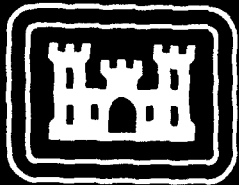


AD-A271 857

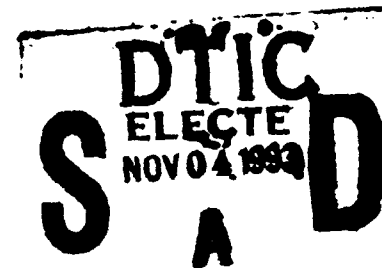


**US Army Corps
of Engineers**



TE

GEOLOG
THE SHRE
DAINGER
REDF



DEF

Waterways E

**Best
Available
Copy**

2

TECHNICAL REPORT GL-92-1

LOGIC RECONNAISSANCE
OF
HREVEPORT, LOUISIANA TO
GERFIELD, TEXAS REACH
REDRIVER WATERWAY

by

PAUL ALBERTSON

Geotechnical Laboratory

DEPARTMENT OF THE ARMY

ways Experiment Station, Corps of Engineers

3909 Halls Ferry Road



DTIC
ELECTE
NOV 04 1993
S A D

D
Waterway

Vi

"Original contains color
plates: All DTIC reproductions
will be in black and
white"

This document has been approved
for public release and sale; its
distribution is unlimited

Apr

RED RIVER WATERWAY

by

PAUL ALBERTSON

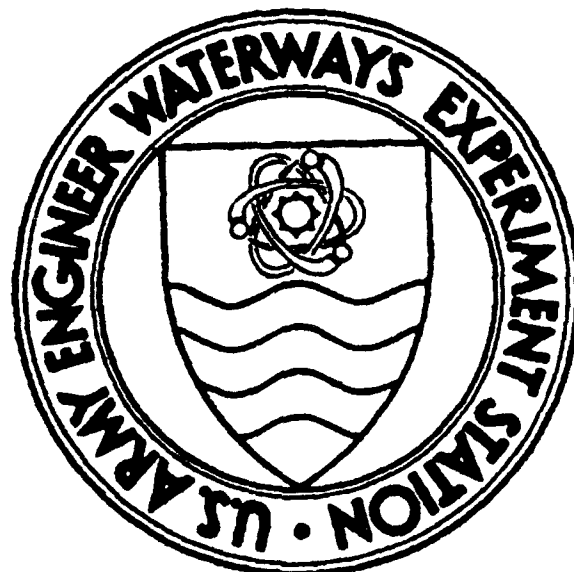
Geotechnical Laboratory

DEPARTMENT OF THE ARMY

Waterways Experiment Station, Corps of Engineers

3909 Halls Ferry Road

Vicksburg, Mississippi 39180-6199

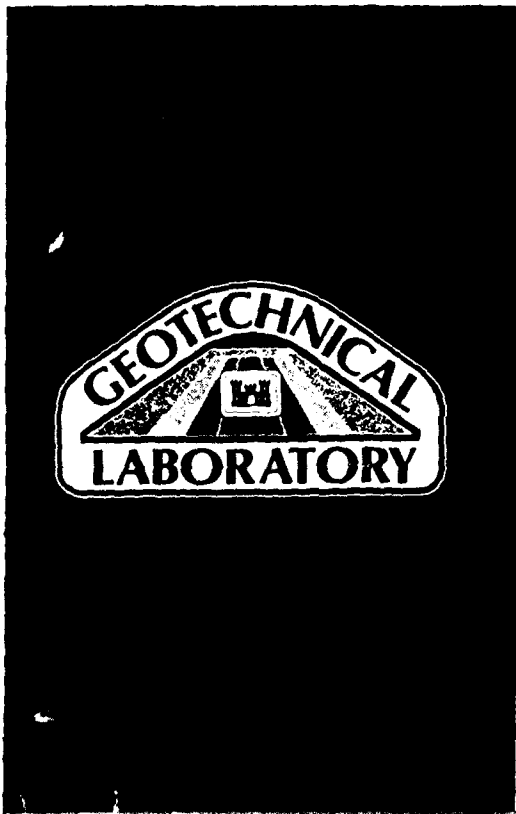


February 1992

IC
TE
1993
D

color
reproduced-
back and

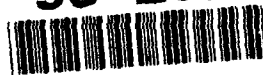
approved
as: its



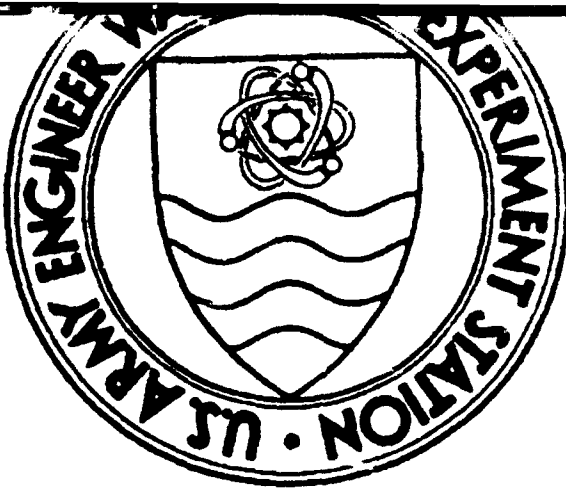
This document has been approved
for public release and sale; its
distribution is unlimited

Approved For

93-26717



U.S. Arr
Vicksb



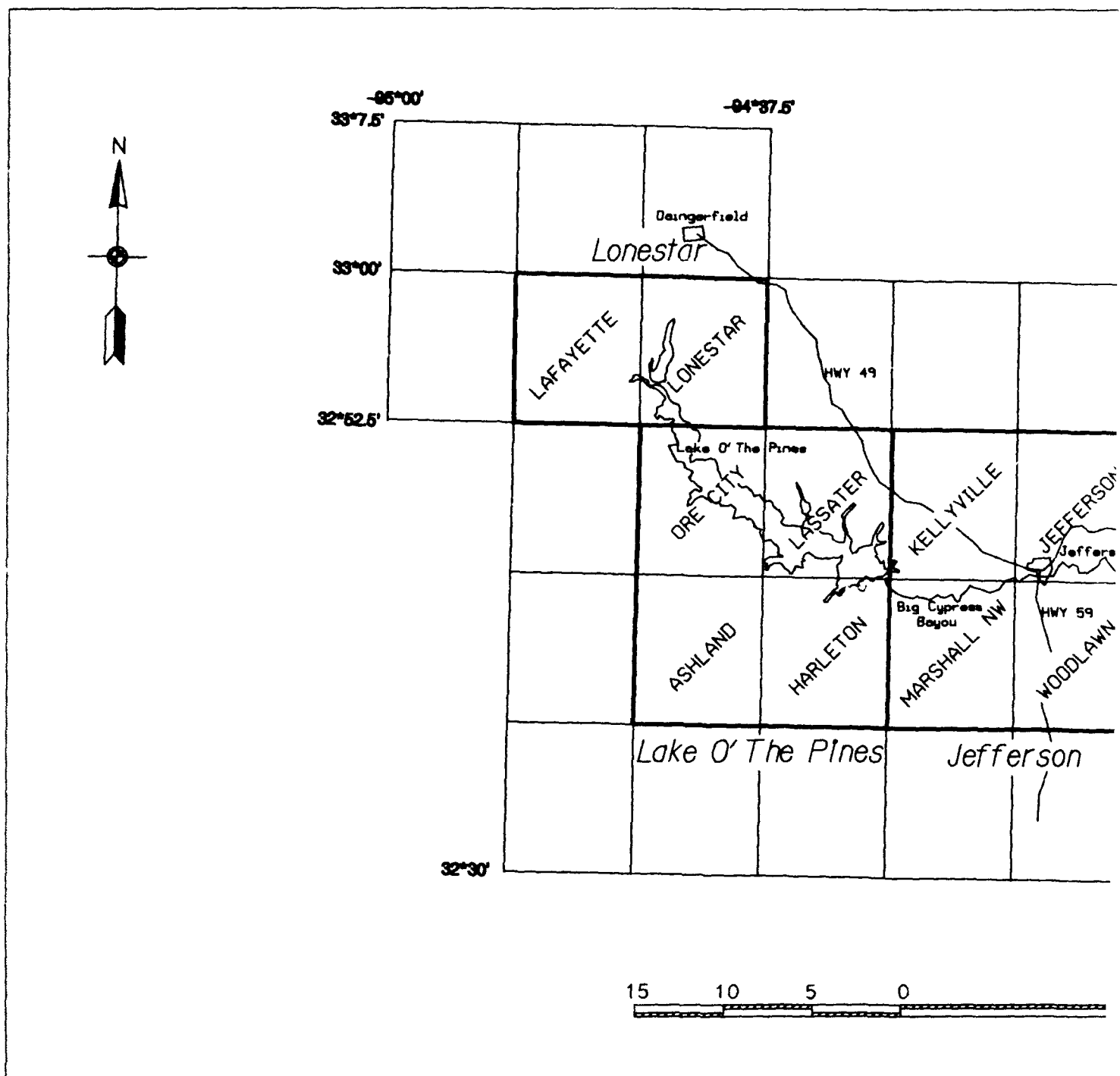
February 1992

Approved For Public Release; Distribution Is Unlimited

Sponsored By

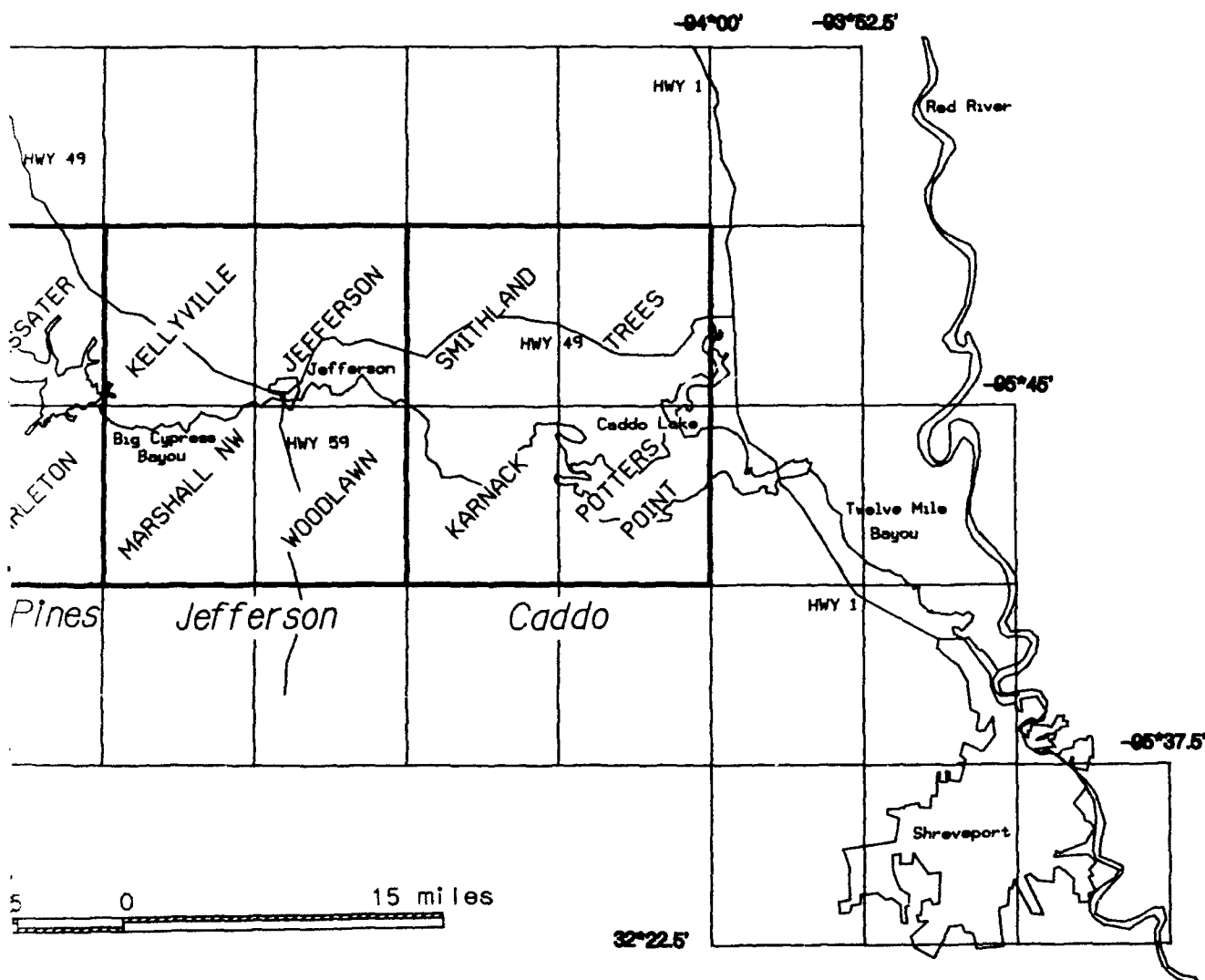
U.S. Army Engineer District, Vicksburg
Vicksburg, Mississippi 39180-0060

98 11 8 048



Index Of Geologic

ERA	SYSTEM	SERIES	GROUP	FORMATION OR UNIT	GENERALIZED SECTION	
	QUATERNARY	RECENT	ALLUVIUM	TOPSTRATUM		Differentiated laid down by r and brown cle
				SUBSTRATUM		Massive sands coarse grains the middle of
		EISTO-CENE	TERRACE DEPOSITS	UNDIFFERENTIATED		Clays and s1

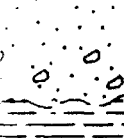
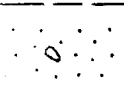
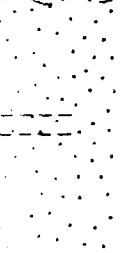
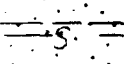
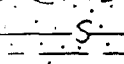
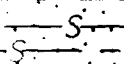
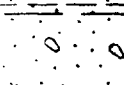
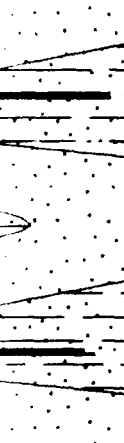
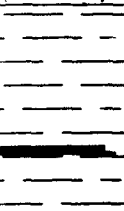
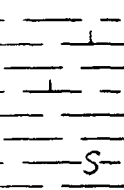


Index Of Geologic Maps

GENERALIZED SECTION	LITHOLOGY	HYDROGEOLOGY
	Differentiated into six distinct environments of deposition laid down by meandering streams. Deposits composed of gray and brown clays and silts.	Yields little water, not generally an aquifer.
	Massive sands and gravels. Fine to medium sands becoming coarse-grained with depth. First gravels generally appear near the middle of the deposit.	Yields small quantities of fresh water to a few wells.
	Clays and silts grading downward into sands and gravels.	Yields small quantities of fresh water to a few wells.

CENOZOIC	QUATERNARY	RECENT	ALLUVIUM	TOPSTRATUM		Thinly bedded, sandstone, overlain by mud and brown clay.
				SUBSTRATUM		Massive sands or coarse-grained, in the middle of the...
		PLEISTOCENE	TERRACE DEPOSITS	UNDIFFERENTIATED		Clays and silts
	TERTIARY	EOCENE	CLAIBORNE	SPARTA		Nonmarine, massive shale. In subsurface common.
				WECHES		Green to red, g. ironstone concretions.
				QUEEN CITY		Interbedded, light sands and clays.
				REKLAW		Soft to hard, light fossiliferous, crystals.
				CARRIZO (NOT PRESENT IN STUDY AREA)		Finer to very fine bedded sands w. Locally iron-ore of formation.
		?	WILCOX	UNDIFFERENTIATED		Interbedded, gray medium-grained.
		PALEOCENE	MIDWAY			Massive, dark gray with calcareous.
						Light to dark with occasional.

Generalized Stratigraph

	Differentiated into six distinct environments of deposition laid down by meandering streams. Deposits composed of gray and brown clays and silts.		Yields little water, not generally an aquifer.
	Massive sands and gravels. Fine to medium sands becoming coarse-grained with depth. First gravels generally appear near the middle of the deposit.		Yields small quantities of fresh water to a few wells.
	Clays and silts grading downward into sands and gravels.		Yields small quantities of fresh water to a few wells.
	Nonmarine, massive sands with minor amounts of sandy clay or shale. In subsurface, lignite and other organic materials are common.		Yields small quantities of fresh water to shallow wells locally.
	Green to red, glauconitic, fossiliferous, sands and clays with ironstone concretions.		Yields small quantities of fresh water to wells locally.
	Interbedded, light gray, glauconitic, lignitic, fossiliferous, sands and clays.	CYPRESS AQUIFER	Yields small to moderate quantities of fresh water to wells.
	Soft to hard, light gray green to red, glauconitic, fossiliferous, lignitic micaceous sands and clays with gypsum crystals.		Yields small quantities of fresh water to wells.
	Fine to very fine-grained, feldspathic, glauconitic, cross-bedded sands with some siltclips and rounded inclusions. Locally iron-cemented sandstone boulders are found at top of formation.		Yields small to moderate quantities of fresh water to wells.
	Interbedded, gray to chocolate brown, calcareous, fine to medium-grained sands, lignitic silts, clays, and lignite.		Yields moderate to possibly large quantities of fresh water to wells.
	Massive, dark gray to black, lignitic, micaceous, calcareous clay with calcareous concretions.		Yields no water.
	Light to dark gray, fossiliferous, glauconitic, silts and clays with occasional chalk lenses and calcareous concretions.		

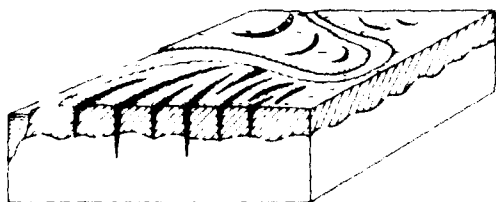
Generalized Stratigraphic Column

TOPS/RATUM
DEPOSITIONAL
ENVIRONMENT

DIAGRAMMATIC ILLUSTRATION

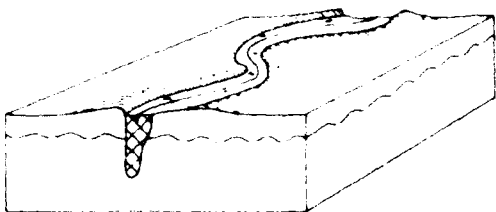
TYPICAL APPEARENCE
ON AERIAL PHOTOGRAPHS

POINT BAR



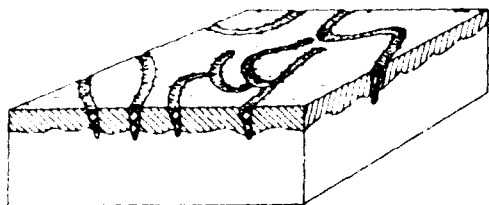
2000 1000 0 2000 Ft.
Scale

ABANDONED
COURSE



2000 1000 0 2000 Ft.
Scale

ABANDONED
CHANNEL



2000 1000 0 2000 Ft.
Scale

ENCE GRAPHS

METHOD OF DEPOSITION

OCCURRENCE AND CHARACTERISTICS



2000 Ft.

Point bar deposits consist of deposits laid down at the insides of river bends as a result of meandering of the stream. Although the deposits extend to a depth equal to the deepest portion or thalweg of the parent stream, only the uppermost fine-grained portion is included as part of the top stratum. Within the point bar topstratum, there are two types of deposits: soft and sandy elongate bar deposits or ridges that are laid down during high stages on the stream and left in place during low stages; and depressions or "swales" that are laid down during falling river stages. Characteristic of the ridges and swales form an alternating series called "rib and slot" top configuration conformable to the curvature of meandering channels and indicates the direction and extent of meandering.

Point bar deposits are deposited in the upper part of the channel, and are typically composed of fine-grained material. They are deposited in the upper part of the channel, and are typically composed of fine-grained material. They are deposited in the upper part of the channel, and are typically composed of fine-grained material.



2000 Ft.

Abandoned channels are straight segments of a river abandoned when the stream forms a new course across the floodplain. The abandoned course by definition is a segment that is no meander loop. The older course gradually fills with fine-grained sediment except for a wedge of relatively coarse-grained sediment where the new course diverges from the old. In many cases, a small, white-floored stream meanders within the confines of the larger meander belt and destroys segments of the abandoned course. In other cases, the smaller stream abandons the extent of the abandoned course when there are no other indications of its presence.

Abandoned channels are straight segments of a river abandoned when the stream forms a new course across the floodplain. The abandoned course by definition is a segment that is no meander loop. The older course gradually fills with fine-grained sediment except for a wedge of relatively coarse-grained sediment where the new course diverges from the old. In many cases, a small, white-floored stream meanders within the confines of the larger meander belt and destroys segments of the abandoned course. In other cases, the smaller stream abandons the extent of the abandoned course when there are no other indications of its presence.

Data defining the characteristics of abandoned channels are limited in quantity. It appears that segments of abandoned channels may be as long as a mile in length. They are typically composed of fine-grained material. They are deposited in the upper part of the channel, and are typically composed of fine-grained material.



2000 Ft.

Abandoned channels are partially or wholly filled segments of meandering streams formed when the stream shortens its course. Soon after formation, they are usually characterized by open water, called "oxbow lakes." Subsequently, they may become filled and occasionally completely obscured by various meander belt deposits. The abandoned segment may represent an entire meander loop formed by the stream cutting directly across a narrow neck of two converging arms of a loop and is termed a neck cutoff. A chute cutoff represents a portion of a loop formed when a stream occupied a large point bar swale during flood stage and abandoned the outer portion of the loop.

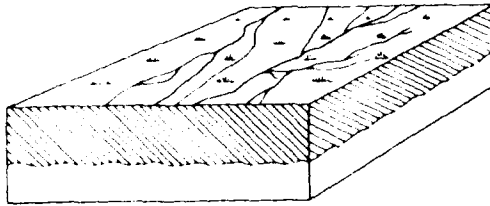
Abandoned channels are 0.25 to 0.5 miles long following the loop. These channels are 15 to 30 feet deep and are filled with soft to medium brown to gray clay with silt interbeds.

The larger abandoned channels are believed to be formed in the early Holocene during wetter climatic conditions.



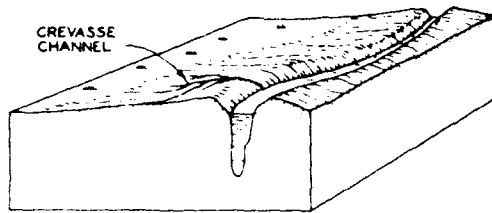
2000 1000 0 2000 Ft.
Scale

BACKSWAMP



2000 1000 0 2000 Ft.
Scale

NATURAL
LEVEE



2000 1000 0 2000 Ft.
Scale

Description of Deposits

DTIC QUALITY INSPECTED

a stream occupied a large point bar below the flood stage and abandoned its course to the sea.

2000 Ft.



Backswamp deposits consist of fine grained sediments laid down in broad, shallow basins within the floodplain during major periods of stream flooding. The sediment carrying floodwater may be ponded between the natural levee ridges and the uplands. Backswamp areas typically have very low relief and a distinctive, and complicated drainage pattern. The channels alternately serve as tributaries and distributaries at different times of the annual flood cycle.

Backswamp deposits are scarce in the project area. The backswamps occur between valley walls and meander belts. Based on limited data the thickness of these deposits are 20 to 30 feet in the Big Cypress Bayou Valley.

Typical backswamp deposits are brown to gray clays with scattered lenses of silt organic matter and wood fragments.

2000 Ft.



Natural levees are broad, low ridges which flank both sides of streams that periodically overflow their banks. The coarsest and greatest quantities of sediment are deposited closest to the streams channels. The natural levees are highest and thickest in these areas and gradually thin away from the channels. In general, the greater the distance from the stream, the greater the percentage of the finer grained sediments. Small drainage channels trending at right angles to the parent stream down the backslope of the levees are common. Major crevasses are indicated when these channels are large and pronounced. Abandoned crevasse channels are often filled with sediments that are distinctly coarser than the remainder of the natural levee.

Natural levees occur along abandoned courses and channels and adjacent to the active Cypress bayou channels. The higher and better drained levee deposits bordering older courses are visible by noting a vegetation change from cypress (*Taxodium*) to oaks and pine (*Quercus* and *Pinus*). Other levee deposits are obscured by recent postsettlement basin infilling or simply erased by reworking by younger courses. Natural levees paralleling courses vary in height from 2 to 5 feet and in width from 100 to 1500 feet.

Natural levee deposits typically consist of brown silty sands, silt, and silty clays which exhibit moderate amounts of oxidation. Since natural levees are well drained, the water content of these soils is low and organic matter is seldom present except for roots.

2000 Ft.

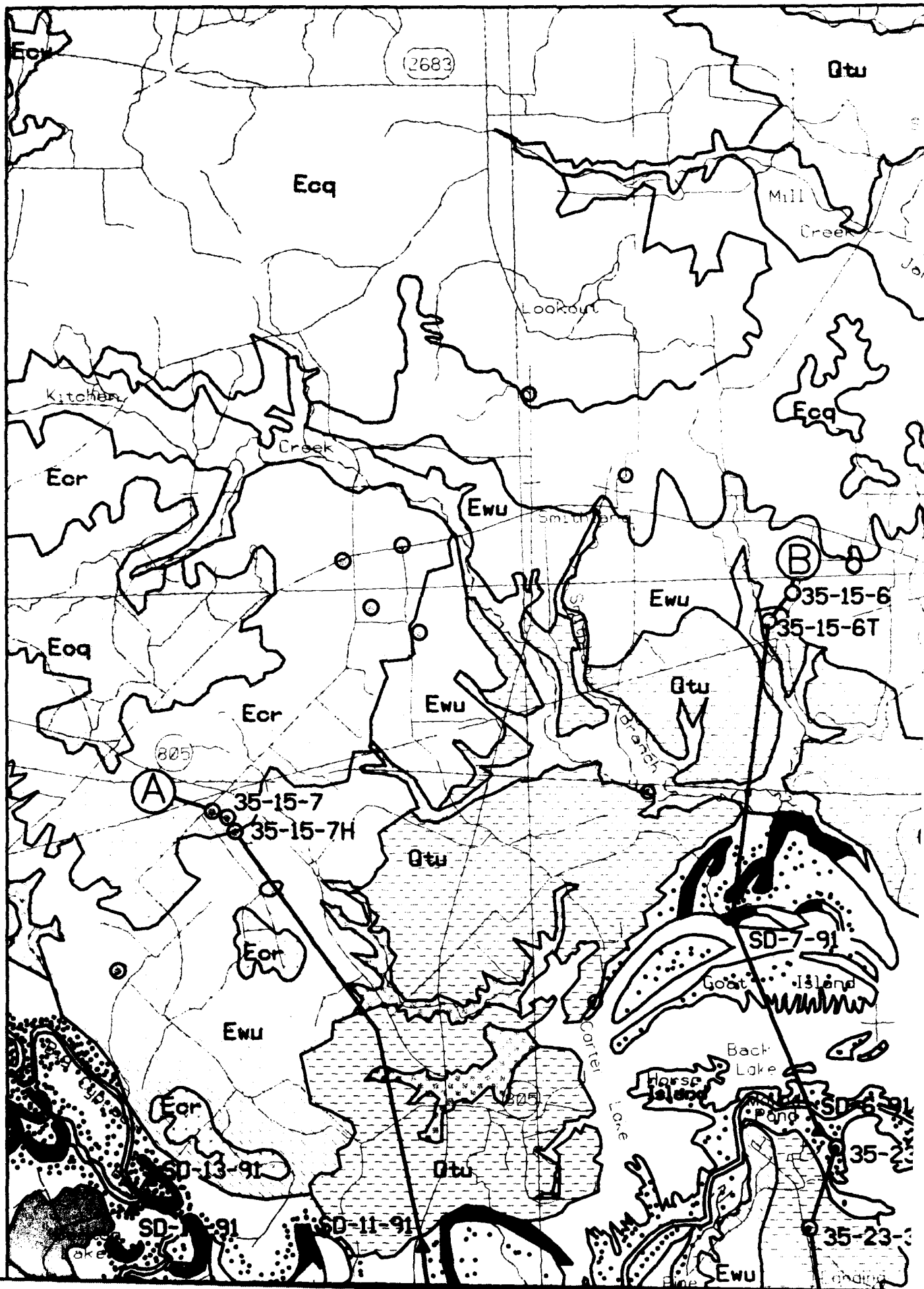
of Depositional Environments

APPENDIX 8

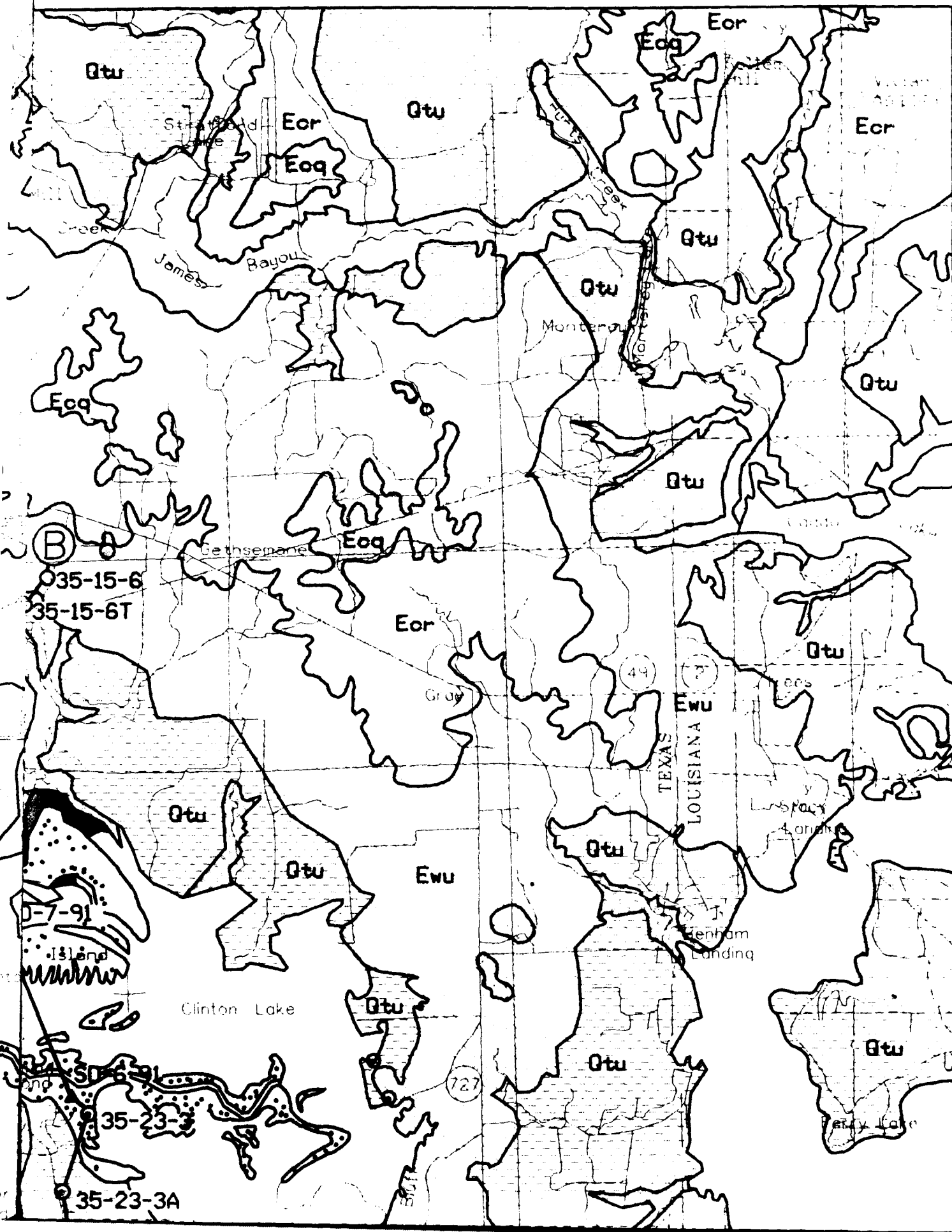
Accession For	
NTIS CRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution	
Availability Codes	
Dist	Avail in Special
A-1	

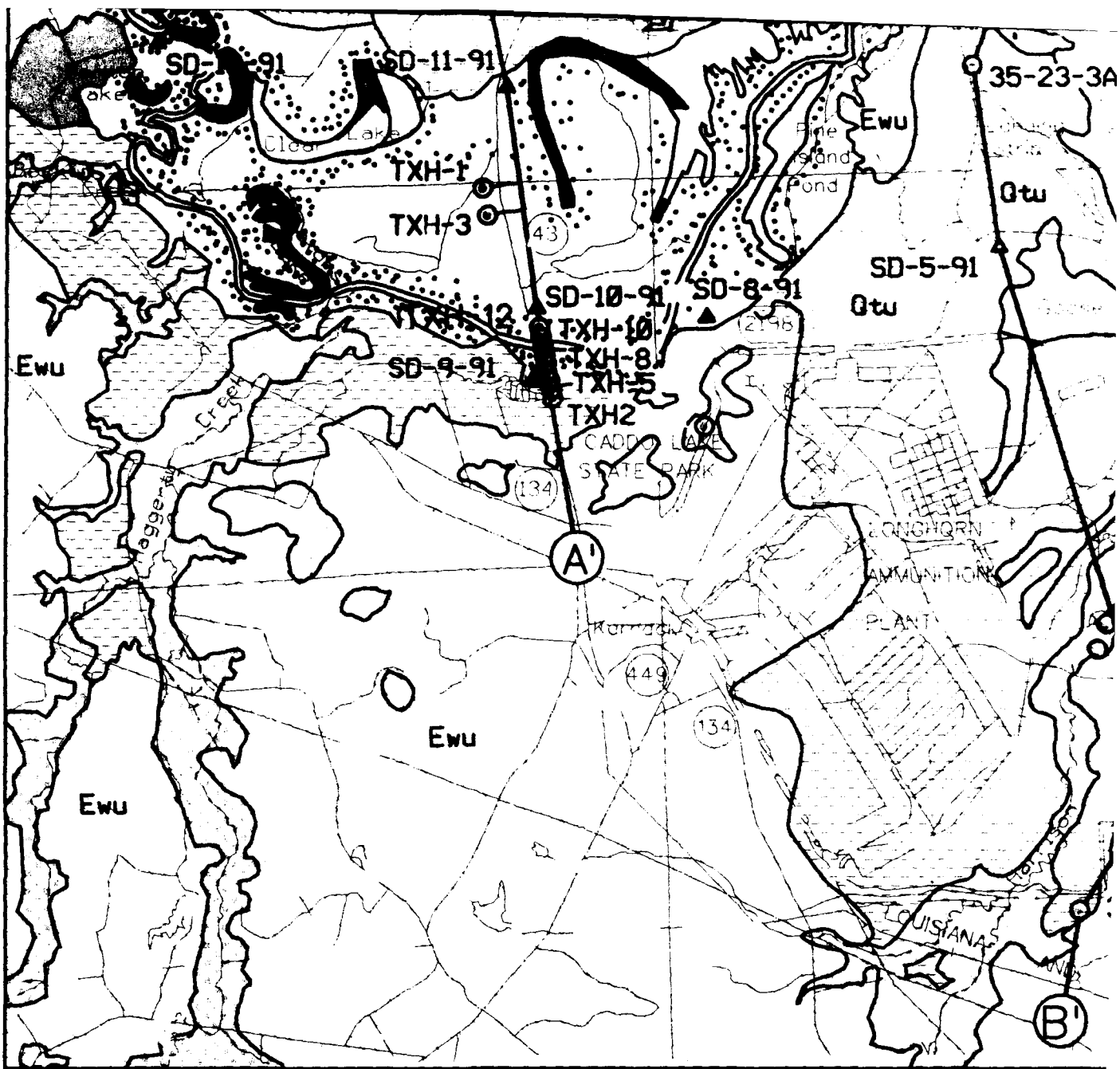
94° 15'

32° 52'30"



94° 00
32° 52' 30





32° 37' 30"

94° 15'

LEGEND

QUATERNARY

RECENT

- NATURAL LEVEE
- POINT BAR
- BACKSWAMP
- ABANDONED CHANNEL
- ABANDONED COURSE
- UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

- UNDIFFERENTIATED TERRACE DEPOSITS

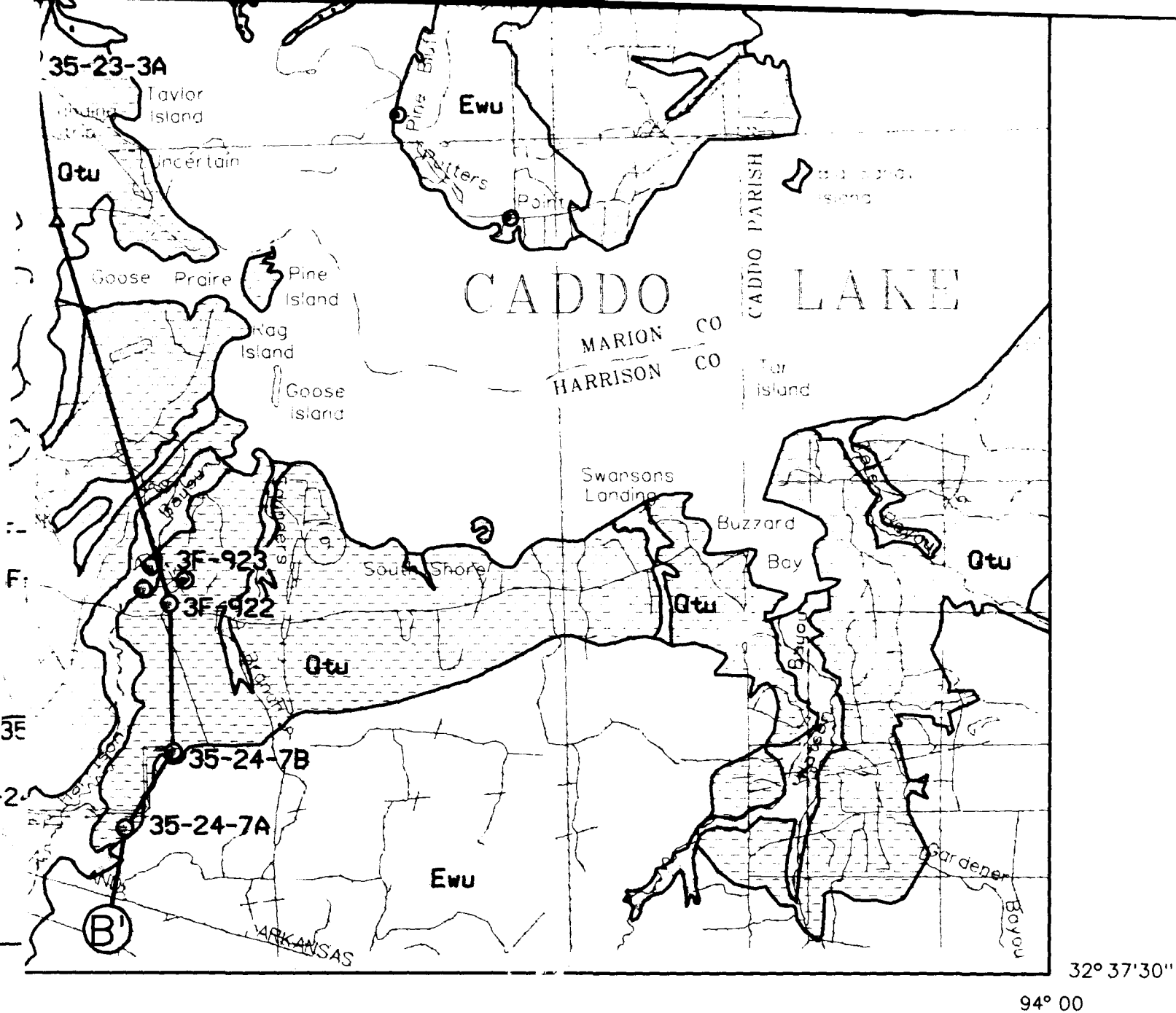
TERTIARY

EOCENE

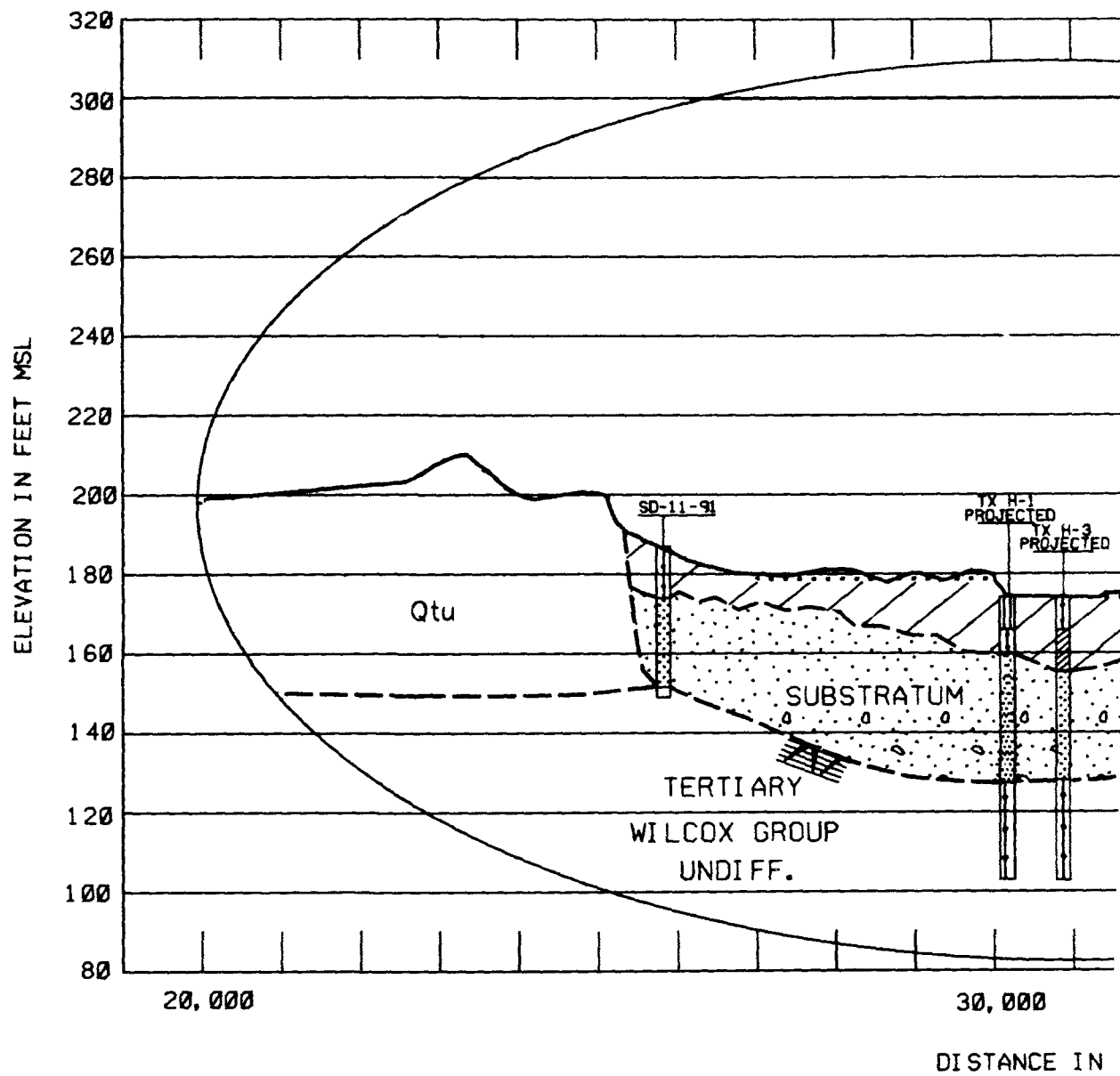
CLAIBORNE GROUP

- SPARTA FORMATION
- WECHES FORMATION
- QUEEN CITY FORMATION
- REKLAW FORMATION
- WILCOX GROUP UNDIFFERENTIATED

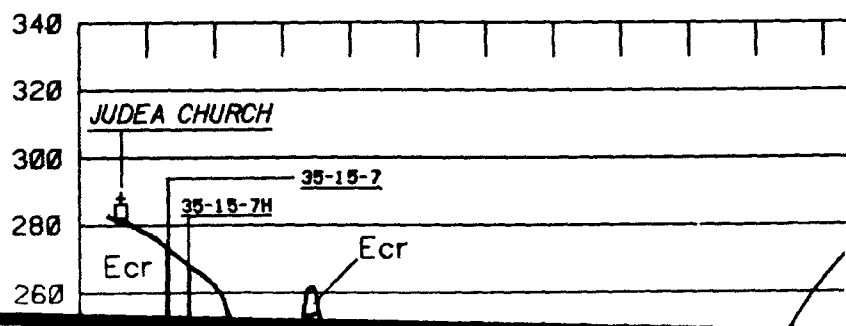
- CONTACT
- FAULT
- BORING
- PIEZOMETER

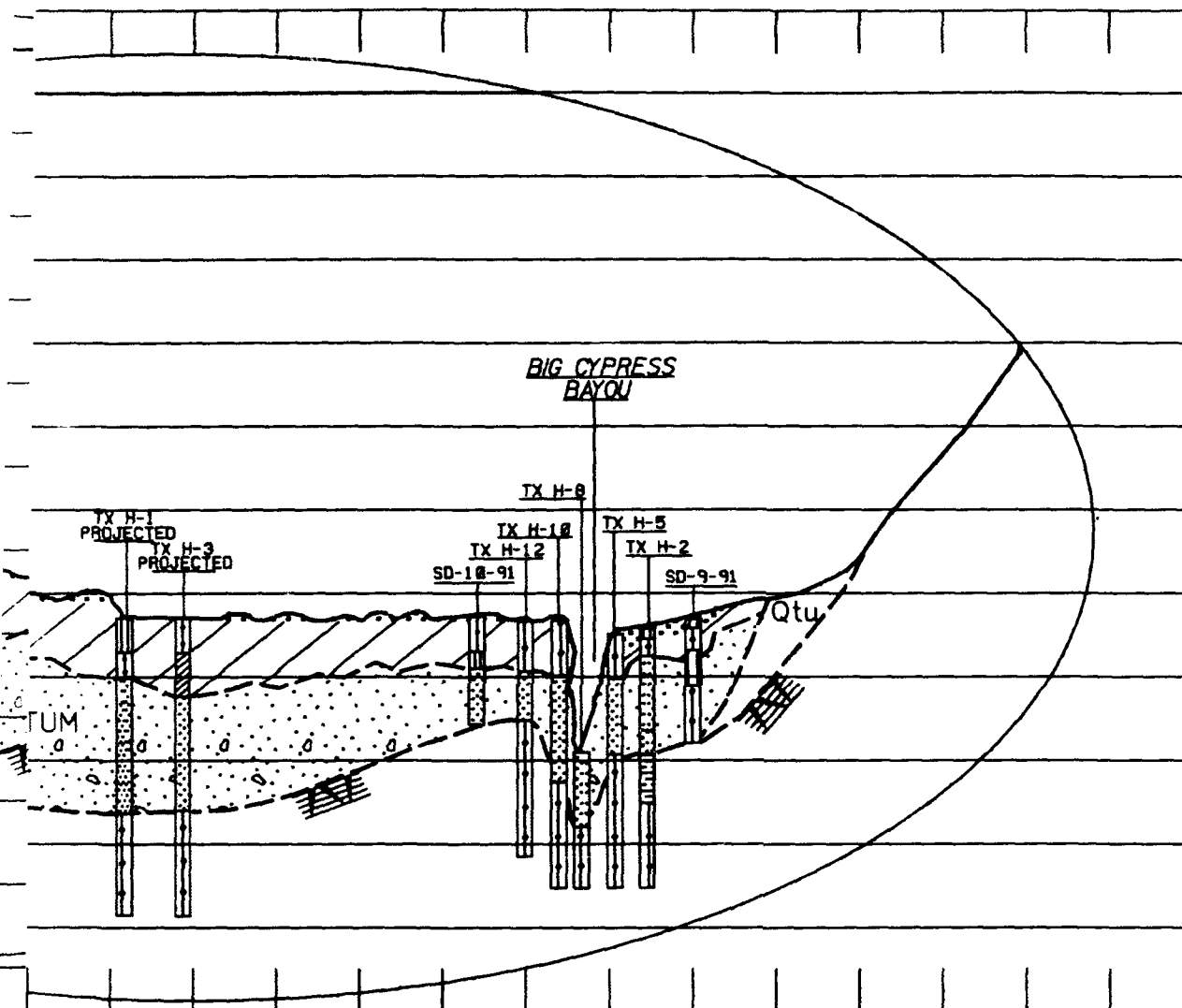


SHREVEPORT, LA - DANGERFIELD, TX
 SURFACE GEOLOGY
 CADDO, TX
 2/92



A

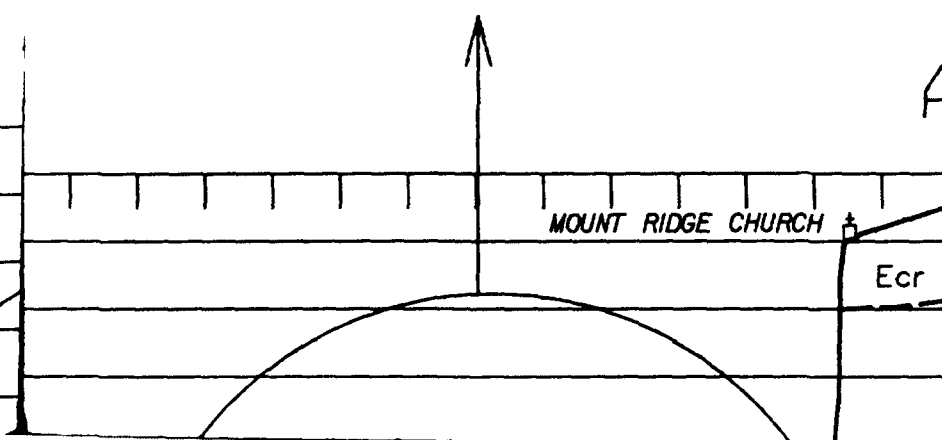




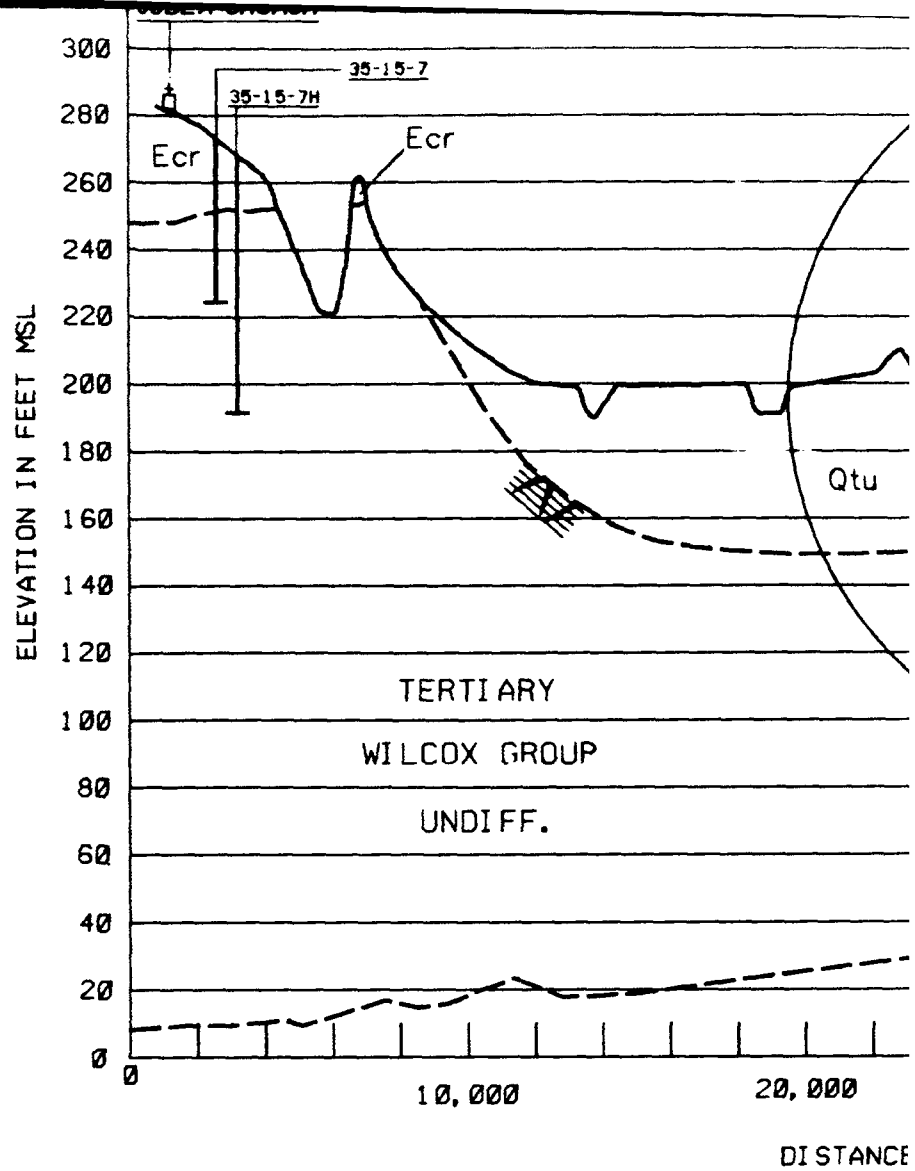
30,000

40,000

DISTANCE IN FEET



A'



LEGEND

ENVIRONMENTS OF DEPOSITION

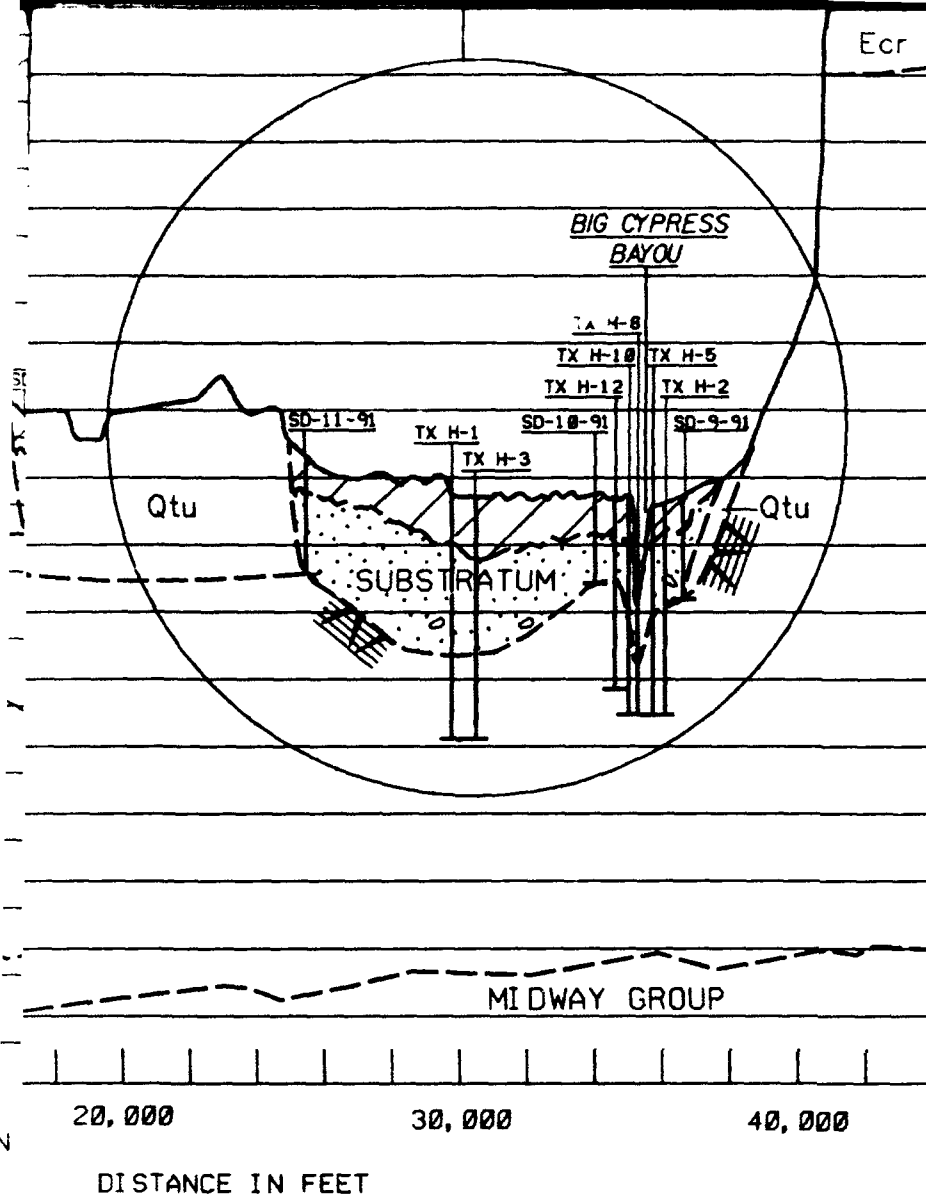
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.

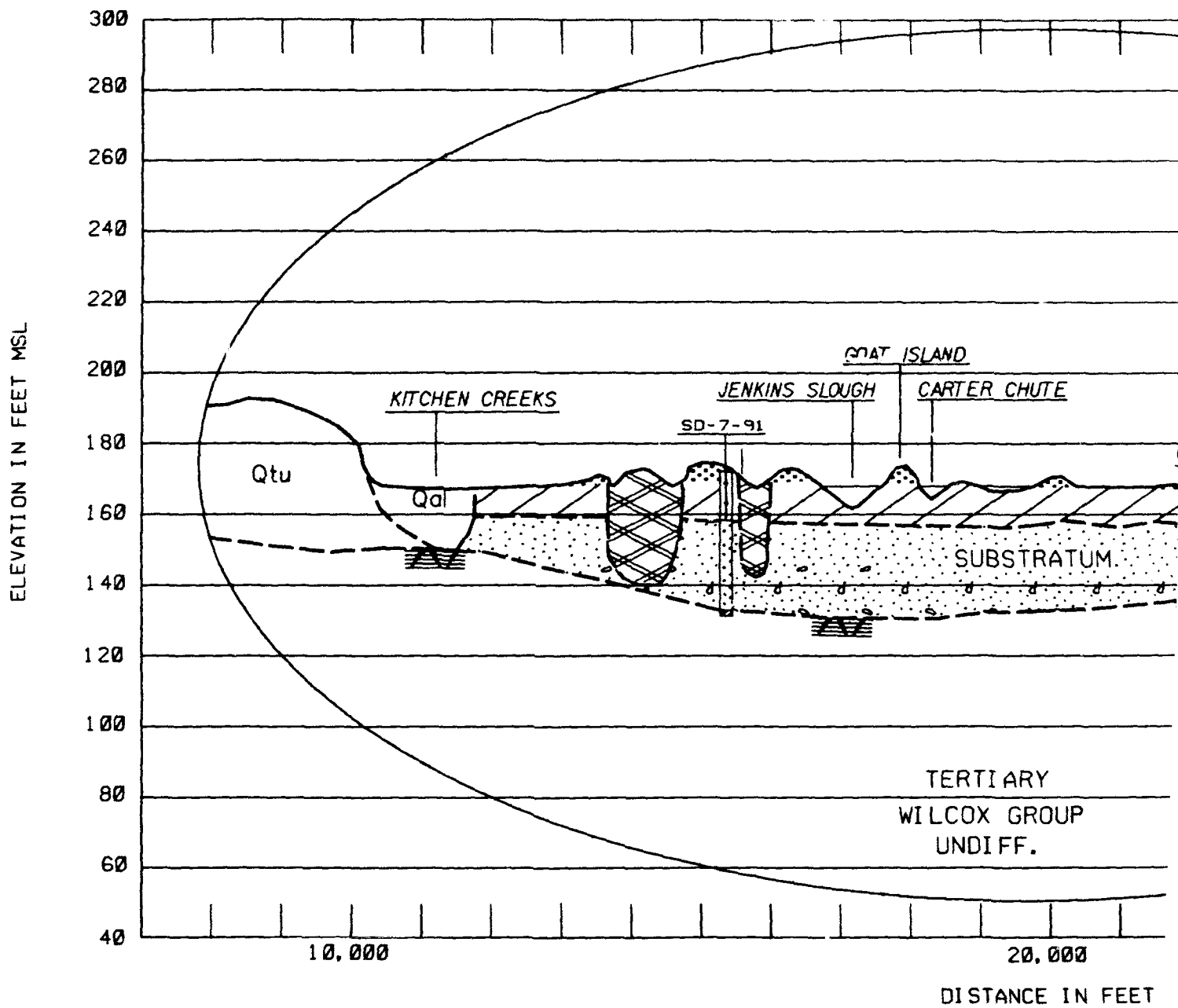


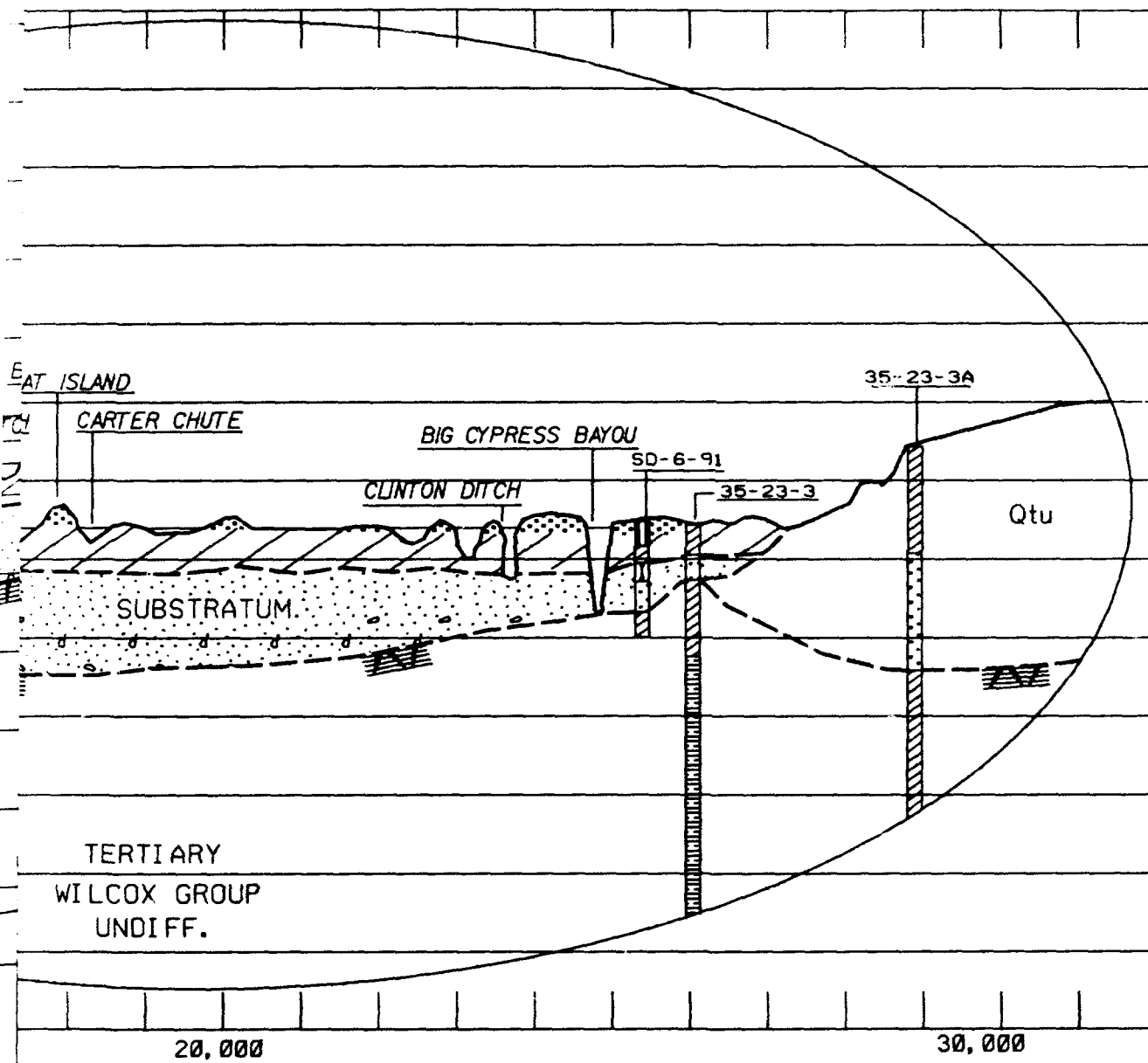
GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX

SECTION A - A'

CADDO

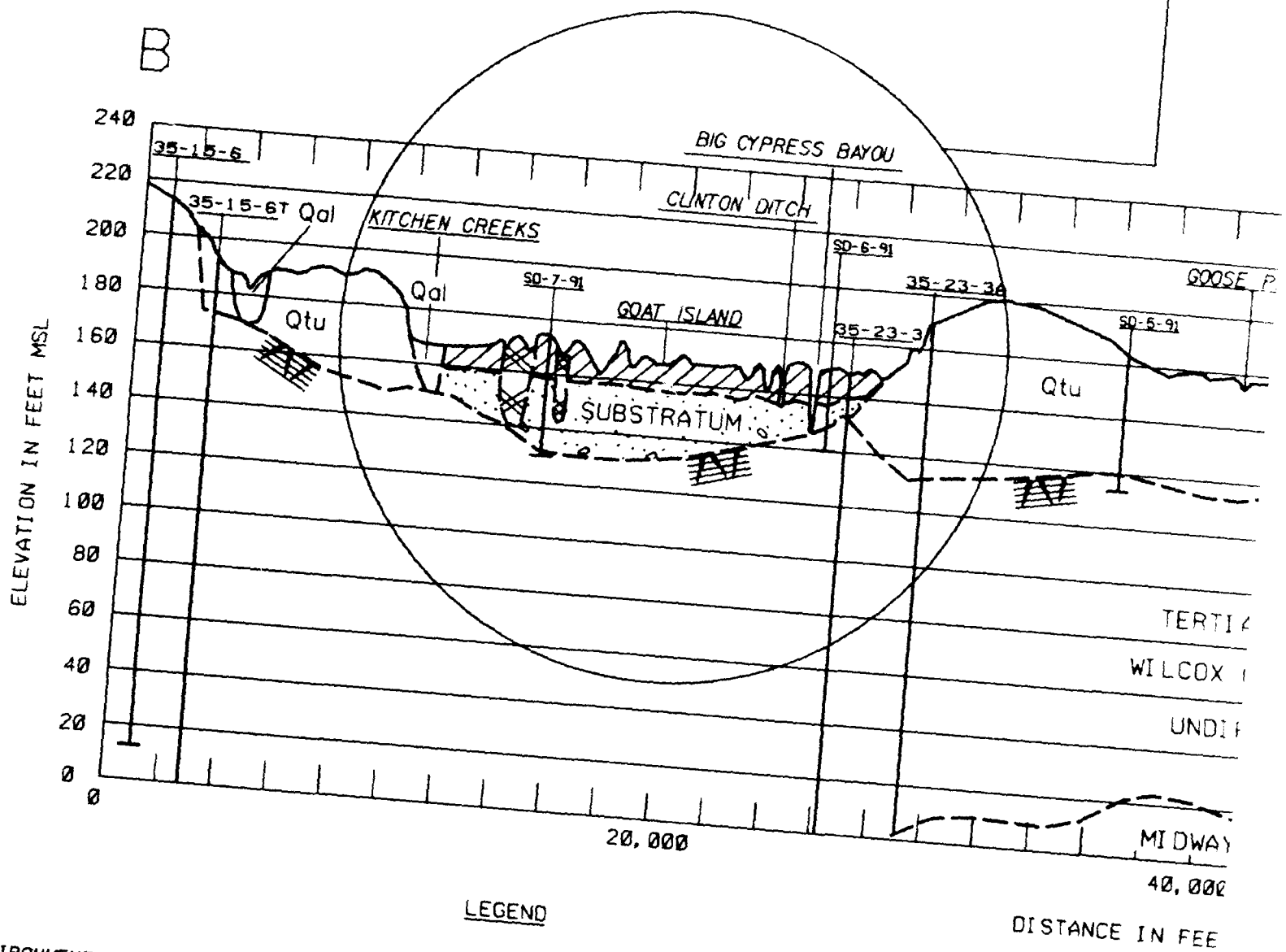
(HIGHWAY 43)





DISTANCE IN FEET





LEGEND

ENVIRONMENTS OF DEPOSITION

- NATURAL LEVEE
- POINT BAR
- BACKSWAMP
- ABANDONED CHANNEL
- ABANDONED COURSE

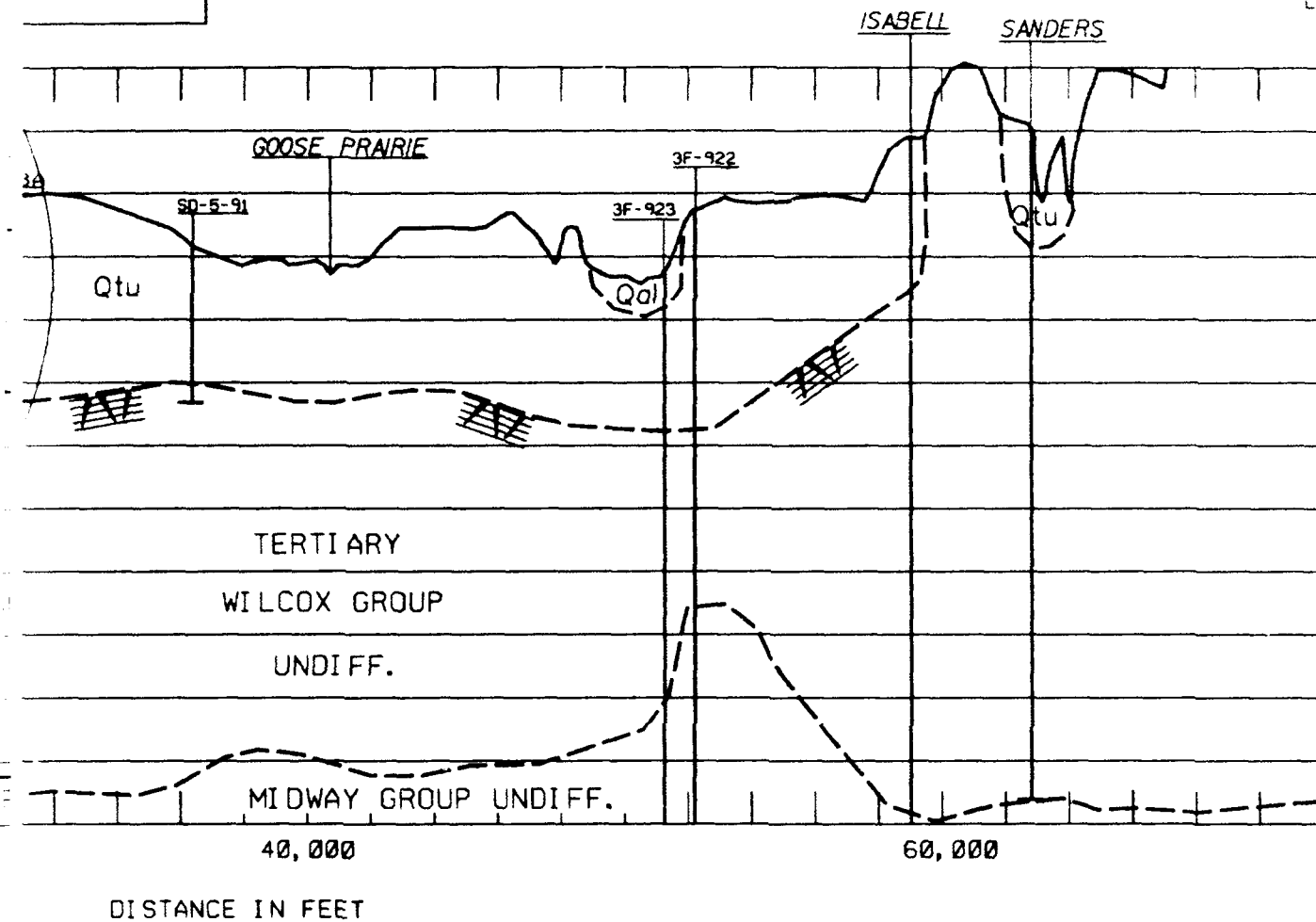
LITHOLOGY

- UNDIFFERENTIATED SAND AND GRAVEL
- SAND
- SILTY SAND
- SILT
- SANDY CLAY
- CLAY
- SHALE
- FILL

MAPPING SYMBOLS

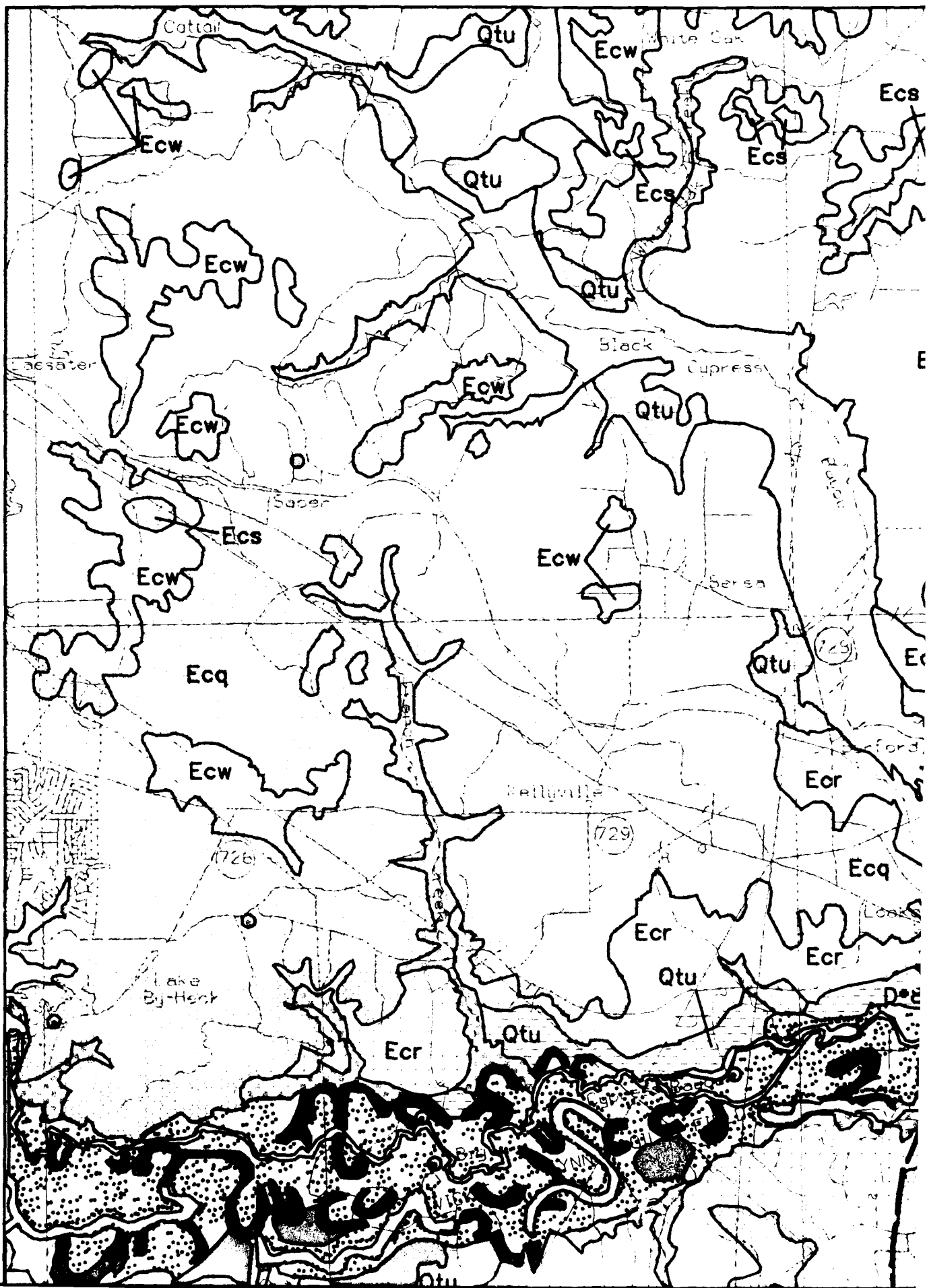
- ALLUVIUM UNDIFF.
- TERRACE DEPOSITS UNDIFF.
- TERTIARY SURFACE
- SPARTA
- WECHES
- QUEEN CITY
- REKLAW
- WILCOX UNDIFF.

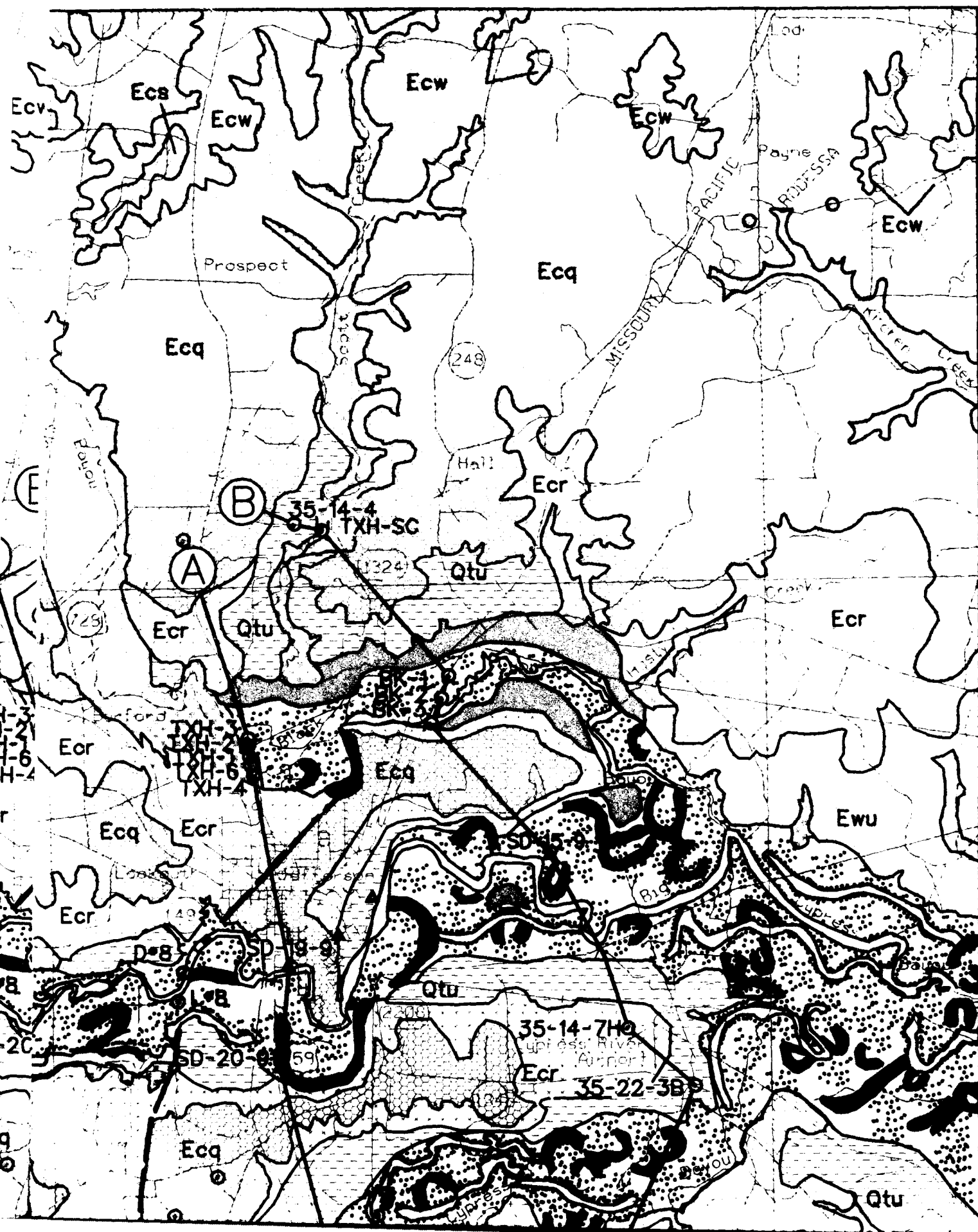
B'



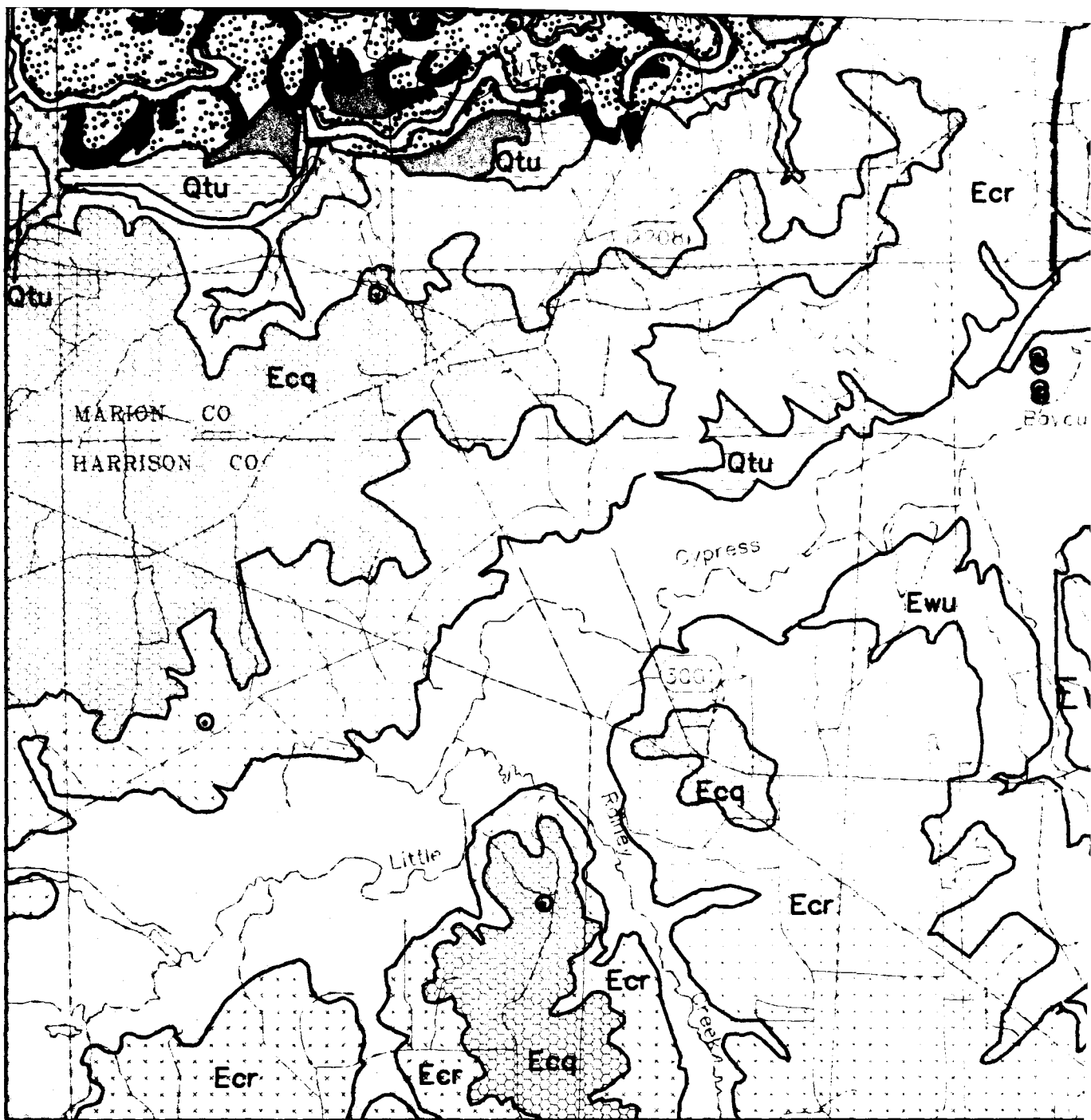
GEOLOGICAL INVESTIGATION
SHREVEPORT , LA - DAINGERFIELD , TX
SECTION B - B'
CADDO
(LONGHORN)

94° 30'
32° 52'30"





32° 37' 30"
94° 30'



LEGEND

QUATERNARY

RECENT

-  NATURAL LEVEE
-  POINT BAR
-  BACKSWAMP
-  ABANDONED CHANNEL
-  ABANDONED COURSE
-  UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

-  UNDIFFERENTIATED TERRACE DEPOSITS

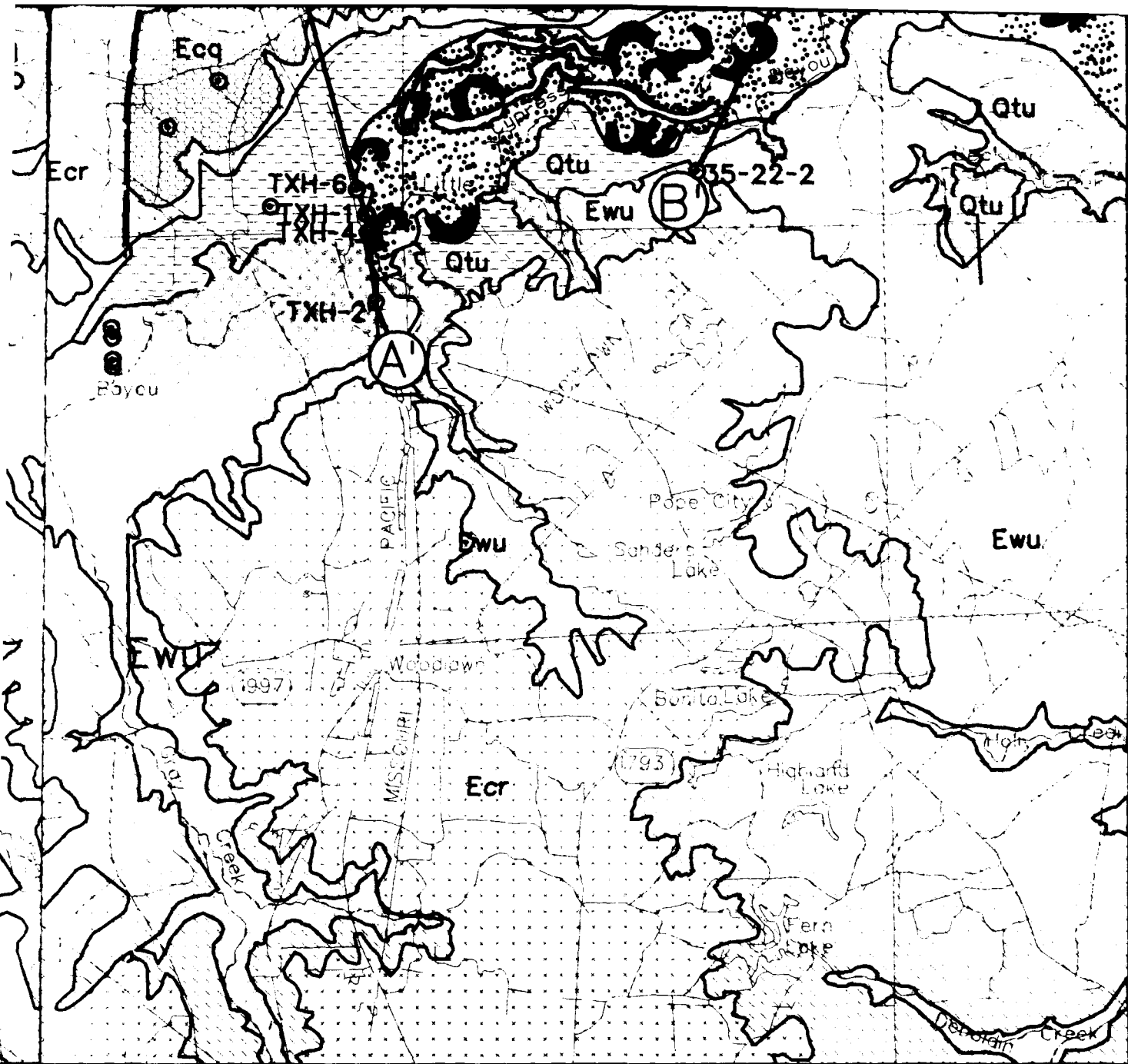
TERTIARY

EOCENE

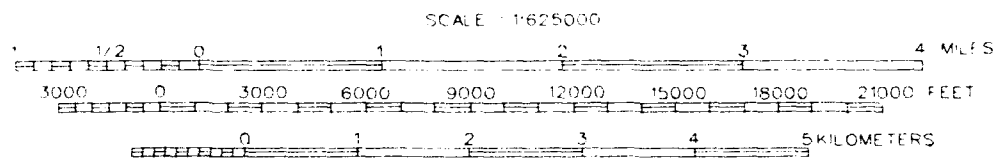
CLAIBORNE GROUP

-  SPARTA FORMATION
-  WECHES FORMATION
-  QUEEN CITY FORMATION
-  REKLAW FORMATION
-  WILCOX GROUP UNDIFFERENTIATED

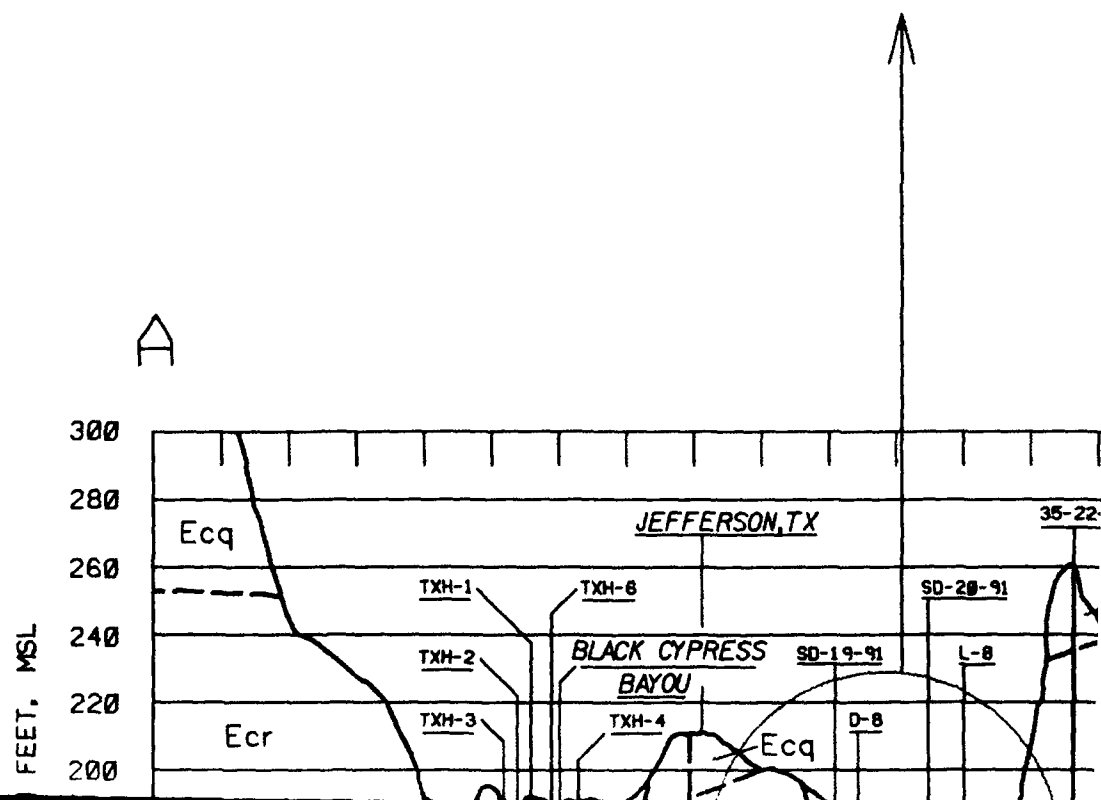
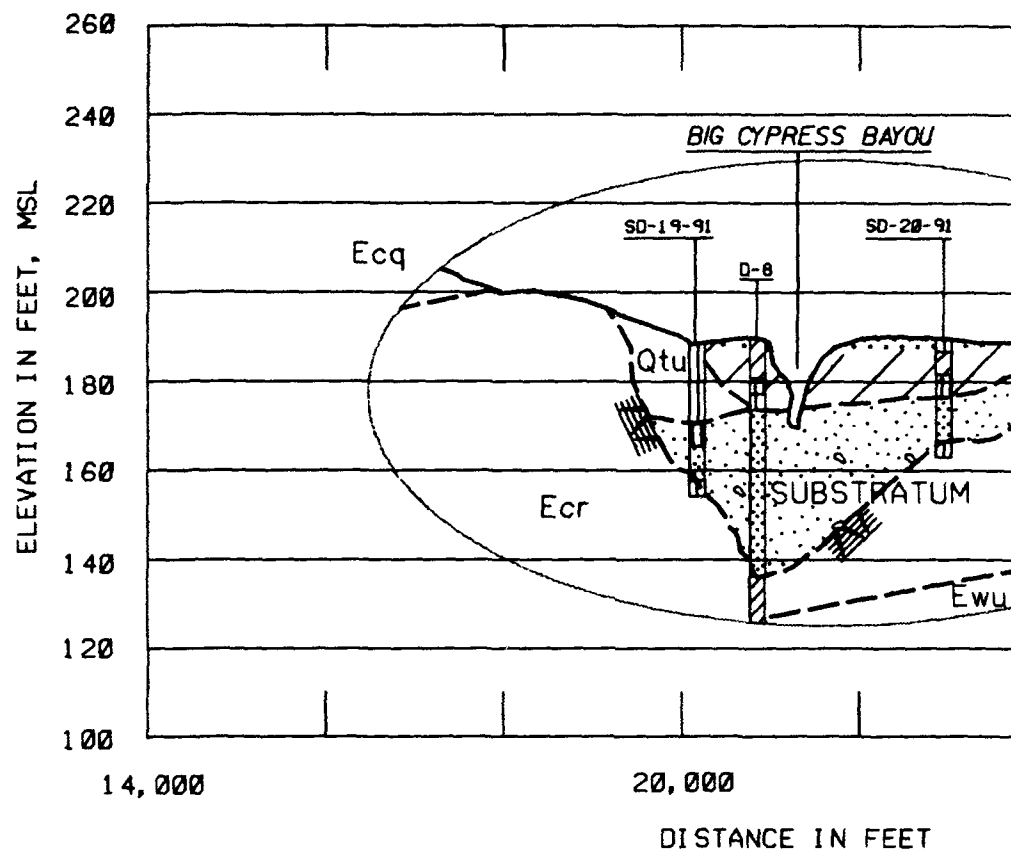
-  CONTACT
-  FAULT
-  BORING
-  PIEZOMETER

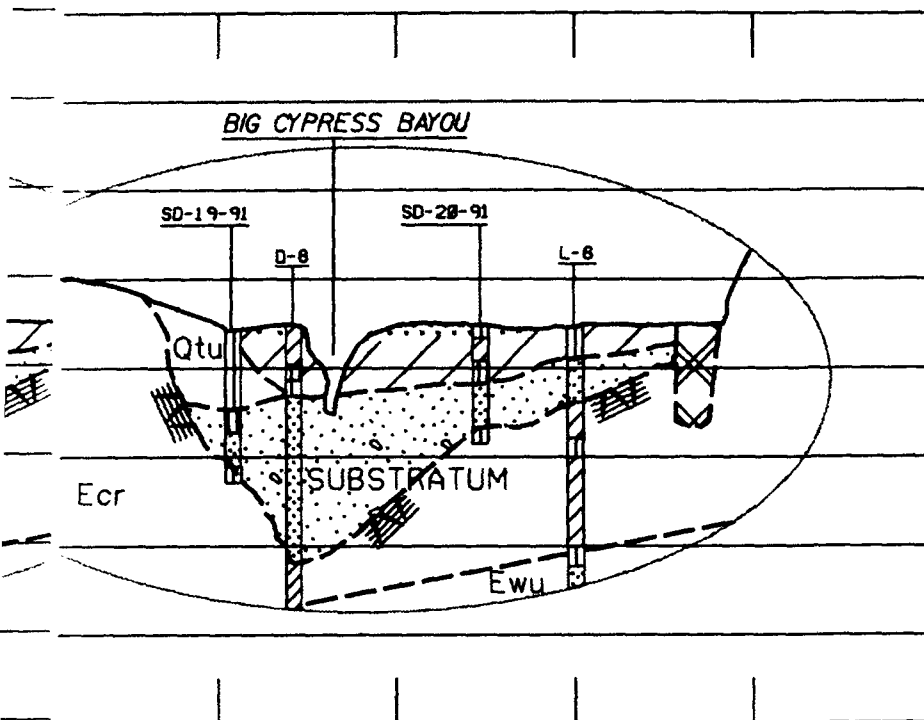


32° 37' 30"
94° 15'



SHREVEPORT, LA - DAINGERFIELD, TX
SURFACE GEOLOGY
JEFFERSON, TX
2/92

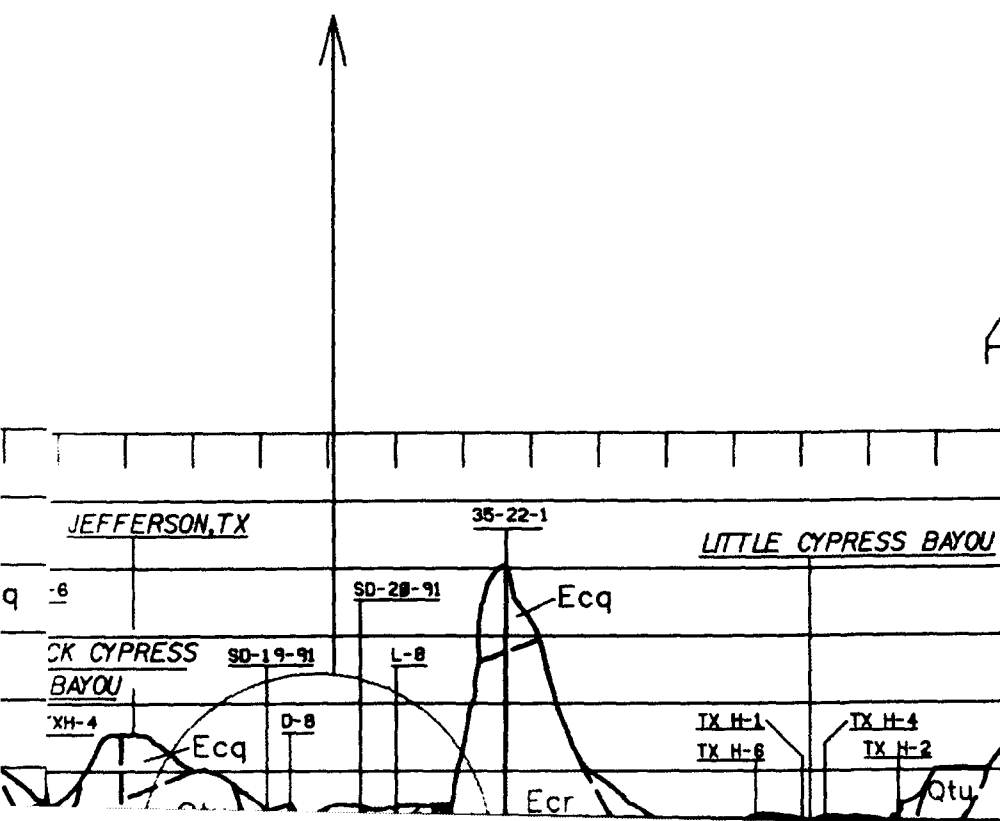


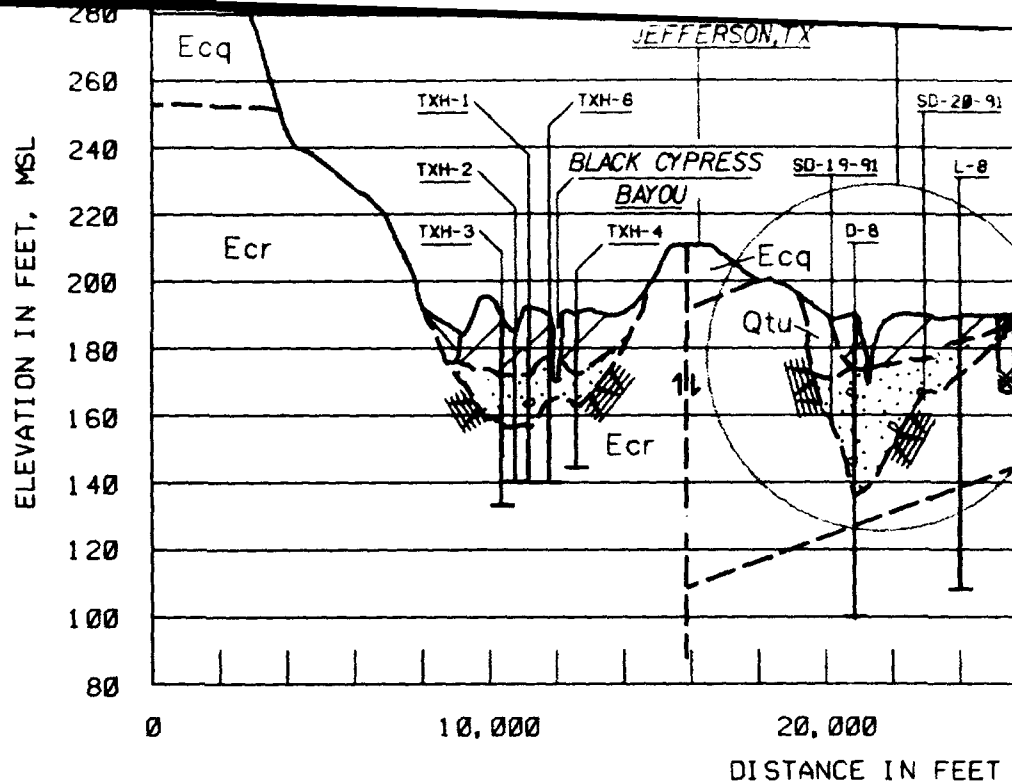


20,000

28,000

DISTANCE IN FEET





LEGEND

ENVIRONMENTS OF DEPOSITION

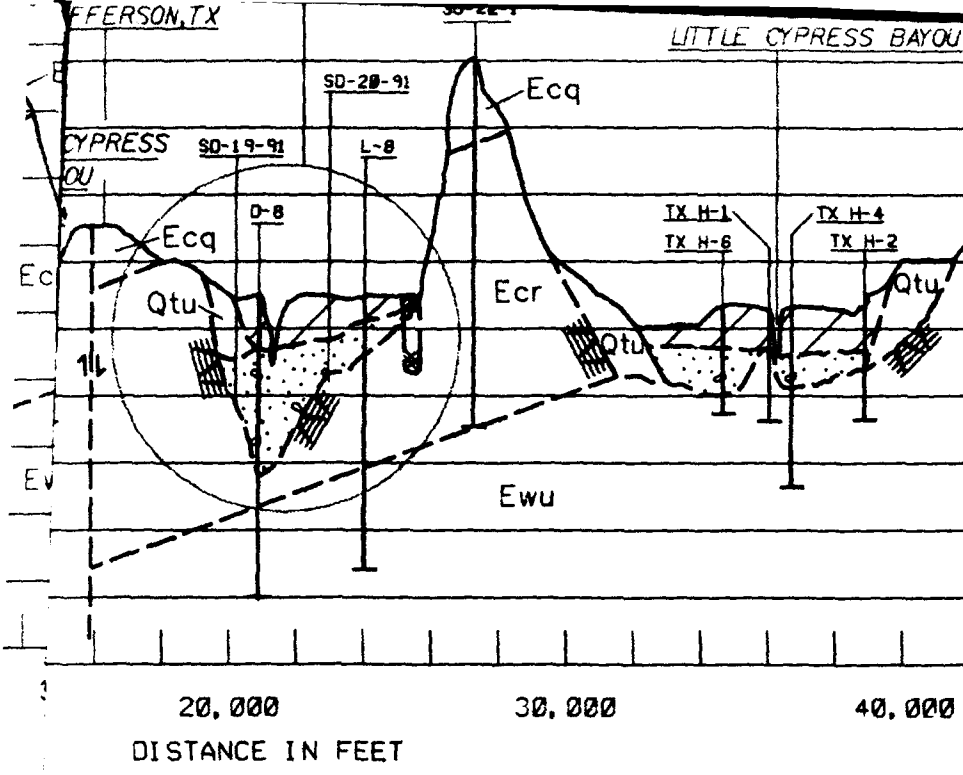
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

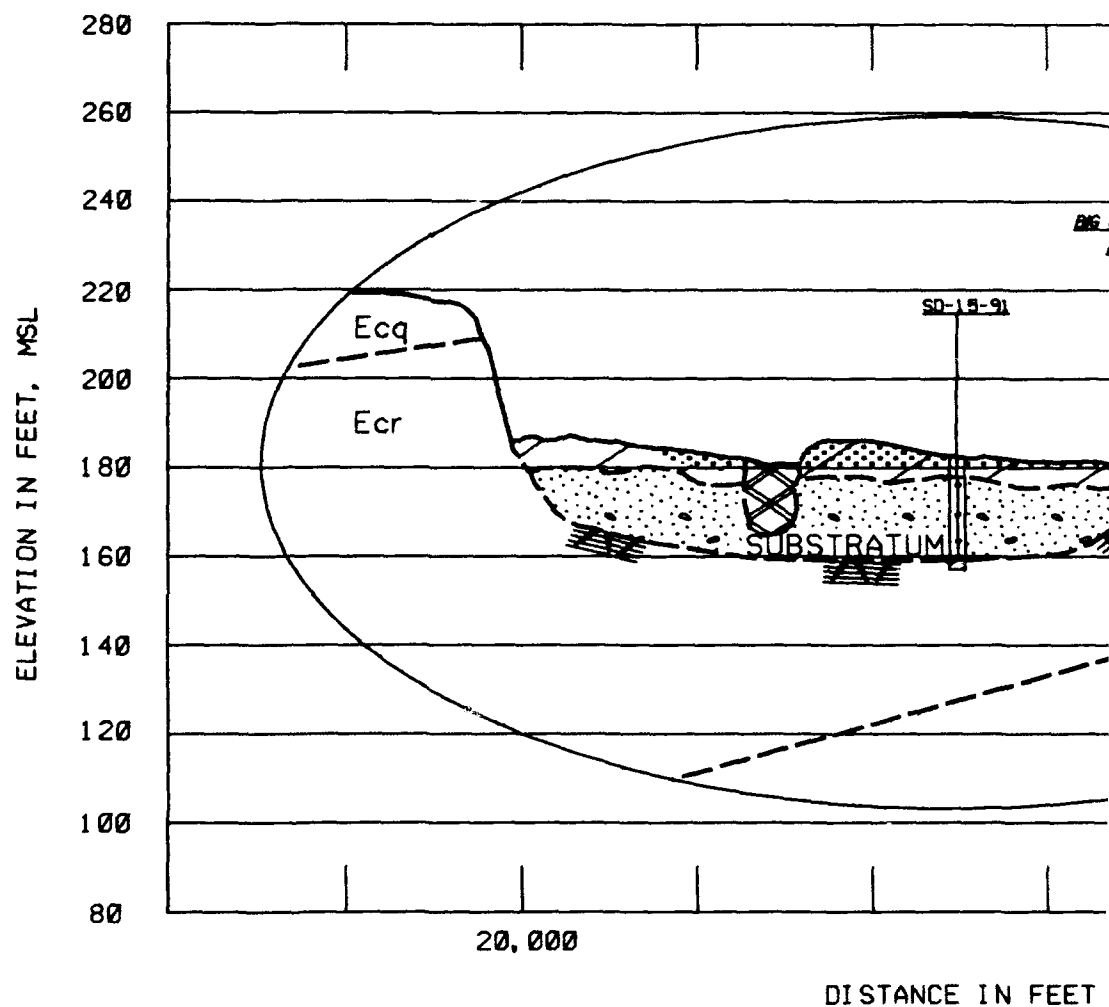
	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.



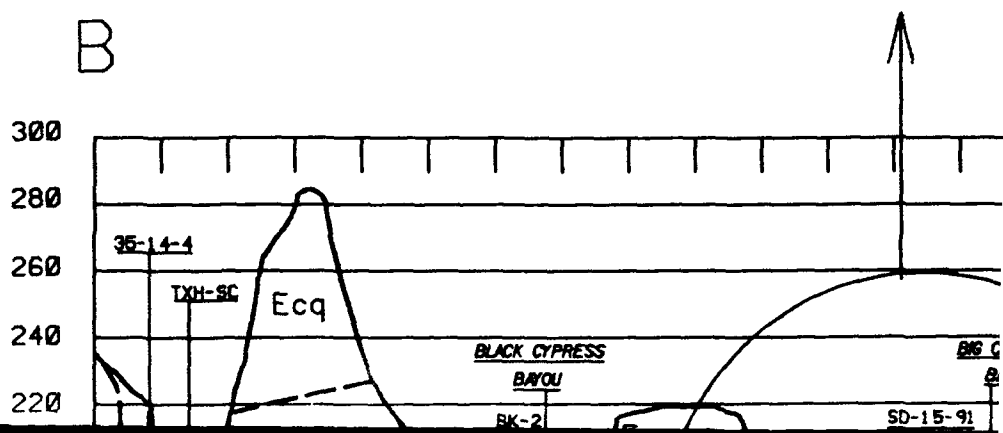
SYMBOLS

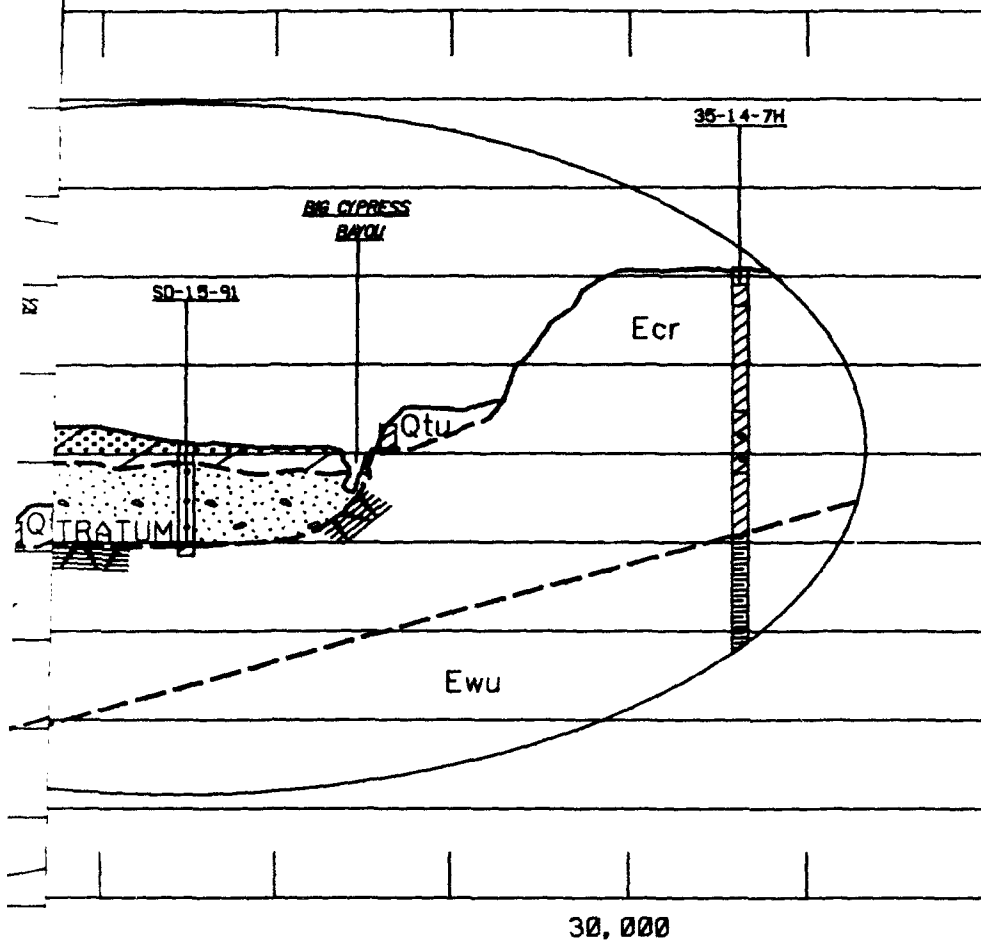
- VIUM
- FF.
- ACE DEPOSITS
- FF.
- TIARY SURFACE
- RTA
- HES
- EN CITY
- SLAW
- COX UNDIFF.

GEOLOGICAL INVESTIGATION SHREVEPORT , LA - DAINGERFIELD , TX SECTION A - A' JEFFERSON (HIGHWAY 59)

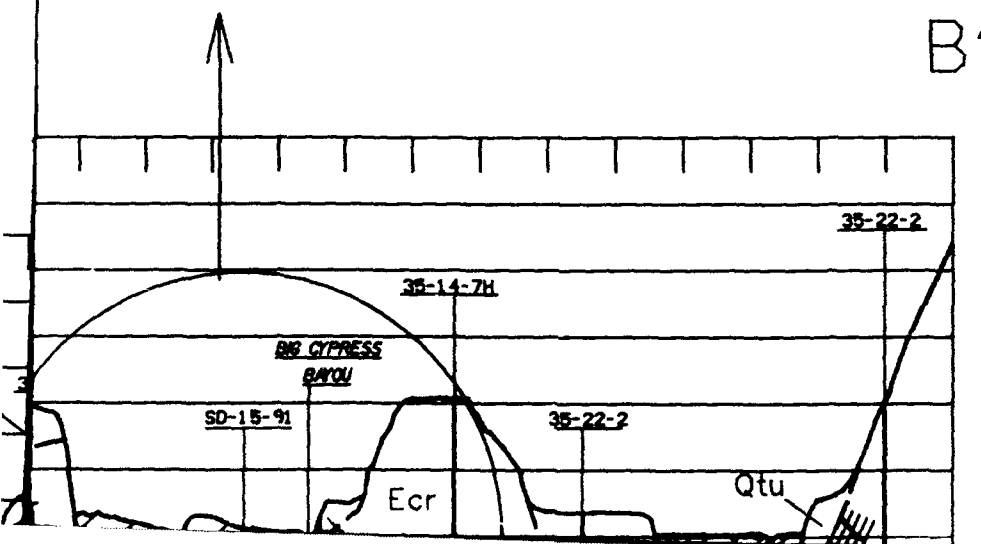


B

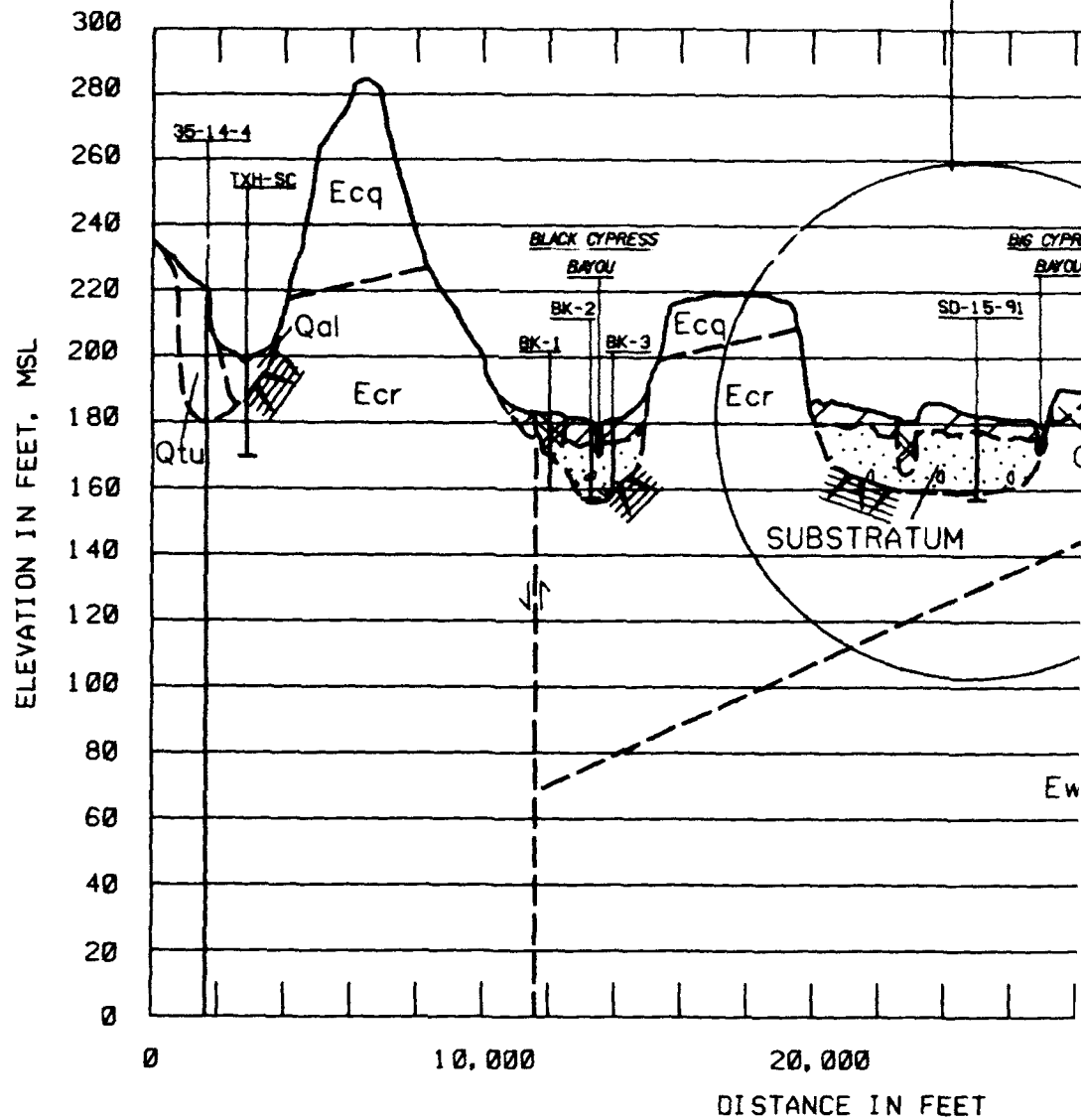




DISTANCE IN FEET



B



LEGEND

ENVIRONMENTS OF DEPOSITION

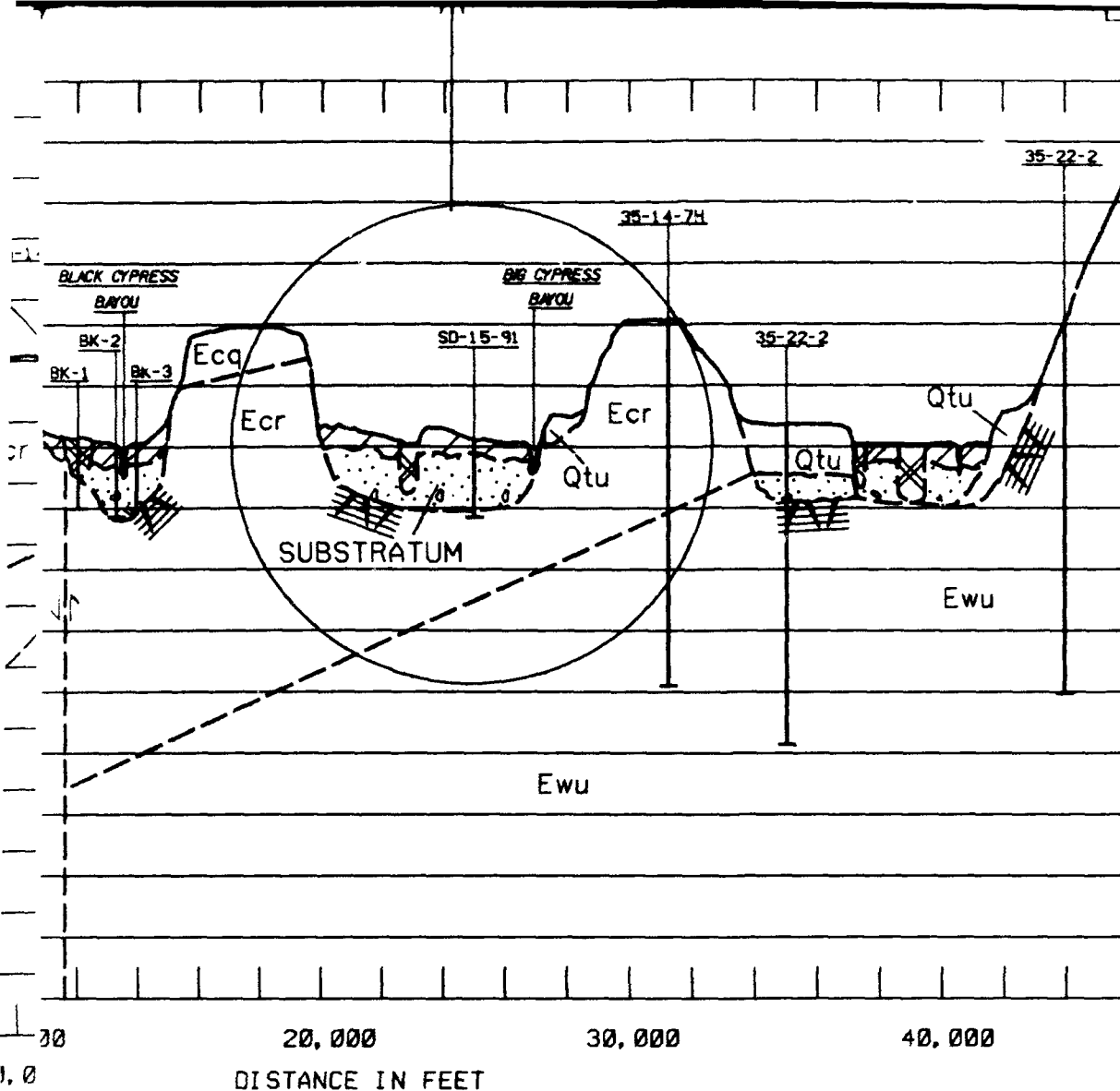
- NATURAL LEVEE
- POINT BAR
- BACKSWAMP
- ABANDONED CHANNEL
- ABANDONED COURSE
- UNDIFFERENTIATED SAND AND GRAVEL

LITHOLOGY

- SAND
- SILTY SAND
- SILT
- SANDY CLAY
- CLAY
- SHALE

MAPPING SYMBOLS

- QTU TERRACE DEPOSITS UNDIFF.
- TERTIARY SURFACE
- EOS SPARTA
- EOW WECHES
- EOQ QUEEN CITY
- EOR REKLAW
- EWU WILCOX UNDIFF.



MAPPING SYMBOLS

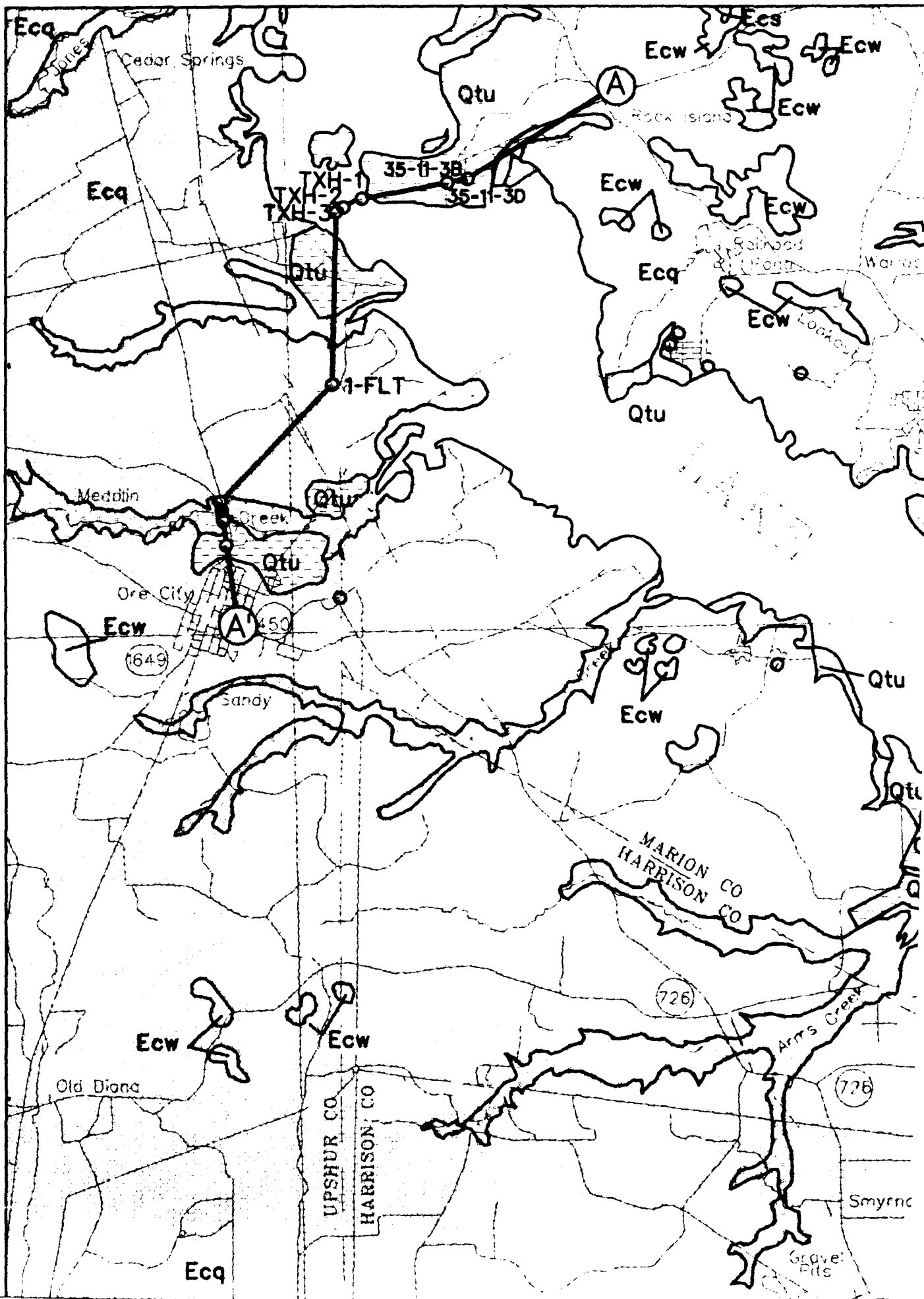
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Eos	SPARTA
Eow	WECHES
Ecu	QUEEN CITY
Ecr	REKLAW
Ewu	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, TX

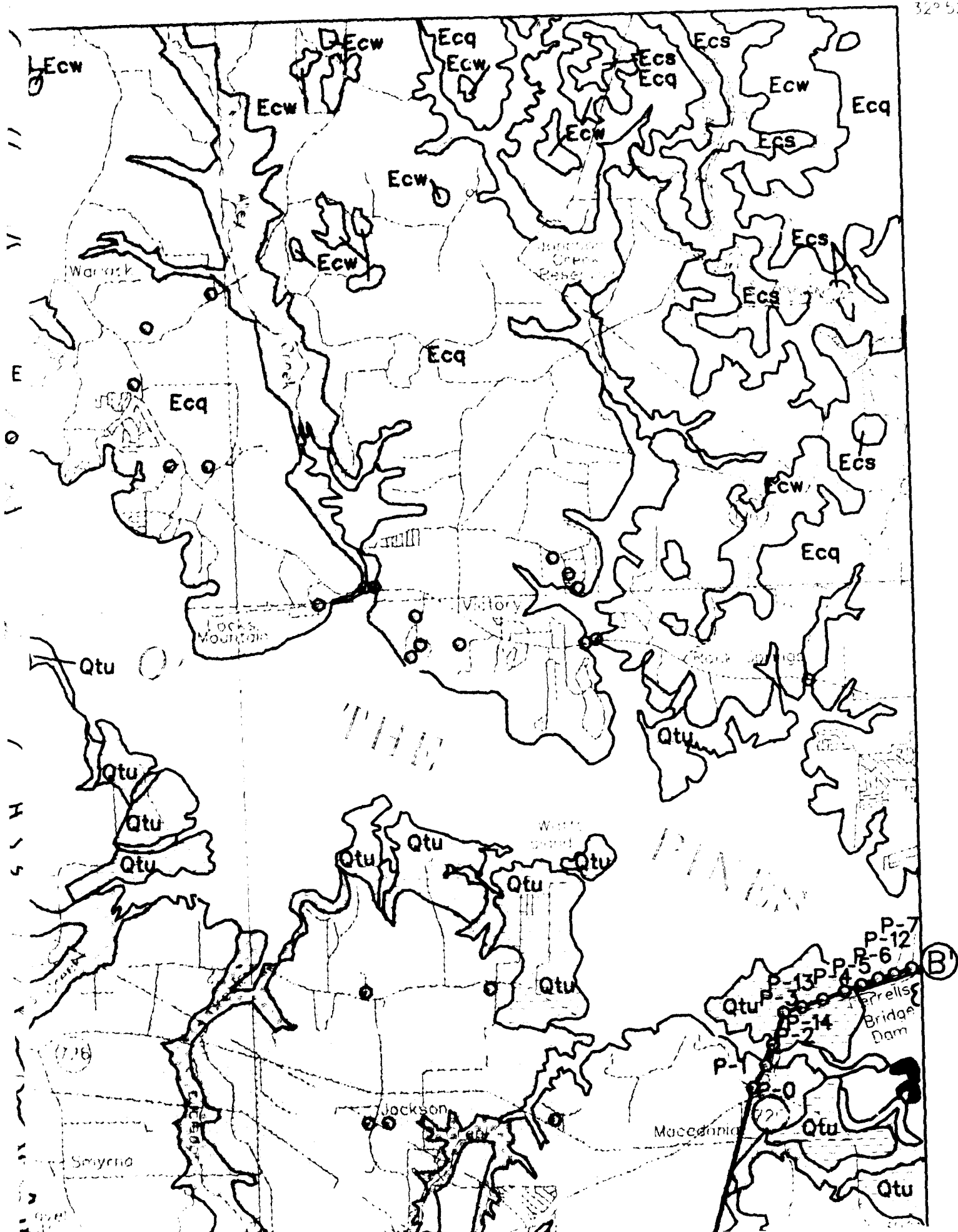
SECTION B - B'

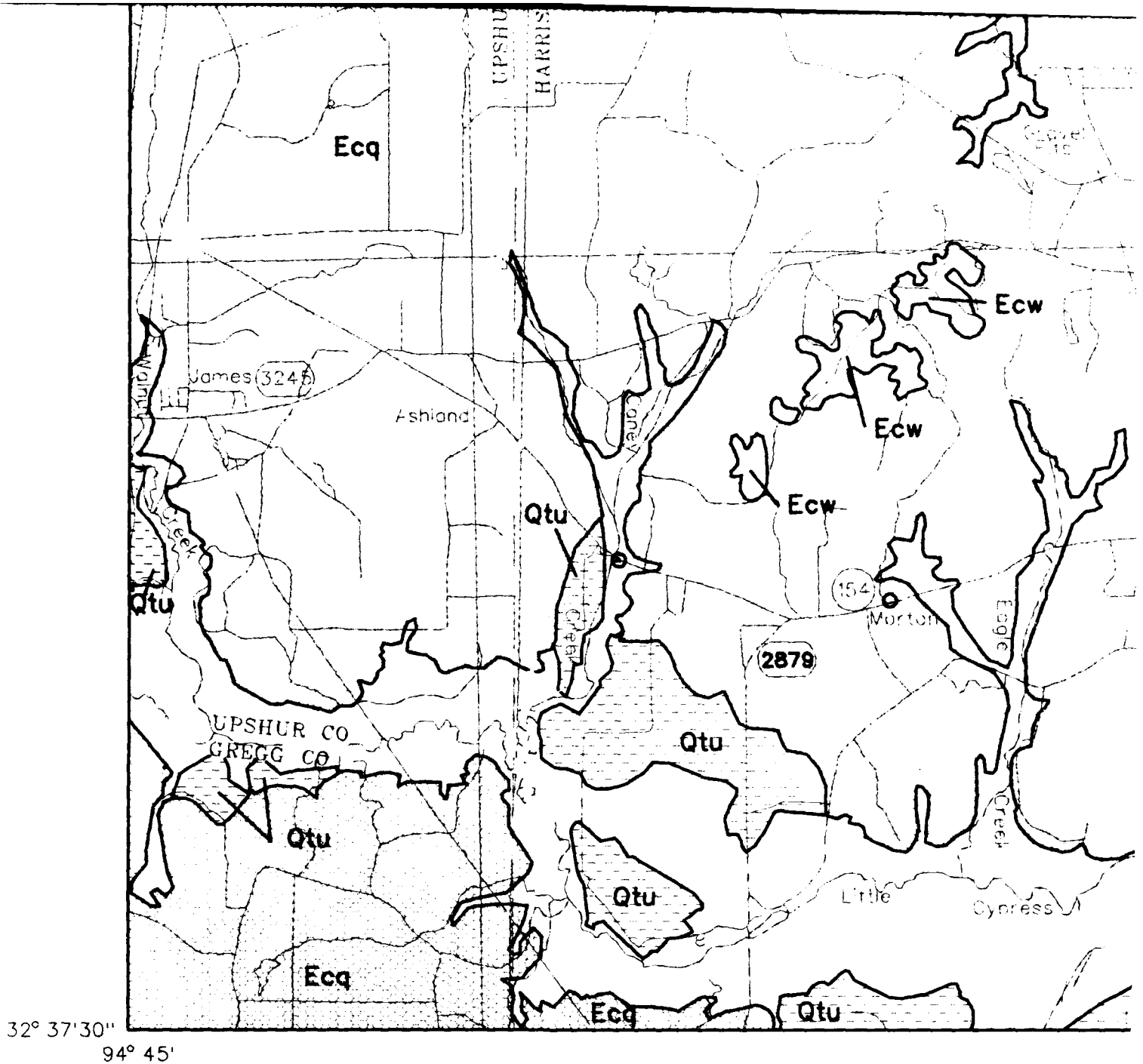
JEFFERSON
(WOODLAWN OIL FIELD)

94° 45'
32° 52' 30"



94° 30'
32° 52' 30"





LEGEND

QUARTERNARY

RECENT

-  NATURAL LEVEE
-  POINT BAR
-  BACKSWAMP
-  ABANDONED CHANNEL
-  ABANDONED COURSE
-  UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

-  UNDIFFERENTIATED TERRACE DEPOSITS

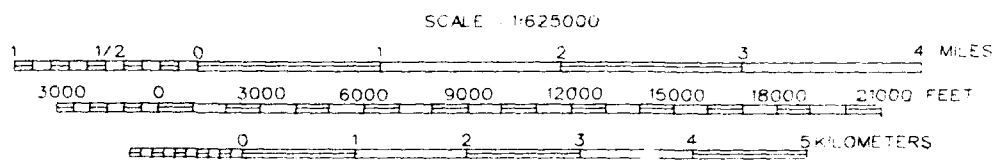
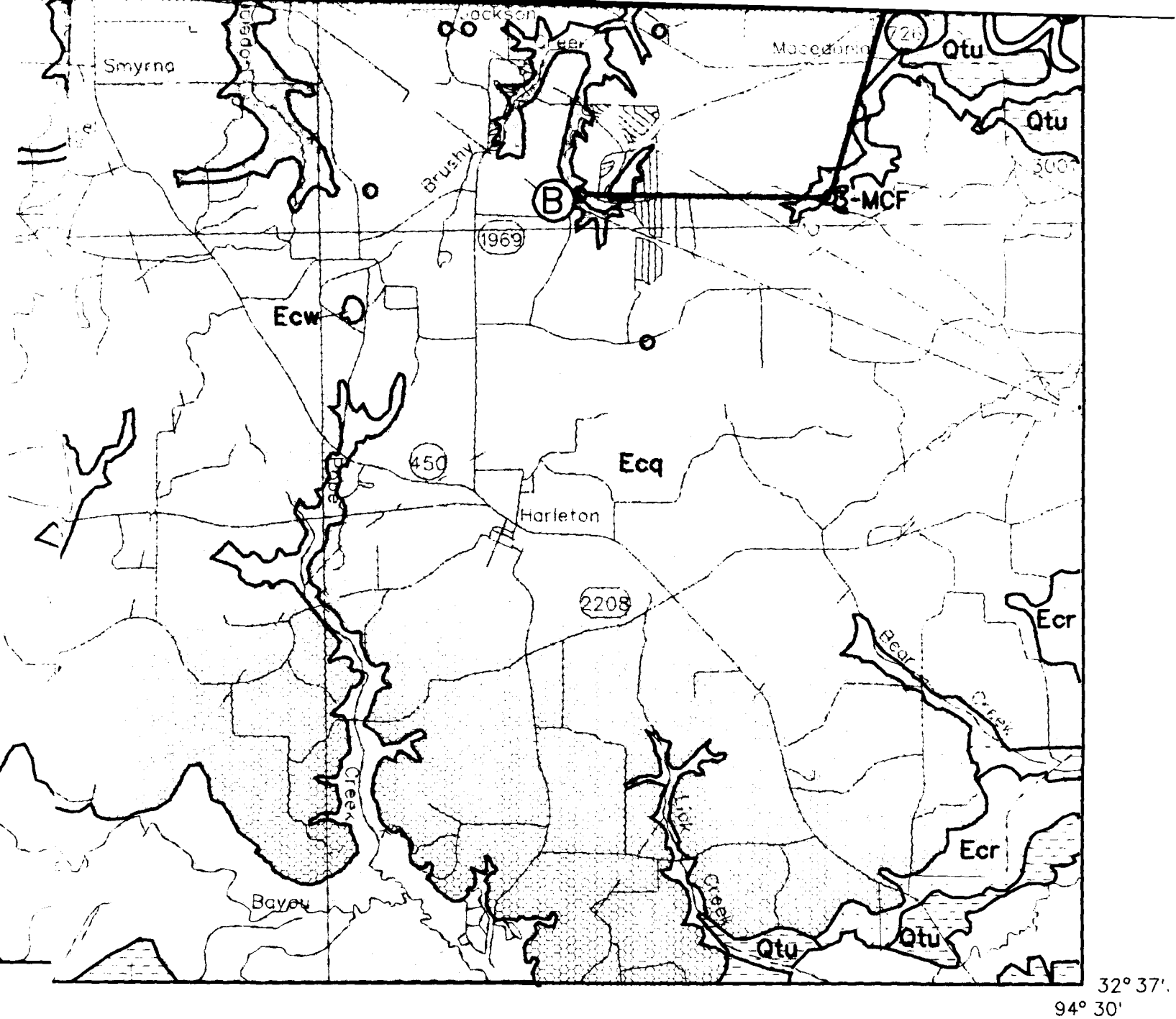
TERTIARY

EOCENE

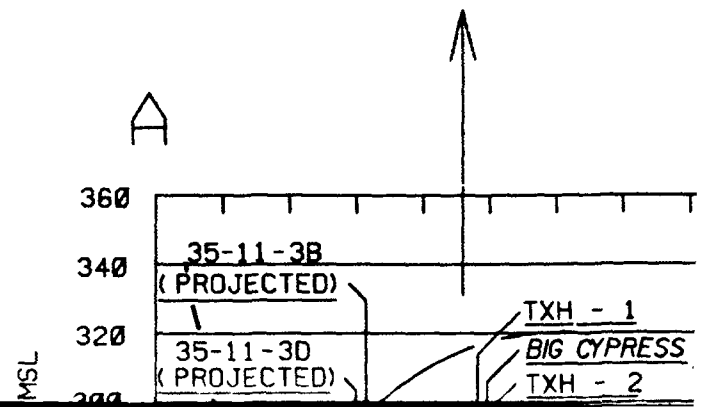
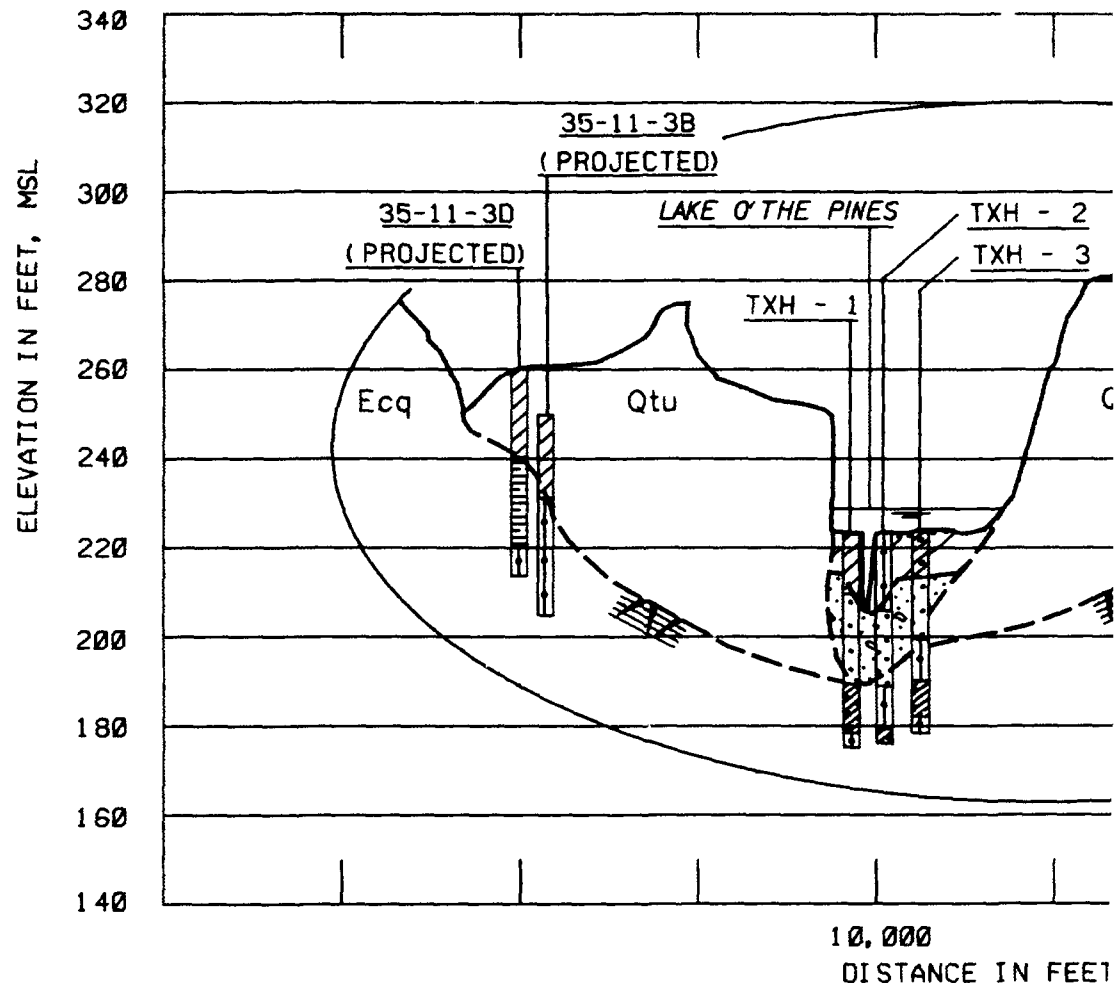
CLAIBORNE GROUP

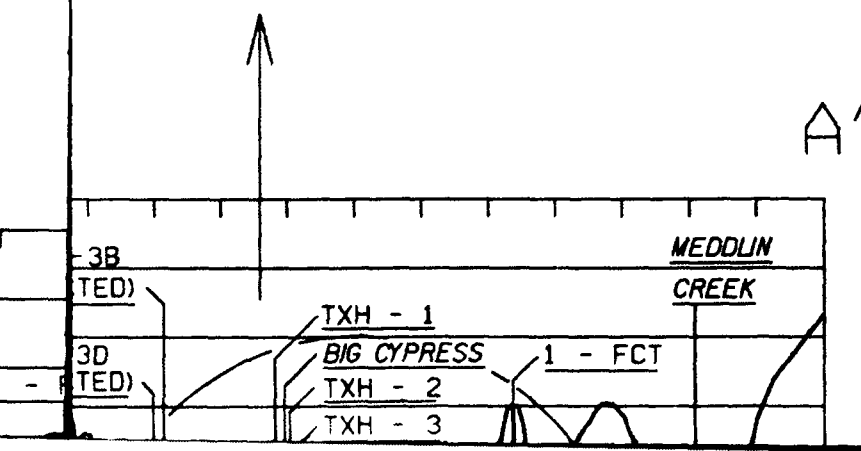
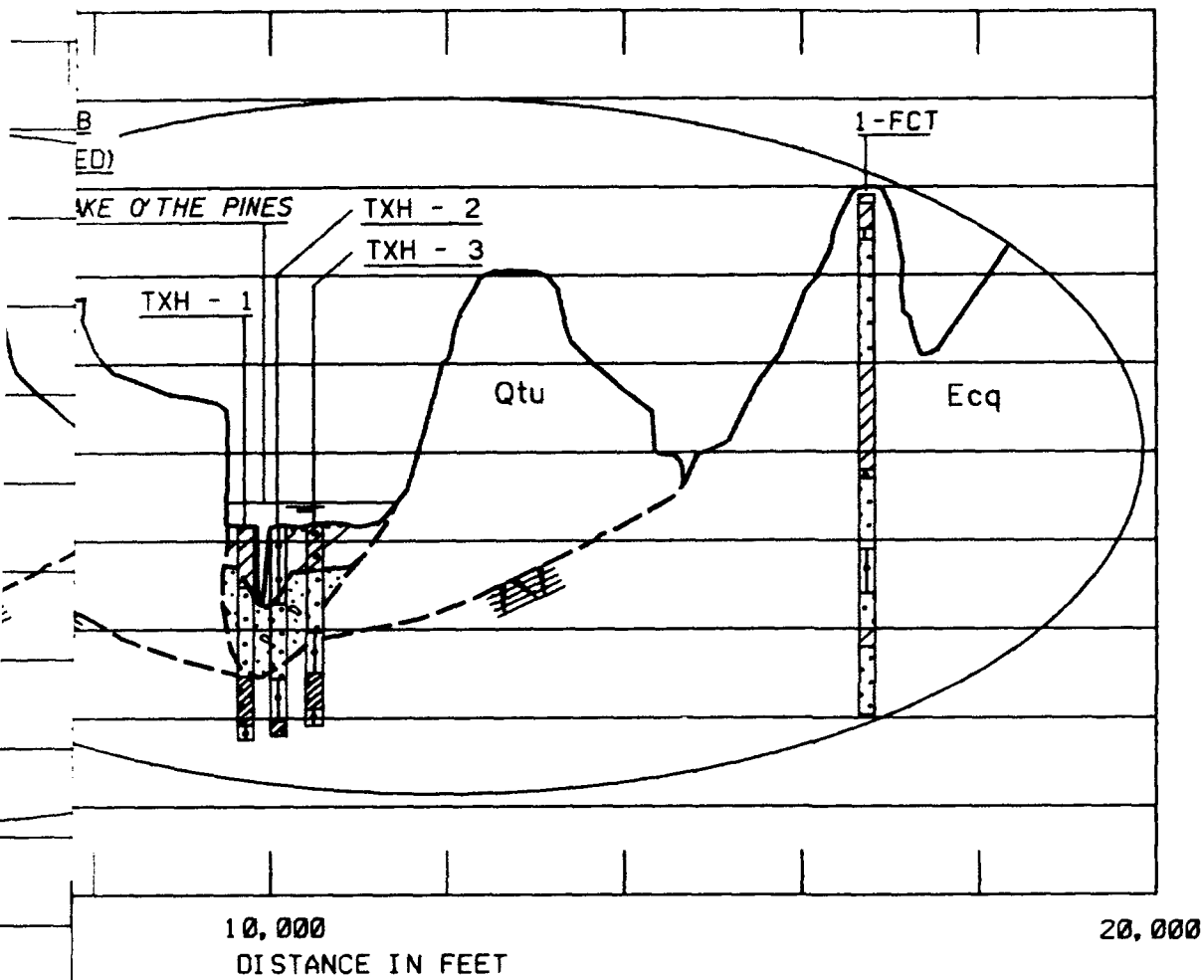
-  SPARTA FORMATION
-  WECHES FORMATION
-  QUEEN CITY FORMATION
-  REKLAW FORMATION
-  WILCOX GROUP UNDIFFERENTIATED

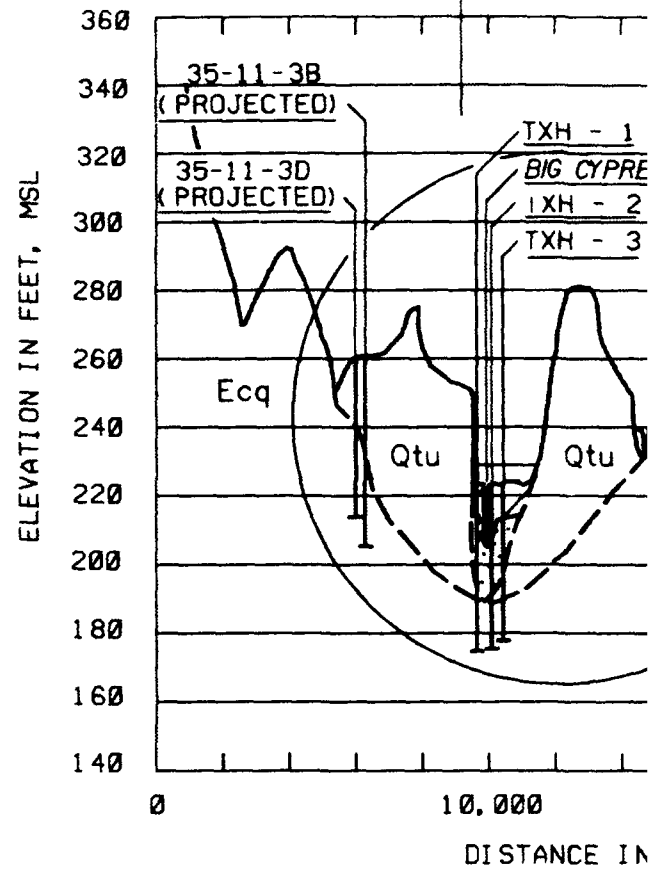
-  CONTACT
-  FAULT
-  BORING
-  PIEZOMETER



SHREVEPORT, LA - DAINGERFIELD, TX
 SURFACE GEOLOGY
 LAKE O' THE PINES, TX
 2/92







LEGEND

ENVIRONMENTS OF DEPOSITION

	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

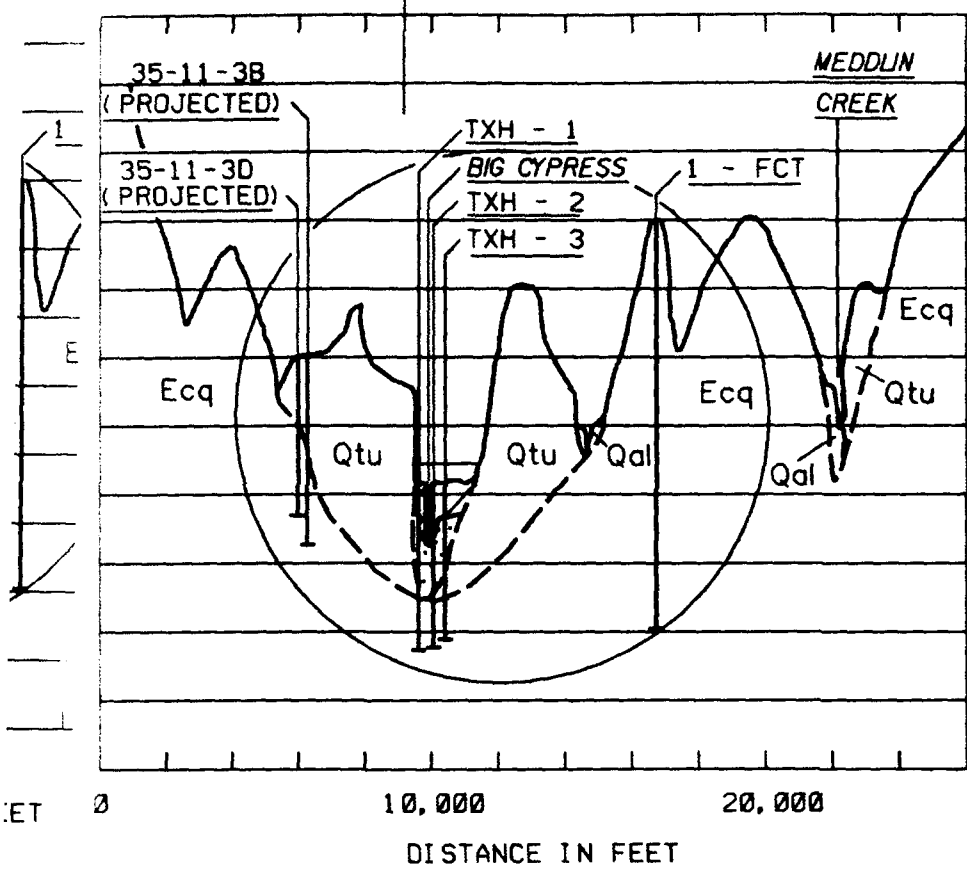
LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.

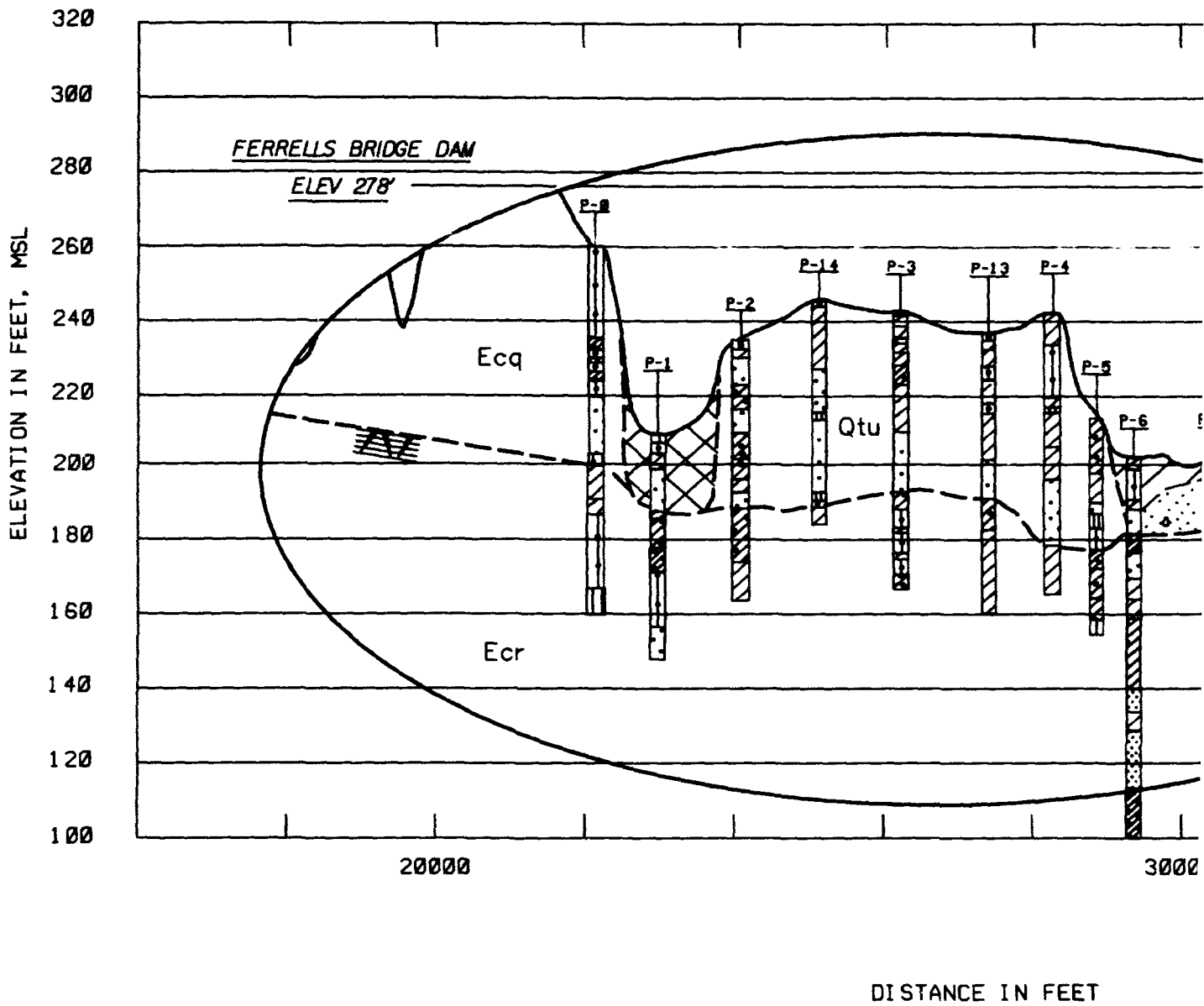
A'



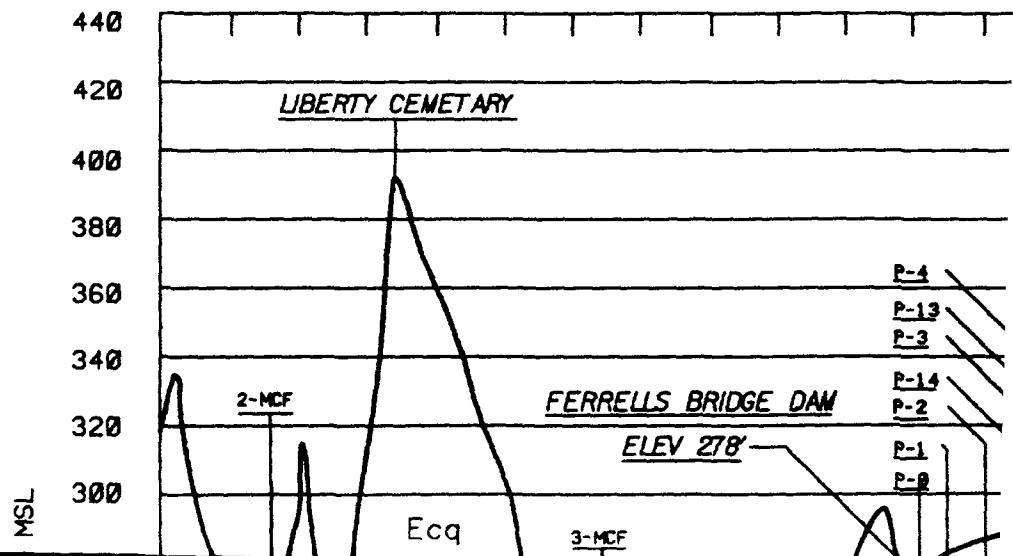
MAPPING SYMBOLS

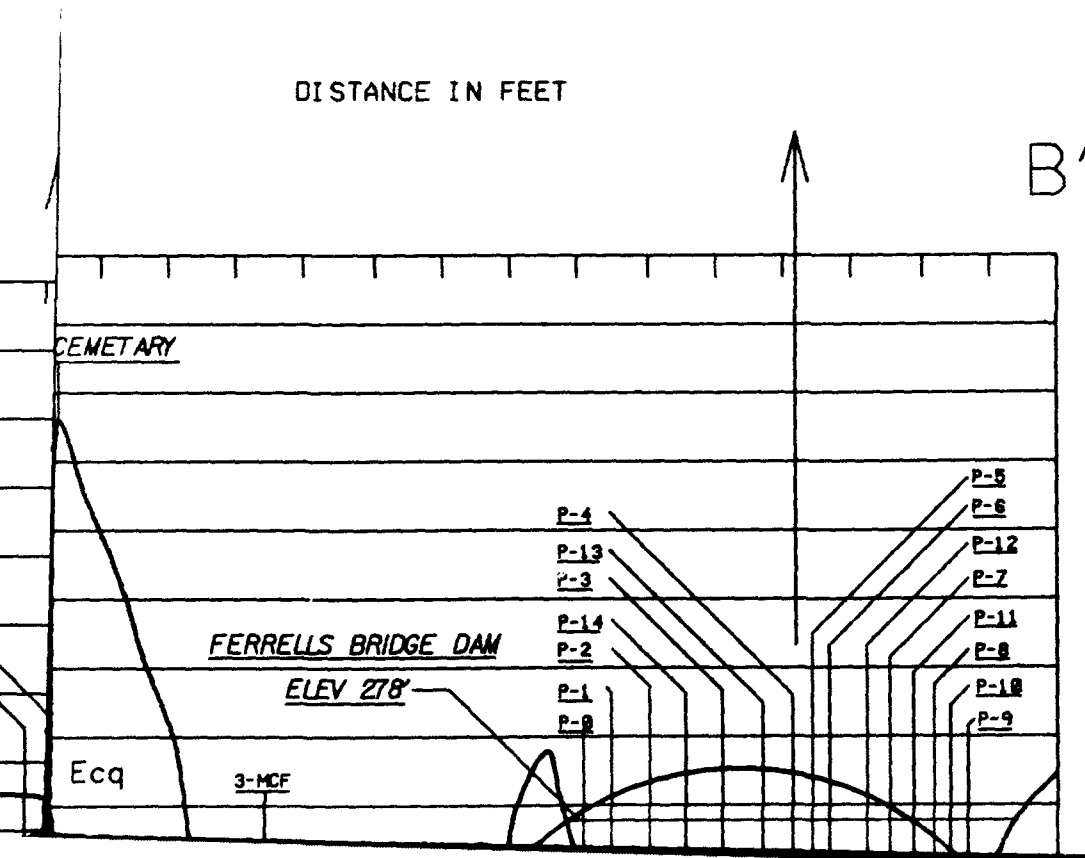
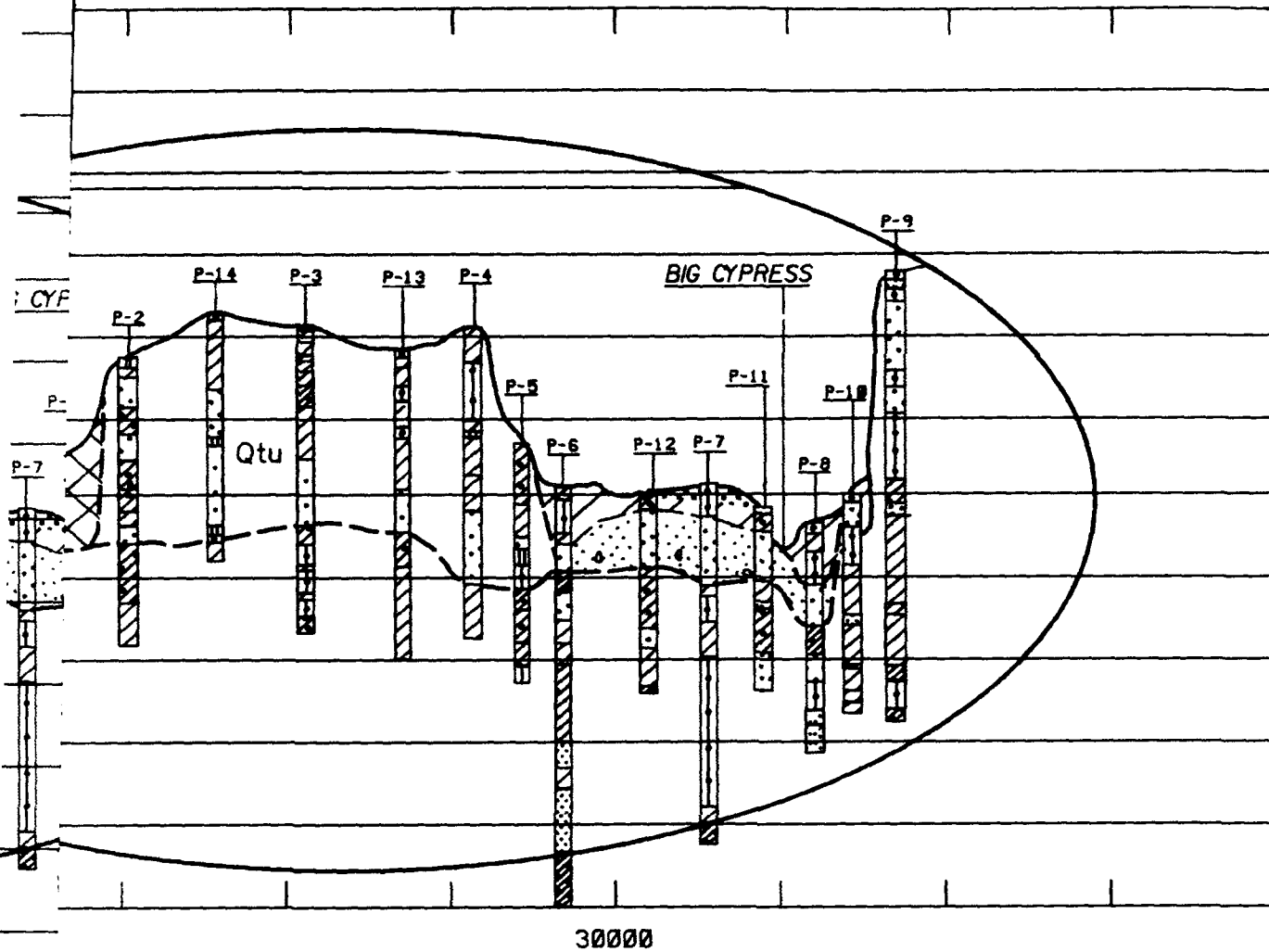
- Qal ALLUVIUM UNDIFF.
- Qtu TERRACE DEPOSITS UNDIFF.
- Tertiary Surface Symbol TERTIARY SURFACE
- Eos SPARTA
- Eow WECHES
- Eqq QUEEN CITY
- Eor REKLAU
- Ewu WILCOX UNDIFF.

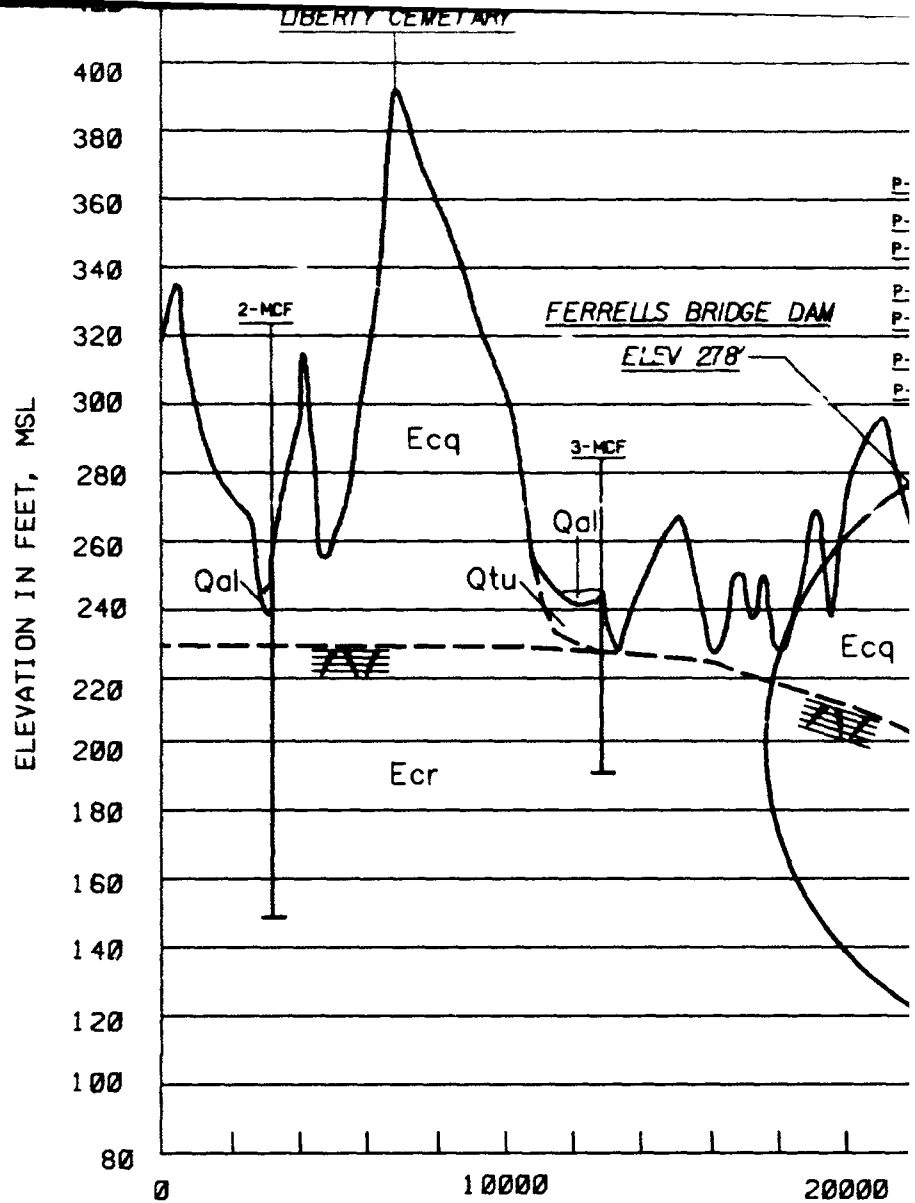
GEOLOGICAL INVESTIGATION
SHREVEPORT , LA - DAINGERFIELD , TX
SECTION A -A'
LAKE O' THE PINES
(ORE CITY)



B







LEGEND

ENVIRONMENTS OF DEPOSITION

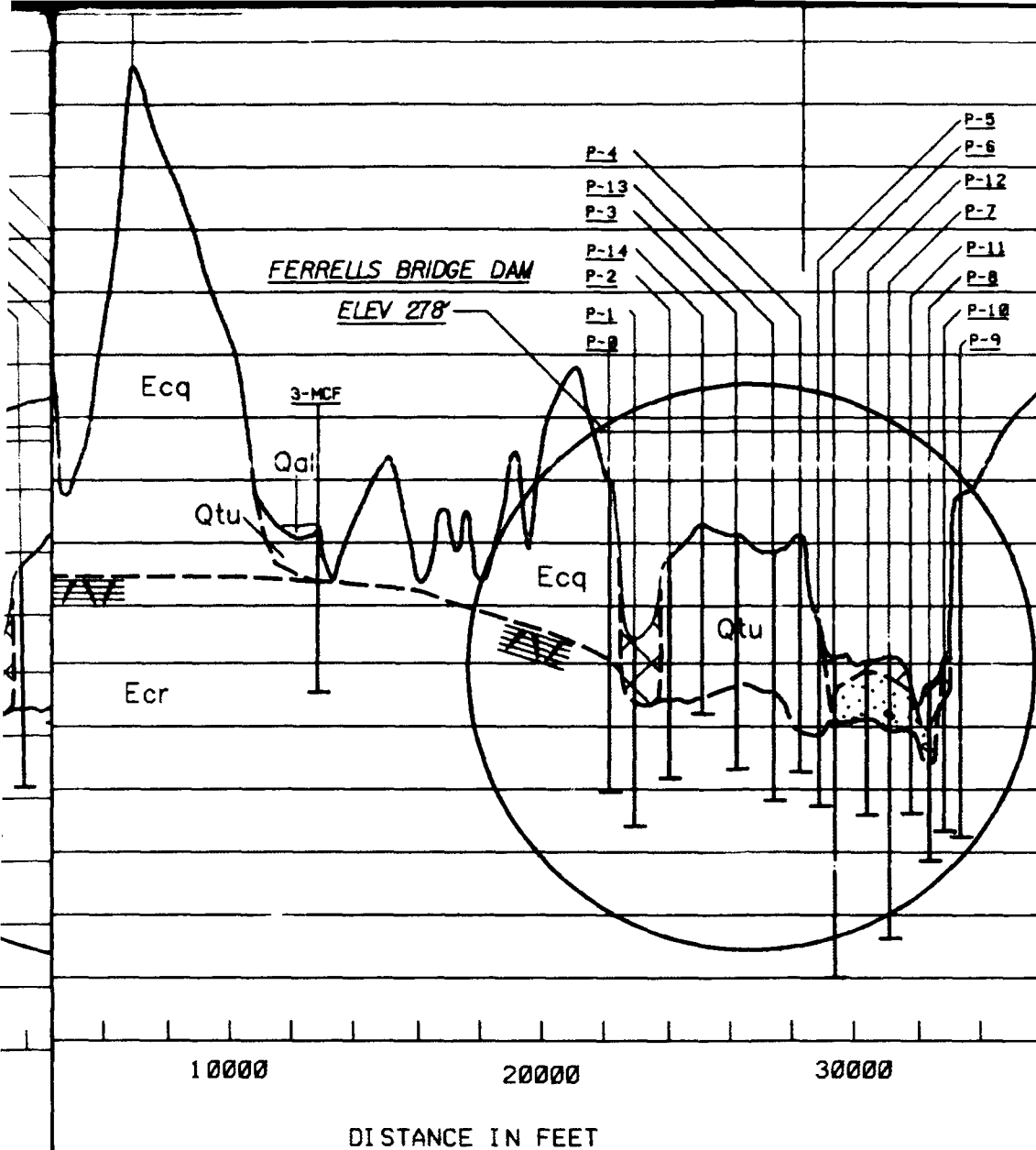
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.



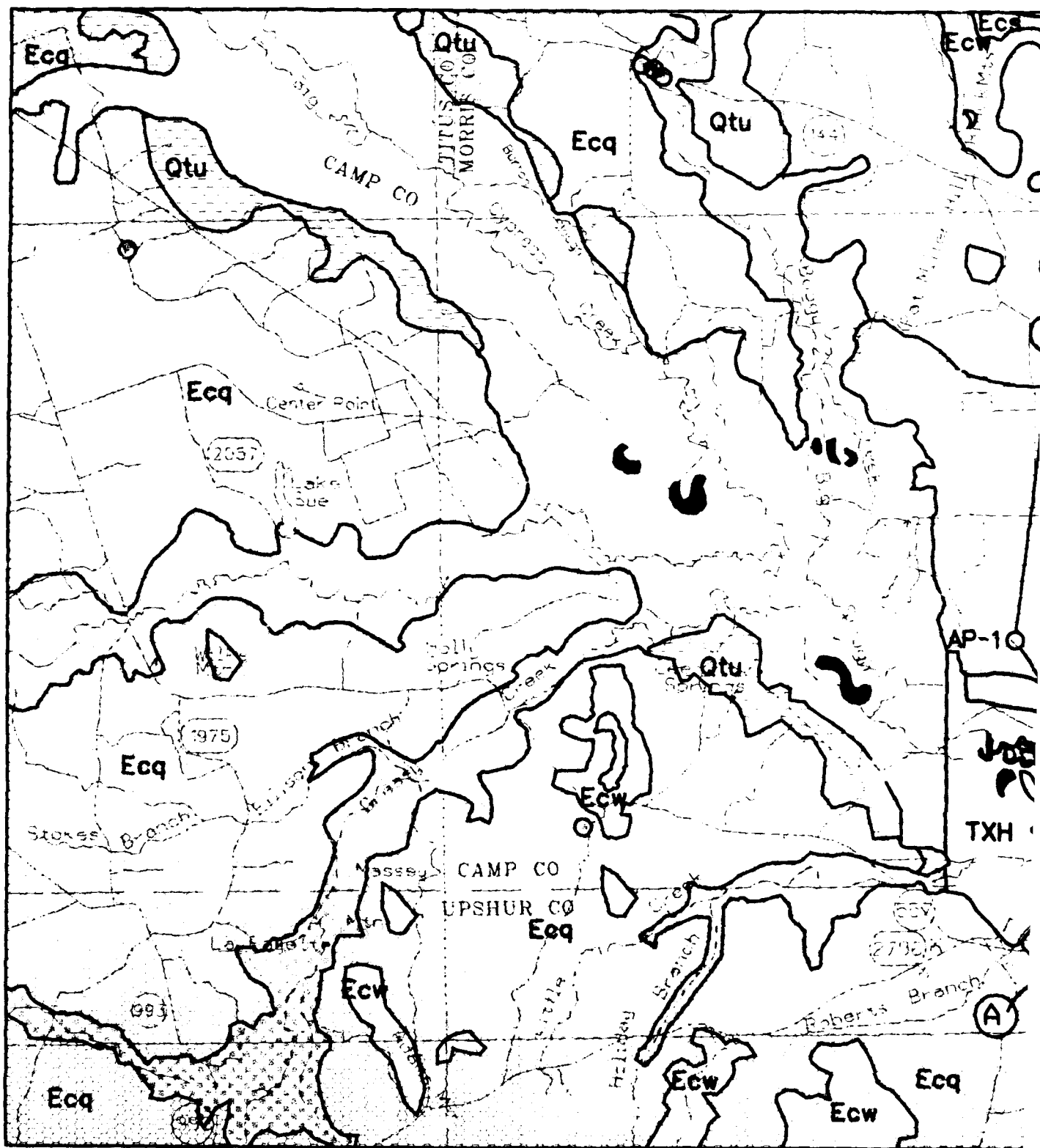
MAPPING SYMBOLS

Qal	ALLUVIUM UNDIFF.
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Ecs	SPARTA
Ecw	WECHES
Eoq	QUEEN CITY
Eor	REKLAW
Ewu	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, T)

SECTION B - B'
LAKE O' THE PINES
(FERRELLS BRIDGE DAM)

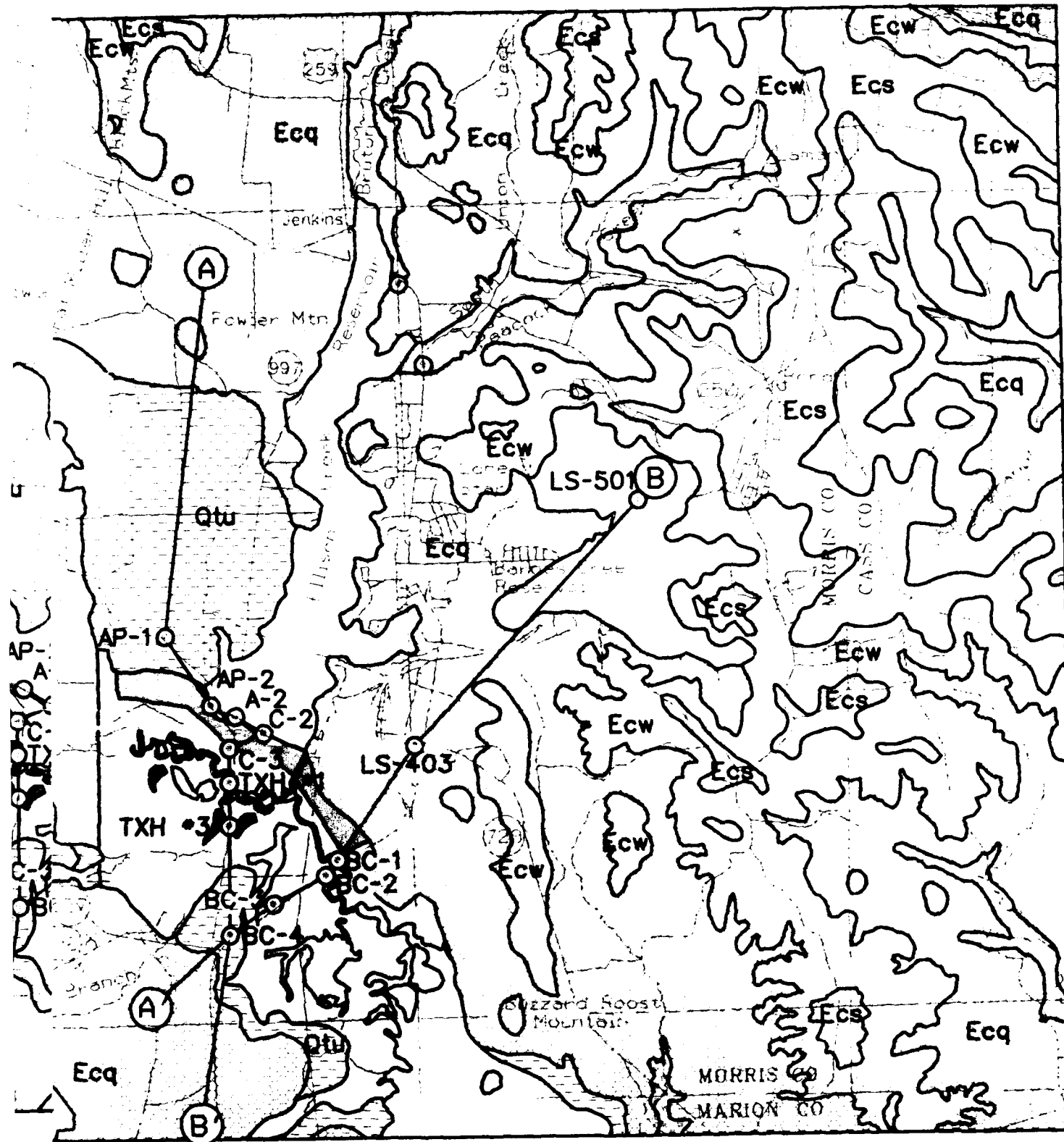
3° 00' 00"



32° 52' 30"

94° 52' 30"

94° 37' 30"
33° 00' 00"



32° 52' 30"

94° 37' 30"

LEGEND

QUARTEARNARY

RECENT

-  NATURAL LEVEE
-  POINT BAR
-  BACKSWAMP
-  ABANDONED CHANNEL
-  ABANDONED COURSE
-  UNDIFFERENTIATED ALLUVIUM

PLEISTOCENE

-  UNDIFFERENTIATED TERRACE DEPOSITS

TERTIARY

EOCENE

CLAIBORNE GROUP

-  SPARTA FORMATION
-  WECHES FORMATION
-  QUEEN CITY FORMATION
-  REKLAW FORMATION
-  WILCOX GROUP UNDIFFERENTIATED

-  CONTACT
-  FAULT
-  BORING
-  PIEZOMETER

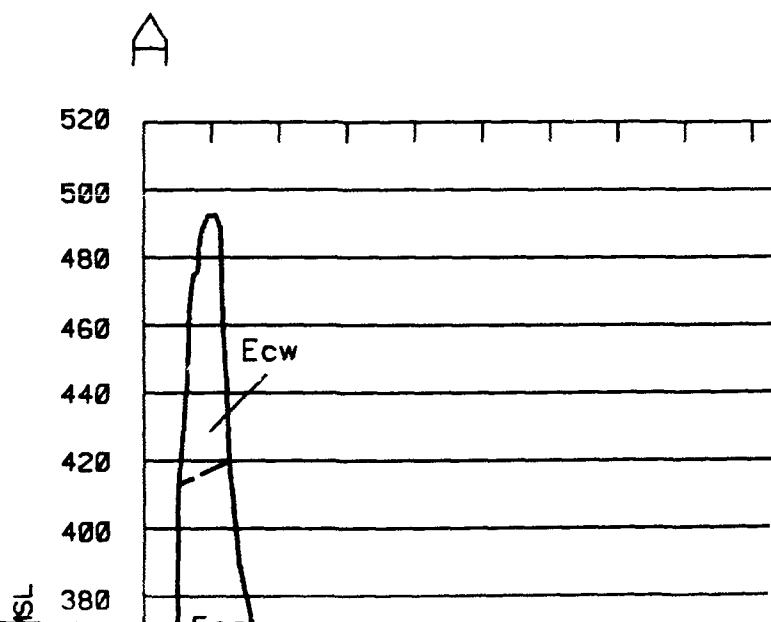
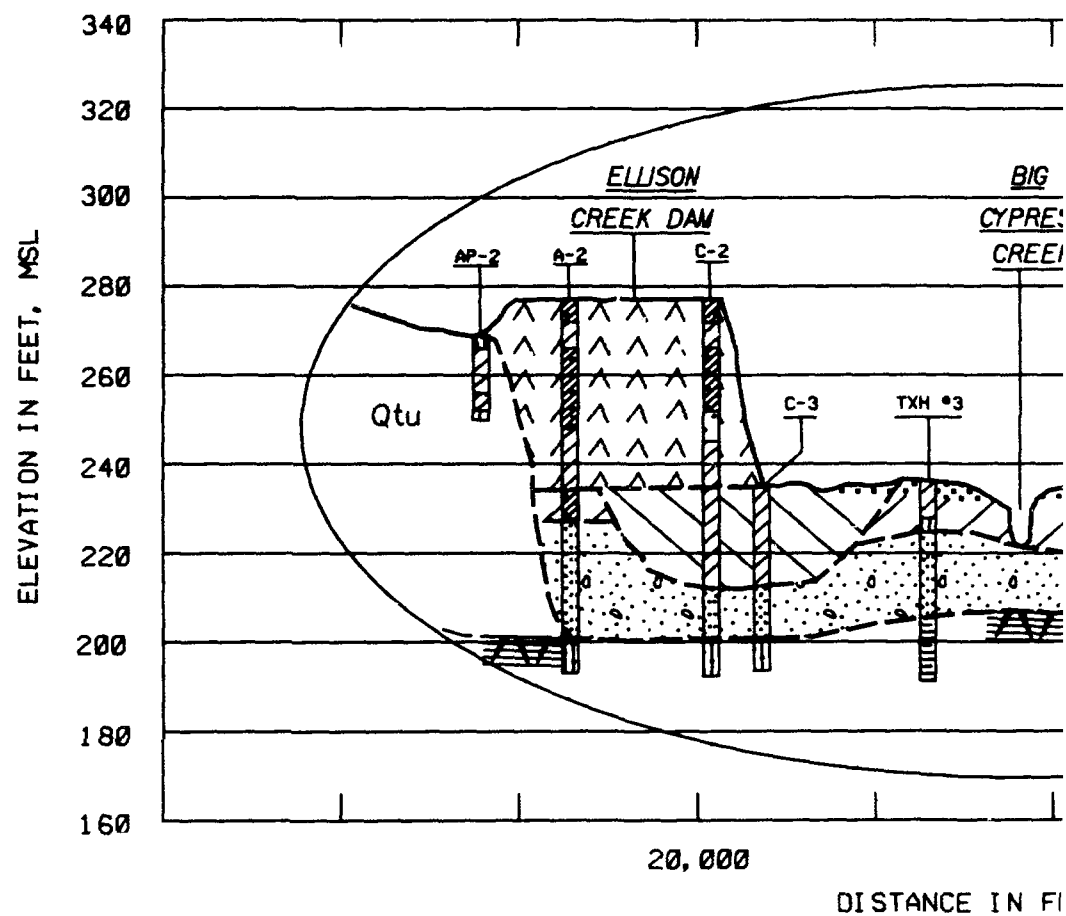
SHREVEPORT, LA - DANGERFIELD, TX
SURFACE GEOLOGY
LONESTAR, TX

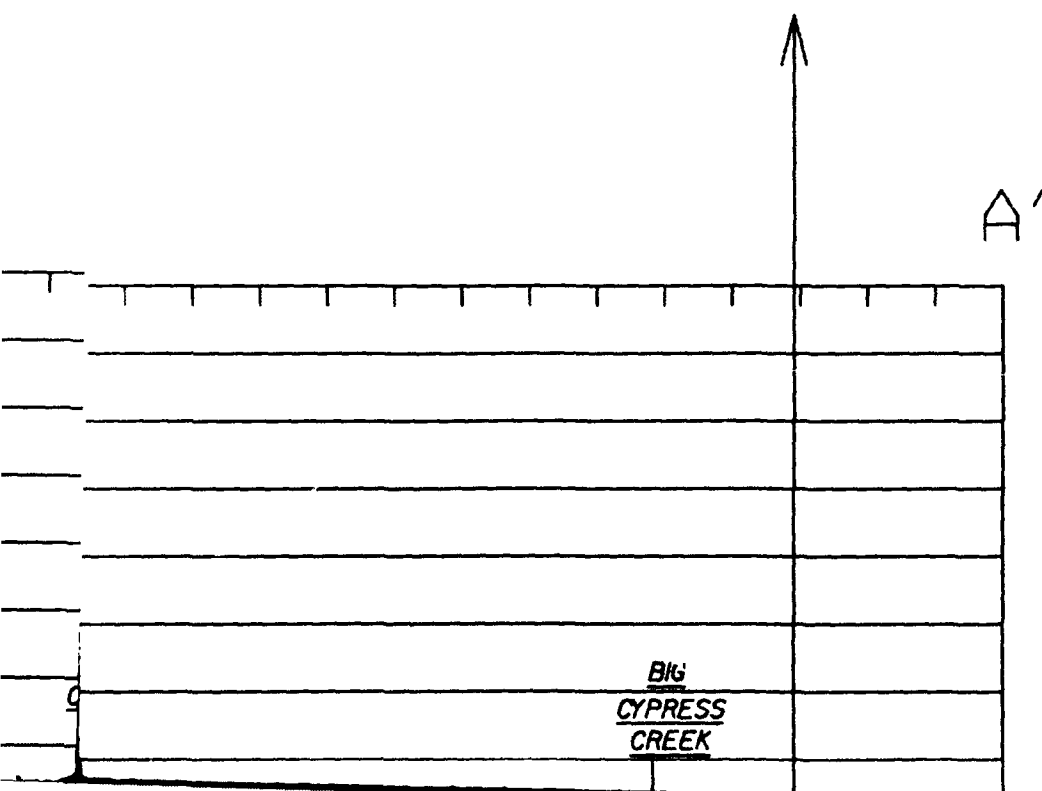
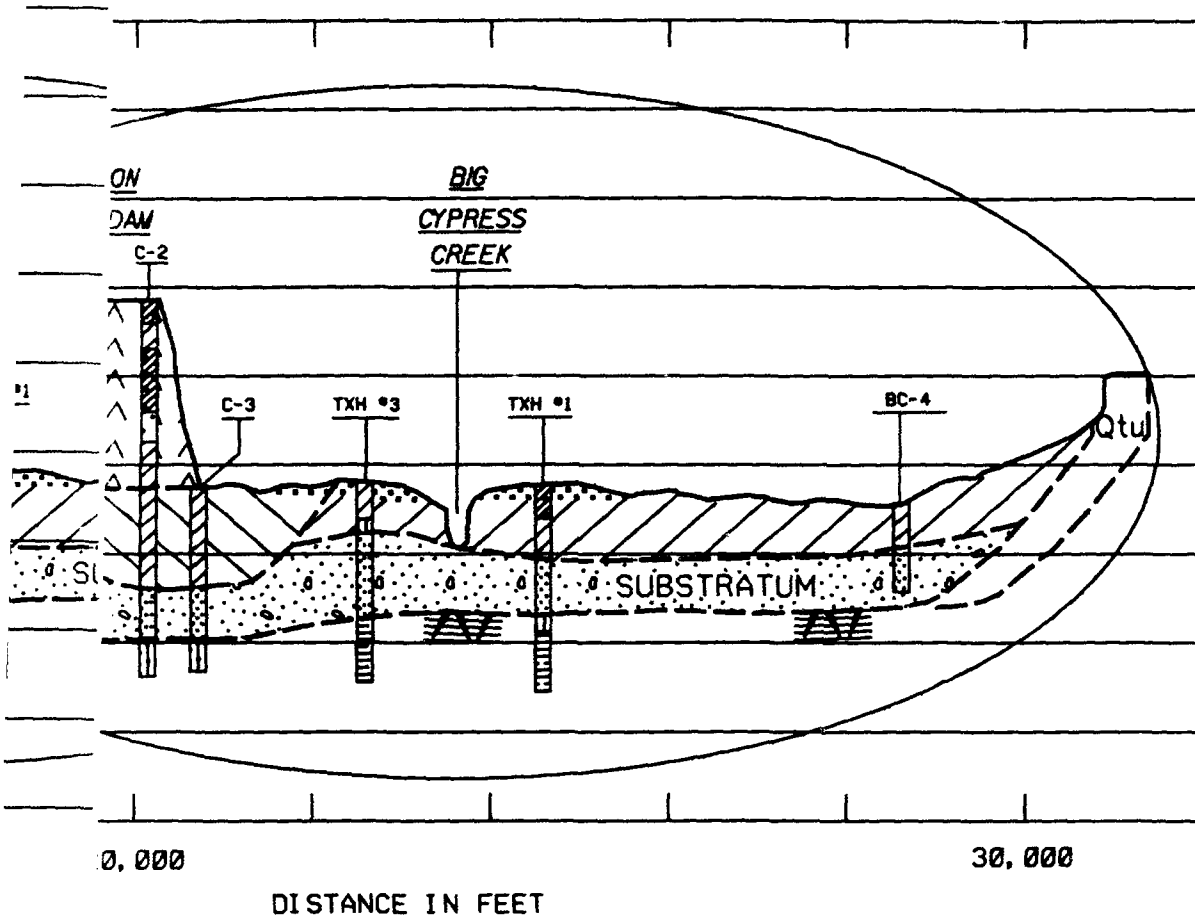
SHREVEPORT, LA - DANGERFIELD, TX

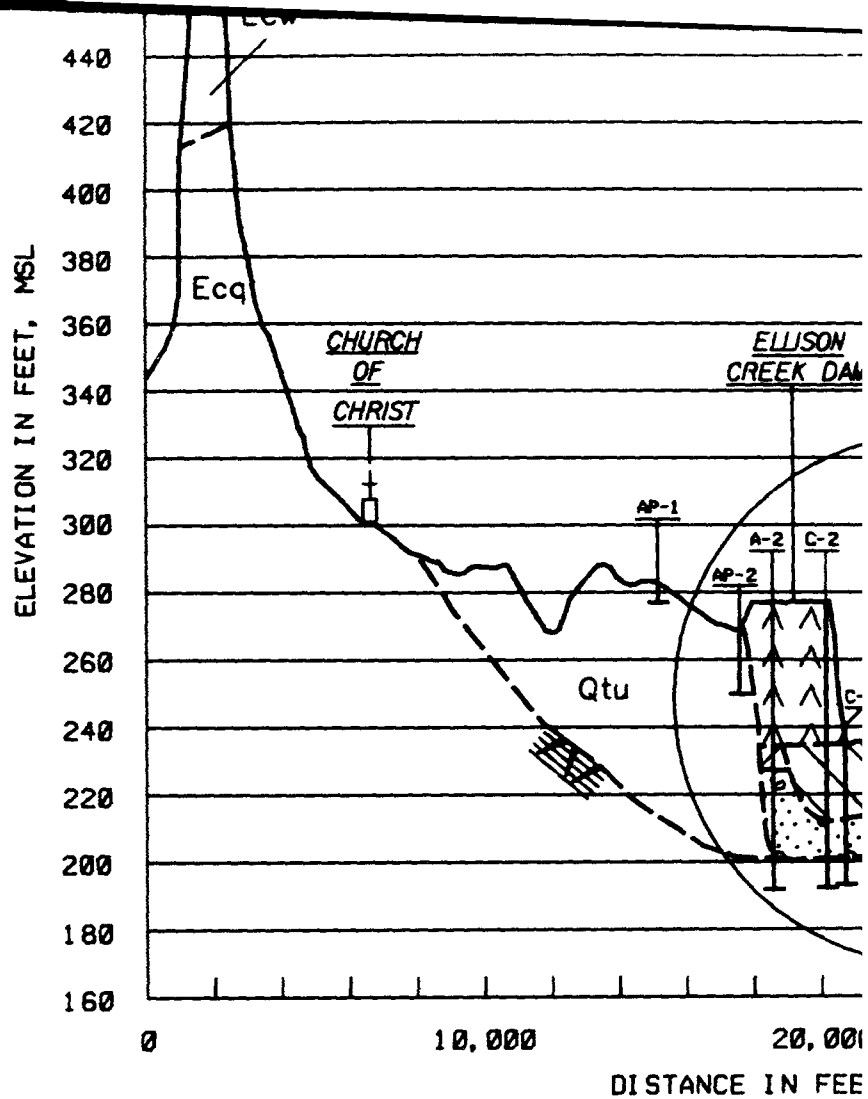
SURFACE GEOLOGY

LONESTAR, TX

2/92







LEGEND

ENVIRONMENTS OF DEPOSITION

	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.

BIG
PRESS
CREEK

BIG
CYPRESS
CREEK

CHURCH
OF
CHRIST

ELLISON
CREEK DAM

TXH

IBSTR

AP-1

A-2

C-2

AP-2

TXH #3

TXH #1

BC-4

Ecq

Qtu

Qtu

SUBSTRATUM

10,000

20,000

30,000

DISTANCE IN FEET

MAPPING SYMBOLS

Qal

ALLUVIUM
UNDIFF.

Qtu

TERRACE DEPOSITS
UNDIFF.

///

TERTIARY SURFACE

Eos

SPARTA

Eow

WECHES

Eqq

QUEEN CITY

Eor

REKLAW

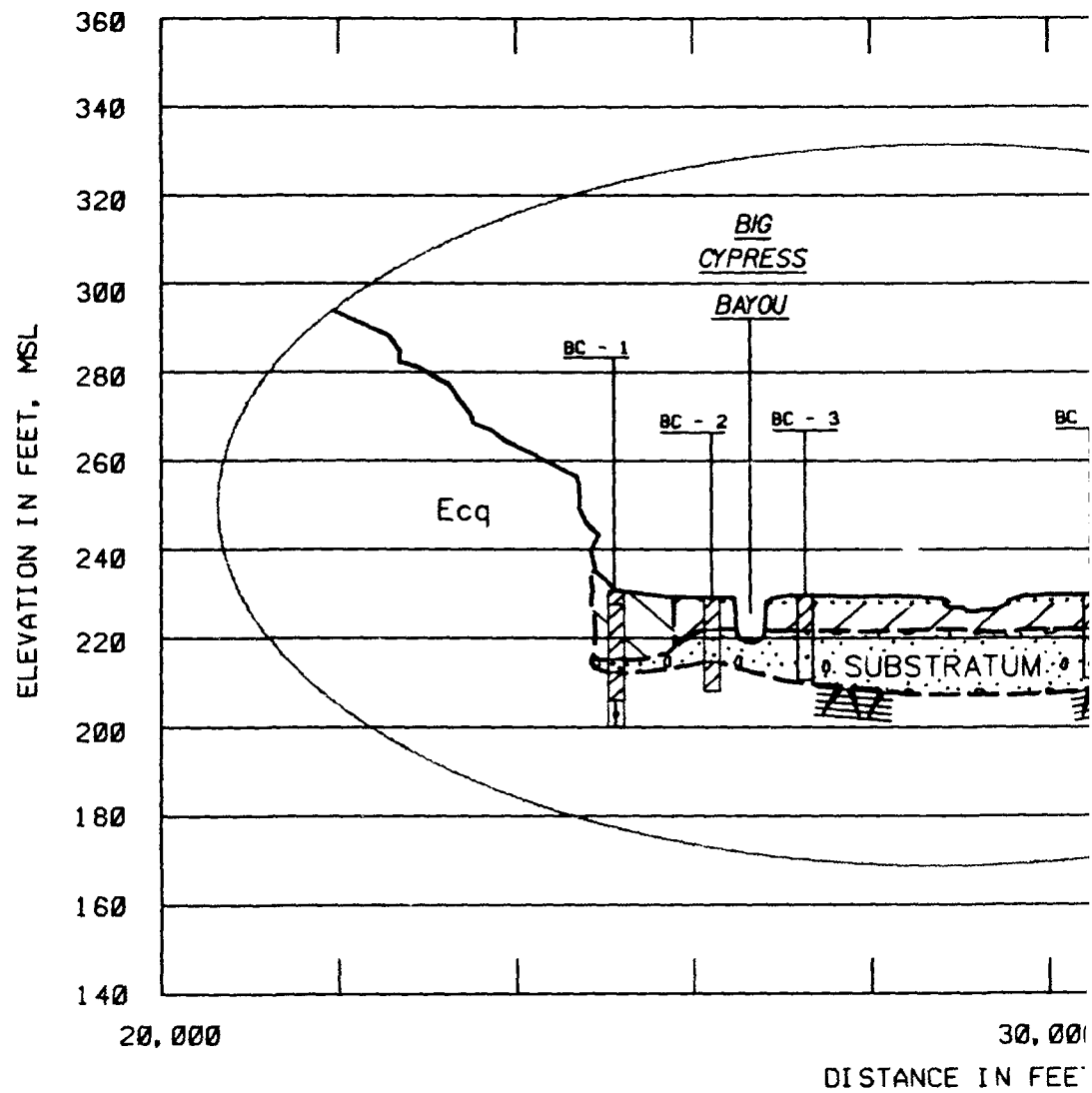
Ewu

WILCOX UNDIFF.

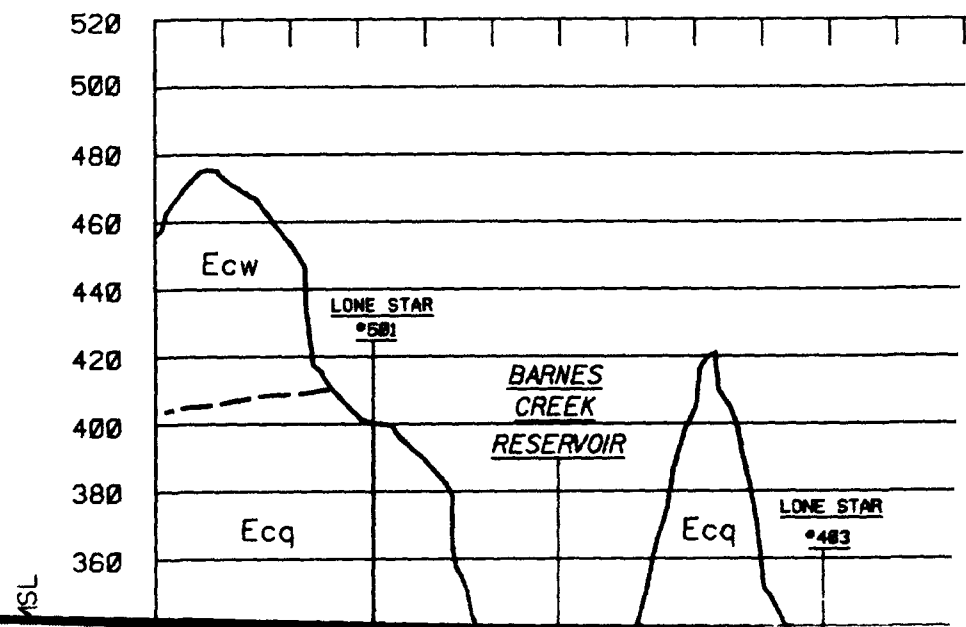
GEOLOGICAL INVESTIGATION
SHREVEPORT , LA - DAINGERFIELD , T

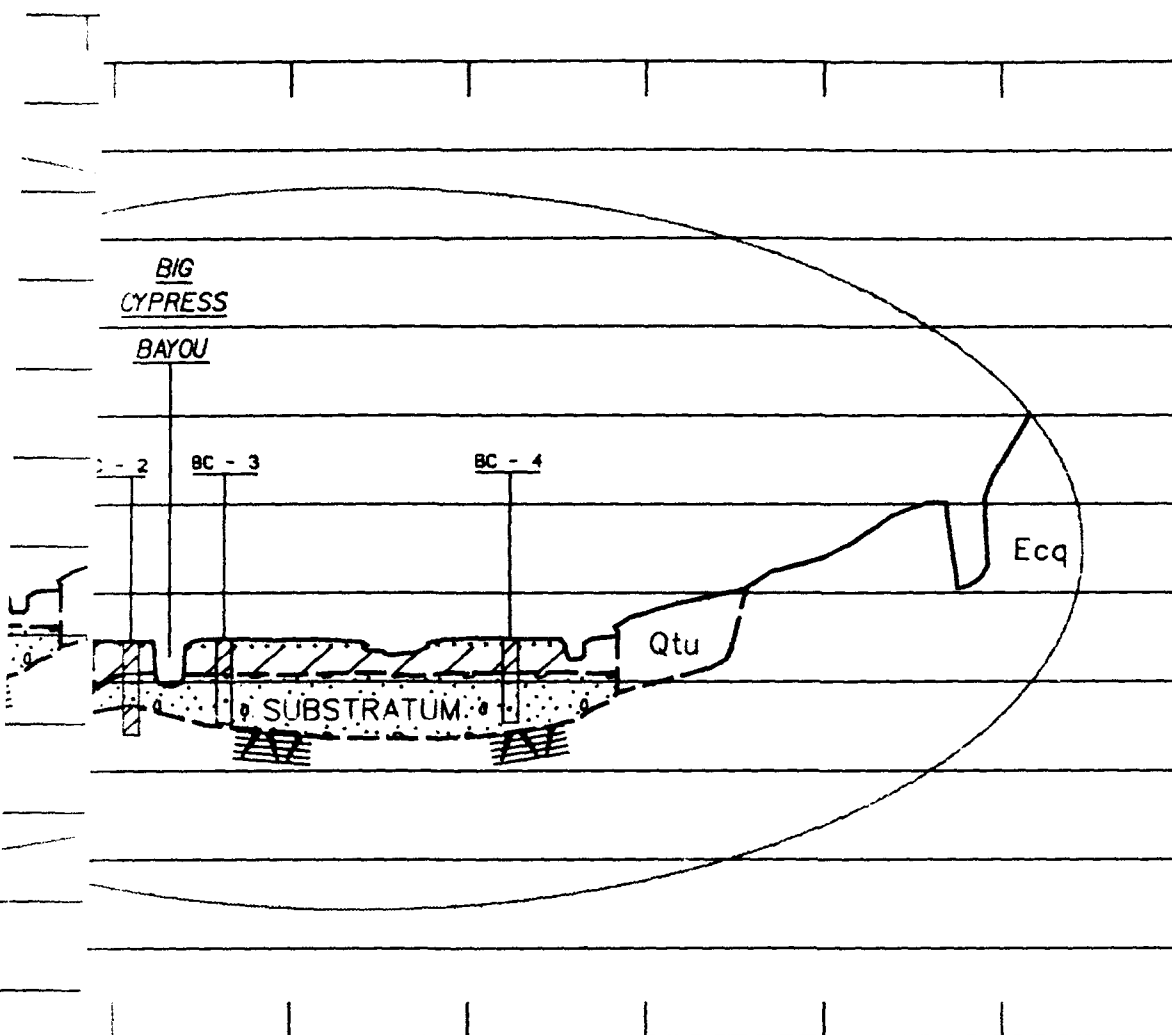
SECTION A - A'

LONESTAR
(ELLISON)

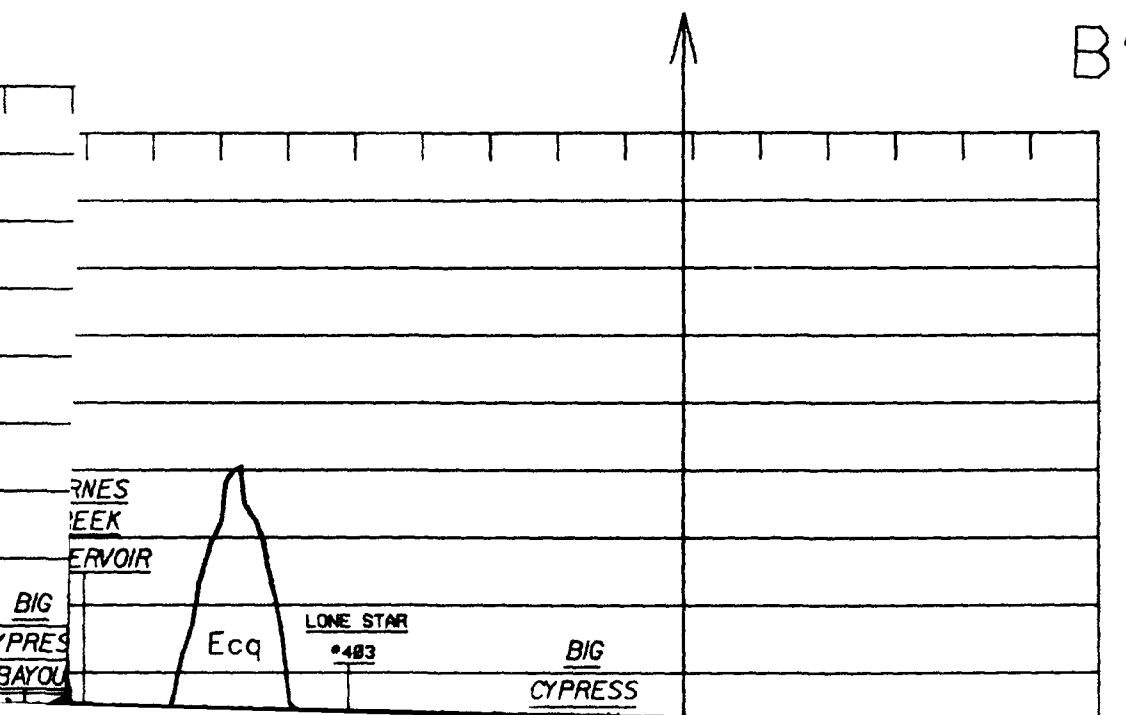


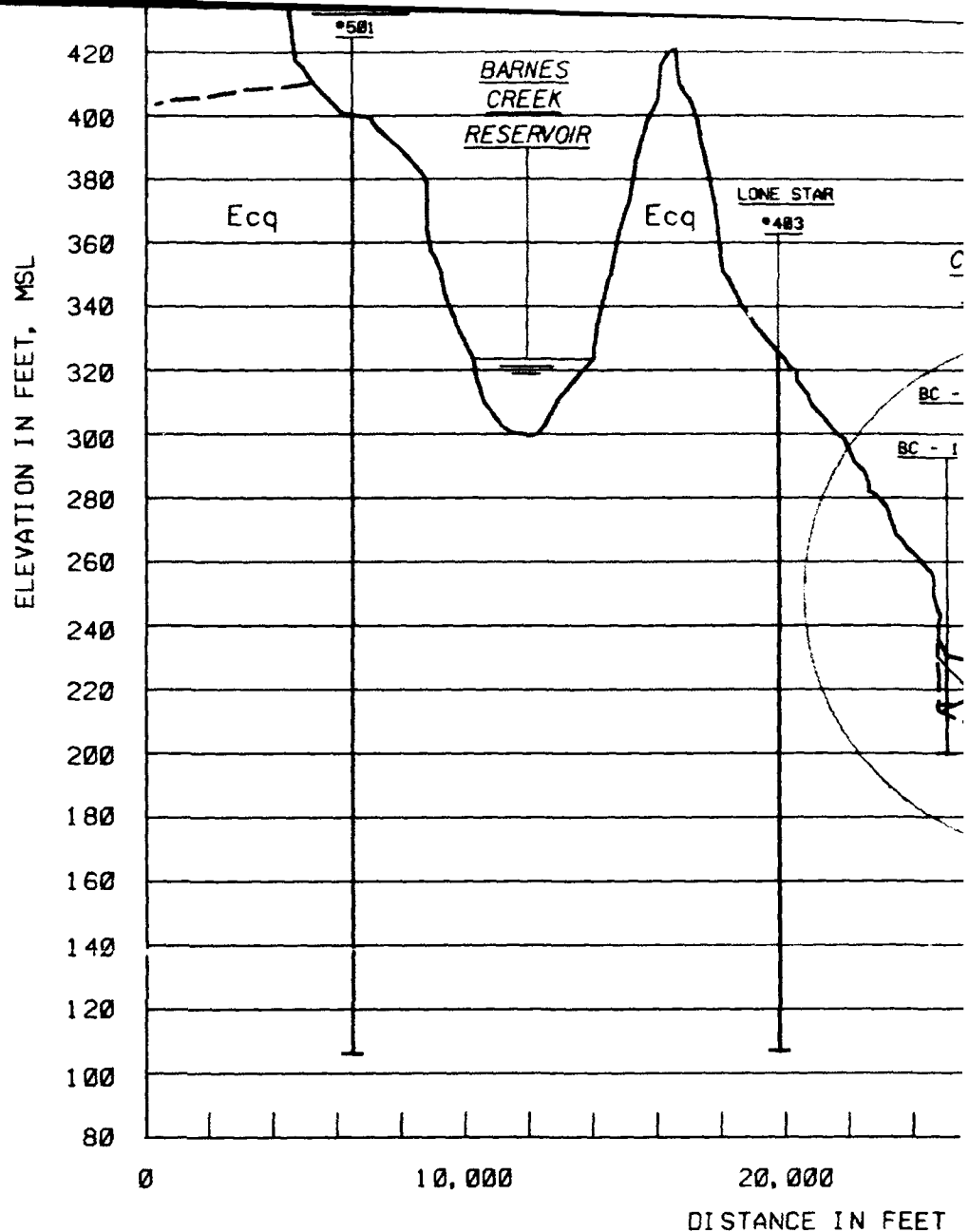
B





30,000
DISTANCE IN FEET





LEGEND

ENVIRONMENTS OF DEPOSITION

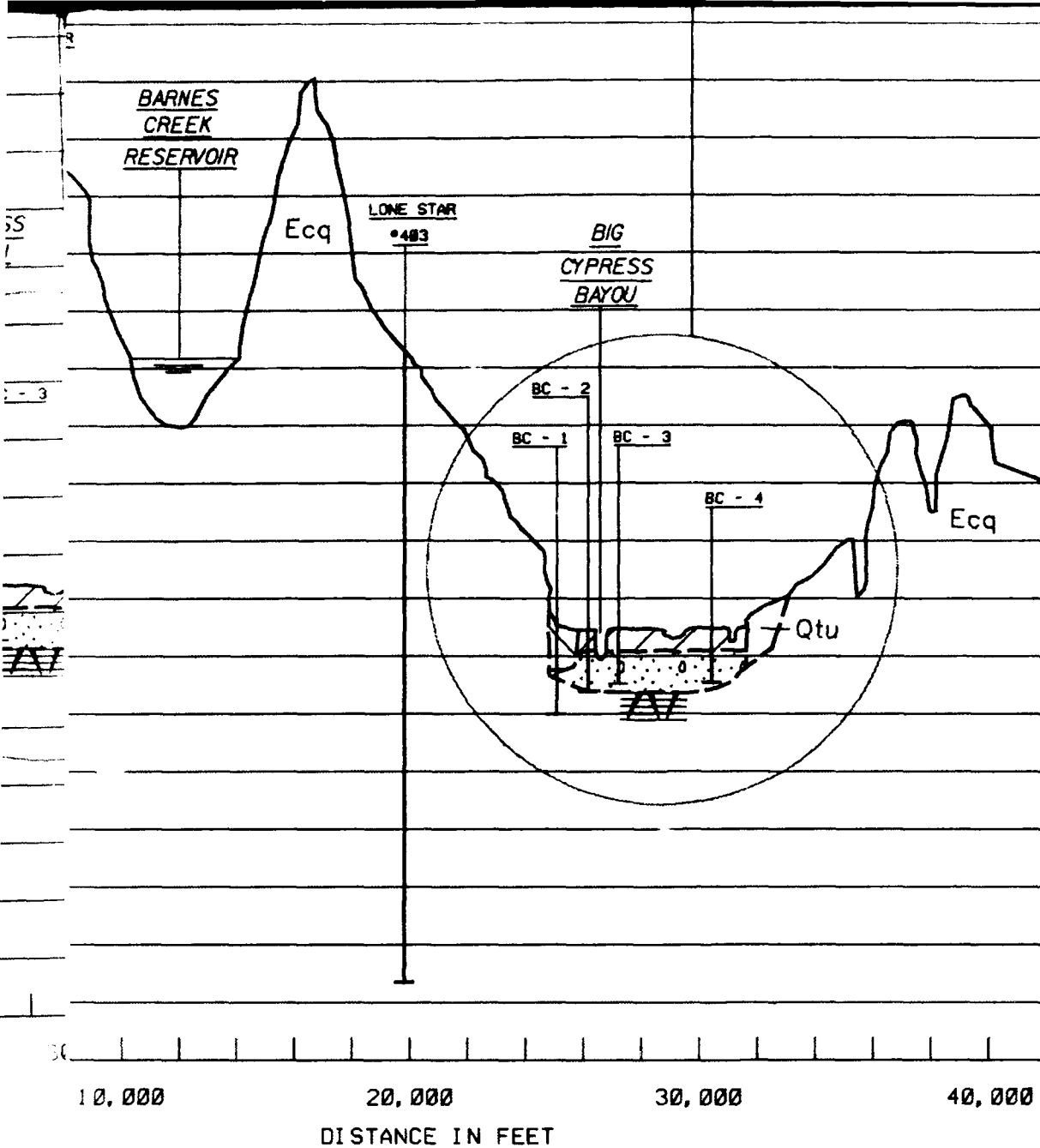
	NATURAL LEVEE
	POINT BAR
	BACKSWAMP
	ABANDONED CHANNEL
	ABANDONED COURSE

LITHOLOGY

	UNDIFFERENTIATED SAND AND GRAVEL
	SAND
	SILTY SAND
	SILT
	SANDY CLAY
	CLAY
	SHALE
	FILL

MAPPING SYMBOLS

	ALLUVIUM UNDIFF.
	TERRACE DEPOSITS UNDIFF.
	SPARTA
	WECHES
	QUEEN CITY
	REKLAW
	WILCOX UNDIFF.



MAPPING SYMBOLS

Qal	ALLUVIUM UNDIFF.
Qtu	TERRACE DEPOSITS UNDIFF.
	TERTIARY SURFACE
Ecs	SPARTA
Eow	WECHES
Eqq	QUEEN CITY
Eor	REKLAW
EWU	WILCOX UNDIFF.

GEOLOGICAL INVESTIGATION
SHREVEPORT, LA - DAINGERFIELD, T

SECTION B - B'

LONESTAR
(HIGHWAY 259)