Open-File Report 90-1

Mesaverde Cross Sections in the Piceance Basin, Colorado:

Index to Published Sections and New Sections at Plateau and White River Fields

* Explanation to Index Map and References *

Compiled by
Carol M. Tremain and Sue H. Cannon

Part A. Index map and references for 46 published cross sections of the Mesaverde Group in the Piceance Basin

Part B. Seven cross sections showing possible Mesaverde fluvial sandstone correlations and coal beds at Plateau and White River gas fields

Colorado Geological Survey
Division of Minerals and Geology
Department of Natural Resources
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1. Index Map of Seven New Cross Sections at Plateau and White River Fields and 46 Published Sections

2. White River Dome North-South Section (Sec. 30, T2N, R96W to Sec. 31, T2N, R96W)

3. White River Dome North-South Section (Sec. 20, T2N, R96W to Sec. 32, T2N, R96W)

4. White River Dome East-West Section (Sec. 31, T2N, R96W to Sec. 28, T2N, R96W)

5. Plateau Field North-South Section (Sec. 17, T10S, R96W to Sec. 29, T10S, R96W)

6. Plateau Field North-South Section (Sec. 16, T10S, R96W to Sec. 27, T10S, R96W)

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EXPLANATION

Enclosed Sections—The seven new sections, list of published sections, and index map of sections (Plate 1) were compiled with funding from a 1989 U.S. Department of Energy contract DE-AC01-88FE61683 and edited with funding from Gas Research Insitute Contract no. 5091-214-2261. The Colorado Geological Survey (CGS) sections together with the index map and reference list of additional sections are being open-filed to assist geologists in the search for coalbed methane or tight gas in the Mesaverde Formation of the Piceance Basin.

Plates 2–8, sections over White River Dome in the northern Piceance Basin and Plateau Field in the southern Piceance Basin, were to have been published in a DOE report entitled *Technical and Economic Evaluation of Low Permeability Sandstones within the Mesaverde Group, Piceance Basin, Colorado*. The White River Dome sections are at a vertical scale of 1 in. = 200 ft , cover the Ohio Creek to Rollins/Trout Creek Sandstone interval, and use porosity logs where available. The Plateau Field sections are also at a vertical scale of 1 in. = 200 ft and cover the upper Mesaverde to top of Corcoran Sandstone interval. Logs used are predominantly spontaneous potential-resistivity (gamma ray-neutron logs were used for better sandstone and coal correlations, where available, but were not depicted on the cross sections). Both the White River Dome and Plateau sections indicate coal seams and include possible Mesaverde sandstone correlations and drillstem tests, producing intervals, and initial production rates in Mesaverde sandstones.

The list of sections—sections previously published by the U.S.G.S., R.M.A.G., etc.—are listed below and located on the index map, Plate 1 along with the enclosed sections.

LIST OF SECTIONS ON PLATE 1

Index Map No.	Reference	Location (sec., T, R)	Section
1	Chancellor & Johnson, 1988	29, T2S, 98W—34, T6S, 94W	Figure 1
2	Dunrud, 1989a	20, T13S, 92W—11, T13S, 89W	Section A–A'
3	Dunrud, 1989a	7, T13S, 89W—23, T13S, 89W	Section B–B'
4	Dunrud, 1989a	7, T11S, 90W—22, T14S, 90W	Section C–C'
5	Dunrud, 1989a	3, T11S, 90W—10, T14S, 90W	Section D–D'
6	Dunrud, 1989a	17, T10S, 89W—35, T14S, 89W	Section E–E'
7	Dunrud, 1989a	8, T12S, 92W—33, T10S, 89W	Section F–F'
8	Dunrud, 1989b	34, T13S, 96W—19, T13S, 92W	Section A–F
9	Dunrud, 1989b	34, T13S, 96W—34, T11S, 94W	Section A–B
10	Dunrud, 1989b	12, T13S, 94W—34, T11S, 94W	Section C–B
11	Dunrud, 1989b	16, T13S, 93W—8, T12S, 92W	Section D–E
12	Ellis, Freeman & Donnel, 1988	14, T7S, 95W—8, T10S, 89W	Section A–A'
13	Ellis, Freeman & Donnel, 1988	15, T8S, 96W—34, T8S, 89W	Section B–B'
14	Ellis, Freeman & Donnel, 1988	17, T10S, 95W—8, T10S, 89W	Section C–C'
15	Ellis, Freeman & Donnel, 1988	2, T13S, 95W—36, T6S, 93W	Section D–D'
16	Ellis, Freeman & Donnel, 1988	6, T11S, 91W—20, T6S, 90W	Section E–E'
17	Ellis & Kelso, 1987	17, T7S, 101W—5, T8S, 97W	Plate A
18	Ellis & Kelso, 1987	T7S, 103W—31, T7S, 95W	Plate B
19	Fender & Murray, 1978	22, T7S, 91W—11, T12S, 90W	Plate 2, A–A'
20	Fender & Murray, 1978	8, T9S, 99W—27, T11S, 90W	Plate 3, B–B'
21	Gunter, 1962	29, T8S, 100W—17, T12S, 89W	Plate 1
22	Irwin, 1977	26, T10N, 87W—27, T10S, 96W	Figure 15
23	Irwin, 1977	34, T9S, 25E—27, T1N, 95W	Figure 16
24	Johnson, 1979a	24, T2S, 98W—29, T2N, 99W	Section A–A'
25	Johnson, 1979b	34, T8S, 99W—24, T2S, 98W	Section B–B'
26	Johnson, 1979c	T2&3S, 100W—8, T2S, 95W	Section C–C'
27	Johnson, 1989a	28, T9S, 23E—21, T2S, 95W	Section B–B'
28	Johnson, 1989b	7, T6S, 93W—11, T12S, 90W	Plate 1, D–D'
29	Johnson, 1989b	20, T4N, 97W—7, T6S, 100W	Plate 1, E–E'
30	Johnson, 1989b	7, T6S, 100W—8, T12S, 92W	Plate 1, F–F'

Index Map No.	Reference	Location (sec., T, R)	Section
31	Johnson, Grancia & Dessenberger, 1979a	30, T9S, 96W—29, T10S, 93W	Section A–A'
32	Johnson, Granica, & Dessenberger, 1979b	30, T9S, R96W—12, T7S, R93W	Section B–B'
33	Johnson, Granica & Dessenberger, 1979c	30, T11S, R95W—22, T8S, R92W	Section C–C'
34	Johnson & Johnson, 1991	T4S, R7W (UT)—T5S, R80W (CO)	Section A–A'
35	Johnson & Johnson, 1991	16, T4S, R9W (UT)—7, T2S, R91W (CO)	Section B–B'
36	McFall et al., 1986	20, T4N, R97W—11, T7S, R97W	Section A–A'
37	McFall et al., 1986	28, T3S, R101W—28, T1N, R94W	Section B–B'
38	McFall et al., 1986	30, T3N, R97W—36, T6S, R93W	Section C–C'
39	McFall et al., 1986	26, T11S, R97W—16, T6S, R90W	Section D–D'
40	McFall et al., 1986	11, T7S, R97W—9, T12S, R90W	Section A'–A'
41	McFall et al., 1986	36, T6S, R93W—9, T12S, R90W	Section C'–A'
42	Millison, 1962	14, T9S, R93W—8, T9S, R92W	Page 43, X–Y–Z
43	Nuccio & Johnson, 1989	23, T6S, R97W—32, T7S, R89W	Plate 1
44	Seccombe et al., 1986	20, T9S, R94W—6, T10S, R94W	Page 21, A–A'
45	Tremain, 1982	17, T2N, R94W—17, T12S, R89W	Plate 3
46	Wiman et al., 1984	36, T9S, R95W—29, T9S, R94W	Page 37, B–B'
A	Haas, 1991	17–29, T10S, R96W	Plate 2, Section A–A'
B	Haas, 1991	16–27, T10S, R96W	Plate 3, Section B–B'
C	Haas, 1991	19–22, T10S, R96W	Plate 4, Section C–C'
D	Haas, 1991	30–27, T10S, R96W	Plate 5, Section D–D'
E	Haas, 1991	30–31, R2N, R96W	Plate 6, Section A–A'
F	Haas, 1991	20–32, R2N, R96W	Plate 7, Section B–B'
G	Haas, 1991	31–28, R2N, R96W	Plate 8, Section C–C"

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Mesaverde Cross Sections in the Piceance Basin, Colorado

Index to Published Sections and New Sections at Plateau and White River Fields

By Carol M. Tremain and Susan H. Cannon

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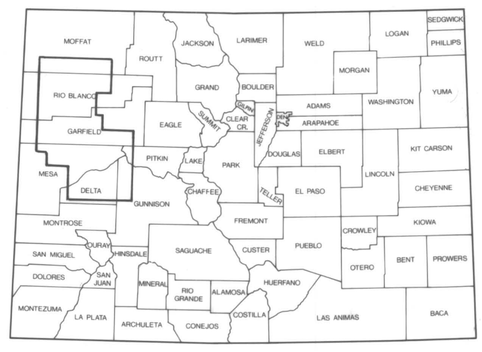
Plate 1 of 8
1994



Colorado Index

EXPLANATION

45 — Line of section

B — B′ (Lettered sections are on Plates 2–8)

Base of Mesaverde Group

Measured section

MOFFAT CO.
RIO BLANCO CO.
RIO BLANCO CO.
GARFIELD CO.
GARFIELD CO.
MESA CO.
MESA CO.
DELTA CO.
GUNNISON CO.
PITKIN CO.

WHITE RIVER
COLORADO RIVER
GUNNISON RIVER

MEEKER
RIFLE
SILT
GLENWOOD SPR.
GRAND VALLEY
DEBEQUE
COLLBRAN
PALISADE
CEDAREDGE
SOMERSET
ECKERT
ORCHARD CITY
CORY
AUSTIN
LAZEAR
DELTA

R 102 W, 101, 100, 99, 98, R 97 W, 96, 95, 94, 93, R 92 W, 91, 90, R 89 W
R 02 W, R 1 W, R 1 E, R 98 W, R 93 W, R 97 W

T 5 N, T 1 N, T 1 S, T 5 S, T 9 S, T 11 S, T 15 S, T 10 S

2 1 0 2 4 6 MILES

Base from Petroleum Information NW Colorado 1 in = 4 mi map

Drafted by Martin Choquette

Base from Petroleum Information

Colorado Geological Survey
Department of Natural Resources
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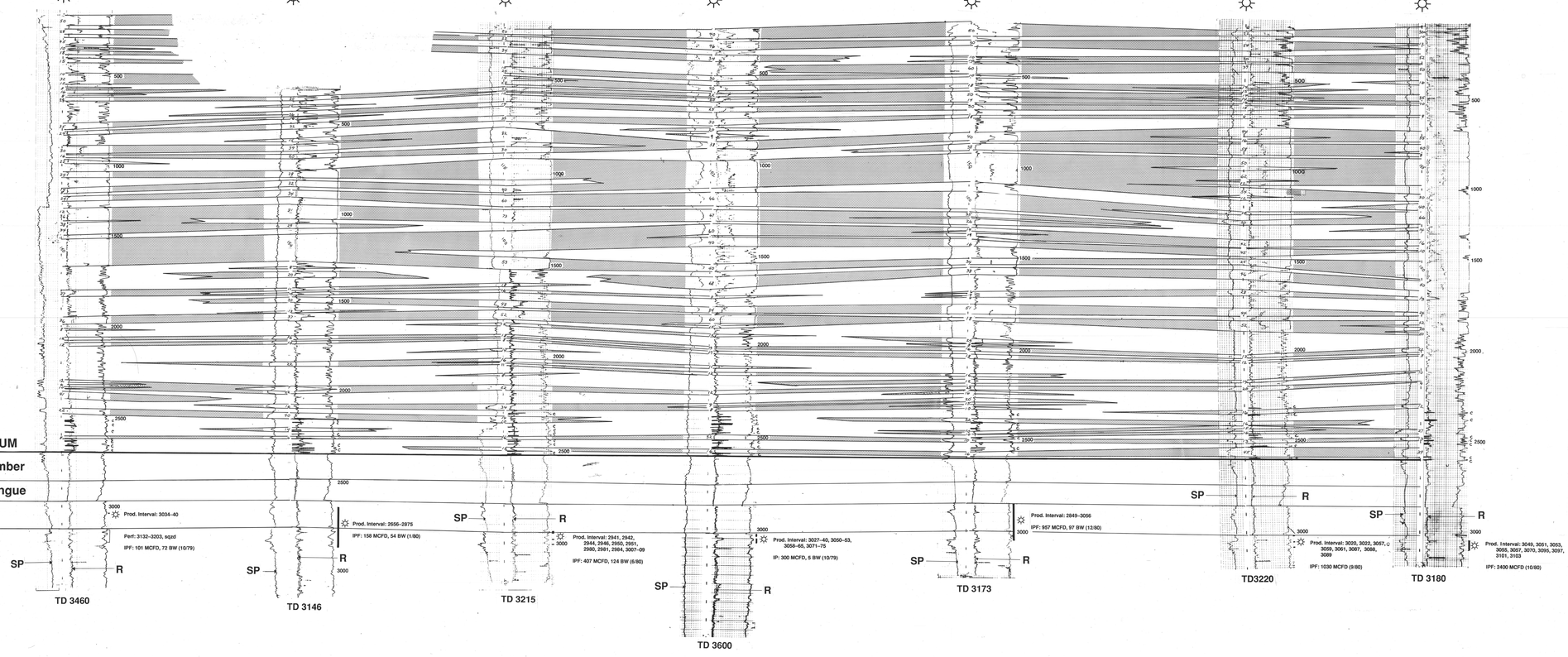
A
North

A'
South

Age	Unit	Fm	Mbr
Upper Cretaceous	Mesaverde Group		

Chandler & Assoc. #2–17 Jenacaro, Sec. 17, T10S, R96W, KB 5480 — .45 mi — Chandler & Assoc. #5–17 Bruton, Sec. 17, T10S, R96W, KB 5197.5 — .43 mi — Adolph Coors #4–17 Ute, Sec. 17, T10S, R96W, KB 5431 — .54 mi — Adolph Coors #1–20 ACCO-Ute, Sec. 20, T10S, R96W, KB 5542 — .48 mi — Adolph Coors #3–20 Shepard, Sec. 20, T10S, R96W, KB 5600 — .58 mi — Adolph Coors #1–29 Bevans, Sec. 29, T10S, R96W, KB 5715 — .36 mi — Adolph Coors #2–29 Wilson, Sec. 29, T10S, R96W, KB 5804



EXPLANATION

- Gas well
- Perforated or open hole interval producing gas
- Gas show from DST
- Coal
- Sandstone
- Sandstone thickness in feet

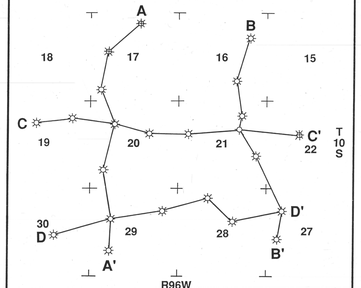
Note: Log curves include Gamma Ray (GR), Spontaneous Potential (SP), and Resisitivity (R). Although not shown on the sections, Gamma Ray-Neutron and Density logs were used where available for better sandstone and coal identification.

SCALE

1" = 200'

1" = 400'

LOCATION MAP



COLORADO GEOLOGICAL SURVEY

CORRELATION OF MESAVERDE SANDSTONES PLATEAU FIELD SOUTHERN PICEANCE BASIN

STRATIGRAPHIC CROSS–SECTION A—A'

INTERPRETATION BY:	DATE:	DRAFTED BY:	REVISIONS:	MAP NO:
C. TREMAIN	2/15/90	C. BRCHAN		

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Department of Natural Resources
Denver, Colorado

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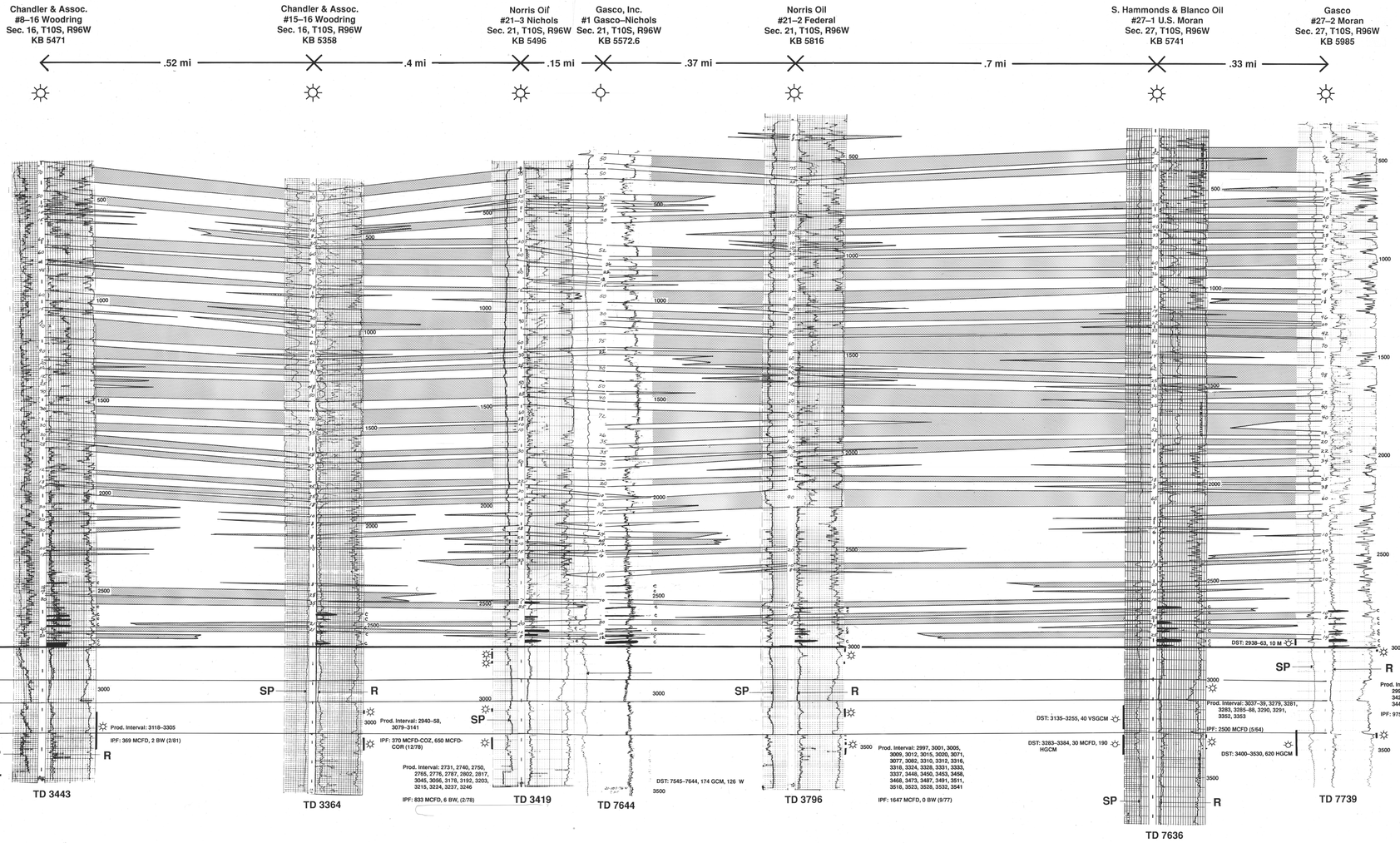
B
North

B'
South

Age	Unit	Fm	Mbr
Upper Cretaceous	Mesaverde Group		



EXPLANATION

- Gas well
- Perforated or open hole interval producing gas
- Gas show from DST
- Coal
- Sandstone
- Sandstone thickness in feet

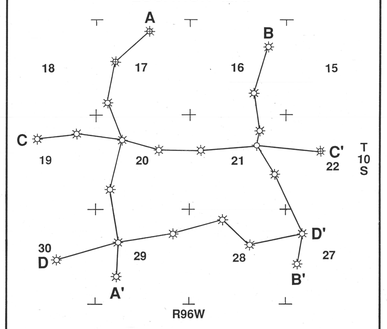
Note: Log curves include Gamma Ray (GR), Spontaneous Potential (SP), and Resisitivity (R). Although not shown on the sections, Gamma Ray-Neutron and Density logs were used where available for better sandstone and coal identification.

SCALE

1" = 200'

1" = 400'

LOCATION MAP



COLORADO GEOLOGICAL SURVEY

CORRELATION OF MESAVERDE SANDSTONES PLATEAU FIELD SOUTHERN PICEANCE BASIN

STRATIGRAPHIC CROSS–SECTION B—B'

INTERPRETATION BY:	DATE:	DRAFTED BY:	REVISIONS:	MAP NO:
C. TREMAIN	2/15/90	C. BRCHAN		

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Department of Natural Resources
Denver, Colorado

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C
West

C'
East

Age	Unit	Fm	Mbr
Upper Cretaceous	Mesaverde Group		DATUM
			Rollins Member
			Mancos Tongue
			Cozzette Member
			Corcoran Member

	Adolph Coors #1–19 Fetters	Adolph Coors #2–19 Fetters	Adolph Coors #1–20 ACCO-Ute	Norris Oil #20–4 Curl	Adolph Coors #4–21 Currier	Gasco, Inc. #1 Gasco–Nichols	Chandler & Assoc. #6–22 Barnard
	Sec. 19, T10S, R96W	Sec. 19, T10S, R96W	Sec. 20, T10S, R96W	Sec. 20, T10S, R96W	Sec. 21, T10S, R96W	Sec. 21, T10S, R96W	Sec. 22, T10S, R96W
	KB 5519	KB 5480	KB 5542	KB 5484	KB 5583	KB 5572.6	KB 5985
Distance	.42 mi	.5 mi	.4 mi	.45 mi	.58 mi	.7 mi	
Total Depth	TD 3174	TD 3110	TD 3600	TD 3169	TD 3348	TD 7644	TD 3585
Curves	SP, R	SP, R	SP, R	GR, SP, R	SP, R	SP, R	SP, R
Production / DST	Prod. Interval: 2902–47 IPF: 1422 MCFD (10/79)	Prod. Interval: 2940–50, 2954–56, 2968–72 IPF: 256 MCFD (10/79)	Prod. Interval: 3027–40, 3050–53, 3058–65, 3071–75 IP: 300 MCFD, 5 BW (10/79)	Prod. Interval: 3039, 3051, 3061, 3068, 3082, 3093 IPF: 320 MCFD, 0 BW (7/83)	Prod. Interval: 3027, 3032, 3033, 3147–73, 3202, 3207, 3208 IPF: 520 MCFD (12/81)	DST: 7545–7644, 174 GCM, 126 W	Prod. Interval: 3193–3378 IPF: 601 MCFD, 50 BW (1/80)

EXPLANATION

- Gas well
- Perforated or open hole interval producing gas
- Gas show from DST
- Coal
- Sandstone
- Sandstone thickness in feet

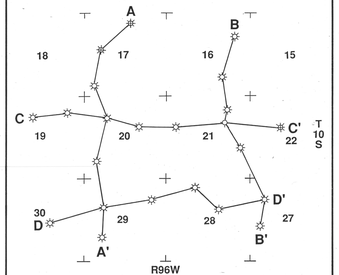
Note: Log curves include Gamma Ray (GR), Spontaneous Potential (SP), and Resisitivity (R). Although not shown on the sections, Gamma Ray-Neutron and Density logs were used where available for better sandstone and coal identification.

SCALE

1" = 200'

1" = 400'

LOCATION MAP



COLORADO GEOLOGICAL SURVEY				
CORRELATION OF MESAVERDE SANDSTONES PLATEAU FIELD SOUTHERN PICEANCE BASIN				
STRATIGRAPHIC CROSS–SECTION C—C'				
INTERPRETATION BY:	DATE:	DRAFTED BY:	REVISIONS:	MAP NO:
C. TREMAIN	2/15/90	C. BRCHAN		

Colorado Geological Survey
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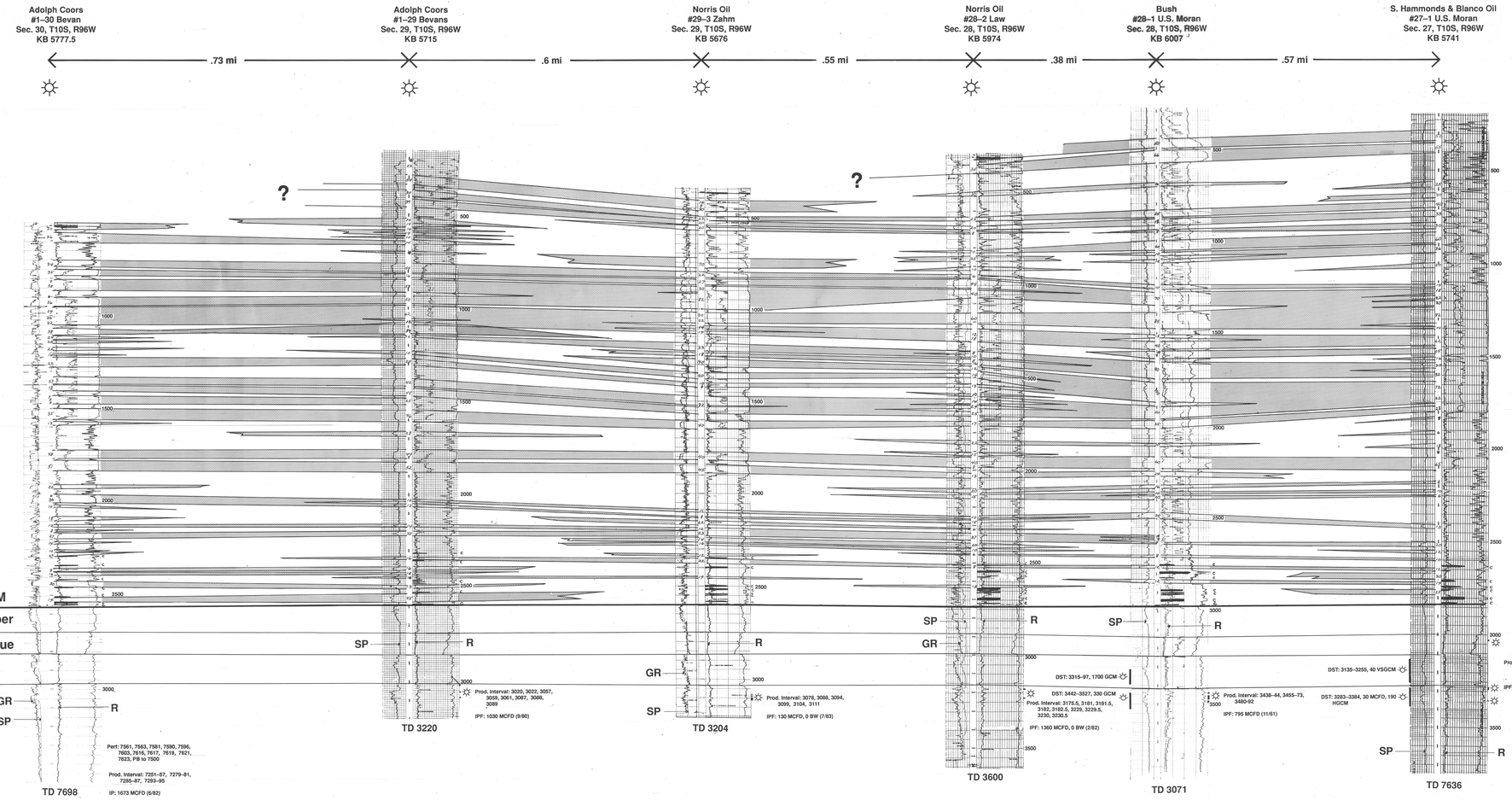
D West — D' East

Age	Unit	Fm	Mbr
Upper Cretaceous	Mesaverde Group		Rollins Member
			Mancos Tongue
			Cozzette Member
			Corcoran Member



EXPLANATION

- Gas well
- Perforated or open hole interval producing gas
- Gas show from DST
- Coal
- Sandstone
- Sandstone thickness in feet

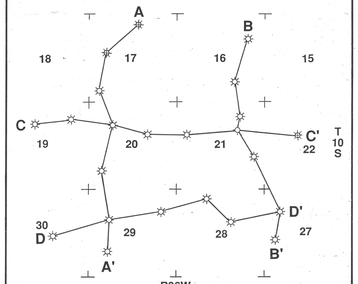
Note: Log curves include Gamma Ray (GR), Spontaneous Potential (SP), and Resisitivity (R). Although not shown on the sections, Gamma Ray-Neutron and Density logs were used where available for better sandstone and coal identification.

SCALE

1" = 200'

1" = 400'

LOCATION MAP



COLORADO GEOLOGICAL SURVEY

CORRELATION OF MESAVERDE SANDSTONES PLATEAU FIELD SOUTHERN PICEANCE BASIN

STRATIGRAPHIC CROSS–SECTION D—D'

INTERPRETATION BY:	DATE:	DRAFTED BY:	REVISIONS:	MAP NO:
C. TREMAIN	2/15/90	C. BRCHAN		

A
North

A'
South

Fuel Resources Development
#1 Potter
Sec. 30, T2N, R96W
GL 6000

Frontier Refining
#3 Govt.-037933
Sec. 30, T2N, R96W
KB 5904

Fuelco
Federal # 1
Sec. 31, T2N, R96W
KB 5858

.35 mi .5 mi

Age	Unit	Fm	Mbr
Tertiary		Ft. Union Fm.	
			Ohio Cr.
Upper Cretaceous	Mesaverde Group	Williams Fork Formation	
			Rollins–Trout Ck.
		Iles Formation	

GR — N

DST: 2606–17, 270 MW

DST: 5354–5369, 284 HGCM

DST: 5345–99, 665 GCM

Prod. Interval: 5535–5987 (open hole)

IP: 2000 MCFD (6/29)

DST: 5465–5516, 577 MCFD, 505 GCM

DST: 5855–92, 2310 HGCM
DST: 5843–50, 1303 MCFD, 108 HGCM
DST: 5916–60, 25 MCFD, 140 HGCM

TD 5987

DST: 5809–5908, 300 HGCM

DST: 6210–6300, 3960 HGCM

DST: 6284–6320, 300 MCFD, 3330 HGCM

Prod. Interval: 5291–5314, 5468–77, 5493–5507, 5606–12, 5656–80, 5712–18, 5760–90, 5892–5900, 5992–6002, 6066–6075, 6220–34, 6662–66, 6760–64, 6777–81, 6933–50

IPF: 1100 MCFD (9/71)

DATUM

Prod. Interval: 5598–5618, 6105–6115, 6205–25, 6253–6273

IP: 2400 MCFD (10/71)

DST: 6547–6640, 2 MCFD, 940 GCM

GR — NP

DST: 7048–7100, 630 HGCM

DST: 7409–72, 2000 MCFD est

DST: 7538–55, 30 SGCM

Perf: 7180—7204, 7295–7330, PB to 7150

TD 7555

TD 7380

EXPLANATION

- Gas well
- Perforated or open hole interval producing gas
- Gas show from DST
- Coal
- Sandstone
- Sandstone thickness in feet

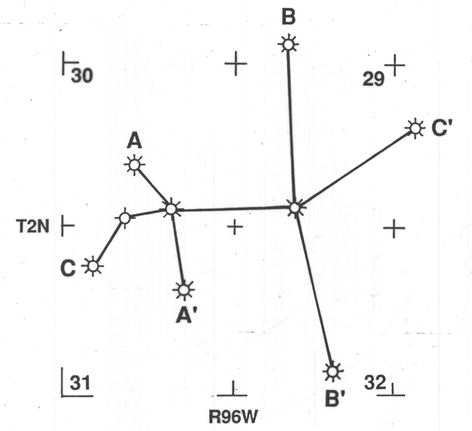
Note: Log curves include Gamma Ray (GR), Neutron (N), Neutron Porosity (NP), Bulk Density (BD), Density Porosity (DP), Spontaneous Potential (SP), and Resisitivity (R). Gamma Ray-Neutron logs were used where available for better sandstone and coal identification.

SCALE

1" = 200'

1" = 400'

LOCATION MAP



COLORADO GEOLOGICAL SURVEY

**CORRELATION OF WILLIAMS FORK SANDSTONES
WHITE RIVER DOME
NORTHERN PICEANCE BASIN**

STRATIGRAPHIC CROSS–SECTION A—A'

INTERPRETATION BY:	DATE:	DRAFTED BY:	REVISIONS:	MAP NO:
C. TREMAIN	12/19/89	C. BRCHAN		

Colorado Geological Survey
Department of Natural Resources
Denver, Colorado

Open-File Report 90-1
Plate 7 of 8
1994

B
North

B'
South

Fuelco
Federal Unit #6-M
Sec. 20, T2N, R96W
KB 6021

Fuel Resources Development
#3 White River Dome Unit
Sec. 29, T2N, R96W
KB 5982

Fuel Resources Development
Unit #2M
Sec. 32, T2N, R96W
KB 5834

1 mi

1 mi

Age	Unit	Fm	Mbr
Tertiary		Ft. Union Fm.	Ohio Cr. ?
Upper Cretaceous	Mesaverde Group	Williams Fork Formation	
		Iles Formation	

DATUM
Rollins–Trout Ck.

Perf: 6382–6393, sqzd

Prod. Interval: 6170–78, 6245–60, 6455–62, 6739–58, 6846–52

IPF: 3681 MCFD (4/79)

Perf: 7092–7104, PB to 7040

DP

NP

GR

TD 7548

DP

NP

Prod. Interval: 6176–94, 6214–22, 6754–60, 6822–32, 6950–58, 7136–44, 7221–25, 7300–12, 7366–92

GR

IPF: 468 MCFD (11/75)

Perf: 6072–6088, acidized
6754–6832 & 6072–88, sqzd
7136–7312 (9/85)

TD 7516

GR

BD

Perf: 6720–44, sqzd

Perf: 6806–10, sqzd

Perf: 6902–18, sqzd

Perf: 7056–68, sqzd

Prod. Interval: 7264–72, 7330–42

IPF: 10 BO, 550 MCFD (12/75)

TD 7500

EXPLANATION

- Gas well
- Perforated or open hole interval producing gas
- Gas show from DST
- Coal
- Sandstone
- Sandstone thickness in feet

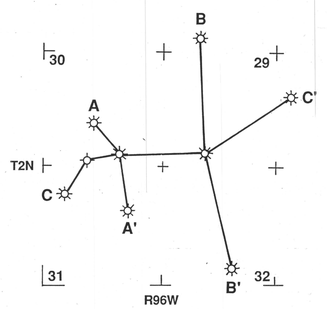
Note: Log curves include Gamma Ray (GR), Neutron (N), Neutron Porosity (NP), Bulk Density (BD), Density Porosity (DP), Spontaneous Potential (SP), and Resisitivity (R). Gamma Ray-Neutron logs were used where available for better sandstone and coal identification.

SCALE

1" = 200'

1" = 400'

LOCATION MAP



COLORADO GEOLOGICAL SURVEY

**CORRELATION OF WILLIAMS FORK SANDSTONES
WHITE RIVER DOME
NORTHERN PICEANCE BASIN**

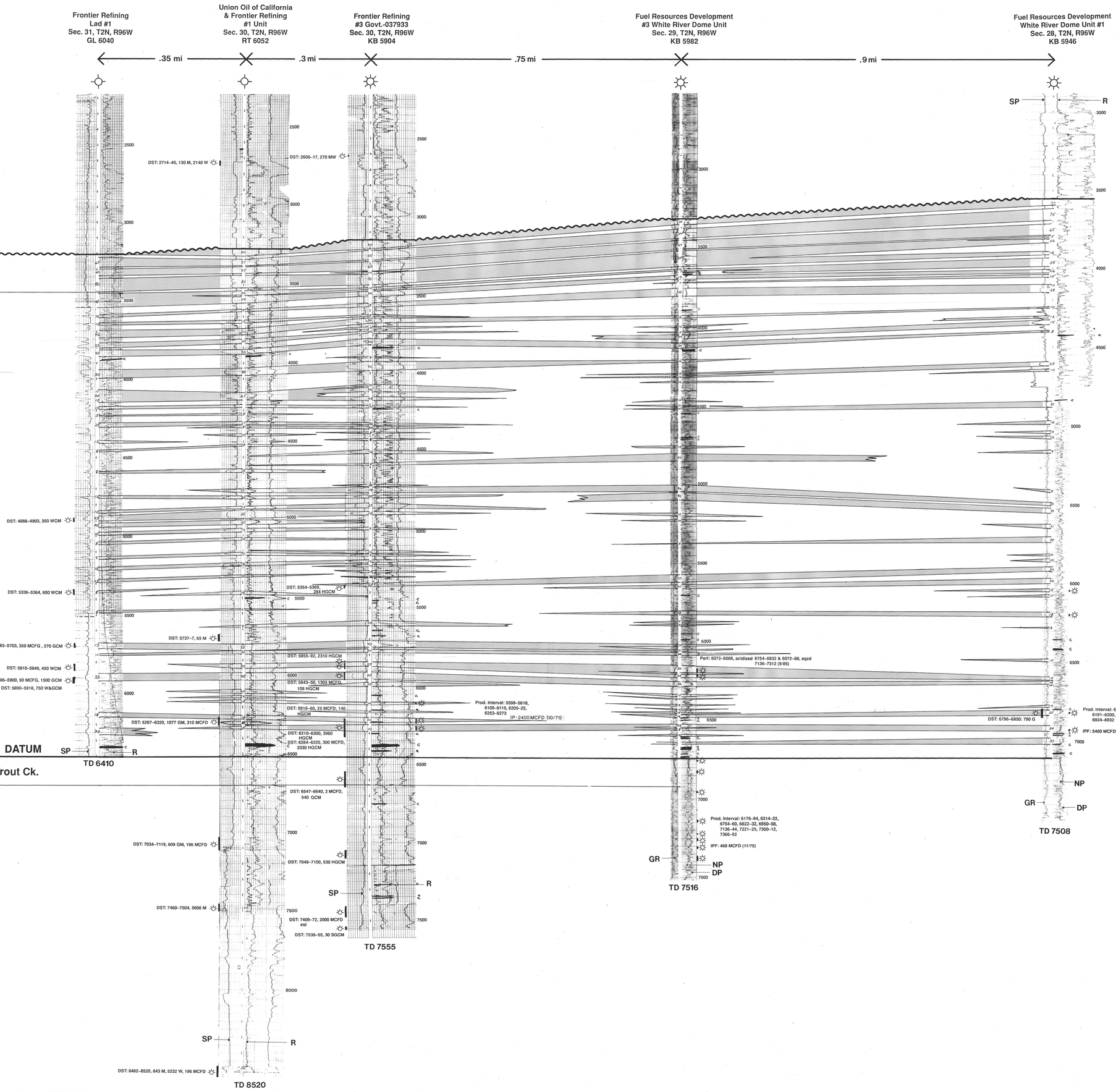
**STRATIGRAPHIC
CROSS–SECTION B—B'**

INTERPRETATION BY:	DATE:	DRAFTED BY:	REVISIONS:	MAP NO:
C. TREMAIN	2/15/90	C. BRCHAN		

C — West

C' — East

Age	Unit	Fm	Mbr
Tertiary		Ft. Union Fm.	
Upper Cretaceous	Mesaverde Group	Williams Fork Formation	Ohio Cr.
			?
			Rollins–Trout Ck.
		Iles Formation	



EXPLANATION

- Gas well
- Perforated or open hole interval producing gas
- Gas show from DST
- Coal
- Sandstone
- Sandstone thickness in feet

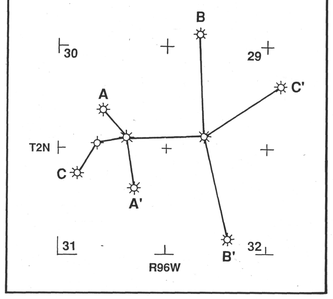
Note: Log curves include Gamma Ray (GR), Neutron (N), Neutron Porosity (NP), Bulk Density (BD), Density Porosity (DP), Spontaneous Potential (SP), and Resisitivity (R). Gamma Ray-Neutron logs were used where available for better sandstone and coal identification.

SCALE

1" = 200'

1" = 400'

LOCATION MAP



COLORADO GEOLOGICAL SURVEY

**CORRELATION OF WILLIAMS FORK SANDSTONES
WHITE RIVER DOME
NORTHERN PICEANCE BASIN**

**STRATIGRAPHIC
CROSS–SECTION C—C'**

INTERPRETATION BY:	DATE:	DRAFTED BY:	REVISIONS:	MAP NO:
C. TREMAIN	2/15/90	C. BRCHAN		