South of 205
Mineral County
item 5

ranging in diameter from 1/4 up to 1 inch in a matrix of amphibole and quartz. It is reported that very little work has been done on the property.

RHODES MARSH DISTRICT

Rhodes Marsh is in the lowest part of Soda Springs Valley just east of Rhodes siding on the Tonopah & Goldfield R. R. The town of Mina is 8 miles north. The altitude of the surface of the marsh is 4,400 feet above sea level.

The marsh was first exploited in the early sixties to supply salt necessary for the extraction of gold and silver from the ore of the Comstock, Aurora, Candelaria, Belmont, and other districts where the Washoe pan process[19] was employed.

An interesting sidelight on the production of salt from Rhodes Marsh is a historical note, mentioning the importation of camels for transporting salt to Virginia City. An old ordinance in Virginia City prohibited camels from entering the city during certain hours of the day to prevent the stampeding of horses.

In the seventies, shortly after its discovery in Teel's Marsh, borax was found in Rhodes Marsh. Considerable activity prevailed and borax mining was pursued for a number of years. The borax occurred mainly as ulexite nodules consisting of rounded masses of loosely compacted acicular crystals several inches in diameter, called "cottonballs" because of their resemblance to balls of cotton. Because these deposits are rather purer than those of the natural borax type, they were much sought after and exploited. The ulexite nodules occurred a few inches below the surface of the lake and were gathered by Chinese and Indians, who hand-picked them out of the shallow excavations in the mud. These nodules were boiled in tanks fired with sagebrush and pinon pine. After the material was in solution, the borax was crystallized out on iron rods suspended in the crystallizing vats. The crude borax was shipped to Alameda, Calif., for refining.

Rhodes Marsh was thoroughly worked for borax in the early days, and it ceased to be a factor when the extensive underground deposits of calcium borate (colemanite) found in the vicinity of Death Valley, Calif., revolutionized the industry.

Some years ago the marsh was prospected for potash, but the potash content of the brines present a short distance beneath the surface is too low to be of commercial interest.

In 1928, P. S. Williams, a chemical engineer, became interested in Rhodes Marsh as a source of sodium sulphate. For many years it was known that mirabilite (Glauber's salt, $Na_2SO_4.10\ H_2O$) occurred in the marsh in large quantities, but nothing was done until Williams interested a group

19/ Amalgamation in pans heated by steam, using quicksilver, salt, and copper sulphate for reagents.

of San Francisco men in obtaining an option on 2,120 acres owned by George A. Betty of Mina, Nev. The San Francisco group organized a company called the Rhodes Alkali & Chemical Corporation and spent considerable money in sampling and investigating processes for the recovery of the sodium sulphate. In the first plant erected in 1930 efforts were directed toward the utilization of seasonal temperature changes in the production of sodium sulphate with natural brines made by passing water over or through the sodium sulphate beds. Next, an attempt was made to free the Glauber's salt from the silt with which it is associated, and then to dehydrate it by heating. Neither process was successful. Later it was found that considerable thenardite (Na_2SO_4) occurred in the marsh and attention was directed to the mining of this product. In 1932, a plant capable of producing 150 tons of sodium sulphate per day was erected and was operated up to 1933.

The Rhodes Alkali & Chemical Corporation is said to have spent $150,000 in sampling and in the erection of a plant. Production of sodium sulphate has been about 20,000 tons.

Rhodes Marsh is 3 miles long and has an average width of 1 1/2 miles. It is dry for the greater part of the year and encrusted with salts. The accumulation of surface salts, mostly sodium chloride, varies in thickness with the season; during warm, dry weather the whole surface is elevated several inches and forms a pulverent mass; this mass shrinks again in cold, wet weather, becoming hard and compact. It rises and falls somewhat in the manner of a great pan of dough. The water level fluctuates with the season and in the summer stands 4 to 5 feet below the surface. The thenardite occurs in lenses from 3 to 5 feet thick under an overburden of silt and salt varying from 2 to 6 feet thick. The Rhodes Alkali & Chemical Corporation has sampled the marsh with several thousand augur holes drilled by hand, and, according to the drill records, at least 3,000,000 tons of sodium sulphate salts are available.

In mining, the thenardite was stripped of the overburden of salt and silt with a P. & H. gasoline shovel. The areas stripped are from 30 to 50 feet in diameter. These pits were drained by means of gasoline pumps.

The thenardite layer was blasted and loaded into 2-yard dump cars by gasoline shovel equipped with trench hoe attachment. The material was hauled about 1 mile to the plant for treatment. A flow sheet of the treatment plant is shown in figure 3.

The treatment of the crude thenardite is merely a process for the removal of sand silt. This is done in several steps to maintain a counter flow of material and wash liquors and to utilize the nearly saturated solution so as to prevent losses. The following is a typical analysis of the finished product:

	Percent
Sodium sulphate	97.33
Sodium chloride	1.07
Calcium sulphate	.28
Insoluble	1.24
Moisture	.08
Total	100.00

Power for the treatment plant is furnished by a 120-horsepower Fairbanks-Morse Diesel engine.

Water is available from shallow wells near the plant. Two artesian wells were drilled by the company at the south end of the marsh in 1930. One well is 450 feet and the other 420 feet deep; both wells have 16-inch casing near the surface and 10-inch casing near the bottom. In sinking the wells, three fresh-water-bearing strata were encountered. The combined flow from the two wells is in excess of 200 gallons per minute.