

## **Geochemistry of the Claiborne Group Ironstone Deposits in East Texas**

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### **Abstract**

The Claiborne Group in East Texas consists of clayey sandstones and mudrocks deposited in a marginal to open marine setting along the Gulf Coast margin, recording the cyclicity of the fluctuating shoreline in the Middle Eocene. From the contact with the underlying Wilcox Group, the Claiborne units are the Carrizo Sandstone, Reklaw Formation, Queen City Sandstone, Weches Formation, Sparta Sandstone, Cook Mountain Formation, and the Yegua Formation. Many of the mudrocks contain appreciable pyrite, glauconitic sands and shales, and iron-rich sandy lenses, providing a geochemical environment that can experience secondary leaching and oxidation of iron-rich minerals in contact with groundwater.

Recent reconnaissance mapping in East Texas delineated numerous iron deposits at the Wilcox/Carrizo, Reklaw/Queen City, and Weches/Sparta contacts along the northern and western borders of the Sabine Uplift. Groundwater transmitting along bedding planes and perched water tables within these units can induce rapid weathering and alteration of ironbearing minerals, and subsequent deposition of iron carbonate, siderite. The siderite can undergo further alteration and form iron oxides such as hematite, magnetite, and limonite. These iron deposits occur along the contact boundaries of underlying mudrocks and overlying sandstones in a variety of habits including nodular concretions, lenticular bodies, and as brown, laminated beds that range in thickness from a few centimeters to a meter or more. Claiborne Group iron deposits are preferentially formed in areas where the overburden is relatively thin (<3.2 meters) and generally do not extend into the hilltops for more than 150 meters.