RECONNAISSANCE OF GROUND-WATER RESOURCES IN THE NORTH FORK GUNNISON RIVER BASIN, SOUTHWESTERN COLORADO

By D. J. Ackerman and Tom Brooks

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DONALD PAUL HODEL, Secretary

U.S. GEOLOGICAL SURVEY

Dallas L. Peck, Director

For additional information
write to:

District Chief
U.S. Geological Survey
Water Resources Division
Box 25046, Mail Stop 415
Denver Federal Center
Denver, CO 80225

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[Telephone: (303) 236-7476]

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GLOSSARY

aquifer--A geologic formation, group of formations, or part of a formation that contains sufficient saturated and permeable material to yield significant quantities of water to wells and springs.

chemical quality--Includes concentration of solutes (any substance dissolved in water) and certain properties or characteristics such as hardness, sodium-adsorption ratio, percent sodium, and specific conductance.

confined aquifer--An aquifer in which ground water is confined under pressure greater than atmosphere by overlying, relatively impermeable strata. Water level in a well penetrating a confined aquifer will be above the upper boundary of the aquifer.

confining bed--A rock unit above or below an aquifer which is much less permeable than the aquifer and that restrains ground-water flow to and from adjoining units.

discharge area--An area in which subsurface water is discharged to the land surface, to surface-water bodies, or to the atmosphere.

drawdown--Decline of the water level in a well or aquifer caused by pumping or artesian flow.

infiltration--The movement of water from the land surface into the underlying soil or rock through pores or other small openings.

saturated zone--That part of the water-bearing material in which, ideally, all voids, large and small, are filled with water under pressure greater than atmospheric.

sodium-adsorption ratio (SAR)--Is the expression of relative activity of sodium ions in exchange reactions with soil. The formula used for the computation of SAR is:

$$SAR = \frac{(Na^{+})}{\sqrt{\frac{(Ca^{+2}) + (Mg^{+2})}{2}}}$$

where solute concentrations are expressed in milliequivalents per liter.

specific capacity--A measure of the productive capacity of the well. The specific capacity of a water well is expressed as the rate of discharge divided by the drawdown. For example: if the pumping rate is 20 gallons per minute and the drawdown is measured as 10 feet after 2 hours of pumping, the specific capacity is 2 gallons per minute per foot at the end of 2 hours:

$$\frac{\text{20 gallons per minute}}{\text{10 feet}} = \text{2 gallons per minute per foot.}$$

specific conductance--A measure of the ability of water to conduct an electrical current, expressed in microsiemens per centimeter at 25° Celsius.

water table--Surface in an unconfined water body at which the pressure is atmospheric. It is defined by the levels at which water stands in wells that penetrate the water body far enough to hold standing water.

METRIC CONVERSION FACTORS

The inch-pound units used in this report may be converted to metric units by use of the following conversion factors:

Multiply inch-pound units	*By*	*To obtain metric units*
foot (ft)	0.3048	meter
gallon per minute (gal/min)	0.06309	liter per second
gallon per minute per foot [(gal/min)/ft]	0.01923	liter per second per meter
inch (in.)	25.40	millimeter
square mile (mi^2)	2.590	square kilometer

To convert degrees Fahrenheit (°F) to degrees Celsius (°C) use the following formula: °C = (°F-32)5/9. To convert degrees Celsius (°C) to degrees Fahrenheit (°F) use the following formula: °F = 9/5°C+32.

The following terms and abbreviations also are used in this report: microsiemens per centimeter at 25° Celsius (μS/cm) and milligrams per liter (mg/L).

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ABSTRACT

Aquifers of large areal extent in the North Fork Gunnison River basin are found in the alluvium and bedrock. Alluvial aquifers yielded water with dissolved-solids concentrations ranging from 43 to 2,300 milligrams per liter. Dissolved-solids concentrations of water samples from the Mesaverde Formation of Late Cretaceous age and the Dakota Sandstone and Burro Canyon Formations of Late and Early Cretaceous age ranged from 56 to 3,200 milligrams per liter. Dissolved-solids concentrations of water samples from Mancos Shale ranged from 1,800 to 8,200 milligrams per liter.

Most wells in the North Fork Gunnison River basin are at altitudes below 7,500 feet, yield from 2 to 40 gallons per minute and are completed in alluvial sand and gravel, sandstone, or fractured bedrock. Springs generally are at altitudes above 7,000 feet, discharge from perched water tables at geologic contacts, have calcium magnesium bicarbonate water types, and are much less saline than water from wells.

INTRODUCTION

The need for additional water supplies in western Colorado is increasing as population, industrial and agriculture development, and recreational activities increase. The U.S. Geological Survey, in cooperation with the Colorado Department of Natural Resources, Division of Water Resources, Office of the State Engineer, has been appraising the ground-water resources in areas of increased water demand, such as the North Fork Gunnison River basin, to determine if these resources can be used to meet, or to partly meet, current and future demands for additional water. The location of the North Fork Gunnison River basin and the location of similar ground-water resources in western Colorado are shown in figure 1.

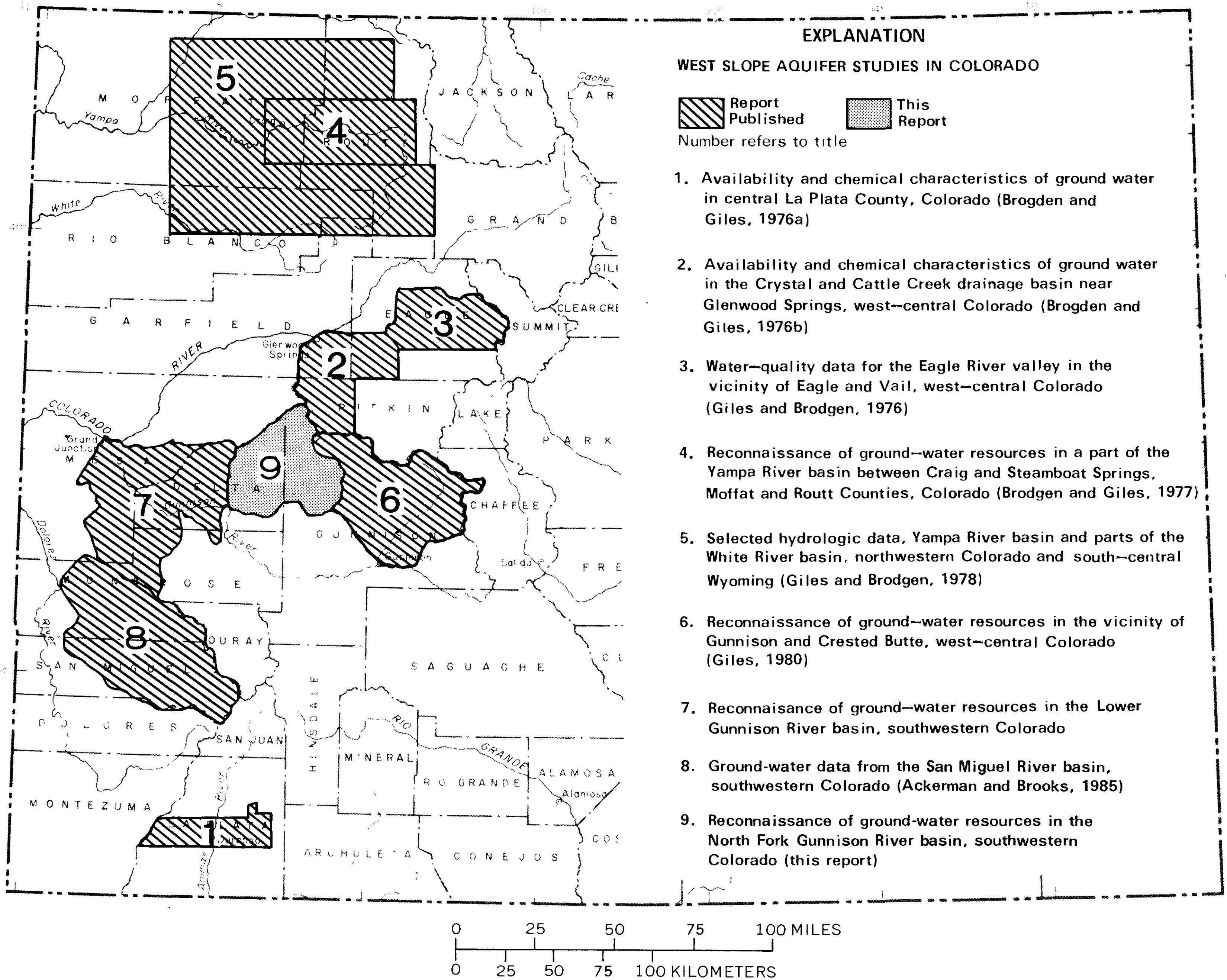

Figure 1.--Location of the North Fork Gunnison River basin and status of aquifer studies in western Colorado.

Purpose and Scope

The purpose of this report is to present ground-water data to help in the efficient development, appropriation, and management of the water resources of the North Fork Gunnison River basin in southwestern Colorado. The data in this report are used to describe aquifers in the North Fork Gunnison River basin. Most data in this report were collected between 1977 and 1982.

Data for this report were compiled from interviews with well and spring users, drillers' records of water wells, completion records and logs for oil and gas test wells, geologic maps, and chemical analyses of water samples from wells and springs. The data reported here consist of: (1) Hydrologic information from wells based on drillers' records, (2) hydrogeologic information from wells and springs, and (3) chemical analyses of water samples from wells and springs. Data for wells and springs are given in tables 2, 3, 4, and 5 in the "Supplemental Data" section at the back of this report. The system of numbering wells is explained in figure 2. All data sites are shown on plate 1 (in pocket).

Approach

Depth to water was measured in wells by using a steel tape, electrical tape, or was taken from recorded data. Discharges from wells were taken from drillers' records and discharges from springs were measured by volumetric measurements with time. Well and spring water samples were collected and analyzed for major chemical constituents and trace elements. The geologic formations that wells were completed in or that springs issue from was determined from well drillers' records and geologic maps.

Acknowledgments

Residents of the basin provided information about their wells and springs, permitted measurements to be made, and allowed samples to be collected. Donald Fawcett, Andrew Wacinski, and Stanley Zawistowski, employees of the Office of the State Engineer (during the data collection 1977-1982), assisted in the collection and compilation of data.

PHYSICAL SETTING

Most residents in the North Fork Gunnison River basin live at lower altitudes and in or near small towns. The two largest towns are Paonia, population 1,425, and Hotchkiss, population 849 (U.S. Bureau of the Census, 1981). The economy in the basin is mainly agricultural and mining, with some lumbering and tourism.

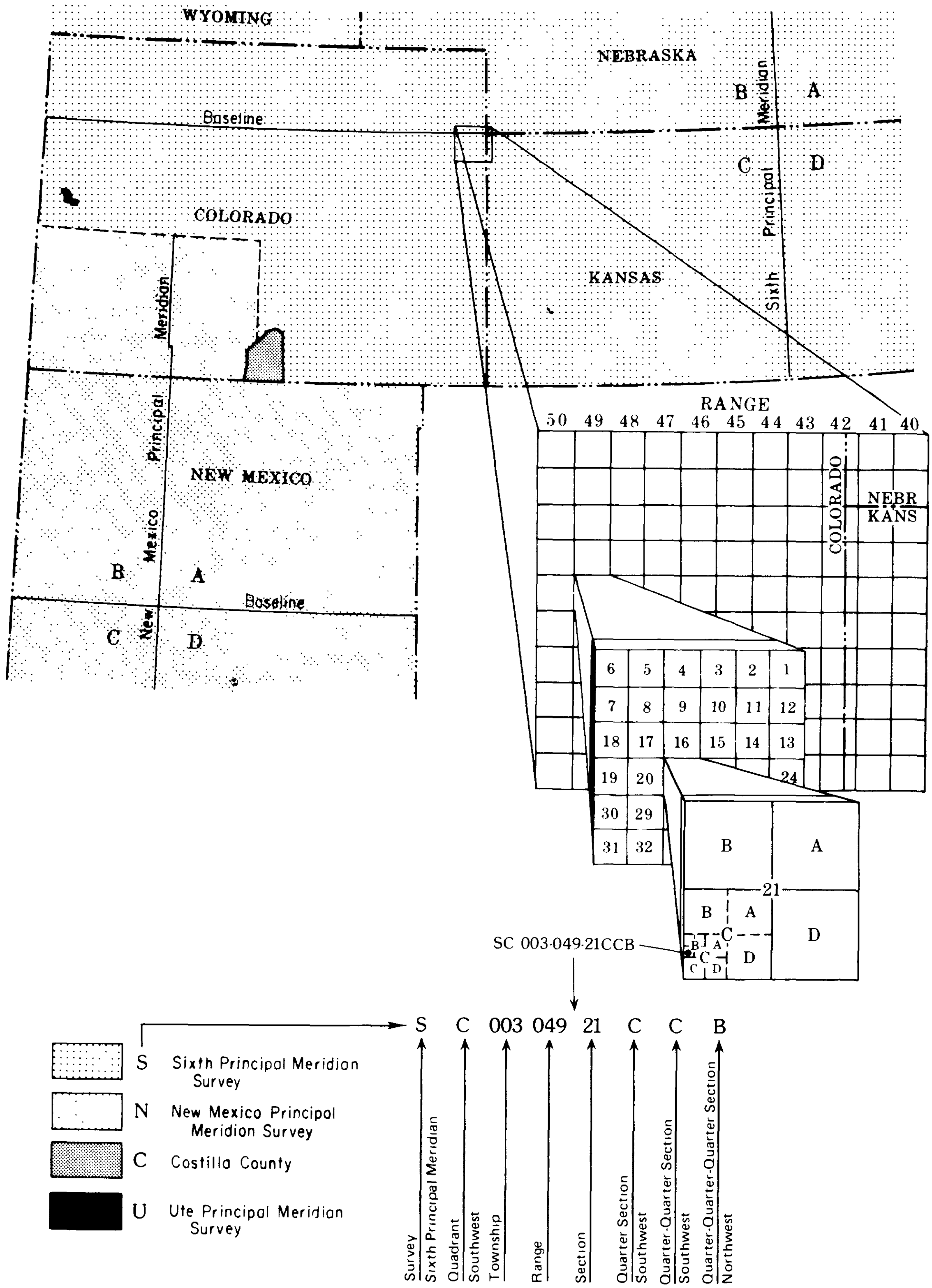

Figure 2.--System of numbering wells and springs using township, range, and section.

The town of Paonia uses springs that issue from alluvium, and the town of Hotchkiss uses surface water from Leroux Creek for public drinking water. Ground water is used domestically and for irrigation and livestock in more remote areas.

Physiography and Drainage

The North Fork Gunnison River basin lies in both the Canyon Lands section of the Colorado Plateau physiographic province and in the Uinta Basin physiographic province (Fenneman, 1946). The topography ranges from high, glaciated peaks to deeply eroded valleys.

The headwaters of the North Fork Gunnison River and its major tributaries are within the mountainous borders of the basin. The highest point in the basin is 13,058-ft Owen Peak near the eastern border. The lowest point in the basin is at the confluence of the North Fork Gunnison and Gunnison Rivers, at an elevation of about 5,100 ft at the southwestern corner. The streams of the basin are in rugged terrain and broad, low-relief valleys. The drainage area of the North Fork Gunnison River is 1,002 mi^2.

Climate

The variable topography is related to the variable climate in the North Fork Gunnison River basin. Average annual precipitation is less than 12 in. near Hotchkiss in the lower part of the valley and is about 40 in. on the mountains in the eastern part of the basin (Iorns and others, 1965, pl. 4). Temperatures typically range from less than -30°F in the mountains in January to more than 95°F at Hotchkiss near the confluence of the North Fork Gunnison and Gunnison Rivers in July. The average number of frost-free days ranges from about 130 days in the lowest areas to less than 60 days in the mountains. Paonia's altitude is 5,580 ft, has an average annual precipitation of 14.3 in., and an average annual air temperature of 49°F (1950-1979 period of record, U.S. National Climatic Data Center, 1950-79).

Geology and Structure

Rock units exposed in the North Fork Gunnison River basin range in age from Late Jurassic to Quaternary. Major rock types are sedimentary sandstone and shale, igneous intrusive and extrusive rocks, and alluvial sand and gravel. The age, thickness, lithology, and water-yielding characteristics of the rock units are summarized in table 1. The areal extent of exposed rock units is shown on plate 2 (in pocket). On plate 2, some of the rock units are grouped with other adjacent rock units believed to be part of the same aquifer system or rock units of similar water-yielding characteristics. For instance, the Dakota Sandstone and Burro Canyon Formation are grouped together because they are believed to be part of the same aquifer system.

Table 1.--*Rock units and their water-yielding characteristics*

[gal/min = gallon per minute]

System or series	Rock unit		Maximum thickness (feet)	Predominant lithology	Water-yielding characteristics
Quaternary	Alluvium landslide, talus, colluvium, glacial drift, and terrace gravels		100?	Silt, sand, and gravel	Well yields generally range from 2 to 40 gal/min.
Tertiary	Volcanic rocks-intrusive and extrusive		--	Dense black basalt, granodiorites and andesite basalt	Water quantity is variable depending on degree of fracturing. No known wells.
	Uinta Formation		?	--	No data available. 1 to 5 gal/min may be expected from sandstone.
	Green River Formation	Parachute Creek Member	400?	Siltstone, sandstone, or marlstone	
	Wasatch Formation		3400	Variegated claystone, siltstone, sandstone, sandstone lignite, and conglomerate	Limited data indicate as much as 25 gal/min available from sandstone and conglomerate.
Upper Cretaceous	Mesaverde Formation		3000	Sandstone, shale, and coal	Limited data indicate yields of less than 10 gal/min.
	Mancos Shale		4500	Dark gray carbonaceous marine shale	Water quantity depends on degree of fracturing. A confining bed for underlying sandstones.
Upper and Lower Cretaceous	Dakota Sandstone and Burro Canyon Formations, undifferentiated		250	Interbedded sandstone, conglomerate, shale and coal	Well yields of more than 10 gal/min are to be expected.
Upper Jurassic	Morrison Formation		580	Mudstone and sandstone.	No data are available.

Most rock units in the North Fork Gunnison River basin dip about 2 to 8 degrees to the north or northwest from the Gunnison uplift into the Piceance basin. There are many small structures and faults in the basin. The geology is complex in the southeast one-third of the basin because there are sills, dikes, laccoliths, and stocks (igneous intrusions).

AVAILABILITY OF GROUND WATER

Alluvial Aquifers

Alluvium deposits consisting of sand, silt, and gravel of Quaternary age are aquifers throughout the basin and usually are less than 100 ft thick. The thickest and most commonly saturated deposits generally are the alluvium of the eroded valleys. Alluvium and eolian deposits on mesas usually are thin. Alluvium, talus, and colluvium on steep slopes are only seasonally saturated.

Wells completed in alluvium have reported well yields from 1 to 150 gal/min with an average of about 20 gal/min (table 2). The water quality of most wells completed in alluvium aquifers is more suitable for domestic and agricultural use than wells completed in bedrock aquifers.

Springs are at the base of colluvial, talus, or landslide deposits on steep slopes. Spring flows are commonly seasonal, lasting from spring to midsummer. Springs primarily are recharged from infiltration of precipitation. Spring discharges were measured at 18 sites where they issued from alluvial aquifers with rates from 0.02 to 20 gal/min and averaged about 5 gal/min (table 4).

Four wells completed in alluvium and glacial deposits had specific conductance values from 171 to 2,700 μS/cm (table 5) and dissolved-solids concentrations of 110 to 2,300 mg/L. The dominant cation was calcium and the dominant anion was bicarbonate. There were 18 springs that issued from alluvium and glacial deposits with specific conductance values ranging from 62 to 875 μS/cm and averaging 451 μS/cm. Dissolved solids for 15 water samples collected from springs ranged from 43 to 760 mg/L and averaged 323 mg/L. The dominant cation was calcium and the dominant anion was bicarbonate. Sulfate, dissolved solids, and manganese concentrations exceeded the U.S. Environmental Protection Agency drinking water regulations (1977b) in some water samples.

Because the flow paths and residence times of water in the alluvial aquifers are shorter than in bedrock aquifers, the bedrock aquifers generally have larger concentrations of dissolved solids. Alluvial aquifers probably are hydraulically connected with adjacent consolidated bedrock aquifers.

Bedrock Aquifers

Sandstone, conglomerate, and fractured bedrock of differing lithologies are bedrock aquifers in most of the basin. The primary bedrock aquifers in the North Fork Gunnison River basin are the Burro Canyon Formation and the Dakota Sandstone of Early and Late Cretaceous age. Fine-grained rock, such as shale, may yield water where fractured or may contain sandstone lenses which may contain water. Finer-grained rock confine adjacent aquifers. Bedrock aquifers generally are confined except near outcrops. Fractured coal seams in the Mesaverde Formation contain water near outcrops.

One well completed in the Dakota Sandstone has a reported yield of 20 gal/min and flows at the surface (table 2). The Dakota Sandstone generally is deeper than 2,000 ft below land surface in all but the extreme southeastern corner of the basin.

Four of the wells completed in the Mancos Shale yield from 0.5 to 15 gal/min, and two are dry (table 2). This formation generally yields little water and has unsuitable water for domestic or agricultural uses.

Three wells completed in the Mesaverde Formation of Late Cretaceous age yield from 2 to 3 gal/min (table 2). The sandstone and shale of the Mesaverde Formation are less permeable than fractured coal seams.

In areas of Tertiary igneous intrusives and basalt flows, no wells have been drilled. Two wells completed in the Wasatch Formation have reported yields of 15 and 26 gal/min, although the formation generally is an aquitard based on lithology (table 2). The Wasatch Formation is exposed over much of the basin; higher altitudes and inaccessible locations limit development.

The depth of wells completed in bedrock ranges from 10 to 2,150 ft (table 3). Wells that were completed for domestic use are generally less than 150 ft deep, and wells completed for monitoring ground-water levels near mining areas are generally from 500 to 2,000 ft deep.

Spring discharges issuing from the Mancos Shale and the Mesaverde and Wasatch Formations were measured. Four spring discharges from the Mancos Shale were 1, 5, 5, and 30 gal/min (table 4). Three spring discharges from the Mesaverde Formation were 5, 10 and 25 gal/min. Three spring discharges from the Wasatch Formation were 1, 1, and 20 gal/min.

Specific-conductance values for 8 wells completed in bedrock aquifers averaged 3,212 μS/cm. Concentrations of dissolved solids for 7 wells averaged 2,569 mg/L and ranged from 490 to 8,200 mg/L (table 5). The dominant cation in most well-water samples was sodium, and the dominant anion was bicarbonate or sulfate. Concentrations of flouride exceeded national interim primary drinking water regulations established by the U.S. Environmental Protection Agency (1977a) in some water samples collected from wells completed in bedrock aquifers. Concentrations of sulfate, chloride, dissolved solids, iron, and manganese in some water samples exceeded the national secondary drinking water regulations established by the U.S. Environmental Protection Agency (1977b).

Four springs issuing from bedrock had specific-conductance values of 3,100, 3,500, 52, and 585 μS/cm and dissolved-solids concentrations of 3,100, 4,300, 56, and 370 mg/L. The dominant cation was calcium, and the dominant anion was sulfate in water samples. Concentrations of selenium exceeded the U.S. Environmental Protection Agency interim primary drinking water regulations (1977a) in two water samples, and concentrations of sulfate, dissolved solids, and manganese exceeded the U.S. Environmental Protection Agency secondary drinking water regulations (1977b) in some water samples.

SUMMARY

The primary aquifers in the North Fork Gunnison River basin are alluvial and bedrock. Alluvial aquifers are thickest in valley bottoms and usually less than 100 ft thick. Dissolved-solids concentrations ranged from 43 to 2,300 mg/L in water from alluvial and glacial deposit aquifers. Well yields averaged about 20 gal/min.

Alluvial water quality was usually more suitable for domestic and agricultural use than bedrock ground water. Alluvial aquifers probably are hydraulically connected with adjacent bedrock aquifers and intermixing of the two aquifers is expected.

Dissolved-solids concentrations of water samples from bedrock aquifers ranged from 56 to 8,200 mg/L. The dominant cation was sodium, and the dominant anion was bicarbonate or sulfate. Concentrations of sulfate, chloride, fluoride, dissolved solids, iron, manganese, and selenium in some water samples exceeded U.S. Environmental Protection Agency drinking water regulations (1977a, 1977b). Well yields up to 26 gal/min are reported.

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SUPPLEMENTAL DATA

Table 2.--*Hydrologic data for wells from drillers' records*

Map location number (see plate 1)	Local identifier (see figure 2)	State well permit number	Principal aquifer	Well depth (feet)	Depth to water (feet)	Well yield (gallons per minute)	Specific capacity (gallons per minute per foot)
1	SC01008901CB	3466F	Alluvium	130	65	8	--
2	SC01108918ADD	83771	Alluvium	93	58	40	2.50
3	SC01108929BBA	72652	Alluvium	150	11	7	.23
4	SC01108002DCD	62475	Alluvium	105	80	6	.60
5	SC01109010BBB	66084	Alluvium	30	10	15	1.50
6	SC01109011CAA	66085	Alluvium	40	8	15	1.00
7	SC01109014ACA	72500	Wasatch Formation	41	18	15	2.14
8	SC01109130AC	67350	Alluvium	55	7	15	2.50
9	SC01308901AD	34667	Wasatch Formation	38	6	26	2.17
10	SC01308902DC	80370	Alluvium	30	5	20	6.67
11	SC01308907BD	61147	Alluvium	30	13	10	1.00
12	SC01308910DA	43469	Alluvium	63	--	25	1.14
13	SC01308911BA	89054	Alluvium	35	11	15	3.00
14	SC01309010CD	80254	Alluvium	37	7	50	7.14
15	SC01309011CD	2146	Alluvium	55	51	20	--
16	SC01309106BBC	11687	Alluvium	32	22	6	3.00
17	SC01309113DD	13512	Mesaverde Formation	80	36	2	.04
18	SC01309114DAA	58396	Alluvium	30	15	15	3.00
19	SC01309115CC	50633	Alluvium	35	8	36	4.50
20	SC01309121CC	43927	Alluvium	40	23	21	3.50
21	SC01309121CD	59487	Alluvium	55	9	7	.44
22	SC01309123CBA	61146	Alluvium	112	70	5	.29
23	SC01309128BA	82911	Alluvium	58	27	30	6.00
24	SC01309129BC	20906	Alluvium	110	Dry	Dry	--
25	SC01309129DA	61898	Alluvium	45	18	30	1.30
26	SC01309131CC	29365	Alluvium	14	2	5	2.50
27	SC01309132CD	53950	Alluvium	30	13	30	6.00
28	SC01309213BCA	22422F	Alluvium	97	3	37	--
29	SC01309232CC	33528	Alluvium	30	10	40	6.67
30	SC01309327BBB	54989	Alluvium	80	4	24	1.20
31	SC01309332CBA	76602	Alluvium	265	111	2	.03
32	SC01409007AC	11392	Mesaverde Formation	53	33	3	--
33	SC01409008AC	92019	Mesaverde Formation	140	110	2	--
34	SC01409102BAC	9155	Alluvium	36	14	3	--
35	SC01409104DBC	14620	Alluvium	15	5	5	--
36	SC01409106AB	27023	Alluvium	18	7	18	3.00
37	SC01409106BBB	22492	Alluvium	23	8	5	--
38	SC01409107CCD	14409	Mancos Shale	70	10	5	--
39	SC01409108AC	57436	Alluvium	48	10	15	.75
40	SC01409109DAC1	30520	Mancos Shale	66	20	.5	.01

Table 2.--*Hydrologic data for wells from drillers' records--Continued*

Map location number (see plate 1)	Local identifier (see figure 2)	State well permit number	Principal aquifer	Well depth (feet)	Depth to water	Well yield (gallons per minute)	Specific capacity (gallons per minute per foot)
41	SC01409116DAB	8654	Alluvium	26	15	9	--
42	SC01409118DCC	9194	Alluvium	40	18	3	0.38
43	SC01409119BD	2777F	Mancos Shale	125	Dry	Dry	--
44	SC01409129CD	15731	Alluvium	27	--	5	--
45	SC01409201ACC	19786	Alluvium	31	15	5	2.50
46	SC01409202CAA1	19684	Alluvium	21	13	6	1.50
47	SC01409206DA	61704	Alluvium	95	59	2.5	.012
48	SC01409209DBD	39709	Alluvium	40	23	15	2.50
49	SC01409210CCC	23437	Alluvium	49	36	5	--
50	SC01409211BAA	26941	Alluvium	41	7	20	10
51	SC01409212AB	46540	Alluvium	40	15	30	10
52	SC01409215CAB	12260F	Alluvium	28	4	150	37.50
53	SC01409216CA	21279F	Dakota Sandstone	1,386	Artesian	20	--
54	SC01409217DAC	61704	Alluvium	95	59	2.5	.12
55	SC01409219ABC	68086	Alluvium	50	31.5	15	3.75
56	SC01409220ADB	92582	Alluvium	35	14	20	2.50
57	SC01409229BCC	89904	Alluvium	40	17.5	30	8.57
58	SC01409230CDB	22597	Alluvium	55	21.5	30	8.57
59	SC01409304BAA	56599	Alluvium	110	58.5	30	1.52
60	SC01409305BBB	25740	Alluvium	75	45	5	.25
61	SC01409305CB	74961	Mancos Shale	142	91	15	1.50
62	SC01409312ADC	17838	Mancos Shale	42	--	Dry	--
63	SC01409322DAB	25412	Alluvium	70	39	5	.17
64	SC01409325ABA	20549F	Alluvium	60	25	100	--
65	SC01409326BD	5007	Alluvium	43	--	Dry	--
66	SC01409326DD	90443	Alluvium	180	115	5	--
67	SC01409328AD	77728	Alluvium	110	85	15	3.00
68	SC01409333CBC	16538F	Alluvium	60	22	70	10
69	SC01508922CBA	12676F	Alluvium	65	40	18	4.50
70	SC01509121DA	12726	Alluvium	105	80	1	.05
71	SC01509129ABA	87144	Mancos Shale	160	40	2.5	.02
72	SC01509303CB	83573	Alluvium	67	32	28	7.00

Table 3.--*Hydrogeologic data for wells*

Map location number (see plate 1)	Local identifier (see figure 2)	Owner	Principal aquifer	Altitude (feet)	Well depth (feet)	Depth to water (feet)	Date water level measured	Date sampled (see table 5)
73	SC01108920CCD1	--	--	6,989	150	11.00	07/13/1978	--
74	SC01208905BAA1	--	--	6,700	46	--	--	--
75	SC01308907BDB1	Sell, Marion	Alluvium	6,225	30	6.00	05/ /1974	05/29/1974
76	SC01309010DCC1	Western Slope Realty Co.	Mesaverde Formation	6,105	63	30.00	05/ /1974	05/29/1974
77	SC01309106DAC1	Colorado Westmoreland Inc.	Mesaverde Formation	7,950	1,500	1,355.00	06/04/1982	--
78	SC01309107BBA1	Colorado Westmoreland Inc.	Mesaverde Formation	8,300	1,975	1,750.00	08/20/1982	--
79	SC01309107CDC1	Colorado Westmoreland Inc.	Mesaverde Formation	8,715	2,150	2,029.00	07/20/1982	--
80	SC01309107DCA1	Colorado Westmoreland Inc.	Mesaverde Formation	8,231	1,694	1,390.00	06/04/1982	--
81	SC01309108CBB1	Colorado Westmoreland Inc.	Mesaverde Formation	7,754	928	909.00	11/07/1981	--
82	SC01309117CBC1	Colorado Westmoreland Inc.	Mesaverde Formation	7,422	690	534.00	07/21/1982	--
83	SC01309118BDA1	Colorado Westmoreland Inc.	Mesaverde Formation	8,597	1,963	Dry	--	--
84	SC01309210CDA1	Colorado Westmoreland Inc.	Mesaverde Formation	8,578	2,035	1,199.00	07/21/1982	--
85	SC01309211CBA1	Colorado Westmoreland Inc.	Mesaverde Formation	8,253	1,420	--	--	--
86	SC01309211DBB1	Colorado Westmoreland Inc.	Mesaverde Formation	8,565	2,073	1,140.00	07/21/1982	--
87	SC01309214AAB1	Colorado Westmoreland Inc.	Mesaverde Formation	7,932	1,345	1,238.00	07/29/1982	07/29/1982
88	SC01309214CBD1	U.S. Bureau of Land Management	Mesaverde Formation	7,480	509	148.95	09/13/1977	08/16/1981
89	SC01309214DBD1	Colorado Westmoreland Inc.	Mesaverde Formation	8,161	1,100	1,067.00	07/21/1982	--
90	SC01309215ABD1	Colorado Westmoreland Inc.	Mesaverde Formation	8,310	1,655	1,044.00	07/21/1982	08/04/1982
91	SC01309215BAC1	Colorado Westmoreland Inc.	Mesaverde Formation	8,193	1,545	1,372.00	07/15/1982	08/03/1982
92	SC01309215BDD1	Colorado Westmoreland Inc.	Mesaverde Formation	8,196	1,475	999.00	07/25/1982	--
93	SC01309215DAC1	Colorado Westmoreland Inc.	Mesaverde Formation	7,762	922	646.00	07/21/1982	--
94	SC01309215DCC1	Colorado Westmoreland Inc.	Mesaverde Formation	8,045	1,169	818.00	07/21/1982	--
95	SC01309219CDB1	Hotchkiss, Dick	Mesaverde Formation	8,220	941	500.00	10/23/1977	--
96	SC01309220ACC1	Hotchkiss, Dick	Mesaverde Formation	8,280	700	494.00	09/19/1977	--
97	SC01309228ACB1	U.S. Bureau of Land Management	Mesaverde Formation	8,170	604	245.25	09/17/1977	--
98	SC01309310DBD1	Becker, Charles	Mesaverde Formation	7,680	310	292.50	10/14/1977	--
99	SC01309316AAD	Becker, Charles	Mesaverde Formation	7,480	560	157.80	10/04/1977	--
100	SC01309324CBA1	Scott, Arthur	Mesaverde Formation	8,300	810	806.00	11/01/1977	--
101	SC01309325DAB1	Hotchkiss, Dick	Mesaverde Formation	8,120	560	120.10	10/24/1977	--
102	SC01409108CCA1	Schumard, Wesley	Mancos Shale	5,915	10	0.00	03/29/1979	--
40	SC01409109DAC1	Miller, C. K.	Mancos Shale	6,226	66	--	--	09/17/1974
103	SC01409118CAC1	Elliot, Richard	Alluvium	5,765	30	14.13	03/22/1979	--
46	SC01409202CAA1		Glacial deposits	6,030	--	10.77	03/28/1979	--
104	SC01409209DBA1	Knight, Macdonald	Glacial deposits	5,800	60	26.96	03/28/1979	--
105	SC01409209DBA2	Azoulay, Lionel	Glacial deposits	5,800	60	37.40	08/28/1979	--

Table 3.--*Hydrogeologic data for wells*--Continued

Map location number (see plate 1)	Local identifier (see figure 2)	Owner	Principal aquifer	Altitude (feet)	Well depth (feet)	Depth to water (feet)	Date water level measured	Date sampled (see table 5)
106	SC01409214ABD1	Chinn, C. R.	Mancos Shale	5,680	--	38.00	03/24/1978	03/24/1978
53	SC01409216CCA1	Ross, Harold	Dakota Sandstone	5,480	1,386	Flowing	--	--
55	SC01409219ABC1	Roells, Loel	Glacial deposits	5,675	39	27.89	03/24/1979	--
107	SC01409220ABD1	Bramlett, J.	Alluvium	5,510	24	10.00	09/ /1974	09/18/1974
108	SC01409229CAA1	Wayne, Webster	Alluvium	5,348	30	7.00	09/ /1974	--
109	SC01409304BAD1	Knight, Macdonald	Glacial deposits	6,580	99	59.46	08/29/1979	--
110	SC01409305CCB1	Kinderkmcht, Alta	Glacial deposits	6,680	185	110.40	03/24/1979	--
111	SC01409323BAB1	Mohan	Glacial deposits	6,120	215	96.79	03/29/1979	--
64	SC01409325ABA1	Coutts, Mary	Glacial deposits	5,620	38	24.78	03/24/1979	--
112	SC01409325CCD1	Smith, Paul	Glacial deposits	5,515	132	112.99	10/16/1977	--
113	SC01409326CCC1	Blees, Dewey	Glacial deposits	5,632	140	74.00	03/10/1978	04/15/1978
114	SC01409327CCC1	Barrett, Harry	--	5,680	119	107.00	--	--
115	SC01409328BBA1	White, Melvin	Glacial deposits	5,785	110	44.00	03/31/1978	03/31/1978
116	SC01509120ACC1	Todd, Lary	Mancos Shale	6,400	--	3.25	04/16/1978	04/16/1978
117	SC01509303AAA1	Roberts	Glacial deposits	5,385	--	67.14	03/23/1979	--
118	SC01509303AAA2	Roberts	Glacial deposits	5,485	113	71.00	03/23/1979	--
119	SC01509305AAA1	Greenwood, Ernest	Glacial deposits	5,440	--	13.84	03/23/1979	--

Table 4.--*Hydrogeologic data for springs*

Map number (see plate 1)	Local identifier (see figure 2)	Owner	Principal aquifer	Altitude (feet)	Discharge (gallons per minute)	Date discharge measured	pH	Specific conductance (microsiemens per centimeter at 25 degrees Celsius)	Date sampled
120	SC01009032ABD1	--	--	7,880	--	--	7.2	490	07/12/1978
121	SC01108911CDD1	--	Wasatch Formation	9,230	--	--	6.6	115	07/12/1978
122	SC01108932BAD1	--	Alluvium	6,880	20	07/13/1978	8.2	205	07/13/1978
123	SC01109011ADA1	--	Wasatch Formation	7,460	--	--	7.0	260	07/12/1978
124	SC01109012BCA1	--	--	7,450	--	--	6.7	370	07/13/1978
125	SC01109013AAA1	--	Wasatch Formation	7,490	--	--	7.0	270	07/13/1978
126	SC01109013BDB1	--	Wasatch Formation	7,200	--	--	7.2	320	07/13/1978
127	SC01109027AAC1	Spadadora	Wasatch Formation	7,500	20	07/12/1978	7.5	285	07/12/1978
128	SC01109110BDB1	--	Wasatch Formation	8,680	1*	07/11/1978	7.2	170	07/11/1978
129	SC01109110DAB1	Flying M Ranch	Glacial deposits	8,350	2*	07/11/1978	--	500	07/11/1978
130	SC01208909ABB1	--	Alluvium	7,880	--	--	6.9	70	07/13/1978
131	SC01208921ACC1	--	Alluvium	7,270	--	--	6.8	230	07/13/1978
132	SC01208927ACC1	Bear, Rudolph	Alluvium	7,350	20	04/15/1978	6.4	315	04/15/1978
133	SC01209111ACD1	--	Wasatch Formation	7,500	1*	07/11/1978	--	170	07/11/1978
134	SC01209132CBD1	U.S. Forest Service	Glacial deposits	8,720	1*	07/11/1978	7.5	225	07/11/1978
135	SC01209208CCC1	U.S. Forest Service	Glacial deposits	9,700	10*	07/10/1978	7.0	--	07/10/1978
136	SC01209312CDD1	U.S. Forest Service	Glacial deposits	9,800	2*	07/10/1978	6.2	--	07/10/1978
137	SC01209312DDD1	U.S. Forest Service	Glacial deposits	9,750	1*	07/10/1978	5.8	--	07/10/1978
138	SC01308731CAD1	--	Wasatch Formation	9,290	--	--	7.7	140	07/25/1978
139	SC01308734CBA	--	--	10,385	--	--	--	--	--
140	SC01308806CBB1	U.S. Forest Service	Mesaverde Formation	6,780	25*	03/23/1978	7.3	52	03/23/1978
141	SC01308902CBC1	--	Wasatch Formation	7,220	--	--	6.4	110	07/13/1978
142	SC01308912BDA1	--	Wasatch Formation	7,400	--	--	7.4	150	07/25/1978
143	SC01308912CBD1	Norris	Wasatch Formation	7,560	--	--	6.7	170	07/25/1978
144	SC01308914BBC1	--	Wasatch Formation	7,560	--	--	7.0	120	07/24/1978
145	SC01309015CCD1	Bear Coal Company	Mesaverde Formation	6,580	--	--	7.1	585	04/14/1978
146	SC01309032AAB1	--	Mesaverde Formation	7,420	5.0	07/25/1978	7.3	480	07/25/1978
147	SC01309034BCA1	--	Mesaverde Formation	7,670	10	07/26/1978	7.1	330	07/26/1978
148	SC01309105BCC1	Colorado Westmoreland Inc.	Alluvium	7,570	2.0	08/18/1982	7.1	398	08/18/1982
149	SC01309105CDC1	U.S. Bureau of Land Management	Alluvium	7,280	1.5	08/18/1982	8.1	666	08/18/1982
150	SC01309105DCB1	U.S. Bureau of land Management	--	7,270	3.3	08/16/1982	--	--	--
151	SC01309105DCC1	U.S. Bureau of Land Management	Alluvium	7,190	8.4	08/11/1982	8.1	644	08/11/1982
152	SC01309107ADC1	Colorado Westmoreland Inc.	Alluvium	7,840	0.22	08/10/1982	5.8	502	08/10/1982
153	SC01309108DBC1	U.S. Bureau of Land Management	Alluvium	7,180	--	--	--	--	--
154	SC01309202ABA1	U.S. Bureau of Land Management	Alluvium	8,180	1.0	08/17/1982	6.8	367	08/17/1982

Table 4.--*Hydrogeologic data for springs*--Continued

Map location number (see plate 1)	Local identifier (see figure 2)	Owner	Principal aquifer	Altitude (feet)	Discharge (gallons per minute)	Date discharge measured	pH	Specific conductance (microsiemens per centimeter at 25 degrees Celsius)	Date sampled
155	SC01309202ABB1	Morrell, J. A.	Alluvium	8,230	0.75	08/17/1982	8.0	437	08/17/1982
156	SC01309203CAB1	ABMSS Investment	Alluvium	9,200	0.58	08/11/1982	6.2	242	08/11/1982
157	SC01309203DAA1	Rozman	Alluvium	9,000	6.0	08/11/1982	5.5	266	08/11/1982
158	SC01309210ACC1	Gross-Rhode, N. W.	Alluvium	8,780	5.2	08/16/1982	6.1	269	08/16/1982
159	SC01309210BAA1	Gross-Rhode, N. W.	Alluvium	9,020	4.8	08/17/1982	6.4	313	08/17/1982
160	SC01309210DBB1	Gross-Rhode, N. W.	Alluvium	8,725	0.02	08/18/1982	6.4	349	08/18/1982
161	SC01309211CDB1	Colorado Westmoreland Inc.,	Alluvium	8,160	3.8	08/19/1982	7.3	501	08/19/1982
162	SC01309213ACA1	Colorado Westmoreland Inc.	Alluvium	7,980	2.7	08/12/1982	7.3	678	08/12/1982
163	SC01309215ABC1	U.S. Bureau of Land Management	Alluvium	8,005	0.16	08/12/1982	7.2	631	08/12/1982
164	SC01408803ACA1	--	Mesaverde Formation	9,620	--	--	6.8	55	07/14/1978
165	SC01408803ACB1	--	Mesaverde Formation	9,450	--	--	7.3	70	07/14/1978
166	SC01409018ACB1	--	Alluvium	7,300	--	--	7.1	380	07/19/1978
167	SC01409114AAC1	U.S. Forest Service	Mancos Shale	7,500	1.0	03/31/1978	8.2	3,000	03/31/1978
168	SC01409114ADA1	--	Mancos Shale	7,550	--	--	7.5	8,000	07/18/1978
169	SC01409114BCD1	--	Mancos Shale	7,380	--	--	--	75	07/18/1978
170	SC01409122CAB1	--	Mancos Shale	7,270	--	--	7.1	180	07/17/1978
171	SC01409125ACD1	--	Alluvium	9,120	1.0	07/20/1978	7.9	120	07/20/1978
172	SC01409125ADC1	--	Alluvium	9,200	5.0	07/20/1978	8.1	160	07/20/1978
173	SC01409127CAC1	--	Mancos Shale	7,630	--	--	8.0	175	07/17/1978
174	SC01409127CBC1	--	Mancos Shale	7,400	--	--	7.6	170	07/17/1978
175	SC01409128AAD1	--	Mancos Shale	7,250	5.0	07/17/1978	7.7	200	07/17/1978
176	SC01409133BAA1	U.S. Forest Service	Glacial deposits	7,190	25*	06/02/1978	7.0	62	06/02/1978
177	SC01409336BAC1	--	Glacial deposits	5,375	15*	03/23/1979	7.5	875	03/23/1979
178	SC01509104BBC1	--	Mancos Shale	7,600	--	--	--	130	07/18/1978
179	SC01509104BCA1	--	Mancos Shale	7,630	--	--	8.3	--	07/18/1978
180	SC01509105AAD1	--	Mancos Shale	7,510	5.0	07/18/1978	7.9	50	07/18/1978
181	SC01509109BCB1	Town of Crawford	Glacial deposits	7,540	110	06/01/1978	6.9	100	06/01/1978
182	SC01509213BCD1	Abrahamson	Mancos Shale	5,960	30*	03/23/1978	7.1	3,500	03/23/1978
183	SC01509303DDB1	Colorado Wildlife Division	Glacial deposits	5,370	1,850	03/30/1978	8.0	825	03/30/1978

*Estimated discharge.

Table 5.--*Chemical analyses of water samples from wells and springs*

[Local identifier, location of well or spring (see figure 2); μs/cm, microsiemens per centimeter at 25 degrees Celsius; °C, degree Celsius; mg/L, milligrams per liter; μg/L, micrograms per liter; <, less than; ND, not detected]

Map location number (see plate 1)	Local identifier	Principal aquifer	Site type	Date of sample	Well depth (feet)	Specific conductance (μs/cm)	pH	Water temperature (°C)	Hardness (mg/L)	Calcium (mg/L)	Magnesium (mg/L)
140	SC01308806CBB1	Mesaverde Formation	Spring	03-23-78	--	52	7.3	4.5	36	11	2
75	SC01308907BDB1	Alluvium	Well	05-29-74	30	171	7.7	8.0	73	21	4.9
76	SC01309010DCC1	Mesaverde Formation	Well	05-29-74	63	877	7.7	15.0	300	93	17
145	SC01309015CCD1	Mesaverde Formation	Spring	04-14-78	--	585	7.1	25.0	200	48	20
148	SC01309105BCC1	Alluvium	Spring	08-18-82	--	398	7.1	8.5	180	47	15
149	SC01309105CDC1	Alluvium	Spring	08-18-82	--	666	8.1	10.5	240	60	22
151	SC01309105DCC1	Alluvium	Spring	08-11-82	--	644	8.1	16.0	280	70	25
152	SC01309107ADC1	Alluvium	Spring	08-10-82	--	502	5.8	8.0	200	49	19
154	SC01309202ABA1	Alluvium	Spring	08-17-82	--	367	6.8	5.0	120	40	4.8
155	SC01309202ABB1	Alluvium	Spring	08-17-82	--	437	8.0	8.0	160	51	8.7
156	SC01309203CAB1	Alluvium	Spring	08-11-82	--	242	6.2	11.5	120	28	11
157	SC01309203DAA1	Alluvium	Spring	08-11-82	--	266	5.5	13.0	91	25	6.8
158	SC01309210ACC1	Alluvium	Spring	08-16-82	--	269	6.1	10.0	120	28	13
159	SC01309210BAA1	Alluvium	Spring	08-17-82	--	313	6.4	12.0	140	33	15
160	SC01309210DBB1	Alluvium	Spring	08-18-82	--	349	6.4	15.5	180	41	19
161	SC01309211CDB1	Alluvium	Spring	08-19-82	--	501	7.3	11.0	200	44	21
162	SC01309213ACA1	Alluvium	Spring	08-12-82	--	678	7.3	9.5	280	69	25
87	SC01309214AAB1	Mesaverde Formation	Well	07-29-82	1,050	2,500	8.4	27.0	43	12	3.1
88	SC01309214CBD1	Mesaverde Formation	Well	08-16-81	683	750	7.3	11.0	150	38	14
163	SC01309215ABC1	Alluvium	Spring	08-12-82	--	631	7.2	15.0	300	84	21
90	SC01309215ABD1	Mesaverde Formation	Well	08-04-82	1,650	2,820	7.1	19.5	8	2.1	.70
93	SC01309215DAC1	Mesaverde Formation	Well	08-03-82	--	4,230	7.5	21.5	37	9	3.2
40	SC01409109DAC1	Mancos Shale	Well	09-17-74	66	9,420	--	15.0	3,200	390	530
167	SC01409114AAC1	Mancos Shale	Spring	03-31-78	--	3,100	8.2	11.0	1,600	220	250
176	SC01409133BAA1	Glacial deposits	Spring	06-02-78	--	62	7.0	3.0	27	7.5	2
106	SC01409214ABD1	Dakota Sandstone	Well	05-21-75	1,900	3,200	6.6	41.0	410	110	34
		Dakota Sandstone	Well	04-11-76	1,900	3,100	6.5	42.0	410	110	32
		Dakota Sandstone	Well	03-24-78	1,900	3,000	6.4	42.0	470	130	35
107	SC01409220ABD1	Alluvium	Well	09-18-74	24	2,700	--	13.0	1,300	320	130
113	SC01409326CCC1	Glacial deposits	Well	04-15-78	140	860	7.5	14.5	310	64	37
115	SC01409328BBA1	Glacial deposits	Well	03-31-78	110	535	7.5	13.0	280	56	34
177	SC01409336BAC1	Glacial deposits	Spring	03-23-79	--	875	7.5	13.5	420	86	50
181	SC01509109BCB1	Glacial deposits	Spring	06-01-78	--	100	6.9	7.5	38	12	1.9
116	SC01509120ACC1	Mancos Shale	Well	04-16-78	--	2,000	7.0	13.0	810	190	79
182	SC01509213BCD1	Mancos Shale	Spring	03-23-78	--	3,500	7.1	10.5	2,500	530	290
183	SC01509303DDB1	Glacial deposits	Spring	03-30-78	--	825	8.0	14.0	350	60	48

Table 5.--*Chemical analyses of water samples from wells and springs*--Continued

Local identifier	Date of sample	Sodium (mg/L)	Percent sodium	Sodium absorb-tion ratio	Potas-ium (mg/L)	Bicar-bonate (mg/L)	Field alka-linity (mg/L)	Sulfate (mg/L)	Chlo-ride (mg/L	Fluo-ride (mg/L)
SC01308806CBB1	03-23-78	2.9	15	0.2	0.40	41	34	5.7	1.5	0.10
SC01308907BDB1	05-29-74	9.6	22	.5	1.0	97	80	7.4	.90	.10
SC01309010DCC1	05-29-74	83	37	2	1.8	380	314	110	30	<.10
SC01309015CCD1	04-14-78	66	41	2	1.9	350	290	50	2.9	.20
SC01309105BCC1	08-18-82	45	35	2	1.2	--	--	25	3.7	.20
SC01309105CDC1	08-18-82	50	31	1	2.2	--	--	23	4.4	.20
SC01309105DCC1	08-11-82	55	30	1	2.6	--	--	22	5.9	.20
SC01309107ADC1	08-10-82	42	31	1	2.2	--	--	14	4.0	.30
SC01309202ABA1	08-17-82	34	38	1	2.5	--	--	12	1.0	.20
SC01309202ABB1	08-17-82	25	25	.9	2.3	--	--	20	1.4	.20
SC01309203CAB1	08-11-82	7	11	.3	2.2	--	--	<5.0	.60	.10
SC01309203DAA1	08-11-82	24	36	1	.90	--	--	5.0	3.8	.20
SC01309210ACC1	08-16-82	7.2	11	.3	2.1	--	--	<5.0	1.3	.20
SC01309210BAA1	08-17-82	9.2	12	.3	2.8	--	--	<5.0	1.4	.20
SC01309210DBB1	08-18-82	9.6	10	.3	1.7	--	--	6.0	2.4	.20
SC01309211CDB1	08-19-82	38	30	1	1.0	--	--	9.0	3.0	.20
SC01309213ACA1	08-12-82	56	31	2	1.7	--	--	62	6.0	.20
SC01309214AAB1	07-29-82	650	95	45	23	--	--	43	130	1.4
SC01309214CBD1	08-16-81	140	66	5	2.8	--	--	50	4.4	.30
SC01309215ABC1	08-12-82	24	15	.6	1.2	--	--	36	6.3	.30
SC01309215ABD1	08-04-82	750	99	120	6.5	--	--	<5.0	56	3.5
SC01309215DAC1	08-03-82	1,300	98	98	13	--	--	11	180	1.9
SC01409109DAC1	09-17-74	1,500	51	12	25	940	769	5,200	88	.30
SC01409114AAC1	03-31-78	410	36	5	7.8	340	280	2,000	27	.60
SC01409133BAA1	06-02-78	2.9	19	.3	.10	30	25	5.5	.70	<.10
SC01409214ABD1	05-21-75	610	74	13	36	1,540	1,260	58	370	2.4
	04-11-76	570	73	13	41	760	896	--	400	2.5
	03-24-78	620	72	13	44	1,520	1,250	110	380	2.2
SC01409220ABD1	09-18-74	190	23	2	11	370	304	1,400	14	.60
SC01409326CCC1	04-15-78	110	42	3	12	410	340	210	6.4	.50
SC01409328BBA1	03-31-78	19	12	.5	7.7	310	250	71	2.1	1.1
SC01409336BAC1	03-23-79	92	31	2	13	--	340	260	13	.50
SC01509109BCB1	06-01-78	5.1	23	.4	.10	51	42	7.4	3.7	.10
SC01509120ACC1	04-16-78	290	44	5	12	560	460	870	57	1.2
SC01509213BCD1	03-23-78	420	27	4	14	450	370	2,800	6.0	.80
SC01509303DDB1	03-30-78	85	33	2	17	430	350	160	6.3	.60

Table 5.--*Chemical analyses of water samples from wells and springs*--Continued

Local identifier	Date of sample	Dis-solved solids (mg/L)	Nitrite and ni-trate as ni-trogen (mg/L)	Ortho phos-phorus (mg/L)	Ortho phos-phate (mg/L)	Alum-inum (ug/L)	Boron (ug/L)	Cadmium (ug/L)	Chro-mium (ug/L)	Coppe (ug/L
SC01308806CBB1	03-23-78	56	.390	.030	.09	80	0	ND	--	2
SC01308907BDB1	05-29-74	110	<.100	.020	.06	--	<20	--	--	--
SC01309010DCC1	05-29-74	540	.060	.010	.03	--	50	--	--	--
SC01309015CCD1	04-14-78	370	.350	.010	.03	<100	50	4	--	14
SC01309105BCC1	08-18-82	290	.210	.020	.06	<10	130	<1	<10	<1
SC01309105CDC1	08-18-82	370	.240	.090	.28	<10	130	<1	<10	<1
SC01309105DCC1	08-11-82	400	<.100	--	--	10	40	<1	<10	<1
SC01309107ADC1	08-10-82	330	.500	<.010	--	<10	10	<1	<10	<1
SC01309202ABA1	08-17-82	220	.110	.010	.03	10	130	<1	<10	<1
SC01309202ABB1	08-17-82	250	<.100	<.010	--	10	130	<1	<10	<1
SC01309203CAB1	08-11-82	--	.190	.030	.09	20	<10	<1	<10	3
SC01309203DAA1	08-11-82	170	.790	--	--	20	<10	<1	<10	11
SC01309210ACC1	08-16-82	--	.440	.270	.83	<10	110	<1	<10	1
SC01309210BAA1	08-17-82	--	.270	.120	.37	10	110	<1	10	4
SC01309210DBB1	08-18-82	230	<.100	.030	.09	10	120	1	<10	1
SC01309211CDB1	08-19-82	310	2.10	.020	.06	10	110	<1	<10	<1
SC01309213ACA1	08-12-82	410	.240	--	--	20	30	<1	<10	<1
SC01309214AAB1	07-29-82	1,700	.390	.080	.25	120	1,000	<1	<10	23
SC01309214CBD1	08-16-81	490	.190	.030	.09	10	80	1	10	4
SC01309215ABC1	08-12-82	370	<.100	--	--	10	30	<1	<10	1
SC01309215ABD1	08-04-82	--	<.100	.010	.03	<10	2,000	<1	<10	<1
SC01309215DAC1	08-03-82	3,200	<.100	.020	.06	40	2,000	<10	10	1
SC01409109DAC1	09-17-74	8,200	3.80	.030	.09	--	1,000	--	--	--
SC01409114AAC1	03-31-78	3,100	--	.010	.03	20	330	2	<20	4
SC01409133BAA1	06-02-78	43	.600	.040	.12	10	<20	ND	--	ND
SC01409214ABD1	05-21-75	2,000	.010	.040	.12	--	--	--	--	--
	04-11-76	--	<.100	.020	.06	--	1,700	--	--	--
	03-24-78	2,100	.570	.020	.06	10	1,800	ND	--	ND
SC01409220ABD1	09-18-74	2,300	1.60	.060	.18	--	360	--	--	--
SC01409326CCC1	04-15-78	680	1.10	.020	.06	<100	180	<2	--	2
SC01409328BBA1	03-31-78	380	.380	.010	.03	10	90	ND	--	4
SC01409336BAC1	03-23-79	760	3.20	.040	.12	10	130	--	--	ND
SC01509109BCB1	06-01-78	69	.430	.030	.09	40	70	ND	--	<2
SC01509120ACC1	04-16-78	1,800	.130	<.010	.00	<100	770	<2	--	ND
SC01509213BCD1	03-23-78	4,300	4.00	.010	.03	<100	590	<2	--	6
SC01509303DDB1	03-30-78	630	1.50	.020	.06	10	150	ND	--	3

Table 5.--*Chemical analyses of water samples*--Continued

Local identifier	Date of sample	Iron (µg/L)	Lead (µg/L)	Manganese (µg/L)	Mercury (µg/L)	Nickel (µg/L)	Selenium (µg/L)	Zinc (µg/L)	Organic carbon (mg/L)
SC01308806CBB1	03-23-78	50	ND	<10	<0.1	3	<1	ND	1.1
SC01308907BDB1	05-29-74	90	--	<10	--	--	--	--	--
SC01309010DCC1	05-29-74	30	--	120	--	--	--	--	--
SC01309015CCD1	04-14-78	40	5	<10	<.1	2	1	1,000	2.8
SC01309105BCC1	08-18-82	<3	<1	2	.3	<1	2	4	--
SC01309105CDC1	08-18-82	<3	<1	8	.1	<1	2	<3	--
SC01309105DCC1	08-11-82	4	1	17	<.1	<1	1	19	--
SC01309107ADC1	08-10-82	<3	<1	2	<.1	<1	1	11	--
SC01309202ABA1	08-17-82	5	7	15	1.0	1	1	4	--
SC01309202ABB1	08-17-82	11	<1	82	.5	1	<1	4	--
SC01309203CAB1	08-11-82	4	<1	<1	.7	<1	<1	7	--
SC01309203DAA1	08-11-82	12	<1	3	<.1	<1	<1	63	--
SC01309210ACC1	08-16-82	6	<1	2	.1	<1	<1	89	--
SC01309210BAA1	08-17-82	4	<1	<1	<.1	<1	<1	52	--
SC01309210DBB1	08-18-82	11	<1	14	<.1	3	<1	8	--
SC01309211CDB1	08-19-82	10	<1	35	<.1	15	1	10	--
SC01309213ACA1	08-12-82	5	<1	1	<.1	<1	2	48	--
SC01309214AAB1	07-29-82	420	<1	40	.1	10	7	50	--
SC01309214CBD1	08-16-81	26	1	66	.0	1	0	39	3.7
SC01309215ABC1	08-12-82	6	<1	9	<.1	<1	1	70	--
SC01309215ABD1	08-04-82	100	<1	40	<.1	<1	<1	10	--
SC01309215DAC1	08-03-82	310	5	120	.1	5	<1	83	--
SC01409109DAC1	09-17-74	50	--	120	--	--	<1	--	--
SC01409114AAC1	03-31-78	50	10	60	<.1	6	18	<20	11
SC01409133BAA1	06-02-78	20	2	<10	<.1	ND	<1	<20	3.6
SC01409214ABD1	05-21-75	110	--	790	--	--	--	--	--
	04-11-76	100	--	880	--	--	--	--	--
	03-24-78	100	ND	800	.3	ND	<1	20	.90
SC01409220ABD1	09-18-74	80	--	30	--	--	36	--	--
SC01409326CCC1	04-15-78	40	6	<10	<.1	2	2	30	1.2
SC01409328BBA1	03-31-78	20	4	<10	<.1	2	4	20	1.8
SC01409336BAC1	03-23-79	20	20	<10	<.1	ND	6	20	--
SC01509109BCB1	06-01-78	<10	2	<10	<.1	ND	<1	<20	1.8
SC01509120ACC1	04-16-78	2,100	5	80	<.1	3	<1	30	.40
SC01509213BCD1	03-23-78	70	ND	450	<.1	<2	13	30	12
SC01509303DDB1	03-30-78	20	2	<10	<.1	4	6	ND	1.7

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