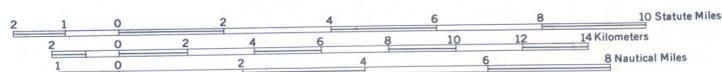


# EAST TEXAS LIGNITE BELT ENVIRONMENTAL GEOLOGY SHEET 4

SCALE 1:125,000

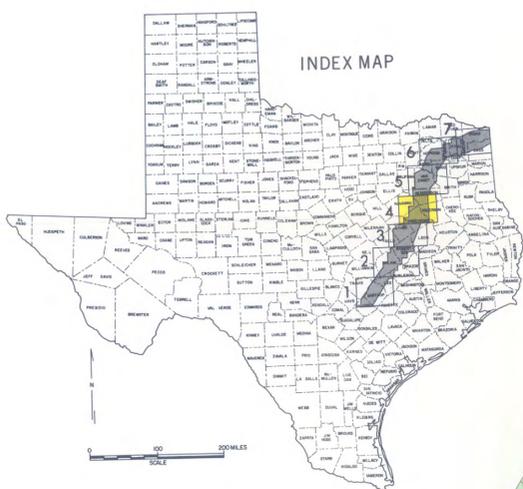


1978 MAGNETIC DECLINATION FOR THE CENTER OF THIS SHEET IS APPROXIMATELY 7°28' EASTERLY

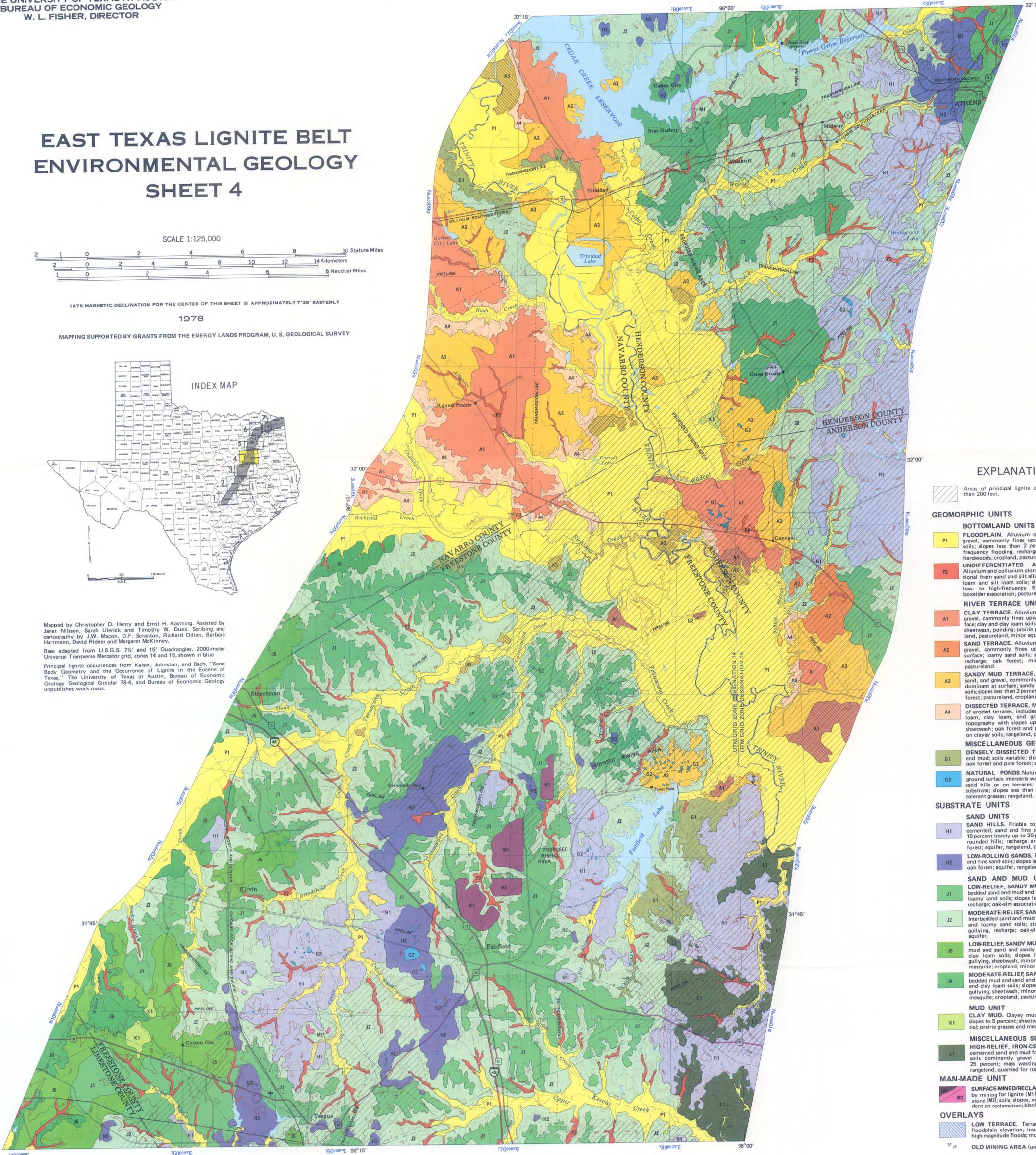
1978

MAPPING SUPPORTED BY GRANTS FROM THE ENERGY LANDS PROGRAM, U. S. GEOLOGICAL SURVEY

INDEX MAP



Mapped by Christopher D. Henry and Ernst H. Kastning. Assisted by Janet Nilson, Sarah Ulerick and Timothy W. Dues. Scribing and cartography by J.W. Macon, D.F. Seranton, Richard Dillon, Barbara Hartmann, David Ridner and Margaret McKinney.  
Base adapted from U.S.G.S. 7 1/2' and 15' Quadrangles. 2000-meter Universal Transverse Mercator grid, zones 14 and 15, shown in blue.  
Principal lignite occurrences from Kaiser, Johnston, and Bach, "Sand Body Geometry and the Occurrence of Lignite in the Eocene of Texas," The University of Texas at Austin, Bureau of Economic Geology Geological Circular 78-4, and Bureau of Economic Geology unpublished work maps.



## EXPLANATION

Areas of principal lignite occurrences at depths less than 200 feet.

### GEOMORPHIC UNITS

#### BOTTOMLAND UNITS

**P1 FLOODPLAIN.** Alluvium of mixed clay, sand, and gravel; commonly fines upward; clay and clay loam soils; slopes less than 2 percent; high- to moderate-frequency flooding; recharge, ponding; water-tolerant hardwoods; cropland, pastureland, aquifer.

**P2 UNDIFFERENTIATED ALLUVIUM-COLLUVIUM.** Alluvium and colluvium along minor tributaries, gradational from sand and silt alluvium to colluvium; sandy loam and silt loam soils; slopes less than 5 percent; low- to high-frequency flooding; oak-elm-hickory-boxelder association; pastureland.

#### RIVER TERRACE UNITS

**A1 CLAY TERRACE.** Alluvium of mixed clay, sand, and gravel; commonly fines upward, clay dominant at surface; clay and clay loam soils; slopes less than 2 percent; sheetwash, ponding; prairie grasses and mesquite; cropland, pastureland, minor aquifer, gravel pits.

**A2 SAND TERRACE.** Alluvium of mixed clay, sand, and gravel; commonly fines upward, sand dominant at surface; loamy sand soils; slopes less than 2 percent; recharge, oak forest; minor aquifer, gravel pits, pastureland.

**A3 SANDY MUD TERRACE.** Alluvium of mixed clay, sand, and gravel; commonly fines upward, sandy mud dominant at surface; sandy loam and fine sandy loam soils; slopes less than 2 percent; recharge, sheetwash, oak forest; pastureland, cropland, minor aquifer, gravel pits.

**A4 DISSECTED TERRACE.** Mixed clay, sand, and gravel of eroded terraces, includes some terrace edges; sandy loam, clay loam, and gravelly loam soils; rolling topography with slopes up to 5 percent; erosion and sheetwash; oak forest and pine forest, mesquite forest on clayey soils; rangeland, pastureland, gravel pits.

#### MISCELLANEOUS GEOMORPHIC UNITS

**G1 DENSELY DISSECTED TERRAIN.** Intermixed sand and mud; soils variable; slopes from 10 to 25 percent; oak forest and pine forest; erosion, gullying; rangeland, aquifer.

**G2 NATURAL PONDS.** Natural closed depressions where ground surface intersects water table, commonly within sand hills or on terraces; soils determined by local substrate; slopes less than 2 percent; ponding; water-tolerant grasses; rangeland.

### SUBSTRATE UNITS

#### SAND UNITS

**H1 SAND HILLS.** Friable to loose sands, locally iron-cemented; sand and fine sand soils; slopes from 3 to 10 percent (rarely up to 20 percent); expressed as steep, rounded hills for recharge area for major aquifers; rangeland, aquifer, pastureland.

**H2 LOW-ROLLING SANDS.** Friable to loose sands; sand and fine sand soils; slopes less than 3 percent; recharge; oak forest; aquifer, rangeland, pastureland.

#### SAND AND MUD UNITS

**J1 LOW-RELIEF, SANDY MUD - OAK FOREST.** Interbedded sand and mud and sandy mud; sandy loam and loamy sand soils; slopes less than 3 percent; gullying, recharge, oak-elm association; pastureland, aquifer.

**J2 MODERATE-RELIEF, SANDY MUD - OAK FOREST.** Interbedded sand and mud and sandy mud; sandy loam and loamy sand soils; slopes from 3 to 8 percent; gullying, recharge; oak-elm association; pastureland, aquifer.

**J5 LOW-RELIEF, SANDY MUD - PRAIRIE.** Interbedded mud and sand and sandy mud; fine sandy loam and clay loam soils; slopes less than 3 percent; minor gullying, sheetwash, minor recharge; prairie grasses and mesquite; cropland, minor aquifer.

**J6 MODERATE-RELIEF, SANDY MUD - PRAIRIE.** Interbedded mud and sand and sandy mud; fine sandy loam and clay loam soils; slopes from 3 to 6 percent; minor gullying, sheetwash, minor recharge; prairie grasses and mesquite; cropland, pastureland, minor aquifer.

#### MUD UNIT

**K1 CLAY MUD.** Clayey mud; clay and clay loam soils; slopes to 5 percent; sheetwash, high shrink-swell potential; prairie grasses and mesquite; cropland, pastureland.

#### MISCELLANEOUS SUBSTRATE UNITS

**L1 HIGH-RELIEF, IRON-CEMENTED UPLANDS.** Iron-cemented sand and mud forming resistant escarpments; soils dominantly gravel lithosols; slopes from 8 to 25 percent; mass wasting; mixed oak-juniper forest; rangeland, used for road metal.

### MAN-MADE UNIT

**M2 SURFACE-MINED/RECLAIMED LAND.** Land disturbed by mining for lignite (M1), or clay, sand, gravel, or ironstone (M2); soils, slopes, vegetation, and land use dependent on reclamation; black overprint for reclaimed land.

### OVERLAYS

**LOW TERRACE.** Terraces less than 10 feet above floodplain elevation; inundated during low-frequency high-magnitude floods; modifies river terrace units only.

**OLD MINING AREA (underground)**