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MONTHLY REPORTS OF INVESTIGATIONSBUREAU OF MINES - - FEBRUARY, 1920 - - DEPARTMENT OF INTERIOR

## STEAMING VALUE OF ALASKA LIGNITE

The Fairbanks, Alaska Station of the Bureau of Mines, has recently completed two series of tests designed to determine, first the comparative steaming value of Alaska lignite and spruce wood, and second the resistance of lignite to weathering when stored in piles in the open. The tests were made under the direction of John A. Davis, superintendent of the Station, who was assisted by Paul Hopkins and John Gross. These investigations are of especial interest to Alaska since much has been written about the large lignite fields of the Nenana district and their possible value as a fuel supply.

The steaming tests were run to determine the relative value of lignite and spruce wood in the small boilers commonly used in the mining camps of Alaska. Spruce wood has been used for steaming purposes almost exclusively in the past, but the price has risen from \$7 to \$20 per cord in the last 15 years and other sources of fuel are sought. The lignite used in the tests was not of the highest quality, since it was obtained near the surface. Both the wood and the lignite were carefully weighed, sampled, and analyzed, so that the results of the tests could be accurately compared. The boiler used was one of a battery of two horizontal water-tube boilers, each rated at 125 b.h.p. Two grades of lignite, one from the Lynn mine and one from the Burns mine, and one grade of wood were tested.

The results showed that, under the conditions of these tests, when compared pound for pound the value of spruce wood lay between the values of the two samples of lignite. The relative water evaporations per pound of fuel were: Lynn lignite, 3.06; Burns lignite, 3.99; spruce wood, 3.68 lb. However, in comparing a cord of wood with a ton of lignite, it was shown that a cord of wood is equivalent to more than a ton of lignite from either mine.

In the weathering tests several hundred pounds of Nenana lignite were used. It was first carefully sampled for analysis and then sized through a series of rings from 3/8 inch to 2 inch in diameter, 80 per cent of the sample was retained on a 1-inch ring. The lignite was then spread

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in shallow trays and placed on the roof of the station, where it was allowed to remain, fully exposed to the weather, for fourteen months. At the end of a week it was noticeably weathered on the surface and at the end of a month it had broken up into small pieces.

At the end of the test period it was found that the surface portion, immediately exposed to the atmosphere, was entirely disintegrated, while that farthest from the surface was only partly disintegrated, although very fragile. Over 50 per cent would then pass through a 3/8-inch ring and 85 per cent passed a 3/4-inch ring. The average loss in weight through weathering was 6.08 per cent (mostly moisture). The weathering at the end of 14 months, however, seemed only slightly more than that at the end of one month. In large piles only the surface, to a depth of 4 inches to 6 inches, would weather badly and the material beneath would be so protected as to suffer little change. These tests show that the behavior of these lignites is substantially the same as that of North Dakota lignite. - - Bureau of Mines, Monthly Reports of Investigations.