UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

Text to accompany:

Open-File Report 79-792

1979

COAL RESOURCE OCCURRENCE AND COAL DEVELOPMENT POTENTIAL MAPS OF THE WILD BILL CREEK QUADRANGLE, POWDER RIVER COUNTY, MONTANA, AND CAMPBELL COUNTY, WYOMING

[Report includes 13 plates]

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To convert	Multiply by	To obtain
feet	0.3048	meters (m)
miles	1.609	kilometers (km)
acres	0.40469	hectares (ha)
tons (short)	0.9072	metric tons (t)
short tons/acre-ft	7.36	metric tons/hectare-meter (t/ha-m)
Btu/lb	2.326	kilojoules/kilogram (kJ/kg)

INTRODUCTION

Purpose

This text is for use in conjunction with the Coal Resource Occurrence (CRO) and Coal Development Potential (CDP) maps of the Wild Bill Creek quadrangle, Powder River County, Montana, and Campbell County, Wyoming. (13 plates; U.S. Geological Survey Open-File Report 79-792). This set of maps was compiled to support the land-use planning work of the Bureau of Land Management in response to the Federal Coal Leasing Amendments Act of 1976 and to provide a systematic inventory of coal resources on Federal coal lands in Known Recoverable Coal Resource Areas (KRCRAs) in the western United States. The inventory includes only those beds of subbituminous coal that are 5 feet (1.5 m) or more thick and under less than 3,000 feet (914 m) of overburden and those beds of lignite that are 5 feet (1.5 m) or more thick and under less than 1,000 feet (305 m) of overburden.

Location

The Wild Bill Creek quadrangle is in southeastern Powder River County, Montana, and northern Campbell County, Wyoming, about 50 miles (80 km) north of Gillette, Wyoming, and 24 miles (39 km) south of Broadus, Montana, a small town in the Powder River valley. Gillette is on U.S. Interstate Highway 90 and the Burlington Northern Railroad. Broadus is on U.S. Highway 212.

Accessibility

The quadrangle is accessible from Gillette, Wyoming, by going north on Wyoming and Montana State Route 59 a distance of about 57 miles (92 km) to the southeastern corner of the quadrangle. The quadrangle is accessible from Broadus by going 29 miles (47 km) southward on Montana State Route 59 to the east-central edge of the quadrangle.

Physiography

The Wild Bill Creek quadrangle is within the Missouri Plateau division of the Great Plains physiographic province. The northern part of the quadrangle is drained and dissected by Badger Creek and Blacktail Creek which flow through the east edge of the quadrangle. The central and southern parts of the quadrangle are drained by Wild Bill Creek and Bowers Creek and its tributaries. Drainage in the quadrangle is eastward into the Little Powder River. The Little Powder River is about 1 mile (1.6 km) from the southeast corner of the quadrangle and about 3 miles (4.8 km) east of the northeast corner of the quadrangle. It flows northward to join the Powder River near Broadus, about 24 miles (39 km) north of the quadrangle. The Powder River flows generally northward to join the Yellowstone River about 113 miles (182 km) north of the quadrangle.

In the central and southern parts of the quadrangle, the relief is moderate; the rounded hills rise about 200 feet (61 m) above the narrow valleys. In the northern part of the quadrangle, the topography is quite rugged. The narrow, sharp ridges rise 200 to 400 feet (61 to 122 m) or more above the steep-sided valleys, and in many places these ridges are carved into badlands.

The lowest point in the quadrangle, with an elevation of 3,320 feet (1,012 m), is along Bowers Creek at the eastern edge of the quadrangle. The highest point in the quadrangle is an unnamed peak with an elevation of 3,965 feet (1,209 m). This peak is in the northwest corner of the quadrangle, 7.1 miles (11.4 km) northwest of the lowest point. The topographic relief in the quadrangle is 645 feet (197 m).

Climate

The climate of Powder River and Campbell Counties is characterized by pronounced variations in seasonal precipitation and temperature. Annual precipitation in the region varies from less than 12 inches (30 cm) to about 16 inches (41 cm). The heaviest precipitation is from April to August. The largest average

monthly precipitation is during June. Temperatures in eastern Montana range from as low as -50°F (-46°C) to as high as 110°F (43°C). The highest temperatures occur in July and the lowest in January; the mean annual temperature is about 45°F (7°C) (Matson and Blumer, 1973, p. 6).

Land status

The Northern Powder River Basin Known Recoverable Coal Resource Area (KRCRA) is represented in the Wild Bill Creek quadrangle by three separate areas in the extreme northwestern corner of the quadrangle. The Boundary and Coal Data Map (pl. 2) shows the location of the KRCRA tracts and the land ownership status. There are no National Forest lands within the Wild Bill Creek quadrangle. There were no outstanding Federal coal leases or prospecting permits recorded as of 1977.

GENERAL GEOLOGY

Previous work

Bryson and Bass (1973, pl. 1) mapped all of the Wild Bill Creek quadrangle as part of the Moorhead coal field. Matson and Blumer (1973, pl. 18) mapped the extreme northwestern part of the quadrangle as part of the East Moorhead coal deposit.

Traces of coal bed outcrops shown by previous workers on planimetric maps which lack topographic control have been modified by us to fit the modern topographic map of the quadrangle.

Stratigraphy

The exposed bedrock units in this quadrangle are the Tongue River, Lebo Shale, and Tullock Members of the Fort Union Formation (Paleocene). The uppermost unit, the Tongue River Member, is made up mainly of yellow to gray sandstone, sandy shale, carbonaceous shale, and coal. Much of the coal has burned, baking the overlying sandstone and shale and forming thick, reddish-colored clinker beds. The upper part of the Tongue River Member has been removed by

erosion, leaving about the lower 350 feet (107 m) of this member in the quadrangle. All of the minable coal beds are in the Tongue River Member.

Coal and other rocks comprising the Tongue River Member were deposited in a continental environment at elevations of perhaps a few tens of feet (a few meters) above sea level in a vast area of shifting rivers, flood plains, sloughs, swamps, and lakes that occupied the area of the Northern Great Plains in Paleocene (early Tertiary) time.

The Lebo Shale Member is predominantly dark-gray and light-gray claystone and brown-to-black, carbonaceous shale containing beds of siltstone, with at least one local coal bed. This member crops out throughout the quadrangle, except in the northwestern corner and in areas along the western border of the quadrangle. The Lebo Shale Member is about 250 feet (76 m) thick in the Wild Bill Creek quadrangle (Lewis and Roberts, 1978, section B-B').

The basal member of the Tongue River Formation is the Tullock Member which is about 550 feet (168 m) thick in this quadrangle (Lewis and Roberts, 1978). The Tullock Member consists of yellow sandstone, sandy shale, carbonaceous shale, and numerous thin and impure coal beds (Matson and Blumer, 1973, p. 8). The upper part of this member crops out along the eastern border of the quadrangle.

Representative samples of the sedimentary rocks overlying and interbedded with minable coal beds in the eastern and northern Powder River Basin have been analyzed for their content of trace elements by the U.S. Geological Survey, and the results have been summarized by the U.S. Department of Agriculture and others (1974) and by Swanson (in Mapel and others, 1977, pt. A, p. 42-44). The rocks contain no greater amounts of trace elements of environmental concern than do similar rocks found throughout other parts of the western United States.

Structure

The Wild Bill Creek quadrangle is on the eastern flank of the Powder River structural basin. Regionally the strata dip westward or southwestward at an angle of less than 1 degree. The regional dip is modified in places by minor local folding and faulting (pls. 4, 7, and 10).

COAL GEOLOGY

The coal beds in the Wild Bill Creek quadrangle are shown in outcrop on the Coal Data Map (pl. 1) and in section on the Coal Data Sheet (pl. 3). Except for a thin local bed, all of the coal beds are in the Tongue River Member of the Fort Union Formation. The lowermost, important coal is the Contact coal bed, whose base is the base of the Tongue River Member. The Contact coal bed is overlain successively by a noncoal interval of about 15 to 20 feet (4.6 to 6.1 m), a local coal bed, a noncoal interval of about 50 to 60 feet (15.2 to 18.3 m), the Broadus coal bed, a noncoal interval of about 50 feet (15 m), the Number 11 coal bed, a noncoal interval of 90 to 100 feet (27.4 to 30.5 m), the Number 9a coal bed, a noncoal interval of 20 to 30 feet (6.1 to 9.2 m), the Cache coal bed, and a noncoal interval, where preserved, of as much as 70 feet (21.3 m).

The coal found along the eastern flank of the Powder River Basin in Montana increases in rank from lignite in the east to subbituminous in the deeper parts of the basin to the west. All available chemical analyses of coal from this and adjacent quadrangles were considered in our decision to assign a rank of lignite A to the coal in this quadrangle.

The trace-element content of coals in this quadrangle has not been determined; however, coals in the Northern Great Plains, including those in the Fort Union Formation in Montana, have been found to contain, in general, appreciably lesser amounts of most elements of environmental concern than coals in other areas of the United Sates (Hatch and Swanson, 1977, p. 147).

Contact coal bed

The Contact coal bed, the basal bed of the Tongue River Member, was first described by Bass (1932, p. 53) from exposures in T. 2 N., R. 48 E., in the Kirkpatrick Hill quadrangle about 53 miles (85 km) north-northwest of the Wild Bill Creek quadrangle. As shown by the isopach and structure contour map (pl. 10), the Contact coal bed ranges from less than 4 to about 6 feet (1.2 to 1.8 m) in thickness and, in general, dips westward at less than 1 degree. The general dip is modified by small folds of low relief. Overburden on the Contact coal bed where it is more than 5 feet (1.5 m) thick (pl. 12) ranges from 0 feet at the outcrops to about 160 feet (0-49 m) in thickness.

There is no known, publicly available chemical analysis of the Contact coal in or near the Wild Bill Creek quadrangle. Because other coals in the area are lignite A in rank, the Contact coal has also been assigned a rank of lignite A.

Local coal bed above the Contact coal bed

A local coal bed with a thickness of about 3 feet (about 1 meter) occurs about 15 to 20 feet (4.6 to 6.1 m) above the Contact coal bed. Because this bed is less than 5 feet (1.5 m) thick and has only a limited areal extent, economic resources have not been calculated for it.

Broadus coal bed

The Broadus coal bed, first described by Warren (1959, p. 570), derives its name from exposures near the town of Broadus in the Epsie NE quadrangle about 21 miles (34 km) north of the Wild Bill Creek quadrangle. The Broadus coal bed crops out in the northwestern part of the quadrangle. The Broadus coal bed occurs about 60 to 80 feet (18.3 to 24.4 m) above the Contact coal bed and the base of the Tongue River Member. The isopach and structure contour map of the Broadus coal bed (pl. 7) shows that the Broadus coal bed ranges from about 2 to 10 feet (0.6 to 3 m) in thickness and dips westward at an angle of less than 1

degree. The general dip is modified locally by minor folding. Overburden on the Broadus coal bed (pl. 13) ranges from 0 feet at the outcrops to 300 feet (0-91 m) in thickness.

There is no known, publicly available chemical analysis of the Broadus coal in this quadrangle, but a chemical analysis of the Broadus coal from the Peerless mine, sec. 23, T. 4 S., R. 50 E., about 24 miles (39 km) north of the Wild Bill Creek quadrangle in the Epsie NE quadrangle, shows ash 6.4 percent, sulfur 0.2 percent, and heating value 7,240 Btu per pound (16,840 kJ/kg) on an as-received basis (Gilmour and Dahl, 1967, p. 16). This heating value converts to about 7,735 Btu per pound (17,992 kJ/kg) on a moist, mineral-matter-free basis, indicating that the Broadus coal at that locality is lignite A in rank. Because of the proximity of that location to the Wild Bill Creek quadrangle, it is assumed that the coals are similar and the Broadus coal in this quadrangle is also lignite A in rank.

Number 11 coal bed

The Number 11 coal bed was first described by Bryson and Bass (1973, p. 100) from exposures in the Moorhead coal field which includes the Wild Bill Creek quadrangle. The Number 11 coal bed occurs about 50 feet (15 m) above the Broadus coal bed. The Number 11 coal bed crops out only in small scattered areas in the northwestern part of the quadrangle. Because the Number 11 coal bed is less than 5 feet (1.5 m) thick in this quadrangle, economic coal resources have not been assigned to it.

Number 9a coal bed

The Number 9a coal bed was first described by Bryson and Bass (1973, p. 103) from exposures of a lenticular coal bed in T. 8 S., R. 51 E., in the Bear Skull Mountain quadrangle, just north of the Wild Bill Creek quadrangle. Here the Number 9a coal bed is about 150 feet (46 m) above the Broadus coal bed. Because the

Number 9a coal bed is less than 3 feet (0.9 m) thick, economic coal resources have not been assigned to it.

Cache coal bed

The Cache coal bed was first described by Warren (1959, p. 572). This bed is named for exposures along Cache Creek in the Lonesome Peak and Yarger Butte quadrangles, about 16 miles (26 km) north-northwest of the Wild Bill Creek quadrangle. In the Wild Bill Creek quadrangle, the Cache coal bed occurs about 140 to 180 feet (43 to 55 m) above the Broadus coal bed. The position of the Cache coal bed near the surface is generally marked by a clinker bed formed by the burning of the coal. The isopach and structure map (pl. 4) shows that the Cache coal bed ranges from 6 to 16 feet (1.8 to 4.9 m) in thickness and, in general, dips northwestward at an angle of less than 1 degree. Overburden on the Cache coal bed (pl. 5) ranges from 0 feet at the outcrops to about 160 feet (0-49 m) in thickness. The T coal bed of Matson and Blumer (1974, p. 92) is equivalent to the Cache coal bed.

A chemical analysis of the T coal (Matson and Blumer, 2973, p. 93) in drill hole SH-714 from a depth of 21 to 30 feet (6.4 to 9.2 m) in sec. 30, T. 8 S., R. 51 E., in the Bay Horse quadrangle about 1 mile (1.6 km) west of the Wild Bill Creek quadrangle, shows ash 4.671 percent, sulfur 0.476 percent, and heating value 6,943 Btu per pound (16,149 kJ/kg) on an as-received basis. This heating value converts to about 7,283 Btu per pound (16,940 kJ/kg) on a moist, mineral-matter-free basis, indicating that the T (Cache) coal at that location is lignite A in rank. Because of the proximity of that location to the Wild Bill Creek quadrangle, it is assumed that the coals are similar and that the Cache coal in this quadrangle is also lignite A in rank.

COAL RESOURCES

Data from all publicly available drill holes and from surface mapping by others (see list of references) were used to construct outcrop, isopach, and structure contour maps of the coal beds in this quadrangle.

A coal resource classification system has been established by the U.S. Bureau of Mines and the U.S. Geological Survey and published in U.S. Geological Survey Bulletin 1450-B (1976). Coal resource is the estimated gross quantity of coal in the ground that is now economically extractable or that may become so. Resources are classified as either Identified or Undiscovered. Identified Resources are specific bodies of coal whose location, rank, quality, and quantity are known from geologic evidence supported by specific measurements. Undiscovered Resources are bodies of coal which are surmised to exist on the basis of broad geologic knowledge and theory.

Identified Resources are further subdivided into three categories of reliability of occurrence: namely Measured, Indicated, and Inferred, according to their distance from a known point of coal-bed measurement. Measured coal is coal located within 0.25 mile (0.4 km) of a measurement point, Indicated coal extends 0.5 mile (0.8 km) beyond Measured coal to a distance of 0.75 mile (1.2 km) from the measurement point, and Inferred coal extends 2.25 miles (3.6 km) beyond Indicated coal to a distance of 3 miles (4.8 km) from the measurement point.

Undiscovered Resources are classified as either Hypothetical or Speculative. Hypothetical Resources are those undiscovered coal resources in beds that may reasonably be expected to exist in known coal fields under known geologic conditions. In general, Hypothetical Resources are located in broad areas of coal fields where the coal bed has not been observed and the evidence of coal's existence is from distant outcrops, drill holes, or wells that are more than 3 miles (4.8 km) away. Hypothetical Resources are located beyond the outer boundary of

the Inferred part of Identified Resources in areas where the assumption of continuity of the coal bed is supported only by extrapolation of geologic evidence. Speculative Resources are undiscovered resources that may occur in favorable areas where no discoveries have been made. Speculative Resources have not been estimated in this report.

For purposes of this report, Hypothetical Resources of lignite are in lignite beds which are 5 feet (1.5 m) or more thick, under less than 1,000 feet (305 m) of overburden, but occur 3 miles (4.8 km) or more from a coal-bed measurement.

Reserve Base coal is that economically minable part of Identified Resources from which Reserves are calculated. In this report, Reserve Base coal is the gross amount of Identified Resources that occurs in beds 5 feet (1.5 m) or more thick and under less than 1,000 feet (305 m) of overburden for lignite.

Reserve Base coal may be either surface-minable coal or underground-minable coal. In this report, surface-minable Reserve Base coal is lignite that is under less than 200 feet (61 m) of overburden. In this report, underground-minable Reserve Base coal is lignite that is under more than 200 feet (61 m), but less than 1,000 feet (305 m) of overburden.

Reserves are the recoverable part of Reserve Base coal. The coal beds in this part of Montana which borders Wyoming are relatively thin -- ranging from 2 feet (0.6 m) to as much as 30 feet (9.1 m) in thickness. Of the 17 coal beds in this area, most of them average 5 to 16 feet (1.5-4.9 m) in thickness, while only two of them average 21 to 30 feet (6.4 to 9.1 m) in thickness, respectively. Because of the relative thinness of the coal beds in this area, only 85 percent of the surface-minable Reserve Base coal is considered to be recoverable (a recovery factor of 85 percent). Thus, these Reserves amount to 85 percent of the surface-minable Reserve Base coal. The 85 percent recovery factor for this area contrasts with the 90 to 95 percent recovery factor prevalent for surface mining

found 30 miles (48 km) to the south in Wyoming where the coal beds are 100 to 125 feet (30-38 m) thick. The thicker the coal beds -- the higher the recovery factor can be for surface mining.

For economic reasons coal is not presently being mined by underground methods in the Northern Powder River Basin. Therefore, the underground-mining recovery factor is unknown and Reserves have not been calculated for the underground-minable Reserve Base coal.

Tonnages of coal resources were estimated using coal-bed thicknesses obtained from the coal isopach map for each coal bed (see list of illustrations). The coal resources, in short tons, for each isopached coal bed are the product of the acreage of coal (measured by planimeter), the average thickness in feet of the coal bed, and a conversion factor of 1,750 short tons of lignite per acre-foot (12,870 metric tons per hectare-meter). Tonnages of coal in Reserve Base, Reserves, and Hypothetical categories, rounded to the nearest one-hundredth of a million short tons, for each coal bed are shown on the Areal Distribution and Tonnage maps (see list of illustrations).

As shown by table 1, the total tonnage of federally owned, surface-minable Reserve Base coal in this quadrangle is estimated to be 45.58 million short tons (41.34 million t). There is no federally owned, surface-minable Hypothetical coal. As shown by table 2, the total federally owned, underground-minable Reserve Base coal is estimated to be 3.81 million short tons (2.89 million t). There is no federally owned, underground-minable Hypothetical coal. The total tonnage of surface- and underground-minable Reserve Base coal is 49.39 million short tons (44.80 million t).

About 6 percent of the surface-minable Reserve Base tonnage is classed as Measured, 33 percent as Indicated, and 61 percent as Inferred. None of the

underground-minable Reserve Base tonnage is Measured, 28 percent is Indicated, and 72 percent is Inferred.

The total tonnages per section for both Reserve Base and Hypothetical coal, including both surface- and underground-minable coal are shown in the northwest corner of the Federal coal lands in each section on plate 2. All numbers on plate 2 are rounded to the nearest one-hundredth of a million short tons.

COAL DEVELOPMENT POTENTIAL

There is a potential for surface-mining in the Northern Powder River Basin in areas where lignite beds 5 feet (1.5 m) or more thick are overlain by 200 feet (61 m) or less of overburden (the stripping limit). This thickness of overburden is the assigned stripping limit for surface mining of lignite in this area. Areas having a potential for surface mining were assigned a high, moderate, or low development potential based on their mining-ratio values (cubic yards of overburden per short ton of recoverable coal).

The formula used to calculate mining-ratio values for lignite is:

$$MR = \frac{t_o\,(cf)}{t_c(rf)}$$

where MR = mining ratio
t_o = thickness of overburden, in feet
t_c = thickness of lignite, in feet
rf = recovery factor = 0.85 in this area
cf = conversion factor = 0.922 cu. yds./ short ton for lignite

The mining-ratio values are used to rate the degree of potential that areas within the stripping limit have for surface-mining development. Areas having mining-ratio values of 0 to 10, 10 to 15, and greater than 15 are considered to have high, moderate, and low development potential, respectively. This grouping of mining-ratio values was provided by the U.S. Geological Survey and is based on economic and technological criteria. Mining-ratio contours and the

stripping-limit overburden isopach, which serve as boundaries for the development-potential areas, are shown on the overburden isopach and mining-ratio contour plates. Estimated tonnages of surface-minable Reserve Base and Hypothetical coal resources in each development-potential category (high, moderate, and low) are shown in table 1.

Estimated tonnages of underground-minable coal resources are shown in table 2. Because coal is not presently being mined by underground mining in the Northern Powder River Basin for economic reasons, for purposes of this report all of the underground-minable coal resources are considered to have low development potential.

Development potential for surface-mining methods

The Coal Development Potential (CDP) map included in this series of maps pertains only to surface mining. It depicts the highest coal development-potential category which occurs within each smallest legal subdivision of land (normally about 40 acres or 16.2 ha). For example, if such a 40-acre (16.2-ha) tract of land contains areas of high, moderate, and low development potential, the entire tract is assigned to the high development-potential category for CDP mapping purposes. Alternatively, if such a 40-acre (16.2-ha) tract of land contains areas of moderate, low, and no development potential, the entire tract is assigned to the moderate development-potential category for CDP mapping purposes. For practical reasons, the development-potential categories of areas of coal smaller than 1 acre (0.4 ha) have been disregarded in assigning a development potential to the entire 40-acre (16.2-ha) tract.

In areas of moderate to high topographic relief, the area of moderate development potential for surface mining of a coal bed (area having mining-ratio values of 10 to 15) is often restricted to a narrow band between the high and low development-potential areas. In fact, because of the 40-acre (16.2-ha) minimum

size of coal development-potential tracts, the narrow band of moderate development-potential area often does not appear on the CDP map because it falls within the 40-acre (16.2-ha) tracts that also include areas of high development potential. The Coal Development Potential (CDP) map then shows areas of high development potential abutting against areas of low development potential.

The Contact coal bed has a potential for surface mining along the northern border of the quadrangle. The Contact coal bed (pl. 11) has rather limited areas of high development potential extending from the outcrops up the hill slopes to the 10 mining-ratio contour. There are narrow bands of moderate development potential higher in the valleys between the 10 and 15 mining-ratio contours under the hills.

The Broadus coal bed has a potential for surface mining in the northwestern part of the quadrangle. The Broadus coal bed (pl. 8) has rather wide areas of high development potential extending from the outcrops to the 10 mining-ratio contour. A band of moderate development potential, in some places very narrow, parallels the high development potential. Wide areas of low development potential extend from the 15 mining-ratio contour to the arbitrarily assigned stripping limit at the 200-foot overburden isopach. Areas of no development potential exist under the crests of the hills above the 200-foot overburden isopach.

The Cache coal bed (pl. 5) has relatively large areas of high development potential for surface mining extending from the outcrops to the 10 mining-ratio contour. Rather limited areas of moderate development potential occur between the 10 and 15 mining-ratio contours. There are small areas of low development potential beyond the 15 mining-ratio contour.

The coal development-potential map for surface-mining methods is shown on the CDP map (pl. 13). About 8 percent of the Federal coal land in the quadrangle has a high development potential for surface mining, 2 percent has a

moderate development potential, 1 percent has a low development potential, and 89 percent has no development potential.

Development potential for underground mining and in-situ gasification

Subbituminous coal beds 5 feet (1.5 m) or more in thickness lying more than 500 feet (152 m) but less than 3,000 feet (914 m) below the surface and lignite beds of the same thickness lying more than 200 feet (61 m) but less than 1,000 feet (305 m) below the surface are considered to have development potential for underground mining. Estimates of the tonnage of underground-minable coal are listed in table 2 by development-potential category for each coal bed. Coal is not currently being mined by underground methods in the Northern Powder River Basin because of poor economics. Therefore, the coal development potential for underground mining of these resources for purposes of this report is rated as low, and a Coal Development Potential map for underground mining was not made.

In-situ gasification of coal on a commercial scale has not been done in the United States. Therefore, the development potential for in-situ gasification of coal found below the surface-mining limit in this area is rated as low, and a Coal Development Potential map for in-situ gasification of coal was not made.

Table 1.--Surface-minable coal resource tonnage (in short tons) by development-potential category for Federal coal lands in the Wild Bill Creek quadrangle, Powder River County, Montana, and Campbell County, Wyoming

[Development potentials are based on mining ratios (cubic yards of overburden/short ton of recoverable coal). To convert short tons to metric tons, multiply by 0.9072]

Coal bed	High development potential (0-10 mining ratio)	Moderate development potential (10-15 mining ratio)	Low development potential (>15 mining ratio)	Total
Reserve Base tonnage				
Cache	6,350,000	1,110,000	460,000	7,920,000
Broadus	9,000,000	6,570,000	18,460,000	34,030,000
Contact	1,240,000	1,160,000	1,230,000	3,630,000
Total	16,590,000	8,840,000	20,150,000	45,580,000

Table 2.--Underground-minable coal resource tonnage (in short tons) by development-potential category for Federal lands in the Wild Bill Creek quadrangle, Powder River County, Montana, and Campbell County, Wyoming

[To convert short tons to metric tons, multiply by 0.9072]

Coal bed	High Development potential	Moderate development potential	Low development potential	Total
Reserve Base tonnage				
Broadus	0	0	3,810,000	3,810,000
Total	0	0	3,810,000	3,810,000

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