

RESOURCE SERIES 27

COAL RESOURCES
OF THE
COLORADO SPRINGS 1/2° X 1° QUADRANGLE, COLORADO

by
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Introduction

This report and series of maps present the findings of an investigation entitled "Exploratory coal drilling and coring program in the Colorado Springs 1/2° X 1° Quadrangle, Colorado". This program is a cooperative investigation conducted by the Colorado Geological Survey and funded by U.S. Geological Survey Grant No. 14-08-0001-A0086. It is part of a nationwide program sponsored by the U.S. Geological Survey to assess the quality and quantity of the nation's coal resources, as authorized by the Federal Coal Leasing Amendments Act of October 1975.

The primary goal of the investigation is to evaluate the coal resources in the approximately 1900 mi² (4900 km²) Colorado Springs 1/2° X 1° quadrangle. Only about one-third of the quadrangle is underlain by coal. Existing data was thoroughly researched, including drillers' logs and geophysical logs from coal exploration holes, uranium exploration drill holes, water wells, oil and gas wells, and miscellaneous other sources.

Primary data sources included the Colorado State Board of Land Commissioners (logs of coal exploration drill holes drilled on state lands), the Colorado Oil and Gas Conservation Commission (oil and gas well logs), the Colorado Mined Land Reclamation Division (information on holes drilled near abandoned mines), the Colorado Division of Mines (coal mine maps and data) the Colorado Division of Water Resources and U.S. Geological Survey, Water Resources Division (water well information), and private industry (exploratory drill hole data). No drilling was done by the Colorado Geological Survey for this project, however, a brief field investigation was conducted. Information from previous studies was the source of all data. Proprietary information was deleted on the published version of this report.

The Colorado Springs 1/2° X 1° quadrangle is located between latitude 38° 30' and 39°N and longitude 104° and 105°W (see Figure 1). The quadrangle includes most of El Paso County (approximately the southern three-fourths) and small portions of Elbert, Lincoln, Crowley, Pueblo, Fremont and Teller Counties. Only El Paso and Elbert Counties are underlain by coal in this quadrangle.

The Colorado Springs 1/2° X 1° quadrangle lies within the Great Plains physiographic province of the Interior Basin (Fenneman, 1931). The major structural features in the quadrangle are the Denver Basin, which comprises most of the northern half, the Front Range uplift in the west and the Apishapa uplift in the south. The Denver Basin is bounded by the outcrop of the Laramie Formation, which contains the oldest coal beds in the region. Coal beds also occur in the Denver Formation within the quadrangle. A generalized stratigraphic column of rocks from Upper Cretaceous through Eocene in age is presented in Figure 2.

Most of the information obtained from this investigation is presented in map and table form. This text serves as a general introduction and outline for the maps. For a more detailed discussion on the geography and geology of the area the following are recommended: Kirkham and Ladwig (1979) and Romero (1976).

Our nation's expanding energy demand requires that a detailed knowledge of our coal resources be available. The identification and classification of these coal resources provides information that will help to optimize resource recovery, and aid in land use decisions and energy planning.

Laramie Formation Coal Zone

The Laramie Formation coal zone underlies the Denver Basin and reaches a maximum depth of about 2,200 ft (675 m) along the basin axis in the north-central part of the quadrangle. The formation crops out in a roughly semicircular band (see Figure 4). The general stratigraphy of the Laramie Formation in the quadrangle is shown in Figure 3. The stratigraphy of the Laramie Formation coal zone is complex and changes significantly across the quadrangle. These changes in the lithologic characteristics of the coal zone and scarcity of data points in most of the quadrangle make correlation difficult.

The Laramie Formation coal zone was deposited within a delta-plain facies in channels, levees, splays, swamps and lakes (Kirkham and Ladwig, 1979). Coal distribution and stratigraphy in the Laramie Formation coal zone can be interpreted through the use of deltaic sedimentation models. The coals developed primarily in poorly drained swamps in overbank areas adjacent to the channel-margin facies (Weimer, 1973). Areas which don't contain coal were probably channel and channel-margin environments. Sandstones were deposited in channel environments, light gray, massive claystones were deposited in the well-drained swamps, and light-colored silts and clays were deposited on the levees. Peat and dark gray, organic-rich claystone were deposited in the poorly drained swamps in overbank areas and occasionally in abandoned channels. Fine-to medium-grained sandstones were deposited in overbank areas when crevasse splays broke through the levees.

Reliable water well and oil and gas well logs were the only data sources available for most of the quadrangle, especially where depths to the coal zone exceed several hundred feet. Areas of concentrated data exist near the edge of the basin, where there has been extensive coal exploration drilling or mining. Limited exposures of the Laramie Formation coal zone occur within the quadrangle. A few outcrops of the Laramie occur along stream courses including Horse Creek, Black Squirrel Creek, Williams Creek and several unnamed drainages. See Tables 1 and 2 and Plates 1-7 for details on Laramie Formation coal zone data used in this report. Table 3 is an index to data point sources.

Three separate coal beds have been identified by previous authors (Goldman, 1913; Boos, 1950) in the lower portion of the Laramie Formation in the Colorado Springs Coal Field (see Figure 6). In ascending order these coal beds are the A, B, and C coal beds. The A coal bed was the primary bed mined in operations throughout the Colorado Springs Coal Field. It locally splits into two or more beds across the quadrangle. Where two major splits of the A coal bed were identified they have been called the Upper A bed and Lower A bed (see Table 2). The Upper A bed is from 2.5-6 ft (0.8-1.8 m) thick at a depth of less than 100 ft (30 m) within a continuous 400 acre (1.6 km²) area of the Hanover NW 7.5' Minute quadrangle. No other significant areas were identified with two splits of the A coal bed over 2.5 ft (0.8 m) thick. The Lower A coal bed and the unsplit A coal bed are the principal coal beds of economic thickness and have both been termed the A coal bed for mapping and resource calculation purposes. Since only a 400 acre area has been identified for which the Upper A coal bed is over 2.5 ft thick, this combining of beds will have a insignificant effect on mapping and resource calculations, considering the extent of the area being studied. The A coal bed lies about 50 ft (15 m) above the base of the Laramie Formation and is within 0-30 ft

(0-9 m) above the Laramie-Fox Hills transition zone. In this report the base of the Laramie Formation coal zone is defined as the top of the transition zone. The top of the Laramie-Fox Hills transition zone was chosen as the boundary because of the difficulty in picking the contact between the Laramie Formation and the Fox Hills Formation on geophysical logs. The prominent sandstone at the top of the transition zone is the only readily distinguishable unit with which to define the Laramie Formation coal zone.

The B coal bed is located 10-45 ft (3-14 m) above the A coal bed and generally marks the top of the Laramie Formation coal zone in the quadrangle. Thin unnamed coal beds of little economic significance are commonly found above the B coal bed, and also between the A and B coal beds.

The C coal bed is reported to be thin and lenticular (Goldman, 1913; Boos, 1950). The position of the C bed is not specified because it was not identified by any information available for this report.

Available coal analysis information shows that Laramie Formation coal is highest in apparent rank close to the mountains on the west side of the basin. In the northeastern part of the quadrangle the coal has an apparent rank of lignite A, based on data just outside this quadrangle (Eakins and Ellis, 1986). No analyses are available for the eastern side of the basin between the north quadrangle boundary and an area southwest of the town of Truckton. On the basis of coal rank data surrounding this area the coal on the east side of the basin probably has an apparent rank between lignite A and subbituminous C. Coal analysis information is available from drilling projects conducted in the Hanover NE and Hanover NW Quadrangles. This information reveals that the A coal bed has an apparent rank ranging from subbituminous C to subbituminous B in this area.

As-received analyses are:

	<u>Hanover NE Quad</u>		<u>Hanover NW Quad</u>
	<u>Range</u>	<u>Avg</u>	<u>Avg</u>
Moisture	20-24	22.5	26
Ash	6-13	9.0	7
Volatile Matter	30-41	32.5	31
Fixed Carbon	26-40	35.5	36
Sulfur	0.4-0.6	0.4	0.6
Btu/lb	8300-9500	8700	9000

Detailed analyses from these drilling projects are contained in files of the Colorado State Land Board which have been loaned to the CGS. Analyses for numerous mine samples from the Colorado Springs Coal Field are available in CGS Open File Report 78-9 (Kirkham, 1978b, p. 70-81). These analyses indicate the Laramie Formation coal throughout the coal field is generally subbituminous B, with some samples subbituminous C in rank.

Mining of the Laramie Formation coals in the quadrangle began in 1883 with the opening of the Franceville mine east of the town of Colorado Springs. Eventually about 75 mine entrances were opened and two surface mines were developed in the Colorado Springs Coal Field. Most of the overall 16.1 million tons of coal were produced between 1900 and 1950. No coal mining took

place from 1965 to 1980. The Bacon Strip Mine operated briefly in 1980 and 1981. Almost all of the coal production has been from underground mines in the A coal bed. See CGS Open File Report 78-9 (Kirkham, 1978b, p. 21-29) for details on mining within the quadrangle.

The A coal bed is mapped on plates 8-10. Map contours generated at a scale of 1:24,000 (see Plate 1) have been transferred to plates 8-10. Plate 8 is an isopach map of A coal bed thickness. Note the deficiency of data points for large areas of the quadrangle and concentration of data points in some areas. Plate 9 is a structure map on the top of the A coal bed and plate 10 is an overburden isopach map of the A coal bed. These maps have been used to generate the coal resource estimates.

Within the quadrangle the A coal bed contains about 2.75 billion tons of coal over 2.5 ft (0.8 m) in thickness (see Table 3). Almost 90 percent of the coal is between 2.5-5 ft (0.8-1.5 m) thick. A bed resources at depths less than 200 ft (61 m) total only about 200 million tons, or 7 percent of the overall tonnage. This shallow depth coal is significantly thicker than the overall average; almost 40 percent of the coal is between 5 and 10 ft (1.5 and 3.0 m) thick. See Table 3 for details of coal resource estimates.

Future development of coal in the A coal bed of the Laramie Formation is possible. Several important coal characteristics and mining economics factors would be considered in planning development of the coal. These are coal bed thickness, Btu value, overburden character and thickness, demand for coal, transportation costs, and environmental considerations. Surface mining of coal in the area of the Franceville and Bacon Mines or in other areas with suitable strip ratios may be feasible in the future. Underground mining could be revitalized in many areas of the Colorado Springs Coal Field where coal bed thicknesses and mining conditions are favorable. Commercial or residential development of the surface would be a possible constraint to mining. In-situ gasification, of these resources is unlikely, because the coal probably is too thin and overburden characteristics are not suitable. The primary economic problems with marketing coal from this area are low coal quality and competition from lower cost coal from the Powder River Basin in Wyoming and from elsewhere in the Rocky Mountain Region. The primary competitive advantage for Colorado Springs coal is its proximity to large markets, particularly the city of Colorado Springs and the Denver metropolitan area.

Denver Formation Coal Zone

In this report the formation names used by previous workers, including Scott (1976) have been altered to fit the regional framework of Denver Basin coal. Coal to the north of this quadrangle, in the Castle Rock 1/2° X 1° Quadrangle, is in the Denver Formation (see Bryant, 1981), and the stratigraphically equivalent unit in the Colorado Springs Quadrangle has been called the Dawson Formation by Scott (1976) and others. For consistency of terms in these adjacent 1/2° X 1° quadrangles the name Denver Formation will be used in both reports for the equivalent units.

The general stratigraphy of the Denver Formation in the quadrangle is shown in Figure 2. The depositional environment in which Denver Formation coal was formed is poorly understood. One possible model to explain the development of the coal is that of an anastomosing fluvial system (see Smith and Putnam, 1980). The Denver Formation coal zone contains numerous thin beds of coal that are ranked as lignite. Very little data exists for this coal zone within the quadrangle. Coal beds are generally less than 4 ft (1.2 m) thick, and

most beds are less than 2.5 ft (0.8 m) thick. Isolated areas may contain lignite of sufficient thickness to be mined, but these could not be identified using available data. Some mining has been done in the past, from 7 very small mines. See CGS Open File Report 78-9 (Kirkham, 1978b, p. 70-81) and 79-1 (Boreck and Murray, 1979) for details on previous mining and depletion figures. The general areal extent of the Denver Formation coal zone can be approximated from information contained in Table 1. The Denver Formation coal zone crops out in a roughly semicircular band closer to the basin interior than the Laramie Formation coal zone outcrop.

Denver Formation coal has an apparent rank of lignite A, according to analyses from the Castle Rock quadrangle (Eakins and Ellis, 1986) and one available analysis for the Mosby mine (Kirkham, 1978b). Throughout the Denver Basin these lignites are noted for their numerous clay partings. Some partings are kaolinitic and might be economically extracted, assuming the lignite could be mined.

For information on coal resources in the Denver Formation see Speltz (1976). Speltz calculated resources for beds over 2 ft (0.6 m) thick at depths less than 150 ft (46 m). Water well logs were used as data in the Speltz report, which could lead to large errors in estimation because they are generally unreliable for coal bed interpretation. No resource estimates or mapping have been done in this report for the Denver Formation coal zone due to insufficient data and generally thin coal beds.

Resource Calculations

Coal beds in the Denver Formation and the B and C coal beds in the Laramie Formation are not included in these resource calculations because of insufficient data and/or insufficient coal bed thickness. Coal resources are only calculated for the A coal bed of the Laramie Formation (Table 4). The density of data points for the A coal bed varies tremendously, with most data points concentrated within a narrow band along the outcrop, especially in areas of heavy mining and a few areas of extensive exploratory drilling. Data points are widely-spaced where the depth to the coal zone exceeds several hundred feet. These widely-spaced data points are generally water wells or oil and gas exploration drill holes, for which interpretation of coal bed thicknesses may be inaccurate. Resource estimates in the vicinity of these data points should be considered preliminary.

Depletion from previous mining was considered in estimating resources. See Table 5 and Boreck and Murray (1979) for depletion figures.

Resource estimate categories used are based on USGS Circular 891 (Wood and others, 1983). Some proprietary data was used in this study. Measured and indicated resource reliability categories are combined and considered demonstrated resources in order to preserve the confidentiality of drill hole locations. The reliability categories are determined by the distance of the coal resources from a data point. Demonstrated resources include coal resources calculated within a radius of 0-.75 mi (0-1.2 km) from a data point, inferred resources include coal resources calculated within a radius of .75-3.0 mi (1.2-4.8 km) from a data point, and hypothetical resources include coal resources calculated in the area greater than 3.0 mi (4.8 km) from a data point. The coal resources for the A coal bed of the Laramie Formation are tabulated on table 4 by township and range. For each township, coal resources are tabulated by overburden thickness and coal thickness categories.

Overburden thickness categories used are 0-200 ft, 200-500 ft, 500-1000 ft, 1000-2000 ft, and 2000+ ft. Coal thickness categories used are 2.5-5 ft, 5-10 ft and 10+ ft. The average thickness shown in table 4 is a weighted average. Total coal resources for the A coal bed are about 2.75 billion tons (see table 4). About 194 million tons are below less than 200 feet of overburden. Previous coal resource estimates within the quadrangle were done by Landis (1971) and Speltz (1976). In his report on Colorado coal resources, Landis only estimated coal resources for 9 townships within the Colorado Springs coal field. They are stated to contain about 400 million tons of coal in the A coal bed. The Speltz report gives an estimate of the total identified strippable coal within Colorado. For the Denver Basin these are subdivided only by township and range, and since the quadrangle boundaries are within townships it is not possible to precisely assign his estimates to the quadrangle. Within 8 townships entirely within the quadrangle Speltz estimates about 315 million tons of strippable coal. Five townships had estimates done by both Landis and Speltz. These are shown in the table below, along with estimates from table 4 of this report.

TONNAGE ESTIMATES (MILLION TONS)

<u>TOWNSHIP</u>	<u>RANGE</u>	<u>LANDIS</u>	<u>SPELTZ</u>	<u>EAKINS</u>
T13S	R64W	2.9	37.9	163.7
	R65W	23.1	12.9	166.7
	R66W	133.1	38.9	57.1
T14S	R65W	93.3	22.7	97.3
	R66W	2.5	51.9	17.9

Conclusions

Coal resources in this report are greater than those estimated in previous coal resource studies of the Colorado Springs Quadrangle. This apparent discrepancy can be explained in part by the somewhat larger data base used for this study and large areas containing hypothetical coal resources due to the distance of the resources from data points, for which data interpretation is questionable.

The probability of future mining in the quadrangle will depend upon many complex and interrelated factors, some of which lie beyond the scope of this report.

Surface and/or underground mining of Laramie Formation coal will be limited to areas within several miles of the basin margin, most likely form the A coal bed within the Colorado Springs Coal Field. Most of the Laramie Formation coal is too deep or too thin for economical recovery using present methods.

Denver Formation coals are not of sufficient thickness within the quadrangle to be mineable, according to the limited amount of available data. Additional subsurface data may reveal isolated areas of minable lignite beds. The development potential for Denver Foramtion coals is very low.

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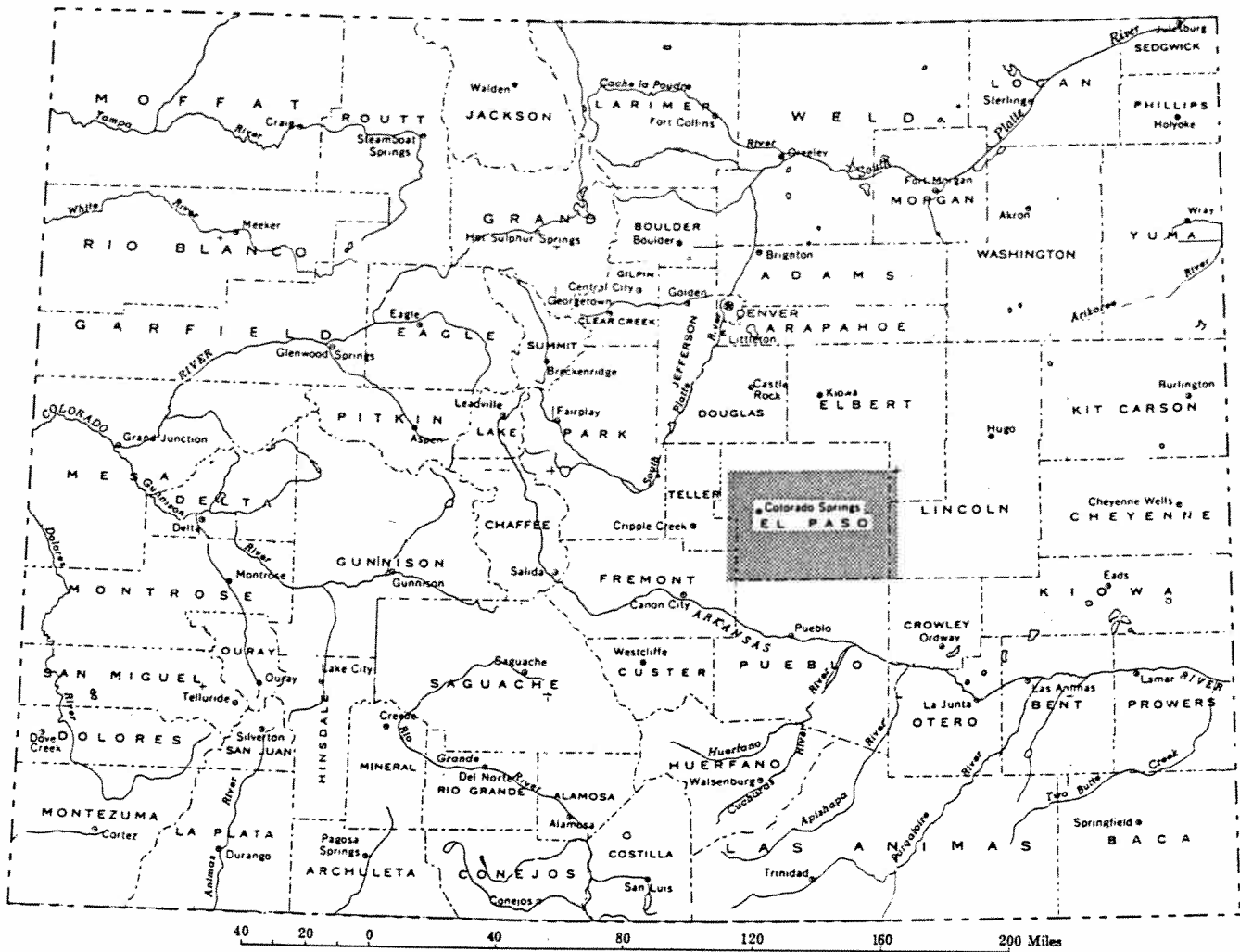


Figure 1. Location map of the Colorado Springs 1/2° X 1° Quadrangle.

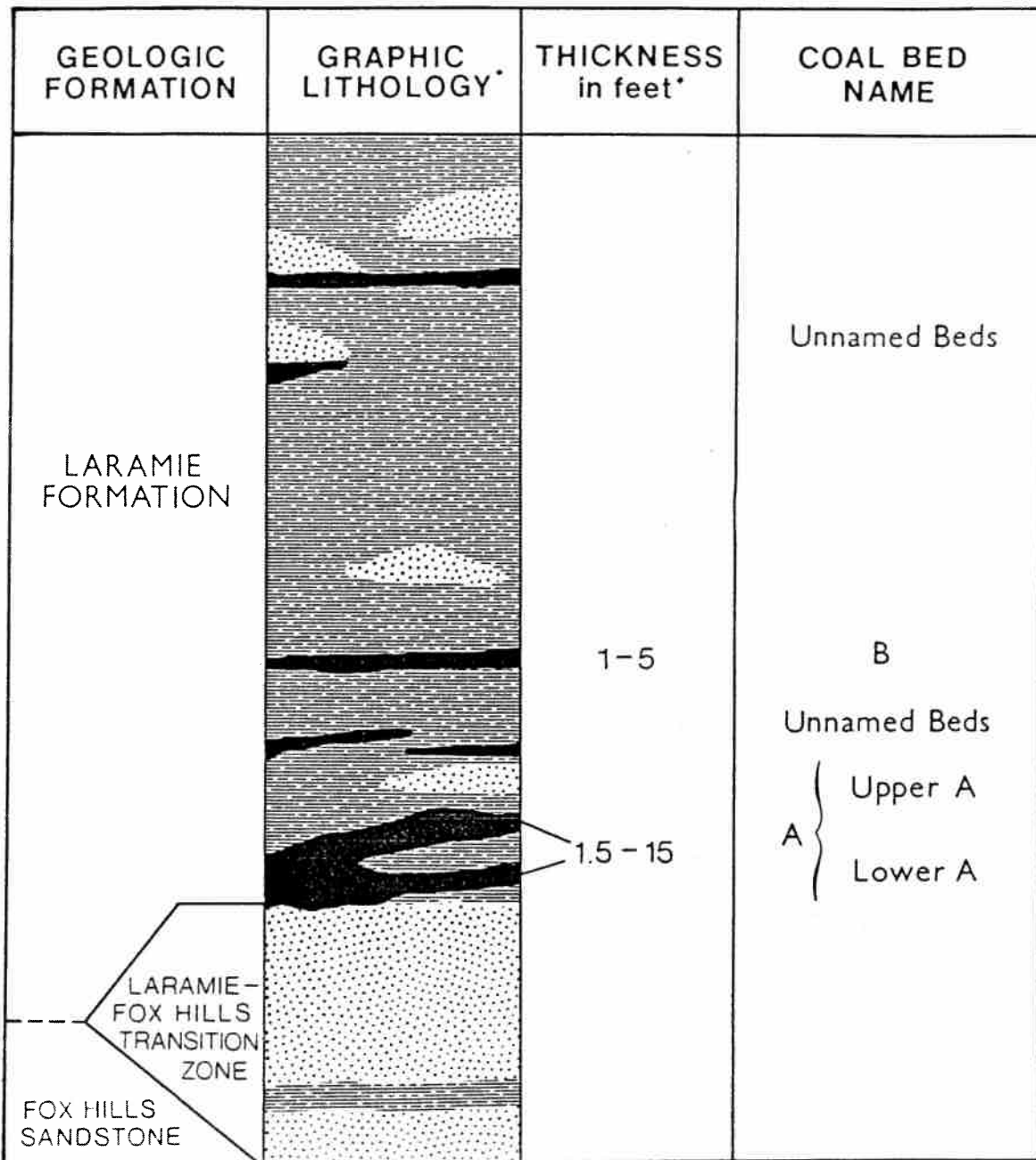
PERIOD	GEOLOGIC FORMATION	GRAPHIC LITHOLOGY*	THICKNESS in feet*
Eocene	DAWSON ARKOSE		800-1000
Paleocene	DENVER FORMATION		400-800
Upper Cretaceous	ARAPAHOE FORMATION		300-400
	LARAMIE FORMATION		250-350
	LARAMIE-FOX HILLS TRANSITION ZONE		50-100
	FOX HILLS SANDSTONE		200-250
	PIERRE SHALE		3800-5200

*NOT TO SCALE

EXPLANATION

- SANDSTONE
- SHALE
- COAL
- ARKOSE

Figure 2. Generalized stratigraphy of the Colorado Springs 1/2° X 1° Quadrangle.



*Not to scale

EXPLANATION

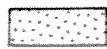


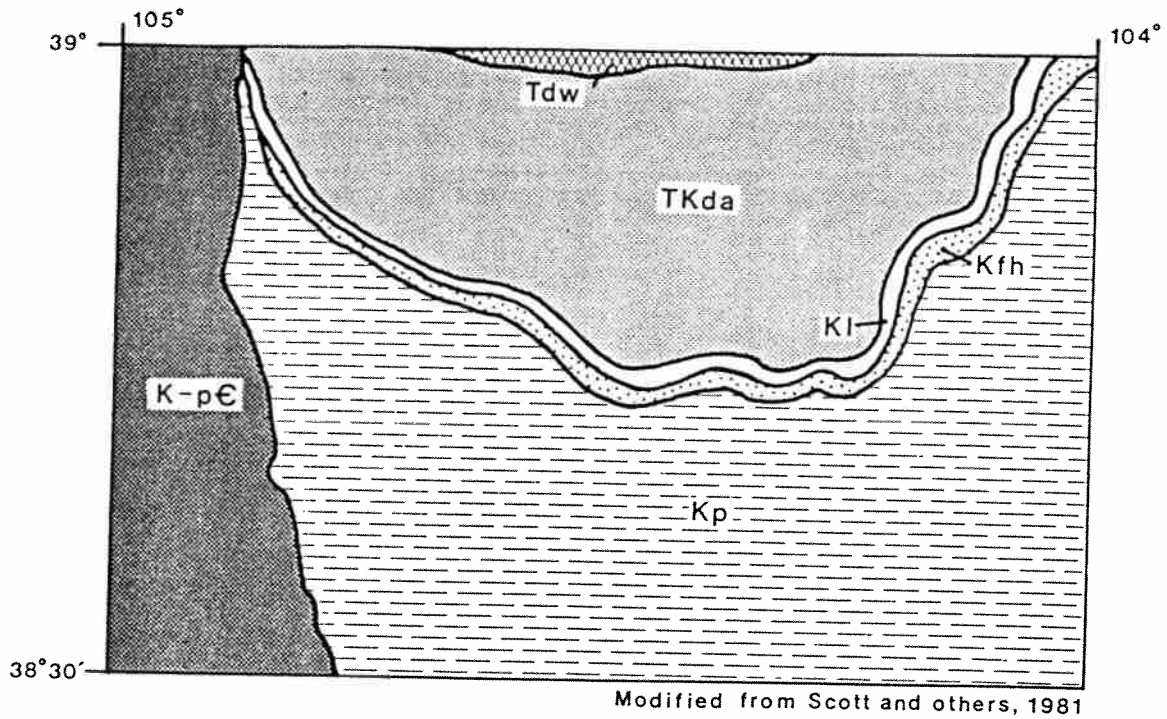
-  SANDSTONE
-  SHALE
-  COAL

Figure 3. Generalized stratigraphy of the lower Laramie Formation and the Laramie-Fox Hills transition zone, Colorado Springs 1/2° X 1° Quadrangle.



EXPLANATION

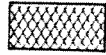

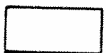
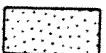


	Tdw	Dawson Arkose
	TKda	Denver and Arapahoe Formations
	Kl	Laramie Formation
	Kfh	Fox Hills Sandstone
	Kp	Pierre Shale
	K-pE	Undifferentiated (Niobrara Fm. through pre-Cambrian age rocks)

Figure 4. Bedrock geology of the Colorado Springs 1/2° X 1° Quadrangle.

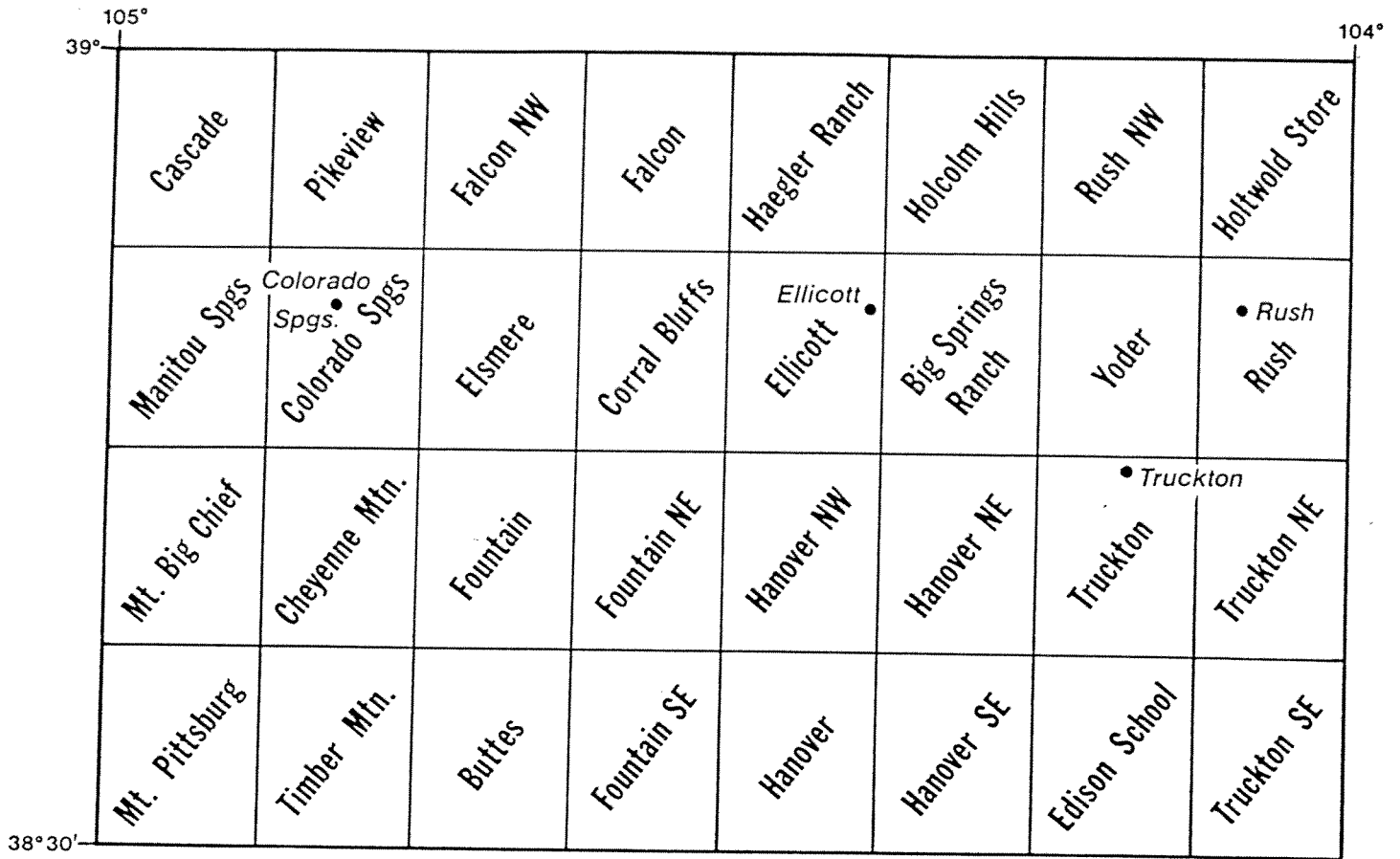
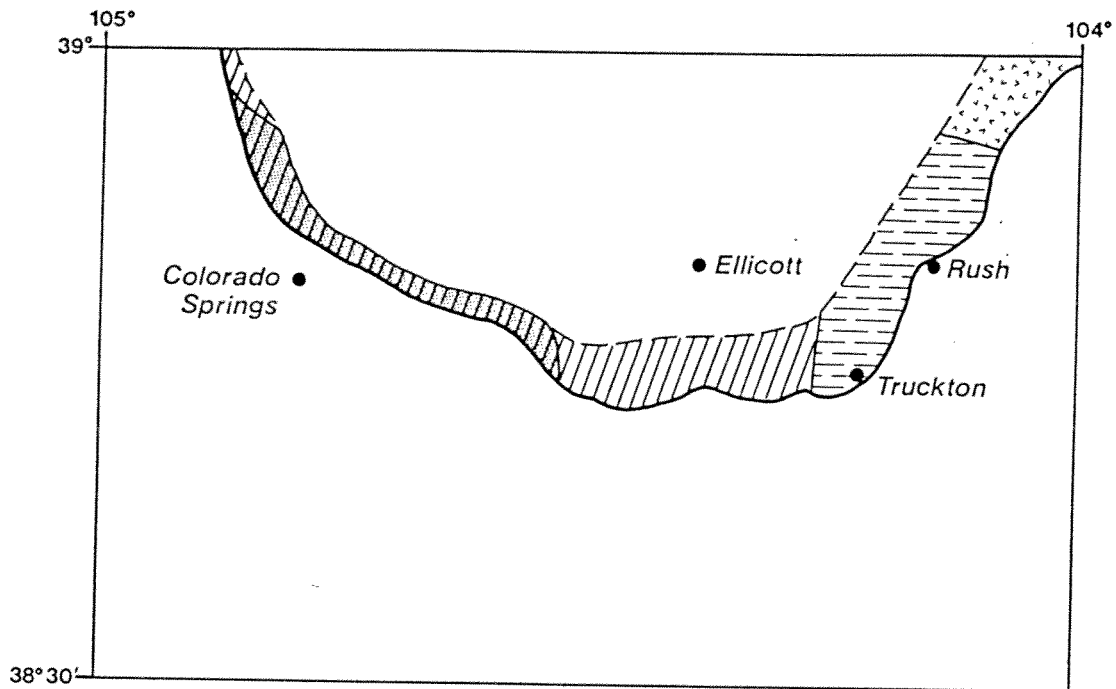


Figure 5. Index map of 7.5' Quadrangles within the Colorado Springs 1/2° X 1° Quadrangle.



EXPLANATION

- Edge of Denver Basin
- ▨ Colorado Springs Coal Field [approx. location]
- Area estimated to have an apparent rank of:
- ▨ Lignite A
- ▨ Lignite A-subbituminous B
- ▨ Subbituminous C-subbituminous B

Figure 6. Location map of the Colorado Springs Coal Field and apparent rank of the A coal bed near the Denver Basin margin, Colorado Springs 1/2° X 1° Quadrangle.

TABLE 1
 DRILL HOLE AND MINE DATA
 QUADRANGLES WITH DENVER FORMATION AND LARAMIE FORMATION DATA

Data Point ID	Location Twp Rge Sec 1/4 1/4	Surface Elevation	Total Depth	DENVER FM COAL ZONE		LARAMIE FM COAL ZONE		Comments
				Depth to Top	Elevation of Zone Thickness (coal)	Depth to top of A Bed	Elevation of top of A Bed	

NOTE: All depths, elevations and thicknesses are in feet

BIG SPRINGS RANCH QUADRANGLE

GO-1	14S 62W 12 SWNW	6,280	759.0	VERY THIN BED		563.0	5,717.0	1.5	
GO-3	14S 62W 10 NW	6,034	38.0	30.0	6,004.0				
GO-4	14S 62W 1 SWNW	6,110	36.0	25.0	6,085.0				
GO-5	14S 62W 1 SE	6,155	15.0	13.0	6,142.0				
GO-6	14S 62W 12 SENE	6,221	30.0	24.0	6,197.0				
GO-8	14S 62W 11 SENE	6,275	15.0	4.0	6,271.0				
GO-9	14S 62W 3 NESE	6,080	40.0	30.0	6,050.0				
0-367	14S 61W 31 NENE	6,128	6,315.0		CSG	453.0	5,675.0	3.0	B BED 5.0 @ 415
0-369	14S 62W 14 NWSE	6,159	6,492.0		CSG	491.0	5,668.0	6.0	3.0/2.0P/3.0
0-370	14S 62W 27 SENW	5,981	6,355.0		CSG	354.0	5,627.0	5.0	COAL UNCERTAIN
0-374	15S 61W 18 NNW	6,031	5,905.0		CSG	247.0	5,784.0	3.0	

ELSMERE QUADRANGLE

16387-F	14S 65W 6 SENE	6,360	930.0	NO INFO. FROM LOG	773.0	5,587.0		5.0	
JC-579	14S 65W 16	6,240	200.0	OC		150.4	6,089.6	3.9	LOCATED TO SECTION ONLY
0-371	14S 65W 2 NNW	6,548	7,600.0	303.0	6,241.0	4.0	1,121.0	4.0	B BED 3.0 @ 1109
W-114	14S 66W 1 SW	6,280	393.0	OC		303.0	5,977.0	3.0	
CARDIFF	14S 66W 2 SWSE	6,270		OC		?		?	NO DEPTH INFORMATION
ENTERPRISE	14S 66W 12 SWNW	6,230		OC		?		?	NO DEPTH INFORMATION
JIMMY CAMP	14S 65W 16 NESE	6,190	55.6	OC		50.0	6,140.0	5.6	
KURIE	14S 65W 14 NWNE	6,130		OC		?		?	NO DEPTH INFORMATION
McFERRAN	14S 65W 10 SWSE	6,230		OC		?		?	NO DEPTH INFORMATION
TUDOR	14S 66W 2 SESW	6,240		OC		?		?	NO DEPTH INFORMATION

FALCON QUADRANGLE

65539	13S 64W 6 NWSE	6,890	110.0	35.0	6,855.0	1.0		NTH	
71041	13S 64W 8 SWSW	6,755	77.0	41.0	6,714.0	2.0		NTH	
0-324	12S 64W 22 SESW	6,871	8,263.0				NO INFO. FROM LOG 1,926.0	4,945.0	4.0

FALCON NW QUADRANGLE

52060	12S 66W 24 SESE	7,350	325.0	190.0	7,160.0	5.0				
CS-1	13S 65W 32 NENE	6,591	1,300.0				NO INFO. FROM LOG 1,252.0	5,339.0	4.0	B BED 3.0 @ 1228

HAEGLER RANCH QUADRANGLE

62325	12S 62W 30 SESW	6,400	131.0	11.0	6,389.0	16.0				
68264	12S 63W 35 NENE	6,450	290.0	110.0	6,340.0	5.0				
0-361	13S 63W 16 NENE	6,382	7,227.0				1,165.0	5,217.0	4.0	B BED 4.0 @ 1150
0-362	13S 63W 20 NWSE	6,410	7,163.0				1,210.0	5,200.0	?	USED FOR STRUCTURE ONLY

TABLE 1 (CONT'D)

Data Point ID	Location Twp Rge Sec 1/4 1/4	Surface Elevation	Total Depth	DENVER FM COAL ZONE		LARAMIE FM COAL ZONE		Comments		
				Depth to Top of Top	Elevation of Zone Thickness (coal)	Depth to top of A Bed	Elevation top of A Bed		A Bed Thickness (coal)	
<u>HOLCOLM HILLS QUADRANGLE</u>										
0-351	12S 62W 32 NESE	6,506	7,215.0	151.0	6,335.0	?	1,263.0	5,243.0	?	CAN'T DETERMINE COAL THICKNESS APPROX BED DEPTH FROM L-F AQ
0-354	13S 61W 5 NNW	6,727	7,270.0	410.0	6,317.0	4.0	1,315.0	5,412.0	?	COALS QUESTIONABLE B BED 2.0 @ 811 1.2/0.1P/1.5/0.3P/1.6 "MOSBY BED", NO DEPTH INFORMATION NO DEPTH INFORMATION
0-358	13S 62W 16 SESE	6,272	6,939.0		CSG		938.0	5,234.0	5.0	
MOSBY	13S 61W 18 NESE	6,490		?	?	4.3		NTH		
MM AND P	13S 61W 19 NNW	6,380		?	?	4.5		NTH		

LIST OF ABBREVIATIONS

CSG	CASING
L-F AQ	LARAMIE-FOX HILLS AQUIFER
NTH	NOT TO HORIZON
OC	OUTCROP
P	PARTING

NOTE: SEE TABLE 3 FOR SOURCES OF DATA POINTS

TABLE 2

DRILL HOLE AND MINE DATA
QUADRANGLES WITH LARAMIE FORMATION DATA ONLY

Data Point ID	Twp	Rge	Sec	1/4	Location	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments
								Depth to Top	Elevation to Top	Depth to top of A Bed	Elevation top of A Bed	

Note: All depths, elevations and thicknesses are in feet

COLORADO SPRINGS (7.5') QUADRANGLE

AUSTIN												
BLUFFS	14S	66W	4	NWNE	6,300							NO DEPTH INFORMATION
CITY NO. 4	14S	66W	3	NWSE	6,270							NO DEPTH INFORMATION
EL PASO	13S	66W	33	SWSE	6,300	48.2						NO DEPTH INFORMATION
RAPSON	13S	66W	33	SWSW	6,230	70.3						USED AVERAGES FROM 29 DRILL HOLES FROM COLO. MINED LAND RECL. DIV.
DH NO. 2	14S	66W	3	NWNE	6,390	354.0						INFORMATION FROM MINE MAP
DH NO. 3	14S	66W	3	NE	6,330	269.0						INFORMATION FROM MINE MAP
DH NO. 4	14S	66W	3	SENE	6,320	205.0						INFORMATION FROM MINE MAP
DH NO. 5	14S	66W	3	NENW	6,350	213.0						INFORMATION FROM MINE MAP

CORRAL BLUFFS QUADRANGLE

CM-3a	14S	64W	32	SWNE	6,140	300.0	84.2	6,055.8	2.0	92.8	6,047.2	2.6	A BED 1.4/1.1P/1.2 B BED 2.3 @ 69.5
CM-15	14S	64W	32	NWSE	6,130	200.0	89.4	6,040.6	2.4	95.5	6,034.5	1.5	B BED 2.3 @ 17.4
CM-16	14S	64W	32	NESE	6,125	220.0	111.6	6,013.4	1.3	121.9	6,003.1	1.4	1.3/0.4P/1.6
CM-17	14S	64W	32	SWSE	6,120	100.0				66.2	6,053.8	3.8	ALSO 1.5 @ 27.5
CM-18	14S	64W	32	SWSE	6,080	120.0				63.0	6,017.0	2.9	B BED 2.4 @ 18
CM-19	14S	64W	32	SESE	6,130	140.0				101.0	6,029.0	1.3	SS CHANNEL IN A POSITION
CM-20	15S	64W	9	NENE	6,125	200.0							ALSO 1.0 @ 84 ALSO 1.6 @ 71
CM-22	15S	64W	11	SWSE	6,000	200.0	114.8	5,885.2	1.3	133.3	5,866.7	1.7	ANALYSIS, NO DEPTH INFO NO DEPTH INFORMATION
SLB-25	14S	64W	29	NWNW	6,140	85.0	59.0	6,081.0	3.0	74.0	6,066.0	5.1	
SLB-26	14S	64W	29	NWSW	6,085	72.6	40.0	6,045.0	2.4	56.0	6,029.0	7.4	
SLB-27	14S	64W	32	NWNW	6,070	56.2	45.0	6,025.0	2.7	51.0	6,019.0	5.2	
SLB-28	14S	64W	32	SENE	6,100	47.7	21.0	6,079.0	2.0	46.0	6,054.0	1.7	
SLB-29	14S	64W	32	NWSW	6,080	25.0	5.0	6,075.0	3.2	23.0	6,057.0	2.0	
SLB-30	14S	64W	32	SWSW	6,140	33.2				31.0	6,109.0	2.2	
SLB-31	14S	64W	32	SESW	6,115	30.3				27.0	6,088.0	3.3	
W-153	15S	64W	5	SENE	6,090	260.0	88.0	6,002.0	2.0	70.0	6,020.0	4.0	
BACON	14S	64W	29	NW	6,090					95.0	5,995.0	5.0	
CELL	14S	64W	30	SENE	6,080					? ?	? ?	5.3	
CLARA BELLE	14S	64W	19	SWSE	6,090	109.0	100.0	5,990.0		100.0	5,990.0	9.0	
CORLEY NO. 3	14S	64W	30	NENE	6,115	114.2	110.0	6,005.0		110.0	6,005.0	4.2	
DAVIES	14S	64W	29	NWSW	6,100					? ?	? ?	4.6	
FRANCEVILLE	14S	64W	30	NENE	6,110					? ?	? ?	6.0	
FRANCEVILLE													
NO. 1	14S	64W	19	NESW	6,070					? ?	? ?	8.0	
FRANCEVILLE													
STRIP	14S	64W	19	SW	6,070					? ?	? ?	7.5	6.5-9 FT., NO DEPTH INFORMATION

TABLE 2 (cont'd)

Data Point ID	Location Twp Rge Sec 1/4 1/4	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments	
				Depth to Top	Elevation of Top	Depth to top of A Bed	A Bed Thickness (coal)		
FRANCEVILLE NO. 2	14S 65W 24 NWSE	6,100				?	?	8.0	NO DEPTH INFORMATION
FRANCEVILLE NO. 2a	14S 65W 24 NESE	6,075				?	?	7.0	NO DEPTH INFORMATION
FRANCEVILLE NO. 2b	14S 65W 24 SENE	6,090				?	?	5.7	NO DEPTH INFORMATION
THOMAS D. DAVIS	14S 64W 30 NE	6,090				?	?	4.7	NO DEPTH INFORMATION
RME-2	14S 64W 30 SENE	6,077	70.0			47.3	6,029.7	8.4	NO DEPTH INFORMATION
RME-4	14S 64W 30 SENE	6,097	95.0	77.6	6,017.4	88.7	6,006.3	1.6	5.0/3.2P/3.4
RME-5	14S 64W 30 SENE	6,070	55.0	20.0	6,050.0	33.0	6,037.0	10.8	6.7/2.4P/4.1, NESENE SEC 30
RME-6	14S64W 19 NWSW	6,070	100.0	66.0	6,004.0	77.9	5,992.1	8.9	4.4/3.6P/3.9
RME-7	14S 64W 30 SENE	6,075	60.0			38.9	6,036.1	8.3	
RME-8a	14S 65W 24 SENE	6,070	80.0			60.0	6,010.0	9.0	
RME-8b	14S 64W 30 SENE	6,075	55.0			43.5	6,031.5	5.0	
RME-14	14S 64W 19 CSM	6,050	60.0	34.0	6,016.0	43.7	6,006.3	9.4	
RME-15	14 64W 19 SESW	6,080	85.0			66.1	6,013.9	9.4	
15752F	14S 63W 13 SENE	5,980	708.0			435.5	5,544.5	3.5	B BED 2.0 @ 421.5
CM-55	15S 61W 20 NWSW	6,000	120.0			87.7	5,912.3	2.5	B BED 3.2 @ 77.5 N/C TO 5810 - POOR LOG?
JC-29	15S 62W 21 SWSW	5,810	300.0			62.5	5,907.5	3.1	CORE HOLE
JC-41	15S 62W 21 NESW	5,870	200.0			49.2	5,910.8	4.6	CORE HOLE, B BED 2.5 @ 61.7
JC-42	15S 62W 21 SWSE	5,860	100.0			79.0	5,801.0	4.6	CORE HOLE
JC-43C	15S 62W 21 NWSE	5,880	200.0			83.6	5,796.4	3.8	CORE HOLE
JC-44	15S 62W 21 NESW	5,880	200.0			102.0	5,778.0	5.3	CORE HOLE
JC-46C	15S 62W 21 SWNE	5,880	120.0			34.9	5,815.1	4.7	CORE HOLE
JC-47C	15S 62W 21 SWSE	5,850	80.0			53.7	5,811.3	4.9	CORE HOLE
JC-60C	15S 62W 21 NWSE	5,865	80.0			41.9	5,833.1	3.8	N/C, SURFICAL DEPOSITS TO 86 FT.?
JC-63	15S 62W 21 SESE	5,875	80.0			67.0	5,813.0	7.6	CORE HOLE, 2.0/1.0P/5.0
JC-64	15S 62W 21 SESE	5,860	100.0			75.4	5,809.6	7.0	
JC-65	15S 62W 21 SESE	5,880	100.0			92.3	5,797.7	8.4	
JC-66C	15S 62W 21 NESE	5,885	100.0			38.0	5,792.0	3.8	N/C
JC-67	15S 62W 21 NESE	5,890	120.0			128.3	5,786.7	5.3	
JC-74	15S 62W 21 SWSW	5,830	60.0			126.3	5,783.7	4.4	
JC-75	15S 62W 21 SWSW	5,830	100.0			95.4	5,779.6	1.8	
JC-81	15S 62W 21 NENE	5,920	140.0						
JC-82	15S 62W 21 NNNE	5,915	140.0						
JC-85	15S 62W 21 NNNE	5,910	140.0						
JC-86	15S 62W 21 NNW	5,900	140.0						
JC-89	15S 62W 21 NNW	5,875	120.0						

ELLICOTT QUADRANGLE

HANOVER NE QUADRANGLE

TABLE 2 (cont'd)

Data Point ID	Location Twp Rge Sec 1/4 1/4	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments
				Depth to Top	Elevation of Top	Depth to top of A Bed	Elevation top of A Bed	
JC-94	15S 62W 17	5,830	260.0	95.8	5,734.2	1.4		B BED 1.5 @ 63.7
JC-98	15S 62W 21 NWNW	5,875	234.0					N/C ?
JC-100	15S 62W 21 SWNW	5,870	140.0					N/C, ALL SURFICIAL DEPOSITS ?
JC-101	15S 62W 21 SWSW	5,880	140.0					N/C, ALL SURFICIAL DEPOSITS ?
JC-107	15S 62W 22 NENW	5,970	120.0					
JC-109	15S 62W 22 SWNW	5,905	120.0					
JC-121	15S 62W 22 SWSW	5,895	100.0					
JC-123C	15S 62W 22 NWSW	5,895	80.0					
JC-125C	15S 62W 22 SESW	5,915	80.0					
JC-129C	15S 62W 22 SWSW	5,890	67.0					
JC-131	15S 62W 22 NWSW	5,915	140.0					
JC-132	15S 62W 22 NENE	5,970	140.0					
JC-134	15S 62W 22 SWSE	5,970	160.0					
JC-138	15S 62W 27 NENE	5,930	120.0					
JC-139	15S 62W 22 SESW	5,930	120.0					
JC-146	15S 62W 22 SWSW	5,875	60.0					
JC-149	15S 62W 22 SWSW	5,880	131.0					
JC-152	15S 62W 23 SWNW	6,090	300.0					
JC-158	15S 62W 23 SWSW	6,080	300.0					
JC-161	15S 62W 27 NENE	5,940	120.0					
JC-163	15S 62W 27 SENE	5,960	100.0					
JC-164C	15S 62W 26 SWNW	5,940	100.0					
JC-166	15S 62W 26 NWSW	5,910	120.0					
JC-167	15S 62W 27 NESE	5,900	120.0					
JC-168	15S 62W 27 NESE	5,900	100.0					
JC-169	15S 62W 27 SENE	5,910	60.0					
JC-177	15S 62W 27 NWNW	5,890	75.0					
JC-181	15S 62W 27 SWNW	5,885	40.4					
JC-186	15S 62W 21 SESE	5,865	100.0					
JC-192C	15S 62W 27 NESE	5,920	80.0					
JC-195C	15S 62W 27 SWSW	5,900	80.0					
JC-196C	15S 62W 27 NENW	5,920	80.0					
JC-207	15S 62W 21 SWSE	5,845	80.0					
JC-209	15S 62W 21 SWSE	5,845	53.5					
JC-214	15S 62W 21 SESW	5,840	40.0					
JC-215	15S 62W 21 SESW	5,840	100.0					
JC-218	15S 62W 21 SESW	5,850	60.0					
JC-224	15S 62W 27 NENE	5,880	122.0					
JC-226	15S 62W 27 NENE	5,960	120.0					
JC-232	15S 62W 21 SESW	5,850	50.0					
JC-237	15S 62W 21 SESW	5,860	60.0					
JC-241	15S 62W 21 SESW	5,830	40.0					
JC-252	15S 62W 21 SENE	5,895	120.0					
JC-262	15S 62W 27 SWNE	5,915	80.0					
JC-264	15S 62W 27 NENW	5,900	80.0					
				62.6	5,857.4	1.3		
				50.2	5,859.8	6.3		
				54.9	5,835.1	5.2		
				28.8	5,856.2	3.9		
				56.7	5,863.3	4.4		
				64.0	5,836.0	4.9		
				67.1	5,852.9	4.0		
				42.0	5,803.0	3.9		
				24.0	5,816.0	4.1*		
				36.3	5,803.7	4.0		
				117.2	5,862.8	2.3		
				114.0	5,846.0	4.1		
				37.4	5,812.6	3.1		
				38.9	5,821.1	4.1		
				20.0	5,810.0	2.6*		
				95.5	5,799.5	5.2		
				69.0	5,846.0	3.5		
				65.8	5,834.2	3.3		

TABLE 2 (cont'd)

Data Point ID	Twp	Rge	Sec	1/4	1/4	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments
								Depth to Top	Elevation of Top	Depth to top of A Bed	Elevation top of A Bed	
JC-267	15S	62W	27	N4NW	5,870	60.0	40.4	5,829.6	6.9	1.7/0.9P/5.2	N/C, USED FOR SUBCROP LINE	
JC-268	15S	62W	27	N4NW	5,860	100.0					N/C, USED FOR SUBCROP LINE	
JC-274	15S	62W	28	N4NE	5,855	85.0					N/C, USED FOR SUBCROP LINE	
JC-275	15S	62W	21	SESE	5,860	60.0	46.8	5,813.2	4.9		N/C, USED FOR SUBCROP LINE	
JC-276	15S	62W	27	SWNW	5,860	100.0					N/C, USED FOR SUBCROP LINE	
JC-278	15S	62W	27	SWNW	5,865	60.0					DARK SHALE WITH COAL	
JC-281	15S	62W	21	SENW	5,880	100.0	19.0	5,846.0	*			
JC-283	15S	62W	21	SENW	5,880	120.0	92.9	5,787.1	3.7			
JC-286	15S	62W	21	N4NE	5,900	120.0	103.0	5,777.0	4.4			
JC-288	15S	62W	26	N4SW	5,945	120.0	112.9	5,787.1	4.3			
JC-290	15S	62W	27	SWNW	5,875	100.0	62.0	5,883.0	3.0*		SMUT, PAST BURN LINE	
JC-293	15	62W	27	N4SW	5,890	60.0	14.4	5,860.6	4.7*		SMUT, PAST BURN LINE	
JC-296	15S	62W	27	N4SW	5,870	100.0	27.0	5,863.0	3.7		N/C, ALL SURFICIAL DEPOSITS ?	
JC-298	15S	62W	27	N4SW	5,900	80.0	52.0	5,848.0	4.9			
JC-304	15S	62W	26	N4SW	5,950	70.0	57.0	5,893.0	5.1			
JC-306	15S	62W	26	SESW	5,925	48.0	42.1	5,882.9	4.0			
JC-309	15S	62W	26	SESW	5,935	100.0						
JC-310	15S	62W	27	N4SE	5,900	60.0	45.8	5,854.2	4.9		N/C, USED FOR SUBCROP LINE	
JC-312	15S	62W	27	N4SE	5,890	100.0						
JC-315	15S	62W	26	SWNW	6,000	140.0	127.0	5,873.0	4.1		N/C, ALL SURFICIAL DEPOSITS	
JC-321	15S	62W	26	SWSE	5,945	80.0					N/C	
JC-323	15S	62W	26	N4SW	5,950	80.0	54.5	5,895.5	3.0*		SMUT	
JC-324	15S	62W	26	SWSE	5,985	80.0	66.0	5,919.0	4.1			
JC-326c	15S	62W	26	SWSE	5,970	60.0	52.1	5,917.9	3.9		CORE HOLE	
JC-331	15S	62W	26	N4SW	5,990	160.0	154.9	5,835.1	4.5			
JC-332	15S	62W	26	N4SW	5,990	140.0	118.5	5,871.5	4.3			
JC-333	15S	62W	26	N4SW	5,975	120.0	99.4	5,875.6	4.6			
JC-335	15S	62W	26	N4SE	5,995	120.0	101.5	5,893.5	4.1			
JC-336	15S	62W	26	SWSE	6,005	120.0	103.3	5,901.7	1.3			
JC-350	15S	62W	26	SWSE	5,950	40.0	27.4	5,922.3	3.2*		SMUT	
JC-353	15S	62W	26	SESE	5,995	100.0	85.9	5,909.1	1.2			
JC-355	15S	62W	26	SESE	5,960	200.0	80.8	5,879.2	1.1			
JC-357	15S	62W	26	SESE	5,960	200.0						
JC-362	15S	62W	26	SENE	6,000	160.0	75.1	5,884.9	2.1			
JC-364	15S	62W	26	SENE	6,000	160.0	140.5	5,859.5	1.2			
JC-368	15S	62W	23	SESE	6,030	200.0	134.8	5,865.2	1.4			
JC-369	15S	62W	24	SWSW	6,040	160.0	166.5	5,863.5	2.2			
JC-370	15S	62W	25	SWNW	5,990	160.0	155.1	5,884.9	1.5*		CORRELATION UNCERTAIN	
JC-372	15S	62W	25	N4NW	6,010	150.0	103.3	5,886.7	1.4			
JC-382	15S	62W	24	N4SW	6,015	140.0	118.6	5,891.4	2.2			
JC-388	15S	62W	24	SWNW	6,010	180.0	126.5	5,888.5	3.1*		DARK SHALE WITH COAL, B BED 1.8 @ 106.9	
JC-390	15S	62W	24	N4NW	6,000	140.0	164.6	5,845.4	1.4		B BED 1.6 @ 122.4	
JC-392	15S	62W	13	SESW	6,010	160.0	141.3	5,868.7	2.4		N/C, SOME DARK SHALE WITH COAL CORRELATION UNCERTAIN	
JC-394	15S	62W	13	SENW	6,050	100.0					N/C, SOME DARK SHALE WITH COAL	
JC-396	15S	62W	13	N4SE	5,990	120.0	109.0	5,881.0	1.7		B BED 2.4 @ 71.4	
JC-398	15S	62W	13	N4SE	6,020	180.0	152.1	5,867.9	1.4		ALSO DARK SHALE WITH COAL UNITS	

TABLE 2 (cont'd)

Data Point ID	Location		Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments		
	Twp	Rge Sec 1/4			Depth to Top	Elevation to Top	Zone Thickness (coal)	Depth to top of A Bed		A Bed Thickness (coal)	
JC-399	15S	62W 13 SENE	6,020	180.0	116.7	5,888.3	1.9	164.2	5,855.8	1.4	B BED 1.8 @ 145.7
JC-421	15S	62W 13 NESE	6,005	160.0				124.2	5,880.8	1.2	
JC-425	15S	62W 13 SESE	5,955	100.0				83.7	5,871.3	2.2	
JC-426	15S	61W 19 NWNW	5,950	200.0				86.9	5,863.1	2.1	N/C
JC-427	15S	62W 24 SENE	5,940	200.0							
JC-428	15S	62W 24 NESE	5,920	160.0			ERODED	50.4	5,869.6	1.4	N/C
JC-429	15S	62W 24 SESE	5,915	200.0			ERODED				
JC-430	15S	61W 30 NWNW	5,900	100.0			ERODED	28.0	5,872.0	0.4	N/C
JC-432	15S	61W 30 SENW	5,890	60.0			ERODED				
JC-435	15S	61W 19 SESW	5,940	80.0	30.4	5,909.6	1.7*	40.7	5,899.3	2.1	UPPER A BED IS SMUT
JC-437	15S	61W 19 SENW	5,980	100.0				89.6	5,890.4	1.6	UPPER A BED IS DARK SHALE WITH COAL
JC-439	15S	61W 18 SESW	6,005	140.0	117.0	5,888.0	2.6	125.6	5,879.4	1.8	
JC-440	15S	62W 18 SESW	6,010	160.0	134.8	5,875.2	1.6	141.7	5,868.3	1.4	
SLB-1	15W	62W 26 NWSW	5,930	78.0				58.0	5,872.0	5.8	
SLB-2	15S	62W 26 NWSW	5,920	59.0				44.0	5,876.0	3.5	
SLB-3	15S	62W 26 SWNW	5,940	138.0				89.5	5,850.5	4.0	
SLB-4	15S	62W 26 SWNW	5,900	108.0							
SLB-5	15S	62W 26 NWNW	6,030	108.0							
SLB-6	15S	62W 21 SWNW	5,870	148.0				124.0	5,746.0	*	N/C, USED FOR SUBCROP LINE
SLB-7	15S	62W 21 NWSW	5,860	98.0				79.3	5,780.7	*	ALL BEDS BURNED
SLB-8	15S	62W 21 SWSW	5,840	98.0				73.0	5,767.0	*	B BED 1.0/1.0P/2.0 @ 92
SLB-9	15S	62W 20 NENW	5,850	118.0				78.0	5,772.0	*	ALL BEDS BURNED,
SLB-10	15S	62W 19 NENE	5,780	78.0				56.0	5,724.0	0.7	B BED 2.3 @ 43
SLB-11	15S	62W 20 SENW	5,840	108.0				88.0	5,752.0	*	B-BED 2.0 SMUT/3.0 COAL @ 55
SLB-12	15S	62W 27 NESE	5,900	65.0				54.0	5,846.0	6.0	B BED 0.5 @ 61
SLB-51	15S	62W 19 NENE	5,770	56.7				56.0	5,714.0	0.7	MOSTLY BURNED?
SLB-52	15S	62W 20 NWNW	5,835	81.4				81.0	5,756.0	0.4	B BED 0.5 SMUT @ 64.5
SLB-53	15S	62W 20 SWNW	5,820	89.4				89.0	5,731.0	0.4	B BED 1.3 SMUT/0.7 COAL @ 60
SLB-54	15S	62W 21 SWNW	5,870	148.0							POSS B BED 0.7 SMUT @ 39
SLB-55	15S	62W 21 NWSW	5,860	45.0							BURNED ?
SLB-56	15S	62W 21 SWSW	5,820	38.0							BURNED ?
SLB-57	15S	62W 26 NWNW	6,030	108.0							BURNED ?
SLB-58	15S	62W 27 SENE	5,930	60.0				54.0	5,876	6.0	POSS B BED 0.7 @ 62
SLB-59	15S	62W 26 SWSW	5,900	108.0							N/C
SLB-60	15S	62W 26 SWSW	5,930	57.4				43.0	5,817.0	2.0	
SLB-61	15S	62W 26 NWSW	5,960	63.8				36.0	5,784.0	2.0	
SLB-62	15S	62W 26 SWNW	5,970	94.0				54.0	5,876	6.0	

TABLE 2 (cont'd)

Data Point ID	Location Twp Rge Sec 1/4 1/4	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments		
				Depth to Top	Elevation Top	Depth to top of A Bed	Elevation top of A Bed			
<u>HANOVER NW QUADRANGLE</u>										
CC-163	15S 62W 20 SWNE	5,835	45.2	35.0	5,800.0	3.0	43.4	5,791.6	1.8	N/C, USED FOR SUBCROP LINE
CM-24	15S 63W 15 NESE	5,760	140.0							N/C, USED FOR SUBCROP LINE
CM-25	15S 63W 20 NENE	5,830	240.0							
CM-26	15S 63W 21 SWNW	5,830	140.0	73.7	5,756.3	1.9	77.0	5,753.0	1.0	
CM-27	15S 63W 20 NESE	5,840	120.0	58.0	5,782.0	4.4	66.7	5,773.3	3.0	
CM-28	15S 63W 16 SESE	5,820	160.0	91.8	5,728.2	2.6	99.5	5,720.5	3.5	
CM-29	15S 63W 20 NWNE	5,835	100.0	59.5	5,775.5	1.5	63.6	5,771.4	1.8	B BED 3.7 @ 51.5
CM-30	15S 63W 17 SESE	5,840	140.0	84.3	5,755.7	4.2	96.2	5,743.8	1.5	
CM-31	15S 63W 21 NWSE	5,800	80.0				38.0	5,762.0	3.0	
CM-32	15S 63W 21 NWSE	5,830	100.0	57.0	5,773.0	5.5	66.8	5,763.0	3.1	
CM-33	15S 63W 21 NWSE	5,830	100.0	50.6	5,779.4	4.4	65.9	5,764.1	3.0	
CM-34	15S 63W 21 NWSE	5,820	80.0	38.2	5,781.8	3.0	50.5	5,769.5	3.1	
CM-35	15S 63W 17 NESE	5,860	200.0	149.0	5,711.0	1.7	157.0	5,803.0	1.8	B BED 1.7 @ 135
CM-36	15S 63W 17 NESE	5,880	200.0	144.8	5,735.2	3.2	165.0	5,715.0	2.3	B BED 2.0 @ 102
CM-37	15S 63W 17 SESE	5,835	140.0				97.0	5,738.0	1.0	SURFICIAL DEPOSITS TO 89'
CM-38	15S 63W 17 SESE	5,845	140.0	108.5	5,736.5	1.0	118.7	5,726.3	1.3	B BED 4.3 @ 96
CM-39	15S 63W 21 SESE	5,815	140.0				71.0	5,744.0	2.0	
CM-40	15S 63W 22 SESE	5,785	140.0							N/C, USED FOR SUBCROP LINE
CM-41	15S 63W 23 SESE	5,715	80.0							N/C, USED FOR SUBCROP LINE
CM-42	15S 63W 23 SESE	5,685	140.0							N/C, USED FOR SUBCROP LINE
CM-43	15S 63W 13 NESE	5,720	60.0							N/C, USED FOR SUBCROP LINE
DRENNON	15S 63W 21 NWSE	5,820	56.0							OVERBURDEN 52' PLUS
JC-414	15S 63W 19	5,880	300.0							N/C, LOC TO SECTION ONLY
JC-415	15S 63W 30	5,800	200.0							N/C, LOC TO SECTION ONLY
SLB-13	15S 63W 18 SESE	5,865	98.0	65.0	5,793.0	2.0	82.0	5,783.0	1.2	
SLB-14	15S 63W 19 NENE	5,850	76.5	45.2	5,804.8	1.7	58.6	5,791.4	2.2	
SLB-15	15S 63W 16 SESE	5,795	118.0	47.5	5,747.5	2.5	63.0	5,732.0	3.3	
SLB-16	15S 63W 19 SESE	5,840	68.0	25.0	5,815.0	2.0	37.5	5,802.5	3.7	
SLB-17	15S 63W 16 NESE	5,790	95.0							
SLB-18	15S 63W 18 SWSW	5,955	128.0	115.0	5,843.5	0.9*	125.0	5,830.0	1.3	N/C
SLB-20	15S 63W 19 SWNW	5,880	108.0	89.0	5,739.0	5.5	103.0	5,725.0	2.0	UPPER A BED IS SMUT
SLB-21	15S 63W 16 SWSW	5,828	109.0							N/C
SLB-22	15S 63W 19 SWNW	5,852	68.0							N/C, ALL SURFICIAL DEPOSITS?
SLB-23	15S 63W 19 SWNW	5,926	101.0	86.0	5,840.0	1.0	97.0	5,826.0	1.3	CORRELATION UNCERTAIN
SLB-38	15S 63W 18 SWSW	5,945	126.3				125.0	5,820	1.3	CORRELATION UNCERTAIN
SLB-45	15S 63W 20 SESE	5,840	64.9	52.0	5,788.0	6.0	61.5	5,778.5	3.4	
SLB-46	15S 63W 20 NESE	5,820	58.0							N/C
SLB-48	15S 63W 16 SESE	5,820	78.1				77.0	5,743.0	1.1	CORRELATION UNCERTAIN

TABLE 2 (cont'd)

Data Point ID	Twp	Rge	Sec	1/4	Location	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments
								Depth to Top	Elevation of Top	Depth to top of A Bed	Elevation of top of A Bed	
								Zone Thickness (coal)			Thickness (coal)	
HOLTWOOD STORE QUADRANGLE												
PS-1262	12S	59W	20	SWSW	6,160	440.0	253.0		5,907.0	5.0		
PS-1263	12S	60W	24	SESW	6,225	660.0	407.0		5,818.0	5.0		
PS-1269	13S	60W	21	SESW	6,240	700.0	475.0		5,765.0	?		
PS-1270	13S	60W	15	NENE	6,180	620.0	293.0		5,887.0	2.5		USED FOR STRUCTURE, THICKNESS UNCERTAIN
PS-1271	13S	60W	26	NWSW	6,135	464.0	234.0		5,901.0	5.0		
PS-1272	13S	59W	8	SWSW	5,950	260.0	127.0		5,883.0	2.5		
PS-1273	13S	60W	25	SESE	6,010	260.0	219.0		5,821.0	5.5		
PS-1304	13S	60W	12	SWSE	6,040	360.0						N/C, USED FOR SUBCROP LINE
PIKEVIEW QUADRANGLE												
NOTE: No depth information available for mines, except where shown												
2222-F	13S	66W	17	NWNE	6,400	753.0	546.0		5,854.0	6.0		
ALTITUDE	13S	66W	29	SWNW	6,270	112.5	100.0		6,170.0	9.4		3.5/3.0P/5.9
BUSY BEE	13S	66W	32	NWNE	6,200		?		?	9.0		
CITY NO. 1	13S	66W	29	SW	6,210	176.7	170.0		6,040.0	6.7		
CITY NO. 2	13S	66W	33	NWNW	6,230	57.0	43.0		6,187.0	14.0		THICKNESS SHOWN AS 4.5' AND 6 TO 20'
CITY NO. 3	13S	66W	33	NWNW	6,220		?		?	6.0		
CLIMAX NO. 1	13S	66W	29	SESW	6,240		?		?	9.0		
COLUMBINE	13S	67W	12	SENE	6,400		?		?	8.0		
CORLEY	13S	66W	32	NENE	6,240		?		?	8.0		
COTTONWOOD	13S	67W	13	SESE	6,300		?		?	3.5		
CURTIS	13S	66W	29	SWSE	6,260		?		?	16.4		THICKNESS RANGE OF 9 TO 20' IN MINE
DANVILLE	13S	66W	29	SESW	6,200		?		?	10.0		
KLONDIKE	13S	66W	8	SWNW	6,340		?		?	8.9		
LAST CHANCE	13S	67W	13	SESE	6,300		?		?	4.0		
MONUMENT												
VALLEY	13S	67W	11	SESW	6,600		?		?	2.6		
MOUNTAIN VIEW	13S	66W	18	NWSW	6,300		?		?	3.0		
NEER	13S	67W	13	SE	6,350		?		?	4.6		
NEW												
ALTITUDE	13S	66W	29	NWNW	6,300		?		?	2.3		NOT THE A BED ?
OAK GROVE	13S	67W	11	SESW	6,600		?		?	8.0		SEE MONUMENT VALLEY
PATTERSON	13S	66W	32	NWNE	6,200		?		?	11.1		NUMEROUS ROLLS
PIKEVIEW	13S	66W	18	SESW	6,250		?		?	6.0		
PIKEVIEW-a	13S	66W	18	NWNE	6,360		?		?	7.1		3.1/1.7P/4.0
PIKEVIEW-b	13S	66W	18	NWSE	6,245	200.0	194.0		6,051.0	6.0		
PIKEVIEW-c	13S	66W	18	NESE	6,260		?		?	7.0		
PIKEVIEW-d	13S	66W	7	SWSE	6,340		?		?	9.5		7.0/1.5P/2.5
PIKEVIEW-e	13S	66W	7	SWSE	6,360		?		?	9.0		
PIKEVIEW-f	13S	66W	7	SWSE	6,320	704.0	695.0		5,625.0	9.0		
PIKEVIEW-g	13S	66W	7	SWSE	6,280		?		?	9.0		6.0/1.3P/3.0
PIKEVIEW-h	13S	66W	7	NESW	6,430	916.0	907.0		5,525.0	9.0		

TABLE 2 (cont'd)

Data Point ID	Location Twp Rge Sec 1/4 1/4	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments	
				Depth to Top	Elevation of Top	Depth to top of A Bed	A Bed Thickness (coal)		
PIKEVIEW-1	13S 67W 13 NE	6,370	242.0	234.0	6,136.0	8.0			
PIKEVIEW-J	13S 67W 13 NE	6,340	213.0	205.0	6,135.0	8.0			
PIKEVIEW-k	13S 67W 13 SENE	6,300	182.0	175.0	6,125.0	7.0			
PIKEVIEW FH NO. 1	13S 67W 12 NENW	6,510	596.0	306.0	6,204.0	6.0	6.0	5.0	GEOPHYSICAL LOG FROM WILLARD OWENS CORRELATION UNCERTAIN
PINE GROVE PROSPECT OPENING TAYMAN TH NO. 1	13S 66W 19 NWSE 13S 67W 24 SESE 13S 66W 27 NNNE	6,210 6,250 6,400	1,318.0	?	?	?	?	3.0	2.3' C BED THIN COALS ABOVE - 1.5/3.5P/2.0/6.0P/1.5 @ 660, GEOPHYSICAL LOG FROM WILLARD OWENS
<u>RUSH NW QUADRANGLE</u>									
0-350	12S 61W 29 NENW	6,776	7,183.0	1,400.0	5,376.0	?			USED FOR STRUCTURE ONLY, DEPTH APPROXIMATE
0-356	13S 61W 21 NNNE	6,543	6,753.0	995.0	5,548.0	4.0			USED FOR STRUCTURE ONLY
PS-1267	13S 60W 8 NWSE	6,320	820.0	543.0	5,777.0	?			USED FOR STRUCTURE ONLY
PS-1268	12S 60W 33 SWSW	6,295	840.0	5,45.0	5,750.0	2.5			USED FOR STRUCTURE ONLY
PS-1302	13S 60W 30 NENE	6,320	800.0	540.0	5,780.0	?			USED FOR STRUCTURE ONLY
<u>TRUCKTON QUADRANGLE</u>									
CM-52	15S 61W 15 NNW	6,105	190.0	140.0	5,965.0	?			USED FOR STRUCTURE ONLY
CM-54	15S 61W 20 SENW	6,030	140.0	82.5	5,947.9	2.5			UPPER A BED IS ERODED
CM-56	15S 61W 28 NWSW	6,040	120.0	53.0	5,987.0	1.7			
<u>YODER QUADRANGLE</u>									
CM-1	14S 60W 28 SWSW	6,020	100.0	67.2	5,952.8	2.8			N/C, L-F A0 @ 64' 35 FT TO L-F A0
CM-2	14S 60W 33 NNW	6,010	120.0	49.8	5,940.2	2.2			B BED 1.3 @ 46.1
CM-4	14S 60W 31 SENE	5,990	140.0	81.3	5,908.7	3.21			B BED 3.0 @ 110.2
CM-5	14S 60W 31 SWNE	5,990	160.0	122.8	5,867.2	2.0			B BED 1.2 @ 58.0
CM-6	14S 60W 31 SWNW	5,990	200.0	69.5	5,970.5	2.0			
CM-7	14S 60W 29 SESW	6,040	160.0	118.4	5,926.6	1.7			
CM-8	14S 60W 29 SWSE	6,045	180.0	64.9	5,965.1	2.2			B BED 2.0 @ 8.0 (?)
CM-9	14S 60W 29 SESE	6,030	220.0	164.5	5,925.5	5.5			B BED 2.0 @ 148.7
CM-10	14S 60W 20 SWSW	6,090	220.0	84.8	5,935.0	2.4			
CM-11	14S 60W 31 NENE	6,020	160.0						N/C, POOR LOG
CM-12	14S 60W 20 SWSE	6,045	140.0	84.0	5,906.0	6.1			N/C, LOG ENDS @ 46.0
CM-13	14S 60W 20 SESE	6,055	90.0						2.5/0.50P/2.1/1.4P/1.5
CM-14	14S 60W 31 SWNE	5,990	120.0	52.9	5,947.1	1.6			N/C, USED FOR SUBCROP LINE
CM-44	14S 61W 36 SESE	5,960	160.0						
CM-45	14S 60W 32 SENE	6,000	120.0						
CM-46	14S 61W 36 SWSE	5,970	140.0	58.8	5,861.2	1.4			N/C, USED FOR SUBCROP LINE
CM-47	15S 61W 1 NESE	5,920	120.0						

TABLE 2 (cont'd)

Data Point ID	Location Twp Rge Sec 1/4 1/4	Surface Elevation	Total Depth	UPPER A BED		A BED OR LOWER A BED		Comments
				Depth to Top	of Top	Depth to top of A Bed	Elevation top of A Bed	
CM-48	15S 60W 6 SWSW	5,900	160.0					N/C USED FOR SUBCROP LINE
CM-49	15S 61W 13 NNW	5,970	80.0					N/C USED FOR SUBCROP LINE
CM-50	15S 61W 14 NNW	6,045	140.0					
CM-51	15S 61W 15 NNW	6,090	180.0			96.7	5,948.3	1.3
CM-58	13S 60W 32 SESE	6,180	100.0			131.5	5,958.5	1.2
CM-59	13S 60W 32 SWSW	6,200	160.0				NTH	
CM-60	14S 60W 6 SESW	6,200	140.0				NTH	
0-365	14S 60W 20 NNW	6,145	5,756.0			310.0	5,815.0	
PS-1305	13S 60W 31 SWSW	6,285	840.0	532.0	5,753.0	536.6	5,748.5	8.5
PS-1306	14S 61W 1 SWSW	6,330	860.0	555.0	5,775.0	570.0	5,760.0	5.0
W-139	14S 60W 4 SWSW	6,110	116.0			95.0	6,015.0	5.0
GOLDEN DAWN	14S 60W 32 NENE	6,010						7.0
RUSH	14S 60W 29 SESE	6,030						3.5

LIST OF ABBREVIATIONS

*	BURNED COAL
CSG	CASING
L-F AQ	LARAMIE-FOX HILLS AQUIFER
LOC	LOCATION
NTH	NOT TO HORIZON
N/C	NO COAL
OC	OUTCROP
P	PARTING

NOTE: SEE TABLE 3 FOR SOURCES OF DATA POINTS

TABLE 3

INDEX TO SOURCES OF DATA POINTS

16387-F, etc.	Water well, identified by permit number; drillers' logs from Colorado Division of Water Resources records
Cardiff, etc.	Coal mine measurement; records from Colorado Division of Mines and Colorado Geological Survey Open File Report 78-9
CC	Drill hole by Columbine Coal Co.; data obtained from map
CM	Coal exploration drill holes from a confidential source, interpreted from natural gamma, gamma gamma density and resistivity logs
CS	Drill hole by Fountain Sand and Gravel Co.; interpreted from a geophysical log
DH	Drill hole information from coal mine maps, Colorado Division of Mines
GO	Coal exploration drill holes by Gypsy Oil Co.; information from lithologic logs of cores, obtained from Colorado Oil and Gas Conservation Commission
JC	Coal exploration drill holes by Ark Land Co.; drillers' logs supplied by Ark Land Co.; maps from Colorado State Land Board
O	Oil and gas exploration holes; interpreted from geophysical logs, generally spontaneous potential and resistivity, from Colorado Oil and Gas Conservation Commission
PS	Uranium exploration drill holes by Powerco/Shell joint venture; interpreted from natural gamma, spontaneous potential and resistivity logs
RME	Coal exploration drill holes by Rocky Mountain Energy; data from cross sections and index map
SLB	Coal exploration drill hole data from files of the Colorado State Land Board; SLB 1 TO 24: Holes drilled by Pittsburg and Midway Coal Co.; SLB 25 to 62: data from a 1938 map
W-109 to 114	Water wells; data interpreted from geophysical logs, Colorado Division of Water Resources
W-115 +	Water wells; data from drillers' logs, Colorado Geological Survey Open File Report 78-8

TABLE 4
COAL RESOURCES ESTIMATES
A COAL BED, LARAMIE FORMATION

* Re1. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons
ELBERT COUNTY												
<u>T12S R59W</u>												
0-200' OVERBURDEN												
D	--	--	--	180	5.5	1.7	--	--	--	180	5.5	1.7
I	--	--	--	1390	5.8	14.3	--	--	--	1390	5.8	14.3
H	--	--	--	--	--	--	--	--	--	--	--	--
T	--	--	--	1570	5.8	16.0	--	--	--	1570	5.8	16.0
200-500' OVERBURDEN												
D	330	4.8	2.8	620	5.5	6.0	--	--	--	950	5.2	8.8
I	200	4.5	1.6	780	5.5	7.6	--	--	--	980	5.3	9.2
H	--	--	--	--	--	--	--	--	--	--	--	--
T	530	4.7	4.4	1400	5.5	13.6	--	--	--	1930	5.3	18.0
<u>T13S R59W</u>												
0-200' OVERBURDEN												
D	--	--	--	160	5.3	1.5	--	--	--	160	5.3	1.5
I	780	3.7	5.1	580	5.3	5.4	--	--	--	1360	4.3	10.4
H	--	--	--	--	--	--	--	--	--	--	--	--
T	780	3.7	5.1	740	5.3	6.9	--	--	--	1520	3.7	11.9
200-500' OVERBURDEN												
D	--	--	--	15	5.3	0.1	--	--	--	15	5.3	0.1
I	--	--	--	120	5.2	1.1	--	--	--	120	5.2	1.1
H	--	--	--	--	--	--	--	--	--	--	--	--
T	--	--	--	135	5.2	1.2	--	--	--	135	5.2	1.2
<u>ELBERT COUNTY TOTALS</u>												
0-200' OVERBURDEN												
D	--	--	--	340	5.4	3.2	--	--	--	340	5.4	3.2
I	780	3.7	5.1	1970	5.7	19.7	--	--	--	2750	5.1	24.8
H	--	--	--	--	--	--	--	--	--	--	--	--
T	780	3.7	5.1	2310	5.6	22.9	--	--	--	3090	5.1	28.0
200-500' OVERBURDEN												
D	330	4.8	2.8	630	5.4	6.1	--	--	--	960	5.3	8.9
I	200	4.5	1.6	900	5.5	8.7	--	--	--	1100	5.4	10.3
H	--	--	--	--	--	--	--	--	--	--	--	--
T	530	4.7	4.4	1530	5.4	14.8	--	--	--	2060	5.3	19.2
EL PASO COUNTY												
<u>T12S R60W</u>												
0-200' OVERBURDEN												
D	100	4.6	0.8	--	--	--	--	--	--	100	4.6	0.8
I	70	4.9	0.6	40	5.0	0.3	--	--	--	110	4.9	0.9
H	--	--	--	--	--	--	--	--	--	--	--	--
T	170	4.7	1.4	40	5.0	0.3	--	--	--	210	4.8	1.7

* [Calculations are in millions of short tons; to convert feet to meters multiply by 0.3048, to convert short tons to metric tons multiply by 0.9071; D=demonstrated resources, I=indicated resources, H=hypothetical resources, T=total of D, I and H]

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MIT Tons	Area (Ac)	Avg Thk (Ft)	MIT Tons	Area (Ac)	Avg Thk (Ft)	MIT Tons	Area (Ac)	Avg Thk (Ft)	MIT Tons
200-500' OVERBURDEN												
D	2680	4.1	19.5	--	--	--	--	--	--	2680	4.1	19.5
I	2250	3.5	13.9	320	5.1	2.9	--	--	--	2570	3.7	16.8
H	--	--	--	190	5.1	1.7	--	--	--	190	5.1	1.7
T	4930	3.8	33.4	510	5.1	4.6	--	--	--	5440	3.9	38.0
500-1000' OVERBURDEN												
D	430	2.6	2.0	--	--	--	--	--	--	430	2.6	2.0
I	3550	2.8	17.6	--	--	--	--	--	--	3550	2.8	17.6
H	260	2.7	1.2	--	--	--	--	--	--	260	2.7	1.2
T	4240	2.8	20.8	--	--	--	--	--	--	4240	2.8	20.8
T12S R61W												
500-1000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	1180	3.2	6.6	--	--	--	--	--	--	1180	3.2	6.6
H	2240	3.5	13.9	--	--	--	--	--	--	2240	3.5	13.9
T	3420	3.4	20.5	--	--	--	--	--	--	3420	3.4	20.5
1000-2000' OVERBURDEN												
D	540	4.0	3.8	--	--	--	--	--	--	540	4.0	3.8
I	6500	4.0	46.0	--	--	--	--	--	--	6500	4.0	46.0
H	1520	4.5	12.1	--	--	--	--	--	--	1520	4.5	12.1
T	8560	4.1	61.9	--	--	--	--	--	--	8560	4.1	61.9
T12S R62W												
1000-2000' OVERBURDEN												
D	90	4.0	0.6	--	--	--	--	--	--	90	4.0	0.6
I	8000	4.0	56.6	360	5.1	3.2	--	--	--	8360	4.1	59.8
H	3450	4.5	27.5	70	5.0	0.6	--	--	--	3520	4.5	28.1
T	11540	4.1	84.7	430	5.1	3.8	--	--	--	11970	4.2	88.5
T12S R63W												
1000-2000' OVERBURDEN												
D	180	3.1	1.0	--	--	--	--	--	--	180	3.1	1.0
I	7680	3.6	48.9	300	5.1	2.7	--	--	--	7980	3.7	51.6
H	3720	4.4	29.0	130	5.0	1.2	--	--	--	3850	4.4	30.2
T	11580	3.8	78.9	430	5.1	3.9	--	--	--	12010	3.9	82.8
T12S R64W												
1000-2000' OVERBURDEN												
D	1130	4.0	8.0	--	--	--	--	--	--	1130	4.0	8.0
I	8900	4.0	63.0	--	--	--	--	--	--	8900	4.0	63.0
H	280	4.0	2.0	--	--	--	--	--	--	280	4.0	2.0
T	10310	4.0	73.0	--	--	--	--	--	--	10310	4.0	73.0
2000'+ OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	1680	4.0	11.9	--	--	--	--	--	--	1680	4.0	11.9
H	--	--	--	--	--	--	--	--	--	--	--	--
T	1680	4.0	11.9	--	--	--	--	--	--	1680	4.0	11.9

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons
<u>T12S R65W</u>												
1000-2000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	3840	4.0	27.2	--	--	--	--	--	--	3840	4.0	27.2
H	2520	4.5	20.1	--	--	--	--	--	--	2520	4.5	20.1
T	6360	4.2	47.3	--	--	--	--	--	--	6360	4.2	47.3
2000'+ OVERBURDEN												
D	1050	4.0	7.4	--	--	--	--	--	--	1050	4.0	7.4
I	3200	4.0	22.7	--	--	--	--	--	--	3200	4.0	22.7
H	1040	4.2	7.7	--	--	--	--	--	--	1040	4.2	7.7
T	5290	4.0	37.8	--	--	--	--	--	--	5290	4.0	37.8
<u>T12S R66W</u>												
500-1000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	820	4.5	6.5	20	5.2	0.2	--	--	--	840	4.6	6.7
H	70	4.9	0.6	90	5.1	0.8	--	--	--	160	5.0	1.4
T	890	4.5	7.1	110	5.1	1.0	--	--	--	1000	4.6	8.1
1000-2000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	2080	4.7	17.3	80	5.2	0.7	--	--	--	2160	4.8	18.0
H	7850	4.6	63.9	760	5.2	7.0	--	--	--	8610	4.7	70.9
T	9930	4.6	81.2	840	5.2	7.7	--	--	--	10770	4.7	88.9
2000'+ OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	--	--	--	--	--	--	--	--	--	--	--	--
H	320	4.5	2.5	--	--	--	--	--	--	320	4.5	2.5
T	320	4.5	2.5	--	--	--	--	--	--	320	4.5	2.5
<u>T12S R67W</u>												
200-500' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	720	4.0	5.1	--	--	--	--	--	--	720	4.0	5.1
H	980	4.0	6.9	--	--	--	--	--	--	980	4.0	6.9
T	1700	4.0	12.0	--	--	--	--	--	--	1700	4.0	12.0
500-1000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	2120	4.0	15.0	150	5.2	1.4	--	--	--	2270	4.0	16.4
H	2080	4.5	16.6	320	5.1	2.9	--	--	--	2400	4.6	19.5
T	4200	4.2	31.6	470	5.1	4.3	--	--	--	4670	4.4	35.9
1000-2000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	20	5.0	0.2	110	5.1	1.0	--	--	--	130	5.1	1.2
H	--	--	--	10	5.1	0.1	--	--	--	10	5.1	0.1
T	20	5.0	0.2	120	5.1	1.1	--	--	--	140	5.1	1.3

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons
<u>T13S R60W</u>												
0-200' OVERBURDEN												
D	780	4.2	5.8	310	5.2	2.9	--	--	--	1090	4.6	8.7
I	1530	3.5	9.5	230	5.1	2.1	--	--	--	1760	3.8	11.6
H	--	--	--	--	--	--	--	--	--	--	--	--
T	2310	3.7	15.3	540	5.2	5.0	--	--	--	2850	4.1	20.3
200-500' OVERBURDEN												
D	2200	3.8	14.8	1240	5.6	12.3	--	--	--	3440	4.5	27.1
I	4580	3.5	28.4	2780	6.0	29.5	--	--	--	7360	4.5	57.9
H	--	--	--	--	--	--	--	--	--	--	--	--
T	6780	3.6	43.2	4020	5.9	41.8	--	--	--	10800	4.5	85.0
500-1000' OVERBURDEN												
D	290	2.7	1.4	190	7.0	2.4	--	--	--	480	4.5	3.8
I	5700	3.5	35.3	140	5.5	1.4	--	--	--	5840	3.6	36.7
H	300	3.5	1.9	--	--	--	--	--	--	300	3.5	1.9
T	6290	3.5	38.6	330	6.5	3.8	--	--	--	6620	3.7	42.4
<u>T13S R61W</u>												
500-1000' OVERBURDEN												
D	820	4.2	6.1	120	5.2	1.1	--	--	--	940	4.3	7.2
I	14500	4.3	110.0	--	--	--	--	--	--	14500	4.3	110.0
H	1320	3.5	8.2	--	--	--	--	--	--	1320	3.5	8.2
T	16640	4.2	124.3	120	5.2	1.1	--	--	--	16760	4.2	125.4
1000-2000' OVERBURDEN												
D	1100	4.0	7.8	--	--	--	--	--	--	1100	4.0	7.8
I	5140	4.0	3.6	--	--	--	--	--	--	5140	4.0	3.6
H	--	--	--	--	--	--	--	--	--	--	--	--
T	6240	4.0	11.4	--	--	--	--	--	--	6240	4.0	11.4
<u>T13S R62W</u>												
500-1000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	3460	4.0	24.5	--	--	--	--	--	--	3460	4.0	24.5
H	9000	4.5	71.7	60	5.0	0.5	--	--	--	9060	4.5	72.2
T	12460	4.4	96.2	60	5.0	0.5	--	--	--	12520	4.4	96.7
1000-2000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	2560	3.9	17.7	--	--	--	--	--	--	2560	3.9	17.7
H	7650	4.5	60.9	300	5.0	2.7	--	--	--	7950	4.6	63.6
T	10210	4.3	78.6	300	5.0	2.7	--	--	--	10510	4.4	81.3
<u>T13S R63W</u>												
500-1000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	1850	3.9	12.8	--	--	--	--	--	--	1850	3.9	12.8
H	4300	4.0	30.4	--	--	--	--	--	--	4300	4.0	30.4
T	6150	4.0	43.2	--	--	--	--	--	--	6150	4.0	43.2

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons
1000-2000' OVERBURDEN												
D	1130	4.0	13.1	--	--	--	--	--	--	1130	4.0	13.1
I	14600	4.0	103.0	--	--	--	--	--	--	14600	4.0	103.0
H	2200	4.5	17.5	--	--	--	--	--	--	2200	4.5	17.5
T	17930	4.2	133.6	--	--	--	--	--	--	17930	4.2	133.6
<u>T13S R64W</u>												
500-1000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	--	--	--	--	--	--	--	--	--	--	--	--
H	810	4.5	6.5	--	--	--	--	--	--	810	4.5	6.5
T	810	4.5	6.5	--	--	--	--	--	--	810	4.5	6.5
1000-2000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	2430	4.0	17.2	--	--	--	--	--	--	2430	4.0	17.2
H	19800	4.0	140.0	--	--	--	--	--	--	19800	4.0	140.0
T	22230	4.0	157.2	--	--	--	--	--	--	22230	4.0	157.2
<u>T13S R65W</u>												
500-1000' OVERBURDEN												
D	20	4.0	0.1	--	--	--	--	--	--	20	4.0	0.1
I	630	4.5	5.0	--	--	--	--	--	--	630	4.5	5.0
H	--	--	--	--	--	--	--	--	--	--	--	--
T	650	4.5	5.1	--	--	--	--	--	--	650	4.5	5.1
1000-2000' OVERBURDEN												
D	1610	4.0	11.4	--	--	--	--	--	--	1610	4.0	11.4
I	11800	4.0	83.6	--	--	--	--	--	--	1180	4.0	83.6
H	9400	4.0	66.6	--	--	--	--	--	--	9400	4.0	66.6
T	22810	4.0	161.6	--	--	--	--	--	--	22810	4.0	161.6
<u>T13W R66W</u>												
0-200' OVERBURDEN												
D	170	4.6	1.4	380	8.2	5.5	60	11.2	1.2	610	7.6	8.1
I	--	--	--	--	--	--	--	--	--	--	--	--
H	--	--	--	--	--	--	--	--	--	--	--	--
T	170	4.6	1.4	380	8.2	5.5	60	11.2	1.2	610	7.6	8.1
200-500' OVERBURDEN												
D	480	4.5	3.8	690	7.5	9.2	140	11.0	2.7	1310	6.8	15.7
I	560	4.7	4.7	100	5.5	1.0	--	--	--	660	4.9	5.7
H	--	--	--	--	--	--	--	--	--	--	--	--
T	1040	4.6	8.5	790	7.3	10.2	140	11.0	2.7	1970	6.2	21.4
500-1000' OVERBURDEN												
D	1060	4.1	7.7	1280	8.0	18.1	--	--	--	2340	6.3	25.8
I	4190	4.5	33.4	1410	5.5	13.7	--	--	--	5600	4.8	47.1
H	--	--	--	--	--	--	--	--	--	--	--	--
T	5250	4.4	41.1	2690	6.7	31.8	--	--	--	7940	5.2	72.9

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MIT Tons	Area (Ac)	Avg Thk (Ft)	MIT Tons	Area (Ac)	Avg Thk (Ft)	MIT Tons	Area (Ac)	Avg Thk (Ft)	MIT Tons
<u>1000-2000' OVERBURDEN</u>												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	5400	4.2	40.1	30	5.0	0.3	--	--	--	5430	4.3	40.4
H	1800	4.5	14.3	--	--	--	--	--	--	1800	4.5	14.3
T	7200	4.3	54.4	30	5.0	0.3	--	--	--	7230	4.3	54.7
<u>T13S R67W</u>												
<u>0-200' OVERBURDEN</u>												
D	460	4.5	3.7	320	6.0	3.4	--	--	--	780	5.2	7.1
I	25	4.0	0.2	--	--	--	--	--	--	25	4.0	0.2
H	--	--	--	--	--	--	--	--	--	--	--	--
T	485	4.5	3.9	320	6.0	3.4	--	--	--	805	5.2	7.3
<u>200-500' OVERBURDEN</u>												
D	320	4.8	2.7	420	7.5	5.5	--	--	--	740	6.3	8.2
I	520	4.5	4.1	--	--	--	--	--	--	520	4.5	4.1
H	--	--	--	--	--	--	--	--	--	--	--	--
T	840	4.6	6.8	420	7.5	5.5	--	--	--	1260	5.6	12.3
<u>500-1000' OVERBURDEN</u>												
D	320	4.8	2.7	220	7.5	2.9	--	--	--	540	5.9	5.6
I	480	4.5	3.8	--	--	--	--	--	--	480	4.5	3.8
H	--	--	--	--	--	--	--	--	--	--	--	--
T	800	4.6	6.5	220	7.5	2.9	--	--	--	1020	5.3	9.4
<u>T14S R60W</u>												
<u>0-200' OVERBURDEN</u>												
D	2290	3.5	14.2	240	5.4	2.3	--	--	--	2530	3.7	16.5
I	300	3.8	2.0	360	5.5	3.5	--	--	--	660	4.8	5.5
H	--	--	--	--	--	--	--	--	--	--	--	--
T	2590	3.5	16.2	600	5.5	5.8	--	--	--	3190	3.9	22.0
<u>200-500' OVERBURDEN</u>												
D	1040	4.5	8.3	460	6.5	5.3	--	--	--	1500	5.2	13.6
I	1160	4.5	9.2	1600	6.0	17.0	--	--	--	2760	5.4	26.2
H	--	--	--	--	--	--	--	--	--	--	--	--
T	2200	4.5	17.5	2060	6.1	22.3	--	--	--	4260	5.3	39.8
<u>T14S R61W</u>												
<u>0-200' OVERBURDEN</u>												
D	80	2.6	0.4	--	--	--	--	--	--	80	2.6	0.4
I	740	2.7	3.5	--	--	--	--	--	--	740	2.7	3.5
H	--	--	--	--	--	--	--	--	--	--	--	--
T	820	2.7	3.9	--	--	--	--	--	--	820	2.7	3.9
<u>200-500' OVERBURDEN</u>												
D	1570	3.0	8.3	240	6.0	2.5	--	--	--	1810	3.4	10.8
I	14100	3.5	87.3	110	5.5	1.1	--	--	--	14210	3.6	88.4
H	40	3.0	0.2	--	--	--	--	--	--	40	3.0	0.2
T	15710	3.5	95.8	350	5.8	3.6	--	--	--	16060	3.5	99.4

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons
500-1000' OVERBURDEN												
D	890	4.6	7.2	360	6.0	3.8	--	--	--	1250	5.0	11.0
I	3360	3.6	21.4	10	5.0	0.1	--	--	--	3370	3.6	21.5
H	100	3.0	0.5	--	--	--	--	--	--	100	3.0	0.5
T	4350	3.8	29.1	370	6.0	3.9	--	--	--	4720	4.0	33.0
<u>T14S R62W</u>												
0-200' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	700	3.5	4.3	--	--	--	--	--	--	700	3.5	4.3
H	80	3.5	0.5	--	--	--	--	--	--	80	3.5	0.5
T	780	3.5	4.8	--	--	--	--	--	--	780	3.5	4.8
200-500' OVERBURDEN												
D	1570	4.3	11.9	760	5.6	7.5	--	--	--	2330	4.8	19.4
I	11400	4.0	80.7	540	5.5	5.3	--	--	--	11940	4.1	86.0
H	200	3.5	1.2	--	--	--	--	--	--	200	3.5	1.2
T	13170	4.0	93.8	1300	5.6	12.8	--	--	--	14470	4.2	107.6
500-1000' OVERBURDEN												
D	1170	3.8	7.9	100	6.0	1.1	--	--	--	1270	4.0	9.0
I	4240	3.8	28.5	--	--	--	--	--	--	4240	3.8	28.5
H	90	4.0	0.6	--	--	--	--	--	--	90	4.0	0.6
T	5500	3.8	37.0	100	6.0	1.1	--	--	--	5600	3.9	38.1
<u>T14S R63W</u>												
200-500' OVERBURDEN												
D	540	3.6	3.4	--	--	--	--	--	--	540	3.6	3.4
I	8480	4.0	60.0	--	--	--	--	--	--	8480	4.0	60.0
H	110	3.5	0.7	--	--	--	--	--	--	110	3.5	0.7
T	9130	4.0	64.1	--	--	--	--	--	--	9130	4.0	64.1
500-1000' OVERBURDEN												
D	200	3.5	1.2	--	--	--	--	--	--	200	3.5	1.2
I	4960	3.8	33.4	--	--	--	--	--	--	4960	3.8	33.4
H	8720	4.0	61.7	--	--	--	--	--	--	8720	4.0	61.7
T	13880	3.9	96.3	--	--	--	--	--	--	13880	3.9	96.3
<u>T14S R64W</u>												
0-200' OVERBURDEN												
D	160	4.2	1.2	310	6.6	3.6	--	--	--	470	5.8	4.8
I	--	--	--	--	--	--	--	--	--	--	--	--
H	--	--	--	--	--	--	--	--	--	--	--	--
T	160	4.2	1.2	310	6.6	3.6	--	--	--	470	5.8	4.8
200-500' OVERBURDEN												
D	980	4.0	6.9	480	6.0	5.1	--	--	--	1460	4.7	12.0
I	3120	3.3	18.2	440	5.5	4.3	--	--	--	3560	3.6	22.5
H	--	--	--	--	--	--	--	--	--	--	--	--
T	4100	3.5	25.1	920	5.8	9.4	--	--	--	5020	3.9	34.5

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	Mt1 Tons	Area (Ac)	Avg Thk (Ft)	Mt1 Tons	Area (Ac)	Avg Thk (Ft)	Mt1 Tons	Area (Ac)	Avg Thk (Ft)	Mt1 Tons
<u>T14S R64W</u>												
500-1000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	5200	4.2	0.8	--	--	--	--	--	--	5200	4.2	0.8
H	8560	4.0	3.7	--	--	--	--	--	--	8560	4.0	3.7
T	13760	4.1	4.5	--	--	--	--	--	--	13760	4.1	4.5
1000-2000' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	120	4.0	0.8	--	--	--	--	--	--	120	4.0	0.8
H	520	4.0	3.7	--	--	--	--	--	--	520	4.0	3.7
T	640	4.0	4.5	--	--	--	--	--	--	640	4.0	4.5
<u>T14S R65W</u>												
0-200' OVERBURDEN												
D	--	--	--	1360	6.0	14.4	--	--	--	1360	6.0	14.4
I	850	4.0	6.0	560	5.4	5.4	--	--	--	1410	4.6	11.4
H	--	--	--	--	--	--	--	--	--	--	--	--
T	850	4.0	6.0	1920	5.8	19.8	--	--	--	2770	5.3	25.8
200-500' OVERBURDEN												
D	500	4.7	4.2	750	5.8	7.7	--	--	--	1250	5.4	11.9
I	780	4.7	6.5	1280	5.5	12.5	--	--	--	2060	5.3	19.0
H	--	--	--	--	--	--	--	--	--	--	--	--
T	1280	4.7	10.7	2030	5.6	20.2	--	--	--	3310	5.3	30.9
500-1000' OVERBURDEN												
D	590	4.4	4.6	200	5.5	1.9	--	--	--	790	4.7	6.5
I	2040	4.5	16.2	1480	5.3	13.9	--	--	--	3520	4.9	30.1
H	--	--	--	--	--	--	--	--	--	--	--	--
T	2630	4.5	20.8	1680	5.3	15.8	--	--	--	4310	4.9	36.6
1000-2000' OVERBURDEN												
D	210	4.0	1.5	--	--	--	--	--	--	210	4.0	1.5
I	340	4.2	2.5	--	--	--	--	--	--	340	4.2	2.5
H	--	--	--	--	--	--	--	--	--	--	--	--
T	550	4.1	4.0	--	--	--	--	--	--	550	4.1	4.0
<u>T14S R66W</u>												
0-200' OVERBURDEN												
D	400	3.5	2.5	300	6.8	3.6	--	--	--	700	5.0	6.1
I	120	4.0	0.8	--	--	--	--	--	--	120	4.0	0.8
H	--	--	--	--	--	--	--	--	--	--	--	--
T	520	3.6	3.3	300	6.8	3.6	--	--	--	820	4.8	6.9
200-500' OVERBURDEN												
D	1000	3.5	6.2	260	6.0	2.8	--	--	--	1260	4.1	9.0
I	--	--	--	--	--	--	--	--	--	--	--	--
H	--	--	--	--	--	--	--	--	--	--	--	--
T	1000	3.5	6.2	260	6.0	2.8	--	--	--	1260	4.1	9.0

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons	Area (Ac)	Avg Thk (Ft)	MtT Tons
500-1000' OVERBURDEN												
D	160	3.5	1.0	--	--	--	--	--	--	160	3.5	1.0
I	140	4.0	1.0	--	--	--	--	--	--	140	4.0	1.0
H	--	--	--	--	--	--	--	--	--	--	--	--
T	300	3.7	2.0	--	--	--	--	--	--	300	3.7	2.0
<u>T15S R61W</u>												
0-200' OVERBURDEN												
D	440	2.6	2.0	--	--	--	--	--	--	440	2.6	2.0
I	170	2.6	0.8	--	--	--	--	--	--	170	2.6	0.8
H	--	--	--	--	--	--	--	--	--	--	--	--
T	610	2.6	2.8	--	--	--	--	--	--	610	2.6	2.8
200-500 OVERBURDEN												
D	550	2.6	2.5	--	--	--	--	--	--	550	2.6	2.5
I	3120	2.7	14.9	--	--	--	--	--	--	3120	2.7	14.9
H	--	--	--	--	--	--	--	--	--	--	--	--
T	3670	2.7	17.4	--	--	--	--	--	--	3670	2.7	17.4
<u>T15S R62W</u>												
0-200' OVERBURDEN												
D	1480	4.2	11.0	350	5.8	3.6	--	--	--	1830	4.6	14.6
I	2380	3.5	14.7	--	--	--	--	--	--	2380	3.5	14.7
H	760	3.0	4.0	--	--	--	--	--	--	760	3.0	4.0
T	4620	3.6	29.7	350	5.8	3.6	--	--	--	4970	3.8	33.3
200-500' OVERBURDEN												
D	3320	3.5	20.6	320	5.1	2.9	--	--	--	3640	3.7	23.5
I	2440	3.5	15.1	--	--	--	--	--	--	2440	3.5	15.1
H	--	--	--	--	--	--	--	--	--	--	--	--
T	5760	3.5	35.7	320	5.1	2.9	--	--	--	6080	3.6	38.6
<u>T15S R63W</u>												
0-200' OVERBURDEN												
D	980	3.0	5.2	--	--	--	--	--	--	980	3.0	5.2
I	3270	3.0	17.4	--	--	--	--	--	--	3270	3.0	17.4
H	--	--	--	--	--	--	--	--	--	--	--	--
T	4250	3.0	22.6	--	--	--	--	--	--	4250	3.0	22.6
200-500' OVERBURDEN												
D	910	4.5	7.2	70	5.0	0.6	--	--	--	980	4.5	7.8
I	2580	3.2	14.6	--	--	--	--	--	--	2580	3.2	14.6
H	--	--	--	--	--	--	--	--	--	--	--	--
T	3490	3.5	21.8	70	5.0	0.6	--	--	--	3560	3.6	22.4
<u>T15S R64W</u>												
0-200' OVERBURDEN												
D	170	3.0	0.9	--	--	--	--	--	--	170	3.0	0.9
I	100	2.7	0.5	--	--	--	--	--	--	100	2.7	0.5
H	--	--	--	--	--	--	--	--	--	--	--	--
T	270	2.9	1.4	--	--	--	--	--	--	270	2.9	1.4

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	MTT Tons	Area (Ac)	Avg Thk (Ft)	MTT Tons	Area (Ac)	Avg Thk (Ft)	MTT Tons	Area (Ac)	Avg Thk (Ft)	MTT Tons
200-500' OVERBURDEN												
D	--	--	--	--	--	--	--	--	--	--	--	--
I	1200	2.8	5.9	--	--	--	--	--	--	1200	2.8	5.9
H	--	--	--	--	--	--	--	--	--	--	--	--
T	1200	2.8	5.9	--	--	--	--	--	--	1200	2.8	5.9
EL PASO COUNTY TOTALS												
0-200' OVERBURDEN												
D	7510	3.7	49.1	3570	6.2	39.3	60	11.2	1.2	11140	5.1	99.6
I	10250	3.3	60.3	1190	5.4	11.3	--	--	--	11440	3.6	71.6
H	840	3.0	4.5	--	--	--	--	--	--	840	3.0	4.5
T	18600	3.5	113.9	4760	6.0	50.6	60	11.2	1.2	23420	4.3	175.7
200-500' OVERBURDEN												
D	17660	3.8	120.3	5690	6.1	61.4	140	11.0	2.7	23490	4.7	192.7
I	57010	3.7	369.4	7170	5.8	73.6	--	--	--	64180	3.9	443.0
H	1330	3.8	9.0	190	5.1	1.7	--	--	--	1520	4.0	10.7
T	76000	3.7	498.7	13050	5.9	136.7	140	11.0	2.7	89190	4.1	646.4
500-1000' OVERBURDEN												
D	5950	4.0	41.9	2470	7.2	31.3	--	--	--	8420	5.0	73.2
I	58420	4.0	409.7	3210	5.4	30.7	--	--	--	61630	4.1	440.6
H	37850	4.1	274.4	470	5.1	4.2	--	--	--	38320	4.2	278.6
T	102220	4.0	726.0	6150	6.1	66.2	--	--	--	108370	4.2	792.4
1000-2000' OVERBURDEN												
D	5990	4.7	49.7	--	--	--	--	--	--	5990	4.7	49.7
I	79410	3.8	529.2	880	5.1	7.9	--	--	--	80290	3.8	537.1
H	60710	4.3	457.6	1270	5.2	11.6	--	--	--	61980	4.3	469.2
T	146110	4.0	1036.5	2150	5.1	19.5	--	--	--	148260	4.1	1056.0
2000'+ OVERBURDEN												
D	1050	4.0	7.4	--	--	--	--	--	--	1050	4.0	7.4
I	4880	4.0	34.6	--	--	--	--	--	--	4880	4.0	34.6
H	1360	4.2	10.2	--	--	--	--	--	--	1360	4.2	10.2
T	7290	4.0	52.2	--	--	--	--	--	--	7290	4.0	52.2
A BED TOTALS												
0-200' OVERBURDEN												
D	7510	3.7	49.1	3910	6.1	42.5	60	11.2	1.2	11480	4.6	92.8
I	11030	3.3	65.4	3160	5.5	31.0	--	--	--	14190	3.9	96.4
H	840	3.0	4.5	--	--	--	--	--	--	840	3.0	4.5
T	19380	3.5	119.0	7070	5.9	73.5	60	11.2	1.2	26510	4.2	193.7
200-500' OVERBURDEN												
D	17990	3.8	123.1	6320	6.0	67.5	140	11.0	2.7	24450	4.5	193.3
I	57210	3.7	371.0	8070	5.8	82.3	--	--	--	65280	4.0	453.3
H	1330	3.8	9.0	190	5.1	1.7	--	--	--	1520	4.0	10.7
T	76530	3.7	503.1	14580	5.9	151.5	140	11.0	2.7	91250	4.1	657.3

TABLE 4 (CONT'D)

Rel. Cat.	Zone 2.5-5' Thick			Zone 5-10' Thick			Zone 10'+ Thick			Total of All Thickness Categories		
	Area (Ac)	Avg Thk (Ft)	Mt Tons	Area (Ac)	Avg Thk (Ft)	Mt Tons	Area (Ac)	Avg Thk (Ft)	Mt Tons	Area (Ac)	Avg Thk (Ft)	Mt Tons
500-1000' OVERBURDEN												
D	5950	4.0	41.9	2470	7.2	31.3	--	--	--	8420	5.0	73.2
I	58420	4.0	409.7	3210	5.4	30.7	--	--	--	61630	4.1	440.4
H	37850	4.1	274.4	470	5.1	4.2	--	--	--	38320	4.2	278.6
T	102220	4.0	726.0	6150	6.1	66.2	--	--	--	108370	4.2	792.2
1000-2000' OVERBURDEN												
D	5990	4.7	49.7	--	--	--	--	--	--	5990	4.7	49.7
I	79410	3.8	529.2	880	5.1	7.9	--	--	--	80290	3.8	537.1
H	60710	4.3	457.6	1270	5.2	11.6	--	--	--	61980	4.3	469.2
T	146110	3.9	1036.5	2150	5.1	19.5	--	--	--	148260	4.1	1056.0
MORE THAN 2000' OVERBURDEN												
D	1050	4.0	7.4	--	--	--	--	--	--	1050	4.0	7.4
I	4880	4.0	34.6	--	--	--	--	--	--	4880	4.0	34.6
H	1360	4.2	10.2	--	--	--	--	--	--	1360	4.2	10.2
T	7290	4.0	52.2	--	--	--	--	--	--	7290	4.0	52.2

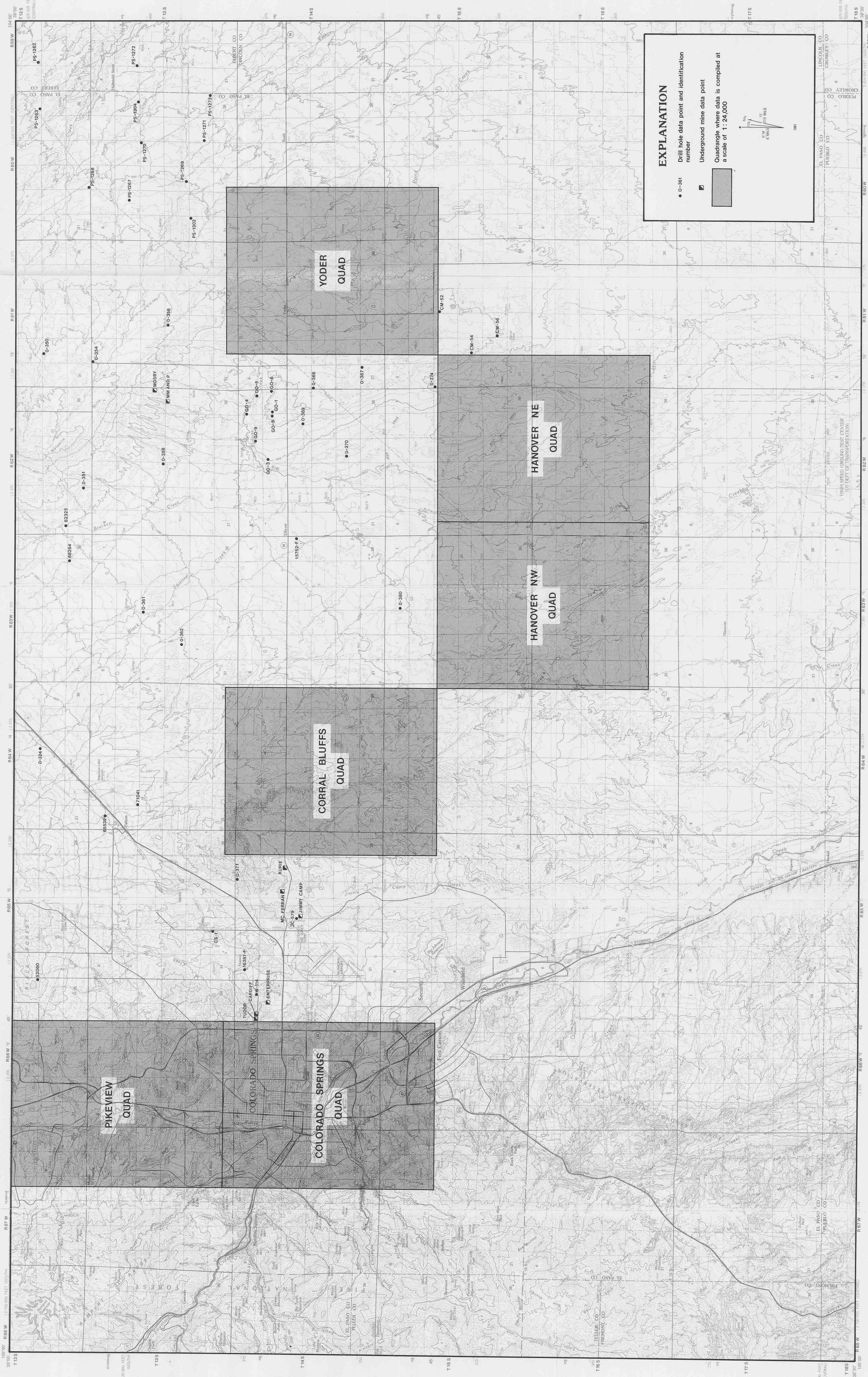
TABLE 5
DEPLETION ESTIMATES,
A COAL BED, LARAMIE FORMATION

<u>Township- Range</u>	<u>2.5-5' beds</u>	<u>5-10' beds</u>	<u>10'+ beds</u>	<u>TOTAL DEPLETION</u>
13S 66W	994,000	21,641,000	5,618,000	28,253,000
13S 67W	35,000	541,000	--	576,000
14S 60W	13,000	35,000	--	48,000
14S 64W	370,000	485,000	--	855,000
14S 65W	--	1,218,000	--	1,218,000
14S 66W	141,000	1,164,000	--	1,305,000
15S 63W	28,000	--	--	28,000

(adapted from CGS Open File Report 79-1)

COAL RESOURCES OF THE COLORADO SPRINGS 1/2° x 1° QUADRANGLE, COLORADO

by Wynn Eakins



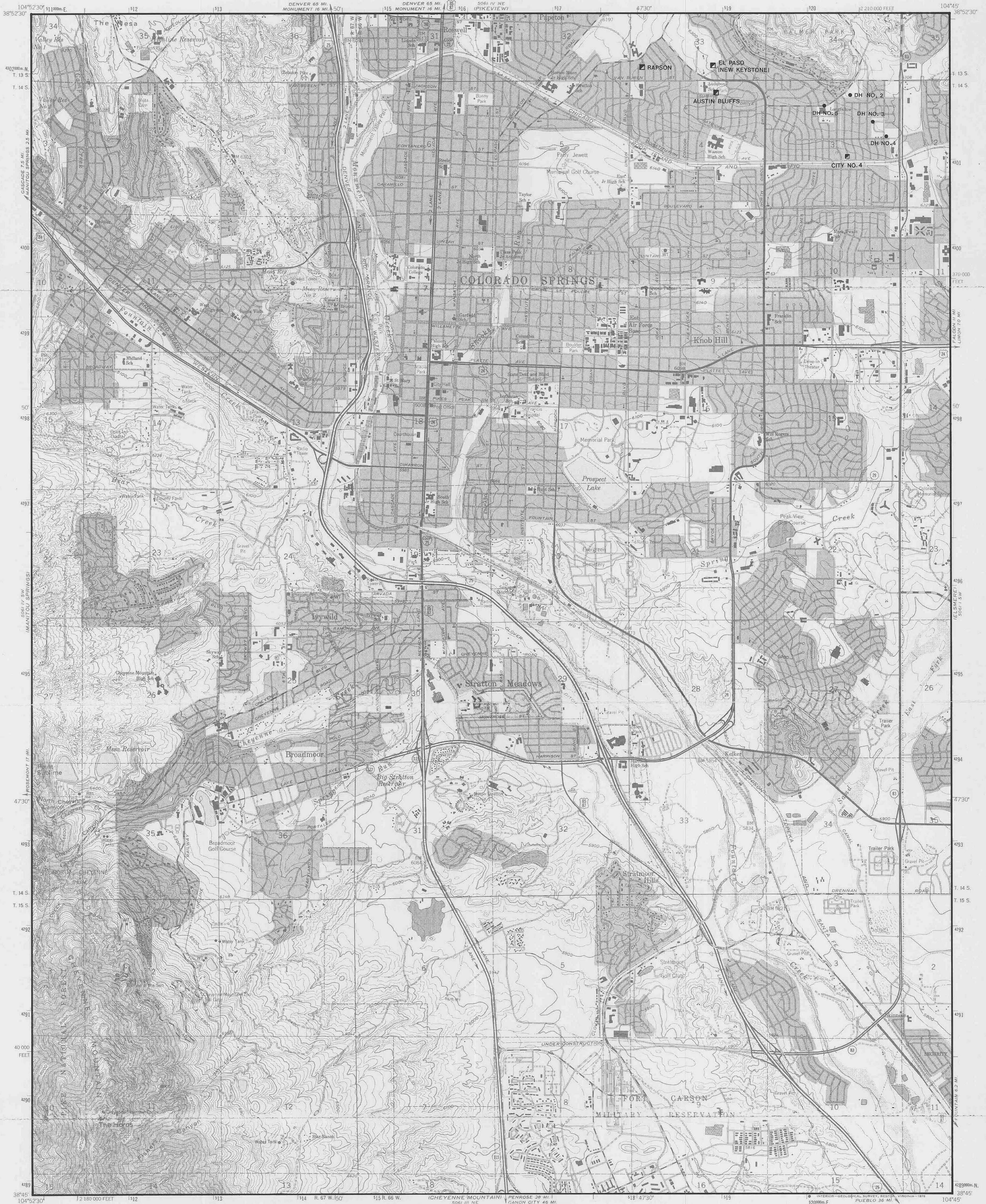
EXPLANATION

- O-381 Drill hole data point and identification number
- ▣ Underground mine data point
- ▭ Quadrangle where data is compiled at a scale of 1:24,000

INDEX MAP OF DATA POINTS COMPILED AT A SCALE OF 1:100,000 AND QUADRANGLES WITH DATA COMPILED AT A SCALE OF 1:24,000

COAL RESOURCES OF THE COLORADO SPRINGS
 1/2° x 1° QUADRANGLE, COLORADO

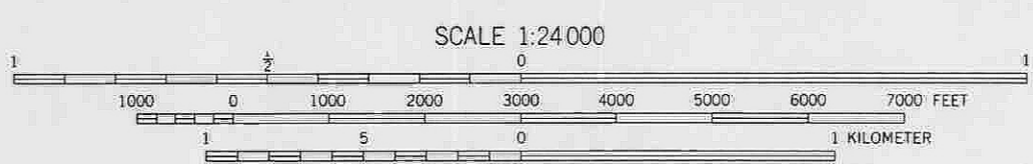
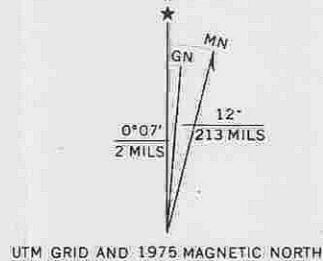
by Wynn Eakins



Base map from U.S.G.S. 7.5' quadrangle

**INDEX MAP OF DRILL HOLE AND MINE DATA POINTS,
 COLORADO SPRINGS 7.5' QUADRANGLE**

- EXPLANATION**
- RME-15 Drill hole data point
 - RAPSON Underground mine data point

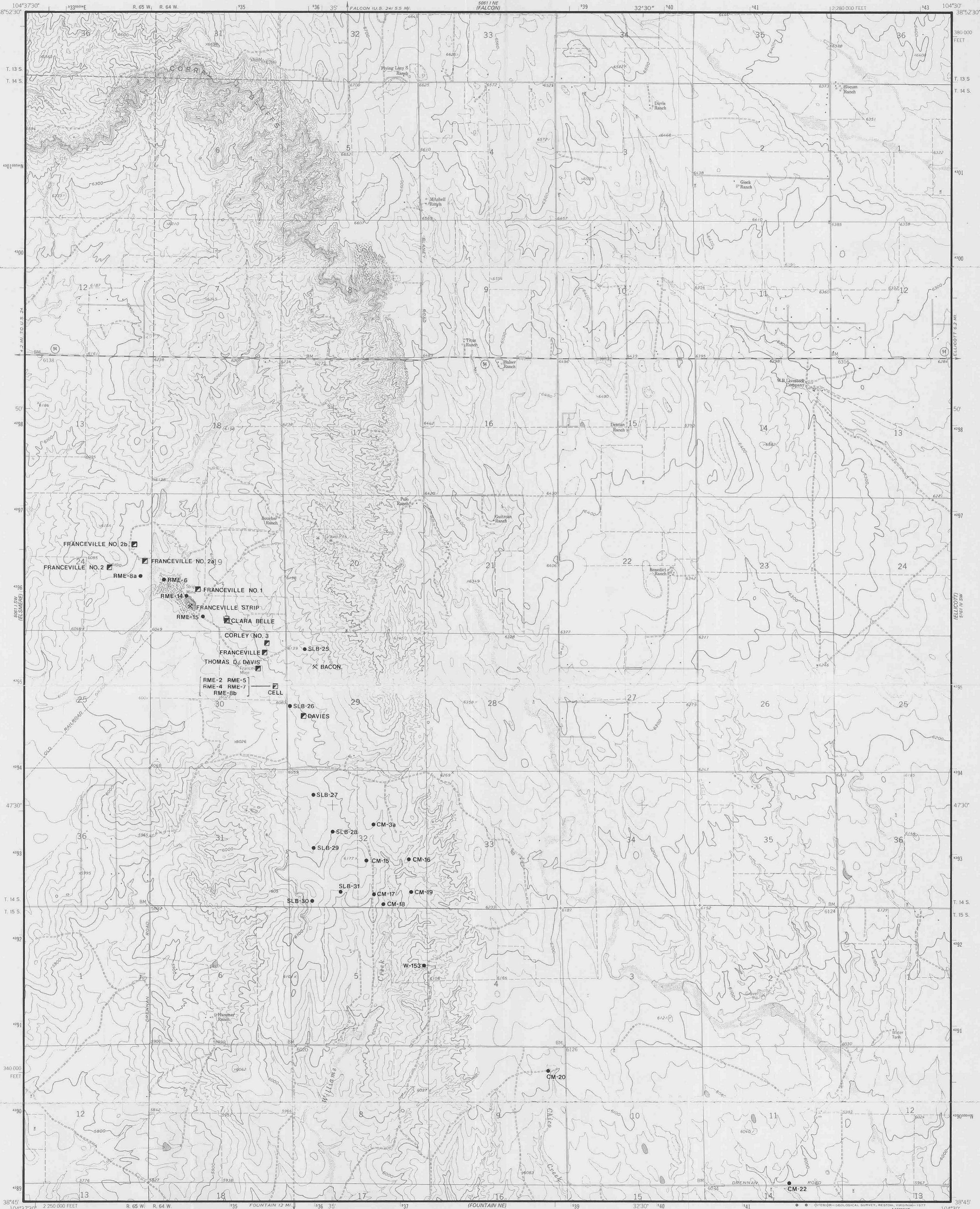


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COLORADO SPRINGS, COLO.

1961
 PHOTOREVISED 1969 AND 1975

by Wynn Eakins

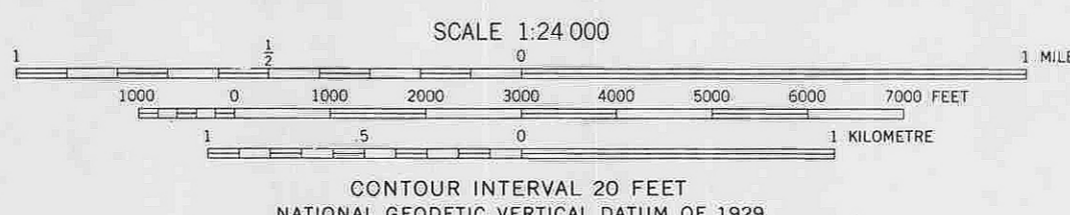
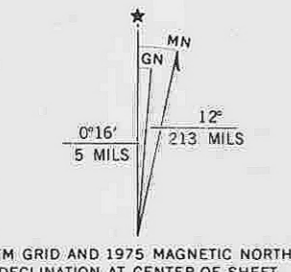


Base map from U.S.G.S. 7.5' quadrangle

**INDEX MAP OF DRILL HOLE AND MINE DATA POINTS,
 CORRAL BLUFFS 7.5' QUADRANGLE**

EXPLANATION

- Drill hole data point
- RME-15
- Underground mine data point
- RAPSON
- ⊗ Surface mine data point
- BACON



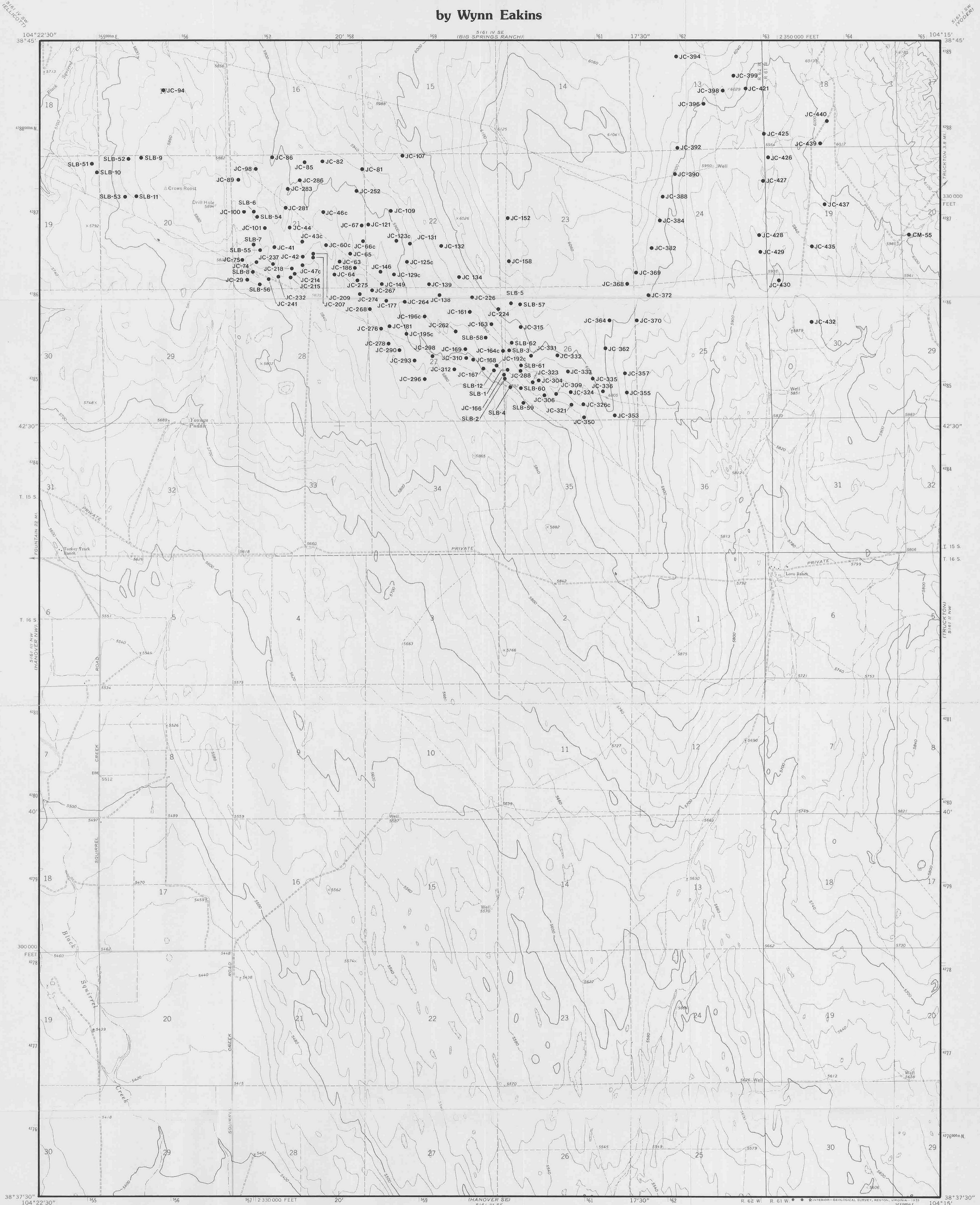
This report is the result of a cooperative investigation conducted by the Colorado Geological Survey and funded by U.S. Geological Survey Grant No. 14-08-001-A0086.

CORRAL BLUFFS, COLO.

1961
 PHOTOREVISED 1975

COAL RESOURCES OF THE COLORADO SPRINGS 1/2° x 1° QUADRANGLE, COLORADO

by Wynn Eakins

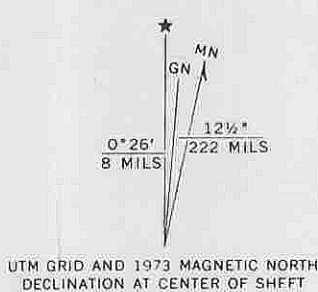


INDEX MAP OF DRILL HOLE AND MINE DATA POINTS, HANOVER NE 7.5' QUADRANGLE

Base map from U.S.G.S 7.5' quadrangle

EXPLANATION

● Drill hole data point
 RME-15

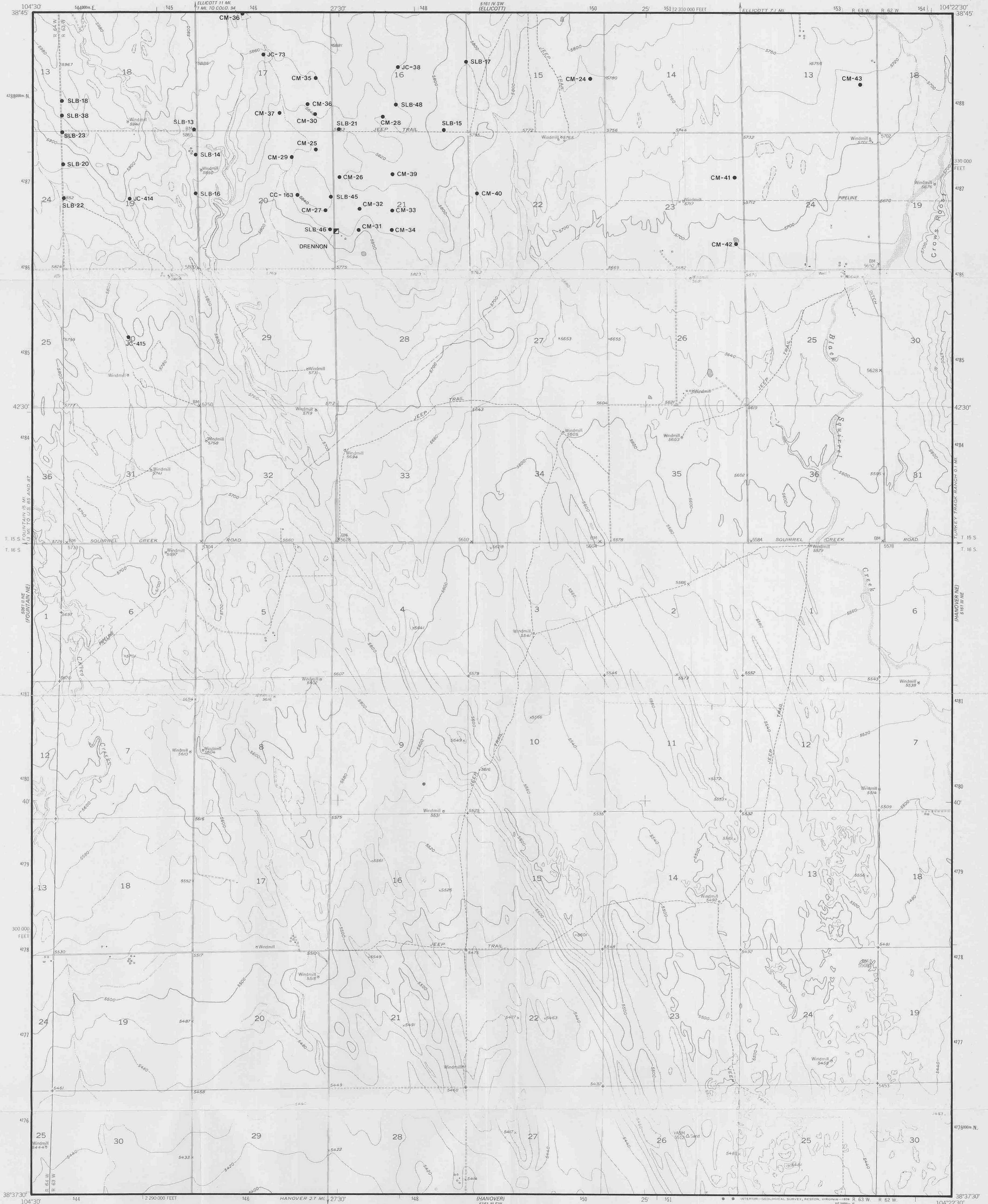


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HANOVER NE, COLO.

COAL RESOURCES OF THE COLORADO SPRINGS 1/2° x 1° QUADRANGLE, COLORADO

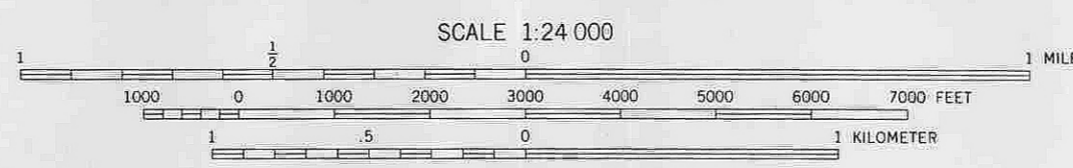
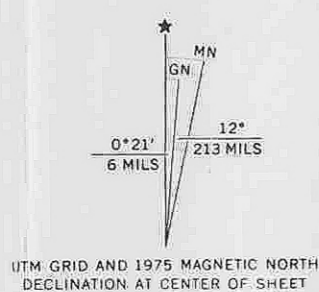
by Wynn Eakins



INDEX MAP OF DRILL HOLE AND MINE DATA POINTS, HANOVER NW 7.5' QUADRANGLE

Base map from U.S.G.S 7.5' quadrangle

- EXPLANATION**
- Drill hole data point
 - Underground mine data point



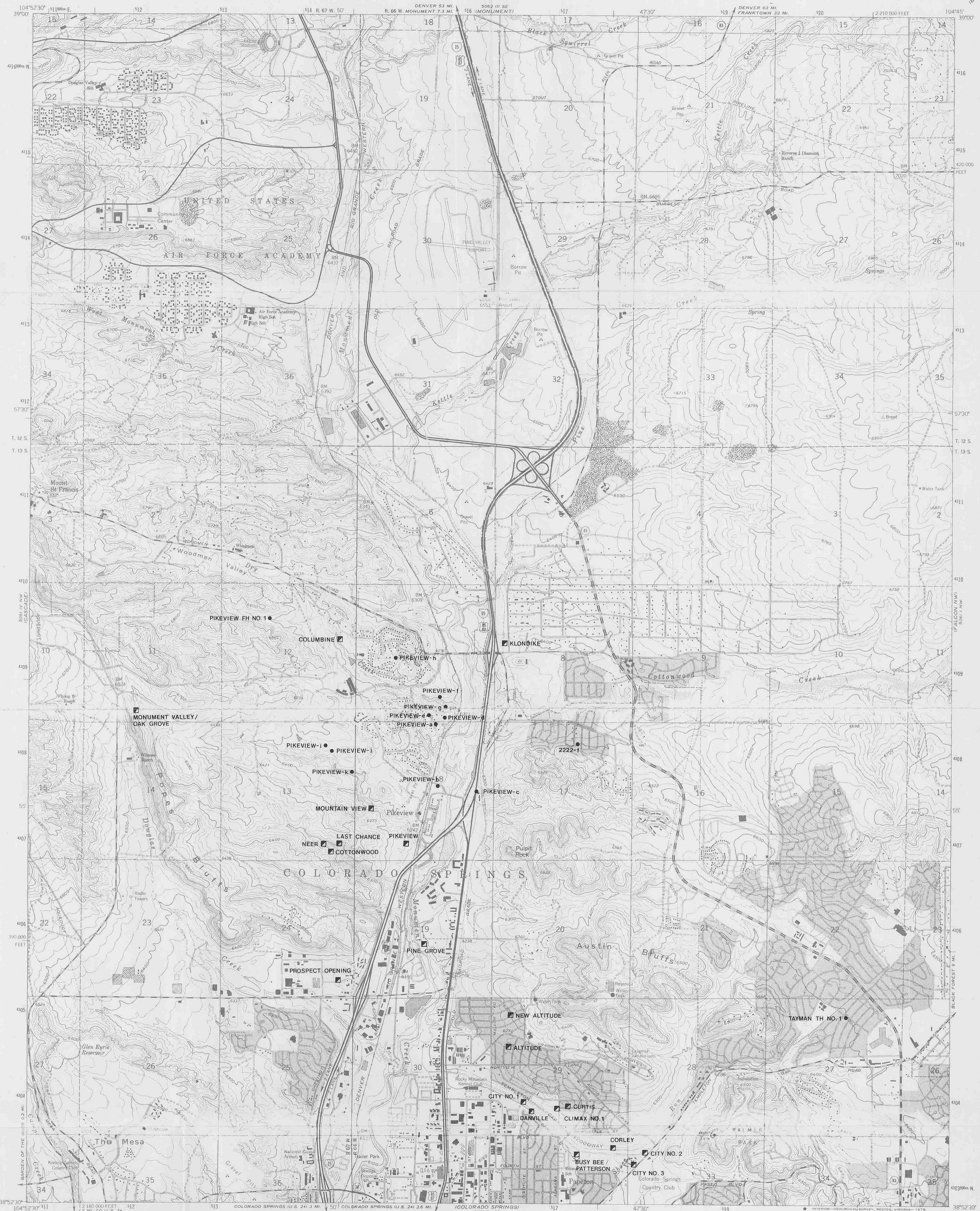
CONTOUR INTERVAL 20 FEET
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

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HANOVER NW, COLO.

COAL RESOURCES OF THE COLORADO SPRINGS 1/2° x 1° QUADRANGLE, COLORADO

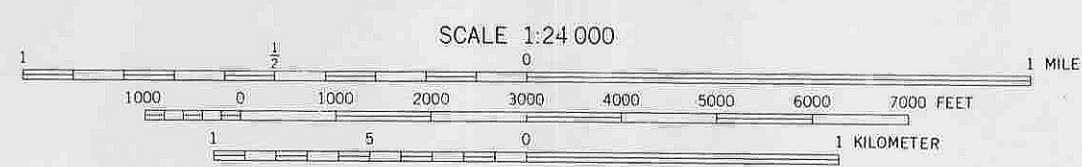
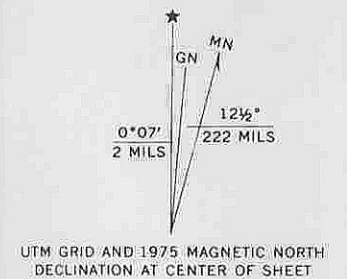
by Wynn Eakins



Base map from U.S.G.S 7.5' quadrangle

INDEX MAP OF DRILL HOLE AND MINE DATA POINTS, PIKEVIEW 7.5' QUADRANGLE

- EXPLANATION**
- Drill hole data point
 - Underground mine data point



CONTOUR INTERVAL 20 FEET
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

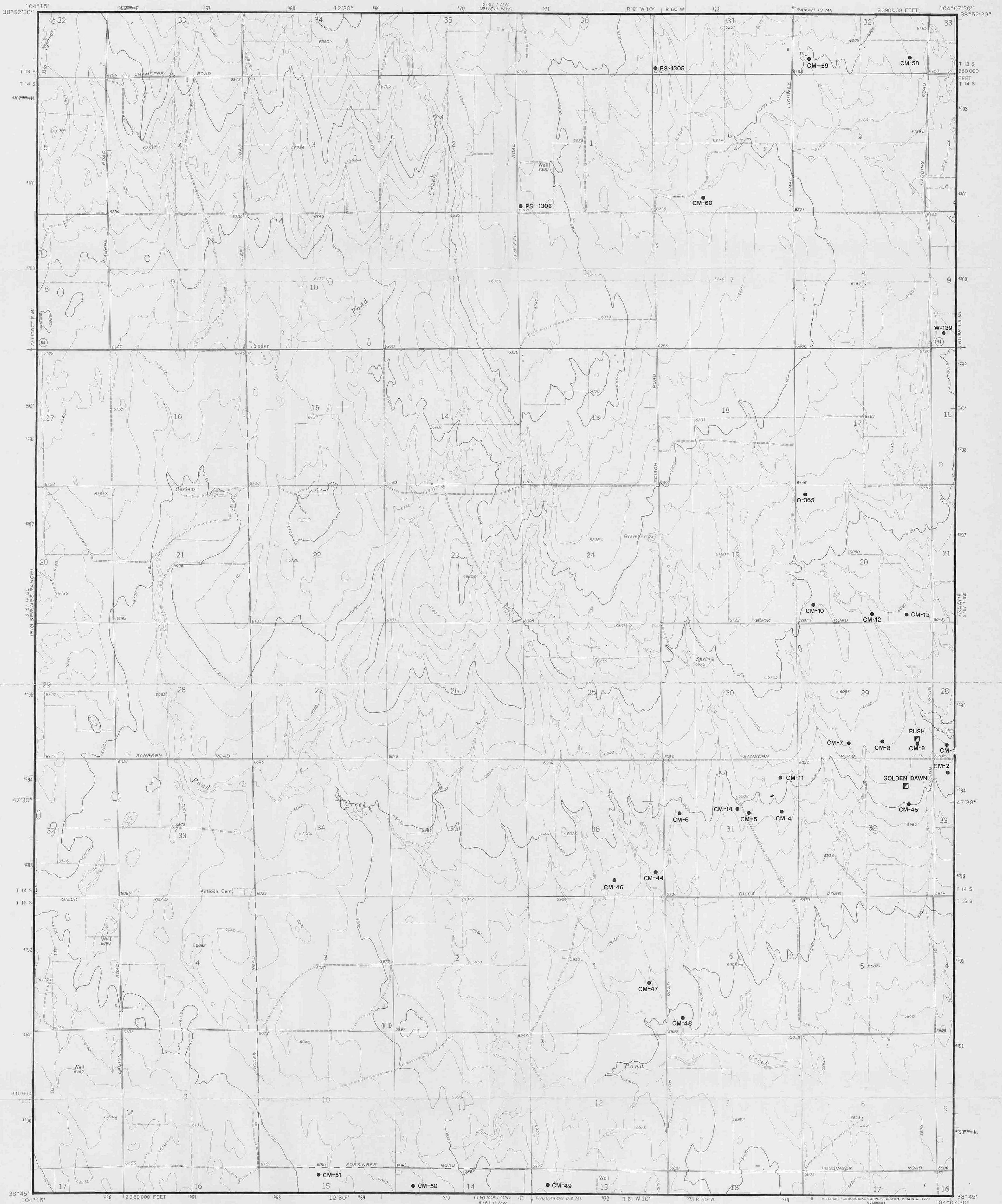
This report is the result of a cooperative investigation conducted by the Colorado Geological Survey and funded by the U.S. Geological Survey Grant No. 14-08-001-A0086.

PIKEVIEW, COLO.

1961
 PHOTOREVISED 1969 AND 1975

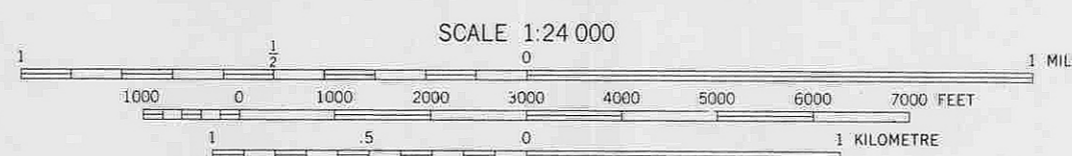
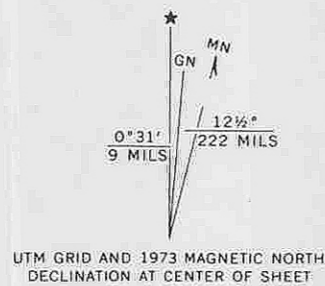
COAL RESOURCES OF THE COLORADO SPRINGS 1/2° x 1° QUADRANGLE, COLORADO

by Wynn Eakins



INDEX MAP OF DRILL HOLE AND MINE DATA POINTS, YODER 7.5' QUADRANGLE

- EXPLANATION**
- Drill hole data point
 - Underground mine data point
 - RAPSON



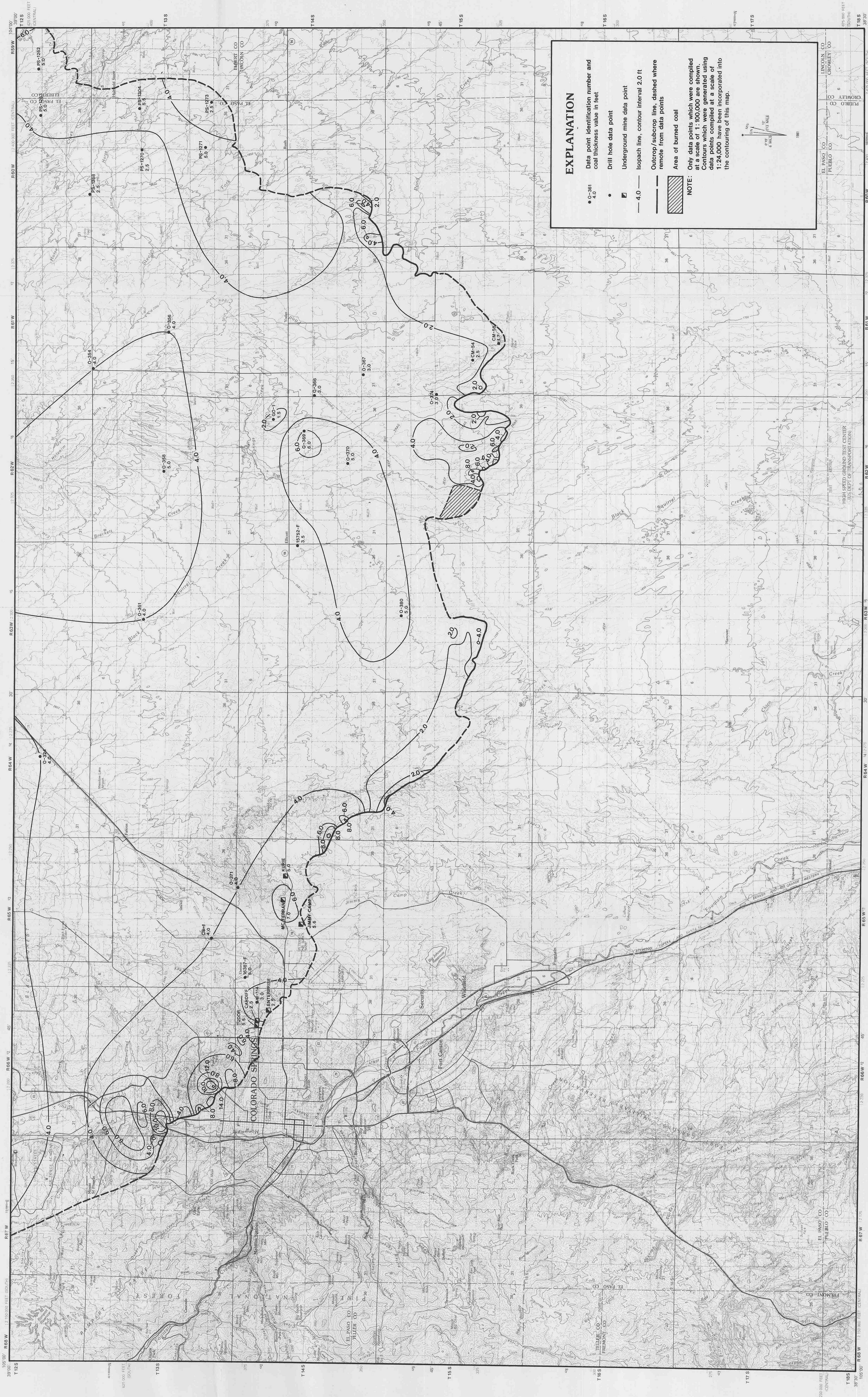
CONTOUR INTERVAL 20 FEET
 NATIONAL GEODETIC VERTICAL DATUM OF 1929

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YODER, COLO.

COAL RESOURCES OF THE COLORADO SPRINGS 1/2° x 1° QUADRANGLE, COLORADO

by Wynn Eakins



Base map from U.S. Geological Survey, Colorado Springs, 1981

ISOPACH MAP OF THE A COAL BED, LARAMIE FORMATION

SCALE 1:100 000
 1 CENTIMETER ON THE MAP REPRESENTS 100 METERS ON THE GROUND
 CONTOUR INTERVAL 10 AND 50 METERS

This report is the result of a cooperative investigation conducted by the Colorado Geological Survey and funded by U.S. Geological Survey Grant No. 14-08-001-A008B.

COAL RESOURCES OF THE COLORADO SPRINGS 1/2 x 1 QUADRANGLE, COLORADO

by Wynn Eakins



EXPLANATION

- O-381 Data point identification number and structure value in feet
- Drill hole data point
- Underground mine data points
- 5800— Structure contour, interval 100 ft
- - - Outcrop/subcrop line, dashed where remote from data points
- ▨ Area of burned coal

NOTE:
 Only data points which were compiled at a scale of 1:100,000 are shown. Contours which were generated using data points compiled at a scale of 1:24,000 have been incorporated into the contouring of this map.

STRUCTURE CONTOUR MAP ON THE A COAL BED, LARAMIE FORMATION



Base map from U.S. Geological Survey, Colorado Springs, 1981

This report is the result of a cooperative investigation conducted by the Colorado Geological Survey and the U.S. Geological Survey. Contract No. 14-DE-CO1-5A0096.

