

Wyoming trona: an overview

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Tg Soda Ash

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Abstract

Trona, an evaporite mineral of the compound sodium sesquicarbonate ($\text{Na}_2\text{CO}_3 \cdot \text{NaHCO}_3 \cdot 2\text{H}_2\text{O}$), was precipitated in a restrictive lacustrine environment during deposition of the Eocene Wilkins Peak Member of the Green River Formation in southwestern Wyoming. Textural variations of the 25 major trona beds are indicative of divergent depositional scenarios.

Situated in the southern three-quarters of the resource area, the lower beds, 1 through 18, are composed of light brown, fine-grained (1 mm to microcrystalline), "maple sugar" type trona with halite prevalent. In contrast, beds 19 through 25 are halite free and consist of amber (light to very dark), translucent, coarse-crystalline (5 mm to 30 cm), fibrous with random to radiating blade-like crystal forms, and commonly referred to as "root beer" type trona. The depocenter of the upper trona beds has transgressed to the northern third of the resource area.

The Wyoming trona deposits are world class with an estimated 134.4 billion short tons, of which 81.7 billion short tons are bedded trona and 52.7 billion short tons are interbedded and intermixed trona and halite. Economical trona reserves of 40 billion short tons are mineable by current technology: conventional "hard rock" methods, mechanized extraction (drum miner, boring machines) and hydraulically supported longwall shearings. Secondary recovery utilizing solution mining methods of remanent mine pillars has the potential of adding 25% (10 billion short tons) more reserves.

Composed of 70% sodium carbonate, trona is referred to as natural soda ash, and refined soda ash is the major industrial product. Over 90% of the United States soda ash is produced in Wyoming. Wyoming's annual trona production exceeds 10 million short tons, which equates to over 29% of the world's soda ash production.