

## BAUXITE IN ARKANSAS

Bauxite, the major ore of aluminum, is the only metal ore being produced in the region. Bauxite was first identified in Arkansas by John C. Branner, State Geologist, in 1887, and has been mined commercially since 1899. Arkansas bauxite output accounts for about 98 percent of the domestic production of bauxite. The major producers in the area are Alcoa and the Reynolds Mining Corporation.

The primary use of Arkansas bauxite is for making aluminum metal. Other important uses of Arkansas bauxite are for chemical, calcining and activating applications.

The Arkansas bauxite area covers approximately 275 square miles and is located in Pulaski and Saline Counties, central Arkansas. The bauxite mines in the area can be grouped into two principal mining districts: one in Pulaski County south of Little Rock, and one in Saline County east of Benton (see map). The Saline County district is the larger and more productive.

The bauxite deposits are centered around intrusives of nepheline syenite from which the deposits were derived. These nepheline syenites, and related igneous rocks of Cretaceous age, were intruded into highly folded Paleozoic beds. Subsequent erosion exposed some parts of these intrusives to weathering and some parts to burial by sediments of Tertiary age.

The bauxite deposits are the result of weathering of the nepheline syenite either in place or as detritus derived from these intrusives. The principal source rocks were the coarse-grained varieties of nepheline syenite. According to Gordon, Tracey and Ellis (U.S. Geological Survey Prof. Paper 299) the bauxite deposits can be classified into four types:

- (1) Residual deposits on the upper slopes of partly buried nepheline syenite hills.
- (2) Colluvial deposits at the base of the Berger Formation (lowermost formation of the Wilcox Group)
- (3) Stratified deposits within the Berger Formation and
- (4) Conglomeratic deposits at the base of the Saline Formation (formation in the Wilcox Group that overlies the Berger Formation).

The principal mineral in the bauxite is gibbsite (aluminum trihydrate). The chief impurities are silica, iron, and titanium. A significant concentration of gallium is present in the bauxite and is recovered as a valuable by-product.

It is possible that, in the future, other by-products of alumina production and other alumina sources within the bauxite area may be utilized.

Briefly these possibilities are:

- (1) The recovery of titanium, iron, and columbium from the black sands and red muds which are waste products from the alumina plants.
- (2) The recovery of both the iron and alumina from the large deposits of high-iron bauxite.
- (3) The recovery of alumina from the vast deposits of high-alumina clays associated with the bauxite deposits (estimated to total over 100 million tons).

The Arkansas bauxite area contains two alumina plants: Reynolds Mining Corporation plant at Hurricane Creek and Alcoa's plant at Bauxite. Aluminum metal is produced at two plants in the state: the Jones Mill Reduction Plant on Lake Catherine and the Gum Springs plant at Arkadelphia.

Bauxite reserves in the area in 1950 were estimated at about 70.7 million long tons averaging 50 percent alumina and 9 percent silica, but assuming no cutoff on iron. Of this total, about 62.6 million tons occur in Saline County and 8.1 million tons in Pulaski County.