COAL MINING IN THE BIGHORN COAL BASIN OF WYOMING

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INTRODUCTION

The Bighorn Coal basin of northwestern Wyoming includes portions of Park, Hot Springs, Washakie, and Big Horn Counties (Fig. 1). This coal-bearing region, which is areally the third largest in the State, coincides with the topographic and structural basin of the same name. As defined, however, the coal basin is limited to that portion of the Bighorn Basin underlain by Mesaverde or younger rocks. This definition was chosen because the Mesaverde Formation is the oldest important coal-bearing formation in the basin.

Based on early mining activity, the U. S. Geological Survey named eight coal fields within the basin. The exact boundaries of the fields were not defined, and seams were not correlated between them. Areas barren of coal mining serve to roughly delimit one field from the other. Since the coal-bearing formations are only exposed along the flanks of the coal basin, the coal fields also lie within this peripheral zone. Clockwise from the Montana border, the eight fields are: Silvertip, Garland, Basin, Southeastern, Gebo, Grass Creek, Meeteetse, and Oregon Basin (Cody) coal fields.

Structurally, these eight coal fields are on the flanks of a broad syncline bounded on the east by the Big Horn Mountains, on the south by the Owl Creek Mountains, and on the west by the Absaroka Plateau and Beartooth Mountains. To the north, the Bighorn Basin continues into Montana and narrows where it is flanked by the Beartooth and Pryor Mountains before it merges with the Crazy Mountains syncline. Local folding characterizes the marginal areas of the basin where the coal fields are located. These small anticlines and synclines create local dips at various angles to the overall synclinal structure of the basin. Dips from 15 to 50 degrees are common in these border areas. There are also numerous normal faults on the flanks of the syncline, especially in the northern half of the basin. Most of these faults trend northeast-southwest with vertical displacements up to 250 feet reported.

The topography of the central basin is characterized by buttes, badlands, irregular ridges, and gravel terraces. Badland topography is particularly well developed in the southeastern portion of the basin. The marginal areas are more rolling with strike ridges and valleys. Rainfall is small, at times less than 10 inches per year, and accounts for the semi-arid conditions that prevail throughout vast portions of the basin. Drainage is northward into Montana through the Bighorn River and its tributaries.

COAL-BEARING FORMATIONS

GENERAL

Although coals are reported in the Cloverly, Frontier, Lance, Willwood, and Tatum Formations, the thicker and more important beds are limited to the Upper Cretaceous Mesaverde and Meeteetse Formations and the Paleocene Polecat Bench Formation (Fig. 2). The geographic distribution of the Mesaverde and younger rocks can be seen in Figure 1. The older formations crop out beyond the margins of the coal basin and have not been illustrated. The younger Willwood and Tatum rocks are depicted in the more central portions of the basin where they overlie the major coal-bearing rocks.

CLOVERLY FORMATION

Fisher (1906a) reports coaly shale and coal are sometimes found associated with the basal sandstones of the Lower Cretaceous Cloverly Formation. He noted an area just outside the boundary of the defined coal basin where 8 feet of coal was mined. He only described the mine location as being near Tensleep on No Wood Creek.

FRONTIER FORMATION

Only thin coals have been found in the Upper Cretaceous Frontier Formation of the Bighorn Basin. Thicknesses of over a few inches are seldom mentioned.

MESAVERDE FORMATION

Although Upper Cretaceous Mesaverde coals occur throughout the basin, they are thin in the southeastern corner where they seldom exceed 14 inches in thickness. The thickest and most persistent Mesaverde coals are in the southern and southwestern portions of the basin where seam thicknesses range up to 12 feet. Four- to 6-foot beds are more common maximums, however. The coals in the Mesaverde Formation have historically been the most important seams in the basin, and have been mined in all but the Basin and Southeastern coal fields. The mineable coals of the Mesaverde are normally found in the basal portion of the formation, but are not limited to there. Splitting and rapid thinning of Mesaverde coals are common.

MEETEETSE FORMATION

Apparently coals are distributed throughout the Upper Cretaceous Meeteetse Formation everywhere in the basin, but they are not as thick nor as persistent as the older Mesaverde coals (Fig. 2). The thicker Meeteetse coal beds

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