**A New Coal-Investigations Program in Oklahoma**

by

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**INTRODUCTION**

**General Statement**

The Oklahoma Geological Survey began a new coal-investigations program in July 1971 with emphasis on resources studies. Although Oklahoma has been a minor coal-producer for 70 years, the national energy shortage and Oklahoma's extensive coal deposits make this program timely and appropriate.

Detailed information is being collected on the distribution, depth, mineability, thickness, structure, proximate and ultimate analysis, heating value, identification, and correlation of the Oklahoma coals.

Public interest in Oklahoma's coal deposits has been increasing because the State contains significant resources of low-and medium-volatile coal for coke manufacture, low-sulfur coal to meet environmental standards for electric-power generation, and high-volatile coal for gasification. Furthermore, the availability of low-cost barge transportation on the Arkansas River Navigation System, connecting downstream with the Mississippi River, is a vital economic incentive to the coal-mining industry in Oklahoma. During the first fiscal year of the waterway, coal has been shipped by barge to consumers in Memphis, St. Louis, and Tampa.

**Purpose**

The purpose of the current project is to revise and determine the remaining resources of bituminous coal in Oklahoma and their potential uses by using the wealth of new information made available since 1952 by company drilling logs and coal analyses and from published reports and maps. The Oklahoma Geological Survey will supplement this data with its own core drilling program and coal analyses during the next fiscal year.

A concurrent, subordinate project is the location of 200 million tons (a revised estimate) of recoverable high-volatile bituminous coal for a proposed gasification plant. Gulf General Atomic Corporation and Stone & Webster Engineering Corporation are completing a feasibility study for a nuclear reactor-driven coal-gasification plant for Oklahoma.

The solvent refined process by which Oklahoma's coal would be gasified involves heating the coal to remove ash and sulfur and adding hydrogen, primarily derived from water, which combines with carbon to form methane gas (CH₄). Thus the raw coal may contain inorganic mineral impurities that produce up to 10 percent ash. The sulfur content of the methane would be a maximum of 0.5 percent. Thus high-sulfur coal (raw coal containing more than 3 percent sulfur) may be utilized in the gasification process. This high-ash, high-sulfur coal does not qualify as coking coal nor is it desirable as utility fuel in view of air pollution regulations. This coal has little or no current market value but it would be of value in a future gasification market.

**Geologic Setting**

The U. S. Geological Survey classifies the Oklahoma coal fields as part of the Western Region of the Interior Coal Province (figs. 1 and 2.) Within the provinces, the coal regions are structural and erosional remnants of wide-spread sedimentary basins.

Previous workers have referred to the coal-bearing rocks of Oklahoma as lying in southern and northern regions of eastern Oklahoma (Trumbull, 1957, plate 16). These coal-bearing strata are about 1,000 feet thick, and in ascending order comprise the Krebs, Caba-niss, and Marmaton Groups of Desmoinesian age, and the lower part of the Skiatook Group of Missourian age. The beds dip gently towards the west at 3° or less, away from the Ozark Uplift. The gentle dip permits widespread surface mining of coals that are 9 inches to 3 feet thick, average 2 feet, and lie beneath 10 to 60 feet of overburden, which is composed of shale, limestone, siltstone, and sandstone.

**PRELIMINARY RESULTS**

A few significant facts, results, and preliminary conclusions drawn from the two coal-resources projects follow.

**Coal Resources**

A 1952 estimate of 3.67 billion tons of original coal resources in eastern Oklahoma was conservative and was based mostly upon measured and indicated categories of reliability (Trumbull, 1957, p. 307). The total coal resources are under investigation in the present study. Meanwhile this previous estimate serves as the base figure which requires confirmation, and from which coal production and coal