# Shallow Coal Exploration Drill-Hole Data, Northern Louisiana

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Chapter E of

**Shallow Coal Exploration Drill-Hole Data—Alabama, Georgia, Kentucky, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, and Texas**

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# Shallow Coal Exploration Drill-Hole Data, Northern Louisiana

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## Introduction

Coal exploration drill-hole data from 2,910 wells drilled in northern Louisiana between 1975 and 1984 by Phillips Coal Company, a division of Phillips Petroleum Company (Phillips), are discussed in this chapter, and the data are provided in an accompanying spreadsheet. The data are part of a larger dataset donated to the U.S. Geological Survey (USGS) by the North American Coal Corporation, which purchased Phillips assets in 2001 (see chapter A, this volume). The data in 10 State reports have been digitized from field maps to create unified and spatially consistent coal exploration drill-hole datasets for each of the States (chapters B–K, this volume). Data for Louisiana include a geologic map of the State with drill-hole coverage (fig. E1), a stratigraphic column (fig. E2), a list of data attributes and explanations of the data format (table E1), a list of comments found in the data and descriptions of them (table E2), a list of parishes and the number of drill holes for each parish (table E3), and tabulated data in spreadsheet format (see appendix E1).

## Methods

Hardcopy Phillips exploration maps, in Louisiana North 1927 state coordinate plane projection, were digitized into a geographic information systems using ArcMap™ software from the Environmental Systems Research Institute, Inc. (ESRI). Roads and parish boundaries served as reference points to georeference scanned maps. Shapefile attribute values were populated with data from drill-hole locations in 18 parishes in northern Louisiana (table E3). The attribute table for each point (table E1) contains basic identification and location references along with depth and thickness data for each coal bed. Changes to the original data did not occur during the digitizing process in order to maintain the integrity of the dataset. Comments were added to the attribute table to indicate any discrepencies or additional information (table E2). After the digitizing was completed, the dataset was projected into a North American Datum of 1983 geographic coordinate system to facilitate combining this dataset with similar Phillips datasets published by the USGS for other States. The shapefile data were exported to a spreadsheet (see appendix E1).

## Generalized Coal Geology of Northern Louisiana

In northern Louisiana, major coal (lignite)-bearing intervals are in the Tertiary Wilcox Group consisting of interbedded sandstone, siltstone, claystone, coal, and limestone (Nilsson, 1984; Warwick and others, 2008, and fig. E2). During the early Cenozoic, peat mires associated with fluvial and deltaic deposits developed across the northern margin of the basin (McIntosh and others, 2010). These peat mires, which are now coal beds, were stacked on a progradational fluvial-deltaic plain and influenced by the positive structural elements of the uplifts in the northeast and the west (Hackley and others, 2007). Lignite coal in the Wilcox Group occurs at depths of 200 feet or less from the surface and, on average, contains 0.81 percent sulfur, 10.72 percent ash, 27.08 percent volatile matter, and 27.09 percent fixed carbon (Louisiana Geological Survey, 2000).

## Data

The northern Louisiana drill-hole dataset contains data on shallow lignite in the Gulf Coast region (fig. E1). Probed depth data for 2,014 drill holes (out of 2,910) had an average depth of 274 feet with a maximum depth of 325 feet. Red River Parish had the densest coverage with 616 drill holes. Bienville Parish also had dense coverage with 532 drill holes. Due to the generalized nature of the original highway maps that contained the drill-hole information and the process of georeferencing these maps to a new base layer, we expect the location error to be ±0.25 miles.

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# Appendix E1

The northern Louisiana coal exploration drill-hole dataset in spreadsheet format is available at *pubs.usgs.gov/of/2011/1261/Appendices/E1.xls.*

**Table E1.** Attribute titles and data descriptions and formats for the northern Louisiana drill-hole dataset.

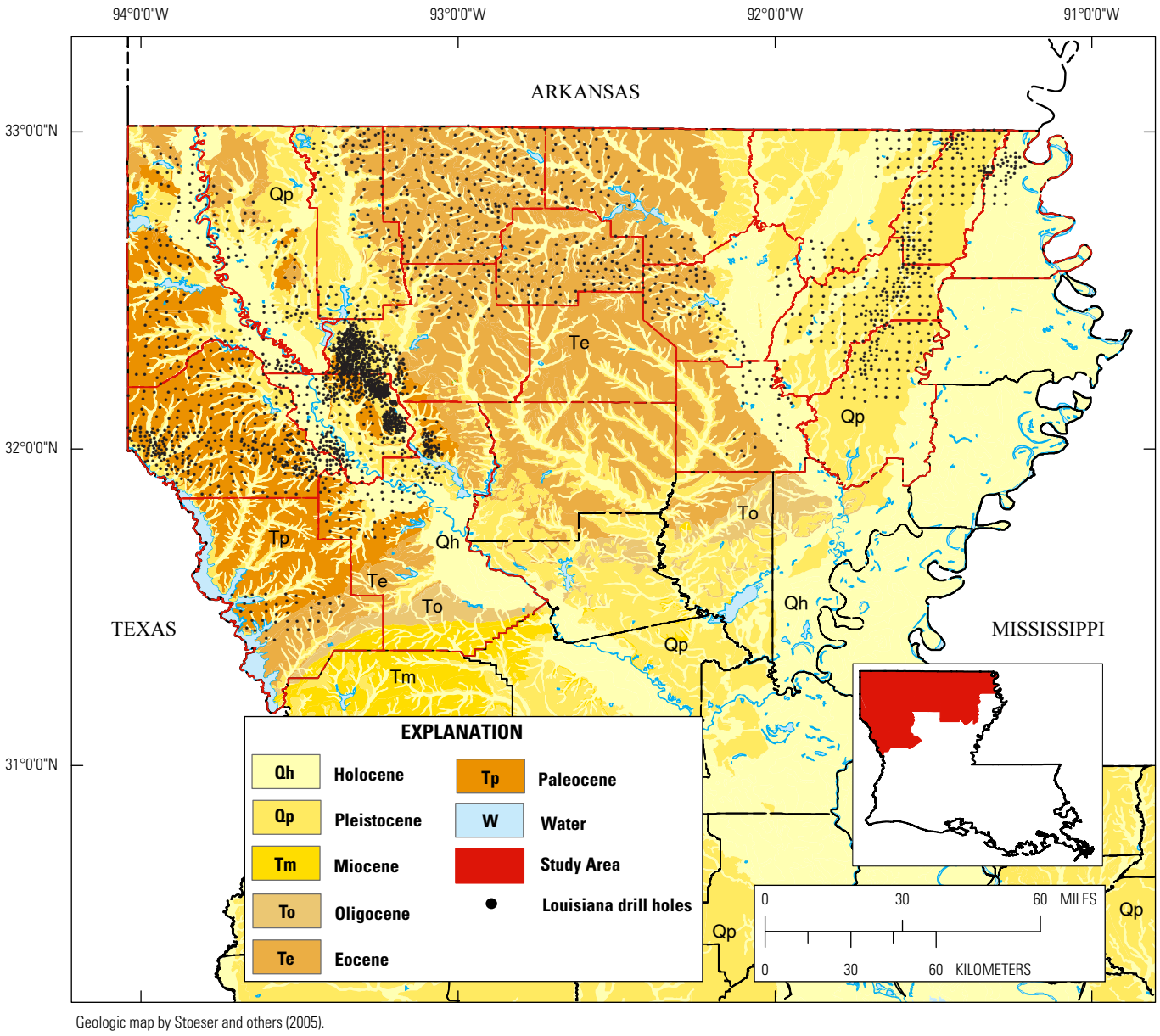
| Attribute title | Data description and format |
|---|---|
| DRILL_HOLE NAME | Two-letter parish code followed by drill-hole number. |
| PARISH | Name of parish in which drill hole is located. |
| ELEVATION | Elevation above sea level in feet. |
| DEPTH_TOT | Total depth of drill hole in feet. |
| DEPTH_PROB | Depth of geophysical probe measurement in feet. |
| LAT | Latitudinal decimal degree location values given to 8 decimal places. |
| LONG | Longitudinal decimal degree location values given to 8 decimal places. |
| COMMENT | Additional information regarding the entire drill hole. |
| X_C | Thickness of coal for bed number X in feet. |
| X_CP | Thickness of coal and partings combined for bed number X in feet. |
| X_DEPTH | Top depth of bed number X in feet. |
| X_BED | A number or letter assigned to different coal beds of the same drill hole, which are not correlated throughout the dataset. |
| X_COMMENT | Additional information regarding coal bed X. |

**Table E2.** Explanation of comments used to describe the northern Louisiana drill-hole dataset (J.A. Luppens, U.S. Geological Survey, written commun., 2009).

| Symbol/Comment | Description |
|---|---|
| ? | Questionable data/information. |
| + | More coal than the amount that was recorded could be expected. |
| CORED | Indicating that the drill hole was cored. |
| DH | Abbreviation for "drill hole." |
| DUPLICATE DH NAME | The drill-hole name was used for two different locations on the original coal exploration maps. |
| I | Abbreviation for inferior. Subjective term used to describe poor coal quality. |
| INACCURATE LOCATION | Original coal exploration maps could not be accurately georeferenced due to insufficient reference points. Drill-hole location accuracy may be greater than 0.25 miles. |
| NC | Abbreviation for "no coal." No coal was found during exploration for this drill hole. |
| NO DATA RECORDED | No data was recorded on original coal exploration maps for this drill hole. |
| NO DENSITY CURVE | No geophysical denisty data was recorded during exploration. |
| NO ELEVATION RECORDED | No ground elevation information was recorded on the original coal exploration maps for this drill hole. |
| NO E-LOG | No geophysical logging was completed for this drill hole. |
| NO LOG | No geophysical logging was completed for this drill hole. |
| NO PROBE DEPTH RECORDED | No probe depth information was recorded on original coal exploration maps for this drill hole. |
| NP | Abbreviation for "not probed." Geophysical logging never occurred at this location. |
| NSL | Abbreviation for "no significant lignite." Coal may have been found during exploration but because the coal beds were thin (usually less than 2 feet thick) no coal data was recorded. |
| OTC | Notation is on the original coal exploration maps and is listed either by itself under the drill-hole name and elevation or it is listed with a depth range (example: OTC (0-128')). No information about the definition of this notation is listed on any of the Phillips coal exploration maps or drilling logs. The meaning of the notation is unknown. |
| OX | Abbreviation for "oxidized" or "oxidation." |
| PI | Abbreviation for "partially inferior." Used to describe that a portion of the coal bed is of a low quality. |
| POOR | A subjective term used to describe coal of poor quality. |
| PUNKY LIGNITE | Describing a poor quality lignite. |
| SPLIT | Comment was written next to coal beds that may contain a layer of high ash partings. |
| VI | Abbreviation for "very inferior." Subjective term used to describe coal of a very low quality. |
| WEATHERED | Used to describe coal that has been altered by chemical or physical means. |
| WO | Abbreviation for "washout." Occurs when a friable layer of material is eroded in the bore hole and the well diameter is enlarged. |

**Table E3.** Louisiana parishes and the number of drill holes by parish.

| Parish | Number of drill holes |
|---|---|
| Bienville | 532 |
| Bossier | 92 |
| Caddo | 143 |
| Caldwell | 31 |
| Claiborne | 177 |
| De Soto | 379 |
| East Carroll | 40 |
| Franklin | 75 |
| Lincoln | 100 |
| Morehouse | 56 |
| Natchitoches | 139 |
| Ouachita | 70 |
| Red River | 616 |
| Richland | 143 |
| Sabine | 41 |
| Union | 67 |
| Webster | 93 |
| West Carroll | 116 |
| Total | 2,910 |




Geologic map by Stoeser and others (2005).

**Figure E1.** Map of northern Louisiana showing generalized geology overlaid with drill-hole locations.

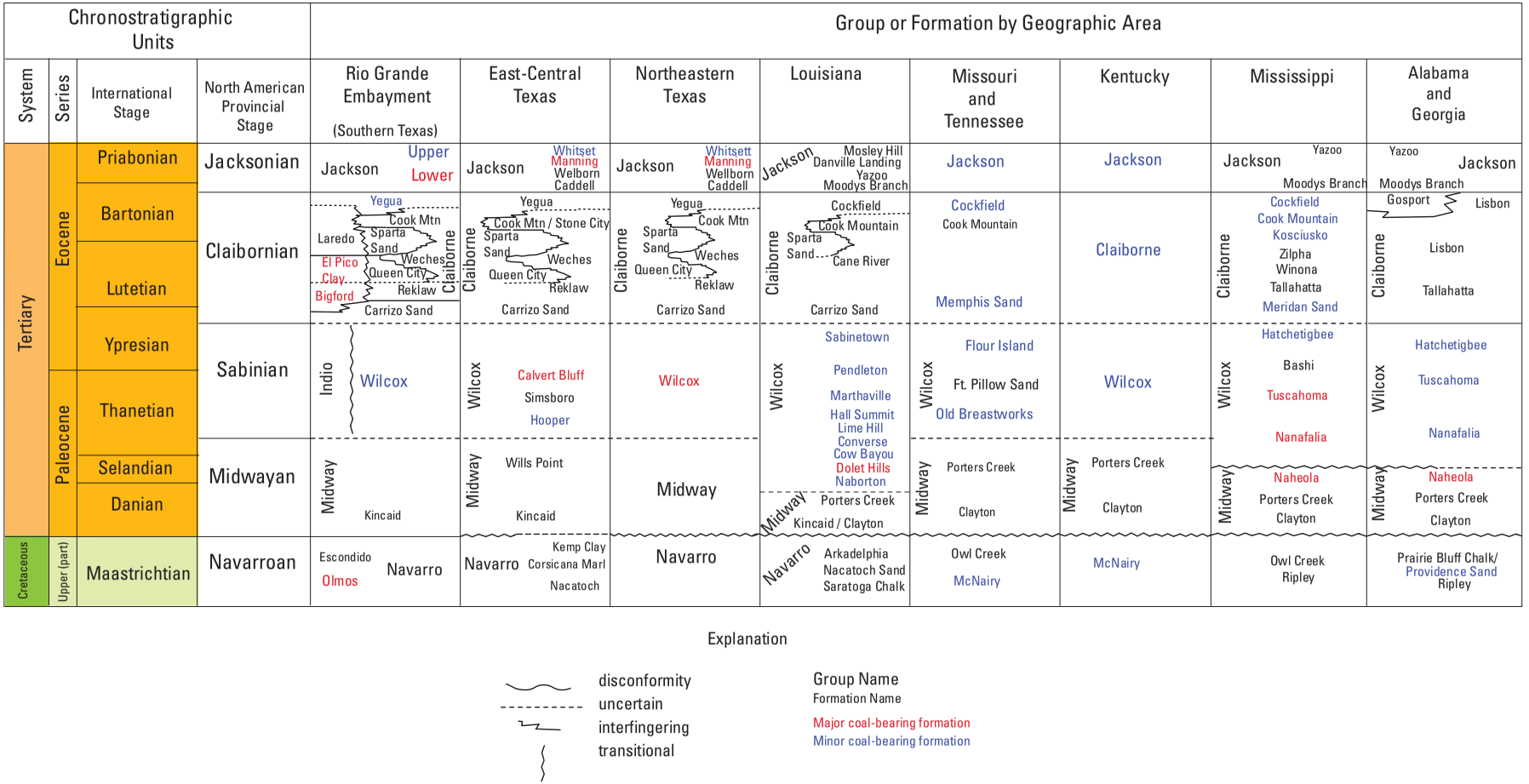



**Figure E2.** Generalized stratigraphic chart showing major and minor coal-bearing formations in the Mississippi Embayment and Gulf Coastal Plain (modified from Warwick and others, 1997; Ogg and others, 2008).