GEOLOGICAL SURVEY OF WYOMING

DESCRIPTIONS OF TWO TEST HOLES DRILLED IN THE VICINITY OF YODER, GOSHEN COUNTY, WYOMING

compiled by

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1985

OPEN FILE REPORT 85-12

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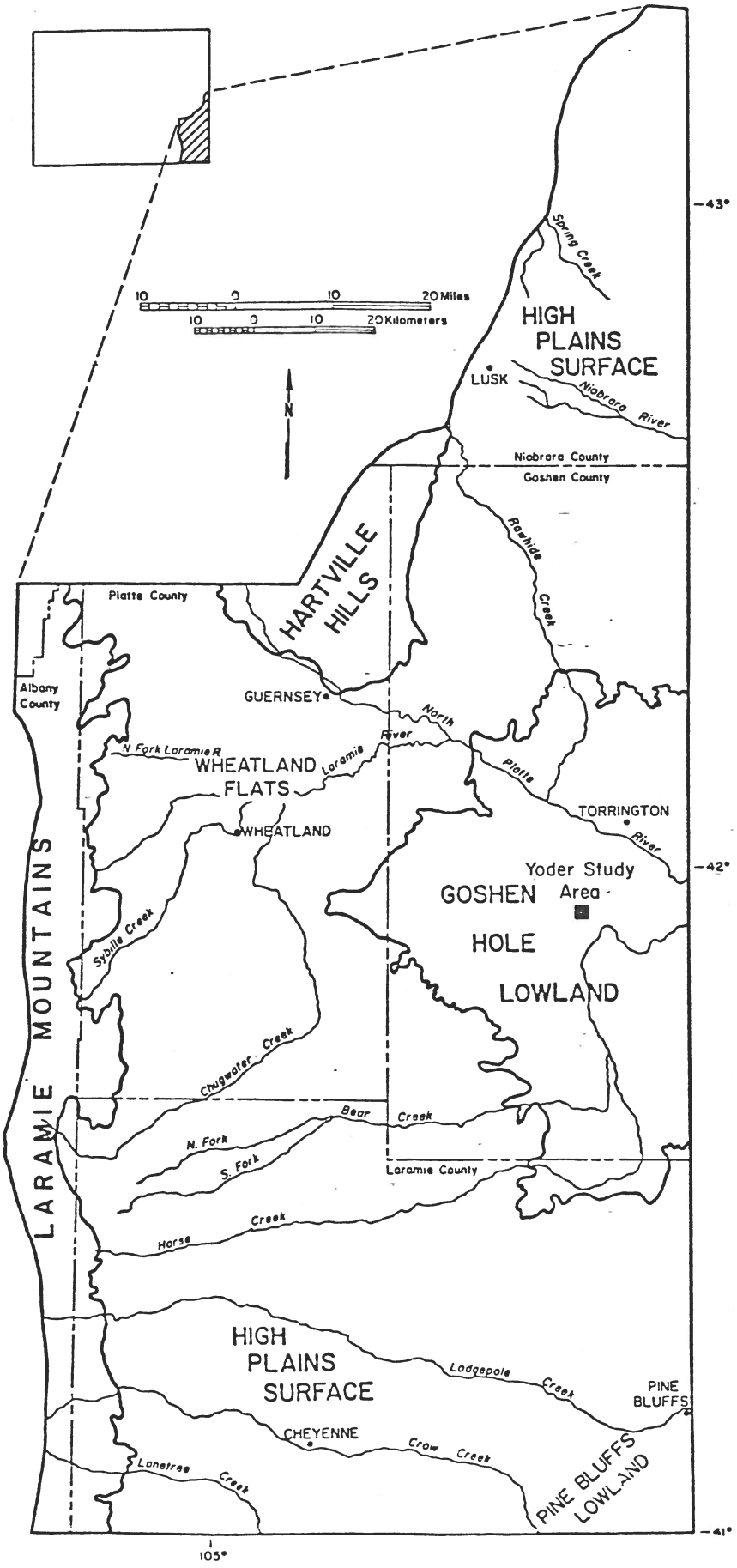

Figure 1. Location map showing the Yoder area within the Denver-Julesburg Basin (from Libra et al., 1981).

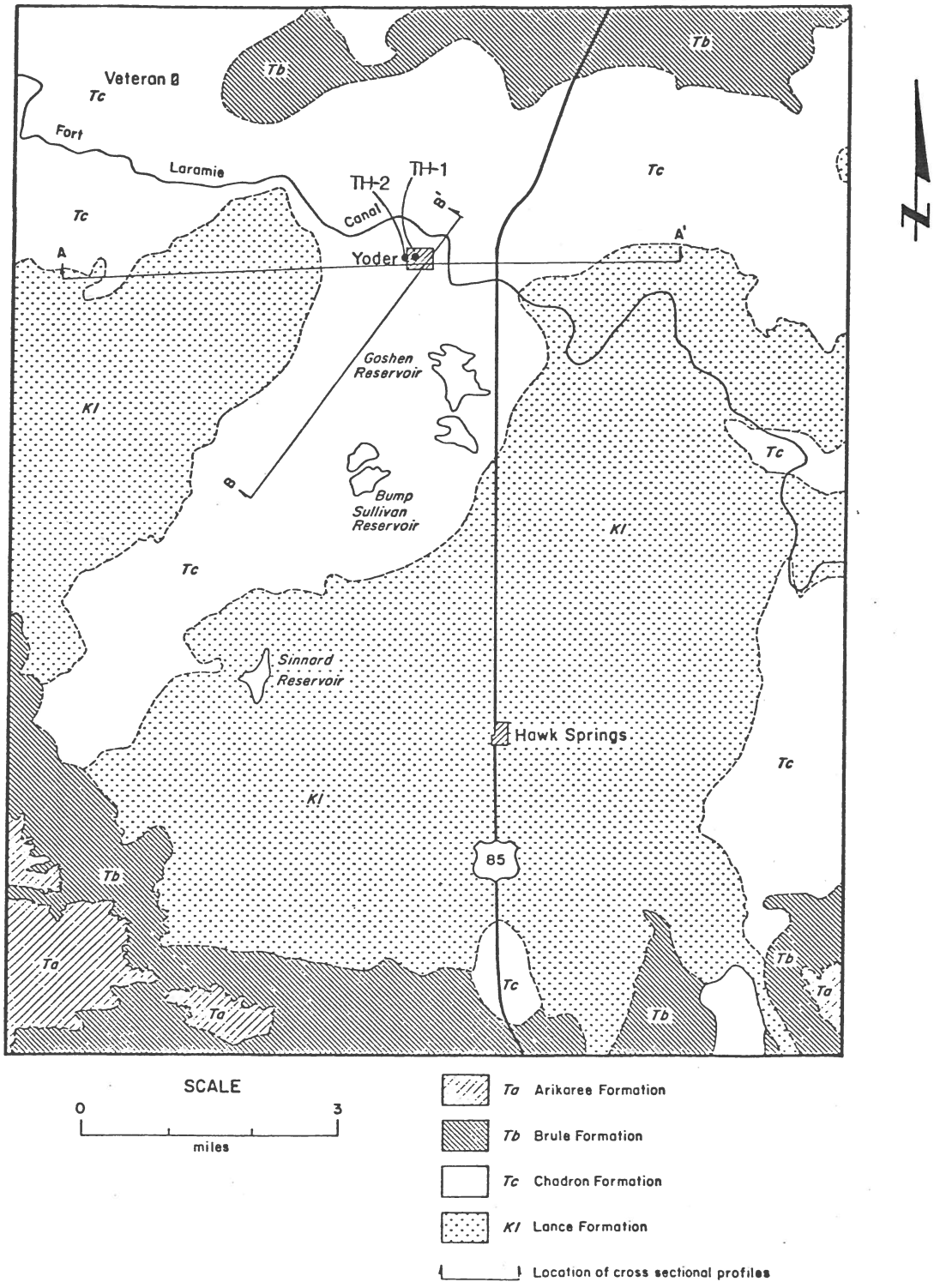

Figure 2. Geologic map of the Yoder area (from Rapp et al., 1957) showing locations of geologic cross sections A-A' and B-B'.

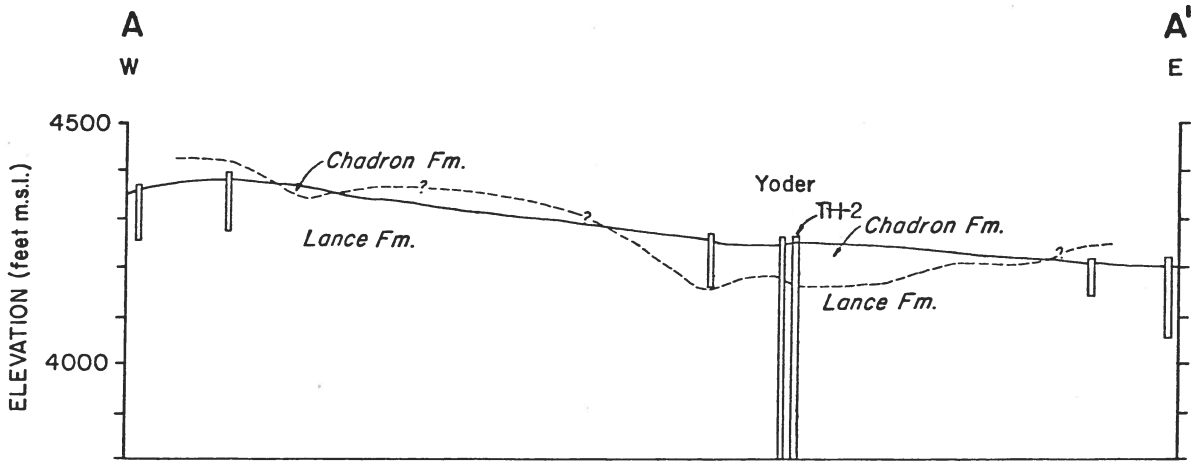

Figure 3. Diagrammatic cross section A-A' (see also Plate 1 for details).

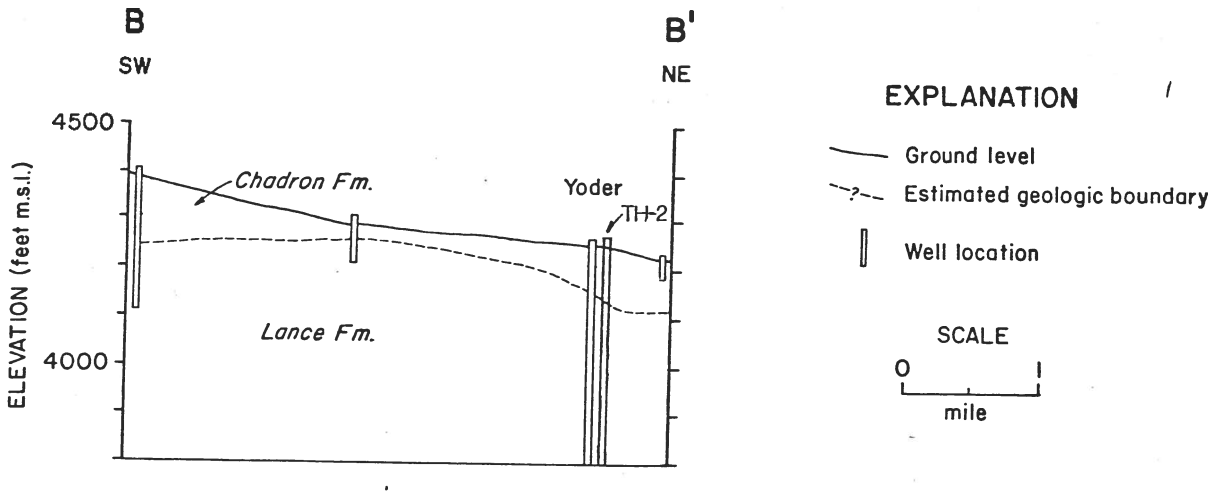

Figure 4. Diagrammatic cross section B-B' (see also Plate 2 for details).

Table 1. Driller's Log of Yoder Test Hole 2 (TH-2). See Appendix B for detailed description.

Location: Town site; 220 feet east, 110 feet north of railroad well (NW1/4, Section 34, T.23N., R.62W.)
Ground Elevation: 4,148 feet (approximate)
Depth: 600 feet
Drill Type: Rotary air

Description	Thickness (feet)	Depth (feet)
Loamy soil and loamy clayey subsoil, brown	10	10
Sand with gravel and mud, yellow-brown (water)	16	26
Mud, sandy mud, clayey mud, red	14	40
Clay with muddy clay, red-gray	9	49
Clay, light gray	3	52
Clay, red-brown	6	58
Sand, gray-green (water)	2	60
Muddy sand and sandy mud, with clay, yellow-gray-red (water)	28	88
Clay, red, with sand, blue-gray	8	96
Clay and mud, yellow, with sand, gray	12	108
Shale, gray-red	9	117
Mudstone, sandy mud with coal, gray-black	6	123
Sand with mudstone, gray (water)	21	144
Shale and mudstone, gray shale, brown and gray (oily)	9	153
Limestone, gray	42	195
Sandy mudstone, green-gray	1	196
Coal with shale, black	3	220
Shale and mudstone, gray-brown	25	245
Limestone, gray-black	1	246
Shale and mudstone, gray-brown with limestone and sandstone, brown	29	275
Shale and muddy shale, black	35	310
Sandy mudstone with sand, gray-green	8	318
Shale and mudstone with limestone, gray-black	19	337
Sand, muddy sand, green-gray (water?)	39	376
Mudstone, shaley mudstone, gray-brown (water)	19	396
Shale, blue-brown, with coal, brown-black	5	400
Mudstone, gray	30	430
Shale, with limestone, gray	5	435
Shale, black, and shale and mudstone, gray-blue	20	455
Mudstone, gray with sandstone, brown	5	460
Limestone, gray-green	2	462
Sand, gray-green	8	470
Shale and mudstone, gray	20	490
Shale, black, with mudstone and sandstone, brown	22	512
Shale, black with limestone	4	516
Shale and mudstone, gray	31	547
Sand, gray (water)	11	558
Shale, black	2	560
Mudstone and shale, gray-black	18	578
Sand, gray (water)	2	580
Sandy mudstone with shale, gray	8	588
Sand, gray (water)	12	600
Shale, black		600+

REFERENCES

Libra, R.D., Collentine, M., and Feathers, K.R., 1981, Occurrence and characteristics of ground water in the Denver-Julesburg Basin, Wyoming: University of Wyoming Water Resources Research Institute EPA-G-008269-79, Laramie, Wyoming.

Rapp, J.R., Visher, F.N., Littleton, R.T., and Duran, W.H., 1957, Geology and ground water resources of Goshen County, Wyoming: U.S. Geological Survey Water-Supply Paper 1377, 145 p.

APPENDIX A

Water Well Log: Yoder Test Hole 1
Project: WY-WDC-01
Location: Town site; 88' north of Town Well #7 (NW1/2, Section 34, T.23N., R.62W.)
Ground Elevation: 4,144 (approximate)

Date: Begin 5/13/82 10:36 AM
End 5/13/82 4:00 PM
Depth: 120 feet
Diameter: 6 1/4"
Drill Type: Rotary (Air)
Casing: Steel case to 40' (83/4" Bit)

Feet	
0- 0.2	Soil, A horizon dark brown, loam, subangular blocky structure, moderately plastic, highly organic
- 0.8	Soil, B horizon, dark brown-yellowish brown, loam-clay loam, subangular blocky structure, moderately plastic
- 10	Light reddish brown-yellowish brown clay, moderately calcareous, slightly-moderately compact, homogeneous with lower layer more sandy; highly plastic
- 15	Brown-yellowish brown muddy gravel, slightly calcareous, friable with some moderately cohesive clay matrix interspersed, poorly sorted, gravel is multicolored and subangular, 1/4" to 3/4" in size; contains water
- 20	Same as above unit except contains more mud, contains water (gravel caving)
- 28	Brown sandy gravel, slightly calcareous, friable, very little mud and clay, moderately sorted, multicolored gravel, subangular, 1/4" - 3/4" in size, interbedded with above unit, less water
- 35	Light brown sandy mud, moderately calcareous, slightly plastic, poorly sorted, homogeneous, contains very little moisture
- 40	Yellowish brown clay, moderately calcareous, highly plastic, compact, moderately homogeneous
- 46	Same as above unit, very compact, platey structure
- 50	Yellowish brown clay with dark brown-black sand-size "specks", possibly organics, slightly calcareous to noncalcareous, highly plastic, compact, moderately homogeneous, no platey structure.
- 55	Reddish clay with dark brown-black organic(?) sand size particles, noncalcareous, highly plastic, moderately homogeneous, contains more mud than above unit, thinly bedded
- 60	Same as above with few pebbles (1/4" - 1/2" in size)
- 70	Yellowish brown muddy medium sand, sandy mud, and muddy gravelly sand, sand is well sorted, mostly white or clear quartz with some red and black sand, gravel less than 1/2" in size, subangular, noncalcareous, nonplastic, slightly cohesive, contains water at 25 gpm

- 75 Light brown-light gray fine sand with clay stringers, well sorted, white quartz with black sand, slightly cohesive, noncalcareous, contains water

- 82 Light brown-light gray fine sand, muddy sand, and muddy gravelly sand, moderately sorted, white quartz sand with black sand, slightly cohesive, noncalcareous, gravel is dark brown and red, less than 1/2" in size, subangular. Gravel is dominant from 77-78' then more sand at 78' and more water than at 70'

-110 Whitish gray fine to very fine sand, clean, well sorted, white and clear quartz with red and black sand, very little clay matrix, friable, homogeneous, nonplastic, noncohesive, noncalcareous, some red clay stringers and gravel (as above unit) at 100'. Contains water

-120 Same as above unit except muddy sand, more compact. Contains water at 60-70 gpm

APPENDIX B

Water Well Log: Yoder Test Hole 2
Project: WY-WDC-01
Location: Town site; 220' east and 110' north of railroad well (NW1/4, Section 34, T.23N., R.62W.)
Ground Elevation: 4,148 (approximate)

Date: Begin 5/19/82 10:56 AM
End 5/20/82 8:00 PM

Depth: 600 feet
Diameter: 6 1/4" & (83/4" first 40')
Casing: Steel case to 93'
Permit: VW 60589 no. 3

Feet	
0- 0.1	Soil, A horizon brown loam, weak, subangular blocky structure, moderately plastic, organic
- 10	Subsoil, B and C horizons, and muddy clay, light brown clay loam and mud, upper part subangular blocky structure, highly calcareous, firm when dry, homogeneous, moderate to highly plastic
- 26	Yellow brown sand with interlayered muddy sand (medium-fine) and gravel (<1" pebbles - multicolored), muddy sand around 20', pebbles are angular-subangular, loose to partly coherent, poorly sorted, nonplastic, water-bearing.
- 32	Red mud, sandy mud, interbedded with thin lenses of red muddy clay and muddy sand, sand is fine, highly calcareous, somewhat firm layers of mud, poorly sorted, mud and clayey mud layers nonplastic to slightly plastic. No water
- 40	Interlayered red sandy mud and clayey mud same as above unit except more clay
- 49	Light red and gray variegated clay with muddy clay, moderately calcareous, moderately compact and firm, interlayered red and gray clay lenses, highly plastic from 44 to 49' clay becomes harder, more compact and is light pink gray, very firm
- 52	Light gray clay, slightly calcareous, moderately compact and slight to moderately firm, highly plastic, homogeneous
- 58	Reddish brown clay, noncalcareous to slightly calcareous, moderately compact and firm, highly plastic, homogeneous
- 60	Loose, muddy, fine-very fine gray-greenish gray sand, dark black-brown sand size particles, noncalcareous, friable. Well caving. Some water
- 80	Interlayered yellow-red-gray sandy mud with lenses of red mud (shale?) and lower 10' is gray-blue muddy sand (fine) with thin lenses of sand. Noncalcareous, loose, poorly sorted, nonplastic. Contains lenses or "pods" of blue mud and clay. Water-bearing
- 88	Interlayered yellow-gray and red muddy sand and mud with clay lenses, clay at 80-82' then more gray-red mud and clay as above unit. Blue muddy lenses from 82-85' then more sand. Slightly calcareous,

very poorly sorted with some ironstone (dark brown) lenses. Slightly compact. Less water than above unit

- 96 Red clay with muddy clay, moderately firm (gummy), noncalcareous, highly plastic, some interbedding with blue-gray sand and blue clay. From 88-90' (like unit from 70-80 feet) contains brown ironstone lenses or "pebbles". Clay layers very firm (lower boundary between Chadron and Lance Formations)

CHADRON FORMATION

LANCE FORMATION

-100 Yellow clay-mud and gray very fine sand with black "specks," very loose. Contains lenses of dark red shale-like material. Some water but less than above (probably uppermost part of Lance Formation)

-108 Yellow muddy clay-clay with gray and red lenses of shaley clay, some pebbles, yellow clay is moderately compact and firm, not homogeneous, noncalcareous

-117 Fractured, hard, firm gray and red shale-mudstone, noncalcareous

-123 Dark gray-black mud, sandy mud with coal lenses and black clay lenses, some brown ironstone lenses, some shale-mudstone lenses, noncalcareous, clay is very sticky and plastic

-130 Same as above except more light gray sand without as much black clay or coal

-140 Moderately gray, fine, well sorted sand interbedded with black mud, very firm (shale and mudstone, weakly consolidated or fractured?). Water-bearing

-153 Gray-brown noncalcareous shale, soft to moderately firm with interlayers of more friable mudstone

-195 Gray-brown noncalcareous shale with thin lenses of hard sandstone and soft mudstone

-196 Gray limestone, firm and brittle, thinly bedded, homogeneous

-217 Green gray calcareous sandy mudstone, loose, interbedded with muddy sand. Very fine sand, poorly sorted

-220 Black coal and shale, highly organic, not firm, plastic, noncalcareous

-240 Gray-black shale and mudstone, not firm to moderately firm, noncalcareous

-245 Gray-brown, fissile, noncalcareous shale

-246 Gray-black limestone, firm, thinly bedded, homogeneous

-266	Gray mudstone and shale, not firm, noncalcareous
-275	Gray-brown interbedded mudstone, shale, limestone, and thin sandstone layers, calcareous
-310	Interbedded gray and black fissile shale, sandy shale, and muddy shale, massive to platey
-318	Gray-green calcareous, very fine, sandy mudstone and muddy loose sand (poorly consolidated)
-325	Interbedded gray shale and mudstone with thin limestone layers, firm, fissile and nonfissile layers
-337	Black muddy limestone (4" to 6" thick) and nonfissile mudstone and shaley mudstone
-376	Green-gray calcareous, muddy, very fine sand (poorly consolidated), some pink sand, massive, interbedded with thin sandy, silty mud
-397	Gray-brown shaley mudstone shale and sandy shale, fissile to poorly consolidated (water-bearing in lower 25')
-400	Blue muddy shale and brown organic-rich shale, thin coal beds
-430	Gray shaley mudstone, shale, and sandy mudstone, nonfissile
-435	Gray shale and mudstone with thin limestone beds, firm, platey
-455	Gray-blue mudstone and shale and black-brown fissile shale interbedded, firm to poorly consolidated
-460	Same as above, some brown interbedded sandstone
-462	Green-gray very firm, very fine crystalline limestone
-470	Green-gray very fine, poorly consolidated, limey sand
-490	Gray muddy shale and green-gray mudstone, noncalcareous
-512	Interbedded black, fissile firm shale and gray mudstone with very thin brown sandstones in lower part, noncalcareous to slightly calcareous
-516	Black oily shale interbedded with limestone
-547	Gray-black shale interbedded with sandy gray-green mudstone and thin sandstone
-558	Gray very fine loose sand with fine silts, poorly consolidated, water-bearing
-560	Black shale, fissile
-578	Gray-black sandy, shaley mudstone and gray-black oily shale, poorly consolidated

-580 Gray very fine sand with silt, poorly consolidated, noncalcareous

-588 Gray sandy mudstone with interbedded shale

-600 Gray very fine sand with silt, poorly consolidated, water-bearing

Black shale at 600 feet

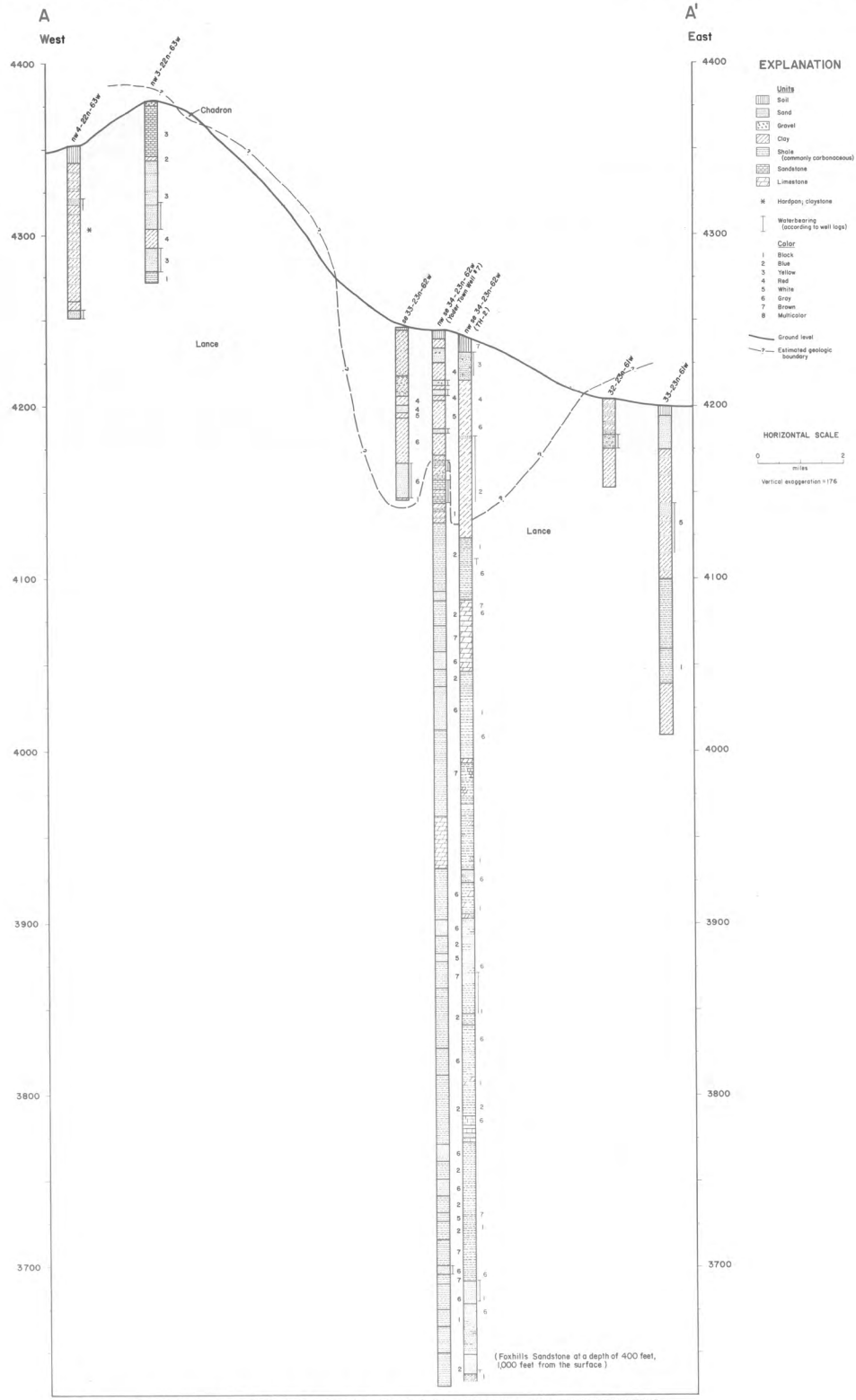

PLATE 1. GEOLOGIC CROSS SECTION A–A' BASED ON DRILLERS' AND HYDROLOGIC LOGS OF WATER WELLS

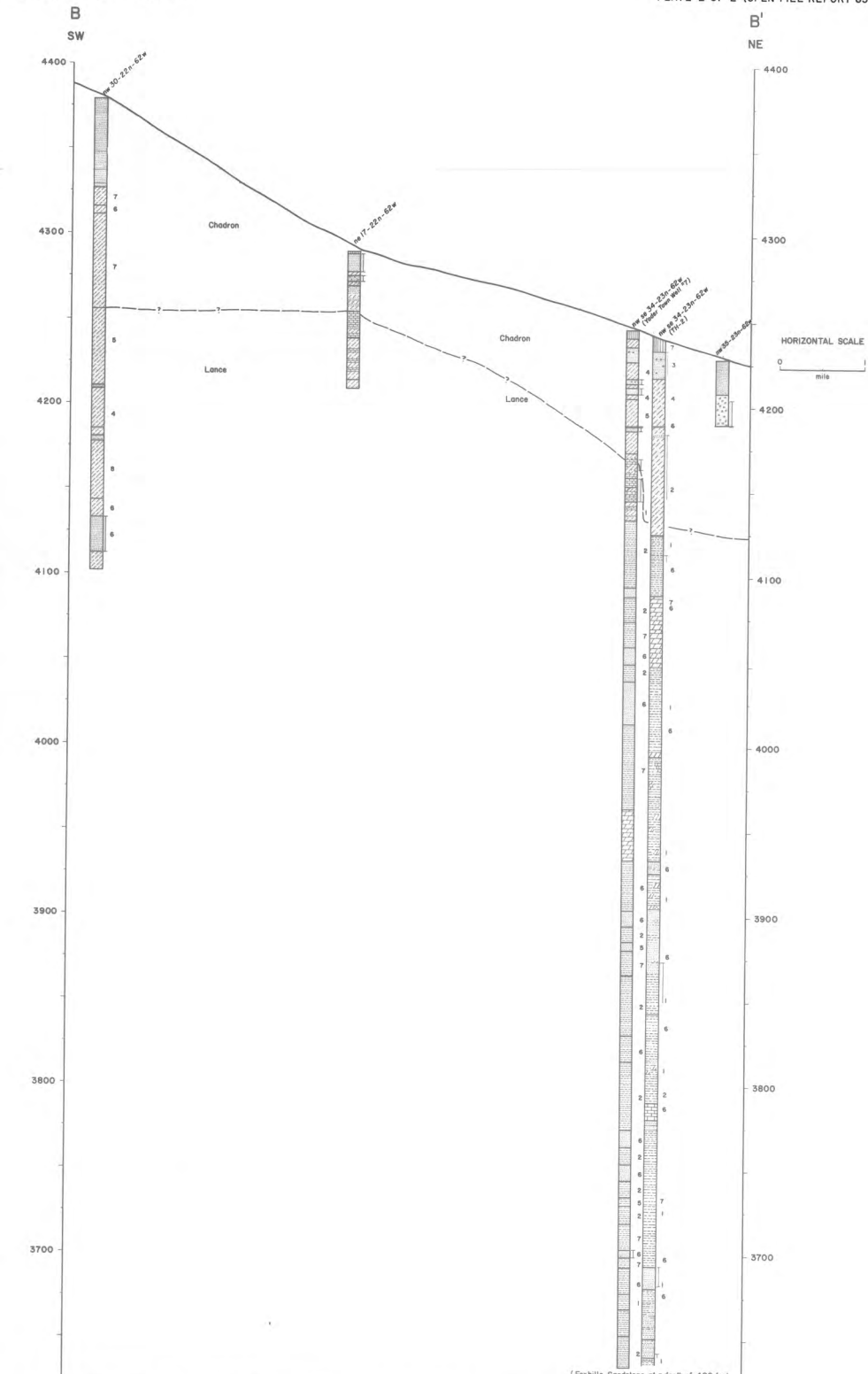

PLATE 2. GEOLOGIC CROSS SECTION B-B' BASED ON DRILLERS' AND HYDROLOGIC LOGS OF WATER WELLS