Remarks: Crest-stage gage indicates record from a gage installed to record annual-peak discharges, the gaged stream in most cases is intermittent or ephemeral.

Remarks

Discharge affected by reservoir

Diversions upstream from station

Gage heights only from 1909 to

1911; discharge affected by

reservoir regulation and

irrigation diversions.

regulation and irrigation

for irrigation.

Crest-stage gage.

Crest-stage gage.

Average annual discharge

Acre-feet of

per year record

74,620 35

956 | 1972-81 | 84.0 | 60,860 | 9 | 2,880 | Sept. 11, 1975 | 0.68

9 2,060

9,720 Sept. 11, 1980

5,340 Sept. 21, 1962

3,720 Sept. 21, 1962

19,500 Sept. 21, 1962

Drainage Period of

(square (water

3.6 1959-68

10 1959-74

4.4 1959-74

1,540 | 1909-11 | 103

1945-81

1959-68

09314250 Price River below Miller Creek,

09314374 Horse Canyon near Sunnyside

2 09314280 Desert Seep Wash near

4 09314400 Coleman Wash tributary

5 09314500 Price River at Woodside

6 09315150 Saleratus Wash tributary

8 09315400 Saleratus Wash above Cotton-

near Wellington

near Woodside

Saleratus Wash tributary No. 2

wood Wash, near Green River

record

191 1973–81 22.6 16,370

Recorded extremes (cubic feet per second)

Minimum

June 25, 1965

Recorded extremes (cubic feet per second)

Minimum

Remarks

Maximum discharge caused by

dam failure upstream from

Discharge affected by trans-

Discharge affected by reservoir

indicated location. Discharge

affected by reservoir regulation

and numerous diversions.

regulation and diversions.

mountain and irrigation

diversions.

Crest-stage gage.

INTRODUCTION

MISCELLANEOUS INVESTIGATIONS SERIES

MAP I-1514

This is one of a series of maps that describe the geology and related natural resources of the Huntington 30  $\times$  60-minute quadrangle, Utah. Streamflow records used to compile this map were collected by the U.S. Geological Survey in cooperation with the Utah Department of Natural Resources, Division of Water Rights, and the Utah Department of Transportation. The principal runoffproducing area shown on the map was delineated from a work map (scale 1:250,000) compiled to estimate water yields in Utah (Bagley and others, 1964). Sources of information about recorded floods resulting from cloudbursts included Woolley (1946) and Butler and Marsell (1972); sources of information about the chemical quality of streamflow included Mundorff (1972) and Mundorff and Thompson (1982).

## DRAINAGE BASINS

The Huntington 30 x 60-minute quadrangle comprises about 1,840 square miles. About 86 percent of the area is in the Price and San Rafael River basins, and the remaining 14 percent is in the Uinta Basin. The entire area drains to the Green River, a major tributary of the Colorado River. Principal streams in the area include the Green, Price, and San Rafael Rivers and Huntington, Cottonwood, and Ferron Creeks. All these streams originate west or north of

Estimated mean annual runoff in the most of the area is less than 1 inch (less than 54 acre-feet per square mile). The only part of the area where mean annual runoff is estimated to exceed 1 inch is the Book Cliffs-Roan Cliffs area. In that area, it ranges from 1 to 4 inches (less than 54 to about 200 acre-feet per square mile). Most of that runoff is to Range Creek, which drains directly to the Green River.

Runoff in the area varies considerably from year to year depending on annual variability of precipitation. An indication of the annual variability of the runoff is the annual runoff graph for the Price River at site 5. As the graph shows, annual runoff at the site ranged from about 22,700 acre-feet during water year 1977 to about 247,800 acre-feet during water year 1952. Most runoff into the area occurs during April-July as indicated by the graphs showing monthly runoff in the Price River (site 5), the San Rafael River (site 13), and Desert Seep Wash (site 2). This seasonal peak runoff into the area is due chiefly to the melting of winter snowpacks in the higher plateaus immediately west and north of the area. The continued relatively large runoff (from August to November) in Desert Seep Wash at site 2 may be due to inflow of seepage and return flow from irrigated

land in Castle Valley. Most discharge in the intermittent and ephemeral streams, and a significant volume of discharge in the perennial streams, results from summer cloudbursts. Although these storms usually are localized and generally last less than an hour, the rainfall intensity is great enough to produce floodflows of more than 1,000 cubic feet per second from drainage basins of only a few square miles. As shown in the following table, for example, a discharge of more than 3,700 cubic feet per second occurred in Saleratus Wash Tributary No. 2 at site 7 on September 21, 1962. The drainage area upstream from site 7 is only 4.4 square miles, and the cloudburst that caused the flood may have passed over only a part of that

drainage area. Floods resulting from cloudbursts have occurred or will occur in most drainages in the map area at one time or another. Because of their large volumes of water, rapid velocities, and intensive erosive power, they commonly cause damage to the natural environment. They also can cause considerable property damage in populated areas. As shown on this map, several floods resulting from cloudbursts have been recorded in the area since 1850, and many unrecorded

floods probably also have occurred in the predominantly remote areas. The small scale of this map precludes delineation of flood-prone areas within the few communities of the area; however, large-scale maps showing such areas are published and distributed by the U.S. Department of Housing and Urban Development. Readers are referred to that agency for the most recent information about flood-prone areas in the communities shown on the map. Alluvial plains and channels of most streams (including dry washes) may be considered as floodprone areas subject to flooding during cloudbursts. Because of this, travelers especially need to avoid deep, narrow canyons during cloudbursts.

Department of Natural Resources, continues to collect streamflow records at several of the gaging stations listed in the following table. These records are available in the files of the U.S. Geological Survey, Salt Lake City, Utah, and in the U.S. Geological Survey report series "Water Resources Data for Utah," of which the most recent edition (1982) is included in the list of references cited.

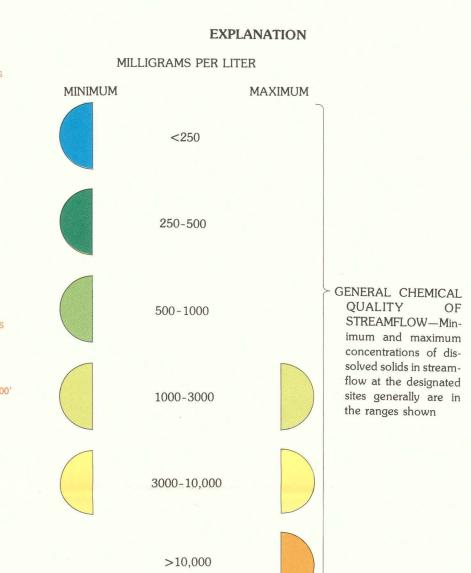
## **SURFACE-WATER QUALITY**

Surface water in the area ranges from fresh to very saline according to the following classification commonly used by the U.S. Geological Survey:

Class	Dissolved-solids concentration (milligrams per liter)
Fresh	Less than 1,000
Slightly saline	1,000 to 3,000
Moderately saline	3,000 to 10,000
Very saline	10,000 to 35,000
Briny	More than 35,000

The freshest water, generally containing less than 500 milligrams per liter of dissolved solids, may be found in the Green River and Huntington, Cottonwood, and Range Creeks during peak-runoff periods. The most saline water, with dissolved-solids concentrations commonly exceeding 5,000 milligrams per liter and locally exceeding 10,000 milligrams per liter, are mostly found in the intermittent and ephemeral streams that drain Castle Valley. The principal source of the large dissolved-solids concentrations in those streams is the Mancos Shale of Cretaceous age. This formation and the soils developed on it contain large quantities of soluble salt. Natural runoff from the formation and irrigation water applied to soils developed on it readily dissolve the salt and transport it to the

Considerably more water-quality data for the area are available than can be shown on this map. Readers interested in more detailed information about the quality of surface water in the area are referred to Mundorff (1972) and Mundorff and Thompson (1982). In addition, records of the quality of streamflow at sites 5, 13, and 15 are published annually by the U.S. Geological Survey. (See U.S. Geological Survey, 1982, for most recent edition.)





REFERENCES CITED

Bagley, J. M., Jeppson, R. W., and Milligan, G. M., 1964, Water yields in Utah:

Butler, Elmer, and Marsell, R. E., 1972, Cloudburst floods in Utah, 1939-69:

Mundorff, J. C., 1972, Reconnaissance of chemical quality of surface water and

Mundorff, J. C., and Thompson, K. R., 1982, Reconnaissance of the quality

U.S. Geological Survey, 1982, Water Resources Data for Utah, water year

Woolley, R. R., 1946, Cloudburst floods in Utah, 1850–1938: U.S. Geological

1981: U.S. Geological Survey Water Data Report 82-1, 708 p.

Resources Technical Publication 39, 55 p.

Survey Water-Supply Paper 994, 128 p.

Natural Resources Technical Publication 72, 53 p.

Utah Division of Water Resources Cooperative Investigations Report 11,

fluvial sediment in the Price River basin, Utah: Utah Department of Natural

of surface water in the San Rafael River basin, Utah: Utah Department of

Utah State University Agricultural Experiment Station Special Report 18,

CONVERSION TABLE

BY

0.001233

0.00047

0.02832

2.540

1.609

2.590

25.40

MULTIPLY

**INCH-POUND** 

UNIT

acre-foot

acre-foot per

second

square mile

square mile

cubic foot per

TO OBTAIN

SI UNIT

cubic hectometer

cubic meter per

square kilometer

second

centimeter

millimeter

kilometer

cubic hectometer per

square kilometer

PRINCIPAL RUNOFF-PRODUCING AREAS—Theoretical mean <1 annual runoff is in the ranges indicated. (Adapted from Bagley and others, 1964)



AREA OF RECORDED FLOOD RESULTING FROM CLOUD-BURSTS—General area in which at least one flood resulting from a cloudburst has been recorded since 1850. (After Woolley, 1946, and Butler and Marsell, 1972)

EXISTING OR DISCONTINUED STREAMFLOW-GAGING STATION—Number corresponds to site number in table SURFACE-WATER-QUALITY SAMPLING SITE—See References

Cited for additional and more detailed water-quality data

— .. — DRAINAGE DIVIDE—Approximately located between the Uinta Basin and the Price and San Rafael River basins

Average annual discharge

Acre-feet

per year

Drainage

area

325

(square

Station name

9 09318500 Huntington Creek near

10 09325000 Cottonwood Creek near

11 09325100 San Rafael River above Ferron

13 09328100 San Rafael River at San Rafael

14 09328200 Buckhorn Draw tributary

15 09315000 Green River at Green River

<sup>1</sup> No flow recorded on several to many days during period of record.

Castle Dale

near Castle Dale

Castle Dale

Castle Dale

Creek, near Castle Dale

Ferron Creek below Paradise

Ranch, near Clawson

Bridge campground, near

Period of

record

(water

years)

1911-17:

1919-21

Cubic feet per

1894–1899; 6,263 4,538,000 82