EXPLANATION

Shale, siltstone, sandstone, or covered

Shale, coaly

Coal, bony

Correlation certain
Correlation probable

Correlation possible

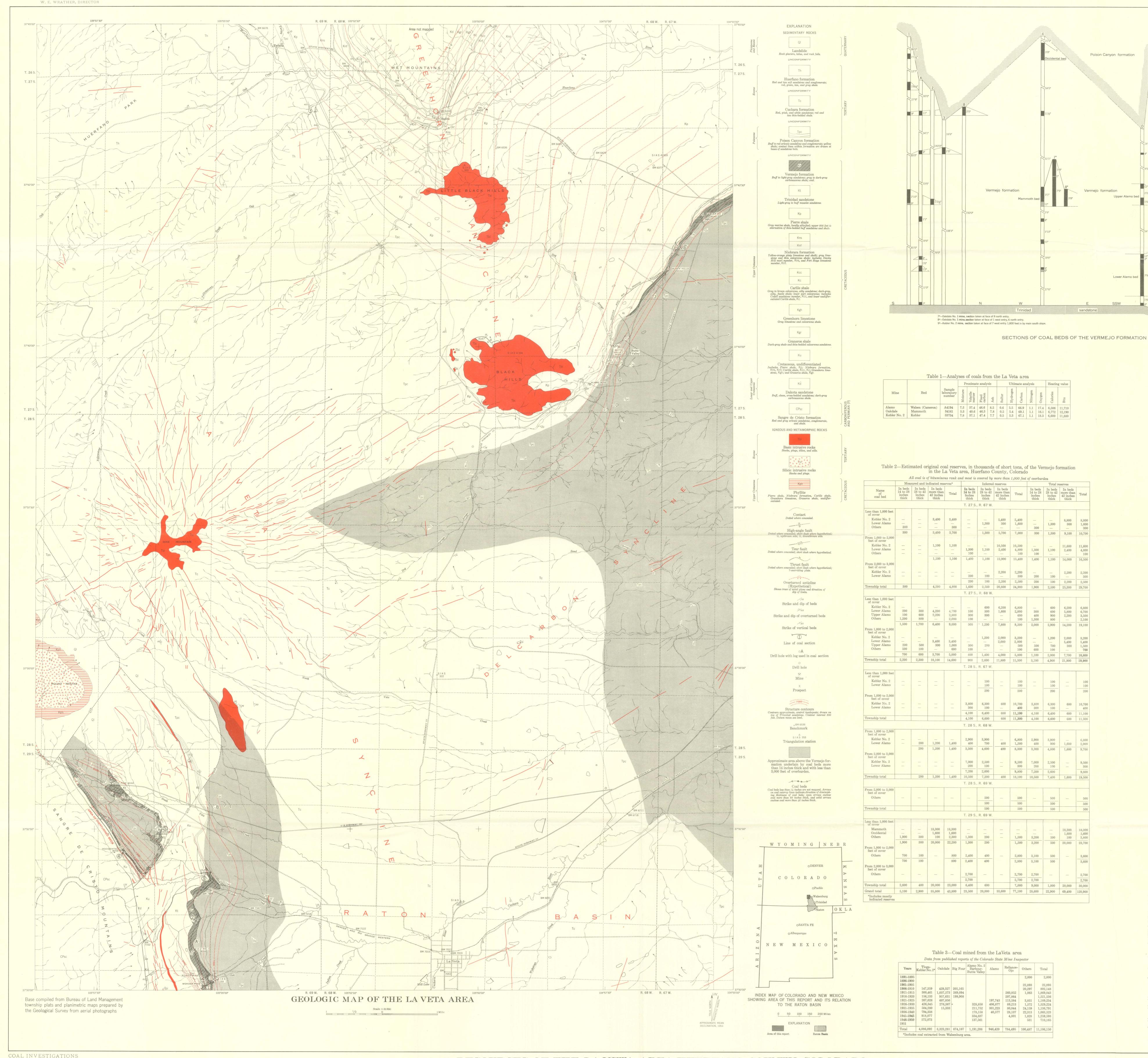
Interval between coal beds

Number of coal section

Letter of well log

Number of mine section

General direction of line of coal sections



COAL RESOURCES OF THE LA VETA AREA
HUERFANO COUNTY, COLORADO
By Ross B. Johnson and James G. Stephens

This report pertains to the coal resources of the La Veta area and those phases of stratigraphy and structure that are related to the coal beds. A more detailed discussion of the geology, stratigraphy, structure, and geologic history of the area is found in OM146 (Johnson and Stephens, 1954).

The Upper Cretaceous Vermejo formation of Montana and Laramie age is the only coal-bearing formation that crops out in the La Veta area. It is poorly exposed along a narrow belt of outcrop in the northeastern part of this area and forms two small isolated outcrops in the southwestern part of the area southeast of Mount Mestas.

In the northeastern belt of outcrop, strata of the Vermejo formation dip 10° to 20° SE into the trough of the Delcarbon syncline. About a mile north of Butte valley, strata of the Vermejo formation strike to the northeast and are truncated by an erosion surface at the base of the Poison Canyon formation of Paleocene age (Johnson and Stephens, 1954).

On the western limb of the Raton basin, strata of the Vermejo formation dip steeply to the east. The beds strike to the north and are truncated about half a mile north of Middle Creek by the erosion surface at the base of the Poison Canyon formation. Vermejo strata also are preserved in a small northwest-trending overturned syncline that is isolated from the Raton basin by thrust faulting. The eastern limb of the fold dips gently to the west; the western limb is vertical or overturned. This small syncline is part of a thrust plate that lies

or overturned. This small syncline is part of a thrust plate that lies to the east of the main frontal thrust fault of the Sangre de Cristo Mountains. The Vermejo and older Cretaceous formations are closely folded and are overlain unconformably by relatively flat lying beds of the Poison Canyon formation.

Although the Vermejo formation crops out within rather small areas, it probably underlies most of the area south and east of a line drawn between the points of overlap of the Poison Canyon formation near Butte Valley and Middle Creek. The Vermejo may extend northwestward for an unknown distance in the subsurface near the trough of the Raton basin.

trough of the Raton basin. The Vermejo formation ranges in thickness from a thin wedge to 410 feet. It contains as many as four coal beds more than 14 inches thick. The formation consists of buff, gray, and gray-green slightly arkosic sandstone; buff, gray, and dark-gray siltstone; gray, darkgray, and nearly black carbonaceous, coaly, and silty shale; and coal beds. The coal beds are lenticular and are interbedded with the shale and siltstone. The floors and roofs of the coal beds are generally carbonaceous shale and claystone, but locally they may be carbonaceous siltstone and sandstone. Partings in the coal beds consist of bony coal, carbonaceous shale, and carbonaceous siltstone. The coal is brittle and friable and consists of vitrain with alternating bands of fusain and durain. It exhibits a prismatic cleat and platy cleavage. Impurities are common in most beds and consist mainly of pyrite and sparse grains of silt and sand. The accompanying table (Table 1) "Analyses of coals from the La Veta area" (George,

agglomerating and nonweathering. It is therefore classified as high volatile C bituminous coal according to the ASTM system (ASTM, 1937).

Before mining began in the La Veta area, the original reserves of coal, in beds more than 14 inches thick and covered by less than 3,000 feet of overburden, are estimated to have been 120,900,000 short tons. Approximately 80 percent of this amount remains unmined. The estimate of reserves is based on measurements of thickness of scattered sections, several logs of diamond-drill holes, and from published measurements within coal mines (George, 1937, p. 192, 196). These are shown graphically in the coal sections, and the location of the measurements and well logs are indicated

1937, p. 76-77, 80-83) indicates that the coal has heating values in

excess of 11,000 Btu. In addition the coal is known to be non-

The table of coal reserves (Table 2) of the La Veta area shows the total estimate of reserves according to township, amount of overburden, thickness of beds, and reliability of the information upon which estimates are based. The reserves are classified into the following three categories according to the thickness of coal beds: 14 to 28 inches, 28 to 42 inches, and more than 42 inches. The reserves are further subdivided into two categories—measured and indicated, and inferred—according to the distance of the coal from points where the beds were measured. The reserve of coal is classified as measured in areas where the points of measurements in outcrops, well logs, and mine workings are a quarter of a mile or less apart. Indicated reserves underlie areas where the points of observation are a quarter of a mile to a mile apart. Inferred reserves are based on a geologic knowledge of the character of the beds, and all coals included in this category lie more than a mile from points of observation. The reserve estimates are also classified according to the thick-

ness of overburden above the coal beds in the following categories: less than 1,000 feet, 1,000 to 2,000 feet, and 2,000 to 3,000 feet. The greater part of the coal in the Vermejo formation in the La Veta area lies beneath more than 3,000 feet of overburden and therefore is not included in the reserves.

Coal mining has been active in the La Veta area since 1891. The era of greatest mining activity was from 1910 to 1930, after which mining tapered off gradually. The Colorado Fuel & Iron Corporation's Kebler No. 2 mine was shut down in 1953; no large mines are now being operated in the area. Several small wagon mines in the southwestern part of the area are operated intermittently.

The accompanying table (Table 3) showing the amount of coal that has been mined is based on all available data; however, tonnage

that has been mined is based on all available data; however, tonnage figures are not available for some years. The depletion figure of about 11,100,000 short tons is only approximate. The Kebler No. 2 mine and perhaps the Big Four mine have extracted coal from beyond the limits of the La Veta area, but their total production is included in the depletion figures for the area. Mine names have changed through the years, and some errors may have been made in tracing the sequence of names.

Data are not available regarding the percentage of coal recovered by mining operations. From averages in the western United States it may be assumed that approximately 50 per cent of the coal has been recovered. On this assumption, the amount of coal mined plus the amount wasted in mining up to January 1, 1951, is about 22 million short tons. The remaining reserves of coal in beds more than

14 inches thick with less than 3,000 feet of overburden are estimated to total about 99,700,000 short tons.

The average thickness of beds of coal that have been mined in the La Veta area is about 7 feet but varies within wide limits. The Oakdale mine, which is on the eastern limb of an overturned syncline, recovered coal from a seam ranging in thickness from less than a foot to almost 14 feet (George, 1937, p. 191, 192). This great variation apparently is due to intense folding associated with thrust faulting. The maximum thickness of the Oakdale bed appears to be in the trough of the syncline, where the coal was crowded by slippage along bedding planes toward a point of minimum pressure in the trough of the fold.

Future development and exploitation of the coal resources of the

La Veta area will necessitate mining by deep shafts or by steeply inclined drifts or slopes. Before developing such a mining program, it may be advisable to explore the areal extent of the individual coal beds by drilling, inasmuch as the relationships of the depths of proposed shafts, the dips of the beds, and the thicknesses of coals may determine the best locations for new mines. The steep dip of the Vermejo formation may present difficult problems in the extraction of coal along the western side of the Raton basin.

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