BIBLIOGRAPHY OF UTAH COAL

1869 THROUGH 1982

By Dan A. Foster and Archie D. Smith
Compilers

UTAH GEOLOGICAL AND MINERAL SURVEY
a division of
Utah Department of Natural Resources

Bulletin 120 **June 1984**

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INTRODUCTION

THE *Bibliography of Utah Coal* has been compiled in recognition of a need for many individuals to know where to find basic geologic and coal information. The bibliography was compiled under a cooperative grant with the Department of Energy, Grant No. DE-FG21-80MC14257, and under the direction of Dan A. Foster and Archie D. Smith. Diane J. Reeves, Darryl L. Chapman, and Sue A. Juch of the Utah Geological and Mineral Survey staff assisted in checking citations.

The compilation process utilized citations from computerized printouts from GEOREF, NTIS, GEOARCHIVE, ENERGYLINE, COMPENDEX, and Department of Energy, as well as Federal and State government reports, and graduate theses.

This bibliography contains 1406 citations to literature published from 1869 through 1982. Considerable effort has been expended to insure accuracy, consistency and completeness of the citations. However, users may note some errors and omissions. Users are encouraged to submit errors and omissions to the Survey for inclusion in future supplements.

A listing of abbreviations is included for clarity. Two index maps are included for use by state land managers as well as for geologists.

It is our hope this bibiliography will serve as a useful aid to the professional geologist as well as be informative to the public and to industrial and academic researcher.

CROSS-REFERENCING

EACH of the listings are considered by author, location, and subject descriptors.

Author - citations are arranged alphabetically according to the author(s) name followed by the year and title of the publication.

Location - location is designated by county, coal field and quadrangle where available and applicable. A separate listing of citations by county has been prepared.

Subject Descriptors - as applicable and possible, each citation has been scanned for informational content and key descriptors listed.

Computer Search - the data base for the bibliography is retained on file at Utah Geological and Mineral Survey and may be searched for unique subject matter, phrases, and descriptors. For information concerning fees and/or charges contact the UGMS (801) 581-6831 during business hours.

[1] Earth Science Specialist, Utah Geological and Mineral Survey.
[2] Senior Geologist, Economic Program, Utah Geological and Mineral Survey.

ABBREVIATIONS

Abstr. — Abstracts
Acad. — Academy
Am. — America, American
Ann. — Annual
Assoc. — Association
Bull. — Bulletin
Bur. — Bureau
Circ. — Circular
Comm. — Commission
Conf. — Conference
Congr. — Congress, Congressional
Conserv. — Conservation
Dept. — Department
Div. — Division
et al. — and others
Eng. — Engineering
Geochem. — Geochemical
Geol. — Geology, Geological, Geologists
Geophys. — Geophysics
Hist. — History, Historical
Inf. — Information
Inst. — Institute, Institution
Int. — International
Inv. — Investigation, Investigations
Intermtn. — Intermountain
Jour. — Journal
Mem. — Memoirs
Min. — Mineral, Mineralogical
Misc. — Miscellaneous
Mon. — Monograph
Nat. — Natural, National
No. — Number
p. — Page, Pages
Pac. — Pacific
Pal. — Paleontology, Paleontological
Pet. — Petroleum
Petr. — Petrology, Petrologists
Proc. — Proceedings
Prof. — Professional
Publ. — Publication
Quart. — Quarterly
Recl. — Reclamation
Res. — Resource, Resources
Sch. — School
Sci. — Science, Sciences
Sec. — Section
Sed. — Sedimentary, Sedimentologist
Ser. — Series
Soc. — Society
Spec. — Special
Stud. — Studies
Surv. — Survey
Tech. — Technical
Transp. — Transportation
U.S. — United States
USGS — United States Geological Survey
Univ. — University
Unpubl. — Unpublished
Vol. — Volume

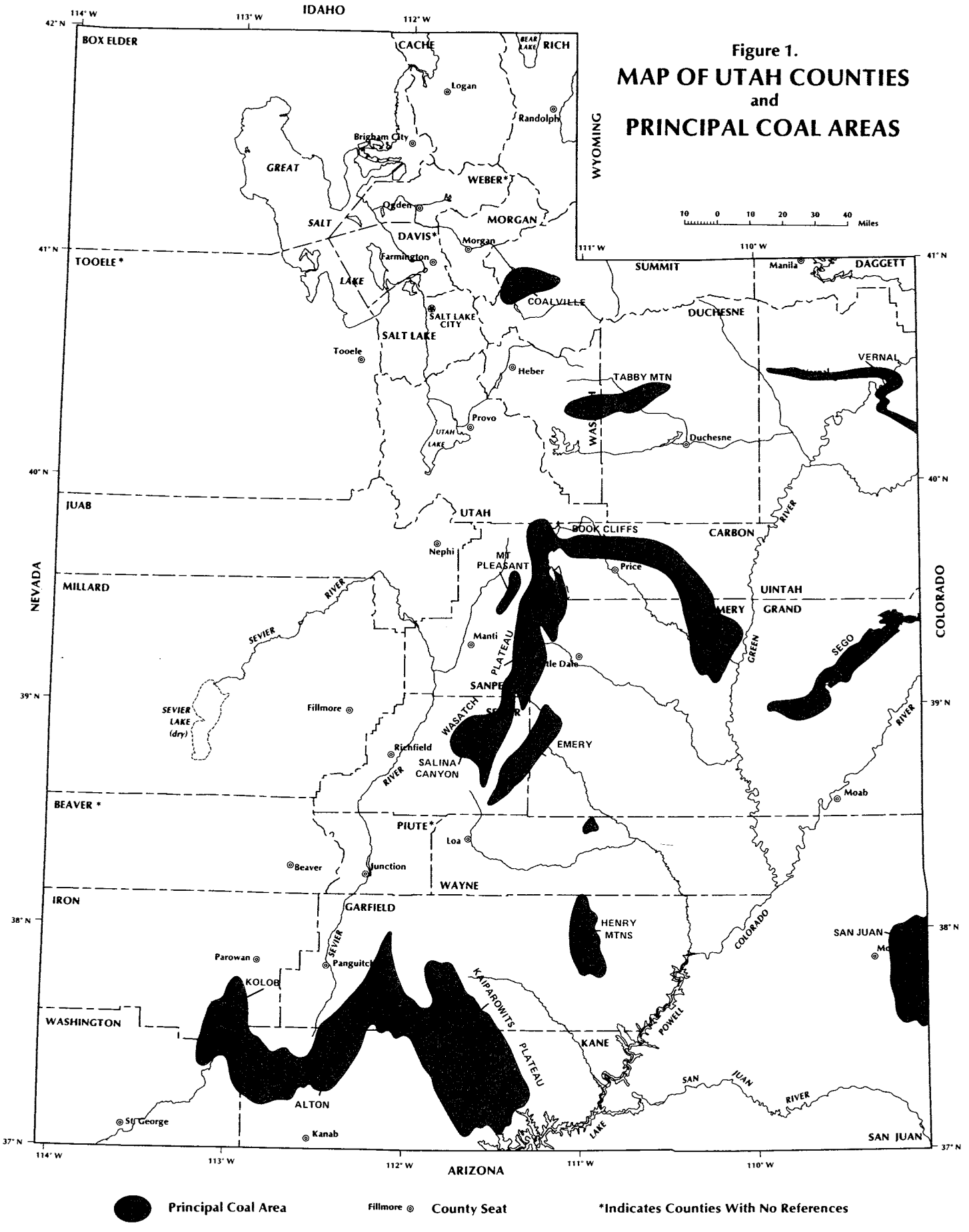


Figure 1.
MAP OF UTAH COUNTIES
and
PRINCIPAL COAL AREAS
IDAHO
WYOMING
NEVADA
COLORADO
ARIZONA
BOX ELDER
CACHE
RICH
BEAR LAKE
Logan
Randolph
Brigham City
GREAT
SALT
LAKE
WEBER*
Ogden
MORGAN
DAVIS*
Morgan
Farmington
TOOELE*
SUMMIT
Manila
DAGGETT
COALVILLE
SALT LAKE CITY
SALT LAKE
DUCHESNE
Tooele
Heber
TABBY MTN
VERNAL
Provo
UTAH LAKE
Duchesne
JUAB
UTAH
BOOK CLIFFS
CARBON
Nephi
MT PLEASANT
Price
MILLARD
UINTAH
EMERY
GRAND
SEVIER RIVER
Manti
PLATEAU
GREEN RIVER
SEGO
SANPETE
SEVIER LAKE (dry)
Fillmore
WASATCH
Richfield
SALINA CANYON
EMERY
Moab
BEAVER *
PIUTE*
Loa
Beaver
Junction
WAYNE
IRON
GARFIELD
HENRY MTNS
COLORADO
SAN JUAN
Parowan
Panguitch
KOLOB
KAIPAROWITS PLATEAU
WASHINGTON
KANE
POWELL LAKE
SAN JUAN RIVER
ALTON
St George
Kanab
SAN JUAN
Principal Coal Area
Fillmore County Seat
*Indicates Counties With No References

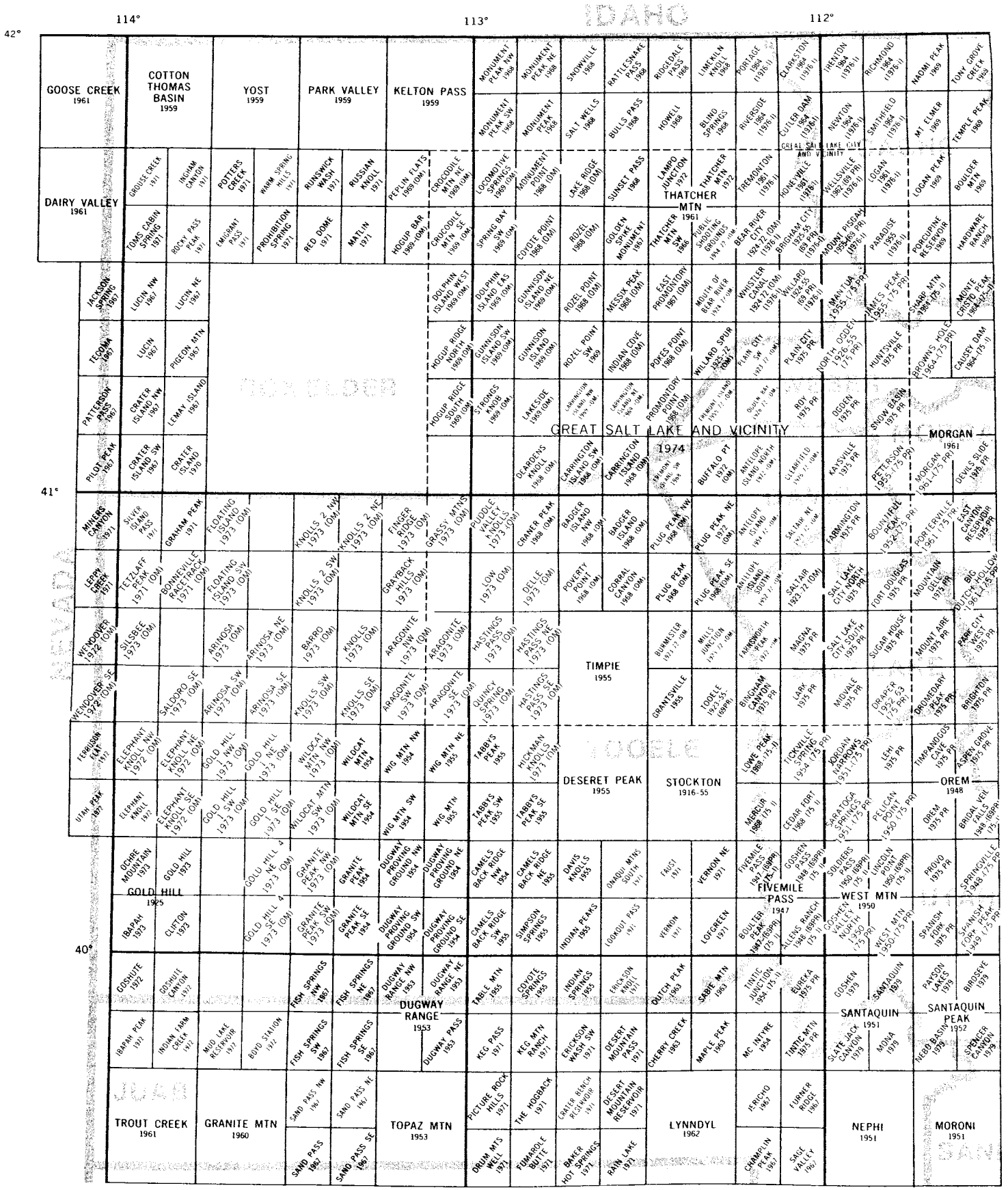
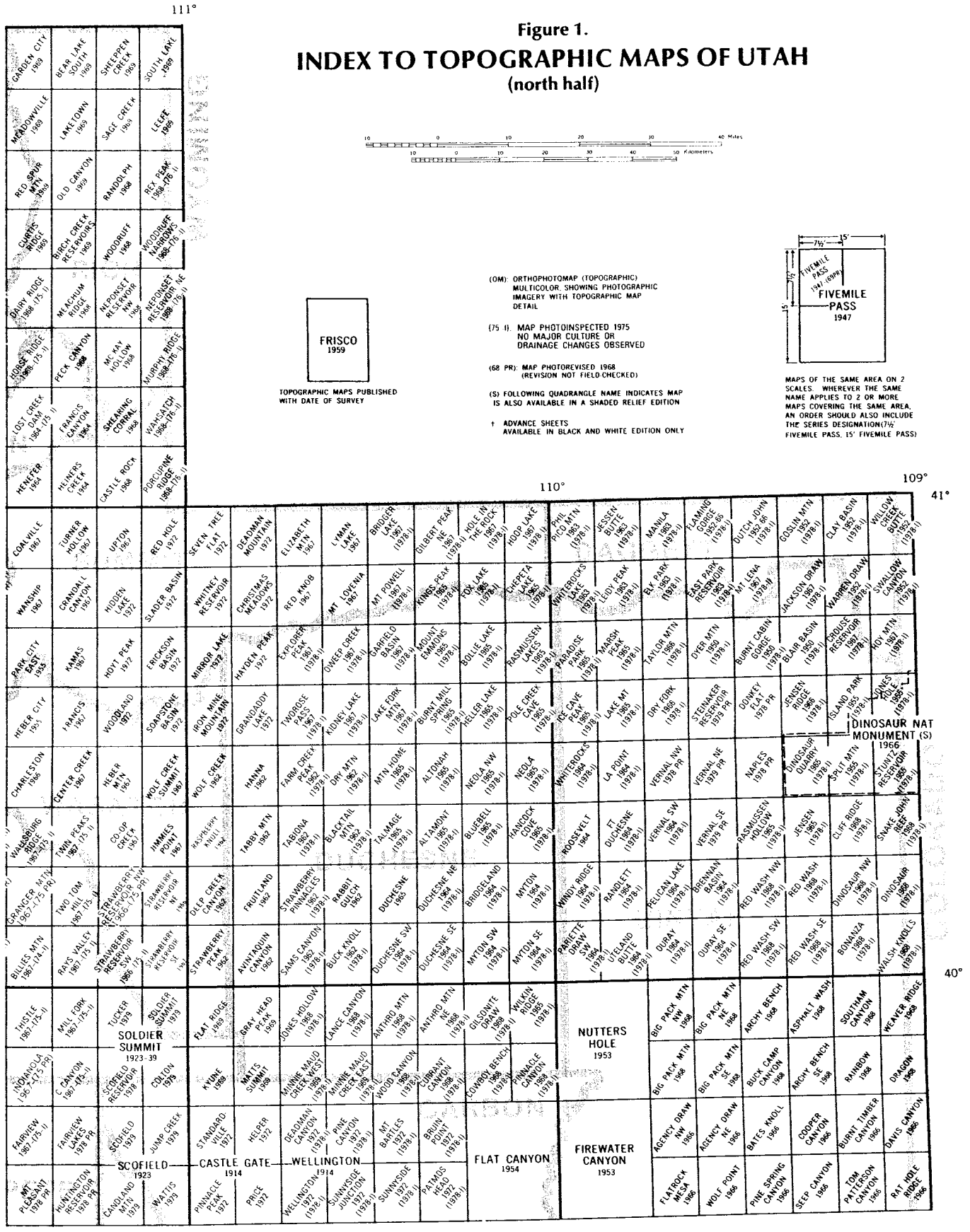
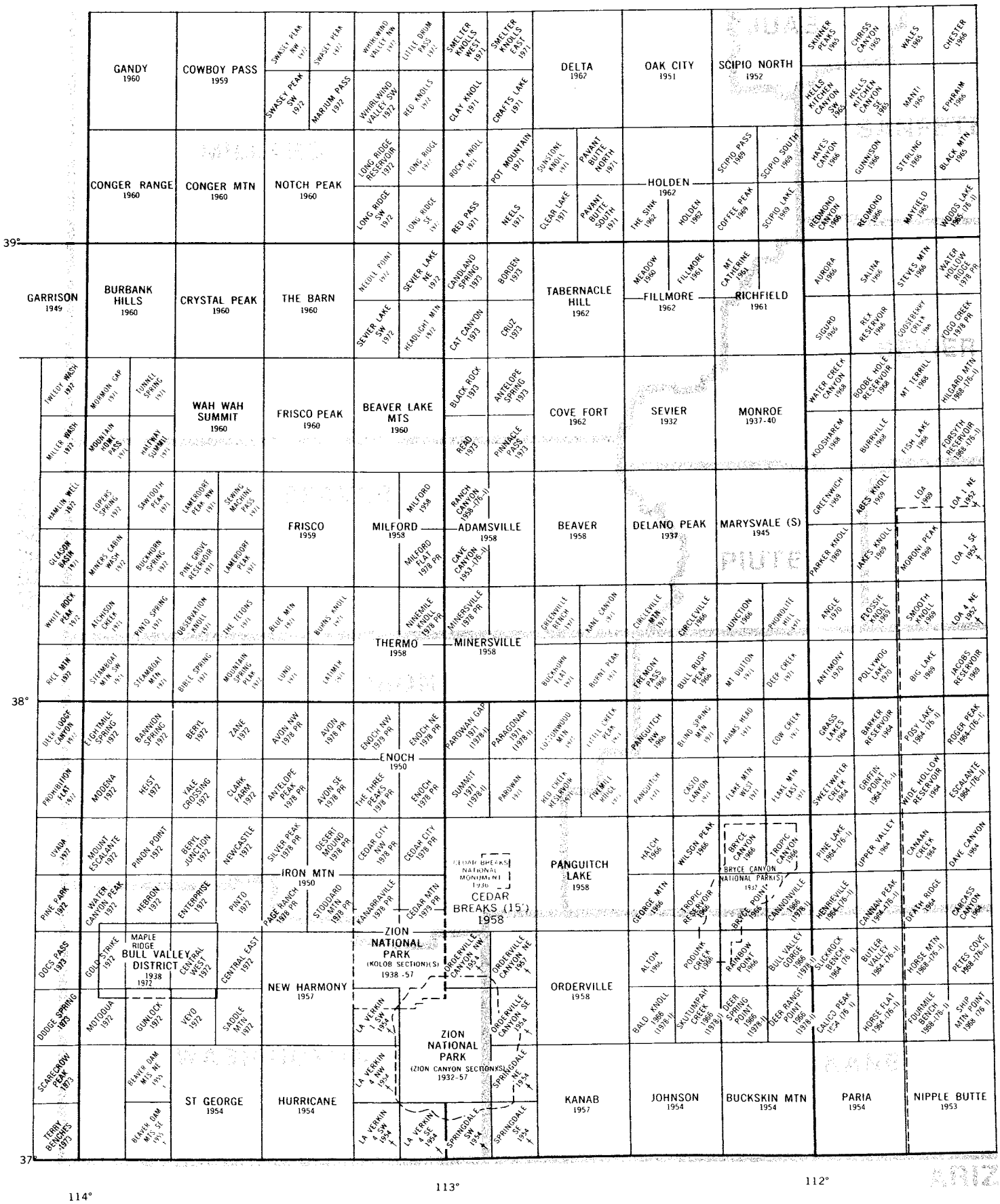

114°
113°
112°
42°
41°
40°
IDAHO
NEVADA
UTAH
GOOSE CREEK 1961
COTTON THOMAS BASIN 1959
YOST 1959
PARK VALLEY 1959
KELTON PASS 1959
DAIRY VALLEY 1961
THATCHER MTN 1961
GREAT SALT LAKE AND VICINITY 1974
MORGAN 1961
TIMPIE 1955
DESERET PEAK 1955
STOCKTON 1916-55
OREM 1948
FIVEMILE PASS 1947
GOLD HILL 1925
WEST MTN 1950
DUGWAY RANGE 1953
SANTAQUIN 1951
SANTAQUIN PEAK 1952
TROUT CREEK 1961
GRANITE MTN 1960
TOPAZ MTN 1953
LYNNDYL 1962
NEPHI 1951
MORONI 1951

Figure 1.

INDEX TO TOPOGRAPHIC MAPS OF UTAH

(north half)




GANDY 1960
COWBOY PASS 1959
SWASEY PEAK NW 1972
SWASEY PEAK 1972
SWASEY PEAK SW 1972
MARIUM PASS 1972
WHIRLWIND VALLEY NW 1972
LITTLE DRUM PASS 1972
WHIRLWIND VALLEY SW 1972
RED KNOLLS 1972
SMELTER KNOLLS WEST 1971
SMELTER KNOLLS EAST 1971
CLAY KNOLL 1971
CRAFTS LAKE 1971
DELTA 1962
OAK CITY 1951
SCIPIO NORTH 1952
SKINNER PEAKS 1965
CHRISS CANYON 1965
WALCS 1965
CHESTER 1966
HELLS KITCHEN CANYON SW 1965
HELLS KITCHEN CANYON SE 1965
MANTI 1965
EPHRAIM 1966
CONGER RANGE 1960
CONGER MTN 1960
NOTCH PEAK 1960
LONG RIDGE RESERVOIR 1972
LONG RIDGE 1972
ROCKY KNOLL 1971
POT MOUNTAIN 1971
SUNSTONE KNOLL 1971
PAVANT BUTTE NORTH 1971
HOLDEN 1962
SCIPIO PASS 1969
SCIPIO SOUTH 1969
HAYES CANYON 1966
GUNNISON 1966
STERLING 1966
BLACK MTN 1965
LONG RIDGE SW 1972
LONG RIDGE SE 1972
RED PASS 1971
NEELS 1971
CLEAR LAKE 1971
PAVANT BUTTE SOUTH 1971
THE SINK 1962
HOLDEN 1962
COFFEE PEAK 1969
SCIPIO LAKE 1969
REDMOND CANYON 1966
REDMOND 1966
MAYFIELD 1965
WOODS LAKE 1965 (76-1)
39°
GARRISON 1949
BURBANK HILLS 1960
CRYSTAL PEAK 1960
THE BARN 1960
NEGRO POINT 1972
SEVIER LAKE NE 1972
CANDLAND SPRING 1973
BORDEN 1973
TABERNACLE HILL 1962
MEADOW 1960
FILLMORE 1961
FILLMORE 1962
MT CATHERINE 1961
RICHFIELD 1961
AURORA 1966
SALINA 1966
STEVES MTN 1966
WATER HOLLOW RIDGE 1978 PR
SEVIER LAKE SW 1972
HEADLIGHT MTN 1972
CAT CANYON 1973
CRUZ 1973
SIGURD 1966
REX RESERVOIR 1966
GOOSEBERRY CREEK 1966
YOGO CREEK 1978 PR
TWEEDY WASH 1972
MORMON GAP 1971
TUNNEL SPRING 1971
WAH WAH SUMMIT 1960
FRISCO PEAK 1960
BEAVER LAKE MTS 1960
BLACK ROCK 1973
ANTELOPE SPRING 1973
COVE FORT 1962
SEVIER 1932
MONROE 1937-40
WATER CREEK CANYON 1958
BOOBE HOLE RESERVOIR 1966
MT TERRILL 1968
HILGARD MTN 1966 (76-1)
MILLER WASH 1972
MOUNTAIN HOME PASS 1971
HALFWAY SUMMIT 1971
READ 1973
PINNACLE PASS 1973
KOOSHAREM 1966
BURRVILLE 1966
FISH LAKE 1966
FORSYTH RESERVOIR 1966 (76-1)
HAMLIN WELL 1972
LOPEAS SPRING 1972
SAWTOOTH PEAK 1971
LAMEROOT PEAK NW 1971
SEWING MACHINE PASS 1971
FRISCO 1959
MILFORD 1958
MILFORD FLAT 1978 PR
RANCH CANYON 1958 (76-1)
ADAMSVILLE 1958
CAVE CANYON 1953 (76-1)
BEAVER 1958
DELANO PEAK 1937
MARYSVILLE (S) 1945
GREENWICH 1969
ABES KNOLL 1969
LOA 1969
LOA 1 NE 1952
GLEASON BASIN 1971
MINERS CABIN WASH 1972
BUCKHORN SPRING 1972
PINE GROVE RESERVOIR 1971
LAMEROOT PEAK 1971
PARKER KNOLL 1969
JAKES KNOLL 1969
MORONI PEAK 1969
LOA 1 SE 1952
WHITE ROCK PEAK 1972
ATCHISON CREEK 1971
PINTO SPRING 1971
OBSERVATION KNOLL 1971
THE TETONS 1971
BLUE MTN 1971
BURNS KNOLL 1971
THERMO 1958
NINEMILE KNOLL 1978 PR
MINERSVILLE 1978 PR
MINERSVILLE 1958
GREENVILLE BENCH 1971
KANE CANYON 1971
CIRCLEVILLE MTN 1971
CIRCLEVILLE 1966
JUNCTION 1966
PHONOLITE HILL 1971
ANGLE 1970
FLOSSIE KNOLL 1965
SMOOTH KNOLL 1969
LOA 4 NE 1952
RICE MTN 1972
STEAMBOAT MTN SW 1971
STEAMBOAT MTN 1971
BIBLE SPRING 1971
MOUNTAIN SPRING PEAK 1971
LUND 1971
LATIMER 1971
BUCKHORN FLAT 1971
BURNT PEAK 1971
FREMONT PASS 1966
BULL RUSH PEAK 1966
MT DUTTON 1971
DEEP CREEK 1971
ANTIMONY 1970
POLLYWOG LAKE 1970
BIG LAKE 1969
JACOBS RESERVOIR 1969
38°
DEER LODGE CANYON 1972
EIGHTMILE SPRING 1972
BANNION SPRING 1972
BERYL 1972
ZANE 1972
AVON NW 1978 PR
AVON 1978 PR
ENOCH NW 1979 PR
ENOCH NE 1978 PR
ENOCH 1950
PARGWAN GAP 1971 (1978-1)
PARAGONAH 1971 (1978-1)
LOTTONWOOD MTN 1971
LITTLE CREEK PEAK 1971
PANGUITCH NW 1966
BLIND SPRING MTN 1971
ADAMS HEAD 1971
COW CREEK 1971
GRASS LAKES 1964
BARKER RESERVOIR 1964
POST LAKE 1964 (76-1)
ROGER PEAK 1964 (76-1)
PROHIBITION FLAT 1972
MODENA 1972
HEIST 1972
YALE CROSSING 1972
CLARK FARM 1972
ANTELOPE PEAK 1978 PR
AVON SE 1978 PR
THE THREE PEAKS 1978 PR
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SUMMIT 1971 (1978-1)
PARGWAN 1971
RED CREEK RESERVOIR 1971
FIVEMILE RIDGE 1971
PANGUITCH 1971
CASTO CANYON 1971
FLAKE MTN WEST 1971
FLAKE MTN EAST 1971
SWEETWATER CREEK 1964
GRIFFIN POINT 1964 (76-1)
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UVAIN 1972
MOUNT ESCALANTE 1972
PINON POINT 1972
BERYL JUNCTION 1972
NEWCASTLE 1972
SILVER PEAK 1978 PR
DESERT MOUND 1978 PR
CEDAR CITY NW 1978 PR
CEDAR CITY 1978 PR
CEDAR BREAKS NATIONAL MONUMENT 1936
CEDAR BREAKS (15') 1958
PANGUITCH LAKE 1958
HATCH 1966
WILSON PEAK 1966
BRYCE CANYON 1966
TROPIC CANYON 1966
BRYCE CANYON NATIONAL PARK(S) 1937
PINE LAKE 1964 (76-1)
UPPER VALLEY 1964
CANAAN CREEK 1964
DAVE CANYON 1964
PINE PARK 1972
WATER CANYON PEAK 1972
HEBRON 1972
ENTERPRISE 1972
PINTO 1972
IRON MTN 1950
PAGE RANCH 1978 PR
STODDARD MTN 1978 PR
KANARRAVILLE 1978 PR
CEDAR MTN 1978 PR
GEORGE MTN 1966
TROPIC RESERVOIR 1966
BRYCE POINT 1966
CANNONVILLE 1966 (1978-1)
HENRIEVILLE 1964 (76-1)
CANAAN PEAK 1964 (76-1)
DEATH RIDGE 1964
CARCASS CANYON 1964
DOCS PASS 1973
GOLD STRIKE 1972
MAPLE RIDGE
BULL VALLEY DISTRICT 1938 1972
CENTRAL WEST 1972
CENTRAL EAST 1972
NEW HARMONY 1957
ZION NATIONAL PARK (KOLOB SECTION)(S) 1938-57
ORDERVILLE CANYON NW 1954
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SLICKROCK BENCH 1964 (76-1)
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MOTOQUA 1972
GUNLOCK 1972
VEYO 1972
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ZION NATIONAL PARK (ZION CANYON SECTION)(S) 1932-57
ORDERVILLE CANYON SE 1954
BALD KNOLL 1966 (1978-1)
SKUTUMPAH CREEK 1966 (1978-1)
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DEER RANGE POINT 1966 (1978-1)
CALICO PEAK 1964 (76-1)
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HURRICANE 1954
LA VERKIN 4 NW 1954
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KANAB 1957
JOHNSON 1954
BUCKSKIN MTN 1954
PARIA 1954
NIPPLE BUTTE 1953
TERRY BENCHES 1973
BEAVER DAM MTS SE 1973
LA VERKIN 4 SW 1954
LA VERKIN 4 SE 1954
SPRINGDALE SW 1954
SPRINGDALE SE 1954
37°
114°
113°
112°
ARIZ

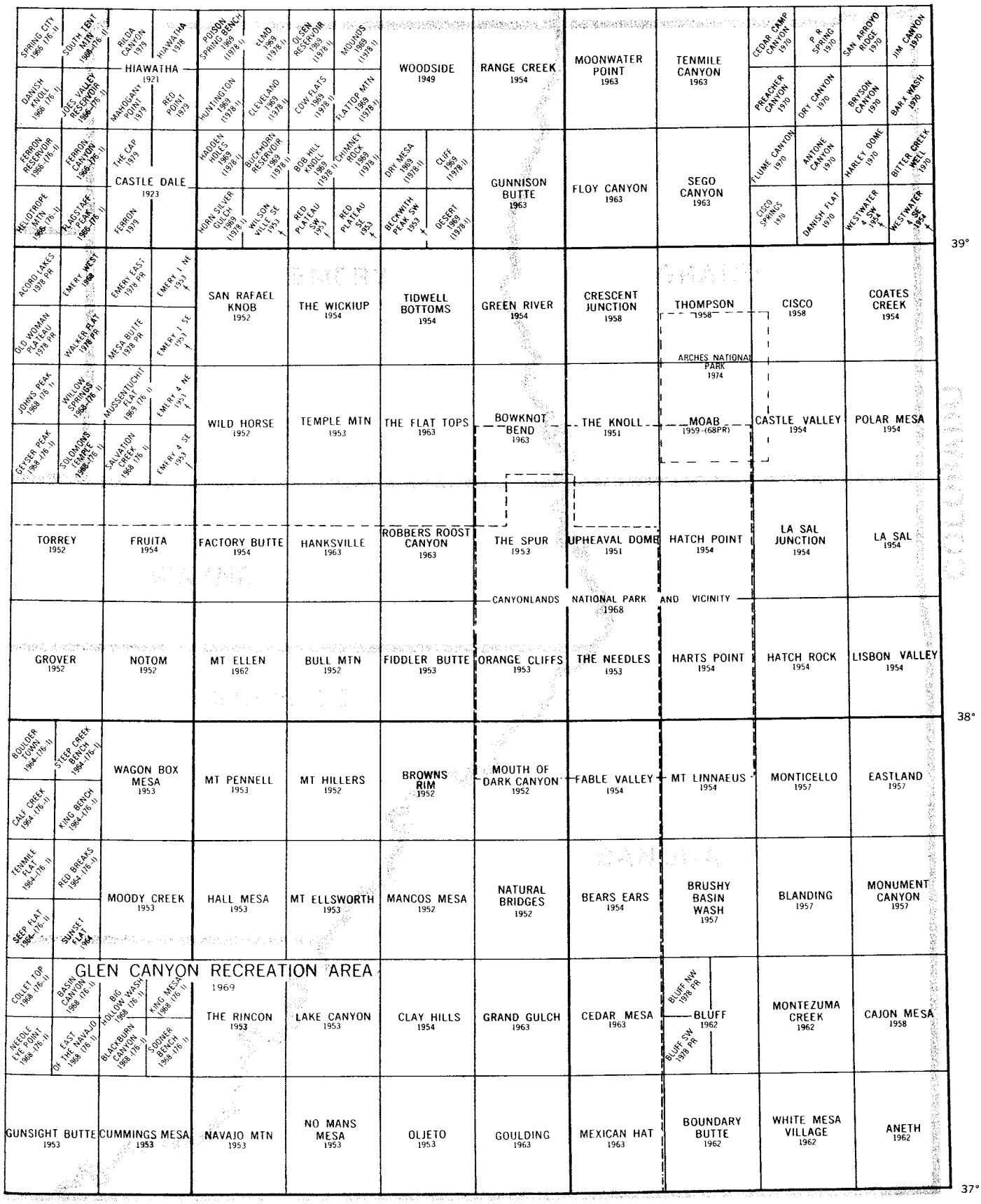

Figure 2. INDEX TO TOPOGRAPHIC MAPS OF UTAH (south half)

AUTHOR INDEX

A

AAA Engineering and Drafting, Inc., 1979a, Coal resources of the Heliotrope Mountain Quadrangle, Sanpete and Sevier Counties, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1006, 20 p.

Sanpete and Sevier Counties; Wasatch Plateau Coal Field; Heliotrope Mountain Quadrangle.

Descriptors: Utah; Sanpete and Sevier Counties; economic geology; coal; maps; organic residues; deposits; resources; economic geology maps; explanatory text; Heliotrope Mountain Quadrangle; USGS.

AAA Engineering and Drafting, Inc., 1979b, Coal resources of the Hilgard Mountain Quadrangle, Sevier County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1014, 19 p.

Sevier County; Salina Canyon Coal Field; Hilgard Mountain Quadrangle.

Descriptors: coal; Sevier County; technical production management; reserve estimation; materials distribution maps and surveys; Utah.

AAA Engineering and Drafting, Inc., 1979c, Coal resources of the Joes Valley Reservoir Quadrangle, Sanpete and Emery Counties, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1002, 24 p.

Sanpete and Emery Counties; Wasatch Plateau Coal Field; Joes Valley Reservoir Quadrangle.

Descriptors: Utah; Sanpete and Emery Counties; economic geology; coal; maps; organic residues; deposits; resources; economic geology maps; explanatory text; Joes Valley Reservoir Quadrangle; USGS.

AAA Engineering and Drafting, Inc., 1979d, Coal resources of the Kyune Quadrangle, Carbon County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-150, 18 p.

Carbon and Utah Counties; Book Cliffs Coal Field; Kyune Quadrangle.

Descriptors: Carbon and Utah Counties; coal resource occurrence; coal development potential maps; Kyune Quadrangle; physiography; climate; stratigraphy; structure; coal geology; mining operations; coal data map; columnar sections.

AAA Engineering and Drafting, Inc., 1979e, Coal resources of the Matts Summit Quadrangle, Carbon County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-151, 14 p.

Duchesne, Utah, and Carbon Counties; Book Cliffs Coal Field; Matts Summit Quadrangle.

Descriptors: economic geology; coal; maps; Carbon, Duchesne, and Utah Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Matts Summit Quadrangle; physiography; climate; land status; stratigraphy; coal geology; chemical analyses; mining operations; development potential; surface mining; subsurface mining; *in situ* gasification; coal data map; columnar section.

AAA Engineering and Drafting, Inc., 1979f, Coal resources of the Minnie Maud Creek East Quadrangle, Carbon County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-488, 18 p.

Duchesne and Carbon Counties; Book Cliffs Coal Field; Minnie Maud Creek East Quadrangle.

Descriptors: economic geology; coal; maps; Carbon and Duchesne Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Minnie Maud Creek East Quadrangle.

AAA Engineering and Drafting, Inc., 1979g, Coal resources of the NE quarter of the Woodside 15-min. Quadrangle, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-896, 16 p.

Emery County; Book Cliffs Coal Field; NE quarter of the Woodside 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Woodside Quadrangle.

AAA Engineering and Drafting, Inc., 1979h, Coal resources of the NW quarter Woodside 15-min. Quadrangle, Emery and Carbon Counties, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-896, 19 p.

Emery and Carbon Counties; Book Cliffs Coal Field; NW quarter Woodside 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery and Carbon Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Woodside Quadrangle.

AAA Engineering and Drafting, Inc., 1979i, Coal resources of the SE quarter of the Range Creek 15-min. Quadrangle, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1017, 15 p.

Emery County; Book Cliffs Coal Field; SE quarter of the Range Creek 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery and Grand Counties; organic residues; deposits; resources; economic geology maps; explanatory text; Range Creek Quadrangle; USGS.

AAA Engineering and Drafting, Inc., 1979j, Coal resources of the SW quarter of the Range Creek 15-min. Quadrangle, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1016, 15 p.

Emery County; Book Cliffs Coal Field; SW quarter of the Range Creek 15-min. Quadrangle.

Descriptors: Utah; economic geology; coal; maps; Emery County; organic residues; deposits; resources; economic geology maps; explanatory text; Range Creek Quadrangle.

AAA Engineering and Drafting, Inc., 1979k, Coal resources of the SW quarter of the Soldier Summit 15-min. Quadrangle, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-481, 17 p.

Utah and Carbon Counties; Wasatch Plateau Coal Field; SW quarter of the Soldier Summit 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Utah and Carbon Counties; organic residues; deposits; resources; economic geology maps; explanatory text; Soldier Summit Quadrangle.

AAA Engineering and Drafting, Inc., 1979l, Coal resources of the Walker Flat Quadrangle, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1013, 21 p.

Sevier and Emery Counties; Emery Coal Field; Walker Flat Quadrangle.

Descriptors: Utah; economic geology; coal; maps; Sevier and Emery Counties; organic residues; deposits; resources; economic geology maps; explanatory text; Walker Flat Quadrangle; USGS.

AAA Engineering and Drafting, Inc., 1979m, Coal resources of the Water Hollow Ridge Quadrangle, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1008, 20 p.

Sevier County; Wasatch Plateau Coal Field; Water Hollow Ridge Quadrangle.

Descriptors: economic geology; coal; maps; Sevier County; organic residues; deposits; resources; economic geology maps; explanatory text; Water Hollow Ridge Quadrangle.

AAA Engineering and Drafting, Inc., 1979n, Coal resources of the Yogo Creek Quadrangle, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1011, 20 p.

Sevier County; Salina Canyon Coal Field; Yogo Creek Quadrangle.

Descriptors: economic geology; coal; maps; Sevier County; organic residues; deposits; resources; economic geology maps; explanatory text; Yogo Creek Quadrangle.

AAA Engineering and Drafting, Inc., 1979o, Coal resource occurrence and coal development potential maps of the Acord Lakes Quadrangle, Sevier County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1009, 24 p.

Sevier County; Wasatch Plateau Coal Field; Acord Lakes Quadrangle.

Descriptors: economic geology; coal; maps; Sevier County; organic residues; deposits; resources; explanatory text; economic geology maps; Acord Lakes Quadrangle.

AAA Engineering and Drafting, Inc., 1979p, Coal resource occurrence and coal development potential maps of the Deadman Canyon Quadrangle, Emery County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-149, 15 p.

Carbon County; Book Cliffs Coal Field; Deadman Canyon Quadrangle.

Descriptors: coal resource occurrence; coal development potential maps; Deadman Canyon Quadrangle; Carbon county; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map, columnar sections.

AAA Engineering and Drafting, Inc., 1979q, Coal resource occurrence and coal development potential maps of the Dinosaur Quadrangle, Rio Blanco and Moffat Counties, Colorado, and Uintah County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1418, 18 p.

Uintah County; Vernal Coal Field; Dinosaur Quadrangle.

Descriptors: Uintah County; economic geology; coal; maps; organic residues; deposits; resources; economic geology maps; explanatory text; inventory; Dinosaur Quadrangle.

AAA Engineering and Drafting, Inc., 1979r, Coal resource occurrence and coal development potential maps of the Emery West Quadrangle, Sevier and Emery Counties, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1010, 23 p.

Sevier and Emery Counties; Emery Coal Field; Emery West Quadrangle.

Descriptors: economic geology; coal; maps; Sevier

and Emery Counties; organic residues; deposits; resources; economic geology maps; explanatory text; Emery West Quadrangle.

AAA **Engineering and Drafting, Inc.,** 1979s, Coal resource occurrence and coal development potential maps of the Ferron Canyon Quadrangle, Sanpete, and Emery Counties, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1003, 11 p.

Sanpete and Emery Counties; Wasatch Plateau Coal Field; Ferron Canyon Quadrangle.

Descriptors: economic geology; coal; maps; Sanpete and Emery Counties; organic residues; deposits; resources; economic geology maps; explanatory text; inventory; Ferron Canyon Quadrangle.

AAA **Engineering and Drafting, Inc.,** 1979t, Coal resource occurrence and coal development potential maps of the Flagstaff Peak Quadrangle, Sanpete, Sevier and Emery Counties, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-1007, 19 p.

Sanpete, Sevier, and Emery Counties; Wasatch Plateau Coal Field; Flagstaff Peak Quadrangle.

Descriptors: economic geology; coal; maps; Sanpete, Emery, and Sevier Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Flagstaff Peak Quadrangle.

AAA **Engineering and Drafting, Inc.,** 1979u, Coal resource occurrence and coal development potential maps of the Helper Quadrangle, Carbon County, Utah: U.S. Geol. Surv., Open-File Rept., No. 79-148, 18 p.

Carbon County; Book Cliffs Coal Field; Helper Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Helper Quadrangle.

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Sevier County; Emery Coal Field; John's Peak Quadrangle.

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Carbon County; Book Cliffs Coal Field; Mount Bartles Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Mount Bartles Quadrangle.

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Carbon County; Wasatch Plateau Coal Field; NE quarter of the Hiawatha 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; economic geology maps; explanatory text; Hiawatha Quadrangle.

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Emery, Carbon, and Sanpete Counties; Wasatch Plateau Coal Field; NE quarter of the Scofield 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery, Carbon, and Sanpete Counties; coal resource occurrence; coal development potential maps; Quadrangle; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map; columnar section.

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Emery County; Book Cliffs Coal Field; NE quarter of the Woodside 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Woodside Quadrangle.

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Emery County; Wasatch Plateau Coal Field; NW quarter of the Castlegate 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Castle Dale Quadrangle.

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Carbon County; Wasatch Plateau Coal Field; NW quarter of Hiawatha 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; ex-

planatory text; economic geology maps; Hiawatha Quadrangle.

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Carbon County; Wasatch Plateau Coal Field; NW quarter of the Scofield 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Scofield Quadrangle.

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Sevier County; Salina Canyon Coal Field; Old Woman Plateau.

Descriptors: economic geology; coal; maps; Sevier County; organic residues; deposits; resources; economic geology maps; explanatory text; Old Woman Plateau Quadrangle; USGS.

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Carbon County; Book Cliffs Coal Field; Patmos Head Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; deposits; resources; explanatory text; economic geology maps; Patmos Head Quadrangle.

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Carbon County; Book Cliffs Coal Field; Pine Canyon Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Pine Canyon Quadrangle.

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Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Hiawatha Quadrangle.

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Descriptors: coal resource occurrence; coal development potential maps; Emery, Carbon, and Sanpete Counties; Wattis Quadrangle; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map; columnar section.

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Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Woodside Quadrangle.

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Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Hiawatha Quadrangle.

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Descriptors: economic geology; coal; maps; Emery, Carbon, and Sanpete Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Candland Mountain Quadrangle; coal resource occurrence; coal development potential; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; surface mining; *in situ* coal gasification; coal data map; composite columnar section.

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Carbon County; Book Cliffs Coal Field; Standardville Quadrangle.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

Descriptors: Utah; well-logging; Cretaceous; coal; geophysical surveys; applications; Carbon County; Emery County; Sevier County; Blackhawk Formation; Wasatch Plateau; stratigraphy; sedimentary rocks; sandstone; shale; deposits; exploration; geophysical methods; electrical; radioactivity; gamma ray; data.

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Garfield County; Kaiparowits Plateau Coal Field; SE quarter Mt. Pennell 15-min. Quadrangle.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

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Wasatch Plateau; Johns Peak Quadrangle; Emery; Last Chance Creek; Upper Last Chance Creek.

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Descriptors: coal industry; imports of coal into the Territory; patents; transportation; analyses; Springville; Grass Creek and Chalk Creek; Castlegate mines; Winter Quarters mine; Pleasant Valley mines.

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Descriptors: western U.S.; sedimentary rocks; economic geology; sedimentary petrology; organic residues; North Horn Formation; Green River Formation; Flagstaff Member; petroleum; coal; exploration; source rocks; environmental analysis; Cretaceous; Mesozoic; Paleocene; Paleogene; Tertiary; Cenozoic; Eocene; biostratigraphy; palynomorphs; Mollusca; geochemistry; organic materials.

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Descriptors: economic geology; coal; maps; Utah and Colorado; coal fields; Henry's Fork field; location; structure; stratigraphy; Mesaverde Formation; sections; Tertiary coal; thin beds; subbituminous; analyses; Uinta Basin.

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Descriptors: economic geology; coal fields; location; accessibility; development; personnel; mapping; land surveys; Colorado Plateau; stratigraphy; structure; Vernal; Yampa; Henry's Fork; coal quality; comparisons; physical properties; chemical analyses; fuel ratio; coking tests; maps; tables; charts.

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Wasatch and Duchesne Counties; Tabby Mountain Coal Field.

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Descriptors: Illinois; coal; sedimentary rocks; geochemistry; organic residues; Herrin No. 6 coal member; Danville No. 7 coal member; Fort Union Formation; Harrisburg No. 5 coal member; Summum No. 4 coal member; Colchester No. 2 coal member; Springfield No. 5 coal member; Pittsburg No. 8 coal member (Ohio); trace elements; deposits; Illinois Basin; statistical analysis; data; Indiana, Arizona, Montana, Colorado, Ohio, Utah, Pennsylvania, West Virginia, Kentucky, Missouri, North Dakota, Wyoming, Iowa, Alabama, and Tennessee.

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Descriptors: reconnaissance study; western Kane County; development of coal deposits; electricity; water supplies; well water; chemical analysis; sedimentary and volcanic rocks; Triassic to Recent; lithologies and water bearing properties; yields; potentials; structure; stratigraphy; Paunsaugunt and Markagunt plateaus; precipitation; physiography; water resources hydrologic cycle; ground water; surface water; records of selected wells; reservoirs; industry; maps.

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Kane County; Alton and Kaiparowits Plateau Coal Fields.

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Garfield and Kane Counties; Kaiparowits Plateau Coal Field.

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Descriptors: energy sources; energy source development; environmental impacts; socioeconomic factors; Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming; air pollution; coal industry; nuclear industry; natural gas and petroleum industries; oil shale industry; geothermal energy; EPA; water pollution.

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San Juan County; La Sal Coal Field.

Descriptors: San Juan County; geography; geology; reconnaissance surveys; physiography; water supply; stock ranching; mineral resources; sedimentary rock; igneous rocks; structure; Abajo Mountains; Comb anticline; maps; inhabitants; stratigraphy; sections; petrography; economic geology; copper; gold; vanadium-uranium; coal seams; Dakota Shales; bituminous; no deposits of large economic value; domestic value; ash; bone; characteristics of coal beds; coal sections; Rassmussen and Pendergraff mines; table of analyses.

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Descriptors: geology; eastern Iron County; stratigraphy; structure; physiography; economic geology; coal deposits; mining; development; coal quality; use; lithology; tables.

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Garfield and Kane Counties; Kaiparowits Plateau Coal Field.

Descriptors: Garfield and Kane Counties; geography; sedimentary rocks; stratigraphic sections; igneous rocks; structure; physiography; economic geology; coal occurrence; Dakota Sandstone; Tropic Shale; Straight Cliffs Sandstone; Cretaceous; commercial value; quality; lignite; subbituminous; bituminous; analyses.

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Descriptors: coal; economic geology; Kolob, Kanab, and Kaiparowits Coal Fields; market; transportation; power plants; coal resources; regional setting; thickness; structure; mining methods; development; chemical analysis; rank; cost; maps; tables.

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Descriptors: well-logging; economic geology; interpretation; coal; Garfield and Grand Counties; organic residues; deposits; exploration; drilling.

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Grand County; Sego Coal Field; Antone Canyon, Cisco Spring, Dry Canyon, and Flume Canyon Quadrangles.

Descriptors: Utah; areal geology; maps; Antone Canyon Quadrangle; Cisco Spring Quadrangle; Dry Canyon Quadrangle; Flume Canyon Quadrangle; geologic maps; coal; organic residues.

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Grand County; Sego Coal Field; Bar X Wash, Bryson Canyon, Jim Canyon, and San Arroyo Ridge Quadrangles.

Descriptors: Utah and Colorado; economic geology; coal; maps; organic residues; geologic maps; USGS.

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Grand County; Sego Coal Field; Sego Canyon and Thompson Quadrangles.

Descriptors: Utah; economic geology; coal; maps; Grand County; USGS; Sego Canyon Quadrangle; Thompson Quadrangle; organic residues; geologic maps.

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Wayne County; Henry Mountains Coal Field; Mt. Ellen Quadrangle.

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Emery County; Wasatch Plateau Coal Field.

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Emery County; Emery Coal Field.

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Sanpete, Sevier, Carbon, Emery, and Grand Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Book Cliffs and Wasatch Plateau Coal Fields; sandstones; characteristic trace fossils; upper Cretaceous; descriptions of trace fossils; depositional environment; facies fauna; subdivisions of wave and energy; *in situ*, ethological classification; bedding planes.

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Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Coal; Utah and Colorado; Cretaceous; Economic geology; Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields; deposits; genesis; controls; environment; lagoons; barrier islands; sedimentary rocks.

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Carbon, Emery, Iron, Sevier, and Summit Counties.

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Sanpete, Sevier, Carbon, Garfield, Kane, and Emery Counties; Book Cliffs, Henry Mountains, and Wasatch Plateau Coal Fields.

Descriptors: Wasatch Plateau; stratigraphy; Cretaceous; Tertiary; correlation; facies; sequences; San Rafael Swell; Kaiparowits Plateau; Henry Mountains; Book Cliffs; depositional environment; formation renaming; fossil evidence; formation dating.

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Emery and Grand Counties; Sego Coal Field.

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Emery County; Wasatch Plateau Coal Field.

Descriptors: Huntington Canyon anticline; Emery County; wells drilled; Castle Valley; Dakota Sandstone; structure; map stratigraphy; shows of oil and gas; Ferron Sandstone; oil staining.

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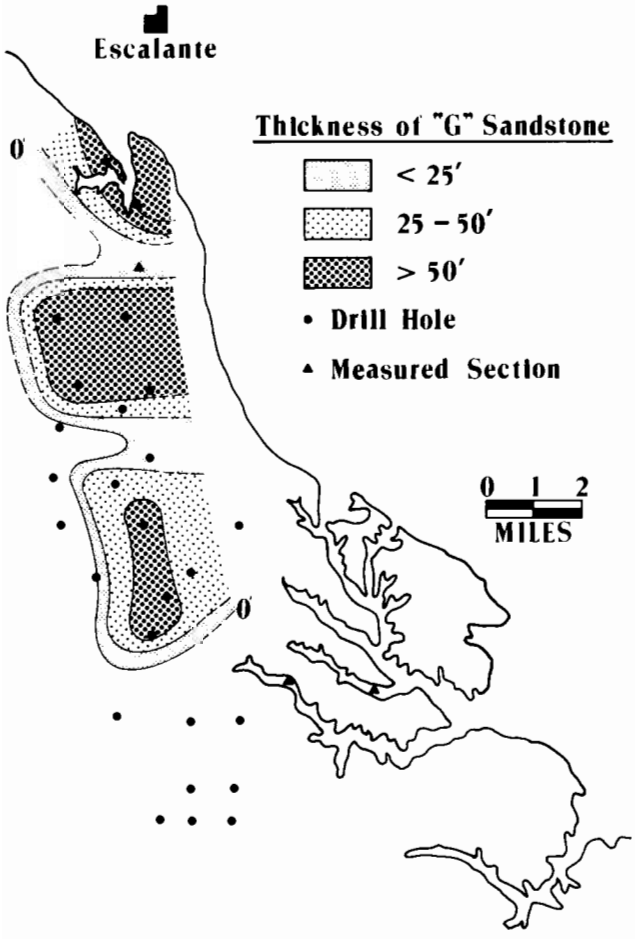

Figure 6a. Isopach map of the G sandstone.

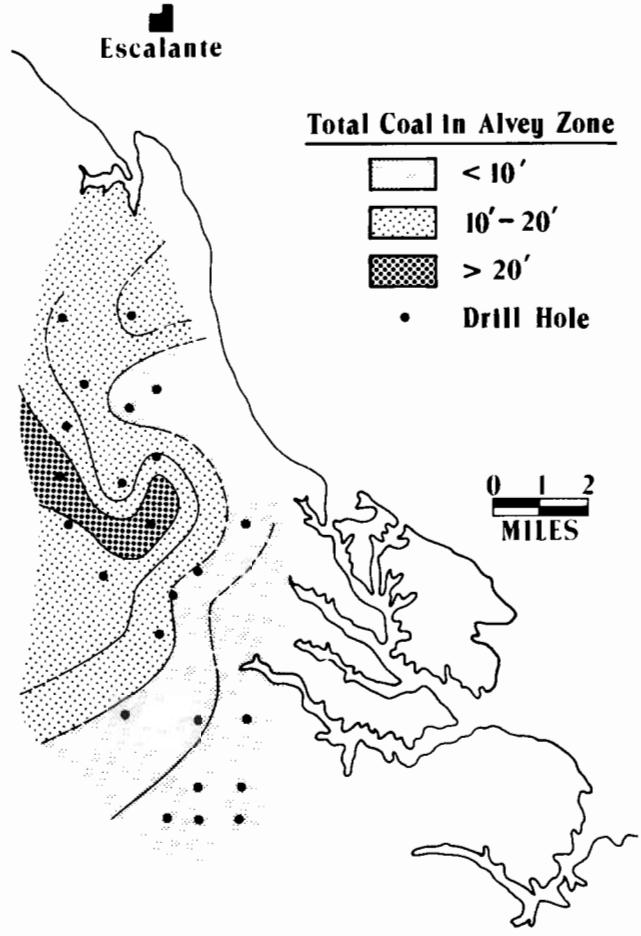

Figure 6b. Isopach map of the coal in the Alvey coal zone.

CONCLUSIONS

The coal deposits of the Northern Kaiparowits Plateau were deposited landward of prograding deltaic and barrier island shorelines. The nature of these marginal marine sandstones and the associated facies suggest a wave dominated/microtidal coast line (Table 1). The extensive coal reserves in the Rees and Christensen zones were probably deposited behind barrier island systems, while the Alvey coal zone was associated with a deltaic system. The key for the recognition of barrier vs. deltaic lies in the variations of the vertical sequences and the nature of the "replacement" facies.

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Table 1. Micro-Tidal Wave-Dominated Characteristics.

- Linear shorelines
- Well-developed lagoons
- Extensive washovers
- Flood tidal deltas
- Absence of ebb-tidal deltas
- Tidal inlet depth 8 meters
- Tidal inlet spacing wide
- Absence of tidal creeks
- Foreshore thickness 1-2 meters

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Uintah County; Vernal Coal Field.

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Descriptors: High volatile bituminous coal; Spring Canyon mine; energy input; benzene; acetone; hydrogen; carbon monoxide; acetylene; infrared spectra; aromatic/aliphatic hydrogen ratios; West Virginia; thermodynamics; thin-film resistance thermometry; platnium film; oscilloscope trace; heat flux; heat capacity; heat transfer theory.

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Wayne and Garfield Counties; Henry Mountains Coal Field.

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Descriptors: economic geology; coal; maps; Kane County; organic residues; resources; economic geology maps; explanatory text; inventory; Rainbow Point Quadrangle; USGS.

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Kane County; Alton Coal Field; Skutumpah Creek Quadrangle.

Descriptors: economic geology; coal; maps; Kane County; organic residues; resources; economic geology maps; explanatory text; inventory; Skutumpah Creek Quadrangle; USGS.

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Emery County; Emery Coal Field.

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Carbon, Emery, and Utah Counties; Book Cliffs Coal Field.

Descriptors: central Utah; northeast Wasatch Plateau; southwestern edge of the Uinta Basin; stratigraphic section; upper Cretataceous; lower Cenozoic non-marine; Colton; Green River and Uinta Formations; Blackhawk; Castlegate sandstone; Price River; North Horn; Flagstaff; Bennion Creek; mountain building; facies; structure; Clear Creek anticline; Beaver Creek syncline; Tic Fork syncline; faults; Pleasant Valley; Starvation Creek; disconformity; gravity; geomorphology; graben; fault scarp; ridge; canyon; hogback; crustal movements; early Laramide orogeny; folding and faulting; late Eocene; Miocene; floodplain; lacustrine; Flagstaff Lake; Uinta Lake; fluvial facies; Duchesne River; present drainage system.

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Carbon County; Book Cliffs Coal Field.

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Sanpete County; Wasatch Plateau Coal Field; Fairview Lakes Quadrangle.

Descriptors: Utah; faults; geomorphology; areal geology; systems; fluvial features; stratigraphy; maps; grabens; drainage patterns; lithostratigraphy; Sanpete County; Blackhawk Formation; Castlegate Sandstone; Price River Formation; Flagstaff Limestone; geologic maps; Fairview Lakes Quadrangle; Cretaceous; Mesozoic; Tertiary; Cenozoic; glaciation; economic geology; coal; organic residues; fuel resources; petroleum; natural gas; construction materials; water resources; structure contour maps; Goniobasis tenera; Lioplacodes marian.

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Kane County; Kaiparowits Plateau Coal Field; NE Cummings Mesa Quadrangle.

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Descriptors: coal; economic geology; maps; geologic; stratigraphy; NE quarter Gunsight Butte Quadrangle; Mesozoic; Quaternary.

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Kane County; Kaiparowits Plateau Coal Field; Nipple Butte and Gunsight Butte Quadrangles.

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Carbon and Emery Counties.

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Duchesne and Uintah Counties.

Descriptors: subsurface stratigraphy; lithology; Green River Formation; Uinta Basin; microscopic studies; well samples; lacustrine environment; fluvial; Lake Uinta; paleogeography; main events; transgression; stability; regression; stratigraphy; black shale facies; formational contact; paleontologic content; age relationships; delta facies; tuff beds; time-equivalence; saline depositional environment; oil; tectonic framework; hydrocarbons; oil exploration history; oil production by field; geologic summary of oil and gas fields; cross-sections; well log.

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Utah, Wasatch, Duchesne, and Carbon Counties.

Descriptors: Green River Formation; Uinta Formation; subsurface stratigraphy; western Uinta Basin; oil and gas; previous work and nomenclature; structural elements; petroleum geology; paleogeography; correlation; water depth chart; lithologic logs; general stratigraphy; cross-sections; source beds; Utah, Wasatch, Duchesne, and Carbon Counties.

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Duchesne and Uintah Counties.

Descriptors: paleocurrents; shoreline orientations; Green River Formation; Eocene; Raven Ridge and Red Wash areas; northeastern Uinta Basin; ripplemarks; cross-stratification; sandstone-body trends; lacustrine; fluvial; vertical stratigraphic variation; asymmetric and symmetric; arcs of azimuths; stable current system; exploration for oil and gas; regional structure; stratigraphy; maximum inclination of foresets; description of structures used; directional results; rose diagrams; regional map.

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Wayne and Garfield Counties; Henry Mountains Coal Field.

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Descriptors: air quality; regional analysis; energy source development; environmental impacts; Arizona, Colorado, Montana, Utah, New Mexico, North Dakota, South Dakota, and Wyoming; coal; data acquisition systems; data base management; fossil fuels; fossil-fuel power plants; measuring instruments; monitoring.

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Descriptors: Uinta Basin; Green River Formation; stratigraphy; petroleum accumulation possibilities; depositional environment; structure; facies; oil occurrence; exploration.

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Carbon County; Book Cliffs Coal Field.

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Descriptors: Knight of Labor; national miners organizations; strike; UMW; labor force; Western Federation of Miners; cheating; pay scale; opposition; National Miners Union; conservative labor philosophy; public opinion; Mormon church; Utah, Wyoming, and Colorado.

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power; bituminous coal; petroleum; natural gas; anthracite coal; reserves; thin seams; mining process; recovery; future supply; settlement; nonferrous metal industry; smelting; interests; Geneva Steel plant; employment; Carbon and Emery Counties; production; transportation problems; economic competition; market; human factor; union wages and benefits; government regulation and supervision; depression; geography; areal relations.

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Descriptors: economic geology; coal; Utah and Colorado; Book Cliffs Coal Field; occurrence; deposits; mining geology; evaluation; Grand County; Mesa County; Sunnyside; topography; stratigraphy; thickness; lithologic descriptions; physical properties; chemical analyses; prospects; mines; charts; tables.

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Utah and Carbon Counties; Book Cliffs Coal Field.

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Carbon and Sanpete Counties; Book Cliffs, Emery, and Wasatch Plateau Coal Fields.

Descriptors: Cretaceous; east-central Utah; facies change; cyclic sedimentation; intertonguing marine and nonmarine coal-bearing sediments; continental; littoral; marine; depositional environment; field trip; Price River; North Horn and Blackhawk Formations; Sunnyside mine; recent work in the area; local geologic history.

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Daggett County; Henry's Fork Coal Field.

Descriptors: Daggett County; geology; geography; physiography; stratigraphy; lithology; structure; geomorphology; economic geology; deposits; coal; resources; Cretaceous; Mesaverde Formation; Frontier Member; Mancos Shale; Manning Canyon Shale; market; transportation.

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Descriptors: southwestern Utah; coal resources; geology; stratigraphy; Henry Mountains, Kaiparowits Plateau, Kanab, Kolob, and Harmony Coal Fields; location; occurrence; rank; reserves; development; economic factors.

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Iron, Washington, Garfield, Kane, and Wayne Counties.

Descriptors; coal; chemical analyses; economic geology; resources; field investigation; Kanab and Kaiparowits Plateaus; coal sections; Federal coal prospecting; permits; exploratory drilling; coal reserves; Iron, Washington, Garfield, Kane, Wayne Counties; subbituminous A; High volatile bituminous C; ash; sulfur; local domestic fuel requirements.

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Descriptors: economic geology; coal; organic residues; mining; liquefaction; exploitation; field test conditions; *in-situ* coal liquefaction; atmospheric pressure; temperature; solvents; time; steady-state extraction rate; data; extraction; products; ash content; heating value.

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Emery County; Wasatch Plateau and Emery Coal Fields.

Descriptors: Western Interior; Utah; sedimentation; sedimetary rocks; paleogeography; economic geology; cyclic processes; environmental analysis; Cretaceous; coal; deltaic sedimentation; deltaic environment; Emery County; Ferron Sandstone; Mancos Shale; clastic rocks; organic residues; exploration; prediction; Mesozoic.

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Descriptors: sedimentation; economic geology; cyclic processes; coal; deltas; Emery County; Ferron Sandstone Member; Mancos Shale; Castle Valley; Cretaceous; organic residues; deposits; coal seams; swamps; exploration; channels; lithofacies; progradation.

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Descriptors: sedimentary rocks; stratigraphy; lithostratigraphy; Cretaceous; Emery and Sevier Counties; Mancos Shale; Ferron Sandstone; USGS; Mesozoic; Emery Coal Field; coal; organic residues; sections; sandstone; clastic rocks.

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Emery County; Emery Coal Field.

Descriptors: western interior; sedimentary rocks; sedimentation; Utah; economic geology; clastic rocks; environment; coal; sandstone; deltas; Ferron Sandstone Member; Mancos Shale; organic residues; Emery Coal Field; Castle Valley; deposition; models; deposits.

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Emery County; Emery Coal Field.

Descriptors: Utah; sedimentary rocks; well-logging; stratigraphy; organic residues; interpretation; Cretaceous; coal; Emery County; Ferron Sandstone Member; Mancos Shale; USGS; cores; coal fields; programs; Muddy Project; Quitchupah Project; correlation; clastic rocks; Mesozoic.

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Carbon, Emery, Grand, Kane, Sevier, Sanpete, and Summit Counties.

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Duchesne and Uintah Counties; Vernal and Tabby Mountain Coal Fields.

Descriptors: geology; Cretaceous; Uinta Basin; stratigraphy; igneous rocks; structure; folding; faulting; structural history; Dakota Sandstone; Mancos Shale; Mesaverde Group; lithologic facies; Vernal and Tabby Mountain Coal Fields; Laramide folding; regional Cretaceous correlation diagram; sections; age and correlation; fossillists; lithology.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

Descriptors: Wasatch Plateau gas fields; Clear Creek; further exploratory drilling; structure; Cretaceous; Paleocene; sedimentary strata; history; coal deposits; stratigraphy; structure map; composite log- self-potential and resistivity; age of faults and folding; cross-section; causes and time of gas accumulation; Ferron Sandstone; depositional environment; Flat Canyon; Gordon Creek; producing formations.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

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Carbon, Wasatch, Utah, Sanpete, Duchesne, and Uintah Counties.

Descriptors: Cretaceous; Paleocene; conglomerates; margin of Uinta Basin; age and correlation; outcrop map; Uintah, Carbon, Duchesne, Sanpete, Utah, and Wasatch Counties; geologic cross-sections; stratigraphy; structure.

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Sanpete County; Sterling Coal Field.

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Iron County; Kolob and New Harmony Coal Fields.

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Descriptors: government policies; regional planning; water quality; land use; land reclamation; housing studies; population growth; fixed investment; site surveys; transportation; environmental impacts; air pollution; water pollution; solid wastes; economics; national government; state government; local government; coal; natural gas; crude oil; oil shale; uranium; Arizona, Colorado, Montana, New Mexico, North Dakota, Utah, and Wyoming.

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Descriptors: environmental geology; impact statements; economic geology; energy sources; resources; reserves; production; exploration; economics; Arizona, Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming; technology; effects; coal; organic residues; uranium; oil shale; petroleum; geothermal energy.

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Descriptors: coal industry; economic impact; environmental impacts; social impact; natural gas industry; oil shale industry; petroleum industry; uranium mining; ecology; land use; employment; population dynamics; Utah, Arizona, Colorado, Montana, New Mexico, Wyoming, North Dakota, and South Dakota.

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Descriptors: coal; oil shale; crude oil; natural gas; legislation; regulations; environmental impacts; air pollution; water pollution; exploration; leasing; mining; water quality; water consumption; solid waste disposal; noise pollution; transportation; distribution; forecasting; Arizona, Colorado, New Mexico, Utah, North Dakota, South Dakota, and Wyoming.

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Descriptors: energy source development; air pollution; Arizona, Colorado, Utah, New Mexico, Wyoming, North Dakota, and South Dakota; coal; distribution; environmental impacts; exploration; forecasting; leasing; legislation; mining; natural gas; petroleum; oil shale; uranium; noise pollution; regulations; transport; waste disposal; water quality; water pollution.

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Descriptors: energy source development; government policies; air pollution; coal; environmental impacts; Arizona, Utah, Colorado, New Mexico, Montana, Wyoming, and South Dakota; economics; land use; local and national government; natural gas; oil shales; petroleum; regional analysis; solid waste; uranium; water quality; water pollution.

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Descriptors: Cretaceous stratigraphy; Coalville area; lithologic descriptions.

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Descriptors: sedimentary facies; intertonguing; Cretaceous; Book Cliffs; marine and nonmarine; continental; lagoon; littoral; depositional environment; stratigraphy; coal-bearing facies; cyclic; shallow basin; subsidences; shale; sandstone; offshore bars; classification and nomenclature.

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Garfield County; Kaiparowits Plateau Coal Field; Death Ridge Quadrangle.

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Garfield County; Kaiparowits Plateau Coal Field; Canaan Creek Quadrangle.

Descriptors: maps; economic geology; Garfield County; coal; petroleum; Canaan Creek Quadrangle; geologic; deposits; resources.

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Garfield and Kane Counties; Kaiparowits Plateau Coal Field; Carcass Canyon Quadrangle.

Descriptors: maps; economic geology; Garfield and Kane Counties; coal; Carcass Canyon Quadrangle; geologic; deposits; resources.

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Garfield County; Kaiparowits Plateau Coal Field; Dave Canyon Quadrangle.

Descriptors: maps; economic geology; Garfield County; coal; Dave Canyon Quadrangle; geologic; deposits; resources.

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Garfield and Kane Counties; Kaiparowits Plateau Coal Field; Death Ridge Quadrangle.

Descriptors: maps; economic geology; Garfield and Kane Counties; Death Ridge Quadrangle; geologic; deposits; resources.

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Garfield County; Kaiparowits Plateau Coal Field.

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Box Elder County; Goose Creek Lignite Field.

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Box Elder County; Goose Creek Lignite Field.

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Duchesne and Carbon Counties; Book Cliffs Coal Field; Matts Summit Quadrangle.

Descriptors: economic geology; coal; maps; Carbon, Duchesne, and Utah Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Matts Summit Quadrangle; physiography; climate; land status; stratigraphy; coal geology; chemical analyses; mining operations; development potential; surface mining; subsurface mining; *in situ* gasification; coal data map; columnar section.

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Duchesne and Carbon Counties; Book Cliffs Coal Field; Minnie Maud Creek East Quadrangle.

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Emery and Carbon Counties; Book Cliffs Coal Field; NW 1/4 Woodside 15-minute Quadrangle.

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Carbon County; Book Cliffs Coal Field; Deadman Canyon Quadrangle.

Descriptors: coal resource occurrence; coal development potential maps; Deadman Canyon Quadrangle; Carbon county; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map, columnar sections.

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Carbon County; Book Cliffs Coal Field; Mount Bartles Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Mount Bartles Quadrangle.

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Emery, Carbon, and Sanpete Counties; Wasatch Plateau Coal Field; NE quarter of the Scofield 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery, Carbon, and Sanpete Counties; coal resource occurrence; coal development potential maps; Jump Creek Quadrangle; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map; columnar section.

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Carbon County; Wasatch Plateau Coal Field; NW quarter of the Scofield 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Scofield Quadrangle.

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Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Pine Canyon Quadrangle.

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Carbon, Emery, and Sanpete Counties; Wasatch Plateau Coal Field; SE quarter of the Scofield 15-min. Quadrangle.

Descriptors: coal resource occurrence; coal development potential maps; Emery, Carbon, and Sanpete Counties; Wattis Quadrangle; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map; columnar section.

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Carbon County; Wasatch Plateau Coal Field; SE quarter of the Soldier Summit 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Soldier Summit Quadrangle.

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Emery, Carbon, and Sanpete Counties; Wasatch Plateau Coal Field; SW quarter of the Scofield 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery, Carbon, and Sanpete Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Candland Mountain Quadrangle; coal resource occurrence; coal development potential; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; surface mining; *in situ* coal gasification; coal data map; composite columnar section.

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Carbon County; Book Cliffs Coal Field; Standardville Quadrangle.

Descriptors: economic geology; coal; maps; Carbon County; organic residues; deposits; resources; explanatory text; economic geology maps; Standardville Quadrangle.

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Coalville, Henry"s Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields.

Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Descriptors: sedimentation; sedimentary rocks; economic geology; stratigraphy; environment; organic residues; coal; Cretaceous; coastal environment; Carbon County; Blackhawk Formation; Kenilworth Tongue; Pine Canyon Quadrangle; Mesozoic; cores; deposits; resources; coal seams; lithofacies; marine environment; brackish-water environment; barriers; thickness; lithostratigraphy; paleoenvironment.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Carbon, Sanpete, Iron, Washington, and Kane Counties; Book Cliffs, Wasatch Plateau, Kolob, Mount Pleasant, and Sunnyside-Castlegate Coal Fields.

Descriptors: western states; manufacture of metallurgical coke; geology; coal resources; Sunnyside-Castlegate field; steel industry; low-volatile bituminous; quality; nonferrous smelting; phosphorus; refining of sugar; Carbon County; typical analyses; production; Mount Pleasant field; Sanpete County; Kolob field; Iron, Washington, and Kane Counties.

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Carbon County; Book Cliffs Coal Field.

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Carbon County; Wasatch Plateau Coal Field.

Descriptors: Utah; sedimentary rocks; economic geology; stratigraphy; lithostratigraphy; coal; maps; Cretaceous; Carbon County; Mesaverde Group; Blackhawk Formation; Star Point Sandstone; USGS; Wasatch Plateau; stratigraphic wedges; Mesozoic; organic residues; sandstone; clastic rocks; lithofacies.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

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Descriptors: economic geology; petroleum; natural gas; coal; lignite; mineral fuels; mines; prospects; Carbon, Emery, and Summit Counties; maps; charts; tables.

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Vernal, Coalville, Book Cliffs, Wasatch Plateau, Kaiparowits Plateau, and Kolob Coal Fields.

Descriptors: southwestern Utah; map of coal fields; estimate of coal reserves of different rank; heat efficiency; classification of coal areas; San Juan, Kaiparowits Plateau, Vernal, Wasatch Plateau, Emery, Kolob, and Coalville Coal Fields.

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Descriptors: Utah; sedimentation; Cretaceous; sedimentary rocks; sedimentary petrology; deposition; environmental analysis; Mancos Shale; Ferron Sandstone Member; Castle Valley; Last Chance Delta; deltas; channels; prodelta; cyclic; shale; carbonaceous shale; coal; siltstone; sandstone; lithostratigraphy; lithofacies; bioturbation.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau and Book Cliffs.

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Descriptors: Utah; Cretaceous; paleoecology; palynomorphs; sedimentary rocks; stratigraphy; organic residues; Ferron Sandstone Member; Mancos Shale; Blackhawk Formation; Price River Formation; biostratigraphy; Book Cliffs; Wasatch Plateau; coal; bogs; marshes; lagoons; swamps; genesis; assemblages; angiosperms; environmental analysis; indicators.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

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Carbon County; Book Cliffs Coal Field.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

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Carbon, Emery, and Sevier Counties; Wasatch Plateau Coal Field.

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Carbon and Emery Counties; Book Cliffs, Wasatch Plateau, and Emery Coal Fields.

Descriptors: coal mine bumps; seismic surveys; Sunnyside district; Carbon and Emery Counties; Book Cliffs Coal Field; siesmic study; epicenters; coking coal; hazards; daily records of tremors caused by bumps; seasonal patterns; maxima; prediction of location; releases of strain energy; surface and subsurface mapping; structural and lithological conditions in coal and associated rocks; instruments; interpretation; geologic and topographic setting.

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Sevier, Sanpete, Emery, and Carbon Counties; Wasatch Plateau Coal Field.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

Descriptors: faults; sedimentation; economic geology; displacements; environment; coal; normal faults; paleochannels; Sevier County; Blackhawk Formation; Star Point Sandstone; Mancos Shale; Ferron Sandstone Member; organic residues; Wasatch Plateau; John's Peak Quadrangle; Emery; Last Chance Creek; Upper Last Chance Creek.

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Emery, Carbon, and Utah Counties; Book Cliffs and Wasatch Plateau Coal Fields.

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Carbon County; Book Cliffs Coal Field.

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Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields.

Descriptors: geology; mineral resources; engineering geology characteristics; environmental geochemistry; east-central Utah; coal development; stratigraphy; Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields; coal quality and composition; oil and gas; non-petroleum gases; oil shale; bituminous sandstone; uranium; base metals; clays; underground coal mining; coal mine subsidence; earthquakes; maps; stratigraphic correlations.

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Sanpete, Sevier, Carbon, Emery, and Grand Counties; Wasatch Plateau and Book Cliffs Coal Fields.

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Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Coal; Utah and Colorado; Cretaceous; Economic geology; Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields; deposits; genesis; controls; environment; lagoons; barrier islands; sedimentary rocks.

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Carbon and Emery Counties; Book Cliffs and Wasatch Plateau Coal Fields.

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Carbon and Grand Counties; Book Cliffs and Sego Coal Fields.

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Descriptors: Emery, Wasatch Plateau, Book Cliffs and Sego Coal Fields; Sevier, Sanpete, Carbon, Emery, and Grand Counties; Wasatch Plateau; Castle Valley; Book Cliffs; geology; sections; Mancos Shale; Mesaverde Formation; Wasatch Formation; lithology; description of coal; mining; engineering; production; transportation; descriptions of mines by company; analyses of coals.

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Carbon, Emery, and Sevier Counties; Wasatch Plateau Coal Field.

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Sanpete, Sevier, Carbon, and Emery Counties; Emery and Wasatch Plateau Coal Fields.

Descriptors: sedimentation; sedimentary rocks; stratigraphy; environment; lithofacies; Cretaceous; coastal environment; environmental analysis; Blackhawk Formation; Star Point Sandstone; Emery and Wasatch Plateau Coal Fields; Mesozoic; lithostratigraphy; sandstone; clastic rocks; fine-grained materials; deltas; floodplains; channels; coal; organic residue; brackish-water environment; paleoenvironment.

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Carbon County; Book Cliffs Coal Field.

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Carbon, Emery, and Grand Counties; Book Cliffs and Sego Coal Fields.

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Carbon and Emery Counties; Book Cliffs Coal Field.

Descriptors: Utah; fractures; structural analysis; mining geology; fossil man; sedimentation; economic geology; style; interpretation; production control; occurrence; environment; coal; joints; Quaternary; deltaic environment; Carbon and Emery Counties; USGS; Sunnyside District; bedrock; surficial geology; organic residues; bituminous coal; gypsum deposits; natural gas; bitumens; organic materials; Cretaceous; Cenozoic; faults; geomorphology; cleavage; deformation; stress; coal seams; deltaic sedimentation; landform description.

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Utah, Wasatch, Duchesne, and Carbon Counties.

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Utah and Carbon Counties; Book Cliffs Coal Field.

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Carbon and Sanpete Counties; Book Cliffs, Emery, and Wasatch Plateau Coal Fields.

Descriptors: Cretaceous; east-central Utah; facies change; cyclic sedimentation; intertonguing marine and nonmarine coal-bearing sediments; continental; littoral; marine; depositional environment; field trip; Price River; North Horn and Blackhawk Formations; Sunnyside mine; recent work in the area; local geologic history.

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Carbon County; Book Cliffs Coal Field.

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Descriptors: Book Cliffs, Sego, Emery, and Wasatch Plateau Coal Fields; drill core samples; methane content of coal; methane extraction; coal analysis; coal beds; tables.

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Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields.

Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields; location; accurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Carbon and Emery Counties; Book Cliffs and Wasatch Plateau Coal Fields.

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Descriptors: high temperature carbonization; low temperature carbonization; smoke elimination; technology; products; problems; industry status; Utah coals; types; producing counties; geology; physical properties; chemical analyses; coking capabilities; coking constituents; briquetting; semi-coke; laboratory investigations; properties; rank; test results; products; tars; gases; oils; blends; reactions; Carbon, Emery, Sevier, Sanpete, Iron, Summit, Kane, and Garfield Counties; tables.

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Descriptors: economic geology; coal; maps; Emery and Carbon Counties; organic residues; economic geology maps; reserves; Book Cliffs Coal Field.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau and Emery Coal Fields.

Descriptors: economic geology; maps; coal; organic residues; Wasatch Plateau and Emery Coal Fields.

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Carbon County; Book Cliffs Coal Field.

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DAGGETT

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Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Henry's Fork, Blacktail (Tabby) Mountain, Vernal, Book Cliffs, Sego, Wasatch Plateau, Mount Pleasant, Wales, Salina Canyon, Emery, Henry Mountains, Kolob-Harmony, Kaiparowits Plateau, San Juan, Lost Creek, and Coalville Coal Fields.

Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Summit and Daggett Counties; Henry's Fork Coal Field.

Descriptors: mineral fuels; coal resources; rank; production; market; Henry's Fork Coal Field; stratigraphy; structure; lithology.

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Daggett and Summit Counties.

Descriptors: geology; Green River and Wasatch formations; Eocene; Tertiary; topography; structure; faults; interpretation of structure; structural effect of original dip and compaction; stratigraphy; mesured sections; deformation; fluvial and lacustrine rocks; Gosiute Lake; trona; shertite; salt beds; paleoclimate; volcanic activity; Daggett and Summit Counties; earlier surveys; analysis of cannel coal; faunal lists; tuffs; table of boreholes drilled for oil and gas.

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Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field.

Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field; occurrence.

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Summit and Daggett Counties; Henry's Fork Coal Field.

Descriptors: Henry's Fork Coal Field; location; geography; physiography; stratigraphy; lithologic descriptions; coal deposits; mining; exploration; production; chemical analysis; reserves; land control; maps.

Fieldner, A. C., H. M. Cooper and F. D. Osgood, 1924, Analyses of mine samples of coal in Utah: U.S. Bur. Mines, Tech. Pub., No. 345.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Summit and Daggett Counties; Henry's Fork Coal Field.

Descriptors: economic geology; coal; maps; Utah and Colorado; coal fields; Henry's Fork field; location; structure; stratigraphy; Mesaverde Formation; sections; Tertiary coal; thin beds; subbituminous; analyses; Uinta Basin.

Gale, H. S., 1910a, Coal fields of northwestern Colorado and northeastern Utah: U.S. Geol. Surv., Bull., No. 415, 265 p.

Summit and Daggett Counties; Henry's Fork and Vernal Coal Fields.

Descriptors: economic geology; coal fields; location; accessibility; development; personnel; mapping; land surveys; Colorado Plateau; stratigraphy; structure; Vernal; Yampa; Henry's Fork; coal quality; comparisons; physical properties; chemical analyses; fuel ratio; coking tests; maps; tables; charts.

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Descriptors: coal; location; structure; stratigraphy; sections; quality.

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Daggett County; Henry's Fork Coal Field.

Descriptors: coal; Rock Springs Formation; mine; stratigraphy; bituminous; Frontier Formation; thin beds; lack potential for production; geologic history; structure; mineral resources.

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Descriptors: coal mining; feasibilty studies; bituminous coal; coal reserves; cost; economics; productivity; Utah.

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Ritzma, H. R., 1959, Geologic atlas of Utah-Daggett County: Utah Geol. and Min. Surv., Bull., No. 66.

Daggett County; Henry's Fork Coal Field.

Descriptors: Daggett County; geology; geography; physiography; stratigraphy; lithology; structure; geomorphology; economic geology; deposits; coal; resources; Cretaceous; Mesaverde Formation; Frontier Member; Mancos Shale; Manning Canyon Shale; market; transportation.

Ritzma, H. R., 1969, Tectonic resume, Uinta Mountains: Intermtn. Assoc. Geol., 16th Ann. Guidebook.

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Descriptors: Uinta Mountain; tectonic history; Uinta anticline; folding; faulting; tectonic controls; structural chronology.

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Uintah and Daggett Counties; Henry's Fork Coal Field.

Descriptors: Uinta Mountain; north flank; faulting; Henry's Fork Fault; Uinta Fault; Spurks Fault; displacement; dip; faulting history; petroleum exploration.

Sadlick, W., 1955, Carboniferous formations of northeastern Uinta Mountains: Wyo. Geol. Assoc., 10th Ann. Guidebook.

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Descriptors: Uinta Mountains; Carboniferous formations; biostratigraphic studies; tectonic history;

Mississippian; Pennsylvanian; fossil record; lithologic correlation.

Schell, E. M., 1969, Summary of the geology of the Sheep Creek Canyon geological area and vicinity, Daggett County, Utah: Intermtn. Assoc. Pet. Geol., 16th Ann. Guidebook.

Daggett County; Henry's Fork Coal Field.

Descriptors: Daggett County; Sheep Creek Canyon; geology; stratigraphy; structure; lithologic descriptions; mineral resources.

Schemel, M. P., 1950, Carboniferous plant spores from Daggett County, Utah: Jour. Pal., Vol. 24, p. 232-244.

Daggett County; Henry's Fork Coal Field.

Descriptors: Daggett County; Carboniferous plant spores; lithologic correlation; systematic descriptions; petrographic rock composition.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields; location; accurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Descriptors: Uinta Mountain and Basin region; structure; Wasatch Mountains; Cretaceous; stratigraphy; geologic map; geological history; correlated columnar section.

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Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

Descriptors: Wasatch Plateau gas fields; Clear Creek; further exploratory drilling; structure; Cretaceous; Paleocene; sedimentary strata; history; coal deposits; stratigraphy; structure map; composite log- self-potential and resistivity; age of faults and folding; cross-section; causes and time of gas accumulation; Ferron Sandstone; depositional environment; Flat Canyon; Gordon Creek; producing formations.

Walton, P. T., 1955, Wasatch Plateau gas fields Utah: Am. Assoc. Pet. Geol. Bull., Vol. 39.

Sanpete, Sevier, Carbon, and Emery Counties; Wasatch Plateau Coal Field.

Descriptors: Wasatch Plateau; natural gas fields; exploration activity; stratigraphy; formations; lithologic log; geophysical log; stratigraphic correlation; structure; causes; age; structural traps; stratigraphic traps; hydrocarbon accumulation; gas analysis; production; drilling practices; charts; diagrams.

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Wasatch, Carbon, and Duchesne Counties; Wasatch Plateau Coal Field.

Descriptors: Soldier Summit area; Wasatch, Carbon, and Duchesne Counties; structure map; regional setting and tectonic history; regional and local structural elements; influence of structural history on local stratigraphy; gas and oil exploration; drilled wells.

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Carbon County; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: natural gas; Clear Creek; Wasatch Plateau and Book Cliffs Coal Fields; stratigraphy; Mesaverde Group; economic geology.

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Carbon, Wasatch, Utah, Sanpete, Duchesne, and Uintah Counties.

Descriptors: Cretaceous; Paleocene; conglomerates; margin of Uinta Basin; age and correlation; outcrop map; Uintah, Carbon, Duchesne, Sanpete, Utah, and Wasatch Counties; geologic cross-sections; stratigraphy; structure.

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Carbon and Emery Counties; Book Cliffs Coal Field.

Descriptors: bounces; virgin territory; fault; Utah Fuel mines; sloughing of coal from the ribs; heavy cover; nature of cover; hard brittle coal; butt cleavage of the coal; pillar workings; tension; slippage plane; unsupported block; stresses; bending action; Book Cliffs; plan of workings; dome theory of faults; synclinal theory.

Winkler, P., 1947, Source mechanisms of earthquakes associated with coal mines in eastern Utah: M.S. thesis, Univ. of Utah.

Carbon County; Book Cliffs Coal Field.

Descriptors: microearthquake activity; Sunnyside mining district; Price; mining hazards; portable high-gain, high-sensitivity seismographs; multichannel magnetic tape; Geneva and Columbia mines; epicenters; hypocenters; fault plane solutions; seismic moment; source dimension; stress drop; fault dislocation; local well logs; saturated sandstone; Mancos Shale; room and pillar mining; compressive principal stress axis; spectral analysis; direct shear waves; maximum ground acceleration; failures; caving; heaving.

Winn, E. L., 1957, Development of Utah's coal mining industry, 1850-1900: M. A. thesis, Brigham Young Univ.

Sanpete, Carbon, Iron, and Kane Counties.

Descriptors: coal mining; history; southern Utah coal fields; Sanpete, Carbon, Iron, and Kane Counties; Union Pacific railroad; mine explosions.

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Carbon, Emery, and Grand Counties; Book Cliffs and Sego Coal Fields.

Descriptors: sedimentary facies; intertonguing; Cretaceous; Book Cliffs; marine and nonmarine; continental; lagoon; littoral; depositional environment; stratigraphy; coal-bearing facies; cyclic; shallow basin; subsidences; shale; sandstone; offshore bars; classification and nomenclature.

Young, R. G., 1957, Late Cretaceous cyclic deposits, Book Cliffs, eastern Utah: Am. Assoc. Pet. Geol. Bull., Vol. 41, p. 1760-74.

Carbon County; Book Cliffs Coal Field.

Descriptors: cyclic deposits; Cretaceous; Book Cliffs; depositional environment; lithofacies; depositional sequence; cyclothem; Blackhawk Formation; correlations; diagrams.

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Descriptors: Book Cliffs; stratigraphy; coal; paleogeography; depositional environment; Blackhawk Formation; lithologic descriptions; depositional history; maps.

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Carbon and Emery Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Cretaceous; coal; economic geology; Blackhawk Formation; Price River Formation; paleoenvironment; deposits; genesis.

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Duchesne, Utah, and Carbon Counties; Book Cliffs Coal Field; Matts Summit Quadrangle.

Descriptors: economic geology; coal; maps; Carbon, Duchesne, and Utah Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Matts Summit Quadrangle; physiography; climate; land status; stratigraphy; coal geology; chemical analyses; mining operations; development potential; surface mining; subsurface mining; *in situ* gasification; coal data map; columnar section.

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Duchesne and Carbon Counties; Book Cliffs Coal Field; Minnie Maud Creek East Quadrangle.

Descriptors: economic geology; coal; maps; Carbon and Duchesne Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Minnie Maud Creek East Quadrangle.

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Descriptors: Uinta Basin; Tertiary rocks; geology; stratigraphy; lithologic descriptions; isopach maps.

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Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

Averitt, P., 1964, Coal, in Mineral and water resources of Utah: Utah Geol. and Min. Surv., Bull., No. 73.

Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Summit and Duchesne Counties.

Descriptors: Uinta Mountains; mineral resources; prospecting; coal occurrence; tar sands.

Cashion, W. B., Jr., 1967, Geology and fuel resources of the Green River Formation southeastern Uinta Basin, Utah and Colorado: U.S. Geol. Surv., Prof. Paper, No. 548, 48 p.

Duchesne and Wasatch Counties.

Descriptors: Green River Formation; southeast Uinta Basin; fuel resources; geology; geography; stratigraphy; lithologic descriptions; economic geology; oil shale; gilsonite; bituminous sandstones; oil and gas; reserves.

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Duchesne and Uintah Counties.

Descriptors: Asphalt Ridge area; Vernal area; bituminous sandstones; physiography; geology; stratigraphy; asphalt saturation; origin and time of accumulation; economics; mining methods.

Covington, R. E., 1963, Bituminous sandstone and limestone deposits of Utah, in Oil and gas possibilities of Utah, re-evaluated: Utah Geol. and Min. Surv., Bull., No. 54, p. 225-47.

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Descriptors: bituminous sands; Uinta Basin; Sunnyside area; stratigraphy; structure; nature; deposits; tables; charts.

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Descriptors: Uinta Basin; bituminous sandstones; Sunnyside area; Asphalt Ridge; White Rocks area; P. R. Springs deposit; Chapita wells area; Dragon-Asphalt wash area; Deep Creek area; mining economics; methods.

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Duchesne, Uintah, and Wasatch Counties.

Descriptors: stratigraphic and facies relationships; Green River Formation; Uinta Formation; Duchesne, Uintah, and Wasatch Counties; correlation; tuff beds; lacustrine; playa; mud-flat; saline facies; Eocene; oil shale; lateral facies changes; correlated colmnar sections; description of members; lithology.

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Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field.

Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field; occurrence.

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Fieldner, A. C., H. M. Cooper and F. D. Osgood, 1924, Analyses of mine samples of coal in Utah: U.S. Bur. Mines, Tech. Pub., No. 345.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Wasatch and Duchesne Counties; Tabby Mountain Coal Field.

Descriptors: stratigraphy; economic significance; tectonic history; Tabby Mountain; Uinta Mountains anticline; oil-impregnated sandstones; petroleum; stratigraphic sections; geologic maps; Cretaceous; Wasatch and Duchesne Counties; correlation; lithology; location; topography; glacial; landslides; sedimentary textures and structures; fossils; well data; structure.

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Duchesne and Uintah Counties.

Descriptors: Uinta Basin; Mesaverde Group; stratigraphy; physiography; structure; lithology; nomenclature; facies descriptions; Star Point Sandstone; Blackhawk Formation; Price River Formation; depositional environment; correlation.

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Duchesne and Uintah Counties.

Descriptors: oil shale; processing techniques; Green River Formation; mining retorting; gas combustion; Union Oil process; Tosco process; in-situ retorting.

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Descriptors: Uinta Basin; structure; stratigraphy; depositional environments; tectonism; interpretation.

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Descriptors: Utah; paleogeography; structural history; depositional environments; orogenic episodes; physiography.

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Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Coal; Utah and Colorado; Cretaceous; Economic geology; Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields; deposits; genesis; controls; environment; lagoons; barrier islands; sedimentary rocks.

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Descriptors: economic geology; coal; maps; Emery, Carbon, and Sanpete Counties; coal resource occurrence; coal development potential maps; Jump Creek Quadrangle; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map; columnar section.

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Carbon, Emery, and Sanpete Counties; Wasatch Plateau Coal Field; SE quarter of the Scofield 15-min. Quadrangle.

Descriptors: coal resource occurrence; coal development potential maps; Emery, Carbon, and Sanpete Counties; Wattis Quadrangle; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map; columnar section.

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Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Woodside Quadrangle.

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Emery County; Wasatch Plateau Coal Field; SW quarter of the Castlegate 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Castle Dale Quadrangle.

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Descriptors: economic geology; coal; maps; Emery County; organic residues; deposits; resources; explanatory text; economic geology maps; Hiawatha Quadrangle.

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Descriptors: economic geology; coal; maps; Emery, Carbon, and Sanpete Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Candland Mountain Quadrangle; coal resource occurrence; coal development potential; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; surface mining; *in situ* coal gasification; coal data map; composite columnar section.

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Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields.

Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Carbon, Emery and Grand Counties; Book Cliffs and Sego Coal Field.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Emery and Sevier Counties; Emery and Wasatch Plateau Coal Fields; John's Peak and Old Woman Plateau Quadrangles.

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Sanpete, Sevier, Carbon and Emery Counties; Wasatch Plateau Coal Field.

Descriptors: Utah; well-logging; Cretaceous; coal; geophysical surveys; applications; Carbon, Emery, and Sevier Counties; Blackhawk Formation;

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Descriptors: economic geology; stratigraphy; coal; Cretaceous; Paleocene; Mancos Shale; Mesaverde Group; North Horn Formation; Flagstaff Limestone; Star Point Sandstone; Blackhawk Formation; Castlegate Sandstone; Price River Formation; Wasatch Plateau; organic residues; Cretaceous; Coloradoan; Paleogene; Tertiary; biostratigraphy; Ostrea; Ostriedae; Bivalvia; Mollusca; Thalassinoides; ichnofossils; sandstone; clastic rocks; mining; biogenic structures; sedimentary structures.

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Descriptors: sedimentation; stratigraphy; economic geology; environment; Cretaceous; coal; deltas; Mesaverde Group; Star Point Sandstone; Blackhawk Formation; Price River Formation; Castlegate Sandstone; Wasatch Plateau; Mesozoic; organic residues; deposits; production; chemical properties; coal seams; thickness; marine environment; shallow-water environment; sandstone; clastic rocks.

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Sevier, Carbon, Emery, and Sanpete Counties; Wasatch Plateau, Book Cliffs, and Emery Coal Fields.

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Emery, and Sevier Counties; Emery Coal Field.

Descriptors: Emery Coal Field; location; geography; physiography; stratigraphy; structure; coal deposits; mining; proposals; reserves; chemical analysis; physical properties; land control; lithologic descriptions; quadrangle reports.

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Descriptors: Sego Coal Field; location; geography; physiography; stratigraphy; lithologic descriptions; coal deposits; mining; exploration; production; chemical analysis; reserves; land control; quadrangle reports; maps.

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Sanpete, Sevier, Carbon and Emery Counties; Wasatch Plateau Coal Field.

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Carbon, Emery and Sevier Counties; Wasatch Plateau Coal Field.

Descriptors: coal deposits; ash; chemical composition; coal; degassing; leading abstract; methane; quantity ratio; core samples; coal fields; gas content; direct methods; High Volatile A or B rank; lower ranked coals; coal desorption; outcrops; mined areas; encasing rock; Book Cliffs; aeromagnetic contours; Wasatch Plateau.

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Emery and Sanpete Counties; Wasatch Plateau Coal Field; Rilda Canyon Quadrangle.

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Carbon and Emery Counties; Book Cliffs, Wasatch Plateau, and Emery Coal Fields.

Descriptors: coal mine bumps; seismic surveys; Sunnyside district; Carbon and Emery Counties; Book Cliffs Coal Field; siesmic study; epicenters; coking coal; hazards; daily records of tremors caused by bumps; seasonal patterns; maxima; prediction of location; releases of strain energy; surface and subsurface mapping; structural and lithological conditions in coal and associated rocks; instruments; interpretation; geologic and topographic setting.

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Emery County; Emery Coal Field; Emery East Quadrangle.

Descriptors: well-logging; economic geology; applications; coal; Emery County; general; organic residues; radioactivity; gravity methods; geophysical methods; density; deposits; sections; boreholes; Emery East Quadrangle; exploration.

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Descriptors: stratigraphy; economic geology; Cretaceous; coal; Emery County; Blackhawk Formation; Mesozoic; The Cap Quadrangle; sections; organic residues; deposits.

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Emery County; Wasatch Plateau Coal Field; The Cap Quadrangle.

Descriptors: Utah; economic geology; coal; maps; Emery County; USGS; The Cap Quadrangle; organic residues; sections; geologic maps; explanatory text.

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Sanpete and Emery Counties; Wasatch Plateau Coal Field; Ferron Canyon Quadrangle.

Descriptors: Utah; economic geology; coal; maps; Sanpete County; Emery County; USGS; Ferron Canyon Quadrangle; sections; geologic maps; organic residues.

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Emery County; Wasatch Plateau Coal Field; Mahogany Point Quadrangle.

Descriptors: well-logging; economic geology; coal; Emery County; Wasatch Plateau; organic residues; coal fields; sections; Mahogany Point Quadrangle; USGS.

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Descriptors: Utah; economic geology; coal; maps; Emery County; USGS; Mahogany Point Quadrangle; geologic maps; coal deposits; maps; organic residues; coal seams; sections; explanatory text.

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Descriptors: Utah; economic geology; coal; maps; Emery County; USGS; Red Point Quadrangle; organic residues; sections; geologic maps.

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Carbon, Emery, Sevier, Summit, Uintah, and Wasatch Counties.

Descriptors: sampling and analytical methods; car samples; mine sampling; determination of ash, moisture, Volatiles, carbon, sulfur, hydrogen, nitrogen and calorific values; proximate and ultimate analyses; descriptions of samples; Carbon, Emery, Sevier, Summit, Uintah, and Wasatch Counties; Hiawatha, Knight, Sunnyside, Browning, Casper, Williams, Hogan, Kearns and Duggins, Rees-Grass, Superior, Wasatch, Blue Bell, Green, Reynolds, Winchester, and Cummings mines,; sections.

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Carbon, Emery, Grand, Morgan, Sanpete, and Summit Counties.

Descriptors: coal analyses; mine samples; car samples; fiscal year; proximate and ultimate analyses; Carbon, Emery, Grand, Morgan, Sanpete, and Summit Counties; lithologic descriptions; tables.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Emery and Grand Counties; Book Cliffs Coal Field.

Descriptors: Book Cliffs Coal Field; Emery, Grand, and Carbon Counties; geography; physiography; stratigraphy; Neslen Formation; structure; economic geology; coal occurrence; physical properties; chemical analysis; tonnage reserves; development; township descriptions; coal thickness; lithologic descriptions; coal rank; maps; tables.

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Carbon, Emery, Iron, Kane, Sanpete, Sevier, and Washington Counties.

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Sanpete, Emery, and Grand Counties; Wasatch Plateau, Book Cliffs, and Sego Coal Fields.

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Descriptors: roof falls; Book Cliffs and Wasatch Plateau Coal Fields; Carbon and Emery Counties; coal mine accidents; fatalities; description of district; coal beds; thickness of cover; mining methods; roof testing; support of roof; accident prevention; physical characteristics; cleavage planes; working faces; diagrams of methods; supervision.

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Descriptors: economic geology; coal; Star Point Sandstone; Blackhawk Formation; organic residues; exploration; Montana, Wyoming, Utah, Colorado, Arizona, and New Mexico; coal fields; San Juan Basin; Powder River Basin; Wasatch Plateau; Kaiparowits Plateau; concepts; practice.

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Emery County; Wasatch Plateau Coal Field.

Descriptors: sedimentation; mining geology; economic geology; deposition; production control; coal; Emery County; Blackhawk Formation; Hiawatha Seam; Blind Canyon Seam; organic residues; isopach maps; paleocurrents; slickensides; fuel quality; roof control; underground installations; mines; deposits.

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Sanpete, Sevier, Carbon and Emery Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Utah; hydrology; hydrogeology; surveys; USGS; Wasatch Plateau and Book Cliffs Coal Fields; coal; organic residues; ground water; surface water; dissolved materials; hydrographs; maps.

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Sanpete, Emery, and Grand Counties; Wasatch Plateau and Book Cliffs Coal Fields.

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Descriptors: Wasatch Plateau gas fields; Clear Creek; further exploratory drilling; structure; Cretaceous; Paleocene; sedimentary strata; history; coal deposits; stratigraphy; structure map; composite log- self-potential and resistivity; age of faults and folding; cross-section; causes and time of gas accumulation; Ferron Sandstone; depositional environment; Flat Canyon; Gordon Creek; producing formations.

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Carbon, Emery, and Grand Counties; Book Cliffs and Sego Coal Fields.

Descriptors: sedimentary facies; intertonguing; Cretaceous; Book Cliffs; marine and nonmarine; continental; lagoon; littoral; depositional environment; stratigraphy; coal-bearing facies; cyclic; shallow basin; subsidences; shale; sandstone; offshore bars; classification and nomenclature.

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Kane and Garfield Counties; Kaiparowits Plateau Coal Field.

Descriptors: Colorado, Utah, and Wyoming; environmental geology; ecology; conservation; Garfield and Kane Counties; Project Rio Blanco; Kaiparowits Plateau; Battle Springs Draw; energy sources; ore deposits; uranium; coal; organic residues; deposits; nuclear facilities; impact statements; inventory; ecosystems; ground motion; faunal studies; floral studies.

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Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields.

Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Iron, Washington, Garfield, and Kane Counties; Kolob Coal Field.

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Descriptors: coal; economic geology; production and exploration history; southwestern Utah; Garfield, Iron and Kane Counties; Kaiparowits Plateau, Kanab, Kolob Terrace, and Harmony Coal Fields; Pacific southwest electricity demand.

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Henry's Fork, Blacktail (Tabby) Mountain, Vernal, Book Cliffs, Sego, Wasatch Plateau, Mount Pleasant, Wales, Salina Canyon, Emery, Henry Mountains, Kolob-Harmony, Kaiparowits Plateau, San Juan, Lost Creek, and Coalville Coal Fields.

Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field; occurrence.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Descriptors: Book Cliffs Coal Field; Emery, Grand, and Carbon Counties; geography; physiography; stratigraphy; Neslen Formation; structure; economic geology; coal occurrence; physical properties; chemical analysis; tonnage reserves; development; township descriptions; coal thickness; lithologic descriptions; coal rank; maps; tables.

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Carbon, Emery, and Grand Counties; Book Cliffs and Sego Coal Fields.

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Grand County; Sego Coal Field.

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Garfield and Grand Counties; Book Cliffs Coal Field.

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Grand County; Sego Coal Field; Antone Canyon, Cisco Spring, Dry Canyon, and Flume Canyon Quadrangles.

Descriptors: Utah; areal geology; maps; Antone Canyon Quadrangle; Cisco Spring Quadrangle; Dry Canyon Quadrangle; Flume Canyon Quadrangle; geologic maps; coal; organic residues.

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Grand County; Sego Coal Field; Bar X Wash, Bryson Canyon, Jim Canyon, and San Arroyo Ridge Quadrangles.

Descriptors: Utah; Colorado; economic geology; coal; maps; Grand County; Mesa County; Garfield County; organic residues; geologic maps; USGS.

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Grand County; Sego Coal Field; Sego Canyon and Thompson Quadrangles.

Descriptors: Utah; economic geology; coal; maps; Grand County; USGS; Sego Canyon Quadrangle; Thompson Quadrangle; organic residues; geologic maps.

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Grand County; Sego and Book Cliffs Coal Fields.

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Carbon, Emery, and Grand Counties; Book Cliffs and Sego Coal Fields.

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Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields.

Descriptors: geology; mineral resources; engineering geology characteristics; environmental geochemistry; east-central Utah; coal development; stratigraphy; Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields; coal quality and composition; oil and gas; non-petroleum gases; oil shale; bituminous sandstone; uranium; base metals; clays; underground coal mining; coal mine subsidence; earthquakes; maps; stratigraphic correlations.

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Sanpete, Sevier, Carbon, Emery, and Grand Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Book Cliffs and Wasatch Plateau Coal Fields; sandstones; characteristic trace fossils; upper Cretaceous; descriptions of trace fossils; depositional environment; facies fauna; subdivisions of wave and energy; *in situ*; ethological classification; bedding planes.

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Carbon and Grand Counties; Book Cliffs and Sego Coal Fields.

Descriptors: Cretaceous faunas; Mancos Shale; Dakota Sandstone; Mesaverde Group; stratigraphy; ammonites; correlation; Price to Grand Junction; occurrence of fossil species; coal-bearing rocks.

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Descriptors: coal seams; Grand Junction;

geography; Book Cliffs; oil; bituminous shale; asphalt; gas; Laramie; Cretaceous sandstones; Montana and Colorado groups; structure; depositional environment; "horses"; mining; sandstone dikes.

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Descriptors: economic geology; coal; Utah and Colorado; Grand County; Book Cliffs; deposits; metamorphism; combustion; spontaneous.

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Sevier, Sanpete, Carbon, Emery, and Grand Counties; Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields.

Descriptors: Emery, Wasatch Plateau, Book Cliffs and Sego Coal Fields; Sevier, Sanpete, Carbon, Emery, and Grand Counties; Wasatch Plateau; Castle Valley; Book Cliffs; geology; sections; Mancos Shale; Mesaverde Formation; Wasatch Formation; lithology; description of coal; mining; engineering; production; transportation; descriptions of mines by company; analyses of coals.

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Descriptors: Emery, Wasatch Plateau, Book Cliffs and Sego Coal Fields; Sevier, Sanpete, Carbon, Emery, and Grand Counties; Wasatch Plateau; Castle Valley; Book Cliffs; geology; sections; Mancos Shale; Mesaverde Formation; Wasatch Formation; lithology; description of coal; mining; engineering; production; transportation; descriptions of mines by company; analyses of coals.

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Grand, Carbon, Duchesne, and Uintah Counties; Book Cliffs, Sego, and Vernal Coal Fields.

Descriptors: American Gilsonite Company; Grand Junction; hydrocarbon; gasoline; carbon-coke; Bonanza; Book Cliffs; refinery; pipeline; blacksmith; Whiterocks Indian Agency; bitumen; grahamite; glance pitch; Uinta Basin; history; industry; origin; characteristics; uses; Rector; mining camp; White River.

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Descriptors: economic geology; coal; Utah and Colorado; Book Cliffs Coal Field; occurrence; deposits; mining geology; evaluation; Grand County; Mesa County; Sunnyside; topography; stratigraphy; thickness; lithologic descriptions; physical properties; chemical analyses; prospects; mines; charts; tables.

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Uintah, Grand, and Carbon Counties; Sego and Book Cliffs Coal Fields.

Descriptors: economic geology; coal; Utah and Colorado; Grand River District; Sunnyside; Book Cliffs; maps; deposits; exploration; evaluation; geologic.

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Emery and Grand Counties; Book Cliffs and Sego Coal Fields; Woodside and Green River Quadrangles.

Descriptors: microfossil zonation; depositional environment; continental, brackish, shallow-water sediments; stratigraphic problems; spores; pollen; acid-insoluble animal fossils; Book Cliffs; phosphoric and hydrofluoric acids; hystrichospherids; dinoflaggelates; microforaminifera; population variation; climatic changes; correlation; time lines; statistical method; preparation of samples; marker species; Woodside and Green River sections.

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Book Cliffs, Sego, Emery, and Wasatch Plateau Coal Fields.

Descriptors: Book Cliffs, Sego, Emery, and Wasatch Plateau Coal Fields; drill core samples; methane content of coal; methane extraction; coal analysis; coal beds; tables.

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Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery,

Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields.

Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields; location; accurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Uinta, Emery, and Grand Counties.

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Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties.

Descriptors: Utah; economic geology; mineral resources; fuel resources; exploration; Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties; production; Uinta Basin; Basin-and-Range Province; Wasatch Plateau; San Rafael Swell; asphalt; bitumens; organic materials; beryl; ring silicates; construction materials; coal; organic residues; metal ores; gems; uranium ores.

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Sanpete, Emery, and Grand Counties; Wasatch Plateau, Book Cliffs, and Sego Coal Fields.

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Descriptors: environmental geology; impact statements; maps; Grand, Wayne, Emery, Sanpete, and Sevier Counties; environmental geology maps; coal; organic residues.

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Sanpete, Emery, and Grand Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: hydrology; hydrogeology; surveys; Sanpete, Emery, and Grand Counties; Wasatch Plateau and Book Cliffs Coal Fields; coal; organic residues; deposits; coal fields; water resources.

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Descriptors: sedimentary facies; intertonguing; Cretaceous; Book Cliffs; marine and nonmarine; continental; lagoon; littoral; depositional environment; stratigraphy; coal-bearing facies; cyclic; shallow basin; subsidences; shale; sandstone; offshore bars; classification and nomenclature.

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Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields.

Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Iron, Washington, Garfield, and Kane Counties; Kolob Coal Field.

Descriptors: cannel coal; physical properties; physical and chemical composition; analyses; origin; use; mining; value; distribution; subbituminous; Kolob Coal Field; Cannel King prospect.

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Garfield, Iron, and Kane Counties; Kaiparowits Plateau, Kanab, Kolob Terrace, and Harmony Coal Fields.

Descriptors: coal; economic geology; production and exploration history; southwestern Utah; Garfield, Iron and Kane Counties; Kaiparowits Plateau, Kanab, Kolob Terrace, and Harmony Coal Fields; Pacific southwest electricity demand.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Iron County; Kolob Coal Field; Cedar Mountain Quadrangle.

Descriptors: coal; Utah; Cretaceous; Jurassic; Triassic; faults; stratigraphy; shear zones; economic geology; structural geology; volcanology; Hurricane fault zone; Cedar Mountain Quadrangle; Triassic-Cretaceous basalt flows; Iron County; Cedar City Coal Field; Hurricane Cliffs; Kolob Terrace; physiography; drainage changes; rank and quality of coal; history of mining; production; methods; reserves; gypsum; uranium.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: western states; manufacture of metallurgical coke; geology; coal resources; steel industry; low-volatile bituminous; quality; nonferrous smelting; phosphorus; refining of sugar; typical analyses; production; Carbon, Sanpete, Iron, Washington, and Kane Counties.

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Vernal, Coalville, Book Cliffs, Wasatch Plateau, Kaiparowits Plateau, and Kolob Coal Fields.

Descriptors: southwestern Utah; map of coal fields; estimate of coal reserves of different rank; heat efficiency; classification of coal areas; Vernal, Wasatch Plateau, Coalville, Kaiparowits Plateau, Emery, San Juan, and Kolob Coal Fields.

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Descriptors: analyses; calorific values; Cedar City and Kanara (Kolob-Harmony) Coal Fields; iron deposits; Cretaceous; Tertiary; description of mines and coal beds; coal sections; Grass Creek mine; Pleasant Valley; Sanpete and Iron Counties.

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Iron, Washington, and Kane Counties; Kolob-Harmony Coal Field.

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Alton, Kolob-Harmony, and Kaiparowits Plateau Coal Fields.

Descriptors: coal; economic geology; lithostratigraphy; Alton, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; properties; reserves.

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Descriptors: brown coals; Reese's mine; railroads; Cretaceous; physical properties; lignites; chemical characteristics; coke; ash; fixed carbon; Coal Creek; Cedar City; sand-coal; gas-producer; gaseous fuel; experiments; tests; coking; stone-coal; Appolt vertical oven; tar; briquettes; moisture.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Sanpete, Iron, Kane, Utah, Summit, and Emery Counties; Wasatch Plateau, Wales, Coalville, Cedar City, Kanarra, Kanab, and New Harmony Coal Fields.

Descriptors: coal industry; imports of coal into the Territory; patents; transportation; analyses; Springville; Grass Creek and Chalk Creek; Castlegate mines; Winter Quarters mine; Pleasant Valley mines.

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Iron County; Kolob Coal Field.

Descriptors: geology; eastern Iron County; stratigraphy; structure; physiography; economic geology; coal deposits; mining; development; coal quality; use; lithology; tables.

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Descriptors: coal; economic geology; Kolob, Kanab, and Kaiparowits Coal Fields; market; transportation; power plants; coal resources; regional setting; thickness; structure; mining methods; development; chemical analysis; rank; cost; maps; tables.

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Descriptors: mineral industry; production value; copper; silver; vanadium; iron; uranium; lead; zinc; gold; molybdenum; mineral fuels; coal; manufacturing steel; nonmetals; employment and injuries; legislation and government programs; review by mineral commodities; coal tonnage; Sunnyside, Columbia, Geneva, Castlegate, Clear Creek, Kenilworth, O'Connor, and King mines; Carbon, Emery, Iron, Sevier, and Summit Counties.

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Kane, Sanpete, Sevier, Iron, Wasatch, and Summit Counties; Coalville, Pleasant Valley, Sanpete, and Castle Valley Coal Fields.

Descriptors: precious metal mining; ore analyses; descriptions of mines by district; production methods; coal fields; Kane, Sanpete, Sevier, Iron, Wasatch, and Summit Counties; Coalville, Pleasant Valley, Sanpete, and Castle Valley Coal Fields; coal sections; coal analyses.

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Descriptors: carbonaceous materials; solid fuels; oil products; commercial uses; oil shale; economic factors; low-temperature carbonization; plant and refinery; Carbon County; power; smokeless fuels; rock asphalt; Vernal; paraffin; road oil; gasoline; diesel fuel; Cedar City; Utah markets; engineering experiments; heat requirements; distillation; burning properties.

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Descriptors: southern Utah; Dakota Formation; Tropic Formation; stratigraphy; Cretaceous; Garfield, Kane, and Iron Counties; lithologic descriptions; nomenclature; correlation; depositional environment; tectonic history; Cashion coal zone; Culver coal zone.

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Iron County; Harmony and Kolob Coal Fields.

Descriptors: economic geology; coal; Iron County Coal Field; stratigraphy; structure; coal resources; quality; chemical analysis; development; transportation; market; use; maps; tables.

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Kolob, Kaiparowits Plateau, Alton, and Henry Mountains Coal Fields.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields; location; accurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: Utah coals; methane content; gas composition; coal analysis; Book Cliffs, Wasatch Plateau, Emery, Sego, Kaiparowits Plateau and Alton Coal Fields; Sunnyside coal zone; physical properties; depositional environment; maps.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Kane and Garfield County; Kaiparowits Plateau Coal Field.

Descriptors: sedimentation; paleogeography; economic geology; environment; Cretaceous; coal; coastal environment; Kane and Garfield Counties; Straight Cliffs Formation; John Henry Member; Kaiparowits Plateau; organic residues; deposits; coal fields; barrier islands; deltas; progradation; swamps; marine transport; longshore currents; transgression; Mesozoic.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Summit, Morgan, and Salt Lake Counties; Coalville Coal Field.

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Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field.

Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field; occurrence.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Morgan County; Coalville Coal Field.

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Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties.

Descriptors: Utah; economic geology; mineral resources; fuel resources; exploration; Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties; production; Uinta Basin; Basin-and-Range Province; Wasatch Plateau; San Rafael Swell; asphalt; bitumens; organic materials; beryl; ring silicates; construction materials; coal; organic residues; metal ores; gems; uranium ores.

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Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties.

Descriptors: Utah; economic geology; mineral resources; fuel resources; exploration; Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties; production; Uinta Basin; Basin-and-Range Province; Wasatch Plateau; San Rafael Swell; asphalt; bitumens; organic materials; beryl; ring silicates; construction materials; coal; organic residues; metal ores; gems; uranium ores.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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San Juan County; San Juan Coal Field.

Descriptors: coal; economic geology; Colorado, Utah, New Mexico, and Arizona; Colorado Plateau; San Juan Basin; occurrence; sedimentation; shorelines; genesis; Cretaceous; Gallup Sandstone; Crevasse Canyon Formation; Menefee Formation; Fruitland Formation; Dakota Sandstone.

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Descriptors: geology; uranium; La Sal Quadrangle; San Juan County; vanadium; Salt Wash member; Jurassic; structure; plastic evaporite masses; laccolithic complexes; salt anticlines; ore; discovery; lithology; paleostream channels; sedimentary structures; mines; exploration drilling; roll deposits; replacement bodies; localization of minerals; exploration guides; stratigraphy; low-rank bituminous coal; thin seams; Dakota Sandstone; Cretaceous; occurrence; Mitchell's coal mine; physical characteristics; ash; fusain; resin; peat; marcasite; coal beds of economic interest.

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San Juan County; San Juan Coal Field.

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San Juan County; La Sal-San Juan Coal Fields.

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Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek Lignite Field.

Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek Lignite Field; occurrence.

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San Juan County; San Juan Coal Field.

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Descriptors: Utah; economic geology; mineral resources; fuel resources; exploration; Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties; production; Uinta Basin; Basin-and-Range Province; Wasatch Plateau; San Rafael Swell; asphalt; bitumens; organic materials; beryl; ring silicates; construction materials; coal; organic residues; metal ores; gems; uranium ores.

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Descriptors: economic geology; coal; Star Point Sandstone; Blackhawk Formation; organic residues; exploration; Montana, Wyoming, Utah, Colorado, Arizona, and New Mexico; coal fields; San Juan Basin; Powder River Basin; Wasatch Plateau; Kaiparowits Plateau; concepts; practice.

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Descriptors: coal resource occurrence; coal development potential maps; Emery, Carbon, and Sanpete Counties; Wattis Quadrangle; climate; land status; stratigraphy; structure; coal geology; mining operations; *in situ* gasification; coal data map; columnar section.

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Descriptors: economic geology; coal; maps; Emery, Carbon, and Sanpete Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Candland Mountain Quadrangle; coal resource occurrence; coal development potential; physiography; climate; land status; stratigraphy; structure; coal geology; mining operations; surface mining; *in situ* coal gasification; coal data map; composite columnar section.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Sandstone; Montana, Wyoming, Utah, Colorado, and New Mexico; Tertiary; Mesozoic; Cretaceous; organic residues; lithostratigraphy; environment; Powder River Basin; Wasatch Plateau; San Juan Basin; Raton Basin; deltas; deposits; coastal environment; terrestrial environment; Ophiomorpha.

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Descriptors: geology; mineral resources; engineering geology characteristics; environmental geochemistry; east-central Utah; coal development; stratigraphy; Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields; coal quality and composition; oil and gas; non-petroleum gases; oil shale; bituminous sandstone; uranium; base metals; clays; underground coal mining; coal mine subsidence; earthquakes; maps; stratigraphic correlations.

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Descriptors: Coal; Utah and Colorado; Cretaceous; Economic geology; Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields; deposits; genesis; controls; environment; lagoons; barrier islands; sedimentary rocks.

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Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob , Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Emery and Sevier; Emery and Wasatch Plateau Coal Field; John's Peak and Old Woman Plateau Quadrangles.

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Sevier County; Wasatch Plateau Coal Field; Old Woman Plateau Quadrangle.

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Descriptors: sedimentation; stratigraphy; economic geology; environment; Cretaceous; coal; deltas; Sanpete County; Mesaverde Group; Star Point Sandstone; Blackhawk Formation; Price River Formation; Castlegate Sandstone; Wasatch Plateau; Mesozoic; organic residues; deposits; production; chemical properties; coal seams; thickness; marine environment; shallow-water environment; sandstone; clastic rocks.

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Carbon, Emery, and Sevier Counties; Wasatch Plateau Coal Field.

Descriptors: coal deposits; ash; chemical composition; coal; degassing; leading abstract; methane; quantity ratio; core samples; coal fields; gas content; direct methods; High Volatile A or B rank; lower ranked coals; coal desorption; outcrops; mined areas; encasing rock; Book Cliffs; aeromagnetic contours; Wasatch Plateau.

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Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek Lignite Field; occurrence.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Emery and Sevier Counties; Emery Coal Field; Emery West Quadrangle.

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Descriptors: geology; mineral resources; engineering geology characteristics; environmental geochemistry; east-central Utah; coal development; stratigraphy; Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields; coal quality and composition; oil and gas; non-petroleum gases; oil shale; bituminous sandstone; uranium; base metals; clays; underground coal mining; coal mine subsidence; earthquakes; maps; stratigraphic correlations.

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Sanpete, Sevier, Carbon, Emery, and Grand Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Book Cliffs and Wasatch Plateau Coal Fields; sandstones; characteristic trace fossils; upper Cretaceous; descriptions of trace fossils; depositional environment; facies fauna; subdivisions of wave and energy; *in situ*; ethological classification; bedding planes.

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Carbon, Emery, Iron, Sevier, and Summit Counties.

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Sanpete, Sevier, Carbon, Garfield, Kane, and Emery Counties; Book Cliffs, Henry Mountains, and Wasatch Plateau Coal Fields.

Descriptors: Wasatch Plateau; stratigraphy; Cretaceous; Tertiary; correlation; facies; sequences; San Rafael Swell; Kaiparowits Plateau; Henry Mountains; Book Cliffs; depositional environment; formation renaming; fossil evidence; formation dating.

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Descriptors: Emery, Wasatch Plateau, Book Cliffs and Sego Coal Fields; Sevier, Sanpete, Carbon, Emery, and Grand Counties; Wasatch Plateau; Castle Valley; Book Cliffs; geology; sections; Mancos Shale; Mesaverde Formation; Wasatch Formation; lithology; description of coal; mining; engineering; production; transportation; descriptions of mines by company; analyses of coals.

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Carbon, Emery, and Sevier Counties; Wasatch Plateau Coal Field.

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Sanpete, Sevier, Carbon, and Emery Counties; Emery and Wasatch Plateau Coal Fields.

Descriptors: sedimentation; sedimentary rocks; stratigraphy; environment; lithofacies; Cretaceous; coastal environment; environmental analysis; Blackhawk Formation; Star Point Sandstone; Emery and Wasatch Plateau Coal Fields; Mesozoic; lithostratigraphy; sandstone; clastic rocks; fine-grained materials; deltas; floodplains; channels; coal; organic residue; brackish-water environment; paleoenvironment.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Vernal, Coalville, Book Cliffs, Wasatch Plateau, Kaiparowits Plateau, and Kolob Coal Fields.

Descriptors: southwestern Utah; map of coal fields; estimate of coal reserves of different rank; heat efficiency; classification of coal areas; Vernal, Wasatch Plateau, Coalville, San Juan, Kaiparowits Plateau, Emery, and Kolob Coal Fields.

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Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek Lignite Field.

Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field; occurrence.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Descriptors: precious metal mining; ore analyses; descriptions of mines by district; production methods; coal fields; Kane, Sanpete, Sevier, Iron, Wasatch, and Summit Counties; Coalville, Pleasant Valley, Sanpete, and Castle Valley Coal Fields; coal sections; coal analyses.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields; location; accurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties.

Descriptors: Utah; economic geology; mineral resources; fuel resources; exploration; Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties; production; Uinta Basin; Basin-and-Range Province; Wasatch Plateau; San Rafael Swell; asphalt; bitumens; organic materials; beryl; ring silicates; con-

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Summit County; Coalville Coal Field.

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Uintah County; Vernal Coal Field; Dinosaur Quadrangle.

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Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields.

Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Henry's Fork, Blacktail (Tabby) Mountain, Vernal, Book Cliffs, Sego, Wasatch Plateau, Mount Pleasant, Wales, Salina Canyon, Emery, Henry Mountains, Kolob-Harmony, Kaiparowits Plateau, San Juan, Lost Creek, and Coalville Coal Fields.

Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classifica-

tion by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: southwestern Utah; map of coal fields; estimate of coal reserves of different rank; heat efficiency; classification of coal areas; Vernal, Wasatch Plateau, Coalville, San Juan, Kaiparowits Plateau, Emery, and Kolob Coal Fields.

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Duchesne and Uintah Counties.

Descriptors: Uinta Basin; bituminous sandstones; Sunnyside area; Asphalt Ridge; White Rocks area; P. R. Springs deposit; Chapita wells area; Dragon-Asphalt wash area; Deep Creek area; mining economics; methods.

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Duchesne, Uintah, and Carbon Counties; Vernal and Book Cliffs Coal Fields.

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Duchesne, Uintah, and Wasatch Counties.

Descriptors: stratigraphic and facies relationships; Green River Formation; Uinta Formation; Duchesne, Uintah, and Wasatch Counties; correlation; tuff beds; lacustrine; playa; mud-flat; saline facies; Eocene; oil shale; lateral facies changes; correlated colmnar sections; description of members; lithology.

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Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field.

Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field; occurrence.

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Descriptors: sampling and analytical methods; car samples; mine sampling; determination of ash, moisture, Volatiles, carbon, sulfur, hydrogen, nitrogen and calorific values; proximate and ultimate analyses; descriptions of samples; Carbon, Emery, Sevier, Summit, Uintah, and Wasatch Counties; Hiawatha, Knight, Sunnyside, Browning, Casper, Williams, Hogan, Kearns and Duggins, Rees-Grass, Superior, Wasatch, Blue Bell, Green, Reynolds, Winchester, and Cummings mines,; sections.

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Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields.

Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Descriptors: oil shale; processing techniques; Green River Formation; mining retorting; gas combustion; Union Oil process; Tosco process; in-situ retorting.

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Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Coal; Utah and Colorado; Cretaceous; Economic geology; Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields; deposits; genesis; controls; environment; lagoons; barrier islands; sedimentary rocks.

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Duchesne and Uintah Counties.

Descriptors: origin of hydrocarbons; Uinta Basin; Eocene; fluvial; deltaic; shales; sands; bituminous siliceous dolomites; oil shale; Salt Lake; chemically stratified; asphalts; stratigraphic units; source rock; field geology; organic solvents; chemical data; geologic data; changes in lithology; chemical character of hydrocarbons and depositonal environment; no evidence of metamorphism, catalytic cracking or depth of burial; subsurface samples; organic matter; stagnant; saline; sulfides; Wasatch, Green River, and Uinta formations; sections; petrography of sediments; composition of hydrocarbons; infrared spectrograms; frequency distribution of refractive indices; chromatography; infrared optical densities; stages of development of lake.

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Carbon, Iron, and Uintah Counties; Book Cliffs, Kolob-Harmony, and Vernal Coal Fields.

Descriptors: carbonaceous materials; solid fuels; oil products; commercial uses; oil shale; economic factors; low-temperature carbonization; plant and refinery; Carbon County; power; smokeless fuels; rock asphalt; Vernal; paraffin; road oil; gasoline; diesel fuel; Cedar City; Utah markets; engineering experiments; heat requirements; distillation; burning properties.

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Duchesne and Uintah Counties.

Descriptors: Brush Creek area; Uintah and Duchesne Counties; geology; stratigraphy; Mississippian coals; Createaceous coals; structure; geomorphology; economic geology; coal deposits; petroleum; natural gas; coal; reserves; tonnage; physical properties; chemical analysis; production; tables.

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Uintah County; Vernal Coal Field.

Descriptors: Deep Creek district; Vernal Coal Field; Uintah County; location; physiography; geology; stratigraphy; structure; lithologic descriptions; coal; occurrence; quality; physical properties; chemical analysis; reserves; tonnage; recoverable reserves; maps; tables; figures.

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Descriptors: eastern Uinta Mountains; Frontier Sandstone; stratigraphy; depositional environment; lithology; correlation; paleogeography; facies; biostratigraphy; zircon-tourmaline ratios.

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Descriptors: tar sands; Threemile Canyon area; P. R. Spring deposit; analyses; cores; oil zone; average properties; saturation; permeability; thickness; Uinta

Basin; oil resource; recovery; technology; geography; stratigraphy; analytical procedures; results.

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Duchesne and Uintah Counties.

Descriptors: Uinta Basin; geomorphology; topography; climate; physiography; landscape districts; plateaus.

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Uintah County; Vernal Coal Field.

Descriptors: Uinta Basin; Utah and Colorado; vertical veins; mining operations; asphaltite class; specific gravity; fixed carbon content; black inks; paints; varnishes; nonconductivity; thermal and electrical insulation; street and highway surfacing; gasoline; metallurgical coke; pyrolysis; sulfuric acid; paraffinic; pyridines; quinolines; distillate; naphthenes; olefins; phenols; chromatography; bitumens; resins; oils.

McGee, L., 1956, Porphyrins in gilsonite: Ph.D. dissertation, Univ. of Utah.

Uintah County; Vernal Coal Field.

Descriptors: asphaltite; early settlers; Vintaite; commercial utility; Uinta Basin; Colorado; vertical beds; glance pitch; grahamite; petroleum metamorphosis; hardness; organic dyes; bituminous; ether extracts; spectra; porphyrins; isolation; hemin; alkylated pyrroles; structure.

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Uintah County; Vernal Coal Field.

Descriptors: Colorado, Utah, and Wyoming; environmental geology; impact statements; White River Basin; Yampa River Basin; resources; water quality; energy sources; pollution; coal; organic residues; oil shale.

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Uintah County; Vernal Coal Field.

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Descriptors: subsurface stratigraphy; lithology; Green River Formation; Uinta Basin; microscopic studies; well samples; lacustrine environment; fluvial; Lake Uinta; paleogeography; main events; transgression; stability; regression; stratigraphy; black shale facies; formational contact; paleontologic content; age relationships; delta facies; tuff beds; time-equivalence; saline depositional environment; oil; tectonic framework; hydrocarbons; oil exploration history; oil production by field; geologic summary of oil and gas fields; cross-sections; well log.

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Duchesne and Uintah Counties.

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Duchesne and Uintah Counties.

Descriptors: paleocurrents; shoreline orientations; Green River Formation; Eocene; Raven Ridge and Red Wash areas; northeastern Uinta Basin; ripplemarks; cross-stratification; sandstone-body trends; lacustrine; fluvial; vertical stratigraphic variation; asymmetric and symmetric; arcs of azimuths; stable current system; exploration for oil and gas; regional structure; stratigraphy; maximum inclination of foresets; description of structures used; directional results; rose diagrams; regional map.

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Uintah County; Vernal Coal Field.

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Grand, Carbon, Duchesne, and Uintah Counties; Book Cliffs, Sego, and Vernal Coal Fields.

Descriptors: American Gilsonite Company; Grand Junction; hydrocarbon; gasoline; carbon-coke; Bonanza; Book Cliffs; refinery; pipeline; blacksmith; Whiterocks Indian Agency; bitumen; grahamite; glance pitch; Uinta Basin; history; industry; origin; characteristics; uses; Rector; mining camp; White River.

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Descriptors: asphalts; hydrocarbons; carbon disulfide; metamorphic products; gilsonite; glance pitch; grahamite; Uinta Basin; Colorado; vertical veins; economic importance; paraffin; naphthenes; fractional distillation.

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Uintah, Grand, and Carbon Counties; Sego and Book Cliffs Coal Fields.

Descriptors: economic geology; coal; Utah and Colorado; Grand River District; Sunnyside; Book Cliffs; maps; deposits; exploration; evaluation; geologic.

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Descriptors: Uinta Mountain; north flank; faulting; Henry's Fork Fault; Uinta Fault; Spurks Fault; displacement; dip; faulting history; petroleum exploration.

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Descriptors: Uinta Mountains; Carboniferous formations; biostratigraphic studies; tectonic history; Mississippian; Pennsylvanian; fossil record; lithologic correlation.

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Duchesne and Uintah Counties; Tabby Mountain, Book Cliffs, and Vernal Coal Fields.

Descriptors: Uinta Basin; coal; resources; stratigraphy; Blackhawk coal zones; Neslen Formation; Frontier Sandstone; coal rank; mining methods; room and pillar; longwall.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields; location; accurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Uintah, Emery, and Grand Counties.

Descriptors: Cretaceous; Colorado Plateau; fossil collections; non-marine microfossils; plants and mollusks; Cedar Mountain Formation; Burro Canyon Formation; Uinta, Emery, and Grand Counties; description of fossil localities; columnar section; criteria for corelation; Morrison Formation; contacts and thickness; sections; regional implications; stratigraphy; Dakota Formation.

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Duchesne and Uintah Counties.

Descriptors: Uinta Mountains; geological exploration; history; J. W. Powell, F. V. Hayden, and Clarence King; geological expeditions; 40th parallel survey; glaciation; geomorphology.

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Rich, Morgan, Summit, Grand, San Juan, Uintah, Duchesne, Garfield, and Sanpete Counties.

Descriptors: Utah; economic geology; mineral resources; fuel resources; exploration; Rich, Morgan, Summit, Grand, San Juan, Uinta, Duchesne, Garfield, and Sanpete Counties; production; Uinta Basin; Basin-and-Range Province; Wasatch Plateau; San Rafael Swell; asphalt; bitumens; organic materials; beryl; ring silicates; construction materials; coal; organic residues; metal ores; gems; uranium ores.

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Descriptors: geology; Cretaceous; Uinta Basin; stratigraphy; igneous rocks; structure; folding; faulting; structural history; Dakota Sandstone; Mancos Shale; Mesaverde Group; lithologic facies; Vernal, and Tabby Mountain Coal Fields; Laramide folding; regional Cretaceous correlation diagram; sections; age and correlation; fossillists; lithology.

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Descriptors: Cretaceous; Paleocene; conglomerates; margin of Uinta Basin; age and correlation; outcrop map; Uintah, Carbon, Duchesne, Sanpete, Utah, and Wasatch Counties; geologic cross-sections; stratigraphy; structure.

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Carbon and Utah Counties; Book Cliffs Coal Field; Kyune Quadrangle.

Descriptors: Carbon and Utah Counties; coal resource occurrence; coal development potential maps; Kyune Quadrangle; physiography; climate; stratigraphy; structure; coal geology; mining operations; coal data map; columnar sections.

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Duchesne, Utah, and Carbon Counties; Book Cliffs Coal Field; Matts Summit Quadrangle.

Descriptors: economic geology; coal; maps; Carbon, Duchesne, and Utah Counties; organic residues; deposits; resources; explanatory text; economic geology maps; Matts Summit Quadrangle; physiography; climate; land status; stratigraphy; coal geology; chemical analyses; mining operations; development potential; surface mining; subsurface mining; *in situ* gasification; coal data map; columnar section.

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Utah and Carbon Counties; Wasatch Plateau Coal Field; SW quarter of the Soldier Summit 15-min. Quadrangle.

Descriptors: economic geology; coal; maps; Utah and Carbon Counties; organic residues; deposits; resources; economic geology maps; explanatory text; Soldier Summit Quadrangle.

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Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields.

Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Utah County.

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Vernal, Coalville, Book Cliffs, Wasatch Plateau, Kaiparowits Plateau, and Kolob Coal Fields.

Descriptors: southwestern Utah; map of coal fields; estimate of coal reserves of different rank; heat efficiency; classification of coal areas; Vernal, Wasatch Plateau, Coalville, San Juan, Kaiparowits Plateau, Emery, and Kolob Coal Fields.

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Descriptors: Utah; Cretaceous; paleoecology; palynomorphs; sedimentary rocks; stratigraphy; organic residues; Ferron Sandstone Member; Mancos Shale; Blackhawk Formation; Price River Formation; biostratigraphy; Book Cliffs; Wasatch Plateau; coal; bogs; marshes; lagoons; swamps; genesis; assemblages; angiosperms; environmental analysis; indicators.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Descriptors: sedimentary rocks; Utah; sedimentation; Wyoming; environmental analysis; sedimentary petrology; deposition; models; Tongue River Member; Fort Union Formation; Star Point Formation; coal; organic residues; Tertiary; Cenzoic; Cretaceous; Mesozoic; Powder River Basin; Wasatch Plateau; thickness; environment; deltas; alluvial plains; economic geology; coal fields.

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Wasatch Plateau Coal Field.

Descriptors: western interior; sedimentation; economic geology; deposition; ichnofossils; occurrence; coal; models; Tongue River Member; Fort Union Formation; Blackhawk Formation; Fruitland Formation; Vermejo Formation; Almond Formation; Rock Springs Uplift; Pictured Cliffs Sandstone; Montana, Wyoming, Utah, Colorado, and New Mexico; Tertiary; Mesozoic; Cretaceous; organic residues; lithostratigraphy; environment; Powder River Basin; Wasatch Plateau; San Juan Basin; Raton Basin; deltas; deposits; coastal environment; terrestrial environment; Ophiomorpha.

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Sanpete, Iron, Kane, Utah, Summit, and Emery Counties; Wasatch Plateau, Wales, Coalville, Cedar City, Kanarra, Kanab, and New Harmony Coal Fields.

Descriptors: coal industry; imports of coal into the Territory; patents; transportation; analyses; Springville; Grass Creek and Chalk Creek; Castlegate mines; Winter Quarters mine; Pleasant Valley mines.

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Emery, Carbon, and Utah Counties; Book Cliffs and Wasatch Plateau Coal Fields.

Descriptors: Utah; petroleum; economic geology; North Horn Formation; Green River Formation; Price River Canyon; Willow Creek Canyon; Soldier Summit; exploration; possibilities; source rocks; detection; non-marine environment; terrestrial environment; sedimentary rocks; coal; wackestone; Paleocene; Eocene.

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Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields.

Descriptors: geology; mineral resources; engineering geology characteristics; environmental geochemistry; east-central Utah; coal development; stratigraphy; Henry Mountains, Emery, Wasatch Plateau, Book Cliffs, and Sego Coal Fields; coal quality and composition; oil and gas; non-petroleum gases; oil shale; bituminous sandstone; uranium; base metals; clays; underground coal mining; coal mine subsidence; earthquakes; maps; stratigraphic correlations.

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Descriptors: Coal; Utah and Colorado; Cretaceous; Economic geology; Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields; deposits; genesis; controls; environment; lagoons; barrier islands; sedimentary rocks.

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Duchesne, Wasatch, and Utah Counties.

Descriptors: Slab Mountain Anticline; structure; Duchesne, Wasatch, and Utah Counties; Soldier Summit; stratigraphy; Tertiary Flagstaff, Colton, Green River Formations; history of exploration; photogeologic; surface geology; seismic exploration; fracture reservoir; gas; oil; form line map; lithology.

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Carbon, Emery, and Utah Counties; Book Cliffs Coal Field.

Descriptors: central Utah; northeast Wasatch Plateau; southwestern edge of the Uinta Basin; stratigraphic section; upper Cretataceous; lower Cenozoic non-marine; Colton; Green River and Uinta Formations; Blackhawk; Castlegate sandstone; Price River; North Horn; Flagstaff; Bennion Creek; mountain building; facies; structure; Clear Creek anticline; Beaver Creek syncline; Tic Fork syncline; faults; Pleasant Valley; Starvation Creek; disconformity; gravity; geomorphology; graben; fault scarp; ridge; canyon; hogback; crustal movements; early Laramide orogeny; folding and faulting; late Eocene; Miocene; floodplain; lacustrine; Flagstaff Lake; Uinta Lake; fluvial facies; Duchesne River; present drainage system.

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Utah, Wasatch, Duchesne, and Carbon Counties.

Descriptors: Green River Formation; Uinta Formation; subsurface stratigraphy; western Uinta Basin; oil and gas; previous work and nomenclature; structural elements; petroleum geology; paleogeography; correlation; water depth chart; lithologic logs; general stratigraphy; cross-sections; source beds; Utah, Wasatch, Duchesne, and Carbon Counties.

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Utah and Carbon Counties; Book Cliffs Coal Field.

Descriptors: fieldtrip guide; Book Cliffs Coal Field; Provo; Price; Sunnyside; mileage; index map showing route and location of stops; stratigraphic sections; road log.

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Juab, Utah, and Sanpete Counties.

Descriptors: Cedar Hills; Sanpete, Juab, and Utah Counties; geology; physiography; stratigraphy; lithologic descriptions; structure; orogenic episodes; Cretaceous; Tertiary.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, Kanab, and Harmony Coal Fields; location; accurrence; structure; lithologic descriptions; chemical analyses; coking capabilities; tables.

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Wasatch Plateau, Kaiparowits, and Kolob Coal Fields.

Descriptors: coal mining; sources; Wasatch Plateau, Kaiparowits, and Kolob Coal Fields; coal slurry pipelines; high voltage transmission lines; Los Angeles; power costs; coal-fired power plants; tables.

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Allen, C. A., 1925, Analyses of Utah coals - coal mining in Utah: U.S. Bur. Mines, Tech. Paper, No. 345.

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Descriptors: coal; mining; history; resources; properties; mining methods; development; market; transportation; coking capability; production; coal field geology; chemical analysis; Coalville, Henrys Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits Plateau, and Kolob-Harmony Coal Fields; maps; tables.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields.

Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Wasatch County; Tabby Mountain Coal Field; NE Strawberry Valley Quadrangle.

Descriptors: Wasatch Mountains; Uinta Mountains; Uinta Basin; stratigraphy; volcanics; drift; alluvium; structure; lithology; overthrust; Laramide orogeny; location of area; summary of previous work; maps; sections; paleogeography; paleotectonics; sequence of geologic events.

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Wasatch County; Tabby Mountain Coal Field.

Descriptors: sedimentation; tectonics; Uinta Mountains; Wasatch Mountains; Uinta Basin; structure; stratigraphy; shelf; craton; miogeosyncline; hinge-line belts; Cordilleran; stresses; Wasatch Line; oil and gas possibilities; general geology.

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Duchesne and Wasatch Counties.

Descriptors: Green River Formation; southeast Uinta Basin; fuel resources; geology; geography; stratigraphy; lithologic descriptions; economic geology; oil shale; gilsonite; bituminous sandstones; oil and gas; reserves.

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Duchesne, Uintah, and Wasatch Counties.

Descriptors: stratigraphic and facies relationships; Green River Formation; Uinta Formation; Duchesne, Uintah, and Wasatch Counties; correlation; tuff beds; lacustrine; playa; mud-flat; saline facies; Eocene; oil shale; lateral facies changes; correlated colmnar sections; description of members; lithology.

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Vernal, Henry Mountains, Sego, La Sal-San Juan,

Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field.

Descriptors: Cretaceous; coal; lignite; economic geology; lithostratigraphy; Vernal, Henry Mountains, Sego, La Sal-San Juan, Tabby Mountain, Coalville, Henry's Fork, and Lost Creek Coal Fields; Goose Creek lignite field; occurrence.

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Descriptors: sampling and analytical methods; car samples; mine sampling; determination of ash, moisture, Volatiles, carbon, sulfur, hydrogen, nitrogen and calorific values; proximate and ultimate analyses; descriptions of samples; Carbon, Emery, Sevier, Summit, Uintah, and Wasatch Counties; Hiawatha, Knight, Sunnyside, Browning, Casper, Williams, Hogan, Kearns and Duggins, Rees-Grass, Superior, Wasatch, Blue Bell, Green, Reynolds, Winchester, and Cummings mines,; sections.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Wasatch and Duchesne Counties; Tabby Mountain Coal Field.

Descriptors: stratigraphy; economic significance; tectonic history; Tabby Mountain; Uinta Mountains anticline; oil-impregnated sandstones; petroleum; stratigraphic sections; geologic maps; Cretaceous; Wasatch and Duchesne Counties; correlation; lithology; location; topography; glacial; landslides; sedimentary textures and structures; fossils; well data; structure.

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Summit and Wasatch Counties.

Descriptors: Summit and Wasatch Counties; back valleys; geography; climate; agriculture; mining; subbituminous noncoking coal; Coalville; economic base.

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Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields.

Descriptors: Coal; Utah and Colorado; Cretaceous; Economic geology; Sanpete, Carbon, Emery, Utah, Wasatch, Duchesne, Uintah, and Garfield Counties; Wasatch Plateau and Book Cliffs Coal Fields; deposits; genesis; controls; environment; lagoons; barrier islands; sedimentary rocks.

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Kane, Sanpete, Sevier, Iron, Wasatch, and Summit Counties; Coalville, Pleasant Valley, Sanpete, and Castle Valley Coal Fields.

Descriptors: precious metal mining; ore analyses; descriptions of mines by district; production methods; coal fields; Kane, Sanpete, Sevier, Iron, Wasatch, and Summit Counties; Coalville, Pleasant Valley, Sanpete, and Castle Valley Coal Fields; coal sections; coal analyses.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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Descriptors: bituminous; subbituminous coal; estimate of reserves; source of estimate; table; classification by characteristics; reserves, original, remaining, recoverable; mining; distribution; coking coal; strippable coal; production; use; uranium; ownership of coal lands; peat; world coal reserves.

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Descriptors: Utah, mineral fuels; coal resources; rank; production; market; Henry's Fork, Tabby Mountain, Vernal, Book Cliffs, Wales, Salina Canyon, Henry Mountains, Kolob, Kaiparowits, San Juan, Lost Creek, Coalville, and Harmony Coal Fields; stratigraphy; structure; lithology.

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Descriptors: coal; geology; Coalville, Henry's Fork, Vernal, Blacktail (Tabby) Mountain, Book Cliffs, Wasatch Plateau, Emery, Henry Mountains, Kaiparowits, Kolob, and Harmony Coal Fields; location; occurrence; structure; lithologic descriptions; chemical analyses; coking capabilities, tables.

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