UNITED STATES DEPARTMENT OF THE INTERIOR
J. A. Krug, Secretary

GEOLOGICAL SURVEY
W. E. Wrather, Director

Water-Supply Paper 1048

# DISCHARGE AND SEDIMENT LOADS IN THE BOISE RIVER DRAINAGE BASIN, IDAHO 1939–40

BY
S. K. LOVE AND P. C. BENEDICT

Prepared in cooperation with the
FLOOD CONTROL COORDINATING COMMITTEE
UNITED STATES DEPARTMENT OF AGRICULTURE



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1948

For sale by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C.
Price 65 cents

# CONTENTS

# ILLUSTRATIONS

# DISCHARGE AND SEDIMENT LOADS IN THE BOISE RIVER DRAINAGE BASIN, IDAHO 1939-40

By S. K. LOVE and P. C. BENEDICT

**ABSTRACT**

The Boise River project is a highly developed agricultural area comprising some 520 square miles of valley and bench lands in southwestern Idaho. Water for irrigation is obtained from the Boise River and its tributaries which are regulated by storage in Arrow Rock and Deer Flat reservoirs. Distribution of water to the farms is effected by 27 principal canals and several small farm laterals which divert directly from the river. The New York Canal, which is the largest, not only supplies water to smaller canals and farm laterals, but also is used to fill Deer Flat Reservoir near Nampa from which water is furnished to farms in the lower valley. During the past 15 years maintenance costs in a number of those canals have increased due to deposition of sediment in them and in the river channel itself below the mouth of Moore Creek.

Interest in determining the runoff and sediment loads from certain areas in the Boise River drainage basin led to an investigation by the Flood Control Coordinating Committee of the Department of Agriculture. Measurements of daily discharge and sediments loads were made by the Geological Survey at 13 stations in the drainage basin during the 18-month period ended June 30, 1940. The stations were on streams in areas having different kinds of vegetative cover and subjected to different kinds of land-use practice. Data obtained during the investigation furnish a basis for certain comparisons of runoff and sediment loads from several areas and for several periods of time.

Runoff measured at stations on the Boise River near Twin Springs and on Moore Creek near Arrow Rock was smaller during 1939 than during 1940 and was below the average annual runoff for the period of available record. Runoff measured at the other stations on the project also was smaller during 1939 than during 1940 and probably did not exceed the average for the previous 25 years.

The sediment loads measured during the spring runoff in 1939 were smaller at most stations than those measured during the spring runoff in 1940. At those stations where the flow was not affected, or only slightly affected, by upstream diversions or by placer-mining operations, the largest sediment loads per unit of drainage area were measured in Grouse Creek during both 1939 and 1940, amounting to 3,460 and 2,490 tons per square mile, respectively, and the smallest loads per unit of drainage area were measured in Bannock Creek during 1939 and in the Boise River near Twin Springs during 1940, amounting to 14 and 83 tons per square mile, respectively.

Size anaylses of a large number of samples of suspended and deposited sediments give an indication of the origin of sediments carried past some of the stations. The analyses show that most of the sediment measured at the five stations in the Moore Creek drainage basin above Idaho City consisted largely of coarse material. They show, also, that the sediment measured at the station on Moore Creek above Thorn Creek consisted almost entirely of fine material during

practically the entire period of the investigation. Most of the coarse material passing the stations above Idaho City probably was retained behind the dikes or in the pools usually formed by tailings from dredging operations in the placer-mining area below Idaho City, and much of the fine material measured at the station on Moore Creek above Thorn Creek probably was contributed by placer-mining activity. During the years when the spring runoff is greater than that measured during 1939 and 1940, it is probable that the dikes and pools will be less effective in retaining coarse sediments within the placered area.

Records of sediment loads measured in the New York Canal indicate that a negligible amount of sediment was deposited there during 1939, but that in 1940 from 10 to 15 percent of the total load at the gaging station consisted of coarse sediment which was later deposited on the canal bottom. Most of the fine material was doubtless carried through the canal and eventually deposited in diversion ditches and on farm land. Because the sediment carried past the station on Moore Creek above Thorn Creek consisted almost entirely of fine material, it is probable that a considerable part of the coarse sediment carried in the New York Canal during the 1940 spring runoff period was scoured from the large bed of deposited material in the Boise River above Diversion Dam, and that the remainder came from Grimes Creek. Arrow Rock Reservoir was not sluiced during the investigation, and it is therefore unlikely that any of the coarse sediment in the New York Canal came from the Boise River above Moore Creek during 1939 and 1940.

The average dry weight of 71 samples of deposited sediments collected from several parts of the Boise River drainage basin is about 90 pounds per cubic foot. The average specific gravity of 77 samples of deposited sediments is 2.57.

## INTRODUCTION

During the 18-month period ended June 30, 1940, under a cooperative arrangement with the Flood Control Coordinating Committee of the Department of Agriculture, the Geological Survey measured runoff and sediment loads at 13 stations on streams in the Boise River drainage basin in Idaho. The project was initiated by the Flood Control Coordinating Committee for the purpose of determining the runoff and sediment loads of certain streams in areas having different kinds of vegetative cover and subjected to different kinds of land-use practice.

Field work was performed by personnel of the Geological Survey under the direction of T. R. Newell, district engineer, Boise, Idaho, who served as the local representative of the Geological Survey. The construction of gaging stations, the measurements of discharge and channel cross sections, and general field operations were under the immediate supervision of P. C. Benedict, engineer. He was assisted in the construction of the gaging stations by J. R. Throckmorton, engineer, and in general field measurements and operations by E. J. Rusho and H. L. Walpole, engineers. The development of sediment-sampling equipment, the collecting of sediment samples and their analysis in the laboratory, and the computation of sediment loads were under the direction of S. K. Love, chemist. He was assisted in the laboratory analysis of samples by H. A. Swenson, chemist. The collecting of sediment samples was done mostly by local help.

Acknowledgements are made to officials of the several interested agencies for their cooperation and assistance during the investigation. Among those who helped plan the work or who furnished information are T. H. Van Meter, project leader, Boise Watershed Survey, who served as the representative of the cooperating agencies of the Department of Agriculture; Guy B. Mains, supervisor, Boise National Forest; W. H. Tuller, manager, Board of Control, Boise Project; R. J. Newell, construction engineer, United States Bureau of Reclamation; W. E. Welsh, watermaster, Boise River; Franklin Girard, Idaho State forester; and the county commissioners of Boise County.

Records collected from the beginning of the investigation to September 30, 1939, are given in two progress reports issued in mimeographed form under the title, "Discharge and silt loads in the Boise River drainage basin, Idaho," The first progress report, issued in November 1939, showed results for the 6-month period ended June 30, 1939, and the second issued in April 1940, covered the 3-month period ended September 30, 1939.

A third report, also mimeographed, was issued in December 1940 under the title, "Discharge and sediment loads in the Boise River drainage basin, Idaho, 1939–40." It contained a brief description of the general features of the Boise River drainage basin and a discussion both of the methods used in the investigation and of the problems involved in the measurement of runoff and sediment loads. It also contained records collected between October 1, 1939, and June 30, 1940, and summarized results for the entire 18-month period.

The present report includes all the basic data given in the mimeographed reports, detailed results of size analyses of sediments most of which were not given in the earlier reports, and other data not previously released. The records of daily discharge obtained during the investigation also are published in Geological Survey Water-Supply Papers 883 and 903.

## BOISE RIVER DRAINAGE BASIN

### GEOGRAPHY

The drainage basin of Boise River is in southwestern Idaho and comprises parts of Camas, Elmore, Boise, Ada, Canyon, Gem, and Payette Counties. It is about 115 miles in length and 60 miles in maximum width, and has an area of about 4,130 square miles. Boise, the capital city of Idaho, is located in the upper end of Boise Valley, 8 miles below the mouth of Boise River Canyon and 22 miles downstream from Arrow Rock Dam. The other principal cities are

Caldwell and Nampa. The Union Pacific Railroad passes through the Valley, crossing the river at Caldwell.

Agriculture is the most important industry, consisting mainly of dairying and general farming. In some parts of the valley, fruit and special crops such as potatoes, peas, and head lettuce are grown. Dry farming and stock raising are carried on in parts of the Moore Creek and South Fork Basins. Sheep and cattle are grazed in the national forests late in spring and during the summer months.

Gold was first discovered near Idaho City, once the Capital of Idaho, in 1862. Since that time placer and hard-rock mining have been carried on in the Moore Creek Basin. Other mining properties have been or are now being operated near Atlanta on the Middle Fork and Rocky Bar on the South Fork.

The mountainous areas of Boise River watershed are in general covered with species of pine, fir, and spruce, depending on elevation, exposure, precipitation, and the condition of the soil. Logging operations have been carried on extensively since the discovery of gold. In 1904 the Barber Lumber Co. constructed a mill and dam at Barber, 7 miles southeast of Boise, and in 1914 the Boise Payette Lumber Co. acquired the property. Logs were shipped from the Idaho City area by rail. Timber cut in the North, Middle, and South Forks Basins was floated down the rivers during the spring runoff each year. Arrow Rock Dam, which was completed in 1917, is provided with a log chute. By 1935 all the readily accessible timber had been logged off and the mill was dismantled. The Boise and Sawtooth National Forests include 2,160 square miles of forested and grazing areas drained by the Boise River and its tributaries. The boundary line of the Boise National Forest crosses Boise River about 2 miles below Arrow Rock Dam. The main drainage features and the location of 13 stream-flow and sediment-measuring stations are shown on the map in plate I.

## TOPOGRAPHY AND DRAINAGE

The topography of the Boise River drainage basin varies from rugged and mountainous in the upper or eastern part of the basin to essentially flat in the lower or western part. Elevations range from a maximum of about 10,000 feet in the Boise River headwaters near Atlanta to about 2,200 feet at Parma near its mouth. The mountainous areas at the higher elevations are in general covered with timber except in regions where extensive logging operations or serious burns have occurred. Areas at lower elevations support only desert vegetation except along stream channels and on irrigated land. The mountains are composed chiefly of granites and comprise about two-thirds of the drainage area. Weathered granites are the source of most of the sediments in the streams. Extensive lava flows have left beds of basalt several hundred feet thick in parts of the valley of the South Fork of the Boise River. Remnants of these flows also are found in the lower part of Moore Creek Basin and in other parts of the Boise River drainage basin.

Boise River, one of the larger tributaries of the Snake River, has a drainage area of 3,820 square miles above the gaging station at Notus. It is formed by the confluence of the North and Middle Forks near Twin Springs. The South Fork, the largest of the major tributaries, discharges into the Boise River just above Arrow Rock Dam. The North and Middle Forks have the most productive watersheds, as their headwaters lie on the western slope of the Sawtooth Mountains. This short range of mountains has some of the highest peaks in southern Idaho and are the source of several other rivers that drain into the Snake River.

The maximum discharge of record (regulated) for the Boise River at the Dowling Ranch gaging station 3 miles below Arrow Rock Dam was 17,600 second-feet in 1928. Moore Creek, the only remaining tributary of any magnitude, discharges into the river about a mile below the Dowling ranch station. The combined drainage area at the mouth of Moore Creek is about 2,650 square miles. The tributary inflow below this point is rather inconsequential except for occasional flood runoff from desert areas from melting snow.

Deer Flat Reservoir, near Nampa, is filled each spring when the runoff is sufficient, by Moore Creek flow and releases from Arrow Rock Reservoir. This water is diverted from the Boise River at Diversion Dam, 8 miles downstream from Moore Creek and is delivered to the reservoir through the New York Canal.

Floods, or the maximum discharge for the Boise River, usually occur during the latter part of May or the first part of June and result from melting snow in the higher mountain areas. The peak discharge for Moore Creek generally occurs in February or March, as a greater part of its drainage area is at a much lower elevation.

## CLIMATE

Winters in the mountainous areas are long and severe. Snowfall is heavy and temperatures below zero are common. Many highways over the high passes are blocked with snow for several months each year. Summers are characterized by warm days and cool nights. At the higher altitudes frosts may be expected during every month of the year.

In the areas at lower altitudes, which include Boise and practically all the irrigated lands, winters are usually mild, although temperatures below zero are experienced at times during some years. Snowfall is ordinarily light, seldom remaining on the ground for more than a few days at a time. Summers are usually hot, but the humidity is seldom high enough to be oppressive. Temperatures of 100° F. and above are not unusual.

Precipitation is heaviest in the mountains and lightest in the plains. Most of the annual precipitation occurs during fall, winter, and spring; summers are usually dry over the entire area. At the higher altitudes a large proportion of the precipitation occurs as snow, a greater part of which reaches the streams as surface runoff, and is largely responsible for the peak discharges experienced in May and June. Part also percolates into the ground to the water table and reaches the streams as ground water runoff which contributes most of the water to the perennial streams during the late summer months.

Monthly and annual precipitation and temperature records for three United States Weather Bureau stations within the Boise River drainage basin are given for the 3-year period ended September 30, 1940, and are shown graphically in figures 1 to 6.

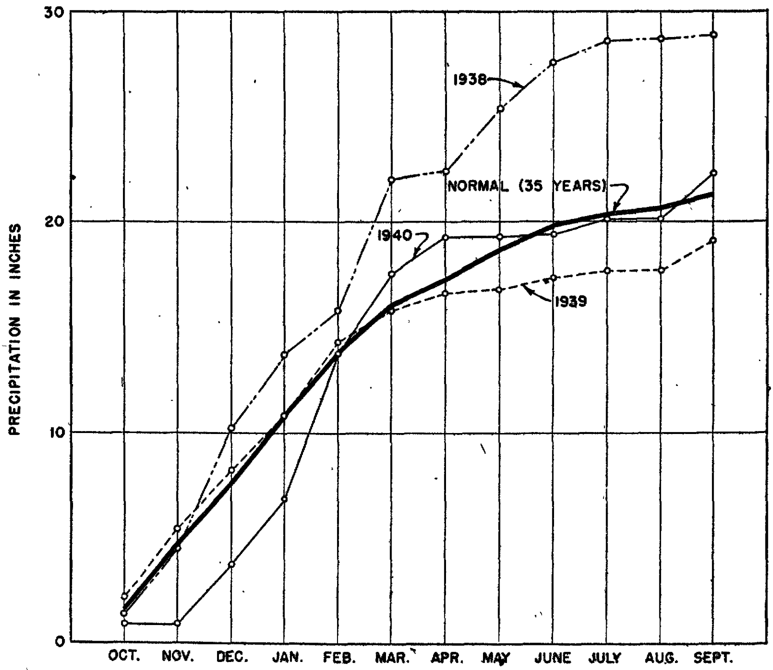



FIGURE 1.—Cumulative precipitation at Idaho City for 3-year period ended September 30, 1940, and the normal for 35 years.

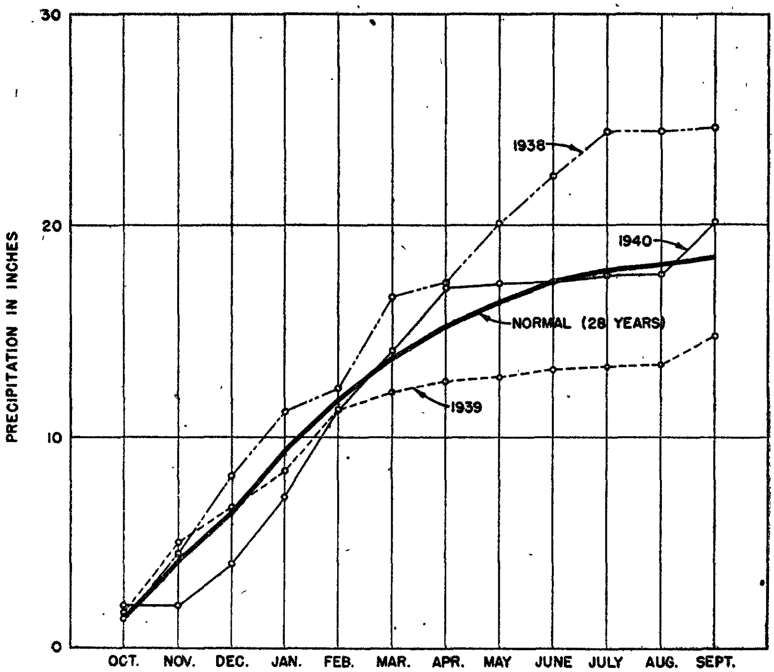



FIGURE 2.—Cumulative precipitation at Arrow Rock for 3-year period ended September 30, 1940, and the normal for 28 years.

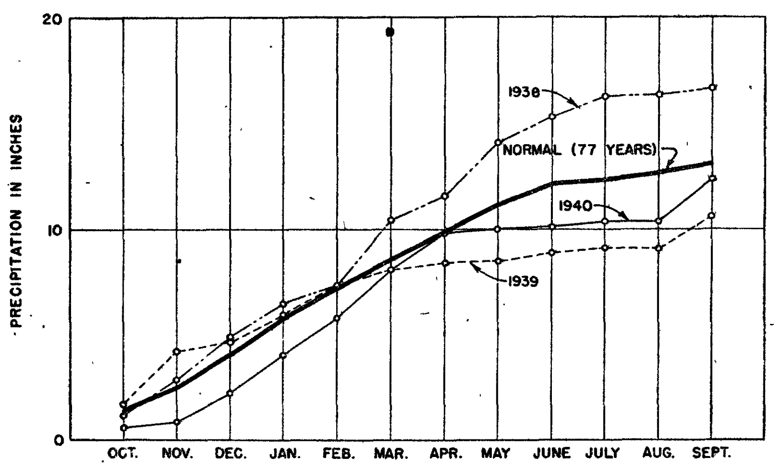



FIGURE 3.—Cumulative precipitation at Boise for 3-year period ended September 30, 1940, and the normal for 77 years.

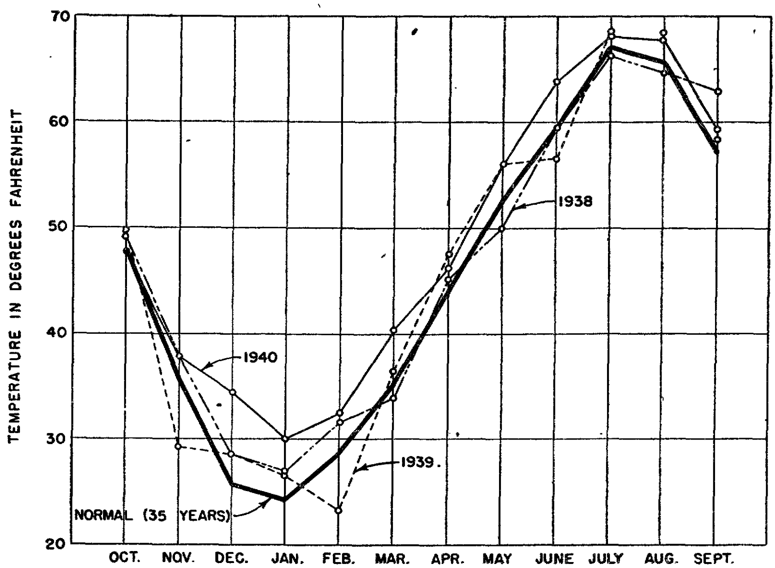



FIGURE 4.—Mean monthly temperatures at Idaho City for 3-year period ended September 30, 1940, and the normal for 35 years.

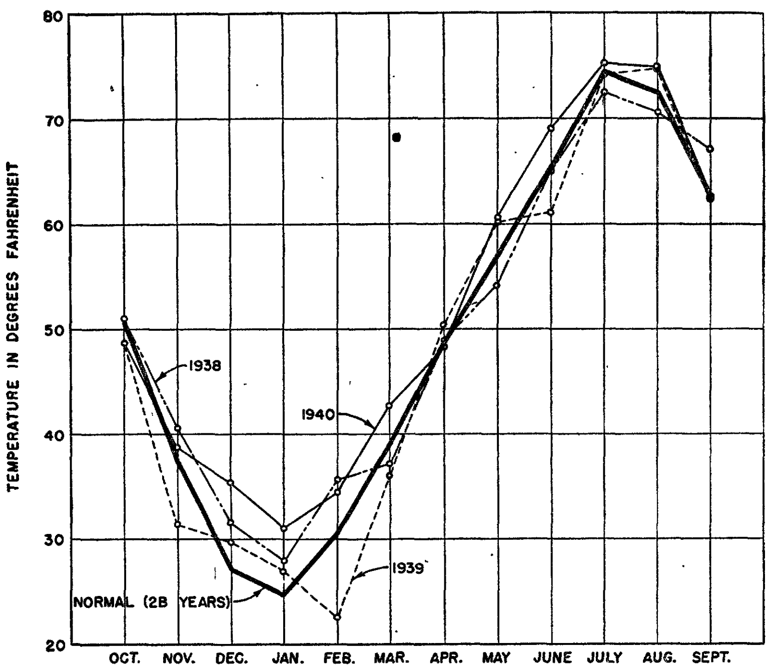



FIGURE 5.—Mean monthly temperatures at Arrow Rock for 3-year period ended September 30, 1940, and the normal for 28 years.

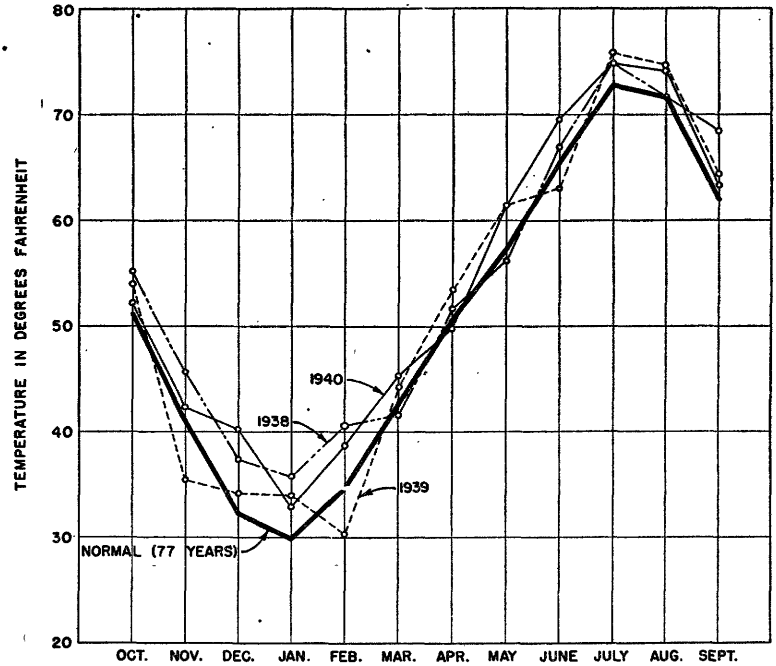



FIGURE 6.—Mean monthly temperatures at Boise for 3-year period ended September 30, 1940, and the normal for 77 years.

The stations for which records of precipitation and temperature are available are at Idaho City, Arrow Rock, and Boise, at altitudes of 4,000, 3,230, and 2,705 feet, respectively. Precipitation and temperature records for those stations have been obtained and published by

*Precipitation in inches for 3-year period ended Sept. 30, 1940, at Idaho City, Arrow Rock, and Boise* [1]

| | Idaho City (elevation 4,000 feet) | | | | Arrow Rock (elevation 3,230 feet) | | | | Boise (elevation 2,705 feet) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1937–38 | 1938–39 | 1939–40 | Normal 35 years | 1937–38 | 1938–39 | 1939–40 | Normal 28 years | 1937–38 | 1938–39 | 1939–40 | Normal 77 years |
| October | 1.32 | 2.19 | 0.90 | 1.58 | 1.36 | 1.57 | 2.00 | 1.31 | 1.18 | 1.68 | 0.70 | 1.24 |
| November | 3.16 | 3.21 | 0 | 3.10 | 3.17 | 3.40 | .03 | 2.77 | 1.71 | 2.51 | .13 | 1.28 |
| December | 5.80 | 2.78 | 2.75 | 3.02 | 3.65 | 1.60 | 1.97 | 2.38 | 2.10 | .57 | 1.39 | 1.57 |
| January | 3.47 | 2.74 | 3.30 | 3.17 | 3.08 | 1.85 | 3.17 | 2.90 | 1.51 | 1.19 | [2] 1.84 | 1.73 |
| February | 2.11 | 3.55 | 6.80 | 2.82 | 1.03 | 2.89 | 4.13 | 2.37 | .82 | 1.38 | 1.78 | 1.44 |
| March | 6.15 | 1.37 | 3.90 | 2.32 | 4.36 | .80 | 2.89 | 2.09 | 3.16 | .76 | 2.26 | 1.36 |
| April | .47 | .71 | 1.70 | 1.30 | .73 | .60 | 3.04 | 1.43 | 1.09 | .36 | 1.80 | 1.19 |
| May | 2.98 | .36 | 0 | 1.40 | 2.71 | .15 | .08 | 1.24 | 2.55 | .11 | .09 | 1.41 |
| June | 2.07 | .50 | .12 | 1.08 | 2.35 | .21 | .08 | .96 | 1.29 | .38 | .08 | .91 |
| July | 1.06 | .26 | .66 | .44 | 2.09 | .26 | .31 | .32 | .85 | .15 | .36 | .24 |
| August | .05 | .02 | 0 | .41 | 0 | .11 | .05 | .26 | .03 | Tr. | .01 | .19 |
| September | .25 | 1.50 | 2.18 | .70 | .14 | 1.38 | 2.43 | .50 | .34 | 1.53 | 1.87 | .55 |
| Total | 28.89 | 19.19 | 22.31 | 21.34 | 24.67 | 14.82 | 20.18 | 18.53 | 16.63 | 10.62 | 12.31 | 13.11 |

[1] From U. S. Weather Bureau records.
[2] Station moved.

the United States Weather Bureau, as follows: Idaho City, 35 years; Arrow Rock, 28 years; and Boise, 77 years. The station at Boise was moved from the Federal Building to the airport in January 1940.

*Temperature in ° F. for 3-year period ended Sept. 30, 1940, at Idaho City, Arrow Rock, and Boise* [1]

| | Idaho City (elevation 4,000 feet) | | | | Arrow Rock (elevation 3,230 feet) | | | | Boise (elevation 2,705 feet) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1937–38 | 1938–39 | 1939–40 | Normal 35 years | 1937–38 | 1938–39 | 1939–40 | Normal 28 years | 1937–38 | 1938–39 | 1939–40 | Normal 77 years |
| October | 49.1 | 49.6 | 47.8 | 48.0 | 51.0 | 51.0 | 48.8 | 50.7 | 55.2 | 54.0 | 52.3 | 51.1 |
| November | 37.8 | 29.2 | 38.1 | 35.7 | 40.6 | 31.4 | 38.8 | 37.5 | 45.7 | 35.6 | 42.4 | 41.0 |
| December | 28.4 | 28.6 | 34.6 | 25.6 | 31.7 | 29.7 | 35.4 | 27.0 | 37.5 | 34.2 | 40.2 | 32.1 |
| January | 27.0 | 26.7 | 30.1 | 24.1 | 28.1 | 27.0 | 31.0 | 24.5 | 36.9 | 34.0 | [2] 33.0 | 29.8 |
| February | 31.6 | 23.2 | 32.7 | 28.9 | 35.8 | 22.6 | 34.4 | 30.4 | 40.6 | 30.4 | 38.9 | 34.9 |
| March | 34.0 | 36.6 | 40.4 | 35.1 | 37.3 | 36.1 | 42.8 | 39.1 | 41.8 | 44.4 | 45.6 | 42.7 |
| April | 45.2 | 47.7 | 46.2 | 44.0 | 49.0 | 50.4 | 48.4 | 48.7 | 51.8 | 53.6 | 50.0 | 50.4 |
| May | 50.1 | 56.2 | 56.4 | 52.9 | 54.2 | 60.1 | 60.8 | 57.2 | 56.2 | 61.8 | 61.3 | 57.2 |
| June | 59.6 | 56.6 | 64.0 | 59.6 | 65.1 | 61.2 | 69.2 | 65.2 | 67.0 | 63.1 | 69.6 | 65.4 |
| July | 66.4 | 68.8 | 68.4 | 67.3 | 72.6 | 74.2 | 75.2 | 74.6 | 75.0 | 75.9 | 74.9 | 72.9 |
| August | 64.9 | 68.5 | 68.1 | 65.8 | 70.6 | 74.8 | 75.1 | 72.7 | 71.8 | 74.7 | 74.2 | 71.8 |
| September | 63.0 | 58.4 | 59.3 | 57.0 | 67.1 | 62.2 | 62.6 | 62.3 | 68.6 | 64.3 | 63.2 | 61.9 |
| Average | 46.4 | 45.8 | 48.8 | 45.3 | 50.3 | 48.4 | 51.9 | 49.2 | 53.9 | 52.2 | 53.8 | 50.9 |

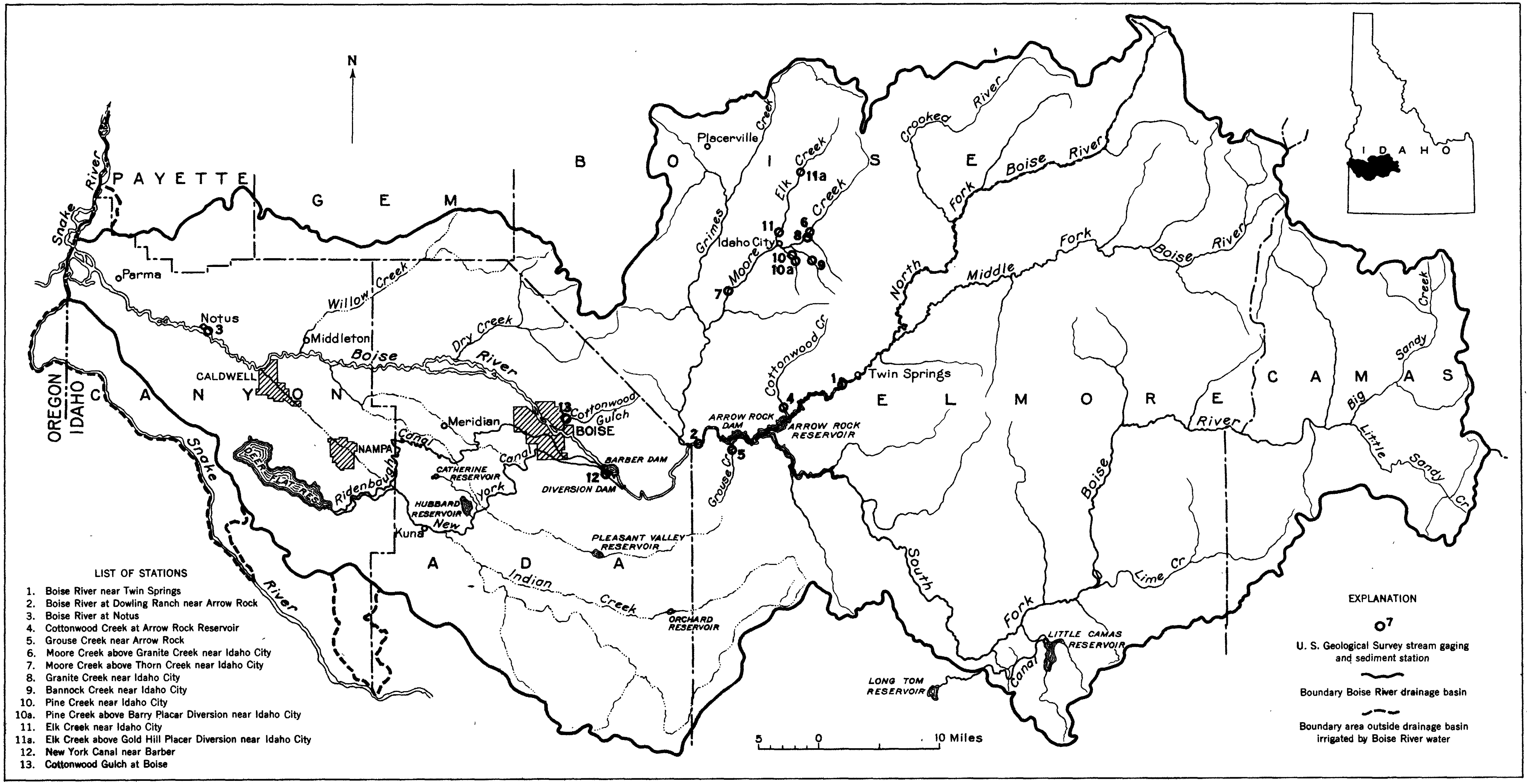
[1] From U. S. Weather Bureau records.
[2] Station moved.

The records show wide variations in precipitation with respect to location and altitude. Precipitation at all three stations was above normal in 1938, below normal in 1939, and approached the long-time average in 1940. Maximum and minimum annual precipitation at the three stations for the period 1914–40, together with the calendar years in which they occurred, are given in the following table.

*Maximum and minimum annual precipitation, 1914–40*

| Station | Maximum | | Minimum | |
|---|---|---|---|---|
| | Amount (inches) | Calendar year | Amount (inches) | Calendar year |
| Idaho City | 33.48 | 1927 | 14.53 | 1924 |
| Arrow Rock | 25.44 | 1927 | 10.61 | 1924 |
| Boise | 15.41 | 1927 | 7.95 | 1933 |

The temperature records indicate that the year ended September 30, 1940, was generally warmer than the years 1938 and 1939. At Idaho City the average temperature during 1940 was 3.5° F. above the 35-year average. During 1939 the averages at all three stations approached the long-time averages although there was considerable variation from the normal during individual months.




MAP OF THE BOISE RIVER DRAINAGE BASIN

758529 O - 48 (Face p. 10)

## STREAM GRADIENTS

Stream gradients in different parts of the Boise River drainage area vary within wide limits. Gradients in the mountainous area are generally steep, ranging from about 20 to 200 feet per mile; those in the Boise River Valley are more gentle, averaging from 9 to 13 feet per mile. The gradients of streams obviously are related to their capacity for transporting sediments. As the gradients decrease, the transporting power of the stream diminishes. Other factors influencing the rate of sediment transportation are the size of particles of the material transported, the availability of sediment for transportation, and the roughness of the stream bed. The velocity of the stream, also an important factor, is a function of the gradient, the roughness of the stream bed, and the hydraulic radius.

*Stream gradients in the Boise River drainage basin*

| Stream | Reach | Length of reach (miles) | Fall in reach (feet) | Gradient (feet per mile) |
|---|---|---|---|---|
| North Fork, Boise River | From 5,400-foot contour to confluence of Middle Fork of Boise River. | 33.4 | 1,926 | 58 |
| Middle Fork, Boise River. | From 5,400-foot contour to confluence of North Fork of Boise River. | 39.1 | 1,926 | 49 |
| South Fork, Boise River | From 6,400-foot contour to 5,400-foot contour | 13.4 | 1,000 | 75 |
| Do | From 5,400-foot contour to Arrow Rock Dam | 92.6 | 2,444 | 26 |
| Boise River | From confluence of North and Middle Forks of Boise River to Arrow Rock Dam. | 23.8 | 518 | 22 |
| Do | Arrow Rock Dam to Boise (8th St. Bridge) | 22 | 282 | 13 |
| Do | Boise (8th St. Bridge) to confluence with Snake River. | 50 | 464 | 9 |
| Moore Creek | From 5,400-foot contour to 4,000-foot contour [1] | 8 | 1,400 | 175 |
| Do | From 4,000-foot contour [2] to 3,550-foot contour | 9 | 450 | 50 |
| Do | From 3,550-foot contour to confluence with Boise River. | 17 | 670 | 39 |
| Grouse Creek | From 4,000-foot contour to 3,200-foot contour [3] | 4 | 800 | 200 |

[1] Gaging station on Moore Creek above Granite Creek.
[2] Gaging station on Moore Creek above Thorn Creek.
[3] Maximum water-surface elevation in Arrow Rock Reservoir in 1939 was 3,219 feet.

## RESERVOIRS

There are three reservoirs in the Boise River drainage basin for which storage or gage-height records are available. These records are given in the annual series of water-supply papers on surface water that are published by the Geological Survey.

Arrow Rock Reservoir is formed by Arrow Rock Dam (see pl. 2), which is located on the Boise River at Arrow Rock, Idaho, 22 miles by road east of Boise, and 4 miles above Moore Creek. The capacity of the reservoir is 291,600 acre-feet between elevations of 2,956 feet (11 feet below center line of sluice gates, 8.5 feet below sill) and 3,216 feet (crest of movable spillway at highest position). Dead storage is negligible. Boise project officials state that the total capacity of the reservoir may have been reduced by as much as 5,000 to 6,000 acre-

758529—48——2

feet by the deposition of sediment since the reservoir was completed in 1915. Water from the reservoir is used for irrigation of lands in Boise Valley.

Deer Flat Reservoir is an off-stream reservoir about 20 miles west of Boise and about 4 miles southwest of Nampa. The capacity of the reservoir is 177,150 acre-feet between gage heights 0.0 feet (sill of outlet gages) and 30.0 feet (maximum operating level). Dead storage is about 13,000 acre-feet. In addition to water from local drainage, the reservoir receives water from the Boise River through the New York Canal. Water is used for irrigation of lower Boise River project lands.

Little Camas Reservoir is located on Little Camas Creek 4 miles northeast of Bennett and 22 miles northeast of Mountain Home. The capacity of the reservoir is 22,300 acre-feet between gage heights 4,931.0 feet (4.5 feet above bottom of outlet) and 4,965.0 feet (crest of spillway). Dead storage is unknown. Water is diverted from the Boise River basin for irrigation of about 5,000 acres of land in the vicinity of Mountain Home.

Three smaller reservoirs in the drainage basin for which gage-height or storage records are not available are Orchard, capacity 4,800 acre-feet; Pleasant Valley, capacity 7,900 acre-feet; and Hubbard, capacity 7,500 acre-feet.

## IRRIGATED AREAS

About 333,000 acres in the Boise River Valley are irrigated by water from the Boise River and its tributaries. Practically all the area is located in the Boise River Valley between Diversion Dam, about 8 miles southeast of Boise, and the mouth of the river at the Idaho-Oregon State line about 45 miles northwest of Boise. A small area outside of the Boise River drainage basin, lying in southwestern Canyon County, Idaho, and in eastern Malheur County, Oregon, also is irrigated by water from the Boise River. Another small area comprising about 5,000 acres in the vicinity of Mountain Home is irrigated by releases from Little Camas Reservoir, which impounds water from small tributaries of the South Fork of the Boise River.

## PLACER-MINING AREAS

The recovery of gold from placer deposits has been carried on in the Boise Basin since its discovery in 1862.[1] The name, Boise Basin, formerly Idaho Basin, has been given to the mining area drained by

[1] Metzger, O. H. Reconnaissance of placer mining in Boise County, Idaho: Bur. Mines Information Circ. 7028, August 1938.

Moore Creek and its tributaries. Mining there has been done by dredging and by hydraulic and hand methods. Dredging of the stream gravels began in 1896 at a point 4¼ miles above the mouth of Grimes Creek.[2] During the period of the investigation covered by this report dredges were operated on Grimes Creek and on Moore Creek below Idaho City. No stream-flow or sediment-measuring stations were located on Grimes Creek. Hydraulic and hand methods also were used on placers on Moore Creek, the most active of which were located above Idaho City. Placers operated in other parts of the Boise River drainage basin were small and had relatively little effect on the streams.

The most important factor, other than those due to nature, affecting sediment loads during the period of investigation was the operation of a large bucket-line dredge in the narrow valley adjacent to Idaho City. The dredged area extends from a point about one-fourth mile above the station on Moore Creek above Thorn Creek to a point near the mouth of Granite Creek, a distance of about 9 miles. Tailings from the dredge have been dumped in large piles over the valley. Dredging operations occasionally interfere with the course of Moore Creek and the channel in the area adjacent to Idaho City has been shifted from time to time. The water level in the "dredge pool" is maintained by building dikes and by controlling the inflow. Other dikes or ridges and deep pools result from the normal operations of the dredge. Some of these pools created by earlier dredging near the mouth of Pine Creek are practically full of sediment. So long as the dikes below Idaho City remain intact and the pools are not filled they are effective in reducing the amount of coarse sediment removed from the area.

The Gold Hill Placer, near Idaho City, was the largest hydraulic placer in operation in the Boise Basin. Water for this placer was diverted from both Moore and Elk Creeks. Actual operation of the placer mine was limited to a few weeks late in the spring of 1939 and 1940.

Rubow Placer, a small but active placer, was operated a short distance above the gaging station on Elk Creek near Idaho City and on Spanish Fork which enters Elk Creek immediately below the station. Tailings from this placer filled the stream channel with sediments to a depth of about 2.5 feet in the vicinity of the station. The station was moved to a new site on February 4, 1940.

---

[2] Lindgren, Waldemar, The mining districts of the Idaho Basin and the Boise Ridge, Idaho, U. S. Geol. Survey. 18th Ann. Rept., pp. 617–744, 1898.

## AREAS SELECTED FOR RUNOFF AND SEDIMENT-LOAD MEASUREMENTS

The following brief descriptions of the drainage areas selected for special runoff and sediment-load investigation were prepared by J. P. Thompson [3] of the Soil Conservation Service:

> * * * a general analysis of the situation on the watershed as a whole suggests that the most important watershed conditions to be sampled are as follows:
>
> 1. Placered areas
> 2. Burned areas
> 3. Cut-over areas
> 4. Virgin timber areas
> 5. Range areas in three different stages of depletion.
>
> To determine the effect of placer mining, samples are taken on lower Moore Creek below an active placer area. The silt measurements at this station are compared with measurements taken on all of the major tributaries which come into Moore Creek above the placer area. These include the Elk Creek station characterized by old placer operations, extensive burn and logged conditions, and intensive grazing. The upper Moore Creek station is below an area characterized in part by virgin timber, but grazed, a portion of a bad burn, and old placer diggings. The remaining three stations are on small tributaries of between 4,000 and 5,000 acres each, Granite Creek being characterized by an old burn, Bannock Creek by virgin Ponderosa pine and Pine Creek by a recent logging operation of Ponderosa pine.
>
> Twin Springs station samples the entire upper and middle fork of Boise River watershed, which is characterized by mixed forest, grass, and brush vegetation in relatively good condition. * * * The Notus station measures the silt leaving the basin. There are three smaller watersheds, namely Cottonwood Creek, Grouse Creek, and Cottonwood Gulch, which are representative of fairly good range, very seriously depleted range, and moderately depleted range conditions, respectively.

## RUNOFF

### MEASUREMENT OF RUNOFF

Runoff was measured at 13 gaging stations as an integral part of the sediment investigation. Three of the stations have been operated many years by the Geological Survey in cooperation with the State of Idaho. One station, on the New York Canal near Barber, was established originally by the Bureau of Reclamation, United States Department of the Interior, and has been operated during recent years by the Boise River watermaster. The New York Canal also is known as the Main South Side Canal. The remaining 9 stations were established especially for this investigation. The new stations were provided with equipment to meet the requirements of a program of 3 to 5 years. The type of artificial control structure used was selected

[3] Thompson, J. P., Report on the program of stream gaging and silt measurements, Boise River Watershed, Idaho, conducted by the United States Department of the Interior, Geological Survey, Water Resources Branch, 1939: Typewritten report in files of Soil Conservation Service, U. S. Dept. Agr. 1939.

after a study of the physical characteristics of each stream. Water-stage recorders were installed in substantial wooden houses and wells. The equipment was improved at the 4 stations previously operated in connection with continuing cooperative programs.

Field reconnaissances of the several drainage areas during the early stages of the investigation showed that diversions for placer mining operations were being made above a number of the gaging stations. Arrangements were made to obtain supplemental records of discharge on those diversions affecting the runoff measured from the designated drainage basins. Immediately after authorization was received from the Flood Control Coördinating Committee of the Department of Agriculture to continue the investigation from January to June 1940, construction was begun on two new gaging stations to replace two which were seriously affected by diversions. On February 4, 1940 (see pl. 3 *B*) the station on Elk Creek was moved 4⅝ miles upstream in order that the records obtained might more nearly represent runoff and sediment-load characteristics of the drainage basin. The station on Pine Creek (see pl. 4) was moved three-fourths of a mile upstream on February 13, 1940, to eliminate the effects of proposed placer mining operations adjacent to the original location. The changes in location, equipment, and drainage areas are given in the station descriptions.

The basic records collected at the gaging stations consist of records of stage, measurements of discharge and general information used to supplement the gage heights and discharge measurements in determining the daily flow. The records of stage at all 13 gaging stations were obtained from water-stage recorders that give a continuous record of fluctuation. Measurements of discharge were made with current meters in accordance with the standard practices of the Geological Survey, except when flows were too small to be obtained in the ordinary manner. Measurements of these small flows were made with the portable V-notch and Cippoletti weirs. Discharges for weir measurements were computed by means of Cone's formulas,[4] thus,

V-notch weir........ $Q=2.49\ H^{2.48}$

Cippoletti weir...... $Q=3.247\ BH^{1.48}-\dfrac{0.566\ B^{1.8}}{1+2\ B^{1.8}}H^{1.9}+0.609\ H^{2.5}$

in which $Q$ is the discharge in second-feet, $B$ is the width of the weir crest in feet, and $H$ is the depth in feet of water over the crest of the weir as measured in the pool above.

Rating tables giving the discharges for all stages recorded were prepared for each station from the discharge measurements. The application of the rating tables to the daily gage heights determined

[4] O'Brien, M. P., and Hickox, G. H., Applied fluid mechanics, p. 146, McGraw-Hill Book Co., 1937.

from the recorder graphs gives the daily discharges from which the monthly mean discharges were computed. The computation of sediment loads requires that frequent instantaneous discharges be determined during periods when fluctuations of stage are consequential.

Other data pertaining to the water supply of the Boise River drainage basin, collected under the regular cooperative stream-gaging program prior to and during the period of this investigation, published by the Geological Survey in the annual series of reports, Surface water supply of the United States, part 13, Snake River Basin (prior to 1935, designated as part XII, B). The locality, kind of information and period covered are indicated below:

Arrow Rock Reservoir at Arrow Rock (contents)—October 1917 to June 1940.
Boise River at Boise (discharge)—March 1940 to June 1940.
Boise River at Strawberry Glen Bridge near Boise (discharge)—March 1938 to June 1940.
South Fork of Boise River near Lenox (discharge)—March 1911 to June 1940.
Little Camas Reservoir near Bennett (fragmentary gage heights)—March 1924 to September 1939.
Little Camas Canal near Bennett (discharge, irrigation seasons only)—1917, 1924 to 1940.
Moore Creek near Arrow Rock (discharge)—December 1915 to June 1940.
Deer Flat Reservoir near Caldwell (contents)—October 1917 to June 1940.
Diversions from Boise River (summary of discharge)—irrigation seasons 1919–40.

The profile of the Boise River between Barber Dam and the mouth was developed by observing water-surface elevations at nine gages in the reach during the freshet period of 1938. Fragmentary repetition of the profile record was made during the season of 1939. These water-surface elevations are referred to sea level, United States Army Engineer datum, Boise River Surveys. (See Water-Supply Papers 863 and 883.)

## COMPARISON OF RUNOFF

In order to compare the runoff measured during the period of the investigation with that of earlier years, stations on the Boise River near Twin Springs and on Moore Creek, at mouth, near Arrow Rock were selected as being representative of the Boise River and Moore Creek drainage basins, respectively. Records for 29 years on the Boise River and 24 years on Moore Creek are given in both tabular and graphical form. (See figs. 7, 8.) Although the period of the investigation covered only 18 months the figures given are for the water years ended September 30, 1939 and 1940, in order that they may be compared with the previous years of record.

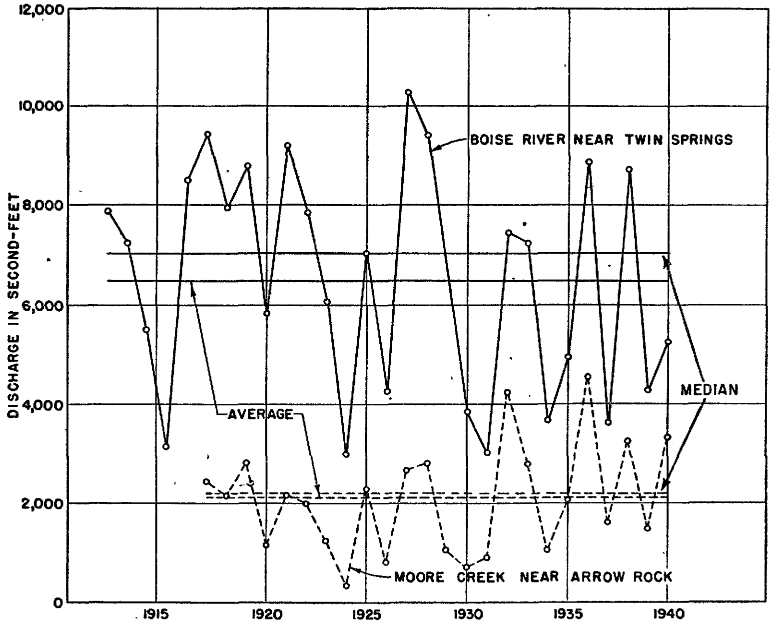



FIGURE 7.—Maximum discharge of Boise River near Twin Springs and Moore Creek near Arrow Rock for years ended September 30, 1939 and 1940.

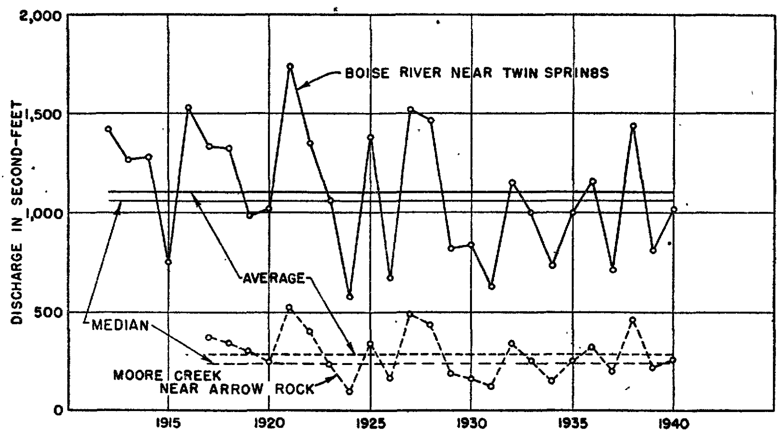



FIGURE 8.—Mean discharge of Boise River near Twin Springs and Moore Creek near Arrow Rock for years ended September 30, 1939 and 1940.

*Comparison of discharge in 1939 and 1940 with average and median for period of record*

**Boise River near Twin Springs**

[Drainage area 830 square miles]

| | 1939 | | 1940 | |
|---|---|---|---|---|
| | Discharge (second-feet) | Percent of 28-year average | Discharge (second-feet) | Percent of 29-year average |
| Average for period Feb. 1 to June 30 | 1,447 | 72 | 1,949 | 97 |
| Average for year ended Sept. 30 | 816 | 74 | 1,010 | 92 |
| Annual average for period of record | 1,105 | | 1,101 | |
| Median of annual average for period of record | 1,040 | | 1,060 | |
| Maximum observed for year ended Sept. 30 | 4,290 | | 5,210 | |
| Maximum observed for period of record | 10,300 | | 10,300 | |
| Average of annual maxima for period of record | 6,521 | | 6,476 | |
| Median of annual maxima for period of record | 7,140 | | 7,060 | |

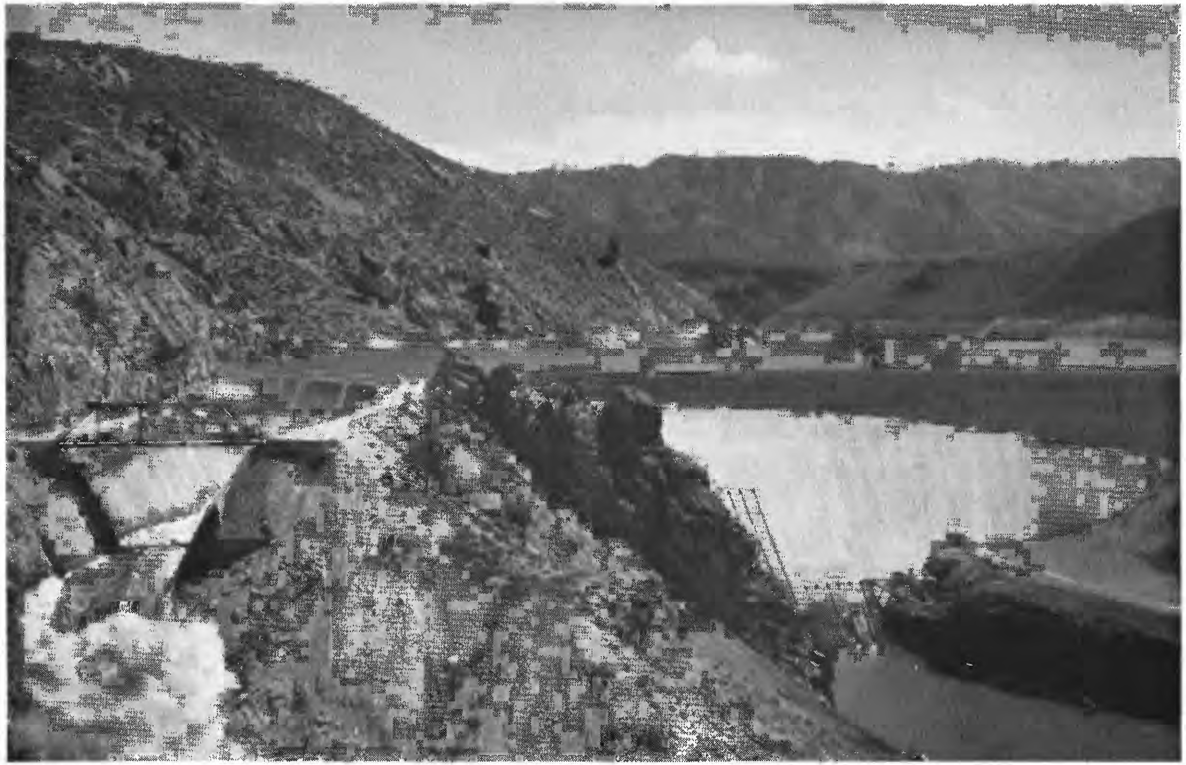
**Moore Creek near Arrow Rock**

[Drainage area 426 square miles]

| | 1939 | | 1940 | |
|---|---|---|---|---|
| | Discharge (second-feet) | Percent of 23-year average | Discharge (second-feet) | Percent of 24-year average |
| Average for period Feb. 1 to June 30 | 427 | 72 | 542 | 91 |
| Average for year ended Sept. 30 | 221 | 77 | 257 | 90 |
| Annual average for period of record | 287 | | 286 | |
| Median of annual average for period of record | 234 | | 246 | |
| Maximum observed for year ended Sept. 30 | 1,500 | | 3,370 | |
| Maximum observed for period of record | 4,550 | | 4,550 | |
| Average of annual maxima for period of record | 2,070 | | 2,122 | |
| Median of annual maxima for period of record | 2,110 | | 2,170 | |

These comparisons show that the runoff during 1940 was greater at both stations than during 1939 but below the average annual runoff for the period of record. The maximum observed discharge on Moore Creek during 1940 was greater than the maximums for all years except 1932 and 1936. On the day of maximum discharge in Moore Creek in 1940 (3,370 second-feet, March 27) the maximum sediment load for a single day (12,200 tons) was measured at the gaging station on the New York Canal. Since there were no releases from Arrow Rock Reservoir between March 18 and April 1, 1940, the river flow at Diversion Dam during this period consisted only of stream flow from Moore Creek and minor tributaries. The sediment loads consisted of material brought in by Moore Creek and material scoured from the sediment deposits in the Boise River channel above Diversion Dam.

Records of the spring runoff for the 13 stations operated during the period of investigation show that the flow was greater in 1940 than in 1939. Runoff is reported in inches in the following table for only those stations above which there was no appreciable regulation or diversion.



ARROW ROCK DAM ON BOISE RIVER AT ARROW ROCK, IDAHO.

Photograph by U. S. Bureau of Reclamation.

*A*. COTTONWOOD CREEK AT ARROW ROCK RESERVOIR.
Broad-crested weir with trapezoidal notch for low stages. Discharge about 8 second-feet.

*B*. ELK CREEK ABOVE GOLD HILL PLACER DIVERSION.
Discharge about 50 second-feet. Overfall structure for sediment sampling in foreground.

*Discharge measured during spring runoff of 1939 and 1940—February–June*

| Station | 1939 | | 1940 | |
|---|---|---|---|---|
| | Acre-feet | Inches [1] | Acre-feet | Inches [1] |
| Boise River near Twin Springs | 430, 400 | 9. 73 | 583, 600 | 13. 18 |
| Cottonwood Creek at Arrow Rock Reservoir | 4, 980 | 4. 36 | 6, 280 | 5. 52 |
| Grouse Creek | 1, 740 | 4. 09 | 1, 960 | 4. 61 |
| Moore Creek above Thorn Creek | 35, 330 | 5. 58 | 44, 600 | 7. 03 |
| Granite Creek | 628 | 2. 46 | 887 | 3. 47 |
| Bannock Creek | 470 | 1. 97 | 761 | 3. 17 |
| Elk Creek above Gold Hill Placer diversion [2] | | | 9, 040 | 12. 95 |
| Cottonwood Gulch at Boise | 1, 990 | 2. 34 | 2, 200 | 2. 57 |
| Boise River at Dowling ranch | 797, 900 | | 946, 800 | |
| Boise River at Notus | 244, 100 | | 444, 000 | |
| Moore Creek above Granite Creek | 16, 740 | | 18, 080 | |
| Pine Creek near Idaho City [3] | 612 | | | |
| Pine Creek above Barry Placer diversion [4] | | | 787 | |
| Elk Creek near Idaho City [5] | 8, 030 | | | |
| New York Canal | 447, 000 | | 470, 600 | |

[1] Runoff in inches not reported for last 7 stations in the table because of appreciable regulation or diversion above stations.
[2] Station operated Feb. 4, to June 30, 1940.
[3] Station operated Jan. 6, 1939 to Feb. 12, 1940.
[4] Station operated Feb. 13 to June 30, 1940.
[5] Station operated Jan. 20, 1939 to Feb. 4, 1940.

## DIVERSIONS FROM THE BOISE RIVER

Between the gaging stations at Dowling ranch and Notus, 27 principal canals and several small farm laterals divert water from the Boise River for irrigation. Records for the year 1919 to 1940 are available. Records of the daily diversions subsequent to 1915 are on file in the office of the Idaho Commissioner of Reclamation. Daily gage heights were obtained, frequent discharge measurements were made, and the records were summarized under the direction of W. E. Welsh, watermaster for Boise River. The total amount of water diverted by these canals during the irrigation season of 1939 was 1,253,000 acre-feet. Of this total 567,640 acre-feet was diverted by the New York Canal, which is the main canal of the Bureau of Reclamation, and 146,460 acre-feet by the Ridenbaugh Canal, the second largest canal in the area.

## SEDIMENT LOADS

### DEFINITION OF TERMS

In this paper certain terms, which depart from the usual terminology, are used in the discussion of sediment loads. Definitions of these terms have been adapted from: (1) Reports 1 and 3 of a series of 9 issued in connection with a study of methods used in measurement and analysis of sediment loads in streams conducted jointly by the Geological Survey, Corps of Engineers, Department of Agriculture, Office of Indian Affairs, Tennessee Valley Authority, Bureau of Reclamation, and Iowa Institute of Hydraulic Research at the Hydraulic Laboratory, State University of Iowa, Iowa City, Iowa;

and (2) Geological Survey Professional Paper 86, "The transportation of debris by running water," by G. K. Gilbert.

*Sediment* is fragmental material transported by, suspended in, or deposited by, water or air, or accumulated in beds by other natural agents.

*Suspended sediment* is sediment that remains in suspension in water for a considerable period of time without contact with the bottom.

*Deposited sediment* is sediment that has been temporarily or permanently deposited from suspension in water.

*Sediment concentration* is the ratio of the weight of the sediment in a water-sediment mixture to the total weight of the mixture. It is expressed in parts per million in the reports issued in connection with the Boise River sediment investigation.

The *sediment load* is the amount of sediment carried by a stream past a reference point, as a gaging station. In this report it refers either to the material carried in suspension or to the total amount of material transported including the so-called bed load.

A *point sample* is a sample of water and sediment obtained at a single point in the cross section of a stream with an instantaneous type of sampler. All point samples were taken with the Tait-Binckley sampler.

A *bottom sample* is a point sample collected at the bottom of a stream, ordinarily including material from the bottom 2½ inches.

An *integrated* (*or depth-integrated*) *sample* is a sample collected in such a manner that it contains water and sediment from all points in the vertical section of a stream.

*Bed load* is that part of the sediment load which is in almost continuous contact with the stream bed and is being rolled or pushed along by the force of the moving water.

A *dune* is a form of bed load in which sediment moves along the bottom of a stream, molded into a hill that travels downstream. Material is eroded from the upstream face and deposited on the downstream face by the flowing water.

## COLLECTION OF SEDIMENT SAMPLES

During the 18-month period of investigation a total of 43,900 sediment samples were collected at the 13 stream-flow, sediment-measuring stations. At the main river stations samples were collected from the cable-car installations. At the tributary stations the samples were taken from foot bridges near the natural or artificial controls.

### SAMPLING EQUIPMENT

The sampling equipment used by the Geological Survey prior to this investigation consisted of the Tait-Binckley, Colorado River, and brass-pipe samplers. The Tait-Binckley sampler was used to collect instantaneous samples when depths and velocities were not excessive. The Colorado River sampler was used to collect both point-integrated and depth-integrated samples, but the brass-pipe sampler was limited to the collection of depth-integrated samples.

Because of the wide range of sampling conditions encountered on the Boise River and tributaries it was necessary to modify the available equipment and develop new in order to obtain reliable results.

Two types of depth-integrating samplers were used. The first type consisted of a pint milk bottle supported on a rigid handle. (See pl. 6*B*.) The bottle was fitted with a rubber cap having a hole about ⅝-inch in diameter and a piece of small copper tubing for an air exhaust. The air exhaust permitted the water-sediment mixture to enter the bottle smoothly without bubbling action. The holder for the bottle was fastened to the handle in such a manner that the opening in the rubber cap was nearly parallel to the direction of flow. This sampler was used at those stations having overfall sections.

A variation of the first type of sampler consisted of a quart milk bottle held in a horizontal position in a frame fastened to a rigid handle. (See pl. 6*A*.) A rubber cap with a ⅝-inch hole and air exhaust were used as with the pint milk bottle. The hole, however, was off center which made it possible to collect a satisfactory sample without any loss of the water-sediment mixture. This sampler permitted the collection of depth-integrated samples to a point within 0.2 feet of the bottom. It was used at those stations without overfall sections and where the depths seldom exceeded 3 feet.

A second type of depth-integrating sampler was used at the large river stations where the use of rigid handle samplers was impracticable. It consisted of a pint milk bottle held in a vertical position in a piece of brass pipe to which was fastened an auxiliary lead weight for use during high stages. The bottle was fitted with a rubber cap and air exhaust similar to that used in the other depth-integrating samplers. It was lowered to the stream bed and raised by means of a small rope. With this type of sampler it was not possible to collect sediment samples closer than about 0.8 foot from the bottom.

Point samples were collected with the Tait-Binckley sampler. (See pl. 5 *A* and *B*.) The sampler consists of three cylindrical metal tubes of equal diameter mounted coaxially on line in a horizontal frame. The middle tube, which is the sample container, is mounted in bearings so that it is free to rotate about its axis and is connected to the two rigidly mounted end cylinders by sections of thin rubber tubing. In operation the sampler is lowered to the desired depth in the open position. The middle section is then rotated by pulling on an auxiliary line wound around that section, thus twisting the rubber sections and sealing the water-sediment mixture in the middle section. This sampler was used for the collection of special samples at all stations.

### SAMPLING PROCEDURE

Sampling procedure used by the Geological Survey on earlier investigations was based on a technique developed on rivers of appreciable size and depth. Integrated samples were collected in pint milk bottles held in a vertical position. Instantaneous point samples were collected with the Tait-Binckley sampler. In this investigation sampling procedure and equipment were modified to fit the conditions encountered in a manner suited to give the best results without a laboratory investigation of the equipment available. All depth integrated samples were collected with the entrance hole open while lowering and raising the sampler vertically. At those stations having overfall sections the bottle was lowered and returned through the nappe from two to five times until it was nearly but not quite full. Successive lowerings were distributed across the weir rather than being made at a single point, thus integrating both the horizontal and vertical sections. In lowering the bottle through the nappe it was held nearly parallel to the axis of flow in order that the opening in the cap would be pointed directly into the current. In lowering it through the nappe, water-sediment mixtures were collected from all points in the vertical. From two to three samples were collected during each sampling period. Some stations have broad-crested weirs with overfalls in two or three sections. During high stages at these stations at least two samples were taken in each section at each sampling period.

At stations without overfall sections depth-integrated samples were collected in much the same manner as at the overfall sections except that it was not possible to obtain water and sediment moving close to the bottom. The distance above the bottom in which the sampler was in operation was 0.2 or 0.8 foot depending on the type of sampling device used. Ordinarily three depth-integrated samples were collected during each sampling period in vertical sections approximately one-fourth, one-half, and three-fourths of the distance across the stream.

Point samples were collected with the Tait-Binckley sampler at frequent intervals at all stations without overfalls. Each set of samples ordinarily consisted of 9 or 12 samples; 3 surface, 3 mid-depth, and 3 bottom samples, and usually 3 samples at a point from 0.2 to 1.0 foot above the bottom. A sample was taken by lowering the sampler to the desired depth in the open position and, 1 to 2 seconds later, closing it by pulling the auxiliary line.

Since the number of samples in each set of point samples amounted to three to four times the number of depth integrated samples ordinarily collected at each sampling period, it was not practicable to use this apparatus for routine work at all the stations without overfalls. However, from February 10 through June 30, 1940, from two to three sets of point samples were collected daily from the New York Canal and at least once daily from the Boise River at Dowling ranch. Tabulated sediment loads for this period are based on point samples for those two stations.

### SAMPLING FREQUENCY

The frequency of sampling was determined with reference to variations in sediment content resulting from changes of stage or from other causes. Major changes of stage during the spring runoff resulted from melting snow usually accompanied by rain. Minor changes of stage during the day resulted from diurnal fluctuations of temperature. Increases in stage were usually accompanied by increases in sediment concentration. At stations on the smaller streams increases of 0.01 to 0.02 foot were frequently accompanied by large increases in sediment content. At times there were increases in sediment when no increases in stage was recorded. Increases in sediment, and usually in stage, ordinarily occurred on the small streams between about noon and midnight. Decreases usually occurred during the other 12 hours.

During the period of spring runoff, samples were collected from 3 to 12 times each day depending on the stream and its discharge and sediment characteristics. Because changes in stage and sediment concentration usually occur more suddenly in small streams than in large streams, samples were collected more frequently on the smaller streams.

The sediment content of depth-integrated samples collected at stations with overfalls frequently varied considerably even for samples collected consecutively. This is attributed to the fact that much of the material consisted of coarse sand and small pebbles and that there was a tendency for the coarse material to move across the weir intermittently. Streaks of coarse sand moving irregularly along the bottom were observed many times when the material in suspension was of such low concentration that sand moving on the bottom was clearly visible. Nevertheless, because two samples in the low-water section and two in the high-water section were taken at each sampling period during high water and because of the large number of sampling periods during the day, computed loads probably are a reliable measure of the total sediment loads passing the stations.

## LABORATORY PROCEDURE

### DETERMINATION OF SEDIMENT CONCENTRATION OF SAMPLES

When the samples were received in the laboratory they were segregated by stations, weighed, and set aside to allow suspended matter to settle. If they did not settle clear within a few days, from 1 to 3 milliliters of dilute hydrochloric acid (1 to 9) was added 24 hours before analysis to hasten coagulation. The clear water was siphoned off and discarded, and the remaining water and sediment were transferred with the aid of a stream of water from a wash bottle to a weighed glass evaporating dish or to a Gooch crucible, which previously had been provided with an asbestos mat, dried and weighed. Residues containing large quantities of sediment were usually transferred to evaporating dishes, and those containing only small amounts of sediment were filtered through Gooch crucibles. Residues in dishes were evaporated to dryness on a hot-air bath, dried in an oven for one hour at 110° C., cooled, and weighed. Residues in the crucibles were dried as completely as possible by suction and then placed in the oven, dried for one hour at 110° C., cooled, and weighed. The quotient obtained by dividing the weight of sediment in the sample in grams by the total weight of water and sediment in grams, multiplied by 1,000,000, gives the concentration of sediment in the sample in parts per million. All sediment concentrations are expressed in parts per million.

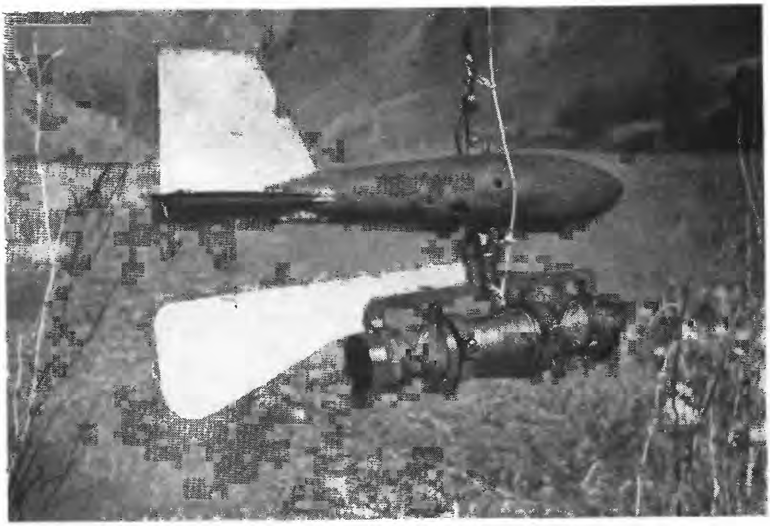
### DETERMINATION OF SIZE COMPOSITION OF SAMPLES

Samples on which size analyses were made were handled by a combination of the sieve and sedimentation methods commonly in use, as worked out in the laboratory of the Water Resources Branch of the Geological Survey. In the sieve method the maximum number of sieves used in an analysis was seven. The actual number used depended somewhat on the character of the material to be analyzed. The sieve openings, expressed in millimeters, were 4.00, 2.00, 1.00, 0.50, 0.250, 0.149, and 0.074.

In the sedimentation method four separations were usually made. The maximum sizes of particles in each separation were, successively, 0.074, 0.050, 0.020, and 0.005 millimeter in diameter.

As soon as samples for analysis were received in the laboratory they were weighed and to each was added about 1 millimeter of formaldehyde to prevent the growth of algae. For the analysis the clear water above the sediment was siphoned off and discarded. The sediment was washed on to the largest size sieve selected and washed free of all material that could pass through. The process was repeated with smaller-mesh sieves in order, including the 200 mesh-sieve (0.074 millimeter openings). The material from each sieve was washed into

*A.* OPEN POSITION.
Adapted for use from footbridge.



*B.* CLOSED POSITION
Adapted for use from cable car.

TAIT-BINCKLEY SAMPLER.

PINE CREEK ABOVE BARRY PLACER DIVERSION.

Broad-crested weir with rectangular flume for low stages. Discharge 1.4 second-feet. Overfall structure for sediment sampling in foreground.

a weighed evaporating dish, evaporated to dryness, dried at 110° C., cooled, and weighed.

The material passing the 200-mesh sieve was transferred to a tall glass cylinder and the volume adjusted to a definite height with tap water. Since Boise tap water contains only about 100 parts per million of dissolved solids, which is not much more than is found in water in samples from most of the stations, it was used in making the analyses. The material in the cylinder was allowed to settle for a predetermined time, according to Stokes' Law of settling velocities, for each size group, after which the water containing unsettled material was decanted into other similar cylinders. The sediment remaining in each cylinder was transferred to weighed dishes, evaporated to dryness, dried at 110° C., cooled, and weighed. Since the time of settling varies with the temperature, tables were prepared showing the time of settling for each 2.5° of temperature on the centigrade scale and that table followed which was closest to room temperature at the time of analysis.

The total sediment content of each sample was taken to be the combined weights of the material measured in each size group. From this the percentage of sediment in each size group and the concentration in the original sample were computed.

Size analyses of suspended and deposited sediments are tabulated on pages 114 to 143. Results of the more important analyses are represented graphically.

## COMPUTATION OF SEDIMENT LOADS

Sediment loads were computed in two ways depending on the rate of change of the concentration of sediment in the samples and the rate of change in stage of the streams. During the periods of spring runoff the loads for most of the stations were computed in tons per hour from the content of dried sediment in parts per million and the corresponding discharge at the times when the samples were taken. The sediment loads in tons per hour were plotted in the form of continuous graphs for each day, and the daily loads in tons were determined by measuring with a planimeter the areas under the graphs. Data plotted for Moore Creek above Thorn Creek and for Granite Creek on March 26 and 27, 1940, are reproduced in figures 9 and 10, respectively. Discharge and sediment concentration, which are shown for reference, are usually not plotted in practice.

During periods of low flow and periods when the sediment content was low and the discharge comparatively uniform, the daily loads were computed from sediment concentrations in daily samples, or in averages of two or more sets of samples per day, and the average discharge of the stream for that day.

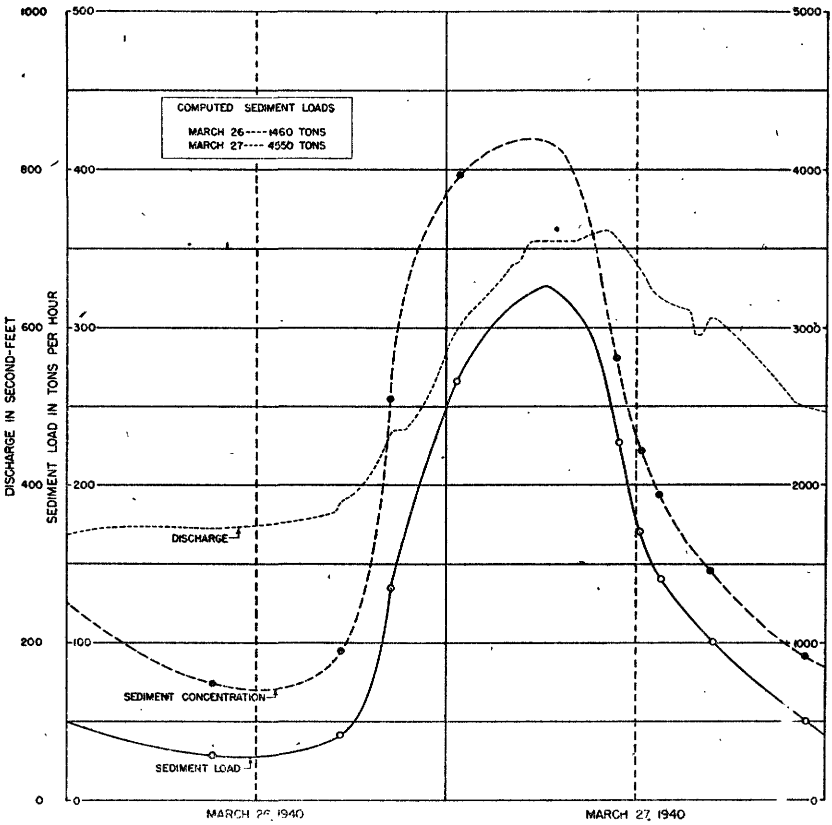



FIGURE 9.—Discharge, sediment concentrations, and sediment loads measured in Moore Creek above Thorn Creek, March 26–27, 1940.

For the stations on the New York Canal and the Boise River at the Dowling ranch, average sediment concentrations in the cross section were determined during the spring runoff period of 1940 from the results of point samples. Samples were collected usually from four points in each of three vertical sections distributed uniformly across the stream. Inasmuch as the New York Canal is concrete-lined and relatively smooth and flat at the bottom, average sediment concentration at this station was computed for each horizontal plane corresponding to the four levels at which samples were collected. These averages were plotted against depth and the average concentration in the vertical determined by graphical methods. Because the stream bottom at the Dowling ranch station is covered with rocks and is not uniform in depth, the average concentration in the cross section was determined first by computing the concentration in the vertical, as described above for each of the three sampling stations, and then by taking the average of the three vertical concentrations.

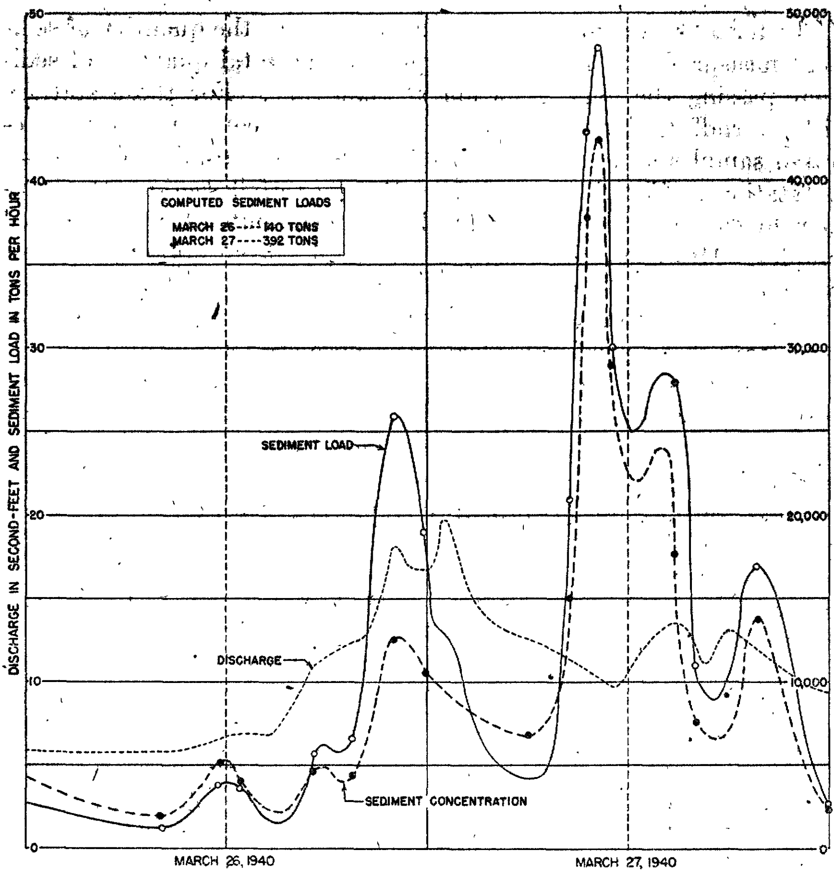



FIGURE 10.—Discharge, sediment concentrations, and sediment loads measured in Granite Creek near Idaho City, March 26–27, 1940.

At stations where the overfalls consist of two or more sections. discharge ratings were prepared and corresponding sediment loads were computed for each section. Since sediment concentrations in samples from the low-water sections were usually considerably greater than those in the high-water sections, it was necessary to compute the loads carried in each section separately during periods of high water.

## BASIS OF REPORTING SEDIMENT LOADS

The quantity of solid material passing a gaging station, as measured at a given time, is referred to as the sediment load of the stream at that point. The term "sediment" has been adopted because it probably better describes particles of fragmental material than the term "silt," which is understood by some to represent material within a particular range of particle size.

758529—48——3

The term "sediment load" is used to represent the quantity of sediment measured, but it may not represent the total quantity of sediment passing the gaging station at that time. For those stations with overfall sections the sediment loads were computed from integrated samples and are assumed to represent the total loads passing the stations. For those stations without overfall sections the sediment loads, with two exceptions, also were computed from integrated samples. However, since integrated samples from stations without overfall sections did not contain sediment from points at and near the bottom, the computed loads are assumed to represent only the sediment loads in suspension carried past those stations.

The stations on the Boise River at Dowling Ranch and the New York Canal are the two for which daily sediment loads in 1940 were not computed from integrated samples. Loads for these stations were computed from point samples. The loads reported for the Dowling ranch station probably represent essentially the total quantities of sediment carried past the station. Data obtained in connection with bed-load observations on the New York Canal, however, show that the reported daily loads do not represent the entire amount of sediment carried past this station.

The stations for which the reported loads represent the total sediment loads and those for which they represent the suspended-sediment loads are listed in two groups as follows:

| Station | Period for which suspended-sediment loads are reported | Period for which total sediment loads are reported |
|---|---|---|
| Boise River near Twin Springs | Jan. 17, 1939, to June 30, 1940 | |
| Boise River at Dowling ranch | Jan. 17, 1939, to Feb. 9, 1940 | Feb. 10, 1940, to June 30, 1940. |
| Boise River at Notus | Jan. 13, 1939, to June 30, 1940 | |
| Cottonwood Creek at Arrow Rock Reservoir. | | Jan. 23, 1939, to June 30, 1940. |
| Grouse Creek | | Jan. 20, 1939, to June 30, 1940. |
| Moore Creek above Granite Creek | Jan. 20, 1939, to June 30, 1940 | |
| Moore Creek above Thorn Creek | Jan. 28, 1939, to June 30, 1940 | |
| Granite Creek | | Jan. 10, 1939, to June 30, 1940. |
| Bannock Creek | | Jan. 16, 1939, to June 30, 1940. |
| Pine Creek | | Do. |
| Elk Creek | Jan. 20, 1939, to Feb. 4, 1940 | Feb. 4, 1940, to June 30, 1940. |
| New York Canal | Feb. 1, 1939, to Feb. 9, 1940 | Feb. 10, 1940, to June 30, 1940. |
| Cottonwood Gulch at Boise | | Jan. 27, 1939, to June 30, 1940. |

## RELIABILITY OF REPORTED SEDIMENT LOADS

The sediment-sampling equipment available for use in this investigation was not considered entirely adequate for all the sampling conditions encountered, but it was modified to give a satisfactory degree of accuracy.

Results of laboratory tests [5] made at the Iowa Institute of Hydraulic Research subsequent to the Boise River investigation show

[5] Report No. 5, Laboratory investigations of suspended sediment samples: U. S. Engineer District Sub-Office, Hydraulic Laboratory, University of Iowa, Iowa City, Iowa, 1941.

that the errors in sediment concentrations determined in samples collected with sampling devices with entrance conditions similar to those in the horizontal depth-integrating sampler vary primarily with the size of particles in suspension and with the stream velocity. The errors, which are positive, increase both with increases in the size of the sediment particles and with decreases in the ratio of the intake velocity to the stream velocity. Sediment concentrations determined in samples collected with the vertical type of depth-integrating sampler also are subject to errors resulting mainly from entrance conditions.

At the stations with overfall sections the reported loads were computed from depth-integrated samples that contained water-sediment mixtures from all points in the vertical. Inasmuch as much of the sediment carried past those stations consisted of a large proportion of coarse material, there is reason to believe that some of the samples may have included more sediment than was representative of the water-sediment mixtures. On the other hand, it is known that at some of the stations considerable quantities of coarse gravel were transported by the streams that were not effectively sampled. Since no standard of reference was available for estimating the accuracy of samples collected at stations with overfall sections, it is tacitly assumed that the reported loads are representative of the actual total loads passing those stations.

At the stations without overfall sections the loads were computed on the basis that the average concentrations for the total depth were the same as those for the sampling depths. The water-sediment mixtures from points less than 0.8 foot from the bottom for the vertical type of integrating sampler and from points less than 0.2 foot from the bottom for the horizontal type of integrating sampler were not included in the samples. Thus the sediment concentrations determined in samples collected with the vertical depth-integrating sampler were usually appreciably smaller than actually existed in the streams at the times the samples were collected, owing to limited sampling depths and entrance conditions. Similarly, concentrations in samples collected with the horizontal depth-integrating sampler were affected by the limited sampling depth and entrance conditions.

Sediment concentrations computed from point samples are believed to represent more nearly the true concentrations in the stream than do the concentrations determined in the depth-integrated samples, not only because the point samples were taken at and near the bottom as well as at several other points in the vertical, but also because there was little disturbance of the stream-flow pattern of the water-sediment mixture approaching and entering the sampler.

During the spring runoff of 1940 the sediment loads reported for the Boise River at Dowling ranch and for the New York Canal are based entirely on point samples, which were collected from one to three times daily. For Dowling ranch the reported loads for 1940 are believed to represent essentially the actual total loads passing the station. For the New York Canal the reported loads are somewhat less than the actual loads largely because of the movement of large quantities of coarse sediment in dunes along the bottom of the Canal which could not be effectively sampled.

The vertical depth-integrating sampler was used at the stations on the Boise River at Dowling ranch and the New York Canal during 1939 and at the stations on the Boise River near Twin Springs and at Notus during 1939 and 1940. The horizontal depth-integrating sampler was used at the stations on Moore Creek, above Granite Creek and above Thorn Creek, throughout the period of the investigation, and at the station on Elk Creek near Idaho City during 1939.

In order to determine the approximate relation between sediment loads computed from point samples and loads computed from depth-integrating samples, point samples were collected at irregular intervals at those stations without overfall sections. From these results rough estimates were made, which indicate the proportion of the total loads that are represented by the loads computed from routine depth-integrated samples. Inasmuch as point samples were collected only two or three times a week at most of the stations, the estimates may be considerably in error. They do, however, give a rough indication of the total loads passing the stations.

*Relation of reported suspended loads to total loads as indicated by point samples*

| Station | Percent of total load | |
|---|---|---|
| | 1939 | 1940 |
| Boise River near Twin Springs | 60– 80 | 50– 70 |
| Boise River at Dowling ranch | 50 | 95–100 |
| Boise River at Notus | 80– 90 | 60– 80 |
| Moore Creek above Granite Creek | 95–105 | 95–105 |
| Moore Creek above Thorn Creek | 95–100 | 95–100 |
| Elk Creek near Idaho City | 95–105 | ------ |
| New York Canal | 80– 90 | 85– 90 |

## SEDIMENT LOADS MEASURED IN STREAMS NEAR IDAHO CITY

At the beginning of the investigation the five stations above Idaho City were above all active placer mines. They were on Moore Creek above Granite Creek and on Granite, Bannock, Pine, and Elk Creeks. The station on Moore Creek above Thorn Creek was situated below all active placer mines on Moore Creek above the mouth of Grimes Creek. The stations on Pine and Elk Creeks were subsequently moved upstream because of actual or proposed placering on those streams after the investigation was under way.

A summary of the monthly sediment loads measured at the six stations in the Idaho City area is given in the accompanying table. The data indicate that the loads measured at Moore Creek above Thorn Creek were a little smaller during the spring runoff months of 1939 and a little larger during the spring runoff months of 1940 than the sums of the loads measured at the five stations above Idaho City during the same periods. During periods of moderate and low flow, however, the loads measured at Moore Creek above Thorn Creek were considerably larger than the combined loads measured at the five stations above Idaho City. This increase in sediment load probably is due almost entirely to placer-mining operations in the vicinity of Idaho City, inasmuch as the unmeasured inflow is negligible and can be disregarded as a source of sediment.

Size analyses of a large number of samples collected at stations in the Idaho City area give information about the origin and disposition of sediments carried past some of the gaging stations. Graphs of these analyses in figure 11 show that during the spring runoff of 1939 from about 60 to 90 percent of the material in samples collected from Pine Creek, Moore Creek above Granite Creek, and Elk and Granite Creeks consisted of particles greater than 0.100 millimeter in diameter, and that more than 70 percent of the material in samples from Pine and Bannock Creeks consisted of particles greater than 1.00 millimeter in diameter. As classified by the former Bureau of Soils—now merged into the Bureau of Plant Industry, Soils, and Agricultural Engineering—material coarser than 1.00 millimeter is fine gravel. Although the analyses show that the material collected from Bannock Creek was very coarse, it should be pointed out that this coarse material was found only in samples collected over a period of a few days during the last week of March 1940.

The sediment loads measured in Moore Creek above Thorn Creek, on the other hand, consisted almost entirely of fine material. Graphs of size analyses in figures 11 and 12 show that from 45 to 55 percent of the material in samples collected at this station during the spring runoff of 1939 and 1940 consists of particles less than 0.005 millimeter in diameter and that from 85 to 95 percent of the material consisted of particles less than 0.050 millimeter in diameter. Material consisting of particles less than 0.005 millimeter in diameter has been classified as clay by the former Bureau of Soils, and is so fine that it does not settle readily, even in reservoirs. There was a period of 3 or 4 days during the last week of March 1940 corresponding to the period of maximum discharge when the sediment concentrations in bottom samples at the station on Moore Creek above Thorn Creek were from

*Monthly sediment loads in tons measured at stations near Idaho City*

| | Moore Creek above Granite Creek | Granite Creek | Bannock Creek | Pine Creek | Elk Creek | Total | Moore Creek above Thorn Creek |
|---|---|---|---|---|---|---|---|
| *1939* | | | | | | | |
| January | 2.3 | 0.3 | 0.09 | 0.9 | 2.2 | 5.8 | 109 |
| February | 12 | 2.3 | .5 | 1.6 | 8.1 | 24 | 1,270 |
| March | 2,730 | 2,060 | 1.4 | 364 | 2,950 | 8,110 | 5,330 |
| April | 1,540 | 802 | 7.7 | 220 | 2,220 | 4,790 | 3,790 |
| May | 720 | 68 | 3.2 | 1.4 | 2,200 | 2,990 | 4,390 |
| June | 23 | .8 | .8 | .2 | 1,710 | 1,730 | 2,240 |
| Total | 5,030 | 2,930 | 14 | 588 | 9,090 | 17,600 | 17,100 |
| July | 9.2 | .3 | .2 | .06 | 615 | 625 | 716 |
| August | 2.7 | .2 | .08 | .04 | 104 | 107 | 211 |
| September | 9.6 | .3 | .1 | .1 | 215 | 225 | 314 |
| October | 3.2 | .2 | .09 | .08 | 701 | 705 | 474 |
| November | 8.2 | .5 | .1 | .06 | 351 | 360 | 1,200 |
| December | 14 | 1.6 | .5 | .4 | 736 | 752 | 1,800 |
| Total | 47 | 3.1 | 1.1 | .7 | 2,720 | 2,770 | 4,720 |
| *1940* | | | | | | | |
| January | 19 | 11 | .5 | 1.0 | 365 | 396 | 2,520 |
| February | 170 | 413 | 1.8 | 356 | 141 | 1,080 | 3,760 |
| March | 2,740 | 1,220 | 443 | 5,780 | 661 | 10,800 | 12,400 |
| April | 2,360 | 272 | 282 | 1,130 | 1,220 | 5,260 | 8,520 |
| May | 928 | 11 | 1.1 | 71 | 811 | 1,820 | 8,250 |
| June | 30 | .8 | .4 | 15 | 102 | 148 | 3,530 |
| Total | 6,250 | 1,930 | 729 | 7,350 | 3,300 | 19,500 | 39,000 |
| Total | 11,300 | 4,860 | 744 | 7,940 | 15,100 | 39,900 | 60,800 |

three to five times greater than sediment concentrations in surface samples. It is probable that the bottom samples during this period contained particles considerably larger than those in surface samples.

It is apparent from the size-analysis data and the information in regard to placer-mining activity that only a small part of the actual material carried past the stations above Idaho City was measured at the station on Moore Creek above Thorn Creek. Most of the coarse sediment carried past the upper stations was deposited in the deep pools behind rock dikes formed by tailings from mining operations. (See pl. 7 *A* and *B*.) These deep pools act as settling basins because of the low velocity through them. The bulk of the fine material carried past the station on Moore Creek above Thorn Creek resulted from mining operations within the area of placers.

Most of the sediment passing the station on Moore Creek above Thorn Creek during 1939 and 1940 was too fine to settle out appreciably in the larger irrigation canals. There is reason to believe, however, that during earlier years a large amount of coarse sediment was carried downstream and was eventually discharged into the Boise River. During future years, when the spring runoff is greater than that measured in 1939 and 1940, it is probable that the loads of coarse sediment carried past the station on Moore Creek above Thorn Creek

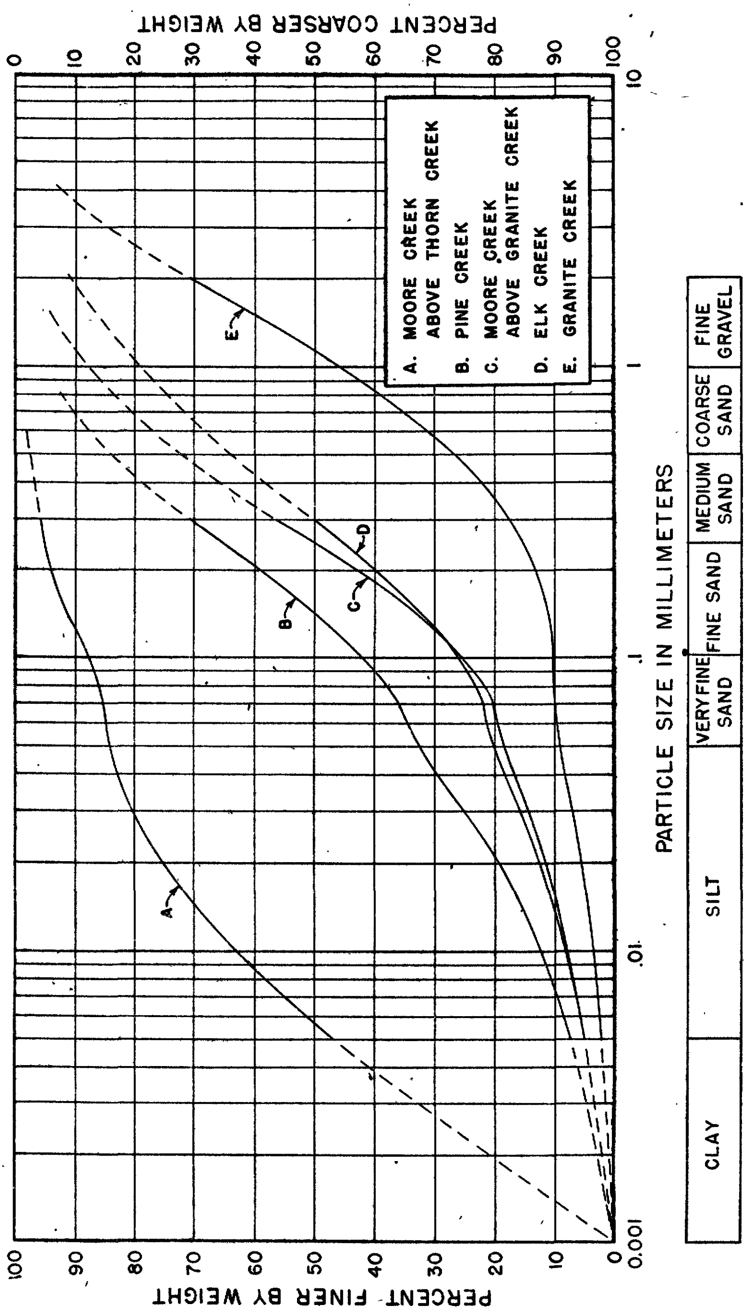



FIGURE 11.—Size analyses of sediment carried past five gaging stations near Idaho City during the spring runoff of 1939.

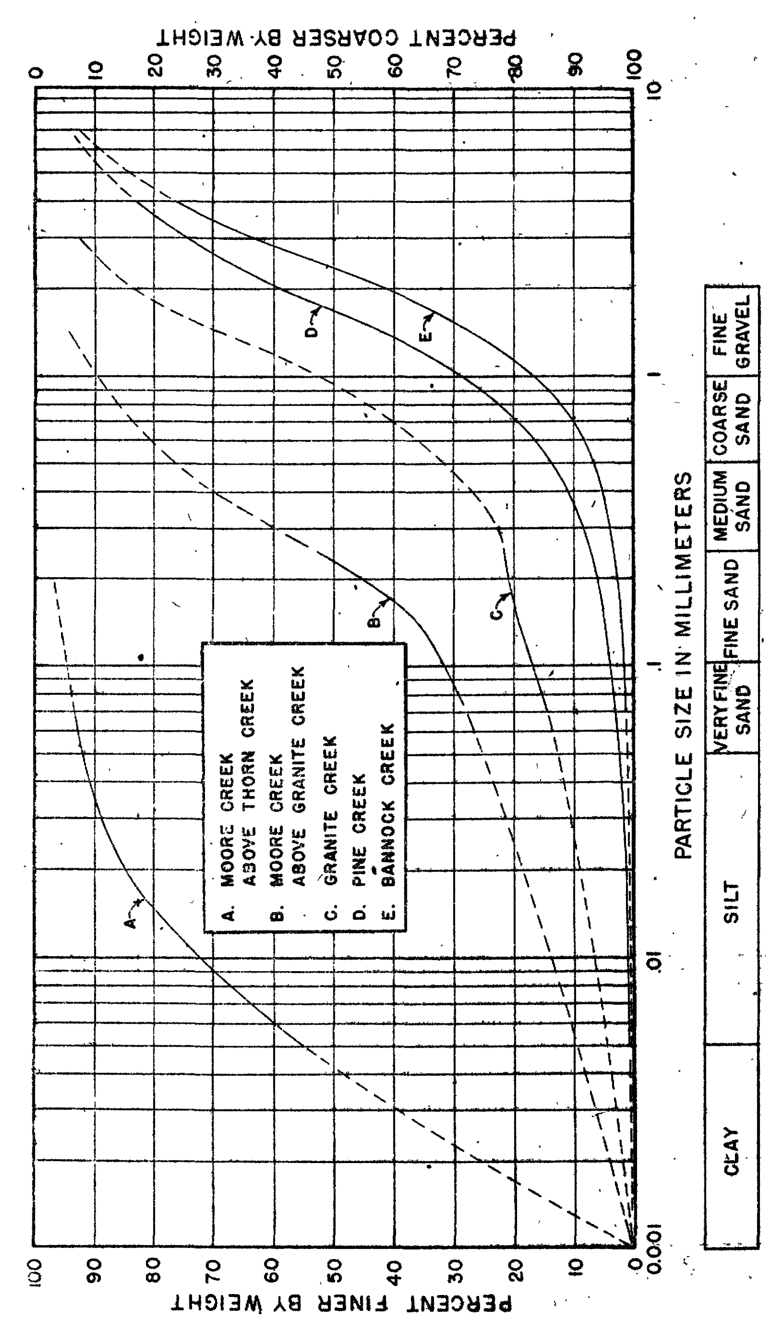



FIGURE 12.—Size analyses of sediment carried past five gaging stations near Idaho City during the spring runoff of 1940.

*A*

*B*

*A*. HORIZONTAL SAMPLER FOR COLLECTING INTEGRATED SAMPLES FROM FOOTBRIDGE.
*B*. SAMPLER USED FOR COLLECTING INTEGRATED SAMPLES FROM OVERFALL SECTION.

*A*. DREDGE TAILINGS FROM PLACER MINING ON MOORE CREEK BELOW IDAHO CITY.

*B*. SHALLOW OUTLET FROM DEEP POOL IN PLACERED AREA ON MOORE CREEK BELOW IDAHO CITY.

will be much larger than those measured during the period of this investigation.

Grimes Creek carries large but unmeasured loads of sediment into Moore Creek 1¾ miles below the station above Thorn Creek. Placer operations of considerable magnitude were carried on in the Grimes Creek drainage basin during the period of the investigation and for several years before. No sediment or stream-flow measuring station was established on Grimes Creek or its tributaries, and therefore no estimate can be made of the sediment contributed by that stream. However, the sediment content of a few samples collected at irregular intervals from Grimes Creek just above its mouth, the appearance of the water in the two streams during the spring runoff periods, and the presence of large deposits of sand in Grimes Creek and in Moore Creek below the junction, contrasted with the sand-free channel in Moore Creek above Grimes Creek, all suggest that the sediment loads carried into Moore Creek from Grimes Creek during the investigation may have been larger than the loads measured at the station on Moore Creek above Thorn Creek, and that the material was considerably coarser.

## SEDIMENT LOADS MEASURED ABOVE AND BELOW ARROW ROCK DAM

Totals of sediment loads measured at stations above and below Arrow Rock Dam for 6-month periods are given in the table below. Since there was no sediment-measuring station on the South Fork of the Boise River, which enters Arrow Rock Reservoir 4 miles above the dam, or on other tributaries that are reported to carry large sediment loads, the sum of the totals given for the three stations above the dam does not represent the total sediment entering the reservoir. The figures for the Dowling ranch station do show, however, that during the January to June periods of 1939 and 1940 the sediment loads measured at that station were very much less than the sum of the measured loads entering the reservoir.

*Sediment loads measured in streams above and below Arrow Rock Dam*

| Period | Loads for three stations[1] above Arrow Rock Dam. (tons) | Loads for Boise River at Dowling ranch below Arrow Rock Dam. (tons) |
|---|---|---|
| January–June 1939 | 80,600 | 13,100 |
| July–December 1939 | 1,860 | 5,130 |
| January–June 1940 | 97,400 | 27,500 |
| Total | 179,860 | 45,730 |

[1] Boise River near Twin Springs, Cottonwood Creek at Arrow Rock Reservoir, and Grouse Creek near Arrow Rock.

Size analyses were made on four integrated samples of suspended sediment collected on May 11, 1940, from the Boise River near Twin Springs. Results of two of the analyses representing samples collected near the left bank and the right bank are shown by curves *A* and *B*, respectively, in figure 13. The curves show that a larger proportion of coarse sediment was carried near the right bank at the time the samples were collected. The suspended-sediment concentration was 192 parts per million at the sampling point near the left bank and 530 parts per million at the sampling point near the right bank. Higher concentrations were more frequently observed near the right bank than near the left.

Size analyses of two sets of integrated samples collected on April 1, 1940, from Cottonwood Creek are represented by curves *C* and *D* in figure 13. Curve *C* represents the average analysis of two duplicate samples taken in the high-water section, and curve *D*, the average of two duplicate samples taken in the low-water section. Approximately 50 percent of the sediment particles in both sets of samples was coarser than 1.00 millimeter in diameter.

Graphs of size analyses of samples collected from Cottonwood Gulch and Grouse Creek during March and April 1929 are shown in figure 14. These stations have broad-crested weirs with low-water and high-water overfall sections. Curves *A* and *C* represent the average particle-size distribution in samples from the high-water sections of Cottonwood Gulch and Grouse Creek, respectively, and curves *B* and *D* represent the average particle-size distribution in samples from the low-water sections. Material from both stations was coarse. From 50 to 80 percent consisted of particles greater than 0.50 millimeter in diameter, and from 20 to 60 percent consisted of particles greater than 1.00 millimeter in diameter. This material was somewhat similar to the sediment collected in samples at the stations above Idaho City, which is represented by curves *B*, *C*, *D*, and *E* in figures 11 and 12. Sediment concentrations in the samples collected from Cottonwood Gulch during March and April 1939 ranged from about 1,000 to 40,000 parts per million and those in Grouse Creek, from about 10,000 to 100,000 parts per million. Discharges during the same period ranged from about 5 to 18 second-feet in Cottonwood Gulch, and from about 19 to 34 second-feet in Grouse Creek.

Graphs of size analyses of samples collected from the New York Canal in April and May 1939 are shown in figure 15. From 45 to 80 percent of the material in these samples consisted of particles less than 0.020 millimeter in diameter. Graphs of analyses of samples collected in March, April, and May 1940 are shown in figure 16. The sediment concentrations in samples represented by curves *A* to *D* in figure 16 ranged from about 100 to 300 parts per million while the concentrations in samples represented by curve *E* ranged from about 50 to 100 parts per million. Although the concentrations were lower, the average particle sizes were larger during April and May than they were in March.

Curves *F* and *G* at the right of figure 16 represent the results of analyses of samples of bottom material at the gaging station and also of material deposited 0.2 mile below the gage. Curve *F* is the average of four samples collected on June 7 from the bottom of the canal at the gage one-fourth the distance from the right bank (station A). Curve *G* is the average of three samples of material collected from the large sand deposit after the canal was drained. It will be seen that the material in the two groups of samples consisted of coarse material, and that the particles were about of the same size. From 60 to 80 percent of the material represented by curves *F* and *G* consisted of particles greater than 1.00 millimeter in diameter.

The loads measured at Dowling ranch during the period July to December 1939 were greater than the sum of those measured at the three upper stations. This increase probably resulted partly from fine material brought in by the South Fork and other unmeasured tributaries and partly from fine material scoured from the old river channel as it was exposed by drawdown in the reservoir. The amount of sediment measured at the Dowling ranch station during the period July to December was very small considering that nearly 500,000 acre-feet of water passed the station during the same 6 months. Reservoir levels were not sufficiently low during the period to permit sluicing operations. The average sediment concentration for the period was only about 10 parts per million.

## SEDIMENT LOADS MEASURED AT 13 STATIONS DURING SPRING RUNOFF OF 1939 AND 1940

In 1939 and 1940 the greater part of the sediment load in most of the streams was measured during the 5-month period from February to June. Appreciable sediment loads measured during the other 7 months in a few streams resulted largely from placer-mining operations.

The sediment loads measured at most of the stations were greater during the spring runoff in 1940 than during the spring runoff in 1939, although at three of the stations the reverse was true. Loads measured at the two locations on Elk Creek are not comparable for the two periods because of the difference in drainage areas and also because of large amounts of sediment added to the creek by mining operations just above the station near Idaho City. Loads measured at the two Pine Creek stations are more nearly comparable. The difference in drainage areas is slight, and there was little if any placer mining above either of the stations during the periods of operation.

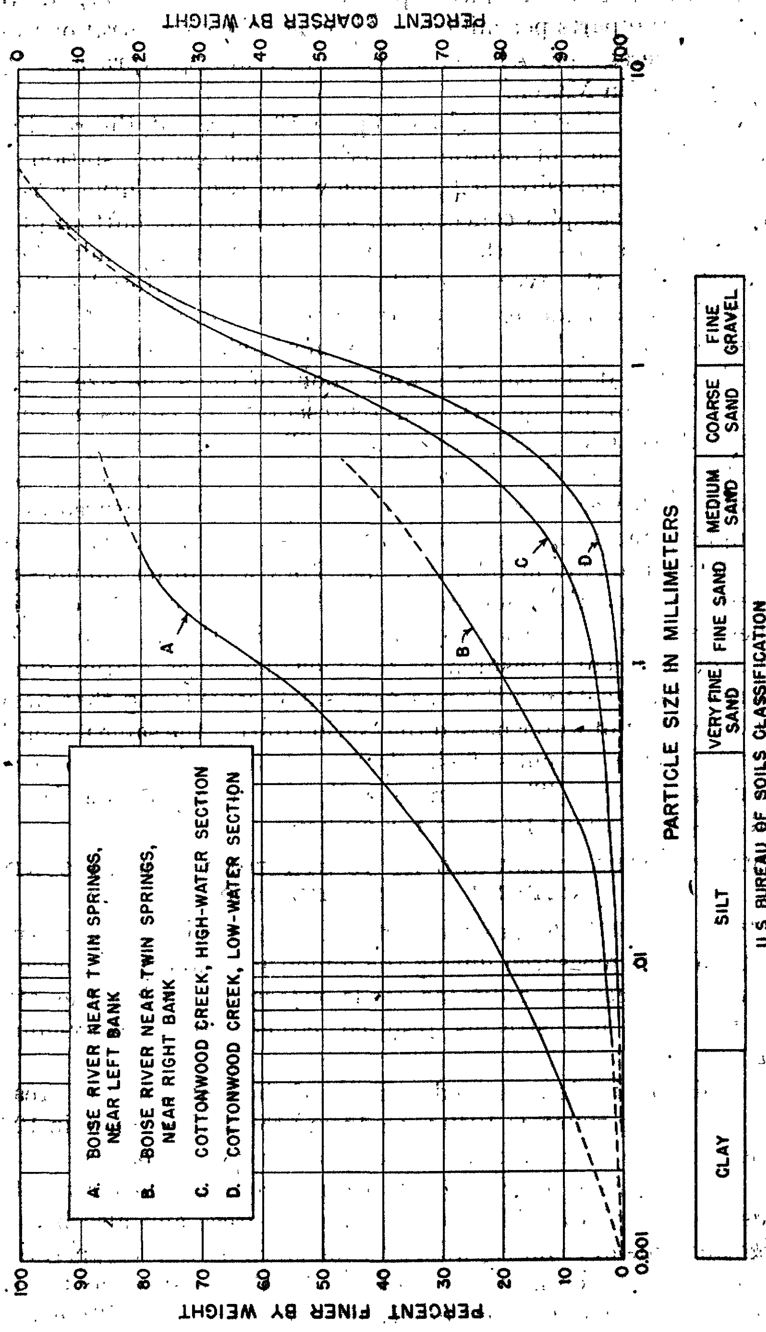



FIGURE 19.—Size analyses of sediment carried by Boise River near Twin Springs and by Cottonwood Creek during spring runoff of 1940.

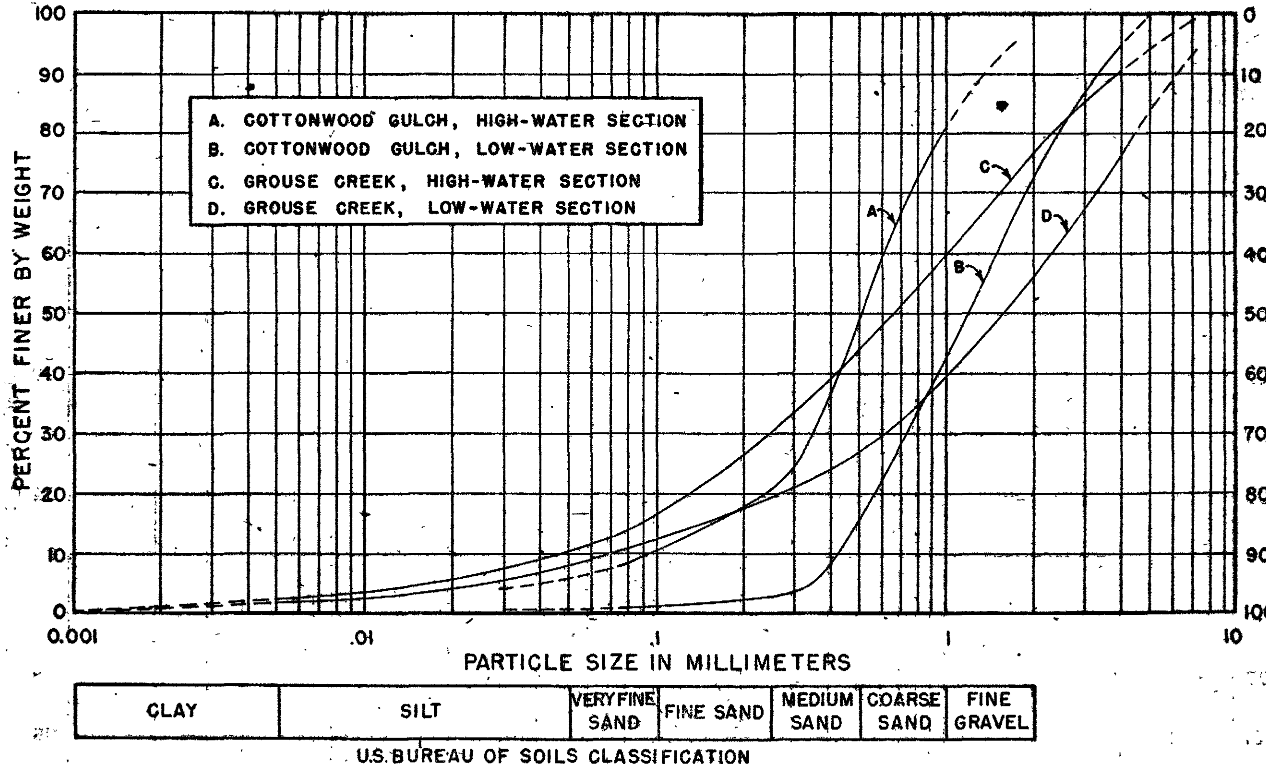



FIGURE 14.—Size analyses of sediment carried by Cottonwood Gulch and by Grouse Creek during spring runoff of 1939.

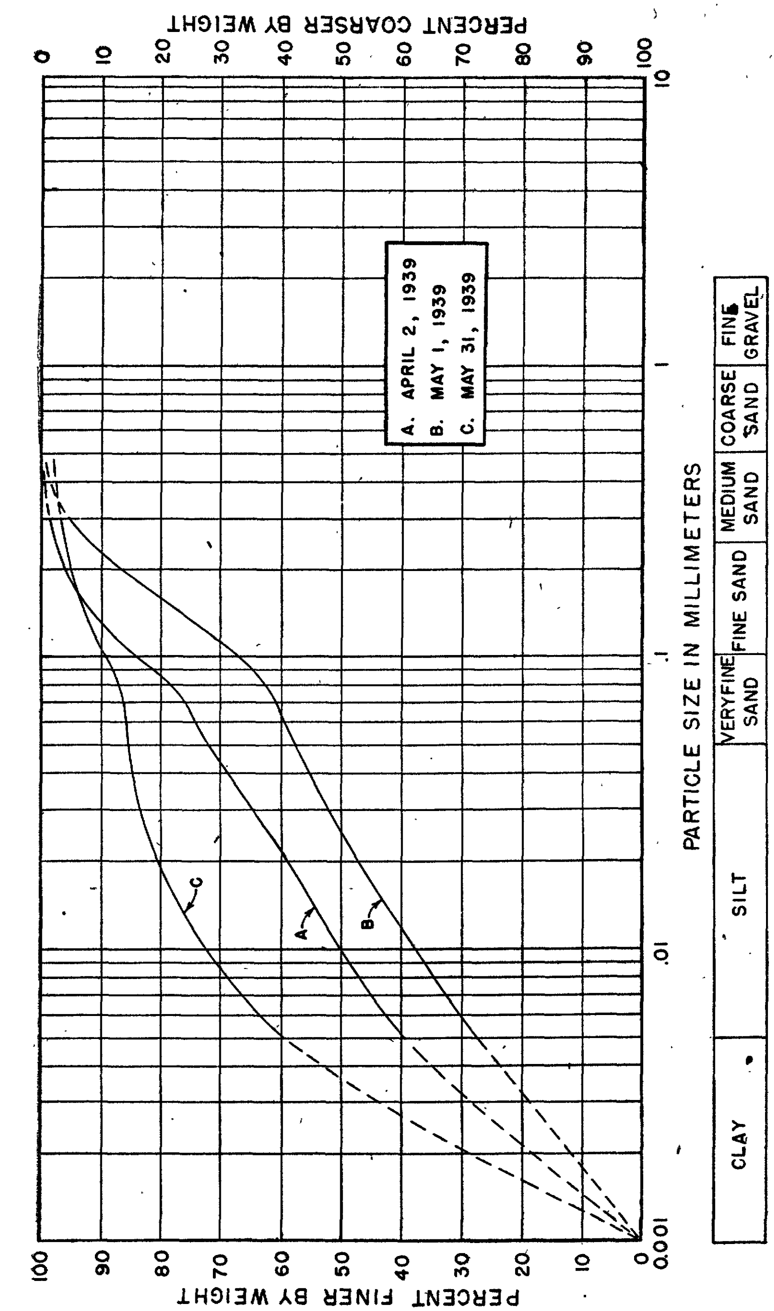



FIGURE 15.—Size analyses of sediment carried by the New York Canal during spring runoff of 1939.

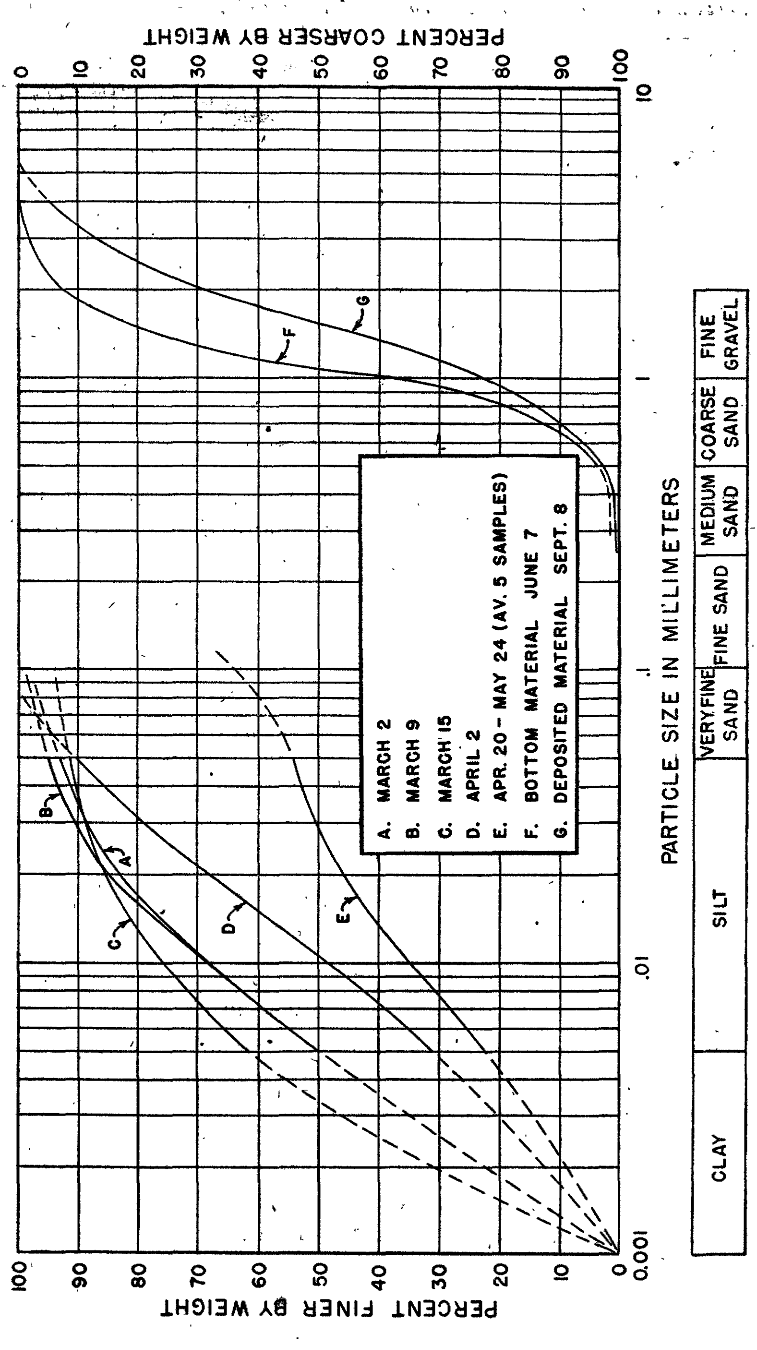



FIGURE 16.—Size analyses of sediment carried by the New York Canal during spring runoff of 1940

*Sediment loads measured during spring runoff of 1939 and 1940—February–June*

| Station | 1939 | | 1940 | |
|---|---|---|---|---|
| | Tons | Tons per square mile | Tons | Tons per square mile |
| Boise River near Twin Springs | 51,900 | 63 | 69,100 | 83 |
| Boise River at Dowling ranch | [1] 13,100 | [1] 5.9 | [1] 27,500 | [1] 12 |
| Boise River at Notus | [1] 86,600 | [1] 23 | [1] 114,000 | [1] 30 |
| Cottonwood Creek at Arrow Rock Reservoir | 716 | 33 | 8,050 | 376 |
| Grouse Creek | 27,700 | 3,460 | 19,900 | 2,490 |
| Moore Creek above Granite Creek | [1] 5,020 | [1] 136 | [1] 6,230 | [1] 168 |
| Moore Creek above Thorn Creek | [1] 17,000 | [1] 143 | [1] 36,500 | [1] 307 |
| Granite Creek | 2,930 | 610 | 1,950 | 406 |
| Bannock Creek | 14 | 3.1 | 728 | 162 |
| Pine Creek near Idaho City | [1] 587 | [1] 90 | --- | --- |
| Pine Creek above Barry Placer diversion | --- | --- | [1] 7,350 | [1] 1,200 |
| Elk Creek near Idaho City | [1] 9,090 | [1] 408 | --- | --- |
| Elk Creek above Gold Hill Placer diversion | --- | --- | 2,820 | 215 |
| New York Canal | [1] 38,600 | --- | [1] 82,400 | --- |
| Cottonwood Gulch at Boise | 24,800 | 1,550 | 15,000 | 938 |

[1] Sediment loads affected by appreciable regulation or diversion above station.

The largest sediment loads per unit of drainage area were measured in Grouse Creek during periods of spring runoff of 1939 and 1940. They were more than twice as large as the load per square mile measured at any other station during each of those years. The second largest loads per square mile were measured in Cottonwood Gulch in 1939 and in Pine Creek in 1940. The smallest loads per square mile were measured in Bannock Creek during 1939 and in the Boise River at Dowling ranch in 1940. The loads measured at Dowling ranch are of little significance, however, because the station is below Arrow Rock Dam. The smallest load per square mile during 1940 at stations unaffected or only slightly affected by regulation or diversions was measured in the Boise River near Twin Springs.

## SEDIMENT LOADS MEASURED AT 13 STATIONS DURING 18-MONTH PERIOD OF INVESTIGATION

The total loads of sediment measured at all of the stations during the 18 months of the investigation are given in the table below. Inasmuch as the loads at many of the stations were affected by regulation, diversion, or other artificial means the loads expressed in tons per square mile are not comparable. The largest loads per square mile during the 18-month period were measured in Grouse Creek and the second largest in Cottonwood Gulch. The smallest loads per square mile for those streams relatively unaffected by regulation, diversion, or other artificial means, were measured in the Boise River near Twin Springs.

*Sediment loads measured during 18 months ended June 30, 1940*

| Station | Tons | Tons per square mile |
|---|---|---|
| Boise River near Twin Springs | 123,400 | 149 |
| Boise River at Dowling ranch | [1] 45,700 | [1] 21 |
| Boise River at Notus | [1] 210,000 | [1] 55 |
| Cottonwood Creek at Arrow Rock Reservoir | 8,780 | 410 |
| Grouse Creek | 47,600 | 5,950 |
| Moore Creek above Granite Creek | [2] 11,300 | [2] 305 |
| Moore Creek above Thorn Creek | [2] 60,800 | [2] 511 |
| Granite Creek | 4,890 | 1,020 |
| Bannock Creek | 743 | 165 |
| Pine Creek near Idaho City [3] | [3] 595 | [2] 92 |
| Pine Creek above Barry Placer diversion [4] | [2] 7,350 | [2] 1,200 |
| Elk Creek near Idaho City [5] | [2] 12,300 | [2] 552 |
| Elk Creek above Gold Hill Placer diversion [6] | 2,820 | 215 |
| New York Canal | [1] 128,500 | |
| Cottonwood Gulch at Boise | 39,800 | 2,490 |

[1] Sediment loads affected by regulation above station.
[2] Sediment loads affected by diversions or minor regulation above station.
[3] Station operated Jan. 16, 1939, to Feb. 12, 1940.
[4] Station operated Feb. 13 to June 30, 1940.
[5] Station operated Jan. 20, 1939, to Feb. 4, 1940.
[6] Station operated Feb. 4 to June 30, 1940.

## VARIATIONS IN SEDIMENT CONCENTRATION AND STREAM VELOCITY IN THE NEW YORK CANAL

During the spring runoff period of 1940, at the time sediment samples were collected, 30 series of velocity measurements were made at the stream-gaging station on the New York Canal. These measurements were made at 12 points in the cross section corresponding to the sediment-sampling points. The velocity was measured at each of 4 points in the vertical—surface, mid-depth, 0.5 to 1.0 foot off the bottom, and 0.2 foot off the bottom—immediately after which sediment samples were collected at those points with the Tait-Binckley sampler. Similar procedure was followed at each of 2 other vertical sections. The 3 vertical measuring sections were approximately one-fourth, one-half, and three-fourths the distance across the canal.

Although there was undoubtedly some fluctuation in sediment concentration from instant to instant at each measuring point, in general the concentrations determined in the samples probably represent very nearly the concentrations at the measuring points at the time the velocity measurements were made.

The results of measurements of velocity and sediment concentrations are given in the accompanying table. Velocities near the surface and bottom and at two intermediate points have been plotted against sediment concentrations and are shown in plate 8. The sediment concentrations of from 3,000 to 3,250 parts per million on March 27 were the highest measured during the 30 series of measurements. Variations in sediment concentration with depth for four sampling periods are shown in figure 17.

758529—48——4

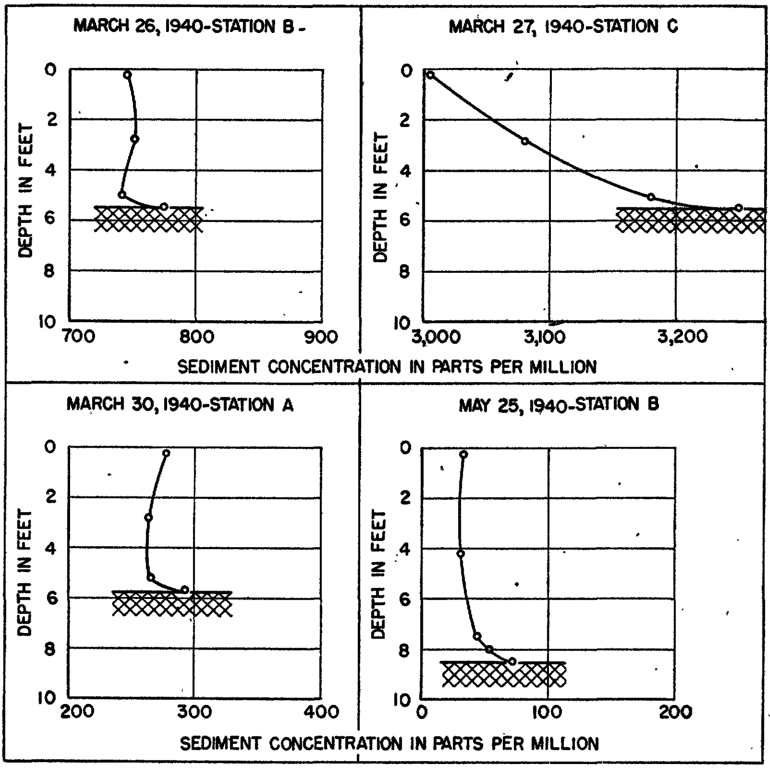
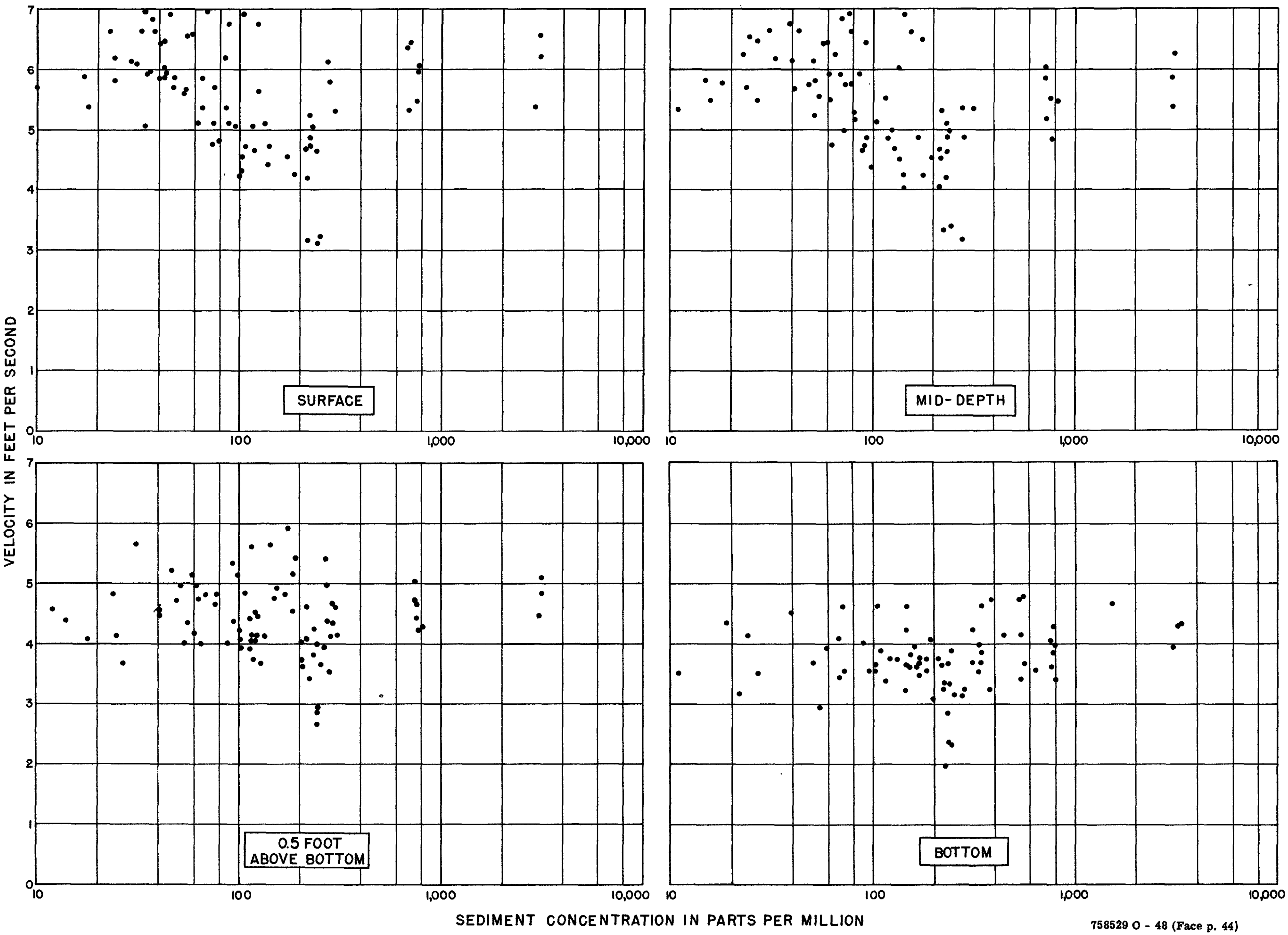



FIGURE 17.—Variation in sediment concentration with depth in New York Canal at different times during spring runoff of 1940.




SEDIMENT CONCENTRATION AND VELOCITY IN NEW YORK CANAL DURING SPRING RUNOFF OF 1940

758529 O - 48 (Face p. 44)

*Velocities and sediment concentrations at various depths in the New York Canal near Barber*

| Date | Time | Station [1] | Depth (feet) | Velocity [2] (ft. per sec.) | Sediment concentration (p. p. m.) |
|---|---|---|---|---|---|
| *1940* | | | | | |
| Feb. 9 | 9:30 a. m. | A | 0.2 | 3.15 | 219 |
| | | | 1.4 | 3.31 | 226 |
| | | | 2.3 | 2.94 | 248 |
| | | | 2.8 | 2.31 | 245 |
| | | B | .2 | 3.22 | 250 |
| | | | 1.4 | 3.39 | 247 |
| | | | 2.3 | 2.88 | 245 |
| | | | 2.8 | 2.35 | 243 |
| | | C | .2 | 3.12 | 247 |
| | | | 1.4 | 3.15 | 279 |
| | | | 2.3 | 2.69 | 248 |
| | | | 2.8 | 1.97 | 229 |
| Feb. 11 | 10:40 a. m. | A | .2 | 4.88 | 224 |
| | | | 2.4 | 4.62 | 239 |
| | | | 4.3 | 4.00 | 243 |
| | | | 4.8 | 3.31 | 240 |
| | | B | .2 | 5.23 | 225 |
| | | | 2.4 | 5.10 | 234 |
| | | | 4.2 | 4.24 | 236 |
| | | | 4.7 | 3.87 | 246 |
| | | C | .2 | 4.72 | 225 |
| | | | 2.4 | 4.88 | 237 |
| | | | 4.2 | 3.83 | 235 |
| | | | 4.7 | 2.82 | 234 |
| Feb. 13 | 10:30 a. m. | A | .2 | 4.81 | 79 |
| | | | 2.4 | 4.67 | 89 |
| | | | 4.4 | 4.09 | 102 |
| | | | 4.9 | 3.67 | 103 |
| | | B | .2 | 5.35 | 86 |
| | | | 2.4 | 4.99 | 73 |
| | | | 4.4 | 4.39 | 95 |
| | | | 4.9 | 4.00 | 90 |
| | | C | .2 | 5.10 | 89 |
| | | | 2.4 | 4.88 | 94 |
| | | | 4.4 | 4.00 | 89 |
| | | | 4.9 | 3.52 | 96 |
| Feb. 14 | 11:15 a. m. | A | .2 | 4.77 | 74 |
| | | | 2.6 | 4.72 | 63 |
| | | | 4.7 | 4.00 | 65 |
| | | | 5.2 | 3.45 | 69 |
| | | B | .2 | 5.35 | 65 |
| | | | 2.5 | 5.49 | 62 |
| | | | 4.5 | 4.34 | 56 |
| | | | 5.0 | 3.91 | 59 |
| | | C | .2 | 5.10 | 62 |
| | | | 2.5 | 5.23 | 52 |
| | | | 4.5 | 4.19 | 61 |
| | | | 5.0 | 2.94 | 55 |
| Feb. 26 | 8:25 a. m. | A | .2 | 4.67 | 118 |
| | | | 2.4 | 4.88 | 120 |
| | | | 4.2 | 3.91 | 115 |
| | | | 4.7 | 3.39 | 116 |
| | | B | .2 | 5.04 | 126 |
| | | | 2.3 | 4.99 | 125 |
| | | | 4.1 | 4.48 | 125 |
| | | | 4.6 | 3.75 | 132 |
| | | C | .2 | 4.58 | 171 |
| | | | 2.3 | 4.67 | 128 |
| | | | 4.1 | 4.04 | 121 |
| | | | 4.6 | 3.63 | 146 |

See footnotes at end of table.

*Velocities and sediment concentrations at various depths in the New York Canal near Barber*—Continued

| Date | Time | Station [1] | Depth (feet) | Velocity [2] (ft. per sec.) | Sediment concentration (p. p. m.) |
|---|---|---|---|---|---|
| *1940* | | | | | |
| Mar. 6 | 5 p. m. | A | 0.2 | 4.19 | 215 |
| | | | 2.0 | 4.04 | 215 |
| | | | 3.6 | 3.43 | 224 |
| | | | 4.1 | 3.08 | 199 |
| | | B | .2 | 4.99 | 204 |
| | | | 2.0 | 4.67 | 214 |
| | | | 3.5 | 4.19 | 218 |
| | | | 4.0 | 3.67 | 223 |
| | | C | .2 | 4.67 | 212 |
| | | | 2.0 | 4.34 | 209 |
| | | | 3.5 | 3.67 | 255 |
| | | | 4.0 | 3.39 | 228 |
| Mar. 16 | 9 a. m. | A | .2 | 4.31 | 102 |
| | | | 2.4 | 4.36 | 99 |
| | | | 4.3 | 3.93 | 103 |
| | | | 4.8 | 3.54 | 103 |
| | | B | .2 | 5.07 | 95 |
| | | | 2.4 | 5.13 | 103 |
| | | | 4.2 | 4.21 | 102 |
| | | | 4.7 | 3.88 | 110 |
| | | C | .2 | | 109 |
| | | | 2.4 | | 102 |
| | | | 4.3 | | 105 |
| | | | 4.8 | 3.67 | 109 |
| Mar. 26 | 3:55 p. m. | A | .2 | 5.46 | 750 |
| | | | 2.8 | 4.81 | 783 |
| | | | 5.1 | 4.21 | 762 |
| | | | 5.6 | 3.61 | 779 |
| | | B | .2 | 5.96 | 766 |
| | | | 2.8 | 5.51 | 771 |
| | | | 5.0 | 4.66 | 762 |
| | | | 5.5 | 3.98 | 795 |
| | | C | .2 | 6.07 | 781 |
| | | | 2.8 | 5.46 | 817 |
| | | | 5.1 | 4.29 | 805 |
| | | | 5.6 | 3.40 | 800 |
| Mar. 27 | 8:40 a. m. | A | .2 | 5.39 | 2,920 |
| | | | 2.8 | 5.35 | 3,090 |
| | | | 5.1 | 4.48 | 3,070 |
| | | | 5.6 | 3.91 | 3,110 |
| | | B | .2 | 6.57 | 3,040 |
| | | | 2.8 | 6.26 | 3,150 |
| | | | 5.0 | 5.10 | 3,170 |
| | | | 5.5 | 4.29 | 3,240 |
| | | C | .2 | 6.20 | 3,040 |
| | | | 2.8 | 5.87 | 3,080 |
| | | | 5.0 | 4.82 | 3,180 |
| | | | 5.5 | 4.29 | 3,250 |
| Mar. 28 | 6:20 p. m. | A | .2 | 5.33 | 692 |
| | | | 3.2 | 5.16 | 732 |
| | | | 5.9 | 4.42 | 760 |
| | | | 6.4 | 4.03 | 768 |
| | | B | .2 | 6.37 | 687 |
| | | | 3.1 | 6.01 | 731 |
| | | | 5.7 | 5.04 | 756 |
| | | | 6.2 | 4.28 | 788 |
| | | C | .2 | 6.43 | 702 |
| | | | 3.2 | 5.85 | 722 |
| | | | 5.9 | 4.71 | 739 |
| | | | 6.4 | 3.81 | 785 |

See footnotes at end of table.

*Velocities and sediment concentrations at various depths in the New York Canal near Barber*—Continued

| Date | Time | Station [1] | Depth (feet) | Velocity [2] (ft. per sec.) | Sediment concentration (p. p. m.) |
|---|---|---|---|---|---|
| *1940* | | | | | |
| Mar. 30 | 5:25 p. m. | A | 0.2 | 5.28 | 299 |
| | | | 2.8 | 4.86 | 283 |
| | | | 5.2 | 4.13 | 286 |
| | | | 5.7 | 3.69 | 312 |
| | | B | .2 | 6.13 | 276 |
| | | | 2.8 | 5.34 | 282 |
| | | | 5.0 | 4.61 | 302 |
| | | | 5.5 | 4.13 | 308 |
| | | C | .2 | 5.80 | 282 |
| | | | 2.8 | 5.34 | 315 |
| | | | 5.1 | 4.38 | 275 |
| | | | 5.6 | 3.69 | 304 |
| Apr. 5 | 9:15 a. m. | A | .2 | 4.25 | 186 |
| | | | 2.2 | 4.21 | 232 |
| | | | 3.9 | 3.54 | 280 |
| | | | 4.4 | 3.22 | 289 |
| | | B | .2 | 5.04 | 230 |
| | | | 2.2 | 4.98 | 241 |
| | | | 3.9 | 4.18 | 305 |
| | | | 4.4 | 3.69 | 347 |
| | | C | .2 | 4.66 | 241 |
| | | | 2.2 | 4.51 | 215 |
| | | | 3.9 | 3.94 | 262 |
| | | | 4.5 | 3.24 | 378 |
| Apr. 10 | 4:25 p. m. | A | .2 | 4.23 | 100 |
| | | | 2.0 | 4.03 | 142 |
| | | | 3.5 | 3.73 | 119 |
| | | | 4.0 | 3.20 | 143 |
| | | B | .2 | 4.71 | 108 |
| | | | 1.9 | 4.51 | 136 |
| | | | 3.4 | 4.13 | 118 |
| | | | 3.9 | 3.61 | 165 |
| | | C | .2 | 4.56 | 104 |
| | | | 2.0 | 4.25 | 143 |
| | | | 3.5 | 3.69 | 130 |
| | | | 4.0 | 3.14 | 253 |
| Apr. 13 | 3 p. m. | A | .2 | 4.42 | 139 |
| | | | 2.0 | 4.23 | 176 |
| | | | 3.6 | 3.61 | 209 |
| | | | 4.1 | 3.22 | 224 |
| | | B | .2 | 5.10 | 133 |
| | | | 2.0 | 4.86 | 169 |
| | | | 3.6 | 4.03 | 201 |
| | | | 4.1 | 3.69 | 232 |
| | | C | .2 | 4.71 | 140 |
| | | | 2.1 | 4.51 | 199 |
| | | | 3.7 | 3.71 | 207 |
| | | | 4.2 | 3.14 | 27 |
| Apr. 17 | 4:15 p. m. | A | .2 | 5.10 | 74 |
| | | | 2.8 | 4.71 | 91 |
| | | | 5.1 | 4.06 | 117 |
| | | | 5.6 | 3.61 | 151 |
| | | B | .2 | 5.86 | 66 |
| | | | 2.8 | 5.51 | 117 |
| | | | 5.0 | 4.42 | 115 |
| | | | 5.5 | 3.77 | 186 |
| | | C | .2 | 5.65 | 126 |
| | | | 2.8 | 5.16 | 82 |
| | | | 5.0 | 4.13 | 123 |
| | | | 5.5 | 3.54 | 185 |

See footnotes at end of table.

*Velocities and sediment concentrations at various depths in the New York Canal near Barber*—Continued

| Date | Time | Station [1] | Depth (feet) | Velocity [2] (ft. per sec.) | Sediment concentration (p. p. m.) |
|---|---|---|---|---|---|
| *1940* | | | | | |
| Apr. 20 | 8 a. m. | A | 0.2 | 5.60 | [3] 53 |
| | | | 3.2 | 5.28 | 81 |
| | | | 6.0 | 4.33 | 134 |
| | | | 6.5 | 3.73 | 171 |
| | | B | .2 | 6.31 | ------------ |
| | | | 3.2 | 5.91 | ------------ |
| | | | 5.9 | 4.81 | ------------ |
| | | | 6.4 | 4.42 | ------------ |
| | | C | .2 | 6.01 | ------------ |
| | | | 3.2 | 5.75 | ------------ |
| | | | 6.0 | 4.71 | ------------ |
| | | | 6.5 | 3.73 | ------------ |
| Apr. 24 | 8:25 a. m. | A | .2 | 6.01 | 42 |
| | | | 4.0 | 5.75 | 73 |
| | | | 7.5 | 4.61 | 216 |
| | | | 8.0 | 4.13 | 451 |
| | | B | .2 | 6.98 | 69 |
| | | | 4.0 | 6.63 | 157 |
| | | | 7.4 | 5.41 | 191 |
| | | | 7.9 | 4.66 | 1,520 |
| | | C | .2 | 6.56 | 58 |
| | | | 4.0 | 6.43 | 93 |
| | | | 7.4 | 4.92 | 157 |
| | | | 7.9 | 3.98 | (4) |
| Apr. 27 | 3:50 p. m. | A | .2 | 6.19 | 84 |
| | | | 4.2 | 6.01 | 135 |
| | | | 8.0 | 4.66 | 296 |
| | | | 8.5 | 3.98 | 339 |
| | | B | .2 | 6.91 | 104 |
| | | | 4.2 | 6.91 | 145 |
| | | | 7.9 | 5.41 | 271 |
| | | | 8.4 | 4.71 | 530 |
| | | C | .2 | 6.77 | 88 |
| | | | 4.2 | 6.49 | 179 |
| | | | 8.0 | 4.98 | 273 |
| | | | 8.5 | 4.23 | 316 |
| May 1 | do | A | .2 | 5.70 | [3] 47 |
| | | | 3.8 | 5.56 | 54 |
| | | | 7.0 | 4.76 | 150 |
| | | | 7.5 | 3.90 | 333 |
| | | B | .2 | 6.77 | ------------ |
| | | | 3.7 | 6.25 | ------------ |
| | | | 6.9 | 5.16 | ------------ |
| | | | 7.4 | 4.51 | ------------ |
| | | C | .2 | 6.37 | ------------ |
| | | | 3.7 | 5.91 | ------------ |
| | | | 6.9 | 4.81 | ------------ |
| | | | 7.4 | 4.18 | ------------ |
| May 8 | 8:20 a. m. | A | .2 | 5.65 | 54 |
| | | | 4.1 | 5.91 | 86 |
| | | | 7.7 | 4.56 | 189 |
| | | | 8.2 | 3.85 | 350 |
| | | B | .2 | 6.91 | 45 |
| | | | 4.0 | 6.91 | 77 |
| | | | 7.5 | 5.16 | 189 |
| | | | 8.0 | 4.76 | 559 |
| | | C | .2 | 6.77 | 123 |
| | | | 4.0 | 6.43 | 58 |
| | | | 7.6 | 4.86 | 109 |
| | | | 8.1 | 4.08 | 193 |

**See footnotes at end of table.**

*Velocities and sediment concentrations at various depths in the New York Canal near Barber*—Continued

| Date | Time | Station [1] | Depth (feet) | Velocity [2] (ft. per sec.) | Sediment concentration (p. p. m.) |
|---|---|---|---|---|---|
| *1940* | | | | | |
| May 11 | 3:05 p. m. | A | 0.2 | 5.70 | 75 |
| | | | 4.3 | 5.75 | 78 |
| | | | 7.6 | 4.81 | 172 |
| | | | 8.6 | 3.40 | 541 |
| | | B | .2 | 7.06 | 60 |
| | | | 4.2 | 6.84 | 71 |
| | | | 7.5 | 5.91 | 175 |
| | | | 8.5 | 4.71 | 386 |
| | | C | .2 | 6.56 | 55 |
| | | | 4.2 | 6.63 | 78 |
| | | | 7.5 | 5.16 | 99 |
| | | | 8.5 | 3.94 | 160 |
| May 15 | 9 a. m. | A | .2 | 5.86 | 48 |
| | | | 4.3 | 5.91 | 61 |
| | | | 7.6 | 4.71 | 101 |
| | | | 8.6 | 3.54 | 645 |
| | | B | .2 | 6.84 | 37 |
| | | | 4.2 | 7.14 | 48 |
| | | | 7.5 | 5.65 | 144 |
| | | | 8.5 | 4.61 | 107 |
| | | C | .2 | 6.43 | 36 |
| | | | 4.2 | 6.43 | 59 |
| | | | 7.5 | 5.16 | 59 |
| | | | 8.5 | 3.65 | 169 |
| May 18 | 8:30 a. m. | A | .2 | 5.96 | 35 |
| | | | 4.2 | 5.80 | 52 |
| | | | 7.5 | 4.81 | 69 |
| | | | 8.5 | 3.47 | 169 |
| | | B | .2 | 6.98 | 34 |
| | | | 4.2 | 6.77 | 39 |
| | | | 7.4 | 5.61 | 116 |
| | | | 8.4 | 4.61 | 349 |
| | | C | .2 | 6.43 | 41 |
| | | | 4.2 | 6.25 | 66 |
| | | | 7.5 | 4.81 | 78 |
| | | | 8.5 | 3.81 | 155 |
| May 22 | 3:50 p. m. | A | .2 | 5.86 | 42 |
| | | | 4.3 | 5.91 | 70 |
| | | | 8.1 | 4.33 | 299 |
| | | | 8.6 | 3.65 | 566 |
| | | B | .2 | 6.63 | 38 |
| | | | 4.2 | 6.63 | 43 |
| | | | 8.0 | 5.22 | 47 |
| | | | 8.5 | 4.23 | 146 |
| | | C | .2 | 6.43 | 42 |
| | | | 4.2 | 6.13 | 51 |
| | | | 8.0 | 5.34 | 93 |
| | | | 8.5 | 3.73 | 222 |
| May 25 | 4 p. m. | A | .2 | 5.91 | 34 |
| | | | 4.3 | 5.65 | 41 |
| | | | 7.6 | 4.71 | 103 |
| | | | 8.1 | 4.66 | 76 |
| | | | 8.6 | 4.13 | 540 |
| | | B | .2 | 6.63 | 33 |
| | | | 4.2 | 6.63 | 31 |
| | | | 7.5 | 5.22 | 44 |
| | | | 8.0 | 4.98 | 52 |
| | | | 8.5 | 4.61 | 71 |

See footnotes at end of table.

*Velocities and sediment concentrations at various depths in the New York Canal near Barber*—Continued

| Date | Time | Station [1] | Depth (feet) | Velocity [2] (ft. per sec.) | Sediment concentration (p. p. m.) |
|---|---|---|---|---|---|
| *1940* | | | | | |
| May 25 | 4 p. m. | C | 0.2 | 6.13 | 29 |
| | | | 4.3 | 6.19 | 33 |
| | | | 7.6 | 4.71 | 35 |
| | | | 8.1 | 4.56 | 41 |
| | | | 8.6 | 3.69 | 51 |
| May 29 | 4:15 p. m. | A | .2 | 5.80 | 24 |
| | | | 4.2 | 5.70 | 24 |
| | | | 7.7 | 4.71 | 49 |
| | | | 8.7 | 3.54 | 72 |
| | | B | .2 | 6.91 | 30 |
| | | | 4.3 | 6.49 | 27 |
| | | | 7.6 | 5.65 | 31 |
| | | | 8.6 | 4.61 | 147 |
| | | C | .2 | 5.91 | 43 |
| | | | 4.4 | 6.13 | 40 |
| | | | 7.7 | 4.76 | 64 |
| | | | 8.7 | 3.77 | 123 |
| June 5 | 5:05 p. m. | A | .2 | 5.86 | 41 |
| | | | 4.4 | 5.75 | 49 |
| | | | 8.4 | 4.51 | 122 |
| | | | 8.9 | [5] 2.33 | [5] 25,000 |
| | | B | .2 | 6.63 | 23 |
| | | | 4.4 | 6.63 | 25 |
| | | | 8.2 | 4.81 | 24 |
| | | | 8.7 | 4.51 | 40 |
| | | C | .2 | 6.19 | 24 |
| | | | 4.4 | 6.25 | 23 |
| | | | 8.4 | 4.13 | 25 |
| | | | 8.9 | 3.50 | 27 |
| June 12 | 6 p. m. | A | .2 | 5.05 | 34 |
| | | | 3.6 | 5.30 | 221 |
| | | | 6.7 | 4.00 | 54 |
| | | | 7.2 | [5] 2.78 | [5] 1,180 |
| | | B | .2 | 6.10 | 31 |
| | | | 3.5 | 5.78 | 18 |
| | | | 6.5 | 4.48 | 41 |
| | | | 7.0 | 4.09 | 68 |
| | | C | .2 | 5.88 | 17 |
| | | | 3.6 | 5.49 | 16 |
| | | | 6.6 | 4.09 | 18 |
| | | | 7.1 | 3.18 | 22 |
| June 19 | 5 p. m. | A | .2 | 5.36 | 18 |
| | | | 3.6 | 5.34 | 11 |
| | | | 6.8 | 3.68 | 27 |
| | | | 7.3 | 3.52 | 339 |
| | | B | .2 | 6.10 | 9 |
| | | | 3.6 | 5.83 | 9 |
| | | | 6.7 | 4.58 | 12 |
| | | | 7.2 | 4.84 | 19 |
| | | C | .2 | 5.73 | 9 |
| | | | 3.6 | 5.68 | 10 |
| | | | 6.8 | 4.34 | 7 |
| | | | 7.3 | 3.52 | 11 |
| June 26 | 4:20 p. m. | A | .2 | 5.63 | 10 |
| | | | 3.7 | 5.83 | 15 |
| | | | 6.9 | 4.39 | 14 |
| | | | 7.4 | 3.52 | [6] 448,000 |

See footnotes at end of table.

*Velocities and sediment concentrations at various depths in the New York Canal near Barber*—Continued

| Date | Time | Station [1] | Depth (feet) | Velocity [2] (ft. per sec.) | Sediment concentration (p. p. m.) |
|---|---|---|---|---|---|
| *1940* | | | | | |
| June 26 | 4:20 p. m. | B | 0.2 | 6.21 | 12 |
| | | | 3.6 | 5.88 | 9 |
| | | | 6.8 | 4.99 | 7 |
| | | | 7.3 | 4.14 | 24 |
| | | C | .2 | 5.17 | 8 |
| | | | 3.7 | 5.30 | 5 |
| | | | 6.9 | 3.67 | 5 |
| | | | 7.4 | 2.96 | 7 |

[1] A, B, and C approximately one-fourth, one-half, and three-fourths the distance across the canal.
[2] Velocity corresponding to bottom samples measured about 0.2 foot above bottom.
[3] Composites of A, B, and C; size analyses made of composites.
[4] Sample lost.
[5] Low velocity and heavy sediment, result of sand wave.
[6] High sediment content, result of sand wave.

Size analyses made on two series of samples, one collected on April 20 and the other on May 1, are shown graphically in figures 18 and 19, respectively. For the series of samples collected on April 20 more than 60 percent of the sediment in surface samples consisted of particles less than 0.020 millimeter in diameter. The sediment became coarser with increasing depth and in the bottom samples 75 percent was larger than 0.050 millimeter. The composition of the sediment in the series of samples collected on May 1 was somewhat similar to the composition in the series collected on April 20. Although size analyses were not made on other samples collected at times of velocity measurements, analyses were made of several series of point samples collected during the period March 2 to May 24, 1940. These analyses indicate that the sediment transported during March and the early part of April was finer than that carried during the latter part of April and during May.

The plots in plate 8 show that there is no relation between velocity and sediment concentration for the size and concentration of material transported. It is obvious that the water was not saturated with suspended sediment for the velocities encountered, and since the canal bottom consisted of concrete instead of sand there was no way in which the sediment load in the canal might be increased except as it moved beneath the head gates at Diversion Dam. There were undoubtedly local areas of saturation along the bottom of the canal at times when coarse sand was transported in the form of dunes. It was not possible, however, to make reliable measurements of velocity at points next to the bottom during the passage of the dunes.

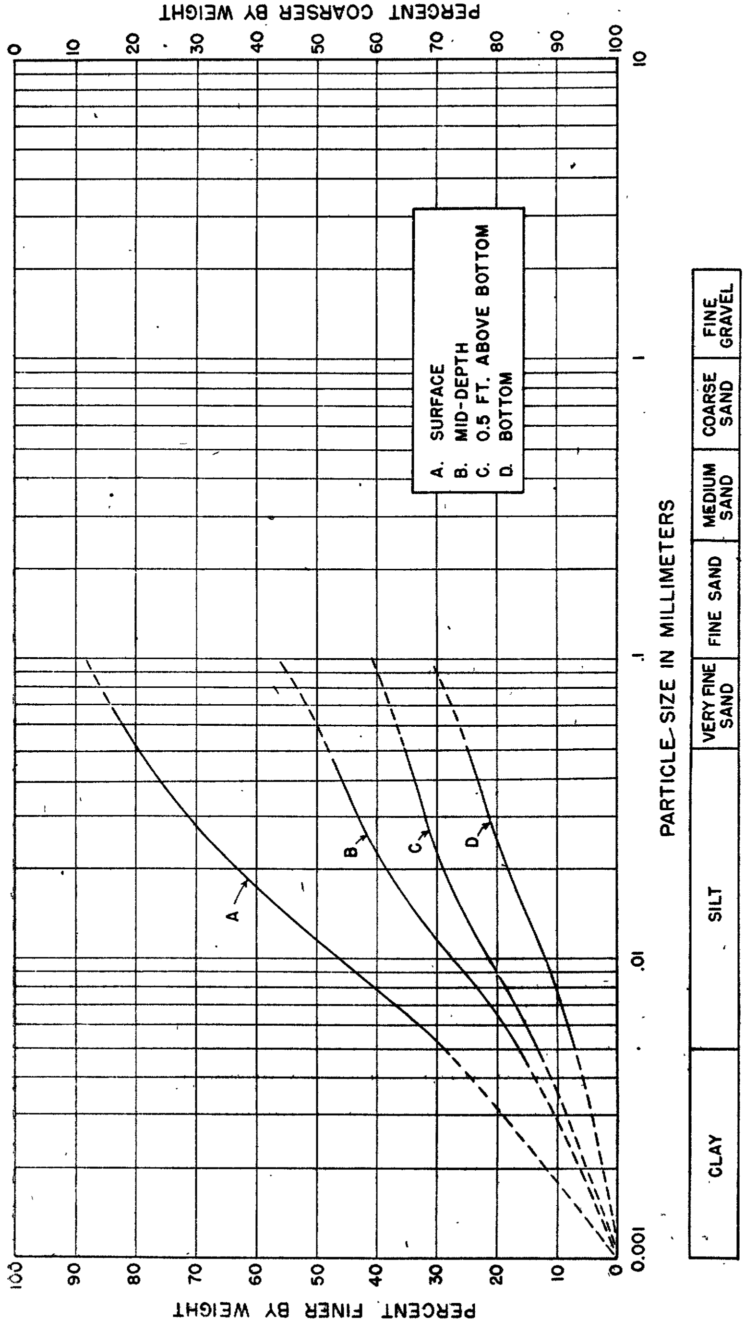



FIGURE 18.—Size analyses of sediment carried at varying depths in New York Canal, April 20, 1940.

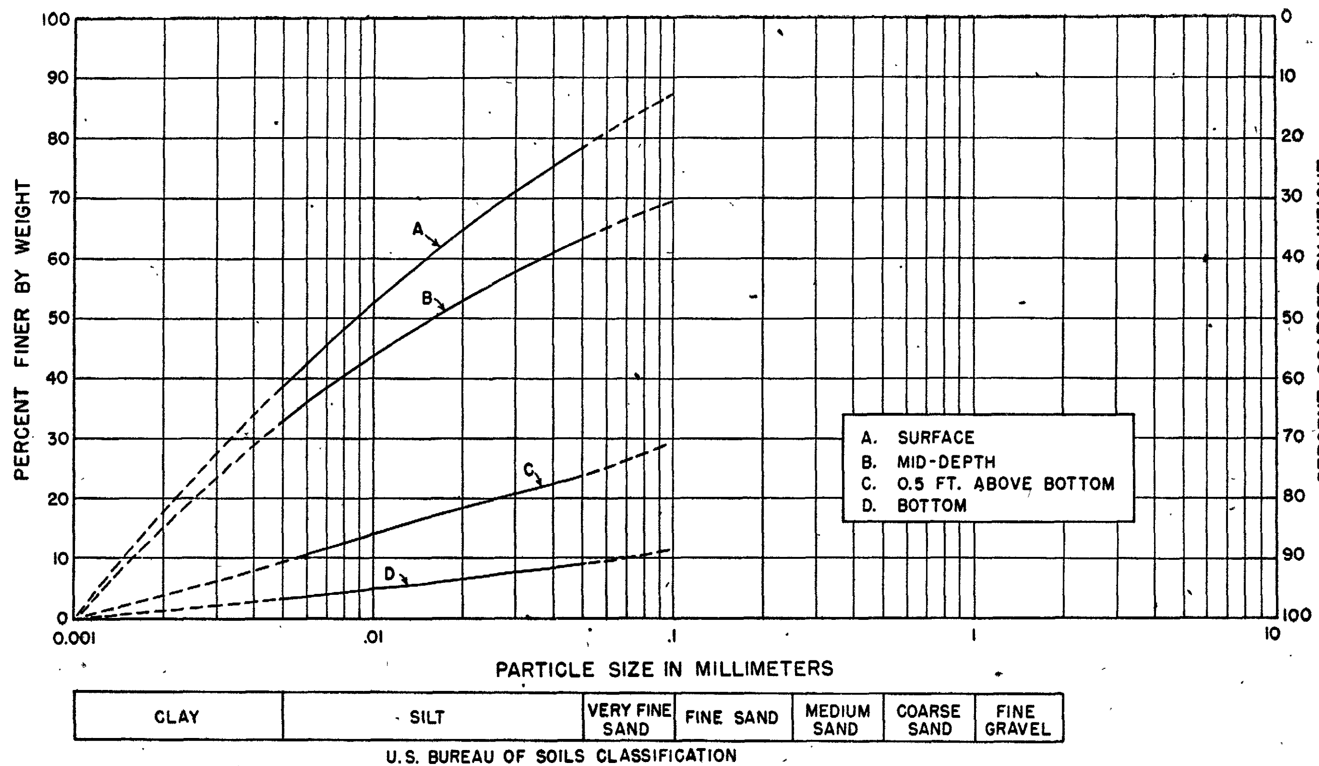



FIGURE 19.—Size analyses of sediment carried at varying depths in New York Canal, May 1, 1940.

## BED LOAD

### BED LOAD IN THE NEW YORK CANAL

The New York Canal diverts water from the Boise River at Diversion Dam 8 miles downstream from Moore Creek. The dam creates a pool from 2 to 3 miles long, which acts as a settling basin for the coarser sediments carried by the river. The pool has become so filled with sediment that the storage capacity is negligible. The deposited material in the pool is always a potential source of sediment in the New York Canal.

During the spring and summer of 1939 very little coarse material was found in bottom samples collected from the canal. The results of size analyses of three sets of point samples, each consisting of surface, mid-depth, and bottom samples collected during April and May 1939, for which graphs are shown in figure 15, show that about 70 percent of the material in the samples consisted of particles less than 0.050 millimeter in diameter. The concentration of sediment in bottom samples on which no size analyses were made usually did not greatly exceed the concentration of sediments carried in suspension. When the canal was drained in September 1939 no material was found in the lined sections for a distance of 3 miles below Diversion Dam. Practically no material was found in the wide section 0.2 mile below the gaging station, where sand always deposits if any appreciable amount is carried past the head gates at Diversion Dam.

During April 1940 coarse sand was observed occasionally in bottom samples collected at the gaging stations. The sand appeared to be moving along the bottom at irregular intervals since it was found in some samples but not in others. During May and June sand was found more frequently than during April, particularly at the sampling point one-fourth of the distance from the right bank.

Results of observations suggest that the sand is rolled or skipped along the bottom of the canal in much the same manner as sand is moved in dunes by the wind. It seems probable that the moving sand particles were at times in suspension and at times rolling. The entire movement appears to have taken place within the zone of saltation which is described by Gilbert [6] as follows: "Some particles of the bed slide, many roll, the multitude make short skips or leaps, the process being called saltation. Saltation grades into suspension. When particles of many sizes are moved together the large ones are rolled." The movement of sand in dunes is a form of bed load.

---

[6] Gilbert, G. K., The transportation of debris by running water: U. S. Geol. Survey Prof. Paper 86, p. 11, 1914.

During the month of June 1940 five series of observations of the movement of sand dunes were made from the bridge at the gaging station. Bottom samples were taken every 2 to 4 minutes at stations A, B, and C, these stations corresponding to distances about one-fourth, one-half, and three-fourths of the distance from the right bank. After it was found that very little sand was being carried past stations B and C, most of the sampling was done at station A.

Point samples were taken with the Tait-Binckley sampler which was fastened to a 15-foot length of ¾-inch pipe. In order to hold the pipe in a vertical position the sampler was fastened to a stay line. The sampler was lowered to the bottom and held in the open position from 2 to 3 seconds, then the cord was pulled to close it.

Sand was observed on the bottom at irregular intervals. The presence or absence of sand could be determined fairly definitely by noting the depth at which the bottom was reached. By careful sounding the approximate width and height of the dunes could be determined. The widths usually varied from about 2 to 6 feet but occasionally widths of 8 feet were observed. The heights were less than 0.5 foot. The lengths of the dunes could be determined only with respect to the time it took them to pass the sampling point. Ordinarily the dunes passed the sampling point in from 2 to 4 minutes. All the data obtained during the five series of observations are given in the following table.

*Variations in sediment concentration in bottom samples and approximate width of sand dunes in the New York Canal*

| Date | Time[1] (p. m.) | Sediment concentration in parts per million at the following stations[2] | | | Approximate width of dune (feet) |
|---|---|---|---|---|---|
| | | A | B | C | |
| *1940* | | | | | |
| June 7 | 2:20 | 8,930 | 81 | 60 | ------ |
| | 2:22 | 240 | ------ | ------ | ------ |
| | 2:24 | 145 | 38 | 28 | ------ |
| | 2:26 | 35 | ------ | ------ | ------ |
| | 2:28 | 71 | ------ | ------ | ------ |
| | 2:30 | 49 | 58 | 34 | ------ |
| | 2:32 | 63 | ------ | ------ | ------ |
| | 2:34 | 272 | 128 | 33 | ------ |
| | 2:36 | 1,630 | ------ | ------ | ------ |
| | 2:38 | 10,400 | ------ | ------ | ------ |
| | 2:40 | 352 | 39 | 33 | ------ |
| | 2:42 | 266,000 | ------ | ------ | ------ |
| | 2:44 | 3,370 | 62 | 35 | ------ |
| | 2:46 | 58 | ------ | ------ | ------ |
| | 2:48 | 330 | ------ | ------ | ------ |
| | 2:50 | 29 | 82 | 30 | ------ |
| | 2:52 | 190 | ------ | ------ | ------ |
| | 2:54 | 47 | 43 | 34 | ------ |
| | 2:56 | 79 | ------ | ------ | ------ |
| | 2:58 | 63 | ------ | ------ | ------ |
| | 3:00 | 105 | 144 | 36 | ------ |
| | 3:02 | 106 | ------ | ------ | ------ |
| | 3:04 | 326 | 34 | 37 | ------ |
| *1940* | | | | | |
| June 7 | 3:06 | 766 | ------ | ------ | ------ |
| | 3:08 | 701 | ------ | ------ | ------ |
| | 3:10 | 109 | 50 | 43 | ------ |
| | 3:12 | 866 | ------ | ------ | ------ |
| | 3:14 | 4,570 | 71 | 33 | ------ |
| | 3:16 | 289 | ------ | ------ | ------ |
| | 3:18 | [3] 28,000 | ------ | ------ | ------ |
| | 3:20 | 140 | 70 | 44 | ------ |
| | 3:22 | 308 | ------ | ------ | ------ |
| | 3:24 | 425 | 148 | 45 | ------ |
| | 3:26 | 120 | ------ | ------ | ------ |
| | 3:28 | 68 | ------ | ------ | ------ |
| | 3:30 | 113 | 48 | 41 | ------ |
| | 3:32 | 229 | ------ | ------ | ------ |
| | 3:34 | [3] 185,000 | 101 | 42 | ------ |
| | 3:36 | 227 | ------ | ------ | ------ |
| | 3:38 | [3] 185,000 | ------ | ------ | ------ |
| | 3:40 | 654 | 71 | 50 | ------ |
| | 3:42 | 144 | ------ | ------ | ------ |
| | 3:44 | 286 | 56 | 47 | ------ |
| | 3:46 | 82 | ------ | ------ | ------ |
| | 3:48 | 56 | ------ | ------ | ------ |
| | 3:50 | 372 | 103 | 46 | ------ |

See footnotes at end of table.

*Variations in sediment concentration in bottom samples and approximate width of sand dunes in the New York Canal*—Continued

| Date | Time [1] (p. m.) | Sediment concentration in parts per million at the following stations [2] | | | Approximate width of dune (feet) |
|---|---|---|---|---|---|
| | | A | B | C | |
| *1940* | | | | | |
| June 7 | 3:52 | 49 | | | |
| | 3:54 | 81 | 57 | 31 | |
| | 3:56 | 55 | | | |
| | 3:58 | 296 | | | |
| | 4:00 | 76 | 44 | 35 | |
| | 4:02 | 46 | | | |
| | 4:04 | 54 | 161 | 42 | |
| | 4:06 | 168 | | | |
| | 4:08 | 109 | | | |
| | 4:10 | 102 | 94 | 33 | |
| | 4:12 | 764 | | | |
| | 4:14 | 198 | 160 | 29 | |
| | 4:16 | 348 | | | |
| | 4:18 | 174 | | | |
| | 4:20 | 734 | 74 | 37 | |
| | 4:22 | 5,160 | | | |
| | 4:24 | 74 | 74 | 30 | |
| | 4:26 | 121 | | | |
| | 4:28 | 55 | | | |
| | 4:30 | 177 | 97 | 31 | |
| | 4:32 | 83 | | | |
| | 4:34 | 135 | 59 | 36 | |
| | 4:38 | 245 | | | |
| | 4:40 | 154 | 72 | 36 | |
| | 4:42 | 136 | | | |
| | 4:44 | 167 | 204 | 41 | |
| | 4:46 | 147 | | | |
| | 4:48 | 87 | | | |
| | 4:50 | Broken | 161 | 39 | |
| | 4:52 | 412 | | | |
| | 4:54 | 3,850 | 141 | 25 | |
| | 4:56 | 17,400 | | | |
| | 4:58 | 16,600 | | | |
| | 5:00 | 124 | 707 | 32 | |
| | 5:02 | 993 | | | |
| | 5:04 | 228,000 | 178 | 23 | |
| | 5:06 | 5,330 | | | |
| | 5:08 | 198 | | | |
| | 5:10 | 84,000 | 176 | 26 | |
| | 5:12 | 2,150 | | | |
| | 5:14 | 130 | 117 | 42 | |
| | 5:16 | 278 | | | |
| | 5:18 | No sample | | | |
| | 5:20 | No sample | 395 | 39 | |
| | 5:22 | 12,400 | | | |
| | 5:24 | 80 | 33 | 18 | |
| | 5:26 | 96 | | | |
| | 5:28 | 248 | | | |
| | 5:30 | 2,500 | 115 | 18 | |
| | 5:32 | No sample | | | |
| | 5:34 | 121 | 1,740 | Broken | |
| | 5:36 | 160 | | | |
| | 5:38 | 543 | | | |
| | 5:40 | 14,400 | 68 | 28 | |
| | 5:42 | 15,100 | | | |
| | 5:44 | 51,200 | 264 | 29 | |
| | 5:46 | 235 | | | |
| | 5:48 | 89 | | | |
| | 5:50 | 248 | 73 | 32 | |
| | 5:52 | 65 | | | |
| | 5:54 | 77 | 315 | 34 | |
| | 5:56 | 312 | | | |
| | 5:58 | 139 | | | |
| | 6:00 | 135 | 61 | 27 | |
| | 6:02 | 536 | | | |
| | 6:04 | 49,000 | 137 | 30 | |
| | 6:06 | No sample | | | |
| *1940* | | | | | |
| June 7 | 6:08 | 100 | | | |
| | 6:10 | 53 | 87 | 32 | |
| | 6:12 | 79 | | | |
| | 6:14 | 290 | 70 | 39 | |
| | 6:16 | 198 | | | |
| | 6:18 | 558 | | | |
| | 6:20 | 213 | 47 | 28 | |
| June 12 | 2:10 | 6,840 | 152 | 30 | |
| | 2:12 | 142,000 | | | |
| | 2:14 | 114 | | | |
| | 2:16 | 86 | | | |
| | 2:18 | 103 | | | |
| | 2:20 | No sample | 64 | 32 | |
| | 2:22 | 109 | | | |
| | 2:26 | 159 | 140 | | |
| | 2:30 | 546 | 1,370 | 23 | |
| | 2:34 | 479 | 194 | | |
| | 2:36 | 2,450 | | | |
| | 2:38 | 7,200 | | | |
| | 2:40 | 203 | 64 | 15 | |
| | 2:44 | 297 | 104 | | |
| | 2:46 | 821 | | | |
| | 2:50 | 14,500 | 521 | 15 | |
| | 2:54 | 3,580 | 72 | | |
| | 2:56 | 198 | | | |
| | 3:00 | 76 | 134 | 15 | |
| | 3:02 | 391 | | | |
| | 3:04 | 363 | 208 | | |
| | 3:08 | 9,340 | | | |
| | 3:10 | 1,120 | 428 | 24 | |
| | 3:14 | 724 | 133 | | |
| | 3:16 | 412 | | | |
| | 3:20 | 55 | 38 | 24 | |
| | 3:22 | 749 | | | |
| | 3:24 | 132 | 56 | | |
| | 3:26 | 1,050 | | | |
| | 3:28 | 80,300 | | | |
| | 3:30 | 316,000 | 330 | 24 | |
| | 3:32 | 127 | | | |
| | 3:34 | 16,300 | 72 | | |
| | 3:38 | 2,070 | | | |
| | 3:40 | 98 | 219 | 23 | |
| | 3:42 | 5,410 | | | |
| | 3:44 | 306 | 47 | | |
| | 3:46 | 93,500 | | | |
| | 3:48 | 1,270 | | | |
| | 3:50 | 392 | 34 | 23 | |
| | 3:54 | 48,200 | 149 | | |
| | 3:56 | 561 | | | |
| | 3:58 | 403 | | | |
| | 4:00 | 999 | 40 | 23 | |
| | 4:02 | 141 | | | |
| | 4:04 | 460 | 111 | | |
| | 4:06 | 6,790 | | | |
| | 4:08 | 132 | | | |
| | 4:10 | 83 | 57 | 24 | |
| | 4:14 | 795 | 69 | | |
| | 4:30 | 45 | 1,350 | 24 | |
| | 4:32 | 286 | 50 | | |
| | 4:40 | 220,000 | 34 | 24 | |
| | 4:42 | 3,940 | | | |
| | 4:44 | 805 | 250 | | |
| | 4:46 | 16,600 | | | |
| | 4:52 | 1,210 | 22 | 24 | |
| | 5:02 | 32 | | | |
| | 5:06 | 973 | 169 | | |
| | 5:08 | 1,260 | | | |
| | 5:20 | 113 | 33 | 22 | |
| | 5:22 | 7,160 | | | |
| | 5:24 | 79 | 134 | | |

**See footnotes at end of table.**

*Variations in sediment concentration in bottom samples and approximate width of sand dunes in the New York Canal*—Continued

| Date | Time[1] (p. m.) | Sediment concentration in parts per million at the following stations[2] | | | Approximate width of dune (feet) |
|---|---|---|---|---|---|
| | | A | B | C | |
| *1940* | | | | | |
| June 12 | 5:28 | 636 | ------ | ------ | ------ |
| | 5:34 | 2,640 | 675 | ------ | ------ |
| | 5:36 | 25,600 | ------ | ------ | ------ |
| | 5:38 | 108 | ------ | ------ | ------ |
| | 5:40 | 53 | 59 | 20 | ------ |
| | 5:42 | 393 | ------ | ------ | ------ |
| | 5:44 | 5,170 | 89 | ------ | ------ |
| | 5:46 | 251 | ------ | ------ | ------ |
| | 5:50 | 724 | 52 | 20 | ------ |
| | 5:52 | 65 | ------ | ------ | ------ |
| | 6:00 | 47 | 114 | 20 | ------ |
| | 6:02 | 82 | ------ | ------ | ------ |
| | 6:04 | 1,010 | 274 | ------ | ------ |
| | 6:06 | 26,900 | ------ | ------ | ------ |
| | 6:08 | 248 | ------ | ------ | ------ |
| | 6:10 | 282,000 | 61 | 20 | ------ |
| | 6:12 | 693 | ------ | ------ | ------ |
| June 19 | 1:30 | 97 | 22 | 12 | ------ |
| | 1:34 | 5,050 | ------ | ------ | 4 |
| | 1:36 | 284 | ------ | ------ | ------ |
| | 1:38 | 262 | 22 | ------ | ------ |
| | 1:42 | 2,660 | ------ | ------ | ------ |
| | 1:44 | 407 | ------ | ------ | ------ |
| | 1:50 | 18 | 22 | 12 | ------ |
| | 1:58 | 6,230 | ------ | ------ | ------ |
| | 2:00 | 2,240 | 22 | ------ | ------ |
| | 2:10 | 214 | 22 | 12 | ------ |
| | 2:18 | 513,000 | ------ | ------ | 6 |
| | 2:20 | 140 | 22 | ------ | ------ |
| | 2:24 | 773 | ------ | ------ | ------ |
| | 2:26 | 585 | ------ | ------ | ------ |
| | 2:28 | 329 | ------ | ------ | ------ |
| | 2:30 | 6,090 | 69 | 12 | ------ |
| | 2:32 | 543 | 69 | ------ | ------ |
| | 2:40 | 397 | 69 | ------ | ------ |
| | 2:50 | 157 | 69 | 12 | ------ |
| | 3:04 | 19,900 | ------ | ------ | ------ |
| | 3:06 | 320 | ------ | ------ | ------ |
| | 3:08 | 153 | ------ | ------ | ------ |
| | 3:10 | 112 | 69 | 12 | ------ |
| | 3:22 | 157 | ------ | ------ | ------ |
| | 3:26 | 2,060 | ------ | ------ | ------ |
| | 3:28 | 331,000 | ------ | ------ | 2 |
| | 3:30 | 795 | 78 | 10 | ------ |
| | 3:32 | 264 | ------ | ------ | ------ |
| | 3:36 | 119 | ------ | ------ | ------ |
| | 3:50 | 52 | 78 | 10 | ------ |
| | 4:02 | 1,000 | 78 | ------ | 3 |
| | 4:04 | 374 | ------ | ------ | ------ |
| | 4:10 | 107 | 47 | 10 | ------ |
| | 4:30 | 87 | 47 | 10 | ------ |
| | 4:32 | 430,000 | ------ | ------ | 5 |
| | 4:34 | 8,270 | ------ | ------ | ------ |
| | 4:36 | 561 | ------ | ------ | ------ |
| | 4:46 | 460 | ------ | ------ | ------ |
| | 4:48 | 267,000 | ------ | ------ | 4 |
| | 4:50 | 763 | 47 | 10 | ------ |
| | 4:52 | 182 | ------ | ------ | ------ |
| | 5:10 | 81 | 11 | 10 | ------ |
| | 5:12 | 13,500 | ------ | ------ | 4 |
| | 5:14 | 347 | ------ | ------ | ------ |
| | 5:16 | 236 | ------ | ------ | ------ |
| | 5:20 | 30 | 11 | 11 | ------ |
| | 5:24 | 274,000 | 11 | ------ | ------ |
| | 5:26 | 589 | ------ | ------ | ------ |
| | 5:30 | 93 | 11 | 11 | ------ |
| June 26 | 1:05 | 27,100 | 22 | 8 | ------ |
| | 1:07 | 115 | ------ | ------ | ------ |
| | 1:09 | 24 | ------ | ------ | ------ |
| | 1:11 | 273 | -- | ------ | ------ |
| | 1:13 | 1,600 | ------ | ------ | 6 |
| *1940* | | | | | |
| June 26 | 1:15 | 22 | 22 | ------ | ------ |
| | 1:17 | 35,200 | ------ | ------ | 8 |
| | 1:19 | 204 | ------ | ------ | ------ |
| | 1:21 | 2,790 | ------ | ------ | 2 |
| | 1:23 | 18 | ------ | ------ | ------ |
| | 1:25 | 18 | 22 | 8 | ------ |
| | 1:45 | 62 | 22 | 8 | ------ |
| | 1:47 | 372,000 | ------ | ------ | 5 |
| | 1:49 | 176 | ------ | ------ | ------ |
| | 1:51 | 368,000 | ------ | ------ | ------ |
| | 1:53 | 178 | ------ | ------ | ------ |
| | 2:01 | 79 | ------ | ------ | ------ |
| | 2:05 | 168 | 27 | 8 | ------ |
| | 2:07 | 242,000 | ------ | ------ | 3 |
| | 2:09 | 361 | ------ | ------ | ------ |
| | 2:13 | 59 | ------ | ------ | ------ |
| | 2:23 | 197 | ------ | ------ | ------ |
| | 2:25 | 117 | 27 | 8 | ------ |
| | 2:31 | 34 | ------ | ------ | ------ |
| | 2:43 | 95 | ------ | ------ | ------ |
| | 2:45 | 1,700 | 27 | 8 | ------ |
| | 2:51 | 953 | ------ | ------ | ------ |
| | 3:03 | 1,180 | ------ | ------ | ------ |
| | 3:05 | 25,600 | 15 | 9 | 4 |
| | 3:07 | 112 | ------ | ------ | ------ |
| | 3:19 | 52 | ------ | ------ | ------ |
| | 3:23 | 247 | ------ | ------ | ------ |
| | 3:25 | 38 | 15 | 9 | ------ |
| | 3:27 | 891 | ------ | ------ | ------ |
| | 3:29 | 173 | ------ | ------ | ------ |
| | 3:31 | 11,200 | ------ | ------ | ------ |
| | 3:33 | 353 | 15 | ------ | ------ |
| | 3:37 | 469 | ------ | ------ | ------ |
| | 3:45 | 19 | 15 | 9 | ------ |
| | 3:47 | 411 | ------ | ------ | ------ |
| | 3:49 | 239,000 | ------ | ------ | 3 |
| | 3:51 | 29 | ------ | ------ | ------ |
| | 3:55 | 271 | 15 | ------ | ------ |
| | 3:57 | 24,800 | ------ | ------ | ------ |
| | 4:05 | 19 | 179 | 9 | ------ |
| | 4:07 | 242 | ------ | ------ | ------ |
| | 4:09 | 255 | ------ | ------ | ------ |
| | 4:11 | 27 | ------ | ------ | ------ |
| | 4:19 | 124 | ------ | ------ | ------ |
| | 4:21 | 244,000 | ------ | ------ | 4 |
| | 4:23 | 69 | 179 | 9 | ------ |
| | 4:29 | 49 | ------ | ------ | ------ |
| | 4:33 | 272 | ------ | ------ | ------ |
| | 4:35 | 5,830 | 179 | ------ | ------ |
| | 4:37 | 364 | ------ | ------ | ------ |
| | 4:41 | 2,850 | ------ | ------ | ------ |
| | 4:45 | 35 | 179 | 9 | ------ |
| | 4:49 | 2,680 | ------ | ------ | ------ |
| | 4:55 | 1,050 | 179 | ------ | ------ |
| | 4:57 | 49 | ------ | ------ | ------ |
| | 5:01 | 56 | 76 | 17 | ------ |
| | 5:03 | 402 | ------ | ------ | ------ |
| | 5:05 | 826 | 76 | 17 | ------ |
| | 5:07 | 49 | ------ | ------ | ------ |
| | 5:09 | 51 | ------ | ------ | ------ |
| July 1 | 2:10 | 107 | 14 | 5 | ------ |
| | 2:12 | 65,200 | ------ | ------ | ------ |
| | 2:14 | 231 | 14 | ------ | ------ |
| | 2:16 | 2,240 | ------ | ------ | 2 |
| | 2:18 | 2,460 | ------ | ------ | ------ |
| | 2:20 | 7,140 | 14 | 5 | 2 |
| | 2:30 | 76 | 14 | ------ | ------ |
| | 2:50 | 20 | ------ | 5 | ------ |
| | 2:52 | 288 | ------ | ------ | ------ |
| | 2:56 | 8,200 | 14 | ------ | ------ |
| | 2:58 | 1,030 | ------ | ------ | ------ |

See footnotes at end of table.

*Variations in sediment concentration in bottom samples and approximate width of sand dunes in the New York Canal*—Continued

| Date | Time[1] (p. m.) | Sediment concentration in parts per million at the following stations[2] | | | Approximate width of dune (feet) |
|---|---|---|---|---|---|
| | | A | B | C | |
| *1940* | | | | | |
| July 1 | 3:00 | 4,180 | | | 4 |
| | 3:02 | 344,000 | | | 3 |
| | 3:04 | 108 | 37 | | |
| | 3:10 | 333 | | 5 | |
| | 3:14 | 555 | 37 | | |
| | 3:16 | 1,430 | | | |
| | 3:18 | 47,200 | | | |
| | 3:30 | 128 | | | |
| | 3:38 | 820 | 37 | | |
| | 3:40 | 395 | | | |
| | 3:44 | 413 | 37 | | |
| | 3:46 | 2,270 | | | |
| | 3:50 | 23 | 37 | 5 | |
| | 4:02 | 85 | | | |
| | 4:04 | 240 | 67 | | |
| | 4:06 | 253 | | | |
| | 4:08 | 295 | | | |
| | 4:10 | 346,000 | 67 | 6 | 5 |
| | 4:12 | 14,000 | | | |
| | 4:14 | 12,500 | | | |
| | 4:16 | 75 | | | |
| | 4:20 | 52 | 67 | | |
| | 4:28 | 314 | | | |
| | 4:30 | 5,070 | 67 | 6 | 1 |
| | 4:32 | 2,680 | | | |
| | 4:34 | 230,000 | | | .4 |
| *1940* | | | | | |
| July 1 | 4:36 | 164 | | | |
| | 4:40 | 81 | 67 | | |
| | 4:44 | 449 | | | |
| | 4:50 | 27 | 67 | 6 | |
| | 5:00 | 120 | 19 | | |
| | 5:02 | 103 | | | |
| | 5:06 | 1,280 | | | |
| | 5:08 | 6,320 | | | 6 |
| | 5:10 | 3,510 | 19 | 6 | |
| | 5:14 | 272,000 | | | |
| | 5:16 | 3,730 | | | |
| | 5:18 | 377,000 | | | |
| | 5:20 | 190,000 | 19 | | |
| | 5:22 | 1,160 | | | |
| | 5:24 | 679 | | | |
| | 5:28 | 121,000 | 19 | | |
| | 5:44 | 34 | 19 | | |
| | 5:48 | 202 | | | |
| | 5:50 | 43 | 19 | 6 | |
| | 5:52 | 325 | | | |
| | 5:54 | 3,900 | | | |
| | 5:56 | 118 | | | |
| | 6:00 | 155 | 13 | | |
| | 6:06 | 89,200 | | | |
| | 6:08 | 140 | | | |
| | 6:10 | 12 | 13 | 10 | |

[1] Time reported is for station A; samples collected at stations B and C were collected about ½ and 1 minute, respectively, after time of collection at station A.
[2] Stations A, B, and C approximately one-fourth, one-half, and three-fourths the distance across canal, measured from right bank.

Sediment concentrations in the bottom samples ranged from 100 parts per million or less when there was no sand on the bottom to three or four hundred thousand parts per million at the time the dunes were passing. The heaviest concentrations were found in samples that appear to have been collected at the time the downstream face of a dune just reached the sampling point. During the process of deposition on the downstream face of the dune large quantities of sand moved into the sampler during the 2 or 3 seconds that it remained on the bottom in the open position. The rapid changes in sediment concentrations in bottom samples at station A on June 19, 1940, are shown graphically in figure 20.

The size composition of the material moved in the dunes is shown by curve *F* in figure 16. This curve is the average of analyses of four samples of material in bottom samples collected at station A on June 7, 1940. The size composition of the samples is essentially the same as that determined on three samples of material collected from the large deposit 0.2 mile below the sampling section of September 5 after the canal was drained. The results of analyses of the deposited sand is represented by curve *G* in figure 16.

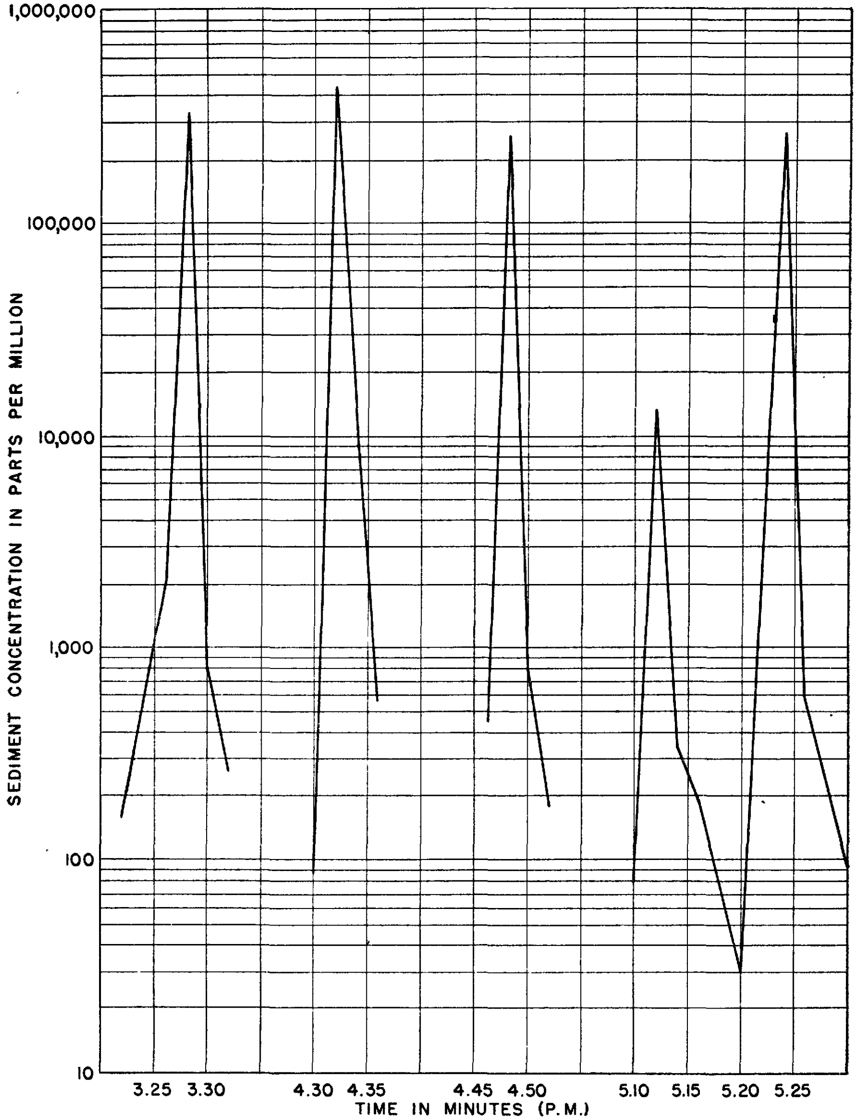



FIGURE 20.—Sediment concentrations in bottom samples from New York Canal, June 19, 1940.

At the time of the observations the depth of the water in the canal was from 8 to 9 feet; the velocity, as measured 0.2 foot above the bottom, varied from 3½ to 5 feet per second; and the discharge in the canal ranged from about 2,000 to 2,700 second-feet.

The quantity of material transported in the form of dunes could not be determined directly, but it is known that large quantities were deposited in the wide section in the canal 0.2 mile below the gage. Results of cross sectioning of the large deposit after the canal was drained in September 1940 show that approximately 5,200 cubic yards were deposited at this point. An additional 1,000 cubic yards is estimated to have been deposited in the big bend one mile below the gage. The results of weight-volume determinations of 3 samples of the material from the big deposit near the gage indicate that the average weight of the material is about 94 pounds per cubic foot. Using this value it is found that the 6,200 cubic yards of deposited material weighed approximately 7,900 tons.

The amount of sand carried along the bottom of the canal during 1940 beyond the two points mentioned above is not known, but it is estimated to have been not more than 5,000 tons. Assuming this to be a maximum amount, the total load of bed material transported in the canal during the spring runoff period of 1940 appears to have been about 13,000 tons. The quantity of sediment measured at the gaging station from point samples during the 6 months ended June 30, 1940, was approximately 83,000 tons. It is entirely possible that this figure includes a small portion of the load represented by the figure given for bed load. Assuming, however, that each figure represents material not included in the other, the total load transported during the 6 months was about 96,000 tons. On the basis of these figures the load measured at the gaging station was between 85 and 90 percent of the total load for the period.

Examination of the canal on September 8, 1940, for a distance of about 24 miles below Diversion Dam showed that there were several small deposits at irregular intervals, usually on the inside of curves. Lined sections of the canal were almost completely free from deposits and in unlined sections for distances of 2 to 5 miles there were practically no deposits. At two points about 18½ and 24 miles below Diversion Dam there were fairly large deposits about 200 to 300 feet long. (See pl. 9 *A* and *B*.) It is understood that most of the deposits in the canal except the two a short distance below the gage are not the result of deposition in 1940 alone but represent accumulations of several years.

It has been estimated that approximately 61,000 cubic yards of sand were removed from the canal by draglines and other mechanical means between 1926 and 1940.

*Sand removed from the New York Canal* [1]

| Year | Estimated volume (cubic yards) | Year | Estimated volume (cubic yards) | Year | Estimated volume (cubic yards) |
|---|---|---|---|---|---|
| 1926 | None | 1932 | 7,000 | 1938 | 7,000 |
| 1927 | 9,000 | 1933 | 3,000 | 1939 | None |
| 1928 | 6,000 | 1934 | None | 1940 | 6,500 |
| 1929 | None | 1935 | None | | |
| 1930 | 4,500 | 1936 | 15,000 | Total | 61,000 |
| 1931 | 3,000 | 1937 | None | | |

[1] Records furnished by the manager, Board of Control, Boise Project.

## BED LOAD IN STREAMS IN OTHER PARTS OF THE BOISE RIVER DRAINAGE BASIN

The station on the New York Canal is the only one at which detailed observations of the movement of sand along the bottom of the stream bed were made. The smooth concrete bottom, ordinarily free of sand except at times when dunes were moving, made it the only station at which such measurements were practicable.

The movement of sand in streaks at irregular intervals was observed at other stations particularly at those with overfall sections. It is known that samples collected in the overfall sections sometimes contained more and sometimes less than the average amount of sediment being transported by the stream. However, since these samples were collected by lowering and raising the sample bottle from two to five times through the nappe and horizontally across the weir, and since at least two samples were collected in the section at each sampling period, in general the samples collected probably represent the total sediment concentrations in the streams during each sampling period. It seems unlikely that there was much, if any, movement of sand past the stations in the form of dunes as observed in the New York Canal.

It is fairly certain that there were no sand dunes moving past the station on Moore Creek above Thorn Creek, since the bottom at the sampling section is made of precast concrete blocks, and the presence of dunes would undoubtedly have been observed while bottom samples were being collected with the Tait-Binckley sampler. Furthermore, practically all of the bottom samples at that station consisted of very fine material which was carried in suspension.

It is possible that there was sand movement in dunes past the river stations on the Boise River near Twin Springs and the Boise River at Notus, although no direct observations could be made at those stations because of the high velocities and the roughness of the stream bottom. Bottom samples occasionally contained relatively large amounts of sand but not in concentrations as large as found in the New York Canal during the passage of the dunes. Whether in the form of dunes or not, the concentration of sand in bottom samples collected at the two stations showed that some sand was moved along the stream bottoms at irregular intervals during periods of high flow.

Relatively little sand was found in bottom samples collected from the Boise River at Dowling ranch either in 1939 or 1940. The only sources of the coarse material found in samples collected at the Dowling ranch station are a few minor tributaries and two or three small gold placers, which are operated irregularly during the spring of the year, and such sediment as may be discharged through the sluice gates of Arrow Rock Dam when the water level in the reservoir falls below the second set of outlet gates. Sediment concentrations of bottom samples seldom exceeded 200 parts per million and usually ranged between 50 and 75 parts per million. Nevertheless, these bottom concentrations were considerably greater than those at other points in the vertical, which usually did not greatly exceed 25 to 30 parts per million.

## DEPOSITED SEDIMENTS

### WEIGHT-VOLUME RELATION OF DEPOSITED SEDIMENTS

The dry weight per unit volume of 71 samples of deposited sediments, collected from several points in the Boise River drainage basin during 1939 and 1940, ranged from 51 to 121 pounds per cubic foot and averaged about 90 pounds. This figure of 90 pounds per cubic foot probably represents the average weight-volume relation of deposited sediments in the drainage basin. The sources and weight-volume relations of the 71 samples are given in the following table.

*Dry weight per cubic foot of deposited material*

| Sample No. | Date of collection | Location | Weight per cubic foot (pounds) | Remarks |
|---|---|---|---|---|
| | *1939* | | | |
| 1 | Mar. 30 | Boise River, 150-200 feet below Diversion Dam near Barber. | 90 | From bed of stream uncovered by closing of Diversion Dam. |
| 2 | do | do | 88 | Do. |
| 3 | do | do | 97 | Do. |
| 4 | do | do | 89 | Do. |
| 5 | do | do | 96 | Sand bank about 6 feet above stream bed. |
| 6 | do | do | 86 | Same as 1-4. |
| 7 | do | Boise River about 1 mile below Diversion Dam. | 85 | From bed of stream uncovered by closing of Diversion Dam. |
| 8 | do | do | 91 | Do. |
| 9 | do | do | 89 | Do. |
| 10 | do | do | 80 | Do. |
| 11 | do | Boise River about 200 feet below Idaho Power Co. Dam at Barber. | 94 | Do. |
| 12 | do | do | 94 | Do. |
| 13 | do | Boise River about 200 feet above Idaho Power Co. Dam at Barber. | 95 | Do. |
| 14 | do | do | 93 | Do. |
| 15 | do | do | 85 | Do. |
| 16 | do | do | 92 | Do. |
| 18 | Apr. 8 | Bannock Creek near Idaho City | 103 | From submerged bar above weir. |
| 19 | do | do | 93 | Do. |
| 20 | do | Moore Creek above Granite Creek near Idaho City. | 84 | From small submerged bar near gage. |
| 21 | do | Right bank of New York Canal about 1 mile below gage. | 95 | From pile of sand dredged from canal over a period of years. |
| 22 | Apr. 12 | Grouse Creek near Arrow Rock | 86 | From small bar about 75 feet above gage. |
| 23 | do | do | 96 | From bar about 75 feet below gage. |
| 24 | Apr. 14 | Cottonwood Gulch at Boise about 10 feet below weir. | 102 | From bar on left bank. |
| 25 | do | do | 101 | Do. |
| 26 | Apr. 16 | Boise River at Notus about 200 feet above highway bridge. | 86 | Do. |
| 27 | do | do | 82 | Do. |
| 28 | do | do | 81 | From bar on right bank. |
| 29 | May 10 | Boise River opposite gage on New York Canal near Barber. | 106 | From bar near left bank. |
| 30 | do | do | 113 | Do. |

*Dry weight per cubic foot of deposited material*—Continued

| Sample No. | Date of collection | Location | Weight per cubic foot (pounds) | Remarks |
|---|---|---|---|---|
| | *1939* | | | |
| 31 | May 14 | Moore Creek about ¾ mile above Idaho City. | 95 | From sand flat about 300 feet wide. |
| 32 | do | do | 103 | Do. |
| 33 | do | do | 71 | Do. |
| 34 | do | Elk Creek near Idaho City about 75 feet above gage. | 86 | From sandy bed of stream. |
| 35 | do | do | 93 | Do. |
| 36 | May 19 | Cottonwood Creek near Arrow Rock about 15 feet below weir. | 84 | From submerged bar. |
| 37 | do | do | 104 | Do. |
| 38 | June 22 | Bannock Creek near Idaho City | 93 | From submerged bar above weir. |
| 39 | do | do | 88 | Do. |
| 40 | Sept. 4 | Elk Creek near Idaho City | 105 | From sandy bottom at bridge above gage. |
| 41 | do | do | 102 | Do. |
| 42 | Sept. 10 | Boise River about 2.4 miles below gage near Twin Springs. | 51 | From bar uncovered by lowering of water in Arrow Rock reservoir. Fine sand containing organic matter. |
| 43 | do | do | 92 | Clean, coarse sand below level of no. 42. |
| 44 | do | Boise River at mouth of Cottonwood Creek, about 7.1 miles below gage near Twin Springs. | 52 | From mud deposited from slack water in Arrow Rock reservoir and uncovered by lowering of water. |
| 45 | Sept. 23 | Boise River about 7.2 miles above Diversion Dam near Barber. | 102 | From bar on right bank. |
| 46 | do | do | 83 | Do. |
| 47 | do | Moore Creek about 1.0 mile above bridge at mouth. | 99 | From one of several bars between boulders. |
| 48 | do | Moore Creek about 3.8 miles above bridge at mouth. | 98 | From long narrow bar in midstream. |
| 49 | do | Moore Creek about 5.9 miles above bridge at mouth. | 97 | From small bar in midstream. |
| 50 | do | Moore Creek about 8.9 miles above bridge at mouth. | 96 | From small bar between boulders. |
| 51 | do | Moore Creek about 13.0 miles above bridge at mouth and 300 feet below Grimes Creek. | 91 | From bar which is apparently bottom of auxiliary channel at higher stages. |
| 52 | Oct. 8 | Arrow Rock Reservoir, ¼ mile above dam. | 77 | About 15 feet above reservoir backwater. |
| 53 | do | do | 53 | About 30 feet above reservoir backwater. |
| 54 | Oct. 25 | 500 feet above Diversion Dam | 94 | From large sand deposit. |
| 55 | do | do | 100 | Do. |
| 56 | do | do | 105 | Do. |
| 57 | do | 700 feet above Diversion Dam | 108 | Do. |
| 58 | do | 400 feet above Diversion Dam | 72 | Do. |
| | *1940* | | | |
| 59 | Mar. 29 | Bannock Creek | 121 | From submerged bar above weir. |
| 60 | do | do | 100 | Do. |
| 61 | July 27 | Grouse Creek | 96 | Debris cone ⅜ mile below gage at edge of reservoir backwater. |
| 62 | do | do | 93 | Debris cone 200 feet above reservoir backwater. |
| 63 | do | do | 107 | Debris cone 400 feet above backwater. |
| 64 | do | do | 86 | Debris cone 400 feet below gage house. |
| 65 | do | do | 92 | Debris cone 300 feet below gage house. |
| 66 | Sept. 8 | New York Canal 0.2 mile below gage | 92 | From downstream edge of large sand deposit. |
| 67 | do | do | 94 | From center of large sand deposit. |
| 68 | do | do | 95 | From upstream edge of large sand deposit. |
| 69 | do | New York Canal 10.4 miles below Diversion Dam. | 82 | From small sand deposit on inside of curve. |
| 70 | do | From lateral ditch adjacent to New York Canal 18.4 miles below Diversion Dam. | 82 | From settling pool in front of head gates. |
| 71 | do | New York Canal 18.6 miles below Diversion Dam. | 87 | From center of large sand deposit about 300 feet long. |
| 72 | Sept. 22 | Moore Creek at mouth | 105 | From submerged bar under highway bridge. |

## SIZE COMPOSITION OF DEPOSITED SEDIMENTS

Size analyses were made on the 71 samples of deposited sediments collected for the determination of weight-volume relation and on four samples of bottom material from dunes in the New York Canal. Results of these analyses are given on pages 140 to 143.

Graphs of a large number of the analyses are shown in figure 21. Curve *A* represents the average particle-size distribution in three samples of deposited material from the Boise River at Notus; curve *B* represents the analysis of a single sample from Cottonwood Creek at Arrow Rock Reservoir; curve *C* is the average of 14 analyses of samples of river-bed sediments collected from the Boise River between Diversion Dam and the Idaho Power Co. Dam about 2 miles downstream; curve *D* is the average of 4 samples from Cottonwood Gulch; curve *E* is the average of 6 samples from Moore Creek between Grimes Creek and the Boise River; curve *F* is the average of 4 samples from Elk Creek; and curve *G* is the average of 3 samples from the New York Canal. Curves *B* to *G*, inclusive, show that deposited sediments in the streams above Boise are composed of predominately coarse material in which from about 40 to 70 percent of the material is larger than 1.00 millimeter. The sediment in the samples from Notus was somewhat finer, as would be expected since Notus is near the lower end of the Boise River Valley.

## SPECIFIC GRAVITY OF SAMPLES OF DEPOSITED SEDIMENTS

Determinations of specific gravity were made on 77 samples of deposited material collected from different parts of the Boise River drainage basin. They were made on portions of 58 samples collected for determination of weight-volume relations and on 19 additional samples collected for size analysis. The term "specific gravity" refers to the weight of the sediment particles, not including pore space, compared to the weight of an equal volume of water as unity.

The specific-gravity determinations were made in Le Chatelier flasks using kerosene as the liquid medium. The minimum specific gravity determined was 2.20 on a sample from a mud deposit in Arrow Rock Reservoir at the mouth of Cottonwood Creek, which was uncovered when water was released from the reservoir. The maximum specific gravity was 2.67, determined on a sample from the bed of Elk Creek near Idaho City. The specific gravities of all but 7 of the 77 samples were greater than 2.50. The average specific gravity computed from the results of these 70 samples is 2.59. If the 7 samples having a specific gravity of less than 2.50 are included, the average is 2.57.

The seven samples for which the specific gravity was less than 2.50 were collected from areas where fine material was deposited in back-

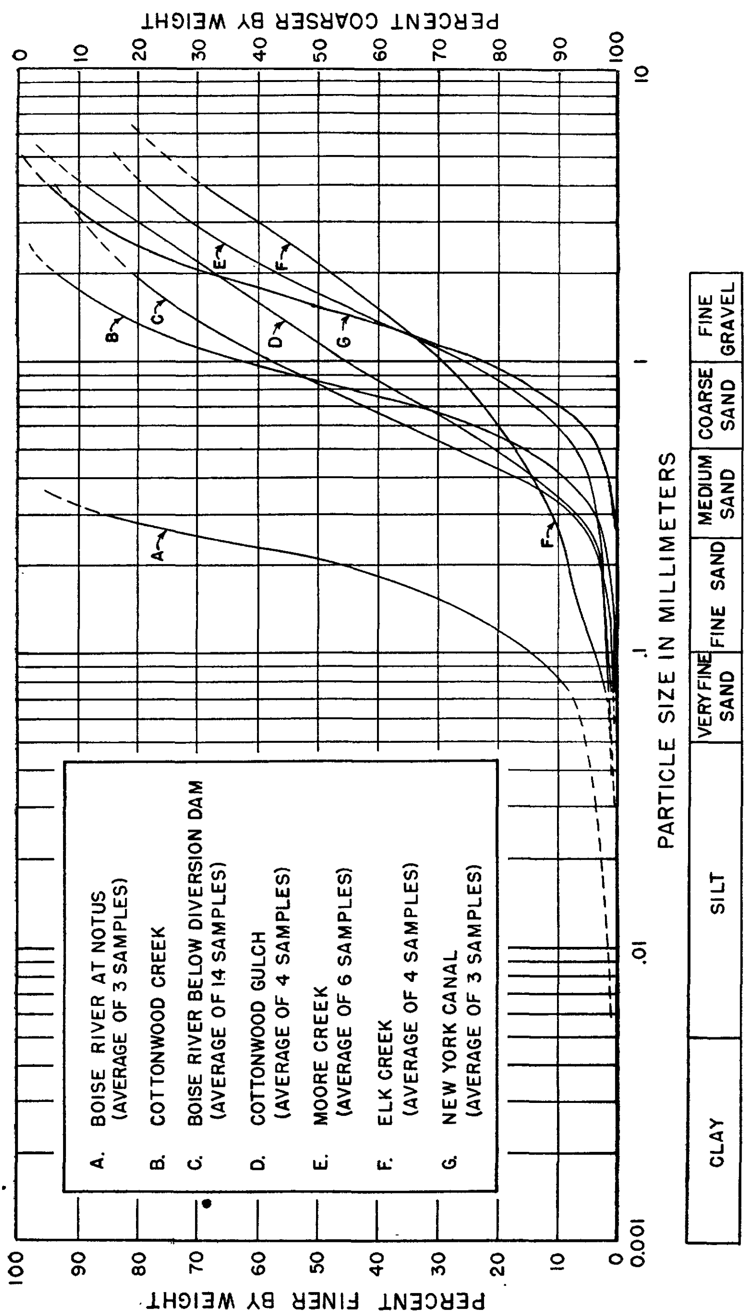



FIGURE 21.—Size analyses of deposited sediment from several streams in the Boise River drainage basin.

water behind Arrow Rock Dam or in quiet pools or eddies along stream banks. The average specific gravity of 2.59 for the 70 samples collected over the area is only slightly less than 2.65, which is the figure usually given for clean quartz sand.

#### SOURCE OF SEDIMENT DEPOSITED ABOVE DIVERSION DAM

The source of the coarse sediment deposited in the pool above Diversion Dam was not definitely established because of the absence of sediment-measuring stations on Grimes Creek and on Moore Creek near the mouth, and also because of the short period of the investigation.

Relatively large quantities of sediment are deposited in Arrow Rock Reservoir as shown in plates 10 and 11. However, the quantity of material carried by water released from Arrow Rock Reservoir is relatively very small except for short periods in some years when sediment is sluiced from the reservoir. During years of small runoff Arrow Rock Reservoir is usually drained by opening the sluice gates, thus permitting the natural flow in the Boise River to pass through the dam unobstructed. During the years 1938, 1939, and 1940 there was sufficient storage to supply the irrigation needs of the Boise project and, consequently, it was not possible to obtain samples of the sediment that is carried through the dam when the sluice gates are open. However, in the Boise River large quantities of sediment are known to move downstream from Arrow Rock Reservoir during sluicing, part of which may have been deposited above Diversion Dam. The river channel between Arrow Rock Dam and Moore Creek was free of deposited sediment during the 18 months of the investigation, which shows that the sediment sluiced from the reservoir prior to 1938 was entirely removed from this section of the river channel.

Sediment deposited in the channel of Moore Creek below Grimes Creek was very coarse. Size analyses of six samples, collected from the stream channel between Grimes Creek and the Boise River at a time when the discharge was low, show that from 70 to 80 percent in most of the samples consisted of particles greater than 1.00 millimeter in diameter. Four of these analyses are shown in figure 22.

Results of size analyses of five samples collected from the sediment deposited in the pool above Diversion Dam (see pl. 12, *A* and *B*) at a time when the dam was open and the entire flow of the Boise River passed through the dam unobstructed, are plotted in figure 23. The analyses show that from 60 to 70 percent of the material in all but one sample consisted of particles greater than 1.00 millimeter in diameter. The size composition was similar to that of samples of bed-load material in the New York Canal.

The available data seem to indicate that the greater part of the sediment deposited in the Boise River above Diversion Dam originated

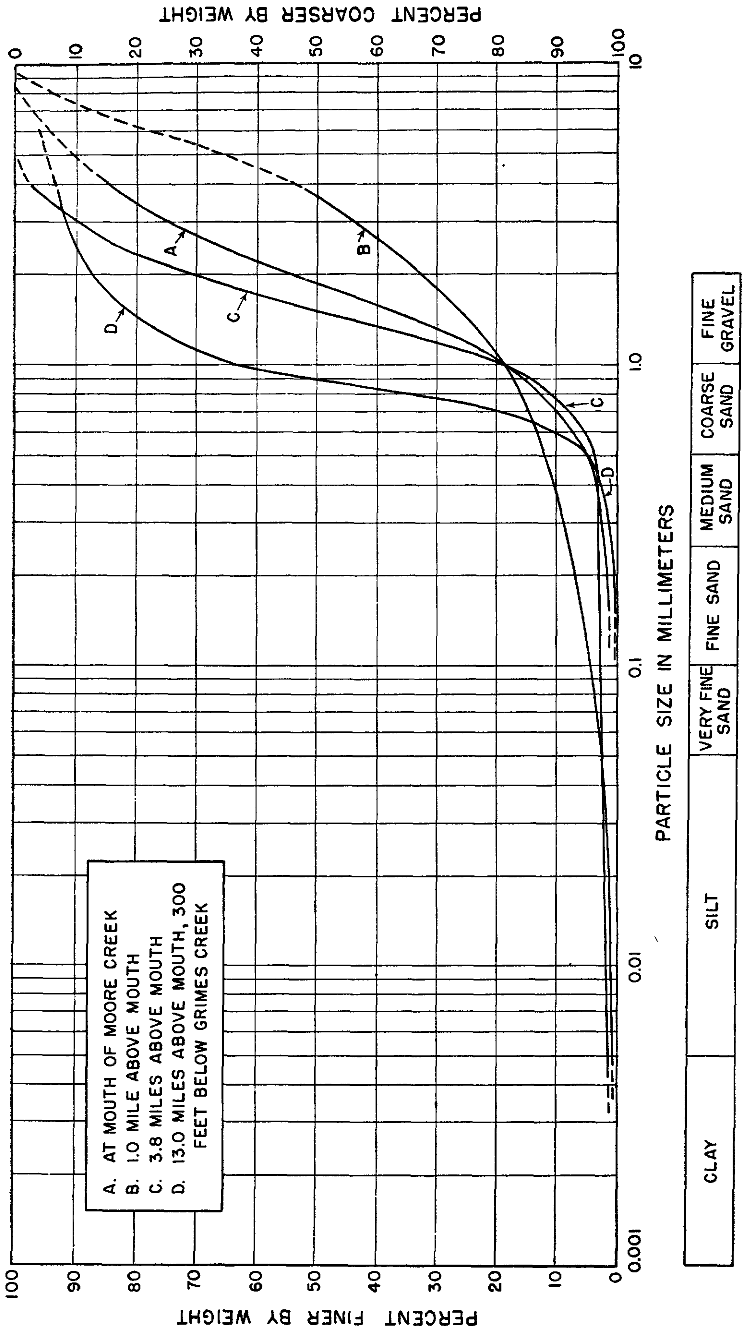



FIGURE 22.—*Size analyses of deposited sediment from Moore Creek between Grimes Creek and Boise River.*

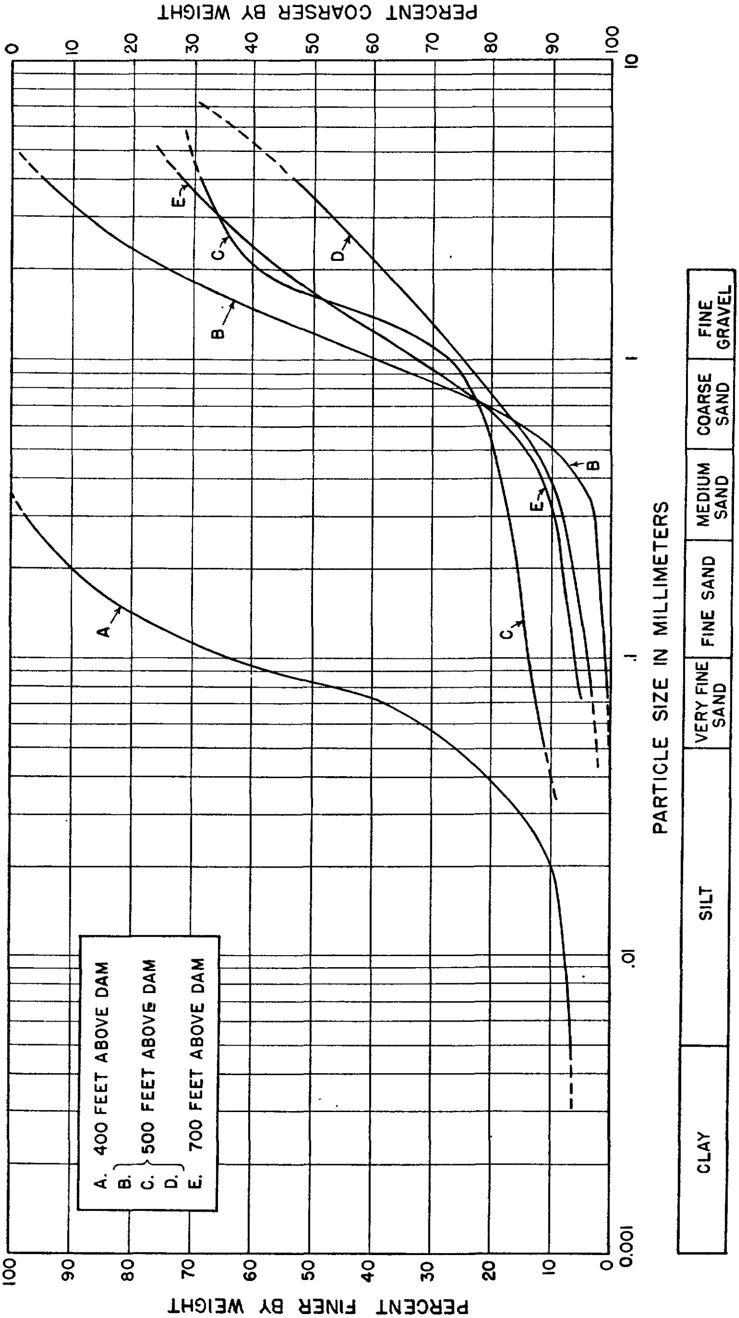



FIGURE 23.—Size analyses of deposited sediment from Boise River above Diversion Dam.

*A*. COARSE SEDIMENT DEPOSITED IN NEW YORK CANAL, 18.6 MILES BELOW DIVERSION DAM

*B*. FINE SEDIMENT DEPOSITED IN FARM LATERAL DITCH OPPOSITE GATE IN NEW YORK CANAL, 18.4 MILES BELOW DIVERSION DAM.

*A.* ARROW ROCK RESERVOIR AT MOUTH OF COTTONWOOD CREEK.

Reservoir is under complete drawdown at this point. Natural flow in Boise River cutting through alluvia fan built up by material brought in by Cottonwood Creek.

*B.* ALTERNATE LAYERS OF FINE MUD AND COARSE SAND DEPOSITED AT MOUTH OF COTTONWOOD CREEK.

The four light-colored bands represent coarse material deposited by Cottonwood Creek presumably during 4 successive years.

in the Moore Creek drainage basin, although some of it may have come from sediment sluiced from Arrow Rock Reservoir prior to 1938. Probably little if any of the coarse material from Moore Creek originated upstream from the station above Thorn Creek during the period of the investigation. It is probable that some coarse sediment was carried downstream from the placered area in Moore Creek near Idaho City during earlier years. Fragmentary data indicate that large quantities of sediment were carried into Moore Creek below Thorn Creek from Grimes Creek, and that a considerable proportion of the sediment from this source consisted of coarse material.

## SLUICING OF ARROW ROCK RESERVOIR

The regulation of flow and storage in Arrow Rock Reservoir began in February 1915. Water may be discharged through the dam at three elevations. The first set of 10 outlets is at elevation 3,105 feet, a second set of 10 outlets is at elevation 3,018 feet, and 5 sluice gates are at elevation 2,967 feet. Elevations refer to the center line of openings. In releasing water from the reservoir it is customary to utilize outlets in 1 of the 2 upper sets until the reservoir is drawn down to within about 20 or 30 feet of the second row of outlet openings. Because of the variations in discharge resulting from changing head as the water surface approaches the second set of outlets, it is then the usual custom to discharge in whole or in part through the openings in the sluice gates.

The sluicing effect produced by discharging water through the sluice gates is reported to be greater when the impounded storage is practically exhausted and the natural flow of the river is allowed to pass through with all sluice gates open. The manager of the Boise Project Board of Control has furnished a list of the periods, since the reservoir was constructed, when this condition prevailed. The dates and length of period in days in each year during which the sluice gates were open, together with the average discharge for each period, are given in the following table.

*Record of sluicing from Arrow Rock Reservoir*

| Year | Period of sluicing | Number of days | Average discharge (second-feet) |
|---|---|---|---|
| 1919 | Sept. 13-17, Sept. 20-Oct. 1 | 17 | 576 |
| 1920 | Sept. 13-Oct. 10 | 28 | 721 |
| 1922 | Sept. 19-Oct. 22 | 34 | 701 |
| 1924 | Aug. 19-Oct. 15 | 58 | 439 |
| 1926 | Sept. 16-Oct. 16 | 31 | 518 |
| 1928 | Oct. 8-21 | 14 | 704 |
| 1929 | Oct. 20-31 | 12 | 608 |
| 1931 | Oct. 13-Nov. 7 | 26 | 548 |
| 1933 | Oct. 16-30 | 15 | 597 |
| 1934 | Oct. 14-24 | 11 | 569 |
| 1935 | Oct. 22-25 | 4 | 566 |
| 1937 | Oct. 10-25 | 16 | 607 |

There is no information concerning the quantity of sediment that was removed from the reservoir during the sluicing periods. The reservoir was not drained down to a point for effective sluicing during the years 1938, 1939, and 1940. The sediment loads measured at the station at Dowling Ranch furnish no basis for computing the quantities of sediment removed from the reservoir during the sluicing periods. Inasmuch as the sluice gates are utilized in making water deliveries when the reservoir level approaches the elevation of the second row of outlets, periods of sluicing given in the preceding table may not include all the periods when some sluicing effect may have been experienced. The capacity table used for Arrow Rock Reservoir is based on inflow and outflow studies, and in irrigation operations it is adjusted from time to time for the estimated accumulations of sediment. Data showing the areas submerged and the capacities of the reservoir at several water-surface elevations were obtained from original records of the contour survey.

*Submerged areas and storage in Arrow Rock Reservoir corresponding to several water-surface elevations*

| Elevation | Gate reference | Area submerged (acres) | Storage (acre-feet) |
|---|---|---|---|
| 3,048 | 30 feet above center line, second row | 362 | 12,968 |
| 3,038 | 20 feet above center line, second row | 290 | 9,676 |
| 3,018 | Center line, second row | 178 | 5,032 |
| 2,967 | Center-line sluice gates | 22 | 132 |
| 2,956 | 11 feet below center-line sluice gates | 0 | 0 |

Periods during years when the reservoir level was below elevation 3,018 feet, and when discharges were effected only through the sluice gates, are given in the following table. These data include the periods

*Periods when water level in Arrow Rock Reservoir was below elevation 3,018 feet*

| Year | Period | Number of days | Average discharge (second-feet) |
|---|---|---|---|
| 1915 | Feb. 24-28, Oct. 21-31 | 16 | 574 |
| 1917 | Sept. 26-Oct. 19 | 24 | 750 |
| 1919 | Sept. 2-Oct. 6 | 35 | 615 |
| 1920 | Sept. 6-Oct. 13 | 38 | 723 |
| 1922 | Sept. 16-Oct. 26 | 42 | 720 |
| 1924 | July 25-Oct. 31 | 99 | 463 |
| 1926 | Sept. 14-Oct. 21, Oct. 24-Nov. 7 | 53 | 536 |
| 1927 | Oct. 21-24 | 4 | 790 |
| 1928 | Sept. 28-Oct. 25 | 28 | 696 |
| 1929 | Sept. 18-Oct. 6, Oct. 18-Nov. 5 | 38 | 579 |
| 1930 | Oct. 6-11 | 6 | 1,090 |
| 1931 | Aug. 13-Nov. 14 | 94 | 440 |
| 1932 | Oct. 21-28 | 8 | 728 |
| 1933 | Oct. 14-Nov. 1 | 19 | 654 |
| 1934 | Oct. 11-30 | 20 | 613 |
| 1935 | Oct. 18-Nov. 9 | 23 | 637 |
| 1936 | Oct. 12-19 | 8 | 700 |
| 1937 | Oct. 7-Nov. 2 | 27 | 590 |

previously tabulated and other periods when some sluicing effect may have been experienced. The average discharge for each of these longer periods is also shown. The mean discharges during these longer periods vary from the average to a greater degree than in the preceding tabulation for the reason that both filling and emptying processes are included.

## VARIATIONS IN CHANNEL CROSS SECTIONS IN THE VICINITY OF GAGING STATIONS

Several channel cross sections were obtained at and near all but one of the gaging stations included in this investigation. Inasmuch as the channel of the New York Canal is lined with concrete above and below that gaging station none was obtained there. Measurements were made at three different periods at most of the stations. The first period was early in 1939 before the spring runoff, the second in the summer of 1939 after the spring runoff, and the third in the summer of 1940 after the spring runoff.

The sections selected at each station were tied in to markers on the banks of the stream. Transverse profiles of the channel bottom between each pair of markers were developed by leveling. The station gage datum was used as the elevation reference.

The cross-section notes for each section selected at or near the gaging stations were reduced. Parallel plottings were made for each, showing the transverse profiles of the stream bed between the markers for the dates on which the surveys were made. These plottings are on file in the Geological Survey district office in Boise. Mean stream bed elevations were computed from the plottings for each cross section at each of the stations for the several surveys.

The changes in elevation of the channel beds at and near the gaging stations do not appear consequential except at the initial location of the station on Elk Creek near Idaho City. Within a channel reach of 102 feet adjacent to this station the channel bed aggraded an average of 1.51 feet between March 24 and June 22, 1939; 0.1 foot, June 22 to July 15, 1939; and 0.78 foot, July 15 to October 25, 1939. With this exception the stream channels at and near the gaging stations remained relatively stable during the period of the investigation.

The relative stability of the channel beds at the gaging stations does not mean that there was no degradation or aggradation of the beds in other reaches of the streams. Certain sections may have gradients sufficiently flat that deposition of sediment may be appreciable. Other sections may have gradients so steep that erosion may take place. Furthermore, a reach of stream bed may degrade during a period of a few weeks, months, or years and then aggrade during another period. Changes in channel beds at and near the gaging stations may be caused by artificial means such as construction of gage housings, sediment sampling structures, artificial controls, and riprap bank protection. They may also be caused by other artificial operations such as various forms of placer mining which affect the natural regimen of the streams. Still other operations that may affect directly or indirectly the stability of channel bed are those connected with grazing, timber-cutting practices, road building, and the ravages of fire. There appears to be no direct evidence, however, of any significant changes in stream beds in the vicinity of any of the gaging stations during the period of the investigation except at the station on Elk Creek near Idaho City, where placer sediments filled the channel to an average depth of about 2.5 feet.

*Variations of mean elevation of stream beds in vicinity of gaging stations*

**Boise River near Twin Springs**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Mar. 8, 1939 | Aug. 14, 1939 | Sept. 26, 1940 | |
| At gage | 1.20 | 1.16 | 1.25 | |
| 67 feet upstream | 1.40 | 1.34 | 1.40 | |
| 158 feet upstream | 1.11 | | 1.22 | |
| 228 feet upstream | .97 | .90 | 1.00 | |
| 380 feet upstream | 1.88 | 1.82 | 1.84 | |
| Average | 1.31 | [1] 1.34 | 1.34 | |

**Boise River at Dowling ranch near Arrow Rock**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | Remarks |
|---|---|---|---|
| | Mar. 22, 1939 | Oct. 28, 1940 | |
| 238 feet upstream | 1.38 | 1.38 | Since 1915 Arrow Rock Reservoir has been operated for storage of river flow above station. No sluicing operation during period of investigation. |
| At gage | .76 | .77 | |
| 186 feet downstream | 1.21 | 1.17 | |
| Average | 1.12 | 1.11 | |

**Boise River at Notus**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Mar. 10, 1939 | July 19, 1939 | June 24, 1940 | |
| 90 feet downstream | 2.81 | 2.72 | 2.91 | Considerable channel work has been done in river bed between Boise and Notus during the past several years. |
| 415 feet downstream | 1.87 | 2.07 | 2.17 | |
| 1,090 feet downstream | .64 | .60 | .72 | |
| Average | 1.77 | 1.80 | 1.93 | |

[1] Weighted.

*Variations of mean elevation of stream beds in vicinity of gaging stations*—Continued

**Cottonwood Creek at Arrow Rock Reservoir**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Mar. 25, 1939 | July 13, 1939 | June 20, 1940 | |
| 3 feet upstream | 1.58 | 1.84 | 2.10 | |
| 11 feet upstream | 2.01 | 2.04 | 2.38 | |
| 23 feet upstream | 2.21 | 2.32 | 2.40 | |
| 45 feet upstream | 3.37 | 3.23 | 3.35 | |
| Average | 2.29 | 2.36 | 2.56 | |

**Grouse Creek near Arrow Rock**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Mar. 11, 1939 | Aug. 4, 1939 | June 21, 1940 | |
| 26 feet upstream | 2.90 | 2.91 | 3.13 | Several check dams were constructed on creek and tributaries farther upstream during fall of 1939. |
| 60 feet upstream | 3.43 | 3.33 | 3.65 | |
| 72 feet upstream | 4.09 | 3.87 | 4.12 | |
| 112 feet upstream | 5.30 | 5.21 | 5.48 | |
| 184 feet upstream | 6.62 | 6.76 | 6.87 | |
| 233 feet upstream | 8.48 | 8.43 | 8.24 | |
| 327 feet upstream | 11.02 | 10.62 | 10.48 | |
| Average | 5.98 | 5.88 | 6.00 | |

**Moore Creek above Granite Creek near Idaho City**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Mar. 23, 1939 | July 15, 1939 | June 13, 1940 | |
| 6 feet upstream | 0.80 | 0.83 | 1.18 | A diversion from Moore Creek 4⅛ miles upstream from station furnishes water for use in placering operations at Gold Hill. |
| 43 feet upstream | 1.13 | 1.04 | 1.54 | |
| Average | .96 | .94 | 1.36 | |

**Moore Creek above Thorn Creek near Idaho City**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Mar. 18, 1939 | July 13, 1939 | July 5, 1940 | |
| 24 feet upstream | 1.72 | 1.80 | 1.70 | Placer mining including dredging was carried on above station throughout the investigation. A section of highway was constructed through the dredged area during the winter of 1939–40. |
| 93 feet upstream | 1.49 | 1.72 | 1.74 | |
| 158 feet upstream | 2.80 | 2.80 | 2.92 | |
| 253 feet upstream | 3.62 | 3.58 | 3.61 | |
| Average | 2.41 | 2.48 | 2.49 | |

*Variations of mean elevation of stream beds in vicinity of gaging stations*—Continued

**Granite Creek near Idaho City**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Apr. 7, 1939 | July 14, 1939 | June 7, 1940 | |
| 13 feet upstream | 2.20 | 2.09 | 2.41 | |
| 45 feet upstream | 3.03 | 2.88 | 3.01 | |
| 88 feet upstream | 5.54 | 5.08 | 5.23 | |
| 145 feet upstream | 10.64 | 10.74 | 10.61 | |
| Average | 5.35 | 5.20 | 5.32 | |

**Bannock Creek near Idaho City**

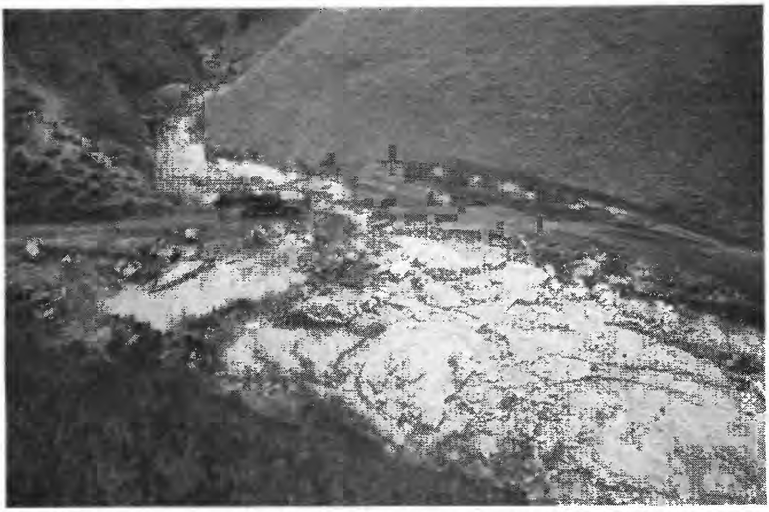
| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Apr. 8, 1939 | July 12, 1939 | June 7, 1940 | |
| 14 feet upstream | 0.33 | 0.45 | 0.67 | Approximately 12.5 cubic yards of sand removed from weir pool during period of investigation. |
| 40 feet upstream | 1.56 | 1.51 | 1.41 | |
| 85 feet upstream | 2.54 | 2.40 | 2.33 | |
| 116 feet upstream | 3.87 | 3.73 | 3.55 | |
| 140 feet upstream | 3.91 | 3.90 | 3.75 | |
| Average | 2.44 | 2.40 | 2.34 | |

**Pine Creek near Idaho City**

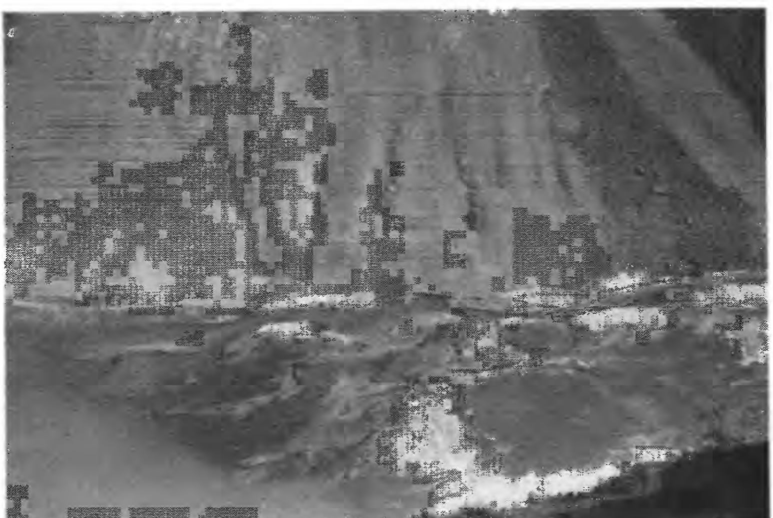
| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | Remarks |
|---|---|---|---|
| | Apr. 7, 1939 | July 14, 1939 | |
| 27 feet upstream | 2.21 | 2.26 | Station operated at this location Jan. 16, 1939, to Feb. 12, 1940. Because of the construction of Barry Placer diversion ditch the station was moved ¾ mile upstream. |
| 49 feet upstream | 3.53 | 3.60 | |
| 76 feet upstream | 4.28 | 4.26 | |
| 115 feet upstream | 5.64 | 5.49 | |
| Average | 3.92 | 3.90 | |

**Pine Creek above Barry placer diversion near Idaho City**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | Remarks |
|---|---|---|---|
| | Mar. 13, 1940 | June 8, 1940 | |
| 11 feet upstream | 4.40 | 4.31 | A diversion 1⅞ miles above station furnishes water for Davis Placer outside of drainage basin. |
| 35 feet upstream | 4.87 | 5.05 | |
| 61 feet upstream | 5.79 | 5.77 | |
| 86 feet upstream | 7.20 | 7.28 | |
| 126 feet upstream | 8.84 | 8.94 | |
| 170 feet upstream | 12.75 | 12.50 | |
| Average | 7.31 | 7.31 | |

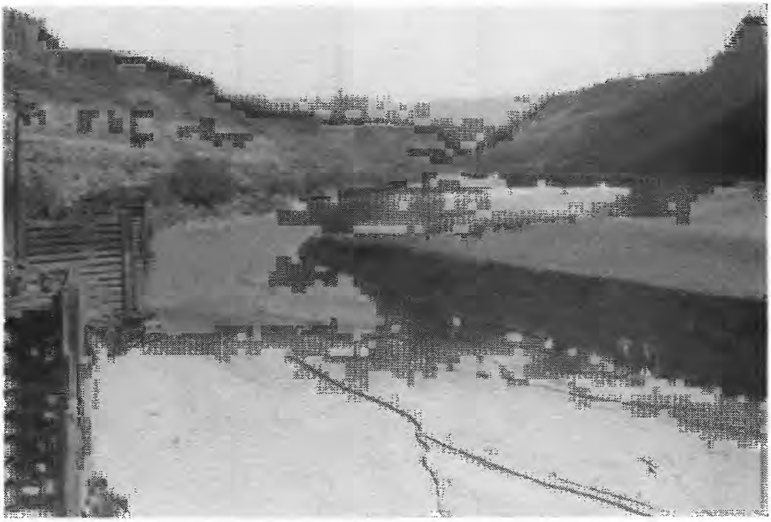


*A*, DEBRIS CONE AT MOUTH OF SIDE CANYON ENTERING GROUSE CREEK, 1 MILE ABOVE GAGING STATION.



*B*. SEDIMENT AND DEBRIS DEPOSITED AT MOUTH OF GROUSE CREEK EXPOSED BY DRAWDOWN IN ARROW ROCK RESERVOIR.

Deposits extend about a mile upstream to a point corresponding with the maximum level of water in the reservoir.



*A*. VIEW UPSTREAM SHOWING SEDIMENT DEPOSITED BEHIND DAM. CHANNEL IN FOREGROUND IS ABOUT 12 FEET BELOW TOP OF DEPOSIT.

*B*. VIEW DOWNSTREAM SHOWING DAM AT RIGHT AND HEAD GATES AT INTAKE OF NEW YORK CANAL AT LEFT OF POWERHOUSE.

BOISE RIVER AT DIVERSION DAM.

*Variations of mean elevation of stream beds in vicinity of gaging stations*—Continued

**Elk Creek near Idaho City**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | | Remarks |
|---|---|---|---|---|---|
| | Mar. 24, 1939 | June 22, 1939 | July 15, 1939 | Oct. 25, 1939 | |
| 14 feet downstream | 1.91 | 3.05 | 3.17 | 4.04 | Operated at this location Jan. 20, 1939 to Feb. 4, 1940. Because of resumption of operations at Gold Hill and Rubow Placers, station was moved 4⅝ miles upstream. |
| 19 feet upstream | 1.80 | 3.28 | 3.51 | 4.07 | |
| 53 feet upstream | 1.85 | 3.58 | 3.87 | 4.64 | |
| 88 feet upstream | 2.24 | 3.95 | 4.04 | 4.97 | |
| Average | 1.95 | 3.46 | 3.65 | 4.43 | |

**Elk Creek above Gold Hill placer diversion near Idaho City**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | Remarks |
|---|---|---|---|
| | Mar. 22, 1940 | June 19, 1940 | |
| 18 feet downstream | 0.22 | 0.52 | Operated at this location Feb. 4, to June 30, 1940, above diversions for Gold Hill and Rubow Placers. |
| 6 feet upstream | .92 | .99 | |
| 35 feet upstream | 3.34 | 2.80 | |
| 63 feet upstream | 5.29 | 4.66 | |
| 92 feet upstream | 5.59 | 5.61 | |
| Average | 3.07 | 2.92 | |

**Cottonwood Gulch at Boise**

| Cross-section location with respect to gage | Mean elevation of stream bed in feet, referred to gage datum, on dates indicated | | | Remarks |
|---|---|---|---|---|
| | Mar. 13, 1939 | Aug. 3, 1939 | June 22, 1940 | |
| 25 feet upstream | 3.62 | 3.52 | 3.64 | Old debris dam 550 feet above station. |
| 52 feet upstream | 3.77 | 3.63 | 3.57 | |
| 84 feet upstream | 3.82 | 3.84 | 3.83 | |
| 169 feet upstream | 7.00 | 6.65 | 6.55 | |
| 227 feet upstream | 8.45 | 8.25 | 7.88 | |
| Average | 5.33 | 5.18 | 5.09 | |

[1] Weighted.

758529—48——6

## DAILY DISCHARGE AND SEDIMENT LOADS

The mean daily discharge in second-feet and daily sediment loads in tons measured at each of the 13 stations during the 18-month period ended June 30, 1940, are given in the following table. Discharge data for all important diversions in the Idaho City area are included. For some of the stations sediment loads reported represent total sediment loads and for other stations they represent only the suspended sediment loads. The type of load measured is indicated for each station. For those stations without overfall sections the probable relation of the measured suspended loads to the total loads is given in the table on page 30.

### STATION DESCRIPTIONS

The following descriptions apply to the stations for which records on sediment loads and size analyses of sediments are given in the tables on pages 82 to 139.

#### Boise River near Twin Springs, Idaho

LOCATION.—Water-stage recorder, lat. 43°40′, long. 115°44′, in NW¼ sec. 27, T. 4 N., R. 6 E., ¼ mile upstream from Birch Creek, 4 miles downstream from Twin Springs and 13 miles upstream from Arrow Rock.

DRAINAGE AREA.—830 square miles.

DISCHARGE RECORDS.—Station established March 21, 1911.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 17, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 5,450 tons May 12, 1940; minimum, 1.2 tons September 11, 1939.

Sediment concentration: Maximum observed, 590 parts per million March 27, 1940.

DIVERSIONS.—No important diversion or regulation. Minor diversions for placering and irrigation within the basin from tributaries above station.

#### Boise River at Notus, Idaho

LOCATION.—Water-stage recorder, lat. 43°43′, long. 116°48′, in SE¼SE¼, sec. 34, T. 5 N., R. 4 W., 360 yards upstream from steel highway bridge, ¼ mile southeast of Notus and 7 miles northwest of Caldwell.

DRAINAGE AREA.—3,820 square miles.

DISCHARGE RECORDS.—Station established April 1, 1920.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 13, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 8,600 tons April 2, 1939; minimum 0.3 ton August 3, 1939.

Sediment concentration: Maximum observed, 1,610 parts per million March 28, 1940.

DIVERSIONS.—Station is below all diversions for irrigation in Boise Valley. Flow regulated by storage in Arrow Rock Reservoir. Several irrigation diversions above station including the New York Canal. Records for New York Canal are given in this report.

**Boise River at Dowling ranch near Arrow Rock, Idaho**

LOCATION.—Water-stage recorder, lat. 43°35′, long. 115°58′, in SE¼SW¼ sec. 15, T 3 N., R. 4 E., at Dowling ranch, ¾ mile upstream from Moore Creek and 4 miles downstream from Arrow Rock.

DRAINAGE AREA.—2,220 square miles.

DICSHARGE RECORDS.—Station established March 12, 1911.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 17, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 1,270 tons May 14, 1940; minimum, 0.01 ton Nov. 5, 1939, and Jan. 8, 1940.

Sediment concentration: Maximum observed, 235 parts per million Mar. 1, 1940.

DIVERSIONS.—No important diversions from river above station. Flow regulated by Arrow Rock Reservoir on river and by Little Camas Reservoir on Little Camas Creek. Minor diversions for placering and irrigation within the basin from tributaries.

**Cottonwood Creek near Arrow Rock Reservoir, Idaho**

LOCATION.—Water stage recorder and broad-crested wooden control structure with overfall, with trapezoidal notch for low stages, lat. 43°38′, long. 115°49′, in NW¼NE¼ sec. 2, T. 3 N., R. 5 E., at flow line of Arrow Rock Reservoir, ¾ mile downstream from Ranger Creek and Cottonwood ranger station and 5½ miles northeast of Arrow Rock.

DRAINAGE AREA.—21.4 square miles.

DISCHARGE RECORDS.—Station established January 23, 1939 (at site 0.4 mile upstream, March 7, 1914, to September 30, 1918).

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 23, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 1,080 tons March 28, 1940; minimum, 0.001 ton September 10, 1940.

Sediment concentration: Maximum observed, 18,700 parts per million March 28, 1940.

DIVERSIONS.—One small diversion for irrigation within the basin.

**Grouse Creek near Arrow Rock, Idaho**

LOCATION.—Water-stage recorder and broad-crested wooden control structure with overfall, with rectangular flume for low stages, lat. 43°35′, long. 115°55′, in SW¼ sec. 19, T. 3 N., R. 5 E., at Sanders ranch, at flow line of Arrow Rock Reservoir, 1¼ miles southeast of Arrow Rock.

DRAINAGE AREA.—8.0 square miles.

DISCHARGE RECORDS.—Station established January 20, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 20, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 3,950 tons March 27, 1939; minimum, 0.003 ton on several days during period of record.

Sediment concentration: Maximum observed, 93,600 parts per million March 23, 1939.

DIVERSIONS.—No important diversion or regulation above station.

**Moore Creek above Granite Creek near Idaho City, Idaho**

LOCATION.—Water-stage recorder and artificial control without overfall, lat. 43°50′, long. 115°47′, in SE¼SE¼ sec. 19, T. 6 N., R. 6 E., ⅝ mile upstream from Granite Creek, and 2⅜ miles northeast of Idaho City.

DRAINAGE AREA.—37.0 square miles.

DISCHARGE RECORDS.—Station established January 20, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 20, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 884 tons March 27, 1940; minimum, 0.008 ton September 10, 1939.

Sediment concentration: Maximum observed, 2,900 parts per million, March 25, 1940.

DIVERSIONS.—One important diversion, Gold Hill Placer diversion, located 4⅛ miles upstream from station, used principally for mining purposes at Gold Hill Placer. A small part is used to supplement the domestic supply at Idaho City. Return flow enters below gaging station. Records of daily discharge are given in this report.

**Moore Creek above Thorn Creek near Idaho City, Idaho**

LOCATION.—Water-stage recorder and broad-crested control structure without overfall, lat. 43°46′, long. 115°55′, in NW¼NW¼ sec. 18, T. 5 N., R. 5 E., 1¾ miles upstream from Thorn Creek and 5½ miles southwest of Idaho City.

DRAINAGE AREA.—119 square miles.

DISCHARGE RECORDS.—Station established January 28, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 28, 1939 to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 4,550 tons March 27, 1940; minimum, 5.3 tons August 22, 1939.

Sediment concentration: Maximum observed 4,390 parts per million June 12, 1939.

DIVERSIONS.—Many diversions for placering purposes within the basin above the station. A small ditch diverting from Thorn Creek carries water into this basin via Pine Creek. Flow slightly regulated by passage through dredged areas in vicinity of Idaho City. Records of daily discharge for diversion from Thorn Creek into Pine Creek near Idaho City are given in this report. (See under Pine Creek above Barry diversion.)

**Granite Creek near Idaho City, Idaho**

LOCATION.—Water-stage recorder and broad-crested wooden control structure with overfall, with modified Parshall flume for low stages, lat. 43°49′30″, long. 115°47′00″, in NE¼SE¼ sec. 30, T. 6 N., R. 6 E., ⅜ mile upstream from mouth and 2¼ miles east of Idaho City.

DRAINAGE AREA.—4.8 square miles.

DISCHARGE RECORDS.—Station established January 16, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 18, 1939 to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 392 tons March 27, 1940; minimum, 0.001 ton on several days during period of record.

Sediment concentration: Maximum observed, 61,200 parts per million March 1, 1940.

DIVERSIONS.—No important diversion or regulation above station.

### Bannock Creek near Idaho City, Idaho

LOCATION.—Water-stage recorder and broad-crested wooden weir with V-notch with overfall, lat. 43°48'30'', long. 115°46'30'', in SE¼SW¼ sec. 32, T. 6 N., R. 6 E., ¾ mile upstream from South Fork, 2¼ miles upstream from confluence with Moore Creek, and 3⅛ miles southeast of Idaho City.

DRAINAGE AREA.—4.5 square miles.

DISCHARGE RECORDS.—Station established January 16, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 16, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 135 tons March 27, 1940; minimum, 0.001 ton on many days during period of record.

Sediment concentration: Maximum observed, 10,900 parts per million March 27, 1940.

DIVERSIONS.—One small diversion within the basin at experimental plot above station.

### Pine Creek near Idaho City, Idaho

LOCATION.—Water-stage recorder and broad-crested wooden control structure with overfall, with rectangular flume for low stages, lat. 43°49'00'', long. 115°48'30'', in SW¼NE¼ sec. 36, T. 6 N , R. 5 E , ¼ mile upstream from Steamboat Gulch, ½ mile upstream from mouth, and 1½ miles southeast of Idaho City.

DRAINAGE AREA.—6.5 square miles.

DISCHARGE RECORDS.—Station established January 16, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 16, 1939, to February 12, 1940. Station moved ¾ mile upstream prior to initial operation of Barry Placer diversion. (See description below.)

EXTREMES.—Sediment load: Maximum, 49 tons March 22, 1939; minimum, 0.001 ton on many days during period of record.

Sediment concentration: Maximum observed, 4,220 parts per million March 22, 1939.

### Pine Creek above Barry Placer diversion near Idaho City Idaho

LOCATION.—Water-stage recorder and broad-crested wooden control structure with rectangular flume for low stages, lat. 43°48'30'', long. 115°48'00'', in NW¼NE¼ sec. 1, T. 5 N., R. 5 E., 100 feet upstream from headgates of Barry Placer diversion, 1 mile upstream from Steamboat Gulch, 1¼ miles upstream from mouth, and 2 miles southeast of Idaho City.

DRAINAGE AREA.—6.1 square miles.

DISCHARGE RECORDS.—Station established February 13, 1940.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from February 13, 1940, to June 30, 1940, from overfall structure 40 feet downstream from gage.

EXTREMES.—Sediment load: Maximum, 2,840 tons March 27, 1940; minimum, 0.004 ton May 30, 1940.

Sediment concentration: Maximum observed, 85,000 parts per million March 27, 1940.

DIVERSIONS.—One diversion, Davis Placer diversion from Pine Creek, 1⅞ miles upstream from station, used for mining and domestic purposes at several placer claims. Return flow enters below gaging station. Pine Creek receives water above Davis Placer diversion by a small ditch that diverts from Thorn Creek in NW¼ sec. 21, T. 5 N , R. 6 E. Records of discharge for these two diversions are given in this report.

**Elk Creek near Idaho City, Idaho**

LOCATION.—Water-stage recorder, lat. 43°50′30″, long. 115°49′30″, in NW¼SE¼ sec. 23, T. 6 N., R 5 E., 400 feet upstream from Spanish Fork and 1 mile north of Idaho City.

DRAINAGE AREA.—22.3 square miles.

DISCHARGE RECORDS.—Station established January 20, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 20, 1939, to February 4, 1940; station moved 4⅝ miles upstream. (See description below.)

EXTREMES.—Sediment load: Maximum, 364 tons March 25, 1939; minimum, 0.02 ton February 8, 1939.

Sediment concentration: Maximum observed, 56,300 parts per million June 9, 1939.

DIVERSIONS.—An important diversion, Gold Hill Placer diversion, from Elk Creek near Idaho City, 4⅜ miles upstream from station, is used for mining purposes at Gold Hill Placer. Return flow, Gold Hill Placer diversion, normally enters below station. During short periods in May, June, and July 1939, a small part of the return flow was rediverted and entered at Rubow Placer adjacent to Elk Creek, ¼ mile above gaging station. In October and November 1939, return flow also reentered Elk Creek via Eldorado Gulch 2½ miles upstream from station.

A second diversion, Rubow diversion No. 3 from Elk Creek near Idaho City, 1¾ miles upstream from station, is used for mining purposes at Rubow Placer on Spanish Fork. Return flow enters below the gaging station.

A third diversion, Rubow diversion No. 2 from Elk Creek near Idaho City, 1¼ miles upstream from station, is used in part at Rubow Placer adjacent to Elk Creek and in part at Rubow Placer on Spanish Fork. The return flow from the first part enters above the gaging station and from the second part below the gaging station. A record of discharge was collected below point where first part is used to show net diversion to placer claims outside the basin.

**Elk Creek above Gold Hill Placer diversion, near Idaho City, Idaho**

LOCATION.—Water-stage recorder and artificial control, lat. 43°54′00″, long. 115°47′30″, in SW¼NW¼ sec. 31, T. 7 N., R. 6 E., ¼ mile upstream from head gates of Gold Hill Placer diversion, ½ mile above Forest King Gulch, and 5½ miles north of Idaho City.

DRAINAGE AREA.—13.1 square miles.

DISCHARGE RECORDS.—Station established February 4, 1940.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from February 4, 1940, to June 30, 1940 at overfall structure 50 feet downstream from gage.

EXTREMES.—Sediment load: Maximum, 180 tons March 27, 1940; minimum, 0.04 ton February 5, 1940.

Sediment concentration: Maximum observed, 1,840 parts per million March 25, 1940.

DIVERSIONS.—No diversion or regulation above station.

### New York Canal near Barber, Idaho

LOCATION.—Water-stage recorder and trapezoidal concrete-lined canal section, lat. 43°33′, long. 116°07′, in SE¼NE¼ sec. 32, T. 3 N., R. 3 E., 1¾ miles downstream from head gates at Boise River diversion dam and power plant, 1 mile south of Barber and 6 miles southeast of Boise post office.

DISCHARGE RECORDS.—Station established February 1, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from February 1, 1939, to June 30, 1940. (Records collected by Boise River watermaster at same site during irrigation seasons of earlier years.)

EXTREMES.—Sediment load: Maximum, 12,200 tons March 27, 1940; no load on many days of zero flow.

Sediment concentration: Maximum observed, 3,770 parts per million March 27, 1940.

DIVERSIONS.—Canal diverts water from the Boise River in sec. 3, T. 2 N., R. 3 E., 8 miles downstream from Moore Creek, for irrigation of approximately 166,400 acres included in Boise project of Bureau of Reclamation. It is used also as a feeder canal for Deer Flat Reservoir near Caldwell. Flow regulated by operation of head gates.

### Cottonwood Gulch at Boise, Idaho

LOCATION.—Water-stage recorder and broad-crested wooden control structure with overfall, with trapezoidal notch for low stages, lat. 43°37′, long. 116°11′, in SE¼SW¼ sec. 2, T. 3 N., R. 2 E., on United States Military Reservation adjacent to city limits and 1 mile east of Boise post office.

DRAINAGE AREA.—16.0 square miles.

DISCHARGE RECORDS.—Station established January 25, 1939.

SEDIMENT-LOAD RECORDS.—Sediment loads determined from January 27, 1939, to June 30, 1940.

EXTREMES.—Sediment load: Maximum, 2,610 tons March 21, 1939; minimum, less than 0.001 ton on many days during periods of low flow.

Sediment concentration: Maximum observed, 42,000 parts per million March 19, 1939.

DIVERSIONS.—No important diversion above station.

### BOISE RIVER NEAR TWIN SPRINGS, IDAHO

*Discharge and suspended sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 385 | -------- | 250 | 4.0 | 379 | 24 | 1,850 | 544 | 3,950 | 2,150 |
| 2 | 397 | -------- | 270 | 14 | 368 | 19 | 1,990 | 451 | 3,700 | 1,700 |
| 3 | 414 | -------- | 330 | 17 | 368 | 18 | 2,110 | 1,130 | 3,780 | 1,200 |
| 4 | 391 | -------- | 390 | 35 | 356 | 12 | 2,330 | 1,670 | 3,860 | 1,580 |
| 5 | 397 | -------- | 403 | 44 | 351 | 20 | 2,190 | 917 | 3,780 | 1,530 |
| 6 | 368 | -------- | 385 | 15 | 345 | 18 | 1,870 | 894 | 3,380 | 694 |
| 7 | 274 | -------- | 351 | 10 | 356 | 12 | 1,690 | 940 | 2,990 | 444 |
| 8 | 279 | -------- | 356 | 14 | 351 | 8.5 | 1,710 | 540 | 2,760 | 373 |
| 9 | 300 | -------- | 328 | 13 | 362 | 14 | 1,730 | 411 | 2,690 | 291 |
| 10 | 350 | -------- | 340 | 24 | 379 | 18 | 1,600 | 363 | 2,760 | 447 |
| 11 | 400 | -------- | 368 | 29 | 408 | 36 | 1,560 | 114 | 2,620 | 248 |
| 12 | 350 | -------- | 385 | 14 | 426 | 41 | 1,570 | 110 | 2,620 | 382 |
| 13 | 345 | -------- | 345 | 15 | 468 | 57 | 1,490 | 129 | 2,540 | 411 |
| 14 | 351 | -------- | 328 | 14 | 462 | 49 | 1,410 | 95 | 2,540 | 343 |
| 15 | 374 | -------- | 362 | 16 | 450 | 66 | 1,480 | 80 | 2,620 | 297 |
| 16 | 368 | -------- | 257 | 5.6 | 462 | 32 | 1,570 | 153 | 2,760 | 268 |
| 17 | 374 | 13 | 306 | 14 | 566 | 109 | 1,630 | 114 | 2,760 | 291 |
| 18 | 379 | 11 | 379 | 15 | 730 | 148 | 1,820 | 236 | 2,690 | 443 |
| 19 | 385 | 23 | 420 | 32 | 931 | 513 | 2,080 | 500 | 2,690 | 552 |
| 20 | 362 | 25 | 408 | 18 | 1,200 | 1,070 | 2,260 | 677 | 2,330 | 315 |
| 21 | 306 | 25 | 391 | 17 | 1,360 | 1,270 | 2,540 | 1,170 | 2,080 | 236 |
| 22 | 252 | 14 | 385 | 21 | 1,550 | 1,020 | 2,840 | 1,870 | 1,920 | 166 |
| 23 | 263 | 8.5 | 403 | 34 | 1,710 | 1,290 | 2,840 | 1,070 | 1,780 | 168 |
| 24 | 334 | 16 | 397 | 28 | 1,910 | 1,830 | 2,760 | 850 | 1,660 | 134 |
| 25 | 374 | 18 | 403 | 15 | 2,040 | 1,320 | 2,400 | 473 | 1,560 | 164 |
| 26 | 397 | 33 | 385 | 36 | 2,040 | 1,220 | 2,120 | 412 | 1,510 | 139 |
| 27 | 440 | 37 | 374 | 11 | 1,870 | 384 | 2,120 | 280 | 1,600 | 138 |
| 28 | 430 | 33 | 385 | 11 | 1,810 | 288 | 2,400 | 467 | 1,830 | 267 |
| 29 | 400 | 25 | -------- | -------- | 1,710 | 212 | 3,060 | 2,050 | 2,120 | 246 |
| 30 | 350 | 29 | -------- | -------- | 1,740 | 390 | 4,120 | 2,250 | 2,470 | 327 |
| 31 | 300 | 26 | -------- | -------- | 1,800 | 282 | -------- | -------- | 2,330 | 359 |
| Total | -------- | 336.5 | -------- | 535.6 | -------- | 11,790.5 | -------- | 20,960 | -------- | 16,303 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1,990 | 156 | 714 | 21 | 345 | 14 | 221 | 4.8 | 252 | 2.0 |
| 2 | 1,730 | 84 | 675 | 27 | 334 | 14 | 226 | 6.1 | 312 | 2.5 |
| 3 | 1,600 | 99 | 645 | 49 | 317 | 13 | 231 | 6.2 | 351 | 6.6 |
| 4 | 1,560 | 72 | 660 | 48 | 317 | 13 | 231 | 6.2 | 317 | 6.0 |
| 5 | 1,450 | 78 | 730 | 34 | 312 | 13 | 236 | 6.4 | 312 | 7.6 |
| 6 | 1,320 | 50 | 706 | 38 | 301 | 12 | 231 | 6.2 | 414 | 10 |
| 7 | 1,230 | 93 | 622 | 34 | 295 | 12 | 226 | 6.1 | 397 | 8.6 |
| 8 | 1,120 | 36 | 587 | 32 | 290 | 12 | 231 | 5.0 | 340 | 4.6 |
| 9 | 1,200 | 87 | 559 | 23 | 279 | 11 | 226 | 4.9 | 323 | 4.4 |
| 10 | 1,150 | 81 | 538 | 22 | 279 | 11 | 221 | 3.6 | 306 | 5.0 |
| 11 | 1,120 | 88 | 538 | 41 | 274 | 8.9 | 221 | 1.2 | 301 | 4.9 |
| 12 | 1,140 | 55 | 526 | 41 | 268 | 15 | 295 | 2.4 | 301 | 5.7 |
| 13 | 1,170 | 66 | 500 | 34 | 257 | 9.0 | 438 | 19 | 295 | 4.8 |
| 14 | 1,220 | 86 | 500 | 34 | 252 | 14 | 374 | 9.1 | 290 | 3.9 |
| 15 | 1,160 | 63 | 480 | 26 | 247 | 13 | 334 | 3.6 | 290 | 7.8 |
| 16 | 1,260 | 143 | 462 | 25 | 247 | 10 | 306 | 1.7 | 284 | 7.7 |
| 17 | 1,150 | 40 | 450 | 22 | 242 | 7.8 | 279 | 3.8 | 279 | 3.0 |
| 18 | 1,050 | 31 | 438 | 18 | 236 | 7.6 | 263 | 2.1 | 279 | 3.0 |
| 19 | 1,010 | 38 | 426 | 25 | 236 | 7.6 | 257 | 2.1 | 279 | 3.0 |
| 20 | 990 | 75 | 408 | 22 | 231 | 6.2 | 247 | 3.3 | 279 | 3.0 |
| 21 | 931 | 63 | 403 | 18 | 231 | 6.2 | 247 | 2.7 | 284 | 3.1 |
| 22 | 874 | 94 | 391 | 18 | 226 | 6.1 | 247 | 2.0 | 284 | 3.1 |
| 23 | 864 | 65 | 379 | 20 | 231 | 2.5 | 242 | 3.3 | 284 | 3.1 |
| 24 | 874 | 57 | 374 | 15 | 236 | 6.4 | 242 | 3.3 | 284 | 3.1 |
| 15 | 855 | 92 | 362 | 11 | 242 | 7.8 | 242 | 2.0 | 306 | 3.3 |
| 26 | 821 | 82 | 356 | 14 | 247 | 10 | 247 | 3.3 | 312 | 4.2 |
| 27 | 787 | 81 | 351 | 12 | 236 | 9.6 | 242 | 1.3 | 301 | 4.1 |
| 28 | 754 | 71 | 385 | 26 | 231 | 11 | 242 | 4.6 | 306 | 1.7 |
| 29 | 730 | 51 | 368 | 20 | 231 | 6.2 | 247 | 1.3 | 328 | 1.8 |
| 30 | 730 | 53 | 362 | 9.8 | 226 | 3.7 | 252 | 3.4 | 317 | 6.8 |
| 31 | -------- | -------- | 374 | 18 | 221 | 5.4 | -------- | -------- | 306 | 5.0 |
| Total | -------- | 2,230 | -------- | 797.8 | -------- | 299.0 | -------- | 131.0 | -------- | 143.4 |

**BOISE RIVER NEAR TWIN SPRINGS, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 301 | 3.3 | 284 | 3.8 | 444 | 12 | 356 | 13 |
| 2 | 295 | 3.2 | 284 | 3.8 | 566 | 35 | 379 | 16 |
| 3 | 290 | 3.1 | 284 | 4.6 | 630 | 34 | 420 | 17 |
| 4 | 290 | 3.1 | 268 | 4.3 | 552 | 27 | 420 | 20 |
| 5 | 279 | 3.0 | 252 | 2.7 | 493 | 16 | 397 | 21 |
| 6 | 268 | 2.2 | 323 | 4.4 | 420 | 11 | 420 | 23 |
| 7 | 290 | 3.9 | 312 | 2.5 | 328 | 11 | 462 | 29 |
| 8 | 290 | 5.5 | 295 | 2.4 | 414 | 18 | 432 | 22 |
| 9 | 279 | 3.0 | 379 | 3.1 | 462 | 19 | 420 | 22 |
| 10 | 231 | 2.5 | 594 | 50 | 426 | 15 | 462 | 31 |
| 11 | 257 | 2.8 | 512 | 12 | 351 | 5.7 | 480 | 30 |
| 12 | 284 | 3.8 | 432 | 10 | 334 | 4.5 | 420 | 12 |
| 13 | 279 | 3.8 | 374 | 4.0 | 310 | 3.3 | 385 | 17 |
| 14 | 274 | 4.4 | 362 | 3.9 | 290 | 7.0 | 480 | 26 |
| 15 | 263 | 4.3 | 356 | 4.8 | 290 | 9.4 | 444 | 19 |
| 16 | 252 | 2.0 | 462 | 15 | 300 | 3.2 | 379 | 25 |
| 17 | 231 | 1.9 | 706 | 82 | 340 | 7.3 | 426 | 21 |
| 18 | 226 | 3.1 | 566 | 24 | 310 | 6.7 | 420 | 11 |
| 19 | 257 | 4.9 | 420 | 19 | 280 | 2.3 | 379 | 16 |
| 20 | 257 | 6.2 | 426 | 23 | 300 | 5.7 | 345 | 11 |
| 21 | 257 | 6.2 | 408 | 11 | 334 | 9.0 | 328 | 13 |
| 22 | 274 | 4.4 | 351 | 9.5 | 306 | 6.6 | 414 | 28 |
| 23 | 295 | 4.8 | 317 | 8.6 | 334 | 6.3 | 408 | 3.3 |
| 24 | 279 | 3.0 | 317 | 12 | 340 | 6.4 | 397 | 11 |
| 25 | 268 | 2.9 | 268 | 11 | 334 | 7.2 | 414 | 10 |
| 26 | 301 | 2.4 | 180 | 5.3 | 351 | 11 | 519 | 42 |
| 27 | 317 | 2.6 | 220 | 5.3 | 362 | 15 | 874 | 349 |
| 28 | 295 | 2.4 | 270 | 4.4 | 351 | 9.5 | 1,450 | 846 |
| 29 | 268 | 1.4 | 330 | 8.9 | 334 | 4.5 | 1,590 | 305 |
| 30 | 268 | 3.6 | 397 | 9.6 | 345 | 1.9 | | |
| 31 | | | 403 | 7.6 | 345 | 9.3 | | |
| Total | | 103.7 | | 372.5 | | 339.8 | | 2,009.3 |
| | **March 1940** | | **April 1940** | | **May 1940** | | **June 1940** | |
| 1 | 1,200 | 117 | 3,540 | 1,060 | 2,080 | 225 | 3,540 | 698 |
| 2 | 1,010 | 87 | 2,820 | 457 | 2,120 | 160 | 3,300 | 642 |
| 3 | 874 | 57 | 2,470 | 400 | 2,760 | 566 | 2,990 | 476 |
| 4 | 796 | 32 | 2,120 | 143 | 2,990 | 710 | 2,760 | 410 |
| 5 | 770 | 25 | 2,030 | 132 | 2,620 | 354 | 2,540 | 411 |
| 6 | 698 | 21 | 1,890 | 133 | 2,400 | 162 | 2,330 | 239 |
| 7 | 675 | 24 | 1,810 | 103 | 2,330 | 101 | 2,260 | 220 |
| 8 | 830 | 47 | 1,730 | 75 | 2,400 | 194 | 2,060 | 267 |
| 9 | 940 | 38 | 1,900 | 133 | 2,690 | 1,020 | 1,850 | 165 |
| 10 | 893 | 22 | 1,860 | 100 | 3,300 | 1,170 | 1,820 | 69 |
| 11 | 787 | 17 | 1,820 | 118 | 4,200 | 3,370 | 1,960 | 116 |
| 12 | 682 | 22 | 1,890 | 138 | 5,020 | 5,450 | 2,260 | 220 |
| 13 | 645 | 10 | 2,260 | 262 | 4,830 | 3,830 | 2,540 | 329 |
| 14 | 645 | 12 | 2,820 | 929 | 4,380 | 1,480 | 2,620 | 396 |
| 15 | 622 | 20 | 3,140 | 1,430 | 4,120 | 1,760 | 2,330 | 201 |
| 16 | 622 | 20 | 2,690 | 596 | 3,780 | 1,320 | 2,190 | 95 |
| 17 | 660 | 25 | 2,470 | 227 | 3,700 | 1,750 | 2,110 | 68 |
| 18 | 722 | 74 | 2,540 | 302 | 3,540 | 860 | 2,040 | 99 |
| 19 | 778 | 59 | 2,760 | 373 | 3,540 | 1,340 | 1,990 | 97 |
| 20 | 838 | 50 | 3,060 | 925 | 3,620 | 1,450 | 1,910 | 52 |
| 21 | 940 | 124 | 2,760 | 350 | 3,700 | 1,120 | 1,670 | 59 |
| 22 | 1,060 | 120 | 2,540 | 329 | 3,700 | 909 | 1,470 | 48 |
| 23 | 1,230 | 179 | 2,540 | 288 | 3,860 | 928 | 1,290 | 31 |
| 24 | 1,370 | 218 | 2,470 | 267 | 4,120 | 1,580 | 1,180 | 32 |
| 25 | 1,860 | 743 | 2,400 | 259 | 4,200 | 1,670 | 1,100 | 27 |
| 26 | 2,690 | 1,250 | 2,540 | 521 | 4,120 | 1,430 | 1,070 | 23 |
| 27 | 4,040 | 4,570 | 2,840 | 422 | 3,860 | 709 | 1,020 | 19 |
| 28 | 2,820 | 944 | 2,760 | 298 | 3,540 | 851 | 931 | 10 |
| 29 | 2,260 | 323 | 2,540 | 206 | 3,300 | 722 | 864 | 12 |
| 30 | 2,110 | 308 | 2,260 | 220 | 3,460 | 925 | 830 | 16 |
| 31 | 3,460 | 1,890 | | | 3,620 | 762 | | |
| Total | | 11,448 | | 11,196 | | 38,878 | | 5,547 |

## BOISE RIVER AT DOWLING RANCH NEAR ARROW ROCK, IDAHO

*Discharge and suspended sediment loads, January 1939 to February 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 6 | -------- | 8 | 0.02 | 1,130 | 12 | 4,660 | 478 | 5,690 | 338 |
| 2 | 6 | -------- | 8 | .02 | 1,130 | 24 | 5,100 | 523 | 6,710 | 417 |
| 3 | 8 | -------- | 8 | .02 | 1,130 | 40 | 5,100 | 413 | 6,980 | 415 |
| 4 | 8 | -------- | 7 | .02 | 1,130 | 55 | 5,220 | 296 | 7,250 | 313 |
| 5 | 195 | -------- | 9 | .02 | 1,120 | 39 | 5,340 | 274 | 7,250 | 450 |
| 6 | 504 | -------- | 8 | .02 | 1,120 | 24 | 5,220 | 240 | 6,980 | 471 |
| 7 | 790 | -------- | 8 | .02 | 1,120 | 12 | 4,550 | 160 | 6,190 | 301 |
| 8 | 898 | -------- | 8 | .02 | 1,160 | 6.3 | 3,440 | 84 | 5,690 | 200 |
| 9 | 890 | -------- | 10 | .1 | 1,300 | 7.0 | 3,440 | 195 | 5,340 | 144 |
| 10 | 898 | -------- | 10 | .03 | 1,300 | 14 | 3,730 | 282 | 5,220 | 113 |
| 11 | 367 | -------- | 10 | .05 | 1,220 | 20 | 3,640 | 275 | 5,220 | 113 |
| 12 | 8 | -------- | 11 | .09 | 1,150 | 25 | 3,540 | 105 | 5,100 | 69 |
| 13 | 6 | -------- | 10 | .09 | 1,020 | 39 | 3,440 | 186 | 4,880 | 67 |
| 14 | 6 | -------- | 10 | .08 | 978 | 26 | 3,350 | 118 | 4,770 | 64 |
| 15 | 6 | -------- | 9 | .07 | 1,000 | 19 | 3,350 | 136 | 4,880 | 92 |
| 16 | 6 | -------- | 8 | .06 | 1,070 | 20 | 3,440 | 241 | 4,990 | 54 |
| 17 | 6 | 0.1 | 11 | .1 | 969 | 31 | 3,830 | 196 | 5,100 | 96 |
| 18 | 6 | .08 | 314 | 3.4 | 742 | 32 | 4,240 | 218 | 4,990 | 81 |
| 19 | 6 | .08 | 352 | 3.8 | 605 | 23 | 4,340 | 246 | 4,990 | 81 |
| 20 | 6 | .08 | 470 | 5.1 | 251 | 10 | 4,240 | 206 | 4,770 | 77 |
| 21 | 6 | .08 | 560 | 6.0 | 30 | 1.3 | 4,240 | 252 | 4,240 | 57 |
| 22 | 6 | .08 | 560 | 6.0 | 32 | 2.7 | 4,240 | 126 | 3,930 | 42 |
| 23 | 7 | .04 | 661 | 7.1 | 32 | 2.7 | 4,340 | 70 | 3,830 | 31 |
| 24 | 6 | .05 | 830 | 9.0 | 495 | 35 | 4,240 | 103 | 3,640 | 98 |
| 25 | 8 | .02 | 951 | 10 | 1,330 | 79 | 4,240 | 126 | 3,440 | 28 |
| 26 | 6 | .02 | 1,030 | 19 | 996 | 38 | 4,240 | 103 | 3,170 | 34 |
| 27 | 8 | .02 | 1,110 | 18 | 1,000 | 49 | 4,340 | 82 | 3,170 | 34 |
| 28 | 8 | .02 | 1,140 | 18 | 1,010 | 60 | 4,440 | 120 | 3,170 | 26 |
| 29 | 7 | .02 | -------- | -------- | 931 | 50 | 4,440 | 132 | 3,260 | 26 |
| 30 | 6 | .02 | -------- | -------- | 330 | 18 | 4,660 | 340 | 3,540 | 29 |
| 31 | 7 | .02 | -------- | -------- | 2,790 | 286 | -------- | -------- | 3,730 | 40 |
| Total | -------- | .73 | -------- | 106.23 | -------- | 1,100.0 | -------- | 6,326 | -------- | 4,401 |
| | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
| 1 | 3,640 | 29 | 3,170 | 17 | 2,190 | 18 | 380 | 7.2 | 1,410 | 126 |
| 2 | 3,540 | 76 | 3,080 | 17 | 2,260 | 12 | 366 | 8.9 | 528 | 48 |
| 3 | 3,080 | 33 | 2,990 | 16 | 2,340 | 25 | 366 | 5.9 | 516 | 50 |
| 4 | 3,080 | 33 | 2,900 | 47 | 2,340 | 32 | 330 | 7.1 | 447 | 47 |
| 5 | 2,990 | 32 | 2,820 | 15 | 2,340 | 32 | 510 | 15 | 322 | 37 |
| 6 | 2,900 | 31 | 2,740 | 22 | 2,340 | 32 | 712 | 27 | 290 | 25 |
| 7 | 2,740 | 30 | 2,740 | 30 | 2,340 | 32 | 1,230 | 46 | 340 | 37 |
| 8 | 2,650 | 36 | 2,820 | 15 | 2,340 | 44 | 1,780 | 48 | 528 | 57 |
| 9 | 2,650 | 50 | 2,820 | 53 | 2,260 | 37 | 1,980 | 86 | 480 | 53 |
| 10 | 2,650 | 43 | 2,740 | 22 | 2,120 | 34 | 2,050 | 77 | 474 | 41 |
| 11 | 2,570 | 35 | 2,740 | 15 | 2,120 | 46 | 2,420 | 78 | 498 | 47 |
| 12 | 2,570 | 42 | 2,740 | 22 | 2,050 | 33 | 2,420 | 78 | 516 | 33 |
| 13 | 2,740 | 37 | 2,820 | 23 | 2,050 | 11 | 2,120 | 74 | 492 | 31 |
| 14 | 2,900 | 47 | 2,740 | 22 | 2,120 | 34 | 2,050 | 105 | 492 | 27 |
| 15 | 2,990 | 65 | 2,740 | 22 | 2,120 | 29 | 1,720 | 93 | 492 | 20 |
| 16 | 2,900 | 55 | 2,650 | 21 | 2,120 | 34 | 1,160 | 63 | 510 | 21 |
| 17 | 2,740 | 74 | 2,650 | 29 | 2,120 | 29 | 415 | 29 | 528 | 21 |
| 18 | 2,570 | 42 | 2,650 | 21 | 2,050 | 44 | 380 | 23 | 528 | 71 |
| 19 | 2,490 | 47 | 2,490 | 20 | 2,260 | 43 | 380 | 24 | 522 | 24 |
| 20 | 2,490 | 40 | 2,490 | 20 | 2,260 | 55 | 352 | 21 | 417 | 30 |
| 21 | 2,570 | 42 | 2,340 | 13 | 2,260 | 37 | 334 | 18 | 236 | 19 |
| 22 | 2,740 | 15 | 2,190 | 24 | 2,260 | 37 | 344 | 17 | 240 | 21 |
| 23 | 2,820 | 30 | 2,120 | 23 | 2,260 | 43 | 366 | 14 | 240 | 16 |
| 24 | 2,820 | 23 | 2,190 | 18 | 2,120 | 52 | 362 | 15 | 562 | 27 |
| 25 | 2,900 | 23 | 2,260 | 24 | 2,120 | 46 | 339 | 15 | 847 | 48 |
| 26 | 2,900 | 16 | 2,260 | 37 | 2,190 | 53 | 529 | 23 | 1,040 | 56 |
| 27 | 2,900 | 31 | 2,260 | 24 | 1,980 | 69 | 996 | 38 | 1,220 | 79 |
| 28 | 2,990 | 16 | 2,260 | 31 | 2,120 | 86 | 1,470 | 64 | 1,410 | 91 |
| 29 | 3,080 | 33 | 2,260 | 31 | 2,190 | 53 | 1,590 | 69 | 1,360 | 55 |
| 30 | 3,170 | 17 | 2,260 | 24 | 1,400 | 30 | 1,650 | 89 | 1,260 | 44 |
| 31 | -------- | -------- | 2,260 | 24 | 380 | 8.2 | -------- | -------- | 1,140 | 49 |
| Total | -------- | 1,123 | -------- | 742 | -------- | 1,170.2 | -------- | 1,278.1 | -------- | 1,351 |

**BOISE RIVER AT DOWLING RANCH NEAR ARROW ROCK, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 513 | 40 | 1,120 | 18 | 6 | 0.4 | 5 | 0.07 |
| 2 | 8 | .3 | 1,120 | 18 | 7 | .2 | 5 | .07 |
| 3 | 5 | .1 | 1,090 | 18 | 8 | .2 | 6 | .08 |
| 4 | 4 | .09 | 1,100 | 18 | 8 | .2 | 7 | .2 |
| 5 | 4 | .01 | 1,100 | 18 | 6 | .06 | 6 | .2 |
| 6 | 4 | .05 | 1,110 | 24 | 6 | .08 | 8 | .2 |
| 7 | 4 | .05 | 1,120 | 30 | 5 | .07 | 8 | .3 |
| 8 | 4 | .05 | 1,120 | 21 | 5 | .01 | 91 | 4.7 |
| 9 | 4 | .03 | 1,120 | 33 | 6 | .1 | 344 | 9.3 |
| 10 | 4 | .03 | 1,120 | 18 | 6 | .1 | 566 | [1] 26 |
| 11 | 4 | .03 | 1,110 | 33 | 5 | .1 | 640 | 16 |
| 12 | 4 | .03 | 1,120 | 36 | 5 | .1 | 774 | 21 |
| 13 | 4 | .2 | 1,120 | 48 | 4 | .05 | 915 | 25 |
| 14 | 4 | .2 | 1,110 | 45 | 4 | .05 | 951 | 31 |
| 15 | 4 | .2 | 1,130 | 46 | 5 | .07 | 951 | 21 |
| 16 | 4 | .2 | 469 | 25 | 4 | .04 | 942 | 20 |
| 17 | 4 | .2 | 8 | .3 | 5 | .05 | 933 | 13 |
| 18 | 4 | .04 | 6 | .1 | 4 | .02 | 933 | 15 |
| 19 | 4 | .04 | 5 | .2 | 4 | .03 | 933 | 13 |
| 20 | 289 | 3.1 | 6 | .2 | 4 | .03 | 933 | 13 |
| 21 | 654 | 7.1 | 5 | .1 | 4 | .05 | 933 | 10 |
| 22 | 942 | 10 | 5 | .08 | 4 | .02 | 933 | 25 |
| 23 | 1,060 | 5.7 | 5 | .07 | 4 | .04 | 856 | 23 |
| 24 | 1,070 | 5.8 | 5 | .05 | 4 | .04 | 750 | 20 |
| 25 | 1,060 | 11 | 4 | .04 | 5 | .05 | 750 | 18 |
| 26 | 1,050 | 5.7 | 4 | .04 | 6 | .08 | 735 | 20 |
| 27 | 1,110 | 9.0 | 4 | .05 | 6 | .08 | 403 | 32 |
| 28 | 1,140 | 15 | 4 | .05 | 6 | .08 | 29 | 2.5 |
| 29 | 1,130 | 12 | 4 | .05 | 5 | .07 | 29 | 13 |
| 30 | 1,110 | 12 | 5 | .3 | 5 | .07 | --------- | --------- |
| 31 | --------- | --------- | 5 | .3 | 5 | .07 | --------- | --------- |
| Total | --------- | 138.25 | --------- | 450.93 | --------- | 2.61 | --------- | 392.62 |

[1] Total sediment loads reported on and after Feb. 10, 1940.

*Discharge and total sediment loads, March to June 1940*

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 25 | 15 | 20 | 1.6 | 4,880 | 211 | 6,450 | 139 |
| 2 | 24 | 5.1 | 396 | 53 | 4,660 | 377 | 6,060 | 131 |
| 3 | 20 | 6.8 | 1,850 | 325 | 4,660 | 252 | 5,570 | 105 |
| 4 | 18 | 1.0 | 3,350 | 724 | 4,770 | 270 | 5,340 | 101 |
| 5 | 104 | 21 | 4,660 | 1,110 | 4,990 | 216 | 4,990 | 121 |
| 6 | 290 | 29 | 4,440 | 468 | 4,990 | 189 | 4,550 | 74 |
| 7 | 385 | 15 | 3,830 | 372 | 4,880 | 145 | 4,340 | 94 |
| 8 | 400 | 14 | 3,640 | 216 | 4,770 | 180 | 4,030 | 76 |
| 9 | 298 | 13 | 3,640 | 354 | 4,990 | 202 | 3,730 | 70 |
| 10 | 302 | 8.2 | 3,260 | 308 | 5,570 | 271 | 3,540 | 86 |
| 11 | 366 | 7.9 | 3,080 | 216 | 6,580 | 391 | 3,540 | 124 |
| 12 | 474 | 24 | 3,170 | 154 | 8,090 | 1,140 | 3,730 | 161 |
| 13 | 586 | 38 | 3,930 | 265 | 8,960 | 968 | 4,030 | 98 |
| 14 | 626 | 25 | 5,100 | 716 | 8,380 | 1,270 | 4,240 | 149 |
| 15 | 626 | 19 | 5,940 | 690 | 8,090 | 786 | 3,930 | 85 |
| 16 | 626 | 29 | 5,820 | 471 | 7,530 | 529 | 3,830 | 62 |
| 17 | 280 | 6.0 | 5,340 | 360 | 7,250 | 744 | 3,830 | 72 |
| 18 | 9 | .2 | 5,450 | 368 | 6,840 | 295 | 3,830 | 124 |
| 19 | 8 | .2 | 5,940 | 593 | 6,580 | 409 | 3,830 | 114 |
| 20 | 8 | .3 | 6,450 | 923 | 6,710 | 308 | 3,830 | 62 |
| 21 | 8 | .4 | 6,450 | 418 | 6,710 | 399 | 3,830 | 134 |
| 22 | 8 | .3 | 6,190 | 501 | 6,710 | 326 | 3,730 | 111 |
| 23 | 8 | .6 | 5,340 | 260 | 6,840 | 388 | 3,640 | 98 |
| 24 | 8 | .5 | 4,880 | 198 | 7,250 | 215 | 3,640 | 128 |
| 25 | 48 | 3.2 | 5,100 | 262 | 7,530 | 264 | 3,540 | 86 |
| 26 | 64 | 1.4 | 5,220 | 268 | 7,250 | 215 | 3,640 | 79 |
| 27 | 12 | .5 | 5,340 | 231 | 6,980 | 415 | 3,730 | 131 |
| 28 | 10 | .6 | 5,570 | 256 | 6,580 | 284 | 3,640 | 108 |
| 29 | 10 | .5 | 5,450 | 206 | 6,060 | 213 | 3,540 | 96 |
| 30 | 10 | .3 | 5,340 | 260 | 6,060 | 131 | 3,540 | 76 |
| 31 | 16 | 1.1 | --------- | --------- | 6,320 | 171 | --------- | --------- |
| Total | --------- | 287.1 | --------- | 11,547.6 | --------- | 12,174 | --------- | 3,095 |

**BOISE RIVER AT NOTUS, IDAHO**

*Discharge and suspended sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 540 | -------- | 488 | 65 | 425 | 15 | 3,760 | 8,120 | 645 | 226 |
| 2 | 555 | -------- | 457 | 52 | 429 | 22 | 5,360 | 8,600 | 1,700 | 1,040 |
| 3 | 550 | -------- | 453 | 46 | 437 | 24 | 5,540 | 6,430 | 2,530 | 1,370 |
| 4 | 540 | -------- | 488 | 45 | 433 | 23 | 5,730 | 5,150 | 2,870 | 1,460 |
| 5 | 555 | -------- | 501 | 47 | 418 | 11 | 5,490 | 4,210 | 2,870 | 1,130 |
| 6 | 540 | -------- | 515 | 60 | 418 | 27 | 4,950 | 2,910 | 2,780 | 946 |
| 7 | 496 | -------- | 515 | 42 | 422 | 15 | 4,410 | 2,050 | 2,440 | 712 |
| 8 | 474 | -------- | 510 | 62 | 394 | 16 | 3,460 | 1,640 | 1,740 | 404 |
| 9 | 465 | -------- | 461 | 41 | 372 | 20 | 2,110 | 712 | 1,110 | 216 |
| 10 | 457 | -------- | 496 | 33 | 372 | 17 | 2,000 | 643 | 839 | 145 |
| 11 | 457 | -------- | 474 | 40 | 375 | 21 | 1,560 | 388 | 768 | 108 |
| 12 | 461 | -------- | 496 | 42 | 414 | 88 | 1,190 | 254 | 724 | 88 |
| 13 | 540 | 58 | 535 | 55 | 555 | 469 | 897 | 179 | 615 | 65 |
| 14 | 520 | 49 | 550 | 67 | 506 | 245 | 660 | 109 | 530 | 50 |
| 15 | 520 | 65 | 602 | 80 | 441 | 148 | 382 | 47 | 444 | 36 |
| 16 | 520 | 60 | 690 | 281 | 429 | 104 | 250 | 29 | 404 | 36 |
| 17 | 501 | 47 | 596 | 109 | 478 | 274 | 121 | 12 | 630 | 87 |
| 18 | 501 | 28 | 566 | 90 | 535 | 423 | 86 | 8.1 | 763 | 127 |
| 19 | 515 | 33 | 535 | 72 | 555 | 581 | 133 | 10 | 686 | 85 |
| 20 | 520 | 38 | 488 | 46 | 560 | 558 | 150 | 13 | 785 | 129 |
| 21 | 510 | 28 | 461 | 36 | 924 | 1,350 | 111 | 7.5 | 655 | 95 |
| 22 | 492 | 25 | 488 | 41 | 1,480 | 2,730 | 71 | 6.6 | 448 | 41 |
| 23 | 470 | 28 | 515 | 53 | 1,620 | 2,590 | 75 | 5.1 | 274 | 21 |
| 24 | 478 | 36 | 506 | 49 | 1,760 | 2,670 | 105 | 9.1 | 253 | 21 |
| 25 | 470 | 33 | 461 | 35 | 2,480 | 6,960 | 123 | 7.6 | 188 | 14 |
| 26 | 483 | 27 | 441 | 27 | 3,340 | 7,480 | 96 | 7.0 | 109 | 8.3 |
| 27 | 510 | 43 | 433 | 22 | 3,080 | 3,290 | 52 | 2.0 | 90 | 5.1 |
| 28 | 550 | 91 | 433 | 18 | 2,660 | 2,010 | 47 | 1.8 | 76 | 5.3 |
| 29 | 535 | 66 | -------- | -------- | 2,000 | 1,470 | 45 | 1.3 | 49 | 3.2 |
| 30 | 540 | 63 | -------- | -------- | 1,260 | 538 | 170 | 12 | 44 | 4.5 |
| 31 | 525 | 61 | -------- | -------- | 853 | 419 | -------- | -------- | 42 | 4.1 |
| Total | -------- | 879 | -------- | 1,656 | -------- | 34,608 | -------- | 41,574.1 | -------- | 8,682.5 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 46 | 3.7 | 44 | 2.5 | 18 | 0.7 | 24 | 1.6 | 75 | 10 |
| 2 | 43 | 3.5 | 45 | 3.5 | 18 | .6 | 25 | 2.2 | 168 | 23 |
| 3 | 38 | 3.4 | 40 | 3.0 | 20 | .3 | 25 | 3.0 | 265 | 36 |
| 4 | 38 | 3.4 | 40 | 2.3 | 26 | .8 | 27 | 5.4 | 220 | 23 |
| 5 | 38 | 4.3 | 43 | 2.1 | 31 | 1.4 | 25 | 4.3 | 223 | 30 |
| 6 | 40 | 3.6 | 47 | 2.0 | 26 | 1.0 | 27 | 5.7 | 226 | 35 |
| 7 | 46 | 4.0 | 44 | 1.2 | 24 | 1.2 | 32 | 3.2 | 200 | 16 |
| 8 | 43 | 3.4 | 36 | 1.7 | 26 | 1.0 | 31 | 4.1 | 178 | 20 |
| 9 | 43 | 2.7 | 31 | 1.8 | 27 | 2.0 | 29 | 2.4 | 244 | 32 |
| 10 | 42 | 2.0 | 36 | 1.7 | 28 | 1.7 | 29 | 2.5 | 190 | 21 |
| 11 | 42 | 2.6 | 40 | 2.9 | 29 | .7 | 29 | 4.0 | 190 | 20 |
| 12 | 42 | 2.4 | 38 | 1.3 | 25 | 1.2 | 32 | 9.3 | 175 | 19 |
| 13 | 40 | 1.9 | 38 | 1.4 | 24 | .7 | 46 | 5.2 | 165 | 20 |
| 14 | 36 | 1.7 | 34 | 3.4 | 36 | 1.4 | 425 | 90 | 129 | 15 |
| 15 | 36 | 1.7 | 29 | 1.5 | 23 | .8 | 530 | 64 | 121 | 14 |
| 16 | 44 | 2.9 | 30 | 4.4 | 19 | .6 | 378 | 34 | 101 | 10 |
| 17 | 47 | 2.7 | 34 | 1.3 | 19 | 1.0 | 444 | 68 | 96 | 9.3 |
| 18 | 49 | 3.2 | 32 | .8 | 21 | 1.1 | 386 | 28 | 87 | 11 |
| 19 | 60 | 5.3 | 34 | .9 | 21 | .9 | 262 | 16 | 90 | 11 |
| 20 | 63 | 3.6 | 34 | 2.1 | 21 | .9 | 250 | 11 | 95 | 11 |
| 21 | 51 | 3.4 | 32 | 1.4 | 19 | 3.1 | 215 | 14 | 93 | 12 |
| 22 | 46 | 3.9 | 25 | 1.7 | 18 | .7 | 158 | 6.0 | 121 | 13 |
| 23 | 40 | 2.9 | 25 | 1.2 | 19 | .8 | 129 | 26 | 96 | 9.8 |
| 24 | 34 | 2.8 | 22 | .8 | 19 | 1.5 | 102 | 12 | 120 | 13 |
| 25 | 28 | 2.8 | 25 | .8 | 20 | .9 | 79 | 10 | 217 | 56 |
| 26 | 32 | 2.0 | 24 | 1.3 | 22 | .7 | 66 | 7.5 | 520 | 119 |
| 27 | 34 | 2.2 | 26 | 1.3 | 22 | 1.2 | 58 | 7.2 | 570 | 62 |
| 28 | 36 | 2.5 | 19 | .8 | 26 | 2.5 | 55 | 8.3 | 560 | 76 |
| 29 | 32 | 1.6 | 17 | .7 | 23 | 4.3 | 50 | 6.9 | 530 | 86 |
| 30 | 34 | 2.3 | 18 | 1.3 | 25 | 2.1 | 46 | 5.2 | 520 | 79 |
| 31 | -------- | -------- | 18 | 1.1 | 25 | 3.3 | -------- | -------- | 520 | 66 |
| Total | -------- | 88.4 | -------- | 54.2 | -------- | 41.1 | -------- | 467.0 | -------- | 978.1 |

**BOISE RIVER AT NOTUS, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 525 | 31 | 430 | 22 | 545 | 160 | 530 | 102 |
| 2 | 525 | 34 | 430 | 21 | 605 | 185 | 525 | 105 |
| 3 | 590 | 45 | 426 | 20 | 650 | 258 | 535 | 88 |
| 4 | 570 | 34 | 417 | 27 | 719 | 460 | 545 | 141 |
| 5 | 565 | 26 | 417 | 27 | 620 | 330 | 560 | 150 |
| 6 | 560 | 30 | 417 | 16 | 489 | 111 | 575 | 199 |
| 7 | 555 | 51 | 417 | 21 | 458 | 87 | 545 | 174 |
| 8 | 545 | 37 | 417 | 118 | 476 | 63 | 555 | 172 |
| 9 | 540 | 34 | 430 | 38 | 575 | 88 | 458 | 110 |
| 10 | 530 | 33 | 430 | 43 | 590 | 124 | 453 | 76 |
| 11 | 525 | 33 | 412 | 31 | 550 | 101 | 458 | 72 |
| 12 | 520 | 27 | 394 | 29 | 480 | 70 | 435 | 62 |
| 13 | 525 | 38 | 399 | 23 | 466 | 73 | 435 | 45 |
| 14 | 520 | 35 | 399 | 31 | 498 | 75 | 480 | 45 |
| 15 | 516 | 40 | 399 | 25 | 502 | 77 | 480 | 56 |
| 16 | 516 | 45 | 399 | 41 | 480 | 84 | 466 | 60 |
| 17 | 512 | 33 | 399 | 36 | 484 | 90 | 458 | 28 |
| 18 | 507 | 37 | 502 | 91 | 489 | 95 | 480 | 32 |
| 19 | 507 | 23 | 550 | 92 | 408 | 68 | 471 | 52 |
| 20 | 502 | 57 | 545 | 147 | 507 | 97 | 458 | 46 |
| 21 | 502 | 35 | 520 | 131 | 494 | 87 | 444 | 42 |
| 22 | 484 | 51 | 516 | 116 | 498 | 112 | 448 | 68 |
| 23 | 466 | 28 | 498 | 101 | 498 | 83 | 466 | 92 |
| 24 | 458 | 22 | 484 | 84 | 502 | 94 | 466 | 128 |
| 25 | 453 | 24 | 471 | 102 | 498 | 98 | 476 | 105 |
| 26 | 453 | 108 | 440 | 95 | 512 | 135 | 555 | 500 |
| 27 | 453 | 35 | 448 | 96 | 590 | 180 | 625 | 790 |
| 28 | 444 | 19 | 453 | 83 | 595 | 177 | 675 | 822 |
| 29 | 440 | 23 | 466 | 89 | 565 | 149 | 635 | 360 |
| 30 | 435 | 25 | 480 | 93 | 550 | 143 | | |
| 31 | | | 507 | 105 | 535 | 124 | | |
| Total | | 1,093 | | 1,994 | | 4,078 | | 4,722 |

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 708 | 474 | 1,010 | 2,780 | 2,160 | 589 | 2,100 | 352 |
| 2 | 615 | 296 | 1,210 | 1,370 | 1,660 | 368 | 2,230 | 391 |
| 3 | 605 | 265 | 1,300 | 1,540 | 1,400 | 299 | 1,900 | 349 |
| 4 | 545 | 155 | 2,660 | 5,410 | 1,330 | 280 | 1,410 | 236 |
| 5 | 520 | 136 | 4,240 | 7,260 | 1,270 | 226 | 1,220 | 119 |
| 6 | 502 | 108 | 5,410 | 6,560 | 1,330 | 262 | 884 | 95 |
| 7 | 489 | 107 | 4,860 | 3,710 | 996 | 137 | 590 | 57 |
| 8 | 507 | 104 | 4,330 | 2,330 | 724 | 90 | 378 | 23 |
| 9 | 507 | 182 | 4,500 | 2,130 | 545 | 63 | 235 | 12 |
| 10 | 480 | 80 | 4,500 | 2,020 | 575 | 79 | 165 | 5.3 |
| 11 | 484 | 68 | 3,820 | 1,640 | 938 | 238 | 131 | 5.7 |
| 12 | 471 | 65 | 3,500 | 1,610 | 2,230 | 1,470 | 109 | 2.1 |
| 13 | 462 | 110 | 3,420 | 2,970 | 3,990 | 2,210 | 76 | 1.4 |
| 14 | 453 | 55 | 4,500 | 2,760 | 4,680 | 2,500 | 111 | 3.0 |
| 15 | 448 | 79 | 5,600 | 3,760 | 3,900 | 1,520 | 70 | 2.1 |
| 16 | 448 | 65 | 5,980 | 3,390 | 3,740 | 1,600 | 65 | 1.9 |
| 17 | 435 | 48 | 5,600 | 2,980 | 3,180 | 996 | 43 | 1.3 |
| 18 | 516 | 68 | 4,860 | 2,130 | 2,960 | 823 | 34 | 1.0 |
| 19 | 821 | 483 | 4,680 | 1,760 | 2,800 | 635 | 38 | 1.3 |
| 20 | 871 | 513 | 4,500 | 1,880 | 2,510 | 508 | 28 | 1.0 |
| 21 | 910 | 523 | 4,860 | 2,550 | 2,510 | 352 | 25 | 1.0 |
| 22 | 938 | 582 | 4,240 | 1,730 | 2,440 | 560 | 25 | 1.0 |
| 23 | 945 | 536 | 3,580 | 1,940 | 2,370 | 608 | 25 | 1.0 |
| 24 | 686 | 280 | 2,100 | 714 | 2,730 | 973 | 30 | .8 |
| 25 | 489 | 114 | 1,500 | 332 | 3,030 | 859 | 26 | .7 |
| 26 | 489 | 103 | 1,440 | 327 | 3,340 | 1,720 | 24 | .6 |
| 27 | 686 | 335 | 1,440 | 268 | 3,100 | 1,100 | 24 | .6 |
| 28 | 1,440 | 5,050 | 1,550 | 402 | 2,880 | 809 | 21 | .6 |
| 29 | 815 | 907 | 2,440 | 1,590 | 2,440 | 659 | 24 | .7 |
| 30 | 615 | 329 | 2,440 | 975 | 1,840 | 348 | 26 | .8 |
| 31 | 635 | 974 | | | 1,900 | 328 | | |
| Total | | 13,194 | | 70,818 | | 23,209 | | 1,667.9 |

**COTTONWOOD CREEK AT ARROW ROCK RESERVOIR, IDAHO**

*Discharge and total sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | | | 4.0 | 0.08 | 5.2 | 0.04 | 46 | 15 | 32 | 19 |
| 2 | | | 4.3 | .09 | 5.5 | .04 | 47 | 13 | 29 | 4.6 |
| 3 | | | 4.3 | .06 | 5.5 | .04 | 49 | 11 | 26 | 7.3 |
| 4 | | | 4.3 | .06 | 5.5 | .03 | 49 | 24 | 26 | 7.6 |
| 5 | | | 4.0 | .04 | 5.1 | .07 | 44 | 23 | 22 | 5.9 |
| 6 | | | 4.3 | .06 | 5.5 | 1.2 | 39 | 15 | 22 | 5.0 |
| 7 | | | 4.3 | .06 | 5.5 | 1.4 | 36 | 6.7 | 20 | 4.0 |
| 8 | | | 4.3 | .06 | 5.5 | .3 | 35 | 10 | 19 | 3.5 |
| 9 | | | 4.0 | .06 | 5.5 | .2 | 35 | 7.7 | 19 | 2.5 |
| 10 | | | 4.3 | .1 | 6.3 | 1.3 | 34 | 9.5 | 18 | 2.3 |
| 11 | | | 3.8 | .05 | 7.0 | .4 | 34 | 8.3 | 17 | 3.1 |
| 12 | | | 4.4 | .04 | 8.4 | 1.4 | 33 | 6.6 | 15 | 2.0 |
| 13 | | | 4.0 | .1 | 10 | 1.2 | 30 | 4.3 | 15 | 2.5 |
| 14 | | | 4.2 | .05 | 10 | 1.1 | 30 | 2.9 | 14 | 1.7 |
| 15 | | | 4.6 | .06 | 10 | 1.1 | 31 | 3.8 | 14 | 1.6 |
| 16 | | | 4.4 | .01 | 11 | .9 | 31 | 3.5 | 13 | 1.5 |
| 17 | | | 4.4 | .09 | 16 | 2.1 | 31 | 11 | 13 | 1.3 |
| 18 | | | 4.4 | .07 | 23 | 7.9 | 32 | 5.3 | 12 | .9 |
| 19 | | | 4.6 | .08 | 29 | 6.7 | 33 | 15 | 12 | 2.1 |
| 20 | | | 4.5 | .05 | 34 | 15 | 35 | 11 | 12 | 2.2 |
| 21 | | | 4.5 | .07 | 39 | 19 | 36 | 23 | 11 | 1.8 |
| 22 | | | 4.6 | .1 | 42 | 18 | 37 | 21 | 12 | .6 |
| 23 | 4.5 | 0.6 | 4.6 | .2 | 44 | 9.0 | 36 | 22 | 12 | .9 |
| 24 | 4.5 | .3 | 4.6 | .09 | 49 | 18 | 33 | 22 | 10 | .8 |
| 25 | 4.5 | .2 | 5.2 | .3 | 53 | 39 | 29 | 27 | 10 | .8 |
| 26 | 4.6 | .02 | 4.9 | .08 | 53 | 27 | 28 | 16 | 9.6 | .4 |
| 27 | 4.9 | .04 | 4.9 | .05 | 49 | 21 | 29 | 13 | 8.8 | .4 |
| 28 | 4.9 | .01 | 5.2 | .2 | 45 | 14 | 31 | 9.5 | 7.6 | .4 |
| 29 | 4.9 | .08 | | | 43 | 11 | 33 | 8.2 | 7.0 | .4 |
| 30 | 4.4 | .06 | | | 43 | 7.4 | 35 | 14 | 6.7 | .3 |
| 31 | 4.0 | .06 | | | 44 | 12 | | | 5.7 | .5 |
| Total | | 1.37 | | 2.36 | | 237.82 | | 382.3 | | 87.9 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 6.0 | 0.4 | 2.1 | 0.04 | 0.62 | 0.008 | 0.32 | 0.009 | 1.1 | 0.02 |
| 2 | 5.5 | .2 | 2.0 | .04 | .57 | .005 | .32 | .009 | 1.5 | .01 |
| 3 | 6.0 | .3 | 2.0 | .04 | .53 | .004 | .35 | .01 | 2.3 | .1 |
| 4 | 5.7 | .4 | 2.3 | .06 | .53 | .004 | .35 | .01 | 1.9 | .02 |
| 5 | 6.0 | .4 | 3.0 | .08 | .53 | .004 | .39 | .01 | 1.8 | .01 |
| 6 | 7.0 | .4 | 2.8 | .08 | .48 | .004 | .39 | .008 | 3.2 | .1 |
| 7 | 6.7 | .2 | 2.3 | .1 | .48 | .006 | .35 | .008 | 2.3 | .06 |
| 8 | 6.0 | .2 | 1.9 | .1 | .48 | .006 | .39 | .008 | 1.9 | .03 |
| 9 | 6.0 | .2 | 1.8 | .1 | .48 | .006 | .39 | .008 | 1.8 | .02 |
| 10 | 5.5 | .1 | 1.6 | .09 | .44 | .006 | .44 | .001 | 1.8 | .03 |
| 11 | 5.2 | .2 | 1.6 | .09 | .35 | .005 | .44 | .002 | 1.8 | .01 |
| 12 | 4.9 | .2 | 1.4 | .03 | .35 | .004 | 1.0 | .2 | 1.7 | .01 |
| 13 | 4.4 | .1 | 1.3 | .02 | .35 | .004 | 2.2 | .3 | 1.7 | .04 |
| 14 | 4.2 | .1 | 1.1 | .02 | .35 | .004 | 1.6 | .004 | 1.5 | .02 |
| 15 | 4.2 | .3 | 1.1 | .02 | .35 | .004 | 1.2 | .006 | 1.5 | .02 |
| 16 | 4.6 | .1 | 1.1 | .02 | .39 | .004 | 1.2 | .03 | 1.5 | .008 |
| 17 | 4.6 | .1 | .95 | .02 | .35 | .004 | 1.1 | .01 | 1.7 | .01 |
| 18 | 4.9 | .2 | .90 | .02 | .35 | .004 | 1.1 | .01 | 1.8 | .01 |
| 19 | 5.2 | .5 | .84 | .02 | .35 | .004 | .95 | .01 | 1.8 | .01 |
| 20 | 5.2 | .2 | .78 | .02 | .35 | .004 | .89 | .02 | 1.8 | .01 |
| 21 | 4.4 | .1 | .73 | .02 | .35 | .004 | .83 | .02 | 1.8 | .01 |
| 22 | 4.2 | .1 | .73 | .02 | .32 | .004 | .83 | .02 | 1.8 | .01 |
| 23 | 3.8 | .3 | .73 | .02 | .32 | .004 | .89 | .02 | 1.8 | .01 |
| 24 | 3.8 | .1 | .73 | .02 | .32 | .004 | .95 | .02 | 1.8 | .01 |
| 25 | 3.6 | .1 | .73 | .02 | .32 | .004 | 1.0 | .02 | 2.0 | .02 |
| 26 | 3.4 | .09 | .67 | .02 | .32 | .004 | 1.0 | .02 | 2.0 | .02 |
| 27 | 3.2 | .09 | .53 | .01 | .32 | .003 | 1.1 | .02 | 2.0 | .02 |
| 28 | 2.2 | .08 | .53 | .007 | .35 | .003 | 1.0 | .02 | 2.1 | .01 |
| 29 | 2.2 | .08 | .62 | .008 | .35 | .003 | 1.1 | .02 | 2.2 | .01 |
| 30 | 2.2 | .08 | .67 | .009 | .39 | .003 | 1.1 | .02 | 2.2 | .01 |
| 31 | | | .67 | .009 | .32 | .003 | | | 2.1 | .01 |
| Total | | 5.92 | | 1.173 | | 0.133 | | 0.873 | | 0.688 |

**COTTONWOOD CREEK AT ARROW ROCK RESERVOIR, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 2. 2 | 0. 01 | 2. 4 | 0. 02 | 5. 2 | 0. 3 | 4. 0 | 0. 05 |
| 2 | 2. 1 | . 01 | 2. 4 | . 02 | 8. 0 | 2. 2 | 4. 0 | . 05 |
| 3 | 2. 1 | . 01 | 2. 3 | . 02 | 7. 3 | . 5 | 4. 6 | . 06 |
| 4 | 2. 1 | . 01 | 2. 3 | . 02 | 6. 0 | . 1 | 4. 9 | . 1 |
| 5 | 2. 1 | . 006 | 2. 3 | . 02 | 5. 2 | . 08 | 4. 6 | . 1 |
| 6 | 2. 0 | . 005 | 3. 5 | . 06 | 3. 8 | . 02 | 8. 0 | 1. 8 |
| 7 | 2. 0 | . 005 | 2. 9 | . 05 | 3. 6 | . 06 | 7. 0 | . 4 |
| 8 | 2. 1 | . 006 | 2. 9 | . 05 | 4. 4 | . 01 | 6. 0 | . 1 |
| 9 | 2. 0 | . 02 | 4. 2 | . 3 | 4. 9 | . 08 | 6. 0 | . 8 |
| 10 | 1. 9 | . 02 | 4. 4 | . 2 | 4. 9 | . 06 | 7. 6 | . 4 |
| 11 | 2. 1 | . 02 | 4. 9 | . 3 | 4. 4 | . 05 | 8. 0 | . 3 |
| 12 | 2. 2 | . 02 | 3. 6 | . 07 | 4. 4 | . 04 | 6. 7 | . 9 |
| 13 | 2. 1 | . 02 | 3. 5 | . 06 | 3. 4 | . 04 | 6. 7 | . 3 |
| 14 | 2. 0 | . 02 | 3. 0 | . 05 | 4. 2 | . 05 | 7. 0 | . 3 |
| 15 | 2. 0 | . 02 | 3. 2 | . 07 | 3. 4 | . 04 | 6. 7 | . 3 |
| 16 | 2. 1 | . 02 | 4. 0 | . 06 | 3. 6 | . 02 | 5. 7 | . 5 |
| 17 | 2. 0 | . 01 | 5. 2 | . 07 | 4. 0 | . 02 | 6. 3 | . 2 |
| 18 | 2. 2 | . 01 | 3. 8 | . 06 | 3. 6 | . 02 | 6. 0 | . 2 |
| 19 | 2. 2 | . 01 | 3. 2 | . 03 | 3. 4 | . 04 | 5. 7 | . 6 |
| 20 | 2. 2 | . 01 | 3. 6 | . 03 | 3. 7 | . 04 | 5. 2 | . 6 |
| 21 | 2. 2 | . 01 | 3. 4 | . 02 | 3. 6 | . 04 | 5. 2 | . 7 |
| 22 | 2. 3 | . 006 | 2. 4 | . 02 | 3. 5 | . 009 | 6. 3 | . 2 |
| 23 | 2. 3 | . 006 | 2. 9 | . 09 | 3. 4 | . 009 | 6. 3 | . 3 |
| 24 | 2. 3 | . 006 | 2. 9 | . 09 | 3. 4 | . 009 | 6. 0 | . 1 |
| 25 | 2. 3 | . 006 | 1. 7 | . 05 | 3. 4 | . 04 | 7. 6 | . 7 |
| 26 | 2. 3 | . 02 | 2. 3 | . 07 | 4. 2 | . 2 | 12 | 5. 2 |
| 27 | 2. 4 | . 02 | 3. 0 | . 09 | 4. 2 | . 02 | 25 | 30 |
| 28 | 2. 3 | . 02 | 2. 5 | . 05 | 4. 0 | . 02 | 47 | 162 |
| 29 | 2. 3 | . 02 | 2. 7 | . 03 | 4. 0 | . 03 | 46 | 77 |
| 30 | 2. 4 | . 01 | 3. 0 | . 03 | 4. 0 | . 03 | --------- | --------- |
| 31 | --------- | --------- | 3. 6 | . 2 | 4. 0 | . 03 | --------- | --------- |
| Total | --------- | 0. 386 | --------- | 2. 30 | --------- | 4. 207 | --------- | 284. 26 |
| | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
| 1 | 37 | 70 | 62 | 625 | 26 | 42 | 10 | 0. 5 |
| 2 | 32 | 50 | 57 | 405 | 26 | 76 | 9. 6 | . 5 |
| 3 | 27 | 24 | 51 | 197 | 27 | 49 | 9. 3 | . 4 |
| 4 | 25 | 15 | 48 | 332 | 26 | 31 | 10 | . 4 |
| 5 | 23 | 13 | 48 | 146 | 24 | 14 | 9. 3 | . 4 |
| 6 | 20 | 9. 8 | 46 | 162 | 22 | 12 | 8. 3 | . 4 |
| 7 | 19 | 11 | 46 | 164 | 23 | 11 | 8. 6 | . 3 |
| 8 | 22 | 10 | 45 | 142 | 23 | 21 | 8. 6 | . 2 |
| 9 | 21 | 8. 2 | 47 | 138 | 24 | 22 | 7. 7 | . 2 |
| 10 | 20 | 10 | 45 | 144 | 26 | 19 | 7. 4 | . 3 |
| 11 | 18 | 3. 4 | 43 | 50 | 26 | 29 | 6. 9 | . 5 |
| 12 | 16 | 4. 3 | 44 | 49 | 26 | 20 | 5. 8 | . 2 |
| 13 | 14 | 7. 4 | 47 | 99 | 26 | 17 | 5. 5 | . 5 |
| 14 | 14 | 5. 8 | 53 | 121 | 24 | 11 | 5. 5 | . 1 |
| 15 | 14 | 2. 4 | 49 | 121 | 24 | 7. 0 | 5. 0 | . 6 |
| 16 | 14 | 1. 3 | 45 | 54 | 22 | 9. 7 | 5. 0 | . 2 |
| 17 | 16 | 2. 8 | 40 | 66 | 21 | 5. 0 | 4. 3 | . 2 |
| 18 | 18 | 9. 4 | 39 | 77 | 20 | 3. 8 | 4. 2 | . 2 |
| 19 | 19 | 8. 8 | 40 | 107 | 18 | 3. 4 | 3. 5 | . 2 |
| 20 | 20 | 7. 7 | 40 | 73 | 18 | 3. 1 | 3. 4 | . 2 |
| 21 | 22 | 7. 0 | 35 | 42 | 17 | 2. 8 | 3. 4 | . 05 |
| 22 | 23 | 9. 3 | 33 | 44 | 16 | 2. 3 | 3. 2 | . 04 |
| 23 | 24 | 5. 3 | 31 | 25 | 16 | 1. 7 | 2. 9 | . 04 |
| 24 | 26 | 11 | 30 | 33 | 15 | 1. 8 | 2. 1 | . 03 |
| 25 | 38 | 62 | 29 | 43 | 14 | 1. 3 | 2. 1 | . 03 |
| 26 | 51 | 182 | 32 | 50 | 14 | 1. 2 | 1. 9 | . 04 |
| 27 | 68 | 609 | 37 | 54 | 21 | 1. 7 | 1. 8 | . 04 |
| 28 | 48 | 1, 080 | 32 | 42 | 12 | 1. 3 | 1. 9 | . 04 |
| 29 | 42 | 480 | 30 | 32 | 12 | 1. 3 | 1. 9 | . 04 |
| 30 | 43 | 366 | 27 | 26 | 11 | 1. 0 | 1. 8 | . 04 |
| 31 | 57 | 594 | --------- | --------- | 10 | . 8 | --------- | --------- |
| Total | --------- | 3, 679. 9 | --------- | 3, 663 | --------- | 423. 2 | --------- | 6. 89 |

## GROUSE CREEK NEAR ARROW ROCK, IDAHO

*Discharge and sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | -------- | -------- | 0.90 | 0.5 | 3.0 | 45 | 24 | 606 | 2.8 | 0.2 |
| 2 | -------- | -------- | .99 | .4 | 2.5 | 5.4 | 20 | 454 | 2.6 | .3 |
| 3 | -------- | -------- | 1.1 | .4 | 2.4 | 3.7 | 18 | 214 | 2.5 | .1 |
| 4 | -------- | -------- | 1.2 | .3 | 2.4 | 2.2 | 16 | 243 | 2.4 | .3 |
| 5 | -------- | -------- | 1.1 | .3 | 2.3 | 19 | 13 | 49 | 2.4 | .2 |
| 6 | -------- | -------- | 1.2 | .3 | 2.3 | 8.2 | 13 | 37 | 2.3 | .3 |
| 7 | -------- | -------- | 1.2 | .3 | 2.2 | 20 | 11 | 16 | 2.2 | .08 |
| 8 | -------- | -------- | 1.1 | .3 | 2.0 | 4.0 | 10 | 28 | 2.3 | .7 |
| 9 | -------- | -------- | 1.0 | .4 | 2.1 | 10 | 9.7 | 13 | 2.3 | .08 |
| 10 | -------- | -------- | 1.1 | .3 | 3.0 | 56 | 9.1 | 14 | 2.2 | .1 |
| 11 | -------- | -------- | 1.2 | .5 | 4.5 | 87 | 8.5 | 9.2 | 2.1 | .1 |
| 12 | -------- | -------- | 1.3 | .5 | 6.5 | 155 | 8.1 | 4.2 | 2.0 | .07 |
| 13 | -------- | -------- | 1.3 | .5 | 9.7 | 415 | 7.7 | 4.9 | 1.8 | .05 |
| 14 | -------- | -------- | 1.4 | .6 | 5.7 | 170 | 7.3 | 5.2 | 1.7 | .03 |
| 15 | -------- | -------- | 1.5 | .8 | 4.5 | 176 | 6.9 | 1.6 | 1.7 | .02 |
| 16 | -------- | -------- | 1.4 | 12 | 7.7 | 577 | 6.5 | 3.1 | 1.7 | .03 |
| 17 | -------- | -------- | 1.6 | 25 | 12 | 749 | 6.1 | 1.3 | 1.7 | .03 |
| 18 | -------- | -------- | 1.6 | 24 | 15 | 816 | 6.1 | .6 | 1.6 | .02 |
| 19 | -------- | -------- | 1.6 | 15 | 23 | 1,720 | 5.3 | .6 | 1.6 | .04 |
| 20 | 1.1 | 0.3 | 1.5 | 3.5 | 27 | 2,030 | 4.9 | .4 | 1.6 | .05 |
| 21 | 1.1 | .4 | 1.6 | 4.0 | 33 | 2,850 | 4.4 | .7 | 1.6 | .04 |
| 22 | 1.1 | .4 | 1.7 | 8.1 | 38 | 1,570 | 4.2 | .4 | 1.6 | .07 |
| 23 | 1.1 | .5 | 2.0 | 6.3 | 43 | 2,120 | 4.2 | 1.1 | 1.7 | .04 |
| 24 | .90 | .3 | 2.0 | 8.1 | 42 | 1,520 | 4.1 | .5 | 1.5 | .03 |
| 25 | .90 | .2 | 2.4 | 17 | 40 | 1,570 | 3.7 | .3 | 1.5 | .03 |
| 26 | 1.0 | .1 | 2.5 | 21 | 34 | 1,850 | 3.4 | .4 | 1.3 | .01 |
| 27 | 1.1 | .3 | 2.4 | 16 | 31 | 3,950 | 3.2 | .4 | 1.3 | .04 |
| 28 | 1.1 | .3 | 2.7 | 95 | 28 | 1,470 | 3.0 | .6 | 1.2 | .03 |
| 29 | 1.1 | .3 | -------- | -------- | 29 | 931 | 3.2 | .5 | 1.2 | .04 |
| 30 | 1.1 | .2 | -------- | -------- | 22 | 369 | 3.1 | .4 | 1.1 | .07 |
| 31 | .87 | .3 | -------- | -------- | 24 | 385 | -------- | -------- | 1.1 | .03 |
| Total | -------- | 3.6 | -------- | 261.4 | -------- | 25,653.5 | -------- | 1,710.4 | -------- | 3.23 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.1 | 0.04 | 0.64 | 0.02 | 0.29 | 0.004 | 0.44 | 0.004 | 0.90 | 0.06 |
| 2 | 1.1 | .01 | .64 | .02 | .29 | .004 | .39 | .003 | .90 | .06 |
| 3 | 1.1 | .02 | .59 | .01 | .29 | .008 | .39 | .003 | .96 | .05 |
| 4 | 1.1 | .03 | .69 | .02 | .32 | .02 | .44 | .004 | .90 | .2 |
| 5 | 1.1 | .04 | .74 | .02 | .29 | .02 | .44 | .004 | .83 | .04 |
| 6 | 1.1 | .04 | .64 | .02 | .24 | .01 | .44 | .002 | 1.1 | .06 |
| 7 | 1.1 | .03 | .59 | .02 | .24 | .01 | .49 | .003 | .83 | .04 |
| 8 | 1.1 | .03 | .54 | .02 | .24 | .01 | .49 | .003 | .77 | .02 |
| 9 | 1.1 | .03 | .49 | .02 | .20 | .01 | .49 | .003 | .77 | .02 |
| 10 | 1.0 | .04 | .47 | .01 | .24 | .006 | .49 | .003 | .71 | .02 |
| 11 | .98 | .04 | .54 | .01 | .24 | .006 | .54 | .006 | .77 | .02 |
| 12 | .93 | .05 | .54 | .01 | .20 | .005 | .93 | .3 | .77 | .02 |
| 13 | .83 | .01 | .59 | .006 | .20 | .005 | 1.1 | .5 | .77 | .02 |
| 14 | .83 | .01 | .54 | .006 | .24 | .006 | .83 | .04 | .77 | .02 |
| 15 | .93 | .02 | .54 | .006 | .28 | .007 | .74 | .05 | .77 | .02 |
| 16 | 1.0 | .02 | .59 | .006 | .24 | .005 | .69 | .05 | .77 | .01 |
| 17 | 1.0 | .02 | .49 | .005 | .24 | .005 | .69 | .05 | .77 | .01 |
| 18 | 1.0 | .03 | .44 | .005 | .24 | .005 | .64 | .04 | .77 | .01 |
| 19 | 1.1 | .04 | .44 | .004 | .24 | .005 | .64 | .05 | .77 | .01 |
| 20 | 1.0 | .04 | .44 | .004 | .29 | .005 | .64 | .05 | .77 | .008 |
| 21 | .93 | .02 | .34 | .003 | .34 | .006 | .64 | .05 | .77 | .008 |
| 22 | .88 | .02 | .34 | .003 | .34 | .004 | .64 | .05 | .77 | .008 |
| 23 | .78 | .02 | .34 | .003 | .34 | .004 | .64 | .04 | .83 | .009 |
| 24 | .78 | .02 | .29 | .005 | .34 | .004 | .59 | .04 | .83 | .009 |
| 25 | .78 | .02 | .24 | .005 | .31 | .003 | .64 | .04 | .90 | .01 |
| 26 | .78 | .02 | .24 | .005 | .29 | .003 | .64 | .04 | .90 | .02 |
| 27 | .78 | .05 | .30 | .006 | .29 | .003 | .64 | .1 | .90 | .02 |
| 28 | .74 | .04 | .34 | .006 | .29 | .003 | .64 | .03 | .90 | .02 |
| 29 | .69 | .04 | .34 | .006 | .29 | .003 | .74 | .03 | .90 | .02 |
| 30 | .69 | .02 | .34 | .005 | .29 | .003 | .74 | .03 | .90 | .02 |
| 31 | -------- | -------- | .34 | .005 | .34 | .003 | -------- | -------- | .90 | .02 |
| Total | -------- | 0.86 | -------- | 0.294 | -------- | 0.195 | -------- | 1.618 | -------- | 0.882 |

**GROUSE CREEK NEAR ARROW ROCK, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 0.96 | 0.03 | 0.90 | 0.01 | 2.1 | 0.1 | 1.7 | 0.07 |
| 2 | .96 | .03 | .96 | .02 | 3.8 | 6.4 | 1.7 | .09 |
| 3 | .90 | .03 | .90 | .01 | 4.4 | .9 | 3.4 | 1.8 |
| 4 | .90 | .03 | .90 | .01 | 3.6 | .7 | 3.6 | 8.3 |
| 5 | .90 | .03 | .90 | .07 | 2.9 | .09 | 3.2 | 1.4 |
| 6 | .90 | .03 | 1.2 | .4 | 2.0 | .3 | 6.3 | 49 |
| 7 | .90 | .02 | 1.0 | .01 | 1.7 | .1 | 5.6 | 7.7 |
| 8 | .90 | .02 | 1.0 | .01 | 1.8 | .01 | 4.8 | 10 |
| 9 | .83 | .02 | 1.4 | .05 | 2.6 | .2 | 4.8 | 7.9 |
| 10 | .77 | .02 | 1.2 | .02 | 2.6 | .1 | 6.2 | 76 |
| 11 | .83 | .02 | 1.5 | .03 | 2.1 | .5 | 5.6 | 37 |
| 12 | .83 | .009 | 1.2 | .02 | 1.8 | .04 | 4.9 | 11 |
| 13 | .83 | .009 | 1.0 | .3 | 1.5 | .02 | 5.2 | 30 |
| 14 | .90 | .01 | 1.0 | .04 | 1.6 | .2 | 5.4 | 63 |
| 15 | .90 | .01 | 1.1 | .03 | 1.4 | .1 | 4.6 | 16 |
| 16 | .90 | .007 | 1.2 | .04 | 1.4 | .06 | 3.7 | 4.9 |
| 17 | .90 | .007 | 1.4 | .02 | 1.4 | .05 | 4.0 | 4.6 |
| 18 | .83 | .007 | 1.2 | .02 | 1.2 | .05 | 3.8 | 9.8 |
| 19 | .90 | .01 | 1.1 | .02 | 1.2 | .05 | 3.5 | 6.2 |
| 20 | .90 | .01 | 1.2 | .03 | 1.3 | .05 | 3.2 | 6.0 |
| 21 | .90 | .01 | 1.1 | .03 | 1.2 | .02 | 3.5 | 8.2 |
| 22 | .90 | .01 | 1.0 | .03 | 1.2 | .02 | 3.8 | 2.5 |
| 23 | .90 | .007 | 1.0 | .02 | 1.2 | .02 | 4.0 | 6.8 |
| 24 | .90 | .007 | .96 | .02 | 1.2 | .01 | 4.0 | 4.5 |
| 25 | .96 | .008 | .59 | .01 | 1.2 | .01 | 7.2 | 68 |
| 26 | .96 | .008 | .83 | .02 | 2.0 | 1.6 | 12 | 272 |
| 27 | .96 | .008 | .96 | .02 | 2.2 | 1.0 | 22 | 900 |
| 28 | .96 | .008 | .96 | .03 | 1.9 | .1 | 36 | 2,920 |
| 29 | .90 | .01 | 1.0 | .03 | 1.8 | .08 | 39 | 2,560 |
| 30 | .90 | .01 | 1.2 | .04 | 1.8 | .08 | | |
| 31 | | | 1.6 | .05 | 1.8 | .08 | | |
| Total | | 0.445 | | 1.46 | | 13.04 | | 7,092.76 |

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 30 | 2,950 | 19 | 558 | 6.0 | 1.1 | 1.4 | 0.03 |
| 2 | 26 | 1,840 | 18 | 631 | 5.4 | .4 | 1.4 | .03 |
| 3 | 19 | 868 | 18 | 551 | 4.8 | .4 | 1.3 | .03 |
| 4 | 16 | 814 | 17 | 553 | 4.5 | .2 | 1.6 | .04 |
| 5 | 15 | 412 | 17 | 480 | 4.0 | .1 | 1.4 | .04 |
| 6 | 14 | 172 | 15 | 293 | 3.7 | .4 | 1.2 | .03 |
| 7 | 13 | 253 | 14 | 223 | 3.5 | .1 | 1.4 | .03 |
| 8 | 13 | 282 | 14 | 102 | 3.3 | .07 | 1.3 | .03 |
| 9 | 13 | 143 | 14 | 39 | 3.1 | .08 | 1.2 | .03 |
| 10 | 12 | 171 | 12 | 43 | 3.0 | .09 | 1.2 | .02 |
| 11 | 10 | 37 | 11 | 93 | 2.9 | .07 | 1.0 | .03 |
| 12 | 9.1 | 21 | 10 | 23 | 2.8 | .06 | .90 | .02 |
| 13 | 8.4 | 27 | 10 | 44 | 2.7 | .05 | .83 | .02 |
| 14 | 8.0 | 27 | 9.5 | 21 | 2.6 | .05 | .77 | .01 |
| 15 | 8.0 | 81 | 9.1 | 7.5 | 2.6 | .05 | .71 | .01 |
| 16 | 8.2 | 14 | 8.4 | 5.9 | 2.4 | .08 | .71 | .01 |
| 17 | 8.0 | 15 | 7.8 | 1.8 | 2.3 | .04 | .71 | .01 |
| 18 | 7.7 | 2.8 | 7.5 | 16 | 2.2 | .6 | .65 | .005 |
| 19 | 7.5 | 1.5 | 7.3 | 9.2 | 2.2 | .03 | .59 | .005 |
| 20 | 7.3 | 1.3 | 7.1 | 5.9 | 2.1 | .03 | .54 | .004 |
| 21 | 7.1 | 1.5 | 6.8 | 3.6 | 2.0 | .03 | .54 | .004 |
| 22 | 7.0 | 10 | 6.4 | 2.6 | 2.0 | .03 | .54 | .004 |
| 23 | 6.8 | 3.4 | 6.1 | .8 | 2.0 | .03 | .48 | .004 |
| 24 | 6.8 | 11 | 6.0 | .7 | 1.9 | .03 | .48 | .004 |
| 25 | 7.7 | 22 | 6.1 | 1.8 | 1.9 | .03 | .48 | .004 |
| 26 | 9.8 | 72 | 6.1 | 1.3 | 1.9 | .03 | .42 | .004 |
| 27 | 9.8 | 91 | 6.4 | 2.8 | 1.8 | .2 | .38 | .003 |
| 28 | 9.1 | 43 | 6.2 | 8.5 | 1.8 | .2 | .38 | .003 |
| 29 | 8.9 | 44 | 6.0 | 1.7 | 1.8 | .2 | .38 | .003 |
| 30 | 9.8 | 73 | 6.0 | 1.4 | 1.6 | .04 | .42 | .01 |
| 31 | 16 | 564 | | | 1.4 | .03 | | |
| Total | | 9,067.5 | | 3,725.5 | | 4.85 | | 0.477 |

758529—48——7

## MOORE CREEK ABOVE GRANITE CREEK NEAR IDAHO CITY, IDAHO

*Discharge and suspended sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | -- | -- | 9.0 | 0.3 | 11 | 0.2 | 135 | 112 | 153 | 71 |
| 2 | -- | -- | 9.0 | .1 | 11 | .3 | 146 | 107 | 148 | 67 |
| 3 | -- | -- | 10 | .2 | 11 | .2 | 157 | 148 | 148 | 55 |
| 4 | -- | -- | 10 | .2 | 11 | .3 | 164 | 139 | 146 | 57 |
| 5 | -- | -- | 11 | .4 | 12 | 1.0 | 143 | 66 | 136 | 40 |
| 6 | -- | -- | 11 | .2 | 11 | .2 | 123 | 39 | 122 | 27 |
| 7 | -- | -- | 11 | .7 | 11 | .8 | 114 | 40 | 105 | 18 |
| 8 | -- | -- | 11 | .7 | 11 | .1 | 114 | 36 | 92 | 12 |
| 9 | -- | -- | 9.4 | .9 | 11 | .4 | 110 | 26 | 84 | 13 |
| 10 | -- | -- | 12 | 1.1 | 12 | .2 | 99 | 18 | 84 | 166 |
| 11 | -- | -- | 11 | .9 | 13 | .1 | 96 | 17 | 97 | 51 |
| 12 | -- | -- | 11 | .6 | 14 | .3 | 95 | 13 | 92 | 36 |
| 13 | -- | -- | 11 | .6 | 15 | 1.6 | 87 | 12 | 87 | 25 |
| 14 | -- | -- | 11 | .5 | 14 | 1.3 | 86 | 16 | 67 | 14 |
| 15 | -- | -- | 11 | .2 | 14 | 1.1 | 90 | 14 | 78 | 3.0 |
| 16 | -- | -- | 11 | .1 | 17 | 1.8 | 92 | 11 | 71 | 20 |
| 17 | -- | -- | 10 | .3 | 27 | 5.9 | 98 | 24 | 53 | 8.9 |
| 18 | -- | -- | 11 | .2 | 43 | 33 | 110 | 44 | 54 | 9.8 |
| 19 | -- | -- | 11 | .4 | 63 | 91 | 123 | 48 | 44 | 4.6 |
| 20 | 10 | 0.05 | 10 | .4 | 83 | 132 | 131 | 46 | 35 | 3.1 |
| 21 | 11 | .09 | 11 | .2 | 95 | 250 | 141 | 59 | 32 | 4.5 |
| 22 | 8.6 | .02 | 11 | .3 | 110 | 348 | 148 | 69 | 29 | 1.6 |
| 23 | 11 | .03 | 11 | .3 | 127 | 336 | 146 | 73 | 26 | 1.3 |
| 24 | 11 | .2 | 11 | .4 | 146 | 394 | 132 | 45 | 23 | 1.6 |
| 25 | 12 | .5 | 11 | .2 | 155 | 416 | 110 | 26 | 20 | 1.1 |
| 26 | 12 | .3 | 11 | 1.0 | 149 | 370 | 101 | 20 | 19 | 1.8 |
| 27 | 12 | .5 | 11 | .5 | 139 | 62 | 102 | 25 | 17 | 1.1 |
| 28 | 12 | .2 | 11 | .1 | 132 | 109 | 122 | 42 | 16 | 1.4 |
| 29 | 11 | .2 | -- | -- | 125 | 64 | 150 | 100 | 16 | 1.3 |
| 30 | 11 | .2 | -- | -- | 130 | 40 | 163 | 101 | 16 | 1.3 |
| 31 | 9.4 | .05 | -- | -- | 132 | 65 | -- | -- | 15 | 1.2 |
| Total | -- | 2.34 | -- | 12.0 | -- | 2,725.8 | -- | 1,536 | -- | 719.6 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 12 | 1.0 | 6.9 | 0.1 | 4.8 | 0.05 | 2.6 | 0.1 | 3.2 | 0.06 |
| 2 | 11 | .7 | 6.9 | .2 | 4.8 | .08 | 2.6 | .08 | 5.1 | .3 |
| 3 | 10 | 1.0 | 7.6 | .08 | 4.5 | .09 | 2.8 | .8 | 5.6 | .1 |
| 4 | 13 | 1.4 | 13 | 1.6 | 4.5 | .1 | 2.6 | .04 | 6.2 | .1 |
| 5 | 9.4 | .6 | 15 | 1.5 | 4.8 | .08 | 2.8 | .06 | 7.2 | .4 |
| 6 | 11 | 1.1 | 13 | .6 | 4.8 | .04 | 2.8 | .06 | 11 | 1.2 |
| 7 | 27 | 2.3 | 11 | .4 | 4.8 | .06 | 2.8 | .05 | 5.9 | .09 |
| 8 | 25 | 1.3 | 10 | .2 | 4.5 | .06 | 2.8 | .05 | 5.4 | .04 |
| 9 | 25 | 1.1 | 9.7 | .8 | 4.5 | .07 | 2.4 | .03 | 5.6 | .03 |
| 10 | 23 | .9 | 9.7 | .3 | 4.5 | .07 | 2.1 | .03 | 6.2 | .08 |
| 11 | 22 | .9 | 9.7 | .8 | 4.2 | .08 | 2.4 | .02 | 2.8 | .08 |
| 12 | 21 | .7 | 8.6 | .2 | 4.2 | .09 | 5.6 | 2.9 | 2.6 | .03 |
| 13 | 20 | .6 | 7.6 | .1 | 4.2 | .2 | 9.4 | 2.7 | 2.6 | .06 |
| 14 | 20 | .5 | 7.2 | .2 | 4.0 | .1 | 5.6 | .5 | 2.8 | .05 |
| 15 | 22 | .9 | 7.2 | .2 | 2.4 | .09 | 4.2 | .09 | 3.2 | .04 |
| 16 | 25 | 1.1 | 7.2 | .1 | 2.4 | .06 | 3.4 | .04 | 3.7 | .04 |
| 17 | 22 | .9 | 7.2 | .1 | 2.1 | .08 | 3.0 | .03 | 4.0 | .04 |
| 18 | 22 | .4 | 6.9 | .1 | 2.1 | .04 | 3.9 | .09 | 3.4 | .04 |
| 19 | 23 | 1.2 | 6.9 | .2 | 2.1 | .04 | 6.9 | 1.2 | 3.0 | .008 |
| 20 | 22 | .7 | 6.6 | .1 | 2.1 | .05 | 6.4 | .4 | 2.6 | .04 |
| 21 | 20 | .9 | 5.6 | .2 | 2.4 | .09 | 2.4 | .02 | 2.6 | .01 |
| 22 | 18 | .6 | 5.6 | .1 | 2.6 | .3 | 2.1 | .01 | 2.6 | .06 |
| 23 | 18 | .3 | 5.4 | .1 | 2.6 | .06 | 2.4 | .006 | 2.6 | .03 |
| 24 | 17 | .3 | 5.4 | .1 | 2.8 | .1 | 2.4 | .01 | 2.6 | .02 |
| 25 | 17 | .2 | 5.1 | .4 | 3.4 | .1 | 2.6 | .02 | 3.0 | .03 |
| 26 | 15 | .3 | 5.1 | .03 | 3.7 | .2 | 2.6 | .03 | 2.8 | .06 |
| 27 | 15 | .4 | 4.5 | .01 | 3.7 | .07 | 2.6 | .1 | 2.6 | .01 |
| 28 | 11 | .3 | 4.8 | .08 | 3.4 | .05 | 2.4 | .03 | 3.2 | .04 |
| 29 | 7.2 | .3 | 4.8 | .2 | 2.6 | .04 | 2.6 | .02 | 3.2 | .03 |
| 30 | 6.9 | .2 | 4.8 | .04 | 2.6 | .06 | 2.8 | .05 | 2.8 | .07 |
| 31 | -- | -- | 4.8 | .05 | 2.6 | .06 | -- | -- | 2.8 | .03 |
| Total | -- | 23.1 | -- | 9.19 | -- | 2.66 | -- | 9.566 | -- | 3.218 |

**MOORE CREEK ABOVE GRANITE CREEK NEAR IDAHO CITY, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 2.8 | 0.05 | 7.6 | 0.1 | 17 | 0.7 | 11 | 0.05 |
| 2 | 2.6 | .02 | 7.6 | .2 | 32 | 9.3 | 11 | .3 |
| 3 | 2.6 | .02 | 7.6 | .08 | 29 | 1.2 | 12 | .1 |
| 4 | 2.6 | .01 | 7.6 | .3 | 23 | .4 | 13 | .2 |
| 5 | 2.4 | .01 | 6.9 | .1 | 19 | .2 | 12 | .2 |
| 6 | 2.4 | .01 | 8.3 | .2 | 12 | .4 | 17 | 1.7 |
| 7 | 2.6 | .01 | 7.6 | .08 | 13 | .3 | 17 | .3 |
| 8 | 2.6 | .01 | 8.0 | .1 | 16 | 1.7 | 15 | .3 |
| 9 | 5.6 | 1.2 | 14 | 2.3 | 16 | .4 | 14 | .3 |
| 10 | 7.6 | 1.3 | 14 | .5 | 14 | .7 | 20 | 1.0 |
| 11 | 7.6 | .3 | 14 | .9 | 11 | .4 | 18 | .2 |
| 12 | 7.6 | .5 | 10 | .3 | 13 | .2 | 14 | .6 |
| 13 | 7.6 | .9 | 9.7 | .4 | 10 | .1 | 16 | 1.9 |
| 14 | 7.2 | .2 | 9.4 | .2 | 12 | .1 | 16 | .3 |
| 15 | 7.2 | .3 | 10 | .2 | 10 | .05 | 14 | .1 |
| 16 | 7.2 | .2 | 17 | .7 | 11 | .09 | 16 | 1.3 |
| 17 | 7.2 | .08 | 23 | 2.7 | 12 | .03 | 13 | .8 |
| 18 | 7.1 | .6 | 15 | .5 | 11 | .2 | 13 | .2 |
| 19 | 7.3 | .6 | 12 | .6 | 9.0 | .1 | 11 | .4 |
| 20 | 7.1 | .3 | 12 | .5 | 11 | .1 | 10 | .5 |
| 21 | 7.2 | .5 | 11 | .5 | 10 | .4 | 12 | .3 |
| 22 | 7.6 | .1 | 7.1 | .2 | 9.7 | .08 | 12 | .06 |
| 23 | 7.6 | .04 | 9.7 | .1 | 10 | .2 | 13 | .04 |
| 24 | 7.6 | .08 | 9.4 | .2 | 10 | .05 | 12 | .03 |
| 25 | 7.6 | .4 | 6.0 | .05 | 9.7 | .03 | 15 | .08 |
| 26 | 7.6 | .2 | 8.0 | .2 | 11 | .2 | 25 | 1.6 |
| 27 | 7.6 | .08 | 9.7 | .4 | 11 | .3 | 53 | 27 |
| 28 | 7.6 | .1 | 8.6 | .09 | 10 | .3 | 87 | 76 |
| 29 | 7.6 | .06 | 10 | .1 | 11 | .1 | 88 | 54 |
| 30 | 7.6 | .06 | 11 | .3 | 11 | .6 | | |
| 31 | | | 12 | .4 | 11 | .2 | | |
| Total | | 8.24 | | 13.5 | | 19.13 | | 169.86 |

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 62 | 11 | 170 | 160 | 67 | 37 | 52 | 5.2 |
| 2 | 53 | 7.3 | 144 | 86 | 72 | 51 | 48 | 2.9 |
| 3 | 46 | 4.3 | 123 | 46 | 83 | 45 | 42 | 4.8 |
| 4 | 43 | 4.1 | 110 | 32 | 86 | 20 | 40 | 1.5 |
| 5 | 40 | 2.3 | 110 | 30 | 78 | 23 | 36 | 1.7 |
| 6 | 37 | 2.7 | 99 | 25 | 74 | 14 | 33 | 2.0 |
| 7 | 36 | 4.8 | 94 | 24 | 74 | 18 | 31 | 1.0 |
| 8 | 62 | 18 | 91 | 28 | 76 | 19 | 28 | 1.4 |
| 9 | 60 | 8.4 | 103 | 41 | 84 | 42 | 24 | .6 |
| 10 | 53 | 4.3 | 100 | 30 | 99 | 55 | 23 | .6 |
| 11 | 46 | 2.2 | 99 | 28 | 116 | 112 | 22 | 1.0 |
| 12 | 40 | 3.6 | 105 | 101 | 123 | 127 | 18 | .6 |
| 13 | 36 | 1.9 | 119 | 204 | 119 | 73 | 16 | .7 |
| 14 | 34 | 1.8 | 136 | 256 | 108 | 48 | 12 | 2.3 |
| 15 | 35 | .9 | 127 | 95 | 97 | 28 | 12 | 1.8 |
| 16 | 38 | 2.4 | 110 | 46 | 90 | 24 | 8.5 | .3 |
| 17 | 42 | 3.5 | 103 | 31 | 86 | 29 | 6.6 | .2 |
| 18 | 48 | 4.9 | 109 | 38 | 82 | 22 | 6.0 | .4 |
| 19 | 52 | 9.1 | 119 | 47 | 80 | 13 | 4.1 | .2 |
| 20 | 58 | 11 | 119 | 59 | 78 | 8.2 | 4.7 | .1 |
| 21 | 64 | 14 | 100 | 32 | 77 | 22 | 2.8 | .1 |
| 22 | 72 | 27 | 93 | 28 | 75 | 15 | 2.8 | .04 |
| 23 | 80 | 42 | 89 | 20 | 74 | 15 | 2.8 | .04 |
| 24 | 86 | 51 | 85 | 18 | 74 | 12 | 2.3 | .05 |
| 25 | 147 | 605 | 84 | 31 | 74 | 12 | 2.3 | .03 |
| 26 | 172 | 406 | 91 | 39 | 72 | 13 | 2.0 | .03 |
| 27 | 218 | 884 | 119 | 230 | 66 | 8.4 | 2.0 | .02 |
| 28 | 163 | 235 | 86 | 306 | 61 | 4.4 | 2.0 | .03 |
| 29 | 123 | 68 | 74 | 190 | 59 | 6.7 | 1.8 | .01 |
| 30 | 117 | 67 | 69 | 59 | 56 | 5.6 | 2.0 | .02 |
| 31 | 168 | 228 | | | 54 | 5.5 | | |
| Total | | 2,735.5 | | 2,360 | | 927.8 | | 29.67 |

## GOLD HILL PLACER DIVERSION FROM MOORE CREEK NEAR IDAHO CITY, IDAHO

*Discharge, in second-feet, April 1939 to June 1940*

| Day | April 1939 | May 1939 | June 1939 | July 1939 | August 1939 | September 1939 | October 1939 | November 1939 |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.1 | 31 | 9.6 | 4.9 | 4.9 | 4.9 | 6.3 |
| 2 | 0 | 0 | 31 | 9.6 | 4.5 | 5.2 | 4.9 | 6.3 |
| 3 | 0 | 0 | 30 | 8.9 | 4.4 | 5.2 | 5.2 | 6.3 |
| 4 | 0 | 0 | 24 | 6.1 | 3.8 | 5.0 | 5.2 | 6.1 |
| 5 | 0 | 1.0 | 29 | 5.9 | 3.3 | 5.0 | 4.7 | 5.9 |
| 6 | 0 | 2.8 | 25 | 5.9 | 4.2 | 5.0 | 4.9 | 5.9 |
| 7 | 0 | 6.3 | 3.3 | 5.6 | 3.6 | 4.7 | 4.7 | 6.3 |
| 8 | 0 | 10 | 4.6 | 5.2 | 3.6 | 4.5 | 3.9 | 6.1 |
| 9 | 0 | 14 | 5.0 | 4.7 | 3.8 | 5.2 | 3.4 | 3.3 |
| 10 | 0 | 11 | 4.9 | 4.9 | 3.8 | 5.2 | 2.6 | 0 |
| 11 | 0 | 0 | 4.5 | 4.7 | 3.9 | 5.0 | 6.3 | 0 |
| 12 | 0 | 0 | 4.2 | 5.2 | 3.3 | 6.3 | 6.3 | 0 |
| 13 | 0 | .7 | 3.6 | 5.7 | 3.9 | 6.5 | 6.1 | 0 |
| 14 | 0 | 17 | 3.4 | 5.7 | 4.9 | 5.9 | 6.3 | 0 |
| 15 | 0 | .2 | 3.3 | 5.6 | 4.9 | 5.9 | 6.1 | 0 |
| 16 | 0 | 9.9 | 4.0 | 5.2 | 4.9 | 5.9 | 5.9 | 0 |
| 17 | 0 | 25 | 3.6 | 5.6 | 5.2 | 5.9 | 5.9 | 0 |
| 18 | 0 | 19 | 3.4 | 5.2 | 5.2 | 3.7 | 6.1 | 0 |
| 19 | 0 | 29 | 4.2 | 5.0 | 5.2 | 0 | 5.4 | 0 |
| 20 | 0 | 29 | 3.6 | 5.2 | 4.9 | .9 | 5.9 | 0 |
| 21 | 0 | 28 | 3.3 | 5.7 | 5.0 | 5.2 | 6.1 | 0 |
| 22 | 0 | 27 | 2.7 | 5.7 | 4.9 | 5.6 | 6.1 | 0 |
| 23 | .5 | 27 | 2.7 | 5.9 | 5.2 | 5.7 | 6.3 | 0 |
| 24 | 1.5 | 27 | 2.5 | 5.6 | 5.2 | 5.6 | 5.9 | 0 |
| 25 | 2.0 | 28 | 2.5 | 5.6 | 5.2 | 5.6 | 6.7 | 0 |
| 26 | 2.0 | 28 | 3.6 | 5.2 | 5.2 | 5.7 | 6.3 | 0 |
| 27 | 2.5 | 29 | 3.3 | 5.6 | 5.2 | 5.4 | 6.3 | 0 |
| 28 | 4.0 | 32 | 6.8 | 5.2 | 5.0 | 5.6 | 7.1 | 0 |
| 29 | 6.1 | 32 | 9.8 | 5.2 | 5.0 | 5.6 | 6.9 | 0 |
| 30 | 3.7 | 32 | 8.9 | 4.5 | 4.9 | 5.0 | 6.7 | 0 |
| 31 | ---- | 32 | ---- | 4.9 | 4.5 | ---- | 6.3 | ---- |

| Day | December 1939 | January 1940 | February 1940 | March 1940 | April 1940 | May 1940 | June 1940 |
|---|---|---|---|---|---|---|---|
| 1 | ---- | ---- | ---- | ---- | 0 | 21 | 25 |
| 2 | ---- | ---- | ---- | ---- | 0 | 21 | 26 |
| 3 | ---- | ---- | ---- | ---- | 0 | 21 | 27 |
| 4 | ---- | ---- | ---- | ---- | 0 | 20 | 27 |
| 5 | ---- | ---- | ---- | ---- | 0 | 21 | 26 |
| 6 | ---- | ---- | ---- | ---- | 0 | 21 | 27 |
| 7 | ---- | ---- | ---- | ---- | 0 | 21 | 26 |
| 8 | ---- | ---- | ---- | ---- | 0 | 22 | 26 |
| 9 | ---- | ---- | ---- | ---- | 0 | 23 | 26 |
| 10 | ---- | ---- | ---- | ---- | 0 | 24 | 26 |
| 11 | ---- | ---- | ---- | ---- | 0 | 25 | 26 |
| 12 | ---- | ---- | ---- | ---- | 0 | 22 | 27 |
| 13 | ---- | ---- | ---- | ---- | 7.3 | 22 | 28 |
| 14 | ---- | ---- | ---- | ---- | 18 | 22 | 27 |
| 15 | ---- | ---- | ---- | ---- | 16 | 25 | 25 |
| 16 | ---- | ---- | ---- | ---- | 14 | 23 | 27 |
| 17 | ---- | ---- | ---- | ---- | 14 | 22 | 27 |
| 18 | ---- | ---- | ---- | ---- | 14 | 23 | 25 |
| 19 | ---- | ---- | ---- | ---- | 14 | 25 | 26 |
| 20 | ---- | ---- | ---- | ---- | 14 | 25 | 23 |
| 21 | ---- | ---- | ---- | ---- | 16 | 25 | 21 |
| 22 | ---- | ---- | ---- | ---- | 19 | 26 | 22 |
| 23 | ---- | ---- | ---- | ---- | 21 | 26 | 22 |
| 24 | ---- | ---- | ---- | ---- | 21 | 25 | 21 |
| 25 | ---- | ---- | ---- | ---- | 21 | 25 | 20 |
| 26 | ---- | ---- | ---- | ---- | 22 | 25 | 18 |
| 27 | ---- | ---- | ---- | ---- | 5.9 | 25 | 18 |
| 28 | ---- | ---- | ---- | ---- | 19 | 25 | 18 |
| 29 | ---- | ---- | ---- | ---- | 18 | 26 | 17 |
| 30 | ---- | ---- | ---- | ---- | 20 | 26 | 16 |
| 31 | ---- | ---- | ---- | ---- | ---- | 26 | ---- |

NOTE.—No flow December 1939 to March 1940.

## MOORE CREEK ABOVE THORN CREEK NEAR IDAHO CITY, IDAHO

*Discharge and suspended sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | -------- | -------- | 22 | 20 | 31 | 67 | 318 | 235 | 261 | 113 |
| 2 | -------- | -------- | 22 | 19 | 30 | 84 | 336 | 237 | 243 | 120 |
| 3 | -------- | -------- | 25 | 23 | 30 | 71 | 348 | 235 | 238 | 128 |
| 4 | -------- | -------- | 28 | 26 | 30 | 68 | 371 | 269 | 234 | 108 |
| 5 | -------- | -------- | 29 | 30 | 29 | 61 | 336 | 163 | 227 | 99 |
| 6 | -------- | -------- | 29 | 33 | 28 | 63 | 285 | 129 | 204 | 81 |
| 7 | -------- | -------- | 28 | 35 | 27 | 76 | 259 | 126 | 182 | 106 |
| 8 | -------- | -------- | 28 | 33 | 27 | 71 | 254 | 109 | 163 | 104 |
| 9 | -------- | -------- | 26 | 33 | 28 | 95 | 250 | 106 | 155 | 93 |
| 10 | -------- | -------- | 26 | 33 | 29 | 81 | 229 | 101 | 151 | 135 |
| 11 | -------- | -------- | 25 | 36 | 33 | 76 | 222 | 111 | 151 | 144 |
| 12 | -------- | -------- | 25 | 43 | 36 | 70 | 218 | 97 | 144 | 120 |
| 13 | -------- | -------- | 25 | 45 | 41 | 96 | 200 | 109 | 128 | 135 |
| 14 | -------- | -------- | 25 | 45 | 42 | 99 | 189 | 100 | 125 | 137 |
| 15 | -------- | -------- | 26 | 49 | 39 | 78 | 193 | 95 | 125 | 137 |
| 16 | -------- | -------- | 23 | 45 | 40 | 79 | 196 | 79 | 126 | 142 |
| 17 | -------- | -------- | 25 | 55 | 60 | 140 | 196 | 79 | 112 | 152 |
| 18 | -------- | -------- | 25 | 72 | 92 | 206 | 207 | 112 | 110 | 186 |
| 19 | -------- | -------- | 25 | 61 | 138 | 291 | 222 | 137 | 107 | 284 |
| 20 | -------- | -------- | 25 | 46 | 189 | 303 | 234 | 140 | 103 | 309 |
| 21 | -------- | -------- | 25 | 57 | 213 | 359 | 245 | 167 | 94 | 175 |
| 22 | -------- | -------- | 25 | 59 | 252 | 366 | 256 | 137 | 81 | 127 |
| 23 | -------- | -------- | 25 | 53 | 290 | 332 | 259 | 144 | 86 | 153 |
| 24 | -------- | -------- | 25 | 68 | 318 | 346 | 250 | 109 | 63 | 115 |
| 25 | -------- | -------- | 26 | 63 | 348 | 410 | 218 | 91 | 70 | 183 |
| 26 | -------- | -------- | 25 | 58 | 354 | 349 | 196 | 69 | 80 | 142 |
| 27 | -------- | -------- | 25 | 63 | 331 | 225 | 187 | 40 | 72 | 130 |
| 28 | 28 | 33 | 28 | 68 | 324 | 225 | 196 | 38 | 68 | 133 |
| 29 | 27 | 26 | -------- | -------- | 297 | 171 | 229 | 98 | 69 | 155 |
| 30 | 27 | 23 | -------- | -------- | 302 | 174 | 266 | 124 | 74 | 135 |
| 31 | 25 | 27 | -------- | -------- | 306 | 195 | -------- | -------- | 68 | 108 |
| Total | -------- | 109 | -------- | 1,271 | -------- | 5,327 | -------- | 3,786 | -------- | 4,389 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 63 | 91 | 25 | 34 | 10 | 9.4 | 5.3 | 5.7 | 11 | 10 |
| 2 | 48 | 101 | 23 | 32 | 10 | 9.4 | 5.3 | 5.8 | 11 | 11 |
| 3 | 37 | 85 | 22 | 32 | 9.7 | 8.8 | 5.7 | 6.7 | 11 | 11 |
| 4 | 50 | 129 | 22 | 31 | 9.1 | 9.2 | 5.7 | 6.5 | 11 | 11 |
| 5 | 56 | 93 | 24 | 36 | 9.1 | 8.9 | 5.7 | 6.7 | 12 | 12 |
| 6 | 58 | 59 | 29 | 30 | 8.6 | 8.4 | 6.0 | 6.9 | 14 | 14 |
| 7 | 52 | 53 | 27 | 19 | 8.1 | 7.4 | 6.0 | 7.8 | 14 | 13 |
| 8 | 50 | 82 | 25 | 21 | 8.1 | 7.1 | 6.4 | 8.3 | 16 | 16 |
| 9 | 52 | 90 | 22 | 24 | 8.1 | 7.6 | 6.4 | 8.9 | 17 | 17 |
| 10 | 52 | 106 | 21 | 26 | 7.7 | 7.3 | 6.4 | 9.4 | 17 | 18 |
| 11 | 49 | 123 | 19 | 29 | 7.7 | 7.2 | 6.4 | 9.0 | 16 | 16 |
| 12 | 44 | 213 | 19 | 30 | 7.2 | 6.8 | 7.7 | 11 | 15 | 15 |
| 13 | 40 | 69 | 18 | 29 | 6.7 | 6.8 | 9.1 | 13 | 15 | 15 |
| 14 | 38 | 56 | 17 | 28 | 6.7 | 6.8 | 10 | 15 | 15 | 14 |
| 15 | 38 | 45 | 16 | 29 | 6.7 | 6.7 | 13 | 20 | 14 | 13 |
| 16 | 42 | 44 | 16 | 32 | 6.7 | 6.8 | 14 | 22 | 14 | 12 |
| 17 | 48 | 41 | 15 | 29 | 6.4 | 6.5 | 15 | 19 | 14 | 12 |
| 18 | 46 | 36 | 14 | 29 | 6.0 | 6.3 | 14 | 14 | 13 | 12 |
| 19 | 46 | 44 | 14 | 26 | 6.0 | 6.4 | 14 | 13 | 14 | 13 |
| 20 | 46 | 69 | 13 | 23 | 5.7 | 5.9 | 13 | 9.4 | 14 | 13 |
| 21 | 45 | 70 | 13 | 21 | 5.3 | 5.7 | 12 | 7.6 | 15 | 14 |
| 22 | 39 | 66 | 13 | 18 | 5.0 | 5.3 | 11 | 6.9 | 15 | 14 |
| 23 | 37 | 88 | 12 | 16 | 5.0 | 5.6 | 11 | 8.1 | 15 | 13 |
| 24 | 34 | 91 | 12 | 13 | 5.0 | 5.7 | 11 | 9.4 | 15 | 13 |
| 25 | 32 | 77 | 11 | 12 | 5.0 | 5.4 | 11 | 11 | 15 | 14 |
| 26 | 30 | 61 | 11 | 12 | 5.0 | 5.7 | 11 | 11 | 18 | 17 |
| 27 | 28 | 51 | 11 | 12 | 5.0 | 5.7 | 11 | 12 | 19 | 20 |
| 28 | 28 | 40 | 11 | 12 | 5.0 | 5.6 | 11 | 11 | 16 | 18 |
| 29 | 27 | 34 | 11 | 11 | 5.0 | 5.7 | 10 | 10 | 16 | 19 |
| 30 | 26 | 30 | 10 | 10 | 5.0 | 5.6 | 10 | 9.4 | 17 | 22 |
| 31 | -------- | -------- | 10 | 9.6 | 5.0 | 5.5 | -------- | -------- | 32 | 42 |
| Total | -------- | 2,237 | -------- | 715.6 | -------- | 211.2 | -------- | 314.5 | -------- | 474 |

**MOORE CREEK ABOVE THORN CREEK NEAR IDAHO CITY, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 35 | 64 | 17 | 45 | 35 | 81 | 25 | 67 |
| 2 | 23 | 33 | 20 | 55 | 52 | 153 | 24 | 62 |
| 3 | 19 | 25 | 19 | 60 | 66 | 168 | 28 | 82 |
| 4 | 17 | 23 | 16 | 49 | 61 | 122 | 32 | 78 |
| 5 | 16 | 23 | 16 | 38 | 50 | 78 | 33 | 77 |
| 6 | 15 | 23 | 18 | 35 | 38 | 59 | 40 | 78 |
| 7 | 15 | 25 | 18 | 35 | 33 | 66 | 52 | 103 |
| 8 | 16 | 26 | 19 | 50 | 25 | 54 | 46 | 72 |
| 9 | 15 | 26 | 22 | 62 | 34 | 98 | 41 | 69 |
| 10 | 14 | 26 | 32 | 97 | 38 | 94 | 51 | 110 |
| 11 | 13 | 21 | 35 | 78 | 34 | 94 | 62 | 114 |
| 12 | 13 | 20 | 33 | 80 | 28 | 76 | 50 | 80 |
| 13 | 14 | 21 | 28 | 70 | 25 | 63 | 42 | 60 |
| 14 | 15 | 23 | 27 | 70 | 24 | 52 | 46 | 65 |
| 15 | 15 | 25 | 29 | 98 | 23 | 74 | 42 | 82 |
| 16 | 15 | 44 | 32 | 83 | 24 | 79 | 35 | 63 |
| 17 | 16 | 33 | 46 | 112 | 25 | 74 | 36 | 80 |
| 18 | 21 | 67 | 41 | 67 | 25 | 59 | 38 | 70 |
| 19 | 18 | 37 | 35 | 67 | 23 | 55 | 32 | 59 |
| 20 | 17 | 33 | 32 | 74 | 23 | 67 | 28 | 50 |
| 21 | 17 | 44 | 30 | 61 | 23 | 80 | 27 | 45 |
| 22 | 18 | 41 | 25 | 46 | 23 | 78 | 34 | 63 |
| 23 | 22 | 71 | 21 | 41 | 23 | 73 | 36 | 54 |
| 24 | 23 | 64 | 21 | 45 | 23 | 53 | 36 | 64 |
| 25 | 22 | 57 | 19 | 40 | 23 | 49 | 37 | 65 |
| 26 | 28 | 83 | 18 | 29 | 25 | 62 | 52 | 108 |
| 27 | 22 | 59 | 19 | 22 | 29 | 96 | 136 | 606 |
| 28 | 19 | 46 | 19 | 27 | 30 | 100 | 263 | 717 |
| 29 | 20 | 65 | 22 | 52 | 28 | 82 | 287 | 519 |
| 30 | 19 | 55 | 22 | 54 | 27 | 92 | | |
| 31 | | | 27 | 60 | 26 | 88 | | |
| Total | | 1,203 | | 1,802 | | 2,519 | | 3,762 |

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 213 | 223 | 448 | 821 | 182 | 476 | 109 | 132 |
| 2 | 174 | 159 | 402 | 507 | 167 | 335 | 104 | 113 |
| 3 | 153 | 131 | 345 | 465 | 188 | 383 | 99 | 129 |
| 4 | 138 | 206 | 291 | 328 | 194 | 386 | 97 | 123 |
| 5 | 126 | 139 | 302 | 373 | 182 | 313 | 99 | 266 |
| 6 | 114 | 141 | 271 | 283 | 169 | 209 | 87 | 189 |
| 7 | 108 | 110 | 266 | 305 | 167 | 317 | 83 | 240 |
| 8 | 155 | 244 | 244 | 163 | 165 | 283 | 80 | 152 |
| 9 | 178 | 161 | 259 | 233 | 173 | 295 | 70 | 152 |
| 10 | 159 | 146 | 249 | 208 | 188 | 321 | 69 | 114 |
| 11 | 136 | 117 | 237 | 136 | 214 | 285 | 65 | 99 |
| 12 | 114 | 98 | 230 | 137 | 228 | 316 | 63 | 122 |
| 13 | 105 | 86 | 247 | 173 | 230 | 347 | 59 | 107 |
| 14 | 103 | 99 | 284 | 217 | 219 | 293 | 56 | 91 |
| 15 | 100 | 97 | 299 | 253 | 203 | 277 | 55 | 95 |
| 16 | 103 | 102 | 261 | 201 | 188 | 308 | 53 | 99 |
| 17 | 112 | 121 | 247 | 215 | 177 | 249 | 48 | 119 |
| 18 | 117 | 158 | 244 | 219 | 169 | 266 | 44 | 105 |
| 19 | 130 | 177 | 251 | 268 | 161 | 218 | 42 | 80 |
| 20 | 136 | 113 | 259 | 278 | 161 | 205 | 32 | 51 |
| 21 | 146 | 58 | 232 | 199 | 155 | 349 | 36 | 67 |
| 22 | 157 | 110 | 212 | 234 | 147 | 243 | 36 | 72 |
| 23 | 170 | 92 | 199 | 226 | 145 | 211 | 36 | 70 |
| 24 | 182 | 136 | 192 | 328 | 143 | 170 | 46 | 150 |
| 25 | 250 | 752 | 192 | 365 | 143 | 137 | 40 | 143 |
| 26 | 381 | 1,460 | 203 | 364 | 143 | 178 | 31 | 80 |
| 27 | 629 | 4,550 | 242 | 340 | 134 | 194 | 32 | 87 |
| 28 | 448 | 655 | 214 | 254 | 127 | 178 | 29 | 91 |
| 29 | 361 | 394 | 203 | 232 | 123 | 173 | 29 | 102 |
| 30 | 312 | 493 | 186 | 200 | 119 | 167 | 24 | 86 |
| 31 | 405 | 894 | | | 112 | 166 | | |
| Total | | 12,422 | | 8,525 | | 8,248 | | 3,526 |

## GRANITE CREEK NEAR IDAHO CITY, IDAHO

*Discharge and total sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | | | 0.75 | 0.03 | 0.88 | 0.05 | 6.6 | 108 | 3.2 | 8.7 |
| 2 | | | .80 | .009 | .92 | .005 | 6.5 | 87 | 3.1 | 2.8 |
| 3 | | | .80 | .02 | .92 | .01 | 6.5 | 147 | 3.0 | 2.0 |
| 4 | | | .80 | .03 | .88 | .2 | 6.6 | 165 | 2.9 | 2.4 |
| 5 | | | .80 | .1 | .88 | .08 | 5.9 | 73 | 2.7 | 1.7 |
| 6 | | | .80 | .04 | .88 | .04 | 5.0 | 30 | 2.5 | 6.6 |
| 7 | | | .80 | .05 | .88 | .07 | 4.6 | 14 | 2.3 | 6.8 |
| 8 | | | .84 | .2 | .88 | .02 | 4.6 | 56 | 2.1 | 13 |
| 9 | | | .80 | .2 | .92 | .02 | 4.5 | 19 | 2.1 | 7.3 |
| 10 | | | .85 | .04 | 1.0 | .1 | 4.2 | 10 | 2.0 | 2.2 |
| 11 | | | .80 | .04 | 1.0 | .3 | 3.9 | 10 | 1.9 | 3.4 |
| 12 | | | .84 | .1 | 1.1 | .1 | 3.7 | 13 | 1.8 | 2.7 |
| 13 | | | .80 | .06 | 1.4 | .6 | 3.4 | 4.3 | 1.7 | 2.6 |
| 14 | | | .84 | .02 | 1.6 | .5 | 3.2 | 12 | 1.6 | 2.2 |
| 15 | | | .96 | .06 | 1.3 | .06 | 3.1 | 10 | 1.5 | .9 |
| 16 | 0.72 | | .72 | .06 | 1.7 | 2.3 | 3.0 | 3.2 | 1.6 | .7 |
| 17 | .74 | | .88 | .02 | 2.4 | 8.7 | 2.8 | 2.9 | 1.5 | .2 |
| 18 | .76 | 0.01 | .80 | .2 | 3.0 | 35 | 2.9 | 2.8 | 1.4 | .3 |
| 19 | .76 | .01 | .80 | .2 | 3.7 | 88 | 3.1 | 4.5 | 1.4 | .1 |
| 20 | .76 | .006 | .80 | .09 | 4.0 | 52 | 3.0 | 1.8 | 1.4 | .09 |
| 21 | .64 | .04 | .75 | .1 | 4.6 | 114 | 3.1 | 3.3 | 1.3 | .3 |
| 22 | .64 | .02 | .84 | .3 | 5.1 | 238 | 3.1 | 1.7 | 1.4 | .2 |
| 23 | .64 | .03 | .88 | .2 | 5.6 | 199 | 3.1 | 1.9 | 1.4 | .2 |
| 24 | .64 | .01 | .88 | .03 | 6.3 | 212 | 3.1 | .9 | 1.3 | .1 |
| 25 | .64 | .02 | .88 | .04 | 6.8 | 276 | 2.8 | 2.6 | 1.3 | .1 |
| 26 | .68 | .02 | .88 | .04 | 6.8 | 212 | 2.6 | 1.7 | 1.2 | .1 |
| 27 | .76 | .04 | .92 | .02 | 6.7 | 233 | 2.6 | .4 | 1.2 | .07 |
| 28 | .72 | .02 | .88 | .02 | 6.6 | 81 | 2.6 | .7 | 1.1 | .05 |
| 29 | .72 | .004 | | | 6.2 | 118 | 3.1 | 3.7 | 1.0 | .07 |
| 30 | .76 | .01 | | | 6.2 | 124 | 3.6 | 12 | .95 | .06 |
| 31 | .72 | .02 | | | 6.4 | 64 | | | .94 | .03 |
| Total | | 0.260 | | 2.319 | | 2,059.155 | | 802.4 | | 67.97 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.88 | 0.04 | 0.56 | 0.01 | 0.38 | 0.007 | 0.35 | 0.001 | 0.51 | 0.007 |
| 2 | .90 | .04 | .56 | .01 | .38 | .007 | .35 | .001 | .57 | .008 |
| 3 | .94 | .06 | .60 | .01 | .38 | .007 | .35 | .001 | .53 | .007 |
| 4 | .82 | .05 | .72 | .03 | .38 | .007 | .35 | .001 | .53 | .01 |
| 5 | .84 | .03 | .68 | .03 | .38 | .007 | .35 | .001 | .62 | .02 |
| 6 | .92 | .02 | .60 | .01 | .38 | .007 | .35 | .001 | .80 | .02 |
| 7 | .88 | .03 | .56 | .03 | .38 | .007 | .35 | .005 | .62 | .01 |
| 8 | .92 | .04 | .53 | .01 | .38 | .005 | .35 | .005 | .57 | .003 |
| 9 | 1.0 | .03 | .53 | .01 | .38 | .005 | .35 | .005 | .53 | .003 |
| 10 | .86 | .02 | .49 | .01 | .38 | .005 | .31 | .004 | .53 | .003 |
| 11 | .81 | .02 | .45 | .01 | .38 | .005 | .35 | .005 | .53 | .003 |
| 12 | .82 | .02 | .45 | .01 | .38 | .005 | .70 | .1 | .53 | .004 |
| 13 | .77 | .02 | .42 | .01 | .38 | .005 | .80 | .1 | .53 | .004 |
| 14 | .74 | .02 | .42 | .01 | .35 | .005 | .45 | .006 | .53 | .004 |
| 15 | .90 | .1 | .45 | .01 | .35 | .005 | .42 | .006 | .53 | .004 |
| 16 | 1.0 | .05 | .45 | .009 | .38 | .005 | .38 | .005 | .53 | .004 |
| 17 | .92 | .06 | .45 | .005 | .38 | .008 | .35 | .003 | .51 | .004 |
| 18 | .92 | .02 | .42 | .006 | .35 | .008 | .35 | .003 | .55 | .006 |
| 19 | 1.0 | .05 | .42 | .01 | .35 | .008 | .35 | .003 | .57 | .006 |
| 20 | .88 | .02 | .38 | .009 | .35 | .008 | .35 | .003 | .59 | .006 |
| 21 | .82 | .01 | .38 | .009 | .35 | .008 | .35 | .003 | .59 | .006 |
| 22 | .77 | .01 | .42 | .01 | .35 | .005 | .35 | .005 | .59 | .006 |
| 23 | .68 | .007 | .42 | .01 | .35 | .005 | .37 | .005 | .57 | .005 |
| 24 | .64 | .009 | .45 | .01 | .38 | .005 | .42 | .006 | .57 | .005 |
| 25 | .60 | .01 | .42 | .01 | .38 | .005 | .44 | .006 | .64 | .005 |
| 26 | .56 | .006 | .42 | .008 | .35 | .001 | .42 | .006 | .62 | .005 |
| 27 | .64 | .01 | .38 | .007 | .35 | .001 | .42 | .005 | .59 | .006 |
| 28 | .64 | .01 | .42 | .008 | .35 | .001 | .44 | .005 | .66 | .007 |
| 29 | .60 | .01 | .42 | .008 | .31 | .001 | .44 | .005 | .62 | .007 |
| 30 | .60 | .01 | .42 | .008 | .35 | .001 | .44 | .005 | .59 | .006 |
| 31 | | | .38 | .007 | .31 | .001 | | | .59 | .006 |
| Total | | 0.832 | | 0.344 | | 0.160 | | 0.310 | | 0.200 |

GRANITE CREEK NEAR IDAHO CITY, IDAHO—Continued

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 0.59 | 0.006 | 0.66 | 0.01 | 1.4 | 2.9 | 0.70 | 0.2 |
| 2 | .62 | .008 | .66 | .01 | 1.8 | 1.5 | .80 | .09 |
| 3 | .59 | .008 | .66 | .01 | 1.5 | .8 | 1.0 | .02 |
| 4 | .59 | .008 | .64 | .01 | 1.3 | 1.4 | 1.1 | .1 |
| 5 | .57 | .04 | .64 | .01 | 1.0 | .2 | 1.0 | .08 |
| 6 | .62 | .003 | .80 | .02 | .59 | .3 | 1.5 | 1.2 |
| 7 | .64 | .004 | .68 | .02 | .75 | .4 | 1.4 | .3 |
| 8 | .62 | .003 | .75 | .02 | 1.0 | .6 | 1.2 | .2 |
| 9 | .50 | .05 | 1.1 | .01 | .97 | .1 | 1.2 | .3 |
| 10 | .51 | .02 | .92 | .04 | .92 | .05 | 1.8 | 1.0 |
| 11 | .66 | .03 | 1.1 | .05 | .71 | .1 | 1.4 | .6 |
| 12 | .62 | .03 | .82 | .04 | .90 | .05 | 1.1 | .5 |
| 13 | .62 | .03 | .80 | .04 | .70 | .04 | 1.3 | .6 |
| 14 | .59 | .02 | .77 | .04 | .88 | .05 | 1.3 | .4 |
| 15 | .59 | .02 | .87 | .2 | .70 | .1 | 1.1 | .5 |
| 16 | .60 | .02 | 1.0 | .1 | .77 | .9 | 1.1 | .5 |
| 17 | .50 | .02 | 1.4 | .1 | .77 | .04 | 1.1 | .05 |
| 18 | .64 | .03 | .92 | .2 | .75 | .02 | 1.0 | .2 |
| 19 | .64 | .02 | .77 | .02 | .73 | .02 | .90 | 2.2 |
| 20 | .66 | .02 | .90 | .02 | .73 | .02 | .87 | .6 |
| 21 | .65 | .02 | .73 | .02 | .73 | .01 | .95 | .08 |
| 22 | .68 | .02 | .49 | .01 | .73 | .01 | 1.0 | .8 |
| 23 | .66 | .02 | .74 | .02 | .73 | .01 | .97 | .4 |
| 24 | .66 | .01 | .77 | .3 | .75 | .01 | .97 | .2 |
| 25 | .66 | .01 | .40 | .02 | .77 | .09 | 1.4 | 1.5 |
| 26 | .70 | .01 | .70 | .04 | .92 | .02 | 2.3 | 3.0 |
| 27 | .70 | .01 | .84 | .05 | .90 | .1 | 5.5 | 104 |
| 28 | .64 | .01 | .73 | .04 | .82 | .03 | 7.3 | 218 |
| 29 | .66 | .01 | .75 | .04 | .80 | .05 | 6.1 | 75 |
| 30 | .66 | .01 | .87 | .08 | .80 | .5 | ---------- | ---------- |
| 31 | ---------- | ---------- | 1.0 | .05 | .75 | .6 | ---------- | ---------- |
| Total | ---------- | 0.520 | ---------- | 1.64 | ---------- | 11.02 | ---------- | 412.62 |

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 4.4 | 40 | 11 | 79 | 4.1 | 1.5 | 1.3 | 0.04 |
| 2 | 3.7 | 14 | 9.1 | 33 | 4.0 | 1.2 | 1.3 | .04 |
| 3 | 3.2 | 6.4 | 8.0 | 48 | 4.0 | .6 | 1.2 | .05 |
| 4 | 2.9 | 4.2 | 7.3 | 18 | 3.9 | .8 | 1.4 | .07 |
| 5 | 2.6 | 2.0 | 7.4 | 8.2 | 3.6 | .5 | 1.2 | .1 |
| 6 | 2.4 | 1.9 | 6.4 | 14 | 3.4 | .3 | 1.1 | .06 |
| 7 | 2.6 | 2.5 | 5.9 | 4.4 | 3.3 | .3 | 1.1 | .06 |
| 8 | 3.5 | 9.7 | 5.7 | 9.3 | 3.1 | .6 | 1.1 | .06 |
| 9 | 3.2 | 5.0 | 5.9 | 7.3 | 3.0 | .6 | 1.0 | .04 |
| 10 | 3.1 | 8.1 | 5.4 | 6.6 | 3.0 | .3 | .94 | .04 |
| 11 | 2.8 | 2.2 | 5.2 | 5.3 | 3.0 | .5 | .90 | .03 |
| 12 | 2.4 | 7.7 | 5.0 | 2.9 | 3.0 | .3 | .84 | .02 |
| 13 | 2.5 | 3.0 | 5.2 | 3.2 | 3.0 | .4 | .80 | .02 |
| 14 | 2.5 | 1.3 | 5.3 | 2.6 | 2.8 | .7 | .77 | .02 |
| 15 | 2.5 | 1.9 | 5.4 | 2.1 | 2.6 | .8 | .73 | .02 |
| 16 | 2.7 | 5.3 | 5.0 | 3.5 | 2.4 | .2 | .70 | .02 |
| 17 | 2.9 | 3.5 | 4.6 | 3.9 | 2.3 | .2 | .68 | .02 |
| 18 | 2.9 | 4.9 | 4.4 | .9 | 2.2 | .2 | .64 | .02 |
| 19 | 3.0 | 4.4 | 4.2 | 1.0 | 2.1 | .2 | .59 | .01 |
| 20 | 3.1 | 3.7 | 4.2 | 2.9 | 2.0 | .1 | .59 | .01 |
| 21 | 3.1 | 8.2 | 4.0 | 1.2 | 1.9 | .08 | .57 | .01 |
| 22 | 3.2 | 13 | 3.8 | 1.2 | 1.8 | .07 | .57 | .009 |
| 23 | 3.4 | 9.9 | 3.7 | .8 | 1.7 | .08 | .55 | .009 |
| 24 | 3.5 | 12 | 3.5 | .5 | 1.6 | .07 | .53 | .01 |
| 25 | 5.5 | 73 | 3.5 | 1.6 | 1.6 | .1 | .51 | .01 |
| 26 | 8.7 | 140 | 4.6 | 2.3 | 1.6 | .08 | .49 | .01 |
| 27 | 12 | 392 | 5.6 | 2.8 | 1.5 | .06 | .49 | .01 |
| 28 | 8.9 | 250 | 5.0 | 3.0 | 1.5 | .09 | .47 | .01 |
| 29 | 7.6 | 104 | 4.8 | 2.2 | 1.4 | .07 | .47 | .01 |
| 30 | 7.2 | 49 | 4.4 | .7 | 1.3 | .06 | .49 | .01 |
| 31 | 9.9 | 69 | ---------- | ---------- | 1.3 | .04 | ---------- | ---------- |
| Total | ---------- | 1,251.8 | ---------- | 272.4 | ---------- | 11.10 | ---------- | 0.848 |

## BANNOCK CREEK NEAR IDAHO CITY, IDAHO

*Discharge and total sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | | | 0.65 | 0.01 | 0.70 | 0.02 | 3.6 | 0.3 | 3.2 | 0.2 |
| 2 | | | .68 | .02 | .74 | .02 | 3.9 | .4 | 3.0 | .2 |
| 3 | | | .68 | .002 | .74 | .02 | 4.1 | .6 | 3.0 | .2 |
| 4 | | | .68 | .002 | .74 | .008 | 4.3 | .6 | 2.9 | .1 |
| 5 | | | .68 | .002 | .70 | .008 | 4.1 | .4 | 2.9 | .1 |
| 6 | | | .68 | .002 | .71 | .008 | 3.8 | .2 | 2.7 | .05 |
| 7 | | | .68 | .002 | .71 | .008 | 3.6 | .2 | 2.6 | .05 |
| 8 | | | .68 | .004 | .71 | .008 | [1] 3.7 | .2 | 2.5 | .05 |
| 9 | | | .68 | .005 | .71 | .008 | 3.6 | .2 | 2.3 | .2 |
| 10 | | | .71 | .002 | .74 | .008 | 3.4 | .3 | 2.2 | .7 |
| 11 | | | .71 | .04 | .71 | .01 | 3.1 | .2 | 2.1 | .05 |
| 12 | | | .71 | .05 | .78 | .01 | 3.1 | .2 | 1.9 | .07 |
| 13 | | | .71 | .06 | .85 | .01 | 2.9 | .2 | 1.7 | .07 |
| 14 | | | .71 | .02 | .74 | .01 | 2.8 | .2 | 1.6 | .3 |
| 15 | | | .74 | .01 | .74 | .01 | 2.8 | .2 | 1.6 | .1 |
| 16 | 0.68 | 0.01 | .71 | .02 | .85 | .01 | 2.7 | .2 | 1.6 | .04 |
| 17 | .68 | .01 | .74 | .04 | .85 | .01 | 2.7 | .2 | 1.6 | .05 |
| 18 | .68 | .01 | .74 | .01 | .93 | .01 | 2.8 | .2 | 1.5 | .02 |
| 19 | .68 | .01 | .74 | .01 | 1.1 | .03 | 3.0 | .2 | 1.4 | .03 |
| 20 | .68 | .007 | .71 | .01 | 1.2 | .06 | 3.0 | .2 | 1.4 | .07 |
| 21 | .68 | .009 | .71 | .02 | 1.3 | .06 | 3.1 | .2 | 1.3 | .07 |
| 22 | .61 | .005 | .68 | .02 | 1.5 | .07 | 3.2 | .2 | 1.3 | .07 |
| 23 | .68 | .005 | .68 | .01 | 1.7 | .08 | 3.1 | .1 | 1.3 | .03 |
| 24 | .68 | .004 | .71 | .01 | 2.0 | .1 | 3.1 | .1 | 1.2 | .03 |
| 25 | .68 | .002 | .68 | .02 | 2.4 | .1 | 2.8 | .08 | 1.2 | .03 |
| 26 | .68 | .002 | .68 | .01 | 2.6 | .1 | 2.6 | .07 | 1.1 | .03 |
| 27 | .68 | .002 | .68 | .007 | 2.8 | .1 | 2.6 | .07 | 1.2 | .05 |
| 28 | .68 | .002 | .71 | .03 | 2.8 | .1 | 2.6 | .1 | 1.1 | .05 |
| 29 | .68 | .002 | | | 2.8 | .1 | 2.9 | .4 | 1.0 | .04 |
| 30 | .68 | .002 | | | 2.9 | .1 | 3.4 | 1.0 | 1.0 | .09 |
| 31 | .65 | .005 | | | 3.2 | .2 | | | .98 | .09 |
| Total | | 0.087 | | 0.448 | | 1.396 | | 7.72 | | 3.23 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.93 | 0.09 | 0.39 | 0.005 | 0.17 | 0.002 | 0.14 | 0.002 | 0.30 | 0.006 |
| 2 | .93 | .09 | .42 | .006 | .17 | .002 | .16 | .003 | .37 | .007 |
| 3 | .93 | .09 | .42 | .006 | .17 | .002 | .17 | .001 | .34 | .006 |
| 4 | .93 | .09 | .55 | .008 | .16 | .004 | .17 | .001 | .34 | .005 |
| 5 | .89 | .02 | .55 | .008 | .16 | .004 | .17 | .001 | .37 | .006 |
| 6 | .89 | .02 | .50 | .007 | .16 | .004 | .17 | .001 | .55 | .009 |
| 7 | .89 | .02 | .44 | .006 | .17 | .005 | .17 | .002 | .39 | .006 |
| 8 | .89 | .03 | .39 | .007 | .17 | .002 | .16 | .002 | .37 | .006 |
| 9 | .98 | .03 | .37 | .007 | .16 | .002 | .17 | .002 | .34 | .001 |
| 10 | .85 | .03 | .37 | .007 | .17 | .002 | .17 | .002 | .34 | .001 |
| 11 | .82 | .02 | .34 | .006 | .17 | .002 | .19 | .002 | .34 | .001 |
| 12 | .78 | .02 | .32 | .006 | .16 | .002 | .46 | .02 | .34 | .001 |
| 13 | .74 | .02 | .30 | .006 | .16 | .002 | .58 | .04 | .34 | .001 |
| 14 | .74 | .006 | .25 | .008 | .14 | .002 | .37 | .004 | .34 | .001 |
| 15 | .78 | .006 | .25 | .008 | .16 | .002 | .30 | .003 | .34 | .001 |
| 16 | .85 | .007 | .25 | .008 | .16 | .002 | .28 | .003 | .34 | .001 |
| 17 | .78 | .006 | .25 | .008 | .14 | .005 | .25 | .003 | .34 | .001 |
| 18 | .78 | .006 | .23 | .007 | .14 | .005 | .23 | .001 | .34 | .003 |
| 19 | .85 | .007 | .23 | .007 | .14 | .005 | .23 | .001 | .32 | .003 |
| 20 | .78 | .006 | .23 | .002 | .16 | .006 | .25 | .001 | .32 | .003 |
| 21 | .68 | .05 | .19 | .002 | .14 | .005 | .25 | .001 | .32 | .003 |
| 22 | [2] .68 | .05 | .21 | .002 | .16 | .001 | .25 | .001 | .32 | .003 |
| 23 | .61 | .04 | .19 | .002 | .16 | .001 | .28 | .002 | .32 | .003 |
| 24 | .61 | .04 | .19 | .002 | .17 | .001 | .28 | .002 | .34 | .003 |
| 25 | .58 | .005 | .17 | .001 | .17 | .001 | .28 | .002 | .39 | .003 |
| 26 | .55 | .004 | .19 | .005 | .17 | .001 | .25 | .001 | .39 | .003 |
| 27 | .52 | .004 | .19 | .005 | .17 | .001 | .23 | .001 | .39 | .001 |
| 28 | .52 | .004 | .21 | .005 | .17 | .001 | .25 | .001 | .44 | .001 |
| 29 | .50 | .007 | .23 | .006 | .14 | .002 | .25 | .001 | .42 | .001 |
| 30 | .39 | .005 | .21 | .005 | .16 | .003 | .25 | .001 | .39 | .001 |
| 31 | | | .19 | .003 | .14 | .002 | | | .39 | .001 |
| Total | | 0.823 | | 0.171 | | 0.081 | | 0.108 | | 0.092 |

[1] Approximately 4.1 cubic yards of sand removed from weir pool.
[2] Approximately 1.1 cubic yards of sand removed from weir pool.

**BANNOCK CREEK NEAR IDAHO CITY, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 0.39 | 0.001 | 0.44 | 0.004 | 0.82 | 0.1 | 0.52 | 0.004 |
| 2 | .39 | .007 | .44 | .004 | 1.2 | .2 | .52 | .004 |
| 3 | .39 | .007 | .44 | .004 | 1.0 | .02 | .61 | .005 |
| 4 | .39 | .007 | .44 | .004 | .82 | .01 | .64 | .01 |
| 5 | .37 | .007 | .42 | .004 | .71 | .01 | .61 | .01 |
| 6 | .39 | .001 | .58 | .005 | .50 | .008 | .78 | .04 |
| 7 | .39 | .001 | .44 | .02 | .55 | .009 | .71 | .01 |
| 8 | .39 | .001 | .52 | .03 | .68 | .004 | .61 | .04 |
| 9 | .32 | .002 | .85 | .05 | .68 | .004 | .64 | .04 |
| 10 | .34 | .002 | .68 | .04 | .68 | .009 | .89 | .1 |
| 11 | .39 | .002 | .85 | .05 | .61 | .002 | .71 | .02 |
| 12 | .39 | .002 | .58 | .008 | .58 | .002 | .58 | .03 |
| 13 | .39 | .002 | .55 | .008 | .50 | .001 | .74 | .04 |
| 14 | .39 | .002 | .55 | .008 | .55 | .001 | .71 | .03 |
| 15 | .37 | .005 | .64 | .009 | .50 | .008 | .64 | .02 |
| 16 | .34 | .005 | .85 | .03 | .50 | .008 | .61 | .01 |
| 17 | .34 | .005 | 1.2 | .07 | .50 | .008 | .61 | .01 |
| 18 | .37 | .005 | 1.1 | .01 | .52 | .006 | .61 | .01 |
| 19 | .37 | .005 | .74 | .006 | .50 | .005 | .55 | .009 |
| 20 | .37 | .005 | .61 | .005 | .50 | .005 | .52 | .007 |
| 21 | .37 | .002 | .52 | .004 | .50 | .005 | .55 | .008 |
| 22 | .39 | .002 | .42 | .004 | .50 | .005 | .58 | .008 |
| 23 | .39 | .002 | .50 | .004 | .50 | .005 | .61 | .01 |
| 24 | .42 | .002 | .47 | .004 | .50 | .004 | .61 | .002 |
| 25 | .39 | .002 | .40 | .003 | .52 | .004 | .78 | .02 |
| 26 | .39 | .002 | .45 | .004 | .61 | .005 | 1.1 | .2 |
| 27 | .39 | .003 | .50 | .004 | .61 | .005 | 1.9 | .4 |
| 28 | .42 | .004 | .47 | .004 | .55 | .004 | 2.8 | .6 |
| 29 | .42 | .004 | .50 | .007 | .55 | .004 | 2.5 | .1 |
| 30 | .44 | .004 | .58 | .03 | .55 | .004 | | |
| 31 | | | .68 | .05 | .52 | .004 | | |
| Total | | 0.101 | | 0.487 | | 0.469 | | 1.797 |

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 2.0 | 0.05 | 7.5 | 81 | 4.8 | 0.9 | 1.3 | 0.02 |
| 2 | 1.7 | .04 | 6.9 | 46 | 4.6 | 1.3 | 1.3 | .02 |
| 3 | 1.6 | .08 | 6.0 | 30 | 4.4 | 1.0 | 1.2 | .02 |
| 4 | 1.4 | .03 | 5.6 | 14 | 4.4 | .7 | 1.3 | .02 |
| 5 | 1.3 | .01 | 5.7 | 14 | 4.2 | .8 | 1.3 | .02 |
| 6 | 1.4 | .07 | 5.3 | 8.4 | 4.1 | .6 | 1.2 | .04 |
| 7 | 1.3 | .04 | 5.1 | 9.8 | 3.7 | .6 | 1.2 | .02 |
| 8 | 1.9 | .08 | 5.1 | 5.7 | 3.5 | .4 | 1.1 | .01 |
| 9 | 1.7 | .05 | 5.1 | 8.2 | 3.4 | .2 | 1.1 | .01 |
| 10 | 1.7 | .03 | 4.8 | 4.2 | 3.4 | .6 | 1.0 | .02 |
| 11 | 1.6 | .06 | 4.6 | 7.6 | 3.4 | .2 | .93 | .02 |
| 12 | 1.4 | .3 | 4.8 | 8.2 | 3.2 | .1 | .85 | .02 |
| 13 | 1.4 | .2 | 5.1 | 5.4 | 3.1 | .2 | .82 | .02 |
| 14 | 1.4 | .05 | 5.4 | 3.1 | 3.0 | .6 | .82 | .02 |
| 15 | 1.4 | .06 | 5.4 | 4.8 | 2.9 | .8 | .78 | .01 |
| 16 | 1.6 | .1 | 5.3 | 2.6 | [1] 2.8 | .3 | .74 | .01 |
| 17 | 1.6 | .06 | 5.0 | 3.4 | 2.7 | .2 | .71 | .01 |
| 18 | 1.7 | .07 | 4.7 | 2.4 | 2.5 | .2 | .68 | .01 |
| 19 | 1.7 | .06 | 4.8 | 3.3 | 2.3 | .2 | .64 | .01 |
| 20 | 1.8 | .07 | 5.3 | 2.0 | 2.3 | .07 | .58 | .008 |
| 21 | 2.0 | .07 | 5.0 | 2.1 | 2.1 | .07 | .61 | .008 |
| 22 | 2.1 | .1 | 4.7 | 1.4 | 2.0 | .06 | .58 | .009 |
| 23 | 2.3 | .1 | 4.4 | 1.2 | 1.9 | .09 | .58 | .009 |
| 24 | 2.6 | .2 | 4.2 | 1.2 | 1.7 | .05 | .55 | .009 |
| 25 | 4.3 | 3.6 | 4.2 | 1.0 | 1.7 | .05 | .52 | .01 |
| 26 | 6.7 | 111 | 4.8 | 1.7 | 1.7 | .09 | .52 | .01 |
| 27 | 11 | 135 | 5.9 | 4.4 | 1.6 | .08 | .50 | .01 |
| 28 | 7.5 | 42 | 5.6 | 1.8 | 1.6 | .05 | .50 | .01 |
| 29 | [2] 6.2 | 25 | 5.4 | 1.9 | 1.5 | .03 | .47 | .008 |
| 30 | 6.4 | 47 | 5.1 | 1.5 | 1.4 | .03 | .50 | .008 |
| 31 | 7.8 | 77 | | | 1.3 | .02 | | |
| Total | | 442.58 | | 282.3 | | 1.059 | | 0.429 |

[1] Approximately 3.9 cubic yards of sand removed from weir pool.
[2] Approximately 3.4 cubic yards of sand removed from weir pool.

## PINE CREEK NEAR IDAHO CITY, IDAHO

*Discharge and total sediment loads, January 1939 to February 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | | | 0.60 | 0.04 | 0.65 | 0.04 | 10 | 22 | 1.2 | 0.05 |
| 2 | | | .65 | .04 | .69 | .04 | 11 | 26 | 1.1 | .1 |
| 3 | | | .65 | .04 | .69 | .04 | 11 | 26 | 1.0 | .1 |
| 4 | | | .65 | .04 | .69 | .03 | 11 | 21 | .93 | .03 |
| 5 | | | .65 | .02 | .70 | .04 | 9.4 | 19 | .85 | .03 |
| 6 | | | .65 | .3 | .69 | .03 | 7.9 | 13 | .81 | .02 |
| 7 | | | .65 | 01 | .65 | .01 | 7.9 | 6.4 | .81 | .05 |
| 8 | | | .65 | .09 | .69 | .09 | 8.4 | 9.2 | .77 | .03 |
| 9 | | | .65 | .009 | .73 | .03 | 8.2 | 27 | .69 | .03 |
| 10 | | | .65 | .05 | .77 | .05 | 7.9 | 19 | .61 | .07 |
| 11 | | | .65 | .02 | .77 | .06 | 6.8 | 14 | .57 | .08 |
| 12 | | | .65 | .03 | .89 | .1 | 5.2 | 12 | .60 | .1 |
| 13 | | | .65 | .04 | 1.0 | .2 | 3.0 | 2.0 | .57 | .04 |
| 14 | | | .65 | .05 | .89 | .2 | 2.3 | .7 | .57 | .03 |
| 15 | | | .77 | .2 | .93 | .2 | 2.1 | .4 | .57 | .02 |
| 16 | 0.57 | 0.02 | .69 | .2 | 1.6 | 1.3 | 2.0 | .7 | .57 | .02 |
| 17 | .57 | .008 | .69 | .03 | 2.5 | 3.2 | 1.9 | .3 | .73 | .4 |
| 18 | .57 | .008 | .69 | .04 | 3.2 | 5.4 | 1.8 | .2 | .57 | .06 |
| 19 | .57 | .005 | .69 | .04 | 4.6 | 19 | 1.7 | .2 | .54 | .02 |
| 20 | .57 | .005 | .69 | .04 | 5.6 | 20 | 1.8 | .4 | .50 | .02 |
| 21 | .57 | .07 | .69 | .04 | 5.5 | 18 | 1.6 | .1 | .50 | .02 |
| 22 | .54 | .01 | .69 | .03 | 6.9 | 49 | 1.6 | .1 | .50 | .01 |
| 23 | .54 | .5 | .69 | .03 | 8.2 | 33 | 1.6 | .1 | .46 | .01 |
| 24 | .54 | .03 | .69 | .03 | 9.0 | 38 | 1.5 | .09 | .38 | .01 |
| 25 | .57 | .05 | .69 | .02 | 9.9 | 37 | 1.4 | .07 | .38 | .009 |
| 26 | .61 | .01 | .73 | .04 | 10 | 32 | 1.3 | .06 | .35 | .04 |
| 27 | .61 | .08 | .69 | .04 | 9.9 | 31 | 1.3 | .1 | .31 | .008 |
| 28 | .61 | .03 | .69 | .03 | 9.7 | 30 | 1.2 | .04 | .31 | .007 |
| 29 | .61 | .02 | | | 9.4 | 17 | 1.3 | .1 | .27 | .005 |
| 30 | .65 | .01 | | | 9.7 | 13 | 1.4 | .2 | .31 | .005 |
| 31 | .60 | .02 | | | 9.9 | 16 | | | .35 | .009 |
| Total | | 0.876 | | 1.589 | | 364.06 | | 220.46 | | 1.433 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.27 | 0.004 | 0.24 | 0.004 | 0.07 | 0 | 0.07 | 0.002 | 0.17 | 0.002 |
| 2 | .31 | .008 | .20 | .002 | .07 | 0 | .10 | 002 | .20 | .002 |
| 3 | .27 | .002 | .24 | 002 | .07 | 0 | .10 | .001 | .24 | .003 |
| 4 | .27 | .004 | .27 | .002 | .07 | .001 | .10 | 001 | .24 | .003 |
| 5 | .31 | .004 | .27 | .006 | .07 | .001 | .07 | .001 | .27 | .004 |
| 6 | .31 | .005 | .24 | .005 | .07 | .001 | .07 | .001 | .35 | .02 |
| 7 | .31 | .004 | .20 | .008 | .10 | .001 | .10 | .002 | .27 | .01 |
| 8 | .31 | .004 | .24 | .01 | .07 | .001 | .10 | .002 | .24 | .001 |
| 9 | .31 | .005 | .20 | .001 | .10 | .001 | .10 | .002 | .24 | .001 |
| 10 | .27 | .003 | .24 | .001 | .07 | .001 | .07 | .002 | .24 | .001 |
| 11 | .31 | .003 | .20 | .003 | .07 | .001 | .10 | .002 | .20 | .001 |
| 12 | .31 | .003 | .20 | .003 | .07 | .001 | .27 | .02 | .20 | .001 |
| 13 | .31 | .01 | .20 | .001 | .07 | .001 | .35 | .02 | .20 | .001 |
| 14 | .31 | .006 | .17 | .002 | .07 | .001 | .20 | .004 | .20 | .001 |
| 15 | .35 | .01 | .17 | .003 | .17 | .002 | .17 | .003 | .24 | .001 |
| 16 | .35 | .008 | .17 | .003 | .14 | .002 | .17 | .003 | .38 | .002 |
| 17 | .35 | .008 | .17 | .003 | .14 | .003 | .14 | .003 | .38 | .002 |
| 18 | .35 | .02 | .14 | 0 | .07 | .001 | .14 | .002 | .38 | .002 |
| 19 | .35 | .008 | .14 | 0 | .07 | .001 | .14 | .002 | .38 | .002 |
| 20 | .35 | .006 | .14 | 0 | .07 | .001 | .10 | .001 | .38 | .002 |
| 21 | .27 | .005 | .14 | .001 | .07 | .001 | .10 | 001 | .38 | .002 |
| 22 | .27 | .004 | .14 | .001 | .07 | .001 | .14 | .002 | .35 | .002 |
| 23 | .24 | .003 | .14 | .001 | .07 | .001 | .14 | .002 | .35 | .003 |
| 24 | .24 | .003 | .10 | .001 | .07 | .001 | .14 | .002 | .35 | .003 |
| 25 | .24 | .003 | .10 | .001 | .07 | .001 | .14 | .002 | .42 | .004 |
| 26 | .24 | .002 | .07 | 0 | .07 | .001 | .14 | .002 | .38 | .003 |
| 27 | .24 | .002 | .07 | 0 | .07 | .001 | .14 | .004 | .38 | .001 |
| 28 | .24 | .003 | .10 | 0 | .07 | .001 | .14 | .004 | .42 | .001 |
| 29 | .20 | .005 | .10 | 0 | .07 | .002 | .14 | 004 | .38 | .001 |
| 30 | .20 | .003 | .10 | 0 | .07 | .002 | .14 | .004 | .17 | 0 |
| 31 | | | .10 | .001 | .07 | .002 | | | .14 | 0 |
| Total | | 0.158 | | 0.065 | | 0.035 | | 0.103 | | 0.082 |

**PINE CREEK NEAR IDAHO CITY, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 0.14 | 0 | 0.27 | 0.001 | 0.65 | 0.03 | 0.35 | 0.003 |
| 2 | .14 | 0 | .27 | .001 | .87 | .2 | .38 | .003 |
| 3 | .14 | 0 | .27 | .001 | 1.0 | .3 | .50 | .004 |
| 4 | .14 | 0 | .27 | .001 | .85 | .04 | .54 | .004 |
| 5 | .14 | 0 | .27 | .001 | .73 | .04 | .57 | .005 |
| 6 | .14 | 0 | .35 | .002 | .54 | .03 | 1.2 | .5 |
| 7 | .17 | 0 | .31 | .009 | .57 | .03 | 1.2 | .3 |
| 8 | .17 | 0 | .31 | .002 | .65 | .009 | .97 | .2 |
| 9 | .14 | .002 | .57 | .1 | .61 | .008 | .96 | .1 |
| 10 | .14 | .002 | .46 | .02 | .61 | .02 | 1.5 | 1.0 |
| 11 | .17 | .003 | .61 | .03 | .54 | .04 | 1.4 | 1.1 |
| 12 | .20 | .003 | .42 | .008 | .57 | .04 | 1.0 | 2.1 |
| 13 | .20 | .003 | .42 | .008 | .54 | .04 | | |
| 14 | .17 | .003 | .38 | .007 | .54 | .04 | | |
| 15 | .20 | .004 | .46 | .009 | .50 | .009 | | |
| 16 | .20 | .004 | .61 | .04 | .46 | .009 | | |
| 17 | .20 | .004 | .85 | .06 | .42 | .008 | | |
| 18 | .20 | .004 | .54 | .04 | .42 | .006 | | |
| 19 | .20 | .004 | .46 | .01 | .42 | .006 | | |
| 20 | .20 | .004 | .46 | .01 | .42 | .006 | | |
| 21 | .27 | .002 | .38 | .008 | .42 | .002 | | |
| 22 | .27 | .002 | .31 | .007 | .42 | .002 | | |
| 23 | .31 | .003 | .35 | .008 | .42 | .002 | | |
| 24 | .31 | .003 | .31 | .005 | .42 | .003 | | |
| 25 | .27 | .002 | .30 | .003 | .38 | .003 | | |
| 26 | .31 | .003 | .35 | .004 | .46 | .004 | | |
| 27 | .31 | .003 | .38 | .004 | .54 | .004 | | |
| 28 | .27 | .002 | .38 | .004 | .46 | .008 | | |
| 29 | .27 | .002 | .38 | .004 | .38 | .006 | | |
| 30 | .27 | .002 | .46 | .005 | .35 | .006 | | |
| 31 | | | .54 | .03 | .31 | .003 | | |
| Total | | 0.064 | | 0.442 | | 0.954 | | 5.319 |

**PINE CREEK ABOVE BARRY PLACER DIVERSION NEAR IDAHO CITY, IDAHO**

*Discharge and total sediment loads, February to June 1940*

| Day | February 1940 | | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | | | 5.8 | 22 | 16 | 364 | 1.1 | 0.08 | 0.35 | 0.006 |
| 2 | | | 5.1 | 6.6 | 15 | 209 | 1.1 | .1 | .32 | .008 |
| 3 | | | 4.5 | 4.7 | 13 | 179 | 1.1 | .06 | .32 | .05 |
| 4 | | | 3.9 | 1.9 | 11 | 151 | 1.1 | .06 | .39 | .3 |
| 5 | | | 3.4 | 1.0 | 11 | 94 | 1.3 | .3 | .35 | .3 |
| 6 | | | 3.2 | 11 | 6.9 | 20 | 1.1 | .08 | .32 | .3 |
| 7 | | | 3.5 | 15 | 6.4 | 19 | 1.1 | .9 | .35 | .2 |
| 8 | | | 5.3 | 11 | 6.4 | 18 | 1.0 | 3.1 | .29 | .1 |
| 9 | | | 5.3 | 17 | 6.6 | 21 | 1.2 | 7.9 | .25 | 1.0 |
| 10 | | | 4.9 | 11 | 6.2 | 18 | .90 | 3.4 | .29 | 2.9 |
| 11 | | | 4.1 | 14 | 6.0 | 8.0 | 1.1 | 9.5 | .25 | 2.6 |
| 12 | | | 3.5 | 7.0 | 3.9 | 3.8 | .90 | 1.2 | .25 | 2.5 |
| 13 | 0.85 | 0.2 | 3.2 | 5.3 | 3.2 | .7 | 1.1 | 10 | .22 | 1.2 |
| 14 | .86 | .2 | 3.3 | 4.5 | 3.0 | .3 | .62 | .05 | .22 | 1.0 |
| 15 | .70 | .1 | 2.9 | 5.2 | 2.9 | .3 | .82 | 6.5 | .22 | 1.0 |
| 16 | .60 | .2 | 2.4 | 1.1 | 2.6 | .09 | .97 | 2.9 | .22 | .1 |
| 17 | .58 | .09 | 2.6 | 1.7 | 2.5 | .3 | 1.8 | 19 | .19 | .1 |
| 18 | .54 | .1 | 2.6 | 1.1 | 2.0 | 1.2 | .78 | 1.0 | .16 | .2 |
| 19 | .45 | .2 | 2.6 | 1.0 | 2.1 | .6 | .62 | .4 | .16 | .09 |
| 20 | .35 | .4 | 2.6 | 1.6 | 2.4 | 1.6 | .51 | .02 | .16 | .05 |
| 21 | .30 | .09 | 2.6 | 2.3 | 2.4 | 1.7 | .47 | .01 | .14 | .04 |
| 22 | .43 | .05 | 2.6 | 1.9 | 2.7 | 3.0 | 1.0 | 4.1 | .14 | .1 |
| 23 | .43 | .06 | 2.6 | 1.6 | 1.5 | .4 | .51 | .03 | .14 | .04 |
| 24 | .39 | .03 | 2.6 | 1.4 | 1.4 | .1 | .43 | .01 | .16 | .1 |
| 25 | .70 | .8 | 4.3 | 25 | 1.4 | .1 | .43 | .006 | .14 | .08 |
| 26 | 1.6 | 4.0 | 9.4 | 315 | 2.0 | 1.8 | .39 | .009 | .14 | .06 |
| 27 | 6.5 | 130 | 27 | 2,840 | 1.8 | .2 | .35 | .009 | .14 | .03 |
| 28 | 11 | 167 | 17 | 1,100 | 1.5 | .09 | .43 | .009 | .14 | .04 |
| 29 | 8.4 | 47 | 12 | 570 | 1.6 | .1 | .43 | .01 | .14 | .06 |
| 30 | | | 11 | 375 | 3.7 | 11 | .35 | .004 | .14 | .03 |
| 31 | | | 15 | 405 | | | .35 | .005 | | |
| Total | | 350.52 | | 5,780.9 | | 1,128.38 | | 70.752 | | 14.584 |

## DAVIS PLACER DIVERSION FROM PINE CREEK NEAR IDAHO CITY, IDAHO

*Discharge, in second-feet, April 1939 to June 1940*

| Day | April 1939 | May 1939 | June 1939 | July 1939 | August 1939 | September 1939 | October 1939 | November 1939 |
|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 3.0 | 0.9 | 0.2 | 0.05 | 0.05 | 0.1 | 0.2 |
| 2 | 0 | 2.7 | .8 | .2 | .05 | .05 | .2 | .2 |
| 3 | 0 | 2.5 | .7 | .2 | .05 | .05 | .1 | .2 |
| 4 | 0 | 2.3 | .7 | .3 | .05 | .05 | .1 | .2 |
| 5 | 0 | 2.2 | .7 | .4 | .05 | .05 | .1 | .2 |
| 6 | 0 | 2.0 | .9 | .3 | .05 | .05 | .2 | .2 |
| 7 | 0 | 1.8 | .7 | .3 | .05 | .05 | .1 | .2 |
| 8 | 0 | 1.8 | .8 | .3 | .05 | .05 | .1 | .2 |
| 9 | 0 | 1.8 | .9 | .2 | .05 | .05 | .1 | .2 |
| 10 | 0 | 1.5 | .8 | .1 | .05 | .05 | .1 | .2 |
| 11 | .5 | 1.6 | .7 | .1 | .05 | .05 | .1 | .2 |
| 12 | 1.5 | 1.4 | .7 | .1 | .05 | .3 | .1 | .2 |
| 13 | 3.5 | 1.4 | .4 | .1 | .05 | .4 | .1 | .1 |
| 14 | | 1.2 | .4 | .1 | 0 | .2 | .1 | .05 |
| 15 | 3.5 | 1.1 | .4 | .1 | 0 | .1 | .1 | .1 |
| 16 | | 1.2 | .4 | .1 | 0 | .1 | 0 | .1 |
| 17 | | .9 | .7 | .1 | 0 | .1 | 0 | .1 |
| 18 | 3.3 | .9 | .5 | .1 | .05 | .1 | 0 | .1 |
| 19 | | 2.0 | .4 | .1 | .05 | .05 | 0 | .1 |
| 20 | | 1.8 | .4 | .1 | .05 | .05 | 0 | .1 |
| 21 | | 1.8 | .4 | .1 | .05 | .05 | 0 | .4 |
| 22 | 3.5 | 1.9 | .4 | .1 | .05 | .05 | 0 | .2 |
| 23 | | 1.8 | .4 | .1 | .05 | .05 | 0 | .2 |
| 24 | 3.2 | 1.5 | .4 | .1 | .05 | .05 | 0 | .1 |
| 25 | | 1.5 | .4 | .1 | .05 | .05 | 0 | .1 |
| 26 | | 1.4 | .3 | .05 | .05 | .05 | 0 | .1 |
| 27 | 2.8 | 1.2 | .3 | .05 | .05 | .05 | 0 | .2 |
| 28 | | 1.1 | .3 | .1 | .05 | .05 | 0 | .1 |
| 29 | 3.0 | 1.1 | .2 | .05 | .05 | .05 | 0 | .1 |
| 30 | 3.5 | .9 | .2 | .05 | .05 | .05 | .2 | .1 |
| 31 | ---- | .9 | ---- | .05 | .05 | ---- | .2 | ---- |

| Day | December 1939 | January 1940 | February 1940 | March 1940 | April 1940 | May 1940 | June 1940 |
|---|---|---|---|---|---|---|---|
| 1 | 0.1 | 0.4 | 0.4 | 0.4 | 2.2 | 4.7 | 2.0 |
| 2 | .2 | .6 | .5 | .3 | 1.9 | 4.7 | 1.9 |
| 3 | .1 | .8 | .4 | .2 | 1.6 | 4.7 | 1.8 |
| 4 | .2 | .8 | .4 | .2 | 2.0 | 5.4 | 2.0 |
| 5 | .1 | .6 | .4 | .2 | 3.0 | 4.2 | 1.8 |
| 6 | .3 | .4 | 1.3 | .1 | 2.6 | 4.5 | 1.7 |
| 7 | .3 | .4 | .6 | .1 | 2.5 | 4.4 | 1.8 |
| 8 | .3 | .4 | .6 | .2 | 2.5 | 4.3 | 1.5 |
| 9 | .6 | .4 | .5 | .3 | 3.4 | 4.7 | 1.4 |
| 10 | .6 | .4 | 1.3 | .5 | 3.2 | 4.5 | 1.4 |
| 11 | .7 | .3 | .9 | .5 | 1.9 | 4.2 | 1.2 |
| 12 | .6 | .3 | .7 | .5 | 3.2 | 5.7 | .9 |
| 13 | .5 | .3 | .6 | .5 | 3.9 | 5.6 | 1.0 |
| 14 | .3 | .3 | .5 | .4 | 3.8 | 5.9 | 1.0 |
| 15 | .4 | .3 | .5 | .4 | 3.7 | 5.1 | .8 |
| 16 | .6 | .3 | .5 | 1.0 | 3.4 | 5.6 | .8 |
| 17 | .6 | .3 | .5 | 1.4 | 4.0 | 2.8 | .5 |
| 18 | .3 | .3 | .4 | 1.7 | 4.7 | 4.3 | .4 |
| 19 | .2 | .1 | .4 | 1.8 | 4.1 | 4.3 | .5 |
| 20 | .3 | .1 | .4 | 1.8 | 4.4 | 4.4 | .5 |
| 21 | .3 | .1 | .4 | 2.0 | 4.3 | 4.1 | .5 |
| 22 | .2 | .1 | .4 | 2.0 | 4.0 | 3.2 | .5 |
| 23 | .3 | .2 | .4 | 2.2 | 4.8 | 3.5 | .6 |
| 24 | .2 | .2 | .4 | 2.3 | 4.8 | 3.4 | .5 |
| 25 | .1 | .3 | .4 | 6.0 | 4.8 | 3.2 | .3 |
| 26 | .2 | .4 | .6 | 5.0 | 4.0 | 3.1 | .4 |
| 27 | .1 | .4 | .9 | 0 | 6.6 | 2.9 | .3 |
| 28 | .1 | .4 | 1.6 | 1.4 | 6.3 | 2.8 | .3 |
| 29 | .1 | .2 | 1.0 | 1.5 | 5.9 | 2.5 | .4 |
| 30 | .1 | .4 | ---- | 1.6 | 2.2 | 2.2 | .4 |
| 31 | .2 | .5 | ---- | 1.9 | ---- | 1.7 | ---- |

**DIVERSION FROM THORN CREEK INTO PINE CREEK NEAR IDAHO CITY, IDAHO**

| Day | May 1939 | June 1939 | July 1939 | August 1939 | September 1939 | October 1939 | November 1939 |
|---|---|---|---|---|---|---|---|
| 1 | 0 | 0.2 | | | | | |
| 2 | 0 | | | | | | |
| 3 | 0 | | | | | | |
| 4 | 0 | | | | | | |
| 5 | 0 | | | | | | |
| 6 | 0 | | | | | | |
| 7 | 0 | .1 | | | | | |
| 8 | 0 | | | | | | |
| 9 | 0 | | | | | | |
| 10 | 0 | | | | | | |
| 11 | 0 | | | | | | |
| 12 | 0 | | | | | | |
| 13 | 9 | 0 | | | | | |
| 14 | 0 | 0 | | | | | |
| 15 | 0 | 0 | | | | | |
| 16 | 0 | 0 | | | | | |
| 17 | 0 | .1 | | | | | |
| 18 | .1 | | | | | | |
| 19 | 1.1 | 0 | | | | | |
| 20 | 1.0 | 0 | | | | | |
| 21 | .9 | 0 | | | | | |
| 22 | .8 | 0 | | | | | |
| 23 | .7 | 0 | | | | | |
| 24 | .5 | 0 | | | | | |
| 25 | .4 | 0 | | | | | |
| 26 | | 0 | | | | | |
| 27 | | 0 | | | | | |
| 28 | .3 | 0 | | | | | |
| 29 | | 0 | | | | | |
| 30 | .2 | 0 | | | | | |
| 31 | | | | | | | |

| Day | December 1939 | January 1940 | February 1940 | March 1940 | April 1940 | May 1940 | June 1940 |
|---|---|---|---|---|---|---|---|
| 1 | | | | | 0 | | |
| 2 | | | | | 0 | | |
| 3 | | | | | 0 | | 1.1 |
| 4 | | | | | 0 | 2.5 | |
| 5 | | | | | 0 | | |
| 6 | | | | | 0 | | .7 |
| 7 | | | | | 0 | | |
| 8 | | | | | 0 | | |
| 9 | | | | | 0 | 2.8 | |
| 10 | | | | | 0 | | .6 |
| 11 | | | | | 0 | | |
| 12 | | | | | 0 | 4.5 | |
| 13 | | | | | 0 | | |
| 14 | | | | | 0 | | |
| 15 | | | | | 0 | | .5 |
| 16 | | | | | 0 | 4.4 | |
| 17 | | | | | 0 | | .4 |
| 18 | | | | | 0 | 3.6 | |
| 19 | | | | | 0 | | .2 |
| 20 | | | | | 0 | | |
| 21 | | | | | 0 | 2.9 | |
| 22 | | | | | 0 | | .2 |
| 23 | | | | | 0 | | |
| 24 | | | | | 0 | 2.2 | |
| 25 | | | | | | | |
| 26 | | | | | | | .2 |
| 27 | | | | | 2.5 | | |
| 28 | | | | | | 1.5 | .2 |
| 29 | | | | | | | |
| 30 | | | | | 2.2 | 1.1 | |
| 31 | | | | | | | |

NOTE.—No flow July 1939 to March 1940.

## ELK CREEK NEAR IDAHO CITY, IDAHO

*Discharge and suspended sediment loads, January 1939 to February 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | | | 7.5 | 0.2 | 8.4 | 0.2 | 78 | 241 | 59 | 47 |
| 2 | | | 7.5 | .2 | 8.1 | .3 | 76 | 209 | 58 | 27 |
| 3 | | | 8.0 | .3 | 8.1 | .4 | 78 | 180 | 56 | 34 |
| 4 | | | 8.4 | .3 | 8.1 | .7 | 84 | 164 | 52 | 35 |
| 5 | | | 8.1 | .2 | 8.7 | .6 | 78 | 90 | 56 | 149 |
| 6 | | | 8.1 | .06 | 8.7 | .4 | 71 | 71 | 55 | 124 |
| 7 | | | 8.1 | .04 | 8.4 | .6 | 68 | 102 | 41 | 75 |
| 8 | | | 7.8 | .02 | 8.1 | .2 | 68 | 90 | 30 | 29 |
| 9 | | | 7.8 | .1 | 7.8 | .1 | 65 | 84 | 25 | 30 |
| 10 | | | 8.1 | .1 | 8.4 | .5 | 58 | 66 | 30 | 65 |
| 11 | | | 8.1 | .3 | 9.0 | 1.8 | 55 | 48 | 30 | 156 |
| 12 | | | 8.1 | .5 | 9.2 | .5 | 54 | 50 | 18 | 61 |
| 13 | | | 7.8 | .4 | 10 | .8 | 48 | 30 | 18 | 165 |
| 14 | | | 7.8 | .1 | 9.5 | 1.7 | 46 | 29 | 16 | 30 |
| 15 | | | 8.1 | .3 | 9.2 | .2 | 47 | 46 | 24 | 98 |
| 16 | | | 7.8 | .3 | 11 | 3.0 | 46 | 29 | 20 | 40 |
| 17 | | | 7.8 | .3 | 17 | 14 | 46 | 47 | 7.3 | 14 |
| 18 | | | 7.8 | .4 | 19 | 42 | 51 | 43 | 6.8 | 14 |
| 19 | | | 7.8 | .5 | 40 | 138 | 54 | 53 | 7.8 | 19 |
| 20 | 7.6 | 0.1 | 8.4 | .6 | 58 | 155 | 55 | 53 | 8.7 | 15 |
| 21 | 8.7 | .2 | 8.7 | .5 | 62 | 133 | 59 | 76 | 8.1 | 4.5 |
| 22 | 6.8 | .1 | 8.4 | .5 | 67 | 217 | 62 | 57 | 8.1 | 4.5 |
| 23 | 8.1 | .02 | 8.4 | .2 | 74 | 252 | 64 | 55 | 7.0 | 60 |
| 24 | 8.4 | .07 | 8.4 | .2 | 79 | 266 | 60 | 48 | 6.3 | 192 |
| 25 | 8.7 | .07 | 8.1 | .2 | 83 | 364 | 50 | 29 | 6.3 | 86 |
| 26 | 8.7 | .09 | 9.0 | .5 | 74 | 254 | 47 | 20 | 6.1 | 73 |
| 27 | 9.0 | .4 | 8.7 | .4 | 71 | 246 | 48 | 30 | 8.1 | 96 |
| 28 | 9.0 | .4 | 8.4 | .4 | 76 | 232 | 54 | 44 | 9.5 | 65 |
| 29 | 8.7 | .1 | | | 71 | 160 | 60 | 66 | 10 | 142 |
| 30 | 8.1 | .4 | | | 74 | 212 | 64 | 75 | 12 | 126 |
| 31 | 7.5 | .3 | | | 76 | 250 | | | 11 | 125 |
| Total | | 2.25 | | 8.12 | | 2,947.0 | | 2,225 | | 2,201.0 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 8.4 | 71 | 0.9 | 0.7 | 3.1 | 8.5 | 0.2 | 0.3 | 1.0 | 7.5 |
| 2 | 8.7 | 164 | .7 | .2 | 2.9 | 8.2 | .2 | .5 | .7 | 14 |
| 3 | 5.2 | 25 | 1.3 | 2.8 | 1.8 | 3.8 | .2 | .4 | 2.2 | 45 |
| 4 | 3.5 | 20 | 1.3 | 3.0 | 1.0 | .9 | .2 | .2 | 1.7 | 34 |
| 5 | 2.2 | 10 | 1.7 | 1.6 | .5 | .4 | .3 | .2 | 1.7 | 38 |
| 6 | 3.5 | 24 | 2.6 | 7.1 | 1.2 | 2.7 | .3 | .2 | 2.2 | 20 |
| 7 | 5.4 | 30 | 1.8 | 5.0 | 1.3 | 2.3 | .3 | .2 | 2.2 | 27 |
| 8 | 6.1 | 16 | 3.7 | 37 | 1.2 | .9 | .3 | .3 | 1.7 | 32 |
| 9 | 7.6 | 398 | 2.9 | 44 | .7 | .6 | .2 | .2 | 2.4 | 45 |
| 10 | 7.8 | 36 | 2.0 | 38 | .8 | .6 | .2 | .3 | 2.4 | 18 |
| 11 | 8.7 | 13 | 2.9 | 61 | 2.0 | 12 | .3 | .5 | 2.9 | 25 |
| 12 | 7.6 | 64 | 2.0 | 36 | 2.4 | 18 | 1.1 | 11 | 3.3 | 16 |
| 13 | 9.5 | 31 | 1.5 | 13 | 1.7 | 13 | 2.7 | 16 | .7 | 1.2 |
| 14 | 9.5 | 65 | 1.3 | 16 | .9 | 12 | 1.3 | 3.6 | .7 | 1.6 |
| 15 | 12 | 115 | 3.3 | 19 | .7 | 4.6 | 1.7 | 12 | 2.4 | 21 |
| 16 | 14 | 62 | 2.4 | 12 | .5 | .4 | 1.5 | 17 | 1.8 | 10 |
| 17 | 13 | 50 | 2.8 | 12 | .2 | .2 | .7 | 6.8 | 2.2 | 12 |
| 18 | 11 | 32 | 3.1 | 41 | .6 | 2.8 | 1.0 | 4.8 | 3.3 | 16 |
| 19 | 12 | 27 | 2.7 | 24 | .2 | .1 | 2.2 | 16 | 3.1 | 26 |
| 20 | 9.2 | 23 | 3.7 | 37 | .7 | 1.0 | 1.2 | 8.7 | 3.1 | 26 |
| 21 | 9.5 | 48 | 3.7 | 43 | 1.5 | 3.7 | 1.5 | 7.2 | 2.9 | 25 |
| 22 | 9.8 | 26 | 3.3 | 21 | 1.0 | 1.3 | 1.0 | 3.2 | 2.0 | 21 |
| 23 | 5.2 | 55 | 4.1 | 11 | .5 | .5 | 1.2 | 4.9 | 2.2 | 28 |
| 24 | 6.5 | 118 | 3.9 | 28 | .4 | .4 | 1.2 | 13 | 3.5 | 23 |
| 25 | 6.5 | 25 | 2.7 | 32 | .3 | 1.0 | 1.8 | 26 | 3.1 | 22 |
| 26 | 7.8 | 49 | 3.1 | 13 | .3 | .4 | 1.2 | 14 | 3.3 | 19 |
| 27 | 6.5 | 43 | 4.3 | 17 | .4 | .2 | 1.2 | 7.9 | 2.5 | 17 |
| 28 | 4.9 | 17 | 2.7 | 14 | .3 | .4 | 1.5 | 7.2 | 2.7 | 28 |
| 29 | 5.8 | 25 | 3.5 | 13 | .4 | .9 | 1.5 | 16 | 2.2 | 27 |
| 30 | 4.7 | 25 | 1.7 | 3.8 | .4 | 1.7 | 1.5 | 16 | 2.5 | 32 |
| 31 | | | 2.8 | 8.7 | .2 | .5 | | | 2.5 | 24 |
| Total | | 1,707 | | 614.9 | | 104.0 | | 214.6 | | 701.3 |

**ELK CREEK NEAR IDAHO CITY, IDAHO—Continued**

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 2.9 | 15 | 4.5 | 5.8 | 11 | 27 | 8.0 | 40 |
| 2 | 1.3 | 7.5 | 5.2 | 7.2 | 20 | 66 | 8.0 | 22 |
| 3 | 1.7 | 13 | 4.5 | 11 | 18 | 31 | 8.1 | 22 |
| 4 | 2.0 | 5.7 | 5.6 | 10 | 14 | 22 | 8.1 | 27 |
| 5 | 1.7 | 3.8 | 4.1 | 15 | 12 | 16 | | |
| 6 | 1.3 | 6.1 | 3.7 | 17 | 7.0 | 5.0 | | |
| 7 | 1.7 | 10 | 4.3 | 18 | 8.0 | 8.2 | | |
| 8 | 1.3 | 1.8 | 5.6 | 44 | 11 | 8.6 | | |
| 9 | 1.8 | 2.8 | 8.1 | 79 | 9.5 | 14 | | |
| 10 | 2.0 | 4.1 | 8.5 | 42 | 9.5 | 22 | | |
| 11 | 3.1 | 19 | 9.5 | 38 | 9.5 | 8.2 | | |
| 12 | 5.4 | 37 | 7.6 | 52 | 8.7 | 9.8 | | |
| 13 | 3.3 | 18 | 5.4 | 38 | 8.0 | 3.6 | | |
| 14 | 3.9 | 5.1 | 5.2 | 26 | 7.5 | 2.5 | | |
| 15 | 2.7 | 3.6 | 5.6 | 50 | 7.5 | 3.2 | | |
| 16 | 3.6 | 12 | 8.4 | 41 | 7.6 | 3.1 | | |
| 17 | 7.3 | 27 | 11 | 36 | 9.8 | 4.4 | | |
| 18 | 5.8 | 26 | 7.0 | 31 | 8.0 | 2.9 | | |
| 19 | 4.3 | 34 | 6.3 | 26 | 7.0 | 2.7 | | |
| 20 | 6.1 | 29 | 5.2 | 12 | 7.6 | 2.6 | | |
| 21 | 4.5 | 12 | 4.3 | 21 | 6.8 | 2.7 | | |
| 22 | 4.5 | 9.5 | 4.5 | 6.9 | 7.3 | 3.8 | | |
| 23 | 5.2 | 8.9 | 8.1 | 9.6 | 7.3 | 6.2 | | |
| 24 | 4.7 | 6.8 | 7.0 | 16 | 6.3 | 6.0 | | |
| 25 | 5.2 | 11 | 5.5 | 4.8 | 6.8 | 5.1 | | |
| 26 | 4.7 | 4.7 | 7.3 | 9.9 | 7.8 | 8.9 | | |
| 27 | 3.9 | 4.7 | 9.0 | 12 | 7.9 | 13 | | |
| 28 | 2.5 | 1.9 | 7.6 | 6.6 | 8.4 | 17 | | |
| 29 | 3.6 | 4.1 | 11 | 15 | 8.0 | 18 | | |
| 30 | 5.6 | 11 | 8.4 | 13 | 8.0 | 9.2 | | |
| 31 | | | 11 | 22 | 8.0 | 12 | | |
| Total | | 355.1 | | 735.8 | | 364.7 | | 111 |

**GOLD HILL PLACER DIVERSION FROM ELK CREEK NEAR IDAHO CITY, IDAHO**

*Discharge, in second-feet, April 1939 to February 1940*

| Day | April 1939 | May 1939 | June 1939 | July 1939 | August 1939 | September 1939 | October 1939 | November 1939 | December 1939 | January 1940 | February 1940 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 12 | 19 | 7.8 | 3.9 | 4.2 | 6.0 | | | | |
| 2 | 0 | 12 | 18 | 7.6 | 5.1 | 4.6 | 6.8 | 5.0 | -------- | -------- | -------- |
| 3 | 0 | 14 | 18 | 8.0 | 4.9 | 4.7 | 7.0 | | | | |
| 4 | 0 | 17 | 17 | 8.4 | 4.9 | 4.2 | 7.2 | 4.7 | -------- | -------- | -------- |
| 5 | 0 | 11 | 17 | 8.4 | 4.6 | 4.4 | 7.4 | | | | |
| 6 | 0 | 4.6 | 14 | 8.0 | 4.9 | 4.6 | 7.6 | 5.0 | -------- | -------- | -------- |
| 7 | 0 | 13 | 7.6 | 7.2 | 4.4 | 4.2 | 6.0 | | | | |
| 8 | 0 | 17 | 7.2 | 7.0 | 4.6 | 4.2 | 5.5 | | | | |
| 9 | 0 | 19 | 8.4 | 6.8 | 4.7 | 4.2 | 5.5 | 5.1 | -------- | -------- | -------- |
| 10 | 0 | 15 | 8.0 | 5.5 | 4.6 | 4.4 | 5.5 | 5.0 | -------- | -------- | -------- |
| 11 | 0 | 11 | 7.8 | 6.6 | 4.6 | 4.2 | 5.7 | 4.9 | -------- | -------- | -------- |
| 12 | 0 | 24 | 7.8 | 7.2 | 4.6 | 7.6 | 5.7 | 4.8 | -------- | -------- | -------- |
| 13 | 0 | 26 | 8.0 | 7.0 | 4.6 | 7.6 | 5.7 | 4.7 | -------- | -------- | -------- |
| 14 | 0 | 27 | 7.6 | 7.0 | 4.6 | 6.0 | 5.7 | 4.7 | -------- | -------- | -------- |
| 15 | 0 | 9.1 | 7.8 | 6.2 | 3.9 | 5.7 | 5.5 | 4.7 | -------- | -------- | -------- |
| 16 | 0 | 9.3 | 8.0 | 2.2 | 3.9 | 5.3 | 5.7 | 2.7 | -------- | -------- | -------- |
| 17 | 0 | 25 | 8.4 | 4.3 | 4.2 | 5.3 | | 0 | -------- | -------- | -------- |
| 18 | 0 | 25 | 8.2 | 6.0 | 4.0 | 4.7 | | 0 | -------- | -------- | -------- |
| 19 | 0 | 26 | 9.2 | 5.8 | 4.2 | 4.9 | | 0 | -------- | -------- | -------- |
| 20 | 0 | 24 | 8.4 | 6.2 | 4.4 | | | 0 | -------- | -------- | -------- |
| 21 | 0 | 23 | 7.6 | 5.8 | 4.0 | | 5.5 | 0 | -------- | -------- | -------- |
| 22 | 0 | 23 | 7.2 | 6.4 | 3.7 | | | 0 | -------- | -------- | -------- |
| 23 | 0 | 22 | 6.8 | 6.0 | 4.2 | | | 0 | -------- | -------- | -------- |
| 24 | 0 | 22 | 6.8 | 6.0 | 4.2 | | | 0 | -------- | -------- | -------- |
| 25 | 0 | 21 | 6.8 | 6.0 | 4.7 | 5.0 | | 0 | -------- | -------- | -------- |
| 26 | 0 | 20 | 6.0 | 4.7 | 4.6 | | | 0 | -------- | -------- | -------- |
| 27 | 0 | 20 | 6.0 | 2.8 | 4.6 | | | 0 | -------- | -------- | -------- |
| 28 | 5.0 | 19 | 5.5 | 2.9 | 4.2 | | 6.0 | 0 | -------- | -------- | -------- |
| 29 | 11 | 20 | 8.0 | 2.8 | 4.4 | | | 0 | -------- | -------- | -------- |
| 30 | 11 | 20 | 8.0 | 3.2 | 4.2 | | | 0 | -------- | -------- | -------- |
| 31 | -------- | 19 | -------- | 2.9 | 4.2 | -------- | 5.5 | -------- | -------- | -------- | -------- |

NOTE.—No flow December 1939 to February 1940.

**GOLD HILL PLACER DIVERSION RETURN FLOW TO ELK CREEK NEAR IDAHO CITY, IDAHO**

*Discharge, in second-feet, May 1939 to February 1940*

| Day | May 1939 | June 1939 | July 1939 | August 1939 | September 1939 | October 1939 | November 1939 | December 1939 | January 1940 | February 1940 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 1.0 | 0 | -------- | -------- | 0 | | | | |
| 2 | 0 | 1.0 | 0 | -------- | -------- | 0 | | | | |
| 3 | 0 | 2.2 | .6 | -------- | -------- | 0 | | | | |
| 4 | 0 | 1.8 | 1.2 | -------- | -------- | 0 | | | | |
| 5 | 0 | 2.4 | 0 | -------- | -------- | 0 | | | | |
| 6 | 0 | 2.2 | 0 | -------- | -------- | 0 | | | | |
| 7 | 0 | 0 | 0 | -------- | -------- | 0 | | | | |
| 8 | 0 | 0 | 0 | -------- | -------- | 0 | 2.5 | -------- | -------- | -------- |
| 9 | 0 | 0 | 0 | -------- | -------- | 0 | | | | |
| 10 | 0 | 0 | 0 | -------- | -------- | 0 | | | | |
| 11 | 0 | 0 | 0 | -------- | -------- | 0 | | | | |
| 12 | 0 | 1.5 | 0 | -------- | -------- | 0 | | | | |
| 13 | 0 | 1.4 | 0 | -------- | -------- | 0 | | | | |
| 14 | 0 | 1.6 | 0 | -------- | -------- | 0 | | | | |
| 15 | 0 | 1.4 | 0 | -------- | -------- | | | | | |
| 16 | 0 | 1.3 | 0 | -------- | -------- | | 1.0 | -------- | -------- | -------- |
| 17 | 0 | 1.5 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 18 | 0 | 1.6 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 19 | 0 | 1.6 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 20 | 0 | 1.7 | 0 | -------- | -------- | 2.5 | 0 | -------- | -------- | -------- |
| 21 | 0 | 1.8 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 22 | 0 | 1.6 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 23 | 0 | 0 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 24 | .1 | 1.5 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 25 | 1.5 | 1.4 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 26 | 1.4 | 1.2 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 27 | 1.6 | 1.8 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 28 | 1.8 | 1.1 | 0 | -------- | -------- | 3.0 | 0 | -------- | -------- | -------- |
| 29 | 1.8 | 2.2 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 30 | 0 | 1.1 | 0 | -------- | -------- | | 0 | -------- | -------- | -------- |
| 31 | 1.4 | -------- | 0 | -------- | -------- | | -------- | -------- | -------- | -------- |

NOTE.—No flow during August, September, and December 1939 and January and February 1940.

758529—48——8

## RUBOW DIVERSION NO. 2 FROM ELK CREEK NEAR IDAHO CITY, IDAHO

*Discharge, in second-feet, May 1939 to January 1940*

| Day | May 1939 | June 1939 | July 1939 | August 1939 | September 1939 | October 1939 | November 1939 | December 1939 | January 1940 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 0 | 3.8 | 2.2 | 0.2 | 0 | 0 | 0.7 | 0.6 |
| 2 | 0 | 0 | 5.2 | .2 | .2 | .2 | .6 | .7 | .2 |
| 3 | 0 | 0 | 3.5 | .4 | .2 | .1 | 0 | .9 | 0 |
| 4 | 0 | 0 | 4.4 | .8 | .2 | .6 | 0 | .7 | |
| 5 | 0 | 0 | 4.6 | .5 | .2 | .6 | .1 | .9 | 0 |
| 6 | 0 | 0 | 3.8 | .3 | .2 | 1.5 | .1 | .7 | 0 |
| 7 | 0 | 0 | 2.3 | .3 | .2 | 1.9 | .2 | 1.0 | 0 |
| 8 | 0 | 0 | .4 | .3 | .2 | .9 | .7 | 1.2 | 0 |
| 9 | 0 | 0 | .7 | .2 | .2 | .4 | .3 | 2.2 | 0 |
| 10 | 0 | 0 | 1.1 | .4 | .2 | .1 | .1 | 2.3 | 0 |
| 11 | 0 | 0 | .8 | .4 | .2 | .3 | 1.5 | 2.0 | 0 |
| 12 | 2.0 | 0 | .2 | 1.1 | .1 | .3 | .3 | 1.2 | 0 |
| 13 | 2.0 | 2.3 | .4 | .8 | .1 | .4 | .3 | 1.2 | 0 |
| 14 | 2.0 | 3.1 | .5 | .2 | 0 | .4 | .4 | 1.2 | 0 |
| 15 | 0 | 3.5 | .4 | .6 | 1.4 | 0 | .2 | 2.2 | 0 |
| 16 | 0 | 3.5 | .2 | .4 | 1.4 | .1 | 1.5 | 2.7 | 0 |
| 17 | 0 | 4.0 | 0 | .4 | 1.4 | 0 | 0 | 3.3 | 0 |
| 18 | 0 | 2.3 | 1.9 | .3 | .5 | 0 | 0 | 2.3 | 0 |
| 19 | 0 | 4.6 | 1.3 | .4 | 0 | 0 | 1.0 | 2.3 | 0 |
| 20 | 0 | 3.4 | .8 | .4 | 0 | .2 | 1.0 | 3.6 | 0 |
| 21 | 0 | 2.2 | .8 | .5 | .6 | .4 | .9 | 4.2 | 0 |
| 22 | .2 | 2.5 | .8 | .8 | .5 | .4 | 2.0 | 2.2 | 0 |
| 23 | .2 | .8 | .7 | 1.7 | .6 | .5 | .9 | 2.3 | 0 |
| 24 | .1 | .8 | .7 | .2 | .2 | 0 | 1.0 | .8 | 0 |
| 25 | 0 | .9 | 3.3 | .2 | .3 | .7 | 1.3 | 0 | 0 |
| 26 | 0 | .8 | 2.5 | .2 | 0 | 0 | 1.2 | 0 | 0 |
| 27 | .1 | .5 | .6 | .2 | .2 | .2 | 3.3 | 0 | 0 |
| 28 | .3 | .3 | 1.6 | .2 | .2 | .6 | 3.5 | 0 | 0 |
| 29 | .2 | 0 | 1.6 | .2 | 0 | .6 | 2.1 | 0 | 0 |
| 30 | .2 | .7 | 2.3 | .2 | 0 | .2 | .9 | 0 | 0 |
| 31 | .2 | ------- | 2.2 | .3 | ------- | .9 | ------- | 0 | 0 |

## RUBOW DIVERSION NO. 3 FROM ELK CREEK NEAR IDAHO CITY, IDAHO

*Discharge, in second-feet, March 1939 to February 1940*

| Day | March 1939 | April 1939 | May 1939 | June 1939 | July 1939 | August 1939 | September 1939 | October 1939 | November 1939 | December 1939 | January 1940 | February 1940 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | | 5.0 | 4.7 | 4.2 | 0.8 | 2.4 | 3.0 | 2.9 | 0 | ------ | ------ |
| 2 | 0 | | 5.0 | 4.4 | 4.2 | .7 | 2.7 | 3.4 | 2.9 | 0 | ------ | ------ |
| 3 | 0 | | 5.0 | 4.4 | 4.2 | .7 | 2.4 | 3.3 | 3.0 | 0 | ------ | ------ |
| 4 | 0 | | 5.0 | 5.0 | 4.5 | 2.0 | 2.6 | 3.2 | 3.0 | 0 | ------ | ------ |
| 5 | 0 | | 6.0 | 5.0 | 4.4 | 1.9 | 2.4 | 3.4 | 2.8 | 0 | ------ | ------ |
| 6 | 0 | | 6.0 | 4.7 | 4.2 | 2.2 | 2.6 | 3.4 | 2.9 | .6 | ------ | ------ |
| 7 | 0 | | 6.1 | 6.1 | 4.2 | 1.9 | 2.7 | 3.4 | 2.9 | 0 | ------ | ------ |
| 8 | 0 | | 6.3 | 5.9 | 4.0 | 1.9 | 2.6 | 3.2 | 2.9 | 0 | ------ | ------ |
| 9 | 0 | | 5.5 | 5.7 | 4.2 | 2.2 | 2.6 | 3.0 | 3.4 | 0 | ------ | ------ |
| 10 | 0 | | 5.7 | 5.7 | 4.2 | 2.4 | 2.6 | 3.0 | 2.3 | 0 | ------ | ------ |
| 11 | 0 | | 5.2 | 5.7 | 4.2 | 1.0 | 2.6 | 2.9 | 0 | 0 | ------ | ------ |
| 12 | 0 | | 4.8 | 5.4 | 3.3 | .9 | 3.9 | 2.9 | 0 | 0 | ------ | ------ |
| 13 | 0 | | 5.0 | 0 | 3.0 | .9 | 4.8 | 2.8 | 0 | 0 | ------ | ------ |
| 14 | 0 | | 5.0 | 0 | 2.9 | .9 | 3.4 | 3.0 | 0 | 0 | ------ | ------ |
| 15 | 0 | | 6.4 | 0 | 2.8 | 1.4 | 2.8 | 2.9 | 0 | 0 | ------ | ------ |
| 16 | 0 | 5 | 5.4 | 0 | 5.0 | 2.6 | 2.8 | 3.0 | 0 | 0 | ------ | ------ |
| 17 | 0 | | 3.7 | 0 | 2.6 | 2.9 | 2.8 | 2.9 | 0 | 0 | ------ | ------ |
| 18 | 0 | | 3.6 | 0 | .8 | 2.4 | 2.6 | 3.2 | 0 | 0 | ------ | ------ |
| 19 | 0 | | 3.3 | 0 | .8 | 2.7 | 2.7 | 2.8 | 0 | 0 | ------ | ------ |
| 20 | | | 4.2 | 0 | .8 | 2.9 | 2.7 | 2.7 | 0 | 0 | ------ | ------ |
| 21 | | | 4.7 | 0 | .7 | 2.9 | 2.7 | 2.7 | 0 | 0 | ------ | ------ |
| 22 | | | 5.5 | 0 | .8 | 2.4 | 2.7 | 2.7 | 0 | 0 | ------ | ------ |
| 23 | | | 5.4 | 4.8 | .8 | 2.9 | 2.7 | 2.7 | 0 | 0 | ------ | ------ |
| 24 | | | 4.7 | 4.8 | .8 | 2.8 | 2.8 | 2.9 | 0 | 0 | ------ | ------ |
| 25 | | | 4.7 | 4.8 | .8 | 2.9 | 2.8 | 3.2 | 0 | 0 | ------ | ------ |
| 26 | 5 | | 4.8 | 3.2 | .8 | 2.8 | 2.9 | 2.4 | 0 | 0 | ------ | ------ |
| 27 | | | 5.0 | 4.8 | .8 | 2.8 | 2.7 | 3.7 | 0 | 0 | ------ | ------ |
| 28 | | | 5.0 | 4.8 | .8 | 2.8 | 2.7 | 4.0 | 0 | 0 | ------ | ------ |
| 29 | | | 5.0 | 4.4 | .8 | 2.7 | 2.8 | 3.3 | 0 | 0 | ------ | ------ |
| 30 | | | 5.0 | 4.4 | .8 | 2.6 | 2.9 | 3.0 | 0 | 0 | ------ | ------ |
| 31 | | ------ | 4.8 | ------ | .8 | 2.0 | ------ | 2.9 | ------ | 0 | ------ | ------ |

NOTE.—No flow January and February 1940.

## ELK CREEK ABOVE GOLD HILL PLACER DIVERSION NEAR IDAHO CITY, IDAHO

*Discharge and total sediment loads, February to June 1940*

| Day | February 1940 | | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | | | 16 | 2.9 | 58 | 88 | 41 | 17 | 32 | 18 |
| 2 | | | 14 | 1.0 | 51 | 27 | 45 | 28 | 31 | 8.2 |
| 3 | | | 13 | 1.2 | 45 | 28 | 51 | 18 | 30 | 7.9 |
| 4 | 6.9 | 0.2 | 12 | .9 | 41 | 22 | 50 | 24 | 29 | 6.2 |
| 5 | 6.7 | .04 | 12 | .6 | 41 | 17 | 45 | 10 | 28 | 11 |
| 6 | 7.4 | 1.1 | 11 | .7 | 39 | 14 | 44 | 13 | 25 | 8.8 |
| 7 | 7.4 | .1 | 11 | .7 | 38 | 16 | 45 | 8.0 | 25 | 8.2 |
| 8 | 7.2 | .06 | 19 | 5.1 | 39 | 17 | 44 | 18 | 24 | 7.4 |
| 9 | 6.9 | .2 | 17 | 3.2 | 42 | 26 | 46 | 15 | 22 | 2.4 |
| 10 | 7.7 | 2. | 15 | 1.3 | 41 | 21 | 53 | 53 | 21 | 3.8 |
| 11 | 7.1 | .3 | 14 | 1.9 | 42 | 27 | 61 | 78 | 20 | 2.0 |
| 12 | 7.0 | .2 | 13 | 5.5 | 45 | 52 | 65 | 71 | 19 | 2.6 |
| 13 | 8.0 | .3 | 12 | 2.6 | 55 | 76 | 63 | 49 | 19 | 3.0 |
| 14 | 7.4 | .2 | 12 | 1.7 | 70 | 122 | 58 | 38 | 18 | 1.7 |
| 15 | 6.9 | .4 | 12 | 1.2 | 69 | 114 | 56 | 41 | 17 | 1.1 |
| 16 | 6.5 | .3 | 13 | 2.1 | 61 | 78 | 52 | 31 | 16 | .6 |
| 17 | 6.9 | .4 | 14 | 2.2 | 58 | 38 | 51 | 20 | 15 | 1.7 |
| 18 | 6.5 | .2 | 15 | 2.6 | 60 | 43 | 46 | 15 | 14 | .9 |
| 19 | 6.0 | .06 | 16 | 2.8 | 65 | 69 | 45 | 9.8 | 14 | 1.2 |
| 20 | 5.5 | .1 | 19 | 8.1 | 63 | 68 | 44 | 19 | 13 | .9 |
| 21 | 6.0 | .1 | 22 | 12 | 57 | 61 | 42 | 21 | 12 | .9 |
| 22 | 6.5 | .05 | 26 | 16 | 56 | 46 | 41 | 32 | 12 | .8 |
| 23 | 6.2 | .1 | 32 | 27 | 53 | 20 | 41 | 23 | 11 | .4 |
| 24 | 6.5 | .2 | 35 | 15 | 49 | 18 | 41 | 13 | 11 | .3 |
| 25 | 7.7 | .4 | 61 | 99 | 48 | 15 | 42 | 12 | 11 | .5 |
| 26 | 9.4 | 2.0 | 74 | 108 | 50 | 18 | 41 | 22 | 11 | .4 |
| 27 | 14 | 7.2 | 95 | 180 | 53 | 33 | 38 | 33 | 10 | .5 |
| 28 | 22 | 12 | 62 | 39 | 49 | 26 | 36 | 23 | 9.8 | .4 |
| 29 | 21 | 3.5 | 48 | 24 | 45 | 13 | 36 | 29 | 9.3 | .4 |
| 30 | | | 48 | 32 | 42 | 12 | 34 | 9.2 | 9.3 | .3 |
| 31 | | | 65 | 61 | | | 33 | 18 | | |
| Total | | 29.91 | | 661.3 | | 1,225 | | 811.0 | | 102.5 |

## NEW YORK CANAL NEAR BARBER, IDAHO

*Discharge and suspended sediment loads, February 1939 to February 1940*

| Day | February 1939 | | March 1939 | | April 1939 | | May 1939 | | June 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 0 | 0 | 1,210 | 131 | 1,330 | 1,020 | 2,790 | 572 | 2,030 | 132 |
| 2 | 0 | 0 | 1,240 | 117 | 1,320 | 684 | 2,840 | 529 | 1,810 | 73 |
| 3 | 0 | 0 | 1,240 | 164 | 1,320 | 584 | 2,830 | 451 | 1,530 | 66 |
| 4 | 0 | 0 | 1,240 | 174 | 1,430 | 764 | 2,840 | 575 | 1,300 | 60 |
| 5 | 0 | 0 | 1,220 | 86 | 1,630 | 651 | 2,860 | 456 | 1,280 | 76 |
| 6 | 0 | 0 | 1,220 | 132 | 1,760 | 646 | 2,860 | 324 | 1,260 | 48 |
| 7 | 0 | 0 | 1,230 | 86 | 1,800 | 423 | 2,850 | 416 | 1,210 | 49 |
| 8 | 0 | 0 | 1,230 | 166 | 1,870 | 475 | 2,840 | 391 | 1,190 | 51 |
| 9 | 0 | 0 | 1,400 | 280 | 2,030 | 696 | 2,810 | 258 | 1,200 | 58 |
| 10 | 0 | 0 | 1,430 | 328 | 2,140 | 589 | 2,800 | 219 | 1,190 | 84 |
| 11 | 0 | 0 | 1,380 | 320 | 2,240 | 689 | 2,800 | 219 | 1,150 | 71 |
| 12 | 0 | 0 | 1,320 | 356 | 2,320 | 595 | 2,780 | 180 | 1,200 | 58 |
| 13 | 0 | 0 | 1,280 | 411 | 2,320 | 514 | 2,760 | 238 | 1,300 | 67 |
| 14 | 0 | 0 | 1,170 | 322 | 2,340 | 449 | 2,760 | 246 | 1,340 | 58 |
| 15 | 0 | 0 | 1,160 | 351 | 2,400 | 661 | 2,740 | 178 | 1,470 | 56 |
| 16 | 0 | 0 | 1,260 | 459 | 2,480 | 623 | 2,720 | 213 | 1,450 | 51 |
| 17 | 0 | 0 | 1,280 | 546 | 2,560 | 574 | 2,720 | 176 | 1,360 | 59 |
| 18 | 130 | 18 | 1,200 | 797 | 2,640 | 727 | 2,740 | 170 | 1,260 | 41 |
| 19 | 360 | 51 | 1,160 | 1,100 | 2,700 | 700 | 2,720 | 206 | 1,200 | 42 |
| 20 | 430 | 109 | 731 | 928 | 2,700 | 663 | 2,720 | 198 | 1,200 | 55 |
| 21 | 560 | 91 | 0 | 0 | 2,700 | 569 | 2,620 | 241 | 1,220 | 53 |
| 22 | 560 | 51 | 0 | 0 | 2,720 | 573 | 2,240 | 139 | 1,340 | 51 |
| 23 | 683 | 94 | 0 | 0 | 2,750 | 446 | 2,220 | 126 | 1,440 | 78 |
| 24 | 883 | 114 | 0 | 0 | 2,750 | 453 | 2,140 | 162 | 1,520 | 49 |
| 25 | 1,030 | 156 | 0 | 0 | 2,720 | 514 | 2,030 | 115 | 1,600 | 56 |
| 26 | 1,110 | 96 | 0 | 0 | 2,680 | 441 | 1,800 | 136 | 1,630 | 172 |
| 27 | 1,170 | 95 | 140 | 113 | 2,660 | 373 | 1,600 | 99 | 1,630 | 114 |
| 28 | 1,230 | 96 | 700 | 575 | 2,680 | 376 | 1,540 | 100 | 1,690 | 59 |
| 29 | | | 1,070 | 719 | 2,740 | 399 | 1,560 | 93 | 1,770 | 48 |
| 30 | | | 1,110 | 617 | 2,780 | 570 | 1,750 | 104 | 1,780 | 48 |
| 31 | | | 1,260 | 1,330 | | | 2,010 | 136 | | |
| Total | | 971 | | 10,608 | | 17,441 | | 7,666 | | 1,983 |

| Day | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 1,780 | 58 | 1,250 | 51 | 0 | 0 | 920 | 79 |
| 2 | 1,740 | 47 | 1,260 | 20 | 0 | 0 | 0 | 0 |
| 3 | 1,680 | 36 | 1,290 | 28 | 0 | 0 | 0 | 0 |
| 4 | 1,670 | 36 | 1,280 | 14 | 0 | 0 | 0 | 0 |
| 5 | 1,610 | 48 | 1,230 | 10 | 0 | 0 | 0 | 0 |
| 6 | 1,520 | 53 | 1,230 | 23 | 0 | 0 | 0 | 0 |
| 7 | 1,530 | 41 | 1,220 | 16 | 272 | 9.5 | 0 | 0 |
| 8 | 1,540 | 33 | 1,220 | 16 | 933 | 27 | 0 | 0 |
| 9 | 1,530 | 25 | 1,240 | 17 | 1,270 | 55 | 0 | 0 |
| 10 | 1,580 | 34 | 1,320 | 21 | 1,230 | 46 | 0 | 0 |
| 11 | 1,630 | 35 | 1,330 | 22 | 1,390 | 75 | 0 | 0 |
| 12 | 1,620 | 44 | 1,300 | 21 | 1,330 | 54 | 0 | 0 |
| 13 | 1,640 | 44 | 1,340 | 14 | 1,190 | 61 | 0 | 0 |
| 14 | 1,650 | 31 | 1,360 | 18 | 1,250 | 78 | 0 | 0 |
| 15 | 1,580 | 26 | 1,370 | 15 | 1,120 | 115 | 0 | 0 |
| 16 | 1,540 | 25 | 1,360 | 37 | 786 | 74 | 0 | 0 |
| 17 | 1,570 | 34 | 1,340 | 25 | 0 | 0 | 0 | 0 |
| 18 | 1,580 | 38 | 1,290 | 28 | 0 | 0 | 0 | 0 |
| 19 | 1,500 | 36 | 1,210 | 26 | 0 | 0 | 0 | 0 |
| 20 | 1,510 | 33 | 1,160 | 22 | 0 | 0 | 0 | 0 |
| 21 | 1,420 | 35 | 1,150 | 22 | 0 | 0 | 0 | 0 |
| 22 | 1,300 | 25 | 1,170 | 25 | 0 | 0 | 0 | 0 |
| 23 | 1,240 | 27 | 1,140 | 25 | 0 | 0 | 0 | 0 |
| 24 | 1,220 | 26 | 1,050 | 20 | 0 | 0 | 152 | 12 |
| 25 | 1,260 | 27 | 1,100 | 27 | 0 | 0 | 732 | 59 |
| 26 | 1,270 | 31 | 1,130 | 24 | 67 | 1.1 | 998 | 84 |
| 27 | 1,280 | 28 | 1,160 | 16 | 521 | 28 | 1,190 | 145 |
| 28 | 1,280 | 21 | 1,340 | 14 | 883 | 41 | 1,370 | 141 |
| 29 | 1,250 | 27 | 1,430 | 19 | 942 | 46 | 1,400 | 155 |
| 30 | 1,260 | 20 | 1,180 | 13 | 1,010 | 65 | 1,280 | 97 |
| 31 | 1,260 | 34 | 0 | 0 | | | 1,180 | 76 |
| Total | | 1,058 | | 649 | | 775.6 | | 848 |

NEW YORK CANAL NEAR BARBER, IDAHO—Continued

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 752 | 238 | 1,130 | 79 | 0 | 0 | 0 | 0 |
| 2 | 0 | 0 | 1,140 | 68 | 0 | 0 | 0 | 0 |
| 3 | 0 | 0 | 1,110 | 69 | 0 | 0 | 0 | 0 |
| 4 | 0 | 0 | 1,110 | 120 | 83 | 45 | 0 | 0 |
| 5 | 0 | 0 | 1,120 | 73 | 147 | 112 | 0 | 0 |
| 6 | 0 | 0 | 1,120 | 112 | 158 | 118 | 0 | 0 |
| 7 | 0 | 0 | 1,130 | 92 | 92 | 46 | 144 | 78 |
| 8 | 0 | 0 | 1,120 | 91 | 0 | 0 | 230 | 124 |
| 9 | 0 | 0 | 1,150 | 106 | 0 | 0 | 445 | 329 |
| 10 | 0 | 0 | 1,180 | 277 | 37 | 29 | 741 | [1] 388 |
| 11 | 0 | 0 | 1,220 | 478 | 79 | 62 | 960 | 575 |
| 12 | 0 | 0 | 1,190 | 180 | 50 | 40 | 967 | 389 |
| 13 | 0 | 0 | 1,180 | 143 | 0 | 0 | 1,090 | 262 |
| 14 | 0 | 0 | 1,160 | 119 | 0 | 0 | 1,150 | 193 |
| 15 | 0 | 0 | 1,170 | 139 | 0 | 0 | 1,140 | 274 |
| 16 | 0 | 0 | 731 | 99 | 0 | 0 | 1,080 | 207 |
| 17 | 0 | 0 | 0 | 0 | 0 | 0 | 1,100 | 166 |
| 18 | 0 | 0 | 0 | 0 | 0 | 0 | 1,110 | 177 |
| 19 | 0 | 0 | 0 | 0 | 0 | 0 | 1,080 | 175 |
| 20 | 69 | 15 | 0 | 0 | 0 | 0 | 1,090 | 171 |
| 21 | 618 | 135 | 0 | 0 | 0 | 0 | 1,050 | 150 |
| 22 | 904 | 173 | 0 | 0 | 0 | 0 | 1,080 | 169 |
| 23 | 1,070 | 144 | 0 | 0 | 0 | 0 | 1,060 | 172 |
| 24 | 1,090 | 106 | 0 | 0 | 0 | 0 | 904 | 186 |
| 25 | 1,080 | 79 | 0 | 0 | 0 | 0 | 922 | 102 |
| 26 | 1,080 | 87 | 0 | 0 | 0 | 0 | 1,040 | 368 |
| 27 | 1,130 | 171 | 0 | 0 | 0 | 0 | 1,120 | 2,120 |
| 28 | 1,170 | 126 | 0 | 0 | 0 | 0 | 1,100 | 2,700 |
| 29 | 1,160 | 53 | 0 | 0 | 0 | 0 | 1,140 | 2,210 |
| 30 | 1,140 | 80 | 0 | 0 | 0 | 0 | | |
| 31 | | | 0 | 0 | 0 | 0 | | |
| Total | | 1,407 | | 2,245 | | 452 | | 11,685 |

[1] Total sediment loads reported on and after Feb. 10, 1940.

*Discharge and total sediment loads, March to June 1940*

| Date | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 1,020 | 1,100 | 1,290 | 1,930 | 2,160 | 420 | 2,700 | 233 |
| 2 | 819 | 559 | 1,370 | 1,240 | 2,180 | 542 | 2,700 | 182 |
| 3 | 699 | 464 | 1,280 | 2,180 | 2,140 | 624 | 2,700 | 190 |
| 4 | 611 | 317 | 1,170 | 1,300 | 2,190 | 461 | 2,700 | 233 |
| 5 | 624 | 377 | 960 | 632 | 2,320 | 564 | 2,710 | 241 |
| 6 | 750 | 397 | 818 | 314 | 2,420 | 425 | 2,710 | 176 |
| 7 | 816 | 372 | 900 | 301 | 2,520 | 544 | 2,700 | 248 |
| 8 | 1,030 | 526 | 762 | 193 | 2,600 | 576 | 2,710 | 220 |
| 9 | 1,040 | 764 | 603 | 166 | 2,640 | 606 | 2,400 | 201 |
| 10 | 960 | 490 | 674 | 206 | 2,670 | 591 | 2,040 | 149 |
| 11 | 914 | 415 | 869 | 291 | 2,660 | 589 | 1,840 | 99 |
| 12 | 946 | 347 | 1,060 | 544 | 2,680 | 760 | 1,900 | 118 |
| 13 | 998 | 340 | 988 | 494 | 2,680 | 832 | 2,110 | 131 |
| 14 | 1,050 | 312 | 928 | 398 | 2,640 | 627 | 2,360 | 115 |
| 15 | 1,040 | 323 | 984 | 361 | 2,640 | 456 | 2,180 | 106 |
| 16 | 1,050 | 309 | 1,040 | 309 | 2,620 | 651 | 1,940 | 84 |
| 17 | 661 | 209 | 1,200 | 337 | 2,610 | 479 | 1,960 | 116 |
| 18 | 0 | 0 | 1,390 | 342 | 2,580 | 404 | 1,960 | 116 |
| 19 | 0 | 0 | 1,600 | 449 | 2,560 | 415 | 1,960 | 85 |
| 20 | 0 | 0 | 1,810 | 489 | 2,570 | 319 | 1,990 | 81 |
| 21 | 0 | 0 | 2,000 | 432 | 2,560 | 484 | 2,020 | 71 |
| 22 | 0 | 0 | 2,180 | 559 | 2,560 | 498 | 1,980 | 86 |
| 23 | 293 | 171 | 2,320 | 601 | 2,520 | 422 | 1,960 | 74 |
| 24 | 671 | 328 | 2,420 | 745 | 2,520 | 306 | 1,950 | 79 |
| 25 | 822 | 635 | 2,520 | 803 | 2,600 | 281 | 1,960 | 90 |
| 26 | 1,260 | 2,700 | 2,580 | 906 | 2,620 | 269 | 2,020 | 71 |
| 27 | 1,520 | 12,200 | 2,640 | 1,080 | 2,630 | 213 | 2,010 | 76 |
| 28 | 1,600 | 4,030 | 2,560 | 968 | 2,620 | 332 | 2,000 | 140 |
| 29 | 1,480 | 2,120 | 2,320 | 802 | 2,640 | 299 | 1,950 | 121 |
| 30 | 1,340 | 1,180 | 2,220 | 569 | 2,660 | 294 | 1,930 | 83 |
| 31 | 1,320 | 1,270 | | | 2,680 | 174 | | |
| Total | | 32,255 | | 19,941 | | 14,457 | | 4,015 |

## COTTONWOOD GULCH AT BOISE, IDAHO

*Discharge and total sediment loads, January 1939 to June 1940*

| Day | January 1939 | | February 1939 | | March 1939 | | April 1939 | | May 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | -------- | -------- | 1.4 | 0.6 | 2.8 | 10 | 16 | 221 | 2.7 | 0.6 |
| 2 | -------- | -------- | 1.4 | .1 | 3.7 | 7.0 | 15 | 190 | 2.5 | .4 |
| 3 | -------- | -------- | 1.5 | .1 | 3.5 | 20 | 14 | 217 | 2.4 | .3 |
| 4 | -------- | -------- | 1.4 | .09 | 3.0 | 16 | 12 | 145 | 2.4 | .2 |
| 5 | -------- | -------- | 1.6 | .6 | 2.6 | 20 | 11 | 133 | 2.2 | .2 |
| 6 | -------- | -------- | 1.5 | .2 | 4.6 | 24 | 10 | 50 | 2.2 | .2 |
| 7 | -------- | -------- | 1.4 | .1 | 4.1 | 45 | 9.4 | 23 | 2.1 | .2 |
| 8 | -------- | -------- | 1.4 | .2 | 4.2 | 36 | 8.7 | 70 | 1.9 | .2 |
| 9 | -------- | -------- | 1.4 | .5 | 4.6 | 45 | 8.0 | 28 | 1.8 | .2 |
| 10 | -------- | -------- | 1.6 | .5 | 6.4 | 87 | 7.7 | 26 | 1.7 | .2 |
| 11 | -------- | -------- | 1.6 | .4 | 9.8 | 123 | 7.7 | 32 | 1.7 | .1 |
| 12 | -------- | -------- | 1.8 | .7 | 23 | 775 | 7.3 | 13 | 1.5 | .1 |
| 13 | -------- | -------- | 1.9 | .9 | 22 | 1,040 | 6.7 | 16 | 1.4 | .08 |
| 14 | -------- | -------- | 2.5 | 5.6 | 15 | 773 | 6.4 | 29 | 1.3 | .09 |
| 15 | -------- | -------- | 3.8 | 15 | 14 | 515 | 6.1 | 11 | 1.3 | .1 |
| 16 | -------- | -------- | 3.1 | 18 | 17 | 591 | 5.6 | 4.8 | 1.3 | .05 |
| 17 | -------- | -------- | 2.4 | 8.1 | 26 | 900 | 5.3 | 5.9 | 1.3 | .1 |
| 18 | -------- | -------- | 2.4 | 5.1 | 38 | 1,850 | 5.1 | 11 | 1.3 | .1 |
| 19 | -------- | -------- | 2.4 | 3.5 | 51 | 2,260 | 4.6 | 5.9 | 1.2 | .05 |
| 20 | -------- | -------- | 2.3 | 3.9 | 51 | 2,440 | 4.4 | 6.5 | 1.2 | .06 |
| 21 | -------- | -------- | 2.3 | 14 | 51 | 2,610 | 4.4 | 9.6 | 1.2 | .05 |
| 22 | -------- | -------- | 3.5 | 14 | 45 | 1,620 | 4.2 | 3.1 | 1.2 | .04 |
| 23 | -------- | -------- | 3.9 | 70 | 43 | 1,160 | 3.9 | 2.9 | 1.3 | .06 |
| 24 | -------- | -------- | 3.6 | 22 | 40 | 1,550 | 3.9 | 3.2 | 1.2 | .07 |
| 25 | 1.3 | -------- | 4.6 | 18 | 37 | 1,680 | 3.7 | 3.2 | 1.0 | .04 |
| 26 | 1.4 | -------- | 3.3 | 20 | 26 | 797 | 3.4 | 2.2 | .94 | .03 |
| 27 | 1.6 | 0.5 | 3.6 | 14 | 27 | 678 | 3.0 | 1.3 | .87 | .05 |
| 28 | 1.8 | .4 | 3.6 | 7.4 | 24 | 606 | 2.9 | 1.1 | .73 | .04 |
| 29 | 1.6 | .3 | -------- | -------- | 23 | 347 | 3.2 | .6 | .67 | .04 |
| 30 | 1.5 | .2 | -------- | -------- | 20 | 378 | 3.2 | .9 | .67 | .03 |
| 31 | .42 | .02 | -------- | -------- | 18 | 288 | -------- | -------- | .67 | .02 |
| Total | -------- | 1.42 | -------- | 243.59 | -------- | 23,291.0 | -------- | 1,266.2 | -------- | 4.00 |

| Day | June 1939 | | July 1939 | | August 1939 | | September 1939 | | October 1939 | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0.67 | 0.02 | 0.10 | 0.001 | 0.05 | 0.001 | 0.10 | 0.001 | 0.06 | 0.001 |
| 2 | .60 | .01 | .10 | .001 | .05 | .001 | .10 | .001 | .06 | .001 |
| 3 | .54 | .006 | .10 | .001 | .05 | .001 | .10 | .001 | .05 | 0 |
| 4 | .54 | .007 | .14 | .002 | .05 | .001 | .05 | .001 | .05 | 0 |
| 5 | .60 | .01 | .14 | .002 | .05 | .001 | .05 | .001 | .05 | 0 |
| 6 | .60 | .01 | .10 | .002 | .05 | 0 | .05 | .001 | .05 | 0 |
| 7 | .60 | .01 | .10 | .002 | .05 | 0 | .05 | .001 | .05 | 0 |
| 8 | .54 | .01 | .10 | .002 | .05 | 0 | .05 | .001 | .05 | 0 |
| 9 | .60 | .02 | .10 | .002 | .10 | 0 | .05 | .001 | .05 | 0 |
| 10 | .54 | .02 | .10 | .002 | .10 | 0 | .05 | .001 | .05 | 0 |
| 11 | .48 | .02 | .05 | .001 | .05 | 0 | .05 | .001 | .05 | 0 |
| 12 | .43 | .02 | .01 | 0 | .05 | 0 | .06 | .001 | .05 | 0 |
| 13 | .38 | .008 | .01 | 0 | .10 | .001 | .07 | .009 | .05 | 0 |
| 14 | .33 | .007 | .01 | 0 | .10 | .001 | .05 | .001 | .05 | 0 |
| 15 | .38 | .008 | .05 | .001 | .10 | .001 | .05 | .001 | .05 | 0 |
| 16 | .54 | .01 | .05 | .001 | .08 | .001 | .05 | .001 | .05 | 0 |
| 17 | .60 | .01 | .05 | .001 | .05 | 0 | .05 | .001 | .05 | 0 |
| 18 | .60 | .01 | .05 | .001 | .10 | .001 | .05 | .001 | .05 | 0 |
| 19 | .60 | .01 | .01 | 0 | .10 | .001 | .04 | 0 | .05 | 0 |
| 20 | .54 | .009 | .05 | .001 | .10 | .001 | .04 | 0 | .05 | 0 |
| 21 | .48 | .008 | .05 | .001 | .10 | .001 | .05 | 0 | .05 | 0 |
| 22 | .38 | .006 | .05 | .001 | .10 | .001 | .05 | 0 | .05 | 0 |
| 23 | .33 | .004 | .05 | .001 | .05 | 0 | .05 | 0 | .05 | 0 |
| 24 | .33 | .004 | .05 | .001 | .04 | 0 | .05 | 0 | .05 | 0 |
| 25 | .28 | .004 | .05 | 0 | .01 | 0 | .05 | 0 | .05 | 0 |
| 26 | .28 | .004 | .05 | 0 | .01 | 0 | .05 | 0 | .05 | 0 |
| 27 | .19 | .003 | .05 | 0 | .01 | 0 | .05 | 0 | .05 | 0 |
| 28 | .14 | .002 | .05 | 0 | .05 | 0 | .05 | 0 | .05 | 0 |
| 29 | .10 | .002 | .05 | .001 | .10 | .001 | .05 | .001 | .05 | 0 |
| 30 | .10 | .002 | .05 | .001 | .10 | .001 | .05 | .001 | .05 | 0 |
| 31 | -------- | -------- | .10 | .001 | .10 | .001 | -------- | -------- | .05 | 0 |
| Total | -------- | 0.274 | -------- | 0.030 | -------- | 0.017 | -------- | 0.028 | -------- | 0.002 |

COTTONWOOD GULCH AT BOISE, IDAHO—Continued

| Day | November 1939 | | December 1939 | | January 1940 | | February 1940 | |
|---|---|---|---|---|---|---|---|---|
| | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) | Discharge (second-feet) | Sediment loads (tons) |
| 1 | 0.05 | 0 | 0.57 | 0.002 | 1.6 | 0.07 | 1.8 | 0.1 |
| 2 | .05 | 0 | .57 | .002 | 2.2 | .6 | 1.8 | .1 |
| 3 | .05 | 0 | .57 | .002 | 3.6 | .3 | 2.0 | 1.3 |
| 4 | .05 | 0 | .64 | .002 | 3.4 | .8 | 2.9 | .5 |
| 5 | .05 | 0 | .68 | .002 | 2.6 | .04 | 2.5 | .4 |
| 6 | .11 | .001 | .68 | .004 | 2.0 | .03 | 3.7 | 2.7 |
| 7 | .13 | .001 | .68 | .009 | 1.6 | .009 | 4.0 | 1.0 |
| 8 | .05 | 0 | .71 | .006 | 1.7 | .009 | 3.7 | .6 |
| 9 | .08 | 0 | .87 | .06 | 2.3 | .4 | 3.6 | .4 |
| 10 | .11 | .001 | .91 | .1 | 2.2 | .06 | 4.6 | 5.9 |
| 11 | .11 | .001 | .95 | .1 | 1.8 | .02 | 5.1 | 2.0 |
| 12 | .11 | .001 | .91 | .007 | 1.6 | .04 | 4.4 | .5 |
| 13 | .11 | .001 | .87 | .007 | 1.2 | .04 | 4.4 | 1.0 |
| 14 | .12 | .001 | .79 | .006 | 1.4 | .04 | 5.5 | 7.3 |
| 15 | .12 | .001 | .75 | .006 | 1.2 | .04 | 5.1 | 2.3 |
| 16 | .12 | .001 | .83 | .01 | 1.1 | .03 | 4.4 | 2.1 |
| 17 | .12 | .001 | 1.1 | .02 | 1.1 | .02 | 4.4 | 2.2 |
| 18 | .12 | .001 | .95 | .02 | .87 | .02 | 4.6 | 3.2 |
| 19 | .13 | .001 | .91 | .01 | .83 | .03 | 4.3 | 1.7 |
| 20 | .13 | .001 | .95 | .01 | 1.0 | .04 | 4.2 | 13 |
| 21 | .13 | .001 | .91 | .01 | .95 | .04 | 4.1 | 4.6 |
| 22 | .15 | .001 | .95 | .01 | 1.0 | .03 | 5.0 | 9.7 |
| 23 | .23 | .001 | .91 | .01 | 1.0 | .02 | 6.0 | 9.7 |
| 24 | .38 | .002 | .87 | .01 | 1.1 | .02 | 7.0 | 18 |
| 25 | .40 | .002 | .68 | .009 | 1.1 | .02 | 11 | 64 |
| 26 | .46 | .002 | .68 | .009 | 2.2 | 2.5 | 15 | 96 |
| 27 | .54 | .003 | .71 | .01 | 2.9 | .5 | 26 | 291 |
| 28 | .57 | .009 | .75 | .01 | 2.4 | .1 | 34 | 673 |
| 29 | .57 | .002 | .79 | .01 | 2.2 | .1 | 31 | 884 |
| 30 | .54 | .001 | .87 | .05 | 2.0 | .1 | | |
| 31 | | | 1.1 | .09 | 1.9 | .09 | | |
| Total | | 0.037 | | 0.613 | | 6.158 | | 2,098.3 |

| Day | March 1940 | | April 1940 | | May 1940 | | June 1940 | |
|---|---|---|---|---|---|---|---|---|
| 1 | 23 | 676 | 35 | 1,160 | 5.2 | 22 | 0.84 | 0.04 |
| 2 | 20 | 774 | 34 | 809 | 4.8 | 8.8 | .92 | .05 |
| 3 | 19 | 488 | 27 | 1,180 | 4.6 | 7.5 | 92 | .05 |
| 4 | 16 | 364 | 24 | 982 | 4.4 | 3.2 | 1.2 | .05 |
| 5 | 15 | 178 | 26 | 878 | 4.1 | 1.0 | 1.0 | .03 |
| 6 | 13 | 87 | 20 | 553 | 3.9 | 1.9 | .94 | .02 |
| 7 | 12 | 82 | 19 | 436 | 3.6 | 1.1 | .94 | .02 |
| 8 | 12 | 65 | 18 | 296 | 3.2 | .6 | .94 | .02 |
| 9 | 12 | 53 | 20 | 279 | 3.0 | .4 | .76 | .01 |
| 10 | 12 | 44 | 16 | 318 | 2.6 | .4 | .61 | .005 |
| 11 | 11 | 48 | 16 | 296 | 2.5 | .3 | .48 | .005 |
| 12 | 11 | 39 | 15 | 149 | 2.4 | .2 | .35 | .004 |
| 13 | 10 | 27 | 15 | 186 | 2.5 | .2 | .30 | .003 |
| 14 | 9.6 | 11 | 14 | 259 | 2.2 | .1 | .30 | .003 |
| 15 | 9.3 | 15 | 14 | 110 | 2.3 | .1 | .22 | .003 |
| 16 | 9.3 | 5.0 | 12 | 134 | 2.2 | .1 | .18 | .002 |
| 17 | 8.9 | 39 | 11 | 100 | 2.1 | .2 | .15 | .002 |
| 18 | 8.6 | 22 | 10 | 51 | 1.9 | .1 | .13 | .002 |
| 19 | 8.6 | 22 | 9.3 | 39 | 1.8 | .1 | .11 | .001 |
| 20 | 8.2 | 14 | 8.9 | 28 | 1.7 | .2 | .11 | 0 |
| 21 | 7.9 | 9.4 | 7.9 | 10 | 1.6 | .2 | .10 | 0 |
| 22 | 7.9 | 4.8 | 7.3 | 5.2 | 1.5 | .1 | .10 | 0 |
| 23 | 7.6 | 3.9 | 6.4 | 4.8 | 1.3 | .1 | .10 | 0 |
| 24 | 7.3 | 5.6 | 6.2 | 4.9 | 1.2 | .08 | .09 | 0 |
| 25 | 8.6 | 11 | 6.2 | 3.8 | 1.2 | .06 | .09 | 0 |
| 26 | 11 | 31 | 6.2 | 2.6 | 1.2 | .06 | .09 | .004 |
| 27 | 12 | 38 | 7.0 | 3.2 | 1.2 | .06 | .09 | .004 |
| 28 | 11 | 52 | 7.9 | 79 | 1.2 | .04 | .09 | .004 |
| 29 | 11 | 46 | 7.9 | 32 | 1.1 | .06 | .09 | .004 |
| 30 | 12 | 74 | 6.2 | 15 | .92 | .05 | .09 | .004 |
| 31 | 30 | 1,130 | | | .84 | .04 | | |
| Total | | 4,458.7 | | 8,403.5 | | 49.35 | | 0.340 |

## SIZE ANALYSES OF SEDIMENTS

Results of size analyses of a large number of samples of suspended and deposited sediments are given in the following tables. A description of the method of analysis is given on page 24.

*Size analyses of suspended sediment*

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Boise River near Twin Springs, Idaho [2]** | | | | | | | | | | | | | | | |
| | | | *Point samples 0.2 ft. above bottom* | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| May 11 | 2:10 p. m. | 2,630 | A | 690 | | | | 1.0 | 0.7 | 2.6 | 95.7 | | | | |
| | | | B | 279 | | | | .7 | 1.7 | 3.5 | 94.1 | | | | |
| | | | C | 52 | | | | 20.4 | 12.0 | 12.0 | 55.6 | | | | |
| | | | D | 48 | | | | 19.9 | 5.7 | 0 | 74.4 | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 411 | | | | 1.5 | 1.1 | 3.5 | 93.9 | | | | |
| | | | B | 3,310 | | | | .3 | .3 | 2.6 | 96.8 | | | | |
| | | | C | 202 | | | | 3.4 | 1.1 | 2.2 | 93.3 | | | | |
| | | | D | 63 | | | | 13.4 | 5.7 | 19.7 | 61.2 | | | | |
| May 18 | 12 m. | 2,690 | A | 388 | | | | 2.7 | 1.2 | 5.3 | 90.8 | | | | |
| | | | B | 93 | | | | 12.8 | 4.5 | 8.5 | 74.2 | | | | |
| | | | C | 96 | | | | 14.6 | 5.8 | 8.3 | 71.3 | | | | |
| | | | D | 40 | | | | 29.4 | 8.6 | 24.9 | 37.1 | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1940* | | | | | | | | | | | | | | | |
| May 11 | 5:10 p. m. | 4,150 | A | 192 | 12.7 | 15.7 | 15.8 | 7.6 | 20.7 | 7.4 | 20.1 | | | | |
| | | | B | 152 | 5.0 | 16.7 | 23.5 | 7.2 | 19.4 | 11.6 | 16.6 | | | | |
| | | | C | 252 | 5.3 | 6.7 | 16.4 | 7.1 | 15.0 | 13.2 | 36.3 | | | | |
| | | | D | 530 | 1.5 | 3.0 | 8.2 | 5.1 | 8.2 | 6.6 | 67.4 | | | | |

**Boise River at Notus, Idaho[3]**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Mar. 21 | 5:35 p. m. | 1,290 | B | 796 | 26.3 | 32.1 | 18.9 | 8.9 | 8.8 | 3.3 | 1.7 | ... | ... | ... | ... |
| Mar. 25 | 3:30 p. m. | 2,930 | B | 1,140 | 26.2 | 30.8 | 19.4 | 4.6 | 8.0 | 5.6 | 5.4 | ... | ... | ... | ... |
| Mar. 30 | 11:20 a. m. | 1,350 | A | 150 | 32.1 | 30.7 | 9.1 | 3.2 | 7.6 | 6.5 | 10.8 | ... | ... | ... | ... |
| | | | B | 158 | 36.8 | 26.4 | 9.9 | 2.5 | 5.0 | 7.0 | 12.4 | ... | ... | ... | ... |
| | | | C | 117 | 50.3 | 14.8 | 14.8 | 1.9 | 5.5 | 3.4 | 9.3 | ... | ... | ... | ... |
| Apr. 4 | 5:20 p. m. | 5,900 | A | 269 | 21.6 | 26.5 | 18.3 | 4.0 | 12.6 | 11.2 | 5.8 | ... | ... | ... | ... |
| | | | B | 408 | 13.5 | 17.9 | 14.0 | 3.2 | 12.7 | 17.2 | 21.5 | ... | ... | ... | ... |
| | | | C | 311 | 16.1 | 28.1 | 16.4 | 4.4 | 12.6 | 15.3 | 7.1 | ... | ... | ... | ... |
| Apr. 8 | 4:20 p. m. | 3,330 | A | 134 | 24.7 | 13.6 | 20.0 | 10.3 | 16.4 | 8.7 | 6.3 | ... | ... | ... | ... |
| | | | B | 186 | 20.8 | 10.8 | 14.1 | 6.8 | 8.8 | 26.6 | 12.1 | ... | ... | ... | ... |
| | | | C | 155 | 23.7 | 25.3 | 20.2 | 7.9 | 9.1 | 6.9 | 6.9 | ... | ... | ... | ... |
| | | | *Point samples Surface* | | | | | | | | | | | | |
| *1940* | | | | | | | | | | | | | | | |
| Apr. 2 | 1:45 p. m. | 1,170 | A | 359 | 37.1 | 43.8 | 13.2 | 1.1 | 3.2 | 1.6 | ... | ... | ... | ... | ... |
| | | | B | 417 | 33.6 | 44.3 | 10.9 | 1.1 | 4.4 | 5.7 | ... | ... | ... | ... | ... |
| | | | C | 384 | 33.2 | 44.6 | 9.9 | 2.5 | 5.9 | 3.9 | ... | ... | ... | ... | ... |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 398 | 41.4 | 36.7 | 11.6 | 1.5 | 4.0 | 4.8 | ... | ... | ... | ... | ... |
| | | | B | 422 | 38.4 | 35.3 | 12.2 | 1.0 | 3.9 | 9.2 | ... | ... | ... | ... | ... |
| | | | C | 397 | 40.9 | 35.2 | 10.0 | 0 | 9.5 | 4.4 | ... | ... | ... | ... | ... |
| | | | *0.3 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 424 | 40.6 | 37.7 | 10.9 | .2 | 3.4 | 7.2 | ... | ... | ... | ... | ... |
| | | | B | 595 | 1.7 | 5.8 | 17.0 | 38.7 | 2.3 | 34.5 | ... | ... | ... | ... | ... |
| | | | C | 662 | 25.6 | 21.0 | 6.0 | .5 | 3.7 | 43.2 | ... | ... | ... | ... | ... |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 456 | 34.7 | 34.6 | 10.4 | 0 | 6.4 | 13.9 | ... | ... | ... | ... | ... |
| | | | B | 3,050 | 4.6 | 5.7 | 2.2 | .1 | 1.3 | 86.1 | ... | ... | ... | ... | ... |
| | | | C | 901 | 18.1 | 16.5 | 5.0 | .9 | 4.2 | 55.3 | ... | ... | ... | ... | ... |
| | | | *Integrated samples* | | | | | | | | | | | | |
| Apr. 5 | 4 p. m. | 4,480 | A | 565 | 15.0 | 29.3 | 21.2 | 5.3 | 12.4 | 7.5 | 9.3 | ... | ... | ... | ... |
| | | | B | 594 | 17.9 | 23.3 | 18.4 | 2.3 | 16.3 | 9.8 | 12.0 | ... | ... | ... | ... |
| | | | C | 562 | 17.8 | 24.6 | 17.6 | 4.4 | 13.9 | 8.0 | 13.7 | ... | ... | ... | ... |
| Apr. 21 | 6 p. m. | 4,860 | A | 315 | 4.8 | 2.9 | 5.9 | .4 | 6.7 | 79.3 | ... | ... | ... | ... | ... |
| | | | B | 81 | 22.0 | 8.9 | 2.5 | 9.2 | 15.3 | 42.1 | ... | ... | ... | ... | ... |
| | | | C | 184 | 10.5 | 11.3 | 8.8 | 1.0 | 5.5 | 62.9 | ... | ... | ... | ... | ... |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Boise River at Notus, Idaho [3]—Continued** | | | | | | | | | | | | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| May 2 | 12:55 p. m. | 1,580 | A | 82 | ----- | ----- | ----- | 80.0 | 18.4 | 1.6 | ----- | ----- | ----- | ----- | ----- |
| | | | B | 103 | ----- | ----- | ----- | 60.6 | 13.2 | 26.2 | ----- | ----- | ----- | ----- | ----- |
| | | | C | 71 | ----- | ----- | ----- | 63.9 | 21.3 | 14.8 | ----- | ----- | ----- | ----- | ----- |
| May 12 | 6 p. m. | 2,670 | A | 174 | ----- | ----- | ----- | 68.4 | 15.2 | 16.4 | ----- | ----- | ----- | ----- | ----- |
| | | | B | 312 | ----- | ----- | ----- | 42.0 | 11.5 | 46.5 | ----- | ----- | ----- | ----- | ----- |
| | | | C | 209 | ----- | ----- | ----- | 60.8 | 13.9 | 25.3 | ----- | ----- | ----- | ----- | ----- |
| May 23 | 2 p. m. | 2,450 | A | 85 | ----- | ----- | ----- | 58.5 | 7.5 | 34.0 | ----- | ----- | ----- | ----- | ----- |
| | | | B | 108 | ----- | ----- | ----- | 33.7 | 3.4 | 62.9 | ----- | ----- | ----- | ----- | ----- |
| | | | C | 124 | ----- | ----- | ----- | 36.5 | 11.8 | 51.7 | ----- | ----- | ----- | ----- | ----- |
| **Cottonwood Creek near Arrow Rock Reservoir, Idaho [4]** | | | | | | | | | | | | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1940* | | | | | | | | | | | | | | | |
| Mar. 3 | 5:10 p. m. | 26 | LWS | 3,570 | 0.2 | 0.6 | 0.4 | 0 | 0.2 | 0.6 | 3.7 | 18.4 | 35.2 | 19.4 | 21.3 |
| | | | LWS | 210 | 16.1 | 12.3 | 12.6 | 9.0 | .7 | 7.4 | 41.9 | ----- | ----- | ----- | ----- |
| | | | HWS | 165 | 1.6 | 15.8 | 28.1 | 1.3 | 10.7 | 7.7 | 34.8 | ----- | ----- | ----- | ----- |
| | | | HWS | 112 | 10.9 | 21.8 | 30.3 | .2 | 7.5 | 8.9 | 20.4 | ----- | ----- | ----- | ----- |
| Apr. 1 | 11 a. m. | 60 | LWS | 12,800 | .1 | .5 | .6 | .2 | .9 | 1.3 | 8.6 | 35.0 | 37.1 | 13.4 | 2.3 |
| | | | LWS | 18,700 | .1 | .3 | .4 | .1 | .5 | 1.1 | 9.5 | 25.5 | 38.9 | 21.7 | 1.9 |
| | | | HWS | 3,320 | .1 | 1.5 | 2.0 | .6 | 3.2 | 4.6 | 15.1 | 29.4 | 30.3 | 13.2 | ----- |
| | | | HWS | 4,170 | .1 | 1.2 | 1.7 | .7 | 2.6 | 4.0 | 14.7 | 27.3 | 24.7 | 23.0 | ----- |
| Apr. 24 | 12:45 p. m. | 28 | LWS | 809 | ----- | ----- | ----- | 4.5 | 1.5 | 3.6 | 10.6 | 22.5 | 20.1 | 37.2 | ----- |
| | | | LWS | 589 | 1.1 | 3.4 | 2.9 | 2.2 | 2.0 | 3.1 | 7.7 | 10.0 | 7.6 | 0 | 60.0 |
| | | | HWS | 120 | ----- | ----- | ----- | 39.1 | 12.5 | 12.0 | 36.4 | ----- | ----- | ----- | ----- |
| | | | HWS | 175 | ----- | ----- | ----- | 23.2 | 5.7 | 3.5 | 13.9 | 53.7 | ----- | ----- | ----- |
| May 4 | 12:45 p. m. | 26 | LWS | 1,380 | ----- | ----- | ----- | 2.5 | 1.0 | 2.1 | 8.6 | 85.8 | ----- | ----- | ----- |
| | | | LWS | 584 | ----- | ----- | ----- | 6.3 | 3.3 | 4.4 | 20.8 | 65.2 | ----- | ----- | ----- |
| | | | HWS | 278 | ----- | ----- | ----- | 10.9 | 3.3 | 14.3 | 15.8 | 55.7 | ----- | ----- | ----- |
| | | | HWS | 455 | ----- | ----- | ----- | 7.1 | 1.4 | 6.0 | 16.0 | 69.5 | ----- | ----- | ----- |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 14 | 11:45 a. m. | 24 | LWS | 887 | ---- | ---- | ---- | 2.0 | .9 | 3.6 | 4.9 | 8.8 | 79.8 | ---- | ---- |
| | | | LWS | 168 | ---- | ---- | ---- | 28.1 | 7.9 | 3.9 | 15.2 | 44.9 | ---- | ---- | ---- |
| | | | HWS | 115 | ---- | ---- | ---- | 27.1 | 12.8 | 12.5 | 47.6 | ---- | ---- | ---- | ---- |
| | | | HWS | 84 | ---- | ---- | ---- | 50.1 | 10.2 | 22.3 | 17.4 | ---- | ---- | ---- | ---- |
| **Grouse Creek near Arrow Rock, Idaho [4]** | | | | | | | | | | | | | | | |
| *1939* | | | *Integrated samples* | | | | | | | | | | | | |
| Mar. 12 | 1:30 p. m. | 8.5 | LWS | 16,600 | 3.8 | 7.7 | 10.1 | 5.9 | 11.6 | 10.0 | 13.3 | 14.0 | 11.6 | 12.0 | ---- |
| | | | HWS | 12,100 | 5.0 | 10.1 | 14.5 | 7.0 | 14.1 | 21.6 | 12.4 | 3.1 | 5.9 | 6.3 | ---- |
| Mar. 14 | 4:45 p. m. | 7.7 | LWS | 13,800 | 1.5 | 2.6 | 20.9 | 2.1 | 8.2 | 8.9 | 12.9 | 12.4 | 13.6 | 16.9 | ---- |
| | | | HWS | 11,500 | 1.8 | 2.9 | 3.7 | 3.4 | 8.8 | 8.6 | 5.8 | 2.3 | 7.2 | 17.8 | 37.7 |
| Do | 6:45 p. m. | 6.9 | LWS | 28,200 | .6 | 1.0 | 1.2 | .6 | 1.8 | 1.7 | 4.6 | 12.6 | 49.7 | 25.2 | 1.0 |
| | | | HWS | 14,700 | 9.2 | 1.7 | 2.2 | 1.4 | 4.4 | 5.3 | 9.6 | 9.6 | 19.3 | 21.5 | 15.8 |
| Mar. 18 | 6:20 p. m. | 15 | LWS | 38,100 | 3.3 | 5.2 | 10.5 | 5.7 | 9.5 | 6.4 | 10.3 | 11.8 | 15.5 | 11.2 | 10.6 |
| | | | HWS | 27,600 | 4.3 | 8.0 | 12.2 | 3.5 | 21.0 | 10.3 | 22.6 | 9.9 | 2.3 | 1.7 | 4.2 |
| | | | HWS | 13,400 | 2.4 | 18.0 | 29.5 | 16.5 | 23.6 | 6.9 | 1.8 | .8 | .5 | ---- | ---- |
| Mar. 21 | 7:15 a. m. | 33 | LWS | 67,400 | .3 | .4 | .8 | .6 | 1.5 | 1.0 | 4.0 | 11.2 | 15.1 | 28.7 | 36.4 |
| | | | HWS | 54,500 | .5 | .8 | 1.2 | .9 | 2.7 | 2.2 | 5.1 | 18.0 | 34.0 | 19.9 | 14.7 |
| | | | HWS | 9,630 | 3.1 | 4.6 | 7.4 | 5.0 | 21.7 | 20.1 | 15.8 | 6.4 | 3.2 | 4.7 | 8.0 |
| Do | 7:30 p. m. | 33 | LWS | 109,000 | .9 | 1.1 | 1.7 | .9 | 2.2 | 1.7 | 3.6 | 6.5 | 10.9 | 30.0 | 40.5 |
| | | | HWS | 47,000 | 2.4 | 3.1 | 4.5 | 2.8 | 5.3 | 5.4 | 11.6 | 17.4 | 28.9 | 12.0 | 6.6 |
| | | | HWS | 31,700 | 3.5 | 4.6 | 7.1 | 3.8 | 9.7 | 9.0 | 13.7 | 6.1 | 11.4 | 21.1 | 10.0 |
| Mar. 26 | 7:30 a. m. | 34 | LWS | 15,500 | 1.2 | 1.9 | 2.6 | 2.4 | 6.2 | 7.3 | 6.0 | 6.0 | 16.2 | 21.0 | 29.2 |
| | | | HWS | 96,600 | .2 | .3 | .4 | .3 | 1.2 | 1.6 | 7.8 | 19.4 | 13.8 | 23.1 | 31.9 |
| | | | HWS | 15,100 | 1.6 | 1.7 | 2.7 | 1.9 | 8.2 | 11.8 | 19.1 | 18.5 | 14.6 | 11.8 | 8.1 |
| Do | 7 p. m. | 34 | LWS | 34,400 | 2.1 | 2.9 | 4.8 | 3.0 | 5.2 | 4.2 | 8.7 | 15.2 | 23.3 | 17.9 | 12.7 |
| | | | HWS | 156,000 | .4 | .5 | 1.0 | .6 | 1.7 | 3.3 | 11.6 | 26.5 | 23.6 | 18.2 | 12.6 |
| | | | HWS | 18,800 | 3.3 | 6.2 | 9.9 | 6.1 | 11.6 | 11.9 | 18.3 | 13.5 | 9.3 | 4.6 | 5.3 |
| Mar. 31 | 7 p. m. | 33 | LWS | 6,300 | 7.8 | 14.9 | 24.1 | 8.1 | 16.2 | 12.5 | 11.5 | 3.1 | 1.5 | .3 | ---- |
| | | | HWS | 11,600 | 4.1 | 7.9 | 12.5 | 5.2 | 8.4 | 7.7 | 17.5 | 14.6 | 11.3 | 10.8 | ---- |
| | | | HWS | 19,200 | 2.6 | 5.1 | 7.8 | 3.5 | 4.7 | 5.6 | 10.5 | 11.7 | 11.8 | 16.8 | 19.9 |
| Apr. 3 | 7 p. m. | 19 | LWS | 7,370 | 1.5 | 2.6 | 4.1 | 1.2 | 4.3 | 5.4 | 11.4 | 24.1 | 20.7 | 10.7 | 14.0 |
| | | | HWS | 8,890 | 1.2 | 1.9 | 3.4 | 1.6 | 3.1 | 3.9 | 10.0 | 15.6 | 25.4 | 29.2 | 4.7 |
| | | | HWS | 24,900 | .6 | .8 | 1.1 | .6 | 1.4 | 2.5 | 15.0 | 21.4 | 35.6 | 14.4 | 6.6 |
| Apr. 7 | 5:05 p. m. | 11 | LWS | 317 | 21.7 | 15.9 | 8.1 | 2.4 | 19.2 | 12.2 | 13.4 | 7.1 | ---- | ---- | ---- |
| | | | HWS | 952 | 8.4 | 4.8 | 2.7 | .1 | 2.8 | 2.9 | 3.3 | 75.0 | ---- | ---- | ---- |
| | | | HWS | 328 | 22.2 | 14.1 | 14.5 | 2.1 | 11.5 | 11.7 | 13.7 | 10.2 | ---- | ---- | ---- |
| *1940* | | | | | | | | | | | | | | | |
| Feb. 29 | 10:40 a. m. | 39 | LWS | 70,300 | .5 | 1.3 | 2.1 | 1.2 | 2.8 | 2.8 | 6.8 | 18.8 | 24.1 | 15.1 | 24.1 |
| | | | LWS | 76,200 | .7 | 1.2 | 1.8 | 1.1 | 2.6 | 2.6 | 4.1 | 9.4 | 20.1 | 27.2 | 29.2 |
| | | | HWS | 25,900 | 2.1 | 3.8 | 4.8 | 1.6 | 9.8 | 8.2 | 10.2 | 10.3 | 17.4 | 22.2 | 9.6 |
| | | | HWS | 10,600 | 4.6 | 8.8 | 14.3 | 5.3 | 20.1 | 17.8 | 14.3 | 14.8 | ---- | ---- | ---- |
| Apr. 4 | 2:45 p. m. | 17 | LWS | 31,800 | ---- | ---- | ---- | .5 | .3 | .8 | 6.7 | 18.8 | 31.2 | 31.0 | 10.7 |
| | | | LWS | 30,900 | ---- | ---- | ---- | .5 | .3 | .6 | 5.2 | 20.1 | 34.3 | 31.5 | 7.5 |
| | | | HWS | 927 | ---- | ---- | ---- | 16.4 | 8.5 | 14.9 | 60.2 | ---- | ---- | ---- | ---- |
| | | | HWS | 1,670 | ---- | ---- | ---- | 9.4 | 5.9 | 8.9 | 27.9 | 47.9 | ---- | ---- | ---- |
| Apr. 28 | 9 p. m. | 10 | LWS | 1,900 | 8.0 | 25.2 | 16.0 | 1.9 | 5.0 | 3.2 | 9.0 | 31.7 | ---- | ---- | ---- |
| | | | LWS | 2,190 | 7.9 | 20.6 | 15.3 | 1.7 | 4.0 | 2.7 | 7.6 | 40.2 | ---- | ---- | ---- |
| | | | HWS | 1,220 | 4.2 | 15.5 | 35.6 | 30.3 | 7.4 | 3.4 | 3.6 | ---- | ---- | ---- | ---- |
| | | | HWS | 1,200 | 20.2 | 36.9 | 24.8 | 4.9 | 6.2 | 3.6 | 3.4 | ---- | ---- | ---- | ---- |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range[1] <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Moore Creek above Granite Creek near Idaho City, Idaho** | | | | | | | | | | | | | | | |
| *1939* | | | *Integrated samples* | | | | | | | | | | | | |
| Apr. 2 | 9:30 p. m. | 159 | Composite | 281 | 5.4 | 7.5 | 8.1 | 4.4 | 15.3 | 20.5 | 38.8 | | | | |
| | | | *Point samples* *Surface* | | | | | | | | | | | | |
| Apr. 8 | 8:15 a. m. | 113 | Composite | 57 | 11.7 | 8.5 | 8.0 | 2.0 | 18.9 | 25.9 | 25.0 | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 110 | 4.9 | 3.2 | 2.6 | .9 | 11.9 | 25.8 | 50.7 | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 1,040 | .5 | .4 | .3 | .1 | 1.6 | 7.8 | 89.3 | | | | |
| | | | *Surface* | | | | | | | | | | | | |
| Apr. 13 | 2:10 p. m. | 86 | Composite | 65 | 3.5 | 2.9 | 5.4 | .7 | 12.6 | 16.3 | 58.6 | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 56 | 5.1 | 6.1 | 12.5 | 1.3 | 12.5 | 26.8 | 35.7 | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 114 | 2.7 | 3.1 | 4.4 | .8 | 7.5 | 21.8 | 59.7 | | | | |
| | | | *Surface* | | | | | | | | | | | | |
| Apr. 20 | 10:45 a. m. | 122 | Composite | 64 | 5.5 | 2.5 | 3.8 | 0 | 12.9 | 22.2 | 53.1 | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 68 | 6.6 | 6.2 | 8.0 | .7 | 14.9 | 22.8 | 40.8 | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 286 | 1.6 | 1.1 | 1.6 | .4 | 3.6 | 16.2 | 75.5 | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| Apr. 28 | 7 p. m. | 145 | (5) | 315 | 3.2 | 7.0 | 9.4 | 3.8 | 13.8 | 19.1 | 43.7 | | | | |
| May 30 | 8:35 a. m. | 23 | (5) | 163 | 7.4 | 18.1 | 38.3 | 11.3 | 14.8 | 4.7 | 5.4 | | | | |
| | | | *Point samples Surface* | | | | | | | | | | | | |
| June 24 | 2:45 p. m. | 17 | Composite | 12 | 22.9 | 19.8 | 17.6 | 3.8 | 16.8 | 10.7 | 8.4 | | | | |
| | | | *0.3 ft. above bottom* | | | | | | | | | | | | |
| | | | Composite | 12 | 15.3 | 20.6 | 9.9 | 3.8 | 18.3 | 6.9 | 25.2 | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 14 | 26.5 | 22.8 | 11.1 | 1.9 | 13.6 | 14.8 | 9.3 | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1940* | | | | | | | | | | | | | | | |
| Apr. 4 | 10:30 p. m. | 116 | (5) | 143 | | | | 25.1 | 15.3 | 11.0 | 48.6 | | | | |
| | | | (5) | 229 | | | | 15.0 | 5.7 | 8.6 | 70.7 | | | | |
| May 9 | 10:15 a. m. | 77 | (5) | 53 | | | | 32.7 | 7.5 | 16.3 | 43.5 | | | | |
| | | | (5) | 121 | | | | 14.0 | 8.9 | 6.4 | 70.7 | | | | |
| May 19 | 1:15 p. m. | 76 | (5) | 38 | | | | 57.1 | 4.7 | 18.9 | 19.3 | | | | |
| | | | (5) | 52 | | | | 28.5 | 7.1 | 32.5 | 31.9 | | | | |

**Moore Creek above Thorn Creek near Idaho City, Idaho** [3]

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Mar. 30 | 1:30 p. m. | 287 | A | 211 | 62.3 | 23.0 | 5.1 | 0.5 | 0.6 | 8.5 | | | | | |
| | | | B | 242 | 43.0 | 23.8 | 10.4 | 1.0 | 3.5 | 18.3 | | | | | |
| | | | C | 229 | 55.3 | 21.1 | 6.5 | .1 | 3.5 | 13.5 | | | | | |
| Apr. 3 | 7:10 p. m. | 341 | A | 339 | 43.5 | 28.2 | 12.3 | 1.1 | 1.2 | 13.7 | | | | | |
| | | | B | 258 | 56.1 | 35.3 | 3.2 | 0 | 2.7 | 2.7 | | | | | |
| | | | C | 288 | 42.6 | 44.4 | 6.7 | 1.7 | 2.2 | 2.4 | | | | | |
| Apr. 4 | 2 p. m. | 369 | A | 270 | 37.3 | 27.0 | 10.4 | .8 | 3.2 | 21.3 | | | | | |
| | | | B | 233 | 45.3 | 34.3 | 9.1 | 0 | 3.7 | 7.6 | | | | | |
| | | | C | 249 | 40.5 | 37.2 | 5.8 | 0 | 2.9 | 13.6 | | | | | |
| Do | 7:10 p. m. | 361 | B | 222 | 42.3 | 31.6 | 9.3 | .9 | 2.3 | 4.6 | 9.0 | | | | |
| | | | C | 224 | 42.0 | 35.2 | 9.0 | 1.5 | 2.9 | 2.9 | 6.5 | | | | |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Moore Creek above Thorn Creek near Idaho City, Idaho [3]—Continued** | | | | | | | | | | | | | | | |
| *1939* | | | *Point samples Surface* | | | | | | | | | | | | |
| Apr. 4 | 7:15 p. m. | 361 | A | 236 | 42.2 | 33.9 | 7.8 | 2.0 | 3.2 | 4.0 | 6.9 | ------ | ------ | ------ | ------ |
| | | | B | 230 | 48.1 | 31.1 | 5.1 | 4.2 | 3.6 | 2.8 | 5.1 | ------ | ------ | ------ | ------ |
| | | | C | 222 | 46.4 | 38.9 | 6.6 | .7 | 3.4 | 2.2 | 1.8 | ------ | ------ | ------ | ------ |
| | | | *Mid depth* | | | | | | | | | | | | |
| | | | A | 233 | 45.9 | 31.7 | 5.5 | 3.2 | 3.6 | 3.3 | 6.8 | ------ | ------ | ------ | ------ |
| | | | B | 234 | 38.5 | 39.4 | 2.2 | 5.1 | 5.4 | 3.3 | 6.1 | ------ | ------ | ------ | ------ |
| | | | C | 210 | 49.6 | 38.0 | 5.1 | 1.2 | 3.2 | 2.1 | .8 | ------ | ------ | ------ | ------ |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 282 | 40.2 | 25.7 | 4.7 | 3.7 | 2.6 | 3.9 | 19.2 | ------ | ------ | ------ | ------ |
| | | | B | 255 | 42.8 | 29.3 | 4.6 | .3 | 3.1 | 4.1 | 15.8 | ------ | ------ | ------ | ------ |
| | | | C | 220 | 42.3 | 39.8 | 5.4 | 1.0 | 2.6 | 4.2 | 4.7 | ------ | ------ | ------ | ------ |
| | | | *Integrated samples* | | | | | | | | | | | | |
| Apr. 7 | 8:45 p. m. | 254 | A | 196 | 43.6 | 30.5 | 6.5 | .1 | 3.4 | 3.3 | 12.6 | ------ | ------ | ------ | ------ |
| | | | B | 181 | 42.1 | 43.7 | 5.0 | 0 | 3.5 | 2.1 | 3.6 | ------ | ------ | ------ | ------ |
| | | | C | 192 | 35.2 | 32.7 | 4.9 | 2.0 | 10.2 | 12.4 | 2.6 | ------ | ------ | ------ | ------ |
| Apr. 13 | 11 a. m. | 200 | A | 182 | 48.1 | 36.2 | 5.4 | 1.6 | 3.5 | 1.8 | 3.4 | ------ | ------ | ------ | ------ |
| | | | B | 176 | 44.3 | 41.0 | 3.4 | 2.4 | 3.0 | 2.3 | 3.6 | ------ | ------ | ------ | ------ |
| | | | C | 165 | 39.5 | 39.4 | 7.2 | 1.6 | 8.6 | 2.4 | 1.3 | ------ | ------ | ------ | ------ |
| | | | *Point samples Surface* | | | | | | | | | | | | |
| Do | 11:05 a. m. | 200 | A | 174 | 40.4 | 47.5 | 4.0 | .8 | 3.5 | 1.9 | 1.9 | ------ | ------ | ------ | ------ |
| | | | B | 171 | 32.3 | 22.4 | 11.2 | .7 | 22.1 | 9.3 | 2.0 | ------ | ------ | ------ | ------ |
| | | | C | 189 | 11.8 | 15.3 | 28.1 | 1.1 | 31.9 | 6.7 | 5.1 | ------ | ------ | ------ | ------ |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Mid-depth* | | | | | | | | | | | | |
| Do | 11:05 a. m. | 200 | A | 181 | 58.2 | 31.9 | 2.9 | 0 | 3.4 | 1.4 | 2.2 | ------ | ------ | ------ | ------ |
| | | | B | 134 | 68.2 | 18.0 | 5.6 | 1.3 | 2.4 | 1.4 | 3.1 | ------ | ------ | ------ | ------ |
| | | | C | 169 | 58.2 | 30.1 | 3.1 | 1.0 | 2.6 | 2.3 | 2.7 | ------ | ------ | ------ | ------ |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 187 | 14.6 | 13.0 | 20.3 | 1.5 | 34.0 | 8.5 | 8.0 | ------ | ------ | ------ | ------ |
| | | | B | 173 | 23.1 | 31.9 | 7.7 | 1.2 | 19.8 | 10.4 | 5.9 | ------ | ------ | ------ | ------ |
| | | | C | 164 | 13.5 | 8.0 | 34.0 | 1.2 | 32.5 | 8.9 | 1.9 | ------ | ------ | ------ | ------ |
| | | | *Integrated samples* | | | | | | | | | | | | |
| Apr. 26 | 5:05 p. m. | 189 | A | 105 | 62.1 | 22.1 | 4.6 | .7 | 5.0 | 4.2 | 1.3 | ------ | ------ | ------ | ------ |
| | | | B | 113 | 58.0 | 29.2 | 4.0 | 0 | .9 | 3.9 | 4.0 | ------ | ------ | ------ | ------ |
| | | | C | 104 | 59.8 | 28.5 | 3.8 | 0 | 4.1 | 1.5 | 2.3 | ------ | ------ | ------ | ------ |
| | | | *Point samples Surface* | | | | | | | | | | | | |
| May 1 | 10:15 a. m. | 263 | A | 142 | 63.2 | 28.6 | 4.9 | .2 | 0 | 2.0 | 1.1 | ------ | ------ | ------ | ------ |
| | | | B | 152 | 77.6 | 10.8 | 5.8 | .3 | 2.1 | 1.6 | 1.8 | ------ | ------ | ------ | ------ |
| | | | C | 144 | 55.4 | 35.0 | 4.7 | 0 | 2.6 | 1.6 | .7 | ------ | ------ | ------ | ------ |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 147 | 55.9 | 33.0 | 5.3 | .1 | 3.0 | .5 | 2.2 | ------ | ------ | ------ | ------ |
| | | | B | 155 | 45.1 | 38.0 | 7.7 | 1.7 | 3.2 | 1.9 | 2.4 | ------ | ------ | ------ | ------ |
| | | | C | 151 | 54.3 | 33.5 | 7.3 | .5 | 2.3 | 1.6 | .5 | ------ | ------ | ------ | ------ |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 159 | 78.6 | 6.9 | 4.9 | .8 | 2.1 | 3.6 | 3.1 | ------ | ------ | ------ | ------ |
| | | | B | 132 | 55.3 | 31.2 | 4.7 | 0 | 3.3 | 2.0 | 3.5 | ------ | ------ | ------ | ------ |
| | | | C | 155 | 70.5 | 13.8 | 5.8 | 1.4 | 1.3 | 1.5 | 5.7 | ------ | ------ | ------ | ------ |
| | | | *Surface* | | | | | | | | | | | | |
| June 13 | 4 p. m. | 39 | A | 380 | 79.7 | 17.9 | 1.5 | 0 | .9 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | | B | 583 | 88.3 | 10.2 | .9 | 0 | .6 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | | C | 515 | 89.8 | 9.7 | .5 | 0 | 0 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 577 | 91.3 | 8.2 | .5 | 0 | 0 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | | B | 158 | 60.0 | 35.3 | 3.7 | 0 | 1.0 | ------ | ------ | ------ | ------ | ------ | ------ |
| | | | C | 707 | 83.1 | 16.3 | .6 | 0 | 0 | ------ | ------ | ------ | ------ | ------ | ------ |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Moore Creek above Thorn Creek near Idaho City, Idaho [3]—Continued** | | | | | | | | | | | | | | | |
| *1939* | | | *Surface* | | | | | | | | | | | | |
| June 24 | 3:15 p. m. | 35 | A | 956 | 93.1 | 6.2 | .5 | 0 | .2 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | B | 990 | 93.0 | 6.3 | .6 | 0 | .1 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | C | 564 | 96.2 | 3.0 | .6 | .1 | .1 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 973 | 94.5 | 4.1 | .8 | 0 | .6 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | B | 1,030 | 93.3 | 6.3 | .2 | 0 | .2 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | C | 979 | 93.0 | 6.0 | .7 | 0 | .3 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | *Surface* | | | | | | | | | | | | |
| July 10 | 11:20 a. m. | 21 | A | 939 | 92.3 | 7.0 | .7 | 0 | 0 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | B | 489 | 94.8 | 4.0 | .8 | .4 | 0 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | C | 499 | 92.1 | 3.9 | 3.5 | .1 | .4 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 474 | 96.3 | 3.1 | .6 | 0 | 0 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | B | 480 | 91.0 | 7.4 | 1.4 | .1 | .1 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | C | 513 | 89.5 | 7.1 | 3.2 | .2 | 0 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | *Surface* | | | | | | | | | | | | |
| July 21 | 3 p. m. | 13 | A | 629 | 97.2 | 2.1 | .3 | 0 | .4 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 554 | 95.3 | 3.4 | .9 | .1 | .3 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | B | 605 | 95.4 | 3.3 | .6 | 0 | .7 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | C | 626 | 95.4 | 3.1 | 1.2 | .1 | .2 | -------- | -------- | -------- | -------- | -------- | -------- |
| | | | *Surface* | | | | | | | | | | | | |
| Aug. 2 | 4:10 p. m. | 10 | A | 365 | 96.8 | 2.0 | 1.2 | 0 | 0 | -------- | -------- | -------- | -------- | -------- | -------- |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 357 | 95.5 | 3.7 | .8 | 0 | 0 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 373 | 94.9 | 3.5 | .1 | 0 | 1.5 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Surface* | | | | | | | | | | | | |
| Aug. 9 | 3:25 p. m. | 7.7 | A | 347 | 92.6 | 2.6 | 1.5 | .5 | 2.8 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 380 | 89.8 | 4.2 | 3.1 | 1.3 | 1.6 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 354 | 91.2 | 4.9 | 2.3 | 0 | 1.6 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Surface* | | | | | | | | | | | | |
| Aug. 18 | 4:30 p. m. | 6.0 | A | 385 | 93.6 | 2.5 | 1.8 | .8 | 1.3 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 398 | 88.8 | 4.5 | 5.0 | 1.0 | .7 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 470 | 72.0 | 4.8 | 15.6 | 5.3 | 2.3 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Surface* | | | | | | | | | | | | |
| Aug. 25 | 3 p. m. | 5.0 | A | 416 | 95.5 | 2.8 | 1.0 | 0 | .7 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 399 | 97.7 | 1.7 | 0 | 0 | .6 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 394 | 98.4 | 1.0 | .2 | .2 | .2 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Integrated samples* | | | | | | | | | | | | |
| Sept. 27 | 9:05 a. m. | 11 | A | 454 | 88.9 | 3.7 | .9 | .5 | 6.0 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 410 | 91.7 | 3.4 | .2 | .3 | 4.4 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Point samples Surface* | | | | | | | | | | | | |
| Oct. 14 | 11:10 a. m. | 15 | A | 388 | 90.9 | 3.3 | .4 | .4 | 5.0 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 427 | 92.4 | 2.7 | .3 | 0 | 4.6 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 403 | 92.9 | 3.3 | .3 | .4 | 3.1 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 385 | 95.3 | 2.2 | .8 | .4 | 1.3 | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | C | 348 | 95.1 | 2.2 | .1 | .2 | 2.4 | ---- | ---- | ---- | ---- | ---- | ---- |

See footnotes at end of table.

758529—48——9

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Moore Creek above Thorn Creek near Idaho City, Idaho [3]—Continued** | | | | | | | | | | | | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Nov. 18 | 3:15 p. m. | 16 | A | 610 | 96.7 | 1.4 | 0.4 | 0.1 | 1.4 | | | | | | |
| | | | B | 596 | 96.4 | 1.5 | .7 | 0 | 1.4 | | | | | | |
| | | | C | 641 | 97.2 | 1.1 | .4 | 0 | 1.3 | | | | | | |
| Nov. 27 | 10:30 a. m. | 22 | A | 1,020 | 93.9 | 4.8 | .6 | 0 | .7 | | | | | | |
| | | | B | 984 | 95.3 | 3.3 | .3 | 0 | 1.1 | | | | | | |
| | | | C | 1,010 | 98.3 | 1.1 | .2 | 0 | .4 | | | | | | |
| | | | *Point samples. Surface* | | | | | | | | | | | | |
| Dec. 14 | 3:30 p. m. | 24 | A | 844 | 94.8 | 3.2 | .6 | .2 | 1.2 | | | | | | |
| | | | B | 899 | 94.5 | 4.6 | .4 | 0 | .5 | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 908 | 94.6 | 4.5 | .4 | 0 | .5 | | | | | | |
| | | | B | 805 | 96.1 | 2.3 | .5 | 0 | 1.1 | | | | | | |
| | | | C | 809 | 97.1 | 1.2 | .6 | 0 | 1.1 | | | | | | |
| *1940* | | | *Surface* | | | | | | | | | | | | |
| Jan. 13 | 4 p. m. | 25 | A | 899 | 91.5 | 5.3 | 1.3 | .5 | 1.4 | | | | | | |
| | | | B | 896 | 91.8 | 4.1 | .9 | .5 | 2.7 | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 974 | 91.5 | 4.1 | 1.0 | .5 | 2.9 | | | | | | |
| | | | B | 930 | 91.6 | 4.7 | 1.1 | .6 | 2.0 | | | | | | |
| | | | C | 967 | 91.7 | 4.6 | 1.1 | .4 | 2.2 | | | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| Jan. 31 | 10:50 a. m. | 28 | A | 1,080 | 47.5 | 50.6 | .5 | .3 | 1.1 | | | | | | |
| | | | B | 1,160 | 80.3 | 17.6 | .9 | .6 | .6 | | | | | | |
| | | | C | 1,740 | 73.2 | 6.8 | .9 | 18.4 | .7 | | | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Point samples Surface* | | | | | | | | | | | | |
| Feb. 12 | 1 p. m. | 48 | A | 523 | 79.6 | 16.7 | 1.6 | .4 | 1.7 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 518 | 77.9 | 17.6 | 1.8 | 1.3 | 1.4 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 519 | 81.1 | 13.7 | 2.8 | .1 | 2.3 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 502 | 76.8 | 18.6 | 1.3 | .4 | 2.9 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 549 | 82.2 | 15.0 | 2.3 | .1 | .4 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 582 | 70.7 | 20.4 | 5.0 | .7 | 3.2 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | *Integrated Samples* | | | | | | | | | | | | |
| Feb. 23 | 10:30 a. m. | 35 | A | 558 | 89.9 | 6.6 | 1.6 | 1.1 | .8 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 551 | 91.0 | 5.1 | 2.1 | .7 | 1.1 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 571 | 89.3 | 7.3 | .4 | 2.2 | .8 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | *Point samples Surface* | | | | | | | | | | | | |
| Feb. 27 | 4:45 p. m. | 182 | A | 1,510 | 32.9 | 38.4 | 17.3 | 2.3 | 9.1 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 1,640 | 44.0 | 34.5 | 13.4 | 1.5 | 6.6 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 1,590 | 43.1 | 35.9 | 13.0 | 1.1 | 6.9 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | *0.3 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 1,710 | 41.8 | 34.7 | 11.6 | 1.7 | 10.2 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 1,660 | 37.5 | 36.7 | 13.3 | 1.3 | 11.2 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 1,620 | 43.0 | 33.4 | 8.6 | 1.3 | 13.7 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 1,730 | 41.0 | 33.9 | 12.5 | .7 | 11.9 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 1,820 | 37.5 | 32.2 | 13.2 | 1.6 | 15.5 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 1,720 | 30.0 | 34.9 | 16.7 | 2.9 | 15.5 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | *Surface* | | | | | | | | | | | | |
| Mar. 11 | 11 a. m. | 136 | A | 250 | 72.0 | 17.6 | 6.7 | 1.0 | 2.7 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 226 | 64.5 | 23.7 | 5.1 | 2.7 | 4.0 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 245 | 76.6 | 19.7 | 2.0 | .6 | 1.1 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | *0.3 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 245 | 74.6 | 14.8 | 3.2 | 3.8 | 3.6 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | B | 226 | 71.6 | 21.7 | 2.7 | .3 | 3.7 | ----- | ----- | ----- | ----- | ----- | ----- |
| | | | C | 225 | 58.3 | 21.6 | 7.2 | 5.0 | 7.9 | ----- | ----- | ----- | ----- | ----- | ----- |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Moore Creek above Thorn Creek near Idaho, City, Idaho[3]—Continued** | | | | | | | | | | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 254 | 75.5 | 16.2 | 5.1 | 0.1 | 3.1 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 240 | 70.3 | 19.1 | 3.7 | 1.7 | 5.2 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Mar. 26 | 9:20 a. m. | 346 | A | 733 | 30.6 | 35.5 | 15.9 | 2.5 | 15.5 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 742 | 33.0 | 31.2 | 17.6 | 1.4 | 16.8 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 727 | 29.4 | 36.2 | 19.3 | 1.1 | 14.0 | ------- | ------- | ------- | ------- | ------- | ------- |
| Apr. 5 | 2:30 p. m. | 286 | A | 384 | 43.3 | 27.9 | 13.4 | 2.3 | 13.1 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 376 | 45.1 | 25.7 | 16.5 | 1.4 | 11.3 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 365 | 48.2 | 24.7 | 15.0 | 1.3 | 10.8 | ------- | ------- | ------- | ------- | ------- | ------- |
| Apr. 13 | 8:50 a. m. | 254 | A | 224 | 47.9 | 24.4 | 9.0 | 2.1 | 16.6 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 220 | 58.4 | 15.4 | 9.8 | 5.6 | 10.8 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 259 | 56.1 | 28.8 | 8.0 | 1.6 | 5.5 | ------- | ------- | ------- | ------- | ------- | ------- |
| Apr. 21 | 12:15 a. m. | 247 | A | 417 | 50.5 | 25.1 | 5.1 | 2.2 | 17.1 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 332 | 59.2 | 30.4 | 5.1 | 1.1 | 4.2 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 330 | 67.6 | 22.8 | 6.0 | 2.0 | 1.6 | ------- | ------- | ------- | ------- | ------- | ------- |
| Apr. 28 | 2:20 p. m. | 214 | A | 414 | 69.4 | 22.3 | 3.5 | 3.3 | 1.5 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 423 | 67.6 | 20.2 | 3.6 | 2.5 | 6.1 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 398 | 71.0 | 20.4 | 5.5 | .5 | 2.6 | ------- | ------- | ------- | ------- | ------- | ------- |
| May 8 | 12 m. | 167 | A | 590 | 63.8 | 33.3 | 1.5 | 0 | 1.4 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 633 | 59.5 | 37.8 | 2.2 | 0 | .5 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 533 | 50.1 | 46.4 | 2.3 | .1 | 1.1 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | *Point samples* *Surface* | | | | | | | | | | | | |
| May 17 | 9:30 a. m. | 182 | A | 399 | 53.5 | 39.6 | 2.6 | 0 | 4.3 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 389 | 56.3 | 39.9 | 2.7 | .4 | .7 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 354 | 59.2 | 38.3 | .6 | 1.0 | .9 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 364 | 54.7 | 38.6 | 2.1 | 1.5 | 3.1 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | B | 371 | 57.5 | 37.4 | 1.9 | 1.3 | 1.9 | ------- | ------- | ------- | ------- | ------- | ------- |
| | | | C | 360 | 61.5 | 34.0 | 2.4 | 1.3 | .8 | ------- | ------- | ------- | ------- | ------- | ------- |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *0.3 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 394 | 58.9 | 38.1 | 1.9 | 0 | 1.1 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | B | 388 | 59.7 | 33.9 | 4.2 | 1.4 | .8 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | C | 385 | 59.6 | 35.1 | 2.1 | 0 | 3.2 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 411 | 61.1 | 32.3 | 2.7 | 1.9 | 2.0 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | B | 390 | 59.2 | 33.9 | 3.6 | .5 | 2.8 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | C | 394 | 58.6 | 34.3 | 2.2 | .2 | 4.7 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | *Integrated samples* | | | | | | | | | | | | |
| May 27 | 11:25 p. m. | 125 | A | 441 | 64.9 | 31.1 | 1.0 | .3 | 2.7 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | B | 450 | 64.5 | 30.7 | 2.3 | .1 | 2.4 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | C | 441 | 63.7 | 32.3 | 1.5 | .4 | 2.1 | ...... | ...... | ...... | ...... | ...... | ...... |
| June 18 | 7:15 p. m. | 46 | A | 772 | 47.3 | 49.8 | 1.9 | 0 | 1.0 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | B | 769 | 44.8 | 52.3 | 1.0 | .9 | 1.0 | ...... | ...... | ...... | ...... | ...... | ...... |
| | | | C | 772 | 45.4 | 52.5 | 1.1 | .3 | .7 | ...... | ...... | ...... | ...... | ...... | ...... |

**Granite Creek near Idaho City, Idaho** [4]

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| *1939* | | | *Integrated samples* | | | | | | | | | | | | |
| Mar. 21 | 10:10 a. m. | 4.0 | LWS | 3,150 | 0.8 | 0.6 | 0.5 | 0 | 2.9 | | 30.8 | 19.1 | 15.7 | 22.9 | 6.7 |
| Do | 4:50 p. m. | 5.5 | LWS | 15,600 | .6 | 1.2 | 1.6 | .6 | 5.5 | | 17.2 | 20.9 | 23.6 | 12.1 | 16.7 |
| Do | 10 p. m. | 5.0 | LWS | 13,800 | .5 | .9 | .7 | .1 | 3.3 | | 11.5 | 18.2 | 28.7 | 24.9 | 11.2 |
| Mar. 27 | 9:50 a. m. | 6.3 | LWS | 19,200 | .2 | .3 | .2 | .1 | 1.4 | | 3.2 | 15.7 | 29.5 | 41.8 | 7.6 |
| | | | LWS | 22,800 | .2 | .2 | .2 | .1 | 1.3 | | 2.7 | 22.7 | 49.3 | 23.3 | ...... |
| Do | 3:15 p. m. | 7.0 | LWS | 11,800 | .7 | 1.2 | 1.3 | .6 | 4.4 | | 5.6 | 12.8 | 28.1 | 29.2 | 16.1 |
| | | | LWS | 6,720 | 1.2 | 2.3 | 2.6 | 1.0 | 8.1 | | 8.2 | 14.4 | 26.4 | 35.8 | ...... |
| Do | 4 p. m. | 7.2 | LWS | 2,630 | 3.7 | 6.2 | 6.6 | 2.8 | 18.2 | | 20.8 | 16.5 | 10.2 | 15.0 | ...... |
| | | | LWS | 4,900 | 2.0 | 2.8 | 2.9 | 1.0 | 12.5 | | 13.9 | 22.4 | 30.5 | 12.0 | ...... |
| Do | 8:15 p. m. | 7.1 | LWS | 31,200 | .3 | .3 | .4 | .1 | 2.3 | | 9.4 | 35.8 | 34.9 | 14.8 | 1.7 |
| | | | LWS | 14,700 | .5 | .7 | .8 | .3 | 4.8 | | 18.6 | 29.0 | 27.8 | 16.5 | 1.0 |
| Apr. 4 | 11 a. m. | 6.3 | LWS | 12,800 | .4 | .3 | .4 | .2 | 3.4 | | 17.4 | 40.0 | 26.7 | 11.2 | ...... |
| | | | LWS | 9,460 | .8 | .4 | .5 | .1 | 3.2 | | 9.9 | 33.9 | 22.6 | 14.6 | 14.5 |
| Do | 4:10 p. m. | 6.6 | LWS | 13,700 | .4 | .6 | .6 | .2 | 2.9 | | 6.0 | 6.8 | 21.0 | 46.2 | 15.3 |
| | | | LWS | 13,000 | .6 | .6 | .7 | .2 | 3.5 | | 9.8 | 15.3 | 21.8 | 27.0 | 20.5 |
| Do | 7:50 p. m. | 6.6 | LWS | 4,190 | 1.2 | 1.5 | 2.0 | .7 | 8.2 | | 18.8 | 24.9 | 28.5 | 14.2 | ...... |
| | | | LWS | 27,400 | .2 | .2 | .3 | 0 | 1.6 | | 13.0 | 44.4 | 38.6 | 10.8 | .9 |
| Apr. 5 | 8:50 a. m. | 6.0 | LWS | 16,400 | .2 | .2 | .2 | 0 | 2.0 | | 11.8 | 38.9 | 38.7 | 6.1 | 1.9 |
| | | | LWS | 2,610 | .7 | 1.4 | 1.6 | .4 | 10.0 | | 31.4 | 36.6 | 9.3 | 8.4 | ...... |
| Apr. 6 | 7:15 p. m. | 5.0 | LWS | 1,760 | 1.7 | 1.8 | 1.9 | .2 | 6.8 | | 8.3 | 11.8 | 24.9 | 7.9 | 34.7 |
| | | | LWS | 5,070 | .2 | .2 | .3 | 0 | 1.8 | | 2.6 | 7.5 | 18.0 | 49.6 | 19.8 |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Granite Creek near Idaho City, Idaho—Continued** | | | | | | | | | | | | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Apr. 30 | 2:45 p. m. | 5.0 | LWS | 1,880 | 3.8 | 3.9 | 4.6 | 1.1 | 8.1 | | 5.9 | 11.2 | 23.2 | 29.6 | 8.6 |
| | | | LWS | 1,110 | 12.0 | 18.2 | 17.6 | 2.9 | 21.9 | | 16.8 | 7.8 | 2.1 | .7 | |
| Do. | 3:20 p. m. | 5.0 | LWS | 1,660 | 7.3 | 12.0 | 11.7 | 2.2 | 12.7 | | 6.1 | 7.5 | 17.5 | 23.0 | |
| | | | LWS | 3,980 | 3.2 | 4.9 | 4.9 | .6 | 5.7 | | 11.0 | 29.4 | 25.5 | 14.8 | |
| Do. | 4 p. m. | 4.6 | LWS | 4,060 | 3.3 | 5.9 | 5.1 | 1.1 | 5.3 | | 7.2 | 13.4 | 25.3 | 18.0 | 15.4 |
| | | | LWS | 3,690 | 3.2 | 6.5 | 6.3 | 1.5 | 1.3 | | 9.9 | 17.9 | 32.0 | 21.4 | |
| Do. | 7 p. m. | 3.7 | LWS | 614 | 8.7 | 11.5 | 9.0 | 2.0 | 8.8 | | 7.8 | 19.3 | 32.9 | | |
| | | | LWS | 504 | 7.6 | 9.6 | 7.5 | 1.6 | 8.9 | | 11.2 | 15.4 | 12.6 | 25.6 | |
| Do. | 10:10 p. m. | 3.5 | LWS | 1,220 | 3.0 | 3.5 | 3.6 | .8 | 3.4 | | 4.2 | 11.8 | 13.2 | 56.5 | |
| | | | LWS | 918 | 3.8 | 5.3 | 4.2 | 1.1 | 5.0 | | 5.5 | 10.2 | 32.9 | 32.0 | |
| *1940* | | | | | | | | | | | | | | | |
| Mar. 4 | 10:15 p. m. | 2.8 | LWS | 542 | | | | 3.1 | 1.1 | 1.9 | 9.0 | 84.9 | | | |
| | | | LWS | 800 | | | | 4.3 | .7 | 2.0 | 7.3 | 85.7 | | | |
| Mar. 12 | 1:50 p. m. | 3.7 | LWS | 2,980 | | | | 7.2 | 2.1 | 2.2 | 11.0 | 77.5 | | | |
| | | | LWS | 4,010 | | | | 4.9 | 1.6 | 1.1 | 4.7 | 13.4 | 74.3 | | |
| Apr. 12 | 1:10 p. m. | 5.0 | LWS | 56 | | | | 40.4 | 14.9 | 3.5 | 41.2 | | | | |
| | | | LWS | 106 | | | | 31.4 | 11.8 | 3.1 | 53.7 | | | | |
| Apr. 19 | 8 p. m. | 4.3 | LWS | 153 | | | | 19.4 | 7.9 | .2 | 72.5 | | | | |
| | | | LWS | 677 | | | | 3.2 | 2.2 | 1.2 | 3.0 | 90.4 | | | |
| Apr. 26 | 3:30 p. m. | 4.3 | LWS | 68 | | | | 53.0 | 14.1 | 7.2 | 25.7 | | | | |
| | | | LWS | 631 | | | | 1.7 | .3 | .6 | 6.4 | 91.0 | | | |
| May 6 | 7:40 p. m. | 3.4 | LWS | 29 | | | | 77.3 | 13.4 | 0 | 9.3 | | | | |
| | | | LWS | 46 | | | | 38.5 | 13.6 | 14.7 | 33.2 | | | | |
| May 16 | 11:25 a. m. | 2.5 | LWS | 455 | | | | 2.6 | 0 | 2.4 | 95.0 | | | | |
| | | | LWS | 19 | | | | 92.1 | 0 | 7.9 | | | | | |
| May 27 | 2:45 p. m. | 1.4 | LWS | 653 | | | | 2.2 | 2.3 | 1.6 | 93.9 | | | | |
| | | | LWS | 229 | | | | 9.6 | 1.4 | .8 | 88.2 | | | | |
| **Bannock Creek near Idaho City, Idaho** | | | | | | | | | | | | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1940* | | | | | | | | | | | | | | | |
| Mar. 12 | 2:45 p. m. | 1.6 | V-notch | 132 | 10.4 | 21.0 | 34.2 | 19.2 | 11.2 | 1.7 | 2.3 | | | | |
| | | | do. | 175 | 17.9 | 22.3 | 27.1 | 6.3 | 12.2 | 7.3 | 6.9 | | | | |
| Mar. 27 | 9:50 a. m. | 11 | do. | 32,900 | .1 | .4 | .5 | .1 | .4 | .6 | 2.5 | 8.1 | 18.8 | 19.1 | 49.4 |
| | | | do. | 10,900 | .4 | .9 | 1.3 | .5 | 1.2 | 1.4 | 6.4 | 15.1 | 29.3 | 27.1 | 16.4 |
| Apr. 12 | 3 p. m. | 4.8 | do. | 273 | | | | 17.2 | 3.5 | 6.9 | 72.4 | | | | |
| | | | do. | 1,800 | | | | 1.6 | .5 | .1 | 2.5 | 7.8 | 25.5 | 46.9 | 15.1 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| May 1 | 2 p. m. | 4.8 | do | 77 | | | | 32.1 | 14.3 | 18.7 | 34.9 | | | | |
| | | | do | 47 | | | | 36.1 | 20.4 | 11.1 | 32.4 | | | | |
| May 10 | 9:15 a. m. | 3.4 | do | 104 | | | | 31.8 | 0 | 32.1 | 36.1 | | | | |
| | | | do | 83 | | | | 26.9 | 1.4 | 6.2 | 65.5 | | | | |
| **Pine Creek near Idaho City, Idaho [4]** | | | | | | | | | | | | | | | |
| *1939* | | | *Integrated samples* | | | | | | | | | | | | |
| Mar. 22 | 2:50 p. m. | 6.8 | LWS | 10,300 | 1.7 | 3.6 | 5.2 | 1.4 | 4.7 | 8.6 | 74.8 | | | | |
| | | | HWS | 2,500 | 7.8 | 14.7 | 22.0 | 4.5 | 21.3 | 19.7 | 10.0 | | | | |
| Mar. 27 | 4:25 p. m. | 11 | LWS | 1,960 | 6.5 | 10.4 | 16.3 | 3.5 | 17.1 | 17.0 | 29.2 | | | | |
| | | | HWS | 1,850 | 7.4 | 14.0 | 21.7 | 6.1 | 18.9 | 19.5 | 12.4 | | | | |
| | | | HWS | 1,970 | 7.6 | 13.1 | 18.7 | 5.4 | 18.0 | 20.6 | 16.6 | | | | |
| Do | 7:55 p. m. | 11 | LWS | 1,690 | 5.1 | 11.0 | 15.5 | 4.7 | 16.0 | 20.4 | 27.3 | | | | |
| | | | HWS | 1,800 | 7.6 | 11.4 | 14.7 | 5.1 | 15.9 | 24.8 | 20.5 | | | | |
| | | | HWS | 1,610 | 8.2 | 11.7 | 14.7 | 4.2 | 16.1 | 27.6 | 17.5 | | | | |
| Mar. 31 | 4:50 p. m. | 11 | LWS | 1,490 | 7.2 | 12.7 | 15.4 | 4.3 | 13.8 | 14.2 | 32.4 | | | | |
| | | | HWS | 1,060 | 7.6 | 17.4 | 20.7 | 5.2 | 19.4 | 17.0 | 12.7 | | | | |
| | | | HWS | 1,230 | 8.6 | 13.8 | 17.3 | 4.6 | 18.8 | 21.4 | 15.5 | | | | |
| Apr. 3 | 8:10 p. m. | 12 | LWS | 1,390 | 6.9 | 11.4 | 12.7 | 3.7 | 17.1 | 21.8 | 26.4 | | | | |
| | | | HWS | 1,320 | 6.5 | 13.7 | 17.0 | 4.8 | 3.1 | 44.7 | 10.2 | | | | |
| | | | HWS | 1,290 | 7.4 | 13.8 | 16.1 | 3.6 | 17.7 | 22.6 | 18.8 | | | | |
| Apr. 6 | 6:45 p. m. | 8.0 | LWS | 492 | 6.2 | 4.2 | 2.4 | .9 | 7.8 | 14.7 | 63.8 | | | | |
| | | | HWS | 257 | 10.0 | 10.9 | 4.8 | 1.2 | 10.6 | 12.7 | 49.8 | | | | |
| | | | HWS | 197 | 18.7 | 11.2 | 5.6 | 1.6 | 11.3 | 5.0 | 46.6 | | | | |
| **Pine Creek above Barry Placer diversion near Idaho City, Idaho** | | | | | | | | | | | | | | | |
| *1940* | | | *Integrated samples* | | | | | | | | | | | | |
| Mar. 11 | 7:40 p. m. | 4.1 | (6) | 1,150 | | | | 3.9 | 3.6 | 1.7 | 4.8 | 10.2 | 22.6 | 53.2 | |
| | | | (6) | 1,480 | | | | 2.5 | .7 | .6 | 4.2 | 17.8 | 31.0 | 43.2 | |
| Mar. 27 | 9:20 a. m. | 28 | (6) | 73,200 | 0.6 | 1.3 | 2.1 | .9 | 2.3 | 2.0 | 5.2 | 12.5 | 30.3 | 27.1 | 15.7 |
| | | | (6) | 78,100 | .8 | 1.7 | 2.7 | 1.1 | 2.6 | 3.2 | 10.2 | 20.3 | 26.6 | 18.6 | 12.2 |
| Apr. 2 | 2 p. m. | 15 | (6) | 9,700 | .2 | .5 | .4 | .1 | .6 | 1.3 | 4.6 | 13.2 | 41.9 | 27.4 | 9.8 |
| | | | (6) | 6,450 | .3 | .9 | .8 | .2 | 1.0 | 1.6 | 6.5 | 12.8 | 19.8 | 23.8 | 32.3 |
| Apr. 12 | 1:50 p. m. | 3.4 | (6) | 393 | 9.5 | 21.7 | 12.9 | 3.9 | 8.0 | 3.8 | 40.2 | | | | |
| | | | (6) | 248 | 19.4 | 28.3 | 25.5 | 0 | 10.7 | 8.2 | 7.9 | | | | |
| Apr. 26 | 3:20 p. m. | 1.6 | (6) | 330 | 15.8 | 22.9 | 12.3 | .6 | 2.9 | 45.5 | | | | | |
| | | | (6) | 438 | 1.3 | 3.1 | 12.0 | 25.1 | 4.1 | 54.4 | | | | | |
| May 7 | 12 m. | 1.1 | (6) | 1,320 | 10.4 | 30.7 | 41.8 | 2.5 | 8.4 | 3.3 | 2.9 | | | | |
| | | | (6) | 1,280 | 11.0 | 35.0 | 39.1 | 1.5 | 8.9 | 2.0 | 2.5 | | | | |
| May 16 | 11:10 p. m. | 1.5 | (6) | 3,240 | 1.9 | 3.8 | 2.0 | .3 | 1.2 | 1.6 | 4.8 | 9.9 | 37.0 | 37.5 | |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **Elk Creek near Idaho City, Idaho [7]** | | | | | | | | | | | | | | | |
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Mar. 29 | 4:20 p. m. | 71 | A | 631 | 7.0 | 7.9 | 10.0 | 3.5 | 11.0 | 17.2 | 43.4 | ---- | ---- | ---- | ---- |
| | | | B | 729 | 5.9 | 8.6 | 7.1 | 2.2 | 13.1 | 16.4 | 46.7 | ---- | ---- | ---- | ---- |
| Apr. 2 | 3 p. m. | 74 | A | 2,140 | 3.0 | 2.6 | 3.4 | .7 | 5.3 | 10.8 | 74.2 | ---- | ---- | ---- | ---- |
| | | | B | 879 | 3.8 | 5.9 | 9.6 | 2.7 | 12.4 | 26.6 | 39.0 | ---- | ---- | ---- | ---- |
| Apr. 6 | 7:35 p. m. | 71 | A | 508 | 3.6 | 4.4 | 5.1 | 1.6 | 11.0 | 20.5 | 53.8 | ---- | ---- | ---- | ---- |
| | | | B | 469 | 4.3 | 5.8 | 5.6 | 2.4 | 11.8 | 17.4 | 52.7 | ---- | ---- | ---- | ---- |
| Apr. 13 | 3 p. m. | 47 | (5) | 241 | 9.5 | 13.6 | 11.5 | 2.8 | 14.0 | 8.4 | 40.2 | ---- | ---- | ---- | ---- |
| | | | (5) | 192 | 10.8 | 12.6 | 12.1 | 2.8 | 13.1 | 15.9 | 32.7 | ---- | ---- | ---- | ---- |
| | | | (5) | 303 | 6.2 | 8.0 | 9.2 | 1.0 | 12.5 | 13.2 | 49.9 | ---- | ---- | ---- | ---- |
| | | | *Point samples* *Surface* | | | | | | | | | | | | |
| Do. | 3 p. m. | 47 | A | 149 | 10.7 | 15.0 | 20.1 | 3.1 | 16.7 | 13.7 | 20.7 | ---- | ---- | ---- | ---- |
| | | | B | 171 | 7.3 | 12.1 | 17.9 | 4.6 | 15.9 | 18.3 | 23.9 | ---- | ---- | ---- | ---- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 299 | 6.1 | 7.7 | 8.8 | 3.6 | 9.1 | 15.4 | 49.3 | ---- | ---- | ---- | ---- |
| | | | B | 207 | 6.3 | 11.2 | 14.0 | 3.0 | 10.4 | 22.5 | 32.6 | ---- | ---- | ---- | ---- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 1,130 | 1.9 | 2.3 | 2.5 | .5 | 3.6 | 11.1 | 78.1 | ---- | ---- | ---- | ---- |
| | | | B | 535 | 3.1 | 4.8 | 4.7 | 1.0 | 6.4 | 18.7 | 61.3 | ---- | ---- | ---- | ---- |
| | | | *Surface* | | | | | | | | | | | | |
| Apr. 27 | 11 a. m. | 46 | A | 88 | 7.3 | 15.6 | 10.8 | 6.0 | 17.7 | 21.1 | 21.5 | ---- | ---- | ---- | ---- |
| | | | B | 75 | 13.4 | 21.3 | 15.3 | 0 | 22.5 | 17.9 | 9.6 | ---- | ---- | ---- | ---- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 228 | 2.1 | 5.8 | 4.3 | 2.5 | 10.0 | 19.1 | 56.2 | ---- | ---- | ---- | ---- |
| | | | B | 123 | 8.4 | 7.4 | 13.4 | 1.2 | 17.9 | 22.1 | 29.6 | ---- | ---- | ---- | ---- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 519 | 1.2 | 2.7 | 2.6 | .6 | 4.6 | 11.3 | 77.0 | ---- | ---- | ---- | ---- |
| | | | B | 643 | 1.4 | 1.0 | 2.7 | .3 | 5.2 | 18.3 | 71.1 | ---- | ---- | ---- | ---- |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Integrated samples* | | | | | | | | | | | | |
| Apr. 30 | 3:30 p. m. | 64 | (5) | 375 | 3.9 | 7.2 | 9.7 | 2.8 | 9.9 | 15.1 | 51.4 | --- | --- | --- | --- |
| | | | (5) | 485 | 3.0 | 5.8 | 7.4 | 1.9 | 9.1 | 17.1 | 55.7 | --- | --- | --- | --- |
| | | | (5) | 436 | 3.2 | 5.8 | 6.8 | 2.1 | 8.8 | 16.0 | 57.3 | --- | --- | --- | --- |
| | | | *Point samples Surface* | | | | | | | | | | | | |
| June 17 | 8:15 p. m. | 14 | A | 816 | 15.3 | 20.0 | 18.8 | 7.6 | 18.9 | 13.0 | 6.4 | --- | --- | --- | --- |
| | | | B | 1,420 | 10.9 | 10.4 | 12.5 | 4.2 | 16.6 | 19.8 | 25.6 | --- | --- | --- | --- |
| | | | *0.1 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 4,540 | 2.9 | 3.4 | 3.1 | 1.5 | 3.9 | 4.9 | 80.3 | --- | --- | --- | --- |
| | | | B | 1,610 | 8.0 | 10.6 | 8.3 | 3.7 | 14.2 | 27.3 | 27.9 | --- | --- | --- | --- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 3,590 | 3.8 | 4.8 | 4.4 | 1.5 | 5.8 | 9.3 | 70.4 | --- | --- | --- | --- |
| | | | B | 32,400 | .4 | .5 | .4 | .1 | .9 | 3.2 | 94.5 | --- | --- | --- | --- |
| | | | *Surface* | | | | | | | | | | | | |
| June 28 | 9:45 a. m. | 4.9 | A | 8,360 | 21.8 | 51.8 | 17.7 | 3.2 | 3.0 | 1.5 | 1.0 | --- | --- | --- | --- |
| | | | B | 6,680 | 6.3 | 66.2 | 17.6 | 2.8 | 3.3 | 2.6 | 1.2 | --- | --- | --- | --- |
| | | | *0.1 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 8,320 | 4.6 | 70.6 | 16.7 | 2.1 | 3.4 | 1.7 | .9 | --- | --- | --- | --- |
| | | | B | 5,960 | 6.8 | 60.8 | 15.5 | 2.6 | 4.1 | 5.3 | 4.9 | --- | --- | --- | --- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 21,400 | 1.6 | 26.0 | 4.4 | 1.0 | 1.7 | 2.2 | 63.1 | --- | --- | --- | --- |
| | | | B | 72,300 | .6 | 4.2 | 1.2 | .2 | .5 | 2.6 | 90.7 | --- | --- | --- | --- |

**Elk Creek above Gold Hill Placer diversion near Idaho City, Idaho**

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Integrated samples* | | | | | | | | | | | | |
| *1940* | | | | | | | | | | | | | | | |
| Feb. 28 | 10:20 a. m. | 22 | (6) | 265 | --- | --- | --- | 12.3 | 12.2 | 9.8 | 65.7 | --- | --- | --- | --- |
| | | | (6) | 189 | --- | --- | --- | 28.4 | 25.3 | 46.3 | --- | --- | --- | --- | --- |
| Mar. 25 | 1:45 p. m. | 73 | (6) | 884 | --- | --- | --- | 6.6 | 6.3 | 4.9 | 11.6 | 70.6 | --- | --- | --- |
| | | | (6) | 395 | --- | --- | --- | 14.2 | 7.7 | 8.9 | 69.2 | --- | --- | --- | --- |
| Apr. 18 | 8 p. m. | 71 | (6) | 567 | --- | --- | --- | 3.9 | 5.0 | 2.6 | 11.7 | 76.8 | --- | --- | --- |
| | | | (6) | 499 | --- | --- | --- | 6.3 | 1.5 | 3.9 | 8.3 | 15.3 | 64.7 | --- | --- |
| Apr. 28 | 11:15 a. m. | 49 | (6) | 125 | --- | --- | --- | 10.8 | 4.3 | 9.1 | 75.8 | --- | --- | --- | --- |
| | | | (6) | 266 | --- | --- | --- | 4.9 | 4.8 | .1 | 90.2 | --- | --- | --- | --- |
| May 11 | 6:30 a. m. | 58 | (6) | 380 | --- | --- | --- | 10.2 | 3.3 | 3.8 | 24.9 | 57.8 | --- | --- | --- |
| | | | (6) | 272 | --- | --- | --- | 17.6 | 4.7 | 1.7 | 11.9 | 64.1 | --- | --- | --- |
| May 21 | 11:40 a. m. | 42 | (6) | 313 | --- | --- | --- | 14.2 | 4.6 | 6.2 | 14.5 | 60.5 | --- | --- | --- |
| | | | (6) | 116 | --- | --- | --- | 14.8 | 5.5 | 4.2 | 75.5 | --- | --- | --- | --- |
| May 31 | 3:15 p. m. | 32 | (6) | 44 | --- | --- | --- | 21.3 | 10.3 | 68.4 | --- | --- | --- | --- | --- |
| | | | (6) | 365 | --- | --- | --- | 3.1 | 4.3 | 92.6 | --- | --- | --- | --- | --- |

**See footnotes at end of table.**

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005-0.020 mm. | 0.020-0.050 mm. | 0.050-0.074 mm. | 0.074-0.149 mm. | 0.149-0.250 mm. | 0.250-0.50 mm. | 0.50-1.00 mm. | 1.00-2.00 mm. | 2.00-4.00 mm. | >4.00 mm. |
| **New York Canal near Barber, Idaho [3]** | | | | | | | | | | | | | | | |
| *1929* | | | *Point samples* | | | | | | | | | | | | |
| | | | *Surface* | | | | | | | | | | | | |
| Apr. 2 | 6:20 p. m. | 1,320 | A | 124 | 41.1 | 22.7 | 15.9 | 4.9 | 11.0 | 3.0 | 1.4 | ----- | ----- | ----- | ----- |
| | | | B | 120 | 51.8 | 24.2 | 12.8 | 1.4 | 7.1 | 2.0 | .7 | ----- | ----- | ----- | ----- |
| | | | C | 141 | 42.9 | 19.9 | 15.7 | 3.4 | 11.1 | 3.8 | 3.2 | ----- | ----- | ----- | ----- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 163 | 38.3 | 21.0 | 13.8 | 5.1 | 17.8 | 4.0 | 0 | ----- | ----- | ----- | ----- |
| | | | B | 148 | 42.0 | 18.6 | 12.8 | 6.6 | 15.2 | 3.8 | 1.0 | ----- | ----- | ----- | ----- |
| | | | C | 146 | 42.4 | 16.1 | 16.5 | 4.7 | 15.4 | 2.9 | 2.0 | ----- | ----- | ----- | ----- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 183 | 37.3 | 16.7 | 12.3 | 5.2 | 17.7 | 8.5 | 2.3 | ----- | ----- | ----- | ----- |
| | | | B | 202 | 28.5 | 16.1 | 10.2 | 4.6 | 26.1 | 12.2 | 2.3 | ----- | ----- | ----- | ----- |
| | | | C | 194 | 32.2 | 19.0 | 9.6 | 4.6 | 22.2 | 10.2 | 2.2 | ----- | ----- | ----- | ----- |
| | | | *Surface* | | | | | | | | | | | | |
| May 1 | 7:30 p. m. | 2,800 | A | (8) | 32.1 | 33.8 | 14.1 | 4.2 | 10.5 | 2.8 | 2.5 | ----- | ----- | ----- | ----- |
| | | | B | (8) | 40.5 | 17.3 | 13.4 | 5.8 | 12.3 | 9.9 | .8 | ----- | ----- | ----- | ----- |
| | | | C | (8) | 36.2 | 19.1 | 11.7 | 4.3 | 17.5 | 9.8 | 1.4 | ----- | ----- | ----- | ----- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | (8) | 31.4 | 29.5 | 13.2 | 2.3 | 15.5 | 5.8 | 2.3 | ----- | ----- | ----- | ----- |
| | | | B | (8) | 26.1 | 20.0 | 14.9 | 4.5 | 18.5 | 13.1 | 2.9 | ----- | ----- | ----- | ----- |
| | | | C | (8) | 36.3 | 18.3 | 10.3 | 6.2 | 20.4 | 7.5 | 1.0 | ----- | ----- | ----- | ----- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | (8) | 16.2 | 15.6 | 5.1 | 1.7 | 23.0 | 32.0 | 6.4 | ----- | ----- | ----- | ----- |
| | | | B | (8) | 13.6 | 12.3 | 5.7 | 3.2 | 16.8 | 35.4 | 13.0 | ----- | ----- | ----- | ----- |
| | | | C | (8) | 16.3 | 8.3 | 6.6 | 3.0 | 24.1 | 31.6 | 10.1 | ----- | ----- | ----- | ----- |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Surface* | | | | | | | | | | | | |
| May 31 | 6 p. m. | 2,010 | A | 23 | 65.7 | 9.8 | 9.8 | 0 | 5.7 | 1.6 | 7.4 | ... | ... | ... | ... |
| | | | B | 25 | 52.2 | 22.1 | 1.4 | .7 | 7.1 | 7.9 | 8.6 | ... | ... | ... | ... |
| | | | C | 30 | 54.3 | 27.1 | 6.2 | 0 | 6.8 | 3.1 | 2.5 | ... | ... | ... | ... |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 22 | 51.6 | 25.0 | 0 | 0 | 8.1 | 6.4 | 8.9 | ... | ... | ... | ... |
| | | | B | 20 | 65.5 | 14.2 | 3.5 | 4.4 | 6.2 | 6.2 | 0 | ... | ... | ... | ... |
| | | | C | 24 | 51.0 | 35.3 | 6.8 | 0 | .8 | .8 | 5.3 | ... | ... | ... | ... |
| | | | *1.0 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 22 | 48.3 | 23.8 | 5.7 | 0 | 15.6 | 0 | 6.6 | ... | ... | ... | ... |
| | | | B | 24 | 67.1 | 23.4 | 8.8 | 0 | .7 | 0 | 0 | ... | ... | ... | ... |
| | | | C | 27 | 63.3 | 20.7 | 3.3 | 2.0 | 6.7 | 3.3 | .7 | ... | ... | ... | ... |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 18 | 53.1 | 16.3 | 3.1 | 1.0 | 19.4 | 5.1 | 2.0 | ... | ... | ... | ... |
| | | | B | 22 | 69.1 | 22.8 | 2.4 | 0 | 2.4 | 0 | 3.3 | ... | ... | ... | ... |
| | | | C | 21 | 72.7 | 16.1 | 4.8 | 3.2 | 2.4 | 0 | .8 | ... | ... | ... | ... |
| | | | *Surface* | | | | | | | | | | | | |
| June 4 | 7:50 p. m. | 1,260 | A | 19 | 50.5 | 28.4 | 9.2 | 0 | 7.3 | 2.8 | 1.8 | ... | ... | ... | ... |
| | | | B | 16 | 64.8 | 21.6 | 0 | 0 | 3.4 | 2.3 | 7.9 | ... | ... | ... | ... |
| | | | C | 20 | 56.2 | 14.9 | 10.5 | 0 | 14.9 | 0 | 3.5 | ... | ... | ... | ... |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 17 | 55.3 | 26.6 | 8.5 | 0 | 6.4 | 0 | 3.2 | ... | ... | ... | ... |
| | | | B | 17 | 57.7 | 21.7 | 0 | 0 | 13.4 | 0 | 7.2 | ... | ... | ... | ... |
| | | | C | 22 | 57.3 | 28.2 | 4.0 | 0 | 1.6 | 8.9 | 0 | ... | ... | ... | ... |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 25 | 52.9 | 13.8 | 6.5 | 5.8 | 5.8 | 5.8 | 9.4 | ... | ... | ... | ... |
| | | | B | 19 | 56.1 | 26.2 | 16.8 | 0 | 0 | .9 | 0 | ... | ... | ... | ... |
| | | | C | 22 | 62.6 | 19.5 | 7.3 | 0 | 7.3 | 3.3 | 0 | ... | ... | ... | ... |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 20 | 33.7 | 7.1 | 7.1 | 5.3 | 15.0 | 8.8 | 23.0 | ... | ... | ... | ... |
| | | | B | 19 | 57.1 | 21.9 | 7.6 | 1.0 | 3.8 | 5.7 | 2.9 | ... | ... | ... | ... |
| | | | C | 24 | 58.6 | 21.8 | 3.0 | .8 | 9.8 | 1.5 | 4.5 | ... | ... | ... | ... |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **New York Canal near Barber, Idaho [3]—Continued** | | | | | | | | | | | | | | | |
| | | | *Surface* | | | | | | | | | | | | |
| June 13 | 10:30 a. m. | 1,310 | A | 21 | 77.9 | 8.6 | 2.4 | 0 | 2.4 | 7.9 | 0.8 | ---- | ---- | ---- | ---- |
| | | | B | 24 | 55.1 | 16.7 | 5.8 | 0 | 8.0 | 1.4 | 13.0 | ---- | ---- | ---- | ---- |
| | | | C | 20 | 92.8 | 4.5 | 0 | 0 | 2.7 | 0 | 0 | ---- | ---- | ---- | ---- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 21 | 71.7 | 12.1 | 6.5 | 0 | 0 | 0 | 9.7 | ---- | ---- | ---- | ---- |
| | | | B | 27 | 50.4 | 17.8 | 1.3 | 0 | 14.6 | 7.0 | 8.9 | ---- | ---- | ---- | ---- |
| | | | C | 17 | 90.6 | 2.1 | 3.1 | 0 | 2.1 | 2.1 | 0 | ---- | ---- | ---- | ---- |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 20 | 62.5 | 24.2 | 11.7 | 0 | .8 | .8 | 0 | ---- | ---- | ---- | ---- |
| | | | B | 21 | 80.0 | 13.0 | 0 | 0 | 6.1 | .9 | 0 | ---- | ---- | ---- | ---- |
| | | | C | 16 | 86.8 | 3.3 | 5.5 | 1.1 | 0 | 0 | 3.3 | ---- | ---- | ---- | ---- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 26 | 60.3 | 27.4 | 0 | 0 | 7.5 | 4.8 | 0 | ---- | ---- | ---- | ---- |
| | | | B | 24 | 75.8 | 15.8 | 3.8 | 0 | 2.3 | 2.3 | 0 | ---- | ---- | ---- | ---- |
| | | | C | 18 | 84.5 | 7.7 | 0 | 1.0 | 4.8 | 1.0 | 1.0 | ---- | ---- | ---- | ---- |
| *1940* | | | *Surface* | | | | | | | | | | | | |
| Mar. 2 | 8:10 a. m. | 831 | A | 238 | 47.6 | 36.5 | 12.0 | 3.9 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 293 | 43.3 | 29.1 | 8.1 | 19.5 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | C | 268 | 32.0 | 30.4 | 6.0 | 31.6 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 244 | 57.4 | 25.5 | 12.9 | 4.2 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 245 | 56.6 | 30.5 | 11.5 | 1.4 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | C | 225 | 53.1 | 35.7 | 9.8 | 1.4 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 254 | 51.9 | 33.2 | 11.9 | 3.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | B | 247 | 54.8 | 32.4 | 7.8 | 5.0 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| | | | C | 259 | 49.3 | 39.8 | 7.7 | 3.2 | ---- | ---- | ---- | ---- | ---- | ---- | ---- |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 252 | 55.1 | 33.2 | 10.3 | 1.4 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 254 | 51.5 | 33.9 | 8.7 | 5.9 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 258 | 44.4 | 38.4 | 10.8 | 6.4 | --- | --- | --- | --- | --- | --- | --- |
| | | | *Surface* | | | | | | | | | | | | |
| Mar. 9 | 8:40 a. m. | 1,060 | A | 276 | 46.9 | 34.8 | 11.1 | 7.2 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 288 | 41.4 | 37.1 | 9.4 | 12.1 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 248 | 50.5 | 38.6 | 8.8 | 2.1 | --- | --- | --- | --- | --- | --- | --- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 281 | 53.2 | 32.3 | 8.6 | 5.9 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 270 | 47.1 | 40.0 | 10.8 | 2.1 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 266 | 53.1 | 33.7 | 9.1 | 4.1 | --- | --- | --- | --- | --- | --- | --- |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 266 | 53.5 | 33.4 | 11.6 | 1.5 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 256 | 47.9 | 37.2 | 10.1 | 4.8 | --- | --- | --- | --- | --- | --- | --- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 286 | 50.6 | 32.6 | 13.0 | 3.8 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 287 | 50.4 | 32.2 | 10.3 | 7.1 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 278 | 50.6 | 34.4 | 10.6 | 4.4 | --- | --- | --- | --- | --- | --- | --- |
| | | | *Surface* | | | | | | | | | | | | |
| Mar. 15 | 9:05 a. m. | 1,040 | A | 155 | 72.7 | 20.1 | 3.6 | 3.6 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 129 | 61.5 | 20.7 | 5.3 | 12.5 | --- | --- | --- | --- | --- | --- | --- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 106 | 49.0 | 31.8 | 10.5 | 8.7 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 73 | 63.9 | 25.1 | 3.3 | 7.7 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 120 | 61.4 | 23.3 | 5.5 | 9.8 | --- | --- | --- | --- | --- | --- | --- |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 97 | 61.5 | 22.0 | 8.5 | 8.0 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 105 | 62.9 | 27.0 | 2.8 | 7.3 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 103 | 54.6 | 23.3 | 10.8 | 11.3 | --- | --- | --- | --- | --- | --- | --- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 122 | 62.9 | 20.2 | 6.7 | 10.2 | --- | --- | --- | --- | --- | --- | --- |
| | | | B | 117 | 67.7 | 21.1 | 6.4 | 4.8 | --- | --- | --- | --- | --- | --- | --- |
| | | | C | 104 | 58.7 | 27.6 | 3.3 | 10.4 | --- | --- | --- | --- | --- | --- | --- |

See footnotes at end of table.

*Size analyses of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **New York Canal near Barber, Idaho [3]—Continued** | | | | | | | | | | | | | | | |
| *1940* | | | *Surface* | | | | | | | | | | | | |
| Apr. 2 | 8:30 a. m. | 1,340 | A | 261 | 30.2 | 37.3 | 27.3 | 5.2 | | | | | | | |
| | | | B | 287 | 25.8 | 41.3 | 25.2 | 7.7 | | | | | | | |
| | | | C | 293 | 33.4 | 41.4 | 18.8 | 6.4 | | | | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | A | 296 | 32.4 | 38.5 | 22.3 | 6.8 | | | | | | | |
| | | | B | 338 | 32.0 | 35.8 | 21.2 | 11.0 | | | | | | | |
| | | | C | 328 | 35.0 | 33.8 | 23.8 | 7.4 | | | | | | | |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | A | 341 | 33.2 | 34.8 | 22.1 | 9.9 | | | | | | | |
| | | | B | 304 | 32.2 | 36.7 | 21.7 | 9.4 | | | | | | | |
| | | | C | 274 | 20.1 | 43.8 | 24.6 | 11.5 | | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | A | 319 | 31.8 | 35.3 | 21.2 | 11.7 | | | | | | | |
| | | | B | 308 | 32.7 | 31.4 | 25.4 | 10.5 | | | | | | | |
| | | | C | 323 | 26.6 | 38.9 | 22.1 | 12.4 | | | | | | | |
| | | | *Surface* | | | | | | | | | | | | |
| Apr. 20 | 8 a. m. | 1,710 | Composite | 53 | 28.5 | 34.5 | 17.0 | 20.0 | | | | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 81 | 16.5 | 22.1 | 9.4 | 52.0 | | | | | | | |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | Composite | 134 | 13.3 | 16.0 | 6.3 | 64.4 | | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 171 | 7.1 | 11.2 | 6.5 | 75.2 | | | | | | | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | *Surface* | | | | | | | | | | | | |
| Apr. 25 | 8:40 a. m. | 2,480 | Composite | 56 | 28.8 | 20.9 | 8.7 | 41.6 | | | | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 92 | 18.7 | 15.3 | 7.3 | 58.7 | | | | | | | |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | Composite | 194 | 11.5 | 5.7 | 3.3 | 79.5 | | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 296 | 5.7 | 4.3 | 2.9 | 87.1 | | | | | | | |
| | | | *Surface* | | | | | | | | | | | | |
| May 1 | 3:50 p. m. | 2,130 | Composite | 47 | 38.8 | 25.9 | 14.4 | 20.9 | | | | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 54 | 33.1 | 20.6 | 9.9 | 36.4 | | | | | | | |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | Composite | 150 | 9.7 | 8.6 | 5.7 | 76.0 | | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 333 | 2.8 | 3.5 | 2.4 | 91.3 | | | | | | | |
| | | | *Surface* | | | | | | | | | | | | |
| May 11 | 8:30 a. m. | 2,620 | Composite | 40 | 19.4 | 46.5 | 9.7 | 24.4 | | | | | | | |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 55 | 17.9 | 28.8 | 21.4 | 31.9 | | | | | | | |
| | | | *1.0 ft. above bottom* | | | | | | | | | | | | |
| | | | Composite | 82 | 10.9 | 23.2 | 5.6 | 60.3 | | | | | | | |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 204 | 5.4 | 11.9 | 3.6 | 79.1 | | | | | | | |

See footnotes at end of table.

*Size angles of suspended sediment*—Continued

| Date | Time | Discharge (second-feet) | Description of sample | Sediment concentration (p. p. m.) | Percent in indicated size range [1] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| **New York Canal near Barber, Idaho [3]—Continued** | | | | | | | | | | | | | | | |
| *1940* | | | *Surface* | | | | | | | | | | | | |
| May 24 | 9:30 a. m. | 2,520 | Composite | 20 | 40.5 | 28.6 | 2.3 | 28.6 | -- | -- | -- | -- | -- | -- | -- |
| | | | *Mid-depth* | | | | | | | | | | | | |
| | | | Composite | 35 | 29.3 | 32.3 | 10.4 | 28.0 | -- | -- | -- | -- | -- | -- | -- |
| | | | *0.5 ft. above bottom* | | | | | | | | | | | | |
| | | | Composite | 77 | 16.2 | 11.9 | 1.4 | 70.5 | -- | -- | -- | -- | -- | -- | -- |
| | | | *Bottom* | | | | | | | | | | | | |
| | | | Composite | 218 | 5.9 | 2.4 | 1.5 | 90.2 | -- | -- | -- | -- | -- | -- | -- |
| **Cottonwood Gulch at Boise, Idaho [4]** | | | | | | | | | | | | | | | |
| *1939* | | | *Integrated samples* | | | | | | | | | | | | |
| Mar. 30 | 5:50 p. m. | 18 | LWS | 34,100 | -- | -- | -- | 0.5 | 0.5 | 1.0 | 5.8 | 27.3 | 33.2 | 24.8 | 6.9 |
| | | | LWS | 45,600 | -- | -- | -- | .3 | .5 | 1.6 | 10.8 | 29.8 | 31.4 | 19.4 | 6.2 |
| | | | HWS | 5,280 | -- | -- | -- | 2.8 | 3.6 | 6.6 | 30.4 | 46.2 | 10.4 | -- | -- |
| Mar. 31 | 7:50 a. m. | 18 | LWS | 14,400 | -- | -- | -- | .9 | .8 | 1.5 | 7.5 | 23.3 | 33.3 | 28.6 | 4.1 |
| | | | LWS | 20,300 | -- | -- | -- | .6 | .6 | 1.5 | 9.7 | 29.9 | 29.6 | 21.0 | 7.1 |
| | | | HWS | 3,180 | -- | -- | -- | 3.2 | 3.5 | 6.3 | 19.9 | 47.3 | 16.3 | 3.5 | -- |
| Apr. 1 | 7:45 a. m. | 16 | LWS | 29,500 | -- | -- | -- | .3 | .3 | 1.0 | 10.2 | 31.4 | 33.9 | 21.4 | 1.5 |
| | | | LWS | 26,700 | -- | -- | -- | .4 | .4 | 1.2 | 15.2 | 32.7 | 31.5 | 14.9 | 3.7 |
| | | 16 | HWS | 1,360 | -- | -- | -- | 6.3 | 6.9 | 11.7 | 29.0 | 27.0 | 19.1 | -- | -- |
| Apr. 2 | 10:15 a. m. | 16 | LWS | 1,020 | -- | -- | -- | 3.9 | 6.2 | 6.3 | 21.4 | 21.9 | 26.5 | 13.8 | -- |
| | | | LWS | 4,470 | -- | -- | -- | 2.0 | 2.0 | 2.9 | 9.4 | 12.0 | 28.2 | 32.9 | 10.6 |
| | | | HWS | 673 | -- | -- | -- | 14.4 | 12.0 | 10.1 | 12.4 | 22.6 | 28.5 | -- | -- |
| | | | HWS | 1,460 | -- | -- | -- | 6.3 | 5.1 | 5.3 | 8.5 | 12.7 | 24.0 | 23.2 | 14.9 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Apr. 5 | 4:10 p. m. | 11 | LWS | 21,500 | — | — | — | .5 | .5 | 2.3 | 22.2 | 35.3 | 25.4 | 11.1 | 2.7 |
| | | | LWS | 4,320 | — | — | — | 2.2 | 1.9 | 3.7 | 26.8 | 43.2 | 15.0 | 7.2 | — |
| | | | HWS | 811 | — | — | — | 10.4 | 11.5 | 11.4 | 29.8 | 19.3 | 17.6 | — | — |
| Apr. 10 | 2:40 p. m. | 7.7 | LWS | 2,420 | — | — | — | 2.0 | 1.3 | 1.7 | 11.3 | 39.2 | 30.4 | 14.1 | — |
| | | | LWS | 5,190 | — | — | — | .9 | .6 | .9 | 10.0 | 41.0 | 34.1 | 12.5 | — |
| | | | HWS | 110 | — | — | — | 40.7 | 29.9 | 11.6 | 17.8 | — | — | — | — |
| Feb. 29 | 10:35 p. m. | 32 | LWS | 26,700 | 0.7 | 1.0 | 1.0 | .4 | .8 | 1.0 | 4.5 | 20.1 | 30.4 | 28.7 | 11.4 |
| | | | LWS | 17,300 | 1.2 | 1.3 | 1.5 | .7 | 1.3 | 1.7 | 6.4 | 21.5 | 30.4 | 21.5 | 12.5 |
| | | | HWS | 2,400 | 10.0 | 12.6 | 10.5 | 5.1 | 9.4 | 11.2 | 20.0 | 10.3 | 3.0 | 7.9 | — |
| | | | HWS | 2,790 | 6.9 | 9.5 | 9.0 | 4.9 | 7.7 | 9.3 | 21.3 | 20.2 | 8.2 | 3.0 | — |
| Mar. 8 | 1:20 p. m. | 13 | LWS | 3,780 | .7 | .5 | .5 | .3 | 1.9 | 2.3 | 8.7 | 19.2 | 29.2 | 15.8 | 20.9 |
| | | | LWS | 7,030 | .3 | .3 | .6 | .1 | .8 | 1.9 | 10.7 | 27.6 | 24.4 | 25.2 | 8.1 |
| | | | HWS | 347 | 7.1 | 6.1 | 6.2 | 5.0 | 12.2 | 14.4 | 18.3 | 8.9 | 21.8 | — | — |
| | | | HWS | 313 | 7.3 | 6.7 | 15.5 | 8.3 | 18.7 | 19.8 | 11.0 | 5.9 | 6.8 | — | — |
| Mar. 31 | 1:30 p. m. | 62 | LWS | 9,250 | 7.0 | 16.9 | 21.3 | 8.4 | 8.5 | 5.6 | 7.5 | 8.3 | 6.6 | 9.9 | — |
| | | | LWS | 13,200 | 5.2 | 12.5 | 14.1 | 4.7 | 6.7 | 3.7 | 5.7 | 10.4 | 17.0 | 20.0 | — |
| | | | HWS | 14,400 | 4.8 | 11.3 | 12.0 | 2.4 | 9.5 | 3.4 | 3.9 | 4.1 | 7.7 | 12.8 | 28.1 |
| | | | HWS | 8,970 | 7.7 | 17.4 | 21.6 | 4.4 | 12.5 | 5.7 | 5.3 | 3.1 | 5.1 | 5.3 | 11.9 |
| Apr. 8 | 9 a. m. | 18 | LWS | 24,700 | .2 | .4 | .5 | .2 | .8 | 1.3 | 6.8 | 27.8 | 32.9 | 19.6 | 9.5 |
| | | | LWS | 20,000 | .2 | .4 | .7 | .3 | 1.1 | 1.8 | 8.7 | 23.1 | 32.8 | 27.3 | 3.6 |
| | | | HWS | 615 | 9.5 | 12.6 | 16.7 | 10.3 | 21.2 | 12.9 | 10.1 | 6.7 | — | — | — |
| | | | HWS | 665 | 6.1 | 11.6 | 16.4 | 8.8 | 21.5 | 13.7 | 11.6 | 10.3 | — | — | — |
| Apr. 11 | 6:30 p. m. | 15 | LWS | 11,900 | .3 | .5 | .5 | .3 | 1.1 | 3.0 | 12.8 | 33.7 | 34.6 | 13.2 | — |
| | | | LWS | 14,900 | .3 | .2 | .4 | .3 | .8 | 2.3 | 11.0 | 33.2 | 33.5 | 18.0 | — |
| | | | HWS | 634 | 3.7 | 4.8 | 9.3 | 4.2 | 10.4 | 8.5 | 7.5 | 13.0 | 38.6 | — | — |
| | | | HWS | 500 | 4.2 | 4.5 | 9.3 | 11.7 | 15.0 | 12.9 | 15.9 | 26.5 | — | — | — |
| Apr. 29 | 9 a. m. | 8.2 | LWS | 5,630 | .3 | 1.1 | 1.3 | .6 | .9 | 1.6 | 6.5 | 34.6 | 38.6 | 14.5 | — |
| | | | LWS | 3,010 | .5 | 1.3 | 2.7 | .8 | 1.2 | 2.3 | 11.6 | 41.1 | 28.3 | 10.2 | — |
| | | | HWS | 183 | 13.5 | 23.4 | 35.0 | 10.8 | 8.9 | 4.6 | 3.8 | — | — | — | — |
| | | | HWS | 181 | 16.0 | 28.1 | 31.9 | 9.4 | 6.9 | 2.9 | 4.8 | — | — | — | — |

[1] First value reported shows percent finer than upper limit of range indicated; last value reported shows percent coarser than lower limit of range indicated.
[2] Sampling points A, B, C, and D are approximately one-fifth, two-fifths, three-fifths, and four-fifths the distance across the stream.
[3] Sampling points A, B, and C are approximately one-fourth, one-half, and three-fourths the distance across stream.
[4] LWS indicates low-water section; HWS indicates high-water section. Sample obtained by lowering bottle through nappe at several points across section.
[5] Sample obtained by lowering bottle to bottom at several points across stream.
[6] Sample obtained by lowering bottle through overfall at several points across stream.
[7] Sampling points A and B are approximately one-third and two-thirds the distance across stream.
[8] Concentration less than 100 parts per million

758529—48——10

*Size analyses of deposited sediment*

| Sample No.[1] | Date | Location | Percent in indicated size range [2] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | <0.005 mm. | 0.005–0.020 mm. | 0.020–0.050 mm. | 0.050–0.074 mm. | 0.074–0.149 mm. | 0.149–0.250 mm. | 0.250–0.50 mm. | 0.50–1.00 mm. | 1.00–2.00 mm. | 2.00–4.00 mm. | >4.00 mm. |
| | | **Boise River** | | | | | | | | | | | |
| | *1939* | | | | | | | | | | | | |
| 1 | Mar. 30 | 150-200 ft. below Diversion Dam near Barber. | | | | 2.7 | 6.4 | 4.0 | 12.4 | 39.9 | 18.2 | 16.4 | |
| 2 | do | do | | | | .2 | 3.0 | 10.3 | 19.2 | 25.6 | 24.3 | 13.1 | 4.3 |
| 3 | do | do | | | | .4 | 1.3 | 1.7 | 4.0 | 9.3 | 21.8 | 25.9 | 35.6 |
| 4 | do | do | | | | .1 | .2 | 1.0 | 4.8 | 26.5 | 37.4 | 27.5 | 2.5 |
| 5 | do | do | | | | .2 | .6 | .6 | 4.4 | 26.8 | 39.1 | 28.3 | |
| 6 | do | do | | | | .2 | .6 | .3 | 12.4 | 48.8 | 32.4 | 3.1 | 2.2 |
| 7 | do | 1.0 mile below Diversion Dam | | | | .6 | 3.6 | 20.7 | 26.5 | 20.0 | 15.6 | 7.9 | 5.1 |
| 8 | do | 1.5 miles below Diversion Dam | | | | .8 | 2.3 | 9.5 | 29.3 | 26.5 | 19.4 | 10.8 | 1.4 |
| 9 | do | do | | | | .2 | .5 | 3.5 | 39.5 | 39.3 | 12.8 | 4.2 | |
| 10 | do | do | | | | .1 | .2 | 2.1 | 38.5 | 53.4 | 5.3 | .4 | |
| 11 | do | 200 ft. below Idaho Power Co. Dam at Barber. | | | | .2 | 1.3 | 2.7 | 16.3 | 37.6 | 31.8 | 4.9 | 5.2 |
| 12 | do | do | | | | .2 | 1.1 | 12.9 | 54.0 | 13.2 | 5.0 | 5.1 | 8.5 |
| 13 | do | 200 ft. above Idaho Power Co. Dam at Barber. | | | | .1 | .2 | 1.1 | 6.2 | 19.9 | 36.6 | 24.7 | 11.2 |
| 14 | do | do | | | | .1 | .1 | 2.9 | 22.5 | 27.1 | 23.3 | 15.8 | 8.2 |
| 15 | do | do | | | | .1 | .1 | 2.9 | 44.7 | 42.8 | 7.7 | 1.7 | |
| 16 | do | do | | | | 1.4 | 1.3 | 8.6 | 40.9 | 20.4 | 27.4 | | |
| 26 | Apr. 16 | 200 ft. above highway bridge at Notus. | | | | 3.7 | 15.3 | 63.7 | 17.3 | | | | |
| 27 | do | do | | | | 9.0 | 23.4 | 55.7 | 11.9 | | | | |
| 28 | do | do | 1.6 | 1.1 | 2.4 | 4.6 | 26.7 | 55.8 | 7.8 | | | | |
| 29 | May 10 | Opposite gage on New York Canal near Barber. | .2 | .1 | .5 | 1.1 | 5.9 | 5.7 | 6.6 | 25.6 | 37.6 | 14.9 | 1.8 |
| 30 | do | do | | | | .1 | .2 | 4.1 | 15.8 | 7.3 | 7.1 | 6.6 | 58.8 |
| 42 | Sept. 10 | 2.4 miles below gage near Twin Springs. | 1.4 | 2.7 | 11.1 | 12.8 | 56.6 | 11.1 | 4.3 | | | | |
| 43 | do | do | .4 | .2 | .5 | 1.1 | 7.0 | 8.5 | 82.3 | | | | |
| 44 | do | At mouth of Cottonwood Creek | 15.9 | 41.5 | 28.2 | 4.3 | 5.0 | 3.1 | 2.0 | | | | |

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | Sept. 23 | 7.2 miles above Diversion Dam near Barber. | .4 | .2 | .1 | .2 | 1.8 | 15.7 | 26.0 | 10.0 | 15.6 | 21.3 | 8.7 |
| 46 | do | do | 1.0 | .7 | 1.5 | 4.6 | 38.0 | 47.7 | 6.5 | | | | |
| 52 | Oct. 8 | Arrow Rock Reservoir, 0.2 mile above dam. | 9.8 | 10.7 | 7.1 | 4.0 | 5.6 | 6.1 | 6.2 | 12.4 | 11.1 | 21.2 | 5.8 |
| 53 | do | do | 25.8 | 24.5 | 18.5 | 4.3 | 7.4 | 5.8 | 13.7 | | | | |
| 54 | Oct. 25 | 500 ft. above Diversion Dam | 3.6 | 4.8 | 2.7 | 2.0 | 2.1 | .7 | 3.7 | 18.8 | 21.0 | 9.4 | 31.2 |
| 55 | do | do | | | | .7 | .8 | 1.2 | 6.3 | 30.6 | 34.9 | 20.0 | 5.5 |
| 56 | do | do | | | | 3.5 | 1.5 | 1.3 | 5.9 | 14.4 | 10.5 | 16.1 | 46.8 |
| 57 | do | 700 ft. above Diversion Dam | | | | 4.8 | 2.1 | 2.4 | 3.9 | 19.1 | 23.3 | 15.4 | 29.0 |
| 58 | do | 400 ft. above Diversion Dam | 6.4 | 3.0 | 16.8 | 12.8 | 43.6 | 15.3 | 2.1 | | | | |
| | | **Cottonwood Creek** | | | | | | | | | | | |
| | *1939* | | | | | | | | | | | | |
| 36 | May 19 | At gaging station | 0.3 | 0.3 | 0.1 | 0.1 | 0.8 | 13.6 | 84.8 | | | | |
| 37 | do | do | .3 | .2 | .2 | .1 | 2.0 | 12.5 | 84.7 | | | | |
| | | **Grouse Creek** | | | | | | | | | | | |
| | *1939* | | | | | | | | | | | | |
| 22 | Apr. 12 | Near gaging station | 1.5 | 0.6 | 4.2 | 5.7 | 26.6 | 46.1 | 15.3 | | | | |
| 23 | do | do | .3 | .2 | .6 | .9 | 5.4 | 16.2 | 8.6 | 5.1 | 6.1 | 9.9 | 46.7 |
| 61 | July 27 | 0.4 mile below gaging station | 3.2 | 4.2 | 8.9 | 6.3 | 11.7 | 12.8 | 16.8 | 11.9 | 9.5 | 9.5 | 5.2 |
| 62 | do | do | .8 | 2.1 | 4.4 | 1.2 | 2.7 | 2.8 | 13.6 | 20.0 | 21.6 | 20.5 | 10.3 |
| 63 | do | do | .3 | .8 | 1.4 | 1.2 | 4.0 | 7.8 | 15.0 | 13.6 | 16.4 | 22.8 | 16.7 |
| 64 | do | do | 1.8 | 1.9 | 2.3 | 1.2 | 3.3 | 4.8 | 23.2 | 45.2 | 12.9 | 1.9 | 1.5 |
| 65 | do | do | | | | .7 | 1.5 | 3.0 | 20.7 | 35.7 | 26.6 | 11.8 | |
| | | **Moore Creek** | | | | | | | | | | | |
| | *1939* | | | | | | | | | | | | |
| 20 | Apr. 8 | At gaging station | | | | 3.5 | 16.5 | 51.5 | 28.5 | | | | |
| 31 | May 14 | 0.8 mile above Idaho City | | | | 4.4 | 19.5 | 31.8 | 44.3 | | | | |
| 32 | do | do | | | | 4.6 | 3.7 | 2.0 | 3.5 | 14.7 | 39.7 | 31.8 | |
| 33 | do | do | 1.4 | 2.3 | 9.5 | 15.5 | 41.7 | 24.2 | 5.4 | | | | |

See footnotes at end of table.

*Size analyses of deposited sediment*—Continued

| Sample No.[1] | Date | Location | Percent in indicated size range[2] | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | <0.005 mm. | 0.005-0.020 mm. | 0.020-0.050 mm. | 0.050-0.074 mm. | 0.074-0.149 mm. | 0.149-0.250 mm. | 0.250-0.50 mm. | 0.50-1.00 mm. | 1.00-2.00 mm. | 2.00-4.00 mm. | >4.00 mm. |
| | | | **Moore Creek—Continued** | | | | | | | | | | |
| | *1939* | | | | | | | | | | | | |
| 47 | Sept. 23 | 1.0 mile above mouth | 0.9 | 0.9 | 0.6 | 0.6 | 3.2 | 3.6 | 2.0 | 6.8 | 14.1 | 20.1 | 47.2 |
| 48 | do | 3.8 miles above mouth | 1.5 | .8 | .1 | .1 | .3 | .3 | .4 | 15.0 | 53.3 | 25.6 | 2.6 |
| 49 | do | 5.9 miles above mouth | .5 | .5 | .2 | .1 | .3 | .3 | 3.1 | 25.7 | 34.8 | 9.8 | 24.7 |
| 50 | do | 8.9 miles above mouth | 1.5 | .5 | .2 | .2 | 2.0 | 4.1 | 3.2 | 10.0 | 55.9 | 22.4 | |
| 51 | do | 13.0 miles above mouth | | | | 1.7 | .8 | .9 | 8.2 | 48.8 | 26.7 | 6.0 | 6.9 |
| | *1940* | | | | | | | | | | | | |
| 72 | Sept. 22 | At mouth | | | | | .9 | .9 | 3.7 | 13.1 | 36.0 | 30.1 | 15.3 |
| | | | **Bannock Creek** | | | | | | | | | | |
| | *1939* | | | | | | | | | | | | |
| 18 | Apr. 8 | At gaging station | | | | 0.6 | 0.9 | 6.3 | 9.8 | 9.5 | 12.7 | 16.5 | 43.7 |
| 19 | do | do | | | | 3.1 | 12.8 | 17.9 | 11.2 | 24.8 | 30.2 | | |
| 38 | June 22 | do | 0.8 | 0.5 | 0.5 | .4 | .3 | .1 | 97.4 | | | | |
| 39 | do | do | 1.0 | .6 | 1.3 | .9 | 2.9 | 18.5 | 74.8 | | | | |
| | *1940* | | | | | | | | | | | | |
| 59 | Mar. 29 | do | | | | 1.4 | 1.8 | 3.5 | 10.9 | 11.1 | 12.2 | 22.5 | 36.6 |
| 60 | do | do | | | | 1.4 | 1.8 | 5.4 | 13.1 | 11.4 | 17.8 | 27.5 | 21.6 |
| | | | **Elk Creek** | | | | | | | | | | |
| | *1939* | | | | | | | | | | | | |
| 34 | May 14 | Near gaging station | 1.3 | 1.9 | 3.5 | 9.2 | 27.6 | 28.5 | 28.0 | | | | |
| 35 | do | do | .6 | .9 | .6 | 1.2 | 13.0 | 35.5 | 48.2 | | | | |
| 40 | Sept. 4 | At gaging station | .3 | .5 | .9 | .8 | 11.0 | .3 | 8.1 | 12.1 | 15.6 | 19.5 | 30.9 |
| 41 | do | do | .4 | .6 | 1.8 | 2.0 | 7.3 | 9.9 | 9.1 | 11.6 | 11.5 | 6.4 | 39.4 |

**New York Canal**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1939* | | | | | | | | | | | | |
| 21 | Apr. 10 | 1.0 mile below gaging station | ---------- | ---------- | ---------- | 1.0 | 2.1 | 7.7 | 32.2 | 23.8 | 10.4 | 12.7 | 10.1 |
| | *1940* | | | | | | | | | | | | |
| 66 | Sept. 8 | 0.2 mile below gaging station | ---------- | ---------- | ---------- | ---------- | ---------- | .6 | 4.1 | 26.5 | 57.4 | 10.9 | .5 |
| 67 | do | do | ---------- | ---------- | ---------- | ---------- | ---------- | 0 | .4 | 16.7 | 50.6 | 26.7 | 5.6 |
| 68 | do | 0.2 mile below gaging station | ---------- | ---------- | ---------- | ---------- | ---------- | 0 | 3.0 | 17.6 | 26.7 | 43.2 | 9.5 |
| 69 | do | 10.4 miles below Diversion Dam | ---------- | ---------- | ---------- | ---------- | ---------- | .7 | 42.1 | 50.0 | 6.9 | .3 | ---------- |
| 70 | do | Lateral ditch adjacent to canal 18.4 miles below Diversion Dam. | ---------- | ---------- | ---------- | 1.6 | 16.0 | 72.4 | 8.5 | 1.5 | ---------- | ---------- | ---------- |
| 71 | do | 18.6 miles below Diversion Dam | ---------- | ---------- | ---------- | ---------- | .8 | 7.3 | 33.2 | 34.0 | 20.6 | 4.1 | ---------- |

**Cottonwood Gulch**

| | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *1939* | | | | | | | | | | | | |
| 24 | Apr. 14 | At gaging station | ---------- | ---------- | ---------- | 1.3 | 3.5 | 12.2 | 26.4 | 27.3 | 14.1 | 10.6 | 4.6 |
| 25 | do | do | ---------- | ---------- | ---------- | 1.1 | 1.7 | 5.3 | 20.1 | 40.0 | 17.5 | 8.0 | 6.3 |

[1] Numbers correspond to those in the table on pages 62 and 63.

[2] For each sample, the first entry shows the percentage of the sample that is finer than the upper limit of the size range indicated; the last entry shows the percentage of the sample that is coarser than the lower limit indicated.

## COMPOSITION OF DISSOLVED MATTER IN THE BOISE RIVER

The chief interest in the Boise River is in its utility in connection with irrigation. In addition to difficulties resulting from sediment loads carried by the river and irrigation canals in the drainage basin there are problems relating to the concentration of dissolved mineral matter in the irrigation and return drainage waters. Although not so readily recognized, damage to lands and crops from high concentrations of certain salts in some parts of the country is frequently of greater significance than damage from clogging of canals and ditches with stream sediments.

Investigation of the composition of dissolved matter in the Boise River was made in connection with the stream-flow and sediment-measuring program. Arrangements were made for the collection of daily water samples from the Boise River at Dowling ranch and at Notus for the purpose of determining the chemical character of the river water at those two points.

The station at Dowling ranch was selected because of its proximity to Arrow Rock Reservoir. It is above all important diversions for irrigation, and water passing this station is representative of water released from the reservoir. Inasmuch as only small releases were being made at the time the sampling program was started, it was decided to collect samples from the Boise River near Twin Springs until larger releases were made from the reservoir. Daily samples were collected at this station from January 21 to March 31, 1939. Daily samples were collected from the station at Dowling ranch from April 1, 1939, to January 17, 1940.

The station at Notus was selected because it is below all diversions and below most of the drainage ditches on the Boise project. Water passing this station contains practically all of the dissolved matter brought in by drains flowing into the Boise River except that which may have been removed from the water by the soil. Daily samples were collected at Notus from January 13, 1939, to January 17, 1940.

Chemical analyses were made in the laboratory of the Water Resources Branch of the Geological Survey in Washington on 10-day composites of daily samples. The results of these analyses, together with the loads of dissolved matter given for each station, are tabulated at the end of this section. The last column of the table is labeled "percent sodium." The percent sodium of a water is the ratio, multiplied by 100, of the equivalents per million of sodium to the sum of the equivalents per million of calcium, magnesium, sodium, and potassium.

According to Scofield,[7]

> The significance of this characteristic of the salt complex in irrigation water lies in the results of reactions of base exchange on the physical properties of the soil. If the dissolved salts are preponderantly those of calcium and magnesium, i. e., if the percent sodium is low, then the reactions of base exchange are in the direction of maintaining good tilth and good permeability in the soil. On the other hand if the percentage of sodium is high the consequent reactions of base exchange in the soil tend in the direction of the replacement of calcium and magnesium by sodium in the exchange complex with the result that the soil becomes deflocculated and impermeable to water. Experience indicates that if the sodium percentage is below 50 there is little danger of impairing seriously the physical condition of the soil. If it is above 60, such danger exists. The critical ratio is believed to lie between 50 and 60.

The water passing the Twin Springs and Dowling ranch stations is low in dissolved matter, is soft, and the percent sodium is well under the critical limit suggested by Scofield. The concentration of dissolved solids ranged from about 50 to 100 parts per million, the total hardness from about 30 to 60 parts per million, and the percent of sodium from about 20 to 35.

The composition of the water passing the station at Notus is characterized by larger amounts of dissolved matter and is more variable than the water passing the upper stations. The concentrations of dissolved solids ranged from about 120 to 900 parts per million, total hardness from about 60 to 280 parts per million, and percent sodium from about 30 to 60. Changes in composition resulted in part from variations in the amount of water released from Arrow Rock Reservoir, the amount of water diverted for irrigation, and the amount of drainage return water discharged into the river. The effect of these variables on the composition of the water is different at different seasons of the year.

Based on Scofield's classification, water released from Arrow Rock Reservoir is suitable for practically all types of agriculture and will, with proper drainage, have little tendency to impair the physical condition of the soil. Water passing the station at Notus sometimes has a higher percent sodium than is generally recommended for agricultural use.

The general increase in dissolved mineral salts in the lower reaches of the Boise River is due largely to the discharge of concentrated drainage waters. With each succeeding diversion of the river water for irrigation, and it may be reused several times, there is usually a corresponding increase in dissolved mineral salts. It seems probable, however, that with adequate drainage and with sufficient flow in the Boise River to dilute the more concentrated drainage water, the quality of the water in the river is suitable for practically all agricultural purposes.

[7] Scofield, C. S., South coastal basin investigation, quality of irrigation waters: California Dept. of Public Works Bull. 40, 1933.

*Analyses of water from the Boise River, 1939–40*

[W. M. Noble and J. D. Hem, analysts. Analytical results in parts per million except as indicated]

| Date of collection | Mean discharge (second-feet) | Specific conductance ($K \times 10^5$ at 25° C.) | Silica ($SiO_2$) | Calcium (Ca) | Magnesium (Mg) | Sodium and potassium (Na+K) | Bicarbonate ($HCO_3$) | Sulfate ($SO_4$) | Chloride (Cl) | Nitrate ($NO_3$) | Total hardness as $CaCO_3$ | Dissolved solids: Parts per million | Dissolved solids: Tons per acre-foot | Dissolved solids: Tons per day | Percent sodium |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Boise River near Twin Springs, Idaho** | | | | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Jan. 21, 23–31 | 350 | 11 | 21 | 12 | 1.4 | 7 | 54 | 5.0 | 0.8 | 0.8 | 36 | 76 | 0.10 | 72 | 30 |
| Feb. 1–10 | 340 | 10 | ---- | 12 | 1.3 | 6 | 50 | 5.8 | .8 | .8 | 35 | 74 | .10 | 68 | 28 |
| Feb. 11, 13, 15–19 | 350 | 9.9 | 19 | 12 | 1.3 | 7 | 52 | 4.8 | .9 | .8 | 35 | 73 | .09 | 69 | 29 |
| Feb. 20–28 | 392 | 9.7 | ---- | 12 | 1.3 | 5 | 50 | 4.7 | .5 | .8 | 35 | 73 | .10 | 77 | 25 |
| Mar. 1–10 | 362 | 9.8 | ---- | 12 | 1.3 | 6 | 52 | 4.5 | .9 | .7 | 35 | 71 | .10 | 69 | 28 |
| Mar. 11–20 | 610 | 9.3 | ---- | 12 | 1.3 | 5 | 48 | 4.2 | .6 | 1.4 | 35 | 69 | .09 | 114 | 22 |
| Mar. 21–31 | 1,776 | 7.6 | ---- | 9.8 | 1.2 | 3 | 38 | 3.0 | .6 | 1.5 | 29 | 59 | .08 | 283 | 19 |
| **Boise River at Dowling ranch near Arrow Rock, Idaho** | | | | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Apr. 1–10 | 4,580 | 10 | ---- | 12 | 1.9 | 5 | 52 | 4.3 | 1.0 | 1.5 | 38 | 76 | 0.10 | 940 | 24 |
| Apr. 11–20 | 3,741 | 9.4 | ---- | 12 | 2.0 | 4 | 50 | 3.8 | .8 | 1.8 | 38 | 73 | .10 | 737 | 20 |
| Apr. 21–30 | 4,342 | 9.0 | ---- | 11 | 2.1 | 4 | 47 | 3.9 | .9 | 1.8 | 36 | 72 | .10 | 844 | 20 |
| May 1–10 | 6,330 | 8.0 | ---- | 10 | 1.4 | 5 | 44 | 3.3 | .6 | .2 | 31 | 63 | .09 | 1,077 | 26 |
| May 11–20 | 4,969 | 6.7 | ---- | 9.0 | 1.1 | 3 | 37 | 2.4 | .5 | 1.2 | 27 | 53 | .07 | 711 | 22 |
| May 21–31 | 3,556 | 6.8 | ---- | 9.2 | 1.2 | 3 | 38 | 2.6 | .6 | .2 | 28 | 50 | .07 | 480 | 20 |
| June 1–10 | 2,992 | 7.6 | 14 | 10 | 1.3 | 4 | 42 | 2.6 | .8 | .6 | 30 | 60 | .08 | 485 | 22 |
| June 11–20 | 2,696 | 7.3 | 15 | 9.4 | 1.4 | 4 | 40 | 3.2 | .8 | .7 | 29 | 59 | .08 | 429 | 23 |
| June 21–30 | 2,889 | 6.7 | 13 | 8.8 | 1.2 | 3 | 36 | 2.7 | .8 | .3 | 27 | 53 | .07 | 413 | 20 |
| July 1–10 | 2,882 | 6.7 | 14 | 9.4 | 1.2 | 4 | 40 | 2.9 | .9 | .3 | 28 | 54 | .07 | 420 | 24 |
| July 11–20 | 2,671 | 6.8 | 13 | 9.3 | 1.2 | 4 | 41 | 2.9 | .6 | .3 | 28 | 52 | .07 | 375 | 25 |
| July 21–29 | 2,242 | 7.3 | 13 | 10 | 1.3 | 5 | 44 | 3.2 | .9 | .4 | 30 | 56 | .08 | 339 | 26 |
| Aug. 2–10 | 2,287 | ---- | 15 | 11 | 1.4 | 5.2 | 47 | 3.0 | 1.5 | .8 | 33 | 68 | .09 | 420 | 25 |
| Aug. 11–20 | 2,127 | 9.2 | 14 | 12 | 1.4 | 4.9 | 50 | 3.3 | 1.1 | .5 | 36 | 66 | .09 | 379 | 23 |
| Aug. 21–31 | 1,935 | 9.2 | 14 | 11 | 1.5 | 5.5 | 49 | 3.6 | .9 | .4 | 34 | 66 | .09 | 345 | 26 |
| Sept. 1–10 | 970 | 9.3 | ---- | 12 | 1.5 | 6.6 | 54 | 4.4 | .8 | .5 | 36 | 68 | .09 | 178 | 28 |
| Sept. 11–15, 17–20 | 1,342 | 10.1 | 10 | 12 | 1.6 | 7.4 | 56 | 4.6 | 1.0 | .7 | 37 | 71 | .10 | 257 | 31 |
| Sept. 21–30 | 798 | 10.4 | ---- | 13 | 1.7 | 6.9 | 58 | 4.8 | 1.0 | .6 | 39 | 75 | .10 | 162 | 28 |
| Oct. 1–10 | 534 | 10.8 | ---- | 14 | 1.8 | 7.4 | 62 | 5.3 | 1.0 | .8 | 42 | 79 | .11 | 114 | 27 |
| Oct. 11–20 | 500 | 11.2 | 11 | 14 | 1.8 | 7.1 | 61 | 5.4 | 1.1 | .7 | 42 | 79 | .11 | 107 | 27 |
| Oct. 21–31 | 869 | 10.8 | ---- | 14 | 1.7 | 6.6 | 60 | 5.0 | 1.0 | .5 | 42 | 77 | .10 | 181 | 25 |
| Nov. 1–10 | 55.4 | 12.8 | ---- | 15 | 2.1 | 12 | 77 | 6.5 | 1.0 | 1.2 | 46 | 85 | .12 | 12.7 | 36 |
| Nov. 11–20 | 32.5 | 13.5 | 13 | 17 | 2.4 | 8.8 | 76 | 5.6 | 1.2 | 2.0 | 52 | 90 | .12 | 7.9 | 27 |
| Nov. 21–30 | 1,033 | 11.0 | ---- | 14 | 1.7 | 8.7 | 64 | 6.1 | 1.2 | .5 | 42 | 84 | .11 | 234 | 31 |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Dec. 1-10 | 1,112 | 11.1 | | 14 | 1.6 | 8.3 | 63 | 5.8 | 1.0 | .5 | 42 | 81 | .11 | 243 | 30 |
| Dec. 11-20 | 608 | 10.7 | 12 | 14 | 1.8 | 6.8 | 60 | 5.6 | 1.0 | .8 | 42 | 76 | .10 | 125 | 26 |
| Dec. 21-31 | 4.5 | 13.3 | | 18 | 2.6 | 8.0 | 77 | 6.5 | 1.1 | 1.9 | 56 | 96 | .13 | 1.2 | 24 |
| *1940* | | | | | | | | | | | | | | | |
| Jan. 1-10 | 6.3 | 13.5 | | 18 | 2.6 | 7.7 | 76 | 6.5 | .9 | 2.4 | 56 | 94 | .13 | 1.6 | 23 |
| Jan. 11-17 | 4.6 | 14.7 | 17 | 20 | 3.1 | 8.1 | 84 | 7.4 | 1.2 | 2.6 | 63 | 103 | .14 | 1.3 | 22 |
| **Boise River at Notus, Idaho** | | | | | | | | | | | | | | | |
| *1939* | | | | | | | | | | | | | | | |
| Jan. 13-20 | 517 | 73 | | 52 | 15 | 85 | 235 | 127 | 36 | 0.1 | 192 | 431 | 0.59 | 602 | 49 |
| Jan. 21-31 | 506 | 71 | | 48 | 15 | 86 | 225 | 127 | 35 | 2.3 | 182 | 424 | .58 | 579 | 50 |
| Feb. 1-10 | 488 | 72 | | 52 | 15 | 85 | 233 | 126 | 36 | 4.8 | 192 | 461 | .63 | 607 | 49 |
| Feb. 11-19 | 560 | 65 | | 49 | 14 | 76 | 221 | 110 | 32 | 5.2 | 180 | 429 | .58 | 649 | 48 |
| Feb. 20-28 | 470 | 72 | | 52 | 15 | 86 | 234 | 127 | 36 | 4.7 | 192 | 479 | .65 | 608 | 49 |
| Mar. 1-10 | 412 | 77 | | 57 | 16 | 93 | 252 | 136 | 41 | 5.3 | 208 | 500 | .68 | 556 | 49 |
| Mar. 11-20 | 485 | 63 | | 46 | 13 | 71 | 204 | 106 | 30 | 5.1 | 168 | 414 | .56 | 542 | 48 |
| Mar. 21-31 | 1,950 | 29 | | 24 | 6.7 | 29 | 104 | 43 | 12 | 5.1 | 87 | 210 | .29 | 1,106 | 42 |
| Apr. 1-10 | 428 | 16 | | 17 | 4.0 | 11 | 70 | 17 | 4.0 | 2.2 | 59 | 120 | .16 | 139 | 29 |
| Apr. 11-20 | 543 | 39 | | 29 | 7.4 | 45 | 130 | 60 | 22 | 2.0 | 103 | 256 | .35 | 375 | 49 |
| Apr. 21-30 | 90 | 78 | | 48 | 15 | 98 | 209 | 142 | 53 | 2.1 | 182 | 489 | .67 | 119 | 54 |
| May 1-10 | 1,952 | 21 | | 18 | 4.1 | 16 | 85 | 22 | 1.8 | 1.7 | 62 | 143 | .19 | 754 | 36 |
| May 11-20 | 635 | 34 | | 26 | 6.4 | 37 | 127 | 46 | 14 | .1 | 91 | 227 | .31 | 389 | 47 |
| May 21-31 | 203 | 76 | | 48 | 14 | 73 | 215 | 132 | 15 | .1 | 177 | 477 | .65 | 261 | 47 |
| June 1-6, 17-20 | 46.2 | 107 | 37 | 57 | 23 | 151 | 271 | 215 | 83 | 1.8 | 237 | 726 | .99 | 85.9 | 58 |
| June 21-30 | 36.7 | 116 | 35 | 61 | 24 | 172 | 291 | 244 | 93 | 1.6 | 251 | 788 | 1.07 | 78.1 | 60 |
| July 1-10 | 40.6 | 113 | 35 | 62 | 22 | 163 | 291 | 225 | 89 | 1.4 | 245 | 766 | 1.04 | 84.0 | 59 |
| July 11-20 | 34.3 | 120 | 37 | 65 | 25 | 167 | 295 | 239 | 96 | 1.4 | 265 | 814 | 1.11 | 75.4 | 58 |
| July 21-31 | 22.8 | 133 | 38 | 71 | 26 | 199 | 323 | 285 | 109 | 1.3 | 284 | 903 | 1.23 | 55.6 | 60 |
| Aug. 1-10 | 24.4 | 129 | 36 | 59 | 27 | 185 | 262 | 279 | 108 | 2.4 | 258 | 860 | 1.17 | 56.7 | 61 |
| Aug. 11-20 | 23.8 | 132 | 32 | 60 | 27 | 188 | 276 | 281 | 105 | 2.4 | 261 | 864 | 1.18 | 55.5 | 61 |
| Aug. 21-31 | 21.6 | 139 | 37 | 68 | 27 | 196 | 291 | 292 | 115 | 2.5 | 281 | 914 | 1.24 | 53.3 | 60 |
| Sept. 1-10 | 27.4 | 130 | | 56 | 26 | 204 | 282 | 291 | 109 | 1.8 | 247 | 876 | 1.19 | 64.8 | 64 |
| Sept. 11-20 | 278 | 80 | 28 | 48 | 16 | 111 | 245 | 142 | 51 | 2.1 | 186 | 526 | .72 | 395 | 57 |
| Sept. 21-30 | 95.8 | 94 | | 61 | 18 | 126 | 286 | 173 | 60 | 1.6 | 226 | 618 | .84 | 160 | 55 |
| Oct. 1-10 | 199 | 71 | | 48 | 14 | 95 | 247 | 120 | 39 | 1.8 | 177 | 468 | .64 | 251 | 54 |
| Oct. 11-20 | 125 | 79 | 24 | 52 | 15 | 103 | 257 | 137 | 43 | 1.9 | 192 | 508 | .69 | 171 | 54 |
| Oct. 21-31 | 352 | 76 | | 53 | 15 | 111 | 261 | 131 | 59 | 2.8 | 194 | 504 | .69 | 479 | 55 |
| Nov. 1-10 | 550 | 72 | | 54 | 16 | 91 | 261 | 128 | 33 | 4.2 | 201 | 496 | .67 | 737 | 50 |
| Nov. 11-20 | 515 | 73 | 30 | 55 | 16 | 93 | 260 | 127 | 35 | 4.3 | 203 | 498 | .68 | 692 | 50 |
| Nov. 21-30 | 459 | 76 | | 57 | 17 | 94 | 267 | 135 | 38 | 5.1 | 212 | 515 | .70 | 638 | 49 |
| Dec. 1-10 | 423 | 78 | | 58 | 17 | 96 | 270 | 139 | 38 | 4.4 | 215 | 530 | .72 | 605 | 49 |
| Dec. 11-20 | 440 | 76 | 32 | 57 | 16 | 93 | 260 | 133 | 38 | 5.9 | 208 | 512 | .70 | 608 | 49 |
| Dec. 21-31 | 480 | 71 | | 53 | 15 | 82 | 237 | 122 | 33 | 6.6 | 194 | 466 | .63 | 604 | 48 |
| *1940* | | | | | | | | | | | | | | | |
| Jan. 1-10 | 573 | 65 | | 49 | 14 | 78 | 223 | 113 | 32 | 5.5 | 180 | 442 | .60 | 684 | 49 |
| Jan. 11-17 | 494 | 70 | 29 | 53 | 14 | 82 | 234 | 120 | 33 | 5.6 | 190 | 462 | .63 | 616 | 48 |

# INDEX

O