UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

TEXT TO ACCOMPANY:

COAL RESOURCE OCCURRENCE

AND

COAL DEVELOPMENT POTENTIAL

MAPS

OF THE

LOST SPRINGS QUADRANGLE,

CONVERSE AND NIOBRARA COUNTIES, WYOMING

BY

INTRASEARCH INC.

DENVER, COLORADO

OPEN FILE REPORT 79-480

1979

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MAPS

CONVERSION TABLE

TO CONVERT	MULTIPLY BY	TO OBTAIN
inches	2.54	centimeters (cm)
feet	0.3048	meters (m)
miles	1.609	kilometers (km)
acres	0.40469	hectares (ha)
tons (short)	0.9072	metric tons (t)
cubic yards/ton	0.8428	cubic meters per metric tons
acre feet	0.12335	hectare-meters
Btu/lb	2.326	kilojoules/kilogram (kJ/kg)
Btu/lb	0.55556	kilocalories/kilogram (kcal/kg)
Fahrenheit	5/9 (F-32)	Celsius

I. Introduction

This report and accompanying maps set forth the Coal Resource Occurrence (CRO) and Coal Development Potential (CDP) of coal beds within the Lost Springs Quadrangle, Converse and Niobrara Counties, Wyoming. This CRO and CDP map series (U. S. Geological Survey Open-File Report 79-480) includes 3 plates and 4 figures. The project is compiled by IntraSearch Inc., 5351 South Roslyn Street, Englewood, Colorado, under KRCRA Eastern Powder River Basin, Wyoming Contract Number 14-08-0001-17180. This contract is part of a program to provide an inventory of unleased federal coal in Known Recoverable Coal Resource Areas (KRCRAs) in the western United States.

The Lost Springs Quadrangle is located in Converse and Niobrara Counties in northeastern Wyoming. It encompasses all or parts of Townships 32, 33, and 34 North, Ranges 67 and 68 west, and covers the area: 42°45' to 42°52'30" north latitude; 104°52'30" to 105°00' west longitude.

Main access to the Lost Springs Quadrangle is provided by U. S. Highway 18-20 which traverses the extreme southern portion of the quadrangle. A maintained gravel road branches from U. S. Highway 18-20 and extends northward. A network of minor roads and trails provides additional access to the area. The Chicago and North Western Railroad parallels U. S. Highway 18-20.

The East Fork of Twentymile Creek flows northward across the Lost Springs coal field into the Cheyenne River. Lost Creek drains southward into the North Platte River. Topographic elevations within the Lost Springs Quadrangle attain heights of 5560 feet (1695 m) above sea level, 400 to 500 feet (122 to 152 m) above the valley floors.

The 10 to 12 inches (25 to 30 cm) of annual precipitation that falls in this semi-arid region accrues principally in the springtime.

Summer and fall precipitation usually originates from thunderstorms, and infrequent snowfalls of six inches (15 cm) or less generally characterize winter precipitation. Although temperatures ranging from less than -25°F (-32°C) to more than 100°F (38°C) have been recorded near Douglas, Wyoming, average wintertime minimums and summertime maximums approach +5° to +°15F (-15° and -9°C) and 75° to 90°F (24° to 32°C), respectively.

Surface ownership is divided among fee, state, and federal categories with the state and federal surface generally leased to ranchers for grazing purposes. Details of surface ownership are available at the Converse and Niobrara County Courthouses in Douglas and Lusk, Wyoming, respectively. Details of mineral ownership on federal lands are available from the U. S. Bureau of Land Management in Cheyenne, Wyoming. Federal coal ownership is shown on Plate 2 of the Coal Resource Occurrence maps. The non-federal coal ownership comprises both fee and state coal resources.

The Coal Resource Occurrence and Coal Development Potential program pertains to unleased federal coal and focuses upon: 1) the delineation of lignite, subbituminous coal, bituminous coal, and anthracite at the surface and in the subsurface on federal land; 2) subdivision of deposits into measured, indicated, and inferred reserve resource categories, and hypothetical resources; 3) the measurement of coal resources in place as well as reserves; and 4) the determination of the potential for surface or underground mining, and in-situ gasification of the coal beds. This report contains an evaluation of the coal resources of all unleased federal coal beds in the quadrangle, which are 5 feet (1.5 m) or greater in thickness and occur at depths

down to 3000 feet (914 m). No resources or reserves are computed for leased federal coal, state coal, fee coal, or lands encompassed by coal prospecting permits and preference-right lease applications.

Surface and subsurface geological and engineering extrapolations drawn from the current data base suggest the occurrence of approximately 1.8 million tons (1.6 million metric tons) of unleased federal coal resources in the Lost Springs Quadrangle.

The suite of maps that accompany this report set forth and portray the coal resource and reserve occurrence in considerable detail. For the most part, this report supplements the cartographically displayed information with minimum verbal duplication of the CRO-CDP map data.

II. Geology

Regional. The thick, economic coal deposits of the Powder River Basin in northeastern Wyoming occur mostly in the Tongue River Member of the Fort Union Formation, and in the lower part of the Wasatch Formation. Approximately 3000 feet (914 m) of the Fort Union Formation, that includes the Tongue River, Lebo, and Tullock Members of Paleocene age, are unconformably overlain by approximately 700 feet (213 m) of the Wasatch Formation of Eocene age. These Tertiary formations lie in a structural basin flanked on the east by the Black Hills uplift, on the south by the Hartville and Casper Mountain uplifts, and on the west by the Casper Arch and the Big Horn Mountain uplift. The structural configuration of the Powder River Basin originated in Late Cretaceous time, with episodic uplift thereafter. The Cretaceous Cordillera was the dominant positive land form throughout the Rocky Mountain area at the close of Mesozoic time.

Outcrops of the Wasatch Formation and the Tongue River Member of the Fort Union Formation cover most of the areas of major coal resource occurrence in the Powder River Basin. The Tongue River Member is composed of very fine-grained sandstones, siltstones, claystones, shales, carbonaceous shales, and numerous coal beds. The Lebo Shale Member of the Fort Union Formation consists of light-to dark-gray very fine-grained to conglomeratic sandstone with interbedded siltstone, claystone, carbonaceous shale and thin coal beds. Thin bedded calcareous ironstone concretions interbedded with massive white sandstone and slightly bentonitic shale occur throughout the unit (Denson and Horn, 1975). The Lebo Member is mapped at the surface northeast of Recluse, Wyoming, east of the principal coal outcrops and associated clinkers (McKay, 1974), and presumably projects into the subsurface beneath much of the basin. One of the principal characteristics for separating the Lebo and Tullock Members (collectively referred to as the Ludlow Member east of Miles City, Montana) from the overlying Tongue River Member is the color differential between the lighter-colored upper portion and the somewhat darker lower portion (Brown, 1958). Although geologists working with subsurface data, principally geophysical logs, in the basin are trying to develop criteria for subsurface recognition of the Lebo-Tullock and Tongue River-Lebo contacts, no definitive guidelines are known to have been published. Hence, for subsurface mapping purposes, the Fort Union Formation is not divided into its members for this study.

During the Paleocene epoch, the Powder River Basin tropic to subtropic depositional environment included broad, inland flood basins with extensive swamps, marshes, freshwater lakes, and a sluggish but active northeastward discharging drainage system, superimposed on an

emerging sea floor, near base level. Much of the vast area where organic debris collected was within a reducing depositional environment. Localized uplifts began to disturb the near sea level terrain of northeastern Wyoming following retreat of the Cretaceous seas. However, the extremely fine-grained characteristics of the Tongue River Member clastics suggest that areas of recurring uplift peripheral to the Powder River Basin were subdued during major coal deposit formation.

The uplift of areas surrounding the Powder River Basin created a structural basin of asymmetric characteristic, with the steep west flank located on the eastern edge of the Big Horn Mountains. The axis of the Powder River Basin is difficult to specifically define, but is thought to be located in the western part of the Basin, and to display a north-south configuration some 15 to 20 miles (24 to 32 km) east of Sheridan, Wyoming. Thus, the sedimentary section described in this report lies on the east flank of the Powder River Basin, with gentle dips of two degrees or less disrupted by surface structure thought to relate to tectonic adjustment and differential compaction.

Some coal beds in the Powder River Basin exceed 200 feet (61 m) in thickness. Deposition of these thick, in-situ coal beds requires a discrete balance between subsidence of the earth's crust and in-filling by trememdous volumes of organic debris. These conditions in concert with a favorable ground water table, non-oxidizing clear water, and a climate amenable to the luxuriant growth of vegetation produce a stabilized swamp critical to the deposition of coal beds.

Deposition of the unusually thick coal beds of the Powder River Basin may be partially attributable to short-distance water transportation of organic detritus into areas of crustal subsidence.

Variations in coal bed thickness throughout the basin relate to changes in the depositional environment. Drill hole data that indicate either the complete absence or extreme attenuation of a thick coal bed probably relate to location of the drill holes within the ancient stream channel system draining this low land area in Early Cenozoic time. Where thick coal beds thin rapidly from the depocenter of a favorable depositional environment, it is not unusual to encounter a synclinal structure over the maximum coal thickness due to the differential compaction between organic debris in the coal depocenter and fine-grained clastics in the adjacent areas.

The Wasatch Formation of Eocene age crops out over most of the central part of the Powder River Basin and exhibits a disconformable contact with the underlying Fort Union Formation. The contact has been placed at various horizons by different workers; however, for the purpose of this report, the contact is positioned near the top of the Roland coal bed as mapped by Olive (1957) in northwestern Campbell County, Wyoming, and is considered to disconformably descend in the stratigraphic column to the top of the Wyodak-Anderson coal bed (Roland coal bed of Taff, 1909) along the eastern boundary of the coal measures. No attempt is made to differentiate the Wasatch and Fort Union Formations on geophysical logs or in the subsurface mapping program that is a part of this CRO-CDP project.

Although Wasatch and Fort Union lithologies are too similar to allow differentiation in some areas, most of the thicker coal beds occur in the Fort Union section on the east flank of the Powder River Basin. Furthermore, orogenic movements peripheral to the basin apparently increased in magnitude during Wasatch time causing the deposition of

friable, coarse-grained to gritty, arkosic sandstones, fine- to very fine-grained sandstones, siltstones, mudstones, claystones, brown-to-black carbonaceous shales and coal beds. These sediments are noticeably to imperceptibly coarser than the underlying Fort Union clastics.

The Lost Springs Quadrangle is located in an area where surface rocks are classified into the White River Formation and the Fort Union Formation. This report utilizes data from Winchester (1912).

Local. The Lost Springs Quadrangle lies on the eastern flank of the Powder River Basin, where the strata dip gently westward. The Arikaree Formation of Lower Miocene age crops out over the southeastern portion of the study area. The Arikaree Formation is composed of buff to tan sandstones, altered ash beds, and conglomerates. The White River Formation of Oligocene age crops out in a diagonal pattern extending southwestward across the center of the quadrangle. Comprised of light-colored clays, soft sandstones, and coarse conglomerates, the White River Formation unconformably overlies the Fort Union Formation. The Fort Union Formation of Paleocene age crops out over the northern portion of the study area. The Fort Union Formation is composed of very fine-grained sandstones, siltstones, claystones, shales, carbonaceous shales, and numerous coal beds (Denson and Horn, 1975).

III. Data Sources

Areal geology of the coal outcrops is derived from Winchester (1912). The coal bed outcrops are adjusted to the current topographic map of the area. Where outcrop and subsurface data is lacking an insufficient data line is drawn. The outcrop mapping is derived and enlarged from a 1:125,000 scale publication (Winchester, 1912). The structural elevation control points established on the outcrop configuration are

considered to be plus or minus 50 to 100 feet (15 to 30 m) in accuracy. Numerous irregularities in outcrop elevations and the areal geology-topographic map relationship emphasizes that these maps present a generalized configuration of the coal bed outcrop. Horizontal accuracy of the outcrop location is estimated at plus or minus 1000 feet (305 m).

The major source of subsurface control, particularly on deep coal beds, is the geophysical logs from oil and gas test bores and producing wells. Some geophysical logs are not applicable to this study, for the logs relate only to the deep potentially productive oil and gas zones. More than eighty percent of the logs include resistivity, conductivity, and self-potential curves. Occasionally the logs include gamma, density, and sonic curves. These logs are available from several commercial sources.

All geophysical logs available in the quadrangle are scanned to select those with data applicable to Coal Resource Occurrence mapping. Paper copies of the logs are obtained, interpreted, and coal intervals annotated. Maximum accuracy of coal bed indentification is accomplished where gamma, density, and resistivity curves are available. Coal bed tops and bottoms are picked on the logs at the midpoint between the minimum and maximum curve deflections. The correlation of coal beds within and between quadrangles is achieved utilizing a fence diagram to associate local correlations with regional coal occurrences.

In some parts of the Powder River Basin, additional subsurface control is available from U. S. Geological Survey open-file reports that include geophysical and lithologic logs of shallow holes drilled specifically for coal exploration. A sparse scattering of subsurface data points are shown on unpublished CRO-CDP maps compiled by the U. S. Geological Survey, and where these data are utilized, the rock-coal intervals are shown on the Coal Data Map (Plate 1). Inasmuch as these drill

holes have no identifier headings, they are not set forth on the Coal Data Sheet (Plate 3). The geophysical logs of these drill holes were not available to IntraSearch to ascertain the accuracy of horizontal location, topographic elevation, and downhole data interpretation.

The reliability of correlations, set forth by IntraSearch in this report, vary depending on: the density and quality of lithologic and geophysical logs; the detail, thoroughness, and accuracy of published and unpublished surface geological maps, and interpretative proficiency. There is no intent on the part of IntraSearch to refute nomenclature established in the literature or used locally by workers in the area. IntraSearch's nomenclature focuses upon the suggestion of regional coal bed names applicable throughout the eastern Powder River Basin. It is expected and entirely reasonable that some differences of opinion regarding correlations, as suggested by IntraSearch, exist. Additional drilling for coal, oil, gas, water, and uranium, coupled with expanded mapping of coal bed outcrops and associated clinkers will broaden the data base for coal bed correlations and allow continued improvement in the understanding of coal bed occurrences in the eastern Powder River Basin.

The topographic map of the Lost Springs Quadrangle is published by the U. S. Geological Survey, compilation date, 1970. Land network and mineral ownership data are compiled from land plats available from the U. S. Bureau of Land Management in Cheyenne, Wyoming. This information is current to October 13, 1977.

IV. Coal Bed Occurrence

Winchester (1912) reports numerous coal bed outcrops in the Lost Springs Quadrangle, and five coal beds are present in the subsurface. However, with the exception of one coal bed in the Fort Union Formation,

labeled the Local coal bed, all of the coal beds are less than 5 feet (1.5 m) thick and are of limited areal extent. Hence, they are not mapped. A complete suite of figures (structure, isopach, mining ratio, overburden, identified resources, and areal distribution of identified resources) is prepared for the Local coal bed.

The following "as received" basis proximate analysis is published for the Local coal bed:

COAL BED NAME		ASH %	FIXED CARBON %	MOISTURE %	VOLATILES %	SULFUR %	BTU/LB
	Lab. No.						
(Local)	10775*	9.99	35.7	27.6	26.7	1.03	7810

* - Winchester, 1912

The Coal Data Sheet, Plate 3, shows the downhole identification of coal beds within the quadrangle as interpreted from geophysical logs from oil and gas test bores and producing sites. This portrayal is schematic by design; hence, no structural or coal thickness implications are suggested by the dashed correlation lines projected through no record (NR) intervals. The uppermost subsurface local coal bed is designated as datum for the correlation diagram.

Throughout approximately ninety-five percent of the Lost Springs Quadrangle either insufficient data exists to evaluate the Local coal bed or the Local coal bed is eroded. Due to the scarcity of subsurface data, mapping control is derived from surface measured sections (Winchester, 1912). Because the Local coal bed is mapped only in the northeastern quadrant, 8 1/2 x 11 inch (22 x 28 cm) figures rather than quadrangle sized maps set forth the CRO/CDP data (Figures 1 - 4). The Local coal bed averages approximately 5 feet (1.5 m) thick, and it dips to the northwest. The

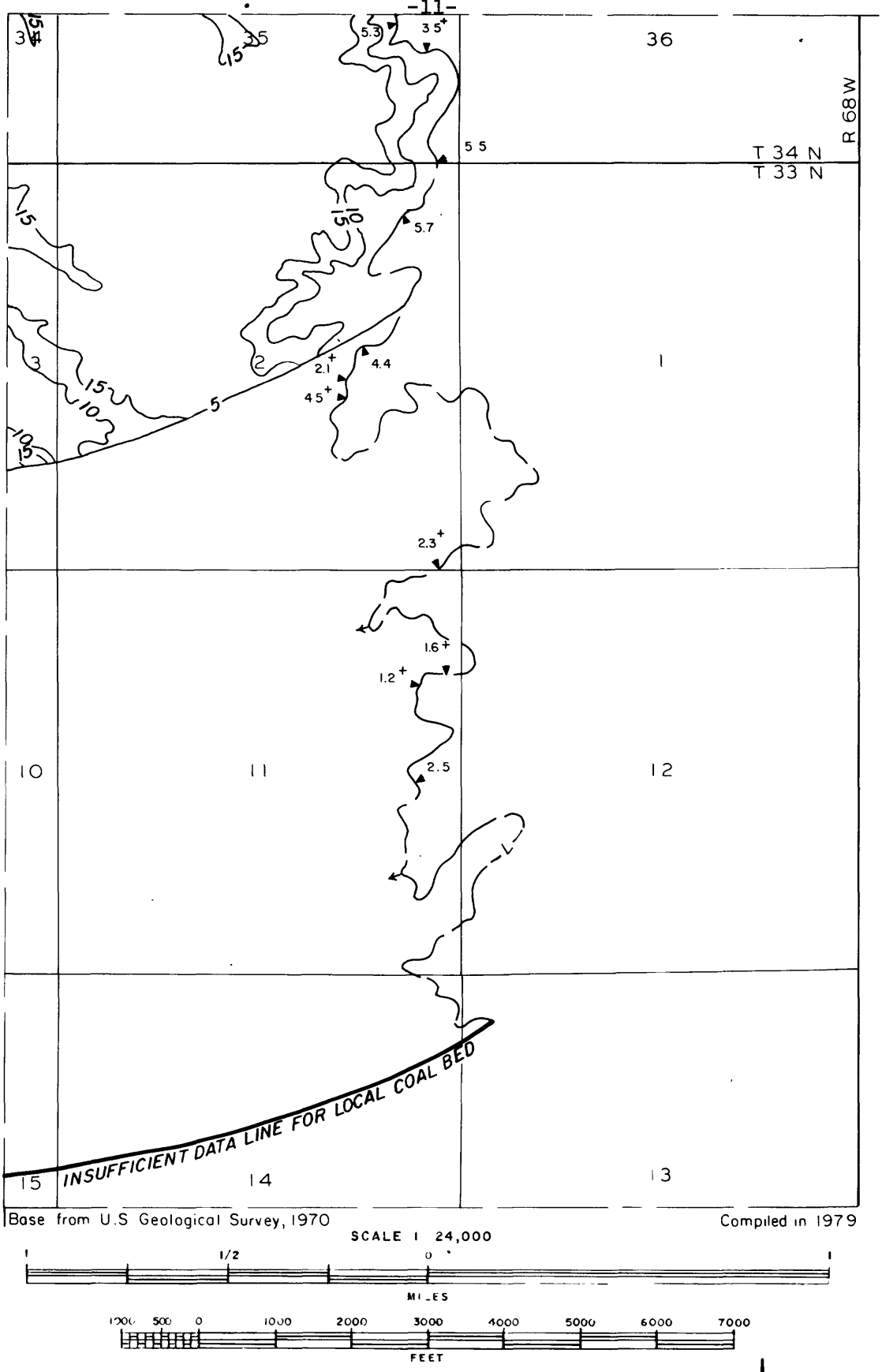
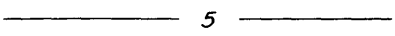
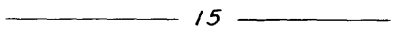


FIGURE 1
ISOPACH AND MINING RATIO MAP
OF LOCAL COAL BED IN
LOST SPRINGS QUADRANGLE
CONVERSE AND NIOBRARA COUNTIES, WYOMING
(See following page for Explanation)

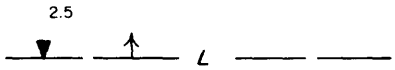
EXPLANATION FOR FIGURE 1



ISOPACHS OF COAL BED-Showing thickness in feet.



MINING RATIO CONTOUR-Number indicates cubic yards of overburden per ton of recoverable coal by surface mining methods. Contours shown only in area suitable for surface mining within the stripping limit.



TRACE OF COAL BED OUTCROP-Showing coal thickness in feet, measured at triangle. Arrow points toward the coal-bearing area. Coal bed dashed where inferred.

To convert feet to meters multiply feet by 0.3048.

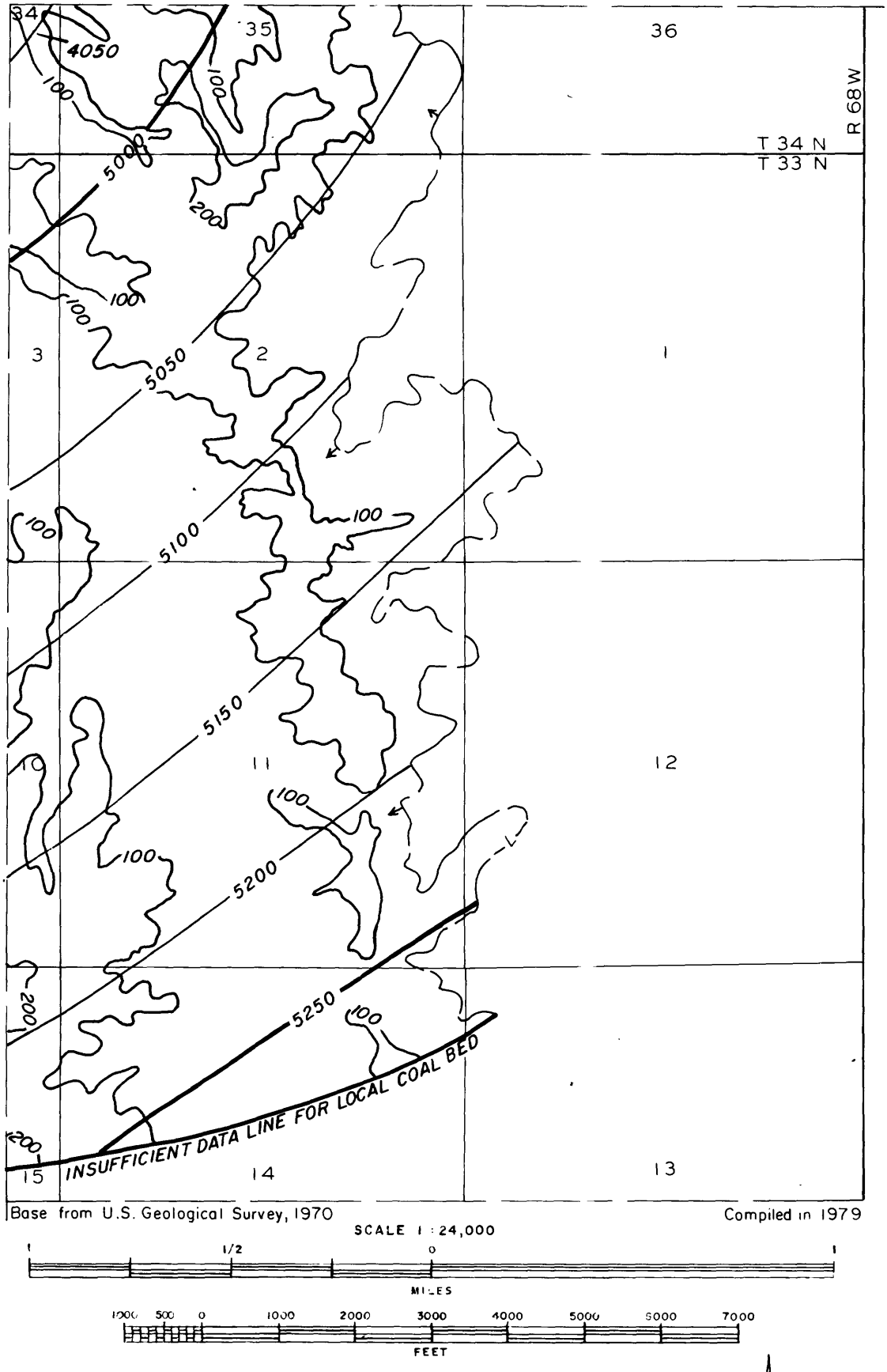
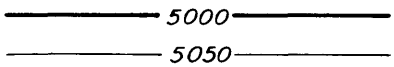
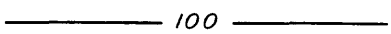


FIGURE 2
STRUCTURE CONTOUR AND ISOPACH OF OVERBURDEN MAP
OF LOCAL COAL BED IN
LOST SPRINGS QUADRANGLE
CONVERSE AND NIOBRARA COUNTIES, WYOMING
(See following page for Explanation)

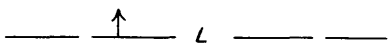
EXPLANATION FOR FIGURE 2



STRUCTURE CONTOURS-Drawn on top of coal bed. Contour interval 50 feet. Datum is mean sea level.



OVERBURDEN ISOPACH-Showing thickness of overburden, in feet, from the surface to the top of the coal bed. Isopach interval 100 feet.



TRACE OF COAL BED OUTCROP-Arrow points toward the coal-bearing area. Coal bed dashed where inferred.

To convert feet to meters multiply feet by 0.3048.

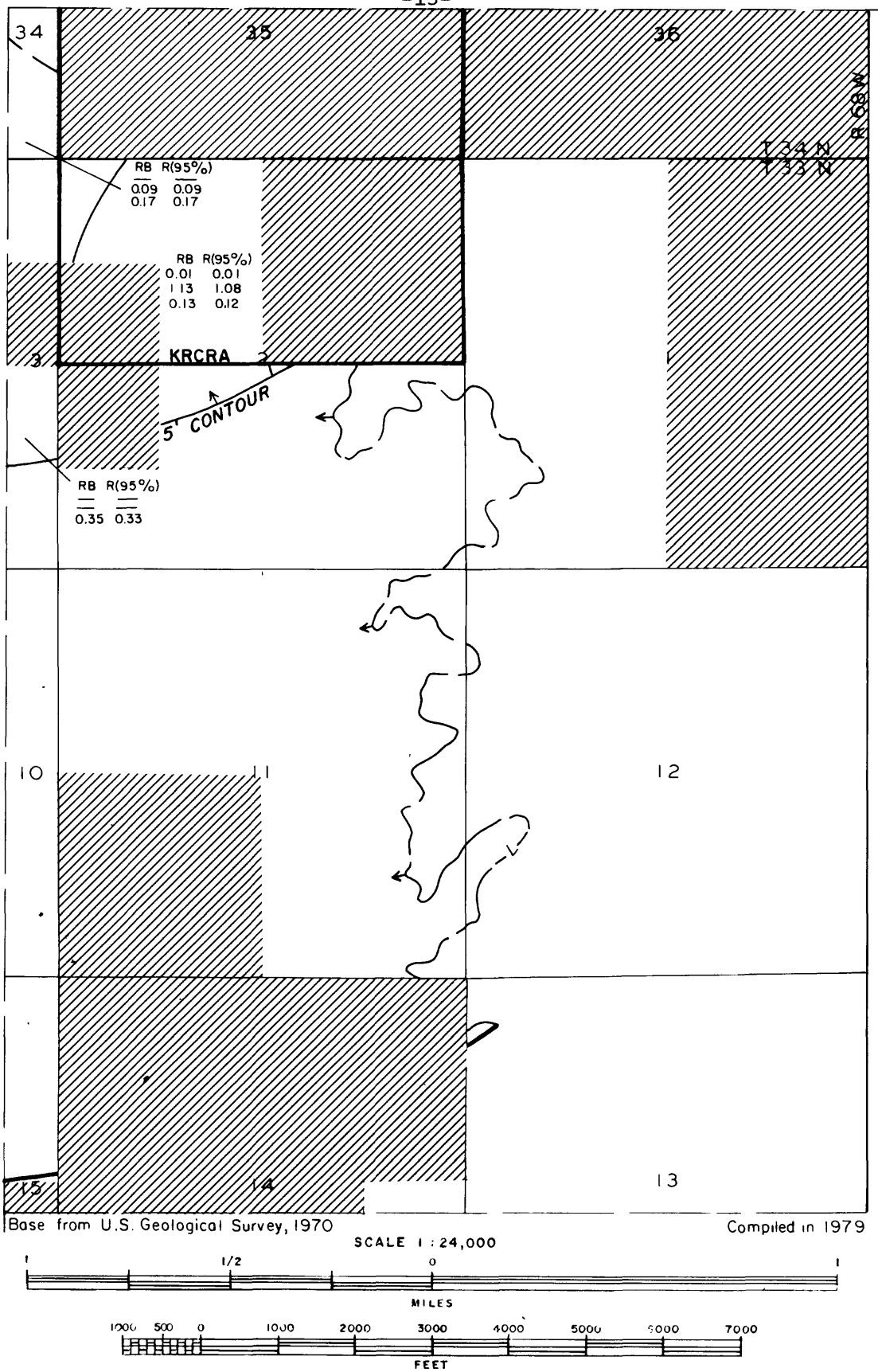
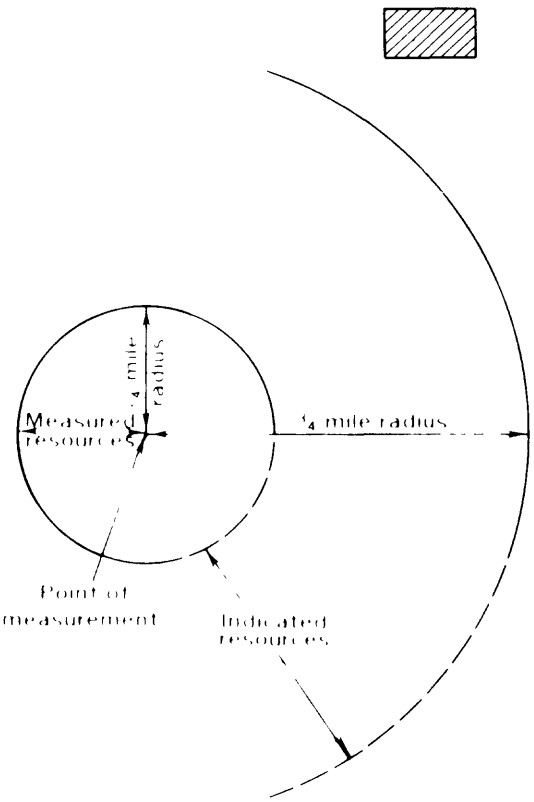


FIGURE 3
AREAL DISTRIBUTION OF IDENTIFIED RESOURCES
AND IDENTIFIED RESOURCES MAP
OF LOCAL COAL BED IN
LOST SPRINGS QUADRANGLE
CONVERSE AND NIOBRARA COUNTIES, WYOMING
(See following page for Explanation)

EXPLANATION FOR FIGURE 3

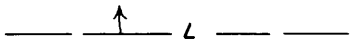


NON-FEDERAL COAL LAND-Coal tonnages not evaluated.

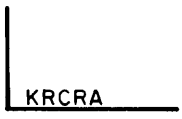
BOUNDARY LINES-Enclosing areas of measured, indicated and inferred coal resources of the coal bed. Dashed where projected from adjacent quadrangles.

RB	R(95%)	
001	001	(Measured)
113	108	(Indicated)
013	012	(Inferred)

IDENTIFIED RESOURCES OF COAL BED-In millions of short tons. Dash indicates no resources in that category. Reserve Base (RB) x the recovery factor (95%) = Reserves (R).



TRACE OF COAL BED OUTCROP-Arrow points toward the coal-bearing area. Coal bed dashed where inferred.



KNOWN RECOVERABLE COAL RESOURCE AREA-KRCRA

To convert short tons to metric tons multiply short tons by 0.9072.

To convert miles to kilometers multiply miles by 1.609.

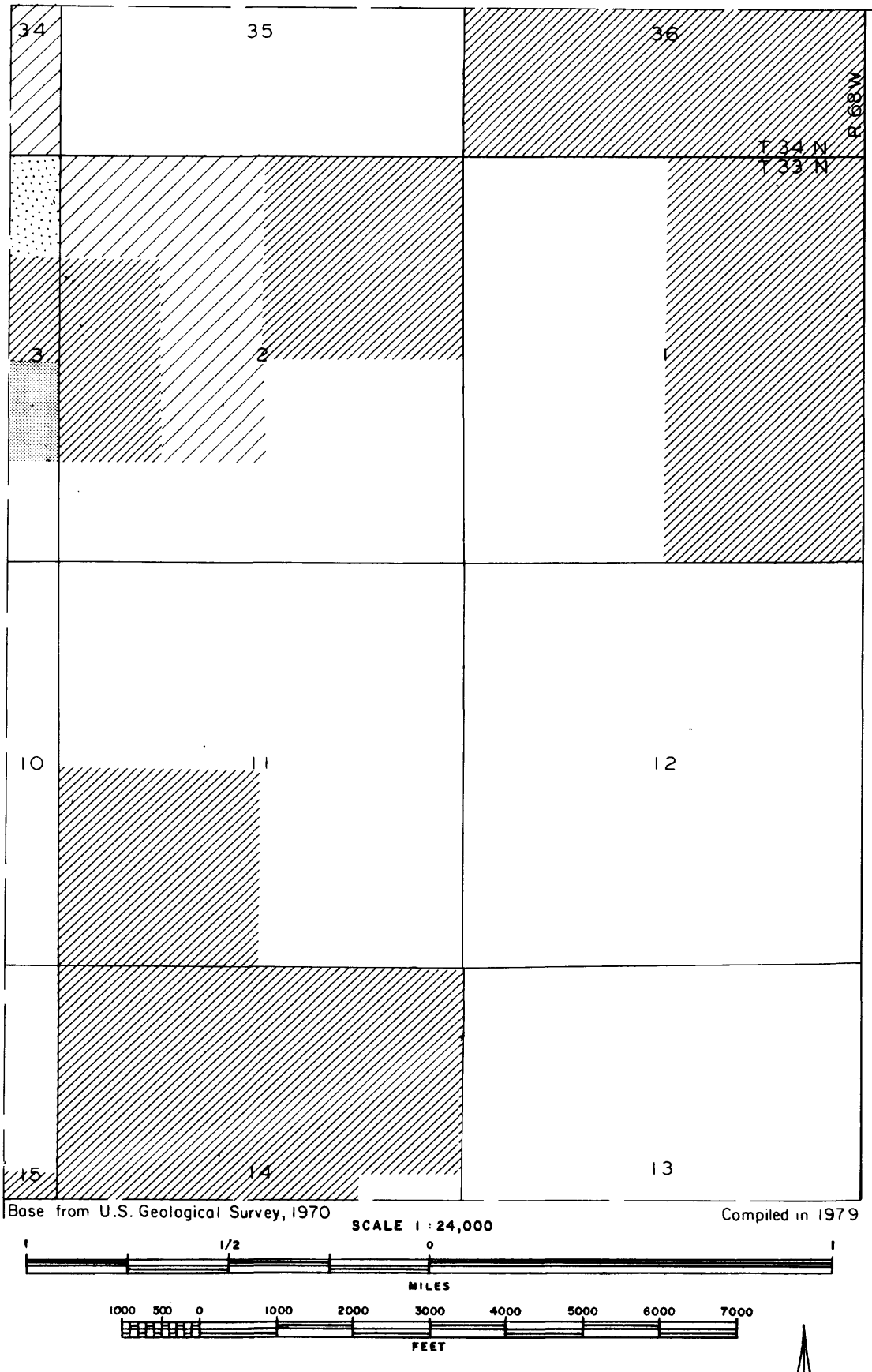
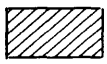
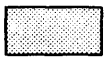


FIGURE 4
COAL DEVELOPMENT POTENTIAL
FOR SURFACE MINING METHODS MAP
LOST SPRINGS QUADRANGLE
CONVERSE AND NIOBRARA COUNTIES, WYOMING
(See following page for Explanation)

EXPLANATION FOR FIGURE 4



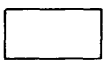
NON-FEDERAL COAL LAND-Coal development potential is not rated



AREA OF HIGH COAL DEVELOPMENT POTENTIAL FOR SURFACE MINING METHODS-Area has mining ratio values ranging from 0 to 10.

AREA OF MODERATE COAL DEVELOPMENT POTENTIAL FOR SURFACE MINING METHODS-Area has mining ratio values ranging from 10 to 15.

AREA OF LOW COAL DEVELOPMENT POTENTIAL FOR SURFACE MINING METHODS-Area has mining ratio values greater than 15.



AREA OF NO COAL DEVELOPMENT POTENTIAL FOR SURFACE MINING METHODS-Area contains no known coal in beds 5 feet (1.5 m) or more thick within 500 feet (152 m) of the surface.

Local coal bed lies less than 300 feet (91 m) beneath the surface throughout its area of occurrence within the quadrangle.

V. Geological and Engineering Mapping Parameters

Isopach lines are drawn to honor selected surface measured sections where there is sparse subsurface control. Where isopach contours do not honor surface measured sections, the surface thicknesses are thought to be attenuated by oxidation and/or erosion, hence not reflective of total coal thickness. Isopach lines extend to the coal bed outcrops, the projections of coal bed outcrops, and the contact between porcellanite (clinker) and unoxidized coal in place. Attenuation of total coal bed thickness is known to take place near these lines of definition; however, the overestimation of coal bed tonnages that results from this projection of total coal thickness is insignificant to the Coal Development Potential maps. Structure contour maps are constructed on the tops of the main coal beds. Where subsurface data are scarce, supplemental structural control points are selected from the topographic map along coal outcrops.

In preparing overburden isopach maps, no attempt is made to identify coal beds that occur in the overburden to a particular coal bed under study. Mining ratio maps for this quadrangle are constructed utilizing a ninety-five percent recovery factor. Contours of these maps identify the ratio of cubic yards of overburden to tons of recoverable coal. Where ratio control points are sparse, interpolated points are computed at the intersections of coal bed and overburden isopach contours using coal structure, coal isopach, and topographic control. On the Areal Distribution of Identified Resources Map (ADIR), coal bed reserves are not calculated where the coal is less than 5 feet (1.5 m) thick, where the coal occurs at a depth greater than 500 feet (152 m), where non-federal coal exists, or where federal coal leases, preference-right lease applications, and coal prospecting permits exist.

Coal tonnage calculations involve the planimetering of areas of measured, indicated, inferred reserves and resources, and hypothetical resources to determine their areal extent in acres. An Insufficient Data Line is drawn to delineate areas where surface and subsurface data are too sparse for CRO map construction. Various categories of resources are calculated in the unmapped areas by utilizing coal bed thicknesses mapped in the geologically controlled area adjacent to the insufficient data line. Acres are multiplied by the average coal bed thickness and 1750, or 1770 (the number of tons of lignite A or subbituminous C coal per acre-foot, respectively; 12,874 or 13,018 metric tons per hectare-meter, respectively), to determine total tons in place. Recoverable tonnage is calculated at ninety-five percent of the total tons in place. Where tonnages are computed for the CRO-CDP map series, resources and reserves are expressed in millions of tons. Frequently the planimetering of coal resources on a sectionized basis involves complexly curvilinear lines (coal bed outcrop and 500-foot stripping limit designations) in relationship with linear section boundaries and circular resource category boundaries. Where these relationships occur, generalizations of complexly curvilinear lines are discretely utilized, and resources and/or reserves are calculated within an estimated two to three percent plus or minus accuracy.

VI. Coal Development Potential

Strippable Coal Development Potential. Areas where coal beds are 5 feet (1.5 m) or more in thickness and are overlain by 500 feet (152 m) or less of overburden are considered to have potential for surface mining and are assigned a high, moderate, or low development potential based on the mining ratio (cubic yards of overburden per ton of recoverable coal). The formula used to calculate mining ratios for subbituminous coal is as follows:

$$MR = \frac{to\ (0.911)^*}{tc\ (rf)}$$

where MR = mining ratio
to = thickness of overburden
tc = thickness of coal
rf = recovery factor
0.911*= conversion factor (cu. yds./ton)

*A conversion factor of 0.922 is used for lignite.

A surface mining potential map (Figure 4) is prepared utilizing the following mining ratio criteria for coal beds 5 to 40 feet (1.5 to 12 m) thick:

1. Low development potential = 15:1 and greater ratio.
2. Moderate development potential = 10:1 to 15:1 ratio.
3. High development potential = 0 to 10:1 ratio.

The following mining ratio criteria is utilized for coal beds greater than 40 feet (12 m) thick:

1. Low development potential = 7:1 and greater ratio.
2. Moderate development potential = 5:1 to 7:1 ratio.
3. High development potential = 0 to 5:1 ratio.

Most of the Lost Springs Quadrangle shows no potential for surface mining development due to the extreme thinness or absence of coal beds. Minute areas of high, moderate, or low surface mining potential occur in regions of the northeastern quadrant where overburden to coal thickness ratios are favorable for the Local coal bed. Table 1 sets forth the estimated strippable reserve base tonnages per coal bed for the quadrangle.

Underground Mining Coal Development Potential. Subsurface coal mining potential throughout the Lost Springs Quadrangle is considered low, hence no CDP map was prepared for this map series.

In-Situ Gasification Coal Development Potential. The evaluation of subsurface coal deposits for in-situ gasification potential

relates to the occurrence of coal beds more than 5 feet (1.5 m) thick buried from 500 to 3000 feet (152 to 914 m) beneath the surface. This categorization is as follows:

1. Low development potential relates to: 1) a total coal section less than 100 feet (30 m) thick that lies 500 feet (152 m) to 3000 feet (914 m) beneath the surface, or 2) a single coal bed or coal zone 5 feet (1.5 m) or more in thickness which lies 500 feet (152 m) to 1000 feet (305 m) beneath the surface.

2. Moderate development potential is assigned to a total coal section from 100 to 200 feet (30 to 61 m) thick, and buried from 1000 to 3000 feet (305 to 914 m) beneath the surface.

3. High development potential involves 200 feet (61 m) or more of total coal thickness buried from 1000 to 3000 feet (305 to 914 m).

The coal development potential for in-situ gasification within the Lost Springs Quadrangle is low, hence no CDP map is generated for this map series.

Table 1.--Strippable Coal Reserve Base Data (in short tons) for Federal Coal Lands in the Lost Springs Quadrangle, Converse and Niobrara Counties, Wyoming.

Development potentials are based on mining ratios (cubic yards of overburden/ton of recoverable coal).

Coal Bed	High Development Potential (0-10:1 Mining Ratio)	Moderate Development Potential (10:1-15:1 Mining Ratio)	Low Development Potential (>15:1 Mining Ratio)	Total
Local	-----	-----	1,800,000	1,800,000
TOTAL	-----	-----	1,800,000	1,800,000

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