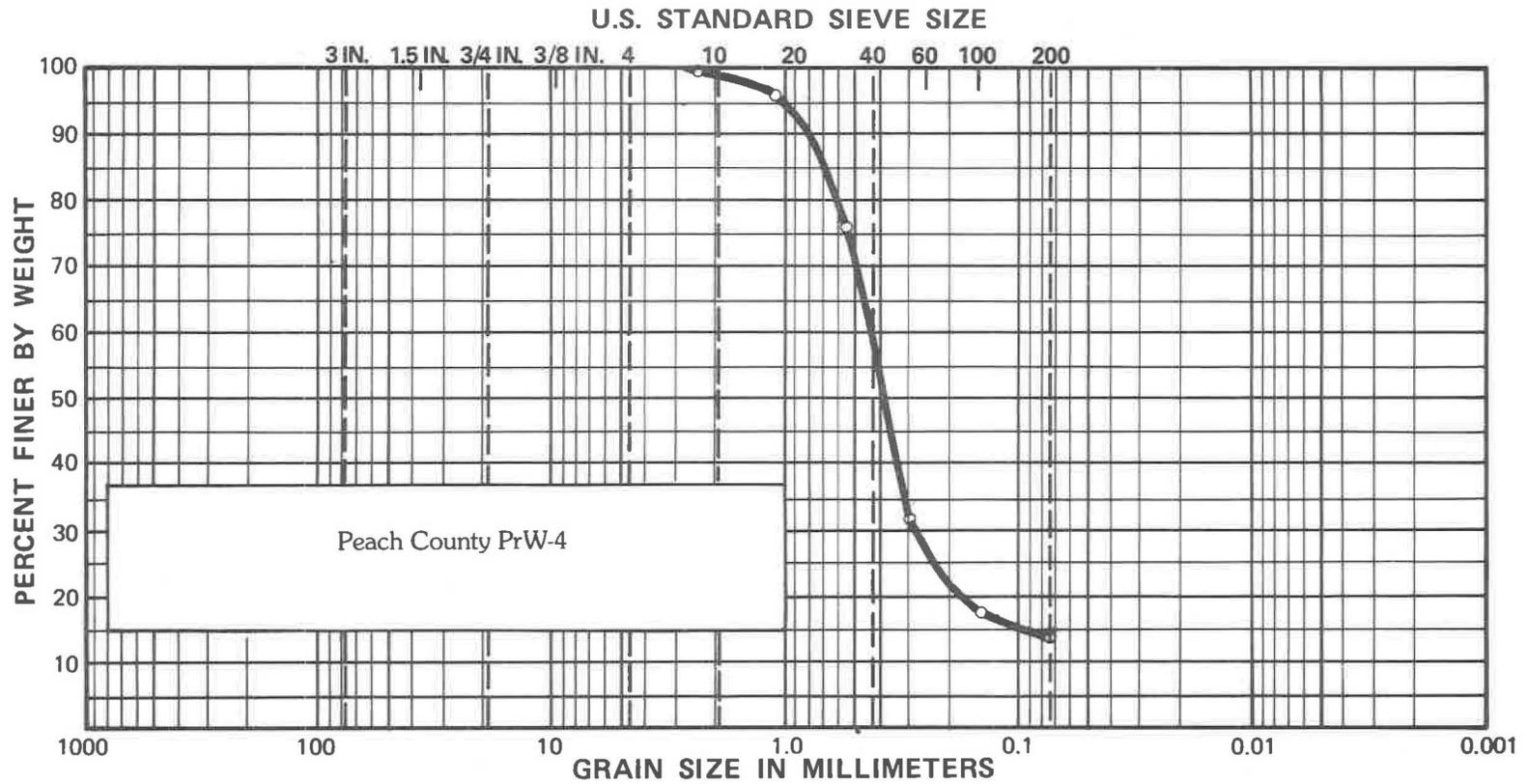


COBBLES	GRAVEL				SAND			SILT OR CLAY	*			
	COARSE	FINE		COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 122. Size Distribution Curve of Sample FVW-3b.



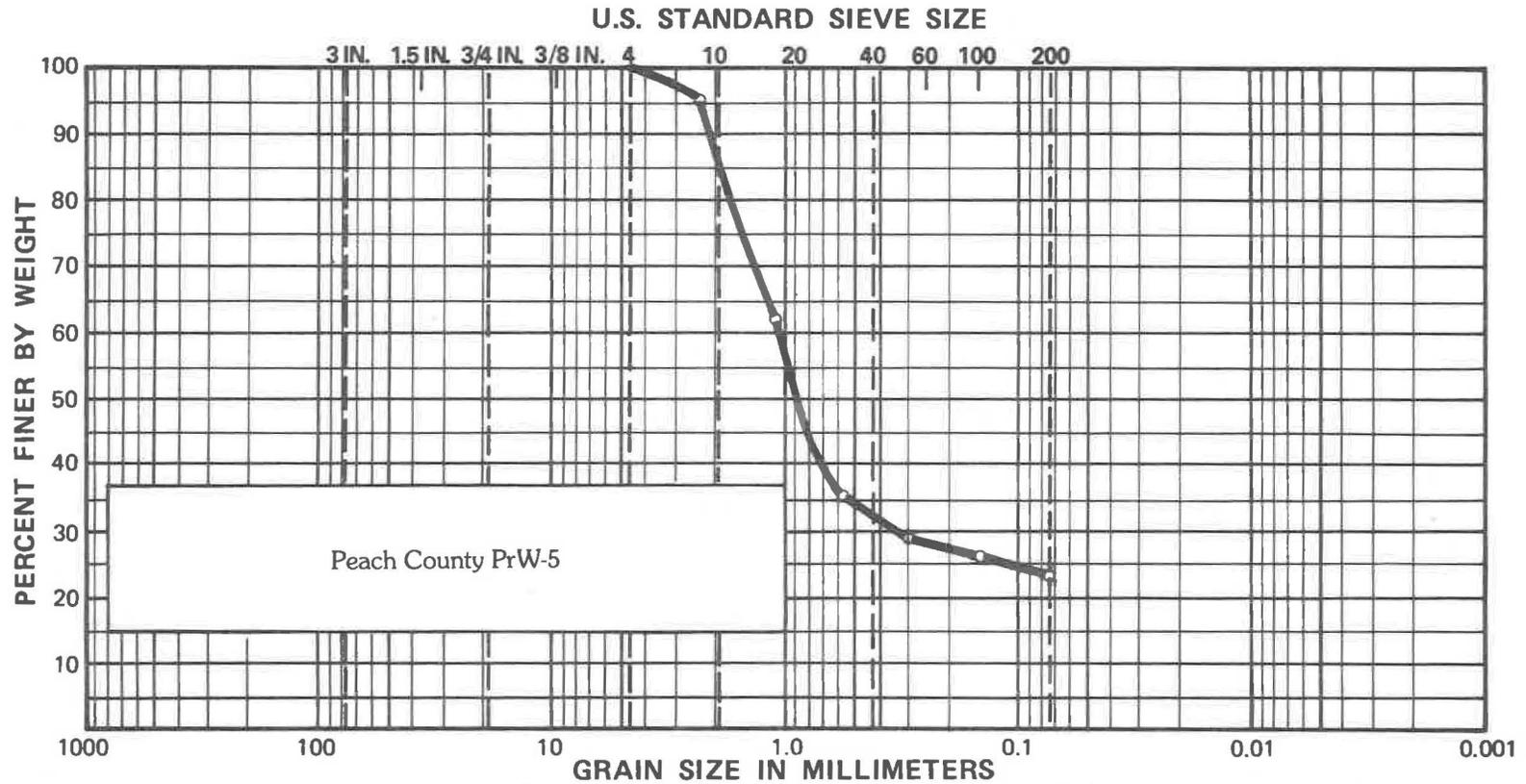
COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE		COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System

**Wentworth-Lane Class Limits

GRADATION CURVE

Figure 123. Size Distribution Curve of Sample PrW-4.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System

**Wentworth-Lane Class Limits

GRADATION CURVE

Figure 124. Size Distribution Curve of Sample PrW-5.

Table 21. Peach County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
FVE-1	2 feet	trench	2 feet	1	no ⁴	2
FVE-2	5 feet	trench	5 feet	1	no	2
FVE-3	8 feet	auger	8 feet	2	no ⁴	2
FVE-4	4 feet	trench	15 feet	1	no	1
FVW-3a	5 feet	trench	5 feet	1	no	2
FVW-3b	4 feet	trench	4 feet	1	no	2
PrW-4	4 feet	auger	10 feet	1	no	1
PrW-5	8 feet	trench	8 feet	0	no	0

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

Quitman

Geology and Physiography

Quitman County lies within the Fall Line Hills District of the Coastal Plain Province. The surficial sediments of the county are derived from the Ripley, Providence, Clayton and Baker Hill Formations.

Previous Studies

Teas (1921, p. 230-232) noted small-scale coarse aggregate production from several pits in Quitman County (fig. 125, Ts-44) (Central of Georgia Railway pit et al). A gravel deposit of "road quality" was also noted (fig. 125, Ts-45). In addition Teas (1921, p. 231-232) described deposits of the "second" terrace, found both north and south of Georgetown, and an outcrop of gravel, 3 to 6 feet thick, west of Georgetown.

Present Study

The soil association used in targeting areas of Quitman County was #24, which is present in interfluvial areas in the eastern, central western, and southwestern portions of Quitman County. Geomorphic features targeted are terrace surfaces along the Chattahoochee River in southwestern and central western Quitman County. Two samples from Quitman County were sieved (figs. 125-127, Table 22). Sample Gtn-1 is from a high terrace deposit and San-1 is from a ridge containing Cretaceous sediments.

Evaluation

Neither of the samples meet ASTM standard C-33 for fine aggregate. The deposit from which the sample Gtn-1 was taken is too thin and of too small an areal extent to have any potential for aggregate production.

Even though the deposit represented by sample San-1 is of large areal extent, and relatively thick, it has deficiencies in both the fine and coarse size ranges (fig. 126). An additional factor limiting development of this deposit is the questionable availability of water for processing of the sand.

The deposit represented by San-1 could be exploited for fine aggregate, but the cost of processing and the amount of waste material present would make it economically unfeasible.

Mining activity

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

Summary evaluation

The areas underlain by Cretaceous sediments are considered to have the best potential for fine aggregate production within the county. In general, the potential for commercial aggregate production in Quitman County is considered to be low.

Table 22. Quitman County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
San-1	9 feet	auger	25 feet	1	no	1
Gtn-1	5 feet	trench	5 feet	1	no	3

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

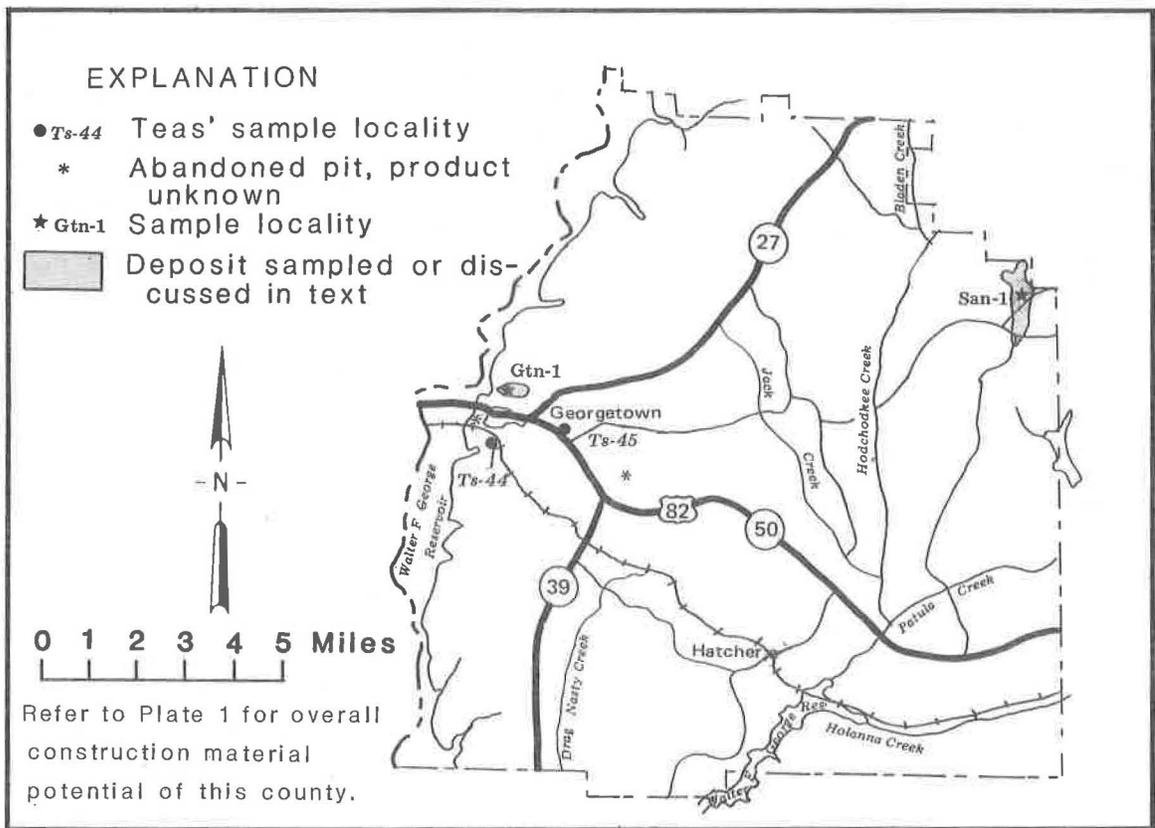
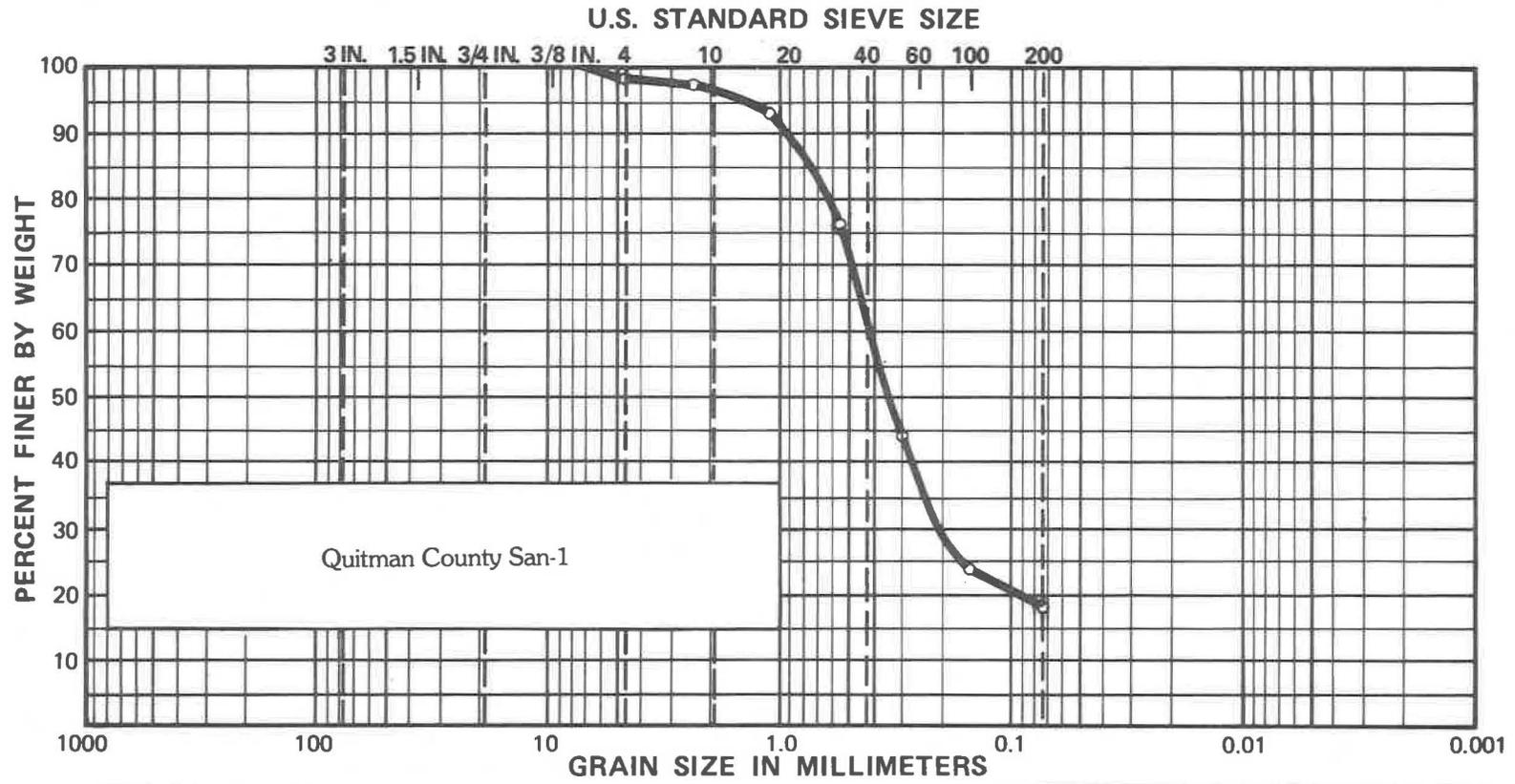


Figure 125. Map of Quitman County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.

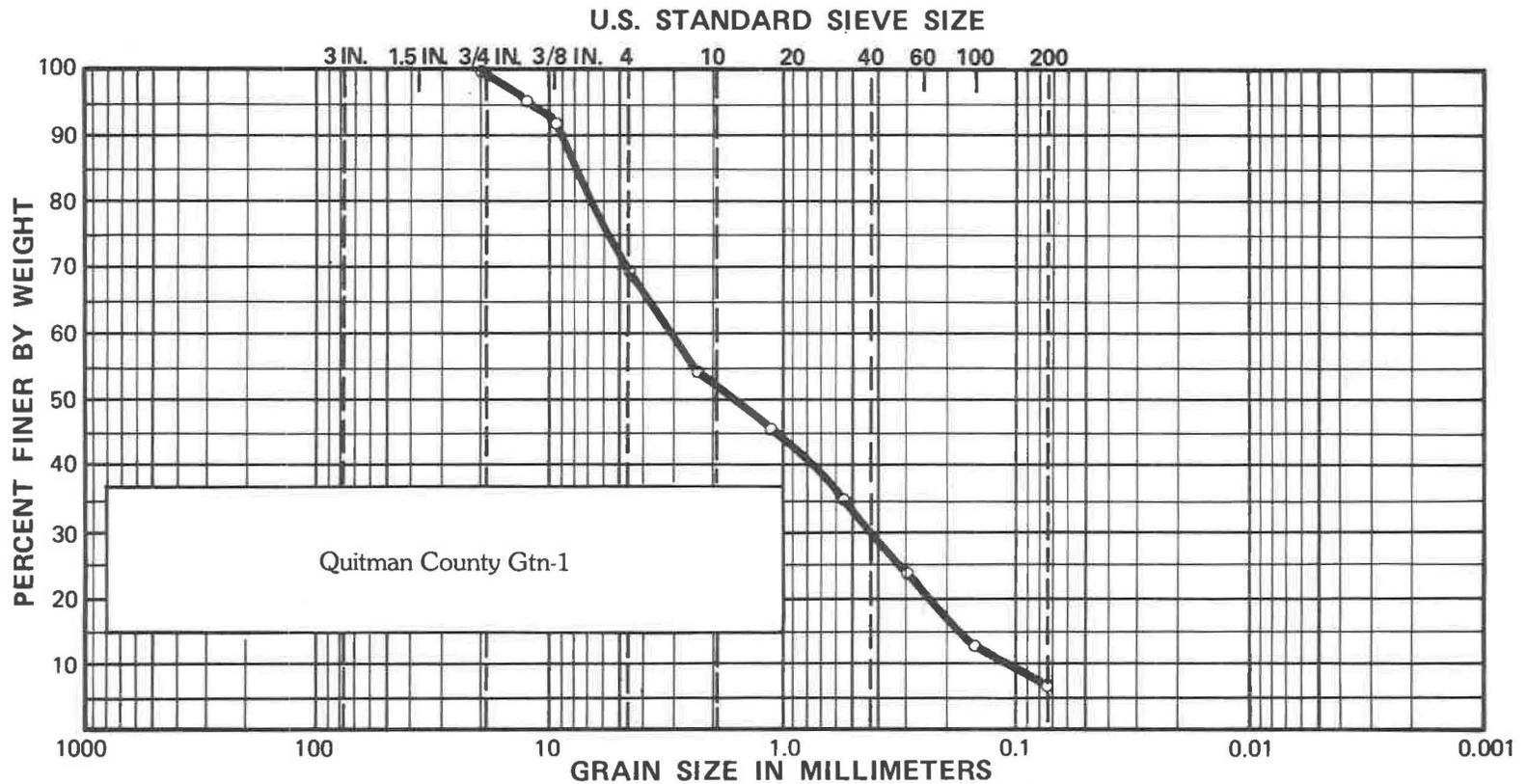


COBBLES	GRAVEL				SAND			SILT OR CLAY *						
	COARSE		FINE		COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 126. Size Distribution Curve of Sample San-1.



COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE		COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine very fine	very coarse	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 127. Size Distribution Curve of Sample Gtn-1.

Randolph County

Geology and Physiography

Randolph County lies within the Fall Line Hills District of the Coastal Plain Province. Surficial sediments of the county are derived from the Providence Sand, Clayton, Baker Hill, Tuscahoma, Hatchetigbee, and Tallahatta Formations, undifferentiated Claiborne Group, and residuum of the Ocala and Oligocene limestones.

Previous Studies

Teas (1921, p. 232) described a thin surficial sand 2 to 5 feet thick near Shellman (fig. 128, Ts-46), an extensive sandy area with considerable overburden near Coleman (fig. 128, Ts-47) and surficial deposits of sand 3 to 4 feet thick near Benevolence (fig. 128, Ts-48).

Present Study

The soil association used in targeting areas of Randolph County was #39, which is present in the interfluvial areas in eastern, southern, and southwestern Randolph County. One sample (MrC-1) from Randolph County was sieved (figs. 128, 129; Table 23). This sample is typical of sand of the undifferentiated Claiborne Group which crops out along the streams of southern and eastern Randolph County.

Evaluation

Sample MrC-1 does not meet ASTM standard C-33 and is not suitable for construction aggregate. The deposit represented by this sample has a clayey sand overburden which probably limits its commercial potential.

Mining activity

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

Summary evaluation

The only areas of Randolph County that have any potential as a source for aggregate are generally along the streams in the southern and eastern portions of the county. Even these areas have limited potential as sources of aggregate due to the overburden from the residuum of the Ocala and Oligocene limestones. The potential for commercial-scale production of either fine or coarse construction aggregate in Randolph County is considered to be low.

Table 23. Randolph County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
MrC-1	15 feet	trench	15 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

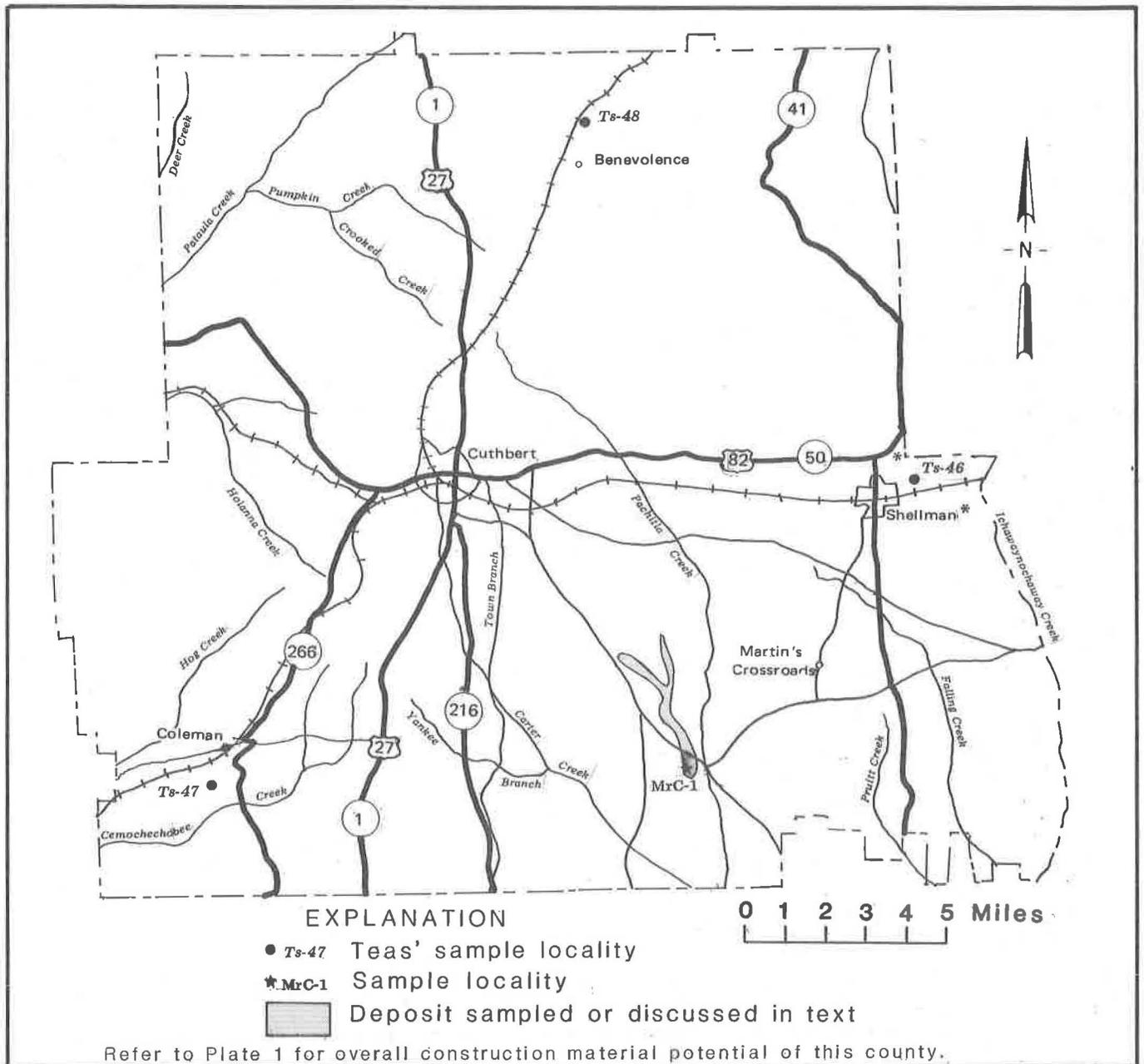
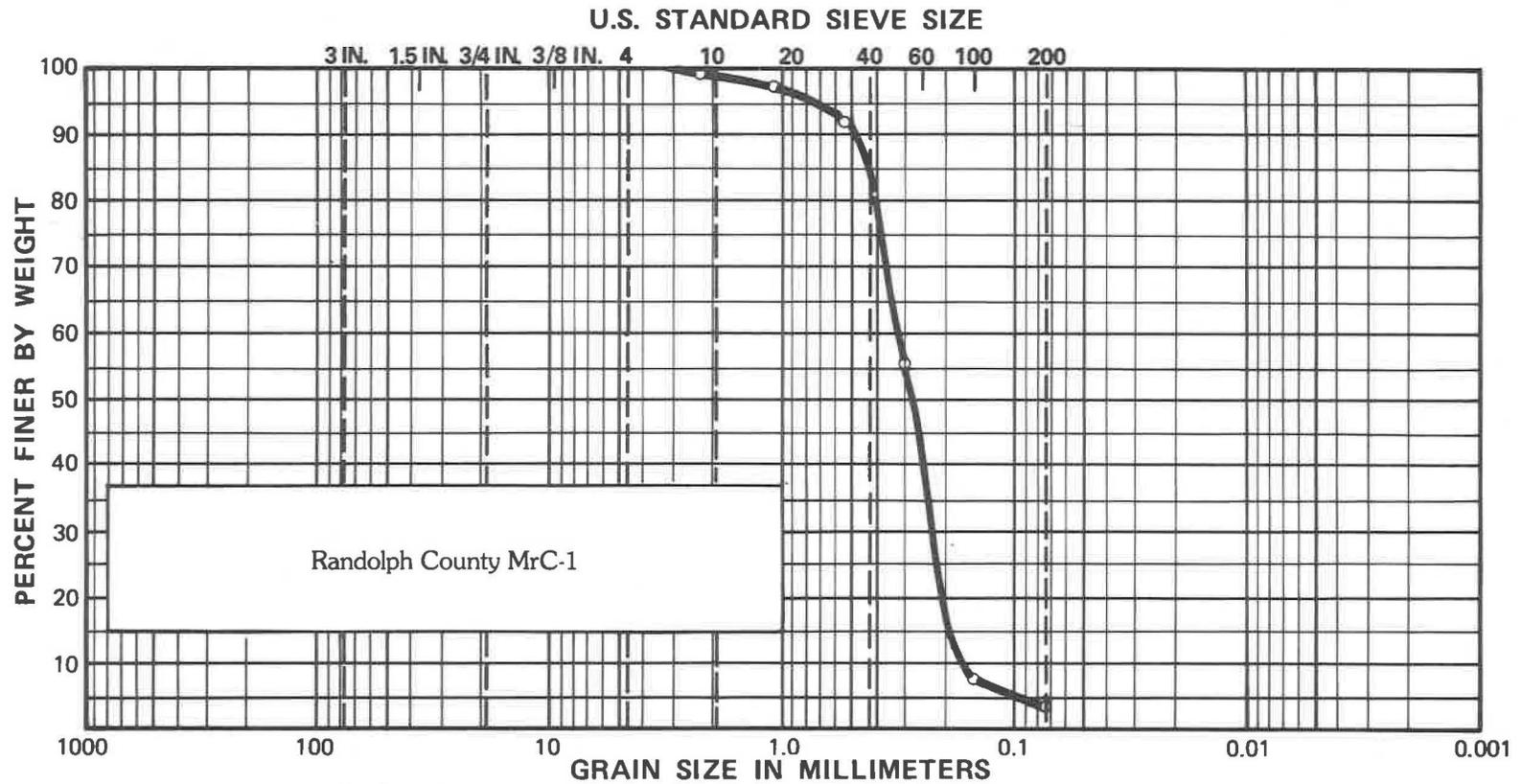


Figure 128. Map of Randolph County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 129. Size Distribution Curve of Sample MrC-1.

Schley County

Geology and Physiography

Schley County lies within the Fall Line Hills District of the Coastal Plain Province. The sediments present in Schley County are derived from the Providence Sand, Ripley, Clayton and Baker Hill Formations, and the residuum of the Ocala and Oligocene limestones.

Previous Studies

Teas (1921, p. 237) noted thin surficial deposits of sand throughout the county. He (Teas, 1921, p. 237) further noted that fine- to medium-grained sands of the Ripley Formation crop out in the northern half of the county.

Present Study

The soil association used in targeting areas of Schley County was Lakeland, which is present in interfluvial areas throughout the county. The geomorphic feature targeted is an area of the floodplain of Deer Creek displaying a complexly braided stream pattern. Three samples from two sites in Schley County were sieved (figs. 130-133; Table 24).

Evaluation

With the exception of sample EIN-1b, none of the samples have appreciable potential as an aggregate source. The deposit represented by samples EIN-1a and EIN-1b could be exploited for mortar sand, but would not be suitable for concrete sand.

The deposit represented by sample EIN-1b represents the lower 6 feet of a trench sample of an exposure of sediments 22 feet thick along a road cut. Sediments from this deposit could be upgraded to meet ASTM standard C-33; however, the upper 16 feet of the outcrop fail the requirements in both the fine and coarse portions (fig. 131). Due to the overburden present, this deposit is not considered to have any economic potential for the production of construction aggregate.

Mining activity

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

Summary evaluation

The potential for either fine or coarse aggregate production in Schley County is considered to be low. The Cretaceous sediments, present in the northern portion of Schley, offer the best possibilities for commercial deposits of aggregate.

Table 24. Schley County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
EIN-1a	16 feet	trench	16 feet	1	no ⁴	2
EIN-1b	6 feet	trench	6 feet	1	no ⁴	1
EIN-2	11 feet	auger	11 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

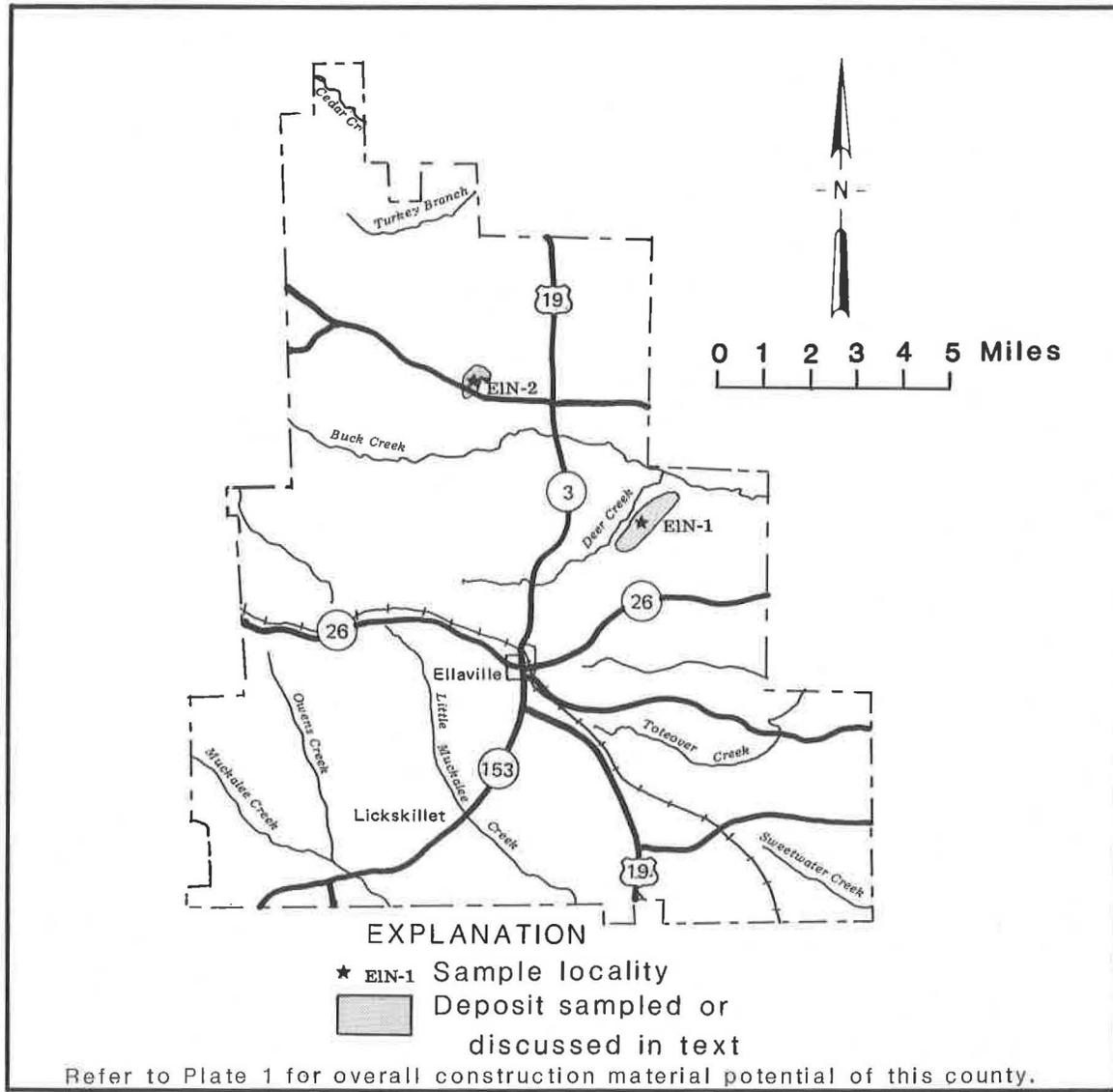
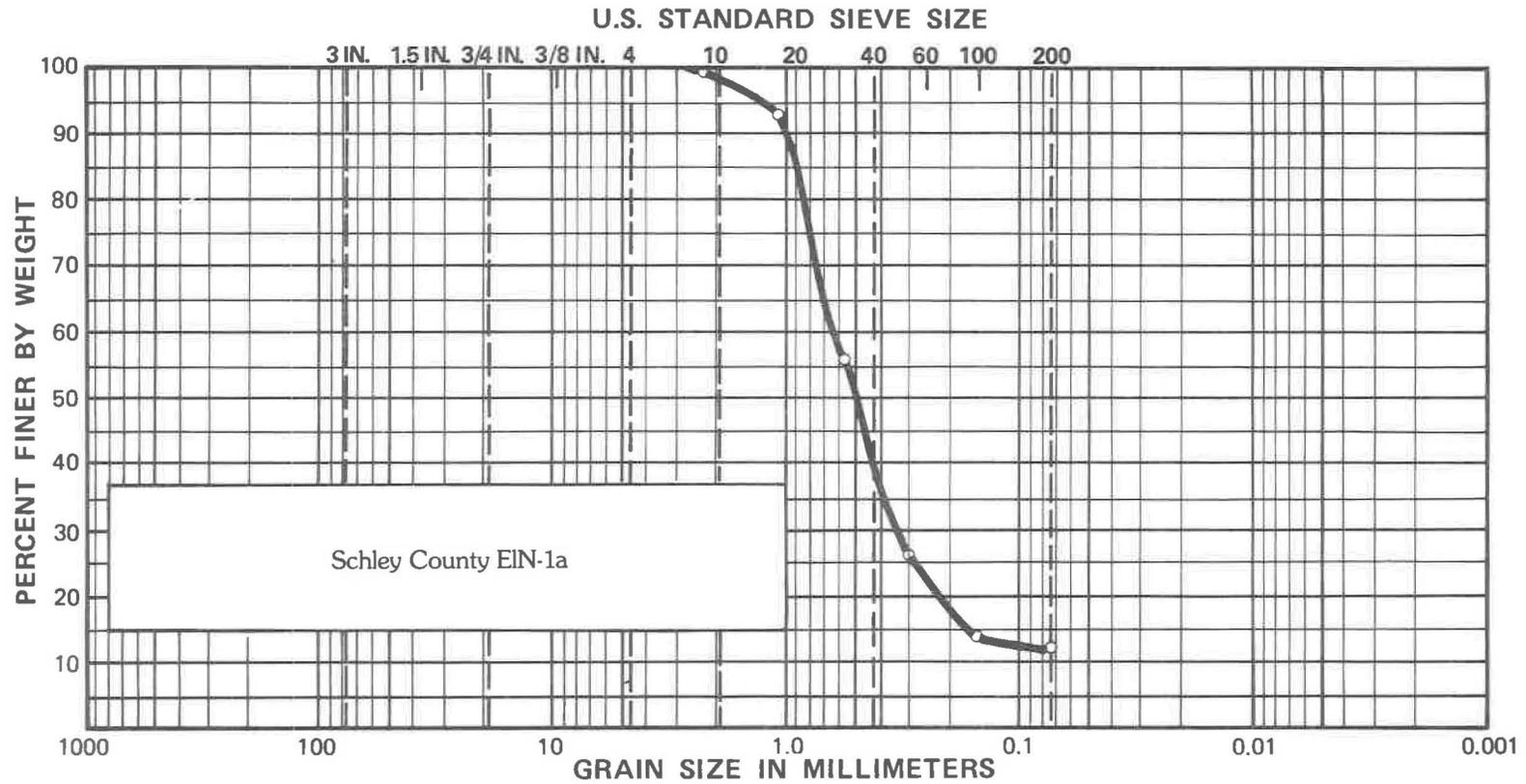


Figure 130. Map of Schley County Showing Localities and Deposits Sampled.

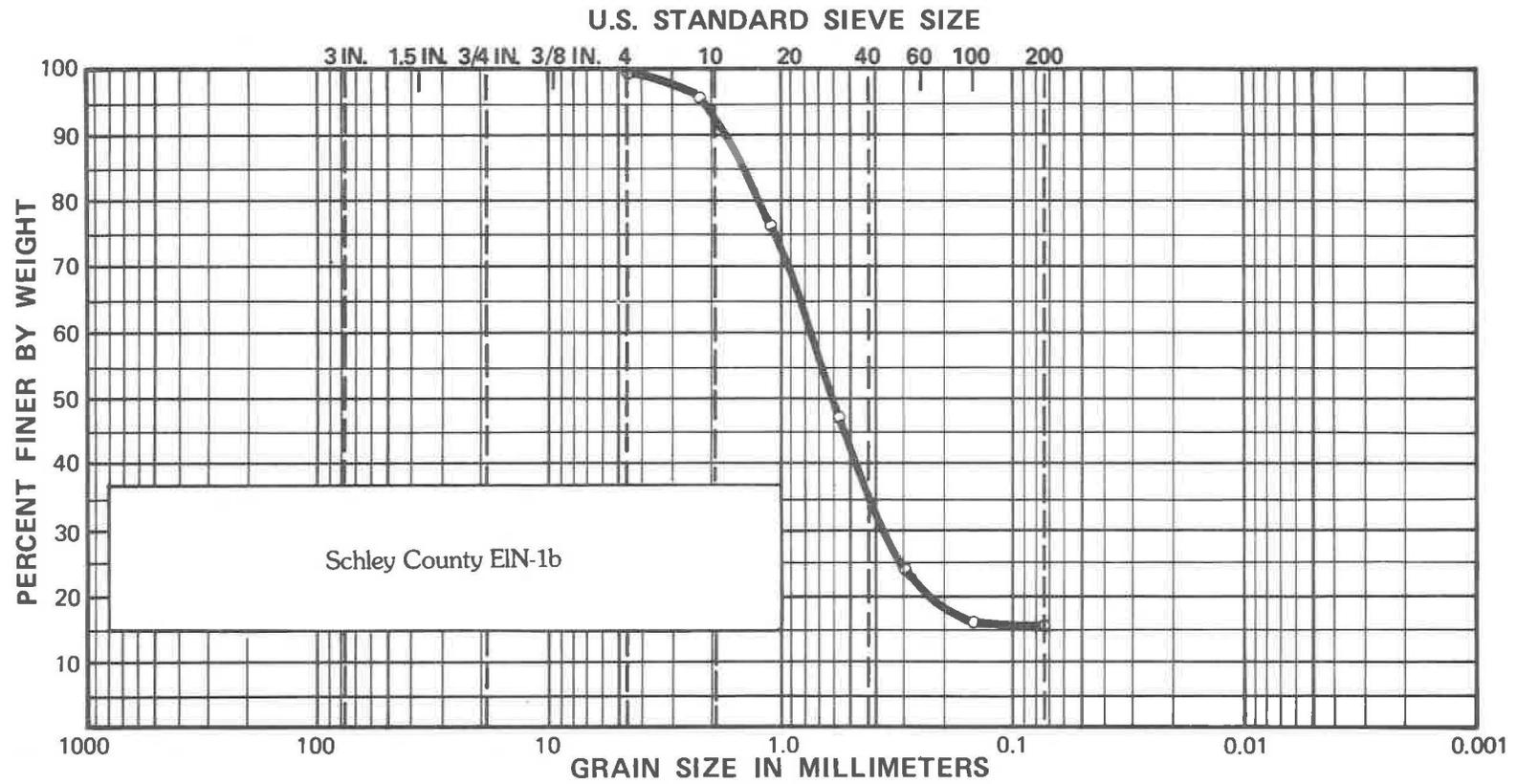


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 131. Size Distribution Curve of Sample EIN-1a.

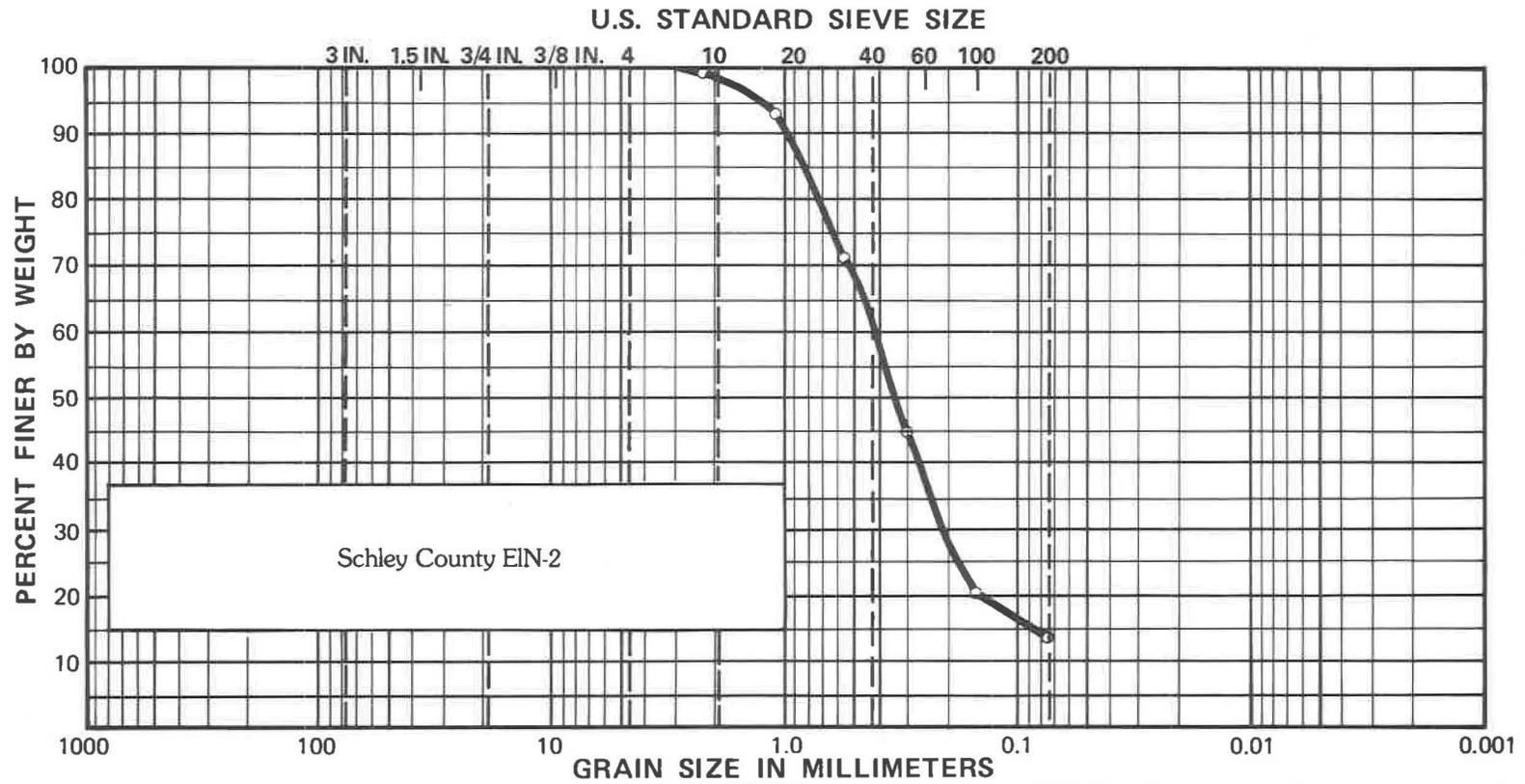


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	coarse	SAND medium fine very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 132. Size Distribution Curve of Sample EIN-1b.



COBBLES		GRAVEL			SAND			SILT OR CLAY *						
		COARSE	FINE		COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	SILT coarse medium fine		very fine	CLAY coarse medium fine	

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 133. Size Distribution Curve of Sample EIN-2.

Seminole County

Geology and Physiography

Seminole County lies within the Dougherty Plain District of the Coastal Plain Province. Surficial sediments present are derived from residuum of the Ocala Limestone.

Previous Studies

Teas (1921, p. 188) reported that large quantities of medium-grained sand are in the Chattahoochee River floodplain, which at that time formed the western boundary of Decatur County.

Present Study

The soil association used in targeting areas of Seminole County was Troup, which is present in interfluvial areas in southern and eastern Seminole County. Geomorphic features targeted are point bars in western Seminole County along the Chattahoochee River. One sample (Des-2) from Seminole County (figs. 134, 135) was sieved. This sample is from a borrow (?) pit located south of U.S. Highway 84 (figs. 136, 137).

Evaluation

The pit (Des-2) is approximately three acres in extent and contains a deposit of gravelly medium- to coarse-grained sand varying in thickness from 3 to 10 feet (fig. 135, Table 25). This deposit also contains boulders of chert, clay lenses and clayey fine-grained sand. The sand pit from which sample Des-2 was taken is quite variable with regard to thickness and grain size of the sand, and the types of material encountered. The presence of chert boulders would be a hindrance to mining the deposit. The chert also may be present as sand size particles which could render the deposit useless as a concrete aggregate.

Mining activity

The only aggregate plant in Seminole County, now inactive, was owned by Radcliff Materials (fig. 134, D-214-F) of Mobile, Alabama. The products of this plant were construction sand and gravel mined from the banks and point bars along the Chattahoochee River. The sand and gravel were mined using a dredge which pumped the material onto a barge. The material was then transported to the company's plant in Chattahoochee, Florida where the sand and gravel were processed. Five acres were permitted to Radcliff Materials, and the acreage has been reclaimed. No production figures are available.

Summary evaluation

Inasmuch as Seminole County is within the Dougherty Plain, the potential for commercial production of either fine or coarse aggregate is considered to be generally low. With the exception of possible point bar deposits along the Chattahoochee River, Seminole County is considered to have a very low potential for commercial production of fine or coarse aggregate.

Table 25. Seminole County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Des-2	8 feet	trench	0-8 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

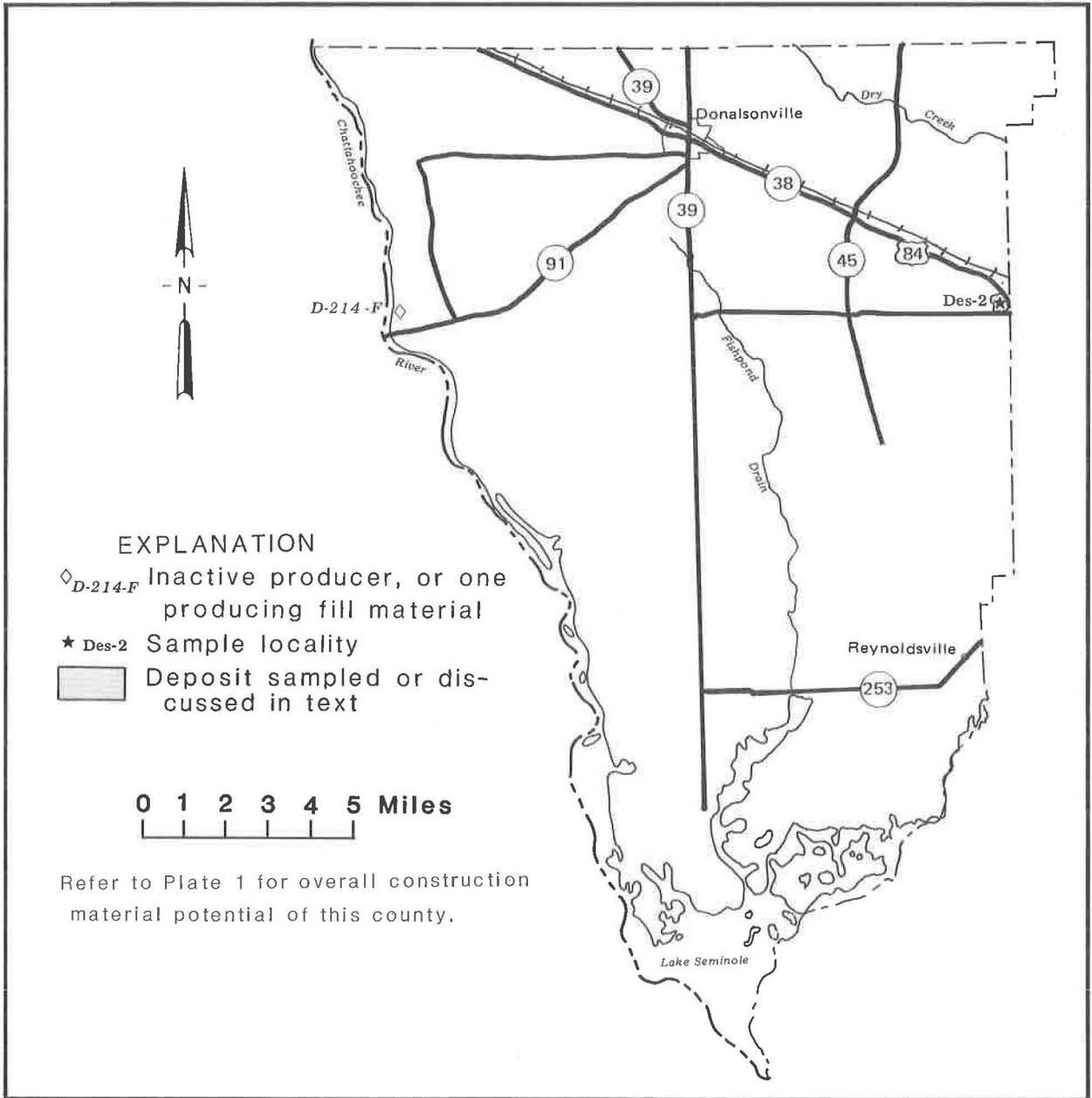
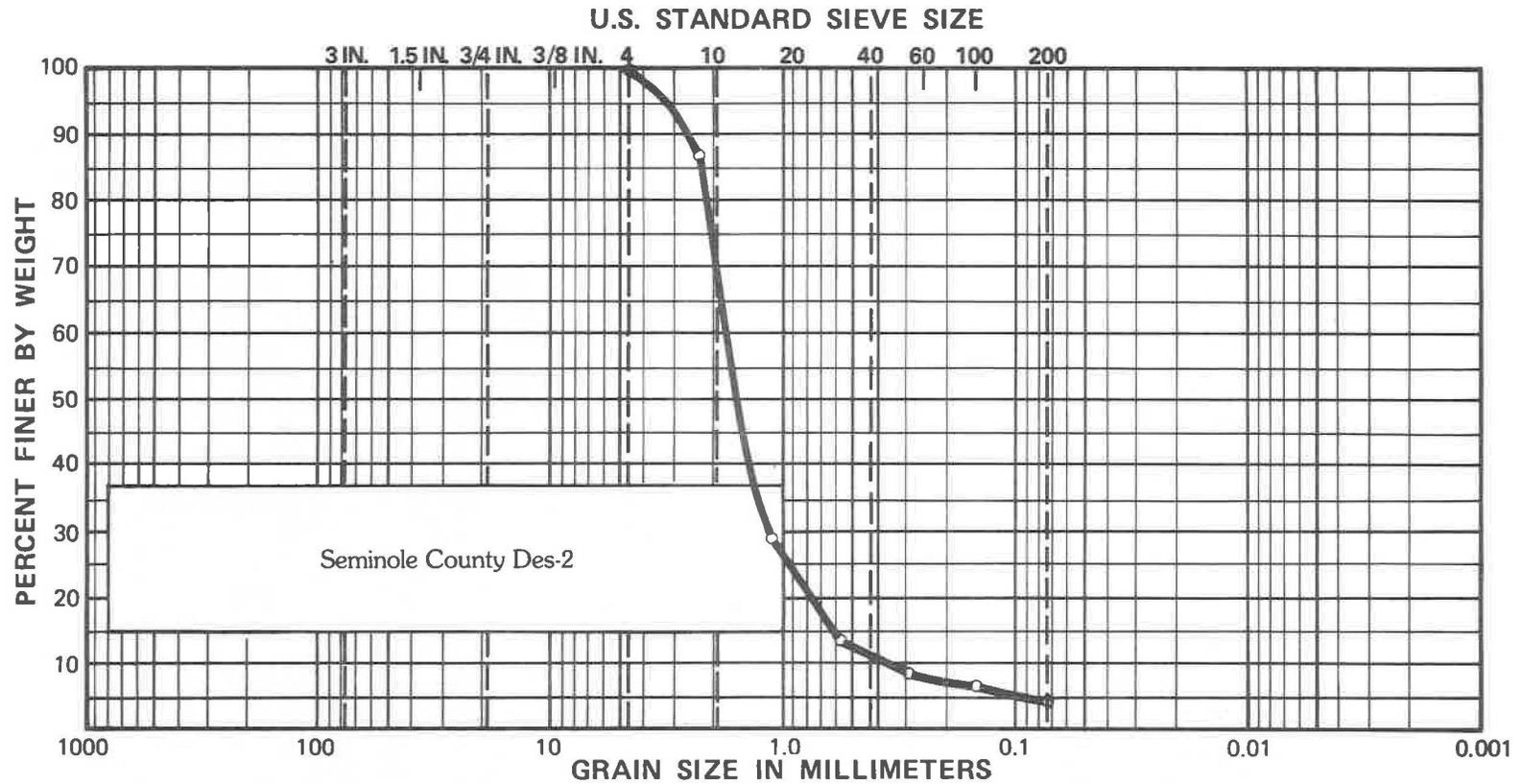


Figure 134. Map of Seminole County Showing Sample Locality, Pits, and Deposit Sampled.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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



Figure 136. Abandoned Sand Pit, Sample Locality Des-2, Seminole County.

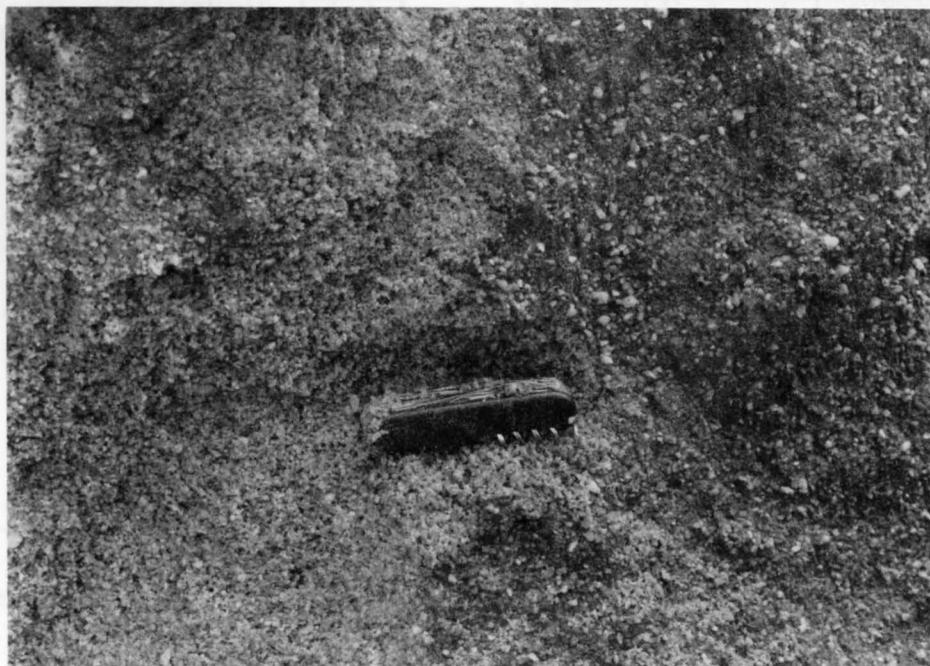


Figure 137. Close-up of Coarse Sandy Zone Exposed in Abandoned Pit at Locality Des-2, Seminole County.

Stewart County

Geology and Physiography

Stewart County lies within the Fall Line Hills District of the Coastal Plain Province. The surficial sediments of the county are derived from the Blufftown, Cusseta, Ripley, Providence, Clayton, and Baker Hill Formations, undifferentiated Claiborne Group deposits, and residuum of the Ocala and Oligocene limestones.

Previous Studies

Teas (1921, p. 238-241) noted a few localities of gravelly sand deposits (fig. 138, Ts-49 [Booth and Pope properties], Ts-52, Ts-53, Ts-54 [Kubo property]). At the time of his writing (Teas, 1921, p. 239), one locality, Ts-50 (Battle property) was an inactive gravel pit and another locality, Ts-51 (Fitzgerald property) was an active aggregate pit within a terrace deposit.

Present Study

The soil associations used in targeting areas of Stewart County were Troup, Orangeburg, and Faceville, which are present in interfluvial areas in western, central, southern, and northeastern Stewart County. Geomorphic features targeted are point bars and terrace surfaces along the Chattahoochee River in western Chattahoochee County. Eight samples from 7 localities (figs. 138-146; Un-1; Lum-1; Om-1,2, 3,4; Brk-1a,1b; Table 26) in Stewart County were sieved in the initial study of Stewart County. A detailed study of the point bar represented by Sample Un-1 was carried out due to its extremely promising economic potential for aggregate production. Twenty-six holes varying in depth from 11 to 20 feet were drilled for this detailed study.

Evaluation

None of the samples meet ASTM standard C-33, but five samples (Un-1, Lum-1, Om-1, Om-4, Brk-1b) marginally failed and probably could be upgraded to meet the standard.

Sample Un-1, represents the lower, more gravelly, portion of a point bar along the Chattahoochee River. This lower portion is 4 feet thick and has a potential for production of coarse as well as fine aggregate. A detailed study of the point bar represented by Sample Un-1 revealed two tracts, 40 and 60 acres in areal extent, that contain gravel. Borings of these two tracts show similarities in that both tracts generally are underlain by an upper zone of clayey, silty, fine- to coarse-grained sand (fig. 147) and a lower zone of slightly clayey, gravelly, fine- to very coarse-grained sand (fig. 149). Within the 40 acre tract, the lower zone is approximately 5 feet thick and averages 17 percent particles greater than 2.38 mm in diameter. The upper zone within the 40 acre tract averages 9 feet in thickness with an overburden (fig. 148) ranging from 3 to 11 feet thick. The 60

acre tract is underlain by an upper zone 8 feet thick and the lower zone averages 5 feet in thickness with approximately 14 percent of the particles being greater than 2.38 mm in diameter. The overburden in this tract is as much as 5.5 feet thick.

Reserve estimates of the 40 acre tract are 320,000 and 580,000 cubic yards for the upper and lower zones respectively. The 60 acre tract has reserves of 480,000 and 750,000 cubic yards for the upper and lower zones respectively. Water for processing could be easily obtained from the Chattahoochee River adjacent to the deposit. The probable best means of mining and transporting the sand and gravel of this deposit would be by dredge and barge.

Sample Om-1, is from a high river terrace deposit of the Chattahoochee River. This deposit has little potential for production of fine and coarse aggregate due to its sporadic occurrence.

Sample Om-4 is from a 6 foot thick gravelly sand layer of a point bar along the Chattahoochee River. This deposit could be as large as 90 acres in areal extent, with potential reserves in excess of one million cubic yards, and, therefore, has potential for commercial-scale production of fine and coarse aggregate. Water for processing is available from the Chattahoochee River. This deposit is within 2 miles of a rail line, thus providing transportation for the finished products.

Sample Lum-1 is from an abandoned borrow pit and appears suitable as a source of fine aggregate. The deposit could have an areal extent of as much as 5 acres, thus having unproven reserves in excess of 140,000 cubic yards. Obtaining water for processing the sand could pose a problem since the deposit is located on a ridge. This deposit is probably too small to warrant a commercial-scale aggregate operation.

Sample Om-2 is from an auger hole in floodplain deposits on the bank of the Chattahoochee River. The deposit that this sample represents has some potential for production of fine aggregate. The areal extent of this deposit could be as large as 20 acres. Assuming a 20 acre area, the unproven reserves of this deposit could be in excess of 300,000 cubic yards.

Sample Brk-1b is from a deposit on a ridge that has 7 feet of overburden and, thus, is not considered further.

Mining activity

There are no active aggregate commercial operations within Stewart County.

Summary evaluation

Deposits represented by Om-4 and Un-1 have the highest potential for production of aggregate in Stewart County. Water for processing the sand and gravel is easily

available to both deposits. The deposit represented by Un-1 shows promise of being larger (approximately five times) than Om-4. Transportation would probably be more readily available for the deposit represented by sample Om-4 (rail) than for Un-1 (dredge and barge). The potential for fine aggregate production within Stewart County is considered to be moderate.

Table 26. Stewart County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Un-1	4 feet	trench	4 feet	1	no ⁴	3
Lum-1	12 feet	auger	18 feet	1	no ⁴	2
Om-1	6 feet	auger	6 feet	3	no ⁴	3
Om-2	14 feet	auger	10 feet	3	no ⁴	2
Om-3	10 feet	auger	8 feet	3	no	2
Om-4	6 feet	trench	6 feet	3	no ⁴	3
Brk-1a	0-7 feet	auger	7 feet	1	no	2
Brk-1b	7-11 feet	auger	4 feet	1	no ⁴	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

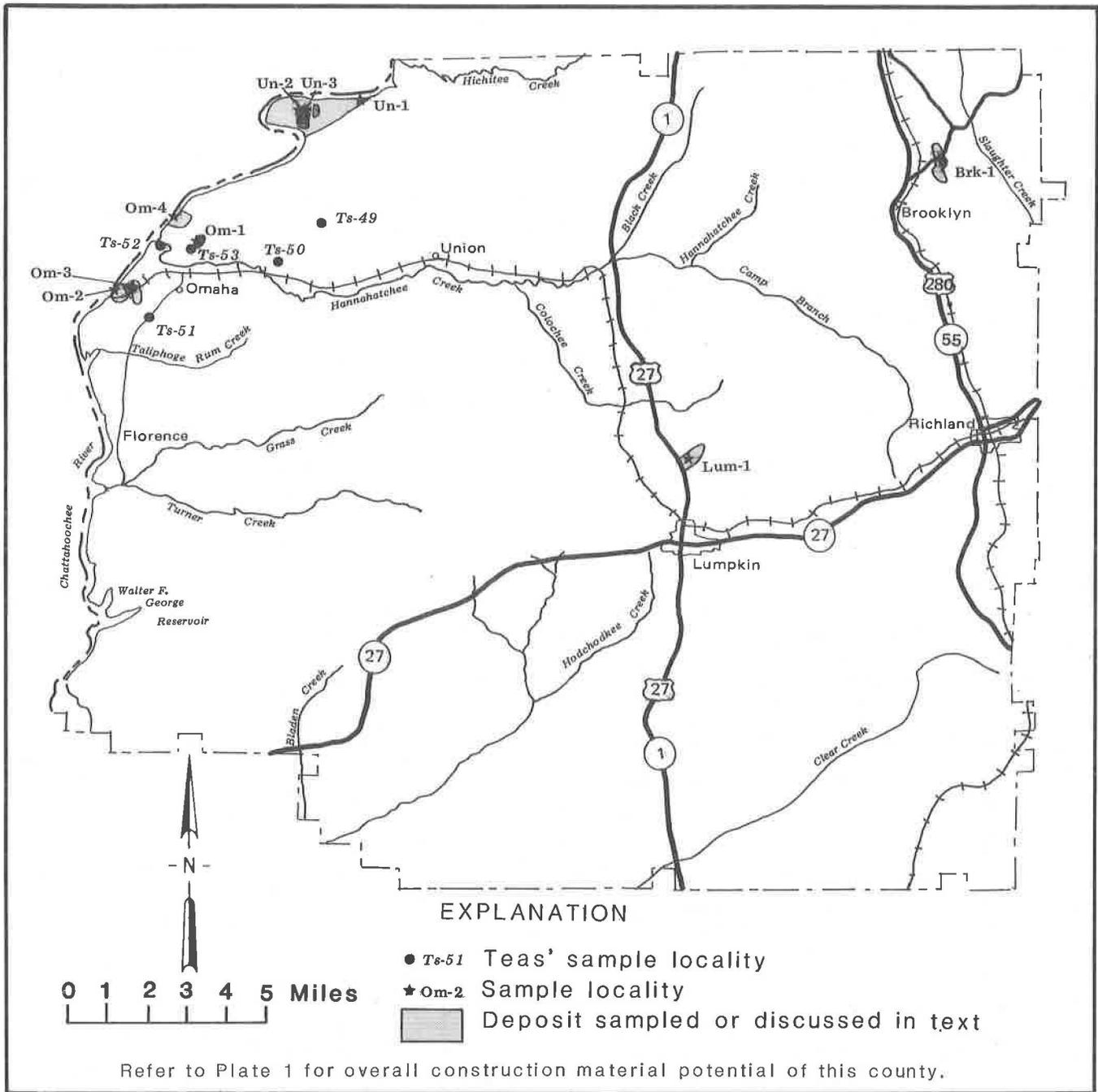
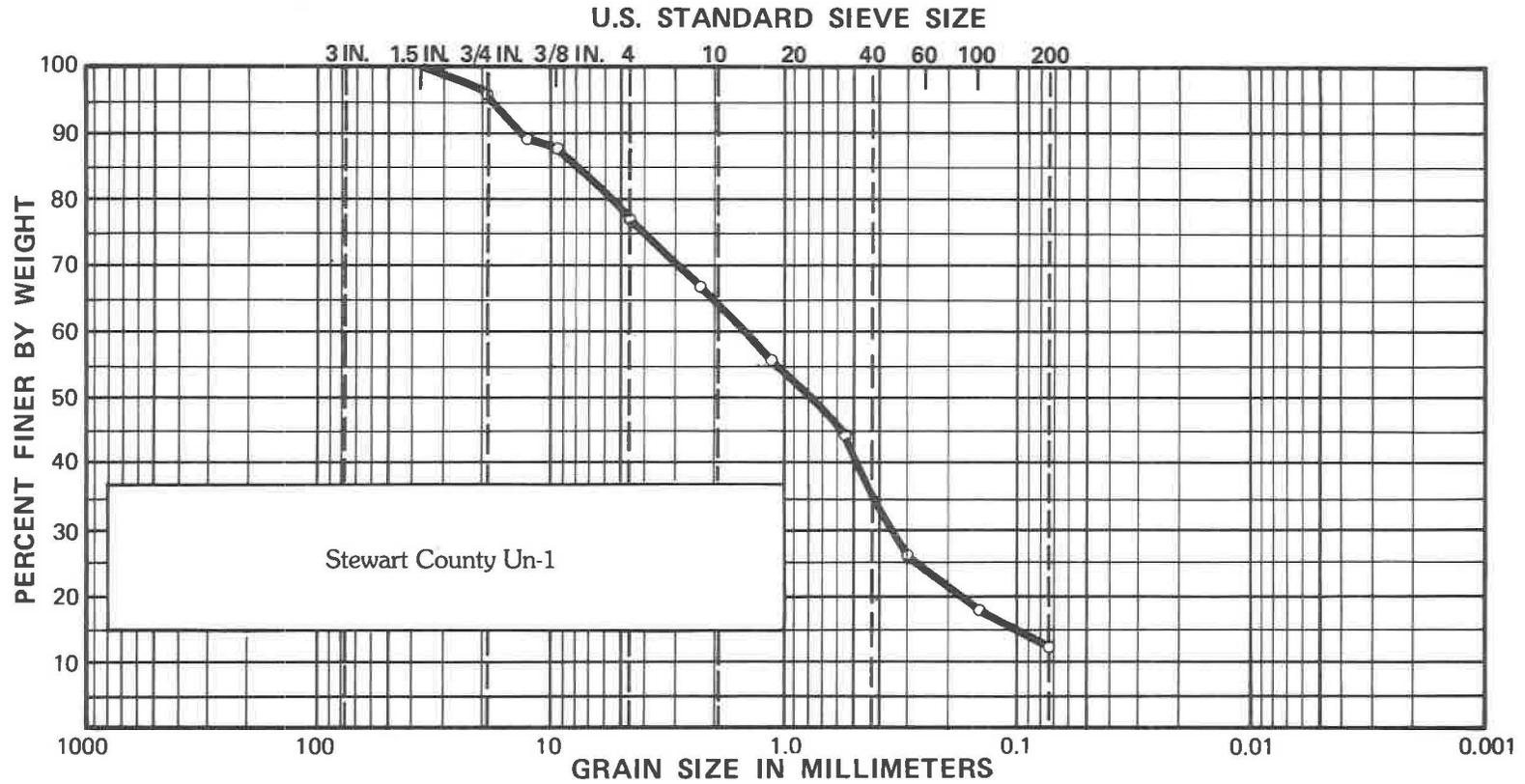


Figure 138. Map of Stewart County Showing Sample Localities, Teas' Sample Localities, and Deposits Sampled.

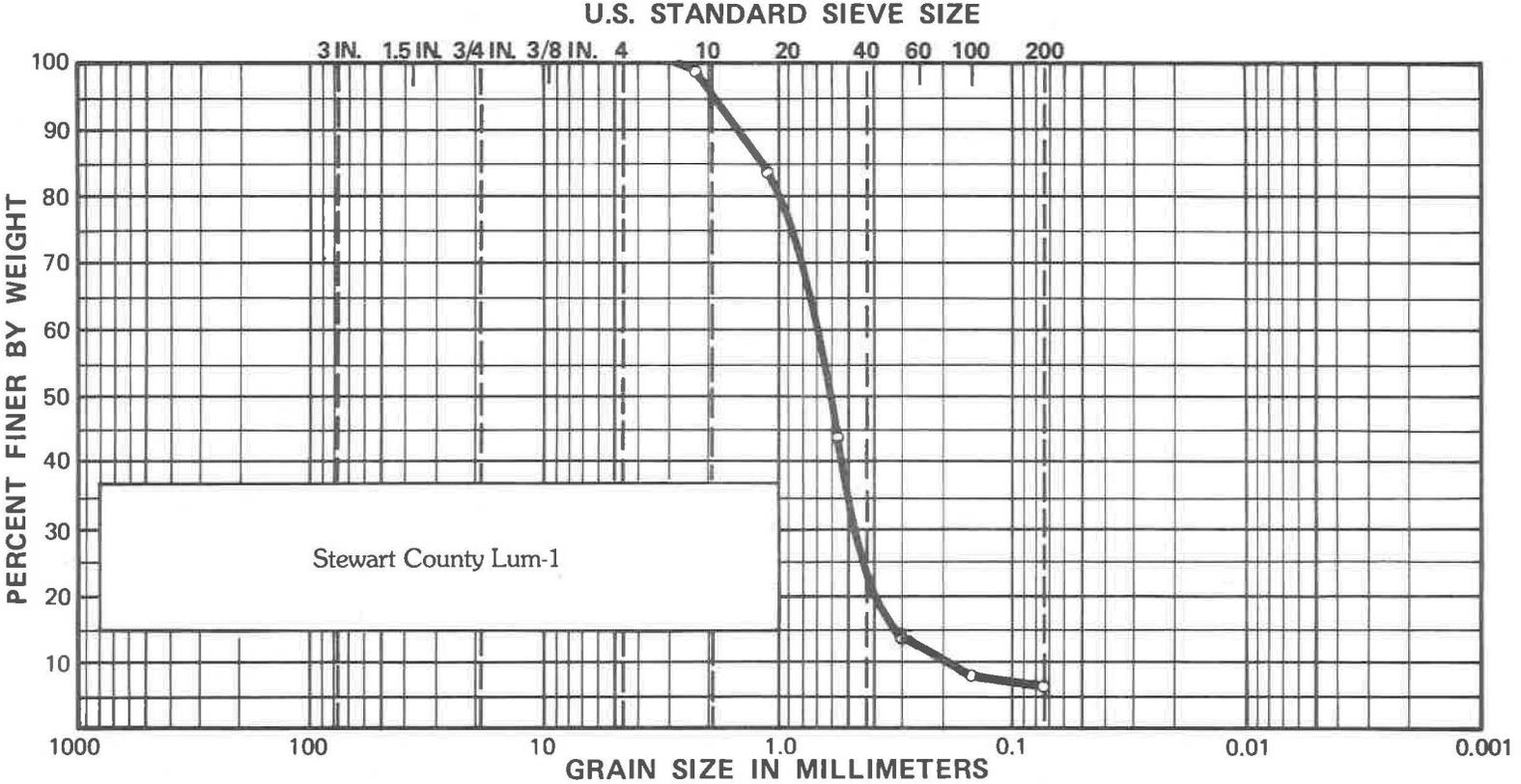


COBBLES	GRAVEL				SAND			SILT OR CLAY *						
	COARSE	FINE		COARSE	MEDIUM	FINE								
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine fine	very fine	coarse	SILT medium fine fine	very fine	coarse	CLAY ** medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 139. Size Distribution Curve of Sample Un-1.

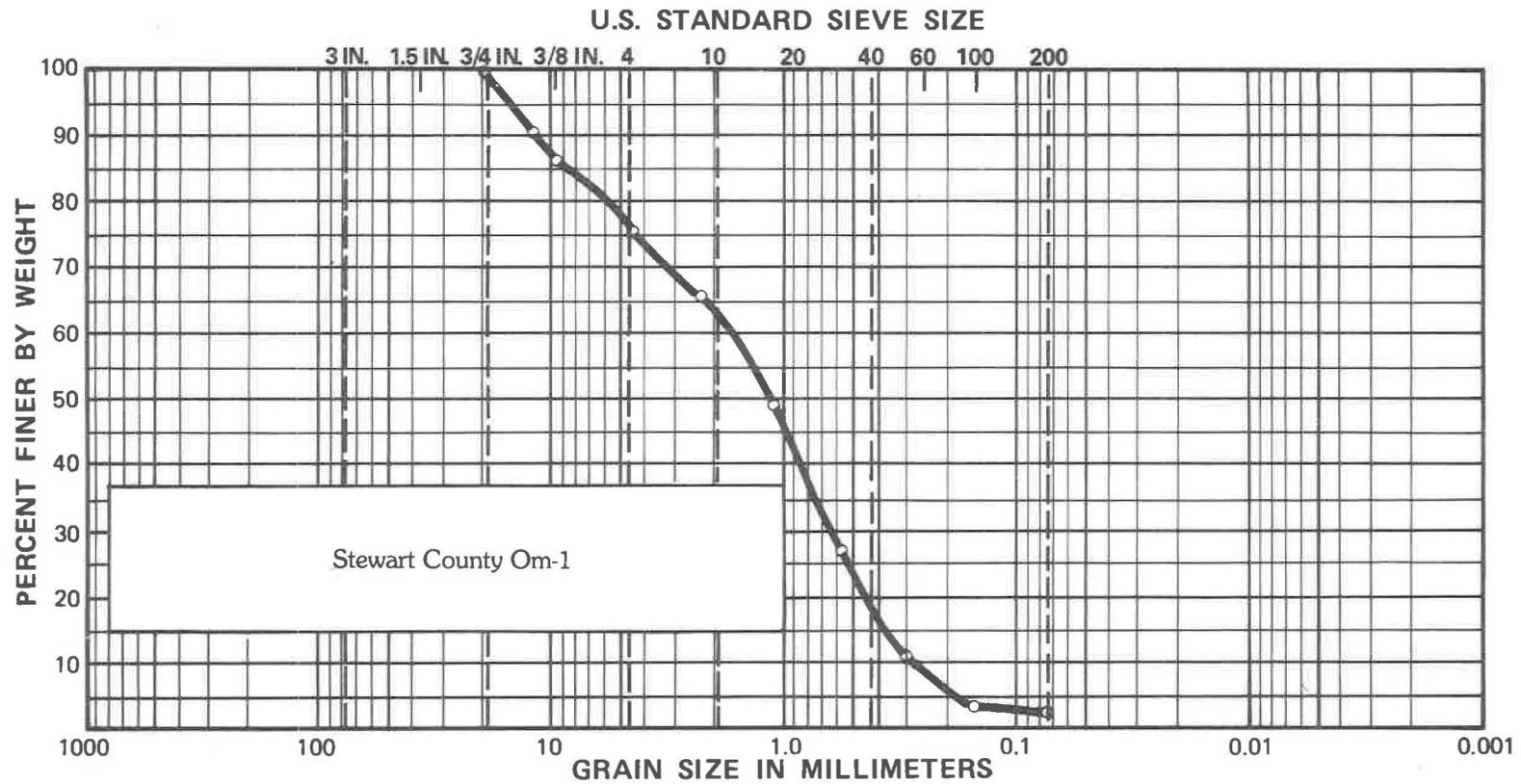


COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE	COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	coarse	SAND medium fine fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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

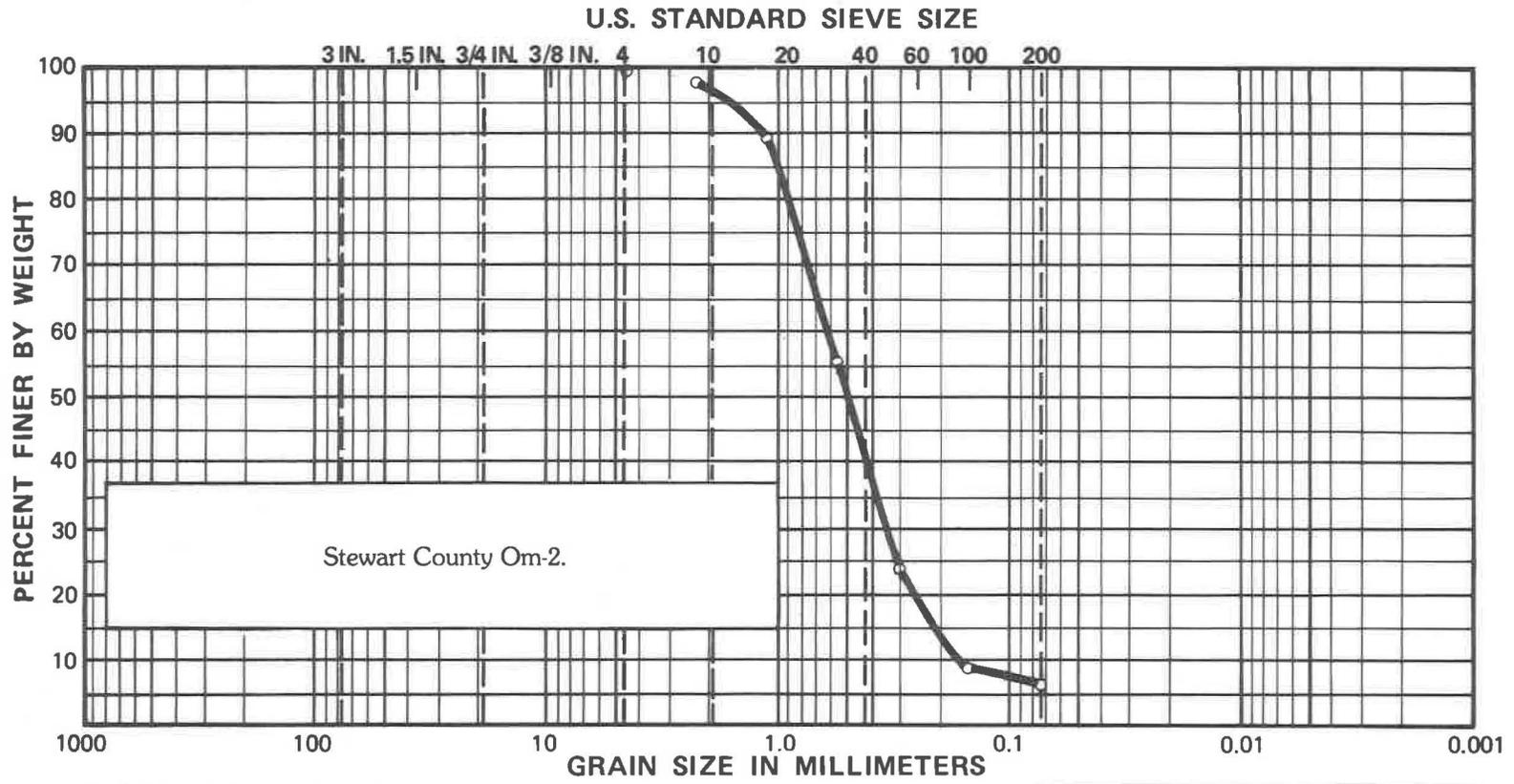


COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE	COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	coarse medium fine	SILT	very fine	CLAY	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 141. Size Distribution Curve of Sample Om-1.

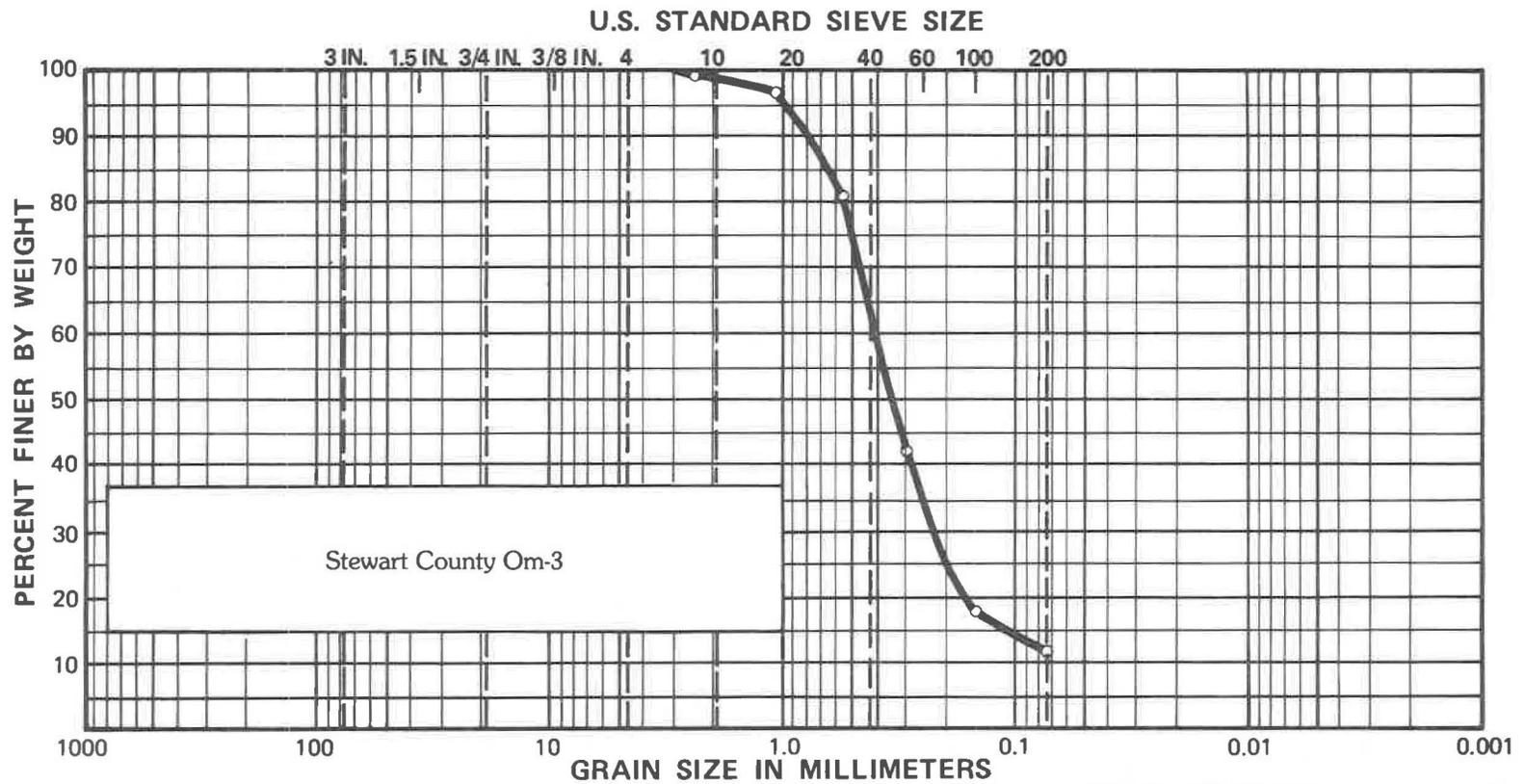


COBBLES	GRAVEL				SAND			SILT OR CLAY *						
	COARSE	FINE		COARSE	MEDIUM	FINE								
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine	**

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 142. Size Distribution Curve of Sample Om-2.

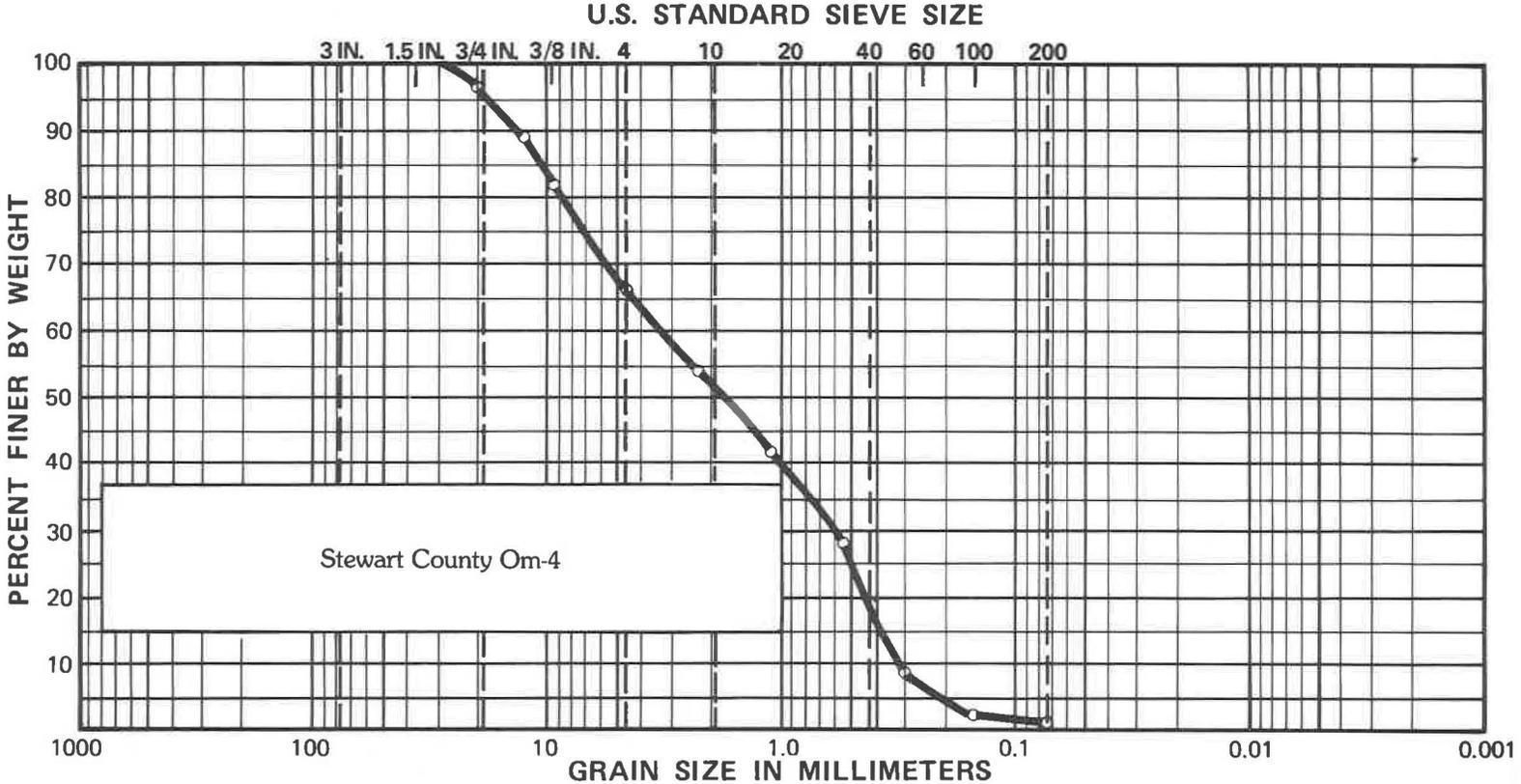


COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE		FINE		COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small		GRAVEL very coarse coarse medium fine			very fine	SAND very coarse coarse medium fine very fine			SILT coarse medium fine very fine		CLAY ** coarse medium fine	

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 143. Size Distribution Curve of Sample Om-3.



Stewart County Om-4

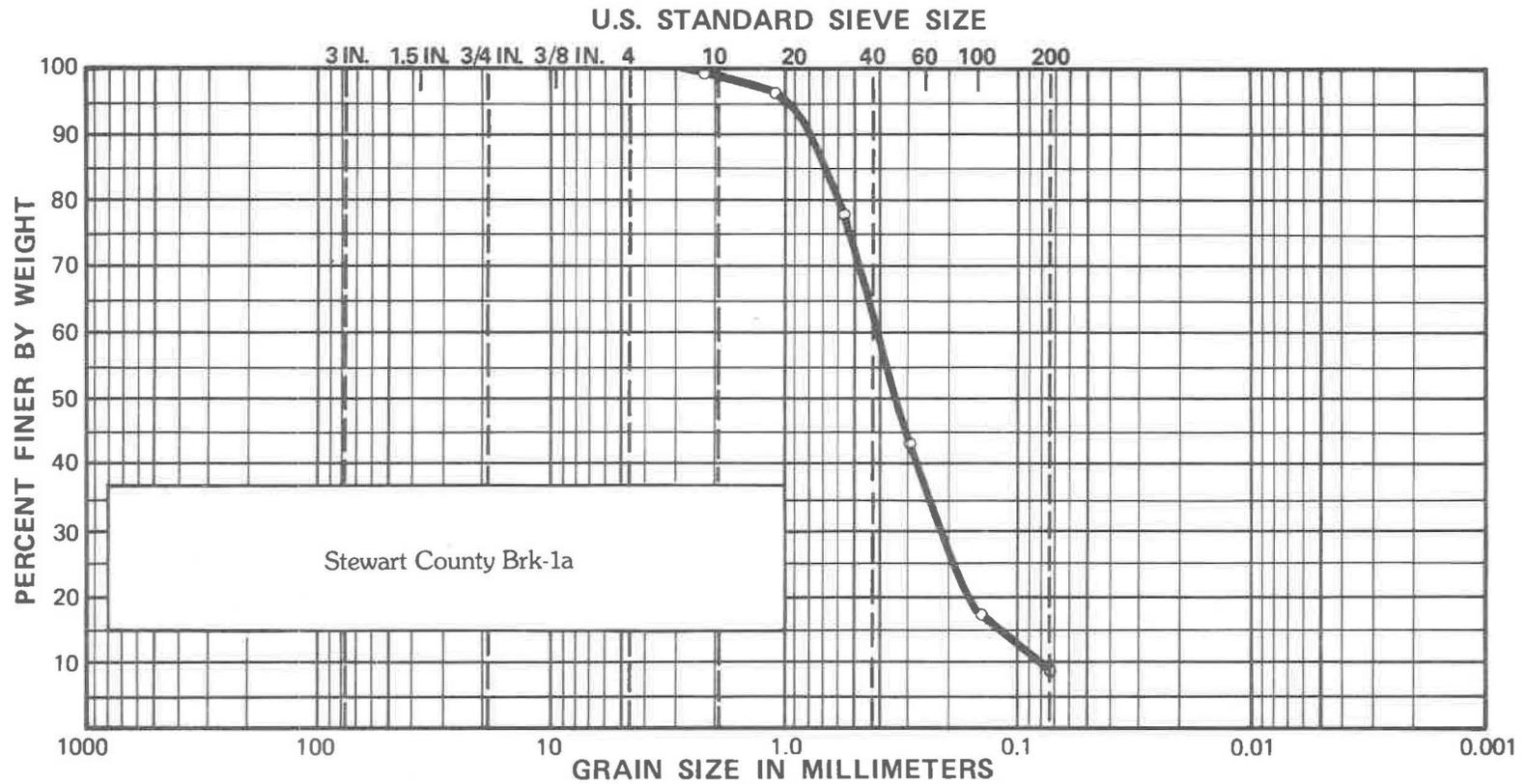
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES large small	very coarse	GRAVEL			very fine	very coarse	SAND			very fine	SILT coarse medium fine	very fine	CLAY		
			coarse	medium	fine			medium	fine	coarse				medium	fine	

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 144. Size Distribution Curve of Sample Om-4.

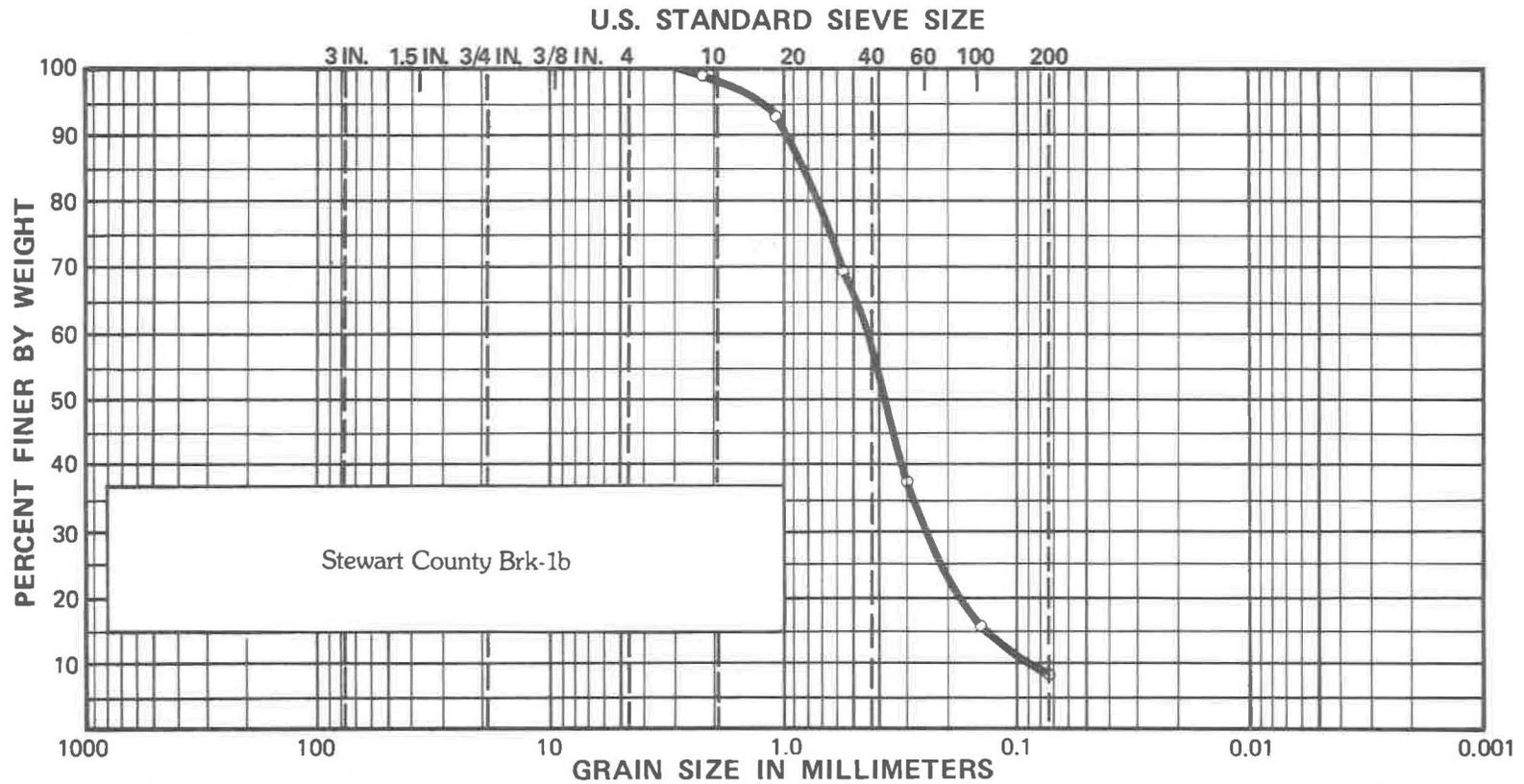


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 145. Size Distribution Curve of Sample Brk-1a.



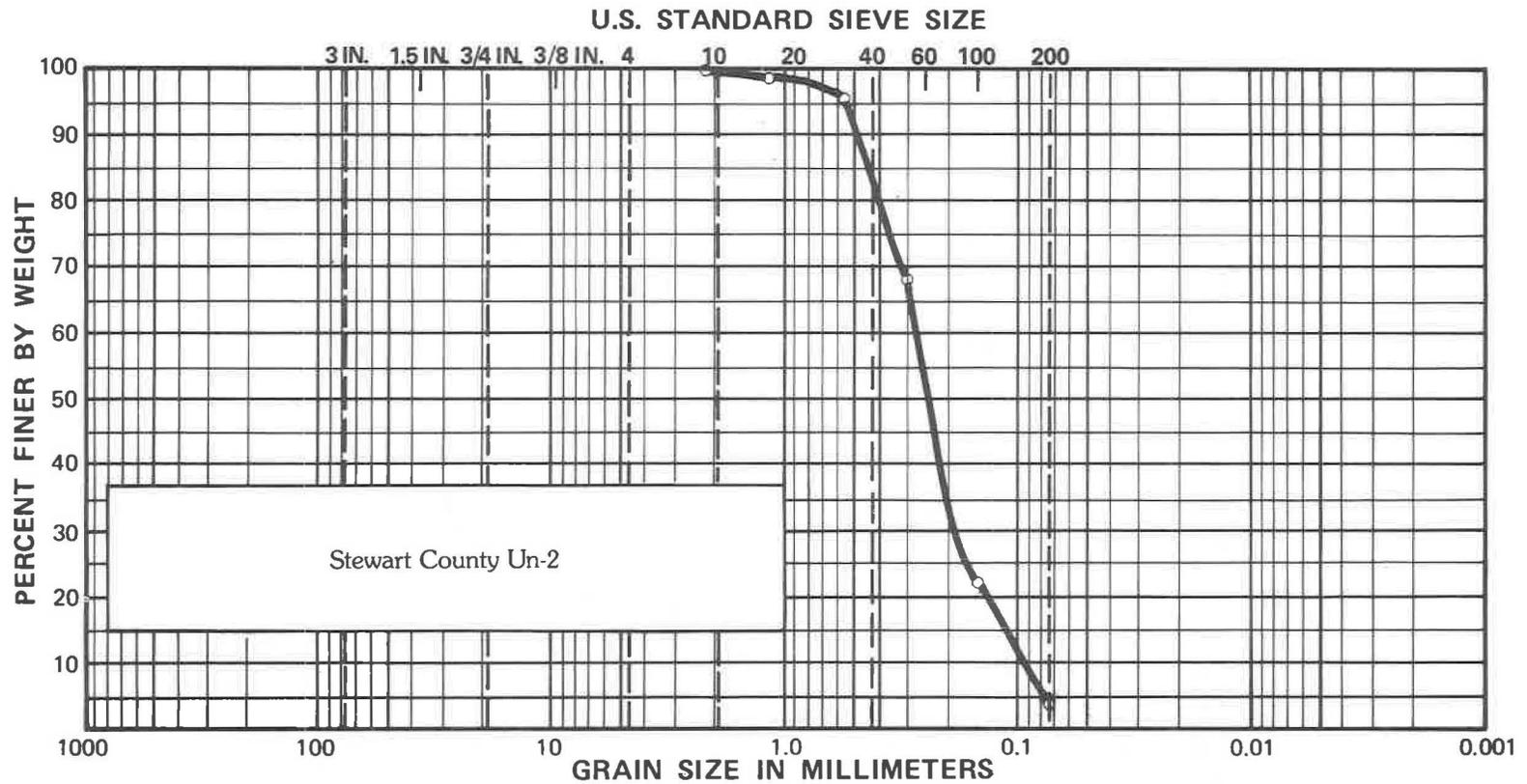
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE		FINE		COARSE	MEDIUM	FINE	

BOULDERS	COBBLES		very coarse	GRAVEL			very fine	very coarse	SAND			very fine	SILT			very fine	CLAY		
	large	small		coarse	medium	fine			coarse	medium	fine		coarse	medium	fine		coarse	medium	fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 146. Size Distribution Curve of Sample Brk-1b.

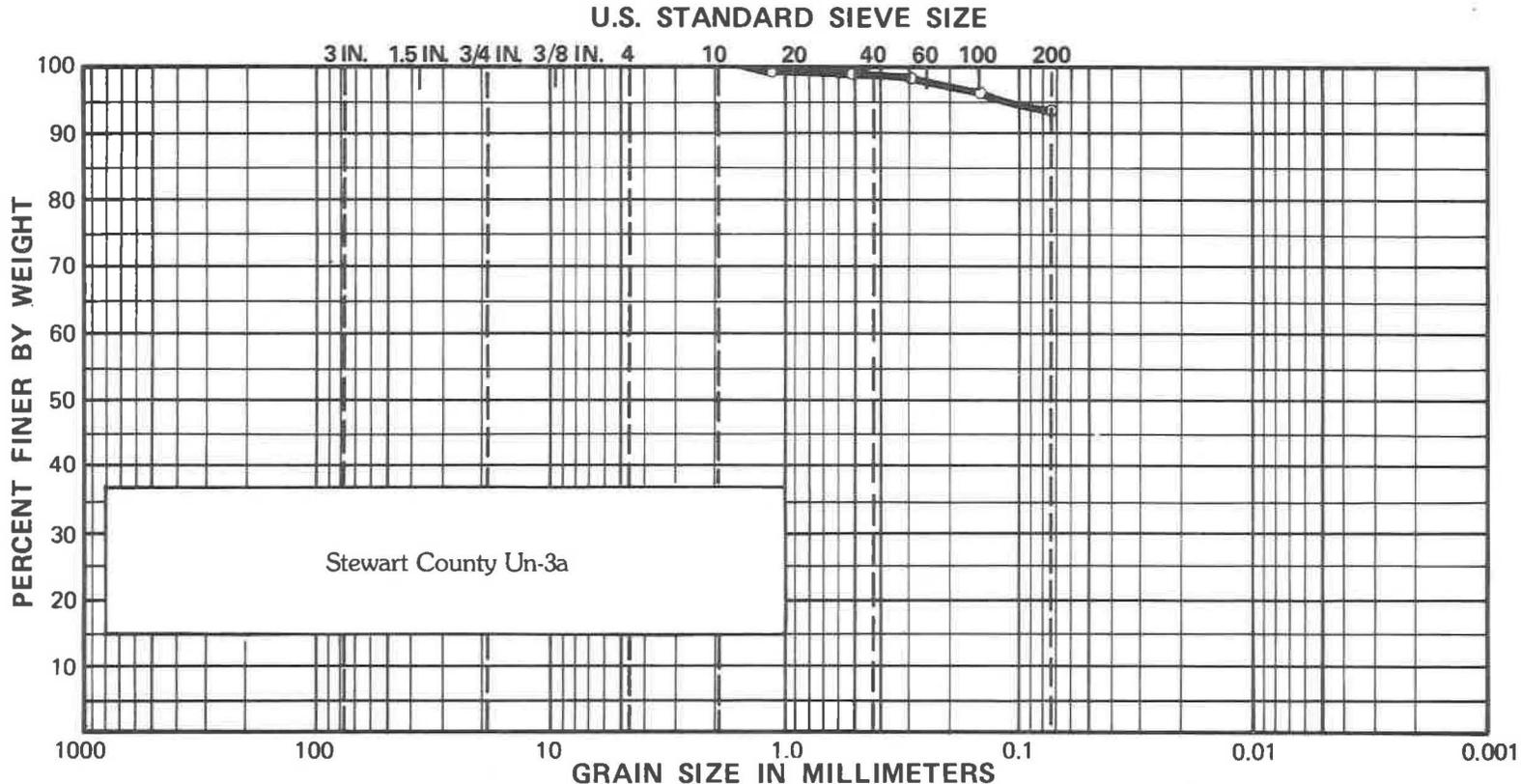


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 147. Example of the Size Distribution of Sediments of the Upper Zone from the 60 Acre Tract (Un-2) Contained within a Point Bar, Stewart County.

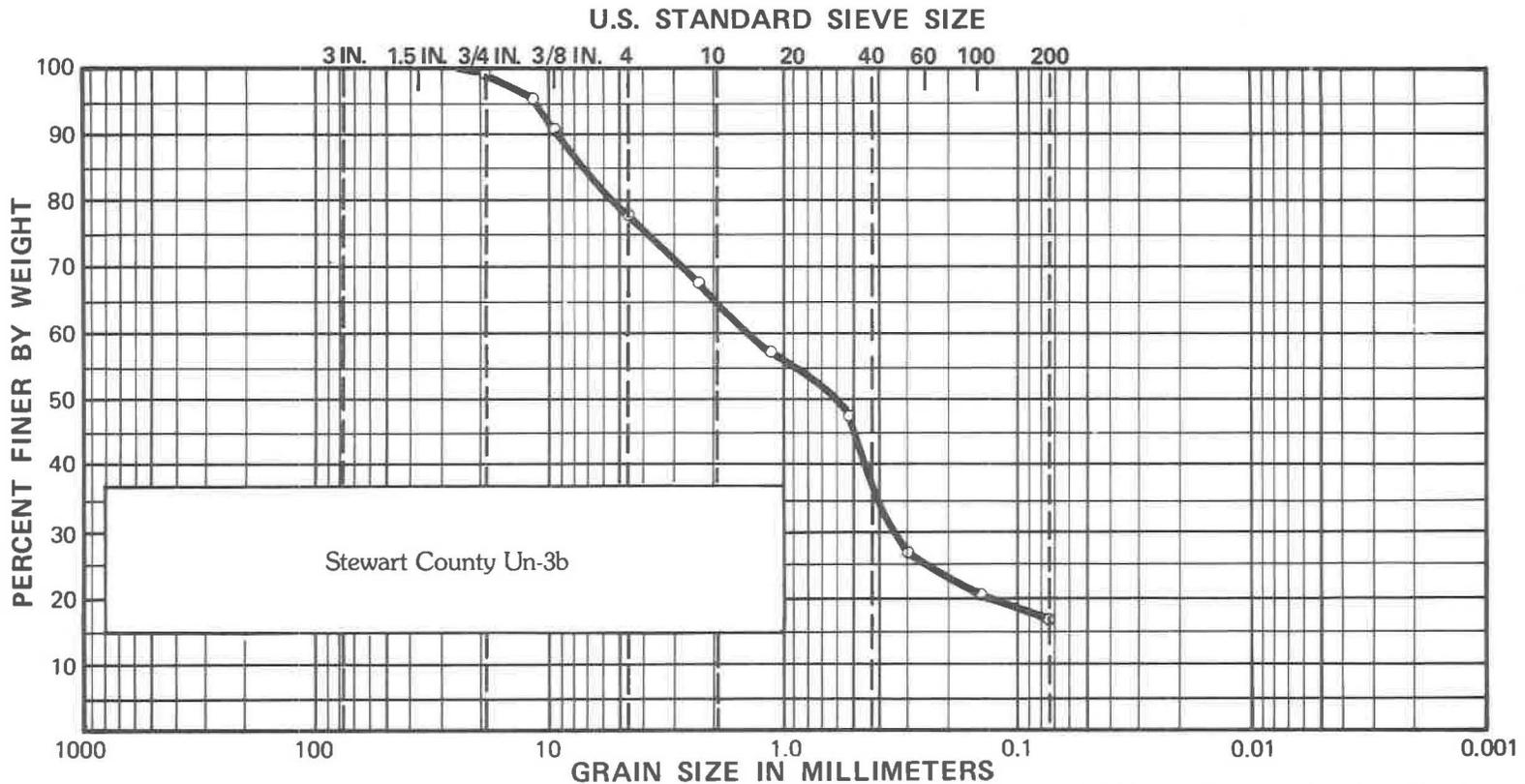


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 148. Example of the Size Distribution of Sediments of the Overburden from the 60 Acre Tract (Un-2) Contained within a Point Bar, Stewart County.



COBBLES		GRAVEL				SAND			SILT OR CLAY *									
		COARSE	FINE			COARSE	MEDIUM	FINE										
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium	fine	very fine	very coarse	coarse	SAND medium	fine	very fine	coarse	SILT medium	fine	very fine	coarse	CLAY medium	fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 149. Example of the Size Distribution of Sediments of the Lower Zone from the 60 Acre Tract (Un-3) Contained within a Point Bar, Stewart County.

Sumter County

Geology and Physiography

Sumter County lies within the Fall Line Hills District of the Coastal Plain Province. The majority of the surficial sediments of Sumter County are derived from the residuum of the Eocene and Oligocene limestones. However, the Clayton, Baker Hill and Tuscaloosa Formations and undifferentiated Claiborne Group are exposed in the valleys of the major streams of the county.

Previous Work

Three areas within Sumter County containing appreciable amounts of fine- to medium-grained sand are mentioned in Teas' (1921) report on sand and gravel deposits of Georgia (fig. 150, Ts-55 [Rylander pit], Ts-56 [Council pit], Ts-57).

Present Study

The soil association used in targeting areas of Sumter County was Lakeland, which is present in interfluvial areas in central, western, and northern Sumter County. The geomorphic feature targeted is a terrace surface in southern Sumter County. Six sites in Sumter County were sampled (figs. 150, 151-156, And-1, Pen-1, LkC-1,2; Pln-1, Dra-1, Table 27). Four of the five sites sampled are from outcrops of the undifferentiated Claiborne Group. The site represented by Sample Dra-1 is a point bar deposit of the Flint River.

Evaluation

None of the samples from the sites in Sumter County pass ASTM standard C-33. The two most promising samples are Dra-1, a point bar deposit, and LkC-2, a fine- to coarse-grained deposit of the undifferentiated Claiborne Group.

The point bar deposit (Sample Dra-1) is contained within a swampy area of the floodplain of the Flint River. Considering the fine-grain size of this deposit and its location, this site is of little economic value.

The site represented by LkC-2 has an adequate grain size distribution, a minimum thickness of 10 feet and covers an area of 5 acres, thus having an estimated reserve of only 80,000 cubic yards. A limiting factor in the development of this deposit, even for local use, is the presence of 6 to 8 feet of clayey fine-grained sand to sandy clay overburden.

Mining activity

The only permitted sand mining operations in Sumter County are those owned by the Reeves Construction Company of Americus (fig. 150, D-236-F, D-526-F, D-681-F). Of the three pits owned by the company, only one is active (D-681) and the product is fill material. Thus there is no active aggregate mining within the county.

Summary evaluation

The sands of the undifferentiated Claiborne Group, which are present in the valleys of the major drainages of Sumter County, have the highest potential for production of fine aggregate. The potential for fine aggregate production in Sumter County is low to moderate.

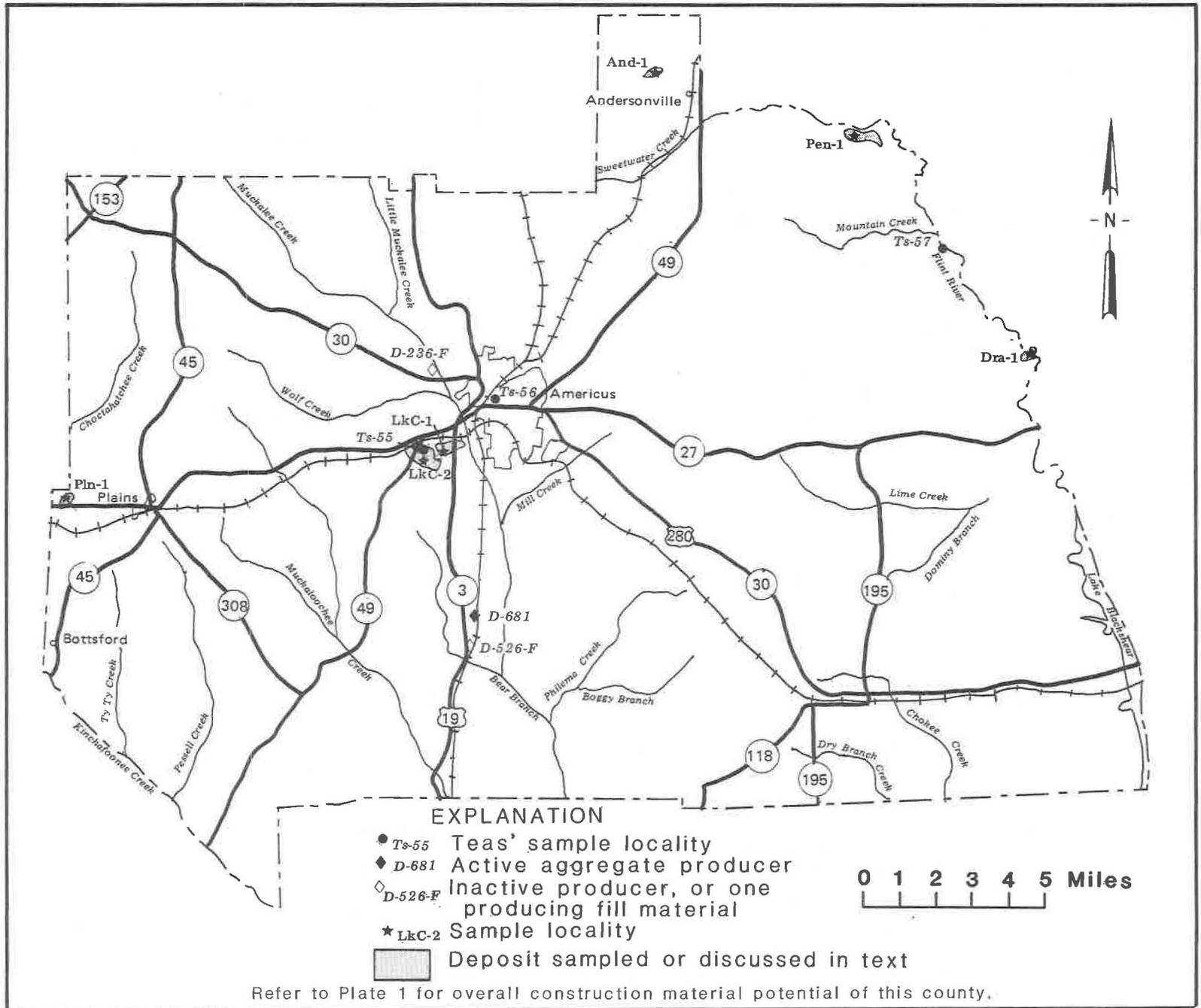
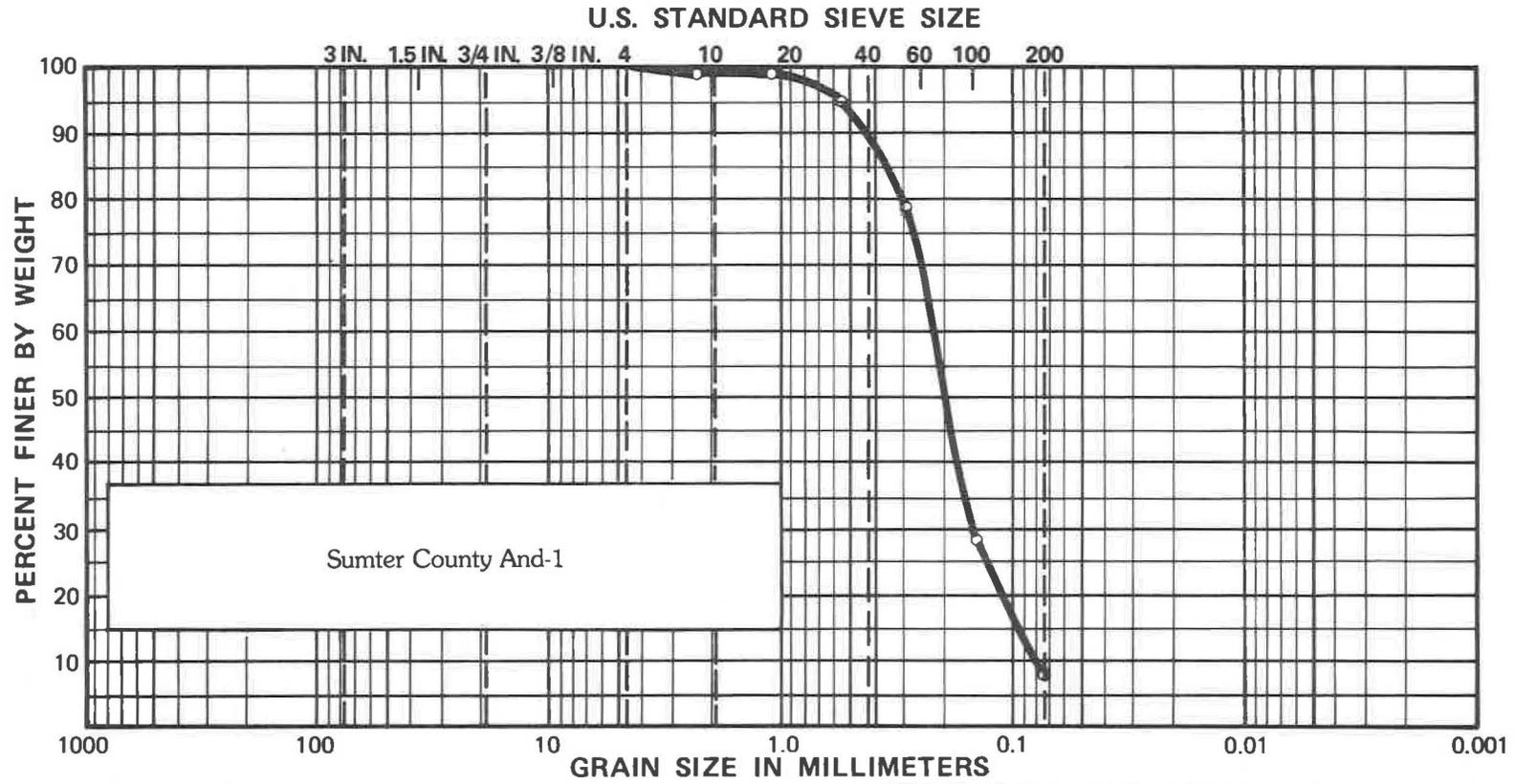


Figure 150. Map of Sumter County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.



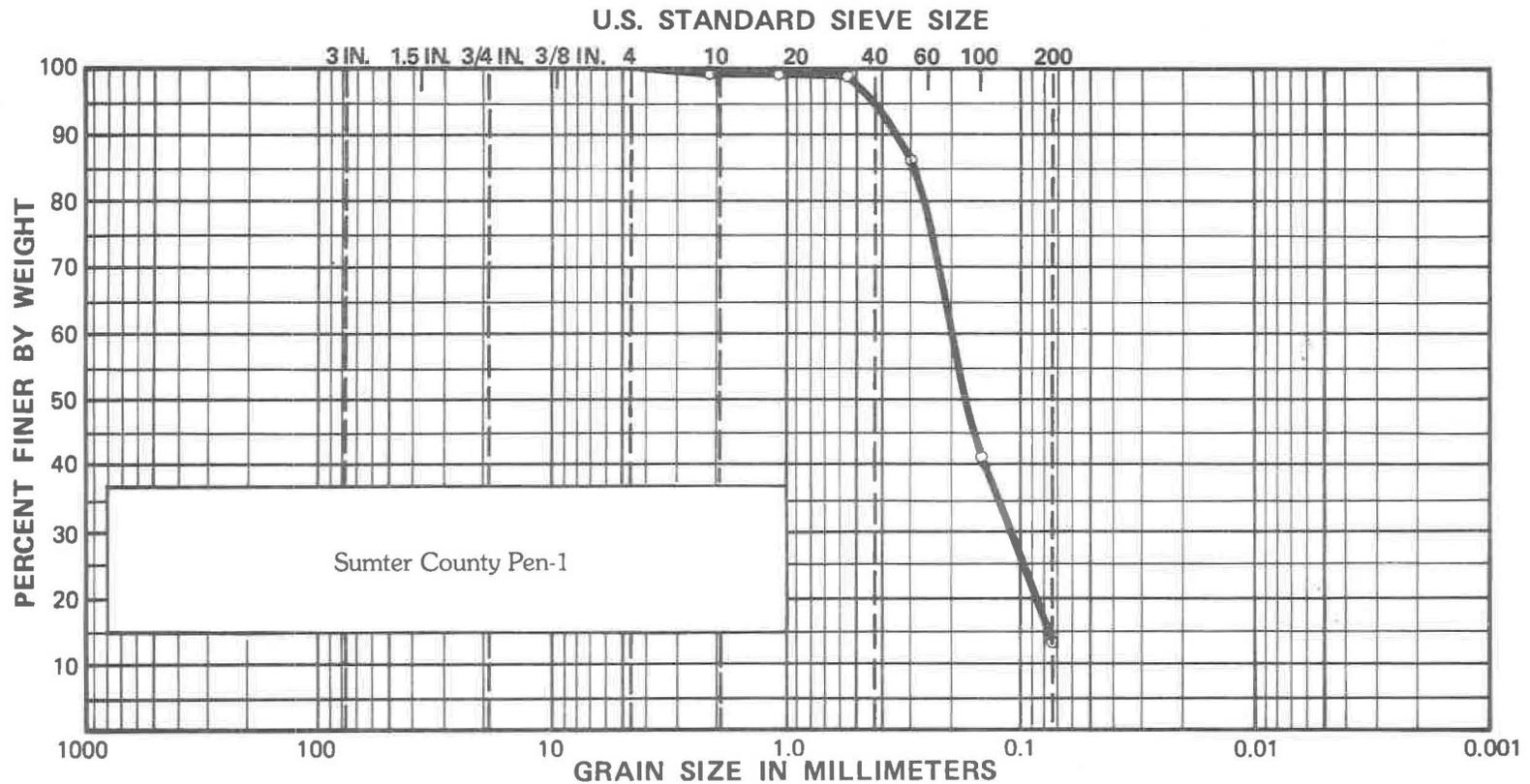
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES		very coarse	GRAVEL			very fine	very coarse	SAND			very fine	SILT			very fine	CLAY		
	large	small		coarse	coarse	medium			fine	coarse	medium		fine	coarse	medium		fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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



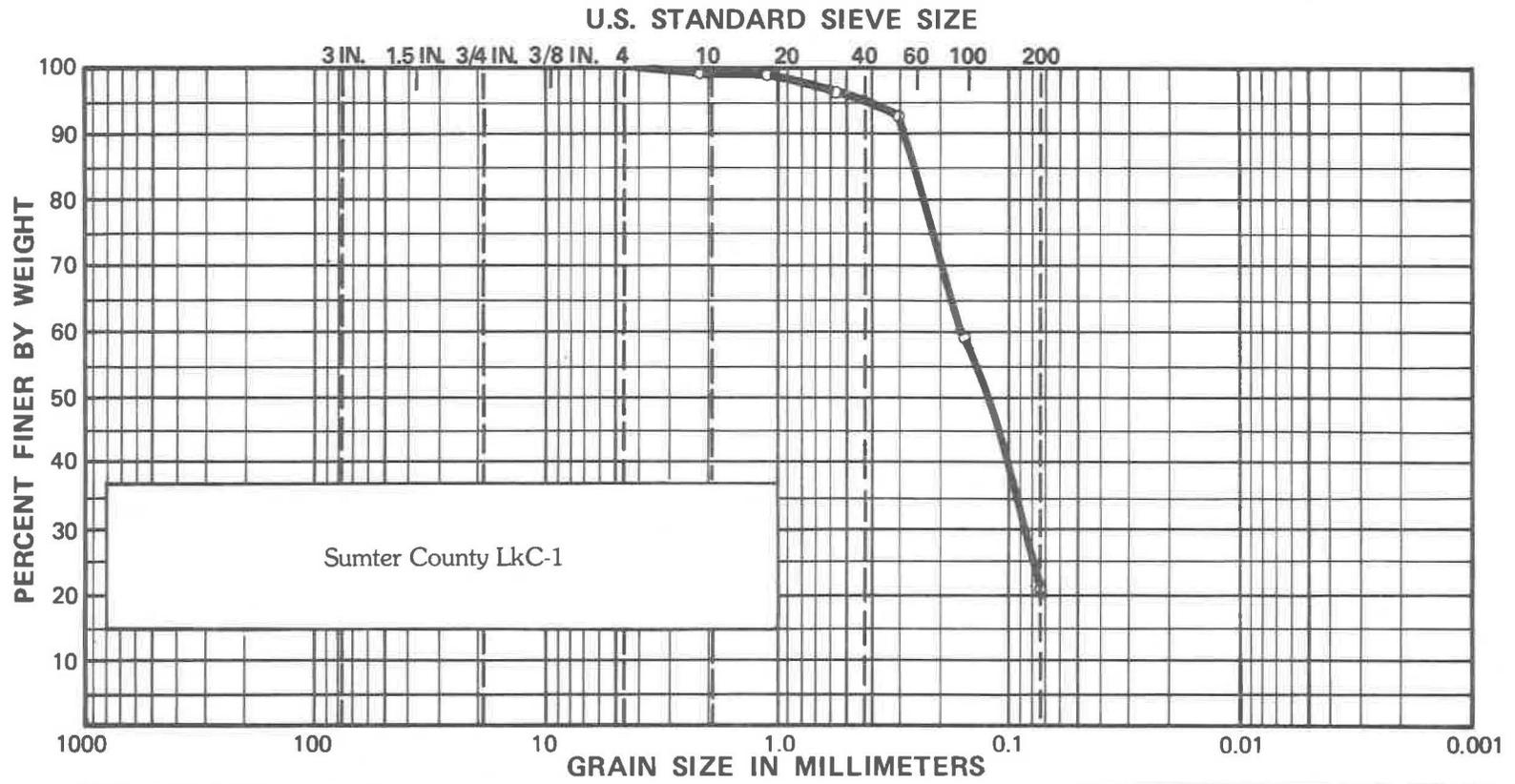
Sumter County Pen-1

COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE	FINE		COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse	SILT medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 152. Size Distribution Curve of Sample Pen-1.



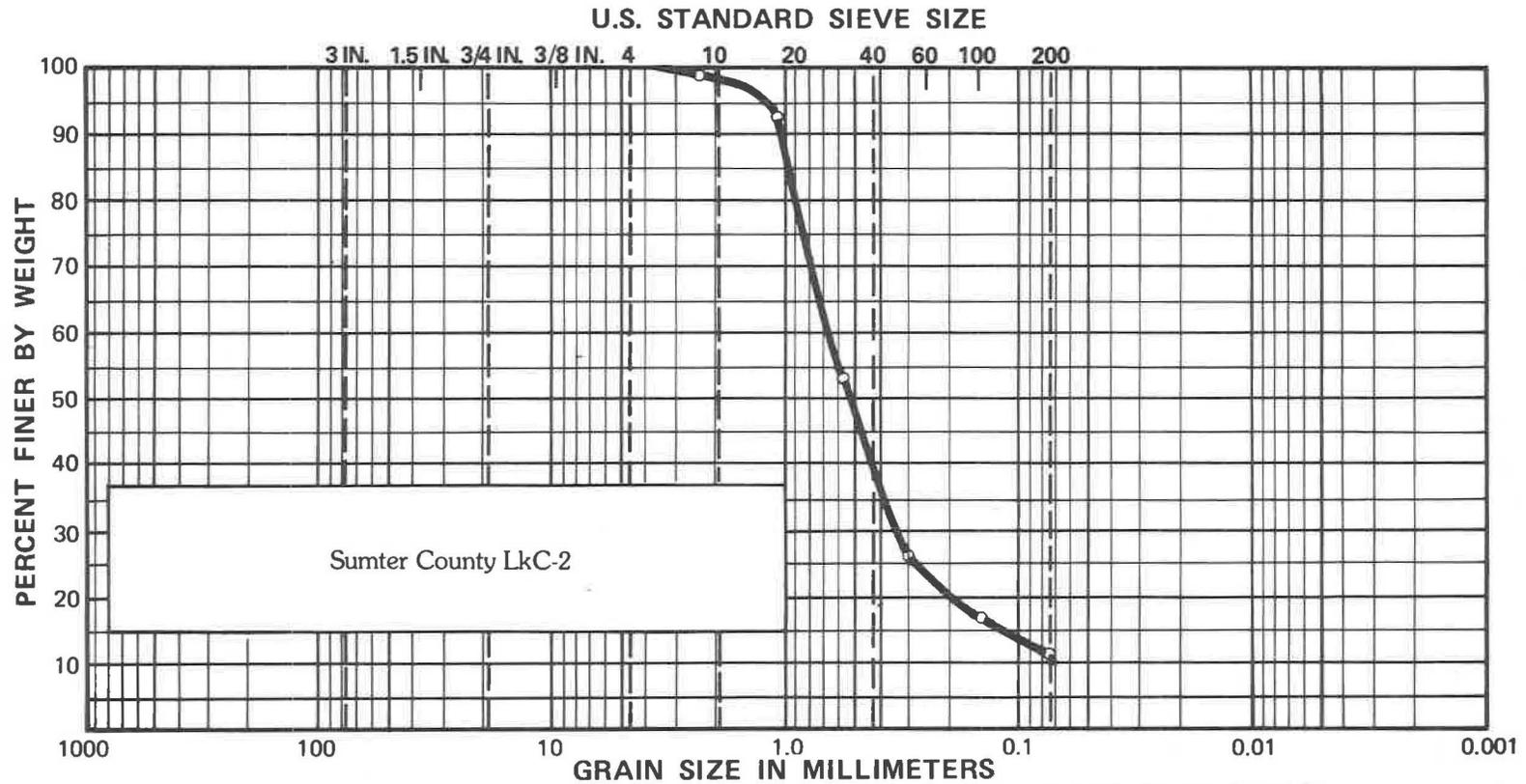
COBBLES	GRAVEL				SAND			SILT OR CLAY *
	COARSE	FINE	COARSE	MEDIUM	FINE			

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY **		
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 153. Size Distribution Curve of Sample LkC-1.



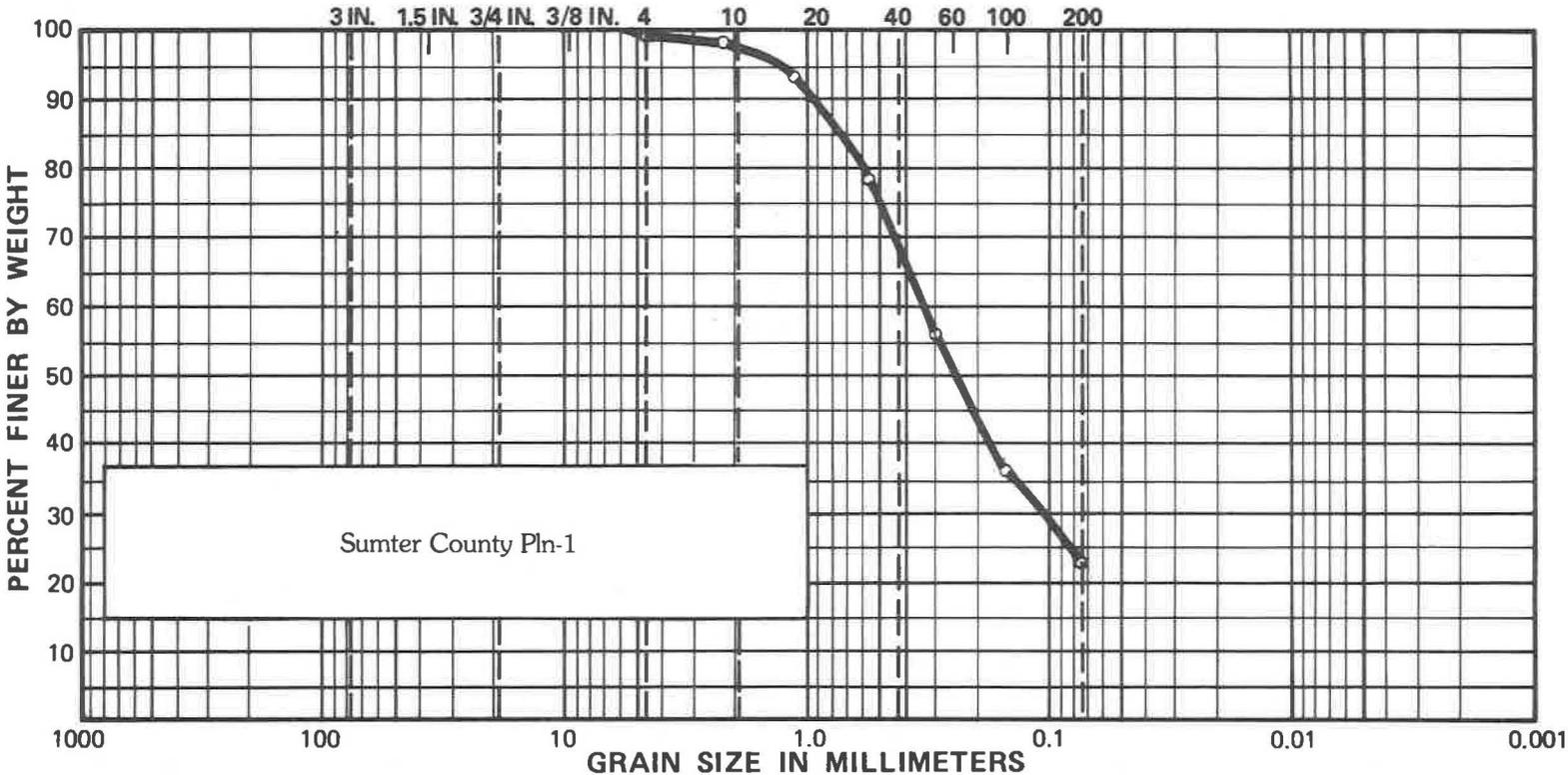
COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 154. Size Distribution Curve of Sample LkC-2.

U.S. STANDARD SIEVE SIZE



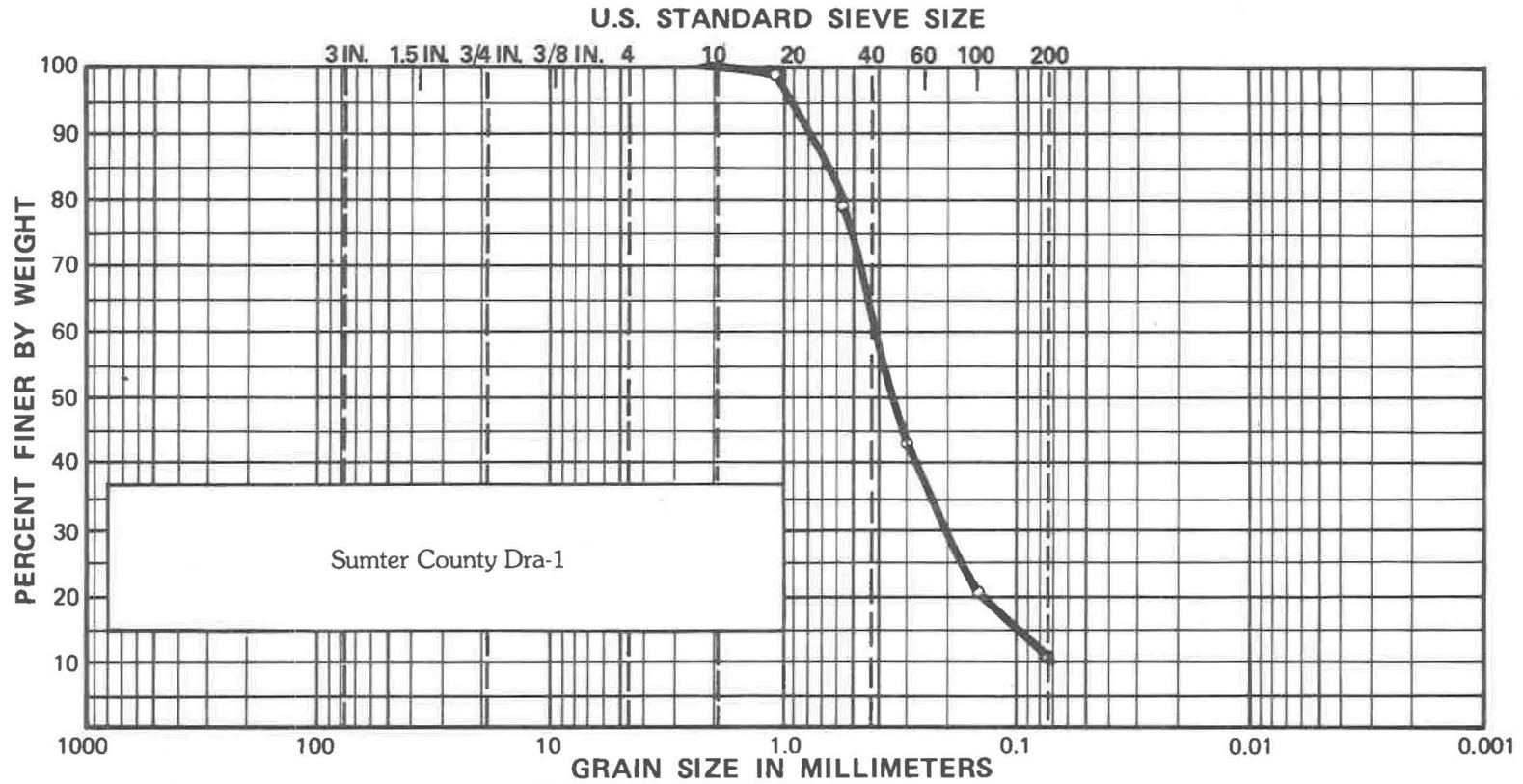
Sumter County Pln-1

COBBLES	GRAVEL				SAND			SILT OR CLAY *			
	COARSE	FINE	COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 155. Size Distribution Curve of Sample Pln-1.



COBBLES	GRAVEL				SAND			SILT OR CLAY *			
	COARSE	FINE	COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 156. Size Distribution Curve of Sample Dra-1.

Table 27. Sumter County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
And-1	9 feet	auger	9 feet	1	no	1
Pen-1	9 feet	auger	9 feet	1	no	1
LkC-1	18 feet	auger	18 feet	0	no	0
LkC-2	10 feet	auger	10 feet	0	no	2
Pln-1	9.5 feet	auger	9.5 feet	1	no	1
Dra-1	4 feet	auger	10 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

Talbot County

Geology and Physiography

Talbot County lies within portions of two physiographic provinces. The major portion of the county lies within the Piedmont Province; the area studied in this report lies in the Fall Line Hills District of the Coastal Plain Province. The Coastal Plain portion of Talbot County is composed of fine- to coarse-grained sands with subordinate amounts of clay of the Tuscaloosa, Eutaw and Blufftown Formations.

Previous Studies

Teas (1921, p. 242-250) described in detail a number of then active operations and prospects of Talbot County. Teas (1921, p. 242-243), noted that "Along the Atlanta, Birmingham & Atlantic and the Central of Georgia railroads, in the southern part of Talbot County, a number of sand pits are in operation, and a great quantity of sand is shipped annually to all parts of Georgia and also to Alabama and Tennessee."

Pits described by Teas (1921, p. 243-250) were the Hime Sand Company pit, the Kirkpatrick Sand and Cement Company pit, the Alexander pit, the Downs pit, and the Central of Georgia Sand Company pit (fig. 157, Ts-58, Ts-59, Ts-62a, Ts-60, Ts-61, Ts-62, respectively). Other large or potentially large deposits of sand noted by Teas were the Morgan property (Ts-62) and a deposit along the Central of Georgia Railway (Ts-64).

Present Study

The soil association used in targeting areas of Talbot County was #39, which is present in interfluvial areas in the southern portion of Talbot County. The geomorphic feature targeted is a series of point bars of Upatoi Creek in southwestern Talbot County. One site located just south of Juniper Creek was sampled and sieved.

Evaluation

Sample Gen-1 (fig. 157, 158, Table 28) does not meet ASTM standards C-33 for a natural fine aggregate.

Mining activity

Current mining activity in Talbot County is centered along a broad ridge along Georgia Highway 96 in the southeastern part of the county. There are two active producers of fine aggregate (fig. 157, D-125, D-008) and one inactive plant (D-366-F).

The Howard Sand Company (D-125) is located north of Junction City and produces concrete and mortar sand by the hydraulic mining method. Two hundred acres are owned by the Howard Sand Company and approximately 150 acres remain to be mined. Currently the depth of mining is 60 feet. The annual production is between 100,000 and 500,000 tons. The haulage radius (by truck) for the products is approximately 75 miles.

The Brown Brothers Sand Company (D-008) is located two miles south of Junction City, east of Georgia Highway 90, and produces concrete and mortar sand by the hydraulic mining method. Approximately 1500 acres are owned by the company with 1400 acres remaining to be mined. The current depth of mining is 125 feet. The annual production is in the 100,000 to 500,000 ton category. The products of this operation are currently being shipped by both truck and rail as far as 150 miles north of the plant.

Lone Star Industries (D-366-F) operated a sand pit located approximately two miles east of Junction City. Thirty-nine acres were permitted by the Environmental Protection Division and have been reclaimed. No other information is available.

Summary evaluation

Southeastern Talbot County (fig. 157), which contains the plants of active producers, has the highest potential for production of fine aggregate. Rail lines and primary roads within this area provide adequate means of transportation for the finished product. The total amount of reserves in this area is possibly 400 million cubic yards. The potential of Talbot County for the production of fine construction aggregate is considered to be moderate to high.

Table 28. Talbot County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Gen-1	8.5 feet	auger	8.5 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

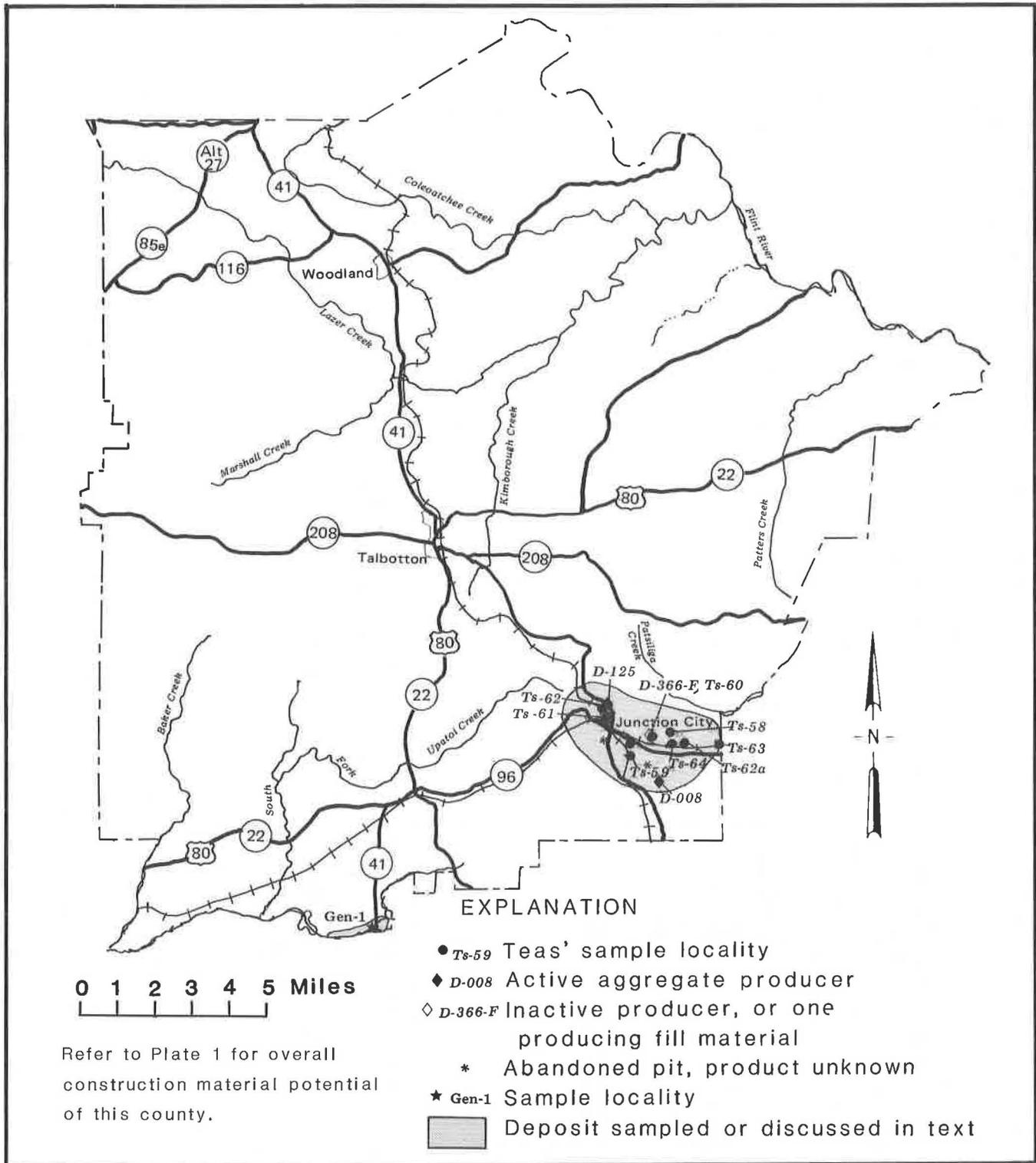
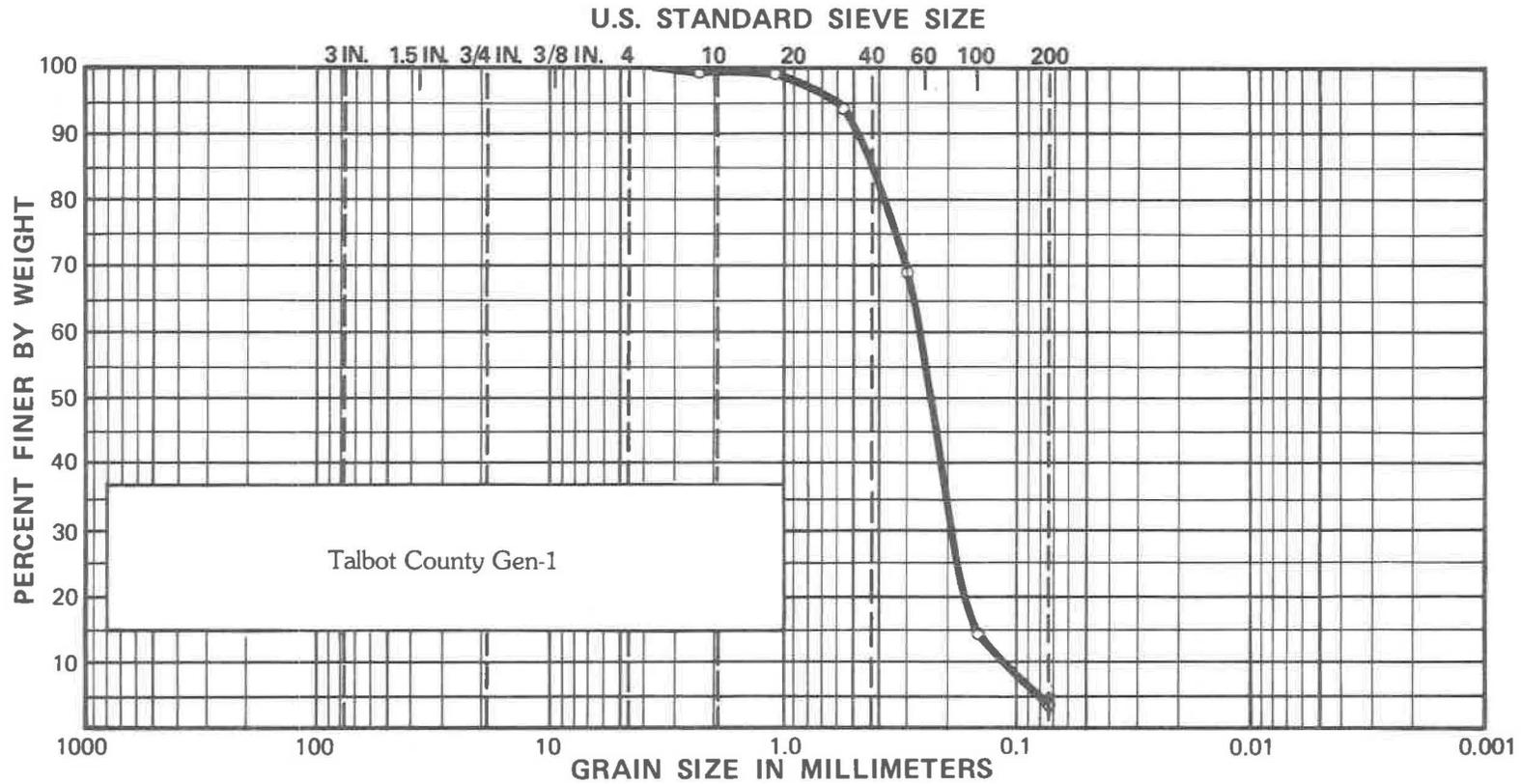


Figure 157. Map of Talbot County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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

Taylor County

Geology and Physiography

Taylor County lies within portions of two physiographic provinces, the Piedmont Province and the Coastal Plain Province. The major portion of Taylor County is within the Fall Line Hills District of the Coastal Plain. The stratigraphic units of the Coastal Plain Province present in Taylor County are the Tuscaloosa, Eutaw, Blufftown, Cusseta, Ripley and Providence Formations and undifferentiated Upper Cretaceous deposits.

Previous Studies

Teas (1921, p. 251-157) noted one active sand plant where fine- to medium-grained sand was mined from a 2 acre pit (fig. 159, Ts-65 [W.C. Harkey Sand Company]). A deposit of fine- to medium-grained sand varying in thickness from 7 to 10 feet was also described by Teas (1921) (fig. 159, Ts-66 [Wall property]). He also noted exposed, discontinuous deposits of gravel, varying in thickness from 2 to 9 feet (fig. 159, Ts-67, Ts-68, Ts-69 [Beechwood Station], Ts-70, Ts-71 [Gaultney property], Ts-72, Ts-73, Ts-74 [Neisler property], Ts-75, Ts-76, Ts-77, Ts-78 [F. M. Griffith]).

Present Study

The soil association used in targeting areas of Taylor County was #39, which is present in interfluvial areas throughout Taylor County. Geomorphic features targeted are point bars along the Flint River, in the northeastern portion of the county, and terrace surfaces, present in the eastern portion of Taylor County. Thirteen samples from nine localities in Taylor County were sieved (figs. 159-172, IdN-1, Rey-2a, 2b, Btw-1, Rey-3a, 3b, 3c, Rup-1,2,3, JnC-1, TzN-1a, 1b; Table 29). Although no samples meet ASTM standard C-33, seven samples representing five localities in Taylor County could be upgraded to meet these requirements.

Evaluation

The deposit represented by samples Rey-2a and Rey-2b (figs. 161, 162) is a stream channel deposit. Sample Rey-2a is from the upper, more gravelly portion of the channel deposit; this upper portion varies in thickness from 1 to 6 feet. Sample Rey-2b is from the lower, less gravelly portion of the deposit; this lower portion may be as much as 6 feet in thickness. The channel deposit is probably a local feature and thus may not have sufficient reserves to be considered for commercial exploitation.

Samples Rey-3a, 3b and 3c are from a terrace deposit of the Flint River (see figs. 164-166). The total thickness of this deposit is 17 feet. Samples Rey-3a, 3b, and 3c represent the upper 4 feet, middle 5 feet and lower 8 feet (respectively) of this deposit. The areal extent of this deposit may be as large as 120 acres, thus reserves could be in excess of 2.5

million cubic yards. Relatively shallow wells may be able to produce a sufficient quantity of water for processing the sands. There are both rail lines and primary highways within 1 mile of the deposit. One possible factor limiting development of this deposit, assuming the deposit is of sufficient quality and areal extent, is the presence of a clayey sandy zone at higher elevations west of the area from which these samples were taken. This clayey sand may be present as overburden within the calculated area of the deposit.

Samples Rup-2 and Rup-3 represent a deposit 19.5 feet thick which may cover 25 acres, thus providing an unproven reserve in excess of 750,000 cubic yards. This deposit has potential for the production of fine aggregate. However, there are two factors which may inhibit commercial development of the deposit: 1) overburden may be present, and 2) questionable availability of water for processing.

The sample JnC-1 was taken from a pit owned by Howard Sand Company of Howard, Georgia. This sample represents a 20-foot thick section of the pit face which is currently being mined.

Mining activity

There are two active commercial aggregate producers in Taylor County; Butler Sand Company of Howard (fig. 159, D-012), and the Howard Sand Company of Howard (fig. 159, D-162).

The Howard Sand Company produces concrete and mortar sand which is transported by trucks to sites within a 75 mile radius. The hydraulic mining method is used to mine the sand. Approximately 200 acres are owned by the company; 150 acres remain to be mined. Current mining depth is 60 feet and annual production is in excess of 100,000 tons.

The Butler Sand Company produces concrete and mortar sand which is transported by trucks to sites within a 75 mile radius. The hydraulic mining method is used to mine the sand. Two hundred acres are owned by the company; 150 acres remain to be mined. Current mining depth is 60 feet and annual production is in excess of 100,000 tons.

Summary evaluation

The three deposits represented by samples Rup-2 (fig. 173), Rey-3a, 3b, 3c, and Rup-3 (figs. 174, 175), have the highest potential for aggregate production of those sites sampled. The area of the Rey-3 samples has the potential for producing some small size coarse aggregate as a co- or by-product of a fine aggregate operation.

The potential for fine aggregate production in Taylor County is considered to be moderate to high. The area in which the current producers are located (approximately

25 square miles) is considered to have a high potential. In general, the areas considered to have the highest potential are those areas containing sediments of the Upper Cretaceous Blufftown, Cusseta and Ripley Formations (fig. 3).

Table 29. Taylor County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
IdN-1	11 feet	auger	11 feet	1	no	1
Rey-2a	3 feet	trench	0-3 feet	2	no ⁴	3
Rey-2b	5 feet	trench	5 feet	2	no ⁴	2
BtW-1	12.5 feet	auger	12.5 feet	2	no	2
Rey-3a	4 feet	trench	4 feet	2	no	2
Rey-3b	5 feet	trench	5 feet	2	no ⁴	3
Rey-3c	8 feet	trench	8 feet	2	no ⁴	3
Rup-1	9 feet	auger	9 feet	1	no	0
Rup-2	8.5 feet	trench	8.5 feet	1	no ⁴	2
Rup-3	11 feet	auger	11 feet	1	no ⁴	2
JnC-1	12 feet	trench	12 feet	3	no ⁴	1
TzN-1a	3 feet	auger	3 feet	1	no	2
TzN-1b	3 feet	auger	7 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

⁴Sample marginally failed ASTM standard C-33; however, the sample can be upgraded to meet specifications.

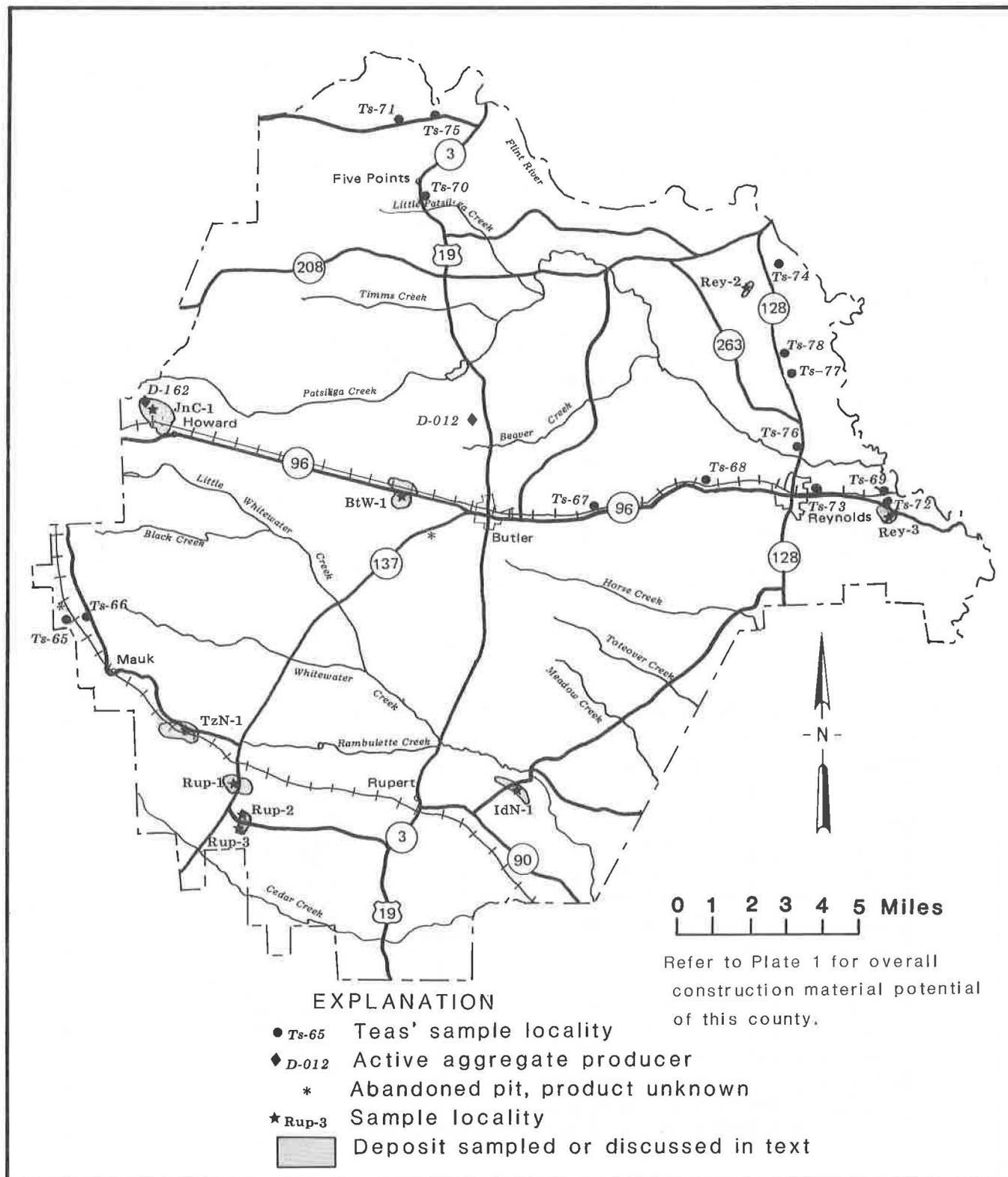
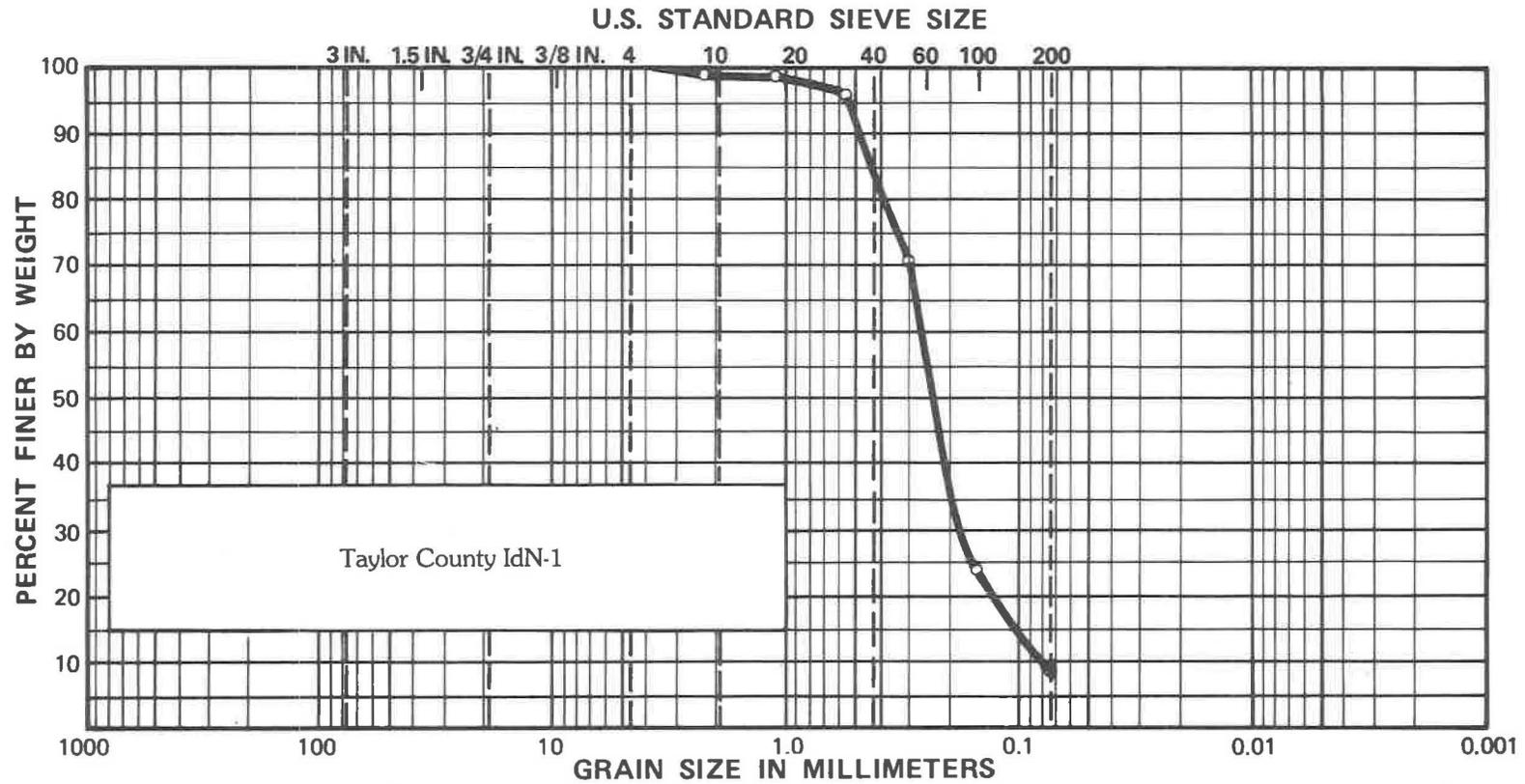


Figure 159. Map of Taylor County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.

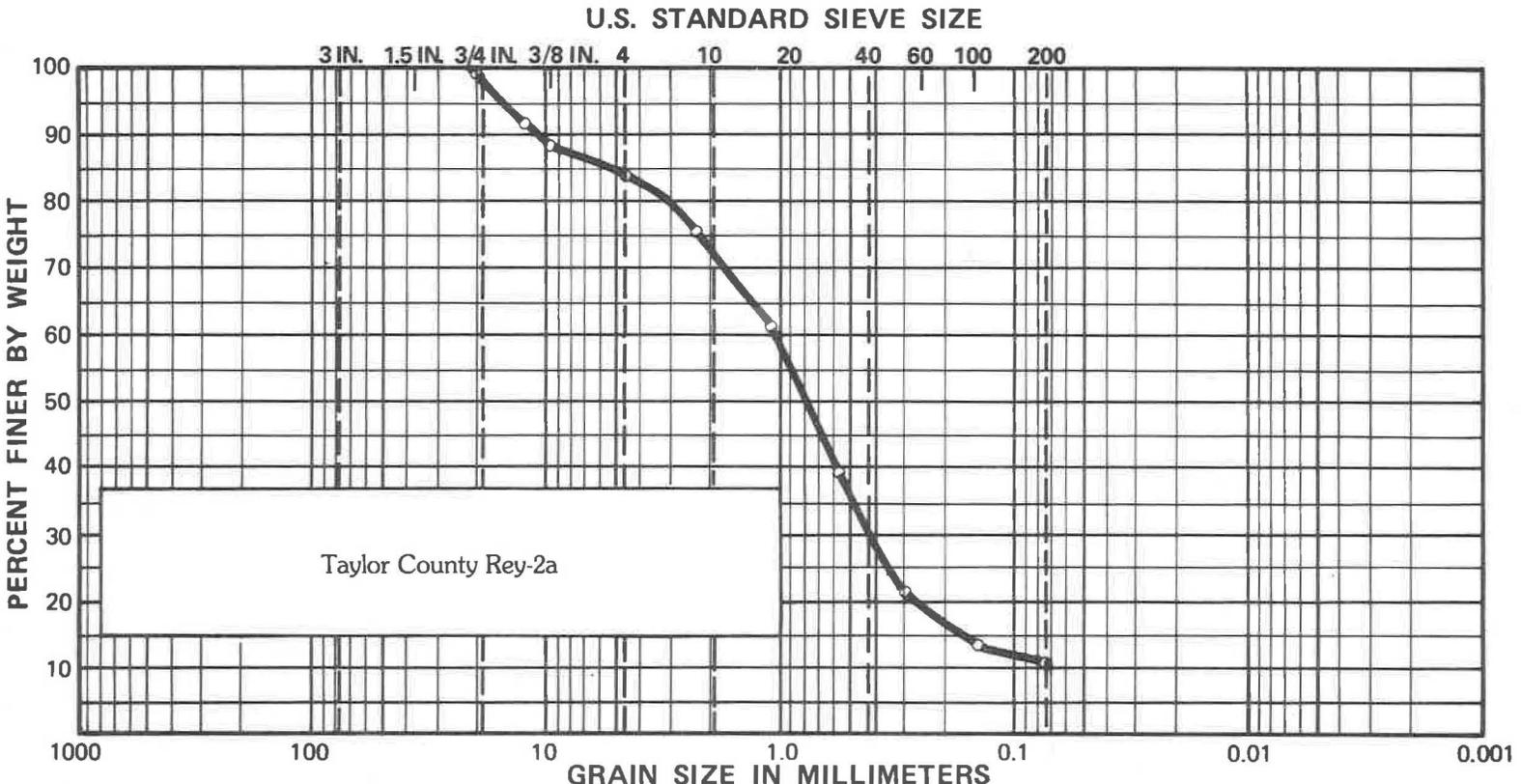


BOULDERS	COBBLES		GRAVEL				SAND			SILT OR CLAY				*							
	large	small	very coarse	coarse	medium	fine	very coarse	very fine	coarse	medium	fine	very coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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



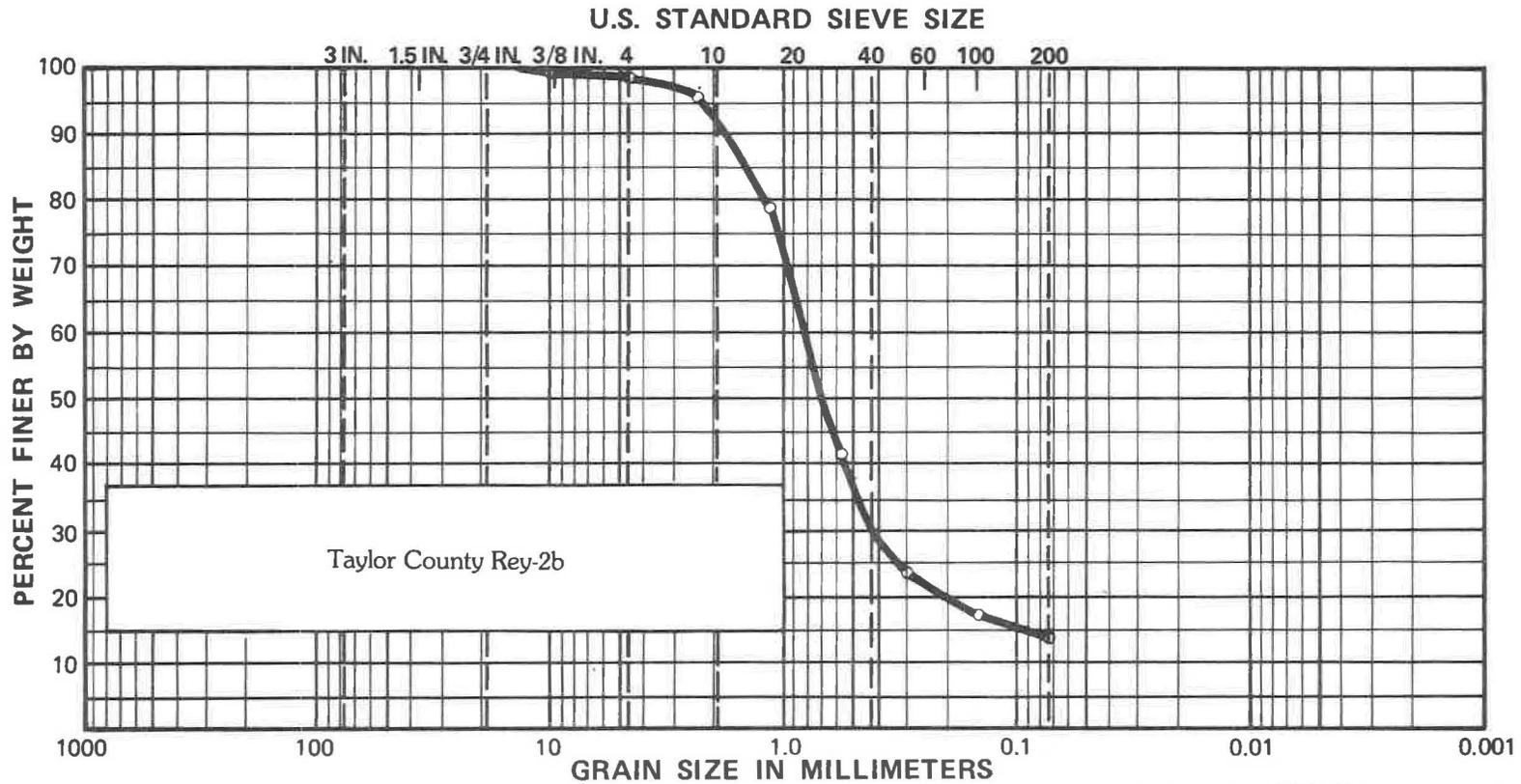
COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE		COARSE	MEDIUM	FINE		

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY					
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 161. Size Distribution Curve of Sample Rey-2a.

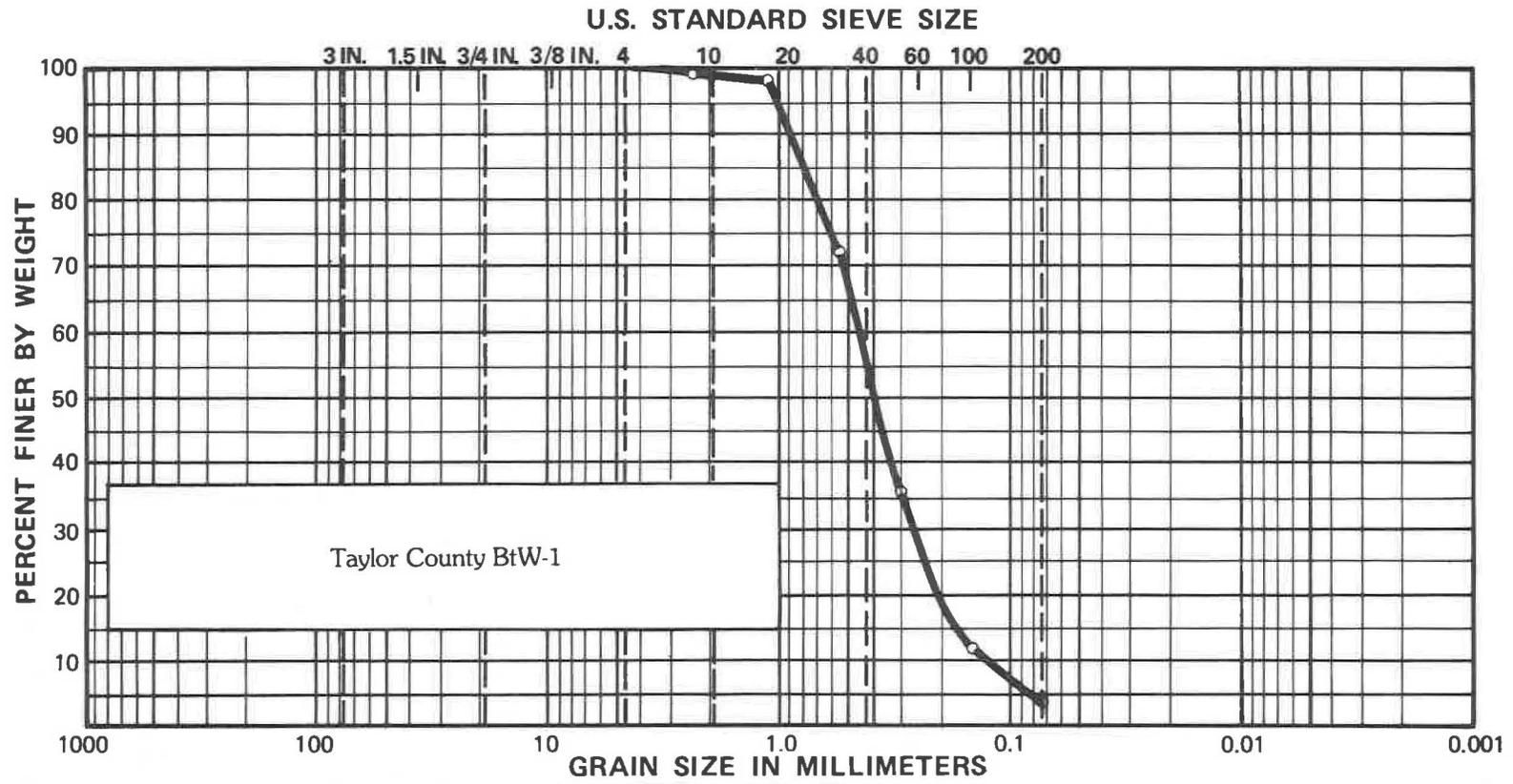


BOULDERS	COBBLES		GRAVEL				SAND			SILT OR CLAY				*								
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 162. Size Distribution Curve of Sample Rey-2b.

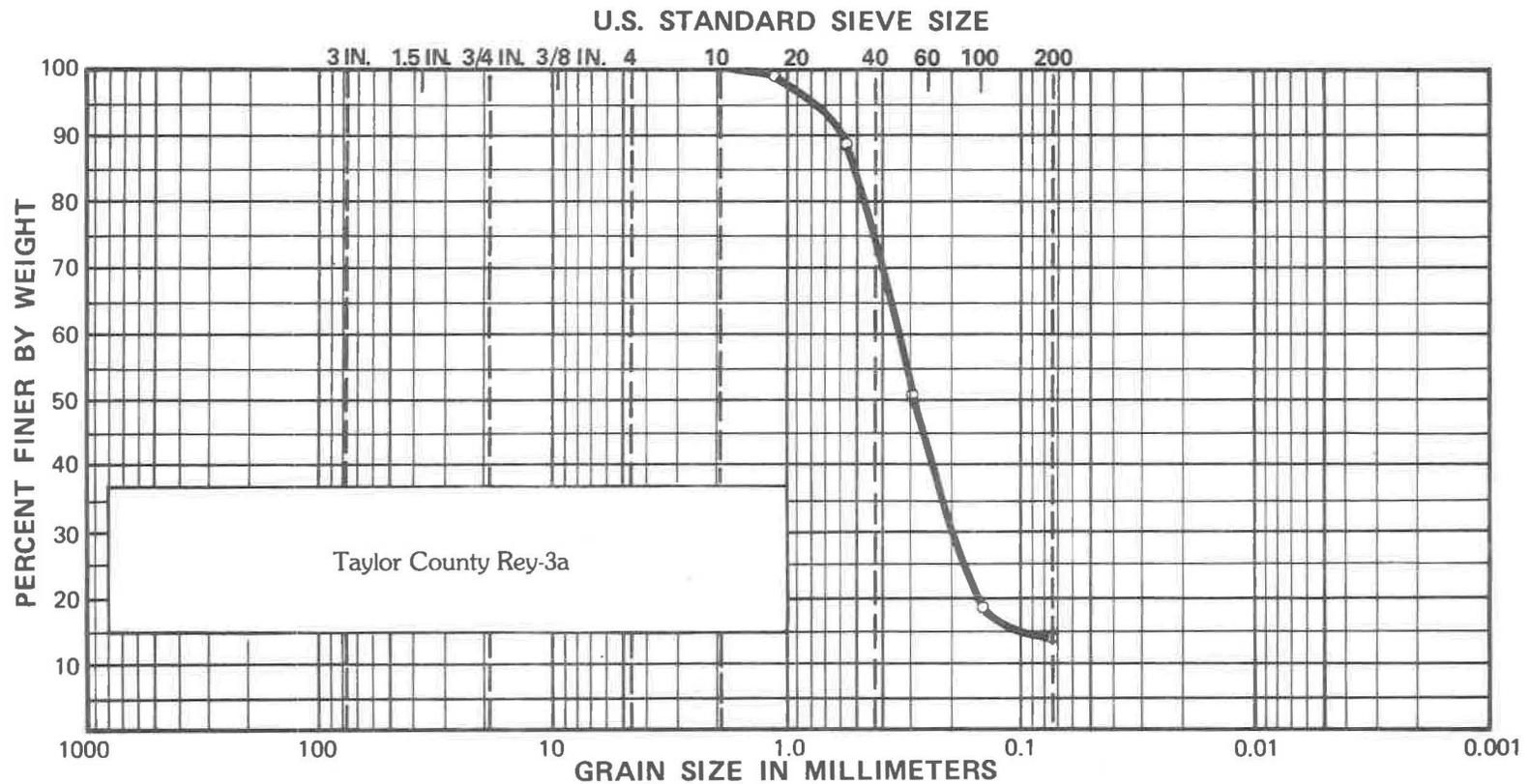


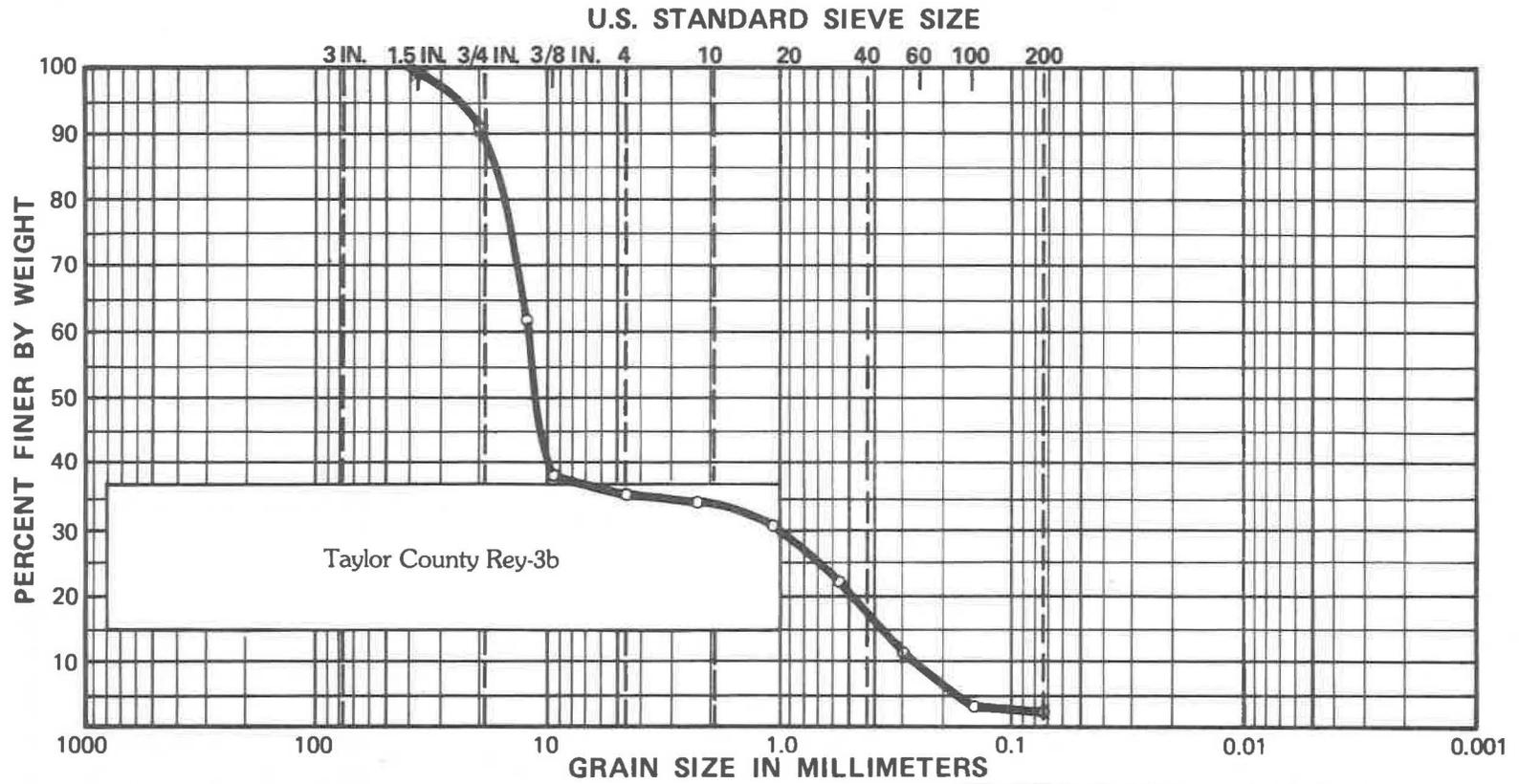
COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 163. Size Distribution Curve of Sample BtW-1.



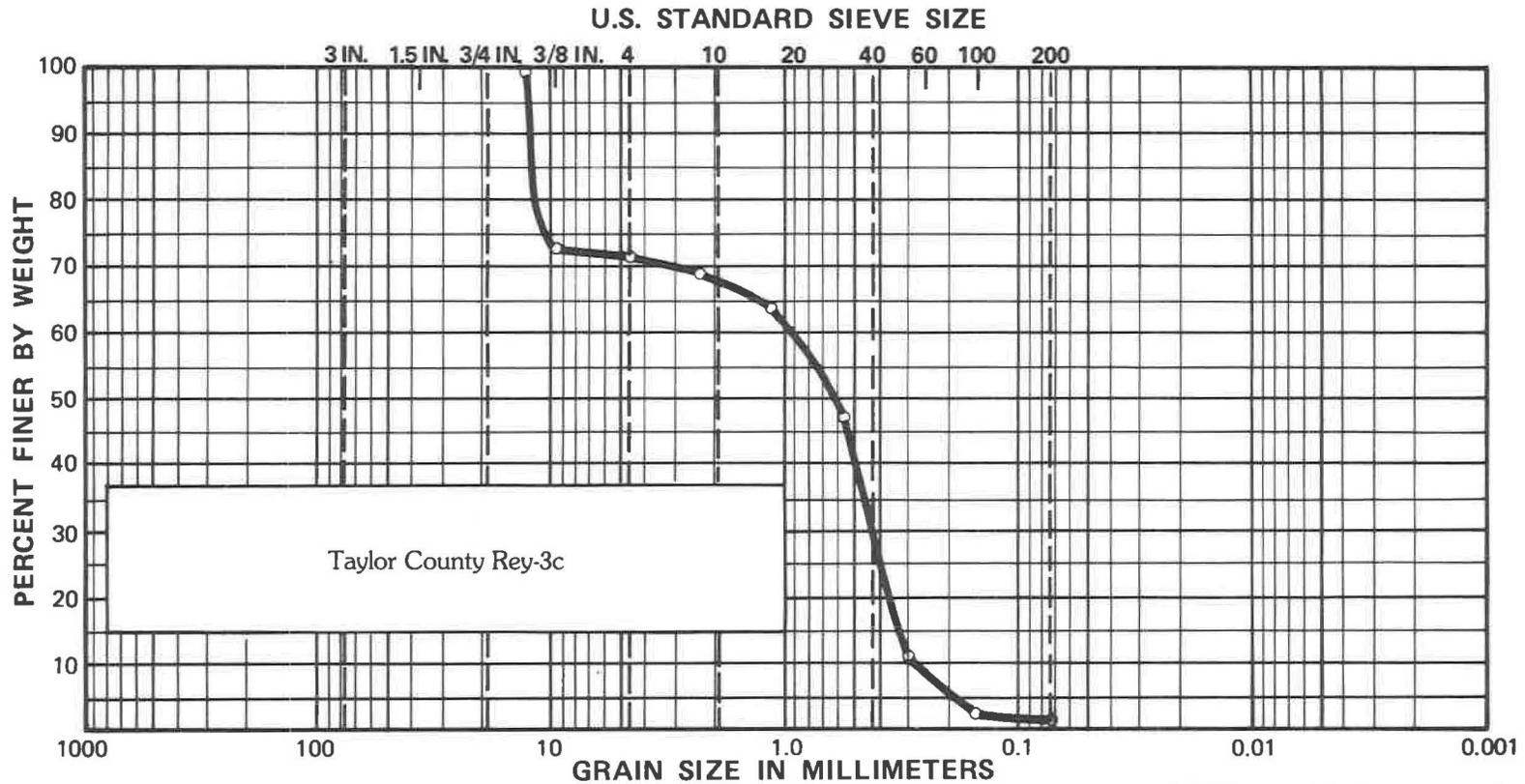


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 165. Size Distribution Curve of Sample Rey-3b.

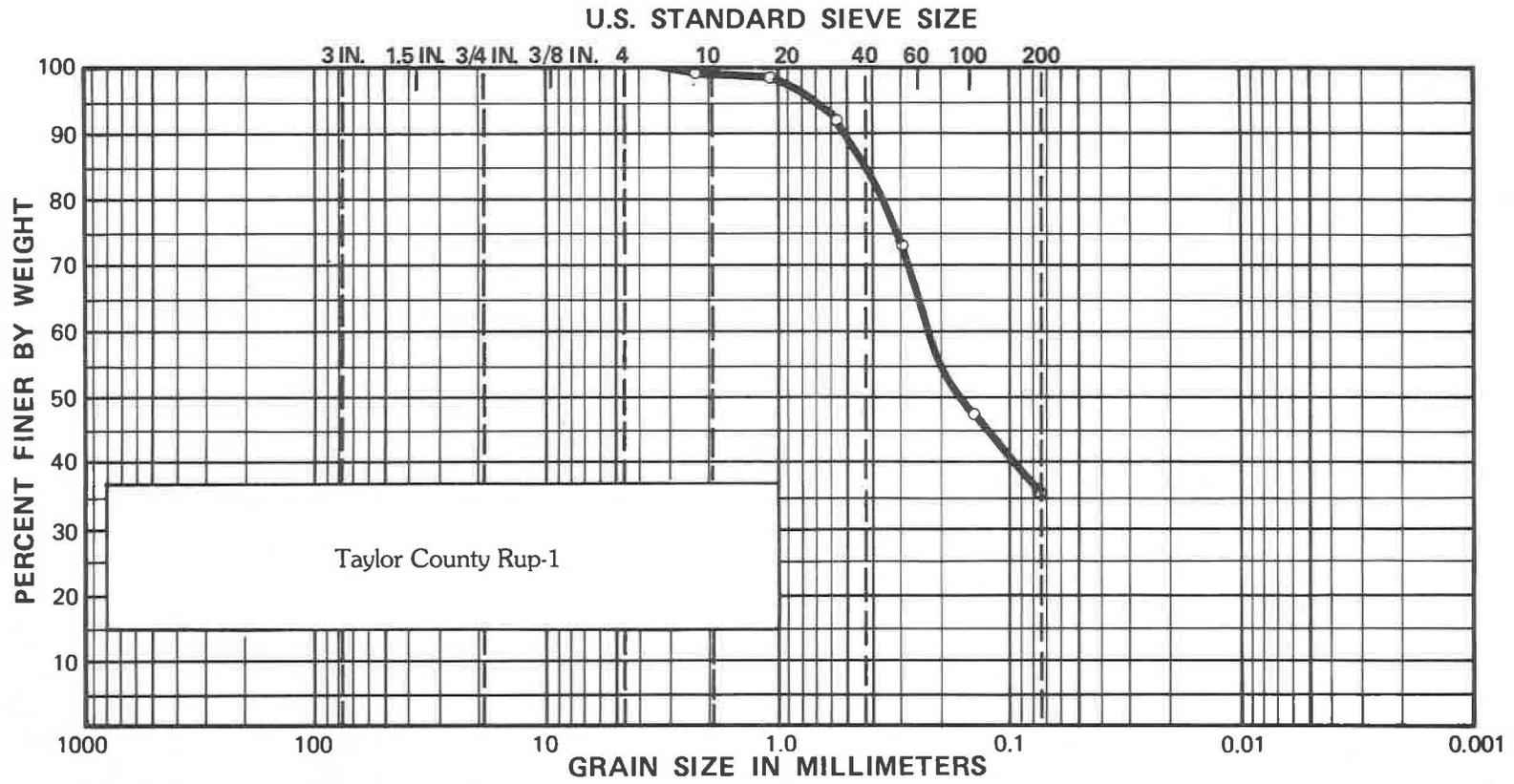


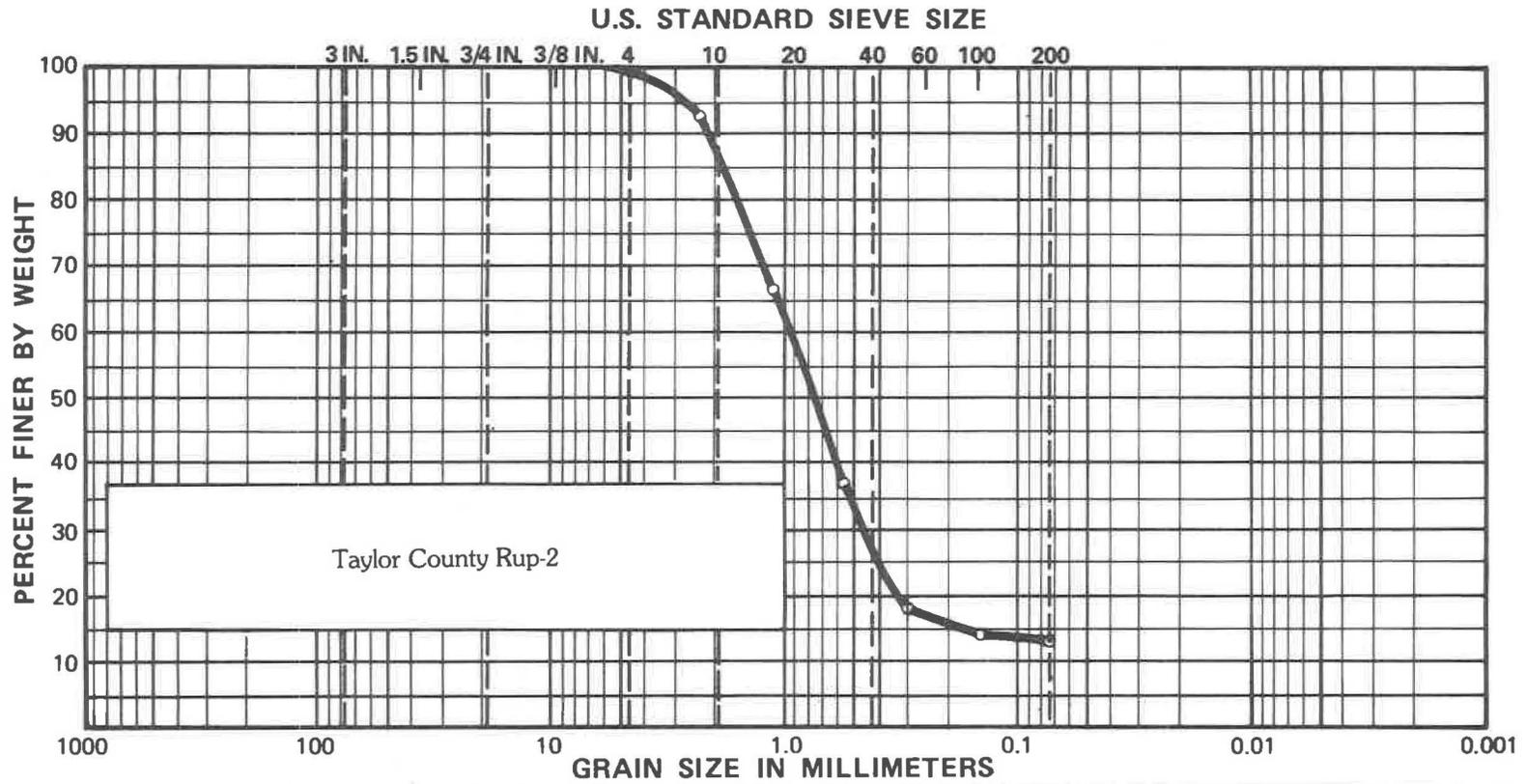
COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE	FINE		COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	coarse	SAND medium fine	very fine	coarse medium fine	SILT	very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 166. Size Distribution Curve of Sample Rey-3c.



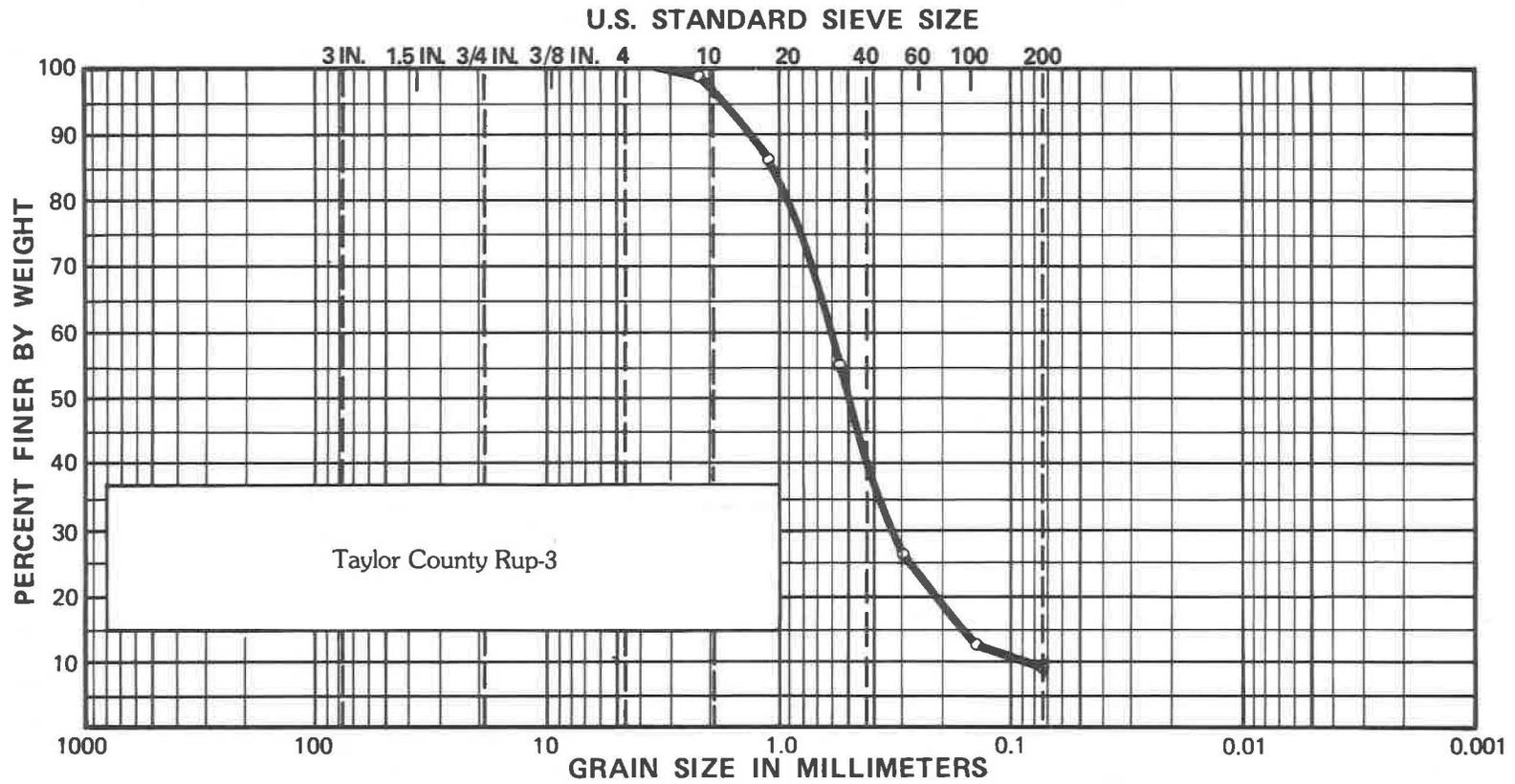


COBBLES		GRAVEL				SAND			SILT OR CLAY *										
		COARSE		FINE		COARSE	MEDIUM		FINE										
BOULDERS	COBBLES large small	very coarse	coarse	GRAVEL medium	fine	very fine	very coarse	coarse	SAND medium	fine	very fine	coarse	SILT medium	fine	very fine	CLAY coarse	medium	fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 168. Size Distribution Curve of Sample Rup-2.

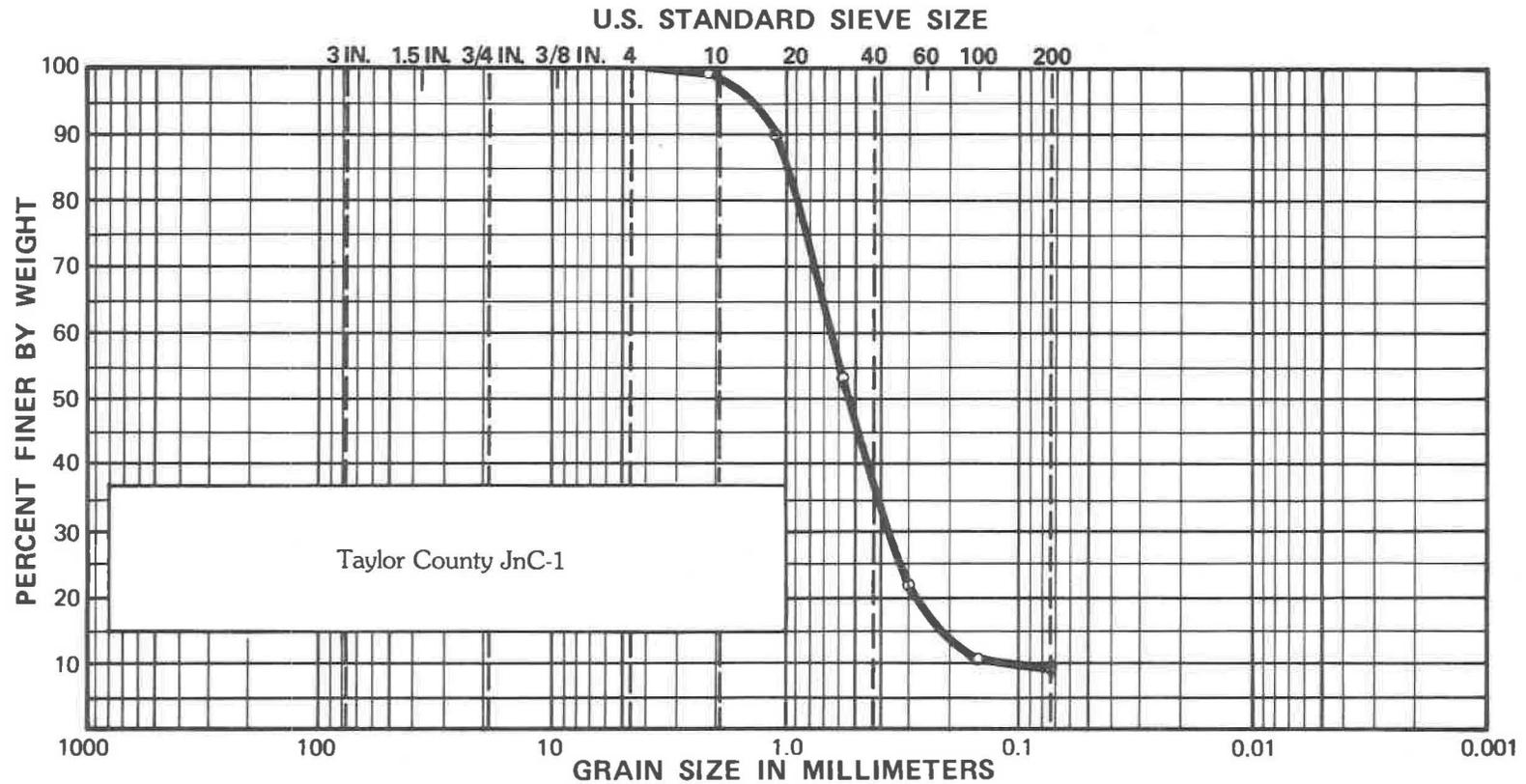


COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 169. Size Distribution Curve of Sample Rup-3.

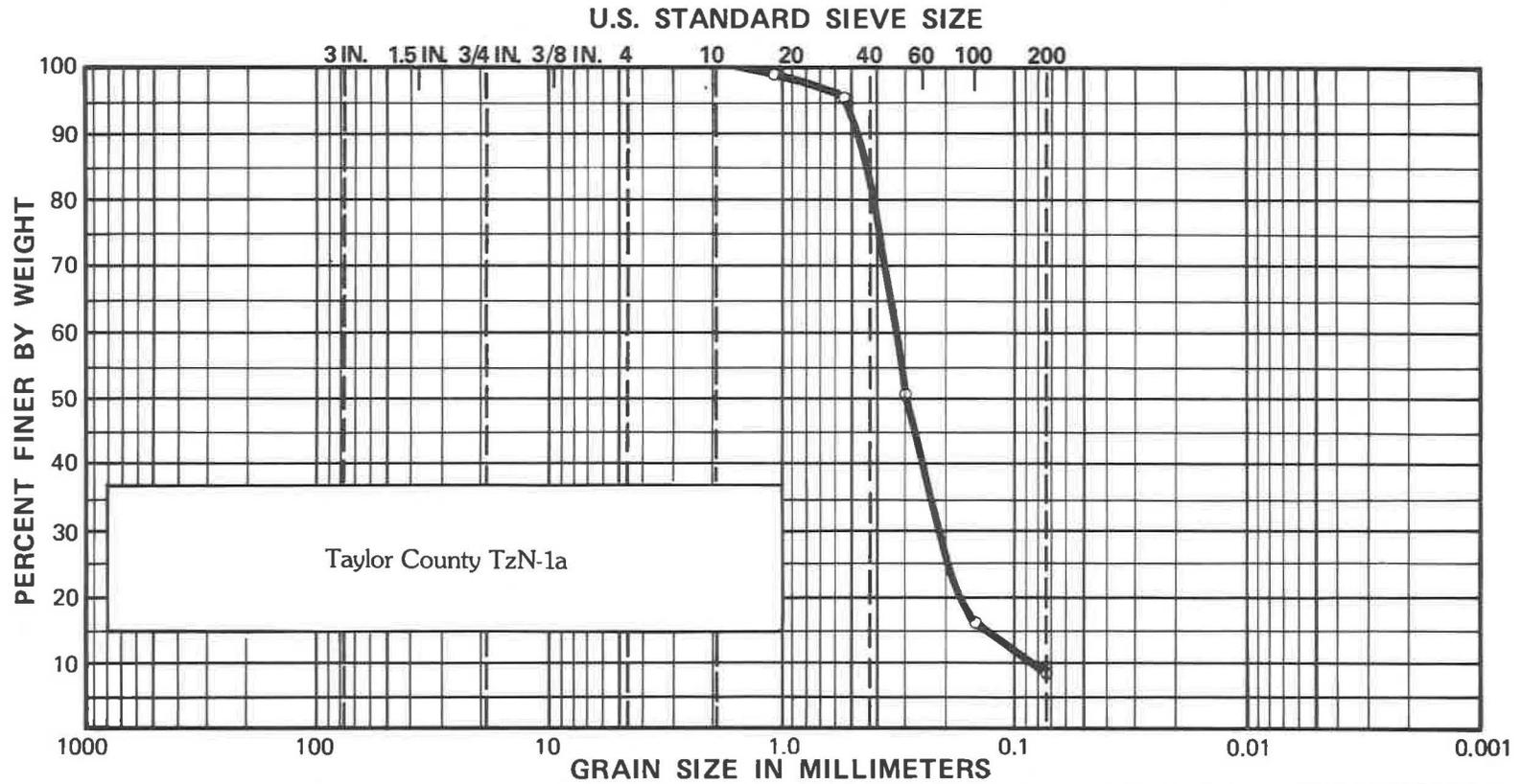


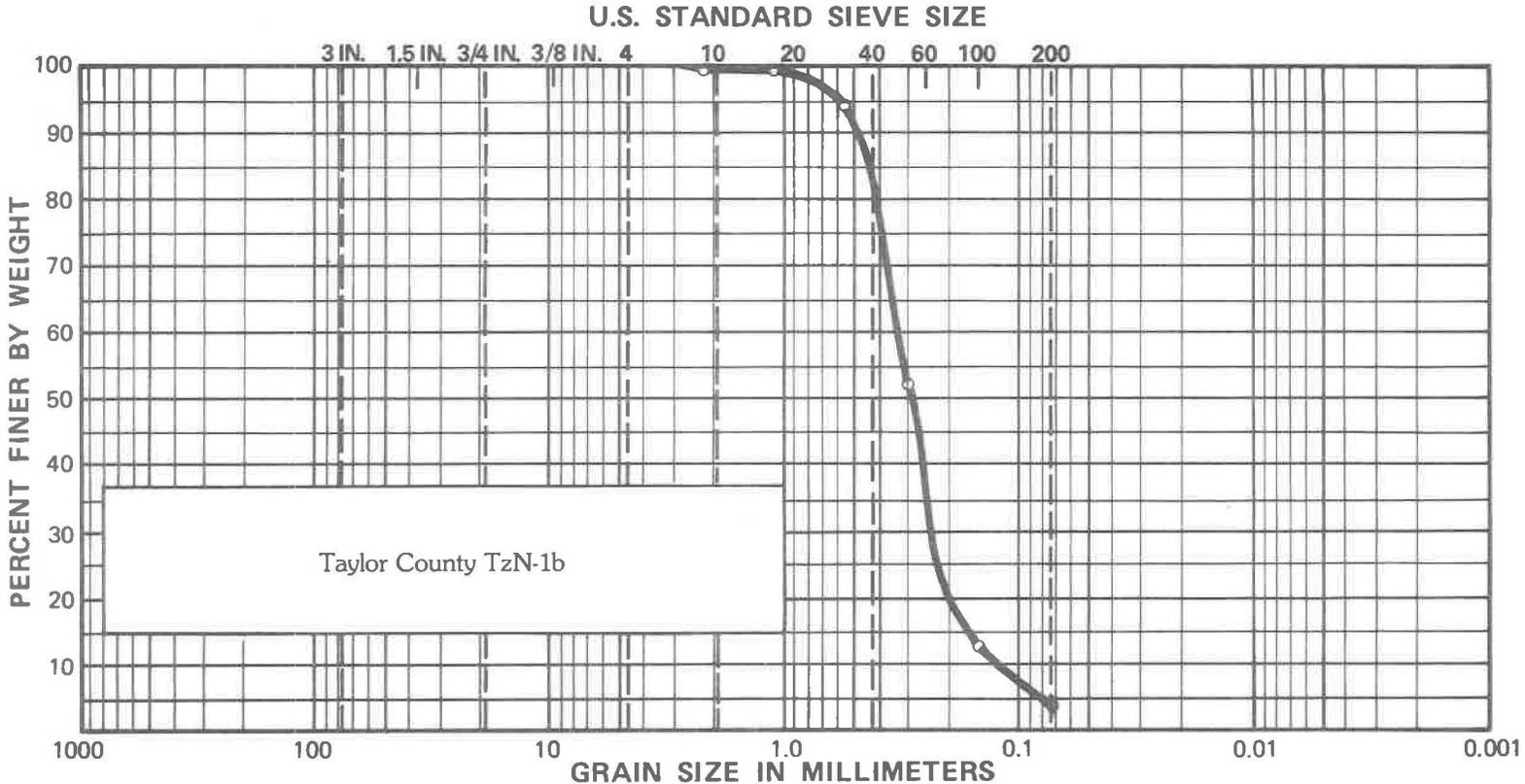
COBBLES	GRAVEL				SAND			SILT OR CLAY *				
	COARSE	FINE	COARSE	MEDIUM	FINE							
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine			very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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





COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE		COARSE	MEDIUM	FINE		

BOULDERS	COBBLES		very coarse	GRAVEL			very fine	very coarse	SAND			very fine	SILT			very fine	CLAY		
	large	small		coarse	medium	fine			coarse	medium	fine		coarse	medium	fine		coarse	medium	fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 172. Size Distribution Curve of Sample TzN-1b.

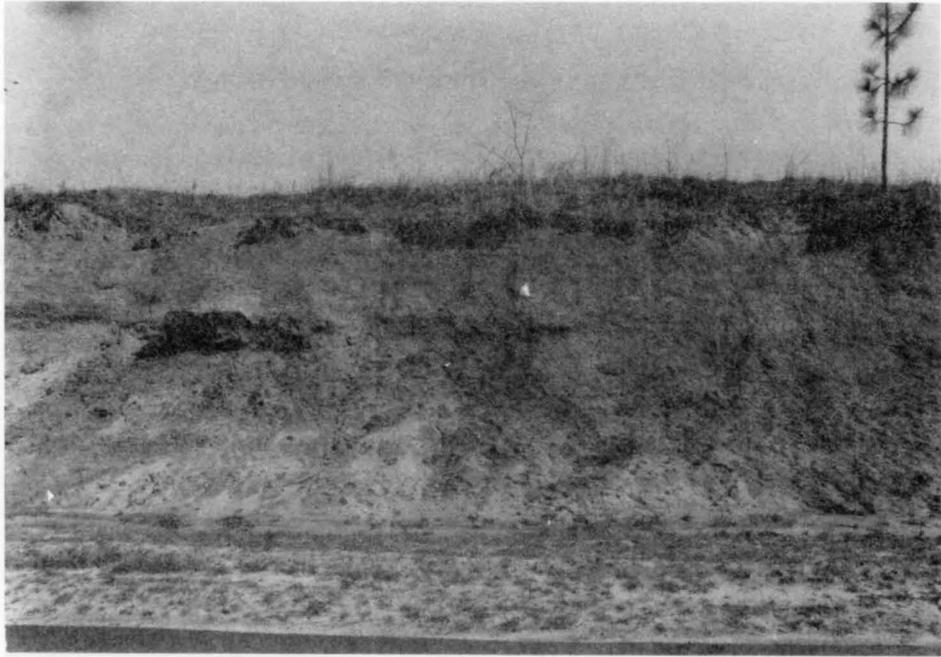


Figure 173. Exposure of Coarse Cretaceous Sands at Sample Locality Rup-2, Taylor County



Figure 174. Gravels of a High Terrace Deposit from the Flint River, at Sample Locality Rey-3, Taylor County.



Figure 175. Close-up of Sandy Zone in High Level Terrace Deposit at Sample Locality Rey-3, Taylor County.

Terrell County

Geology and Physiography

Terrell County lies within portions of two physiographic districts of the Coastal Plain Province, the Dougherty Plain and the Fall Line Hills. The surficial sediments of Terrell County are derived from the Tuscaloosa Formation, the undifferentiated Claiborne Group, and the residuum of the Ocala and Oligocene limestones.

Previous Work

Teas (1921, p. 258-259) described an exposure of fine-grained sand 6 feet thick, which was overlain by 10 feet of sandy clay (fig. 176, Ts-79). Teas (1921) noted that this deposit was only of value for local purposes due to the clay overburden. A deposit of fine-grained surficial sand less than 5 feet thick (fig. 176, Ts-80) was noted by Teas (1921) as being useful only for local purposes.

Present Study

The soil association used in targeting areas of Terrell County was Americus, which is present in interfluvial areas of western Terrell County. The geomorphic features targeted are point bars along Kinchafoonee Creek in eastern Terrell County. Three samples from Terrell County were sieved (fig. 176, Shl-1, Shl-2, Bot-1; figs. 177-179; Table 30).

Evaluation

None of the natural materials sieved met ASTM standard C-33. Of the three samples sieved Bot-1 has the best grain-size distribution (fig. 179). The deposit represented by Bot-1 has a "workable" area of approximately 20 acres; however, as with the other two deposits represented by Shl-1 and Shl-2, a clayey sand overburden is present and would probably prevent development of this deposit on a commercial scale.

Mining activity

There are no active or recently inactive commercial aggregate mining operations within Terrell County.

Summary evaluation

The areas with the highest potential for aggregate production are those in which the undifferentiated Claiborne Group is exposed (western and northeastern Terrell County). Judging from the grain-size distribution of Bot-1, it is possible that a deposit of adequate size and quality for commercial production of aggregate could be present within the outcrop area of the undifferentiated Claiborne Group. The major problem would be finding a deposit with little or no overburden. The potential for fine aggregate production in Terrell County is considered to be low to moderate.

Table 30. Terrell County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Shl-1	10 feet	trench	10 feet	2	no	0
Shl-2	6 feet	trench	12 feet	2	no	2
Bot-1	4.5 feet	trench	10 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

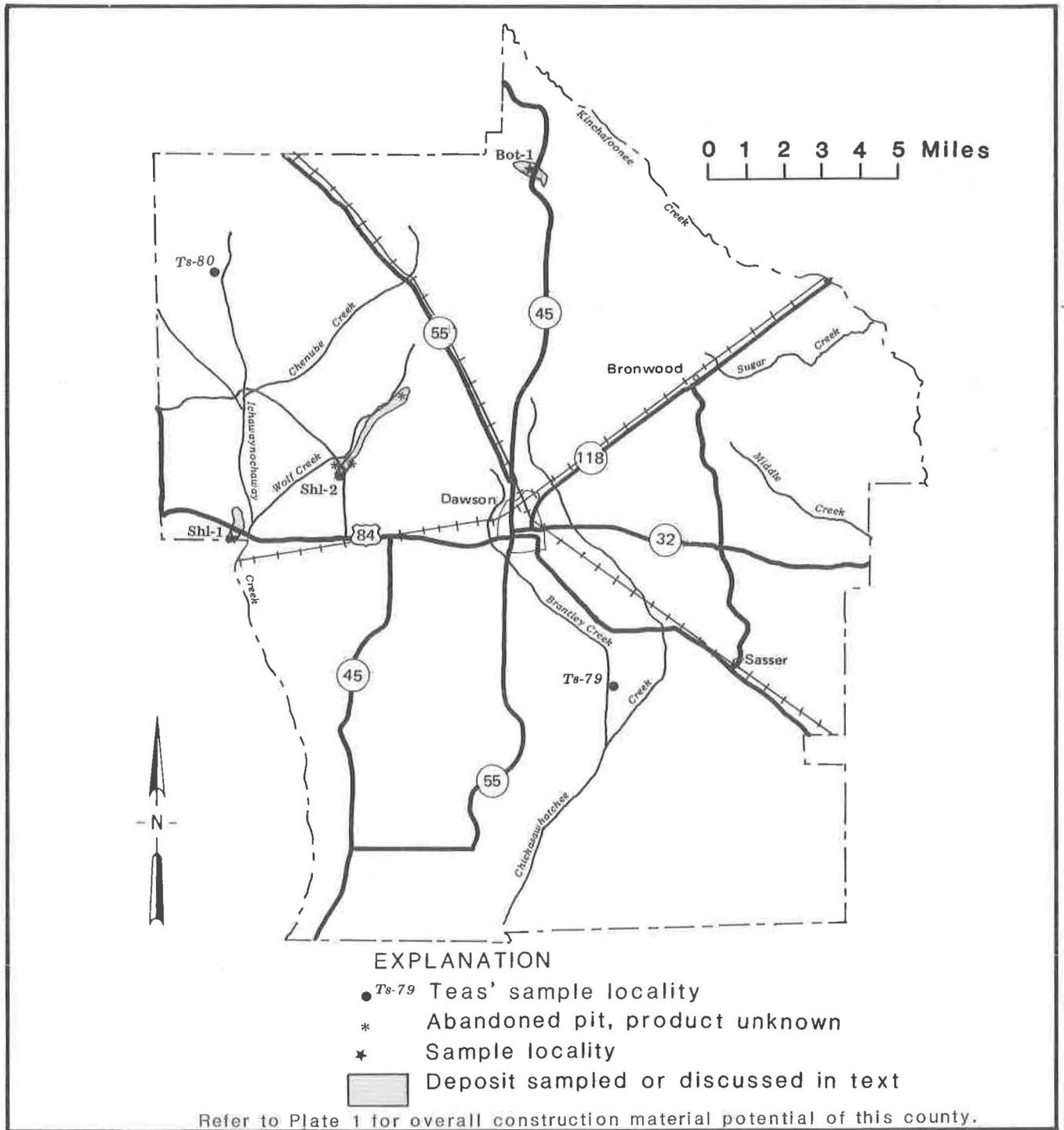
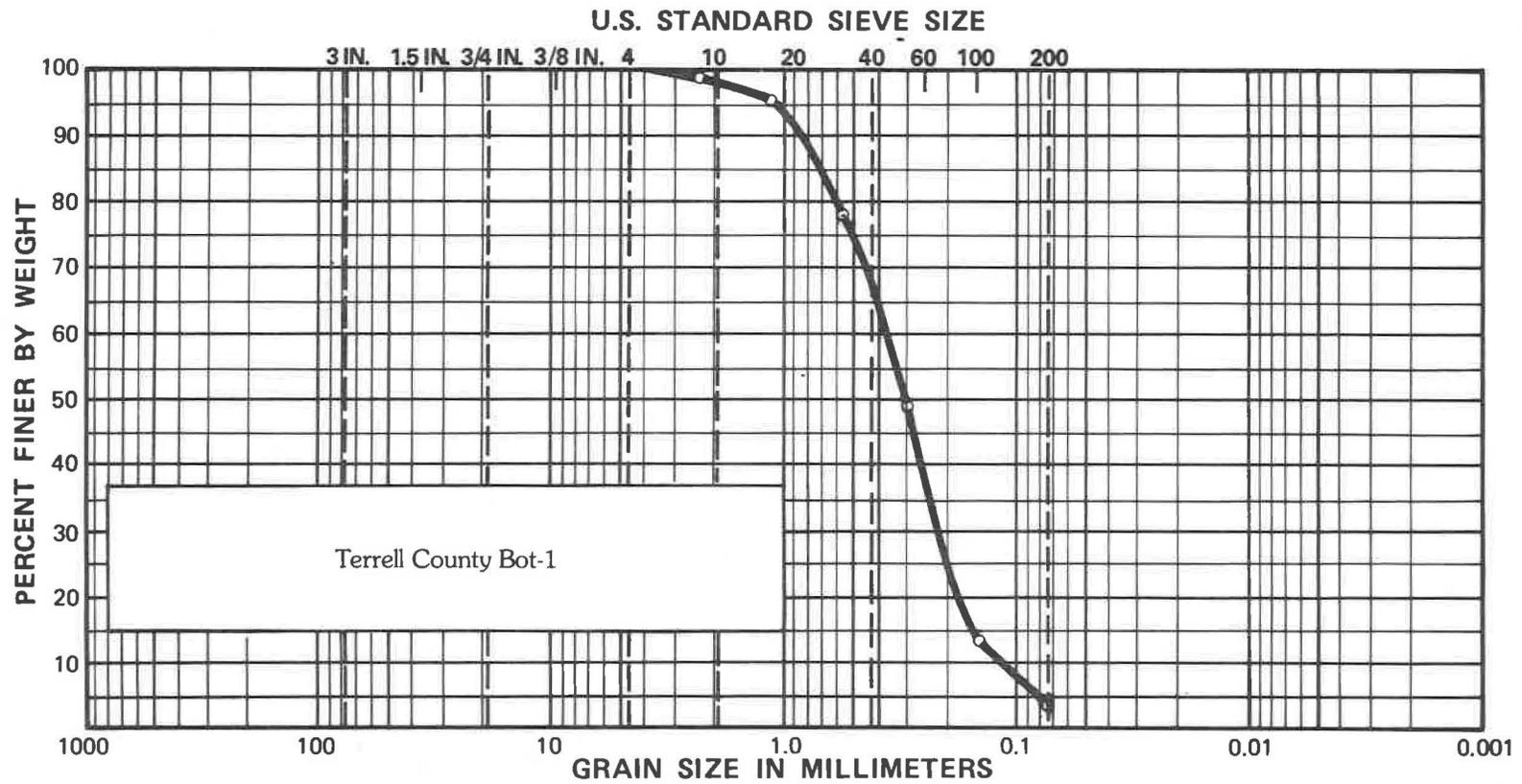


Figure 176. Map of Terrell County Showing Sample Localities, Teas' Sample Localities, Pits, and Deposits Sampled.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 179. Size Distribution Curve of Sample Bot-1.

Thomas County

Geology and Physiography

Thomas County lies within the Tifton Upland District of the Coastal Plain Province. The surficial sediments of this county are derived from the Miccosukee Formation and the Hawthorne Group.

Previous Studies

Teas (1921, p. 259-262) described deposits of fine- to coarse-grained sands at several locations (fig. 180, Ts-81, Ts-82 [Williams pit]) and one deposit of fine- to very fine-grained white sand suitable for glass manufacture (fig. 180, Ts-83). In a general statement on the sands of Thomas County, Teas (1921, p. 259) stated "Light sandy clay, or sand, covers most of Thomas County, but is underlain at depths of from a few inches to several feet by clay and clayey sand."

Present Study

The soil association used in targeting areas of Thomas County was Lakeland, which is present in interfluvial areas adjacent to the Little Ochlocknee and Ochlocknee Rivers in northwest Thomas County. Geomorphic features targeted in the county are point bars of the Ochlocknee River in northwestern Thomas County. One sample from Thomas County, Mer-1, was analyzed (figs. 180, 181, Table 31). As shown by the grain-size distribution graph, this sample failed to pass ASTM standard C-33 for a fine aggregate. A second sample taken from an area 4 miles due west of the intersection of the Ochlocknee River and the Thomasville-Meigs road on the east bank of Barnett Creek revealed the same type sand.

Evaluation

The deposit represented by sample Mer-1 is too fine-grained to be of use as a construction aggregate. The sand of this deposit could, if present in sufficient amounts, and if sufficiently pure, be used as a glass sand.

Mining activity

Currently there are one active and two inactive aggregate plants within Thomas County.

Southern Sand Company (fig. 180, D-710-F) of Thomasville produced fill material from a 3 acre pit. No information on production figures or depth of mining is available.

Montgomery Industries of Mount Vernon recently bought the properties formerly owned by Dawes Silica (fig. 180, D-109-F) and was permitted by the Land Reclamation Branch of the Department of Natural Resources to mine an adjacent 36 acre tract of land (fig. 180, D-684-F). The products of this adjacent tract were concrete, mortar, foundry and sand-blasting sand. The concrete and mortar sands were transported within a 50 mile radius by truck. The sand-blasting sand was transported by pneumatic tanker and tractor trailer within a 100 mile radius, including shipment to Alabama and northern Florida. The foundry sand, a minor product, was shipped by rail to Birmingham, Alabama. The mining was accomplished with a dredge which pumped the sand by pipeline to classifiers. Mining depth varied from 20 to 50 feet in man-made ponds. Annual production was between 50,000 and 100,000 tons.

Montgomery Industries (fig. 180, D-768) began mining in March 1985 and is the current active aggregate producer in Thomas County. The products are concrete, mortar, foundry and sand-blasting sand. The transportation, mining methods and depths, haulage radius, and market areas are the same as those of their former operation (D-684-F) in Thomas County. The new mining area is a 300 acre tract and annual production of all products is expected to be between 50,000 and 100,000 tons.

Summary evaluation

The deposit sampled (Mer-1) offers no potential for either fine or coarse aggregate production. Based on field and laboratory data, as well as mining activity, the fine aggregate production potential of Thomas County is considered to be low to moderate.

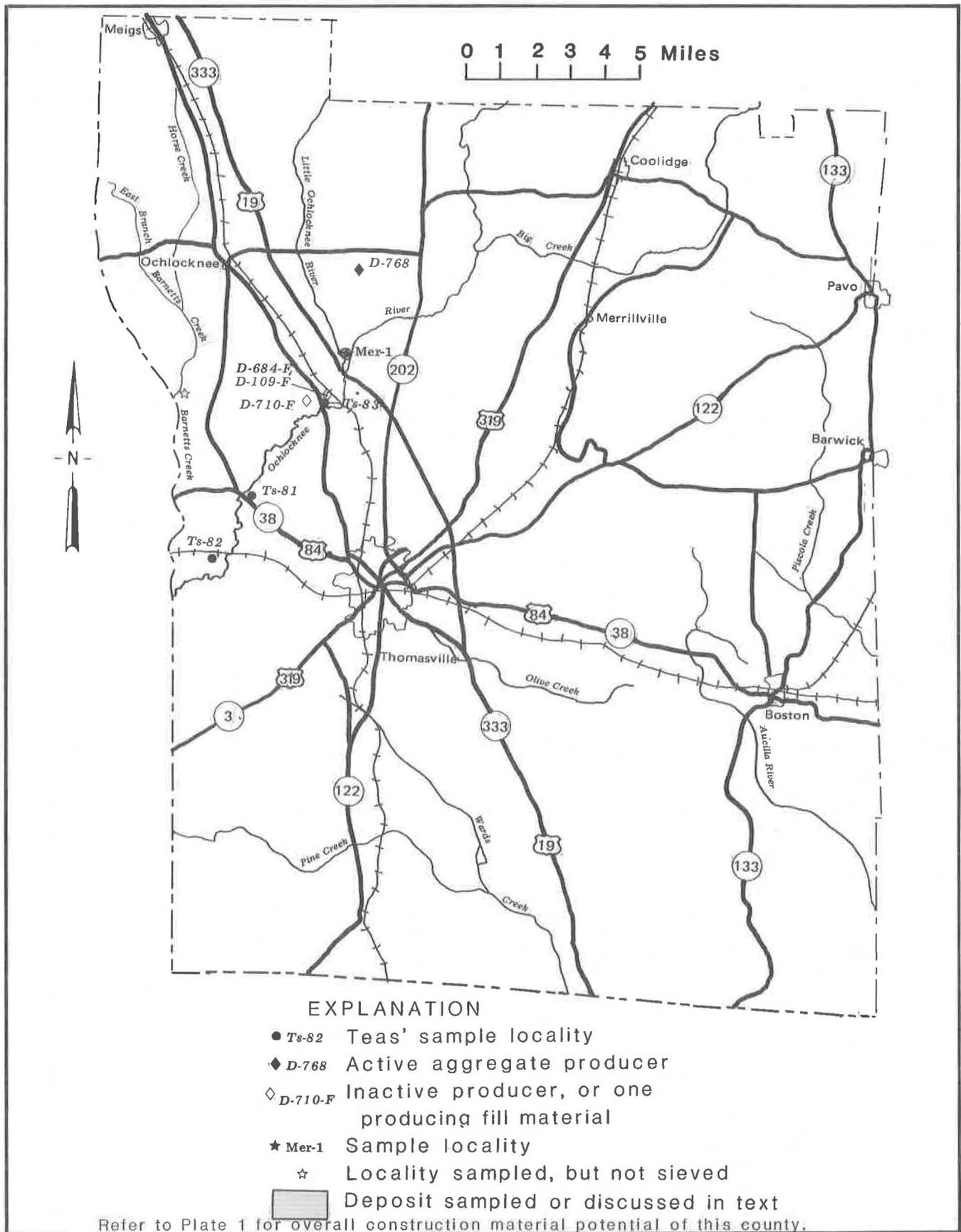
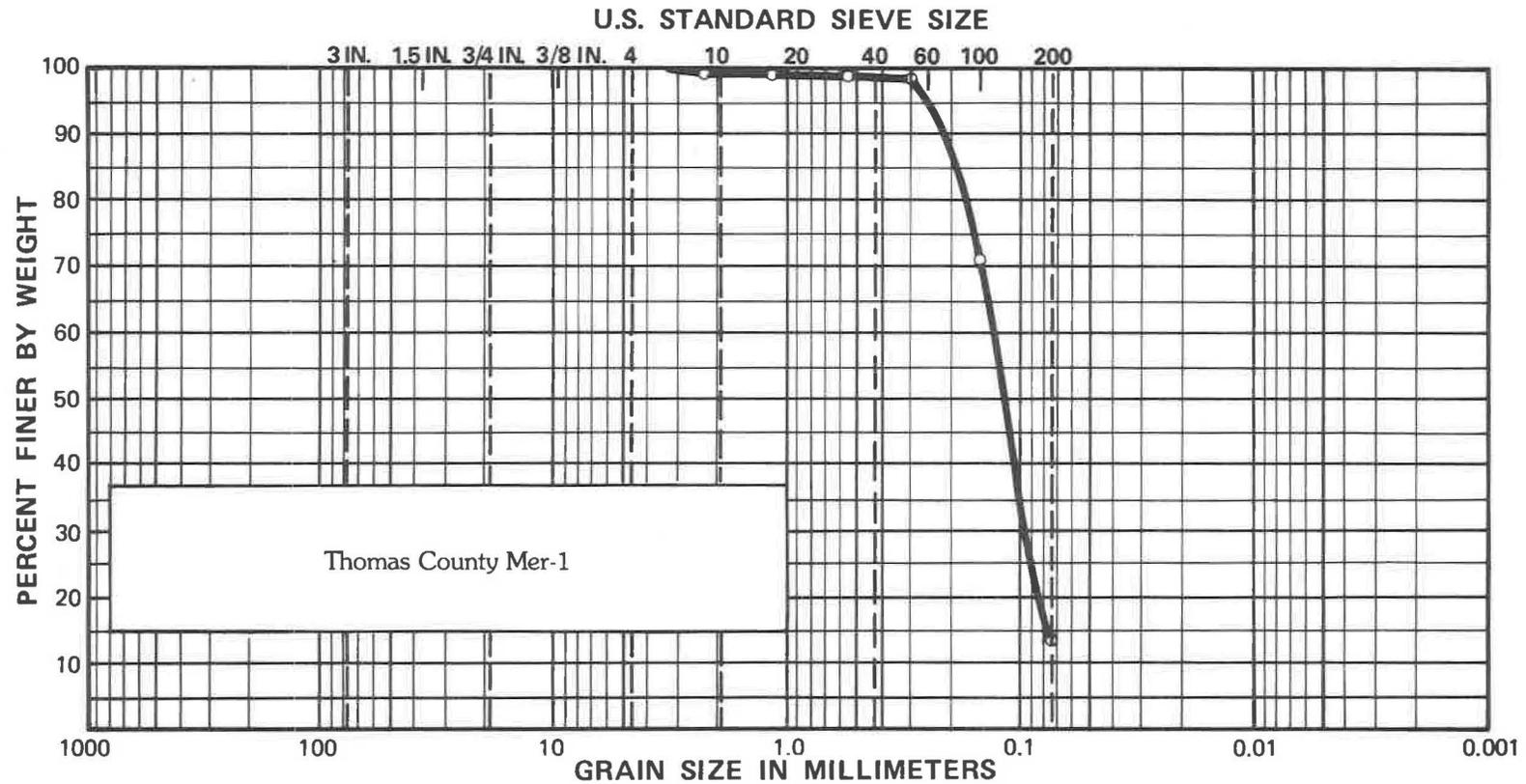


Figure 180. Map of Thomas County Showing Sample Localities, Teas' Sample Localities, Pits, Deposits Sampled, and Locality Sampled but not Sieved.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

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

Table 31. Thomas County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
Mer-1	9 feet	auger	9 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

Tift County

Geology and Physiography

Tift County lies within the Tifton Upland District of the Coastal Plain Province. The surficial sediments present are derived from the Altamaha Formation which crops out throughout the county.

Previous Studies

According to Teas (1921, p. 262-263), the surficial material of Tift County consists of clays and clayey sands with numerous limonite pebbles. Teas also noted localized thin (3-4 feet) deposits of coarse-grained sand capping the high hills and ridges of the area (fig. 182, Ts-86a, Ts-86b). Teas (1921) described sand hills paralleling the Little River throughout the county. Reference was made to sand deposited at localities Ts-84 and Ts-85 which, Teas (1921) reports, are 10 feet thick but of limited extent and suitable only for plaster and mortar sand.

Present Study

The soil associations used in targeting areas in Tift County were Kershaw and Lakeland, which are present in interfluvial areas and adjacent to the Little River and Ty Ty Creek in western Tift County. The areas with the highest potential for aggregate production are eastward of, and adjacent to, the Little River (fig. 182). Samples from six sites in Tift County were sieved (fig. 182, Table 32). A seventh site was sampled, and clay was encountered at a shallow depth; the sample was not sieved.

Evaluation

The six samples sieved from Tift County are similar in that they are moderately to well-sorted, silty and fine-grained (figs. 183-188). None of the material sampled meets ASTM standard C-33 for a natural, fine aggregate. The two samples with the best grain-size distribution are Chu-1 and Chu-2 (figs. 186, 187).

Mining activity

Current mining activity in Tift County is limited to the Robert O'Quinn sand pit. This sand pit is located south of Georgia Highway 50 and west of Georgia Highway 35. Currently the operator is mining the deposit to a depth of approximately 15 feet using a front end loader. The probable use of the product mined is fill material for the unpaved roads of the county. No estimates of production are available.

Abandoned (inactive) mines include three pits (fig. 182) in the western portion of Tift County. One pit (fig. 182, D-173-F) is located 5 miles northwest of Tifton between the forks of the Little River and its tributary, Oldfield Creek. This pit was operated by Jones Construction Company of Tifton. The sand mined from this pit was used as fill material. The product of the other two pits is not known, but probably was fill material.

Summary evaluation

The aggregate deposits of Tift County offer little or no possibility for economic development with the exception of fill material and small local deposits of mortar sand. The two sand bodies represented by the samples Chu-1 and Chu-2 are too thin to be of economic value.

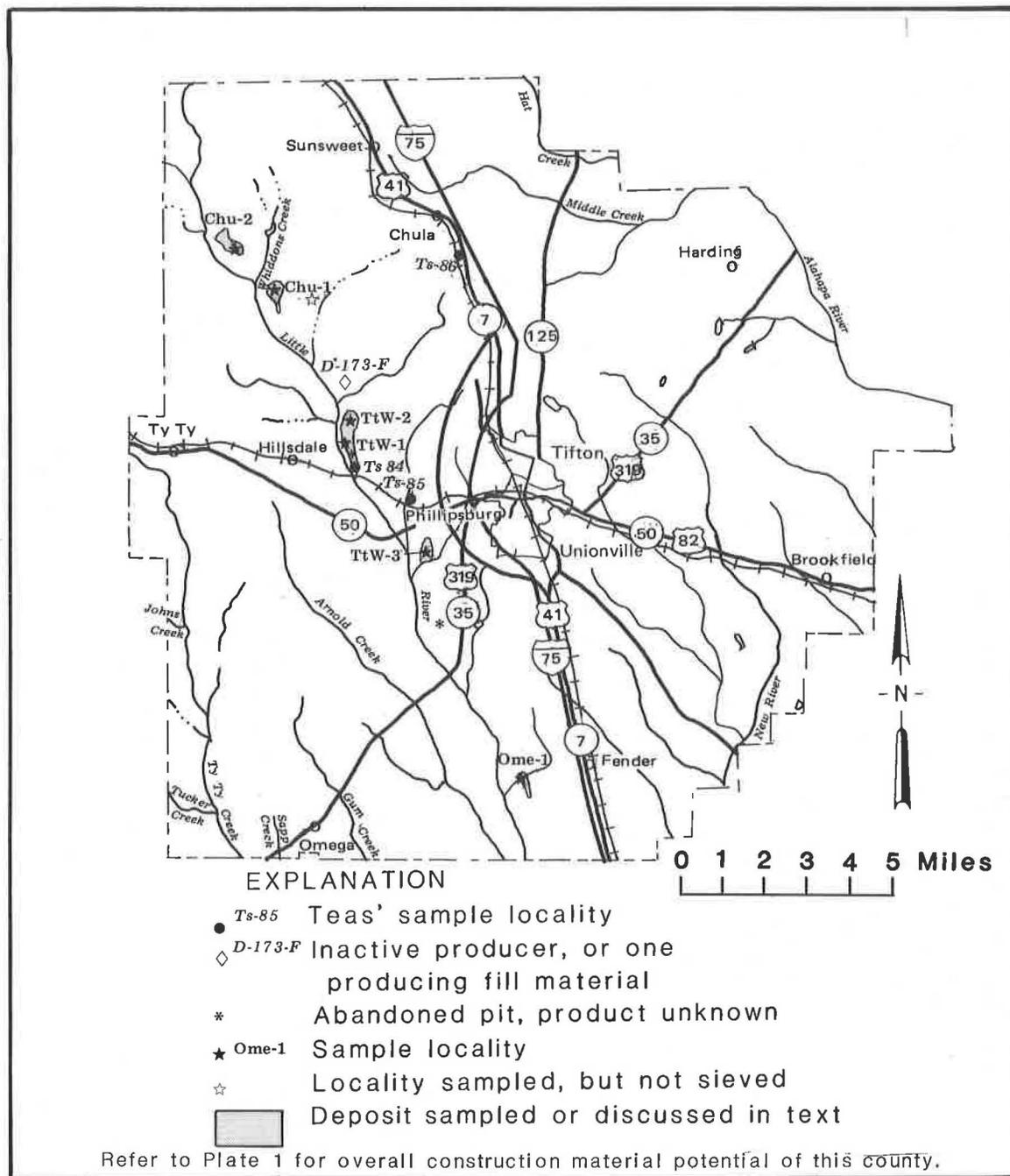
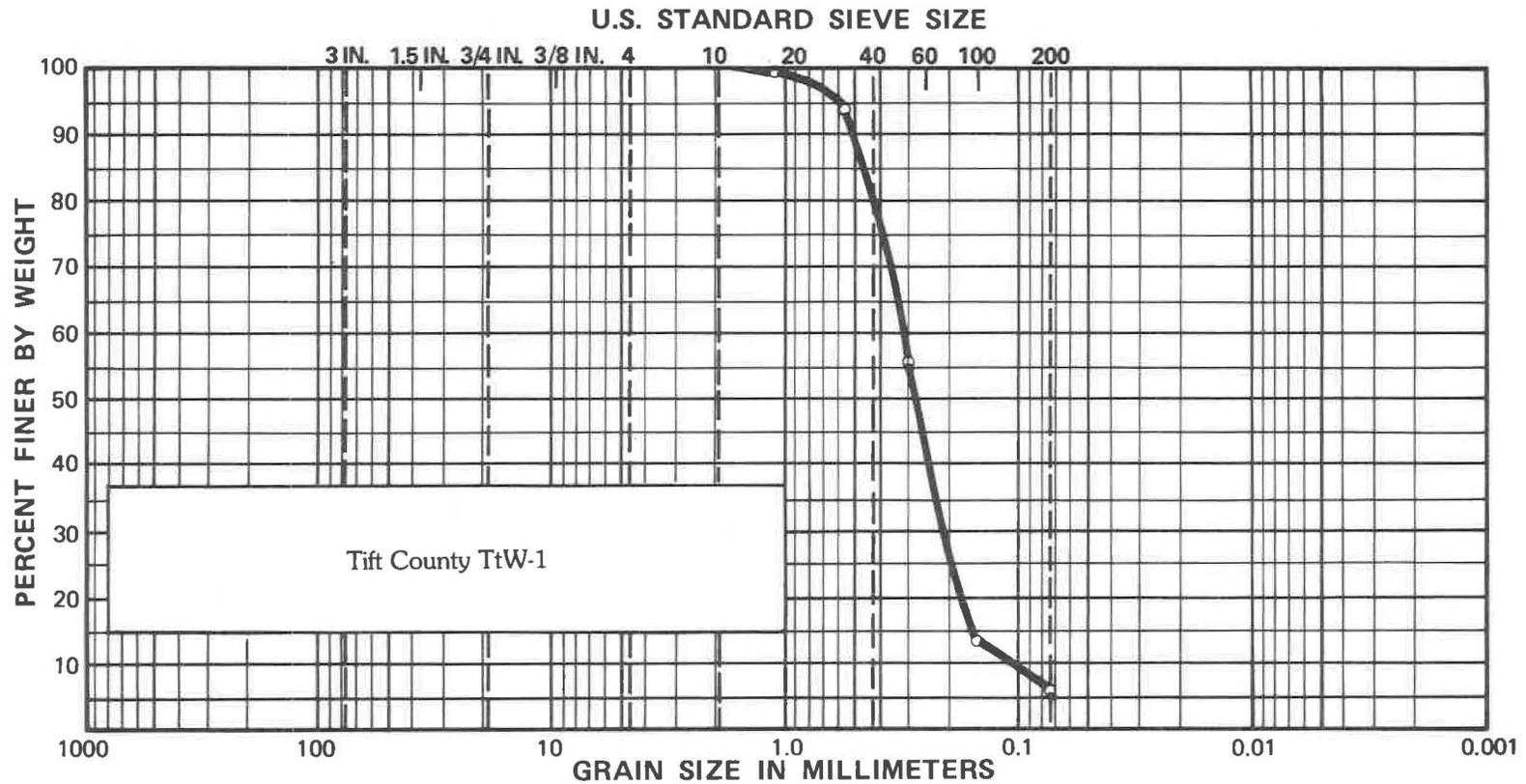


Figure 182. Map of Tift County Showing Sample Localities, Teas' Sample Localities, Pits, Deposits Sampled, and Locality Sampled but not Sieved.

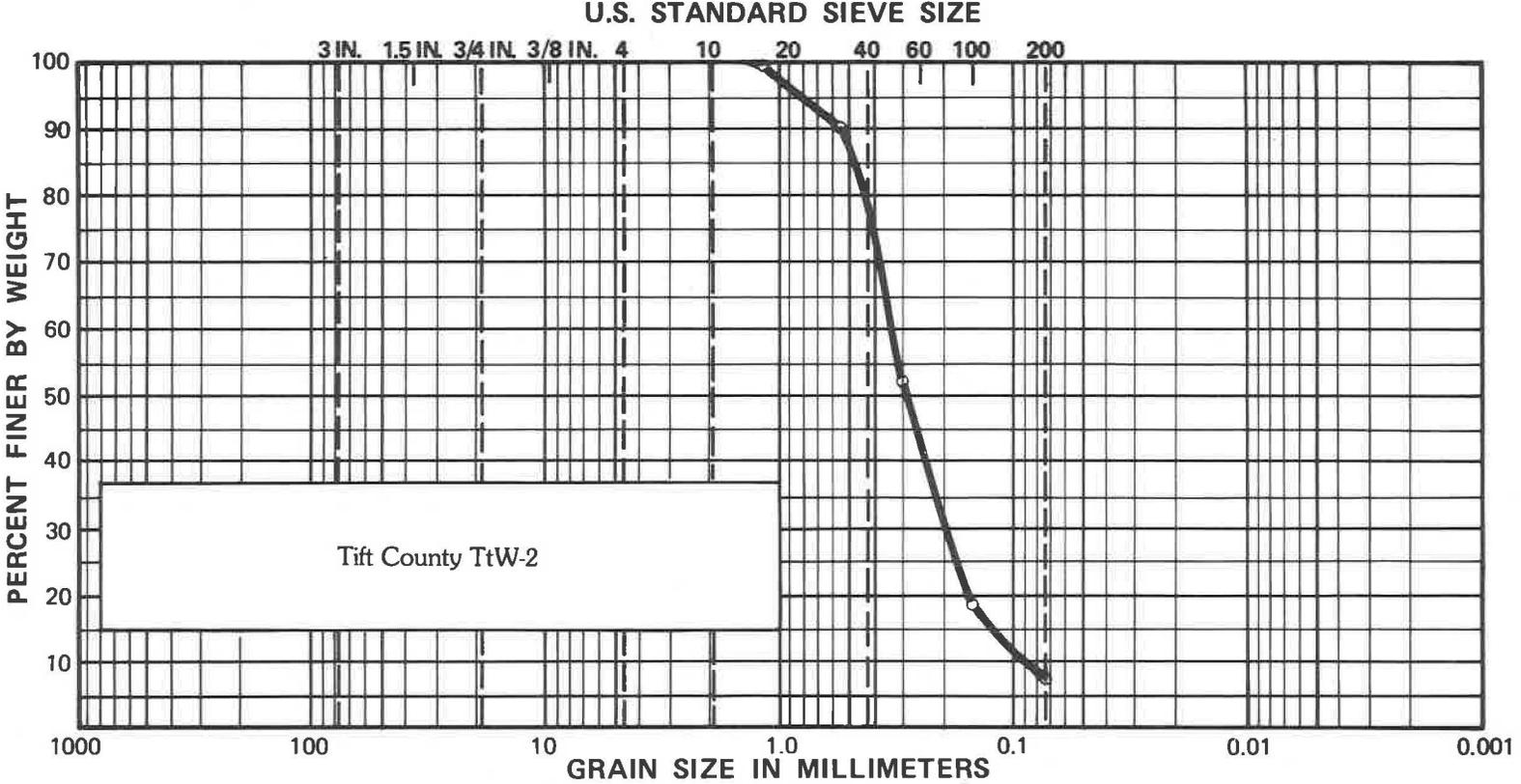


COBBLES	GRAVEL				SAND			SILT OR CLAY *					
	COARSE	FINE	COARSE	MEDIUM	FINE								
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine			very fine	CLAY coarse medium fine	**

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

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



COBBLES	GRAVEL				SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE			

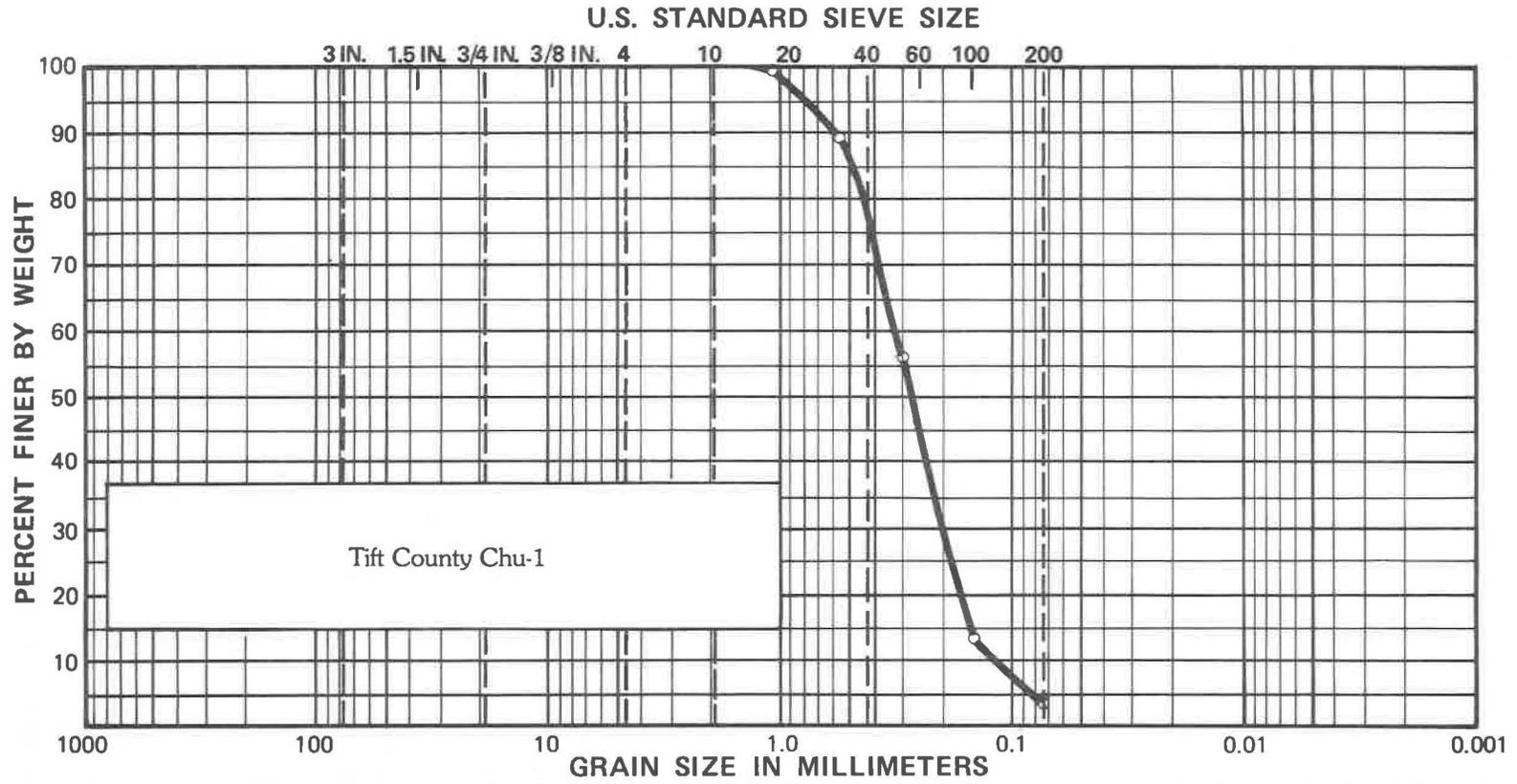
BOULDERS	COBBLES large small	very coarse	GRAVEL				very fine	very coarse	SAND			very fine	SILT			very fine	CLAY	
			coarse	coarse	medium	fine			coarse	medium	fine		coarse	medium	fine		coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 184. Size Distribution Curve of Sample TtW-2.

233

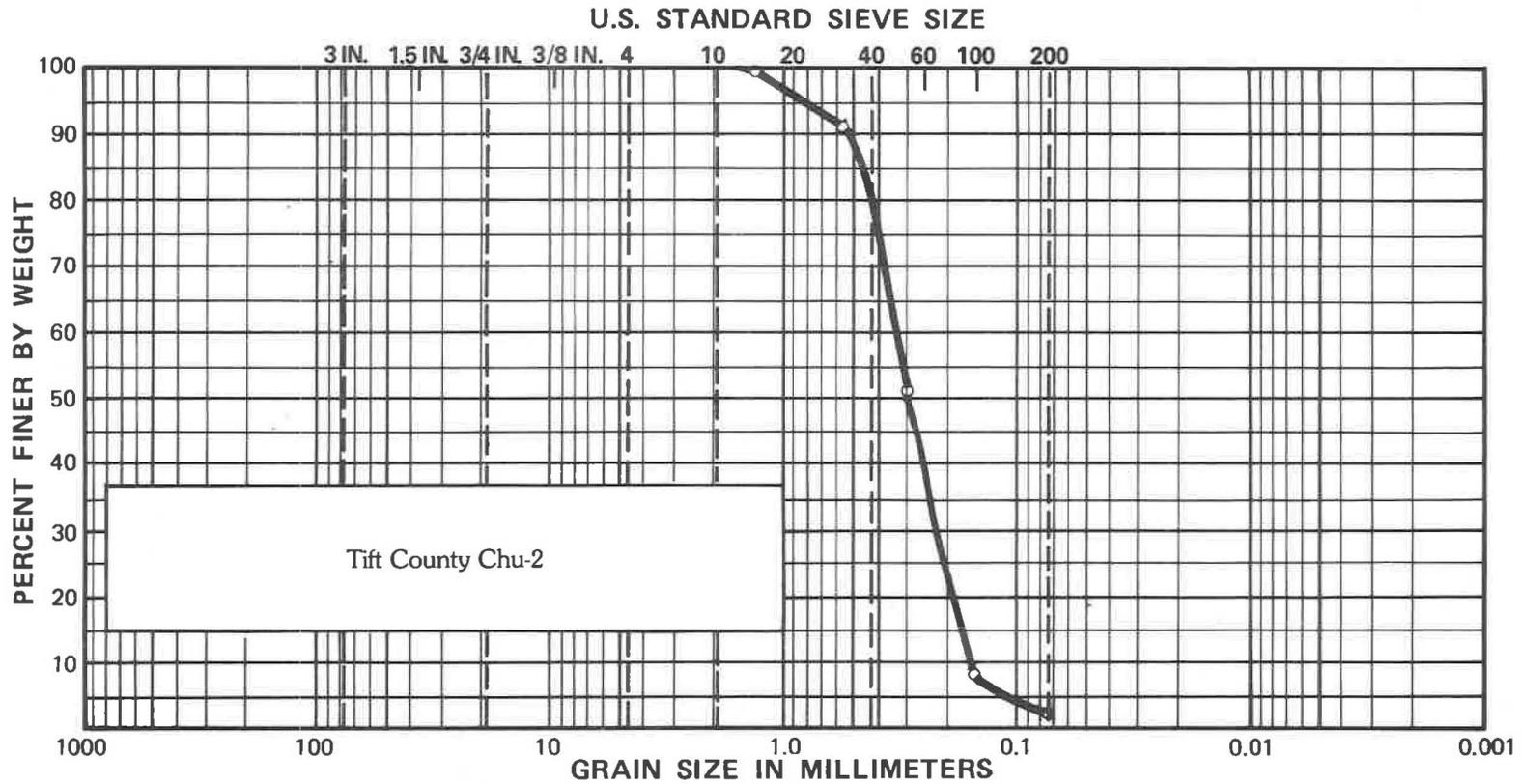


COBBLES	GRAVEL				SAND			SILT OR CLAY		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 186. Size Distribution Curve of Sample Chu-1.

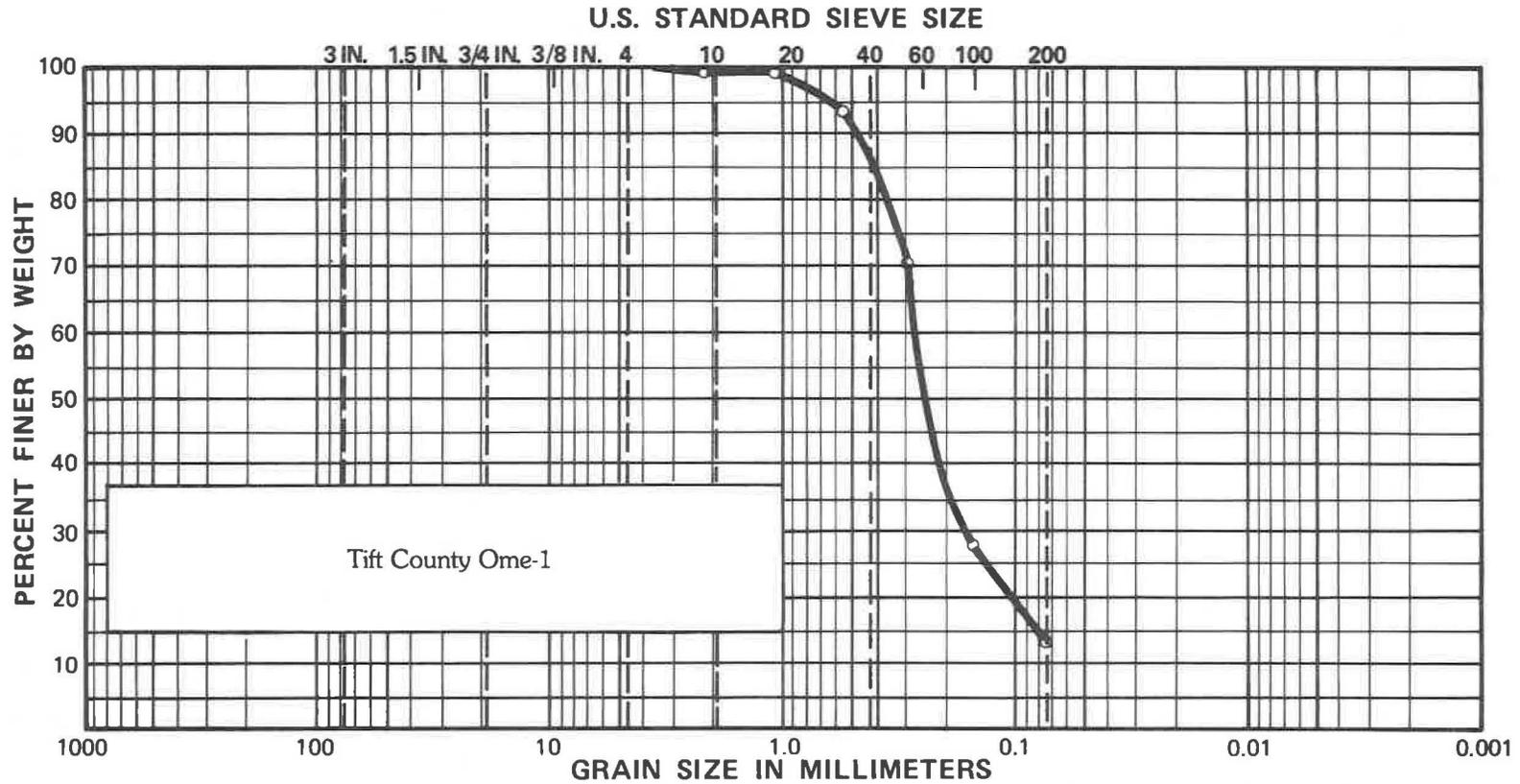


COBBLES	GRAVEL				SAND			SILT OR CLAY *			
	COARSE	FINE	COARSE	MEDIUM	FINE						
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine	**

GRADATION CURVE

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

Figure 187. Size Distribution Curve of Sample Chu-2.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 188. Size Distribution Curve of Sample Ome-1.

Table 32. Tift County sample data

Sample designation	Depth¹	Sample type	Minimum² thickness of the deposit	Priority of³ body sampled	Natural Material Passing ASTM C-33	Rating³
TtW-1	8 feet	auger	22 feet	2	no	2
TtW-2	5 feet	auger	5 feet	2	no	2
TtW-3	5 feet	auger	5 feet	1	no	1
Chu-1	7 feet	auger	7 feet	2	no	2
Chu-2	5 feet	auger	5 feet	1	no	2
Ome-1	4 feet	auger	4 feet	1	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

Turner County

Geology and Physiography

Turner County lies within the Tifton Upland District of the Coastal Plain Province. The surficial sediments of Turner County are derived from the Altamaha Formation.

Previous Studies

According to Teas (1921, p. 265) Turner County has a sandy surface underlain by clays. As a result, very little sand of any commercial value is present in the county.

Present Study

The soil associations used in targeting areas of Turner County were Lakeland and Kershaw, which are present in interfluvial areas in central southern Turner County. Two samples from Turner County, Sum-1 and Ash-1 (fig. 189), were sieved.

Evaluation

None of the natural materials from Turner County pass ASTM standard C-33 (figs. 190, 191; Table 33). The deposits represented by these samples are too thin and silty to be of commercial value.

Mining activity

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

Summary evaluation

The aggregate producing potential of Turner County is severely limited due to the thinness of the sand deposits, their limited areal extent, and their fine grain size. Low local demand for mortar sand could be met by utilizing the small deposits along and adjacent to streams of the county. The potential for commercial-scale production of either fine or coarse aggregate in Turner County is considered to be very low.

Table 33. Turner County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Sum-1	9 feet	auger	9 feet	1	no	1
Ash-1	8 feet	trench	9 feet	1	no	2

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

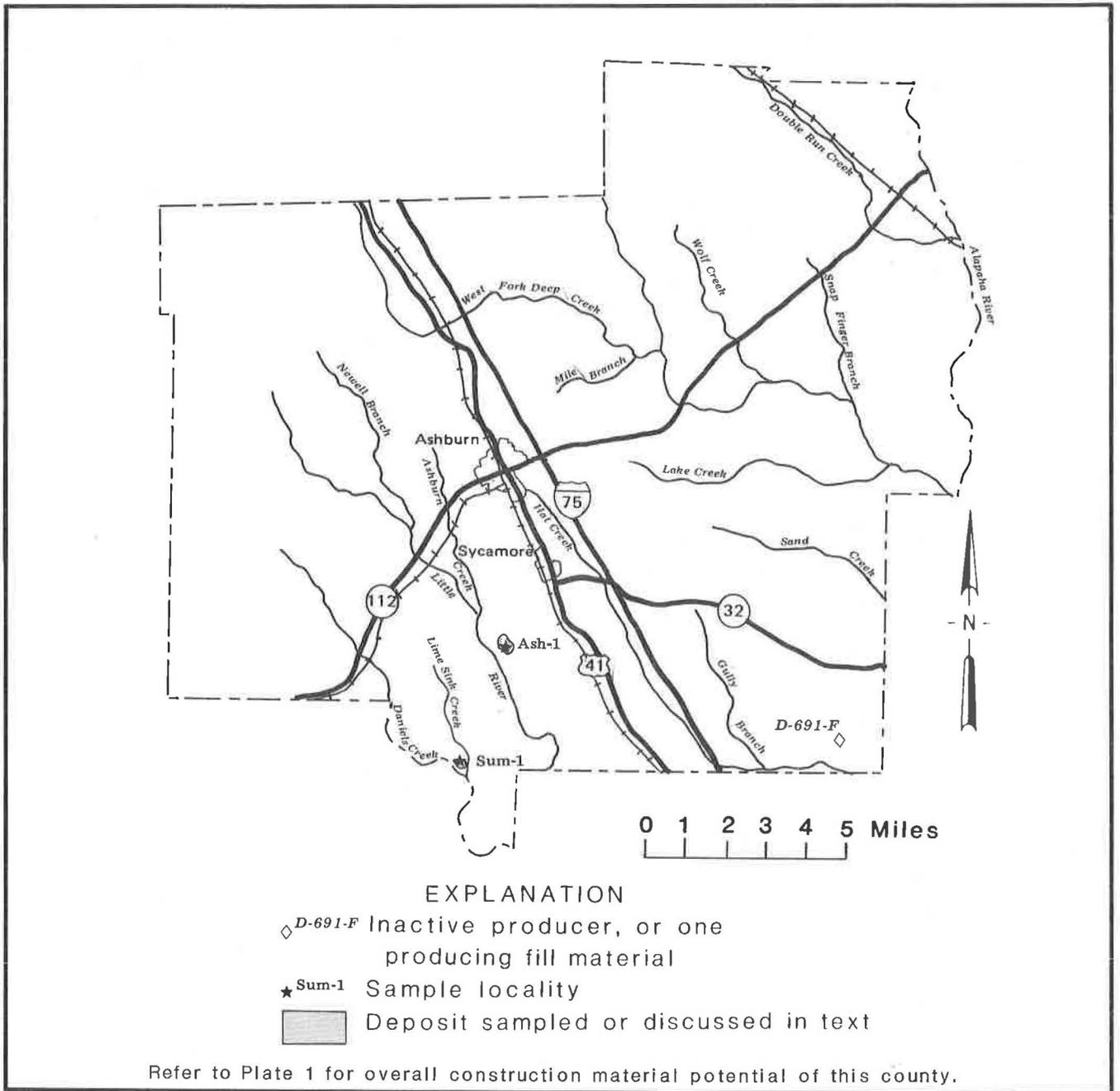
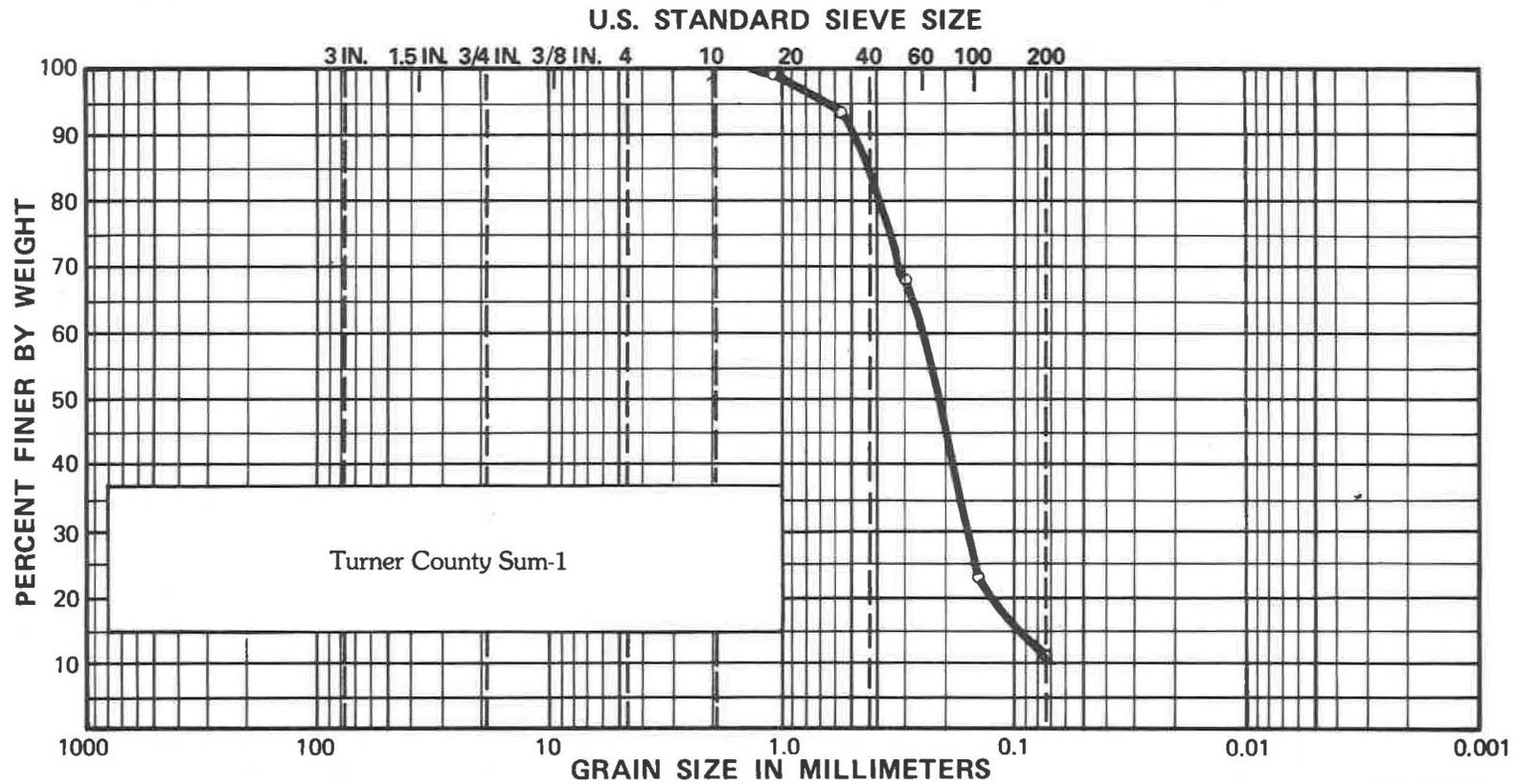


Figure 189. Map of Turner County Showing Sample Localities, Pits, and Deposits Sampled.

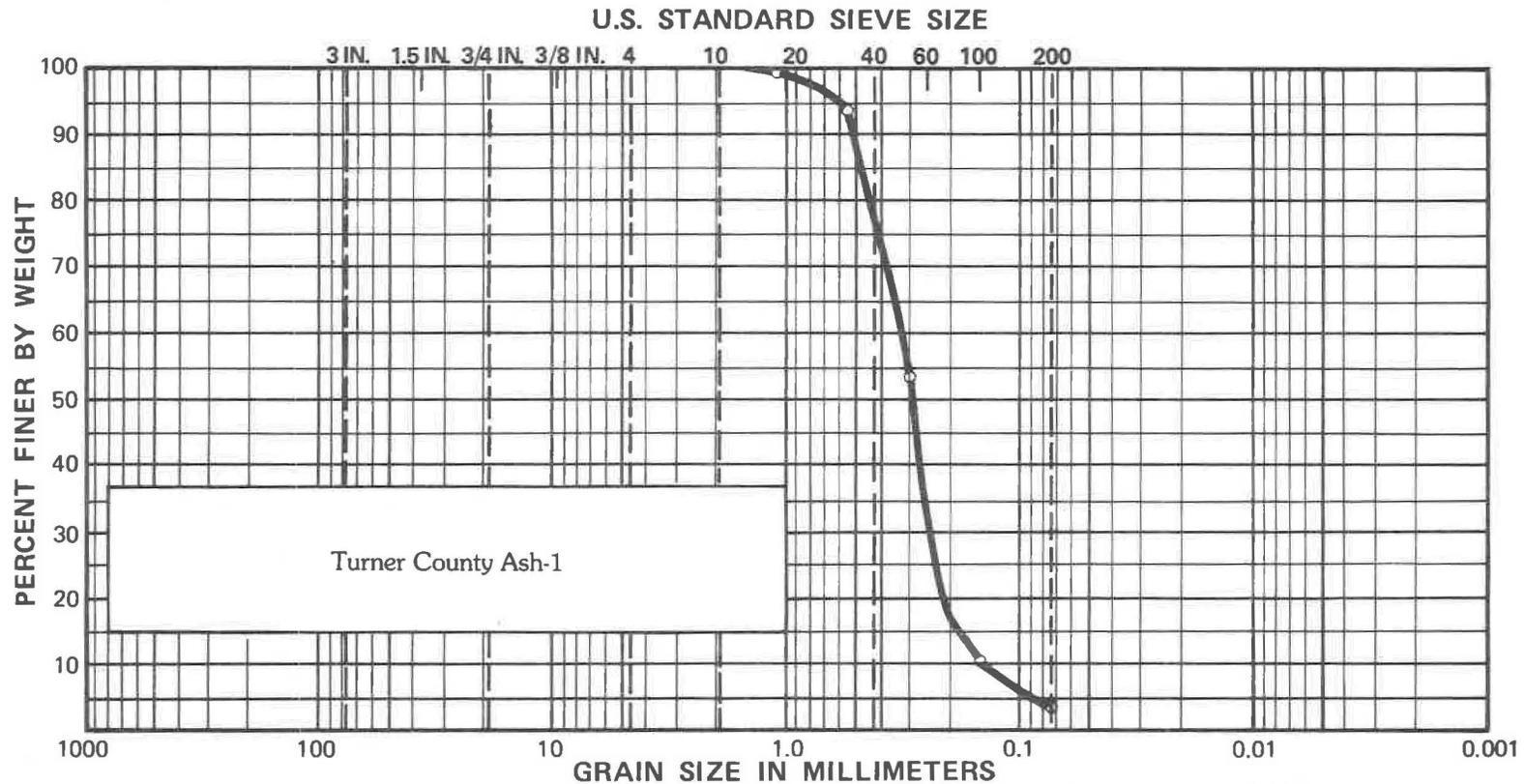


COBBLES	GRAVEL				SAND			SILT OR CLAY *	
	COARSE	FINE	COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	GRAVEL very coarse coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY ** coarse medium fine

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 190. Size Distribution Curve of Sample Sum-1.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE	COARSE	MEDIUM	FINE					
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 191. Size Distribution Curve of Sample Ash-1.

Webster County

Geology and Physiography

Webster County lies within the Fall Line Hills District of the Coastal Plain Province. The surficial sediments of Webster County are derived from the Ripley, Providence, Baker Hill and Tuscahoma Formations, the undifferentiated Claiborne Group, and residuum of the Ocala and Oligocene limestones.

Previous Studies

Teas (1921, p. 268) noted that the Providence Formation, present in the valleys in the northwestern portion of the county, could produce fairly good quality sand. Teas (1921) also described deposits of sand of the Midway Formation (undifferentiated Claiborne Group) in gulleys at numerous places in the county. However, a clayey overburden also present would hinder development of these deposits.

Present Study

The soil association used in targeting areas of Webster County was #39, which is present in interfluvial areas in the southern and extreme northwestern portions of the County. Two samples from Webster County, Pre-1 and Par-1 (fig. 192) were sieved (figs. 193,194; Table 34). Although neither of the sieved samples passed ASTM standard C-33 the sample Pre-1 has the better grain-size distribution of the two samples (fig. 193).

Evaluation

The deposit represented by sample Par-1 is extensive; however, a thick overburden of clayey sand to sandy clay is present. This overburden, along with the fine-grain size of this deposit, makes it unfeasible for development. The deposit represented by sample Pre-1 has an adequate grain-size distribution, but overburden is also present here, thus hindering commercial development.

Neither of the deposits represented by samples Pre-1 and Par-1 are regarded as having a potential for commercial scale aggregate production.

Mining activity

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

Summary evaluation

Potential for commercial production of either fine or coarse aggregate in Webster County is considered to be low.

Table 34. Webster County sample data

Sample designation	Depth ¹	Sample type	Minimum ² thickness of the deposit	Priority of ³ body sampled	Natural Material Passing ASTM C-33	Rating ³
Pre-1	6 feet	trench	15 feet	2	no	2
Par-1	6 feet	trench	25 feet	2	no	1

¹For trench samples this figure is the vertical depth of the trench.

²Thicknesses of the deposits greater than the depths of the auger holes or greater than the height of the exposures trench sampled are estimated from field observations.

³Increasing 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.

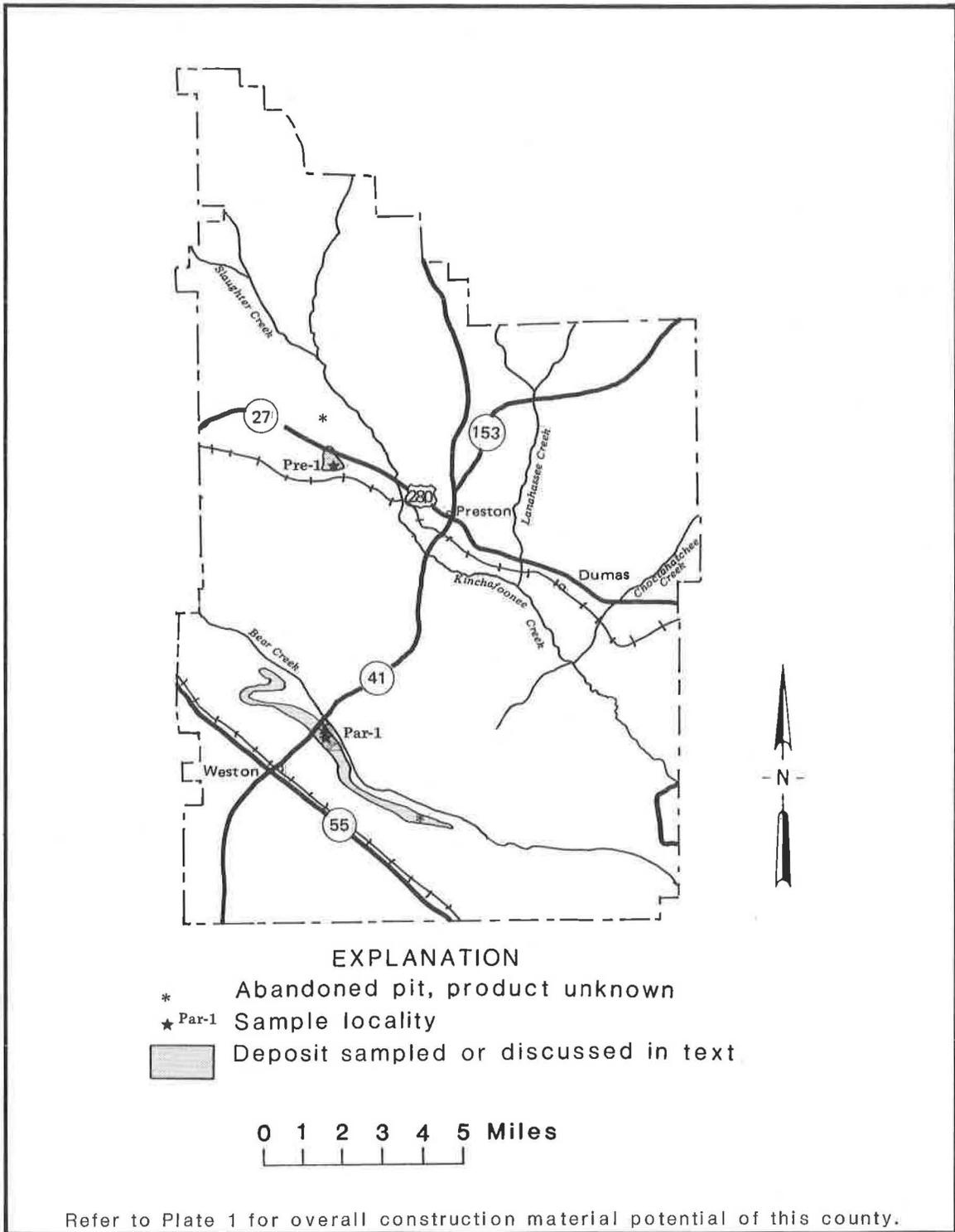
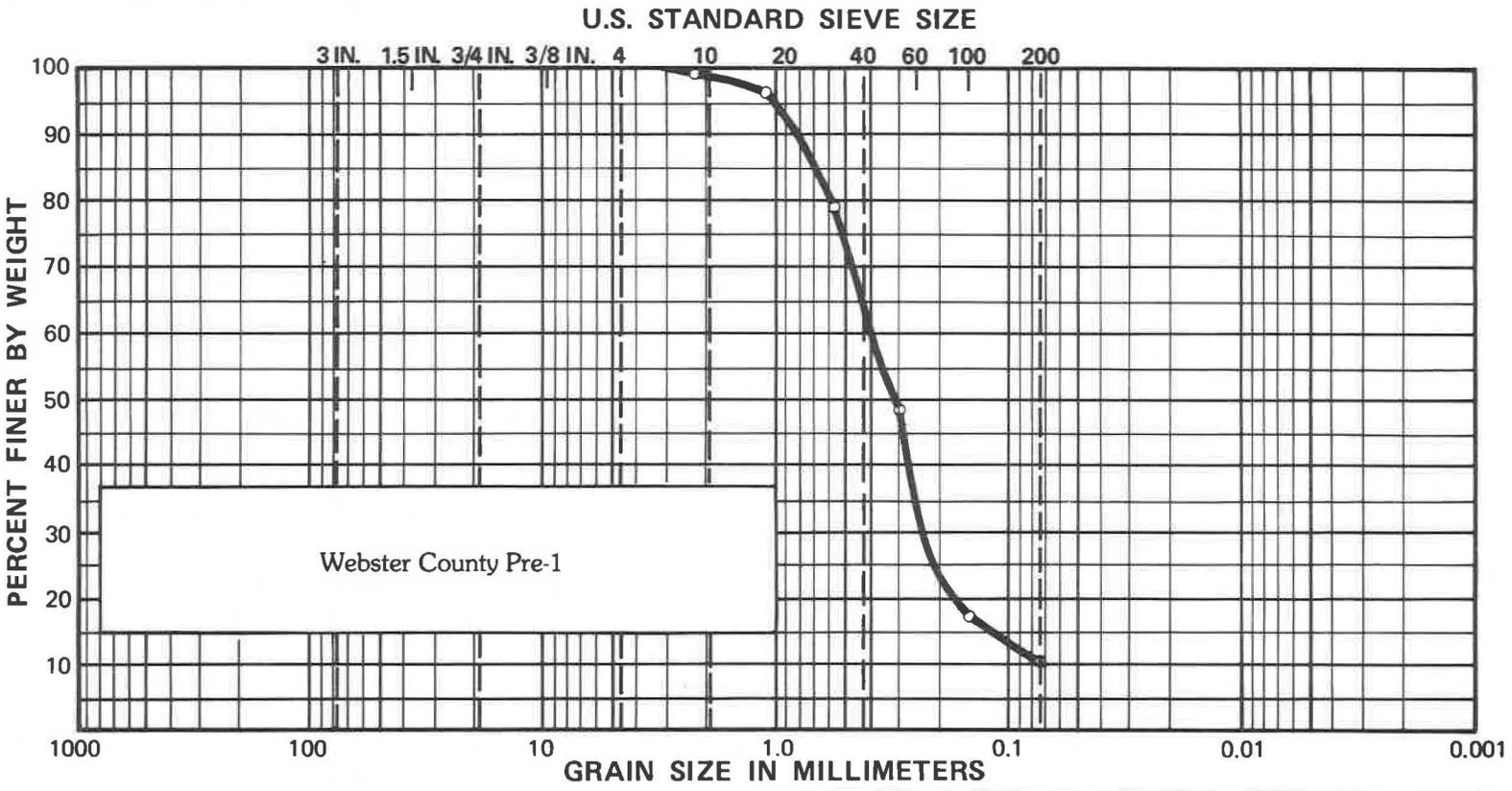


Figure 192. Map of Webster County Showing Sample Localities, Pits, and Deposits Sampled.



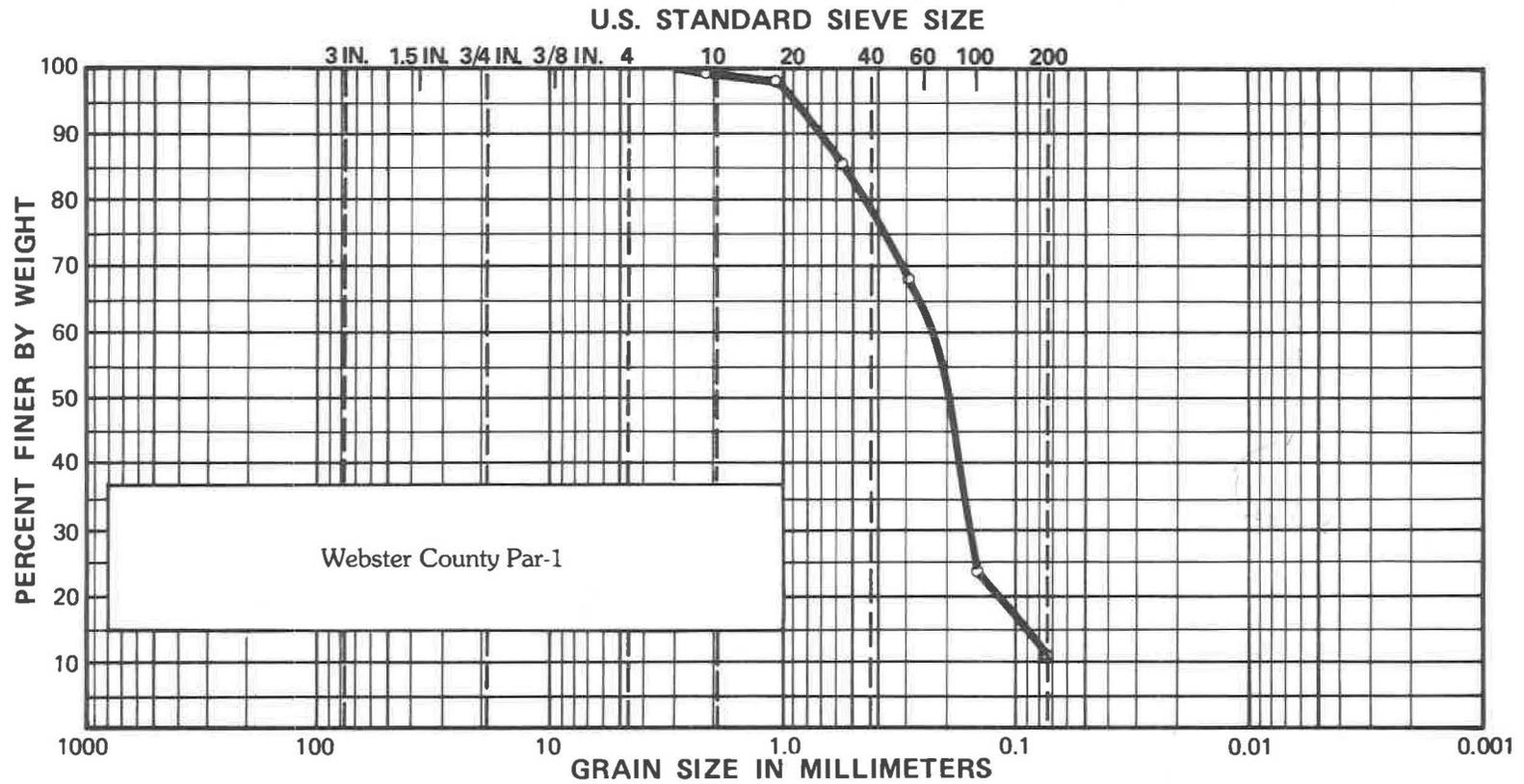
COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

BOULDERS	COBBLES		GRAVEL				SAND			SILT			CLAY					
	large	small	very coarse	coarse	medium	fine	very fine	very coarse	coarse	medium	fine	very fine	coarse	medium	fine	very fine	coarse	medium

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 193. Size Distribution Curve of Sample Pre-1.



COBBLES	GRAVEL				SAND			SILT OR CLAY *		
	COARSE	FINE		COARSE	MEDIUM	FINE				
BOULDERS	COBBLES large small	very coarse	GRAVEL coarse medium fine	very fine	very coarse	SAND coarse medium fine	very fine	SILT coarse medium fine	very fine	CLAY coarse medium fine **

*Unified Soil Classification System
 **Wentworth-Lane Class Limits

GRADATION CURVE

Figure 194. Size Distribution Curve of Sample Par-1.

Worth County

Geology and Physiography

Worth County contains portions of two physiographic districts of the Coastal Plain Province, the Dougherty Plain and the Tifton Upland. The surficial sediments present in Worth County are derived from the residuum of the Ocala and Oligocene limestones and the Altamaha Formation.

Previous work

According to Teas (1921, p. 275), at the time of his survey there was no sand produced commercially in Worth County and local demand was met by surficial deposits along small streams and ditches. Gray surficial sand from several inches to several feet in thickness is present within the county (Teas, 1921, p. 275).

Present Study

The soil association used in targeting areas of Worth County was #39, which is present in the interfluvial areas in northeastern Worth County. One site located 2 miles west of Doles in Worth County (fig. 195) was examined. Only 2 feet of fine- to medium-grained sand was penetrated before a very clayey sand to sandy clay was encountered (no sample was taken). Field reconnaissance of Worth County revealed this to be the case throughout most of the county.

Evaluation

From the information gained from the site in Worth County and field reconnaissance, it is apparent that only very thin surficial deposits of sand underlain by clayey sand to sandy clay exist in Worth County.

Mining activity

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

Summary evaluation

Worth County has a very low potential for commercial aggregate production.

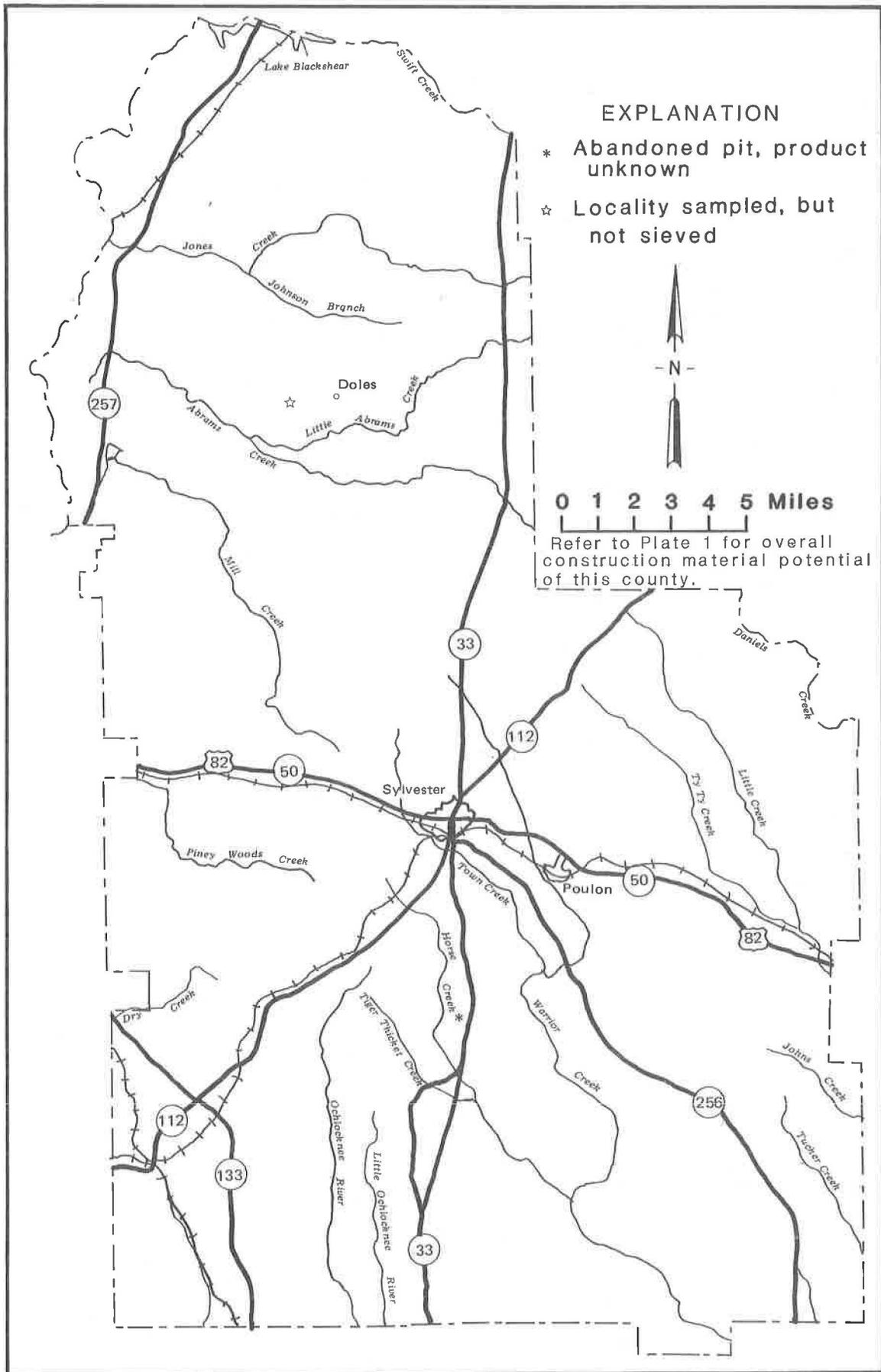


Figure 195. Map of Worth County Showing Pit, and Locality Sampled but not Sieved.

Summary

Favorable Areas

Within the study area of this report there are seven major areas favorable for the production of aggregate (Plate 1). These areas are in (1) Marion, Talbot, Taylor, and Crawford Counties, (2) immediately adjacent to the Chattahoochee River Valley, (3) Webster, Randolph, Terrell, Clay and Early Counties, (4) Decatur, Baker and Mitchell Counties, (5) Dougherty and Lee Counties along the Flint River and its tributaries, (6) Thomas County and (7) adjacent to the Withlacoochee and Little Rivers in Brooks, Lowndes, Cook, Colquitt and Tift Counties.

The favorable areas for aggregate production in Marion, Talbot, Taylor, and Crawford Counties occur within the outcrop belt of Upper Cretaceous sediments, generally as interfluvial areas. One exception to this is the area of high terrace deposits immediately adjacent to the modern floodplain of the Flint River in eastern Taylor County.

The favorable areas for aggregate production immediately adjacent to the Chattahoochee River in Muscogee, Stewart, Quitman, Clay, southern Early and northern Seminole Counties are generally within Quaternary terrace deposits of the Chattahoochee River. The only commercial-scale production of aggregate from this area is in the northernmost portion of this area in southern Muscogee County. These sediments, generally point bars or higher, older terrace deposits, are mixtures of fine and coarse aggregate.

The areas within Webster, Randolph, Terrell, Clay and Early Counties of favorable potential for aggregate production are almost exclusively within the outcrop belt of the Lisbon and Tallahatta Formations and their equivalent, the undifferentiated Claiborne Group. Whereas the sand deposits within these five counties are somewhat favorable for aggregate production, the deposits generally consist of fine-to-medium grained sands with a clayey sand to sandy clay overburden. This overburden limits the potential for commercial-scale aggregate production.

The areas of favorable potential for aggregate production in Dougherty County are within dune fields adjacent to the Flint River. The areal extent of this deposit is quite large; however, the potential use of this dune sand is limited due to its fine grain size. The area of favorable potential for aggregate production in Lee County is within the floodplain of Kinchafoonee Creek.

Within Decatur, Mitchell and Baker Counties, the majority of the areas of favorable potential for aggregate production are within the floodplain of the Flint River. These deposits are generally fine- to medium-grained and are of considerable extent and thickness.

In Thomas County there is a relatively small area of favorable potential for aggregate production within the floodplain of the Ochlocknee River, and an area within the outcrop area of the Hawthorne Group adjacent to the

Ochlocknee River. The Thomas County deposits are quite fine-grained and offer little potential for the production of concrete or mortar aggregate; however, due to the "clean", fine-grained nature of these sediments, they may be suitable for glass sand if of sufficient purity. Areas within and adjacent to the floodplain of the Withlacoochee and Little Rivers and within the outcrop area of the Miocene Hawthorne Group in Lowndes, Brooks, Cook, Colquitt and Tift Counties have favorable potential for aggregate production. As with the deposits in Thomas County, the deposits within these areas are fine-grained and may be best suited for glass sand.

Favorable Deposits

The current unmined deposits which have the highest potential for commercial-scale production are those represented by samples Un-2, Chattahoochee County; CNE-1, Early County; Moz-1, Macon County; TzS-3, Marion County; Nwt-1, Mitchell County; Un-1 and Om-4, Stewart County; and Rey-3 from Taylor County.

Chattahoochee County

The deposit in Chattahoochee County is an accretion or point bar deposit in the floodplain of the Chattahoochee River and is located in the extreme southwestern portion of the county. This deposit contains minor amounts of coarse aggregate as well as sand suitable for concrete aggregate, and although it marginally failed ASTM standard C-33 (fig. 25) it probably could be upgraded through sizing and blending to meet this standard.

The failure of sample Un-2 to pass ASTM standard C-33 is due to its containing 89 percent sand less than 1.19 mm (#16 mesh) and 66 percent less than 0.59 mm (#30 mesh). The maximum allowable percentages are 85 and .60 respectively. Approximately 11 percent of sample Un-2 is greater than 2.38 mm (#8 mesh), thus providing a small amount of coarse aggregate.

The areal extent of this deposit could be as large as 40 acres. Based on a body 10 feet thick, the reserves of this deposit could be in excess of 645,000 cubic yards. There are only light-duty roads in the vicinity of the deposit. Consequently, a barge fed by a dredge would probably be the most economical means of mining and transporting the sand. The Chattahoochee River, which is adjacent to this deposit, could provide an adequate supply of water for processing the sand.

Early County

Sample CNE-1 is from a point bar deposit of the Chattahoochee River located approximately 7.5 river miles south of the Clay-Early County line. This deposit (represented by sample CNE-1), a mixture of fine and coarse aggregate,

marginally failed ASTM standard C-33. Sample CNE-1 is from the lower 4.5 feet of an exposure of a gravelly fine- to coarse-grained sand 20 feet thick. Forty-six percent of the particles in this sample are greater than 4.76 mm (#4 mesh). This gravelly zone is exposed for a distance of approximately 20 feet along the face of the point bar.

The areal extent of this deposit could be as much as 200 acres, thus having a potential reserve in excess of 6 million cubic yards, assuming a tabular body 20 feet thick. The entire deposit does not contain as much gravel as the zone sampled, but it could provide concrete and mortar sand with gravel as a by-product. The Chattahoochee River, which is adjacent to this deposit, could supply adequate amounts of water for processing. There is a light-duty road within one mile of this deposit and it could, if improved, afford a means of transportation for the finished products.

Macon County

The deposit represented by samples Moz-1a, 1b, and 1c is located 1.1 miles south of Oglethorpe within the floodplain of the Flint River. The upper 7 feet of this deposit is a clayey, fine- to medium-grained sand that, although not sampled, could after processing, provide small amounts of mortar sand.

Samples Moz-1a, 1b, and 1c represent the lower 6 feet of this deposit (figs. 87-89). The lower 4 feet of deposit (Moz-1b, 1c) marginally failed ASTM standard C-33 but could be upgraded to meet this standard. Assuming a tabular body 4 feet thick, and having areal extent between 10 and 120 acres, the reserves could range from 60,000 to 775,000 cubic yards. Assuming that the upper 9 feet (the unsampled upper 7 feet and the 2 foot interval represented by Moz-1a) has some potential use, such as mortar and concrete sand, the deposit represented by Moz-1 could be of economic value. The lower four foot zone of this deposit probably extends below the depth sampled.

This deposit is within 0.3 mile of a rail line, and within 0.5 mile of a primary highway. The water table in this area is within 10 feet of the ground surface, thus water for processing is readily available. The best probable mining method for the deposit would be dredging from man-made ponds. Concrete and mortar sand could be produced from the deposit.

Marion County

The deposit from which samples TzS-3a and 3b were taken is located in a valley wall approximately 6.2 miles southwest of Buena Vista. These samples were taken from an exposure of sediments 16 feet thick. The samples of this deposit marginally failed ASTM standard C-33 (figs. 101,102) but could be upgraded to meet these standards.

This deposit has a probable areal extent of at least 20 acres. Assuming a tabular body 16 feet thick, reserves of this deposit are in excess of 500,000 cubic yards. Muckalee Creek is within 0.2 mile of this deposit and could furnish an adequate supply of water for hydraulically mining and processing the sand. The sands of this deposit are best suited for concrete and mortar sand. There is a rail line and primary road within 1.5 miles of this deposit, and either rail or road could provide means of transporting the sands.

Mitchell County

The deposit represented by sample Nwt-1 is located in a dune field just south of Georgia Highway 37 and approximately 600 feet east of the Flint River. This sample marginally failed ASTM standard C-33 (6 percent was less than #200 mesh). This deposit has a probable areal extent of 60 acres and, based on a tabular body 8.5 feet thick, has an estimated reserve in excess of 800,000 cubic yards. The Flint River, adjacent to this deposit, could provide adequate water for processing the sands of the deposit. A primary road, Georgia Highway 37, intersects the deposit and could provide means of transporting the finished products. The best mining method for this deposit would probably be either hydraulic or dredging from the Flint River.

Stewart County

Samples Un-1 and Om-4 are from point bars of the Chattahoochee River in Stewart County. These point bars are considered to have economic potential for the production of aggregate.

Sample Un-1 represents a sandy gravelly layer 4 feet thick in a point bar which is 12 feet thick and located 4 miles (by river) south of the Chattahoochee-Stewart County line. A detailed study of the point bar represented by sample Un-1 revealed two tracts, 40 and 60 acres in areal extent, that contain gravel. Borings of these two tracts show similarities in that both tracts generally are underlain by an upper zone of clayey, silty, fine- to coarse-grained sand (fig. 147) and a lower zone of slightly clayey, gravelly, fine- to very coarse-grained sand (fig. 149). Within the 40 acre tract, the lower zone is approximately 5 feet thick and averages 17 percent particles greater than 2.38 mm in diameter. The upper zone within the 40 acre tract averages 9 feet in thickness and overburden (fig. 148) ranging from 3 to 11 feet in thickness is present. The 60 acre tract is underlain by an upper zone 8 feet thick and a lower zone averaging 5 feet in thickness with approximately 14 percent of the particles being greater than 2.38 mm in diameter. The overburden in this tract is as much as 5.5 feet thick. Reserve estimates of the 40 acre tract are 320,000 and 580,000 cubic yards for the upper and lower zones

respectively. Water for processing could be obtained easily from the Chattahoochee River. The best means of mining and transporting the sand and gravel would probably be by dredge to a barge.

Sample Om-4 is from a six foot thick gravelly sand layer of a point bar located 2.2 miles (by river) north of the Seaboard Air Line crossing of the Chattahoochee River west of Omaha. This deposit has the potential for producing both fine and coarse aggregate (fig. 144).

This deposit, represented by sample Om-4, could be as large as 90 acres in areal extent, with potential reserves as much as 1 million cubic yards, assuming a tabular body 6 feet thick is present. Water for processing is readily available from the Chattahoochee River. The Seaboard Rail Line is within 1 mile of the deposit and could provide a means of transporting the finished products.

Taylor County

Samples Rey-3a, 3b, and 3c are from a terrace deposit of the Flint River located 1.6 miles east of Reynolds. The total exposed thickness of this deposit is 17 feet. These samples Rey-3a, 3b, and 3c, represent the upper 4 feet, middle 5 feet, and lower 8 feet of this deposit, respectively. The lower thirteen feet, although not meeting ASTM C-33 requirements, (figs. 164-166) contain the coarsest sands and gravels of this deposit.

The areal extent of this deposit may be as much as 120 acres, and assuming a tabular body 13 feet thick, unproven reserves could be in excess of 2.5 million cubic yards. Relatively shallow wells could be used to provide water supplies sufficient to mine the deposit hydraulically and process the sand and gravel. Both a rail line and a primary highway are within one mile of this deposit, providing means of transportation for the finished products.

One possible limiting factor to the development of this deposit, assuming the deposit is of sufficient quality and quantity, is the presence of a clayey sand zone present at higher elevations west of the sampled area which may be present as unusable overburden.

Current Aggregate Producers

All of the commercial aggregate plants within the study area produce fine aggregate. Only one plant, Camp Concrete in Muscogee County, produces coarse aggregate. The mining methods used at these plants are open pit hydraulic (which is predominant) and dredging in man-made ponds.

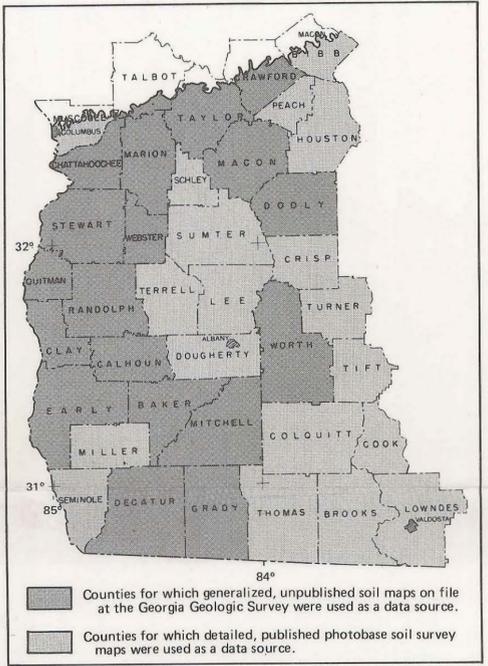
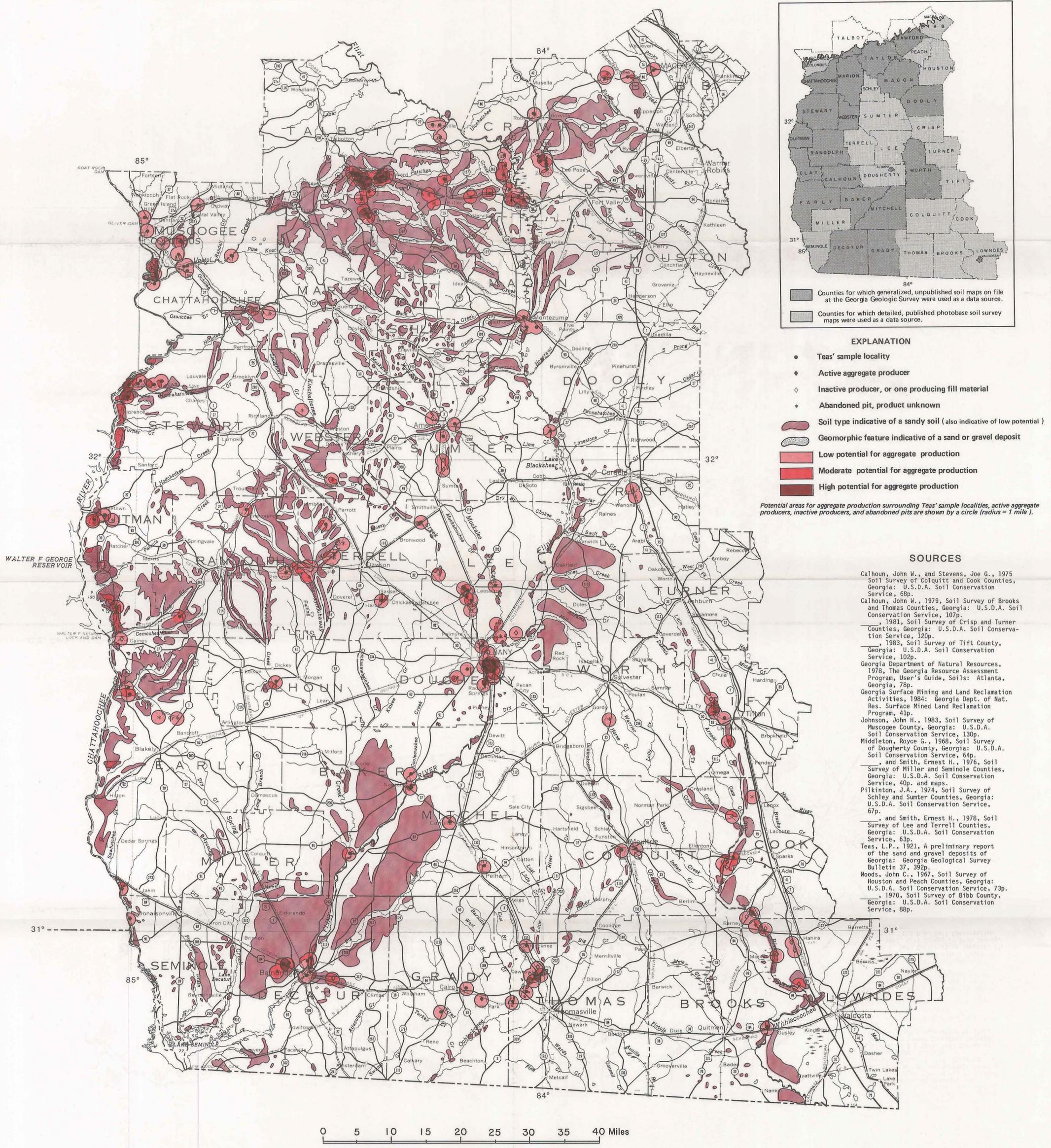
The commercial aggregate producers within the study area, with one possible exception, have adequate reserves to operate for a minimum of 20 years at current production levels. The reserves were estimated assuming that: (1) all of the acreage owned would be mined, (2) mining would be carried out to the current depth of mining, and (3) the amount of unusable fine-grained material does not exceed 15 percent.

REFERENCES

- A.S.T.M. 1983, Annual book of standards- section 4: construction, Volume 4.02-concrete and mineral aggregates: Philadelphia, American Society for Testing and Materials, 890 p.
- Buie, B.F., 1978, The Huber Formation of eastern central Georgia, in Short contributions to the geology of Georgia: Georgia Geologic Survey Bulletin 93, p. 1-7.
- Carver, R.E., and Waters, S.A., 1984, Fluvial terraces and late Pleistocene tectonism in Georgia: Southeastern Geology, v. 25, no. 2, p. 117-122.
- Clark, W.Z., Jr., and Zisa, A.C., 1976, Physiographic map of Georgia: Georgia Geologic Survey, 1:2,000,000.
- Clark, L.D., 1965, Bauxite deposits of the Springvale District, Georgia: U.S. Geological Survey Bulletin 1199-F, 24 p.
- Cooke, C.W., in LaForge, L., and others, 1925, Physical geography of Georgia: Georgia Geologic Survey Bulletin 42, p. 19-54.
- Eargle, D.H., 1955, Stratigraphy of the outcropping Cretaceous rocks of Georgia: U.S. Geological Survey Bulletin 1014, 101 p.
- Environmental Protection Division, 1984, Georgia surface mining and land reclamation activities: Georgia Department of Natural Resources, Atlanta, 41 p.
- Folk, R.L., 1974, Petrology of sedimentary rocks: Hemphill Publishing Co., Austin, Texas, 183 p.
- Georgia Geologic Survey, 1976, Geologic map of Georgia: Atlanta, 1:500,000.
- Huddlestun, P.F., 1981, Correlation chart, Georgia Coastal Plain: Georgia Geologic Survey Open-file Report 82-1.
- _____, A revision of the lithostratigraphic units of the Coastal Plain of Georgia: the Paleogene: Georgia Geologic Survey Bulletin 104, (in preparation).
- Kline, S.W., and O'Connor, B.J., 1981, Mining directory of Georgia: Georgia Geologic Survey Circular 2, 49 p.
- Lawton, D.E., 1977, Geologic map of Georgia: Georgia Geologic Survey, Atlanta, 1:2,000,000.
- Marsalis, W.E., Jr., and Friddell, M.S., 1975, A guide to selected Upper Cretaceous and Lower Tertiary outcrops in the lower Chattahoochee River Valley of Georgia: Georgia Geologic Survey Guidebook 15, 79 p.
- McCallie, S.W., 1901, A preliminary report on the roads and road-building materials of Georgia: Georgia Geologic Survey Bulletin 8, 264 p.
- McFadden, S.S. and Perriello, P.D., 1983, Hydrogeology of the Clayton and Claiborne aquifers in southwestern Georgia: Georgia Geologic Survey Information Circular 55, 59 p.
- Owen, V., 1963a, Geology and ground-water resources of Lee and Sumter Counties, southwest Georgia: U.S. Geological Survey Water-Supply Paper 1666, 70 p.
- _____, 1963b, Geology and ground-water resources of Mitchell County, Georgia: Georgia Geologic Survey Information Circular 24, 40 p.
- Roberts, W.B., 1958, A study of river terraces of the Chattahoochee River between Chattahoochee, Florida and Fort Gaines, Georgia: Unpublished M.S. thesis, Florida State University, Tallahassee, 47 p.
- Sever, C.W., 1965, Ground-water resources and geology of Seminole, Decatur and Grady Counties, Georgia: U.S. Geological Survey Water-Supply Paper 1809-Q, 30 p.
- _____, 1966, Reconnaissance of the ground water and geology of Thomas County, Georgia: Georgia Geologic Survey Information Circular 34, 14 p.
- Teas, L.P., 1921, Preliminary report on the sand and gravel deposits of Georgia: Georgia Geologic Survey Bulletin 37, 392 p.
- Thornbury, W.D., 1969, Principles of geomorphology: John Wiley and Sons, Inc., New York, 594 p.

- Veatch, O. and Stephenson, L.W., 1911, Preliminary report on the geology of the Coastal Plain of Georgia: Georgia Geologic Survey Bulletin 26, 466 p.
- Wait, R.L., 1963, Geology and ground-water resources of Dougherty County, Georgia: U.S. Geological Survey Water-Supply Paper 1539-P, 102 p.
- Zapp, A.D., 1965, Bauxite deposits of the Andersonville District, Georgia: U.S. Geological Survey Bulletin 1199-G, 37 p.
- Zapp, A.D. and Clark, L.D., 1965, Bauxite in areas adjacent to and between the Springvale and Andersonville Districts, Georgia: U.S. Geological Survey Bulletin 1199-H, 10 p.
- Zimmerman, E.A., 1977, Ground-water resources of Colquitt County, Georgia: U.S. Geological Survey Open-File Report 77-56, 41 p.

Plate I. CONSTRUCTION MATERIAL POTENTIAL OF SOUTHWEST GEORGIA



- EXPLANATION**
- Teas' sample locality
 - ◆ Active aggregate producer
 - ◇ Inactive producer, or one producing fill material
 - * Abandoned pit, product unknown
 - Soil type indicative of a sandy soil (also indicative of low potential)
 - ⊃ Geomorphic feature indicative of a sand or gravel deposit
 - Light Red Low potential for aggregate production
 - Medium Red Moderate potential for aggregate production
 - Dark Red 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).

SOURCES

Calhoun, John W., and Stevens, Joe G., 1975 Soil Survey of Colquitt and Cook Counties, Georgia: U.S.D.A. Soil Conservation Service, 68p.

Calhoun, John W., 1979, Soil Survey of Brooks and Thomas Counties, Georgia: U.S.D.A. Soil Conservation Service, 107p.

_____, 1981, Soil Survey of Crisp and Turner Counties, Georgia: U.S.D.A. Soil Conservation Service, 120p.

_____, 1983, Soil Survey of Tift County, Georgia: U.S.D.A. Soil Conservation Service, 102p.

Georgia Department of Natural Resources, 1978, The Georgia Resource Assessment Program, User's Guide, Soils: Atlanta, Georgia, 78p.

Georgia Surface Mining and Land Reclamation Activities, 1984: Georgia Dept. of Nat. Res. Surface Mined Land Reclamation Program, 41p.

Johnson, John H., 1983, Soil Survey of Muscogee County, Georgia: U.S.D.A. Soil Conservation Service, 130p.

Middleton, Royce G., 1968, Soil Survey of Dougherty County, Georgia: U.S.D.A. Soil Conservation Service, 64p.

_____, and Smith, Ernest H., 1976, Soil Survey of Miller and Seminole Counties, Georgia: U.S.D.A. Soil Conservation Service, 40p. and maps.

Pilkinton, J.A., 1974, Soil Survey of Schley and Sumter Counties, Georgia: U.S.D.A. Soil Conservation Service, 67p.

_____, and Smith, Ernest H., 1978, Soil Survey of Lee and Terrell Counties, Georgia: U.S.D.A. Soil Conservation Service, 63p.

Teas, L.P., 1921, A preliminary report of the sand and gravel deposits of Georgia: Georgia Geological Survey Bulletin 37, 392p.

Woods, John C., 1967, Soil Survey of Houston and Peach Counties, Georgia: U.S.D.A. Soil Conservation Service, 73p.

_____, 1970, Soil Survey of Bibb County, Georgia: U.S.D.A. Soil Conservation Service, 88p.

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