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REPORT 83-4040

SUSPENDED-SEDIMENT YIELDS IN THE TAYLOR RUN AND SHAVERS FORK BASINS, RANDOLPH COUNTY, WEST VIRGINIA, 1973-80

Prepared By
UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY
In Cooperation With
WEST VIRGINIA DEPARTMENT OF HIGHWAYS

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By

Stephen M. Ward

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UNITED STATES DEPARTMENT OF THE INTERIOR

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM OF UNITS (SI)

For the convenience of readers who may want to use the International System of Units (SI), the data may be converted by using the following factors:

Multiply	By	To obtain
inch (in.)	25.40	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
acre	0.4047	hectare (ha)
square mile (mi^2)	2.590	square kilometer (km^2)
ton, short	0.9072	megagram (Mg)
ton per square mile (ton/mi^2)	0.3502	megagram per square kilometer (Mg/km^2)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
cubic foot per second per square mile [$(ft^3/s)/mi^2$]	0.01093	cubic meter per second per square kilometer [$(m^3/s)/km^2$]
cubic foot per second-day (ft^3/s-d)	0.02832	cubic meter per second-day (m^3/s-d)
cubic yard (yd^3)	0.7646	cubic meter (m^3)
degree Fahrenheit (°F)	-32 × 5/9	degree Celsius (°C)

National Geodetic Vertical Datum of 1929 (NGVD of 1929): A geodetic datum derived from a general adjustment of the first-order level nets of both the United States and Canada, formerly called mean sea level. NGVD of 1929 is referred to as sea level in this report.

SUSPENDED-SEDIMENT YIELDS IN THE TAYLOR RUN AND SHAVERS FORK BASINS, RANDOLPH COUNTY, WEST VIRGINIA, 1973-80

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ABSTRACT

Precipitation, streamflow, and sediment data were collected in two adjacent basins near Bowden, West Virginia, to evaluate the effects of highway construction (Appalachian Corridor H) on stream-sediment discharge. From October 1974 to September 1980 (1975-80 water years), daily suspended-sediment data were collected in the 5.06-square-mile Taylor Run basin to provide background data in anticipation of highway construction. However, construction was halted near the mouth of Taylor Run just east of the Shavers Fork crossing pending evaluation of an Environmental Impact Statement. Construction was completed in the late summer of 1976. Daily suspended-sediment data were collected on the main stem of Shavers Fork from July 1975 to September 1980 to evaluate the sediment discharge associated with areas already excavated and filled.

About 2,340 tons of suspended sediment was discharged past the gaging station at Taylor Run at Bowden (5.06 square miles) during the 1975-80 water years. The maximum daily yield of 32 tons per square mile and the maximum daily precipitation of 3.30 inches occurred on July 3, 1980. Annual suspended-sediment yields ranged from 23 to 140 tons per square mile. Sediment produced by man's activities in Taylor Run during the investigation was slight. High sediment yields were usually associated with intense storms in this small, steep, forested drainage.

Suspended-sediment yield was high during and immediately after an 11-month logging operation (1977-78) in Taylor Run but declined significantly during 1979, even though precipitation increased. Annual suspended-sediment discharge in relation to runoff decreased nearly 10 percent. Precipitation during this time increased 25 percent to about 60 inches. High suspended-sediment concentrations were measured, however, in the Stalnaker Run basin, a tributary to Taylor Run, where the soil has not been disturbed since logging operations in 1970.

About 112,000 tons of suspended sediment was discharged past the gaging station at Shavers Fork below Bowden (151 square miles) during the 1976-80 water years. The maximum daily yield of 108 tons per square mile was associated with a large storm during March 1977, which accounted for 53 percent of the total load for the water year and nearly 15 percent of the load for the 5-year investigation. Annual suspended-sediment yields ranged from 39 to 204 tons per square mile. Sediment produced by man's activities in the Shavers Fork drainage was varied and of greater magnitude than in Taylor Run.

Sediment yields stabilized in the main stem of Shavers Fork approximately 2 years after completion of Corridor H construction. Sediment yields were high after highway completion during the 1977 water year, when two major storms produced 75 percent of the annual suspended-sediment load. Runoff during the 1978-80 water years ranged from 38.5 to 42.5 inches per year, and suspended-sediment yields ranged from 154 to 175 tons per square mile.

INTRODUCTION

A cooperative study by the U.S. Geological Survey and the West Virginia Department of Highways was begun in 1973 to evaluate sediment yields associated with highway construction. The first phase was the collection of hydrologic data from the Taylor Run basin [5.06 mi^2 (square miles)] and a 5-mi (mile) reach of the Shavers Fork in northeastern West Virginia. The study area is near Bowden, Randolph County, 8 mi east of Elkins, West Virginia (fig. 1). Taylor Run is a tributary of Shavers Fork, a popular trout stream, and is 1 mi east of the Bowden National Fish Hatchery (fig. 2). A segment of the Shavers Fork basin is also discussed in this report in reference to a completed 5-mi segment of four-lane divided highway that ends near the mouth of Taylor Run (fig. 2). This is the first segment of the Appalachian Corridor H, which would ultimately connect Interstate 79 in central West Virginia and Interstate 81 in central Virginia.

Data collection began in April 1973 and ended in September 1980 with modifications in the type and frequency of collection. Suspended-sediment samples were collected once or twice daily during low flow and more frequently during high flows by local observers and verified by comparison with periodic samples collected by U.S. Geological Survey personnel. The study was revised in 1978 to provide for more intensive data collection in Taylor Run in anticipation of further highway construction. However, highway construction was delayed indefinitely to consider alternative locations persuant to Federal regulations before adopting a final location. Various construction alternatives are now being evaluated by the West Virginia Department of Highways and the Federal Highway Administration.

Initially this study was designed to determine the effects of highway construction on sediment yields in the Taylor Run basin by separating the sediment contribution from logging and mining areas. Because the highway construction has been delayed, this report discusses only variations in sediment yields relative to the revegetation and soil stabilization associated with highway construction along the main stem of Shavers Fork and variations in sediment yields associated with the logging activities in Taylor Run. This study did not attempt to divide the total sediment load of Shavers Fork into components contributed by individual activity. Insufficient data were available to determine sediment yields in Shavers Fork before or during highway construction.

This report evaluates data on a "water year" basis. A water year is defined as the period from October 1 of a previous calendar year to September 30 of the referenced year.

BASIN CHARACTERISTICS AFFECTING SEDIMENT YIELDS

Surface Drainage

The study area is west of the Allegheny Front, which divides the Appalachian Plateaus province from the Valley and Ridge province (fig. 1). A dendritic drainage system characterizes the long narrow valleys of the Appalachian Plateaus province. Valley walls are moderately steep to steep. The steep slopes and rough topography cause high rates of soil erosion.

Taylor Run originates 2.6 mi northeast of Bowden at an altitude of 3,100 ft (feet) and drains into Shavers Fork ½ mi upstream from Bowden at an altitude of 2,220 ft. Stalnaker Run is the largest tributary to Taylor Run.

Shavers Fork originates at an altitude of 4,500 ft in Pocahontas County. It flows 83.4 mi, falls 2,875 ft, and drains 213 mi^2. Shavers Fork, at the downstream boundary of the study area, 26 mi upstream from the mouth at an altitude of 2,110 ft, drains 151 mi^2. The highway construction parallels Shavers Fork for about 5 mi. The average fall of Shavers Fork in the 5 mi between Taylor Run and the lower limit of highway construction is 22 ft/mi (feet per mile).

Geology

The generalized stratigraphy of the Taylor Run basin, from the youngest to oldest, is the Pottsville Group of the Pennsylvanian Period and the Mauch Chunk and Greenbrier Groups of the Mississippian Period. The axis of the North Potomac-Georges Creek Syncline coincides closely with the Taylor Run stream valley (fig. 3).

The geology of the Shavers Fork basin upstream from the mouth of Taylor Run is essentially the same as in Taylor Run, with the exception of about 20 mi of alluvium along the stream from the

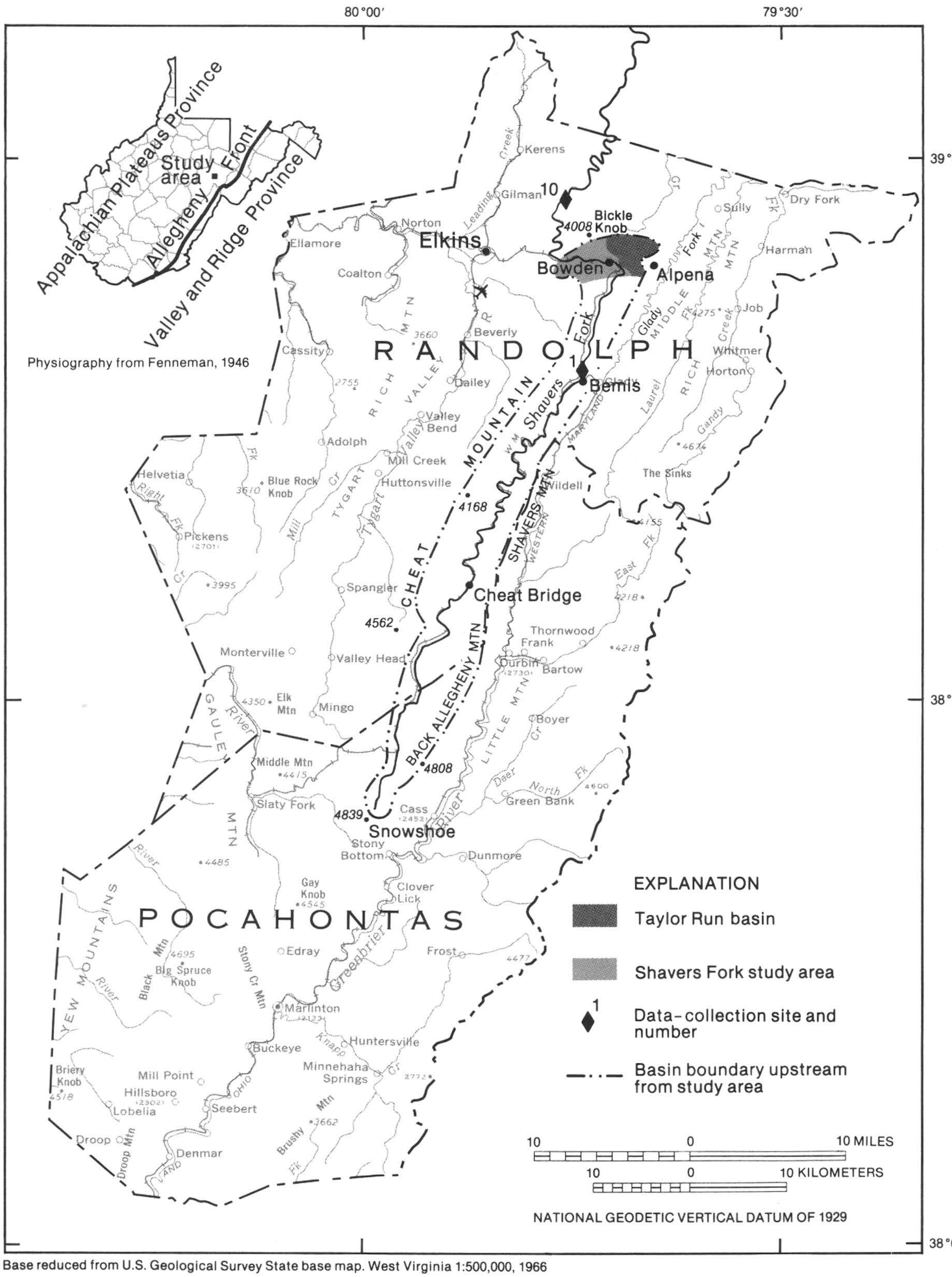

Figure 1. Major features of Taylor Run and Shavers Fork study area.

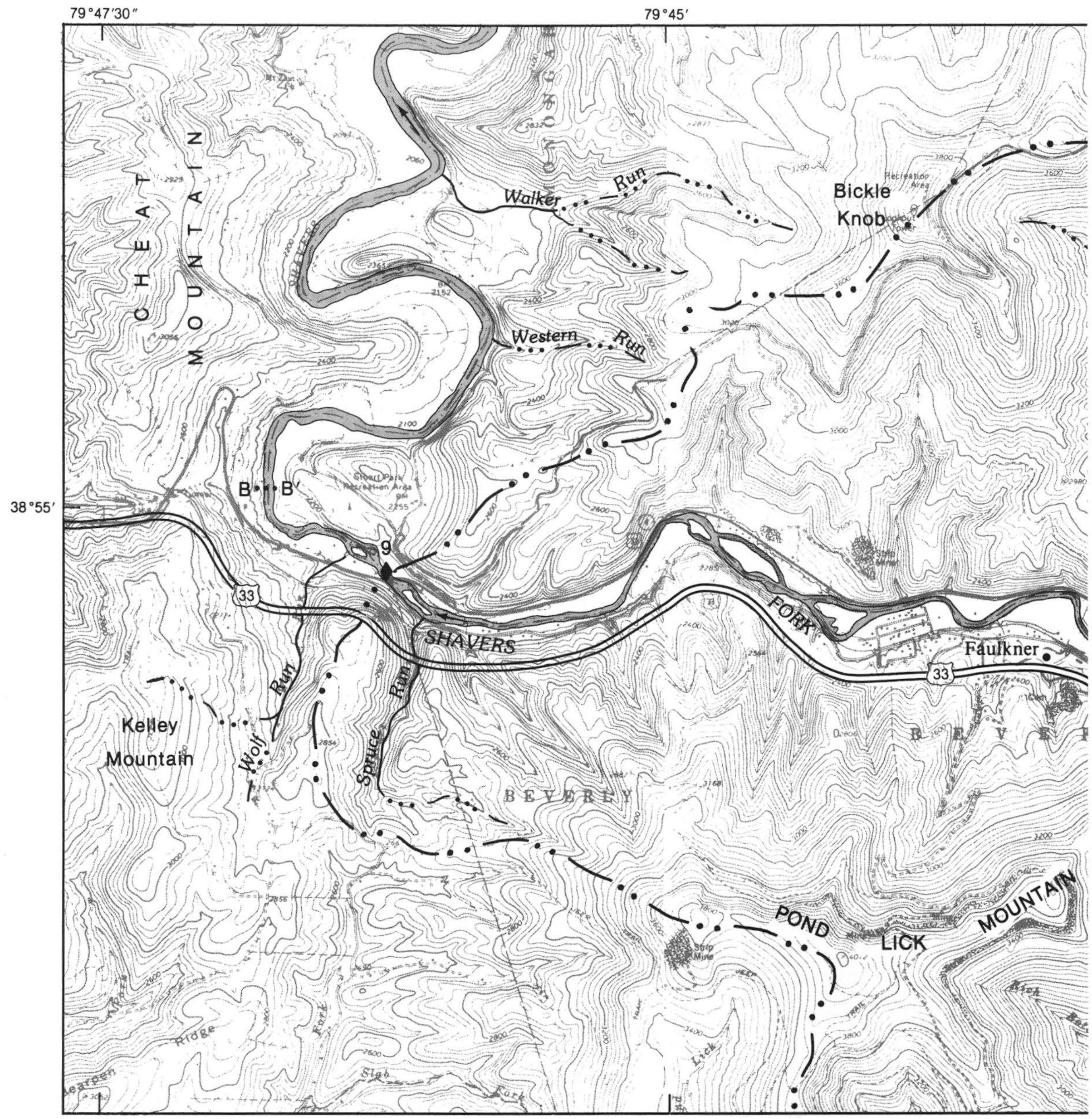

Figure continued on following page

Base reduced from U.S. Geological Survey
Bowden 1:24,000, 1968 (Pr 1976)
Elkins 1:24,000, 1969 (Pr 1976)

1 ½ 0 1 MILE

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 40 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

EXPLANATION

- Appalachian Corridor H (completed highway)
- Proposed Corridor continuation (delayed highway construction)
- A•••A' Upper limit of sediment contribution from highway construction
- B•••B' Lower limit of sediment contribution from highway construction
- Data-collection site and number
- Precipitation gage
- XX Landslide area
- Direction of flow
- Basin boundary
- Zones of logging projects
- Taylor Run basin

Figure 2. Location of completed and proposed highway through Taylor Run and Shavers Fork Basins.

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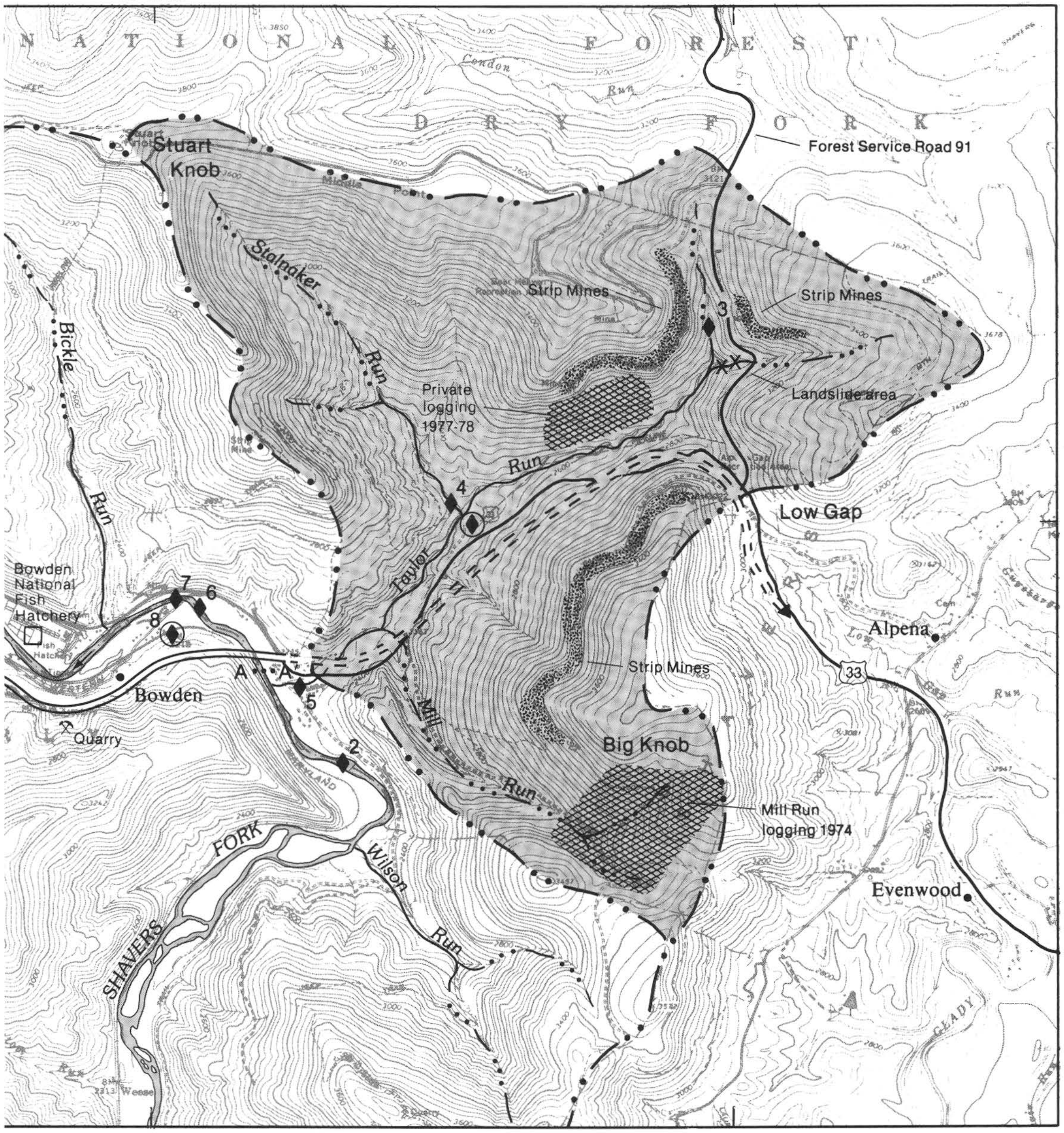

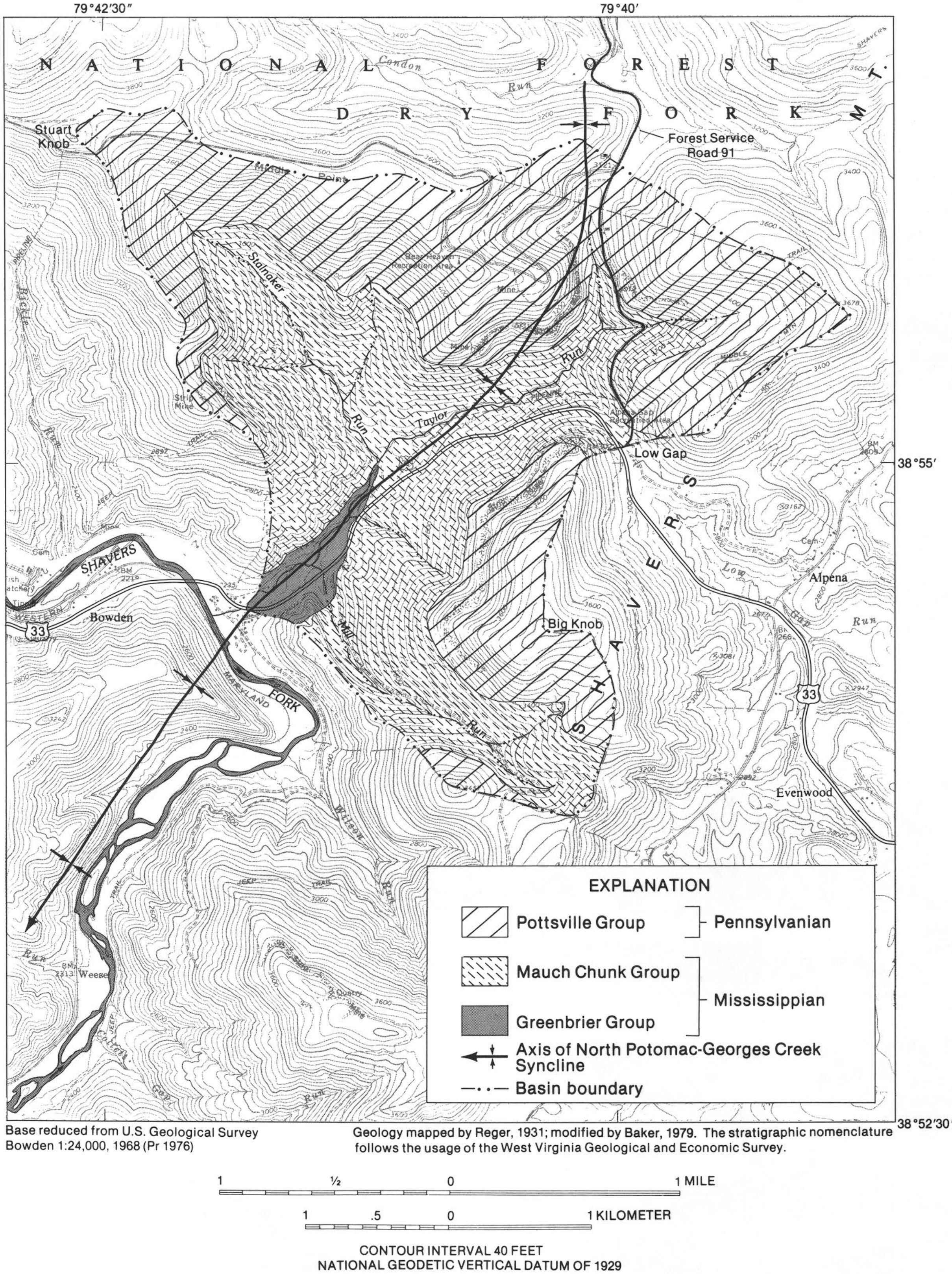

Figure 3. Generalized geology of Taylor Run basin.

head of the basin downstream to near Bemis (fig. 1). The North Potomac-Georges Creek Syncline crosses Shavers Fork just upstream from the mouth of Taylor Run and roughly parallels the Shavers Fork streambed to the head of the basin.

The geology of the Shavers Fork basin downstream from the mouth of Taylor Run, where the stream bends sharply to the west, varies. Stratigraphy upstream from the lower end of the highway construction zone, from youngest to oldest, is: Quaternary alluvium of the Cenozoic Era, the Pottsville Group of the Pennsylvanian Period, the Mauch Chunk, Greenbrier and Pocono Groups of the Mississippian Period, and the Hampshire Formation of the Devonian Period.

The general geology of the Shavers Fork area is summarized in reports by the West Virginia Geological Survey pertaining to Randolph County (Reger, 1931) and Pocahontas County (Reger, 1929). Geology is shown in detail on Map II of Randolph County (Reger, 1931) and Map II of Pocahontas County (Reger, 1929) and more recently on the 1968 Geologic Map of West Virginia, West Virginia Geological and Economic Survey (Cardwell, Erwin, and Woodward, 1968). The geologic names shown are those used by the West Virginia Geological and Economic Survey and do not necessarily conform to those used by the U.S. Geological Survey.

Cultural Activities

Taylor Run

Human activities contributing to sediment production in the Taylor Run study area were minimal during 1975-80. Routine annual road maintenance was done along 2.1 mi of U.S. Route 33, which bisects the basin, and also along 3.6 mi of Forest Service Road 91 (fig. 2), which meanders along the headwater sections of Taylor Run and eventually crosses the uppermost drainage of Stalnaker Run.

Three projects affecting suspended-sediment yield were active in the basin just before or during the study:

1. A project to repair a landslide (fig. 2) above Forest Service Road 91, immediately south of the crossing of the right fork of Taylor Run, was completed in the fall of 1974. Nearly 5,000 yd^3 (cubic yards) of material was excavated at this site (R. C. Trochlil, U.S. Forest Service, written commun., 1981).

2. Approximately 149 acres of timber was logged during 1974 in the Mill Run drainage (fig. 2), southeast of U.S. Route 33. Timber was hauled over a dirt logging road east of and parallel to Mill Run (R. C. Trochlil, U.S. Forest Service, written commun., 1981).

These two projects were concluded just before the beginning of daily-sediment sampling.

3. Approximately 70 acres of timber was logged from a 115-acre private tract surrounded by national forest near the center of the Taylor Run basin (fig. 2). This operation disturbed soil on about 2 percent of the Taylor Run drainage along the lower and middle north slopes. Logging started in August 1977 and ended in early June 1978 (J. Sloan, logging contractor, oral commun., 1981).

Other soil-disturbing activities in the Taylor Run basin before October 1974 may have a bearing on sediment yields. Seventy-two acres of timber in four units were either clearcut or thinned in the upper half of the Stalnaker Run drainage from 1968 to 1970. Approximately 115 acres were logged during 1971-72 in the head of Taylor Run on the upper slopes, but most of the timber was hauled down the east side of the mountain toward Glady Fork (fig. 1). Fifty acres were logged in the lower and middle slopes of Taylor Run just east of Stalnaker Run from 1968 to 1970, of which 34 were clearcut and 16 thinned. The refuse on this 34-acre clearcut was removed in June 1973.

Four strip mines are located in the basin but have been inactive since 1970 or before. Data were not available to differentiate mining-derived sediment yields from the normal annual suspended-sediment yield of the basin.

Shavers Fork

Human activities disrupting soil and vegetation in the Shavers Fork basin were of a greater magnitude than those in the Taylor Run basin. Soil-disturbing activities along the 5-mi reach between the mouth of Taylor Run and the Shavers Fork below Bowden gage were numerous; these included logging, limestone quarry excavations, and excavation and fill for 5 mi of four-lane highway. These activities affected about 900 acres or nearly 18 percent of the Shavers Fork drainage between the upper and lower limits of highway construction (8 mi^2) shown in figure 2. Clearing of the highway right-of-way in the Shavers Fork drainage began in the fall of 1972; completion of the highway and final cleanup ended in late summer 1976. Highway construction involved a total cleared area of 0.30 mi^2 or 192 acres in the Shavers Fork drainage (J. Chenoweth, West Virginia Department of Highways, oral commun., 1981). This represents only 0.2 percent of the total drainage area upstream from the gaging station at Shavers Fork below Bowden.

Climate

The climate is characterized as continental inland. Warm humid summers and relatively long winters are typical, with prevailing winds from the west and northwest. Temperature and precipitation data obtained from National Oceanic and Atmospheric Administration (NOAA) records from the Elkins airport, 9 mi west of the study area (fig. 1), show average January and July temperature to be 30.0° F (-1.0° C) and 68.7° F (20.5° C), respectively. (U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1974-1980).

The average frost-free season, from mid-May to mid-September, is about 130 days. Temperature extremes during the 6-year investigation were 91°F (33.0° C) and -22° F (-28.9° C).

Precipitation was recorded continuously from July 1975 to September 1980 at the South Spring at Bowden gage (site 8) and from October 1978 to September 1980 near the Stalnaker Run gage (site 4). (Rain-gage locations shown in figure 2.) Yearly precipitation totals at the South Spring and Stalnaker Run rain gages and Elkins airport (fig. 1) are compared in figure 4; yearly precipitation at South Spring averaged approximately 6 in. (inches) more than at Elkins airport. The average monthly and annual precipitation measured at Elkins airport from 1941 to 1970 (normal period) is summarized in table 1. The departure of the monthly and annual precipitation from normal at Elkins airport is graphed in figure 5.

Annual precipitation at Elkins airport was 13.56 in. above normal during 1980 and 7.34 in. below normal during 1976. The largest monthly departure above normal was 6.38 in. during August 1980, and the largest monthly departure below normal was 2.93 in. during August 1976.

Storms producing greater than 2.0 in. rainfall in 24 hours at South Spring occurred five times from August 1975 to September 1980. The largest of these produced 3.34 in. on July 3, 1980 at the South Spring gage.

DATA COLLECTION

Collection of hydrologic data in the Taylor Run-Shavers Fork area began in April 1973 and ended in September 1980. Locations of all data-collection sites are shown on the map in figure 2 except Shavers Fork at Bemis and Shavers Fork near Elkins, which are shown in figure 1. Data-collection sites are listed by site number in table 2.

All suspended-sediment and streamflow data are published annually by the U.S. Geological Survey (1973-80), with the exception of data from the instantaneous pump samplers at Taylor Run near Alpena and Stalnaker Run near Bowden, which are given in Appendix A. Suspended-sediment concentrations, expressed in mg/L (milligrams per liter), were determined by the dry-weight method outlined by Guy (1969); and, from the concentrations, the daily suspended-sediment discharge or load (expressed in tons per day), was computed by techniques described by Porterfield (1972).

Water-quality data were collected at each site in the study area. Properties measured were specific conductance, pH, air temperature, water temperature, turbidity, and occasionally dissolved oxygen. Samples for standard complete laboratory analyses and particle-size determinations were collected at some sites. The water-quality data are published annually by the U.S. Geological Survey (1973-80).

Rainfall records for South Spring at Bowden (July 1975 to September 1980) and for Stalnaker Run near Bowden (October 1978 to September 1980) are kept in U.S. Geological Survey files; monthly totals are published in U.S. Geological Survey annual data reports (1975-80). Daily precipitation totals for both sites are given in Appendix B.

Daily flow records and other data for North and South Springs at Bowden are also published annually by the Geological Survey.

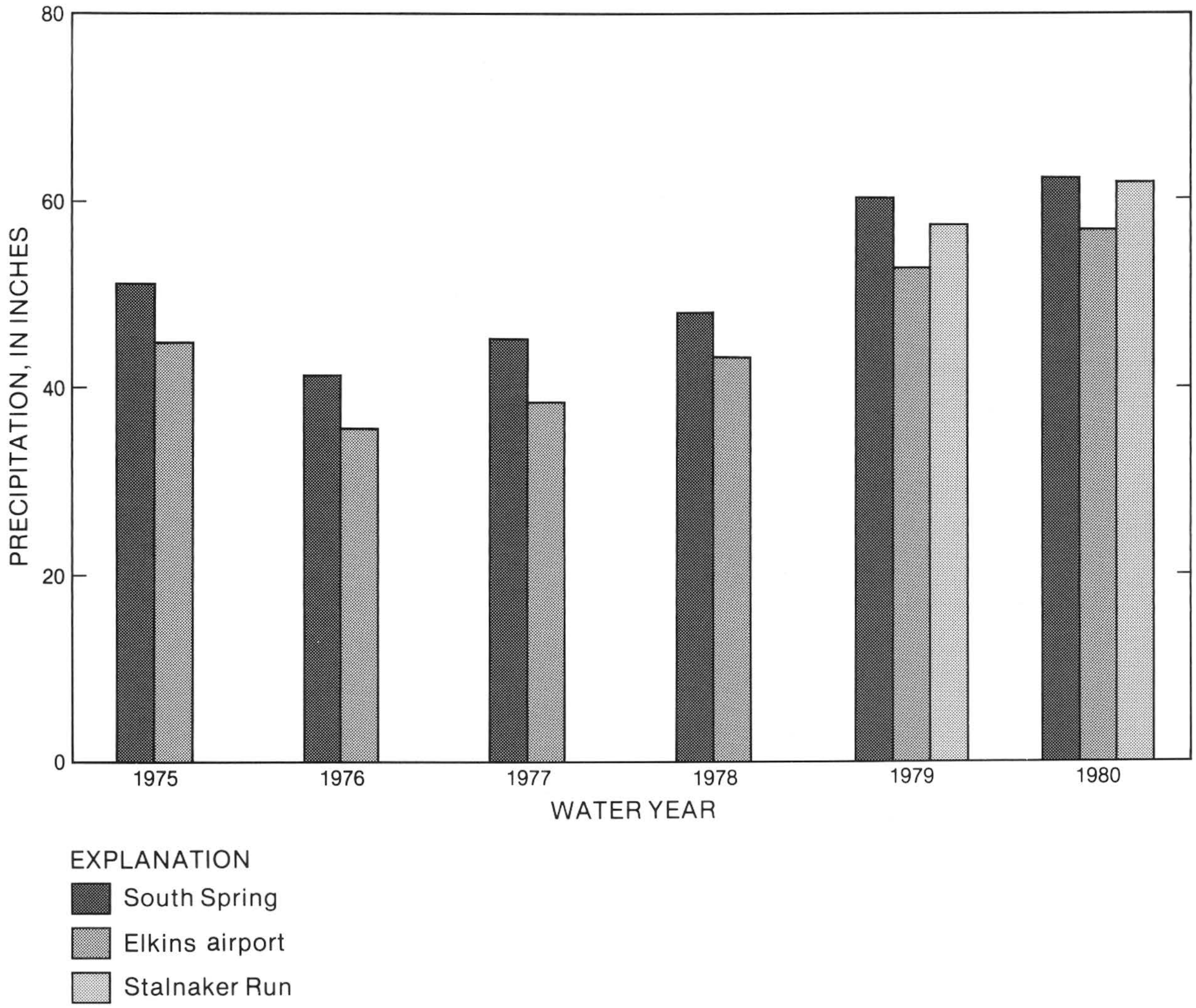

Figure 4. Precipitation by water year, at rain gages at South Spring, Stalnaker Run, and Elkins airport, 1975-80.

RUNOFF

Average annual runoff at the Taylor Run at Bowden gage (5.06 mi^2) was 39.8 in. for the 6-year study period, which includes the 1975-80 water years. Average annual runoff at the Shavers Fork below Bowden gage (151 mi^2) during the same period was 38.4 in. Precipitation at the South Spring rain gage during the same period averaged 51.5 in. Table 3 gives annual precipitation and runoff at gaging sites in the study area.

About 77 percent of the precipitation on the Taylor Run basin during this 6-year period was discharged as streamflow or surface runoff. The remainder either evaporated, was transpired by vegetation, and (or) possibly lost by seepage through fractured zones of the Greenbrier limestone. Dye tracing, resistivity testing, and coreboring tests show that Taylor Run basin supplies water to local springs and that ground water moves along fissures and joints from the vicinity of Taylor Run toward the North Spring, the major water source for the Bowden National Fish Hatchery (Baker, 1979).

The maximum and minimum monthly runoff at Taylor Run at Bowden during the study period occurred during 1978. The minimum monthly runoff of 0.24 in. was in October 1978, and the maximum monthly runoff of 8.61 in. was in December 1978. The minimum monthly runoff corresponded with the minimum monthly suspended-sediment discharge. The maximum monthly runoff did not correspond with the maximum monthly suspended-sediment discharge owing to basin disturbances, rainfall intensity, and other factors.

Table 1. Monthly and annual precipitation at Elkins airport during 1941-70 (normal period).

January	3.29
February	2.92
March	3.93
April	3.62
May	3.88
June	4.76
July	4.94
August	4.02
September	3.18
October	2.71
November	2.72
December	3.25
Average long-term annual precipitation	43.22

The minimum monthly runoff at Shavers Fork below Bowden during the study (0.33 in.) was in October 1978; the maximum monthly runoff (7.63 in.) was in March 1975. The minimum monthly runoff did not correspond with the minimum monthly suspended-sediment discharge. The maximum monthly runoff occurred before the start of daily suspended-sediment record in June 1975.

SUSPENDED-SEDIMENT YIELD

Taylor Run

Suspended-sediment loads and yields at the Taylor Run at Bowden site (5.06 mi^2) were computed on a daily basis from October 1974 to September 1980. Yields are summarized in table 4; figure 6 is a graph of the cumulative monthly suspended-sediment discharge plotted against cumulative monthly streamflow. As can be seen in figure 6, the relationship between yield and streamflow remained constant during 1975-77. During 1978, however, suspended-sediment yields more than doubled from the previous year. The new relationship between suspended-sediment yield and streamflow remained relatively constant during 1979 and 1980. The increase in sediment yield corresponds to a logging operation in the basin from August 1977 to June 1978.

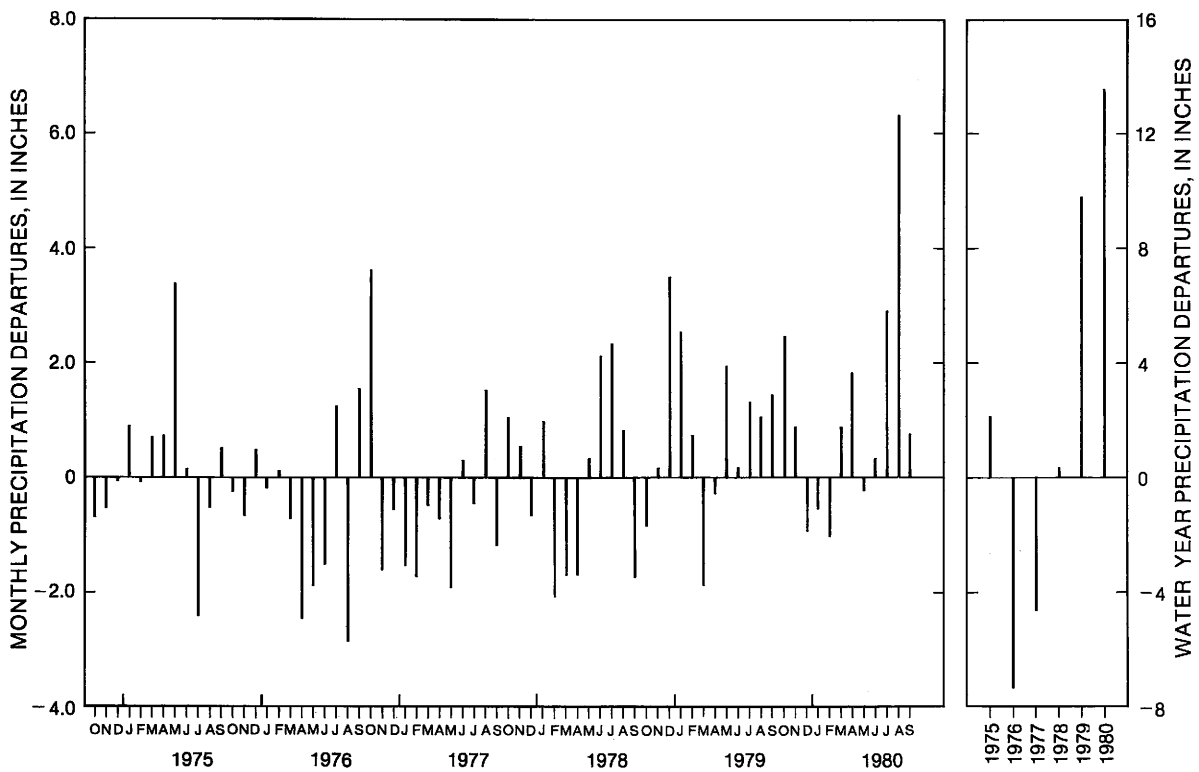

Figure 5. Departure of monthly and water-year precipitation from normal at Elkins airport, 1975-80.

The period of the logging operation is also shown in figure 6. The data in figure 6 can generally be divided into two straight-line segments--from October 1974 to September 1977 and October 1977 to September 1980. Suspended-sediment yields averaged about 41 (tons/mi^2)/year (tons per square mile per year) the first 3 years and 114 (tons/mi^2)/year the last 3 years. Annual streamflow averaged 945 ft^3/s-d (cubic feet per second-days) the first 3 years and 1,194 ft^3/s-d the last 3 years. The average suspended-sediment concentration from October 1974 to September 1977 was 15.9 mg/L, and the average concentration from October 1977 to September 1980 was 35.3 mg/L. Two factors--higher precipitation and logging--are probably the cause of the higher suspended-sediment yields and concentrations.

The maximum daily suspended-sediment load, 162 tons, and instantaneous streamflow, 302 ft^3/s (cubic feet per second), over the study period occurred on July 3, 1980 (table 5). Suspended sediment discharged during this storm was 23 percent of the total suspended-sediment load for 1980. Precipitation at the Stalnaker Run rain gage (fig. 2) totaled 3.30 in. on July 3, 1980 with a maximum hourly precipitation of 1.38 in. Precipitation at the South Spring rain gage (fig. 2) totaled 3.34 in. on July 3, 1980 with a maximum hourly precipitation of 2.07 in. The mean suspended-sediment concentration associated with this storm was 638 mg/L, as shown in figure 7.

The second greatest instantaneous streamflow during the study, 255 ft^3/s, occurred on July 3, 1978. The daily suspended-sediment load, 140 tons, during the storm was 27 percent of the total load for 1978. Precipitation at the South Spring rain gage totaled 2.51 in. on July 3, 1978, with a maximum hourly precipitation of 0.73 in. The mean suspended-sediment concentration associated with this storm was 376 mg/L.

Another large storm occurred on June 1, 1974, before the beginning of daily suspended-sediment sample collection. The maximum instantaneous

Table 2. Data-collection sites within Taylor Run-Shavers Fork study area.

				Streamflow		Suspended sediment	
Site No.	Station No.	Station Name	Drainage area, in square miles	Period of record (water years)1/	Type of data	Period of record (water years)	Type of data
1	03068000	Shavers Fork at Bemis	115	1974-79	Daily.	1973-79	Intermittent.
2	03068600	Shavers Fork above Bowden	138	1973-75 1976-80	Intermittent. Daily.	1973-75 1976-80	Do. Daily.
3	03068604	Taylor Run near Alpena	1.06	1979,80	Do.	1979,80	Intermittent. Storm Samples.2/
4	03068607	Stalnaker Run near Bowden3/	1.55	1979,80	Do.	1979,80	Intermittent. Storm samples.2/
5	03068610	Taylor Run at Bowden	5.06	1973 partial 1974-	Do.	1973,74 1975-80	Intermittent. Daily.
6	03068690	North Spring at Bowden	---	1975 partial 1976-	Do.	---	---
7	03068700	Shavers Fork at Bowden	143	1973,74	Intermittent.	1973,74	Intermittent.
8	03068710	South Spring at Bowden4/	---	1975 partial 1976-80	Daily.	---	---
9	03068800	Shavers Fork below Bowden	151	1973 partial 1974-80	Do.	1973-75 1976-80	Do. Daily.
10	03068900	Shavers Fork near Elkins	161	1973-80	Intermittent.	1973-80	Intermittent.

1/ Water year is the period from October of a previous calendar year to September 30 of the proper water year.
2/ Storm-runoff samples were collected at 15-minute intervals.
3/ Recording precipitation gage October 1978 to September 1980.
4/ Recording precipitation gage July 1975 to September 1980.

Table 3. Annual precipitation and runoff, in inches, for gaging sites in the study area.

Water year	Precipitation		Runoff			
	South Spring Site 8	Stalnaker Run Site 4	Taylor Run at Bowden Site 5	Taylor Run near Alpena Site 3	Stalnaker Run near Bowden Site 4	Shavers Fork below Bowden Site 9
1975	*51.00	---	45.35	---	---	44.45
1976	41.31	---	26.28	---	---	28.94
1977	45.31	---	33.84	---	---	34.91
1978	48.34	---	42.79	---	---	38.33
1979	60.34	57.41	44.41	40.53	45.08	42.56
1980	62.53	62.16	46.08	45.15	44.20	41.34

* Estimated from partial record and nearby National Oceanic and Atmospheric Administration (NOAA) precipitation-observation sites.

Table 4. Annual suspended-sediment discharge and streamflow at the Taylor Run at Bowden gage, water years 1975-80.

Water year	Suspended-sediment discharge		Streamflow	
	Load (tons)	Yield (tons/mi^2)	(ft^3/s-d)	[(ft^3/s-d)/mi^2]
1975	248.31	49.07	6,169.24	1,219.22
1976	115.76	22.88	3,574.86	706.49
1977	251.51	49.71	4,603.70	909.82
1978	527.02	104.15	5,821.08	1,150.41
1979	495.27	97.88	6,042.12	1,194.09
1980	705.88	139.50	6,268.70	1,238.87
Total	2,343.75	---	32,479.70	---
Average	390.62	---	5,413.28	---

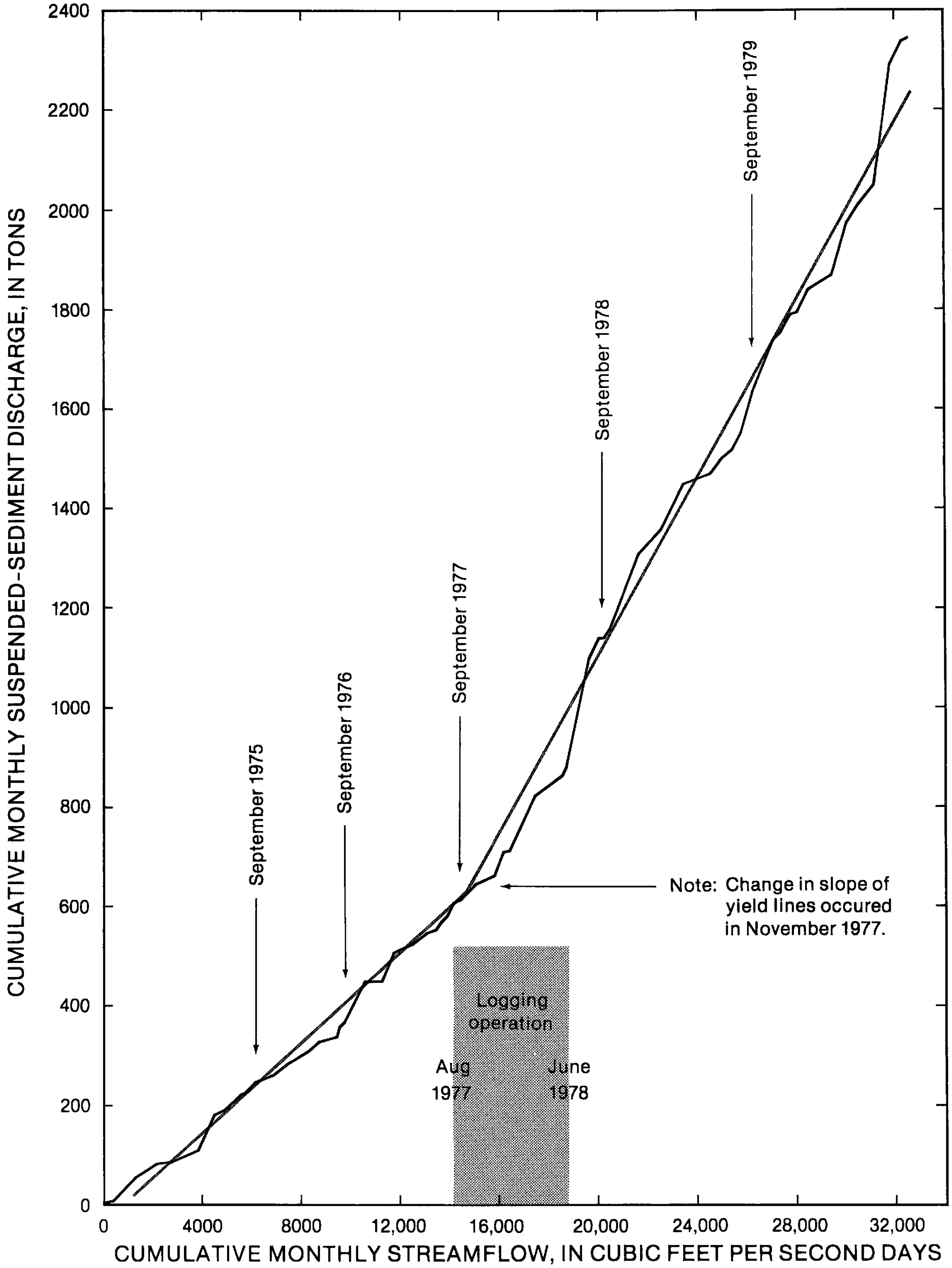

Figure 6. Cumulative monthly suspended-sediment discharge and streamflow from Taylor Run, October 1974-September 1980.

streamflow associated with this storm was 208 ft^3/s, and the computed daily-suspended sediment load was 92 tons. Estimated daily precipitation was 1.75 in. and no hourly precipitation data are available. The mean suspended-sediment concentration associated with this storm was 321 mg/L; this may reflect logging activities in the Mill Run drainage (fig. 2). This and other June 1974 storms probably caused the slide above Forest Service Road 91 in the upper reaches of the Taylor Run drainage.

The storms in July 1978 and July 1980 caused abrupt rises in the cumulative suspended-sediment discharge and streamflow plot (fig. 6). The storm on July 3, 1978 occurred immediately after the completion of an 11-month logging project near the center of the basin. Runoff from this storm probably washed loosened soil out of the basin. Suspended-sediment yield during the intense storm of July 3, 1980 could not be directly related to recent activities of man in the basin. This high yield was probably associated with rainfall intensity because rainfall from a convective storm generally has considerable kinetic energy that may cause soil erosion and high sediment yields. Five major storms with rainfall greater than 2.0 in. within 24 hours at South Spring occurred from August 1975 to September 1980 and produced runoff that carried nearly 20 percent of the total suspended-sediment load for the 6-year study period.

The annual suspended-sediment yield for the study period (tons per square mile) is plotted in figure 8. The pattern coincides with that of annual precipitation during the study (fig. 4) except that the sediment discharge in 1978 and 1980 is high as a result of major storms. Suspended-sediment yields from the storms on July 3, 1978 and July 3, 1980 accounted for nearly 14 percent of the 6-year total suspended-sediment load.

Suspended-sediment regression curves for each water year (1975-80) are shown in figure 9. The slope of any single curve is not significantly different from any other, which indicates no major change in the relationship between suspended-sediment load and streamflow, as would be expected from a major land disturbance. The relatively small differences in slope were probably the result of annual precipitation variation.

Upper Taylor Run

The streamflow-gaging stations in the upper part of the Taylor Run basin at Stalnaker Run near Bowden and Taylor Run near Alpena (fig. 2) began operating October 1978. Automatic pump samplers were installed at these stations to obtain water samples during storm runoff. About 52 percent of the Taylor Run drainage area lies upstream from these two stations, and the logging operation from 1977-78 was downstream from these stations.

The maximum daily suspended-sediment yield at both stations was on July 3, 1980. Maximum concentrations sampled at Stalnaker Run near Bowden were in excess of 5,000 mg/L and at Taylor Run near Alpena in excess of 7,000 mg/L. Logging in the Stalnaker Run basin ceased in the summer of 1970 and in the upper Taylor Run basin in 1972. The repair of the slide above Forest Service Road 91 was completed in the fall of 1974. There have been

Table 5. Data for three major storms in the Taylor Run basin, 1974-80.

Date	Daily suspended-sediment yield (tons)	Daily suspended-sediment yield ($tons/mi^2$)	Instantaneous discharge (ft^3/s)	Mean daily discharge (ft^3/s)	Runoff (inches)	Daily precipitation (inches)	Maximum hourly precipitation (inches)
June 1, 1974	92	18.2	208	106	0.78	*1.75	---
July 3, 1978	140	27.7	255	138	1.01	**2.51 1/	**0.73
July 3, 1980	162	32.0	302	94	.69	**3.34	**2.07

* Estimated from Elkins Airport and records of other nearby NOAA precipitation observers.

** From South Spring rain gage.

1/ Total precipitation during the storm of July 2-3, 1978 was 3.73 in.

no mining activities since at least 1970 in the upper Taylor Run basin. Thus, these suspended-sediment concentrations and corresponding yields were directly related to rainfall intensity.

A general relation usually exists between streamflow and particle-size distribution of the suspended sediment. As flow increases, velocity generally increases, and the stream is able to transport larger particles. Consequently, the percentage of suspended sediment composed of sand [particles with diameters between 0.062 and 2.0 mm (millimeters)] would increase, and the percentage of suspended sediment composed of silt (particles with diameters between 0.004 and 0.062 mm) and clay (particles with diameters less than 0.004 mm) would decrease (Reed 1978).

Usually the first storms after the land is disturbed will erode and transport large quantities of fine (silt and clay) particles. The larger sand particles eroded by rain or by overland runoff are usually deposited in the stream channel near the point of erosion. Later storms continue to erode fine particles and lift the heavier sand particles and redeposit them farther downstream. If the surface soils are not reworked to expose new sources of fine sediments, the surface soils become armored with the remaining large particles. When this happens, fewer fine particles will be available for transport, and sand particles will represent a greater percentage of the suspended load (Yorke and Herb, 1978).

Particle-size analyses of selected individual storm samples collected in the 1979 and 1980 water years at Stalnaker Run near Bowden and Taylor Run near Alpena have been published by the U.S. Geological Survey (1979, 1980).

Shavers Fork

Suspended-sediment loads and yields at the Shavers Fork below Bowden site (151 mi^2) were computed on a daily basis from June 1975 to September 1980. Table 6 summarizes the annual suspended-sediment discharge and streamflow for the 1976-80 water years.

Suspended-sediment discharge increased markedly from 1976 to 1977. Suspended-sediment discharge dropped in 1978 and then increased in 1979 and 1980. During 1976-79, streamflow increased each year in the basin but decreased slightly in 1980.

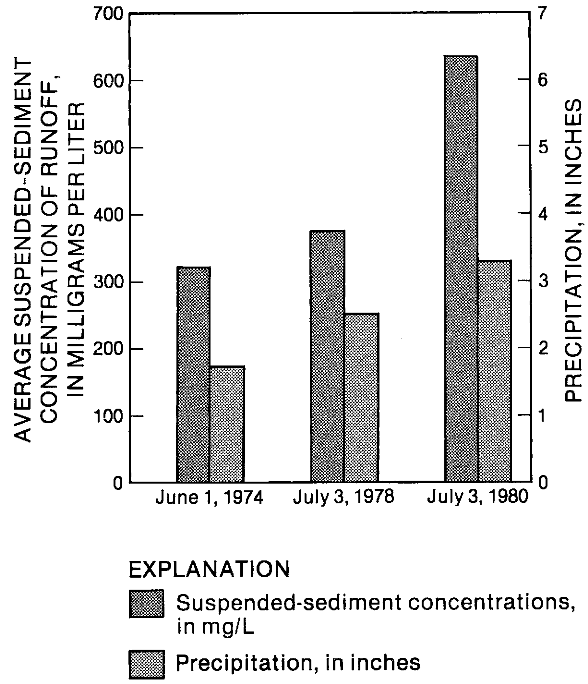

Figure 7. Suspended-sediment concentrations and precipitation data for storms in Taylor Run, June 1, 1974, July 3, 1978, and July 3, 1980.

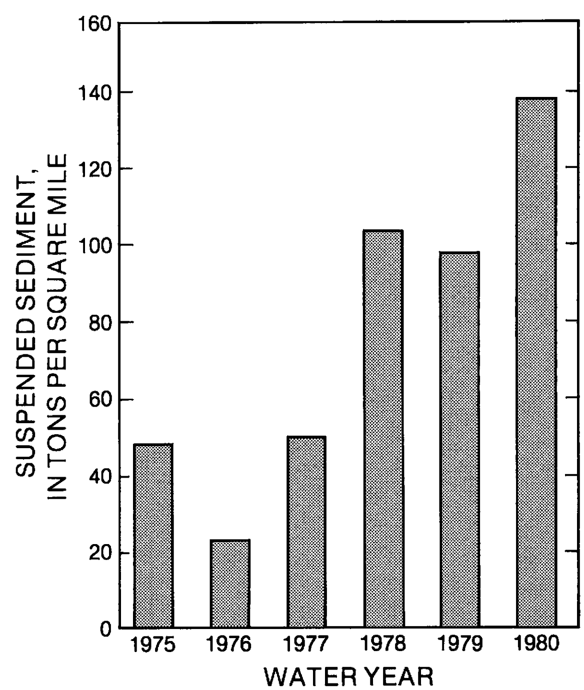

Figure 8. Annual suspended-sediment yield at Taylor Run at Bowden, water years 1975-80.

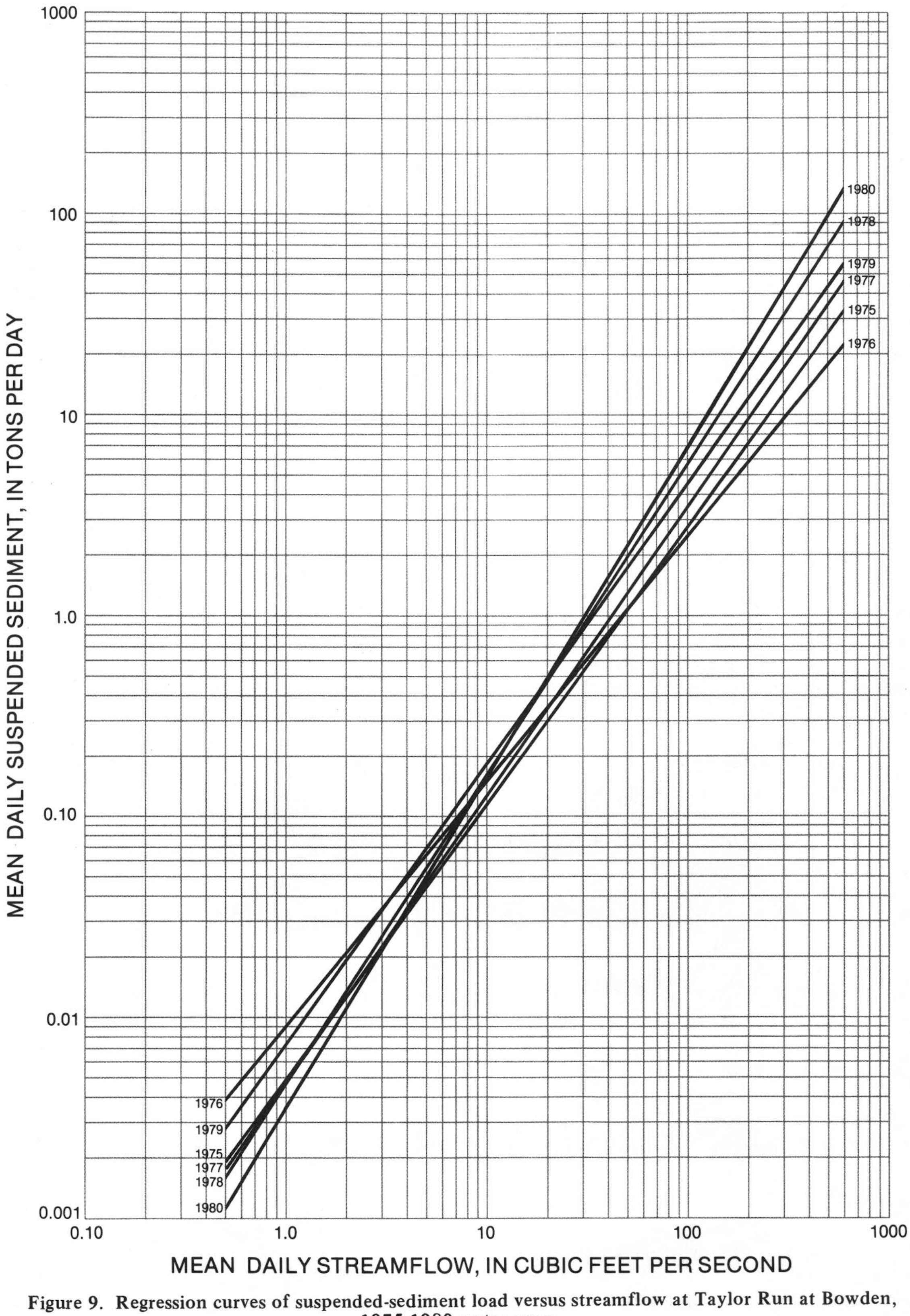

Figure 9. Regression curves of suspended-sediment load versus streamflow at Taylor Run at Bowden, 1975-1980 water years.

Table 6. Annual suspended-sediment discharge and streamflow at the Shavers Fork below Bowden gage, water years 1976-80.

Water year	Suspended-sediment discharge: Load (tons)	Suspended-sediment discharge: Yield (tons/mi²)	Streamflow: (ft³/s-d)	Streamflow: [(ft³/s-d)/mi²]
1976	5,838	38.7	117,492	778.1
1977	30,767	203.8	141,689	938.3
1978	23,223	153.8	155,593	1,030.4
1979	25,479	168.7	172,744	1,144.0
1980	26,412	174.9	167,789	1,111.2
Total	111,719	---	755,307	---
Average	22,343	---	151,061	---

A decrease in 1980 also occurred at sites at Shavers Fork above Bowden, Stalnaker Run near Bowden, and South Spring at Bowden. The largest increase in streamflow, 20.6 percent, occurred between 1976 and 1977. The corresponding suspended-sediment load for 1977 was more than five times the load of the previous year.

A graph of the cumulative monthly suspended-sediment discharge plotted against cumulative monthly streamflow for Shavers Fork below Bowden for the period of record (1975-80) is given in figure 10. The last month of each water year is labeled on the graph. The final cleanup for the highway construction was in the late summer of 1976, and suspended-sediment discharge per unit runoff was very high during October 1976 to April 1977. Figure 10 also shows that the relationship of suspended sediment to streamflow was fairly constant from the fall of 1977 to 1980, which indicates no major changes.

The maximum daily suspended-sediment load, 16,300 tons, and instantaneous streamflow, 12,400 ft^3/s, during the study was on March 13, 1977, the first spring after completion of the highway. The suspended-sediment load from this storm was nearly 53 percent of the total load for 1977. Precipitation on March 12-13, 1977, was 1.15 in. at the South Spring rain gage and 2.63 in. at Snowshoe (fig. 1). An increase in runoff due to snow melt was observed March 13, 1977 by the author. The suspended-sediment load on March 13, 1977, was probably increased as the result of highway construction completed in the previous year. The daily suspended-sediment load of March 13, 1977, at Shavers Fork above Bowden was 16 $tons/mi^2$, compared with 108 $tons/mi^2$ at the Shavers Fork below Bowden site. The daily suspended-sediment load on March 13, 1977, at the Taylor Run gaging site (immediately above the construction area and which probably received about 1.0 in. of rain) was about 2 $tons/mi^2$. The intervening drainage (8 mi^2) from the mouth of Taylor Run to the Shavers Fork below Bowden gage (including the construction area) contributed a daily suspended-sediment load of 1,760 $tons/mi^2$.

The second largest instantaneous streamflow (11,800 ft^3/s) during the study was on October 9, 1976, just after the cleanup and completion of the highway. This storm carried the third largest daily suspended-sediment load (6,620 tons) of the study period. The suspended-sediment load from this storm was 22 percent of the annual load. Precipitation at the South Spring rain gage was 1.93 in. on October 9 and 3.62 in. during the period October 7-10 and seemed to be uniform throughout the basin. The suspended-sediment load at Shavers Fork above Bowden during the period October 7-10 was 42 $tons/mi^2$, compared with 47 $tons/mi^2$ for Shavers Fork below Bowden. The suspended-

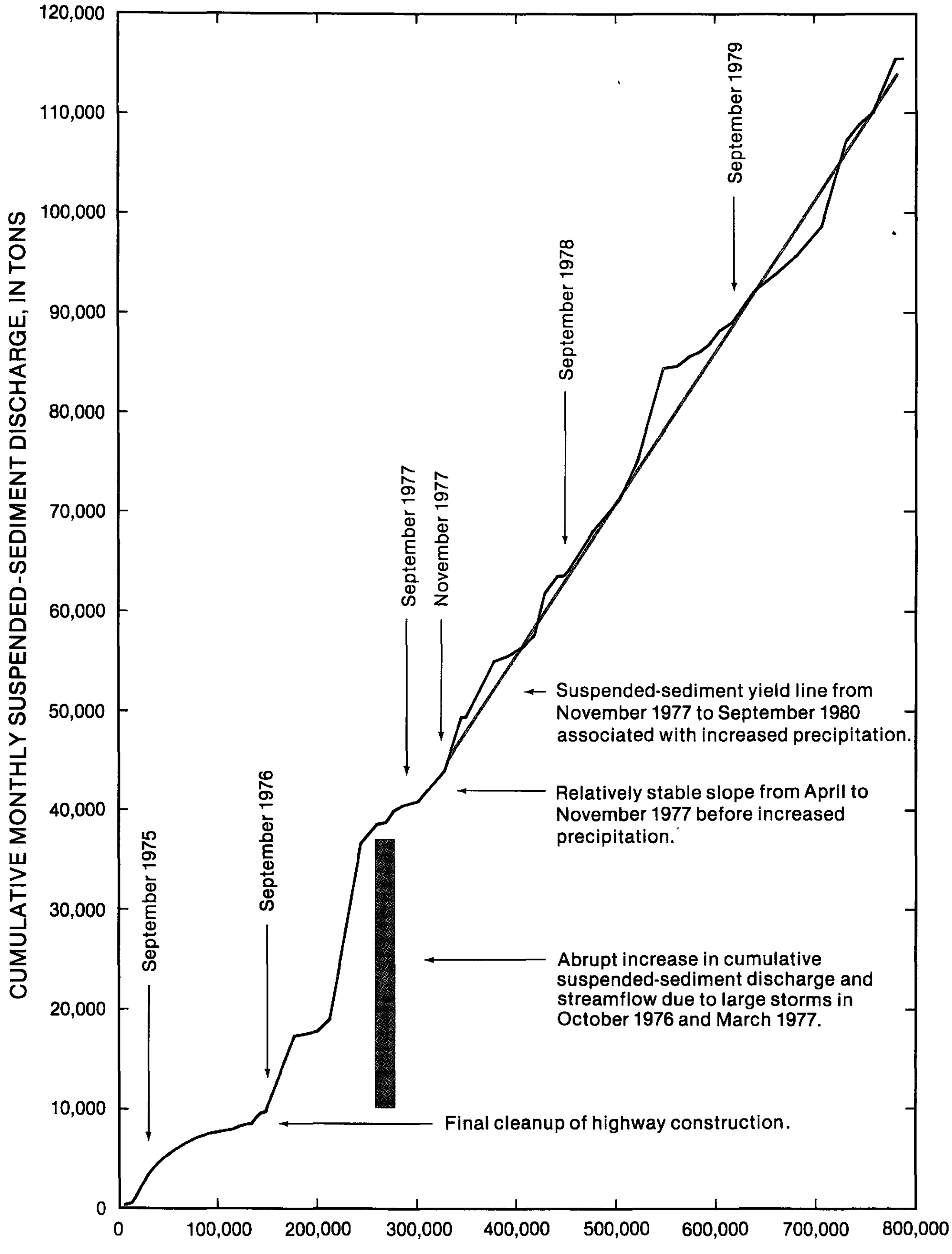

Figure 10. Cumulative monthly suspended-sediment discharge and streamflow at Shavers Fork below Bowden, June 1975 to September 1980.

sediment load during the period October 7-10 at Taylor Run was 14 tons/mi^2. The suspended-sediment load from the intervening drainage from the mouth of Taylor Run to the Shavers Fork below Bowden gage (including the construction area) was about 150 tons/mi^2.

The storms of October 9, 1976 and March 13, 1977, accounted for 75 percent of the annual suspended-sediment load for 1977. Suspended sediment from these two storms cause the abrupt jump on the cumulative plot (fig. 10).

Other significant storms occurred on January 26, 1978, March 26, 1978, March 5, 1979, and April 9, 1980. Runoff for the 1978-80 water years (table 6) ranged from 38.33 to 42.56 in., and suspended-sediment yields ranged from 154 to 175 tons/mi^2.

The suspended-sediment discharge during the first two major storms in October 1976 and March 1977 after completion and final cleanup of the highway construction was significant. The combined suspended-sediment yield for these two storms was equivalent to 98 percent, 90 percent, and 86 percent of the annual suspended-sediment load for the 1978, 1979 and 1980 water years, respectively. The excessive sediment loads in the intervening drainage associated with these two large storms may not have been the direct result of overland flow.

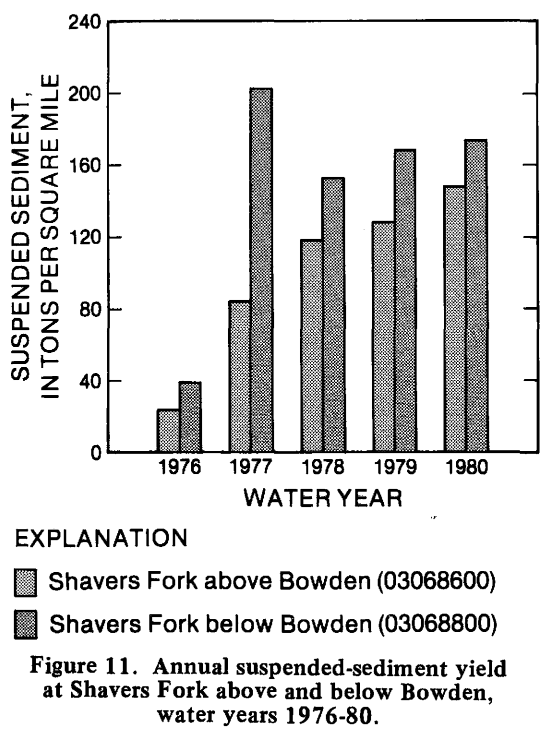

Figure 11. Annual suspended-sediment yield at Shavers Fork above and below Bowden, water years 1976-80.

Sediment catchment ponds built in conjunction with the highway construction could have overflowed, and unstable revegetation could have resulted in high sediment yields. Sediment deposited in the stream bottom and on the sides of the channel by stream rises with lesser velocities could have accumulated and been transported by these two large storms. Noticeable boulder movement was observed by the author at Shavers Fork below Bowden on the recession of the March 13, 1977, storm. Other soil-disturbing activities in addition to the highway construction in this intervening drainage contributed to high sediment yields, but their contribution to the total load was not determined.

Figure 11 is a plot of the annual suspended-sediment yield for the study period in tons per square mile. The yield from the storm of March 13, 1977, accounted for nearly 15 percent of the 5-year total suspended-sediment load.

Suspended-sediment regression curves for each water year (1976-80) are shown in figure 12. The slope of any single curve is not significantly different from any other, which indicates no major change in the relationship between suspended-sediment load and streamflow, as would be expected from a major land disturbance. The slight differences in slope were probably the result of changes in annual precipitation.

BASIN COMPARISONS

The cumulative suspended-sediment discharges (tons/mi^2) at the gaging stations at Taylor Run at Bowden and Shavers Fork above and below Bowden for July 1975 to September 1980 are plotted in figure 13. The yield lines for Taylor Run and Shavers Fork above Bowden are generally the same. The major storm of March 13, 1977, after the completion of the highway construction, removed the majority of readily available sediment, which drastically offset the yield line for Shavers Fork below Bowden. The noticeable offset of about 95 tons/mi^2 (fig. 13) is probably the maximum sediment discharge attributable to highway construction.

The sediment yield from spring runoff in the main stem of Shavers Fork seems to be greater than in the Taylor Run basin. Also summer thunderstorms, more local in nature, have a greater impact on sediment yield in the smaller Taylor Run drain-

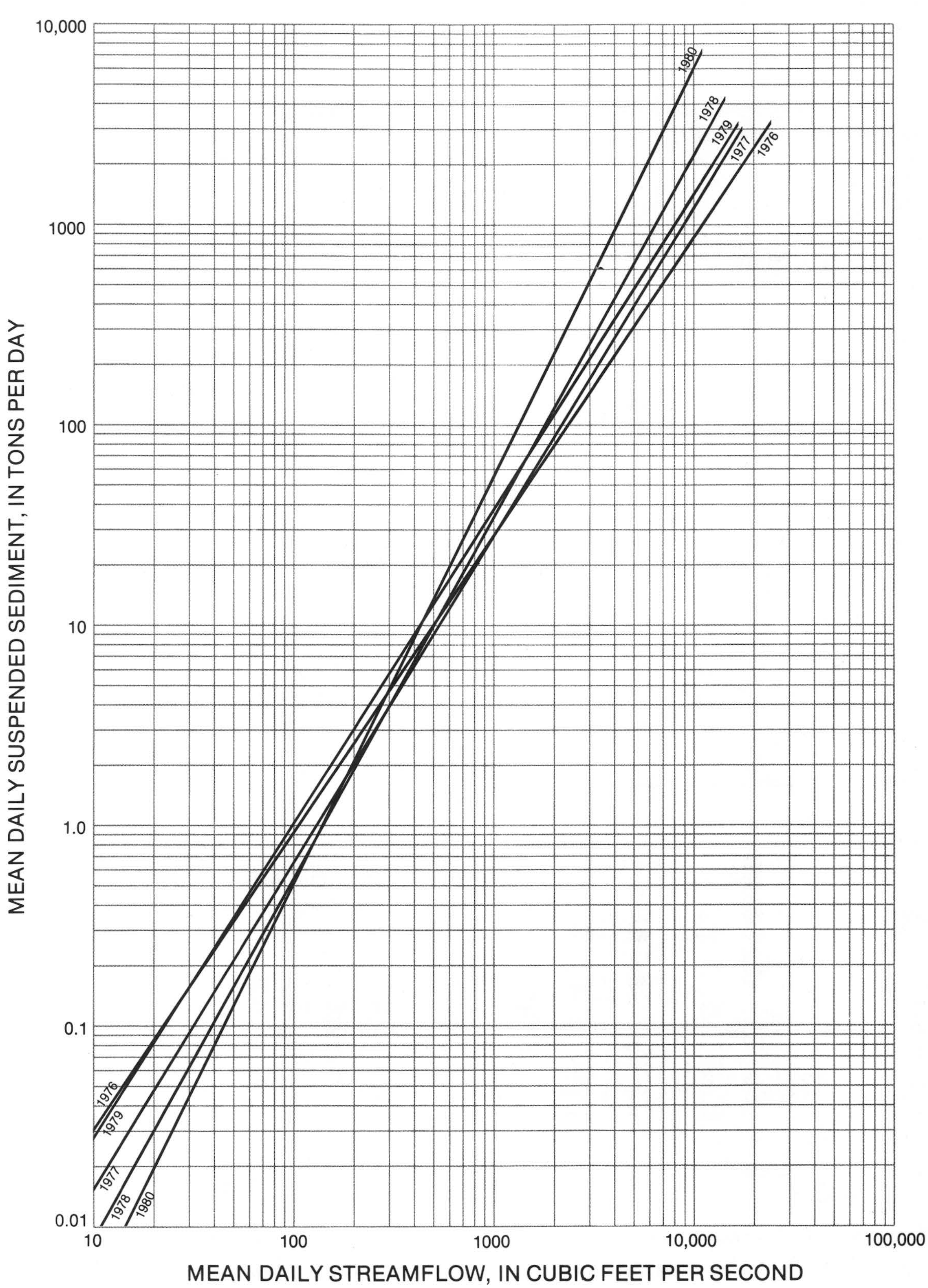

Figure 12. Regression curves of suspended-sediment load versus streamflow at Shavers Fork below Bowden, 1976-80 water years.

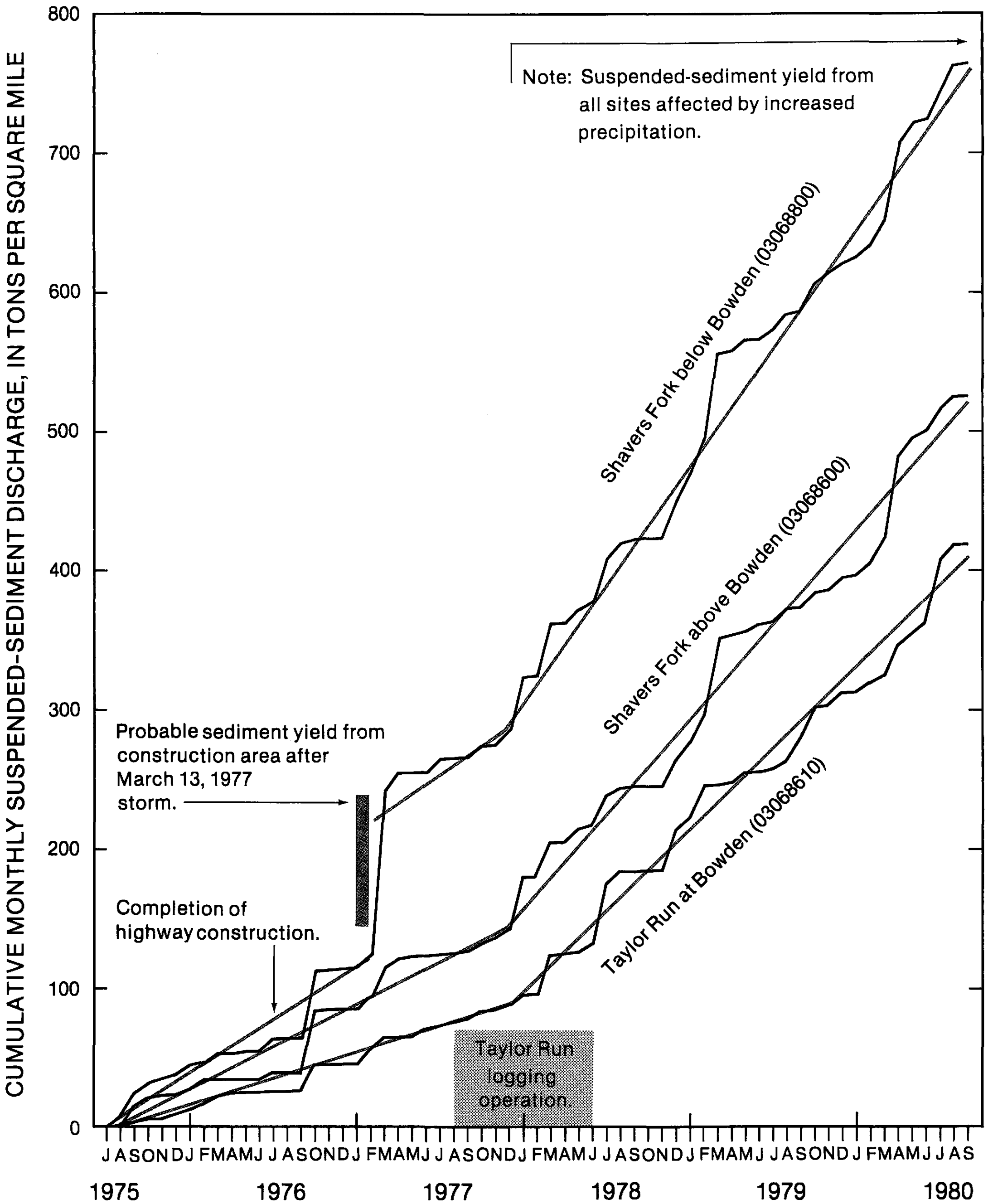

Figure 13. Cumulative suspended-sediment discharge at Taylor Run and Shavers Fork, July 1975 to September 1980.

age than in the larger Shavers Fork drainage. Additional activities of man in the Shavers Fork drainage during 1978-80, and increased runoff during this time, account for the upward trend of the suspended-sediment curve for Shavers Fork below Bowden. Little, if any, soil disturbance occurred in the Taylor Run basin after logging ceased in June 1978; the change in slope shown about December 1977 (fig. 13) was probably the result of increased precipitation.

Suspended-sediment yields increase (fig. 13) in the winter owing to the lack of protective foliage and decrease during summer because the soils are sheltered from precipitation by vegetation and by full forest canopies. These effects are often altered, however, by other factors such as topography, soil characteristics, precipitation duration and intensity, land-use practices, percentage of disturbed areas, and the amount of runoff.

Table 7 gives the average annual and 5-year average daily suspended-sediment yield (tons/mi^2) for Taylor Run at Bowden and Shavers Fork above and below Bowden. The 5-year average load for Shavers Fork below Bowden was nearly double the load for Taylor Run at Bowden. The graph in figure 14 shows the average daily yield (tons/mi^2) at the three daily suspended-sediment stations in the study area.

Table 7. Average daily suspended-sediment yield for gaging stations in the study area.

Water year	Average daily suspended-sediment yield, in tons per square mile		
	Taylor Run at Bowden	Shavers Fork above Bowden	Shavers Fork below Bowden
1976	0.06	0.06	0.11
1977	.14	.23	.56
1978	.29	.33	.42
1979	.27	.35	.46
1980	.38	.41	.48
5-year average	0.23	0.28	0.41

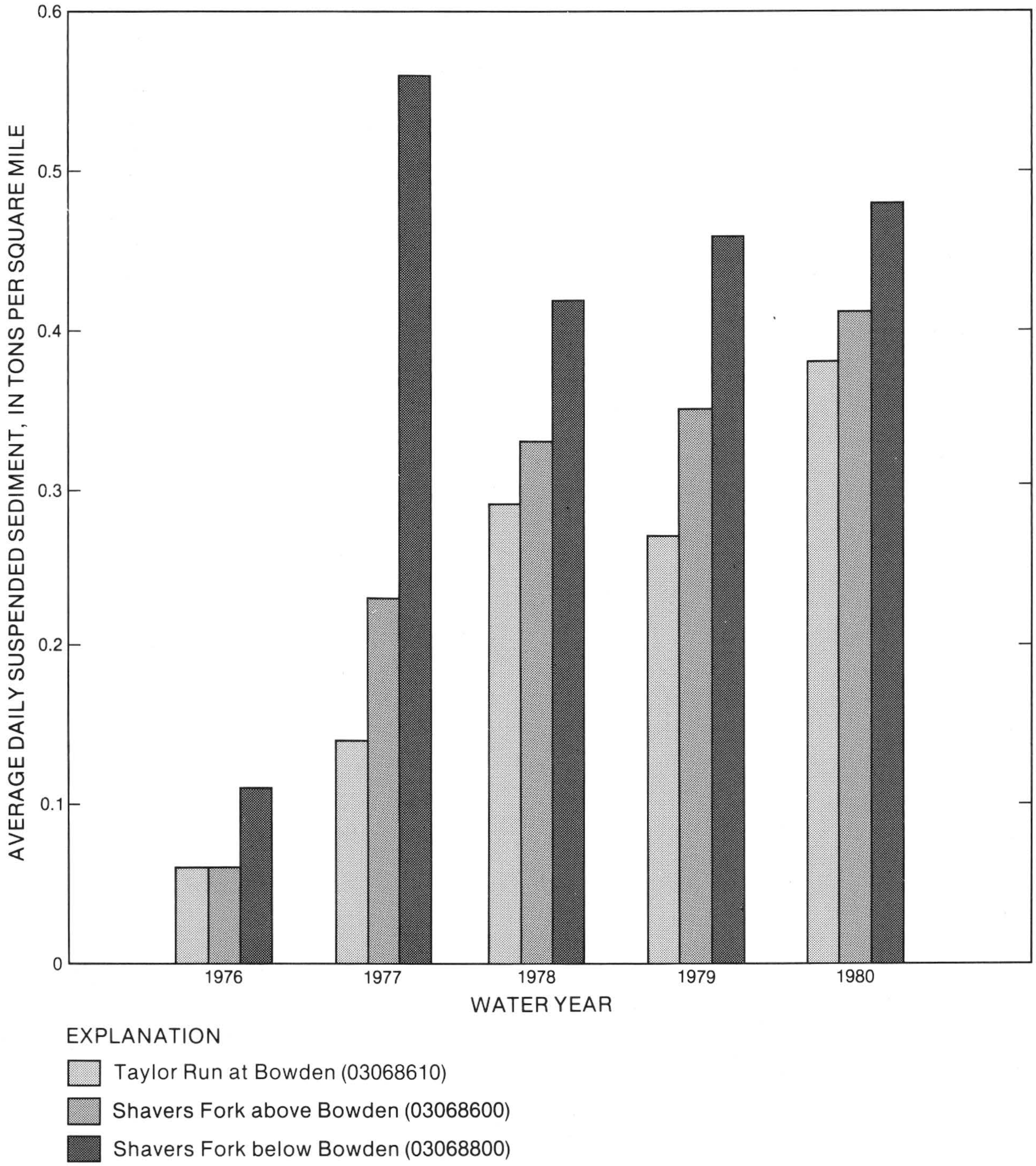

Figure 14. Average daily suspended-sediment yield at Taylor Run and Shavers Fork, water years 1976-80.

SUMMARY AND CONCLUSIONS

The first segment of Appalachian Corridor H highway affecting the Shavers Fork basin disturbed about 0.30 mi^2 along a 5-mi zone parallel to Shavers Fork. The highway crosses Shavers Fork, but ends near the mouth of Taylor Run. Construction ended late in the summer of 1976. Insufficient data were available to determine sediment yields in Shavers Fork before or during highway construction. The U.S. Geological Survey has continued to collect data pending adoption of a final highway location.

Hydrologic data to determine suspended-sediment yields in Shavers Fork and Taylor Run basins were collected from April 1973 to September 1980. The data included daily precipitation, streamflow, and suspended-sediment concentrations.

In Taylor Run basin (5.06 mi^2), approximately 2,340 tons of suspended sediment was discharge during the 1975-80 water years. Runoff averaged 39.8 in. per year; precipitation averaged 51.5 in. From August 1975 to September 1980, five major storms with rainfall greater than 2.0 in. within 24 hours took place at South Spring, producing runoff that carried nearly 20 percent of the total suspended-sediment load of the 6-year study. The major change in land use in Taylor Run basin during the study was a 70-acre logging operation from 1977 to 1978. Runoff from a major storm 1 month after completion of logging carried nearly 27 percent of the annual suspended-sediment load for the 1978 water year. The rate of sediment discharge changed during the logging operation and continued to increase through 1980 because of increased precipitation. The maximum daily suspended-sediment load during the study was 162 tons on July 3, 1980, which resulted from an intense storm of 3.30 in. of precipitation. The 1980 annual precipitation, runoff, and suspended-sediment load was the largest during the 6-year study.

In Shavers Fork basin (151 mi^2), approximately 111,700 tons of suspended sediment was discharged during the 1976-80 water years. Runoff averaged 37.2 in. per year, 14.3 in. below the average annual precipitation of 51.5 in. Numerous changes in land use occurred during the study, including the completion of the first segment of Appalachian Corridor H, which disturbed only 0.2 percent of the drainage basin. Two major storms occurred in the 1977 water year after highway construction was completed in the late summer of 1976. Runoff from these storms carried nearly 75 percent of the annual suspended-sediment load for the 1977 water year. Runoff associated with the storm on March 13, 1977 carried nearly 15 percent of the suspended-sediment load for the study.

Conclusions from this study are:

1. Suspended-sediment concentrations and therefore suspended-sediment yields are directly affected by the amount of runoff or streamflow within the study area. Precipitation duration and intensity affect sediment yields and can mask natural revegetation and soil stabilization trends.

2. The first intense storm after completion of logging in the Taylor Run basin, and the major storm of March 13, 1977, after completion of highway construction in the Shavers Fork basin, removed most of the readily available sediment from the disturbed area, and resulted in high annual yields.

3. Rate of sediment discharge increased at the end of 1977 in both Taylor Run and Shavers Fork; this is attributed to the increase in precipitation.

4. Average daily suspended-sediment load (tons per square mile) from the Shavers Fork basin was nearly double that from the Taylor Run basin.

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Table A-1. Water-quality data for 1979 and 1980 water years at Taylor Run near Alpena, West Virginia (station number 03068604, site 3)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
AUG						
12...	0445	5.1	3.2	50	118	1.6
12...	0500	5.1	29	48	118	1.6
12...	0515	5.4	28	48	110	1.6
12...	0530	5.7	21	46	102	1.6
12...	0545	6.0	19	44	117	1.9
12...	0600	6.3	22	45	148	2.5
12...	0615	6.9	32	46	174	3.2
12...	0745	7.2	15	42	82	1.6
12...	0800	7.2	15	42	60	1.2
12...	0815	6.9	9.1	42	48	.89
12...	0845	6.3	9.6	41	35	.60
12...	1000	5.7	7.0	40	33	.51
12...	1015	5.7	7.9	41	21	.32
12...	1030	5.7	6.2	41	20	.31
19...	0915	9.7	6.0	58	538	14
19...	0930	12	52	100	921	30
19...	0945	13	110	60	541	19
19...	1000	14	72	54	405	15
19...	1015	14	50	53	289	11
19...	1030	15	50	47	230	9.3
19...	1045	14	45	57	195	7.4
19...	1100	14	36	42	152	5.7
19...	1115	13	30	43	106	3.7
19...	1130	12	24	42	86	2.8
19...	1145	12	20	41	80	2.6
19...	1200	12	18	41	66	2.1
19...	1215	11	17	41	62	1.8
19...	1230	11	15	41	61	1.8
19...	1245	10	13	40	50	1.4
19...	1300	10	13	40	45	1.2
19...	1315	9.7	12	40	41	1.1
19...	1330	9.7	11	40	38	1.0
19...	1345	9.3	11	40	29	.73
19...	1400	9.3	10	40	28	.70
19...	1415	8.9	10	40	31	.74
19...	1430	8.9	9.4	40	34	.82
19...	1445	8.5	9.2	39	33	.76
19...	1500	8.1	8.2	39	37	.81

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
SEP						
02...	1930	23	100	55	1690	105
02...	1945	15	90	40	973	39
02...	2000	20	90	60	658	36
02...	2015	21	56	45	407	23
02...	2030	20	50	50	278	15
02...	2045	19	34	70	226	12
02...	2100	16	16	60	176	7.6
02...	2115	14	26	60	150	5.7
02...	2130	13	22	60	130	4.6
02...	2145	12	19	60	109	3.5
03...	0130	12	30	70	139	4.5
03...	0145	14	20	70	111	4.2
03...	0200	15	20	60	121	4.9
03...	0215	16	16	60	111	4.8
03...	0230	16	21	60	105	4.5
03...	0245	19	21	60	145	7.4
03...	0300	20	41	70	278	15
03...	0315	18	43	60	392	19
03...	0330	16	62	60	641	28
03...	0345	16	67	60	588	25
03...	0400	19	60	50	457	23
03...	0415	16	43	55	269	12
06...	0345	11	15	54	95	2.8
06...	0400	12	18	57	111	3.6
06...	0415	12	18	57	159	5.2
06...	0430	13	21	54	114	4.0
06...	0445	13	15	55	70	2.5
06...	0500	13	13	55	59	2.1
06...	0515	12	11	54	46	1.5
06...	0530	11	9.5	53	39	1.2
06...	0545	11	9.0	52	36	1.1
06...	0600	12	8.4	54	28	.91
06...	0615	11	9.1	54	31	.92
06...	0630	11	7.5	55	29	.86
06...	0700	12	6.4	56	27	.87
06...	0715	11	6.6	54	22	.65
06...	0730	11	5.6	54	22	.65
06...	0800	11	4.8	54	20	.59

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table A-1 Continued. Water-quality data for 1979 and 1980 water years at Taylor Run near Alpena, West Virginia (station number 03068604, site 3)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
SEP						
21...	1815	4.5	14	70	56	.68
21...	1830	4.9	19	60	107	1.4
21...	1845	5.7	25	70	132	2.0
21...	1900	6.3	34	70	179	3.0
21...	1915	6.9	35	70	191	3.6
21...	1930	7.2	32	70	170	3.3
21...	1945	7.5	30	60	147	3.0
21...	2000	7.8	25	60	121	2.5
21...	2015	7.8	14	60	75	1.6
21...	2030	7.8	12	60	53	1.1
21...	2045	7.5	10	60	44	.89
21...	2100	7.2	7.5	55	35	.68
21...	2115	6.9	6.1	60	28	.52
21...	2130	6.6	5.2	60	26	.46
21...	2145	6.3	5.5	55	22	.37
21...	2200	6.0	4.5	55	20	.32
21...	2215	6.0	4.0	55	18	.29
21...	2230	5.7	4.0	60	17	.26
21...	2245	5.4	4.0	60	16	.23
21...	2300	5.1	3.4	60	27	.37
21...	2315	4.9	2.9	60	12	.16
21...	2330	4.9	3.1	60	12	.16
21...	2345	4.7	2.4	65	8	.10
OCT						
02...	1845	4.9	50	74	250	3.3
02...	1900	5.7	90	156	282	4.3
02...	1915	5.7	55	107	191	2.9
02...	1930	6.0	30	81	118	1.9
02...	1945	6.3	23	79	84	1.4
02...	2000	6.0	18	78	58	.94
02...	2015	6.0	16	74	46	.75
02...	2030	6.0	14	75	38	.62
02...	2045	6.0	12	73	35	.57
02...	2100	5.4	10	72	26	.38
02...	2115	5.1	10	70	25	.34
02...	2130	5.1	8.1	69	19	.26
02...	2145	4.7	7.4	70	19	.24
02...	2200	4.5	5.8	68	16	.19
02...	2215	4.5	5.5	68	11	.13
NOV						
02...	1230	12	7.6	42	45	1.5
02...	1245	12	3.5	41	37	1.2
02...	1300	12	8.6	41	31	1.0
02...	1315	12	5.5	41	23	.75
02...	1330	12	4.5	41	22	.71

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
FEB						
22...	1315	14	6.0	33	48	1.8
22...	1330	15	4.5	33	48	1.9
22...	1345	15	7.0	33	47	1.9
22...	1400	16	6.0	33	50	2.2
22...	1415	16	5.5	33	47	2.0
22...	1430	16	9.0	33	58	2.5
22...	1445	17	5.5	33	52	2.4
22...	1500	18	5.5	33	50	2.4
22...	1515	18	4.9	32	51	2.5
22...	1530	19	7.0	33	47	2.4
22...	1545	19	4.0	33	47	2.4
22...	1600	19	3.0	33	39	2.0
MAR						
08...	1445	12	3.7	33	18	.58
08...	1500	12	4.1	32	24	.78
08...	1515	12	4.6	32	25	.81
08...	1530	13	3.9	32	20	.70
08...	1545	13	4.5	32	20	.70
08...	1600	13	5.0	32	24	.84
08...	1615	13	4.6	32	21	.74
08...	1630	13	4.3	32	18	.63
08...	1645	13	4.5	32	16	.56
08...	1700	13	4.3	32	15	.53
08...	1715	14	4.1	32	16	.60
08...	1730	14	4.0	32	14	.53
08...	1745	14	4.6	32	23	.87
08...	1800	15	6.1	35	33	1.3
08...	1815	15	7.3	35	38	1.5
08...	1830	16	9.0	36	48	2.1
08...	1845	16	9.0	39	42	1.8
08...	1900	16	7.0	37	36	1.6
08...	1915	15	7.1	36	36	1.5
08...	1930	16	8.0	36	29	1.3
08...	1945	15	6.9	36	21	.85
08...	2000	15	4.8	35	21	.85
08...	2015	15	5.7	35	18	.73
08...	2030	15	3.8	35	14	.57
31...	0930	12	.80	41	2	.06
31...	0945	13	2.3	33	13	.46
31...	1000	13	2.5	32	17	.60
31...	1015	14	2.5	32	13	.49
31...	1030	14	2.2	32	10	.38
31...	1045	14	1.9	32	7	.26
31...	1100	14	1.4	32	7	.26
31...	1115	14	6.4	33	23	.87
31...	1130	14	3.2	31	9	.34
31...	1145	14	3.4	31	7	.26

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table A-1 Continued. Water-quality data for 1979 and 1980 water years at Taylor Run near Alpena, West Virginia (station number 03068604, site 3)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
MAR						
31...	1200	14	3.1	31	10	.38
31...	1215	13	3.8	31	5	.18
31...	1230	13	3.4	31	10	.35
31...	1245	13	3.1	32	9	.32
31...	1300	13	2.9	32	9	.32
31...	1315	13	2.5	31	9	.32
31...	1330	12	2.1	32	9	.29
31...	1345	12	1.8	32	7	.23
31...	1400	12	1.6	32	2	.06
31...	1415	12	2.9	32	4	.13
APR						
09...	0015	14	25	37	101	3.8
09...	0030	15	19	35	96	3.9
09...	0045	15	16	35	81	3.3
09...	0100	16	8.0	37	77	3.3
09...	0130	16	2.0	35	68	2.9
09...	0145	16	10	33	55	2.4
09...	0200	17	5.0	32	39	1.8
09...	0215	16	8.0	33	26	1.1
09...	0230	16	3.3	33	10	.43
27...	0500	13	2.5	42	16	.56
27...	0515	14	7.5	35	35	1.3
27...	0530	15	5.0	35	26	1.1
27...	0545	15	6.0	34	27	1.1
27...	0600	15	4.5	34	19	.77
27...	0615	15	3.0	34	23	.93
27...	0630	15	6.0	35	33	1.3
27...	0645	15	2.0	34	28	1.1
27...	0700	15	1.0	34	23	.93
27...	0715	15	2.5	34	18	.73
27...	0730	14	6.5	34	21	.79
27...	0745	14	1.0	34	6	.23
27...	0800	14	1.0	35	3	.11
27...	0815	13	1.5	34	4	.14
27...	0830	13	2.0	34	6	.21
27...	0845	13	1.4	34	5	.18
30...	0730	14	9.5	34	198	7.5
30...	0745	14	7.0	34	111	4.2
30...	0800	14	3.0	35	11	.42
30...	0815	14	2.0	34	10	.38
30...	0830	14	5.5	34	77	2.9
30...	0845	14	3.0	34	15	.57
30...	0900	14	4.0	34	188	7.1
30...	0915	14	2.5	35	124	4.7

DATE	TIME	STREAMFLOW, INSTANTANEOUS (CFS)1	TURBIDITY (NTU)2	SPECIFIC CONDUCTANCE (UMHOS)3	SEDIMENT, SUSPENDED (MG/L)4	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)5
JUL						
03...	0300	21	90	62	1660	94
03...	0315	49	75	79	7630	1010
03...	0330	24	85	62	3820	248
08...	1630	16	90	68	878	38
08...	1645	15	55	47	435	18
08...	1715	14	36	39	223	8.4
08...	1730	15	8.0	38	138	5.6
08...	1745	14	10	37	98	3.7
08...	1800	18	9.0	37	88	4.3
08...	1815	16	9.0	36	76	3.3
08...	1830	16	10	37	61	2.6
08...	1845	16	6.3	36	50	2.2
08...	1900	17	3.6	36	45	2.1
08...	1915	15	4.6	37	43	1.7
08...	1930	16	3.1	37	43	1.9
08...	1945	15	4.4	36	90	3.6
08...	2000	15	3.4	37	30	1.2
08...	2015	14	2.9	37	29	1.1
08...	2030	15	2.8	37	27	1.1
08...	2045	15	2.0	36	25	1.0
08...	2100	15	2.5	36	26	1.1
08...	2115	15	2.5	37	25	1.0
08...	2130	15	2.1	36	21	.85
08...	2145	15	1.7	36	20	.81

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table A-2. Water-quality data for 1979 and 1980 water years at Stalnaker Run near Bowden, West Virginia (station number 03068607, site 4)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
APR						
26...	2215	8.3	40	25	186	4.2
26...	2230	9.7	45	25	209	5.5
26...	2245	11	45	24	174	5.2
26...	2300	12	33	24	142	4.6
26...	2315	13	20	24	103	3.6
26...	2330	13	21	24	89	3.1
26...	2345	13	17	24	66	2.3
26...	2400	13	14	24	54	1.9
27...	0015	12	13	25	44	1.4
27...	0030	12	8.9	25	35	1.1
27...	0045	12	11	25	35	1.1
27...	0100	12	10	25	29	.94
27...	0115	12	8.6	25	27	.87
27...	0130	12	8.0	25	26	.84
27...	0145	11	7.5	25	21	.62
27...	0200	11	6.6	25	22	.65
27...	0215	11	7.0	25	19	.56
27...	0230	11	6.0	25	17	.50
27...	0245	10	5.3	25	15	.41
27...	0300	10	5.0	25	16	.43
27...	0315	10	4.4	25	14	.38
27...	0330	10	5.7	25	17	.46
27...	0345	10	6.8	25	17	.46
27...	0400	10	6.3	25	18	.49

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
MAY						
10...	1445	18	110	27	1620	79
10...	1515	22	100	25	615	37
10...	1530	21	55	25	249	14
10...	1545	20	85	25	351	19
10...	1600	20	45	25	205	11
10...	1615	20	35	25	136	7.3
10...	1630	19	27	26	69	3.5
10...	1645	18	17	25	99	4.8
10...	1700	17	23	25	82	3.8
10...	1715	16	16	25	69	3.0
10...	1730	15	16	25	66	2.7
10...	1745	15	13	25	50	2.0
10...	1800	14	14	25	48	1.8
10...	1815	14	15	25	45	1.7
10...	1830	13	10	25	37	1.3
10...	1845	13	10	25	37	1.3
10...	1900	12	8.4	25	34	1.1
10...	1915	12	6.4	25	28	.91
10...	1930	12	9.2	25	28	.91
10...	1945	12	8.9	25	26	.84
10...	2000	11	8.1	25	27	.80
10...	2015	11	9.4	25	24	.71
13...	1000	15	6.4	27	31	1.3
13...	1100	15	7.5	24	40	1.6
13...	1200	15	6.1	24	25	1.0
13...	1300	15	5.6	23	23	.93
13...	1400	14	5.0	24	18	.68
13...	1500	14	5.8	23	21	.79
13...	1600	14	4.8	23	19	.72
13...	1700	13	4.0	23	17	.60
13...	1800	13	4.4	23	18	.63
13...	1900	13	3.1	23	18	.63
13...	2000	12	4.7	23	18	.58
13...	2100	12	4.8	23	22	.71
13...	2200	12	4.4	23	22	.71
13...	2300	12	3.9	24	20	.65
13...	2400	12	4.0	24	19	.62

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table A-2 Continued. Water-quality data for 1979 and 1980 water years at Stalnaker Run near Bowden, West Virginia (station number 03068607, site 4)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
MAY						
14...	0100	12	5.4	23	20	.65
14...	0200	12	3.8	23	17	.55
14...	0300	11	3.9	23	16	.48
14...	0400	11	3.6	23	16	.48
14...	0500	11	2.5	23	14	.42
14...	0600	11	3.0	22	16	.48
14...	0700	11	3.9	24	16	.48
14...	0800	11	4.7	22	15	.45
14...	0900	11	4.8	22	18	.53
24...	0430	8.8	38	28	186	4.4
24...	0445	10	50	23	185	5.0
24...	0500	11	40	23	168	5.0
24...	0515	12	36	23	153	5.0
24...	0530	12	30	23	122	4.0
24...	0545	12	24	23	99	3.2
24...	0600	12	20	23	82	2.7
24...	0615	12	17	23	70	2.3
24...	0630	12	14	23	63	2.0
24...	0645	12	13	23	53	1.7
24...	0700	12	12	23	42	1.4
24...	0715	12	10	23	39	1.3
24...	0730	12	8.8	23	34	1.1
24...	0745	12	8.4	23	31	1.0
24...	0800	12	6.5	23	30	.97
24...	0815	12	6.9	23	27	.87
24...	0830	11	7.4	24	26	.77
24...	0845	11	6.2	24	22	.65
24...	0900	11	6.0	24	20	.59
24...	0915	11	6.6	24	21	.62
25...	0900	17	5.4	32	33	1.5
25...	0930	17	5.5	31	20	.92
25...	1100	16	5.6	27	31	1.3
25...	1300	15	7.2	26	17	.69
25...	1500	14	5.5	26	18	.68
25...	1700	13	4.4	25	10	.35
25...	1900	12	4.9	25	13	.42
25...	2100	12	4.5	25	13	.42
25...	2300	12	4.1	25	10	.32

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
MAY						
26...	0100	12	3.0	25	7	.23
26...	0300	11	3.3	25	8	.24
26...	0500	11	3.2	25	6	.18
26...	0700	11	3.9	24	1	.03
26...	0900	11	4.2	24	9	.27
26...	1100	11	3.0	24	8	.24
26...	1300	12	3.2	24	10	.32
26...	1500	12	4.0	24	9	.29
26...	1700	12	3.3	24	9	.29
26...	1900	12	3.1	23	6	.19
26...	2100	12	3.5	23	9	.29
26...	2300	11	3.2	23	7	.21
27...	0100	11	2.2	23	5	.15
27...	0300	11	2.4	23	6	.18
27...	0500	11	2.0	23	6	.18
27...	0700	10	2.9	23	7	.19
JUN						
18...	0250	15	83	30	602	24
18...	0315	21	30	27	135	7.7
18...	0330	22	30	27	144	8.6
18...	0345	22	34	26	161	9.6
18...	0400	20	30	26	173	9.3
18...	0415	19	29	26	174	8.9
18...	0430	18	34	26	173	8.4
18...	0445	17	31	26	246	11
18...	0500	17	34	27	228	10
18...	0515	16	48	27	262	11
18...	0530	15	45	27	249	10
18...	0545	14	42	27	232	8.8
18...	0600	13	39	27	218	7.7
18...	0615	12	35	27	233	7.5
18...	0630	12	30	28	163	5.3
18...	0645	10	29	27	179	4.8
18...	0700	10	24	27	127	3.4
18...	0715	9.5	20	27	96	2.5
18...	0730	9.0	19	27	90	2.2
18...	0745	8.5	15	27	85	2.0
18...	0800	8.3	15	26	66	1.5
JUL						
01...	2100	8.3	9.5	27	59	1.3
01...	2115	8.3	12	27	69	1.5

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table A-2 Continued. Water-quality data for 1979 and 1980 water years at Stalnaker Run near Bowden, West Virginia (station number 03068607, site 4)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
AUG						
19...	0945	26	45	32	884	62
19...	1000	28	50	32	590	45
19...	1015	28	50	33	436	33
19...	1030	27	45	33	338	25
19...	1045	28	40	33	233	18
19...	1100	28	37	33	190	14
19...	1115	27	33	33	178	13
19...	1130	26	31	32	168	12
19...	1145	25	27	32	145	9.8
19...	1200	24	21	33	112	7.3
19...	1215	24	22	33	103	6.7
19...	1230	22	18	33	86	5.1
19...	1245	22	15	33	80	4.8
19...	1300	21	15	33	62	3.5
19...	1315	21	13	32	58	3.3
19...	1330	20	16	34	66	3.6
19...	1345	19	12	32	42	2.2
19...	1400	19	14	32	52	2.7
19...	1415	18	10	32	39	1.9
19...	1430	18	9.9	32	43	2.1
19...	1445	17	13	33	54	2.5
19...	1500	17	9.2	35	29	1.3
SEP						
02...	1900	15	230	92	4040	164
02...	1930	44	170	44	2840	337
02...	1945	69	140	45	1560	291
02...	2000	63	50	45	778	132
02...	2015	50	50	47	788	106
02...	2030	44	45	49	385	46
02...	2045	41	45	47	297	33
02...	2100	38	45	48	383	39
02...	2115	33	37	49	209	19
02...	2130	31	34	52	302	25
02...	2145	29	28	50	197	15
02...	2200	30	27	49	197	16
02...	2215	28	23	48	124	9.4
02...	2230	28	23	48	112	8.5
02...	2245	27	21	48	270	20
02...	2300	26	21	52	94	6.6

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
FEB						
22...	1115	28	8.4	40	52	3.9
22...	1130	29	10	36	72	5.6
22...	1145	30	9.0	40	77	6.2
22...	1200	31	11	40	87	7.3
22...	1215	32	9.0	39	89	7.7
22...	1230	33	10	39	120	11
22...	1245	34	14	40	126	12
22...	1300	35	13	39	139	13
22...	1315	36	17	41	146	14
22...	1330	36	18	40	145	14
22...	1345	36	17	42	145	14
22...	1400	37	13	41	140	14
22...	1415	38	12	39	122	13
22...	1430	38	19	37	110	11
MAR						
08...	1000	16	2.3	31	7	.30
08...	1100	16	1.5	31	5	.22
08...	1200	16	2.8	33	9	.39
08...	1300	16	2.5	31	9	.39
08...	1400	17	2.4	31	9	.41
08...	1500	18	3.1	31	10	.49
08...	1600	18	3.7	33	15	.73
08...	1700	19	4.4	31	13	.67
08...	1800	20	3.5	32	27	1.5
08...	1900	21	2.9	33	12	.68
08...	2000	20	3.4	33	9	.49
08...	2100	20	2.4	34	9	.49
08...	2200	19	2.5	32	7	.36
08...	2300	19	3.3	32	8	.41
08...	2400	18	2.1	31	7	.34
09...	0100	18	1.9	32	8	.39
09...	0200	18	1.8	33	9	.44
09...	0300	18	2.0	32	5	.24
09...	0400	17	2.1	33	6	.28
09...	0500	17	1.8	32	3	.14
09...	0600	17	2.4	31	5	.23
09...	0700	16	1.6	32	3	.13
09...	0800	16	1.2	31	2	.09

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table A-2 Continued. Water-quality data for 1979 and 1980 water years at Stalnaker Run near Bowden, West Virginia (station number 03068607, site 4)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
APR						
09...	0015	23	13	33	169	10
09...	0030	24	22	28	294	19
09...	0045	26	31	33	147	10
09...	0100	29	32	29	188	15
09...	0115	31	33	29	215	18
09...	0130	32	28	30	543	47
09...	0145	33	20	30	174	16
09...	0200	33	25	29	138	12
09...	0215	34	19	30	111	10
09...	0230	33	14	30	92	8.2
09...	0245	33	13	30	79	7.0
09...	0300	31	8.0	31	77	6.4
09...	0315	30	7.0	31	57	4.6
09...	0330	29	8.0	31	44	3.4
09...	0345	28	5.0	31	39	2.9
09...	0400	28	6.0	31	34	2.6
09...	0415	28	4.0	31	40	3.0
09...	0430	26	7.0	31	34	2.4
09...	0445	24	5.0	31	34	2.2
09...	0500	24	5.0	31	41	2.7
09...	0515	24	7.2	32	39	2.5
09...	0530	22	7.7	32	31	1.8
09...	0545	22	7.5	32	30	1.8
27...	0515	22	25	35	230	14
27...	0530	23	30	31	196	12
27...	0545	24	27	31	159	10
27...	0600	25	26	31	140	9.4
27...	0615	26	23	31	127	8.9
27...	0630	26	25	32	131	9.2
27...	0645	26	21	32	95	6.7
27...	0700	26	16	32	92	6.5
27...	0715	26	14	32	77	5.4
27...	0730	26	10	32	270	19
27...	0745	25	7.6	33	116	7.8
27...	0800	24	9.5	33	49	3.2
27...	0815	24	8.6	32	38	2.5
27...	0830	24	9.5	33	35	2.3
27...	0845	22	9.6	32	33	2.0
27...	0900	22	8.0	32	42	2.5
27...	1730	22	10	31	52	3.1
27...	1815	22	9.4	31	29	1.7
30...	0830	22	5.4	30	24	1.4
30...	0900	22	6.6	30	28	1.7
30...	0915	22	5.3	31	24	1.4
30...	0945	22	6.5	30	30	1.8
30...	1000	22	1.9	30	4	.24
30...	1015	22	2.0	30	3	.18

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
MAY						
20...	2145	23	80	31	448	28
20...	2200	26	55	31	407	29
20...	2215	28	33	31	520	39
20...	2230	28	40	31	240	18
20...	2245	28	25	31	175	13
20...	2300	28	25	31	132	10
20...	2315	27	19	32	110	8.0
20...	2330	26	18	32	80	5.6
20...	2345	26	15	33	90	6.3
20...	2400	25	9.0	32	65	4.4
21...	0015	24	10	32	71	4.6
21...	0030	24	10	33	59	3.8
21...	0045	23	10	33	59	3.7
21...	0100	22	10	33	50	3.0
21...	0115	22	10	33	50	3.0
JUN						
10...	0215	22	34	31	228	14
10...	0230	24	16	30	248	16
10...	0245	24	19	29	201	13
10...	0300	24	25	29	195	13
10...	0315	24	20	30	139	9.0
10...	0330	24	16	30	109	7.1
10...	0345	24	16	29	110	7.1
10...	0400	25	19	30	90	6.1
10...	0415	25	18	30	129	8.7
10...	0430	25	11	30	77	5.2
10...	0445	24	13	30	202	13
10...	0500	24	13	30	73	4.7
10...	0515	24	10	30	58	3.8
10...	0530	25	10	30	57	3.8
10...	0545	24	8.4	30	55	3.6
10...	0600	26	14	30	66	4.6
10...	0615	26	18	30	89	6.2
10...	0630	27	18	30	103	7.5
10...	0645	28	19	30	95	7.2
10...	0700	28	18	30	108	8.2
10...	0715	28	13	31	84	6.4
10...	0730	28	17	30	80	6.0
10...	0745	28	12	30	75	5.7
10...	0800	28	12	31	53	4.0

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table A-2 Continued. Water-quality data for 1979 and 1980 water years at Stalnaker Run near Bowden, West Virginia (station number 03068607, site 4)

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
JUL						
03...	0400	320	100	42	2960	2560
03...	0415	281	90	36	1540	1170
03...	0430	256	65	34	1100	760
03...	0445	201	75	38	1050	570
03...	0500	170	55	37	820	376
03...	0515	138	45	36	540	201
03...	0530	121	45	34	395	129
03...	0545	104	33	34	500	140
03...	0600	87	24	34	237	56
03...	0615	83	29	33	267	60
03...	0630	75	24	33	256	52
03...	0645	67	24	33	340	62
03...	0700	61	13	33	146	24
03...	0715	56	14	33	157	24
03...	0730	52	16	32	123	17
03...	0745	47	5.5	32	88	11
03...	0800	44	12	32	109	13
03...	0815	41	4.4	31	95	11
03...	0830	38	5.3	32	114	12
03...	0845	36	1.9	32	62	6.0
03...	0900	35	5.5	32	99	9.4
03...	0915	33	2.2	31	82	7.3
08...	1630	21	45	32	--	--
08...	1645	30	60	30	665	54
08...	1700	36	50	29	257	25
08...	1715	40	50	28	339	37
08...	1730	42	27	29	116	13
08...	1745	44	13	28	124	15
08...	1800	42	11	29	110	12
08...	1815	40	10	29	2310	249
08...	1830	39	12	29	1960	206
08...	1845	38	7.5	29	115	12
08...	1900	37	5.3	29	137	14
08...	1915	36	4.2	29	99	9.6
08...	1930	35	4.6	30	108	10
08...	1945	33	5.9	29	30	2.7
08...	2000	32	4.8	29	28	2.4
08...	2015	31	4.7	29	28	2.3
08...	2030	30	6.2	29	31	2.5
08...	2045	30	4.3	29	28	2.3
08...	2100	29	4.1	30	23	1.8
08...	2115	28	3.9	30	27	2.0
08...	2130	27	8.6	29	26	1.9
08...	2145	26	3.7	29	13	.91
08...	2200	26	2.9	29	16	1.1
08...	2215	26	4.5	29	10	.70

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)1	TUR-BID-ITY (NTU)2	SPE-CIFIC CON-DUCT-ANCE (UMHOS)3	SEDI-MENT, SUS-PENDED (MG/L)4	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)5
AUG						
11...	1730	28	90	40	1910	144
11...	1815	55	70	37	1430	212
11...	1830	53	36	38	439	63
11...	1845	49	24	33	192	25
11...	1900	44	21	36	182	22
11...	1930	40	24	37	166	18
11...	1945	39	18	40	133	14
11...	2000	36	18	37	116	11
11...	2015	35	15	37	108	10
11...	2030	31	10	37	83	6.9
11...	2045	30	13	37	73	5.9
11...	2100	28	8.0	37	72	5.4
11...	2115	26	8.0	37	67	4.7
11...	2130	24	9.0	36	60	3.9
11...	2145	24	9.0	37	61	4.0
11...	2200	22	7.0	36	51	3.0
11...	2215	21	6.0	35	33	1.9
15...	0700	33	2.4	33	12	1.1
15...	0715	53	6.4	34	20	2.9
15...	0730	61	3.6	33	19	3.1
SEP						
14...	2145	33	75	37	1050	94
14...	2200	36	90	37	757	74
14...	2215	32	90	38	744	64
14...	2230	31	65	37	361	30
14...	2245	29	45	37	1030	81
14...	2300	25	33	38	134	9.0
14...	2315	22	27	38	153	9.1

1 Instantaneous streamflow (discharge) expressed in cubic feet per second.
2 Turbidity value expressed as nephelometric turbidity units.
3 Specific conductance expressed in micromhos per centimeter at 25°C.
4 Instantaneous suspended-sediment concentration expressed in milligrams per liter.
5 Instantaneous suspended-sediment discharge (load) expressed in tons per day.

Table B-1. Daily precipitation July 1975 to September 1980 at South Spring at Bowden, West Virginia (station number 03068710, site 8)

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1										.00	.00	.15
2										.00	.00	.00
3										.01	.88	.00
4										1.12	.11	.00
5										.15	.78	.00
6										.04	.16	.15
7										.05	.01	.01
8										.63	.00	.00
9										.08	.00	.00
10										.04	.00	.00
11										.05	.11	.07
12										1.45	.16	.65
13										.02	.84	.00
14										.00	1.15	.00
15										.00	.58	.00
16										.09	.76	.01
17										.01	.45	.01
18										.04	.01	.66
19										.00	.00	.08
20										.02	.00	.31
21										.01	.01	.00
22										.01	.00	.70
23										.36	.01	.80
24										.00	.01	.02
25										.21	.01	.03
26										.00	.00	.00
27										.00	.00	.04
28										.00	.00	.00
29										.00	.00	.01
30										.00	.00	.00
31										.00	.26	---
TOTAL										4.39	6.30	3.70

WTR YR 1975 TOTAL 14.39 (PARTIAL)

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.00	.20	.03	.33	.00	.07	.77	.16	.00	.00	.13
2	.24	.01	.00	.19	.00	.00	.07	.02	.01	.00	.00	.41
3	.00	.00	.01	.39	.15	.02	.47	.22	.01	.00	.01	.00
4	.01	.00	.09	.00	.26	.00	.13	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.26	.03	.02	.01	.00	.17	.00	.03
6	.00	.00	.34	.01	.12	.00	.01	.00	.00	.11	.03	.00
7	.00	.04	.00	.04	.00	.00	.00	.06	.00	.02	.24	.00
8	.06	.01	.01	.03	.00	.00	.00	.00	.00	.46	.01	.00
9	.33	.01	.13	.00	.02	.00	.00	.00	.00	.11	.00	.13
10	.54	.16	.01	.00	.02	.59	.01	.00	.00	.05	.00	1.06
11	.19	.00	.02	.46	.41	.18	.10	.13	.00	1.16	.00	.00
12	.00	1.25	.19	.00	.00	.03	.02	.00	.00	.17	.01	.00
13	.01	.01	.14	.50	.89	.16	.00	.01	.31	.00	.00	.00
14	.00	.00	.01	.01	.00	.04	.00	.00	.02	.01	.37	.00
15	.00	.12	.28	.01	.00	.00	.00	.07	.00	.61	.21	.83
16	.02	.08	.27	.01	.06	.45	.00	.46	.47	.67	.01	.02
17	1.19	.01	.01	.00	.20	.03	.00	.12	.03	.01	.00	.31
18	.06	.00	.00	.00	.17	.06	.00	.45	.05	.00	.00	.09
19	.03	.00	.00	.06	.01	.00	.00	.05	.55	.00	.00	.00
20	.08	.00	.02	.04	.00	.10	.29	.01	.65	.00	.00	.27
21	.02	.14	.00	.00	.11	.98	.02	.00	.22	.09	.00	.40
22	.00	.00	.00	.00	.49	.01	.35	.00	.02	.43	.00	.00
23	.00	.00	.00	.02	.04	.01	.00	.00	.00	1.46	.00	.01
24	.01	.00	.04	.00	.05	.00	.02	.00	.11	.61	.00	.00
25	.00	.00	.12	.02	.00	.11	.53	.16	.31	.01	.00	.00
26	.06	.00	.32	.11	.00	.01	.11	.00	.04	.00	.65	.08
27	.02	.22	.00	.23	.00	.22	.00	.00	.00	.00	.21	1.08
28	.00	.00	.03	.01	.00	.00	.00	.01	.01	.68	.04	.03
29	.16	.01	.05	.01	.00	.24	.00	.06	.00	.00	.02	.00
30	.04	.08	.40	.00	---	.04	.01	.28	.09	.01	.00	.90
31	.00	---	1.14	.01	---	.37	---	.04	---	.10	.00	---
TOTAL	3.12	2.15	3.83	2.19	3.59	3.68	2.23	2.93	3.06	6.94	1.81	5.78

WTR YR 1976 TOTAL 41.31

Table B-1 Continued. Daily precipitation July 1975 to September 1980 at South Spring at Bowden, West Virginia (station number 03068710, site 8)

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.73	.04	.09	.01	.00	.00	.01	.00	.03	.03	.02	.01
2	.44	.01	.00	.00	.00	.01	.21	.16	.11	.00	.00	.04
3	.11	.00	.01	.00	.02	.10	.00	.00	.02	.00	.00	.25
4	.00	.03	.01	.00	.01	.43	1.31	.11	.00	.00	.00	.01
5	.00	.00	.00	.00	.00	.00	.37	.16	.03	.30	.16	.00
6	.00	.00	.18	.00	.00	.00	.05	.22	.18	.01	.15	.00
7	.61	.00	.80	.00	.00	.00	.16	.94	.01	.01	.16	.53
8	1.01	.00	.00	.00	.11	.00	.00	.00	.45	.11	.76	.01
9	1.93	.02	.01	.00	.01	.00	.00	.00	1.30	.00	.00	.00
10	.07	.11	.00	.00	.01	.00	.02	.00	.01	.17	.26	.00
11	.00	.00	.43	.01	.00	.01	.01	.00	.00	.95	.01	.00
12	.00	.00	.31	.01	.04	.14	.01	.00	.00	.44	1.30	.00
13	.00	.00	.00	.00	.12	1.01	.00	.12	.00	.38	.20	.00
14	.00	.07	.00	.37	.00	.00	.12	.00	.00	.02	1.00	.44
15	.07	.21	.00	.00	.00	.02	.00	.00	.00	.00	.01	.06
16	.06	.00	.05	.01	.00	.00	.00	.00	.64	.00	.00	.10
17	.18	.00	.00	.02	.00	.00	.00	.00	.00	.00	.38	.10
18	.01	.00	.00	.00	.07	.45	.00	.01	.08	.00	.01	.00
19	.02	.01	.01	.00	.08	.00	.02	.08	.03	.00	.00	.40
20	.99	.00	.30	.00	.01	.21	1.43	.00	.44	.00	.00	.62
21	.07	.00	.00	.00	.00	.01	.02	.00	.00	.94	.00	.00
22	.00	.00	.02	.00	.15	.59	.00	.00	.00	.17	.00	.01
23	.10	.00	.00	.01	.01	.07	.06	.47	.02	.00	.00	.00
24	.79	.00	.02	.02	.40	.00	.16	.00	.02	.00	.59	.00
25	.33	.23	.03	.00	.02	.00	.01	.00	1.67	1.77	.01	.10
26	.00	.01	.00	.00	.00	.00	.26	.01	.00	.01	.00	.16
27	.00	.05	.00	.00	.01	.01	.20	.00	.19	.01	.00	.16
28	.15	.13	.34	.10	.00	.40	.23	.00	.06	.00	.00	.01
29	.01	.07	.00	.00	---	.02	.01	.00	.48	.16	.00	.00
30	.40	.00	.00	.00	---	.06	.00	.00	.01	.07	1.07	.00
31	.46	---	.00	.00	---	.16	---	.44	---	.00	.02	---
TOTAL	8.54	0.99	2.61	0.56	1.07	3.70	4.67	2.72	5.78	5.55	6.11	3.01

WTR YR 1977 TOTAL 45.31

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.69	.00	.00	.14	.01	.06	.00	.00	.00	.00	.01	.02
2	.19	.00	.00	.00	.00	.08	.05	.00	.07	1.22	.00	.00
3	.09	.00	.20	.00	.03	.00	.04	.00	.73	2.51	1.51	.05
4	.00	.00	.01	.06	.07	.00	.31	.77	.00	.05	.23	.00
5	.01	.09	.39	.00	.01	.05	.01	.45	.14	.02	.31	.00
6	.51	.01	.15	.09	.00	.01	.32	.06	.01	.00	.20	.00
7	.00	.03	.00	.02	.00	.16	.19	.00	.50	.00	.48	.00
8	.51	.09	.08	.34	.12	.08	.00	.73	.69	.47	.07	.00
9	.97	.01	.14	.00	.00	.00	.00	.09	.17	.01	.00	.00
10	.00	.43	.00	.00	.00	.00	.00	.00	.01	.18	.01	.00
11	.01	.01	.00	.00	.00	.00	.63	.00	.00	.01	.72	.05
12	.01	.02	.03	.02	.00	.11	.01	.00	.00	.01	.02	.43
13	.00	.14	.04	.11	.00	.00	.00	1.33	.03	.00	.15	.03
14	.02	.05	.52	.00	.00	.22	.00	.16	.00	1.37	.02	.00
15	.01	.01	.01	.00	.12	.00	.00	.05	.00	.00	.00	.17
16	1.03	.07	.00	.00	.06	.03	.00	.32	.00	.12	.00	.57
17	.01	.25	.03	.00	.00	.01	.00	.09	.02	.02	.01	.02
18	.01	.00	.16	.00	.02	.15	.18	.04	.00	.01	.00	.00
19	.50	.00	.00	.00	.08	.15	.52	.02	.00	.01	.00	.01
20	.01	.00	.18	.00	.02	.02	.42	.00	.71	.01	.00	.00
21	.00	.14	.13	.00	.00	.16	.33	.00	.63	.00	.01	.00
22	.00	.57	.00	.00	.00	.01	.02	.00	.09	.00	.00	.15
23	.00	.12	.09	.01	.04	.02	.00	.32	.02	.00	.01	.01
24	.00	.11	.13	.17	.00	.03	.00	.63	.00	.15	.00	.00
25	.00	.15	.27	.89	.00	.85	.20	.04	.00	.33	.01	.01
26	.29	.06	.00	.40	.00	.74	.33	.01	1.80	.00	.01	.00
27	.00	.17	.00	.00	.00	.06	.00	.00	.65	.79	.68	.00
28	.01	.03	.00	.12	.00	.05	.00	.00	.00	.01	.59	.00
29	.00	.57	.01	.00	---	.00	.00	.00	.00	.01	.00	.00
30	.00	.48	.02	.00	---	.01	.00	.03	.00	.85	.16	.00
31	.00	---	.00	.00	---	.00	---	.17	---	1.14	.08	---
TOTAL	4.88	3.61	2.59	2.37	0.58	3.06	3.56	5.31	6.27	9.30	5.29	1.52

WTR YR 1978 TOTAL 48.34

Table B-1 Continued. Daily precipitation July 1975 to September 1980 at South Spring at Bowden, West Virginia (station number 03068710, site 8)

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.01	.01	.19	.00	.13	.49	.01	.10	.89	.07	.00
2	.01	.01	.00	.00	.00	.04	.05	.04	.00	.08	.19	1.68
3	.00	.02	.72	.00	.02	.03	.50	.33	.69	.01	.01	1.26
4	.45	.01	.64	.02	.01	.17	.28	.30	.02	1.07	.00	.00
5	.01	.01	.01	.01	.01	.10	.18	.06	.00	.00	.00	.41
6	.03	.02	.00	.01	.04	.01	.04	.01	.00	.01	.00	.41
7	.39	.10	.08	1.06	.00	.02	.02	.00	.31	.00	.00	.01
8	.04	.02	1.52	.01	.01	.05	.06	.00	.24	.00	.15	.00
9	.00	.02	.61	.01	.00	.02	.66	.00	.01	.01	.01	.00
10	.00	.01	.01	.01	.00	.41	.17	1.04	.19	.23	.34	.00
11	.00	.01	.25	.00	.02	.00	.04	.12	.11	.00	.22	.00
12	.03	.02	.00	.03	.00	.02	.01	1.02	.01	.00	1.15	.00
13	.04	.02	.02	.42	.00	.04	.00	.35	.00	.25	.00	.01
14	.26	.05	.01	.08	.02	.31	.06	.00	.00	.53	.13	.81
15	.12	.68	.08	.01	1.12	.02	.11	.16	.00	1.05	.01	.00
16	.38	.22	.24	.01	.16	.03	.09	.01	.00	.05	.00	.01
17	.00	.30	.01	.55	.03	.04	.08	.00	.34	.02	.00	.00
18	.00	.00	.00	.00	.00	.02	.01	.00	1.24	.04	.78	.00
19	.00	.00	.00	.00	.01	.05	.02	.00	.00	.02	.99	.04
20	.00	.00	1.85	1.49	.21	.04	.04	.00	.00	.42	.98	.00
21	.00	.00	.67	.61	.15	.03	.04	.31	.43	.09	.03	1.29
22	.00	.01	.08	.00	.02	.04	.03	.00	.04	.01	.01	.33
23	.16	.61	.00	.09	.48	.01	.07	.34	.32	.03	.00	.04
24	.01	.20	.94	.17	.68	.61	.05	.85	.09	.20	.00	.00
25	.00	.00	.03	.00	.26	.02	.03	.28	.01	.24	.32	.00
26	.63	.00	.06	.00	.04	.00	.75	.14	.00	.18	.03	.00
27	.10	.94	.03	.14	.01	.00	.26	.28	.00	.05	.68	.00
28	.01	.10	.14	.00	.10	.05	.07	.11	.00	.01	.01	.38
29	.01	.21	.35	.01	---	.04	.02	.00	.03	.71	.07	.14
30	.01	.00	.03	.00	---	.03	.02	.01	.54	.02	.00	.02
31	.01	---	.45	.00	---	.44	---	.07	---	.00	.00	---
TOTAL	2.70	3.60	8.84	4.93	3.40	2.82	4.25	5.84	4.72	6.22	6.18	6.84

WTR YR 1979 TOTAL 60.34

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

SU[illegible]IATION [illegible]

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	.00	.07	.01	.00	.08	.06	.04	.54	.00	.31	.00
2	.59	1.15	.00	.02	.00	.01	.01	.00	.42	.00	.01	.34
3	.09	.00	.11	.01	.00	.10	.09	.00	.07	3.34	.02	.04
4	.33	.01	.01	.00	.00	.45	.21	.00	.00	.00	.25	.68
5	.59	.00	.00	.00	.08	1.07	.07	.00	.00	.26	.01	.03
6	.16	.00	.03	.09	.00	.01	.02	.83	.72	.00	.00	.27
7	.01	.18	.00	.43	.00	.00	.01	.01	.03	.00	.00	.00
8	.69	.02	.00	.08	.03	.02	.77	.00	.22	1.27	.75	.00
9	1.91	.17	.00	.01	.04	.02	.37	.00	.42	.90	.30	.07
10	.42	.32	.00	.00	.04	.28	.00	.00	.74	.45	.20	.18
11	.48	.08	.00	.19	.00	.02	.00	.04	.00	.02	1.25	.00
12	.53	.18	.50	.00	.00	.00	.17	.07	.00	.50	.34	.01
13	.22	.03	.51	.02	.08	.00	.27	.49	.00	.02	.00	.00
14	.00	.01	.00	.36	.00	.00	.44	.00	.00	.00	.00	1.99
15	.00	.08	.03	.01	.00	.66	.03	.01	.69	.00	1.53	.01
16	.00	.11	.04	.00	.38	.02	.24	.00	1.26	.00	.05	.00
17	.01	.01	.01	.05	.00	.16	.00	.24	.00	.67	.00	.03
18	.01	.00	.13	.33	.09	.60	.01	.21	.00	.00	2.31	.01
19	.00	.00	.00	.00	.00	.00	.00	.26	.00	.00	.56	.01
20	.00	.00	.00	.00	.04	.00	.01	.80	.00	.00	.11	.00
21	.00	.00	.00	.00	.15	.35	.04	.36	.00	.00	.02	.40
22	.00	.00	.00	.21	.29	.25	.01	.00	.00	.83	.03	.26
23	.05	.00	.00	.01	.21	.03	.00	.00	.00	.19	.05	.39
24	.03	.24	1.04	.00	.00	.27	.12	.34	.00	.01	.01	.06
25	.03	.01	.42	.17	.01	.03	.00	.07	.00	.00	.00	.51
26	.01	.52	.00	.02	.00	.02	.87	.00	.00	.00	.00	.10
27	.01	.00	.00	.21	.01	.04	1.06	.00	.06	.00	.00	.00
28	.29	.07	.00	.00	.00	.60	.00	.00	.00	1.15	.00	.00
29	.01	.00	.13	.00	.04	.03	.15	.00	.08	.00	.00	.00
30	.00	.00	.14	.00	---	.05	1.00	1.38	.09	.00	.00	.07
31	.00	---	.06	.00	---	.80	---	.16	---	.00	.03	---
TOTAL	6.53	3.19	3.23	2.23	1.49	5.97	6.03	5.31	5.34	9.61	8.14	5.46

WTR YR 1980 TOTAL 62.53

Table B-1 Continued. Daily precipitation July 1975 to September 1980 at South Spring at Bowden, West Virginia (station number 03068710, site 8)

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.00	.01	.52	.00	.10	.53	.00	.07	.71	.06	.00
2	---	.00	.00	.41	.00	.01	.03	.00	.00	.09	.08	1.77
3	.00	.00	.76	.11	.06	.00	.44	.32	.68	.01	.00	1.31
4	.36	.00	.65	.05	.00	.12	.31	.33	.03	.98	.00	.01
5	.00	.00	.01	.00	.05	.10	.24	.04	.00	.00	.00	.50
6	.00	.00	.00	.00	.08	.00	.04	.00	.00	.00	.00	.56
7	.29	.06	.07	.90	.01	.00	.00	.00	.34	.00	.00	.04
8	.05	.02	1.59	.00	.00	.00	.01	.00	.20	.00	.13	.00
9	.01	.02	.57	.00	.00	.00	.61	.00	.03	.00	.02	.00
10	.00	.00	.00	.00	.00	.39	.07	1.04	.19	.23	.27	.00
11	.00	.00	.06	.00	.00	.00	.00	.07	.09	.00	.22	.00
12	.00	.03	.00	.02	.00	.02	.00	.81	.00	.00	1.07	.00
13	.00	.01	.00	.30	.00	.01	.00	.30	.00	.24	.00	.01
14	.20	.07	.00	.10	.00	.34	.04	.01	.00	.45	.13	.80
15	.07	.67	.00	.00	1.49	.01	.12	.15	.00	.48	.00	.01
16	.41	.24	.27	.00	.17	.00	.09	.01	.00	.05	.02	.00
17	.01	.31	.00	.56	.03	.00	.03	.00	.36	.02	.00	.00
18	.01	.00	.00	.00	.00	.00	.00	.00	1.05	.04	.70	.00
19	.00	.00	.00	.00	.00	.03	.00	.00	.01	.00	1.13	.02
20	.00	.01	2.11	1.56	.19	.01	.00	.00	.00	.25	.32	.00
21	.00	.00	.77	.52	.14	.00	.00	.29	.38	.16	.05	1.28
22	.00	.00	.00	.00	.01	.00	.00	.01	.08	.01	.00	.33
23	.12	.76	.00	.06	.48	.00	.01	.44	.33	.04	.01	.07
24	.01	.11	.99	.16	.68	.66	.01	.91	.07	.19	.00	.00
25	.00	.00	.02	.00	.26	.01	.00	.27	.02	.20	.49	.00
26	.72	.00	.01	.00	.01	.00	.73	.18	.00	.27	.03	.00
27	.08	1.00	.00	.07	.00	.00	.23	.33	.00	.05	.64	.00
28	.00	.10	.03	.00	.27	.00	.04	.14	.00	.00	.00	.34
29	.00	.23	.00	.00	---	.00	.00	.00	.08	.59	.05	.15
30	.00	.00	.08	.00	---	.00	.00	.00	.42	.01	.00	.03
31	.00	---	.50	.00	---	.40	---	.07	---	.00	.00	---
TOTAL	2.34	3.64	8.50	5.34	3.93	2.21	3.58	5.72	4.43	5.07	5.42	7.23

WTR YR 1979 TOTAL 57.41

RAINFALL, ACCUMULATED (INCHES), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	.00	.08	.00	.00	.00	.06	.02	.46	.01	.27	.01
2	.48	1.18	.00	.00	.00	.00	.00	.00	.39	.00	.02	.30
3	.12	.01	.10	.00	.01	.00	.06	.00	.10	3.30	.04	.02
4	.20	.11	.00	.00	.00	.25	.22	.00	.01	.02	.29	.65
5	.61	.04	.00	.00	.06	1.05	.11	.00	.00	.28	.01	.04
6	.18	.00	.01	.00	.00	.12	.01	.82	.82	.03	.01	.20
7	.01	.12	.01	.35	.00	.00	.00	.03	.04	.00	.00	.03
8	.72	.03	.00	.01	.08	.00	.84	.00	.25	1.49	.55	.01
9	2.09	.15	.00	.01	.02	.03	.31	.00	.57	.88	.25	.05
10	.33	.33	.00	.03	.03	.27	.00	.00	.68	.44	.18	.19
11	.55	.06	.00	.27	.02	.14	.00	.03	.01	.02	.21	.01
12	.50	.18	.49	.00	.01	.07	.19	.14	.01	.63	1.05	.00
13	.24	.02	.52	.03	.01	.02	.27	.48	.00	.03	.01	.00
14	.00	.03	.00	.36	.00	.00	.42	.01	.00	.01	.01	1.08
15	.10	.12	.01	.01	.00	.56	.02	.00	.66	.00	1.07	.14
16	.00	.08	.03	.03	.29	.11	.24	.00	1.38	.00	.12	.01
17	.00	.13	.01	.07	.00	.19	.05	.35	.02	.81	.01	.01
18	.00	.00	.02	.35	.12	.59	.00	.17	.00	.01	2.32	.01
19	.00	.03	.02	.01	.04	.14	.00	.26	.00	.01	.51	.01
20	.00	.00	.00	.02	.00	.00	.00	1.08	.00	.00	.12	.00
21	.00	.00	.00	.09	.17	.36	.00	.34	.00	.00	.02	.38
22	.00	.00	.00	.13	.31	.27	.00	.02	.00	.81	.05	.23
23	.01	.00	.00	.01	.16	.07	.00	.08	.00	.30	.05	.45
24	.03	.18	.97	.00	.00	.29	.07	.50	.00	.02	.02	.05
25	.03	.02	.48	.31	.02	.06	.02	.07	.00	.01	.01	.47
26	.02	.57	.00	.02	.00	.02	.86	.01	.00	.00	.00	.09
27	.13	.02	.00	.07	.00	.06	.96	.00	.00	.00	.00	.01
28	.31	.04	.01	.00	.00	.62	.01	.00	.01	.87	.00	.01
29	.00	.03	.15	.00	.00	.03	.18	.00	.11	.02	.00	.01
30	.00	.00	.01	.00	---	.06	.99	1.36	.15	.01	.03	.02
31	.00	---	.00	.00	---	.85	---	.19	---	.01	.01	---
TOTAL	6.73	3.48	2.92	2.18	1.35	6.23	5.89	5.96	5.67	10.02	7.24	4.49

WTR YR 1980 TOTAL 62.16