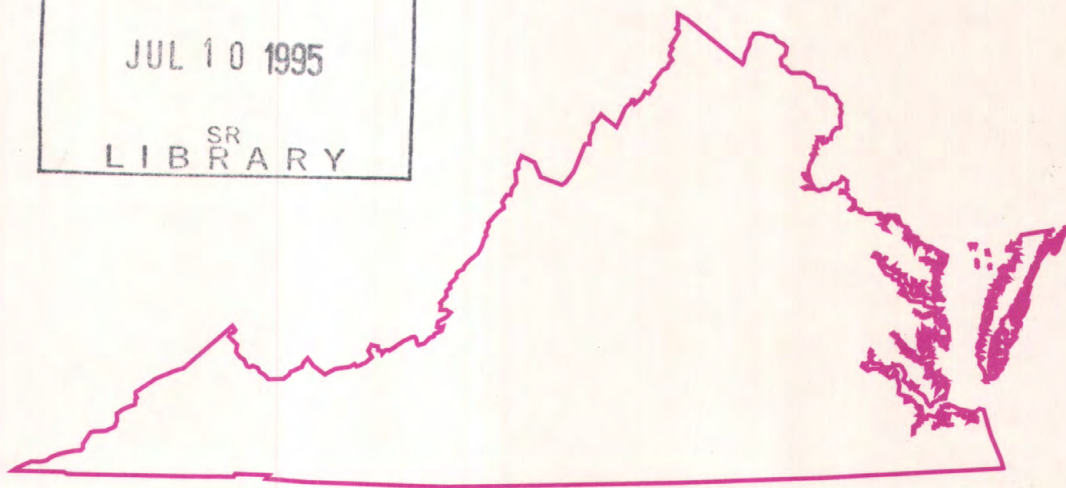
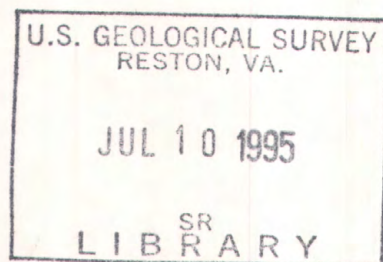




# Water Resources Data Virginia Water Year 1994

Volume 1. Surface-Water-Discharge and  
Surface-Water-Quality Records



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT VA-94-1  
Prepared in cooperation with the Virginia Department of Environmental  
Quality and with other agencies



## CALENDAR FOR WATER YEAR 1994

1993

[illegible]

1994

[illegible]

APRIL							MAY							JUNE						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
					1	2	1	2	3	4	5	6	7				1	2	3	4
3	4	5	6	7	8	9	8	9	10	11	12	13	14	5	6	7	8	9	10	11
10	11	12	13	14	15	16	15	16	17	18	19	20	21	12	13	14	15	16	17	18
17	18	19	20	21	22	23	22	23	24	25	26	27	28	19	20	21	22	23	24	25
24	25	26	27	28	29	30	29	30	31					26	27	28	29	30		

[illegible]





# Water Resources Data Virginia Water Year 1994

Volume 1. Surface-Water-Discharge and  
Surface-Water-Quality Records

by Byron J. Prugh, Jr., Paul E. Herman, and Donna L. Belval



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT VA-94-1  
Prepared in cooperation with the Virginia Department of Environmental  
Quality and with other agencies



**U.S. DEPARTMENT OF THE INTERIOR**

BRUCE BABBITT, Secretary

**U.S. GEOLOGICAL SURVEY**

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Charlottesville, Virginia 22903

1995



## PREFACE

This volume of the annual hydrologic data report of Virginia is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's and cooperating agencies' surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and water quality provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Virginia are contained in two volumes:

Volume 1. Surface-Water-Discharge and Surface-Water-Quality Records

Volume 2. Ground-Water-Level and Ground-Water-Quality Records

This report (Volume 1) is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey and the Virginia Department of Environmental Quality who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, the following personnel contributed significantly to the collection, computation, processing, and completion of this information:

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[Letters after station name designate type of data collected: (d) discharge, (c) chemical, (b) biological, (m) microbiological, (t) water temperature, (s) sediment, (e) elevation, gage heights, or contents]

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[Letters after station name designate type of data collected: (d) discharge, (c) chemical, (b) biological, (m) microbiological, (t) water temperature, (s) sediment, (e) elevation, gage heights, or contents]

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## DISCONTINUED SURFACE-WATER-DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water-discharge or stage-only stations (gaging stations) in Virginia have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Those stations with an asterisk (\*) after the station number are currently operated as crest-stage partial-record stations. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

[Letters after station name designate type of data collected: (d) discharge, (e) elevation]

## Discontinued surface-water-discharge or stage-only stations

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
POTOMAC RIVER BASIN			
Abrams Creek at Winchester, Va. (d)	01615500	5.6	1946-49
Dry River at Rawley Springs, Va. (d)	01621000	72.6	1946-48
Cooks Creek at Mt. Crawford, Va. (d)	01621500	42	1905-06
Castle Spring near Churchville, Va. (d)	01622500	-	1949-56
Bell Creek at St. Pauls Chapel, near Staunton, Va. (d)	01623000	.61	1948-55
Bell Creek near Staunton, Va. (d)	01623500	3.8	1948-55
Bell Creek at Franks Mill, near Staunton, Va. (d)	01624000	9.6	1948-56
Middle River near Verona, Va. (d)	01624300	178	1967-86
Lewis Creek near Staunton, Va. (d)	01624500	18	1905-06
North River at Port Republic, Va. (d)	01625500	804	1895-99
Back Creek near Lyndhurst, Va. (d)	01625900	41.2	1974-77
South River at Waynesboro, Va. (d)	01626500	133	1905-06, 1928-52
South River at Port Republic, Va. (d)	01628000	248	1895-99
Elk Run at Elkton, Va. (d)	01629000	17	1901-06
Yagers Spring near Luray, Va. (d)	01629990	-	1949-56
Hawksbill Creek near Luray, Va. (d)	01630000	52	1905-06
Plains Mill Spring near New Market, Va. (d)	01632500	-	1949-56
Stony Creek at Columbia Furnace, Va. (d)	01633500	79.4	1947-56
Marlboro Spring at Marlboro, Va. (d)	01635000	-	1949-56
North Fork Shenandoah River near Riverton, Va. (d)	01636000	1,040	1899-1906
Happy Creek at Front Royal, Va. (d)	01636210	14.0	1948-77
Big Spring near Leesburg, Va. (d)	01643610	.03	1968-69, 1980-81
Stave Run at Reston, Va. (d)	01624290	.05	1966-71, 1973
Stave Run near Reston, Va. (d)	01624291	.08	1971-82
Smilax Branch at Reston, Va. (d)	01644295	.32	1967-78
Snakeden Branch at Reston, Va. (d)	01645784*	.79	1973-78
Fourmile Run at Alexandria, Va. (d)	01652500*	14.4 13.8	1951-69, 1974-75, 1979-82
Long Branch near Annandale, Va. (d)	01654500	3.71	1947-57

\* Currently operated as a crest-stage partial-record station.

## Discontinued surface-water-discharge or stage-only stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
POTOMAC RIVER BASIN--Continued			
Accotink Creek near Accotink Station, Va. (d)	01655000	37.0	1949-57
Cedar Run near Warrenton, Va. (d)	01655500*	12.3	1950-87
Cedar Run near Aden, Va. (d)	01656100	155	1973-87
Broad Run at Buckland, Va. (d)	01656500	50.5	1950-79, 1981-87
Broad Run near Bristow, Va. (d)	01656650	89.6	1975-87
Occoquan River near Manassas, Va. (d)	01656700	343	1968-81
Bull Run near Catharpin, Va. (d)	01656725	25.8	1969-87
Cub Run near Bull Run, Va. (d)	01656960	49.9	1973-87
Bull Run near Manassas, Va. (d)	01657000	147	1950-81
Bull Run near Manassas Park, Va. (d)	01657020	148	1984-87
Bull Run near Clifton, Va. (d)	01657415	185	1972-84
Occoquan River (Creek) near Occoquan, Va. (d)	01657500	570	1913-16, 1921-23, 1937-56
Hooes Run near Occoquan, Va. (d)	01657655	3.97	1975-82
Quantico Creek near Dumfries, Va. (d)	01658480	6.90	1983-85
South Fork Quantico Creek near Joplin, Va. (d)	01658550	9.62	1983-85
South Fork Quantico Creek near Dumfries, Va. (d)	01658650	16.6	1983-85
North Branch Chopawamsic Creek near Independent Hill, Va. (d)	01659000	5.79	1951-57, 1990
Middle Fork Chopawamsic Creek near Garrisonville, Va. (d)	01659500*	4.51	1951-57, 1960-67
South Branch Chopawamsic Creek near Garrisonville, Va. (d)	01660000	2.56	1951-57
Beaverdam Run near Garrisonville, Va. (d)	01660500	12.7	1951-57
GREAT WICOMICO RIVER BASIN			
Bush Mill Stream near Heathsville, Va. (d)	01661800*	6.82	1964-87
RAPPAHANNOCK RIVER BASIN			
Carter Run near Marshall, Va. (d)	01661900*	19.5	1977-82
Rappahannock River near Warrenton, Va. (d)	01662000*	195	1943-86
Rush River at Washington, Va. (d)	01662500	14.7	1953-77
Thornton River near Laurel Mills, Va. (d)	01663000	142	1943-56
Hazel River at Rixeyville, Va. (d)	01663500	287	1942-92
Rappahannock River at Kellys Ford, Va. (d)	01664500	641	1925-52
Robinson River at Locust Dale, Va. (d)	01666000	148	1942
Rapidan River at Rapidan, Va. (d)	01667000	446	1924-31
Mountain Run near Burr Hill, Va. (d)	01667870*	28.8	1990-92
Hoskins Creek near Tappahannock, Va. (d)	01668800*	15.5	1965-86

\* Currently operated as a crest-stage partial-record station.

## Discontinued surface-water-discharge or stage-only stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
PIANKATANK RIVER BASIN			
Dragon Swamp near Church View, Va. (d)	01669500	84.9	1943-81
YORK RIVER BASIN			
Beaverdam Swamp near Ark, Va. (d)	01670000	6.63	1950-89
Pamunkey Creek at Lahore, Va. (d)	01670180*	40.5	1989-92
Contrary Creek near Mineral, Va. (d)	01670300*	5.53	1976-86
North Anna River near Hewlett, Va. (d)	01670500	424	1926-28
North Anna River near Doswell, Va. (d)	01671000	441	1926-86
Bunch Creek near Boswells Tavern, Va. (d)	01671500	4.37	1949-79
South Anna River at Vontay, Va. (d)	01672000	332	1927-30
Totopotomoy Creek near Atlee, Va. (d)	01673500	5.89	1949-77
JAMES RIVER BASIN			
Bolar Spring at Bolar, Va. (d)	02010000	-	1950-56
Muddy Run Spring near Warm Springs, Va. (d)	02010500	-	1946-56
Warm Spring at Warm Springs, Va. (d)	02011000	-	1928-44
Back Creek on Rt. 600, near Mountain Grove, Va. (d)	02011480	85.8	1974-84
Falling Spring Creek near Falling Spring, Va. (d)	02012000	11.5	1948-52
Jackson River at Falling Spring, Va. (d)	02012500*	411	1925-84
Jackson River at Covington, Va. (d)	02012900	440	1907-08
Smith Creek above old dam, near Clifton Forge, Va. (d)	02014500	12.4	1947-56
Smith Creek near Clifton Forge, Va. (d)	02015000	12.5	1944-47
Stuart Spring near McDowell, Va. (d)	02015500	-	1950-56
Meadow Creek at New Castle, Va. (d)	02017000	13.8	1929-52
Catawba Creek near Fincastle, Va. (d)	02019000	104	1928-37
Karnes Spring near Buchanan, Va. (d)	02020000	-	1950-56
Calfpasture River at Goshen, Va. (d)	02021000	190	1925-39
Big Spring at Kerrs Creek, Va. (d)	02022000	-	1950-56
Maury River near Lexington, Va. (d)	02023000	487	1925-60
South River near Riverside, Va. (d)	02023500	111	1950-62
Buffalo Creek near Glasgow, Va. (d)	02024300	123	1963-64
Maury River at Glasgow, Va. (d)	02024500	831	1895-1906
Pedlar River near Pedlar Mills, Va. (d)	02025000	91	1942-56
Tye River at Roseland, Va. (d)	02026500	68	1927-38
Tye (Buffalo) River near Norwood, Va. (d)	02028000	360	1940-60
Hardware River near Scottsville, Va. (d)	02029500	104	1925-39
Mechums River near White Hall (Ivy), Va. (d)	02031000	95.4	1942-51
North Fork Moormans River near White Hall, Va. (d)	02031500	11.4	1952-63, 1982-84

\* Currently operated as a crest-stage partial-record station.



## Discontinued surface-water-discharge or stage-only stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
JAMES RIVER BASIN--Continued			
Moormans River near White Hall, Va. (d)	02032000	18	1943-46
South Fork Rivanna River near Earlysville, Va. (d)	02032500	216	1951-66
North Fork Rivanna River near Proffit, Va. (d)	02032680*	176	1970-92
Rivanna River near Charlottesville, Va. (d)	02033000	473	1925
Rivanna River below Moores Creek, near Charlottesville, Va. (d)	02033500	507	1925-34
Willis River at Lakeside Village (Flanagan Mills), Va. (d)	02034500*	262	1927-86
(Big) Lickinghole Creek near Goochland, Va. (d)	02035500	70	1944-46
Beaverdam Creek at State Farm, Va. (d)	02036000	42	1944-47
Falling Creek near Drewrys Bluff, Va. (d)	02038500	54	1942-56, 1957-64
Vaghans Creek near Hixburg, Va. (d)	02038880	23.2	1980-81
Fishpond Creek near Hixburg, Va. (d)	02038830	14	1980-81
Flat Creek near Amelia, Va. (d)	02040500*	73	1946-48
Appomattox River near Petersburg, Va. (d)	02041500	1,335	1927-66
Swift Creek near Chester, Va. (d)	02042000	143	1943-49
GREAT DISMAL SWAMP BASIN			
Washington Ditch near Cypress Chapel, Va. (d)	02043550	41	1979-81
CHOWAN RIVER BASIN			
Nottoway River near Burkeville, Va. (d)	02044000*	38.7	1946-86
Nottoway River near McKenney, Va. (d)	02045000	362	1946-50
Waqua Creek near Alberta, Va. (d)	02045200	15.0	1966-67
Anderson Branch at Sussex, Va. (d)	02046500	5.35	1949-56
Assamoosick Swamp near Sebrell, Va. (d)	02047100	86.4	1982-88
Blackwater River at Zuni, Va. (d)	02048000	456	1943-88
Seacock Creek at Unity, Va. (d)	02048500	102	1943-49
Blackwater River near Burdette, Va. (d)	02049000	576	1942-44
North Meherrin River near Keysville, Va. (d)	02050500	9.2	1949-61
Great Creek near Cochran, Va. (d)	02051600*	30.7	1958-86
Fontaine (Fountains) Creek near Emporia, Va. (d)	02053000	96	1944-53
ROANOKE RIVER BASIN			
Big Springs at Elliston, Va. (d)	02054000	-	1948-56
Tinker Creek at Roanoke, Va. (d)	02055500	70	1907-08
Back Creek near Roanoke, Va. (d)	02056500	43	1907-08
Blackwater River near Union Hall, Va. (d)	02057000	208	1925-64
Roanoke River near Toshes, Va. (d)	02057500	1,020	1925-63

\* Currently operated as a crest-stage partial-record station.

## Discontinued surface-water-discharge or stage-only stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
ROANOKE RIVER BASIN--Continued			
Snow Creek at Sago, Va. (d)	02058000	60	1935-44
Pigg River near Toshes, Va. (d)	02058500	394	1930-63
Roanoke River near Gretna, Va. (d)	02059000	1,430	1925-30
Goose Creek at Huddleston, Va. (d)	02060000	218	1929-32
Big Otter River near Bedford, Va. (d)	02061000	116	1944-60
Big Otter River near Altavista, Va. (d)	02062000	372	1929-37
Caldwells Creek near Appomattox, Va. (d)	02063000	5.13	1954-60
Falling River at Spring Mills, Va. (d)	02063500	52.2	1954-60
Little Falling River at Hat Creek, Va. (d)	02064500	43	1929-36
Falling River near Brookneal, Va. (d)	02065000	228	1936-41
Roanoke River at Clarkton, Va. (d)	02065200	2,691	1963-76
Roanoke Creek at Saxe, Va. (d)	02066500	135	1946-72
Roanoke River near Clover, Va. (d)	02067000	3,230	1929-52
Roanoke River above Dan River, at Clarksville, Va. (d)	02067500	-	1895-98
Leatherwood Creek near Martinsville (Old Liberty), Va. (d)	02073500	68	1926-34
Dan River at South Boston, Va. (d)	02076000*	2,730	1900-07, 1923-52
Hyc0 River near Omega, Va. (d)	02078000	413	1934-50
Dan River at Clarksville, Va. (d)	02078500	-	1896-98
Roanoke River at Clarksville, Va. (d)	02079000	7,320	1935-52
Roanoke River at Buggs Island, Va. (d)	02079500*	7,780	1947-62
KANAWHA RIVER BASIN			
New River near Baywood, Va. (d)	03163000	1,000	1928-30
New River near Grayson, Va. (d)	03164500	1,160	1908-12
New River at Ivanhoe, Va. (d)	03165500	1,340	1927, 1930-78
Cripple Creek near Ivanhoe, Va. (d)	03166000	148	1930-34
Neff-Litz Spring near Rural Retreat, Va. (d)	03166500	-	1947-56
Glade Creek at Grahams Forge, Va. (d)	03166800*	7.15	1976-93
Peak Creek at Pulaski, Va. (d)	03168500	58.3 60.9	1927-33, 1951-57
Little River near Copper Valley, Va. (d)	03169500	239	1908-16
New River at Eggleston, Va. (d)	03171500	2,941	1915-76
Wabash Spring near Poplar Hill, Va. (d)	03172000	-	1950-51
Walker Creek at Staffordsville, Va. (d)	03172500	277	1908-16
Francis Spring near Bane, Va. (d)	03173500	-	1952-56
Wolf Creek near Shawver Mill (Burkes Garden), Va. (d)	03174500	36	1927-28
West Fork Cove Creek near Bluefield, Va. (d)	03175000	5.5	1929-32

\* Currently operated as a crest-stage partial-record station.

## Discontinued surface-water-discharge or stage-only stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
KANAWHA RIVER BASIN--Continued			
Cox Branch above Tazewell Reservoir, near Gratton, Va. (d)	03175100	2.06	1988-92
Bluestone River at Bluefield, Va. (d)	03177700	39.8	1965-80
BIG SANDY RIVER BASIN			
Levisa Fork near Grundy, Va. (d)	03207500*	235	1942-74, 1986-87
Grissom Creek near Council, Va. (d)	03208034	2.82	1981-83
Barton Fork near Council, Va. (d)	03208036	1.23	1981-83
Russell Fork at Council, Va. (d)	03208040*	10.2	1981-83
Russell Fork near Birchleaf, Va. (d)	03208100*	87.4	1981-83
North Fork Pound River at Pound, Va. (d)	03208700*	18.5	1962-87
Pound River above Indian Creek, at Pound, Va. (d)	03208800*	36.7	1966-78
Pound River below Bold Camp Creek, at Pound, Va. (d)	03208850*	61.2	1966-78
Pound River near Georges Fork, Va. (d)	03208900*	82.5	1964-82
Russell Fork at Bartlick, Va. (d)	03209200*	526	1963-82
Kersaw Branch near Hurley, Va. (d)	03213577	.60	1981-82
Knox Creek at Kelsa, Va. (d)	03213590*	84.3	1980-81
Steve Keesling Spring at Sugar Grove, Va. (d)	03471000	-	1928, 1948-56
TENNESSEE RIVER BASIN			
South Fork Holston River near Chilhowie, Va. (d)	03472000	89.5	1907-10
Beaverdam Creek at Damascus, Va. (d)	03472500*	56.0	1947-59
Middle Fork Holston River at Groseclose, Va. (d)	03473500*	7.39	1948-57 1988-89
Middle Fork Holston River at Seven Mile Ford, Va. (d)	03474000*	132	1942-81 1988-89
Middle Fork Holston River at Chilhowie, Va. (d)	03474500	155	1907-10, 1921-32
Cedarville Spring at Cedarville, Va. (d)	03475500	-	1950-53
Beaver Creek near Wallace, Va. (d)	03477500	13.7	1946-57
Percy Preston Spring near Wallace, Va. (d)	03478000	-	1950-56
Lick Creek near Chatham Hill, Va. (d)	03487800*	25.5	1966-68
North Fork Holston River near Plasterco, Va. (d)	03488100	259	1963-66
Brumley Creek near Hansonville, Va. (d)	03488445	4.29	1979-82
Brumley Creek at Brumley Gap, Va. (d)	03488450*	21.1	1979-82
North Fork Holston River at Holston, Va. (d)	03488500	402	1951-59
North Fork Holston River near Mendota, Va. (d)	03489500	493	1921-32
Cove Creek near Hilton, Va. (d)	03489850	17.6	1966-68

\* Currently operated as a crest-stage partial-record station.



## Discontinued surface-water-discharge or stage-only stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
TENNESSEE RIVER BASIN--Continued			
Big Moccasin Creek at Collinwood, near Hansonville, Va. (d)	03489870*	41.9	1966-68
Big Moccasin Creek near Gate City, Va. (d)	03489900	79.6	1953-59, 1966-68
North Fork Holston River near Gate City, Va. (d)	03490000*	672	1932-82
Taylor Springs at Cedar Bluff, Va. (d)	03520500	-	1953
Clinch River at Cedar Bluff, Va. (d)	03521000	125	1944-46
Clinch River at Richlands, Va. (d)	03521500*	137	1946-89
Little River at Wardell, Va. (d)	03522000	103	1949-52
Will Brooks Spring at Wardell, Va. (d)	03522500	-	1950-52
(Big) Cedar Creek near Lebanon, Va. (d)	03523000*	51.5	1953-59
Thompson Creek near Coulwood, Va. (d)	03523500	14.0	1942-49
Guest River at Coeburn, Va. (d)	03524500*	87.3	1949-59, 1979-81
Stony Creek at Ka, Va. (d)	03524900*	30.9	1980-81
Stony Creek at Fort Blackmore, Va. (d)	03525000	41.4	1949-52
Clinch River at Clinchport, Va. (d)	03525500	986	1907-10
Copper Creek near Gate City, Va. (d)	03526000*	106	1947-72
Quillen Springs near Gate City, Va. (d)	03526500	-	1954-56
Clinch River at Speers Ferry, Va. (d)	03527000*	1,126	1920-76, 1979-81
North Fork Clinch River at Duffield, Va. (d)	03527500	23.1	1953-59
Powell River at Big Stone Gap, Va. (d)	03529500*	112	1945-59, 1979-81
South Fork Powell River at Big Stone Gap, Va. (d)	03530000	40	1945-47 1951-77
Powell River near Pennington Gap, Va. (d)	03531000	290	1921-32

\* Currently operated as a crest-stage partial-record station.

## DISCONTINUED SURFACE-WATER-QUALITY STATIONS

The following surface-water-quality stations in Virginia have been discontinued. Water-quality data (daily or periodic samples with collection frequency not less than quarterly) were collected and published for the period of record, expressed in water years, shown for each station. For each station entry, a period of record is provided for each type of record listed. Those stations with an asterisk (\*) after the station number are currently operated as partial-record water-quality sampling stations (sampling frequency less than quarterly).

[Type of record: C (chemical), T (water temperature), SC (specific conductance), SED (sediment)]

## Discontinued surface-water-quality stations

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
POTOMAC RIVER BASIN				
South River at Harriston, Va.	01627500	212	SC	1949
South Fork Shenandoah River near Luray, Va.	01629500	1,377	SC	1949
South Fork Shenandoah River at Front Royal, Va.	01631000	1,642	T, SC SED C	1953-56, 1968-77, 1980 1953-56 1949, 1953-56, 1968-86
North Fork Shenandoah River near Strasburg, Va.	01634000	768	T, SC SED C	1949, 1956, 1969-71 1956 1930, 1949, 1952, 1956, 1970-86
Goose Creek near Leesburg, Va.	01644000	332	T, SC	1969-71
Stave Run near Reston, Va.	01644291	.08	SED	1971-74
Smilax Branch at Reston, Va.	01644295	.32	SED	1971-75
Snakeden Branch at Reston, Va.	01645784	.79	SED	1973-78
Cedar Run near Aden, Va.	01656100	155	SED	1974
Bull Run near Catharpin, Va.	01656725	25.8	SED	1974
Cub Run near Bull Run, Va.	01656960	49.9	SED	1972-74
Bull Run near Clifton, Va.	01657415	185	SED	1973-74
Quantico Creek near Dumfries, Va.	01658480	6.90	C	1983-85
South Fork Quantico Creek near Independent Hill, Va.	01658500*	7.64	C	1951, 1953, 1955-56, 1969, 1973-75, 1983-85
South Fork Quantico Creek at Camp 5, near Joplin, Va.	01658550	9.62	C	1983-85
South Fork Quantico Creek near Dumfries, Va.	01658650	16.6	C	1983-85
South Fork Quantico Creek near Triangle, Va.	01658620	15.7	T, SC	1973
RAPPAHANNOCK RIVER BASIN				
Carter Run near Marshall, Va.	01661900	19.5	SED	1977-78
Hazel River at Rixeyville, Va.	01663500	287	T SC SED	1951-55 1953-55 1952-55
Rappahannock River at Remington, Va.	01664000	620	SC, T SED	1951-56, 1965-86 1951-93

\* Presently active periodic sampling station.

## Discontinued surface-water-quality stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
RAPPAHANNOCK RIVER BASIN--Continued				
Rapidan River near Culpeper, Va.	01667500	472	T SC SED	1946, 1951-56 1953-56 1951-56
Mountain Run near Burr Hill, Va.	01667870	28.8	C, T, SC	1990-92
Rappahannock River near Fredericksburg, Va.	01668000*	1,596	T, SC	1956, 1968-74
Rappahannock River at VEPCO Dam, at Fredericksburg, Va.	01668020	-	T, SC	1971-72
YORK RIVER BASIN				
North Anna River below Lake Anna, near Hewlett, Va.	01670600	-	T, SC	1972-73
Pamunkey Creek at Lahore, Va.	01670180	40.5	C, T, SC	1989-92
Bunch Creek near Boswells Tavern, Va.	01671500	4.37	T	1954-56
Pamunkey River near Hanover, Va.	01673000*	1,081	T SC	1946, 1968-76 1968-76
Mattaponi River near Bowling Green, Va.	01674000	257	T	1946
Mattaponi River near Beulahville, Va.	01674500*	601	T	1946
JAMES RIVER BASIN				
Jackson River at Falling Spring, Va.	02012500	411	T, SC C	1969-86 1930, 1948, 1968-86
James River at Buchanan, Va.	02019500	2,075	T  SC  SED C	1948, 1951-56, 1968-86 1953-56, 1968-86 1951-56 1930, 1948, 1951-56, 1968-86
James River at Bent Creek, Va.	02026000	3,683	T	1948
James River at Scottsville, Va.	02029000	4,584	T, SC SED	1951-56, 1987 1951-56
James River at Cartersville, Va.	02035000*	6,257	T, SC  SED	1968-76, 1979, 1981 1981
James River and Kanawha Canal, near Richmond, Va.	02037000	-	C, T, SC	1972-73
James River near Richmond, Va.	02037500	6,758	T, SC	1948-51, 1953-56
Fishpond Creek near Hixsburg, Va.	02038830	14.0	SC	1981
Vaughans Creek near Hixsburg, Va.	02038880	23.2	SC	1981
Chickahominy River near Atlee, Va.	02042287	62.2	C, SED	1989-91
Upham Brook near Richmond, Va.	02042428	38.6	C, SED	1989-91
Chickahominy River at Rt. 156, near Seven Pines, Va.	02042440	149.3	C SED	1984, 1987-91 1988-91

TYPE OF RECORD: C (chemical), T (water temperature), SC (specific conductance), SED (sediment)

\* Presently active periodic sampling station.



## Discontinued surface-water-quality stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
JAMES RIVER BASIN--Continued				
Chickahominy River near Providence Forge, Va.	02042500	248	C, T, SC SED	1969-70, 1972-91 1990-91
Chickahominy River above Walkers Dam, at Walkers, Va.	02042720	301	C, T, SC SED	1983-91 1990-91
Diascund Creek at Rt. 628, near New Kent, Va.	02042726	9.25	C, T, SC SED	1986-91 1991
Diascund Creek Reservoir off Timber Swamp, near Walkers, Va.	02042734	-	C, T, SC	1983-91
Beaverdam Creek at Rt. 632, near Barhamsville, Va.	02042736	4.82	C, T, SC SED	1986-91 1991
Wahrani Swamp at Rt. 632, near Barhamsville, Va.	02042742	4.02	C, T, SC	1986-91
Diascund Creek Reservoir off pump station, near Walkers, Va.	02042746	-	C, T, SC	1983-91
Little Creek Reservoir Infall near Norge, Va.	0204275415	-	C, T, SC	1983-85
Little Creek Reservoir (North) near Norge, Va.	0204275420	-	C, T, SC	1983-85
Little Creek Reservoir (North Central) near Norge, Va.	0204275430	-	C, T, SC	1983-91
Little Creek Reservoir (Northeast) near Norge, Va.	0204275440	-	C, T, SC	1983-85
Little Creek Reservoir (South Central) near Norge, Va.	0204275470	-	C, T, SC	1983-91
Little Creek Reservoir (West) near Norge, Va.	0204275490	-	C, T, SC	1983-91
CHOWAN RIVER BASIN				
Nottoway River near Burkeville, Va.	02044000	38.7	T	1947
Nottoway River near Sebrell, Va.	02047000*	1,421	T	1947
Blackwater River at Zuni, Va.	02048000	456	T	1947
North Meherrin River near Lunenburg, Va.	02051000	55.6	T	1947
Meherrin River at Emporia, Va.	02052000	747	T, SC C	1968-80 1968-93
ROANOKE RIVER BASIN				
Roanoke River at Lafayette, Va.	02054500	257	T, SC	1951
Roanoke River at Altavista, Va.	02060500	1,789	T SC SED C	1951, 1953-56, 1968-86 1953-56, 1968-86 1953-56 1951, 1953-56, 1968-86
Roanoke River at Randolph, Va.	02066000	2,977	T, SC SED C	1951-56, 1968-62 1954-81 1930, 1951-86

TYPE OF RECORD: C (chemical), T (water temperature), SC (specific conductance), SED (sediment)

\* Presently active periodic sampling station.

## Discontinued surface-water-quality stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
ROANOKE RIVER BASIN--Continued				
Dan River at Paces, Va.	02075500	2,550	T, SC SED C	1954-56 1954-81 1954-93
Dan River at South Boston, Va.	02076000	2,730	T SC	1952 1951-52
Roanoke River at Clarksville, Va.	02079000	7,320	C	1987-91
Lake Gaston near Elams, N. C.	02079785	-	T, SC SED	1988 1988
Lake Gaston (Little River Channel) near Henrico, Va.	0207987950	-	C, T, SC	1987-92
Pea Hill Creek at Route 665, near Gasburg, Va.	02079880	-	C, T, SC	1987-92
Pea Hill Creek above Rt. 667, near Gasburg, Va.	0207988050	-	C, T, SC	1989-90
Pea Hill Creek tributary No. 1, near Gasburg, Va.	02079881	-	C, T, SC	1989-90
Pea Hill Creek tributary No. 2, near Valentines, Va.	0207988130	-	C, T, SC	1989-90
Pea Hill Creek tributary No. 3, near Valentines, Va.	0207988160	-	C, T, SC	1989-90
Pea Hill Creek tributary No. 4, near Valentines, Va.	02079883	-	C, T, SC	1989-90
Pea Hill Creek tributary No. 4 tributary, near Valentines, Va.	0207988430	-	C, T, SC	1989-90
Cold Spring Branch near Gasburg, Va.	0207988440	-	C, T, SC	1989-90
Pea Hill Creek above North Carolina State line, near Gasburg, Va.	0207988450	-	C, T, SC	1987-92
Lake Gaston (Pea Hill Creek) near Henrico, N. C.	0207988490	-	C, T, SC	1989-90
Lake Gaston tributary near Tillans Chapel, near Elams, N. C.	0207988510	-	C, T, SC	1989-90
Pea Hill Creek tributary No. 5, near Henrico, N. C.	0207988550	-	C, T, SC	1989-90
Pea Hill Creek near Bowens Corner, near Valentines, Va.	02079882	-	C, T, SC	1988
KANAWHA RIVER BASIN				
New River near Galax, Va.	03164000	1,131	T, SC C	1950, 1968-83 1931, 1950, 1952, 1968-86
New River at Radford, Va.	03170000	2,748	T, SC	1950, 1956
New River at Eggleston, Va.	03171500	2,941	T, SC	1953-55
New River at Glen Lyn, Va.	03176500*	3,768	SC T	1968-88 1964-88
BIG SANDY RIVER BASIN				
Levisa Fork near Grundy, Va.	03207500	235	T, SC SED	1950 1986

TYPE OF RECORD: C (chemical), T (water temperature), SC (specific conductance), SED (sediment)  
 \* Presently active periodic sampling station.

## Discontinued surface-water-quality stations--Continued

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
BIG SANDY RIVER BASIN--Continued				
Levisa Fork at Big Rock, Va.	03207800	297	T, SC SED	1970-81 1970-81
Grissom Creek near Council, Va.	03208034	2.82	T, SC, C, SED	1982-83
Barton Fork near Council, Va.	03208036	10.2	T, SC, C, SED	1981-83
Russell Fork at Council, Va.	03208040	1.23	T, SC C	1981-83 1982-83
Russell Fork near Birchleaf, Va.	03208100	87.4	T, SC, C	1982-83
TENNESSEE RIVER BASIN				
South Fork Holston River near Damascus, Va.	03473000	301	T SC C	1950, 1968-73 1950 1950, 1952, 1968-86
Middle Fork Holston River at Chilhowie, Va.	03474500	155	T	1962
Brumley Creek near Hansonville, Va.	03488445	4.29	T	1980-81
Brumley Creek at Brumley Gap, Va.	03488450	21.1	T	1979-81
North Fork Holston River at Holston, Va.	03488500	402	T, SC	1952-56
North Fork Holston River near Gate City, Va.	03490000	672	T  SC SED	1950-51, 1968-78 1950-51 1935-38, 1963-65
Clinch River at Speers Ferry, Va.	03527000	1,126	T SC SED	1950, 1965-67 1950 1935-38, 1963-65
Powell River at Big Stone Gap, Va.	03529500	112	T, SC	1950
Powell River near Jonesville, Va.	03531500	319	T	1964-67

TYPE OF RECORD: C (chemical), T (water temperature), SC (specific conductance), SED (sediment)

\* Presently active periodic sampling station.

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## WATER RESOURCES DATA - VIRGINIA, 1994

### VOLUME 1. SURFACE-WATER-DISCHARGE AND SURFACE-WATER-QUALITY RECORDS

#### INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of Virginia each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Virginia."

This report series includes records of stage, discharge, and water quality of streams and stage, contents, and water quality of lakes and reservoirs. This volume contains records for water discharge at 173 gaging stations; stage only at 1 gaging station; stage and contents at 10 lakes and reservoirs; and water quality at 37 gaging stations. Also included are data for 98 crest-stage partial-record stations. Locations of these sites are shown on figures 6 and 7. Miscellaneous hydrologic data were collected at 171 measuring sites and 20 water-quality sampling sites not involved in the systematic data-collection program. The data in this report represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Virginia.

This series of annual reports for Virginia began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels. Beginning with the 1990 water year, the report format was changed to two volumes. Volume 1 contains surface-water-discharge and surface-water-quality data and Volume 2 contains ground-water-level and ground-water-quality data.

Prior to the introduction of this series and for several water years concurrent with it, water-resources data for Virginia were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United States, Parts 6A and 6B." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from the U.S. Geological Survey, Branch of Information Services, Federal Center, Bldg. 41, Box 25286, Denver, Colorado 80225.

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this volume is identified as "U.S. Geological Survey Water-Data Report VA-94-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161. Beginning with the 1990 water year, all water-data reports will also be available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc.

Additional information, including current prices, for ordering specific reports may be obtained from the District Office at the address given on the back of the title page or by telephone (804) 771-2427. A limited number of CD-ROM discs will be available for sale by the Branch of Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, Colorado 80225.

#### COOPERATION

The U.S. Geological Survey and agencies of the State of Virginia have had joint-funding agreements for the collection of water-resource records since 1930. Organizations that assisted in collecting the data in this report through joint-funding agreements with the Survey are:

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY, Peter W. Schmidt, executive director.

VIRGINIA DEPARTMENT OF TRANSPORTATION, David P. Gehr, commissioner.

CITY OF ALEXANDRIA, Vola Lawson, city manager.

CITY OF DANVILLE, Herbert Dawson, director, Water and Wastewater.

CITY OF NEWPORT NEWS, Brian Ramaley, director, Department of Public Utilities.

CITY OF ROANOKE, Kit B. Kiser, director, Utilities and Operations.

JAMES CITY COUNTY, David B. Norman, county administrator

NORTHERN VIRGINIA PLANNING DISTRICT COMMISSION, G. Mark Gibb, executive director.

WEST PIEDMONT PLANNING DISTRICT COMMISSION, Robert W. Dowd, executive director.

SOUTHEASTERN PUBLIC SERVICE AUTHORITY, Durwood S. Curling, executive director.

UNIVERSITY OF VIRGINIA, Dr. James N. Galloway, chairman, Graduate Admissions.

Assistance with funds or services was given by the U.S. Army Corps of Engineers in collecting records for 59 gaging stations and 4 water-quality stations throughout the State.

Under a cooperative agreement covering the Tennessee River Basin, the Tennessee Valley Authority provided financial assistance for the operation of 2 gaging stations, the records for which are published herein. Similar financial assistance for water-quality studies was provided by the U.S. Marine Corps Base, Quantico, Va., for the Quantico, Cannon, and Aquia Creek Basins. Other cooperators that provided funds for the collection of records are the Appalachian Power Company, Virginia Power, City of Danville, City of Radford, City of Bedford, Multitrade of Pittsylvania County, Hadson Power, STS Hydropower, and Georgia Pacific Corporation.

Organizations that provided data are acknowledged in station descriptions.

#### RECORDS COLLECTED BY THE STATE OF VIRGINIA

In addition to data collected by the U.S. Geological Survey, there are included herein records for 82 gaging stations operated by the Virginia Department of Environmental Quality. These records are published as provided and are acknowledged in the "COOPERATION" paragraph of each individual station. The Virginia Department of Environmental Quality is under the direction of Peter W. Schmidt, executive director. Published material for the gaging-station records is supplied, respectively, through the Water Division, Robert G. Burnley, director, and Office of Water Resources Management, Larry G. Lawson, director.

#### SUMMARY OF HYDROLOGIC CONDITIONS

##### Surface-Water Discharge

The 1994 water year (October 1, 1993, through September 30, 1994) in Virginia was highlighted by predominately above-average streamflows during the early winter through the early spring period. The year began with below-normal streamflow conditions prevailing across the State, flows increased to well above normal before decreasing to near normal during the last quarter of the year (fig. 1). This pattern of flow variation from normal conditions was very similar to that experienced during the 1993 water year. New monthly low streamflows were recorded at 14 stream-gaging stations during the year (5 in October, 1 in November, 1 in April, 1 in May, and 6 in June). New monthly high streamflows were recorded at 77 stream-gaging stations (5 in November, 5 in December, 1 in January, 30 in February, 22 in March, 1 in April, 3 in July, 7 in August, and 3 in September).

Annual mean streamflows were above the long-term mean at most stream-gaging stations (fig. 2). Exceptions to this trend were noted in the southeastern part of the State in the Meherrin, Nottoway, and Blackwater River and Dismal Swamp Basins, and in the extreme eastern part of the State on the Eastern Shore east of Chesapeake Bay in the Nassawadox Creek Basin. (The physiographic provinces and major rivers of Virginia are shown in fig. 6). The greatest departure above the long-term mean flow was in the Shenandoah, upper Rappahannock, York, upper Appomattox, Big Sandy, and Powell River Basins where annual mean streamflows were 50 percent greater than the long-term mean. New high annual means were recorded at three stream-gaging stations in the Shenandoah River Basin, at five stations in the Jackson River Basin (headwaters of the James River), at two stations in the Richmond area, and at one station in the Powell River Basin. The period of record at these stations was generally about 10 years except at Pamunkey River near Hanover, which is 53 years. No new record-low annual means were observed. At the opposite end of the flow spectrum, in the Dismal Swamp and Blackwater River Basins, streamflows were 25 percent below the long-term mean for these stations and were the lowest annual flows for these stations since 1991 or 1992, respectively. The annual mean and monthly mean flows at four stream-gaging stations representative of different areas of the State are shown in figure 3. Annual mean flows at eight other representative stream-gaging stations are listed in the table on the following page.

The 1994 water year began in October (1993) with streamflows the lowest for October since at least 1989. Many streams east of the Blue Ridge in the Rappahannock, York, James, and Chowan River Basins, and many streams west of the Blue Ridge in the Shenandoah, upper James, and New River Basins, had flows below normal--in the lower 25 percent of historical flows for the month. An exception was in the extreme southwestern corner of the State where streamflows in the Big Sandy River Basin were above average but still within the range considered normal for this time of year. New monthly low flows were recorded at five stations in the central part of the State: Upham Brook near Richmond and Chickahominy River near Atlee (newer stations with less than 5 years of record), Appomattox River at Matoaca (previous record low was in 1971), North Meherrin River near Lunenburg (lowest since 1964), and Roanoke River at Glenvar (another new station with less than 5 years of record). The weighted average of streamflows for the month was 55 percent of the long-term median for October. The weighted average is based on the sum of the proportionate drainage areas of the different river basins in the State multiplied by the respective departure in each basin from median flow conditions. Annual instantaneous low flows for the 1994 water year were recorded at 90 percent of the stream-gaging stations in the State during the month. The few exceptions to this general pattern were at stations on streams that are tributaries of the Chesapeake Bay in the Tidewater area, which recorded their annual low flows in September 1994.

Annual mean flow during 1994 water year at eight representative gaging stations

Gaging Station	Part of State	Annual mean flow for 1994 in cubic feet per second	Percentage of median annual flow	Length of record, in years
North Fork Shenandoah River near Strasburg, Va.	Northwestern	1,030	*182	69
Rappahannock River near Fredericksburg, Va.	Northeastern	2,390	*146	86
James River at Buchanan, Va.	Western	3,045	113	96
Slate River near Arvonnia, Va.	Central	317	*143	68
Nottoway River near Sebrell, Va.	Southeastern	1,160	96	53
Dan River at Danville, Va.	Southern	2,330	100	43
New River at Allisonia, Va.	Southwestern	3,930	*125	65
Russell Fork at Haysi, Va.	Southwestern	568	*166	68

\* Flow is above normal--in the upper 25 percent of historical annual flows for the station.

Flow conditions became more variable during November when streamflows at most stations increased as the result of runoff from widespread heavy rains late in the month. The largest runoff peaks were recorded in streams in the central and eastern Piedmont Province from the Appomattox River Basin northward. The recurrence frequency of the peaks was about 2 to 3 years in the central James River Basin, 3 years in the York River Basin, 3 to 5 years in the Rappahannock River Basin, and 3 years on smaller streams that are tributaries of the Potomac River. Locally, the recurrence frequency on smaller streams may have been greater. Annual maximum instantaneous peak flows for the 1994 water year at stream-gaging stations along the eastern slope of the Blue Ridge and in northern Virginia were recorded during the month. As a result of the runoff, monthly streamflows on many streams in the Piedmont Province were above normal--in the upper 25 percent of historical flows for the month. Flows in streams west of the Blue Ridge Province generally were in the normal range, while streams in the Tidewater area around Norfolk continued to record below-normal flows. The weighted average of streamflows in the State was 110 percent of the long-term median for the month. Six stations in the eastern and northern part of the State recorded new high monthly flows, while the new short-term station on the Roanoke River at Glenvar recorded a new low for the month. The new record-high monthly flows were at Upham Brook near Richmond and Chickahominy River near Atlee (record dates from 1990), Po River near Spotsylvania (previous record was established in 1973), and Opequon Creek near Berryville (a long-term station since 1944 which is now affected by wastewater discharge from a local facility--the new record is for the period since 1988 when regulation began).

Monthly mean streamflows continued to increase at most stream-gaging stations in December. The exceptions were on streams in the central James River Basin where flows declined. Statewide, daily streamflows were well above normal early in the month in response to runoff from widespread precipitation late in the previous month. By midmonth, however, daily streamflows had returned to near-normal conditions. For the month, streams in central and northern Virginia had above-normal flows. Streamflows were in the normal range elsewhere except in the Big Sandy River Basin where they were above normal and in the Blackwater River Basin in the southeastern corner of the State where monthly streamflows remained below normal for the sixth consecutive month. The weighted average of streamflows for the State was 141 percent of the long-term median for the month. Five stations recorded new monthly high flows: Upham Brook near Richmond, Chickahominy River near Atlee, and Roanoke River at Glenvar (all newer stations with relatively short periods of record); Appomattox River at Mattoax (previous record high was established in 1949); and Appomattox River at Matoaca (previous record was established in 1973).

During January, monthly mean streamflows generally increased over most of the State except in the York and Appomattox River Basins where flows continued to decline. A well-defined pattern in departure from normal flow conditions was evident across the State. Streams west of the Blue Ridge and in the northern part of the State had above-normal flows for this time of year. Streams in the central and southern Piedmont Province had flows within the range normally expected for January, while stations in the Blackwater River Basin in the

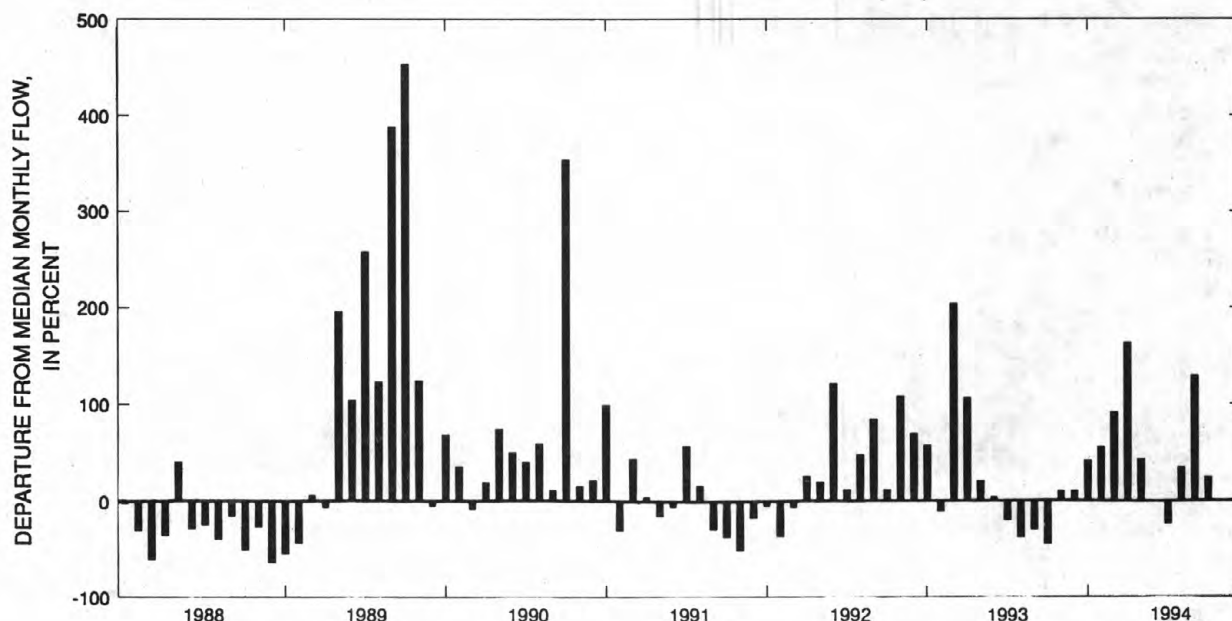


Figure 1. Departure of monthly streamflows from median monthly streamflow.

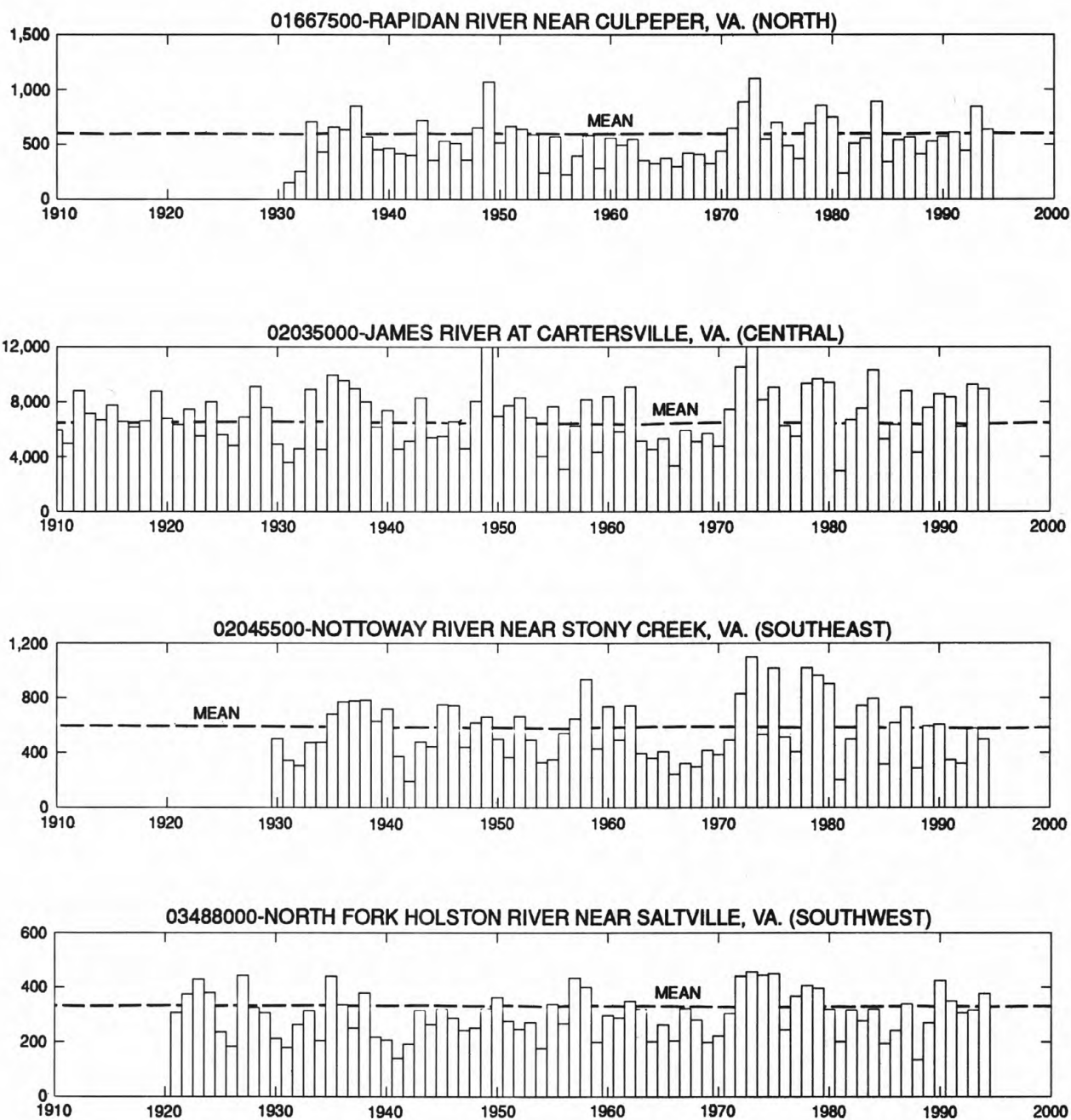
southeastern corner of the State had below-normal flows for the seventh consecutive month. Water-use restrictions--implemented in mid-December--remained in effect for several communities in the Norfolk area. The weighted average of streamflows across the State was 155 percent of the long-term median for January. Flows were the highest for January since 1991 in the James, Rappahannock, and Shenandoah River Basins, and since the late 1970's in the New and Big Sandy River Basins. In contrast, flow in the Blackwater River was the lowest for January since 1989. Only one new monthly extreme was recorded--a new high at the short-term station on the Roanoke River at Glenvar.

Monthly mean streamflows increased during February. Streamflows at all stream-gaging stations were above normal for the month except at a few stations in the lower Roanoke, Meherrin, Nottoway, and Blackwater River Basins in the southern and southeastern parts of the State and in the Nassawadox Creek Basin on the Eastern Shore where flows were above average but within the range normally expected for this time of year. New monthly high flows were recorded at 30 stream-gaging stations during the month: 1 in the Big Sandy, 4 in the Tennessee, 4 in the Roanoke, 12 in the James, 6 in the Shenandoah, 1 in the York, and 1 in the Piankatank River Basins, and 1 in the Dismal Swamp Basin. In general, flows were the highest for February since 1984 in the Rappahannock and Rivanna River Basins, since 1979 at stations in the Roanoke and parts of the middle James River Basins, and since 1957 at stations in the Tennessee and New River Basins in the southwestern part of the State. At a few of the very long-term stations, the new record-high monthly mean flows for February were the highest for many years. At the James River at Buchanan, the monthly flows were the highest for February since record began in 1899; at James River at Cartersville, the highest for the month since 1915 and the third highest for February since 1899; at North Fork Shenandoah River near Strasburg, the highest since record began in 1926; and at Pamunkey River near Hanover, the highest since the station was established in 1942. The weighted average of streamflows for the month was 191 percent of the long-term median. February was the fourth consecutive month that the weighted average was above the long-term median. Annual maximum instantaneous flows for many stream-gaging stations in the Tennessee and Big Sandy River Basins were recorded during the month.

Monthly mean streamflows generally increased at stream-gaging stations across the State during March. An exception to the general trend was in the southwestern corner of the State where flows decreased at several stations in the New River Basin and at all stations in the Tennessee River Basin. Streamflows across the entire State were above normal for the month. The weighted average of streamflows across the State was 263 percent of the long-term median. As high as the weighted average was, it was still less than the 304 percent of the



DISCHARGE, IN CUBIC FEET PER SECOND

**Figure 2.** Annual mean discharge at selected stream-gaging stations.

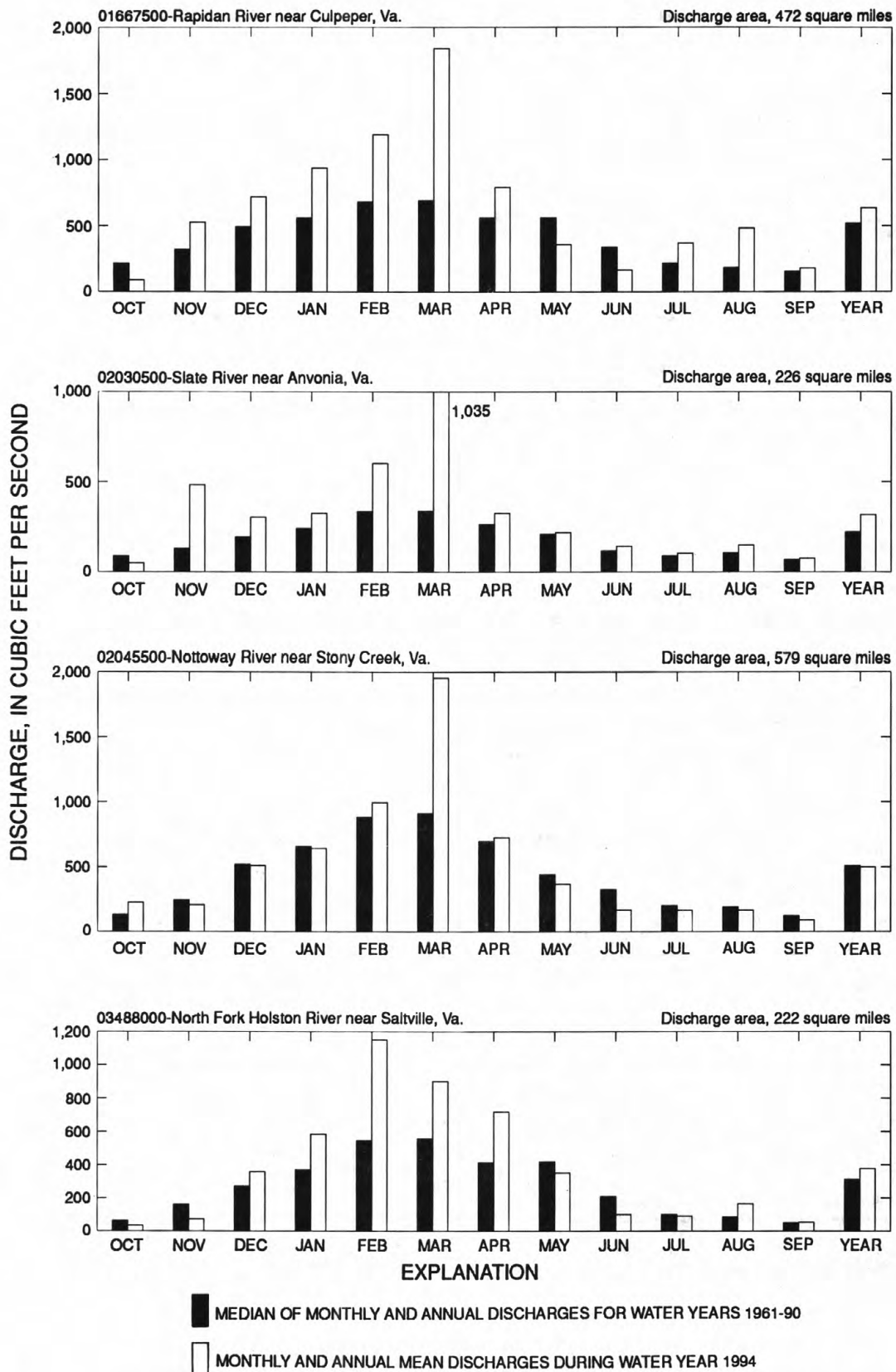
long-term median value that was recorded for March in 1993. March was the fifth consecutive month in which flows averaged above the long-term median. New monthly high streamflows were recorded at 22 stream-gaging stations: 5 in the Shenandoah River Basin, 4 in the James River Basin, 6 in the York River Basin, 2 in the Rappahannock River Basin, 2 in streams that are tributaries of the Potomac River, 1 in the Piankatank River Basin, 1 in the Dismal Swamp Basin, and 1 in the Tennessee River Basin. Annual maximum instantaneous flows were recorded at most stream-gaging stations in the eastern and southern parts of the State during the month. There were three major episodes of high water during the month: March 3-5, March 8-11, and March 28-30. The latter event was the largest with peaks of 2- to 10-year recurrence frequency recorded in the New, Tennessee, and Big Sandy River Basins, 2- to 5-year recurrence frequency in the Roanoke River Basin, and 3- to 9-year recurrence frequency in the lower James and York River Basins. Elsewhere in the State, peak flows had less than a 2-year recurrence frequency for this event. Flooding from this event caused the temporary closure of more than 225 roads across the State. Peaks for the March 8-11 event were all less than a 2-year recurrence frequency. Peaks for the early March event were less than a 2-year recurrence frequency except in the Chowan and Appomattox River Basins (4- to 5-year recurrence frequency) and in the York River Basin (3-year recurrence frequency).

Monthly mean streamflows declined at most stream-gaging stations during April. Despite the decline, streamflows for the month were above normal in the southwestern part of the State in the New, Tennessee, and Big Sandy River Basins, in northern Virginia in the lower Shenandoah River Basin and in streams that are tributaries of the Potomac River, and in the York River and Dismal Swamp Basins in the eastern part of the State. Elsewhere, streamflows were in the range considered normal for the month. The general trend in streamflows was downward during the entire month, and by late in the month, most streams had daily flows near or below the long-term median for April. The downward trend was broken by widespread precipitation on April 28 that resulted in small rises on many streams. Rainfall in the Roanoke area was heavier and more intense than elsewhere during this event, and there were reports of minor flooding in the area. The weighted average of streamflows across the State was 142 percent of the long-term median for the month. April was the sixth consecutive month in which the weighted average was above the long-term median. Flows were the highest for April since 1987 at many stations in the Tennessee, New, Big Sandy, lower Shenandoah, Rappahannock, York, and lower James River Basins. A new monthly high flow was recorded at the recently reactivated station on the North Fork Powell River at Pennington Gap, and a new monthly low flow was recorded at the newly established station on the Roanoke River at Glenvar. These stations both have short periods of record--11 years and 3 years, respectively--and the occurrence of new monthly extremes in any given month is not especially significant unless they occur in conjunction with new extremes at other longer-term stations.

Monthly mean streamflows continued to decline at most stream-gaging stations during May. Flows were within the range normally expected for this time of year except in the lower North Fork Shenandoah River where flows were above normal. Although in the normal range, streamflows east of the Blue Ridge were generally less than the long-term median, while streamflows west of the Blue Ridge were above the median. The trend in flows was generally downward during the month with brief interruptions as runoff from several periods of precipitation resulted in minor rises on many streams. The response of the streams to the precipitation events was not uniform across the State; however, the May 1-4 and May 7-8 events produced the highest peaks. Monthly mean streamflows were the lowest for May since 1988 in the New and Roanoke River Basins and since 1991 in the Nottoway and Blackwater River Basins. By monthend, daily flows were below normal across most of the State. The weighted average of streamflows was 99 percent of the long-term median for the month. May was the first time in the past seven months that the weighted average dipped below the long-term median for the month. One new monthly low flow was recorded during the month (at the short-term station on the Roanoke River at Glenvar).

Monthly mean streamflows continued to decline during June. Streams on the Coastal Plain and eastern Piedmont Provinces recorded below-normal flows for the month, while streams west of the Blue Ridge Province generally had streamflows that were less than the long-term median but within the normal range expected for this time of year. One exception to the general trend was in the upper Appomattox River Basin and on nearby streams in the central Piedmont Province where flows were above normal for June. There were no episodes of widespread or Statewide high water during the month but runoff from thunderstorms could have produced localized high water on small streams. Flows were the lowest for June since 1988 in the New and Roanoke River Basins and since 1991 in the upper James, York, Rappahannock, lower Appomattox, and Blackwater River Basins. New monthly lows were recorded at six stations: Guy Creek near Nassawadox on the Eastern Shore, White Oak Run near Grottoes on the west slope of the Blue Ridge, Back Creek near Sunrise and Back Creek at Sunrise in the headwaters of the James River, and at short-term stations on the Chickahominy River near Atlee and Roanoke River at Glenvar. The weighted average of streamflows was 76 percent of the long-term median for the month.

Changes in flow conditions were mixed during July with streamflows generally increasing in the Roanoke, New, upper James, York, and Rappahannock River Basins, and generally declining in the Tennessee, Chowan, and Appomattox River Basins. Streamflows were below normal across much of the State during the first half of the month. Runoff from persistent thunderstorms and frontal systems, especially during the last week of the month, resulted in high flows during the second half of the month. Flood peaks in the Rapidan and Rappahannock River Basins had a recurrence frequency of 2 to 3 years, but elsewhere in the State, peak stages and discharges were of lesser magnitude. Monthly streamflows for many stations on the Piedmont Province were above normal for the month, while stations on the Meherrin, Nottoway, and Blackwater Rivers had below-normal monthly mean flows for July. The weighted average of streamflows for the State was 134 percent of the long-term median for the month. Four stations: Dragon Swamp near Mascot on the Coastal Plain Province and three stations in the headwaters of the James River Basin--Back Creek near Sunrise, Back Creek at Sunrise, and Little Back Creek near Sunrise--recorded new monthly high flows. Streamflows were the highest for July since 1989 at several stations in the Rappahannock River Basin, since 1990 along the lower Roanoke River, and since 1991 at stations in the middle and upper James River Basin.



**Figure 3.** Monthly and annual mean discharge during 1994 water year compared with median of monthly and annual mean discharge for 1961-90 at four representative stream-gaging stations.

Streamflows increased in unseasonable fashion at many stations during August. The exceptions were in the lower Roanoke River Basin and adjacent streams in the James River Basin in the south-central part of the State where monthly mean streamflows declined slightly or remained unchanged from the previous month. Streamflows were above normal for August in all parts of the State except the extreme south and southeast. Streamflows generally declined for the first two weeks of the month. This trend was reversed when runoff from widespread precipitation on August 17 resulted in the highest flows recorded on many streams since April. Peak flows were highest along the eastern slope of the Blue Ridge in the headwaters of the Rivanna and Rappahannock River Basins. Locally, some areas were affected by minor flooding along smaller streams. Streamflows were the highest since the mid-1980's at many stations in the James, York, and Roanoke River Basins, since 1978 at some stations in the Big Sandy and North Fork Shenandoah River Basins, since 1955 along the mainstem Rappahannock River, and since 1949 on the mainstem New River at Allisonia. The weighted average of streamflows for the State was 229 percent of the long-term median for the month. This was the second consecutive month in which the weighted average was above the long-term median. Seven stations recorded new high monthly flows: (1) White Oak Run near Grottoes, (2) Linville Creek at Broadway, and (3) Opequon Creek near Berryville (since regulation began in 1989)--all in the Shenandoah River Basin or on streams tributary to the Potomac River; (4) Battle Run near Laurel Mills in the Rappahannock River Basin; (5) Smith River near Bassett (largely regulated by Philpott Dam 6.2 mi upstream); (6) South Fork Roanoke River near Shawsville, and (7) Roanoke River at Glenvar (both in the upper Roanoke River Basin).

Monthly mean streamflows generally declined during September. However, despite the decrease, streamflows at many stream-gaging stations remained either above normal or above the long-term median for the month. An exception to the general trend was in the southeastern corner of the State in the Meherrin, Nottoway, and Blackwater Rivers where flows continued below the long-term median for the fifth consecutive month. The weighted average for streamflows across the State was 124 percent of the long-term median for September. New record-high monthly flows were recorded at three short-term record stations: Upham Brook near Richmond, Chickahominy River near Atlee, and Roanoke River at Glenvar. Flows remained fairly constant throughout the month with several minor rises occurring near the end of the month.

#### Surface-Water Quality

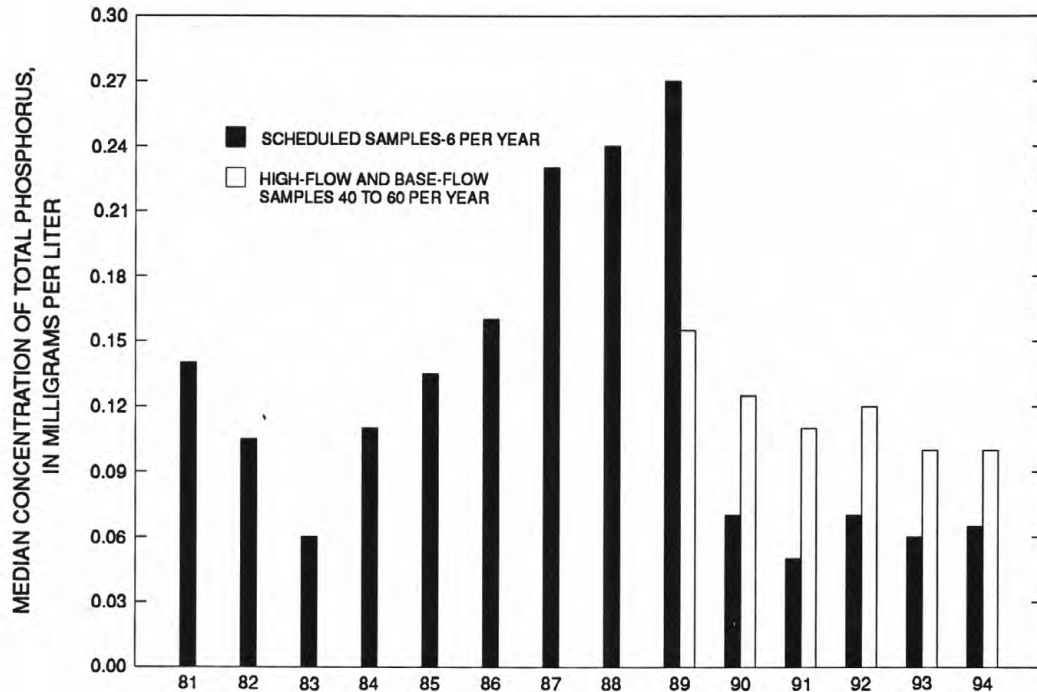
The median concentration of total phosphorus (as P) at the seven National Stream-Quality Accounting Network (NASQAN) stations in Virginia from regularly scheduled sampling was 0.03 mg/L (milligrams per liter) in water year 1994, a decrease of 0.01 mg/L from water year 1993. The median concentration of dissolved orthophosphorus (as P) was 0.02 mg/L, an increase of 0.01 mg/L from water year 1993. The greatest median concentration of total phosphorus at an individual station was 0.065 mg/L at the James River at Cartersville, and for dissolved orthophosphorus, 0.04 mg/L, also at the James River at Cartersville. The median value of total phosphorus increased steadily between 1981 and 1989 at the James River station but decreased dramatically beginning in 1991 as shown in figure 4. The overall decrease in total phosphorus may have resulted from changes in point-source discharges, including the Statewide ban on phosphate detergents in 1988, and (or) to changes in agricultural practices in the basin. Graphed with the median concentrations of the scheduled samples are median values for samples collected during a wider range of flow conditions from 1989 through 1994. These data also show a decrease in the concentration of total phosphorus; however, the median values collected over a wider range of flow conditions show a less dramatic peak and decline than the median values for the scheduled samples.

The median concentration of total nitrogen (as N) (computed as the sum of total ammonia plus organic nitrogen as N and dissolved nitrite and nitrate as N) at the seven NASQAN stations was 0.56 mg/L in water year 1994, no change from water year 1993. The greatest median concentration of total nitrogen (approximately 0.83 mg/L) was found at the New River at Glen Lyn and the lowest (0.44 mg/L) at the Appomattox River at Matoaca. The greatest concentration of nitrite and nitrate (as N) was 0.63 mg/L at the New River at Glen Lyn.

Dissolved oxygen measured during routine sampling at NASQAN stations in water year 1994 averaged 94 percent of saturation, having a mean concentration of 9.9 mg/L, an increase from the 1993 values of 85 percent, and 9.0 mg/L, respectively. Of the 59 dissolved-oxygen measurements made during NASQAN and National Water-Quality Assessment (NAWQA) sampling throughout the year, three measurements below 5.0 mg/L were recorded, as compared with five measurements last year. All three of these measurements (at or below 5.0 mg/L) were recorded at the Blackwater River near Franklin.

The concentrations of trace metals sampled, including aluminum, barium, cobalt, nickel, silver, selenium, strontium, and vanadium in all samples collected from NASQAN stations were well below the U.S. Environmental Protection Agency (USEPA) standards for safe drinking water. In most cases, concentrations were less than one-tenth of the established regulation. However, concentrations of dissolved iron and manganese reached relatively high concentrations in some eastern-Virginia streams. Dissolved-iron concentrations in excess of 300 µg/L (micrograms per liter) were measured consistently in the rivers at three NASQAN stations--the Nottoway River near Sebrell in the Chowan River Basin; the Pamunkey River near Hanover, and the Mattaponi River near Beulahville in the York River Basin. The maximum dissolved-iron concentration for an individual station was recorded August 10 in the Mattaponi River near Beulahville, at 2,500 µg/L. Dissolved-manganese concentrations greater than 50 µg/L were measured periodically at several stations and most consistently at Nottoway River near Sebrell and Mattaponi River near Beulahville. The maximum dissolved-manganese concentration measured during the year was 110 µg/L at the Mattaponi River near Beulahville on August 10. Although these concentrations of iron and manganese exceed USEPA secondary drinking-water standards, they are not a threat to human health; however, they can produce objectionable taste and stain laundered clothing.





**Figure 4.** Annual median concentration of total phosphorus for 1981-94 in James River at Cartersville, Virginia.

The median counts of fecal coliform and fecal streptococcal bacteria at the seven NASQAN stations were 31 and 46 col/100 ml (colonies per 100 milliliters), respectively. The greatest median counts of fecal coliform and fecal streptococcal bacteria were recorded at Pamunkey River near Hanover, at counts of 85 and 133 col/100 ml, respectively. The greatest single count of fecal coliform bacteria (720 col/100 ml) was measured at James River at Cartersville on December 2, and the single greatest count of fecal streptococcal bacteria (690 col/100 ml) was measured at Pamunkey River near Hanover on January 13. The lowest median count of fecal coliform bacteria (19 col/100 ml) was recorded at the Rappahannock River near Fredericksburg, and the lowest median count of fecal streptococcal bacteria (31 col/100 ml) was recorded at the New River at Glen Lyn.

#### SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 53 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream-Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 284 sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used

for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, diverse, and geographically distributed part of the Nation's ground- and surface-water resources, and to identify, describe, and explain the major natural and human factors that affect these observed conditions and trends.

Assessment activities have begun in more than one-third of the study units and ultimately will be conducted in 60 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide a basis for decision making on the use of water resources within the study units and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Radiochemical Programs is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

#### EXPLANATION OF THE RECORDS

The surface-water-discharge and surface-water-quality records published in this report are for the 1994 water year that began October 1, 1993, and ended September 30, 1994. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, and water-quality data for surface water. The locations of the stations where the data were collected are shown in figures 6 and 7. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

#### Station Identification Numbers

Each data station in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The system used by the U.S. Geological Survey to assign identification numbers for surface-water stations is based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is occasionally used for surface-water stations where only miscellaneous measurements are made.

#### Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indentation in the "List of Stations" in the front of this report. Each indentation represents one rank. This downstream order and system of indentation shows which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 02027500, which appears just to the left of the station name, includes the two-digit Part number "02" plus the six-digit downstream-order number "027500." The Part number designates the major river basin; for example, Part "02" is the James River Basin.

## Latitude-Longitude System

The identification numbers for some miscellaneous surface-water and water-quality sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the sites within a 1-second grid. This site-identification number, once assigned, is a pure number and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description.

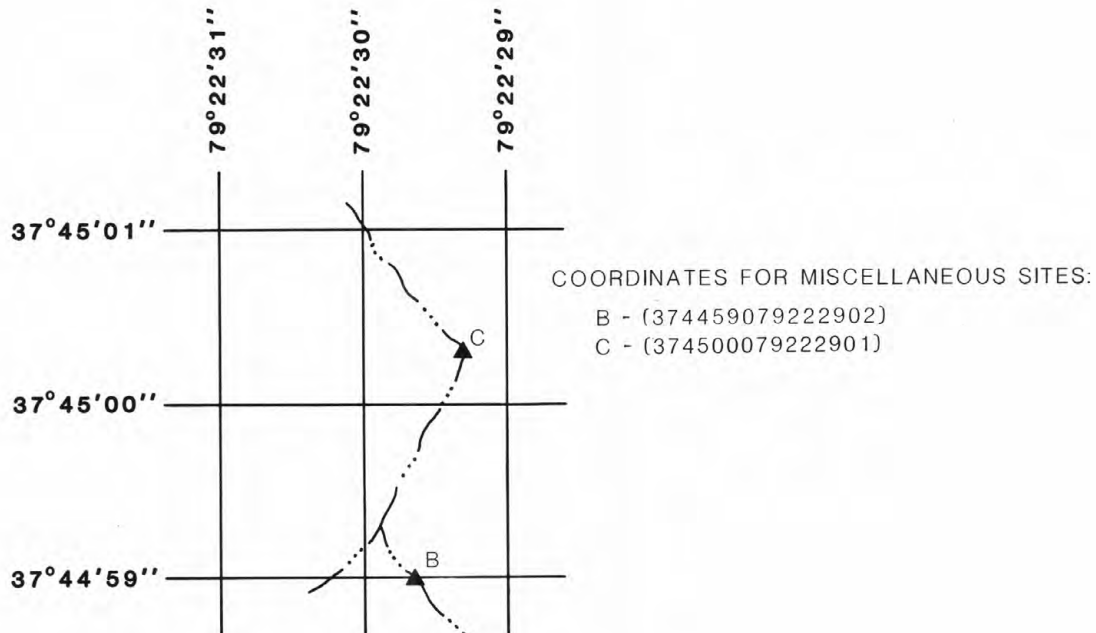


FIGURE 5. System for numbering selected miscellaneous sites

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device, and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figures 6 and 7.

## Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adopted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI's), Book 3, Chapter A1 through A19 and Book 8, Chapters A2 to B2. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow over dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations, the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as the lapsed time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

For some gaging stations, there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

## Data Presentation

Streamflow data in this report are presented in a new format that is considerably different from the format in data reports prior to the 1991 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences.

The records published for each continuous-record surface-water-discharge station (gaging station) now consist of four parts: the manuscript or station description; the data table of daily mean values of discharge for the current water year with summary data; a tabular statistical summary of monthly mean flow data for a designated period, by water year; and a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration.



Station manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; extremes for the current year; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gaging station with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which records have been published for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not and whose location was such that flow at it can reasonably be considered equivalent to flow at the present station.

REVISED RECORDS.--Because of new information, published records occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to sea level (see glossary), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--All periods of estimated daily discharge will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a REMARKS paragraph is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, and to conditions that affect natural flow at the station. In addition, information may be presented pertaining to average discharge data for the period of record; to extremes data for the period of record and the current year; and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the U.S. Geological Survey by a cooperating organization are identified here.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and equal to or greater than a selected base discharge are presented under this heading. The peaks equal to or greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were ever revised after the station was discontinued. Of course, if the data for a discontinued station were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

Headings for AVERAGE DISCHARGE and EXTREMES FOR PERIOD OF RECORD have been deleted and the information contained in these paragraphs is now presented in the tabular summaries following the discharge table or in the REMARKS paragraph, as appropriate. No changes have been made to the data presentation of lake contents.

Data table of daily mean values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed "TOTAL" gives the sum of the daily figures for each month; the line headed "MEAN" gives the average flow in cubic feet per second for the month; and the lines headed "MAX" and "MIN" give the maximum and minimum daily mean discharges, respectively, for each month. Discharge for the month also is usually expressed in cubic feet per second per square mile (line headed "CFSM"); or in inches (line headed "IN."); or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches or in acre-feet may be omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. At some stations, monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversion, or diversion data or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Statistics of monthly mean data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "MIN") of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those figures. The designated period will be expressed as "FOR WATER YEARS \_\_\_\_\_ BY WATER YEAR (WY)," and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript.

Summary statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, "WATER YEARS \_\_\_\_\_," will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (See line headings below.), except for the "ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the heading. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff data are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

ANNUAL TOTAL.--The sum of the daily mean values of discharge for the year. At some stations, the annual total discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period. At some stations the yearly mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

HIGHEST ANNUAL MEAN.--The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.--The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.--The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.--The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.--The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

INSTANTANEOUS PEAK FLOW.--The maximum instantaneous discharge occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are stored in District computer files for stations meeting certain criteria. Those discharge values may be obtained by writing to the District Office. (See address on back of title page of this report.)

INSTANTANEOUS PEAK STAGE.--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.--The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.--Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

Acre-foot (AC-FT) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicates the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.--The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.--The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.--The discharge that has been exceeded 90 percent of the time for the designated period.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage stations, and the second is a table of discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

#### Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

#### Accuracy of the Records

The accuracy of streamflow records depends primarily on: (1) The stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements; and (2) the accuracy of measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft<sup>3</sup>/s to the nearest tenth between 1.0 and 10 ft<sup>3</sup>/s; to whole numbers between 10 and 1,000 ft<sup>3</sup>/s; and to 3 significant figures for more than 1,000 ft<sup>3</sup>/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

#### Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables is on file in the Virginia District Office. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the Virginia District Office. (See address on back of title page of this report.)



### Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

#### Classification of records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be once or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records", as used in this report, and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 6.

#### Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

#### On-site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are detailed in the "Techniques of Water-Resources Investigations," Book 1, Chapter D2; Book 3, Chapter C2; Book 5, Chapters A1, A3, and A4. These references are listed in the "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" section of this report which appears at the end of the introductory text. These methods are consistent with American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO). Detailed information on collecting, treating, and shipping samples may be obtained from the Virginia District Office. (Address on back of title page.)

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the Virginia District Office whose address is given on the back of the title page of this report.



### Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at the time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the Virginia District Office. (Address on back of title page.)

### Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge. Methods used in the computation of sediment records are described in the TWRI Book 3, Chapters C1 and C3. These methods are consistent with American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

### Laboratory Measurements

Sediment samples, samples for biochemical-oxygen demand (BOD), samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratory in Arvada, Colorado. Methods used to analyze sediment samples and to compute sediment records are given in TWRI Book 5, Chapter C1. Methods used by the Geological Survey laboratories are given in TWRI Book 1, Chapter D2; Book 3, Chapter C2; Book 5, Chapters A1, A3, A4, and A5. These methods are consistent with American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

### Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily, are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

#### REMARK CODES

The following remark codes may appear with the water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
&	Biological organism estimated as dominant.

#### ACCESS TO WATSTORE DATA

The U.S. Geological Survey is the principal Federal water-data agency and, as such, collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other Federal agencies to develop and manage our water resources. As part of the Geological Survey's program of releasing water data to the public, a large-scale computerized system has been developed for the storage and retrieval of water data collected through its activities. The National Water Data Storage and Retrieval System (WATSTORE) was established in 1972 to provide an effective and efficient means for the processing and maintenance of water data collected through the activities of the U.S. Geological Survey and to facilitate release of the data to the public. A variety of useful products, ranging from data tables to complex statistical analyses such as Log Pearson Type III, can be produced using WATSTORE. The system resides on the central computer facilities of the U.S. Geological Survey at its National Center in Reston, Virginia, and consists of related files and data bases.

\* Station Header File - Contains descriptive information on more than 440,000 sites throughout the United States and its territories where the U.S. Geological Survey collects or has collected data.

\* Daily Values File - Contains more than 220 million daily values of stream flows, stages, reservoir contents, water temperatures, specific conductances, sediment concentrations, sediment discharges, and ground-water levels.

- \* Peak Flow File - Contains approximately 500,000 maximum (peak) streamflow and gage-height values at surface-water sites.
- \* Water Quality File - Contains approximately 2 million analyses of water samples that describe the chemical, physical, biological, and radio-chemical characteristics of both surface and ground water.

In 1976, the U.S. Geological Survey opened WATSTORE to the public for direct access. The signing of a Memorandum of Agreement with the Survey is required to obtain direct access to WATSTORE. The system can be accessed either synchronously or asynchronously. The requestor will be expected to pay all computer costs he/she incurs. Direct access may be obtained by contacting:

U.S. Geological Survey  
National Water Data Exchange  
421 USGS National Center  
Reston, Virginia 22092

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or 5-1/4 inch floppy disk; and, as noted in the introduction, on CD-ROM discs. Beginning with the 1990 water year, all water-data reports will also be available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division's District offices. (See address on the back of the title page.) A limited number of CD-ROM discs will be available for sale by the Branch of Information Services, U.S. Geological Survey, Federal Center, Box 25286, Denver, Colorado 80225.

#### DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory, these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C ± 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5°C ± 0.2°C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory, they are defined as all the organisms which produce red or pink colonies within 48 hours at  $35^{\circ}\text{C} \pm 1.0^{\circ}\text{C}$  on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by micro-organisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of  $500^{\circ}\text{C}$  for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter ( $\text{g}/\text{m}^3$ ), and periphyton and benthic organisms in grams per square mile ( $\text{g}/\text{mi}^2$ ).

Dry mass refers to the mass of residue present after drying in an oven at  $105^{\circ}\text{C}$  for zooplankton and periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll "a" and "b" are the two most common green pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic feet per second per square mile [ $(\text{ft}^3/\text{s})/\text{mi}^2$ ] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Cubic foot per second ( $\text{ft}^3/\text{s}$ ) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.



Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

Dissolved refers to that material in a representative water sample which passes through a 0.45  $\mu\text{m}$  membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate ( $\text{CaCO}_3$ ).

Hydrologic Bench-Mark Network is a network of 53 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Methylene blue active substances (MBAS) are apparent detergents. The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

Micrograms per gram ( $\mu\text{g/g}$ ) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter (UG/L,  $\mu\text{g/L}$ ) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/l and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 284 sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, diverse, and geographically distributed part of the Nation's ground- and surface-water resources, and to identify, describe, and explain the major natural and human factors that affect these observed conditions and trends.

Assessment activities have begun in more than one-third of the study units and ultimately will be conducted in 60 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide a basis for decision making on the use of water resources within the study units and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meter ( $\text{m}^2$ ), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

<u>Classification</u>	<u>Size (mm)</u>	<u>Method of analysis</u>
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic matter is removed, and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass, or volume.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (PC, pCi) is one trillionth ( $1 \times 10^{-12}$ ) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields  $3.7 \times 10^{10}$  radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [ $\text{mg C}/(\text{m}^2 \cdot \text{time})$ ] for periphyton and macrophytes and [ $\text{mg C}/(\text{m}^3 \cdot \text{time})$ ] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.



Milligrams of oxygen per area or volume per unit time [ $\text{mg O}_2/(\text{m}^2 \cdot \text{time})$ ] for periphyton and macrophytes and [ $\text{mg O}_2/(\text{m}^3 \cdot \text{time})$ ] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN., in.) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sea level: In this report, "sea level" refers to the 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 Sea Level Datum of 1929.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) x discharge ( $\text{ft}^3/\text{s}$ ) x 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

7-day 10-year low flow ( $7 Q_{10}$ ) is the discharge at the 10-year recurrence interval taken from a frequency curve of annual values of the lowest mean discharge for 7 consecutive days (the 7-day low flow).



Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and volume of water, per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring emerged or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

Surface area of a lake is that area outlined on the latest U.S.G.S. topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the material retained on a 0.45-micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45  $\mu$ m membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results. Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45  $\mu$ m membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata, is the following:

Kingdom.....	Animal
Phylum.....	Arthropoda
Class.....	Insecta
Order.....	Ephemeroptera
Family.....	Ephemeridae
Genus.....	<u>Hexagenia</u>
Species.....	<u>Hexagenia limbata</u>

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determined all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross-section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1994, is called the "1994 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WSP is used as an abbreviation for "Water-Supply Paper" in reference to previously published reports.

## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Branch of Information Services, Federal Center, Box 25286, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

- 1-D1. Water temperature--influential factors, field measurement, and data presentation, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. Guidelines for collection and field analysis of ground-water samples for selected unstable constituents, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. Application of surface geophysics to ground-water investigations, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-D2. Application of seismic-refraction techniques to hydrologic studies, by F. P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.
- 2-E1. Application of borehole geophysics to water-resources investigations, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 2-E2. Borehole geophysics applied to ground-water investigations, by W. Scott Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.
- 2-F1. Application of drilling, coring, and sampling techniques to test holes and wells, by Eugene Shuter and Warren E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.
- 3-A1. General field and office procedures for indirect discharge measurements, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
- 3-A2. Measurement of peak discharge by the slope-area method, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.
- 3-A3. Measurement of peak discharge at culverts by indirect methods, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.
- 3-A4. Measurement of peak discharge at width contractions by indirect methods, by H. J. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.
- 3-A5. Measurement of peak discharge at dams by indirect methods, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
- 3-A6. General procedure for gaging streams, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. Stage measurements at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
- 3-A8. Discharge measurements at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
- 3-A9. Measurement of time of travel in streams by dye tracing, by F. A. Kilpatrick and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

- 3-A10. Discharge ratings at gaging stations, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. Measurement of discharge by moving-boat method, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A12. Fluorometric procedures for dye tracing, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.
- 3-A13. Computation of continuous records of streamflow, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
- 3-A14. Use of flumes in measuring discharge, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. Computation of water-surface profiles in open channels, by Jacob Davidian: USGS--TWRI Book 3, Chapter A-15. 1984. 48 pages.
- 3-A16. Measurement of discharge using tracers, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A-16. 1985. 52 pages.
- 3-A17. Acoustic velocity meter systems, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.
- 3-A18. Determination of stream reaeration coefficients by use of tracers, by F. A. Kilpatrick, R. E. Rathburn, N. Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.
- 3-A19. Levels of streamflow gaging stations, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 pages.
- 3-A20. Simulation of soluble waste transport and buildup in surface waters using tracers, by F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 pages.
- 3-B1. Aquifer-test design, observation, and data analysis, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
- 3-B2. Introduction to ground-water hydraulics, a programmed test for self-instruction, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
- 3-B3. Type curves for selected problems of flow to wells in confined aquifers, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.
- 3-B4. Regression modeling of ground-water flow, by Richard L. Cooley and Richard L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.
- 3-B4. Supplement 1. Regression modeling of ground-water flow - Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems, by R. L. Cooley. USGS--TWRI Book 3, Chapter B4. 1994. 8 pages.
- 3-B5. Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.
- 3-B6. The principle of superposition and its application in ground-water hydraulics, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.
- 3-B7. Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow, by Eliezer J. Wexler: USGS--TWRI Book 3, Chapter B7. 1994. 90 pages.
- 3-C1. Fluvial sediment concepts, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.



## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

- 3-C2. Field methods for measurement of fluvial sediment, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
- 3-C3. Computation of fluvial-sediment discharge, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. Some statistical tools in hydrology, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. Frequency curves, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. Low-flow investigations, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. Storage analyses for water supply, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
- 4-B3. Regional analyses of streamflow characteristics, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
- 4-D1. Computation of rate and volume of stream depletion by wells, by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.
- 5-A1. Methods for determination of inorganic substances in water and fluvial sediments, by M. J. Fishman and L. C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.
- 5-A2. Determination of minor elements in water by emission spectroscopy, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
- 5-A3. Methods for the determination of organic substances in water and fluvial sediments, edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.
- 5-A4. Methods for collection and analysis of aquatic biological and microbiological samples, by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.
- 5-A5. Methods for determination of radioactive substances in water and fluvial sediments, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.
- 5-A6. Quality assurance practices for the chemical and biological analyses of water and fluvial sediments, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. Laboratory theory and methods for sediment analysis, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
- 6-A1. A modular three-dimensional finite-difference ground-water flow model, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.
- 6-A2. Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model, by S. A. Leake and D. E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 pages.
- 6-A3. A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems. Part 1: Model Description and User's Manual, by L. J. Torak: USGS--TWRI Book 6, Chapter A3. 1994. 136 pages.
- 6-A4. A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems. Part 2: Derivation of finite-element equations and comparisons with analytical solutions, by R. L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.

## PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

- 6-A5. A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details, by L. J. Torak. USGS--TWRI Book 6, Chapter A5. 1994. 243 pages.
- 7-C1. Finite difference model for aquifer simulation in two dimensions with results of numerical experiments, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
- 7-C2. Computer model of two-dimensional solute transport and dispersion in ground water, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
- 7-C3. A model for simulation of flow in singular and interconnected channels, by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 8-A1. Methods of measuring water levels in deep wells, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
- 8-A2. Installation and service manual for U.S. Geological Survey manometers, by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.
- 8-B2. Calibration and maintenance of vertical-axis type current meters, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

## SELECTED U.S. GEOLOGICAL SURVEY REPORTS ON WATER RESOURCES IN VIRGINIA

Listed below is a selection of reports on water resources in Virginia which are available through the Virginia District at the U.S. Geological Survey, WRD, 3600 West Broad Street, Room 606, Richmond, Virginia 23230.

An index of geophysical logging in Virginia by the U.S. Geological Survey, by M. P. Mulheren, J. D. Larson, and H. T. Hopkins: U.S. Geological Survey Open-File Report 82-432. 1982. 34 pages.

Annual maximum stages and discharges of selected streams in Virginia through 1990, by B. J. Prugh, Jr., E. H. Nuckels, and C. G. Humphrey: U.S. Geological Survey Open-File Report 90-587. 1991. 442 pages.

Assessment of ground-water contamination from a leaking underground storage tank at a Defense Supply Center near Richmond, Virginia, by W. G. Wright and J. D. Powell: U.S. Geological Survey Water-Resources Investigations Report 90-4091. 1990. 38 pages.

Availability and quality of ground water in the Piedmont province of Virginia, by J. D. Powell and J. M. Abe: U.S. Geological Survey Water-Resources Investigations Report 85-4235. 1985. 33 pages.

Compilation of surface-water and water-quality data-collection sites on selected streams in Virginia, by B. J. Prugh, Jr. and C. G. Humphrey: U.S. Geological Survey Open-File Report 93-462. 1993. 645 pages.

Conceptualization and analysis of ground-water flow system in the Coastal Plain of Virginia and adjacent parts of Maryland and North Carolina, by J. F. Harsh and R. J. Lacznik: U.S. Geological Survey Professional Paper 1404-F. 1990. 100 pages.

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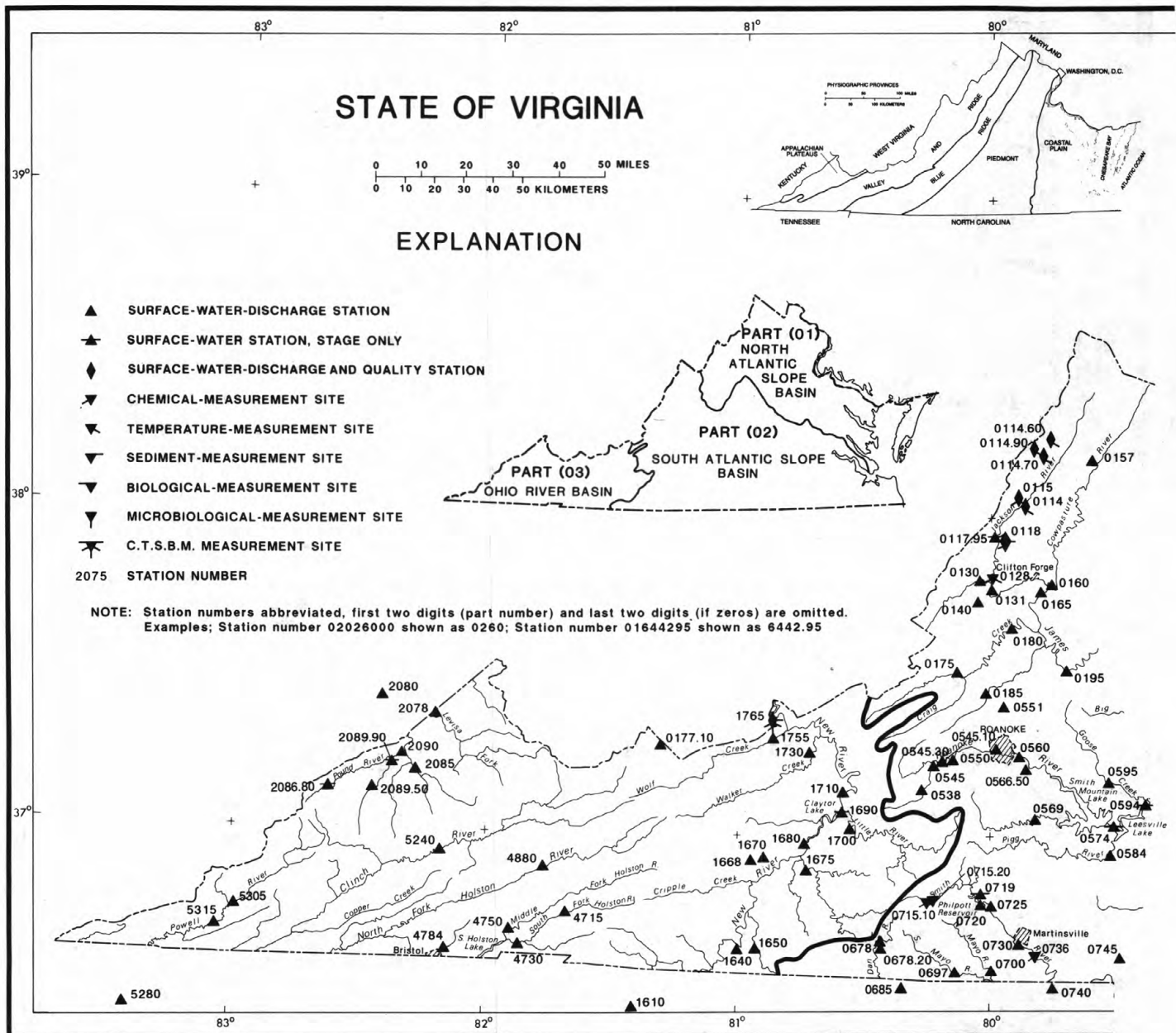
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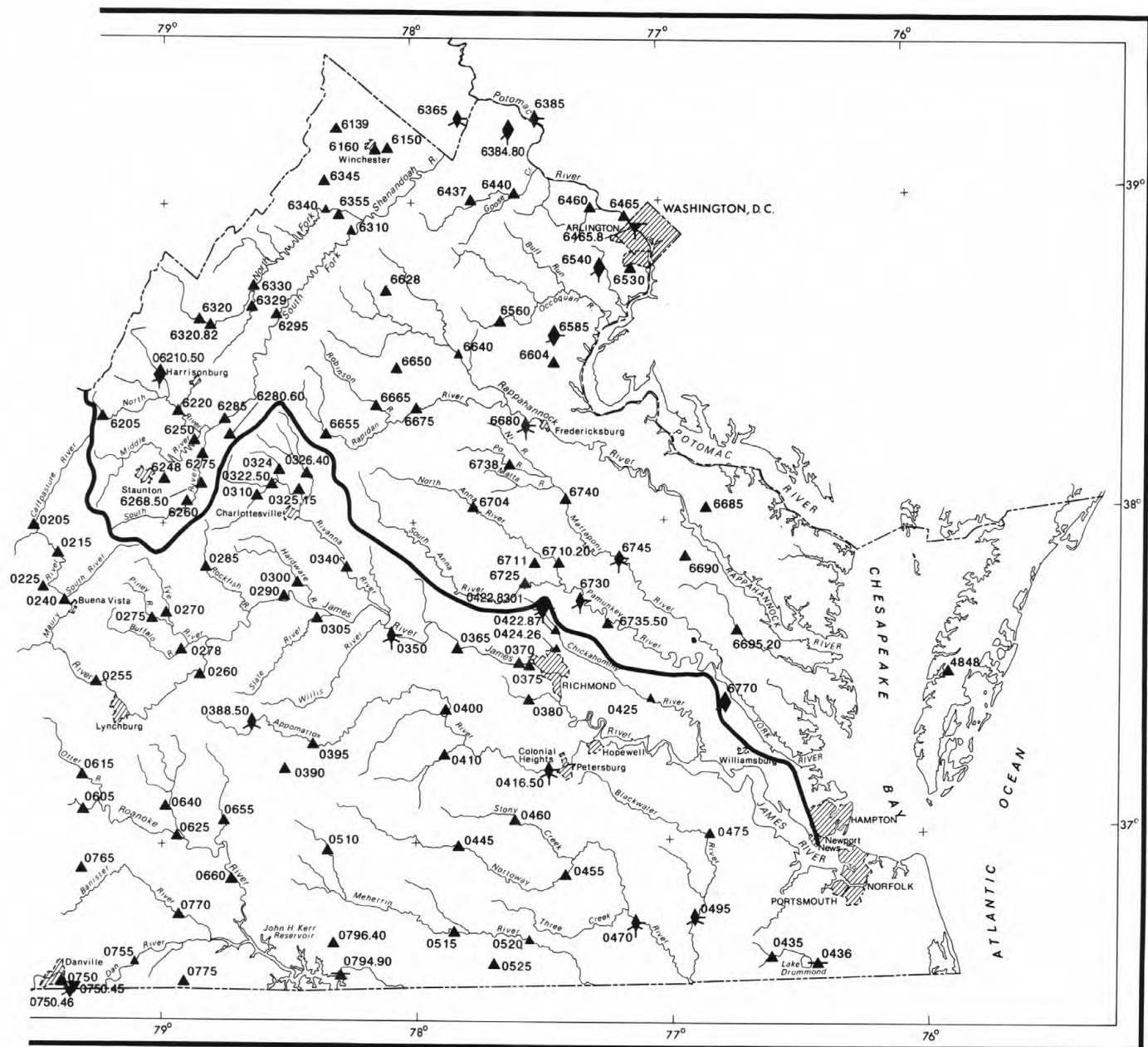
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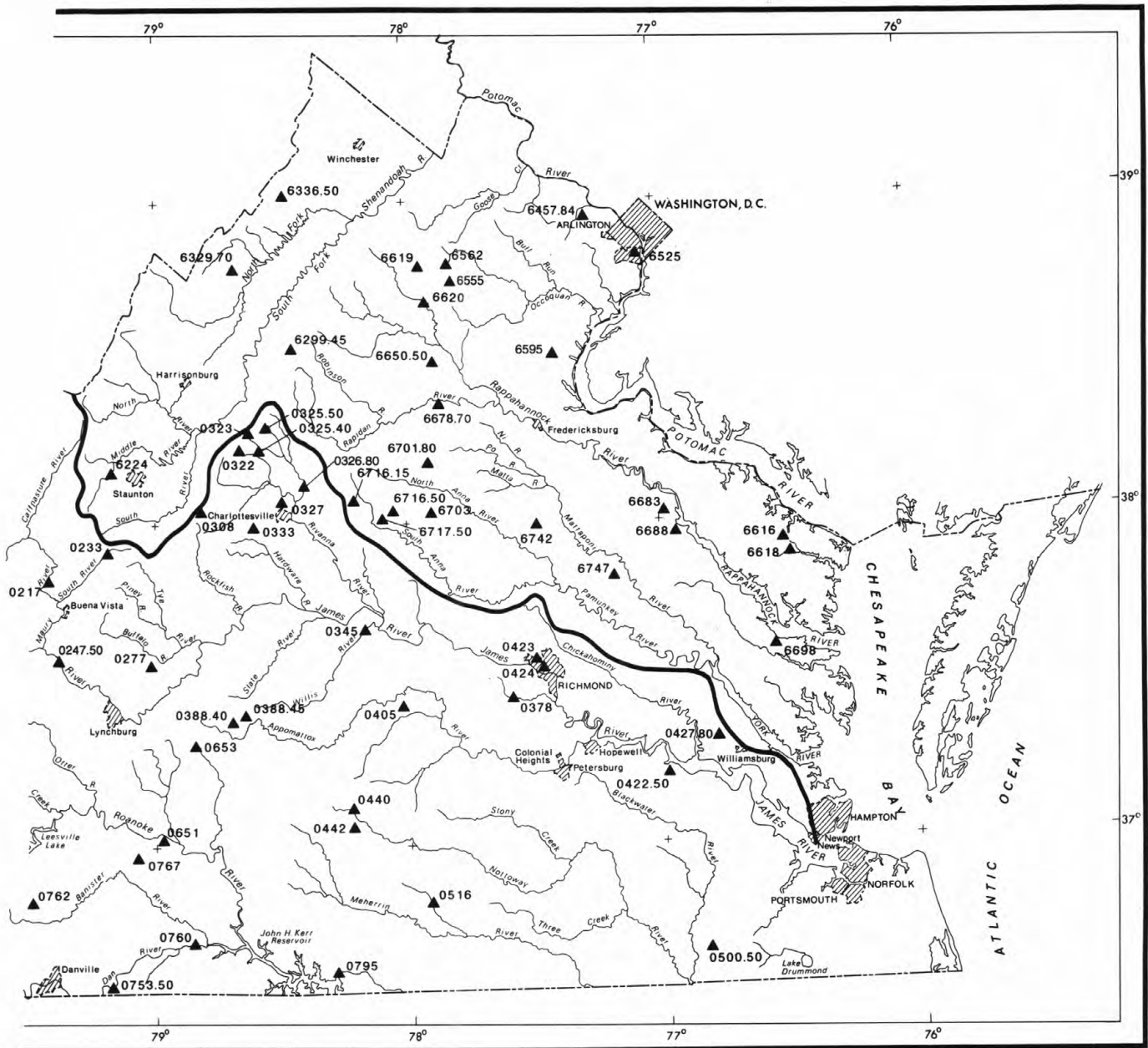
**Figure 6.** Location of surface-water-discharge and surface-water-quality data-collection stations.





**Figure 7. Location of surface-water partial-record stations.**





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## SURFACE-WATER-DISCHARGE AND SURFACE-WATER-QUALITY RECORDS

### Remarks Codes

The following remark codes may appear with the water-quality data in this section:

PRINTED OUTPUT	REMARK
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
&	Biological organism estimated as dominant.

### Dissolved Trace-Element Concentrations

\*NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter ( $\mu\text{g/L}$ ) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's to 100's of nanograms per liter ( $\text{ng/L}$ ). Data above the  $\mu\text{g/L}$  level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994. Full implementation of the protocols will take place during the 1995 water year.

### Change in National Trends Network procedures

\*NOTE.--Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences, based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (Telephone: 303-491-5643).

## HYDROLOGIC-DATA STATION RECORDS

## NORTH ATLANTIC SLOPE BASINS

## NASSAWADOX CREEK BASIN

01484800 GUY CREEK NEAR NASSAWADOX, VA

LOCATION.--Lat 37°30'08", long 75°52'22", Northampton County, Hydrologic Unit 02080109, on left bank 25 ft upstream from bridge on State Highway 606, 1.9 mi northwest of Nassawadox, and 2.1 mi upstream from mouth.

DRAINAGE AREA.--1.72 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is 11.67 ft above sea level.

REMARKS.--No estimated daily discharges. Records fair. Some diversion into pond for irrigation upstream from station, amount unknown. Maximum discharge, 171 ft<sup>3</sup>/s, from rating curve extended above 20 ft<sup>3</sup>/s. No flow at times in 1964, 1966, 1981, 1983-85, 1987, 1991-94. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 56 ft<sup>3</sup>/s, Mar. 2, gage height, 4.67 ft; no flow at times April to September, due to pumpage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.26	.39	.47	.79	1.2	2.1	5.5	.94	.00	.00	2.1	.00
2	.24	.35	.47	1.9	1.2	20	4.2	.57	.00	.00	2.9	.00
3	.23	.33	.47	1.4	1.2	25	2.3	.35	.00	.00	3.0	.02
4	.22	.34	.49	1.6	1.3	8.8	1.9	1.1	.00	.00	1.9	.03
5	.20	.36	.63	1.3	1.5	5.8	1.8	1.4	.00	.00	4.8	.02
6	.20	.44	.59	1.3	1.6	4.0	1.7	1.3	.00	.00	6.1	.00
7	.21	.47	.60	1.2	1.3	3.4	1.7	1.1	.00	.00	3.5	.00
8	.22	.41	.57	1.2	1.4	3.0	1.6	1.3	.00	.00	2.8	.00
9	.19	.41	.48	1.1	1.7	2.9	1.5	1.1	.00	.00	2.3	.00
10	.20	.41	.47	1.0	1.9	7.6	1.5	.19	.00	.00	1.9	.00
11	.21	.40	.70	.96	7.0	11	1.4	.25	.00	.00	1.5	.00
12	.22	.35	.58	1.1	9.3	5.5	1.4	.11	.00	.00	1.1	.02
13	.22	.35	.54	1.3	3.7	4.0	1.5	.09	.00	.00	.68	.00
14	.21	.35	.54	1.3	2.7	3.5	1.5	.00	.00	.00	.30	.00
15	.21	.35	.60	1.3	2.2	3.1	1.5	.01	.00	.00	1.3	.00
16	.23	.35	1.1	1.1	1.8	2.8	1.4	1.1	.00	.00	1.0	.00
17	.26	.37	.84	1.2	1.5	2.5	1.4	.28	.00	.00	.88	.00
18	.26	.37	.78	2.6	1.6	2.4	1.3	.06	.00	5.2	.63	.00
19	.24	.38	.76	1.5	1.6	2.7	1.3	.03	.00	2.6	.30	.01
20	.24	.43	.69	1.3	1.6	2.2	1.2	.08	.00	.22	.36	.01
21	.30	.42	.87	1.2	1.4	2.2	1.2	.09	.00	.03	.25	.01
22	.35	.47	.78	1.1	1.3	4.9	1.1	.00	.00	.02	.12	2.7
23	.36	.47	.81	1.2	2.0	3.3	.81	.00	.00	.02	.07	2.4
24	.37	.47	.84	1.2	8.4	2.7	.85	.00	.00	.02	.04	.60
25	.31	.46	.78	1.2	4.3	4.1	.35	.00	.00	.02	.03	.39
26	.30	.46	.80	1.2	2.5	4.1	.27	.93	.00	.04	.19	.35
27	.46	.53	.87	1.2	2.4	4.9	.40	.97	.00	.25	.01	.36
28	.58	.76	.87	1.5	2.1	5.5	.25	.05	.00	1.8	.00	.30
29	.35	.59	.87	1.5	---	10	.73	.00	.00	3.3	.22	.30
30	.48	.52	.84	1.3	---	7.0	.57	.00	.00	2.8	.45	.30
31	.51	---	.78	1.3	---	5.0	---	.00	---	1.5	.01	---
TOTAL	8.84	12.76	21.48	40.35	71.7	176.0	44.13	13.40	0.00	17.82	40.74	7.82
MEAN	.29	.43	.69	1.30	2.56	5.68	1.47	.43	.000	.57	1.31	.26
MAX	.58	.76	1.1	2.6	9.3	25	5.5	1.4	.00	5.2	6.1	2.7
MIN	.19	.33	.47	.79	1.2	2.1	.25	.00	.00	.00	.00	.00
CFSM	.17	.25	.40	.76	1.49	3.30	.86	.25	.00	.33	.76	.15
IN.	.19	.28	.46	.87	1.55	3.81	.95	.29	.00	.39	.88	.17



NASSAWADOX CREEK BASIN

41

01484800 GUY CREEK NEAR NASSAWADOX, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	.42	.77	1.18	2.02	2.41	3.14	2.16	1.17	.56	.63	.78	.40
MAX	1.59	4.90	2.98	5.42	5.44	6.85	6.23	5.13	1.99	3.55	4.59	2.66
(WY)	1965	1980	1984	1979	1979	1975	1983	1978	1979	1965	1979	1979
MIN	.095	.16	.21	.31	.50	.42	.51	.22	.000	.021	.10	.067
(WY)	1978	1977	1992	1966	1981	1981	1981	1991	1994	1993	1977	1977

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1965 - 1994

ANNUAL TOTAL	473.09	455.04	
ANNUAL MEAN	1.30	1.25	1.30
HIGHEST ANNUAL MEAN			3.01
LOWEST ANNUAL MEAN			.45
HIGHEST DAILY MEAN	19 Mar 13	25 Mar 3	41 Jul 30
LOWEST DAILY MEAN	b.00 (c)	b.00 (d)	b.00 (f)
ANNUAL SEVEN-DAY MINIMUM	b.00 Jul 13	b.00 May 29	b.00 Aug 27
INSTANTANEOUS PEAK FLOW		56 Mar 2	171 Aug 22
INSTANTANEOUS PEAK STAGE		4.67 Mar 2	6.84 Aug 22
INSTANTANEOUS LOW FLOW		b.00 (i)	b.00 (f)
ANNUAL RUNOFF (CFSM)	.75	.72	.75
ANNUAL RUNOFF (INCHES)	10.23	9.84	10.26
10 PERCENT EXCEEDS	3.0	2.9	2.9
50 PERCENT EXCEEDS	.58	.52	.55
90 PERCENT EXCEEDS	.00	.00	.14

a Also July 31, 1979.

b Due to pumpage.

c Many days June to September 1993.

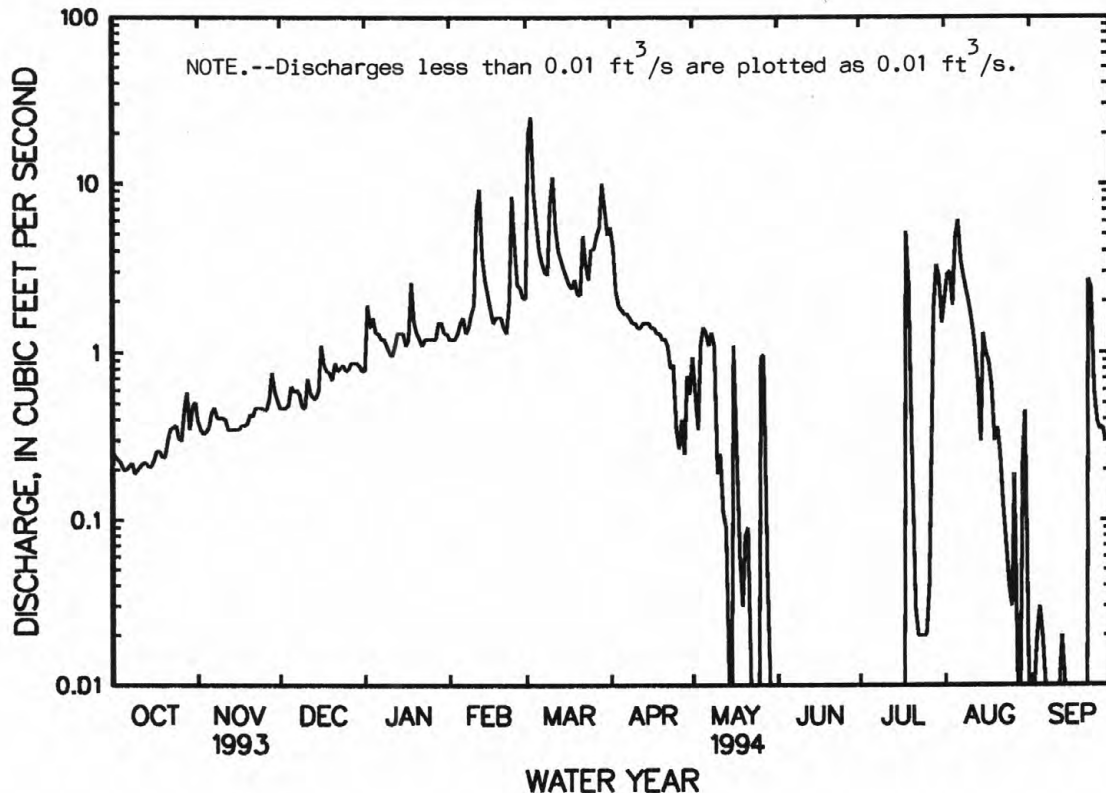
d Many days May to September 1994.

f At times in 1964 (partial year), 1966, 1981, 1983-85, 1987, 1991-94.

g Also May 30 to July 11, 1994.

h Also Aug. 28 to Sept. 19, 1985, July 9-11, 1992, July 13, 1993, and May 29 to July 11, 1994.

j At times April to September 1994.



## POTOMAC RIVER BASIN

01613900 HOGUE CREEK NEAR HAYFIELD, VA

LOCATION.--Lat 39°12'52", long 78°17'18", Frederick County, Hydrologic Unit 02070004, on right bank 15 ft upstream from bridge on State Highway 614, 0.8 mi upstream from Gap Run, and 1.3 mi southeast of Hayfield.

DRAINAGE AREA.--15.0 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1960 to December 1986, October 1992 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 668.60 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 30 to Jan. 1, Jan. 5, 15-18, and Feb. 2-4, 10-12, and period of doubtful gage-height record, Jan. 19-24, which are fair. Maximum discharge, 2,760 ft<sup>3</sup>/s, from rating curve extended above 870 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0300	*1,170	*5.24	Aug. 17	1745	493	3.58
Dec. 5	0545	760	4.31				

Minimum discharge, 0.43 ft<sup>3</sup>/s, Aug. 12, result of regulation from unknown source; minimum daily, 1.2 ft<sup>3</sup>/s, Oct. 5-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	3.5	11	e6.6	26	30	49	8.6	3.1	2.0	3.0	2.1
2	1.4	2.3	8.6	6.5	e20	28	36	6.9	2.7	1.8	2.2	2.0
3	1.3	2.2	7.3	7.3	e16	33	29	6.2	2.7	3.9	2.0	1.9
4	1.3	2.0	11	8.9	e14	60	25	13	2.7	4.7	1.8	1.9
5	1.2	2.1	418	e8.0	13	149	22	15	2.7	2.7	3.4	1.8
6	1.2	2.2	98	7.3	16	118	19	11	3.4	2.2	2.9	1.7
7	1.2	1.9	39	8.5	19	134	63	30	3.5	3.1	2.0	1.7
8	1.3	1.7	23	15	23	260	35	164	2.9	3.0	1.7	1.6
9	1.3	1.7	16	28	54	182	27	55	2.7	2.4	1.6	1.5
10	1.4	1.6	16	22	e47	295	26	32	2.5	2.9	1.5	1.5
11	1.4	1.6	13	16	e34	161	23	22	2.6	2.0	1.8	1.5
12	2.9	1.6	9.5	15	e26	105	20	18	2.8	1.8	1.6	1.4
13	1.8	1.7	8.6	19	21	101	43	14	2.5	1.7	1.5	1.4
14	1.5	2.3	8.1	19	19	133	47	11	2.2	1.7	1.9	1.4
15	1.4	2.1	11	e18	17	129	32	10	2.2	1.9	1.6	1.4
16	1.3	1.9	36	e16	23	96	29	9.5	2.1	1.7	1.5	1.4
17	1.4	2.9	21	e21	33	60	22	8.1	2.6	1.9	101	1.5
18	1.3	6.3	17	e32	55	49	19	7.4	2.3	4.3	46	1.7
19	1.4	4.2	15	e25	112	44	17	6.9	2.0	3.5	13	1.5
20	1.8	3.2	13	e21	163	38	15	6.5	1.9	2.5	7.6	1.4
21	1.9	2.6	16	e18	206	49	13	6.0	2.2	2.2	9.3	1.5
22	1.8	2.2	14	e15	131	73	12	5.5	2.0	4.0	8.4	2.4
23	1.7	2.0	12	e13	100	50	11	4.9	2.0	4.9	5.2	4.0
24	1.6	1.9	11	e29	135	40	9.9	4.4	2.3	2.9	3.8	2.0
25	1.6	1.8	10	55	105	34	9.2	5.0	2.3	2.1	3.2	1.7
26	1.5	1.7	9.0	64	73	26	8.5	5.7	1.9	2.1	2.8	2.0
27	1.6	52	7.8	43	46	103	8.2	4.9	2.8	2.2	2.6	1.7
28	1.6	377	7.2	61	35	199	8.0	4.1	3.3	2.3	2.4	1.6
29	1.6	43	7.2	78	---	239	7.2	3.8	2.5	2.0	2.4	1.6
30	3.6	18	e7.0	48	---	109	7.1	3.5	2.5	3.2	2.2	1.4
31	5.3	---	e6.8	34	---	66	---	3.3	---	5.3	2.1	---
TOTAL	53.1	551.2	908.1	778.1	1582	3193	692.1	506.2	75.9	84.9	244.0	52.2
MEAN	1.71	18.4	29.3	25.1	56.5	103	23.1	16.3	2.53	2.74	7.87	1.74
MAX	5.3	377	418	78	206	295	63	164	3.5	5.3	101	4.0
MIN	1.2	1.6	6.8	6.5	13	26	7.1	3.3	1.9	1.7	1.5	1.4
CFSM	.11	1.22	1.95	1.67	3.77	6.87	1.54	1.09	.17	.18	.52	.12
IN.	.13	1.37	2.25	1.93	3.92	7.92	1.72	1.26	.19	.21	.61	.13

e Estimated.

POTOMAC RIVER BASIN

43

01613900 HOGUE CREEK NEAR HAYFIELD, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1986, 1993 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	7.04	12.3	16.0	16.6	26.7	38.6	27.2	16.8	11.7	4.85	4.65	3.90
MAX	53.6	52.5	51.2	43.6	62.8	114	89.7	47.4	94.2	30.6	54.2	32.6
(WY)	1980	1986	1973	1979	1979	1993	1983	1978	1972	1978	1978	1975
MIN	.52	1.08	1.06	1.72	4.38	5.81	6.31	2.17	.98	.81	.60	.78
(WY)	1964	1966	1966	1966	1977	1981	1963	1969	1969	1964	1977	1963

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

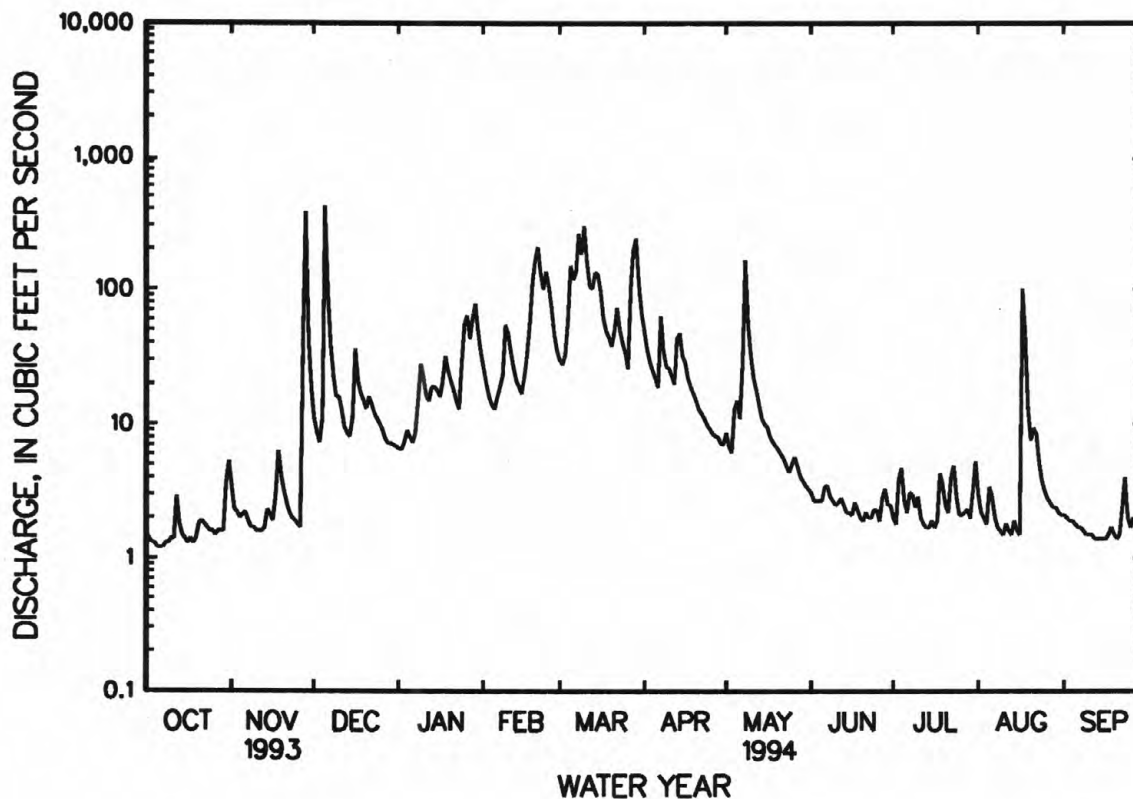
WATER YEARS 1960 - 1986,  
1993 - 1994

ANNUAL TOTAL	8716.47	8720.8	15.5
ANNUAL MEAN	23.9	23.9	27.8
HIGHEST ANNUAL MEAN			3.84
LOWEST ANNUAL MEAN			1978
HIGHEST DAILY MEAN	862	Mar 4	418
LOWEST DAILY MEAN	.95	Sep 14	Dec 5
ANNUAL SEVEN-DAY MINIMUM	1.0	Sep 11	1.2
INSTANTANEOUS PEAK FLOW			1.3
INSTANTANEOUS PEAK STAGE			Oct 3
INSTANTANEOUS LOW FLOW			Nov 28
ANNUAL RUNOFF (CFSM)	1.59		5.24
ANNUAL RUNOFF (INCHES)	21.62		Nov 28
10 PERCENT EXCEEDS	60		Aug 12
50 PERCENT EXCEEDS	4.4		8.85
90 PERCENT EXCEEDS	1.3		c.00
			1.03
			14.04
			34
			5.1
			1.1

a Also Oct. 6, 7, 1993.

b Result of regulation from unknown source.

c No flow part of Sept. 14, 1968, cause unknown.



## POTOMAC RIVER BASIN

01615000 OPEQUON CREEK NEAR BERRYVILLE, VA

LOCATION.--Lat 39°10'40", long 78°04'20", Frederick County, Hydrologic Unit 02070004, on left bank between the bridges on State Highway 7, 0.2 mi upstream from Abrams Creek, and 5.0 mi west of Berryville.

DRAINAGE AREA.--57.4 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1943 to current year.

REVISED RECORDS.--WSP 2103: Drainage area. WDR VA-72-1: 1971(P).

GAGE.--Water-stage recorder. Datum of gage is 503.24 ft above sea level. Prior to July 26, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period with ice effect, Jan. 24-26, and period of doubtful gage-height record, Apr. 6, which are fair. Some diurnal fluctuation caused by mills and since July 18, 1988, by wastewater treatment plant 1,000 ft upstream from station. Most of water discharged from treatment plant was diverted from another drainage basin for municipal supply. Maximum discharge, 12,600 ft<sup>3</sup>/s, from rating curve extended above 4,800 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 18.4 ft, discharge not determined, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0800	*2,920	*8.80	Mar. 10	1830	1,470	6.57
Dec. 5	1130	2,160	7.87	Mar. 29	1100	1,220	6.03
Feb. 24	1900	1,260	6.11	Aug. 17	2000	2,470	8.27
Mar. 5	2200	973	5.42				

Minimum discharge, 10 ft<sup>3</sup>/s, Oct. 19; minimum daily, 13 ft<sup>3</sup>/s, Oct. 10, 11, Aug. 4, 10, 11, 14-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	26	54	33	83	93	128	37	24	19	14	21
2	15	21	46	34	66	87	104	35	23	17	14	20
3	15	18	40	38	58	90	99	34	22	18	14	19
4	15	17	41	42	52	151	90	46	22	19	13	18
5	15	17	1230	39	52	554	81	46	22	18	17	18
6	14	18	248	37	57	516	e74	38	22	18	19	18
7	14	18	106	41	65	488	116	43	22	21	15	18
8	14	17	76	86	67	568	84	288	22	22	14	17
9	14	16	63	71	203	358	72	92	21	18	14	17
10	13	16	58	50	146	856	74	61	21	18	13	17
11	13	16	57	46	85	417	74	49	20	17	13	17
12	23	15	46	82	75	233	67	43	20	16	14	17
13	22	16	41	123	67	190	197	38	20	16	14	16
14	17	17	39	116	65	198	163	35	20	16	13	16
15	16	17	45	79	66	173	100	35	20	16	13	16
16	15	16	136	52	78	141	102	36	20	15	13	16
17	14	18	78	48	130	105	79	32	20	15	577	16
18	14	29	62	52	222	100	68	31	19	17	438	16
19	14	24	56	41	392	99	62	30	19	22	68	16
20	15	19	50	39	451	88	56	29	19	16	44	16
21	18	17	67	36	423	86	51	28	18	20	37	16
22	18	17	73	34	278	101	49	27	19	19	36	21
23	16	16	62	35	233	83	46	27	19	17	29	47
24	16	17	58	e91	786	76	44	26	20	16	26	25
25	15	16	52	e199	415	78	42	27	20	16	24	20
26	15	16	46	e260	254	68	40	29	18	15	23	20
27	15	71	40	116	131	276	40	28	21	16	21	19
28	14	1480	37	221	102	556	41	26	26	18	20	18
29	14	130	38	256	---	858	38	25	21	16	21	17
30	18	74	35	138	---	299	37	24	20	15	20	16
31	32	---	34	96	---	164	---	24	---	14	21	---
TOTAL	500	2225	3114	2631	5102	8150	2318	1369	620	536	1632	564
MEAN	16.1	74.2	100	84.9	182	263	77.3	44.2	20.7	17.3	52.6	18.8
MAX	32	1480	1230	260	786	858	197	288	26	22	577	47
MIN	13	15	34	33	52	68	37	24	18	14	13	16
(†)	6.25	6.85	8.87	9.24	13.5	17.3	10.1	7.80	6.47	7.49	9.52	6.34

CAL YR 1993 TOTAL 28008 MEAN 76.7 MAX 2380 MIN 13 (†) 8.39  
WTR YR 1994 TOTAL 28761 MEAN 78.8 MAX 1480 MIN 13 (†) 9.14

† Discharge from wastewater treatment plant, equivalent in cubic feet per second; provided by the Frederick-Winchester Service Authority.

e Estimated.



## 01615000 OPEQUON CREEK NEAR BERRYVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1988, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	24.7	32.2	46.9	53.1	72.3	80.8	61.4	47.1	35.7	19.4	21.0	21.8
MAX	186	146	167	161	250	215	254	269	347	120	130	219
(WY)	1977	1971	1973	1979	1984	1984	1952	1988	1972	1975	1955	1975
MIN	2.67	2.61	2.83	4.63	12.0	16.8	11.0	10.3	5.58	1.87	.92	1.32
(WY)	1966	1966	1966	1966	1947	1981	1947	1969	1966	1966	1966	1965

## SUMMARY STATISTICS

## WATER YEARS 1944 - 1988

ANNUAL MEAN	42.9
HIGHEST ANNUAL MEAN	90.4
LOWEST ANNUAL MEAN	14.5
HIGHEST DAILY MEAN	4670
LOWEST DAILY MEAN	.20
ANNUAL SEVERN-DAY MINIMUM	.27
INSTANTANEOUS PEAK FLOW	12600
INSTANTANEOUS PEAK STAGE	13.49
INSTANTANEOUS LOW FLOW	.20
ANNUAL RUNOFF (CFSM)	.75
ANNUAL RUNOFF (INCHES)	10.15
10 PERCENT EXCEEDS	81
50 PERCENT EXCEEDS	16
90 PERCENT EXCEEDS	4.7

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	39.2	30.8	56.6	64.4	64.5	149	85.7	50.7	31.5	22.6	22.2	18.0
MAX	148	74.2	116	136	182	309	184	119	77.0	36.6	52.6	27.6
(WY)	1991	1994	1993	1991	1994	1993	1993	1989	1992	1990	1994	1992
MIN	8.71	9.87	11.3	25.5	35.6	30.5	26.6	19.6	16.7	11.4	8.90	8.85
(WY)	1992	1992	1989	1989	1992	1990	1989	1991	1991	1991	1991	1991

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1989 - 1994

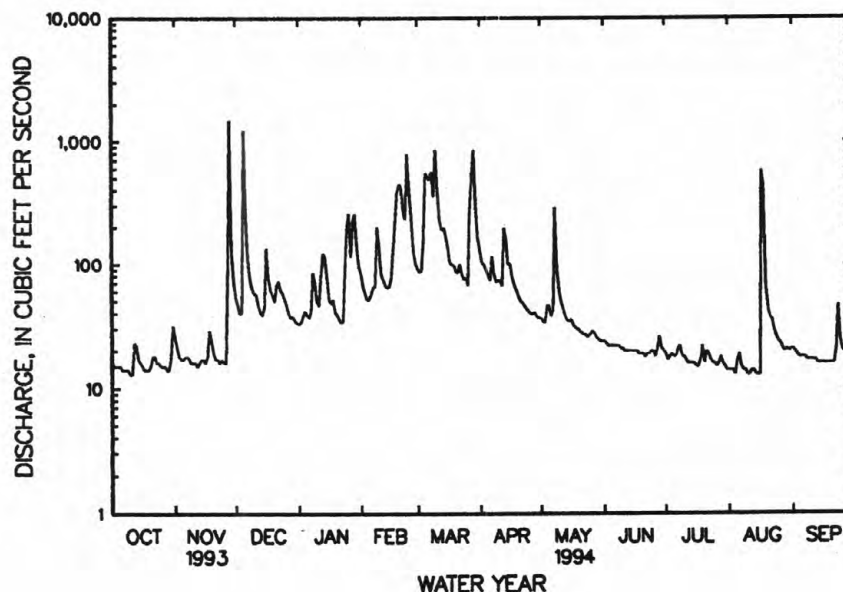
ANNUAL TOTAL	28008	28761	
ANNUAL MEAN	76.7	78.8	53.0
HIGHEST ANNUAL MEAN			78.8
LOWEST ANNUAL MEAN			32.3
HIGHEST DAILY MEAN	2380	Mar 4	2380
LOWEST DAILY MEAN	13	cAug 28	7.6
ANNUAL SEVERN-DAY MINIMUM	13	Aug 27	7.9
INSTANTANEOUS PEAK FLOW			5990
INSTANTANEOUS PEAK STAGE		8.80	11.07
INSTANTANEOUS LOW FLOW		10	5.9
ANNUAL RUNOFF (CFSM)	1.34	1.37	.92
ANNUAL RUNOFF (INCHES)	18.15	18.64	12.55
10 PERCENT EXCEEDS	137	168	92
50 PERCENT EXCEEDS	30	29	23
90 PERCENT EXCEEDS	15	15	12

a Also Sept. 13, 1966.

b Also Sept. 12, 13, 1966.

c Also Aug. 29 to Sept. 2, Sept. 11-14, and Oct. 10, 11, 1993.

d Also Oct. 11, 1993, and Aug. 4, 10, 11, 14-16, 1994.



## POTOMAC RIVER BASIN

O1616000 ABRAMS CREEK NEAR WINCHESTER, VA

LOCATION.--Lat 39°10'40", long 78°05'10", Frederick County, Hydrologic Unit 02070004, on right bank 1,000 ft upstream from bridge on State Highway 659, 0.9 mi upstream from mouth, and 4.4 mi east of Winchester.

DRAINAGE AREA.--16.5 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1949 to September 1960, June 1979 to November 1994 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 526.46 ft above sea level.

REMARKS.--Records good for period October 1993 to September 1994 except those for periods with ice effect, Dec. 31 and Jan. 10, and period of no gage-height record, Jan. 15-24, which are fair. Records good for period October to November 1994 except for period of no gage-height record, Nov. 14, which is fair. Slight diurnal fluctuation prior to September 1990 caused by wastewater treatment plant upstream from station at Winchester. Occasional diversion for irrigation upstream from gage. Maximum discharge, 1,410 ft<sup>3</sup>/s, from rating curve extended above 890 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT PERIOD OCTOBER 1993 TO SEPTEMBER 1994.--Peak discharges equal to or greater than base discharge of 250 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	2000	375	3.43	Mar. 29	0830	347	3.15
Nov. 28	0230	1,030	5.50	May 8	0030	339	3.13
Dec. 5	0530	688	4.33	Aug. 17	1800	*1,280	*6.34
Feb. 24	0830	276	2.89	Aug. 21	1530	252	2.69
Mar. 10	1430	425	3.42	Sept. 22	2300	256	2.71

October 1993 to September 1994: Minimum discharge, 8.5 ft<sup>3</sup>/s, Aug. 13, 14, 15-16.

October to November 1994: Maximum discharge during period, 69 ft<sup>3</sup>/s, Nov. 1, gage height, 1.85 ft; minimum, 6.7 ft<sup>3</sup>/s, Oct. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	16	22	18	25	34	44	25	17	14	12	14
2	12	16	20	18	22	33	38	22	16	13	12	13
3	11	15	19	18	22	33	37	23	16	21	14	12
4	11	14	29	19	21	68	35	30	16	15	11	12
5	11	16	317	18	21	142	35	24	15	15	18	11
6	11	13	54	18	21	99	35	22	16	14	12	11
7	10	12	34	20	22	94	50	48	16	28	11	11
8	11	12	28	24	23	114	34	82	14	18	11	11
9	11	13	25	20	44	83	31	28	15	16	10	11
10	11	13	25	e16	30	225	33	25	15	15	10	11
11	12	13	24	15	26	115	30	24	15	14	9.9	11
12	27	13	22	28	24	73	30	24	15	14	10	11
13	11	16	20	25	23	60	51	22	14	14	9.4	10
14	11	13	21	25	24	61	36	22	14	14	12	11
15	10	13	31	e21	24	55	31	26	14	14	9.7	10
16	11	13	34	e19	29	49	31	23	14	14	9.6	10
17	10	20	25	e18	33	42	28	22	14	14	244	11
18	11	14	23	e19	45	42	27	21	14	20	58	11
19	11	12	22	e18	64	39	27	21	13	14	22	10
20	15	12	21	e17	62	37	25	20	13	15	18	10
21	13	12	30	e17	75	40	25	19	14	16	33	11
22	14	12	24	e16	47	41	25	19	13	14	18	36
23	13	12	22	e16	50	37	24	19	13	13	16	28
24	12	12	22	e20	167	35	24	19	20	12	14	13
25	13	11	21	21	86	36	23	21	15	12	13	12
26	13	11	19	40	53	33	23	20	14	12	13	13
27	13	89	19	27	37	101	29	19	28	16	13	12
28	13	316	19	64	35	152	24	18	18	14	12	11
29	13	33	19	39	---	201	23	18	16	13	13	10
30	25	25	19	29	---	79	22	17	15	12	12	10
31	19	---	e17	25	---	53	---	17	---	12	23	---
TOTAL	402	812	1047	708	1155	2306	930	760	462	462	703.6	378
MEAN	13.0	27.1	33.8	22.8	41.2	74.4	31.0	24.5	15.4	14.9	22.7	12.6
MAX	27	316	317	64	167	225	51	82	28	28	244	36
MIN	10	11	17	15	21	33	22	17	13	12	9.4	10
CFSM	.79	1.64	2.05	1.38	2.50	4.51	1.88	1.49	.93	.90	1.38	.76
IN.	.91	1.83	2.36	1.60	2.60	5.20	2.10	1.71	1.04	1.04	1.59	.85

e Estimated.

POTOMAC RIVER BASIN

47

01616000 ABRAMS CREEK NEAR WINCHESTER, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1960, 1979 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	17.8	18.5	21.1	19.2	25.3	30.9	30.5	26.4	20.8	17.3	16.6	15.4
MAX	58.1	46.9	61.1	36.3	72.6	75.3	78.9	61.5	48.2	33.4	39.8	42.6
(WY)	1980	1986	1951	1991	1984	1984	1984	1988	1982	1979	1955	1987
MIN	8.32	7.70	7.77	10.5	8.15	11.4	8.98	11.7	8.18	8.01	7.97	7.54
(WY)	1992	1954	1990	1954	a1954	1990	1954	1955	1954	1955	1991	1954

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1950 - 1960,  
1980 - 1994

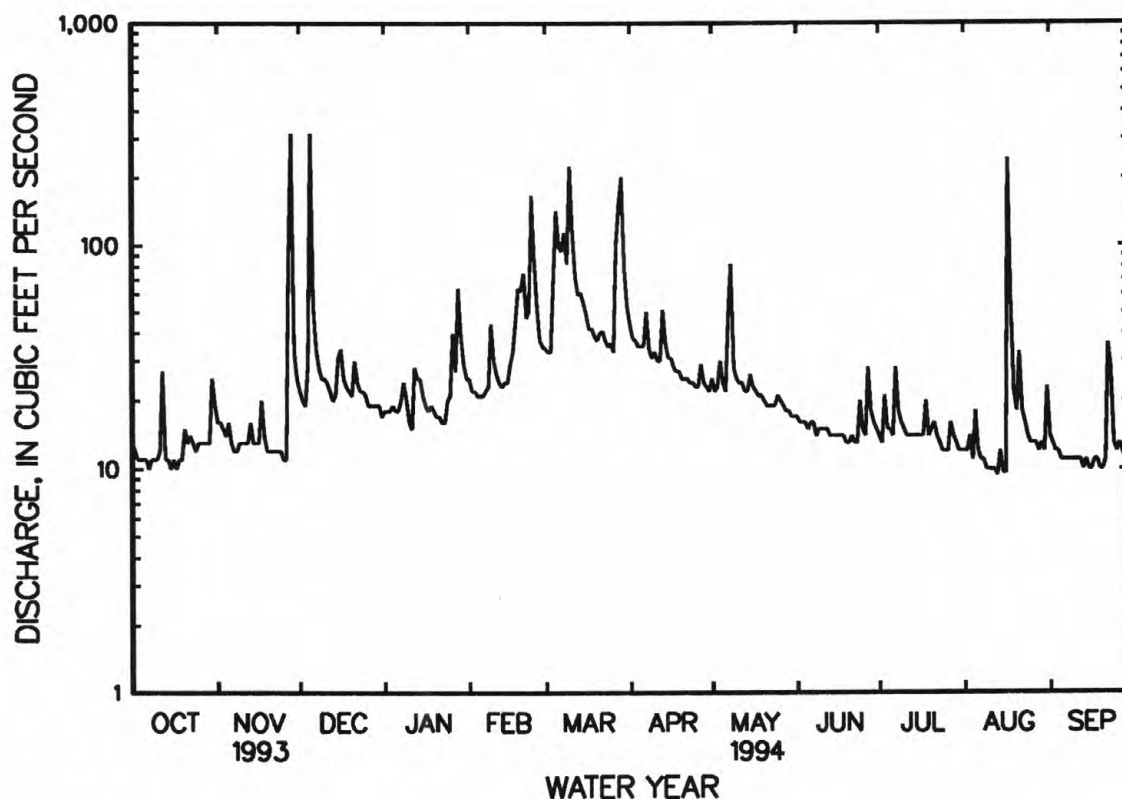
ANNUAL TOTAL	10203.5	10125.6	
ANNUAL MEAN	28.0	27.7	21.5
HIGHEST ANNUAL MEAN			39.3
LOWEST ANNUAL MEAN			9.60
HIGHEST DAILY MEAN	468	Mar 4	590
LOWEST DAILY MEAN	8.1	Sep 2	e4.3
ANNUAL SEVEN-DAY MINIMUM	8.7	Aug 27	5.1
INSTANTANEOUS PEAK FLOW			1280
INSTANTANEOUS PEAK STAGE			6.34
INSTANTANEOUS LOW FLOW			8.5
ANNUAL RUNOFF (CFSM)	1.69		bAug 13
ANNUAL RUNOFF (INCHES)	23.00		1.68
10 PERCENT EXCEEDS	47		22.83
50 PERCENT EXCEEDS	19		47
90 PERCENT EXCEEDS	11		19
			11
			9.4

a Also 1956.

b Also Aug. 14-16, 1994.

c Result of freezeup.

e Estimated.



## POTOMAC RIVER BASIN

01616000 ABRAMS CREEK NEAR WINCHESTER, VA--Continued

DISCHARGE, CUBIC FEET PER SECOND, OCTOBER TO NOVEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	15	---	---	---	---	---	---	---	---	---	---
2	11	12	---	---	---	---	---	---	---	---	---	---
3	10	11	---	---	---	---	---	---	---	---	---	---
4	11	11	---	---	---	---	---	---	---	---	---	---
5	11	10	---	---	---	---	---	---	---	---	---	---
6	11	10	---	---	---	---	---	---	---	---	---	---
7	11	9.9	---	---	---	---	---	---	---	---	---	---
8	10	11	---	---	---	---	---	---	---	---	---	---
9	9.5	11	---	---	---	---	---	---	---	---	---	---
10	9.0	16	---	---	---	---	---	---	---	---	---	---
11	9.2	9.9	---	---	---	---	---	---	---	---	---	---
12	10	9.3	---	---	---	---	---	---	---	---	---	---
13	9.9	9.4	---	---	---	---	---	---	---	---	---	---
14	9.5	e8.8	---	---	---	---	---	---	---	---	---	---
15	8.5	---	---	---	---	---	---	---	---	---	---	---
16	8.6	---	---	---	---	---	---	---	---	---	---	---
17	9.0	---	---	---	---	---	---	---	---	---	---	---
18	9.3	---	---	---	---	---	---	---	---	---	---	---
19	9.6	---	---	---	---	---	---	---	---	---	---	---
20	9.1	---	---	---	---	---	---	---	---	---	---	---
21	11	---	---	---	---	---	---	---	---	---	---	---
22	11	---	---	---	---	---	---	---	---	---	---	---
23	15	---	---	---	---	---	---	---	---	---	---	---
24	12	---	---	---	---	---	---	---	---	---	---	---
25	11	---	---	---	---	---	---	---	---	---	---	---
26	12	---	---	---	---	---	---	---	---	---	---	---
27	12	---	---	---	---	---	---	---	---	---	---	---
28	11	---	---	---	---	---	---	---	---	---	---	---
29	9.9	---	---	---	---	---	---	---	---	---	---	---
30	8.7	---	---	---	---	---	---	---	---	---	---	---
31	9.6	---	---	---	---	---	---	---	---	---	---	---
TOTAL	319.4	---	---	---	---	---	---	---	---	---	---	---
MEAN	10.3	---	---	---	---	---	---	---	---	---	---	---
MAX	15	---	---	---	---	---	---	---	---	---	---	---
MIN	8.5	---	---	---	---	---	---	---	---	---	---	---
CFSM	.62	---	---	---	---	---	---	---	---	---	---	---
IN.	.72	---	---	---	---	---	---	---	---	---	---	---

e Estimated.



## POTOMAC RIVER BASIN

49

01616000 ABRAMS CREEK NEAR WINCHESTER, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1960, 1979 - 1995\*\*

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	17.5	18.5	21.1	19.2	25.3	30.9	30.5	26.4	20.8	17.3	16.6	15.4
MAX	58.1	46.9	61.1	36.3	72.6	75.3	78.9	61.5	48.2	33.4	39.8	42.6
(WY)	1980	1986	1951	1991	1984	1984	1984	1988	1982	1979	1955	1987
MIN	8.32	7.70	7.77	10.5	8.15	11.4	8.98	11.7	8.18	8.01	7.97	7.54
(WY)	1992	1954	1990	1954	a1954	1990	1954	1955	1954	1955	1991	1954

## SUMMARY STATISTICS

WATER YEARS 1950 - 1960,  
1980 - 1995\*\*

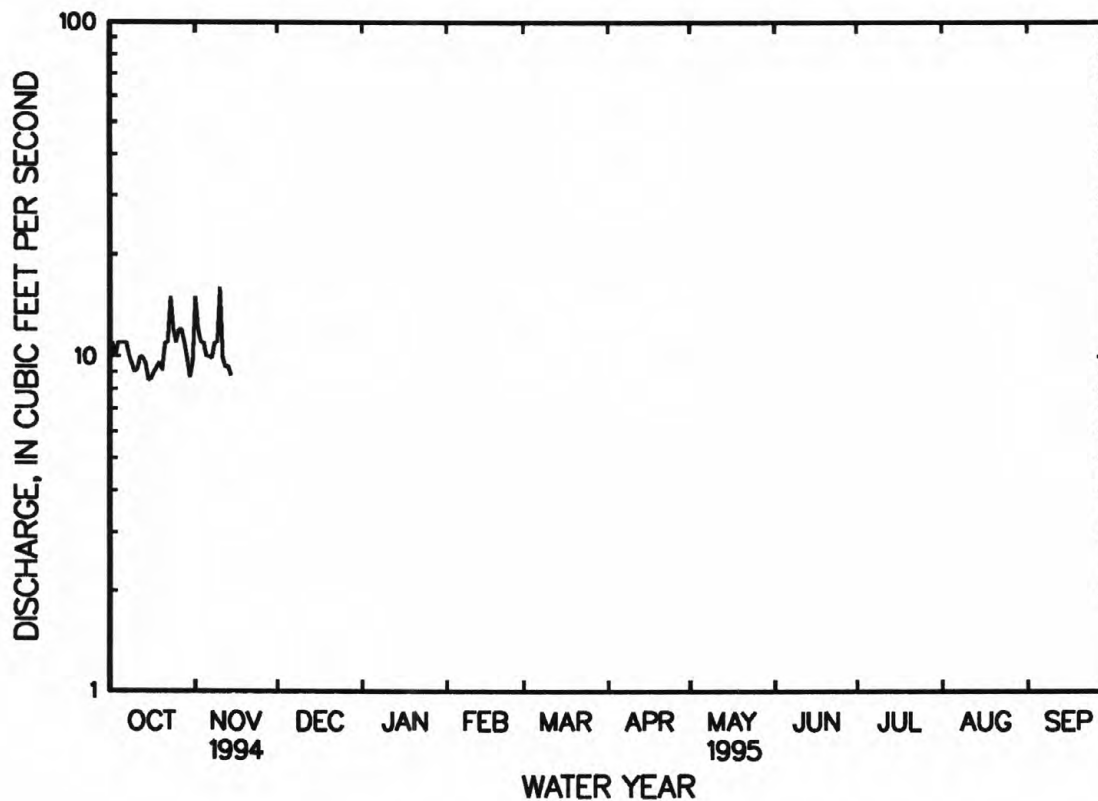
ANNUAL MEAN	21.5	
HIGHEST ANNUAL MEAN	39.3	1984
LOWEST ANNUAL MEAN	9.60	1954
HIGHEST DAILY MEAN	590	Dec 4 1950
LOWEST DAILY MEAN	e4.3	Feb 10 1992
ANNUAL SEVEN-DAY MINIMUM	5.1	Oct 7 1954
INSTANTANEOUS PEAK FLOW	1410	Apr 21 1992
INSTANTANEOUS PEAK STAGE	6.78	Apr 21 1992
INSTANTANEOUS LOW FLOW	b1.3	Feb 10 1992
ANNUAL RUNOFF (CFSM)	1.30	
ANNUAL RUNOFF (INCHES)	17.68	
10 PERCENT EXCEEDS	35	
50 PERCENT EXCEEDS	17	
90 PERCENT EXCEEDS	9.4	

\*\* Partial water year.

a Also 1956.

b Result of freezeup.

e Estimated.



## POTOMAC RIVER BASIN

01620500 NORTH RIVER NEAR STOKESVILLE, VA

LOCATION.--Lat 38°20'15", long 79°14'25", Augusta County, Hydrologic Unit 02070005, George Washington National Forest, on left bank 575 ft upstream from highway bridge, 2.8 mi upstream from city of Staunton dam, 3.8 mi upstream from Broad Run, 5.0 mi west of Stokesville, and 7.8 mi upstream from Skidmore Fork.

DRAINAGE AREA.--17.2 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1946 to current year.

REVISED RECORDS.--WSP 1903: 1960. WSP 2103: Drainage area. WDR VA-89-1: 1949 (M).

GAGE.--Water-stage recorder. Datum of gage is 2,054.57 ft above sea level. Prior to June 10, 1958, at site 575 ft downstream at datum 6.0 ft lower.

REMARKS.--Records fair except those for periods of doubtful or no gage-height record, Nov. 2-26, Feb. 1-7, July 22 to Aug. 2, Aug. 5-11, Aug. 17 to Sept. 16, and periods with ice effect, Dec. 28 to Jan. 4 and Jan. 13-24, which are poor. Maximum discharge, 9,530 ft<sup>3</sup>/s, from rating curve extended above 900 ft<sup>3</sup>/s on basis of computation of peak flow over dam at site 2.8 mi downstream. Maximum gage height, 19.8 ft, from floodmarks, backwater from Elkhorn Lake. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 8.4 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0330	294	4.08	Mar. 10	1830	324	4.15
Dec. 5	1030	465	4.44	Mar. 29	1500	469	4.45
Jan. 29	0100	469	4.45	May 8	0645	572	4.70
Feb. 10	0015	239	3.94	July 21	1730	250	3.97
Feb. 24	1530	542	4.63	Aug. 18	0430	*1,020	*5.46
Mar. 8	1945	357	4.22				

Minimum daily discharge, 1.2 ft<sup>3</sup>/s, Nov. 12, 13, 24, 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	1.8	26	e11	e62	31	73	15	4.6	2.0	e13	e6.0
2	3.8	e1.7	22	e11	e43	28	43	15	4.3	1.9	e12	e5.6
3	3.4	e1.5	19	e12	e31	25	32	14	4.1	1.8	12	e5.2
4	3.1	e1.4	19	e13	e26	25	28	32	3.9	1.8	18	e4.9
5	2.9	e1.5	371	12	e23	33	25	74	3.9	1.6	e14	e4.6
6	2.7	e1.6	227	11	e20	42	23	67	4.0	1.6	e12	e4.1
7	2.5	e1.4	91	12	e18	96	29	85	3.5	1.8	e11	e3.8
8	2.3	e1.4	43	18	17	303	31	512	3.4	1.7	e9.6	e3.5
9	2.2	e1.3	30	23	121	289	31	273	3.3	2.3	e8.8	e3.3
10	2.1	e1.3	25	25	216	276	29	114	3.7	2.8	e8.8	e4.0
11	2.0	e1.3	22	26	137	263	26	65	3.7	2.7	e7.8	e3.0
12	2.1	e1.2	20	87	72	144	24	45	3.4	2.4	7.2	e2.8
13	2.0	e1.2	17	e100	45	79	31	34	3.1	2.2	6.4	e2.6
14	1.9	e1.4	16	e41	33	48	54	28	3.0	2.0	5.9	e2.5
15	1.8	e1.6	15	e23	29	35	50	23	3.0	2.0	5.8	e2.4
16	1.7	e1.4	15	e25	28	33	41	20	3.3	1.8	6.1	e2.3
17	1.7	e1.3	15	e27	28	31	33	17	3.5	1.9	e380	2.1
18	1.7	e2.0	14	e31	29	29	29	15	3.0	2.0	e280	2.0
19	1.7	e1.6	15	e19	32	26	25	13	3.0	2.2	e100	1.9
20	1.8	e1.4	16	e17	41	24	23	12	3.3	7.0	e73	1.8
21	1.9	e1.3	17	e18	66	23	21	10	3.6	87	e54	1.7
22	1.9	e1.3	17	e16	88	28	21	9.0	3.4	e40	e40	1.6
23	1.8	e1.3	16	e14	136	33	19	8.3	3.1	e28	e32	1.5
24	1.7	e1.2	16	e20	441	40	19	7.4	3.0	e20	e25	1.5
25	1.6	e1.2	16	20	358	57	18	7.0	2.8	e16	e20	1.5
26	1.5	e1.3	15	27	168	47	18	7.1	2.6	e11	e15	1.4
27	1.5	17	14	34	79	103	18	6.8	2.5	e9.5	e13	1.4
28	1.4	225	e13	211	44	217	17	6.3	2.4	e30	e12	1.4
29	1.4	82	e12	408	---	402	16	5.7	2.2	e25	e10	1.3
30	1.6	36	e12	201	---	290	16	5.3	2.1	e20	e8.4	1.3
31	1.8	---	e11	93	---	142	---	5.0	---	e16	e7.1	---
TOTAL	65.6	396.9	1197	1606	2431	3242	863	1550.9	98.7	348.0	1227.9	83.0
MEAN	2.12	13.2	38.6	51.8	86.8	105	28.8	50.0	3.29	11.2	39.6	2.77
MAX	4.1	225	371	408	441	402	73	512	4.6	87	380	6.0
MIN	1.4	1.2	11	11	17	23	16	5.0	2.1	1.6	5.8	1.3
CFSM	.12	.77	2.24	3.01	5.05	6.08	1.67	2.91	.19	.65	2.30	.16
IN.	.14	.86	2.59	3.47	5.26	7.01	1.87	3.35	.21	.75	2.66	.18

e Estimated.

POTOMAC RIVER BASIN

51

01620500 NORTH RIVER NEAR STOKESVILLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	14.5	25.6	27.8	30.5	37.2	57.9	49.0	34.0	22.8	6.20	8.87	7.52
MAX	90.7	257	99.5	78.5	88.7	230	196	86.4	177	41.1	66.8	62.4
(WY)	1980	1986	1974	1978	1950	1993	1992	1960	1949	1972	1989	1979
MIN	.21	.41	1.29	.74	4.64	8.21	12.0	5.32	2.37	.87	.26	.25
(WY)	1964	1954	1961	1981	1977	1981	1967	1977	1977	1966	1987	1963

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1947 - 1994

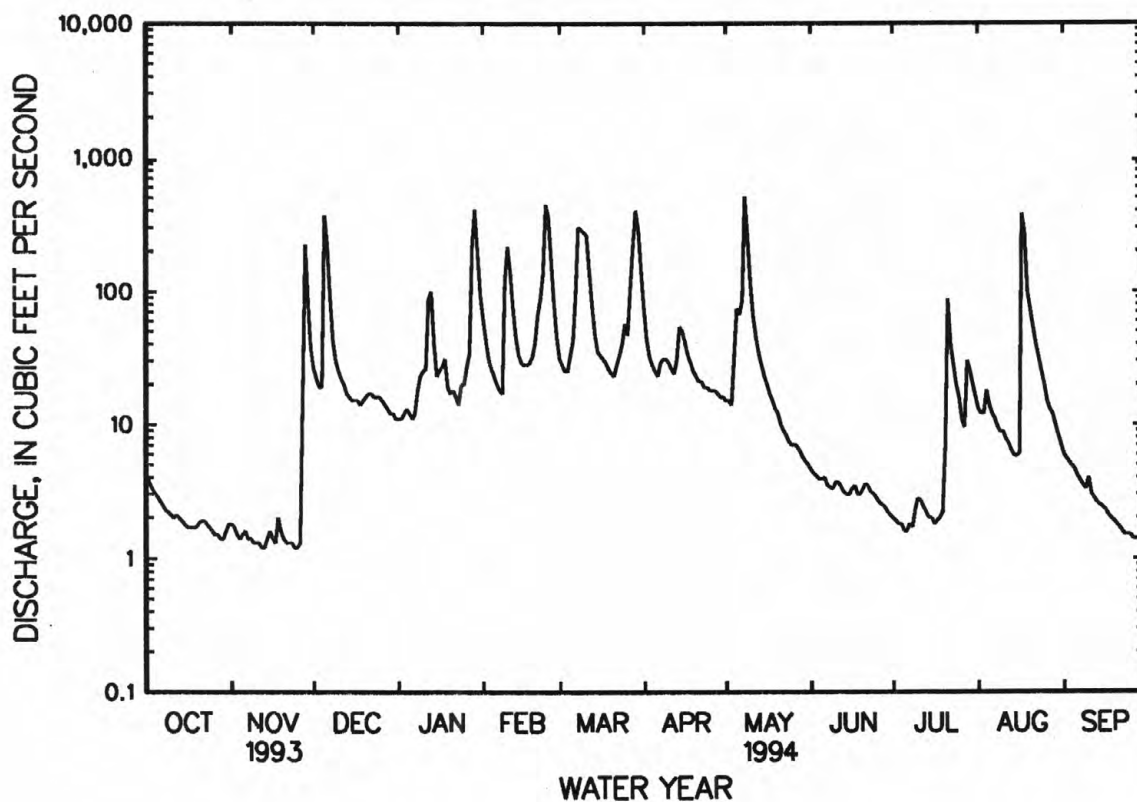
ANNUAL TOTAL	14662.03	13110.0	
ANNUAL MEAN	40.2	35.9	26.7
HIGHEST ANNUAL MEAN			49.0
LOWEST ANNUAL MEAN			10.4
HIGHEST DAILY MEAN	955	Mar 5	512
LOWEST DAILY MEAN	.62	Aug 4	1.2
ANNUAL SEVEN-DAY MINIMUM	.67	Jul 30	1.3
INSTANTANEOUS PEAK FLOW			1020
INSTANTANEOUS PEAK STAGE			5.46
INSTANTANEOUS LOW FLOW			(d)
ANNUAL RUNOFF (CFSM)	2.34	2.09	1.56
ANNUAL RUNOFF (INCHES)	31.71	28.35	21.13
10 PERCENT EXCEEDS	82	86	60
50 PERCENT EXCEEDS	10	14	12
90 PERCENT EXCEEDS	1.0	1.6	1.1

a Also Nov. 13, 24, 25, 1993.

b Also Sept. 16, 19-22, 1962, and Sept. 7-13, 1966.

c From floodmarks, backwater from Elkhorn Lake.

d Unknown.



## POTOMAC RIVER BASIN

01621050 MUDDY CREEK AT MOUNT CLINTON, VA

LOCATION.--Lat 38°29'12", long 78°57'40", Rockingham County, Hydrologic Unit 02070005, on right downstream side of bridge on State Highway 726, at Mount Clinton.

DRAINAGE AREA.--14.2 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1993 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,320 ft above sea level, from topographic map.

REMARKS.--Records fair except those for periods with ice effect, Dec. 27-31 and Jan. 16-22, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 282 ft<sup>3</sup>/s, Jan. 28, gage height, 5.96 ft; minimum, 1.4 ft<sup>3</sup>/s, Oct. 21, 22-24, 26, and Sept. 26; minimum gage height, 2.56 ft, July 9, 12, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	3.2	6.2	3.6	14	24	34	12	9.0	4.7	4.5	5.6
2	2.0	2.4	5.3	3.8	12	21	29	10	8.3	4.4	4.5	5.2
3	1.8	2.3	4.6	3.8	11	23	26	9.8	8.0	4.6	22	5.2
4	1.8	2.1	5.8	4.2	10	32	24	20	7.9	4.3	12	5.1
5	1.8	2.4	55	3.6	10	63	23	16	7.8	4.1	9.1	4.9
6	1.8	2.9	20	3.3	9.8	61	23	13	7.8	3.7	7.3	4.9
7	1.8	2.1	15	4.3	9.4	72	28	23	7.5	4.3	6.6	4.5
8	1.8	1.9	14	7.7	9.6	67	21	55	11	3.7	6.2	4.3
9	1.8	1.9	12	7.1	49	61	20	28	8.3	3.4	6.3	4.2
10	2.0	1.9	12	5.4	23	93	19	23	7.6	4.3	6.0	4.5
11	2.0	1.8	11	5.1	20	55	18	20	7.5	3.3	5.9	4.2
12	3.2	1.8	9.6	20	18	42	18	18	7.1	3.2	9.9	4.0
13	2.4	2.7	9.0	12	17	36	23	16	6.8	4.4	6.3	3.8
14	2.3	4.3	8.7	10	17	33	19	15	6.4	5.1	5.8	3.6
15	2.2	2.5	9.3	8.3	17	30	21	15	6.4	6.0	5.6	3.6
16	2.0	2.0	11	e6.2	22	30	30	15	6.6	4.7	5.8	3.5
17	2.3	2.2	8.7	e6.0	28	29	22	14	6.5	6.4	60	3.6
18	2.4	3.4	8.0	e6.2	41	29	20	13	6.3	6.3	31	3.5
19	2.3	2.0	7.6	e5.7	42	25	19	13	6.5	4.9	18	3.3
20	3.0	1.9	7.2	e5.5	29	23	17	13	6.4	5.0	16	3.1
21	1.7	1.6	7.9	e5.2	27	25	16	12	5.9	9.2	12	3.1
22	1.6	1.5	6.6	e5.1	24	25	18	12	5.7	7.2	11	3.5
23	1.4	1.5	6.3	6.0	82	20	15	11	5.6	6.3	9.8	3.9
24	1.4	1.5	5.8	51	86	19	14	11	5.5	5.5	8.9	3.5
25	1.5	1.5	5.6	26	49	19	13	11	5.2	5.8	8.5	3.3
26	1.5	1.8	6.5	31	36	17	12	11	5.0	6.0	8.1	3.4
27	1.6	13	e4.6	14	29	32	12	11	6.3	5.7	7.3	3.3
28	1.5	32	e4.4	123	26	40	11	10	5.4	5.6	6.9	3.1
29	1.5	11	e4.0	42	---	99	16	9.8	5.0	5.1	6.4	3.0
30	3.6	7.9	e4.1	25	---	50	14	9.4	5.0	4.8	6.5	3.0
31	4.3	---	e3.6	18	---	39	---	9.1	---	4.6	5.9	---
TOTAL	64.3	121.0	299.4	478.1	767.8	1234	595	479.1	204.3	156.6	340.1	117.7
MEAN	2.07	4.03	9.66	15.4	27.4	39.8	19.8	15.5	6.81	5.05	11.0	3.92
MAX	4.3	32	55	123	86	99	34	55	11	9.2	60	5.6
MIN	1.4	1.5	3.6	3.3	9.4	17	11	9.1	5.0	3.2	4.5	3.0
CFSM	.15	.28	.68	1.09	1.93	2.80	1.40	1.09	.48	.36	.77	.28
IN.	.17	.32	.78	1.25	2.01	3.23	1.56	1.26	.54	.41	.89	.31

e Estimated.



POTOMAC RIVER BASIN

53

01621050 MUDDY CREEK AT MOUNT CLINTON, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2.07	4.03	9.66	15.4	27.4	39.8	19.8	13.0	6.14	4.10	6.36	2.89
MAX	2.07	4.03	9.66	15.4	27.4	39.8	19.8	15.5	6.81	5.05	11.0	3.92
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	2.07	4.03	9.66	15.4	27.4	39.8	19.8	10.6	5.48	3.16	1.75	1.85
(WY)	1994	1994	1994	1994	1994	1994	1994	1993	1993	1993	1993	1993

SUMMARY STATISTICS

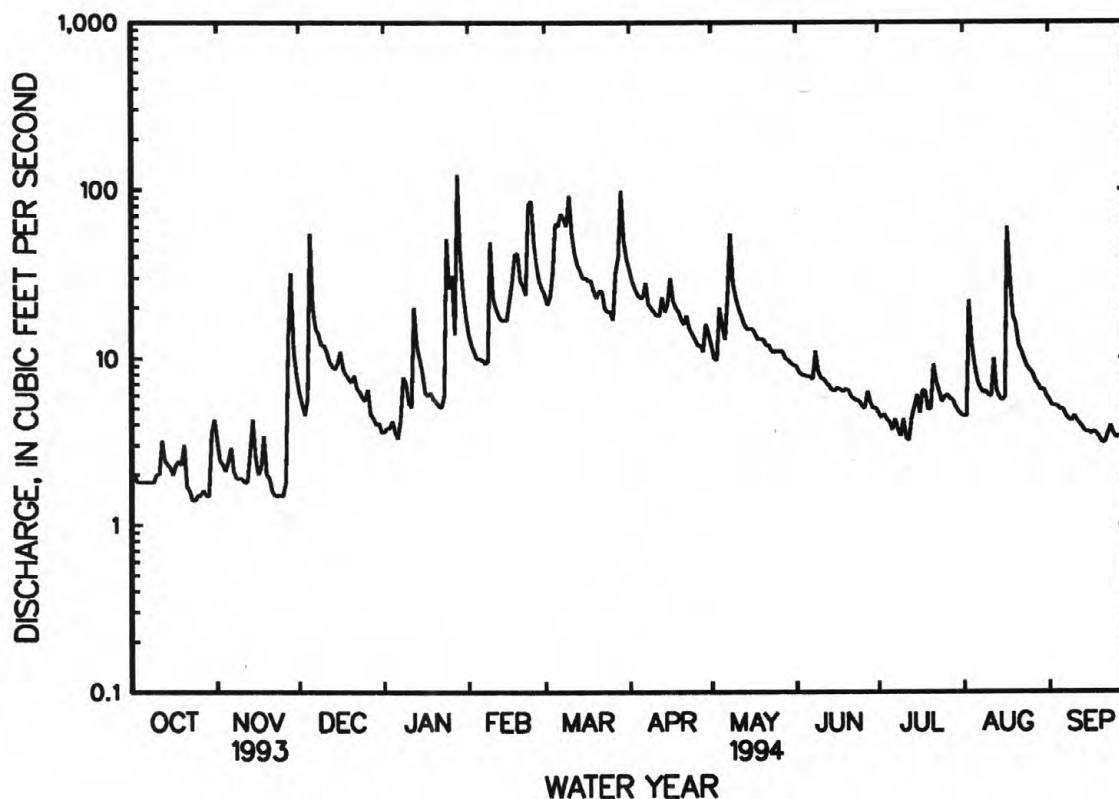
FOR 1994 WATER YEAR

WATER YEARS 1993 - 1994

ANNUAL TOTAL	4857.4	
ANNUAL MEAN	13.3	13.3
HIGHEST ANNUAL MEAN		13.3
LOWEST ANNUAL MEAN		13.3
HIGHEST DAILY MEAN	123	123
LOWEST DAILY MEAN	1.4	1.1
ANNUAL SEVEN-DAY MINIMUM	1.5	1.4
INSTANTANEOUS PEAK FLOW	282	282
INSTANTANEOUS PEAK STAGE	5.96	5.96
INSTANTANEOUS LOW FLOW	1.4	.93
ANNUAL RUNOFF (CFSM)	.94	.94
ANNUAL RUNOFF (INCHES)	12.72	12.72
10 PERCENT EXCEEDS	29	25
50 PERCENT EXCEEDS	7.2	6.2
90 PERCENT EXCEEDS	2.1	1.7

a Also Oct. 24, 1993.

b Also Oct. 22-24, 26, 1993, and Sept. 26, 1994.



## POTOMAC RIVER BASIN

01621050 MUDDY CREEK AT MOUNT CLINTON, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--March 1993 to current year.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT											
07...	1100	1.8	440	7.7	10.5	18.5	733	10.1	94	230	56
NOV											
04...	0945	4.7	450	7.7	5.0	6.0	730	11.5	94	250	60
17...	2200	6.9	437	7.6	13.0	18.0	725	5.9	59	240	58
DEC											
06...	1000	18	420	7.9	6.0	4.0	743	11.0	91	--	--
JAN											
03...	1000	7.9	442	7.4	3.0	2.0	736	11.0	85	240	60
12...	0800	19	416	7.4	2.0	-0.5	738	10.9	81	180	43
FEB											
01...	1000	14	388	7.9	3.5	-4.0	740	12.0	93	200	50
23...	1445	96	238	7.3	4.5	4.0	723	11.8	96	--	--
MAR											
11...	1100	51	249	7.5	3.5	9.5	739	10.2	79	--	--
28...	0900	44	413	7.9	7.5	10.5	735	8.2	71	160	39
MAY											
03...	0845	9.5	434	7.6	8.5	12.5	739	10.0	88	210	54
JUN											
07...	0830	7.5	435	7.9	20.0	25.5	723	8.9	103	220	54
JUL											
14...	1030	4.1	418	8.0	24.0	29.0	726	10.4	130	210	49
AUG											
02...	1205	3.8	444	7.9	22.5	30.0	729	11.4	138	240	57
SEP											
13...	1100	4.1	464	7.9	14.0	20.0	738	7.2	72	240	59

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
OCT											
07...	23	3.1	3.7	185	226	--	9.4	6.7	0.20	4.6	257
NOV											
04...	24	3.2	3.9	179	218	--	10	17	0.20	5.5	281
17...	23	4.0	7.2	212	259	--	10	8.1	0.10	4.0	259
DEC											
06...	--	--	--	136	166	--	--	--	--	--	--
JAN											
03...	22	3.6	2.0	163	199	--	13	8.9	<0.10	3.0	269
12...	17	6.5	22	168	205	--	15	14	<0.10	4.3	290
FEB											
01...	18	3.8	3.5	154	188	0	14	8.8	<0.10	6.6	244
23...	--	--	--	70	85	--	--	--	--	--	--
MAR											
11...	--	--	--	70	85	--	--	--	--	--	--
28...	14	3.8	6.0	143	174	--	12	7.4	<0.10	5.0	195
MAY											
03...	19	3.3	2.5	162	198	--	11	7.9	<0.10	4.8	244
JUN											
07...	21	3.2	3.0	198	242	--	9.9	7.7	<0.10	5.8	254
JUL											
14...	21	3.3	6.7	189	231	--	10	8.4	0.10	5.9	252
AUG											
02...	24	3.8	3.5	206	251	--	9.6	7.8	0.10	3.9	271
SEP											
13...	23	3.5	3.2	203	248	--	10	7.8	0.10	4.0	272

< Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

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01621050 MUDDY CREEK AT MOUNT CLINTON, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT 07...	16	0.030	3.60	3.60	0.030	0.30	0.20	0.070	0.050	0.060	10
NOV 04...	17	0.030	3.80	3.80	0.060	0.40	0.30	0.080	0.060	0.050	15
17...	14	0.140	3.20	3.20	0.210	1.6	0.70	0.300	0.080	0.090	43
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	29	0.020	6.60	6.60	0.020	0.30	0.30	0.020	0.030	0.020	7
12...	19	0.060	4.40	4.40	3.80	13	9.0	2.50	1.00	0.910	160
FEB 01...	34	0.030	7.70	7.70	0.080	0.40	0.30	0.080	0.080	0.060	5
23...	--	--	--	--	--	--	--	--	--	--	--
MAR 11...	28	0.020	6.30	6.30	0.080	0.60	0.40	0.210	0.140	0.140	--
28...	17	0.030	3.90	3.90	0.370	1.8	1.3	0.470	0.260	0.260	29
MAY 03...	25	0.050	5.70	5.70	0.060	0.30	0.20	0.050	0.050	0.030	37
JUN 07...	24	0.110	5.50	5.50	0.060	0.40	0.40	0.060	0.040	0.040	27
JUL 14...	14	0.130	3.30	3.30	0.080	0.70	0.50	0.170	0.110	0.090	49
AUG 02...	--	--	--	--	--	--	--	--	--	--	40
SEP 13...	24	0.050	5.40	5.40	0.030	0.30	0.30	0.050	0.050	0.050	31

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,4-D, DIS- SOLVED (UG/L) (39732)	2,4,5-T DIS- SOLVED (UG/L) (39742)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)
OCT 07...	29	3.1	0.2	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
NOV 04...	26	2.3	0.6	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
17...	91	4.4	3.4	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	20	2.9	0.5	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
12...	70	160	>9.4	--	--	--	--	--	<0.05	<0.05	--
FEB 01...	19	30	0.8	--	--	--	--	--	<0.05	<0.05	--
23...	--	--	--	--	--	--	--	--	--	--	--
MAR 11...	--	9.8	0.8	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
28...	30	6.7	2.2	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
MAY 03...	32	1.9	0.3	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
JUN 07...	25	1.8	0.4	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
JUL 14...	78	4.0	--	--	--	--	--	--	--	--	--
AUG 02...	39	2.2	0.5	--	--	--	--	--	--	--	--
SEP 13...	15	2.9	0.3	--	--	--	--	--	--	--	--

&gt; Actual value is known to be greater than the value shown.

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01621050 MUDDY CREEK AT MOUNT CLINTON, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	BRO- MACIL, WATER, DISS, REC (UG/L) (04029)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)
OCT 07...	<0.01	<0.01	0.07	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
NOV 04...	<0.01	<0.01	0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
NOV 17...	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	<0.01	<0.01	0.07	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
JAN 12...	--	--	--	--	--	<0.05	--	--	--	--	--
FEB 01...	--	--	--	--	--	<0.05	--	--	--	--	--
FEB 23...	--	--	--	--	--	--	--	--	--	--	--
MAR 11...	<0.01	<0.01	0.05	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
MAR 28...	<0.01	<0.01	0.04	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
MAY 03...	<0.01	<0.01	0.15	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.00
JUN 07...	<0.01	<0.01	0.16	<0.01	<0.01	--	<0.05	<0.01	<0.00	<0.01	<0.00
JUL 14...	--	--	--	--	--	--	--	--	--	--	--
AUG 02...	--	--	--	--	--	--	--	--	--	--	--
SEP 13...	--	--	--	--	--	--	--	--	--	--	--

DATE	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)
OCT 07...	<0.01	0.05	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
NOV 04...	<0.01	0.03	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
NOV 17...	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	<0.01	0.07	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
JAN 12...	--	--	--	--	--	--	--	--	--	--	--
FEB 01...	--	--	--	--	--	--	--	--	--	--	--
FEB 23...	--	--	--	--	--	--	--	--	--	--	--
MAR 11...	<0.01	0.03	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
MAR 28...	<0.01	0.03	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
MAY 03...	<0.01	0.07	<0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
JUN 07...	<0.01	0.07	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
JUL 14...	--	--	--	--	--	--	--	--	--	--	--
AUG 02...	--	--	--	--	--	--	--	--	--	--	--
SEP 13...	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.



## POTOMAC RIVER BASIN

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01621050 MUDDY CREEK AT MOUNT CLINTON, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)
OCT 07...	<0.04	<0.03	0.00	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.01
NOV 04...	<0.04	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01
NOV 17...	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	<0.04	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01
JAN 12...	--	--	--	--	--	--	--	--	--	--	--
FEB 01...	--	--	--	--	--	--	--	--	--	--	--
FEB 23...	--	--	--	--	--	--	--	--	--	--	--
MAR 11...	<0.04	<0.03	0.01	0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01
MAR 28...	<0.04	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01
MAY 03...	<0.05	<0.03	0.11	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01
JUN 07...	<0.04	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01
JUL 14...	--	--	--	--	--	--	--	--	--	--	--
AUG 02...	--	--	--	--	--	--	--	--	--	--	--
SEP 13...	--	--	--	--	--	--	--	--	--	--	--

DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SILVEX, DIS- SOLVED (UG/L) (39762)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
OCT 07...	<0.01	<0.02	<0.01	<0.02	<0.05	0.02	0.00	<0.01	<0.01	<0.01
NOV 04...	<0.01	<0.02	<0.01	<0.02	<0.05	<0.01	<0.02	<0.01	<0.01	<0.01
NOV 17...	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--
JAN 03...	<0.01	<0.02	<0.01	<0.02	<0.05	0.02	<0.05	<0.01	<0.01	<0.01
JAN 12...	--	--	--	--	<0.05	--	--	--	--	--
FEB 01...	--	--	--	--	<0.05	--	--	--	--	--
FEB 23...	--	--	--	--	--	--	--	--	--	--
MAR 11...	<0.01	<0.02	<0.01	<0.02	<0.05	0.02	<0.02	<0.01	<0.01	<0.01
MAR 28...	<0.01	<0.02	<0.01	<0.02	<0.05	0.01	<0.02	<0.01	<0.01	<0.01
MAY 03...	<0.01	<0.02	<0.01	<0.02	<0.05	0.13	<0.02	<0.01	<0.01	<0.01
JUN 07...	<0.01	<0.02	<0.01	<0.02	--	0.07	<0.02	<0.01	<0.01	<0.01
JUL 14...	--	--	--	--	--	--	--	--	--	--
AUG 02...	--	--	--	--	--	--	--	--	--	--
SEP 13...	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01622000 NORTH RIVER NEAR BURKETOWN, VA

LOCATION.--Lat 38°20'25", long 78°54'50", Rockingham County, Hydrologic Unit 02070005, on right bank 0.8 mi downstream from Pleasant Run, 2.8 mi northeast of Burkettown, and 8.5 mi upstream from Middle River.  
DRAINAGE AREA.--379 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1925 to October 1972, May 1975 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 1171: 1936(M). WSP 1302: 1928-29(M), 1932-34(M), 1937-38(M). WSP 2103: Drainage area. GAGE.--Water-stage recorder. Datum of gage is 1,103.49 ft above sea level. Prior to Dec. 12, 1938, nonrecording gage at site 3.0 mi downstream at different datum.

REMARKS.--Records good except those for periods with ice effect, Jan. 9-11, 19, 23, and period of no gage-height record, Jan. 20-22, which are fair. At a point 26.8 mi upstream from station, there is an aqueduct tunnel diversion of about 2.7 ft<sup>3</sup>/s from Staunton Dam Reservoir by city of Staunton for industrial and municipal use. Some diurnal fluctuation caused by discharge from wastewater treatment plant about 0.9 mi upstream from station and diversion during low flow by irrigation at points upstream. Maximum discharge, 65,000 ft<sup>3</sup>/s, from rating curve extended above 16,000 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 32.4 ft and 36.3 ft and contracted-opening measurements at gage heights 35.85 ft and 36.3 ft. Minimum discharge, 16 ft<sup>3</sup>/s, result of temporary dam upstream.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1852, that of June 18, 1949.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0630	3,010	7.04	Mar. 10	1800	3,480	7.62
Dec. 5	1030	3,590	7.76	Mar. 29	1130	5,340	9.73
Jan. 28	2000	5,790	10.23	May 8	0930	3,850	8.08
Feb. 23	1400	4,490	8.79	Aug. 17	2230	*6,390	*10.89
Feb. 24	1300	3,710	7.91	Aug. 20	0130	4,430	8.72

Minimum discharge, 62 ft<sup>3</sup>/s, Oct. 18, Nov. 13, result of regulation; minimum daily, 69 ft<sup>3</sup>/s, Oct. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	102	100	642	177	1170	988	1750	354	174	107	499	190
2	96	85	441	171	903	899	1350	329	167	97	394	182
3	93	83	337	173	732	816	1080	312	163	125	365	170
4	93	80	313	184	611	821	900	510	157	127	454	166
5	88	81	2640	180	532	1650	774	764	158	96	292	160
6	86	86	1990	169	478	1790	711	932	155	151	257	153
7	84	78	1340	178	435	2060	803	1010	153	148	226	145
8	83	78	984	237	402	2690	712	3260	177	107	206	140
9	82	73	734	e232	1080	2730	701	2480	162	107	188	141
10	79	74	575	e225	1580	3280	689	1650	155	106	172	141
11	79	73	469	e220	1440	2870	648	1210	158	104	160	147
12	99	72	392	617	1130	2130	611	925	147	92	162	134
13	86	71	345	986	913	1670	644	729	141	83	287	127
14	81	76	312	946	794	1350	761	599	132	91	243	122
15	78	80	303	775	729	1130	820	493	127	112	210	122
16	77	77	318	622	783	984	1010	428	139	115	197	123
17	76	81	290	624	875	876	831	377	143	109	1730	117
18	77	115	281	736	938	804	737	348	135	132	3910	119
19	75	84	277	e441	1010	730	658	323	128	117	2310	114
20	107	83	271	e394	1060	648	585	301	157	152	2430	106
21	83	77	289	e379	1160	607	528	286	126	235	1300	103
22	89	78	270	e356	1170	622	548	268	123	738	864	104
23	76	76	253	e407	2930	646	490	252	115	515	588	115
24	73	74	243	764	3310	680	452	233	114	345	427	107
25	76	77	234	629	2910	741	425	229	112	290	354	99
26	75	74	221	733	2100	745	400	225	110	309	318	104
27	71	220	212	775	1550	1080	403	220	157	263	283	100
28	69	2070	207	2880	1220	2230	381	206	126	288	257	96
29	70	1310	205	3070	---	4410	371	198	111	372	237	98
30	94	911	191	2070	---	3260	384	189	106	752	214	92
31	104	---	182	1520	---	2260	---	178	---	667	200	---
TOTAL	2601	6597	15761	21870	33945	48197	21157	19818	4228	7052	19734	3837
MEAN	83.9	220	508	705	1212	1555	705	639	141	227	637	128
MAX	107	2070	2640	3070	3310	4410	1750	3260	177	752	3910	190
MIN	69	71	182	169	402	607	371	178	106	83	160	92
CFSM	.22	.58	1.34	1.86	3.20	4.10	1.86	1.69	.37	.60	1.68	.34
IN.	.26	.65	1.55	2.15	3.33	4.73	2.08	1.95	.41	.69	1.94	.38

e Estimated.

POTOMAC RIVER BASIN

59

01622000 NORTH RIVER NEAR BURKETOWN, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1926 - 1972, 1976 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	251	280	330	408	515	708	624	491	318	195	239	188
MAX	1500	2080	1087	1337	1256	1932	1831	1486	1704	809	1102	1057
(WY)	1943	1986	1935	1937	1939	1936	1987	1942	1949	1949	1949	1979
MIN	38.1	36.5	39.2	53.5	47.9	136	107	106	72.7	48.6	41.0	34.2
(WY)	1931	1931	1966	1966	1931	1981	1981	1930	1977	1977	1964	1930

SUMMARY STATISTICS

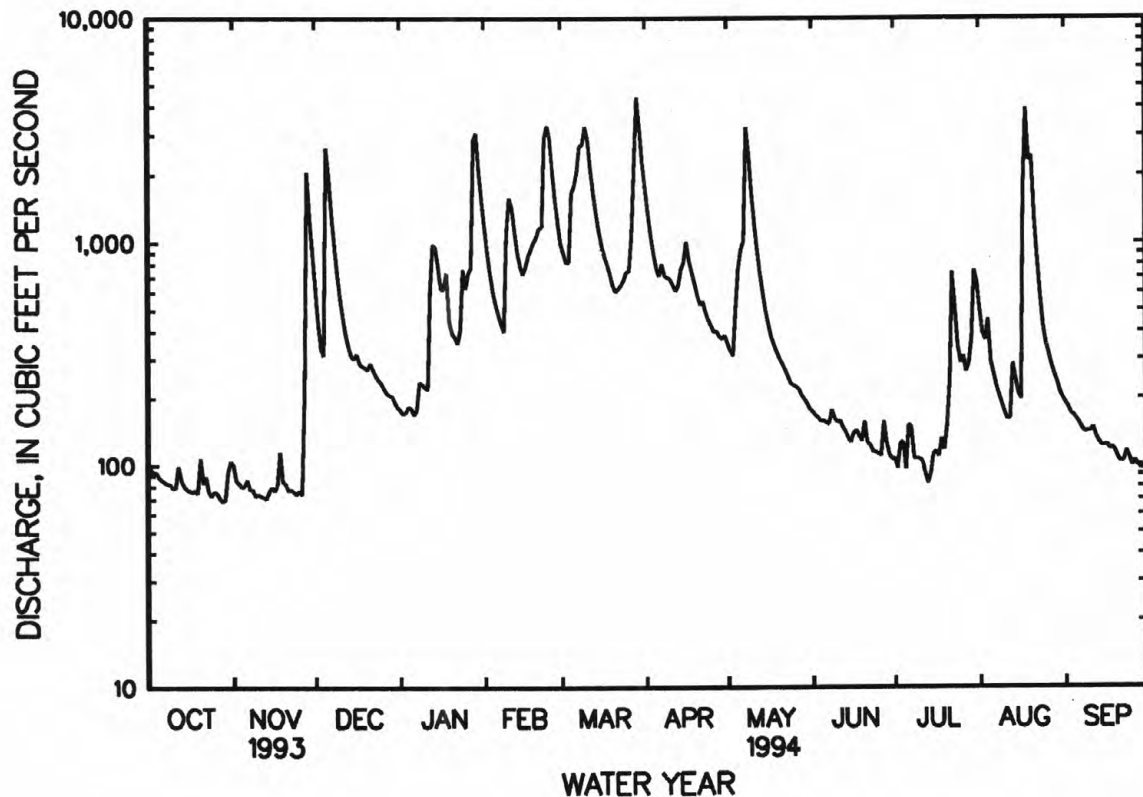
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1926 - 1972,  
1976 - 1994

ANNUAL TOTAL	173068		204797									
ANNUAL MEAN	474		561							376		
HIGHEST ANNUAL MEAN										820		1949
LOWEST ANNUAL MEAN										168		1956
HIGHEST DAILY MEAN	5420	Mar 4	4410	Mar 29					e30000	Nov 5	1985	
LOWEST DAILY MEAN	63	Aug 25	69	Oct 28					22	Sep 24	1930	
ANNUAL SEVEN-DAY MINIMUM	68	Aug 21	73	Oct 23					30	Dec 20	1930	
INSTANTANEOUS PEAK FLOW			6390	Aug 17					65000	Nov 5	1985	
INSTANTANEOUS PEAK STAGE			10.89	Aug 17					a36.30	Jun 18	1949	
INSTANTANEOUS LOW FLOW			b62	cOct 18					d16	Nov 23	1965	
ANNUAL RUNOFF (CFSM)	1.25		1.48						.99			
ANNUAL RUNOFF (INCHES)	16.99		20.10						13.47			
10 PERCENT EXCEEDS	1060		1350						808			
50 PERCENT EXCEEDS	216		263						202			
90 PERCENT EXCEEDS	76		83						64			

- a From floodmarks; peak discharge, 62,600 ft<sup>3</sup>/s.
- b Result of regulation.
- c Also Nov. 13, 1993.
- d Result of temporary dam upstream.
- e Estimated.



## POTOMAC RIVER BASIN

01622000 NORTH RIVER NEAR BURKETOWN, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, JUNE 1994

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	
JUN 06...	0830	365	7.8	20.5	25.5	732	8.4	97	150	183	17	0.030	
DATE		NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	
JUN 06...	3.90	3.90	0.050	0.30	0.20	0.120	0.110	0.110	<0.02	<0.01	<0.01	<0.03	
DATE		TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,4-D, DIS- SOLVED (UG/L) (39732)	2,4,5-T DIS- SOLVED (UG/L) (39742)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	BRO- MACIL, WATER, DISS, REC (UG/L) (04029)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)
JUN 06...	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	0.09	<0.01	<0.01	<0.05	0.02	<0.01	

< Actual value is known to be less than the value shown.



## POTOMAC RIVER BASIN

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01622000 NORTH RIVER NEAR BURKETOWN, VA--Continued

## WATER QUALITY DATA, JUNE 1994

DATE	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
JUN 06...	<0.00	<0.01	<0.00	<0.01	0.04	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	FEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
JUN 06...	<0.04	<0.01	<0.04	<0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02
DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SILVEX, DIS- SOLVED (UG/L) (39762)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	
JUN 06...	0.02	<0.01	<0.02	<0.01	<0.02	<0.05	0.04	<0.02	<0.01	<0.01	<0.01	

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01624800 CHRISTIANS CREEK NEAR FISHERSVILLE, VA

LOCATION.--Lat 38°07'42", long 78°59'41", Augusta County, Hydrologic Unit 02070005, on right bank at upstream side of bridge on State Highway 794, 2.2 mi northwest of Fishersville, and 12 mi upstream from mouth.

DRAINAGE AREA.--70.1 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,230 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods with ice effect, Dec. 26 to Jan. 1 and Jan. 4, 5, 24, and period of no gage-height record, Jan. 15-23, which are fair. Some diurnal fluctuation caused by discharge of about 1.8 ft<sup>3</sup>/s from wastewater treatment plants upstream from station. Most of the water discharged from treatment plants was diverted from another drainage basin for municipal supply. Maximum discharge, 4,520 ft<sup>3</sup>/s, from rating curve extended above 2,400 ft<sup>3</sup>/s. Minimum discharge, 3.8 ft<sup>3</sup>/s, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 28	1700	1,650	7.27	Mar. 8	1800	1,040	5.38
Feb. 23	1230	*1,960	*8.17	Mar. 10	1230	1,030	5.35
Mar. 7	1800	1,480	6.77	Mar. 29	0830	1,810	7.72

Minimum discharge, 7.7 ft<sup>3</sup>/s, Dec. 26, result of freezeup; minimum daily, 15 ft<sup>3</sup>/s, Oct. 3-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	31	25	e23	87	123	248	61	35	24	35	23
2	16	25	24	24	75	125	200	57	34	24	38	22
3	15	24	23	25	67	120	173	57	34	24	38	21
4	15	23	30	e27	62	158	157	89	34	27	32	21
5	15	24	251	e25	61	412	143	81	33	24	37	21
6	15	25	81	27	58	422	138	68	32	24	38	20
7	15	23	54	42	54	747	137	69	32	29	31	20
8	15	24	43	102	54	935	120	78	31	23	30	19
9	16	29	37	62	139	593	112	65	31	23	28	19
10	18	25	34	51	117	836	108	60	33	28	27	21
11	18	26	32	45	114	417	103	57	34	24	27	20
12	23	22	28	202	86	279	102	53	31	23	28	20
13	20	22	28	140	78	230	129	53	30	22	27	19
14	19	22	27	107	81	199	115	51	28	24	28	19
15	18	22	32	e65	91	175	99	51	28	23	29	19
16	18	22	49	e94	114	154	93	53	52	23	35	19
17	19	25	38	e194	139	138	86	48	42	30	166	19
18	19	32	34	e233	194	135	83	48	31	32	89	23
19	19	23	32	e60	230	125	79	47	28	24	46	20
20	21	21	29	e57	203	115	76	47	28	22	37	19
21	21	20	32	e54	178	119	74	46	27	25	35	19
22	21	20	29	e51	150	116	84	43	27	29	33	19
23	21	20	29	e60	992	103	75	42	27	25	28	20
24	21	19	27	e137	412	98	70	41	27	23	26	19
25	21	19	26	94	241	104	68	40	29	30	25	19
26	21	19	e23	86	178	94	66	40	26	71	27	21
27	22	59	e23	72	147	284	68	40	34	58	26	20
28	22	117	e23	612	131	618	65	38	31	61	25	19
29	22	39	e23	208	---	1160	63	37	26	40	24	19
30	30	29	e22	124	---	420	62	36	26	37	23	18
31	36	---	e22	100	---	290	---	36	---	33	22	---
TOTAL	608	851	1210	3203	4533	9844	3196	1632	941	929	1140	597
MEAN	19.6	28.4	39.0	103	162	318	107	52.6	31.4	30.0	36.8	19.9
MAX	36	117	251	612	992	1160	248	89	52	71	166	23
MIN	15	19	22	23	54	94	62	36	26	22	22	18
CFSM	.28	.40	.56	1.47	2.31	4.53	1.52	.75	.45	.43	.52	.28
IN.	.32	.45	.64	1.70	2.41	5.22	1.70	.87	.50	.49	.60	.32

e Estimated.

POTOMAC RIVER BASIN

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01624800 CHRISTIANS CREEK NEAR FISHERSVILLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	60.0	61.0	69.3	83.7	101	131	106	75.3	57.1	41.8	40.2	40.5
MAX	238	400	205	173	211	359	409	259	227	180	128	147
(WY)	1980	1986	1973	1978	1984	1993	1987	1989	1972	1972	1984	1989
MIN	14.3	16.4	16.7	14.9	28.8	20.3	16.2	16.4	17.5	15.0	13.0	12.4
(WY)	1969	1982	1969	1981	1969	1981	1981	1981	1969	1977	1977	1968

SUMMARY STATISTICS

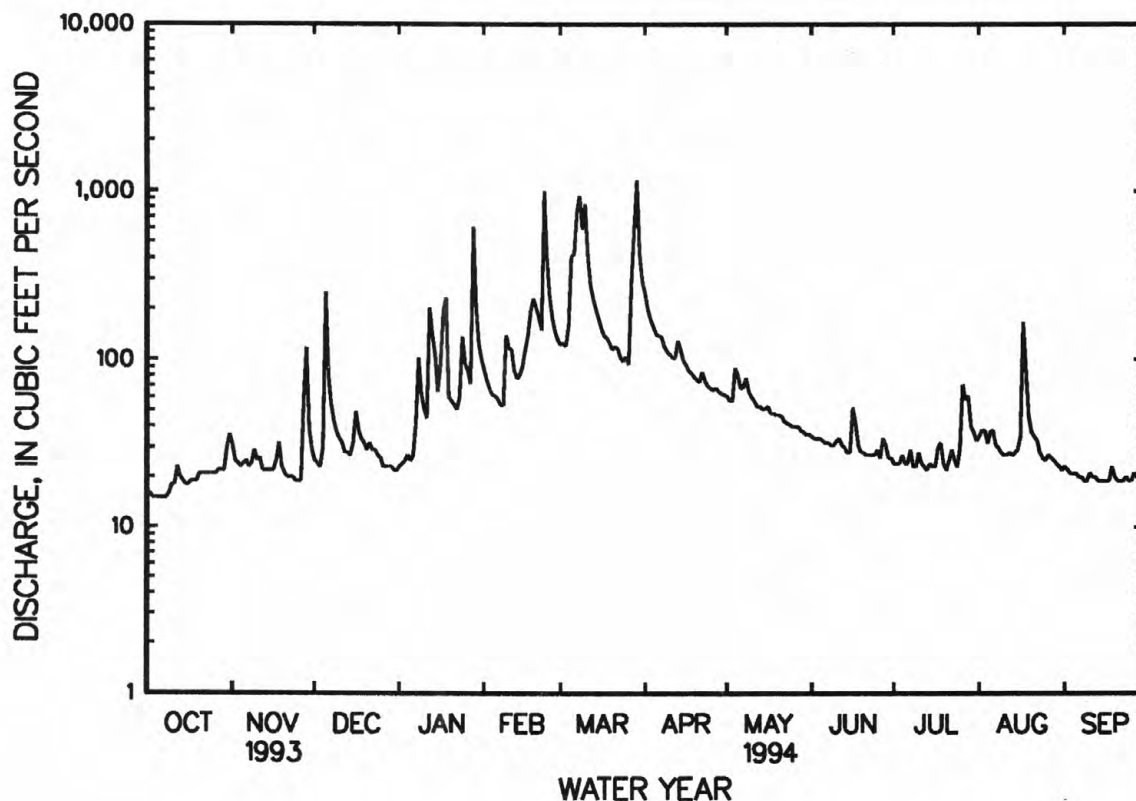
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1968 - 1994

ANNUAL TOTAL	29719	28684	
ANNUAL MEAN	81.4	78.6	72.2
HIGHEST ANNUAL MEAN			121
LOWEST ANNUAL MEAN			21.9
HIGHEST DAILY MEAN	2040	Mar 4	2730
LOWEST DAILY MEAN	14	Sep 14	8.5
ANNUAL SEVEN-DAY MINIMUM	15	cOct 2	9.0
INSTANTANEOUS PEAK FLOW		1960	4520
INSTANTANEOUS PEAK STAGE		8.17	13.58
INSTANTANEOUS LOW FLOW		f7.7	f3.8
ANNUAL RUNOFF (CFSM)	1.16	1.12	1.03
ANNUAL RUNOFF (INCHES)	15.77	15.22	13.99
10 PERCENT EXCEEDS	177	155	132
50 PERCENT EXCEEDS	35	33	43
90 PERCENT EXCEEDS	17	20	18

- a Also Oct. 4-8, 1993.  
b Also Oct. 29, 30, 1968.  
c Also Oct. 3, 1993.  
d Also Oct. 27, 1968.  
f Result of freezeup.



## POTOMAC RIVER BASIN

01625000 MIDDLE RIVER NEAR GROTTOS, VA

LOCATION.--Lat 38°15'42", long 78°51'44", Augusta County, Hydrologic Unit 02070005, on left bank at upstream side of bridge on State Highway 769 at Mount Meridian, 1.8 mi upstream from mouth, and 2.0 mi west of Grottoes.

DRAINAGE AREA.--375 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1927 to current year. Records for February 1925 to September 1926, published in WSP 601 and 621, are unreliable and should not be used.

REVISED RECORDS.--WSP 1051: 1928-29, 1930(M), 1932, 1935-37, 1938(M), 1940. WSP 1171: 1933. WSP 1302: 1928-29(M), 1931-34(M). WSP 2103: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 1,061.51 ft above sea level. Prior to Sept. 1, 1938, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 26 to Jan. 2 and Jan. 5, 6, 9-11, 16-24, and periods of doubtful gage-height record, Jan. 14, 15, 25, which are fair. There are discharges of about 6.9 ft<sup>3</sup>/s from wastewater treatment plants upstream from station. Most of water discharged from treatment plants was diverted from another drainage basin for industrial and municipal supply. Small diurnal fluctuation at low flow caused by mills upstream from station. Maximum discharge, 38,500 ft<sup>3</sup>/s, from rating curve extended above 15,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 18 ft<sup>3</sup>/s, result of freezeup.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1877, that of Nov. 5, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 29	0300	4,850	11.80	Mar. 10	1400	3,510	10.06
Feb. 23	2100	4,780	11.72	Mar. 29	1800	*5,540	*12.65
Mar. 8	0300	3,990	10.69	Aug. 18	0530	3,450	9.97

Minimum discharge, 78 ft<sup>3</sup>/s, Oct. 10-11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	129	161	e118	626	730	1400	319	173	116	220	155
2	86	107	139	e127	506	719	1100	304	165	109	215	151
3	86	96	130	132	430	664	927	288	161	108	225	144
4	81	92	129	162	373	715	818	403	158	117	182	142
5	80	95	1040	e168	340	1560	734	571	161	119	163	140
6	80	94	1060	e140	324	2140	684	608	159	114	168	138
7	80	95	504	143	302	2550	708	518	163	154	163	133
8	81	91	332	300	294	3680	721	814	160	139	144	129
9	81	89	258	e320	714	2940	666	832	161	116	136	125
10	82	91	219	e243	1260	3280	620	591	162	130	130	124
11	81	90	198	e238	879	2640	577	469	170	116	124	134
12	89	90	175	583	665	1820	548	396	166	107	125	125
13	98	87	158	1140	531	1410	547	351	154	104	122	119
14	91	91	154	e767	493	1190	628	319	145	100	116	116
15	87	90	155	e500	521	1020	543	300	138	100	122	111
16	86	90	206	e314	599	896	636	290	151	100	125	115
17	84	89	191	e351	777	781	644	272	209	108	392	111
18	86	119	171	e1010	886	722	557	256	189	274	2290	118
19	87	104	164	e452	1020	682	503	249	155	261	788	117
20	87	93	158	e270	1020	612	462	244	150	394	454	111
21	90	86	166	e265	942	572	426	236	156	219	338	108
22	92	84	168	e260	880	604	448	227	141	327	315	112
23	87	83	152	e314	2980	538	442	219	135	294	258	116
24	86	83	149	e608	3130	506	401	210	132	232	222	116
25	85	84	141	e912	2240	516	387	205	136	188	203	111
26	87	82	e125	566	1440	506	372	200	127	257	202	114
27	87	114	e120	591	1030	754	363	201	138	240	189	118
28	88	606	e120	1640	838	2530	356	192	159	315	187	111
29	84	369	e122	2980	---	4760	336	187	134	244	176	106
30	93	210	e120	1210	---	3100	340	181	125	229	168	102
31	124	---	e118	804	---	1770	---	177	---	306	158	---
TOTAL	2703	3723	7203	17628	26040	46907	17894	10629	4633	5737	8820	3672
MEAN	87.2	124	232	569	930	1513	596	343	154	185	285	122
MAX	124	606	1060	2980	3130	4760	1400	832	209	394	2290	155
MIN	80	82	118	118	294	506	336	177	125	100	116	102
CFSM	.23	.33	.62	1.52	2.48	4.04	1.59	.91	.41	.49	.76	.33
IN.	.27	.37	.71	1.75	2.58	4.65	1.78	1.05	.46	.57	.87	.36

e Estimated.



POTOMAC RIVER BASIN

65

01625000 MIDDLE RIVER NEAR GROTTOES, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	239	236	302	383	450	583	470	344	249	177	200	180
MAX	1138	2019	1111	1173	987	1704	1674	963	993	705	1017	727
(WY)	1980	1986	1949	1937	1936	1936	1987	1989	1972	1972	1940	1979
MIN	64.8	58.9	55.8	66.9	91.3	106	95.8	89.7	77.7	47.2	55.6	64.4
(WY)	1964	1931	1966	1981	1931	1981	1981	1969	1969	1966	1977	1932

SUMMARY STATISTICS

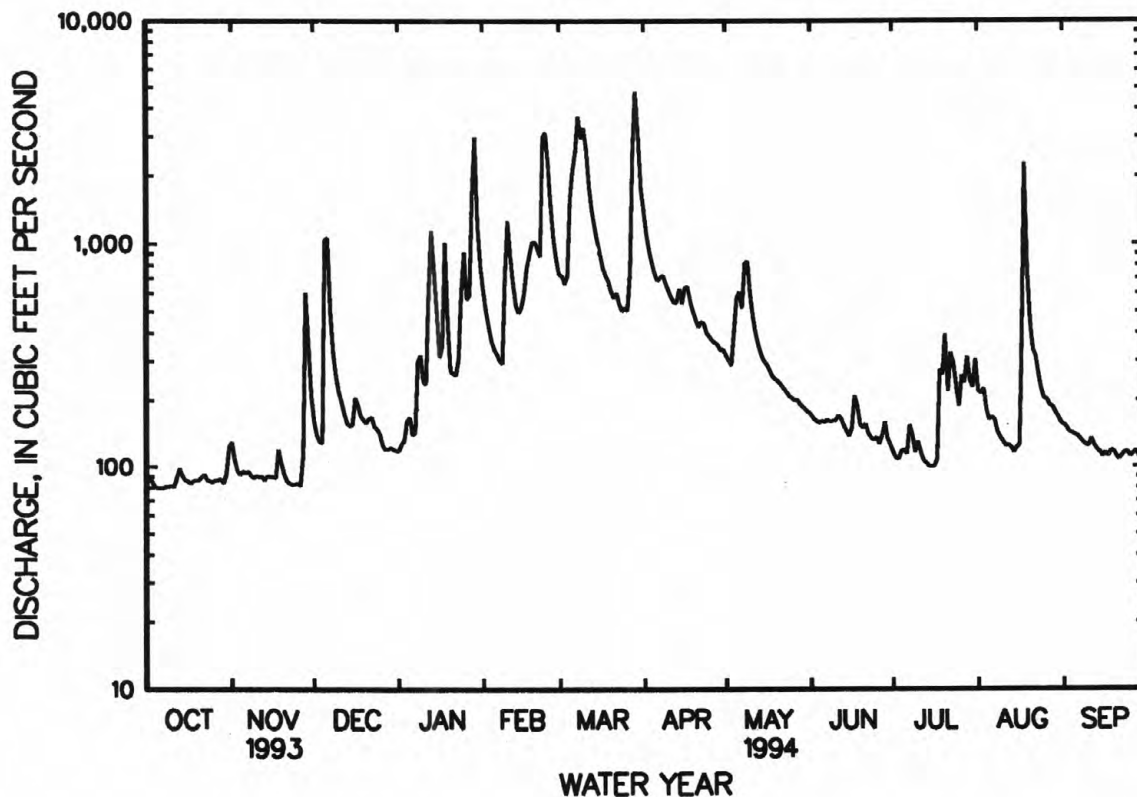
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1928 - 1994

ANNUAL TOTAL	143486		155589									
ANNUAL MEAN	393		426									
HIGHEST ANNUAL MEAN												
LOWEST ANNUAL MEAN												
HIGHEST DAILY MEAN	6480	Mar 5	4760	Mar 29								
LOWEST DAILY MEAN	80	aOct 5	80	aOct 5								
ANNUAL SEVEN-DAY MINIMUM	81	bOct 4	81	bOct 4								
INSTANTANEOUS PEAK FLOW			5540	Mar 29								
INSTANTANEOUS PEAK STAGE			12.65	Mar 29								
INSTANTANEOUS LOW FLOW			78	cOct 10								
ANNUAL RUNOFF (CFSM)	1.05		1.14									
ANNUAL RUNOFF (INCHES)	14.23		15.43									
10 PERCENT EXCEEDS	962		902									
50 PERCENT EXCEEDS	175		188									
90 PERCENT EXCEEDS	88		90									

- a Also Oct. 6, 7, 1993.  
b Also Oct. 5, 1993.  
c Also Oct. 11, 1993.  
d Result of freezeup.



## POTOMAC RIVER BASIN

01625000 MIDDLE RIVER NEAR GROTTOS, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, JUNE 1994

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	ALKA- LINIT WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)
JUN 06...	1130	417	7.9	22.5	29.0	734	8.5	102	197	233	4	6.1

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
JUN 06...	0.030	1.40	1.40	0.040	0.30	0.20	0.070	0.070	0.060	<0.02	<0.01	<0.01

DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)
JUN 06...	<0.03	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.05	<0.01	<0.00

< Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

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01625000 MIDDLE RIVER NEAR GROTTOS, VA--Continued

## WATER QUALITY DATA, JUNE 1994

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
JUN 06...	<0.01	<0.00	<0.01	0.03	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
JUN 06...	<0.04	<0.01	<0.04	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
JUN 06...	<0.02	0.03	<0.01	<0.02	<0.01	<0.02	0.02	<0.02	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## 01626000 SOUTH RIVER NEAR WAYNESBORO, VA

LOCATION.--Lat 38°03'27", long 78°54'30", Waynesboro City, Hydrologic Unit 02070005, on right bank 80 ft downstream from bridge on State Highway 664, 1.3 mi southwest of Waynesboro Post Office, and 2.4 mi downstream from Back Creek.

DRAINAGE AREA.--127 mi<sup>2</sup>, of which 41 mi<sup>2</sup> are above flood-detention structures.

PERIOD OF RECORD.--October 1952 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,296.20 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Jan. 15, 16, 19, and period of no gage-height record, Apr. 18 to May 7, which are fair. There is discharge of about 1.1 ft<sup>3</sup>/s from a wastewater treatment plant upstream from station, originating from well fields. Flow from 41 mi<sup>2</sup> upstream from station slightly regulated by flood-detention reservoirs (sixteen of which were built by Soil Conservation Service between 1954 and 1961). National Weather Service gage-height telemeter and Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 17,500 ft<sup>3</sup>/s, from rating curve extended above 4,200 ft<sup>3</sup>/s on basis of contracted-opening measurement at gage height 13.95 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 14.3 ft, from floodmarks, discharge, 14,500 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1130	1,240	5.50	Mar. 8	2030	*1,760	*6.35
Jan. 28	1130	1,710	6.27	Mar. 10	1900	1,760	6.34
Feb. 23	2330	1,310	5.61	Mar. 29	1730	1,690	6.25

Minimum discharge, 29 ft<sup>3</sup>/s, Oct. 4, 6, 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32	37	58	52	316	333	638	e119	63	44	57	53
2	32	35	51	53	261	338	506	e110	60	42	56	50
3	31	34	47	55	224	315	425	e104	58	42	58	48
4	30	34	48	64	196	310	370	e160	57	46	53	47
5	31	35	847	60	181	426	326	e308	57	44	50	46
6	30	35	556	57	171	538	300	e270	56	42	51	46
7	30	34	247	59	157	732	290	e228	55	53	46	44
8	31	33	165	102	147	1500	263	227	54	49	43	42
9	31	33	130	106	196	1470	236	194	54	45	41	42
10	31	33	111	94	241	1500	222	171	55	49	39	41
11	32	33	99	91	236	1330	209	155	59	44	39	41
12	34	33	86	182	218	903	198	142	55	41	40	40
13	33	33	78	279	195	714	205	131	51	41	39	40
14	32	33	74	240	186	628	220	122	48	41	38	38
15	32	33	74	e180	176	567	191	117	50	40	39	38
16	31	32	87	e146	173	504	179	132	56	40	41	37
17	32	34	87	198	187	425	167	112	104	44	298	37
18	33	36	80	395	214	380	e158	104	64	50	472	41
19	32	36	78	e252	313	345	e150	100	55	42	209	41
20	33	34	74	195	441	301	e144	98	51	40	124	37
21	34	33	78	163	497	283	e139	96	47	42	137	37
22	34	33	71	145	470	299	e144	90	52	55	162	38
23	33	35	69	144	945	276	e141	85	49	50	126	38
24	34	33	65	201	1190	256	e132	84	50	43	103	38
25	33	32	63	196	850	253	e125	79	49	45	89	38
26	34	32	57	172	611	243	e119	77	46	69	80	47
27	34	95	60	161	460	323	e123	80	48	93	73	45
28	34	373	58	968	380	630	e123	74	56	170	67	40
29	34	126	58	1060	---	1450	e128	70	48	96	62	37
30	37	75	53	607	---	1270	e123	68	46	71	58	37
31	40	---	52	404	---	814	---	65	---	59	55	---
TOTAL	1014	1547	3761	7081	9832	19656	6694	3972	1653	1672	2845	1244
MEAN	32.7	51.6	121	228	351	634	223	128	55.1	53.9	91.8	41.5
MAX	40	373	847	1060	1190	1500	638	308	104	170	472	53
MIN	30	32	47	52	147	243	119	65	46	40	38	37
CFSM	.26	.41	.96	1.80	2.76	4.99	1.76	1.01	.43	.42	.72	.33
IN.	.30	.45	1.10	2.07	2.88	5.76	1.96	1.16	.48	.49	.83	.36

e Estimated.



## POTOMAC RIVER BASIN

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01626000 SOUTH RIVER NEAR WAYNESBORO, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	115	132	134	159	188	284	248	169	110	62.2	85.5	71.3
MAX	549	1214	349	372	454	748	1062	485	875	305	700	494
(WY)	1973	1986	1974	1978	1984	1993	1987	1989	1972	1972	1955	1979
MIN	25.5	25.1	24.2	23.6	64.5	49.0	44.0	50.4	37.5	26.1	26.3	27.0
(WY)	1966	1966	1966	1966	1959	1981	1981	1981	1964	1966	1966	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1953 - 1994

ANNUAL TOTAL	69355	60971	
ANNUAL MEAN	190	167	146
HIGHEST ANNUAL MEAN			265
LOWEST ANNUAL MEAN			47.5
HIGHEST DAILY MEAN	2320	1500	9670
LOWEST DAILY MEAN	30	30	17
ANNUAL SEVEN-DAY MINIMUM	31	31	21
INSTANTANEOUS PEAK FLOW		1760	17500
INSTANTANEOUS PEAK STAGE		6.35	15.30
INSTANTANEOUS LOW FLOW		29	17.0
ANNUAL RUNOFF (CFSM)	1.50	1.32	1.15
ANNUAL RUNOFF (INCHES)	20.32	17.86	15.64
10 PERCENT EXCEEDS	442	386	293
50 PERCENT EXCEEDS	74	68	82
90 PERCENT EXCEEDS	33	34	33

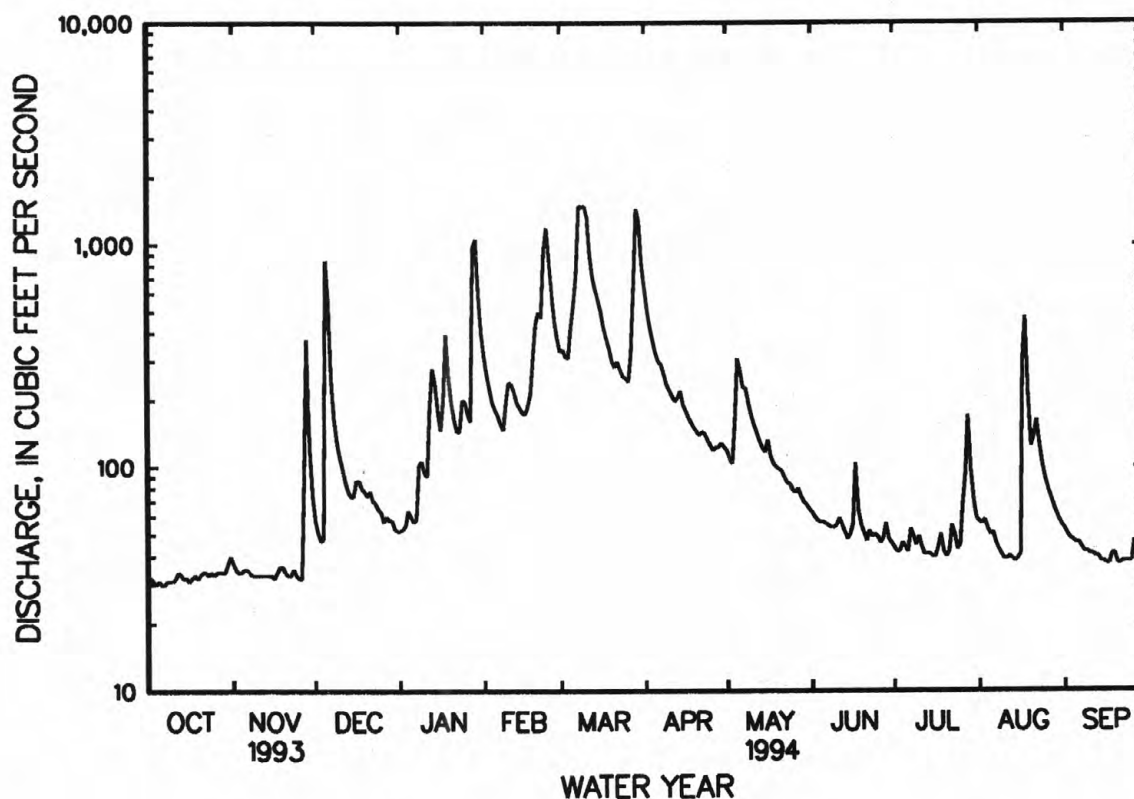
a Also Mar. 10, 1994.

b Also Oct. 6, 7, 1993.

c Also Oct. 4, 1993.

d Also Feb. 2, 1966.

f Result of regulation from unknown source upstream from gage.



## POTOMAC RIVER BASIN

01626850 SOUTH RIVER NEAR DOOMS, VA

LOCATION.--Lat 38°05'19", long 78°52'38", Augusta County, Hydrologic Unit 02070005, on left bank at downstream side of Hopeman Parkway Road bridge, 1.1 mi downstream from Steele Run, and 1.6 mi southwest of Doms.

DRAINAGE AREA.--149 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,247.04 ft above sea level (Norfolk and Western Railway bench mark). Prior to Sept. 18, 1980, nonrecording gage at site 30 ft upstream at same datum.

REMARKS.--Records good except those for periods with backwater from debris, Nov. 1-16 and Apr. 5, and periods of no gage-height record, Jan. 10, 15-23, which are fair. There are discharges of about 6.9 ft<sup>3</sup>/s from industrial and municipal wastewater treatment plants upstream from station, originating from well fields. Maximum discharge, 19,100 ft<sup>3</sup>/s, from rating curve extended above 8,100 ft<sup>3</sup>/s. Minimum gage height, 2.17 ft, Aug. 29, 30, 1981. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0830	1,460	6.47	Mar. 10	1900	2,120	7.90
Jan. 28	1300	*2,280	*8.24	Mar. 29	1530	2,000	7.65
Feb. 23	1400	1,630	6.84	July 18	1900	1,200	5.86
Mar. 8	2100	2,180	8.03	Aug. 17	1900	1,280	6.04

Minimum discharge, 45 ft<sup>3</sup>/s, Oct. 4, Nov. 22, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50	e62	93	91	399	414	696	184	99	78	98	85
2	51	e61	84	94	337	412	570	171	96	75	100	80
3	52	e60	79	95	296	400	493	163	93	75	96	76
4	50	e60	93	110	264	408	441	256	92	79	90	75
5	52	e62	984	104	249	533	e390	444	93	78	91	75
6	51	e63	635	100	236	637	371	379	91	74	88	74
7	51	e60	332	105	218	862	360	324	90	84	81	71
8	51	e58	234	162	207	1820	330	311	89	81	77	68
9	55	e57	191	165	268	1780	303	270	88	79	73	67
10	55	e57	168	e150	315	1800	287	240	91	81	71	74
11	53	e56	151	144	309	1570	274	219	96	75	70	68
12	68	e57	134	269	289	995	261	203	92	71	69	66
13	57	e57	124	368	263	781	273	188	88	69	70	66
14	55	e58	118	324	256	694	286	178	83	70	68	64
15	54	e58	124	e261	245	635	254	175	84	70	69	64
16	53	e57	138	e226	245	575	242	189	100	70	81	64
17	55	76	136	e258	261	499	229	164	159	83	560	70
18	55	58	126	e492	300	465	218	154	105	181	612	67
19	54	54	123	e358	415	451	211	147	94	97	301	67
20	53	52	119	e301	548	405	203	144	89	74	187	62
21	58	49	126	e261	608	386	196	141	95	92	192	61
22	58	49	117	e235	570	396	206	134	89	91	221	68
23	58	52	112	e220	1190	376	198	130	86	86	177	65
24	61	50	108	280	1370	354	185	126	89	76	145	63
25	58	49	105	268	935	351	180	120	85	98	128	65
26	58	48	98	241	688	336	174	119	82	135	117	84
27	60	211	101	230	538	430	180	122	92	219	107	72
28	58	531	98	1290	459	724	177	114	95	279	102	65
29	63	182	99	1210	---	1720	224	110	88	163	95	62
30	80	117	93	689	---	1470	195	106	81	123	90	60
31	74	---	92	488	---	882	---	103	---	104	87	---
TOTAL	1761	2521	5335	9589	12278	23561	8607	5828	2794	3110	4413	2068
MEAN	56.8	84.0	172	309	438	760	287	188	93.1	100	142	68.9
MAX	80	531	984	1290	1370	1820	696	444	159	279	612	85
MIN	50	48	79	91	207	336	174	103	81	69	68	60
CFSM	.38	.56	1.16	2.08	2.94	5.10	1.93	1.26	.63	.67	.96	.46
IN.	.44	.63	1.33	2.39	3.07	5.88	2.15	1.46	.70	.78	1.10	.52

e Estimated.

POTOMAC RIVER BASIN

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01626850 SOUTH RIVER NEAR DOOMS, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	159	221	185	228	244	399	359	229	139	102	108	133
MAX	604	1528	428	471	583	872	1248	589	340	260	294	653
(WY)	1980	1986	1984	1978	1984	1993	1987	1989	1992	1991	1985	1979
MIN	52.4	62.8	54.8	51.1	100	78.7	73.5	85.5	65.6	59.1	53.8	49.5
(WY)	1987	1982	1981	1981	1977	1981	1981	1977	<sup>a</sup> 1977	1986	1977	1977

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1974 - 1994

ANNUAL TOTAL	86365	81865	
ANNUAL MEAN	237	224	208
HIGHEST ANNUAL MEAN			293
LOWEST ANNUAL MEAN			77.4
HIGHEST DAILY MEAN	2800	1820	<sup>e</sup> 12000
LOWEST DAILY MEAN	48	48	44
ANNUAL SEVEN-DAY MINIMUM	50	50	46
INSTANTANEOUS PEAK FLOW		2280	19100
INSTANTANEOUS PEAK STAGE		8.24	<sup>c</sup> 14.03
INSTANTANEOUS LOW FLOW		45	42
ANNUAL RUNOFF (CFSM)	1.59	1.51	1.40
ANNUAL RUNOFF (INCHES)	21.56	20.44	19.01
10 PERCENT EXCEEDS	530	492	387
50 PERCENT EXCEEDS	115	110	125
90 PERCENT EXCEEDS	54	58	59

a Also 1986.

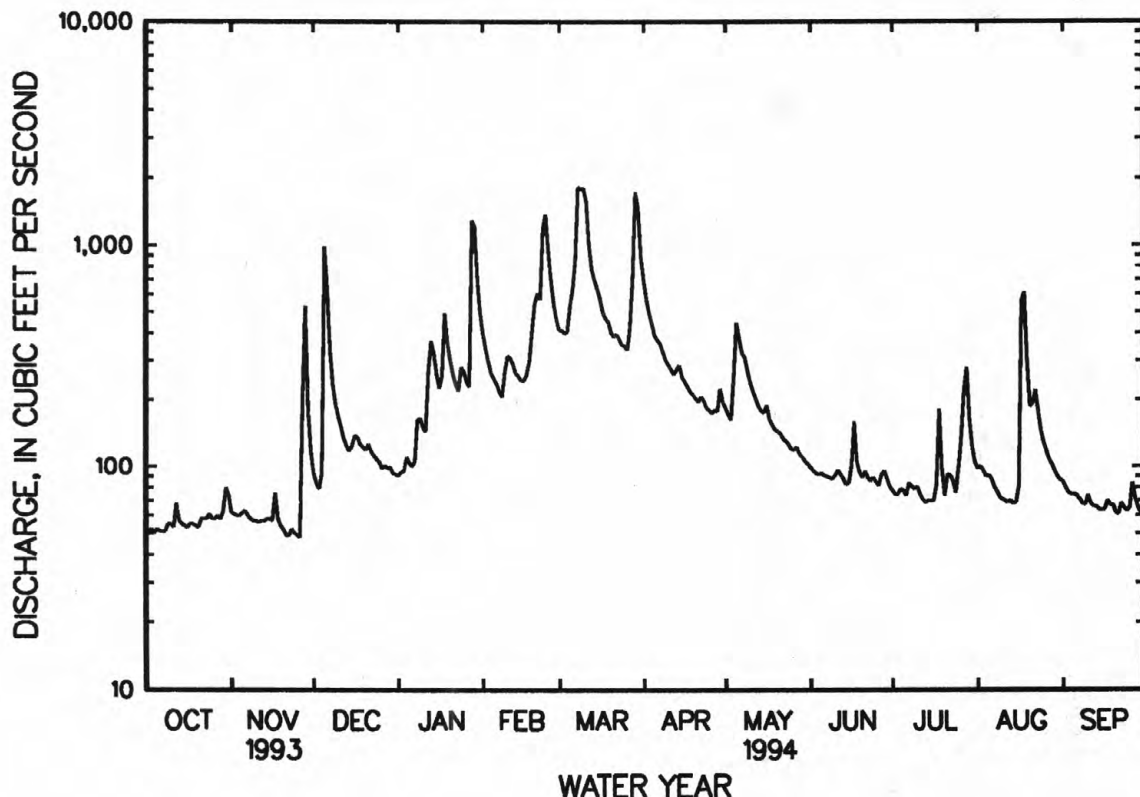
b Also Sept. 25, Oct. 7, 1977, and Aug. 29, 30, 1981.

c From floodmarks.

d Also Nov. 22, 24, 1993.

e Estimated.

f Also Aug. 30, 1981.



## POTOMAC RIVER BASIN

01627500 SOUTH RIVER AT HARRISTON, VA

LOCATION.--Lat 38°13'07", long 78°50'13", Augusta County, Hydrologic Unit 02070005, on left bank 200 ft downstream from bridge on State Highway 778, 0.3 mi northwest of Harriston, 0.6 mi downstream from Paine Run, and 7.2 mi upstream from confluence with North River.

DRAINAGE AREA.--212 mi<sup>2</sup>

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1925 to September 1951, October 1968 to current year.

REVISED RECORDS.--WSP 1171: 1926(M), 1927-28, 1929-32(M), 1933, 1934(M), 1935, 1937. WSP 1302: 1937(M), 1938(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,129.87 ft above sea level. Prior to Sept. 1, 1938, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Jan. 16, 19-21, which are fair. There are discharges of about 6.9 ft<sup>3</sup>/s from industrial and municipal wastewater treatment plants upstream from station, originating from well fields. Maximum discharge, 28,100 ft<sup>3</sup>/s, from rating curve extended above 10,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in 1870 and 1877 reached a stage of about 18.8 ft, from information by observer in 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0600	1,420	5.16	Mar. 9	0130	*2,800	*7.13
Dec. 5	1430	1,670	5.53	Mar. 29	1430	2,530	6.77
Jan. 28	1730	2,640	6.91	Aug. 17	2200	1,400	5.13
Feb. 23	1830	2,250	6.37				

Minimum discharge, 59 ft<sup>3</sup>/s, Oct. 5, gage height, 2.53 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	87	127	105	519	527	967	245	116	90	117	102
2	63	74	109	108	427	531	764	221	112	86	116	98
3	64	75	101	109	371	506	643	204	109	85	121	93
4	63	73	102	127	327	504	562	281	108	86	111	91
5	62	75	1030	125	302	687	503	530	108	91	106	91
6	63	75	901	117	286	877	468	509	106	86	108	89
7	62	73	471	121	264	1200	452	426	105	87	99	86
8	63	69	308	181	248	2320	410	397	104	93	93	82
9	63	69	242	220	315	2410	374	346	102	89	89	81
10	68	69	207	190	374	2240	356	302	103	94	86	81
11	66	68	186	182	381	2100	340	271	111	91	85	90
12	81	67	166	306	353	1400	326	249	107	83	85	81
13	67	69	150	495	320	1090	342	230	101	83	84	79
14	64	70	142	439	308	937	354	215	94	83	82	77
15	62	69	142	358	295	839	320	204	91	83	81	76
16	62	68	164	e265	295	757	300	221	94	82	90	76
17	63	71	162	311	327	650	284	199	163	95	432	78
18	65	98	152	610	390	580	270	185	123	128	825	90
19	65	71	145	e416	534	530	261	177	106	221	404	82
20	67	69	141	e343	712	471	252	172	100	94	233	78
21	71	66	148	e290	826	440	243	167	95	99	209	75
22	72	64	141	259	784	445	258	159	106	108	251	80
23	71	65	134	249	1530	423	249	152	100	106	207	88
24	72	67	129	308	1890	392	232	149	99	93	172	78
25	74	64	125	329	1370	393	223	142	99	88	152	79
26	72	63	120	291	987	379	213	138	94	160	140	100
27	73	133	116	276	734	478	217	141	102	199	129	94
28	72	884	117	1330	600	868	216	134	107	350	122	82
29	69	300	117	1620	---	2100	248	129	100	209	114	77
30	89	167	112	973	---	1960	283	126	94	154	108	74
31	98	---	105	663	---	1250	---	121	---	129	104	---
TOTAL	2128	3332	6512	11716	16069	30284	10930	7142	3159	3625	5155	2528
MEAN	68.6	111	210	378	574	977	364	230	105	117	166	84.3
MAX	98	884	1030	1620	1890	2410	967	530	163	350	825	102
MIN	62	63	101	105	248	379	213	121	91	82	81	74
CFSM	.32	.52	.99	1.78	2.71	4.61	1.72	1.09	.50	.55	.78	.40
IN.	.37	.58	1.14	2.06	2.82	5.31	1.92	1.25	.55	.64	.90	.44

e Estimated.



## POTOMAC RIVER BASIN

73

01627500 SOUTH RIVER AT HARRISTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1951, 1969 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	230	236	257	289	331	407	403	287	200	130	156	169
MAX	1048	1988	802	825	822	1407	1414	819	1454	520	925	970
(WY)	1943	1986	1949	1936	1984	1936	1987	1989	1972	1972	1940	1979
MIN	46.5	54.0	53.8	64.9	57.0	102	93.1	83.2	67.8	47.3	42.1	41.0
(WY)	1931	1931	1932	1981	1931	1981	1981	1930	1930	1930	1930	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

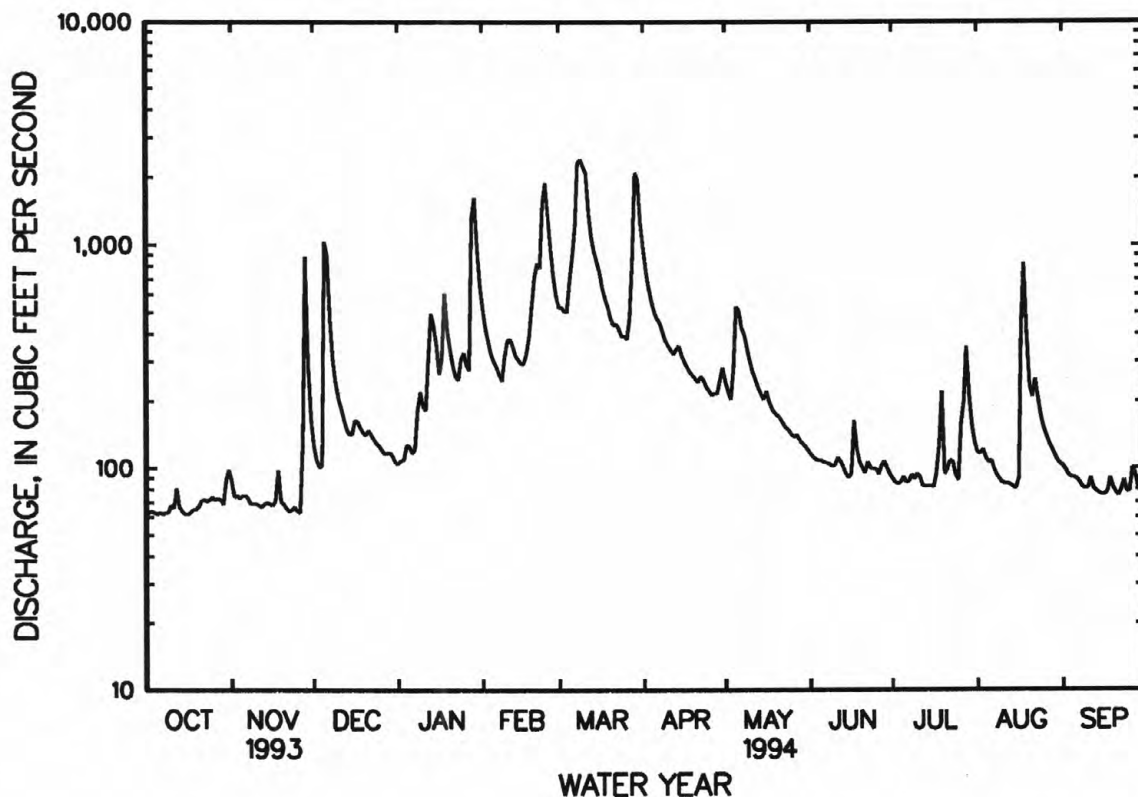
## FOR 1994 WATER YEAR

WATER YEARS 1926 - 1951,  
1969 - 1994

ANNUAL TOTAL	114456		102580									
ANNUAL MEAN	314		281							259		
HIGHEST ANNUAL MEAN										462		1973
LOWEST ANNUAL MEAN										97.5		1981
HIGHEST DAILY MEAN	3650	Mar 5	2410	Mar 9					16400	Nov 5	1985	
LOWEST DAILY MEAN	60	Sep 14	62	aOct 1					b25	Aug 24	1930	
ANNUAL SEVEN-DAY MINIMUM	63	Oct 1	63	Oct 1					38	Sep 23	1930	
INSTANTANEOUS PEAK FLOW			2800	Mar 9					28100	Nov 4	1985	
INSTANTANEOUS PEAK STAGE			7.13	Mar 9					c17.20	Oct 15	1942	
INSTANTANEOUS LOW FLOW			59	Oct 5					b17	Nov 14	1941	
ANNUAL RUNOFF (CFSM)	1.48		1.33						1.22			
ANNUAL RUNOFF (INCHES)	20.08		18.00						16.59			
10 PERCENT EXCEEDS	750		623						483			
50 PERCENT EXCEEDS	141		129						156			
90 PERCENT EXCEEDS	65		71						69			

a Also Oct. 5, 7, 15, 16, 1993.

b Probably result of regulation by mill then in existence upstream from station.

c Peak discharge, 23,100 ft<sup>3</sup>/s.

## POTOMAC RIVER BASIN

01627500 SOUTH RIVER AT HARRISTON, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, JUNE 1994

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
JUN 06...	1515	264	8.1	22.5	31.5	730	8.7	105	104	127	6.6	0.020
DATE		NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
JUN 06...		1.50	1.50	0.040	0.20	0.30	0.080	0.080	0.080	<0.02	<0.01	<0.01
DATE		TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)
JUN 06...		<0.03	<0.01	<0.01	<0.01	<0.01	0.03	<0.01	<0.01	<0.05	<0.01	<0.00

< Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

75

01627500 SOUTH RIVER AT HARRISTON, VA--Continued

## WATER QUALITY DATA, JUNE 1994

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P, P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
JUN 06...	<0.01	<0.00	<0.01	0.02	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	FEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
JUN 06...	<0.04	<0.01	<0.04	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
JUN 06...	<0.02	0.02	<0.01	<0.02	<0.01	<0.02	0.01	<0.02	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01628060 WHITE OAK RUN NEAR GROTTOS, VA

LOCATION.--Lat 38°15'01", long 78°44'57", Rockingham County, Hydrologic Unit 02070005, Shenandoah National Park, on left bank 700 ft upstream from Madison Run, 0.2 mi south of Madison Run Forest Trail, 1.4 mi upstream from southwest boundary of Shenandoah National Park, and 4.3 mi southeast of Grottoes.

DRAINAGE AREA.--1.94 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1979 to current year.

REVISED RECORDS.--WDR VA-85-1: 1983-84(P).

GAGE.--Water-stage recorder. Elevation of gage is 1,480 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods with partial flow, Oct. 7-9, 11, 12, 16, 21, 22, 24, 30, and July 3, 4, 7-10, 12, 18, 20, 21, 25, 27, and periods with ice effect, Dec. 29-31 and Jan. 16-26, which are fair. Maximum discharge, 515 ft<sup>3</sup>/s, from rating curve extended above 33 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. No flow many days in 1980-89, 1993-94. Several measurements of water temperature were made during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 30 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0145	113	3.11	Mar. 8	2100	49	2.40
Dec. 5	0515	57	2.50	Mar. 29	1130	79	2.76
Feb. 23	1315	41	2.28	Aug. 17	1600	*131	*3.29

No flow many days in October and July.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.11	2.6	.38	6.3	3.8	12	.80	.15	.03	.02	.31
2	.01	.10	1.9	.37	3.9	3.4	7.0	.71	.15	.01	.03	.24
3	.01	.09	1.5	.40	2.9	2.8	5.1	.68	.15	.01	.15	.21
4	.01	.08	1.5	.64	2.4	2.9	3.6	2.3	.13	.01	.50	.19
5	.01	.07	43	.64	2.2	5.1	2.7	11	.13	.00	.17	.16
6	.01	.07	27	.54	1.9	7.3	2.5	13	.11	.00	.14	.15
7	.01	.08	12	.97	1.6	22	2.3	9.6	.11	.00	.10	.15
8	.00	.08	6.2	6.8	1.5	44	1.9	7.2	.11	.00	.08	.13
9	.00	.08	3.2	4.6	2.6	38	1.9	4.6	.11	.01	.06	.12
10	.01	.08	2.4	2.7	3.5	33	1.9	3.0	.11	.04	.05	.10
11	.01	.08	2.0	2.2	5.7	31	1.8	2.4	.10	.03	.04	.12
12	.01	.08	1.5	9.0	4.8	18	1.6	2.1	.09	.00	.04	.10
13	.02	.08	1.2	13	3.8	11	1.9	1.7	.08	.00	.03	.08
14	.01	.09	1.0	10	2.8	7.6	2.0	1.4	.07	.00	.03	.08
15	.01	.11	1.0	6.9	2.6	5.7	2.2	1.2	.06	.00	.02	.07
16	.01	.11	1.2	e4.3	2.5	5.0	2.5	1.1	.07	.00	.02	.06
17	.00	.12	1.1	e4.5	3.1	4.0	2.3	.91	.08	.00	.06	.06
18	.00	.23	1.1	e5.6	4.4	3.1	2.1	.81	.08	.03	36	.07
19	.00	.18	1.1	e3.5	7.2	2.6	1.9	.71	.06	.03	9.6	.08
20	.00	.15	1.0	e2.5	10	2.1	1.8	.64	.05	.01	3.5	.06
21	.00	.14	1.1	e2.0	13	1.9	1.5	.53	.05	.01	2.6	.05
22	.01	.13	.96	e1.7	14	1.8	1.6	.47	.06	.07	2.2	.05
23	.01	.11	.86	e1.5	30	1.8	1.3	.39	.04	.03	1.8	.18
24	.00	.11	.75	e1.4	38	1.8	1.2	.39	.04	.01	1.5	.13
25	.00	.11	.68	e1.3	31	2.2	1.1	.39	.04	.00	1.2	.08
26	.00	.13	.68	e1.2	17	2.9	1.0	.33	.03	.00	1.0	.08
27	.00	16	.60	1.2	9.4	6.8	.92	.33	.04	.04	.82	.09
28	.00	64	.49	14	5.7	24	.81	.28	.07	.18	.67	.07
29	.00	16	e.46	23	---	62	.81	.21	.04	.10	.53	.06
30	.01	5.8	e.43	15	---	36	.82	.19	.03	.07	.44	.05
31	.05	---	e.40	9.5	---	20	---	.17	---	.04	.34	---
TOTAL	0.24	104.60	120.91	151.34	233.8	413.6	72.06	69.54	2.44	0.76	101.68	3.38
MEAN	.008	3.49	3.90	4.88	8.35	13.3	2.40	2.24	.081	.025	3.28	.11
MAX	.05	64	43	23	38	62	12	13	.15	.18	38	.31
MIN	.00	.07	.40	.37	1.5	1.8	.81	.17	.03	.00	.02	.05
CFSM	<.01	1.80	2.01	2.52	4.30	6.88	1.24	1.16	.04	.01	1.69	.06
IN.	<.01	2.01	2.32	2.90	4.48	7.93	1.38	1.33	.05	.01	1.95	.06

< Less than.  
e Estimated.



## POTOMAC RIVER BASIN

77

01628060 WHITE OAK RUN NEAR GROTTOS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2.37	3.48	2.58	2.56	3.76	5.75	5.33	3.61	1.34	1.01	.72	.69
MAX	12.0	21.5	7.35	6.21	13.5	13.3	15.3	13.6	7.00	9.58	3.28	3.78
(WY)	1991	1986	1984	1991	1984	1994	1987	1989	1982	1991	1994	1992
MIN	.000	.059	.040	.007	.52	.46	.66	.27	.081	.002	.000	.000
(WY)	(a)	1982	1981	1981	1980	1981	1981	1991	1994	1987	1987	(b)

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	1024.96	1274.35	
ANNUAL MEAN	2.81	3.49	2.76
HIGHEST ANNUAL MEAN			3.95
LOWEST ANNUAL MEAN			.62
HIGHEST DAILY MEAN	64 Nov 28	64 Nov 28	337 Nov 4 1985
LOWEST DAILY MEAN	.00 cAug 1	.00 dOct 8	.00 (f)
ANNUAL SEVEN-DAY MINIMUM	.00 Aug 17	.00 Oct 23	.00 (f)
INSTANTANEOUS PEAK FLOW		131 Aug 17	515 Nov 4 1985
INSTANTANEOUS PEAK STAGE		3.29 Aug 17	26.17 Nov 4 1985
INSTANTANEOUS LOW FLOW		.00 dOct 8	.00 (f)
ANNUAL RUNOFF (CFSM)	1.45	1.80	1.42
ANNUAL RUNOFF (INCHES)	19.65	24.44	19.33
10 PERCENT EXCEEDS	7.2	9.5	6.5
50 PERCENT EXCEEDS	.60	.50	.60
90 PERCENT EXCEEDS	.01	.01	.00

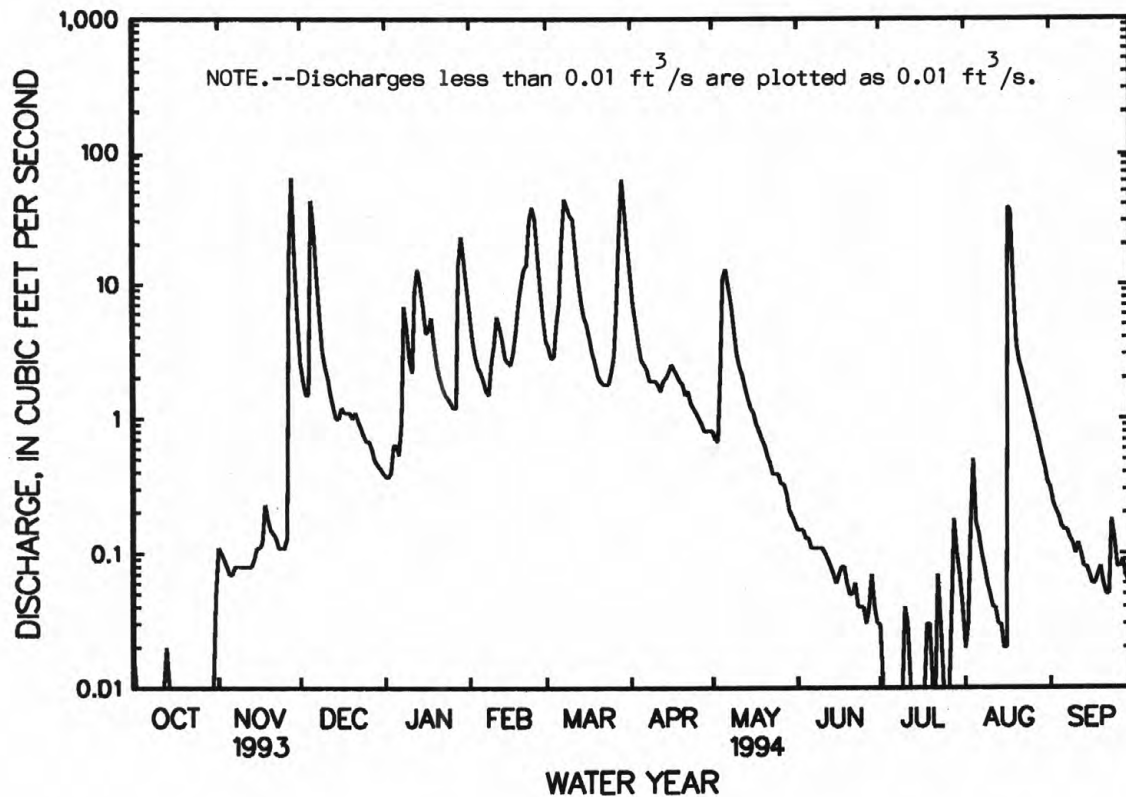
a Monthly mean flow is 0.0 ft<sup>3</sup>/s in 1987, 1989.b Monthly mean flow is 0.0 ft<sup>3</sup>/s in 1980, 1983, 1984.

c Many days in August and September 1993.

d Many days in October 1993 and July 1994.

f No flow many days in 1980-89, 1993-94.

g From floodmarks.



## POTOMAC RIVER BASIN

01628500 SOUTH FORK SHENANDOAH RIVER NEAR LYNNWOOD, VA

LOCATION.--Lat 38°19'21", long 78°45'18", Rockingham County, Hydrologic Unit 02070005, on left bank 1.2 mi northeast of Lynnwood and 3.3 mi downstream from confluence of North and South Rivers.

DRAINAGE AREA.--1,084 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1930 to current year.

REVISED RECORDS.--WSP 1171: 1933(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,013.17 ft above sea level.

REMARKS.--Records good except those for period of no gage-height record, Jan. 19, 20, and period with ice effect, Jan. 21-23, which are fair. Diurnal fluctuation at low flow prior to 1960 caused by mill at Lynnwood. National Weather Service rain gage and gage-height telemeters and Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 95,100 ft<sup>3</sup>/s, from rating curve extended above 22,000 ft<sup>3</sup>/s on basis of computations of flow over dam at gage heights 23.60 ft and 27.2 ft. Minimum gage height, 1.63 ft, Sept. 20, 1932. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, that of Nov. 5, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 7,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 29	0200	12,100	12.08	Mar. 29	1630	*14,200	*12.92
Feb. 23	2100	11,900	11.97	Aug. 18	0600	9,960	10.95
Mar. 10	2130	9,900	10.91				

Minimum discharge, 259 ft<sup>3</sup>/s, Oct. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	294	338	1040	452	2740	2610	4810	986	524	355	943	488
2	288	307	778	466	2150	2480	3830	921	511	345	851	470
3	287	291	642	457	1760	2290	3170	863	494	385	756	449
4	280	284	588	483	1480	2230	2710	1170	485	438	893	433
5	277	288	4520	499	1300	4090	2360	1930	484	360	660	427
6	276	289	4660	471	1200	5460	2170	2280	481	343	629	415
7	274	290	2740	483	1090	6380	2250	2120	478	440	579	405
8	277	280	1890	732	1020	9410	2130	4340	487	398	534	388
9	276	278	1400	844	2130	8870	2000	4250	487	359	498	382
10	278	281	1100	753	3550	9340	1910	2980	467	380	475	378
11	270	281	924	740	3110	8380	1800	2270	486	365	457	401
12	286	279	799	1520	2480	5980	1700	1810	473	345	446	377
13	305	281	712	2940	2020	4780	1680	1480	451	333	542	364
14	287	286	656	2480	1800	4040	1950	1260	425	332	555	352
15	279	287	640	1930	1740	3490	1890	1100	402	347	526	343
16	280	287	717	1330	1860	3080	2180	1020	412	368	508	346
17	275	289	691	1410	2260	2690	2010	924	532	367	1350	344
18	275	360	644	2940	2500	2440	1780	857	505	526	8050	359
19	273	324	628	e1800	2900	2250	1600	819	440	760	4210	351
20	277	305	613	e1300	3160	2010	1450	786	442	658	3640	337
21	293	297	630	e1140	3290	1850	1320	759	429	567	2250	325
22	278	291	630	e996	3260	1910	1370	725	416	1150	1750	332
23	272	290	584	e1050	7460	1820	1310	692	396	1060	1230	353
24	269	295	565	1760	8950	1780	1180	665	382	798	917	339
25	268	294	543	2320	7180	1850	1120	640	390	651	769	330
26	269	293	518	1730	5140	1860	1060	627	370	818	699	344
27	271	334	499	1780	3870	2440	1040	627	400	737	649	345
28	267	3770	500	5050	3100	6070	1020	597	457	1080	606	329
29	263	2420	481	8740	---	11700	977	574	397	866	574	315
30	280	1490	472	4930	---	9280	1120	562	373	1130	537	307
31	341	---	448	3530	---	5990	---	541	---	1280	506	---
TOTAL	8685	15679	32252	57056	84500	138850	56897	41175	13476	18341	37589	11128
MEAN	280	523	1040	1841	3018	4479	1897	1328	449	592	1213	371
MAX	341	3770	4660	8740	8950	11700	4810	4340	532	1280	8050	488
MIN	263	278	448	452	1020	1780	977	541	370	332	446	307
CFSM	.26	.48	.96	1.70	2.78	4.13	1.75	1.23	.41	.55	1.12	.34
IN.	.30	.54	1.11	1.96	2.90	4.76	1.95	1.41	.46	.63	1.29	.38

e Estimated.

POTOMAC RIVER BASIN

79

01628500 SOUTH FORK SHENANDOAH RIVER NEAR LYNNWOOD, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	738	777	950	1169	1395	1876	1602	1208	834	538	626	555
MAX	4172	6886	3302	3516	3018	5785	5454	3086	3656	2013	2895	2888
(WY)	1943	1986	1949	1937	1994	1936	1987	1989	1972	1949	1940	1979
MIN	122	150	156	154	203	360	317	362	245	162	166	173
(WY)	1931	1931	1966	1966	1931	1981	1981	1977	1956	1966	1932	1964

SUMMARY STATISTICS

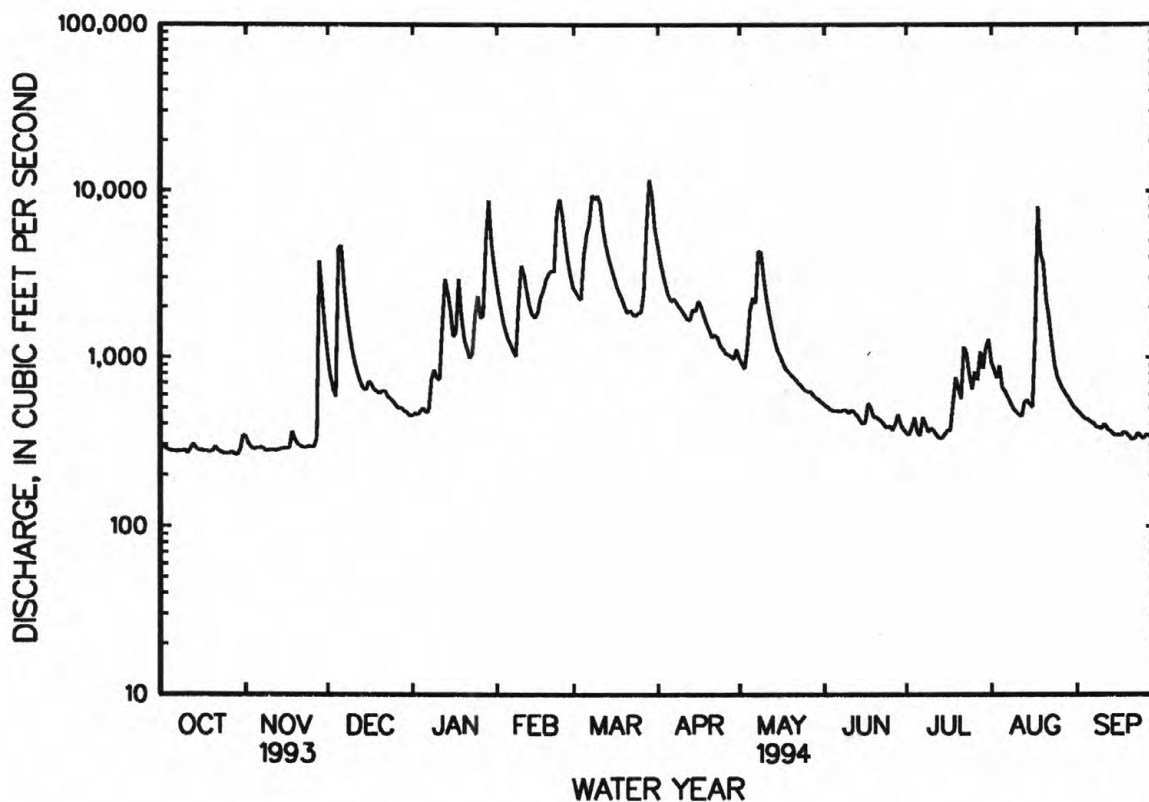
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1931 - 1994

ANNUAL TOTAL	484699		515628									
ANNUAL MEAN	1328		1413							1020		
HIGHEST ANNUAL MEAN										1977		1949
LOWEST ANNUAL MEAN										397		1981
HIGHEST DAILY MEAN	19100	Mar 5	11700	Mar 29					e600000	Nov 5	1985	
LOWEST DAILY MEAN	263	Oct 29	263	Oct 29					100	Oct 13	1930	
ANNUAL SEVEN-DAY MINIMUM	268	Oct 23	268	Oct 23					106	Oct 9	1930	
INSTANTANEOUS PEAK FLOW			14200	Mar 29					95100	Nov 5	1985	
INSTANTANEOUS PEAK STAGE			12.92	Mar 29					a29.46	Nov 5	1985	
INSTANTANEOUS LOW FLOW			259	Oct 29					b32	Sep 20	1932	
ANNUAL RUNOFF (CFSM)	1.23		1.30						.94			
ANNUAL RUNOFF (INCHES)	16.63		17.69						12.79			
10 PERCENT EXCEEDS	3240		3270						2070			
50 PERCENT EXCEEDS	611		644						598			
90 PERCENT EXCEEDS	280		288						235			

- a From floodmarks.  
b Result of regulation.  
e Estimated.



## POTOMAC RIVER BASIN

01629500 SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA

LOCATION.--Lat 38°38'46", long 78°32'06", Page County, Hydrologic Unit 02070005, on right bank between bridges on U.S. Highway 211, 1.2 mi downstream from Big Run, 2.2 mi upstream from Mill Creek, and 4.1 mi west of Luray.

DRAINAGE AREA.--1,377 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1925 to September 1930, October 1938 to September 1951, June 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 721.76 ft above sea level. April 1925 to September 1930, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Jan. 19-22, which is fair. Diurnal fluctuation at low and medium flow caused by powerplant 10 mi upstream from station. Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 110,000 ft<sup>3</sup>/s, from rating curve extended above 86,300 ft<sup>3</sup>/s. Minimum gage height, 2.15 ft, Sept. 27, 1941.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 18, 1936, reached a stage of 23.6 ft, from floodmarks, discharge, 81,600 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 8,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1930	8,460	7.96	Mar. 8	1000	16,100	10.98
Dec. 6	0030	9,730	8.50	Mar. 29	2300	*19,900	*12.30
Jan. 29	0830	15,900	10.92	Aug. 18	1430	11,400	9.36
Feb. 24	0130	17,300	11.42				

Minimum discharge, 236 ft<sup>3</sup>/s, July 13, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	402	459	1710	584	3850	3580	6610	1430	731	465	1310	610
2	380	469	1280	570	3000	3310	5180	1330	687	449	1050	579
3	370	430	1000	589	2470	3200	4170	1250	674	437	964	566
4	364	394	881	615	2120	2980	3490	1330	656	510	912	547
5	356	398	4690	620	1880	4430	3020	1900	641	590	985	541
6	358	397	8010	610	1740	7220	2730	2560	649	455	758	539
7	353	401	4410	649	1610	8870	2790	2550	640	439	720	525
8	353	404	2810	1010	1500	15100	2660	3760	671	490	682	512
9	356	382	2090	1290	1960	14500	2450	5500	642	486	615	488
10	353	391	1660	1150	3840	14500	2340	3840	628	444	590	487
11	346	361	1390	1030	4030	13600	2230	2860	616	456	637	499
12	373	385	1190	1360	3290	9320	2110	2310	625	517	512	506
13	359	375	1030	3460	2670	7010	2050	1950	615	367	566	485
14	392	393	936	3450	2330	5830	2180	1700	564	410	624	467
15	372	405	904	2680	2210	5050	2240	1550	538	417	641	460
16	360	385	951	1890	2230	4450	2520	1440	537	462	612	441
17	359	399	998	1930	2720	3860	2540	1340	600	461	904	450
18	361	442	920	3440	3160	3410	2250	1230	700	479	7580	455
19	362	491	875	e2500	3670	3120	2050	1160	635	767	5990	453
20	400	445	845	e1900	4070	2810	1900	1110	603	828	4150	449
21	384	422	855	e1600	4280	2580	1760	1070	578	743	2940	436
22	403	419	852	e1450	4320	2560	1740	1030	585	673	2250	451
23	370	399	813	1400	8320	2490	1770	982	540	1400	1740	496
24	370	401	767	1780	14700	2400	1640	941	509	1100	1330	466
25	356	392	740	2660	11200	2410	1560	921	488	855	1060	454
26	360	406	707	2160	7720	2450	1500	885	491	738	912	487
27	366	501	681	2040	5590	2650	1460	864	504	983	848	487
28	364	6540	661	3910	4350	7150	1430	851	550	959	780	468
29	363	4500	659	13400	---	16100	1410	809	571	1190	719	436
30	374	2470	639	7580	---	15800	1480	785	508	996	684	417
31	403	---	618	5120	---	9070	---	773	---	1380	644	---
TOTAL	11442	24656	46572	74427	114830	201810	73260	52011	17976	20946	44709	14657
MEAN	369	822	1502	2401	4101	6510	2442	1678	599	676	1442	489
MAX	403	6540	8010	13400	14700	16100	6610	5500	731	1400	7580	610
MIN	346	361	618	570	1500	2400	1410	773	488	367	512	417
CFSM	.27	.60	1.09	1.74	2.98	4.73	1.77	1.22	.44	.49	1.05	.35
IN.	.31	.67	1.26	2.01	3.10	5.45	1.98	1.41	.49	.57	1.21	.40

e Estimated.



POTOMAC RIVER BASIN

81

01629500 SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1926 - 1930, 1939 - 1951, 1980 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1064	1145	1330	1371	1876	2221	2242	1694	1162	738	887	853
MAX	6332	8783	3821	3780	4415	7143	7412	4449	3418	2460	3637	4076
(WY)	1943	1986	1949	1991	1984	1993	1987	1989	1949	1949	1940	1979
MIN	271	254	351	260	574	548	452	499	438	296	258	257
(WY)	1942	1942	1944	1981	1944	1981	1981	1930	1930	1930	1930	1930

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

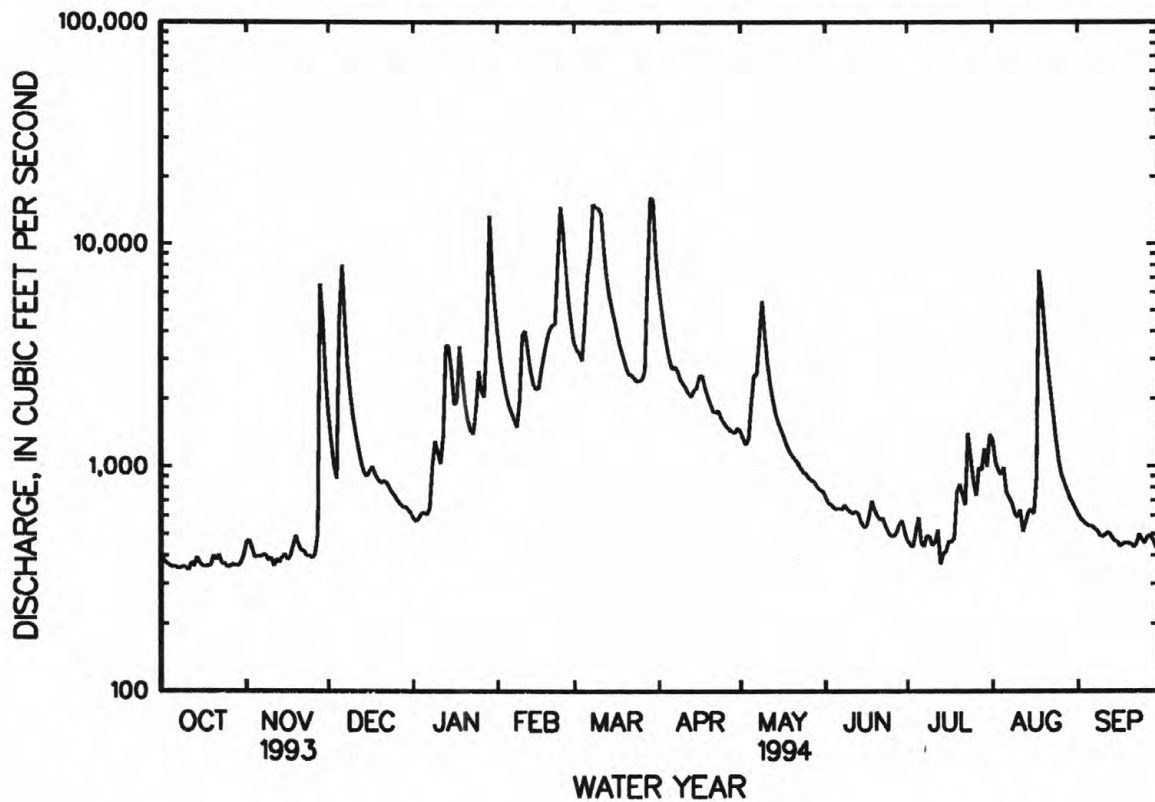
FOR 1994 WATER YEAR

WATER YEARS 1926 - 1930,  
1939 - 1951,  
1980 - 1994

ANNUAL TOTAL	685437	697296	1369
ANNUAL MEAN	1878	1910	2404
HIGHEST ANNUAL MEAN			580
LOWEST ANNUAL MEAN			1949
HIGHEST DAILY MEAN	31900	Mar 5	78700
LOWEST DAILY MEAN	346	Oct 11	135
ANNUAL SEVEN-DAY MINIMUM	354	Oct 5	195
INSTANTANEOUS PEAK FLOW		19900	Mar 29
INSTANTANEOUS PEAK STAGE		12.30	Mar 29
INSTANTANEOUS LOW FLOW		236	Jul 13
ANNUAL RUNOFF (CFSM)	1.36	1.39	.99
ANNUAL RUNOFF (INCHES)	18.52	18.84	13.51
10 PERCENT EXCEEDS	4700	4300	2710
50 PERCENT EXCEEDS	875	875	840
90 PERCENT EXCEEDS	379	394	360

a Result of regulation.

b Also Sept. 16, 1925; data were collected for only part of the 1925 water year.



## POTOMAC RIVER BASIN

01629500 SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, JUNE 1994

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STANDARD UNITS) (00400)	TEMPERATURE WATER (DEG C) (00010)	TEMPERATURE AIR (DEG C) (00020)	BAROMETRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PERCENT SATURATION) (00301)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	NITROGEN, NITRATE DIS-SOLVED (MG/L AS NO3) (71851)	
JUN 07...	1230	354	8.2	24.5	32.5	739	10.0	124	144	163	6	9.2	
DATE		NITROGEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA + ORGANIC DIS. TOTAL (MG/L AS N) (00623)	PHOSPHORUS DIS-SOLVED (MG/L AS P) (00665)	PHOSPHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	DIMETHOATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHALFLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
JUN 07...	0.030	2.10	2.10	0.030	0.40	0.40	0.090	0.060	0.060	<0.02	<0.01	<0.01	
DATE		TERBACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRIFLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALACHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	ATRAZINE, WATER, DISS, REC (UG/L) (39632)	BENFLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYLATE, WATER, DISS, REC (UG/L) (04028)	CARBARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBOFURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	
JUN 07...	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	0.07	<0.01	<0.01	<0.05	<0.01	<0.00	

< Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

83

01629500 SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA--Continued

## WATER QUALITY DATA, JUNE 1994

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
JUN 07...	0.01	<0.00	<0.01	0.02	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
JUN 07...	<0.04	<0.01	<0.04	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
JUN 07...	<0.02	0.02	<0.01	<0.02	<0.01	<0.02	0.03	<0.02	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01631000 SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA

LOCATION.--Lat 38°54'50", long 78°12'40", Warren County, Hydrologic Unit 02070005, on left bank 0.7 mi downstream from bridge on State Highway 619, 1.0 mi west of Front Royal, and 3.5 mi upstream from confluence with North Fork.

DRAINAGE AREA.--1,642 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1899 to September 1906, September 1930 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 951: 1936(M). WSP 1171: 1935(M), 1937(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 469.38 ft above sea level. June 1899 to July 1906, nonrecording gage at site 1.0 mi upstream at different datum.

REMARKS.--Records good except those for period of doubtful gage-height record, Oct. 1-10, and periods with ice effect, Dec. 29 to Jan. 1 and Jan. 15-27, which are fair. Large diurnal fluctuation at low and medium flow caused by powerplants upstream from station prior to 1954; occasional large diurnal fluctuation thereafter. National Weather Service gage-height telemeter at station. Maximum discharge, 130,000 ft<sup>3</sup>/s, from rating curve extended above 92,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 0.56 ft, Jan. 30, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 8,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	0600	8,580	6.55	Mar. 8	2100	18,600	10.28
Dec. 6	1215	9,670	7.06	Mar. 30	0630	*20,900	*11.00
Jan. 29	1845	15,200	9.16	Aug. 19	0245	9,810	7.12
Feb. 24	1330	18,100	10.12				

Minimum daily discharge, 473 ft<sup>3</sup>/s, Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e540	544	2550	e950	4570	4160	7670	1670	932	710	1330	772
2	e530	574	1930	896	3630	3750	6110	1550	841	656	1250	704
3	e525	614	1510	831	2940	3690	5040	1470	809	628	1070	675
4	e520	585	1230	892	2510	3320	4430	1470	790	611	1010	655
5	e510	551	2950	997	2230	3960	3760	1670	783	634	1040	642
6	e500	559	8460	940	2010	6670	3390	2370	774	730	1020	625
7	e490	535	6130	919	1860	8290	3510	2860	802	647	868	623
8	e490	531	3950	1330	1770	15400	3430	4490	791	609	795	607
9	e480	536	2890	1680	1890	17000	3100	5530	805	632	825	592
10	e480	525	2280	1700	3050	16200	2920	4950	771	673	729	570
11	496	520	1860	1560	4350	16400	2760	3670	764	596	728	559
12	523	520	1580	1540	4390	11100	2600	2960	761	601	849	565
13	527	530	1410	2800	3710	8030	2630	2460	770	619	688	569
14	510	551	1260	4140	2710	6690	2530	2280	771	570	733	556
15	521	559	1230	e3300	2570	5890	2640	2110	727	536	750	537
16	527	547	1390	e2400	2530	5250	3000	1960	719	575	775	520
17	505	548	1350	e3000	2650	4640	3130	1850	719	620	1310	500
18	491	583	1320	e3400	3310	4050	2890	1730	749	633	3860	498
19	488	597	1230	e3200	4050	3670	2590	1610	822	674	7820	496
20	494	628	1160	e3100	4610	3330	2350	1540	808	840	4360	493
21	523	633	1170	e3300	4820	3040	2170	1470	774	913	3710	485
22	548	582	1130	e2900	4800	3100	2050	1410	747	850	2580	500
23	526	578	1120	e2000	5460	3030	2010	1350	750	870	2080	569
24	515	560	1070	e2400	15500	2910	1970	1280	716	1360	1570	538
25	500	563	1020	e3400	12500	2910	1820	1220	677	1120	1290	506
26	494	555	982	e3200	8980	2880	1700	1190	637	964	1080	549
27	491	699	935	e3000	6400	3380	1700	1130	683	885	963	563
28	495	4780	916	2770	4980	5780	1620	1070	679	1110	911	544
29	494	7060	e880	10900	---	15300	1560	1040	725	1040	848	496
30	511	3890	e900	9550	---	19300	1630	1030	765	1170	804	473
31	538	---	e880	5980	---	11200	---	1010	755	1050	762	---
TOTAL	15782	31037	58673	88975	124780	224320	88710	63400	22861	24126	48408	16981
MEAN	509	1035	1893	2870	4456	7236	2957	2045	762	778	1562	566
MAX	548	7060	8460	10900	15500	19300	7670	5530	932	1360	7820	772
MIN	480	520	880	831	1770	2880	1560	1010	637	536	688	473
CFSM	.31	.63	1.15	1.75	2.71	4.41	1.80	1.25	.46	.47	.95	.34
IN.	.36	.70	1.33	2.02	2.83	5.08	2.01	1.44	.52	.55	1.10	.38

e Estimated.



POTOMAC RIVER BASIN

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01631000 SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1900 - 1906, 1931 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1172	1212	1478	1785	2138	2869	2499	1860	1302	781	954	840
MAX	8678	10130	4795	4758	5392	10300	7963	4807	6586	2876	6807	4426
(WY)	1943	1986	1973	1937	1984	1936	1987	1989	1972	1949	1955	1979
MIN	225	242	268	285	348	632	516	578	393	252	281	314
(WY)	1931	1931	1966	1966	1931	1981	1981	1977	1977	1966	1932	1965

SUMMARY STATISTICS

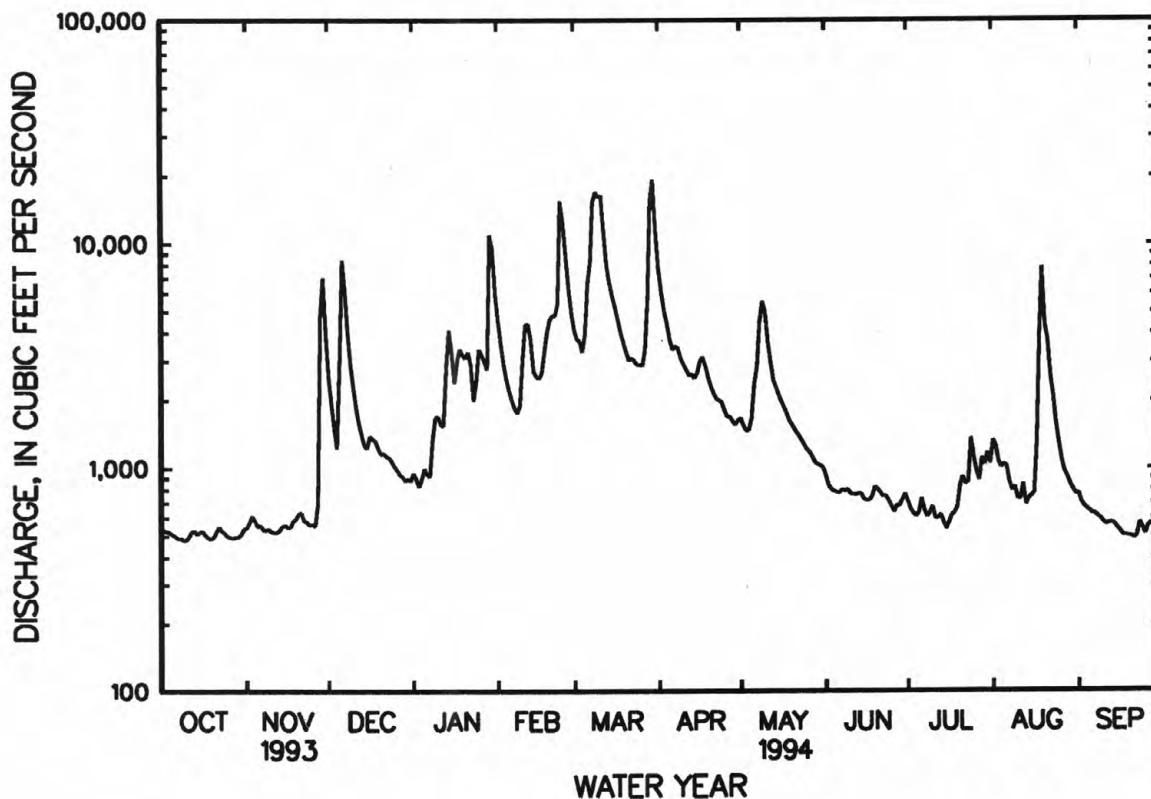
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1900 - 1906,  
1931 - 1994

ANNUAL TOTAL	765438	808053	
ANNUAL MEAN	2097	2214	1571
HIGHEST ANNUAL MEAN			2894
LOWEST ANNUAL MEAN			680
HIGHEST DAILY MEAN	34200	Mar 5	19300
LOWEST DAILY MEAN	e380	Aug 26	473
ANNUAL SEVEN-DAY MINIMUM	426	Aug 23	492
INSTANTANEOUS PEAK FLOW			20900
INSTANTANEOUS PEAK STAGE			11.00
INSTANTANEOUS LOW FLOW			417
ANNUAL RUNOFF (CFSM)	1.28	1.35	.96
ANNUAL RUNOFF (INCHES)	17.34	18.31	13.00
10 PERCENT EXCEEDS	5100	4700	3150
50 PERCENT EXCEEDS	1050	1070	940
90 PERCENT EXCEEDS	491	525	385

a From floodmarks.  
e Estimated.



## POTOMAC RIVER BASIN

01631000 SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, JUNE 1994

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, (PER- CENT SATUR- ATION) (00301)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
JUN 08...	0930	318	7.8	25.5	25.0	746	6.9	86	134	163	5.7	0.020
DATE		NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
JUN 08...		1.30	1.30	0.050	0.40	0.40	0.050	0.050	0.030	<0.02	<0.01	<0.01
DATE		TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)
JUN 08...		<0.03	<0.01	<0.01	<0.01	<0.01	0.08	<0.01	<0.01	<0.05	<0.01	<0.00

< Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

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01631000 SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA--Continued

## WATER QUALITY DATA, JUNE 1994

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
JUN 08...	0.01	<0.00	<0.01	0.02	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
JUN 08...	<0.04	<0.01	<0.04	<0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
JUN 08...	<0.02	0.01	<0.01	<0.02	<0.01	<0.02	0.04	<0.02	<0.01	<0.01	<0.01

&lt; Actual values are known to be less than the values shown.

## 01632000 NORTH FORK SHENANDOAH RIVER AT COOTES STORE, VA

LOCATION.--Lat 38°38'13", long 78°51'11", Rockingham County, Hydrologic Unit 02070006, on right bank at Cootes Store, 300 ft upstream from bridge on State Highway 259, and 3.7 mi upstream from Linville Creek.

DRAINAGE AREA.--210 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1925 to current year.

REVISED RECORDS.--WSP 726: 1928-31. WSP 951: 1936, 1939(M). WSP 1171: 1935, 1937, 1938(M). WSP 1502: 1926, 1927-28(M), 1929, 1930-34(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,051.8 ft above mean sea level (U.S. Army Corps of Engineers bench mark). Prior to Nov. 15, 1937, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period with ice effect, Jan. 16-24, and period of no gage-height record, May 4-14, which are fair. National Weather Service gage-height telemeter and Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 50,000 ft<sup>3</sup>/s, from rating curve extended above 9,000 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. Minimum gage height, 1.74 ft, Sept. 7-10, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1836, that of Oct. 15, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0345	5,430	9.29	Mar. 29	1445	4,900	8.83
Dec. 5	0845	4,270	8.24	Aug. 17	1900	*14,800	*15.26
Mar. 8	0100	3,610	7.57				

Minimum daily discharge, 2.6 ft<sup>3</sup>/s, Oct. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	7.1	175	48	428	346	714	164	25	16	126	29
2	4.0	6.5	129	48	309	309	488	136	24	14	92	27
3	4.1	6.9	103	49	248	278	361	115	22	13	79	24
4	3.7	7.2	90	58	205	432	295	e240	21	14	130	23
5	3.8	7.4	2920	61	179	1310	242	e360	20	18	100	22
6	3.7	7.4	1320	58	160	1310	215	e340	19	14	87	21
7	3.5	7.2	551	69	144	1910	281	e330	19	11	64	19
8	2.8	7.2	312	371	139	3030	296	e2300	24	9.5	51	17
9	2.8	7.2	213	357	1740	1930	277	e1000	23	8.9	43	16
10	2.6	7.2	163	248	1470	2380	262	e550	20	23	36	15
11	2.6	7.0	137	207	837	1930	238	e350	18	24	104	14
12	3.5	6.8	113	447	514	1030	206	e260	17	18	579	13
13	3.3	8.4	96	702	366	684	274	e210	16	13	189	12
14	3.5	16	82	554	297	554	447	e180	15	12	131	11
15	3.4	16	82	382	270	458	398	150	13	14	99	10
16	3.5	18	173	e350	350	489	466	136	21	23	75	9.4
17	3.4	18	220	e320	477	404	348	115	24	22	4530	8.1
18	3.4	22	191	e360	577	326	286	99	16	20	3410	7.9
19	3.3	24	166	e330	797	280	242	86	14	17	1040	7.3
20	3.5	23	144	e310	990	227	210	77	18	21	493	7.0
21	3.6	22	139	e290	1070	199	179	68	15	24	235	6.6
22	3.4	21	122	e250	874	273	169	59	20	75	169	7.4
23	3.7	20	106	e430	2180	321	153	53	14	83	125	8.0
24	3.5	20	94	e350	2620	313	138	48	58	61	94	7.4
25	3.7	18	83	372	1960	330	127	46	32	50	73	6.7
26	3.8	18	75	584	1060	319	119	45	24	80	60	7.1
27	3.9	246	69	549	642	622	115	41	23	65	51	6.8
28	3.8	2830	65	1700	445	1660	107	37	21	102	44	6.3
29	3.8	665	60	2110	---	3860	101	34	19	105	38	6.0
30	6.3	289	54	1030	---	2420	230	31	18	412	35	5.7
31	9.2	---	50	622	---	1160	---	28	---	185	32	---
TOTAL	117.0	4379.5	8297	13616	21348	31094	7984	7688	633	1567.4	12414	380.7
MEAN	3.77	146	268	439	762	1003	266	248	21.1	50.6	400	12.7
MAX	9.2	2830	2920	2110	2620	3860	714	2300	58	412	4530	29
MIN	2.6	6.5	50	48	139	199	101	28	13	8.9	32	5.7
CFSM	.02	.70	1.27	2.09	3.63	4.78	1.27	1.18	.10	.24	1.91	.06
IN.	.02	.78	1.47	2.41	3.78	5.51	1.41	1.36	.11	.28	2.20	.07

e Estimated.



## POTOMAC RIVER BASIN

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01632000 NORTH FORK SHENANDOAH RIVER AT COOTES STORE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	129	142	185	202	285	414	355	271	123	63.7	86.9	68.6
MAX	1401	1883	850	656	762	1536	1156	964	906	552	697	954
(WY)	1943	1986	1974	1937	1994	1936	1987	1942	1972	1949	1955	1945
MIN	.76	3.26	3.04	5.13	11.3	38.4	27.7	24.3	6.10	1.60	.52	.66
(WY)	1931	1931	1966	1966	1934	1981	1981	1977	1977	1977	1930	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1925 - 1994

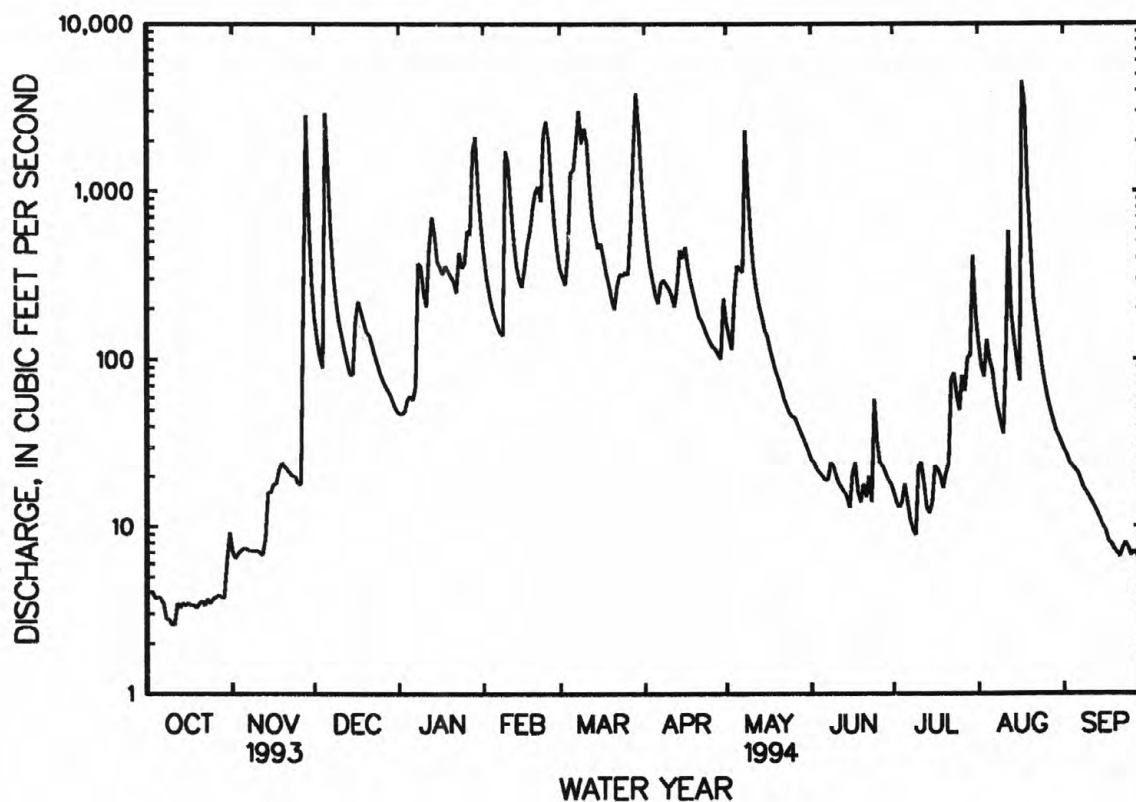
ANNUAL TOTAL	91032.7	109518.6	
ANNUAL MEAN	249	300	194
HIGHEST ANNUAL MEAN			389
LOWEST ANNUAL MEAN			58.1
HIGHEST DAILY MEAN	6310	Mar 4	24900
LOWEST DAILY MEAN	1.3	Sep 15	.20
ANNUAL SEVEN-DAY MINIMUM	1.6	Sep 3	.27
INSTANTANEOUS PEAK FLOW			50000
INSTANTANEOUS PEAK STAGE			c25.30
INSTANTANEOUS LOW FLOW			.20
ANNUAL RUNOFF (CFSM)	1.19		.92
ANNUAL RUNOFF (INCHES)	16.13		12.55
10 PERCENT EXCEEDS	671		422
50 PERCENT EXCEEDS	43		61
90 PERCENT EXCEEDS	3.2		4.6

a Also Oct. 11, 1993.

b Also Aug. 29, Sept. 4, 1957, and Sept. 7-10, 1966.

c From floodmarks.

d Also Oct. 9-12, 1993.



## POTOMAC RIVER BASIN

01632082 LINVILLE CREEK AT BROADWAY, VA

LOCATION.--Lat 38°36'24", long 78°48'13", Rockingham County, Hydrologic Unit 02070006, on left bank at Linville, 170 ft downstream from bridge on State Highway 1421, and 1.1 mi upstream from mouth.

DRAINAGE AREA.--45.5 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,029.90 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 26, 30, 31, and Jan. 9, 10, 16, 17, 19-21, which are fair. Maximum discharge, 3,160 ft<sup>3</sup>/s, from rating curve extended above 3,100 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0200	956	3.88	Mar. 6	2000	600	3.28
Dec. 5	0545	1,100	4.08	Mar. 7	1645	1,100	4.09
Jan. 24	1645	882	3.77	Mar. 10	1315	828	3.68
Jan. 28	1700	1,600	4.70	Mar. 29	0700	1,130	4.13
Feb. 23	1045	1,210	4.23	May 8	0200	580	3.24
Feb. 24	0900	852	3.72	Aug. 17	1630	*1,820	*4.94

Minimum discharge, 5.6 ft<sup>3</sup>/s, Oct. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	13	34	14	77	107	164	45	27	13	12	16
2	7.1	11	28	13	66	107	139	41	25	12	12	15
3	6.5	10	25	14	58	101	122	40	24	12	12	15
4	6.3	9.9	26	16	53	122	107	71	24	12	19	14
5	6.2	11	432	13	51	256	96	65	23	12	17	14
6	6.4	11	109	13	48	347	94	54	23	12	15	13
7	6.4	9.2	73	17	44	556	124	86	23	12	13	13
8	6.4	8.7	59	42	44	392	89	262	31	11	12	12
9	6.3	8.7	50	e38	185	329	82	125	24	11	12	12
10	6.4	9.5	44	e32	92	642	77	99	22	11	12	13
11	6.8	8.9	38	30	80	281	71	84	22	11	14	13
12	9.9	8.9	32	119	64	214	67	75	21	10	30	12
13	7.7	10	29	91	59	184	78	67	20	9.9	16	12
14	7.4	13	26	77	56	163	65	61	19	10	14	11
15	7.1	11	29	58	60	145	80	58	18	12	13	11
16	7.3	9.6	35	e51	93	128	153	55	19	13	14	12
17	7.4	11	31	e79	139	111	91	50	19	13	391	12
18	8.3	12	29	144	189	105	77	48	17	20	130	12
19	8.6	11	26	e54	179	93	70	46	17	18	62	11
20	11	9.6	25	e43	143	85	62	44	18	13	47	11
21	9.7	8.1	27	e39	137	87	58	41	17	24	39	11
22	10	7.7	23	35	118	85	64	39	16	24	35	13
23	9.6	7.9	21	77	597	73	54	38	15	18	30	14
24	8.6	7.7	20	334	445	69	51	36	15	15	26	11
25	8.1	7.5	19	119	222	69	47	35	14	21	24	11
26	8.0	7.5	e18	137	171	61	44	35	13	19	22	12
27	7.8	42	17	67	137	116	61	33	18	17	20	11
28	7.5	292	16	652	118	276	49	31	15	17	19	10
29	7.4	59	16	200	---	663	57	30	16	15	18	9.6
30	11	42	e13	118	---	244	53	28	15	14	17	9.4
31	14	---	e11	91	---	190	---	28	---	12	17	---
TOTAL	248.9	688.4	1381	2827	3725	6401	2446	1850	590	443.9	1134	366.0
MEAN	8.03	22.9	44.5	91.2	133	206	81.5	59.7	19.7	14.3	36.6	12.2
MAX	14	292	432	652	597	663	164	262	31	24	391	16
MIN	6.2	7.5	11	13	44	61	44	28	13	9.9	12	9.4
CF5M	.18	.50	.98	2.00	2.92	4.54	1.79	1.31	.43	.31	.80	.27
IN.	.20	.56	1.13	2.31	3.05	5.23	2.00	1.51	.48	.36	.93	.30

e Estimated.

POTOMAC RIVER BASIN

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01632082 LINVILLE CREEK AT BROADWAY, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	24.3	33.4	32.1	50.7	44.9	77.9	58.8	43.1	22.5	13.0	15.0	18.8
MAX	108	144	52.9	141	133	206	135	91.0	36.2	20.0	36.6	85.9
(WY)	1991	1986	1991	1991	1994	1994	1993	1989	1987	1991	1994	1987
MIN	6.66	7.34	7.05	9.75	10.1	17.1	11.9	12.9	9.68	8.28	5.79	5.21
(WY)	1989	1992	1989	1989	1989	1989	1989	1986	1986	1986	1986	1986

SUMMARY STATISTICS

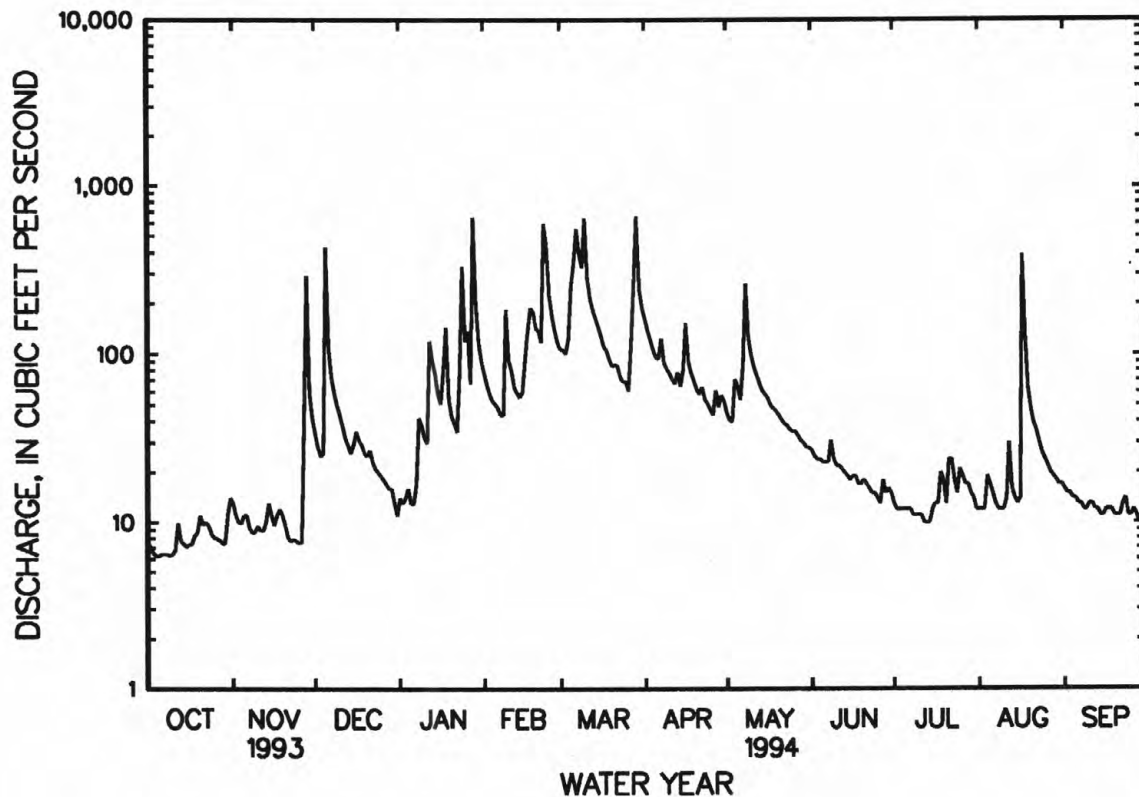
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1985 - 1994

ANNUAL TOTAL	17967.9		22101.2									
ANNUAL MEAN	49.2		60.6							36.3		
HIGHEST ANNUAL MEAN										60.6		1994
LOWEST ANNUAL MEAN										22.6		1992
HIGHEST DAILY MEAN	1170	Mar 4				663	Mar 29			1170	Mar 4	1993
LOWEST DAILY MEAN	6.2	Oct 5				6.2	Oct 5			3.2	Sep 17	1986
ANNUAL SEVEN-DAY MINIMUM	6.3	Oct 4				6.3	Oct 4			3.6	Sep 12	1986
INSTANTANEOUS PEAK FLOW						1820	Aug 17			3160	Nov 4	1985
INSTANTANEOUS PEAK STAGE						4.94	Aug 17			6.22	Nov 4	1985
INSTANTANEOUS LOW FLOW						5.6	Oct 4			2.8	aSep 13	1986
ANNUAL RUNOFF (CFSM)	1.08					1.33				.80		
ANNUAL RUNOFF (INCHES)	14.69					18.07				10.83		
10 PERCENT EXCEEDS	109					137				72		
50 PERCENT EXCEEDS	23					24				18		
90 PERCENT EXCEEDS	7.3					9.5				7.1		

a Also Sept. 14, 17, 1986.



## 01632900 SMITH CREEK NEAR NEW MARKET, VA

LOCATION.--Lat 38°41'36", Long 78°38'35", Shenandoah County, Hydrologic Unit 02070006, on left bank 25 ft upstream from bridge on State Highway 620, 3.6 mi north of New Market, and 4.4 mi upstream from mouth.

DRAINAGE AREA.--93.2 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 881.50 ft above sea level. Prior to Aug. 2, 1963, on right bank a short distance downstream, at datum 0.71 ft higher.

REMARKS.--Records good except those for periods with ice effect, Dec. 31 and Jan. 1, 16, 17, 19-24, which are fair. Maximum discharge, 10,600 ft<sup>3</sup>/s, from rating curve extended above 2,300 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. Minimum discharge, 4.5 ft<sup>3</sup>/s, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 1, 1959, reached a stage of 10.7 ft, discharge not determined, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0900	*3,390	*10.60	Feb. 24	1730	1,250	6.97
Dec. 5	1300	2,530	9.61	Mar. 8	0530	2,380	9.41
Jan. 12	1800	696	5.14	Mar. 10	2000	2,100	9.00
Jan. 18	0730	1,020	6.21	Mar. 29	1400	2,360	9.38
Jan. 29	0100	2,480	9.54	May 8	0300	804	5.48
Feb. 23	2000	2,210	9.18	Aug. 17	1800	1,140	6.59

Minimum discharge, 16 ft<sup>3</sup>/s, Oct. 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	31	131	e57	179	213	369	94	51	36	27	26
2	21	29	103	55	154	212	301	85	49	34	28	25
3	20	26	86	58	137	232	261	83	48	34	36	25
4	19	24	86	70	125	210	233	167	47	34	30	25
5	19	24	1540	62	118	323	211	164	47	32	34	24
6	18	25	488	57	110	416	204	127	47	32	31	23
7	17	24	279	125	101	672	327	161	47	32	27	23
8	17	22	210	400	101	1950	216	512	58	31	26	23
9	17	21	170	224	357	1230	190	223	51	30	25	22
10	17	21	148	153	210	1620	179	164	47	30	23	22
11	17	21	132	136	165	1080	165	136	46	28	25	23
12	20	20	112	421	138	577	157	121	45	28	34	22
13	21	22	99	343	125	463	175	106	43	27	25	21
14	19	29	92	252	118	396	156	99	41	28	24	20
15	18	26	101	175	118	353	152	94	41	28	24	21
16	18	23	174	e152	126	305	242	101	41	34	23	21
17	18	23	128	e175	179	257	164	85	42	31	300	20
18	18	37	110	565	267	242	143	81	39	37	241	21
19	18	35	101	e172	395	214	133	78	38	32	64	21
20	20	29	91	e116	377	193	124	77	39	31	46	19
21	30	26	102	e97	316	220	117	74	38	30	40	21
22	24	24	91	e90	270	214	134	70	41	32	44	23
23	21	23	84	e96	1140	185	120	66	38	38	37	29
24	20	22	79	e240	1160	168	110	64	38	32	33	24
25	19	22	76	235	598	177	106	63	36	30	32	23
26	19	21	72	229	379	159	101	62	35	33	31	22
27	19	130	66	154	280	303	124	61	40	32	29	21
28	18	2020	66	786	235	873	116	58	47	36	29	21
29	18	328	66	852	---	1830	103	56	39	32	28	20
30	21	185	62	284	---	705	104	55	39	30	27	20
31	28	---	e54	211	---	446	---	52	---	28	27	---
TOTAL	612	3313	5199	7042	7978	16438	5237	3439	1298	982	1450	671
MEAN	19.7	110	168	227	285	530	175	111	43.3	31.7	46.8	22.4
MAX	30	2020	1540	852	1160	1950	369	512	58	38	300	29
MIN	17	20	54	55	101	159	101	52	35	27	23	19
CFSM	.21	1.18	1.80	2.44	3.06	5.69	1.87	1.19	.46	.34	.50	.24
IN.	.24	1.32	2.08	2.81	3.18	6.56	2.09	1.37	.52	.39	.58	.27

e Estimated.



POTOMAC RIVER BASIN

93

01632900 SMITH CREEK NEAR NEW MARKET, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	53.8	57.3	67.8	91.9	111	157	120	86.6	58.8	35.2	34.1	30.0
MAX	297	323	222	248	313	530	372	238	294	121	121	120
(WY)	1973	1986	1973	1991	1984	1994	1987	1988	1972	1972	1969	1979
MIN	8.56	11.0	8.86	10.1	21.1	26.4	19.4	20.0	18.1	10.0	10.8	9.36
(WY)	1987	1966	1966	1966	1989	1981	1981	1969	1977	1977	1966	1986

SUMMARY STATISTICS

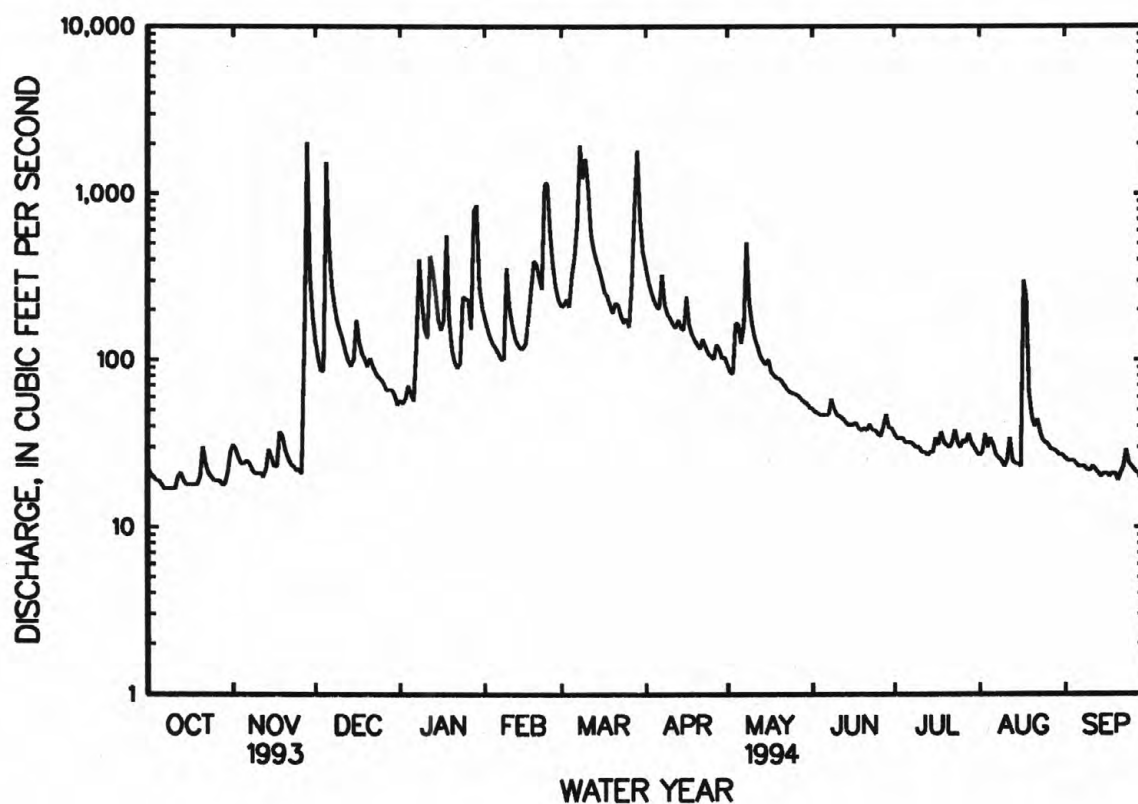
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1961 - 1994

ANNUAL TOTAL	44073	53659	
ANNUAL MEAN	121	147	75.1
HIGHEST ANNUAL MEAN			148
LOWEST ANNUAL MEAN			27.8
HIGHEST DAILY MEAN	2020	aMar 4	3840
LOWEST DAILY MEAN	15	Sep 15	6.5
ANNUAL SEVEN-DAY MINIMUM	17	Sep 9	7.5
INSTANTANEOUS PEAK FLOW			10600
INSTANTANEOUS PEAK STAGE			16.38
INSTANTANEOUS LOW FLOW			4.5
ANNUAL RUNOFF (CFSM)	1.30	1.58	f.81
ANNUAL RUNOFF (INCHES)	17.59	21.42	10.96
10 PERCENT EXCEEDS	266	309	150
50 PERCENT EXCEEDS	57	58	42
90 PERCENT EXCEEDS	20	21	15

- a Also Nov. 28, 1993.  
b Also Oct. 8-11, 1993.  
c Also July 28, 1977.  
d Also Oct. 8, 1993.  
f Result of freezeup.



## POTOMAC RIVER BASIN

## 01633000 NORTH FORK SHENANDOAH RIVER AT MOUNT JACKSON, VA

LOCATION.--Lat 38°44'43", long 78°38'21", Shenandoah County, Hydrologic Unit 02070006, on right bank at upstream side of bridge on State Highway 698 at Mount Jackson and 0.4 mi downstream from Mill Creek.

DRAINAGE AREA.--506 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1943 to current year.

REVISED RECORDS.--WSP 1382: 1945, 1948-50(M), 1951-53(P), 1954(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 838.55 ft above sea level. Prior to July 1, 1976, nonrecording gage, and July 1, 1976, to Oct. 23, 1981, water-stage recorder, at site 400 ft upstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 31 and Jan. 1, 9-11, 16, 17, 18-24, and period of no gage-height record, June 16 to July 25, which are fair. Some diversion during low flow for irrigation at points upstream from station. Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 50,800 ft<sup>3</sup>/s, Nov. 5, 1985, from rating curve extended above 19,000 ft<sup>3</sup>/s on basis of peak runoff for stations at Cootes Store and near Strasburg. Minimum gage height, 1.97 ft, Sept. 3, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1942 reached a stage of 20.2 ft, from floodmarks, discharge, about 80,000 ft<sup>3</sup>/s, from rating curve extended above 18,000 ft<sup>3</sup>/s on basis of peak runoff for flood in October 1942 for stations at Cootes Store and near Strasburg.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0830	10,800	11.93	Mar. 10	2000	7,780	10.40
Dec. 5	1300	8,720	10.91	Mar. 29	1400	11,100	12.12
Jan. 28	2230	8,960	11.03	May 8	0900	10,600	11.83
Feb. 23	1800	8,090	10.57	Aug. 18	0130	*19,800	*15.11
Mar. 8	0530	8,600	10.85				

Minimum discharge, 45 ft<sup>3</sup>/s, Oct. 11-12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	93	483	e173	998	1030	1760	495	191	e120	258	154
2	55	87	369	175	788	982	1380	432	180	e110	212	142
3	54	79	304	175	674	926	1160	394	172	e115	203	133
4	53	74	274	193	589	945	1010	625	169	e105	225	129
5	51	75	5040	192	536	2230	890	994	165	e98	234	123
6	49	79	2520	183	496	2710	839	909	176	e97	213	118
7	49	78	1210	233	455	3790	1140	871	174	e96	174	112
8	50	73	786	652	429	7420	948	6550	182	e95	151	104
9	50	68	597	e714	2140	4800	862	2550	178	e99	133	100
10	48	67	495	e532	2380	6170	819	1430	161	e93	121	96
11	46	66	427	e460	1490	4780	761	1010	157	e87	255	96
12	52	64	362	823	1040	2580	695	796	149	e84	818	93
13	55	70	319	1360	817	1950	859	662	142	e93	435	88
14	52	94	288	1100	706	1670	998	568	131	e90	315	84
15	50	98	285	827	662	1490	942	507	126	e90	251	81
16	50	85	431	e640	734	1360	1330	493	e123	e100	206	81
17	50	88	494	e580	1040	1170	954	426	e144	e97	4740	78
18	50	110	450	1130	1380	1050	814	390	e136	e108	8340	77
19	50	113	406	e714	1790	947	729	364	e200	e115	1740	76
20	52	102	362	e537	1880	828	659	346	e180	e128	992	73
21	67	95	358	e465	1890	792	599	326	e160	e125	619	73
22	64	89	328	e437	1670	924	606	301	e150	e130	495	81
23	58	85	292	e450	4510	880	557	282	e146	e172	398	98
24	55	83	269	e1190	5590	837	511	265	e144	e185	324	85
25	55	80	251	1120	3930	867	481	261	e142	e180	280	78
26	55	78	233	1190	2190	819	452	259	e139	208	251	77
27	54	169	220	1030	1530	1340	462	245	e134	197	223	75
28	54	6150	212	3140	1200	3450	470	229	e130	212	203	72
29	55	1460	206	4590	---	8640	424	219	e133	219	188	71
30	63	724	189	1950	---	4280	581	209	e130	425	172	68
31	82	---	e169	1300	---	2350	---	199	---	366	162	---
TOTAL	1686	10676	18629	28255	43534	74007	24692	23607	4644	4439	23331	2816
MEAN	54.4	356	601	911	1555	2387	823	762	155	143	753	93.9
MAX	82	6150	5040	4590	5590	8640	1760	6550	200	425	8340	154
MIN	46	64	169	173	429	792	424	199	123	84	121	68
CFSM	.11	.70	1.19	1.80	3.07	4.72	1.63	1.50	.31	.28	1.49	.19
IN.	.12	.78	1.37	2.08	3.20	5.44	1.82	1.74	.34	.33	1.72	.21

e Estimated.

## POTOMAC RIVER BASIN

95

01633000 NORTH FORK SHENANDOAH RIVER AT MOUNT JACKSON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	238	284	378	442	564	835	655	520	295	165	210	176
MAX	1580	2371	1272	1388	1555	2387	2193	1418	1483	834	1403	1316
(WY)	1980	1986	1973	1991	1994	1994	1987	1988	1972	1949	1955	1945
MIN	22.2	26.3	22.7	30.1	62.7	119	79.2	84.3	53.8	26.0	19.9	26.2
(WY)	1987	1966	1966	1966	1959	1981	1981	1969	1977	1977	1964	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1944 - 1994

ANNUAL TOTAL	207658	260316	
ANNUAL MEAN	569	713	396
HIGHEST ANNUAL MEAN			777
LOWEST ANNUAL MEAN			136
HIGHEST DAILY MEAN	8670	Mar 4	30300
LOWEST DAILY MEAN	46	aSep 15	8.0
ANNUAL SEVEN-DAY MINIMUM	49	Oct 5	11
INSTANTANEOUS PEAK FLOW			50800
INSTANTANEOUS PEAK STAGE		15.11	c18.10
INSTANTANEOUS LOW FLOW		45	dOct 11
ANNUAL RUNOFF (CFSM)	1.12	1.41	.78
ANNUAL RUNOFF (INCHES)	15.27	19.14	10.63
10 PERCENT EXCEEDS	1420	1590	860
50 PERCENT EXCEEDS	199	251	186
90 PERCENT EXCEEDS	55	71	44

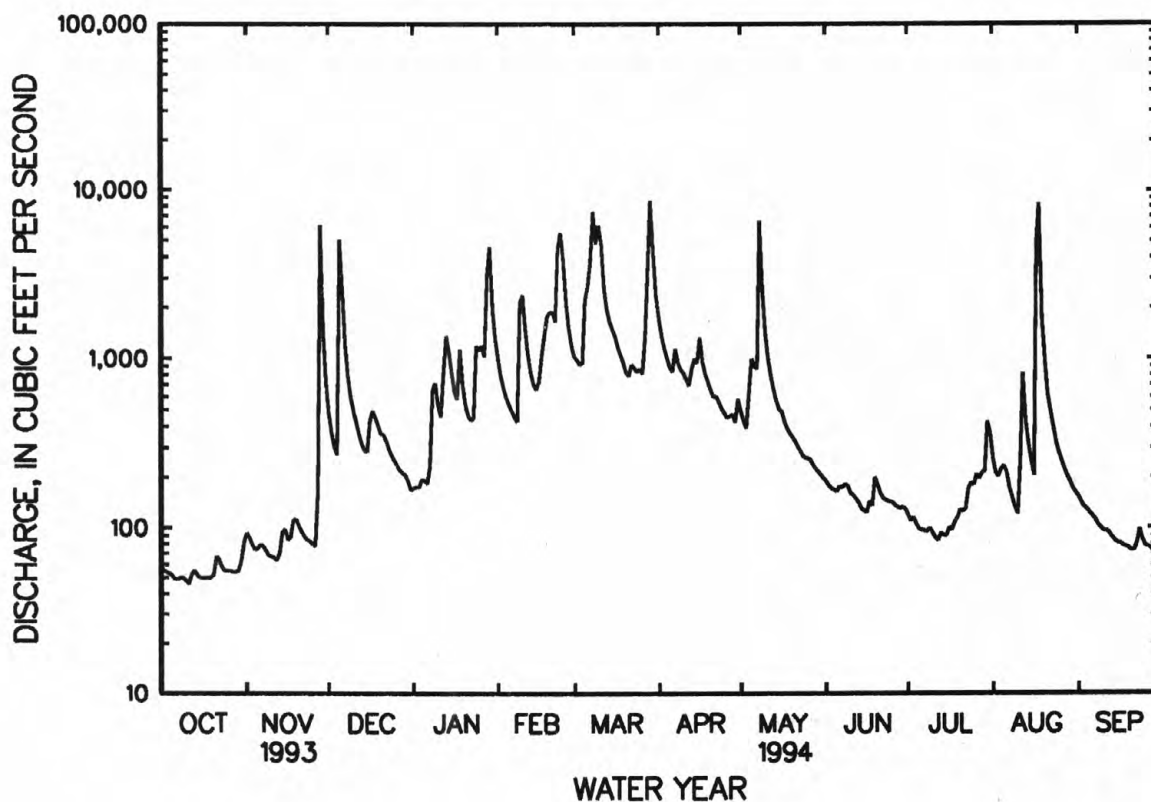
a Also Oct. 11, 1993.

b Also Sept. 3, 1966.

c Peak discharge, 40,500 ft<sup>3</sup>/s.

d Also Oct. 12, 1993.

f Observed.



## 01634000 NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA

LOCATION.--Lat 38°58'36", long 78°20'11", Warren County, Hydrologic Unit 02070006, on right bank at downstream side of bridge on State Highway 55, 1.5 mi southeast of Strasburg, 2.2 mi upstream from Cedar Creek, and 10 mi upstream from confluence with South Fork.

DRAINAGE AREA.--768 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1925 to current year.

REVISED RECORDS.--WSP 951: 1936(M). WSP 1001: 1931. WSP 1171: 1929(M), 1933(M), 1936-37. WSP 1302: 1928(M), 1930(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 494.03 ft above sea level. Prior to Sept. 21, 1930, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 26 to Jan. 2 and Jan. 17-24, which are fair. Large diurnal fluctuation at low and medium flow from unknown cause. Water-level elevations at the site were affected during the 1992-93 water years by construction of a new bridge about 50 ft downstream from the gage. National Weather Service gage-height telemeter at station. Maximum discharge, 100,000 ft<sup>3</sup>/s, from rating curve extended above 46,000 ft<sup>3</sup>/s. Minimum gage height, 1.52 ft, Feb. 9, 1934.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	2345	8,880	11.29	Mar. 8	1800	9,230	11.56
Dec. 6	0215	8,440	10.94	Mar. 11	0600	8,880	11.29
Jan. 25	1330	7,560	10.23	Mar. 30	0215	11,300	13.09
Jan. 29	1215	7,870	10.48	May 8	2300	9,390	11.68
Feb. 24	0900	8,280	10.81	Aug. 18	1800	*14,700	*15.38

Minimum daily discharge, 123 ft<sup>3</sup>/s, Oct. 26, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	189	145	945	e290	1670	1700	2940	826	340	233	648	307
2	144	158	682	e290	1350	1580	2320	709	320	228	505	283
3	142	161	550	303	1110	1540	1920	639	307	218	430	269
4	136	160	490	320	967	1500	1680	659	294	264	377	251
5	132	147	2740	330	865	2540	1480	1030	289	211	496	244
6	131	154	5820	318	807	4040	1360	1320	290	206	552	237
7	130	139	2400	319	759	4270	1500	1200	285	203	464	231
8	131	141	1480	464	716	7540	1740	5270	300	198	372	225
9	132	148	1080	1020	940	7130	1420	5660	285	196	326	217
10	134	146	863	934	3720	6760	1330	2670	287	226	294	211
11	131	130	743	752	2480	7770	1280	1830	278	198	279	205
12	144	128	646	766	1790	4490	1170	1420	265	189	385	200
13	142	136	559	1500	1360	3210	1280	1180	255	192	1310	201
14	131	145	502	1670	1150	2700	1620	1000	250	205	787	192
15	145	144	478	1390	1040	2420	1460	884	236	197	587	187
16	130	167	642	1070	1020	2200	1610	822	239	205	486	182
17	130	167	753	e750	1240	1950	1670	771	380	239	760	177
18	128	166	740	e940	1670	1720	1340	683	361	221	9430	179
19	130	198	680	e1300	2430	1570	1190	628	270	232	4210	166
20	136	179	616	e930	2950	1400	1090	600	866	244	2050	165
21	130	180	594	e750	2830	1280	986	569	609	263	1320	167
22	125	167	579	e680	2720	1390	907	535	328	251	928	175
23	125	164	527	e630	2490	1420	894	501	279	312	746	196
24	137	162	481	e1100	7280	1340	827	472	262	413	612	187
25	132	154	453	4120	6470	1310	770	461	274	446	513	189
26	123	145	e400	2300	3970	1320	729	465	263	407	456	183
27	123	188	e370	1700	2680	1530	709	447	254	501	414	173
28	127	3520	e350	1630	2030	3410	718	413	251	415	368	166
29	127	4350	e360	5780	---	8210	703	391	258	414	342	163
30	141	1550	e350	3500	---	8420	692	374	247	392	320	158
31	150	---	e320	2210	---	4180	---	360	---	667	295	---
TOTAL	4188	13639	28193	40056	60504	101840	39335	34789	9422	8786	31062	6086
MEAN	135	455	909	1292	2161	3285	1311	1122	314	283	1002	203
MAX	189	4350	5820	5780	7280	8420	2940	5660	866	667	9430	307
MIN	123	128	320	290	716	1280	692	360	236	189	279	158
CFSM	.18	.59	1.18	1.68	2.81	4.28	1.71	1.46	.41	.37	1.30	.26
IN.	.20	.66	1.37	1.94	2.93	4.93	1.91	1.69	.46	.43	1.50	.29

e Estimated.

POTOMAC RIVER BASIN

97

01634000 NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	406	413	533	646	856	1141	993	762	459	294	348	278
MAX	3488	2813	1955	1937	2161	5017	2876	1821	2234	1169	2510	2033
(WY)	1943	1986	1973	1991	1994	1936	1993	1988	1972	1949	1955	1945
MIN	58.9	75.8	82.0	86.4	94.0	183	182	154	115	76.4	66.7	67.1
(WY)	1931	1931	1932	1966	1931	1931	1981	1969	1977	1977	1930	1986

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

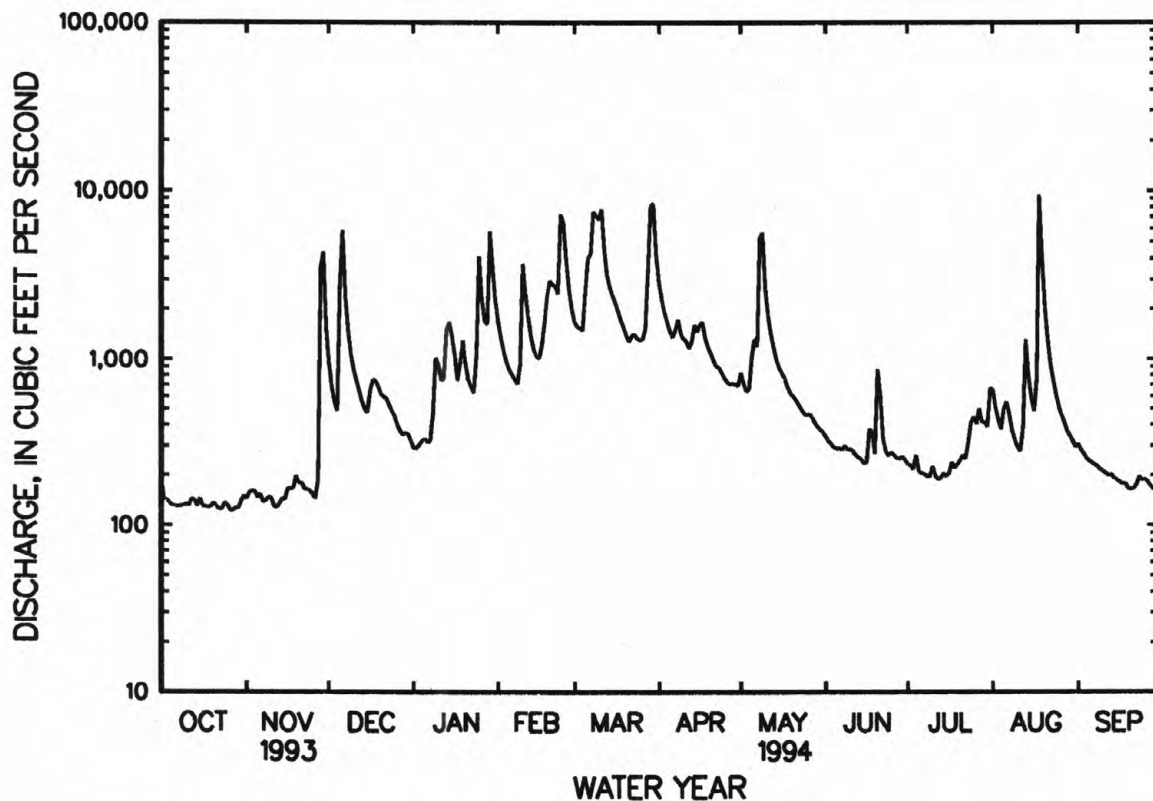
WATER YEARS 1925 - 1994

ANNUAL TOTAL	335968	377900	
ANNUAL MEAN	920	1035	594
HIGHEST ANNUAL MEAN			1174
LOWEST ANNUAL MEAN			226
HIGHEST DAILY MEAN	16300	Mar 5	56500
LOWEST DAILY MEAN	120	Jul 26	35
ANNUAL SEVEN-DAY MINIMUM	127	Oct 22	45
INSTANTANEOUS PEAK FLOW			100000
INSTANTANEOUS PEAK STAGE			31.20
INSTANTANEOUS LOW FLOW			6.0
ANNUAL RUNOFF (CFSM)	1.20	1.35	.77
ANNUAL RUNOFF (INCHES)	16.27	18.30	10.51
10 PERCENT EXCEEDS	2650	2480	1240
50 PERCENT EXCEEDS	366	478	313
90 PERCENT EXCEEDS	134	145	110

a Also Oct. 27, 1993.

b Also Sept. 14, 18, 1986.

c From high-water mark in well.





## POTOMAC RIVER BASIN

01634000 NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, JUNE 1994

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (MG/L) (00301)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	
JUN 08...	1330	431	8.0	25.0	28.5	745	8.7	108	175	204	5	11	
DATE		NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
JUN 08...	0.040	2.50	2.50	0.040	0.30	0.30	0.020	<0.010	<0.010	<0.02	<0.01	<0.01	
DATE		TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	
JUN 08...	<0.03	<0.01	<0.01	<0.01	<0.01	0.06	<0.01	<0.01	<0.05	<0.01	<0.00		

< Actual value is known to be less than the value shown.

POTOMAC RIVER BASIN

99

01634000 NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA--Continued

WATER QUALITY DATA, JUNE 1994

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
JUN 08...	<0.01	<0.00	<0.01	0.03	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
JUN 08...	<0.04	<0.01	<0.04	<0.03	0.09	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
JUN 08...	<0.02	0.02	<0.01	<0.02	<0.01	<0.02	0.06	<0.02	<0.01	<0.01	<0.01

< Actual values are known to be less than the values shown.

## POTOMAC RIVER BASIN

01634500 CEDAR CREEK NEAR WINCHESTER, VA

LOCATION.--Lat 39°04'52", long 78°19'47", Frederick County, Hydrologic Unit 02070006, on left bank 0.2 mi upstream from Fawcett Run, 0.3 mi upstream from bridge on State Highway 628, 1.3 mi downstream from Froman Run, and 11.4 mi southwest of Winchester.

DRAINAGE AREA.--103 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1937 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 647.09 ft above sea level.

REMARKS.--Records good except those for period of no gage-height record, Oct. 1-21, and periods with ice effect, Dec. 31, Jan. 1, 10, 11, 16-23, 28, and Feb. 2, 3, which are fair. Maximum discharge, 22,000 ft<sup>3</sup>/s, from rating curve extended above 15,000 ft<sup>3</sup>/s. Minimum discharge, 1.5 ft<sup>3</sup>/s, result of freezeup. Minimum gage height, 1.04 ft, Feb. 19, 1941, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 17, 1936, reached a stage of about 25 ft, discharge, about

18,000 ft<sup>3</sup>/s, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0500	*4,270	*10.39	Mar. 5	2000	1,120	4.86
Dec. 5	0800	4,000	9.95	Mar. 8	0300	1,810	6.23
Jan. 28	2200	Unknown	6.64	Mar. 10	1700	2,730	7.82
Feb. 20	2000	1,190	5.01	Mar. 27	1330	1,690	6.00
Feb. 21	1630	1,160	4.95	Mar. 29	1000	2,770	7.89
Feb. 24	1830	1,400	5.43	May 8	0300	2,090	6.74

a Result of ice jam.

Minimum discharge, 2.7 ft<sup>3</sup>/s, June 19, result of regulation from unknown source; minimum daily, 9.4 ft<sup>3</sup>/s, Oct. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e13	31	108	e66	210	218	369	75	30	14	23	24
2	e13	21	87	64	e165	206	285	66	28	12	18	19
3	e12	17	74	63	e150	201	240	61	27	15	17	15
4	e12	16	74	69	135	347	207	102	26	27	15	14
5	e12	16	2460	72	119	852	182	127	25	18	23	14
6	e11	16	664	70	120	672	170	105	25	15	42	13
7	e11	15	296	64	123	803	351	137	29	24	23	13
8	e10	14	202	139	130	1660	230	1110	25	22	17	12
9	e10	13	156	159	327	1080	197	359	23	15	15	12
10	e9.4	12	133	e138	338	1850	192	229	21	18	14	11
11	e9.4	12	120	e128	240	1090	175	172	21	15	16	12
12	e19	11	95	186	199	644	155	145	26	12	24	11
13	e16	13	86	222	171	551	222	121	21	11	18	10
14	e14	20	79	186	151	640	262	104	18	12	14	11
15	e13	21	79	129	139	651	203	95	17	20	14	12
16	e12	17	159	e100	161	549	210	98	16	19	13	13
17	e11	16	127	e140	205	365	174	80	23	16	207	15
18	e11	25	113	e180	297	303	153	73	19	20	212	17
19	e11	24	108	e130	535	295	140	68	15	23	86	16
20	e14	19	96	e125	765	247	127	65	25	17	57	14
21	e20	17	107	e120	964	253	115	60	23	15	48	14
22	15	15	100	e115	666	351	107	54	22	30	50	17
23	13	15	90	e110	523	297	99	50	18	26	39	32
24	12	14	84	218	931	267	96	45	19	44	29	26
25	13	14	80	351	709	253	89	45	19	26	25	20
26	11	14	74	456	495	214	82	51	15	22	23	20
27	12	60	71	312	309	792	91	45	18	22	23	23
28	13	1860	70	e470	245	1340	93	40	30	34	19	19
29	12	284	76	654	---	2010	77	37	18	26	17	17
30	20	154	72	371	---	884	81	36	16	35	15	16
31	58	---	e67	264	---	513	---	33	---	34	16	---
TOTAL	442.8	2796	6207	5871	9522	20398	5174	3888	658	659	1172	482
MEAN	14.3	93.2	200	189	340	658	172	125	21.9	21.3	37.8	16.1
MAX	58	1860	2460	654	964	2010	369	1110	30	44	212	32
MIN	9.4	11	67	63	119	201	77	33	15	11	13	10
CFSM	.14	.90	1.94	1.84	3.30	6.39	1.67	1.22	.21	.21	.37	.16
IN.	.16	1.01	2.24	2.12	3.44	7.37	1.87	1.40	.24	.24	.42	.17

e Estimated.

01634500 CEDAR CREEK NEAR WINCHESTER, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	62.0	67.6	89.8	103	143	204	177	129	79.1	31.7	37.9	32.3
MAX	777	500	320	282	443	708	600	382	664	181	420	352
(WY)	1943	1986	1973	1979	1984	1993	1983	1988	1972	1978	1955	1945
MIN	6.01	8.64	7.95	10.2	21.5	38.2	37.0	24.5	10.5	6.06	4.52	6.95
(WY)	1964	1966	1966	1966	1959	1981	1947	1969	1969	1966	1957	1986

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1938 - 1994

ANNUAL TOTAL	57721.0	57269.8	96.1
ANNUAL MEAN	158	157	181
HIGHEST ANNUAL MEAN			1972
LOWEST ANNUAL MEAN			28.3
HIGHEST DAILY MEAN	4280	2460	Dec 5
LOWEST DAILY MEAN	8.5	9.4	Oct 10
ANNUAL SEVEN-DAY MINIMUM	9.8	10	Oct 5
INSTANTANEOUS PEAK FLOW		4270	Nov 28
INSTANTANEOUS PEAK STAGE		10.39	Nov 28
INSTANTANEOUS LOW FLOW		2.7	Jun 19
ANNUAL RUNOFF (CFSM)	1.54	1.52	1.93
ANNUAL RUNOFF (INCHES)	20.85	20.68	12.68
10 PERCENT EXCEEDS	380	354	206
50 PERCENT EXCEEDS	49	51	41
90 PERCENT EXCEEDS	11	13	10

b Also Oct. 11, 1993.

c Also Sept. 3, 4, 7, 8, 1966.

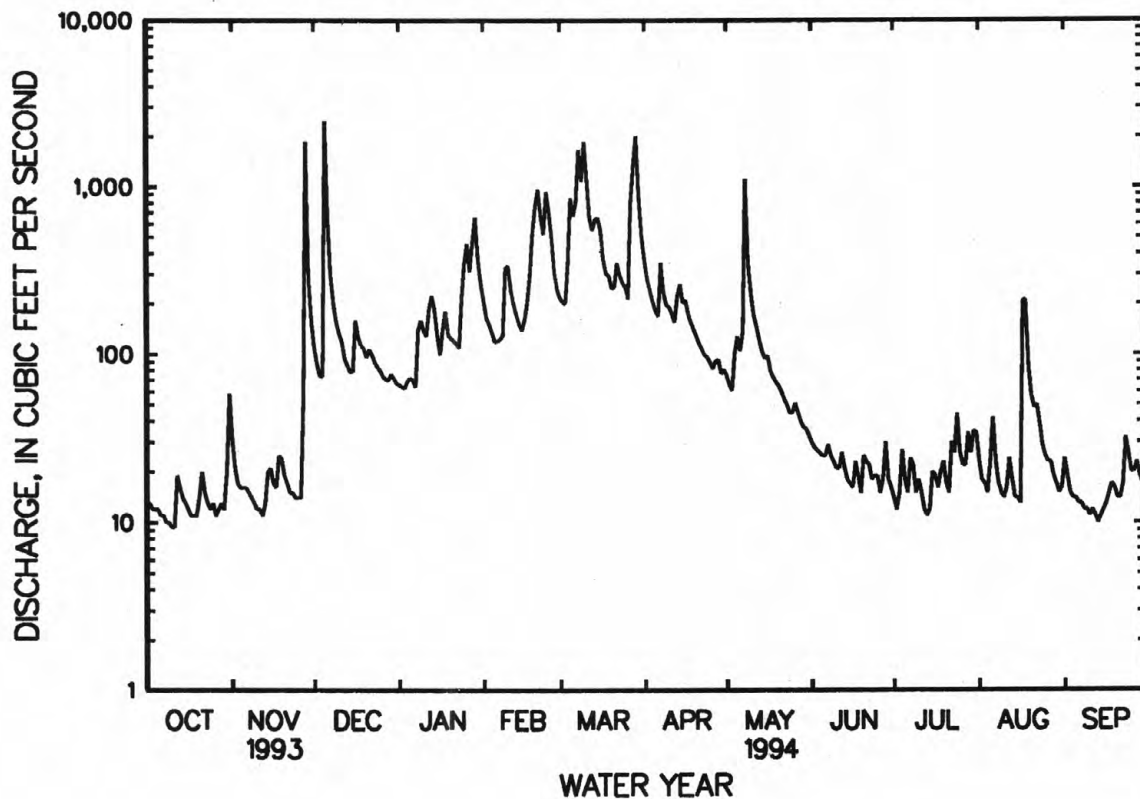
d Also Sept. 3, 1966.

e Estimated.

f From floodmarks.

g Result of regulation from unknown source.

h Result of freezeup.



## POTOMAC RIVER BASIN

01635500 PASSAGE CREEK NEAR BUCKTON, VA

LOCATION.--Lat 38°57'29", long 78°16'01", Warren County, Hydrologic Unit 02070006, on right bank 350 ft upstream from bridge on State Highway 55, 1.2 mi south of Buckton railroad station, 1.4 mi upstream from mouth, and 4.2 mi west of Riverton.

DRAINAGE AREA.--87.8 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1905 to July 1906 (gage heights only), April 1932 to current year. Prior to October 1966 published as "at Buckton."

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 525.14 ft above sea level. October 1905 to July 1906, nonrecording gage at site 1 mi downstream at different datum. Apr. 4, 1932, to Oct. 7, 1937, nonrecording gage at site 350 ft downstream at different datum.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Dec. 27 to Jan. 2, Jan. 8-11, Jan. 15 to Feb. 3, and Feb. 10-13, which are fair. Occasional diurnal fluctuation during low flow caused by State Fish Hatchery 2 mi upstream from station. At a point 14.2 mi upstream from station on Little Passage Creek, there has been a diversion in some years from Strasburg Reservoir, capacity, 54.6 acre-ft, by town of Strasburg for municipal water supply. There was no diversion during the year. Maximum discharge, 21,000 ft<sup>3</sup>/s, from rating curve extended above 5,200 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1530	1,980	7.51	Mar. 10	2300	2,170	7.79
Dec. 5	1730	*2,420	*8.12	Mar. 29	1600	2,330	8.01
Jan. 28	Unknown	1,380	a6.66	May 8	1330	2,020	7.60
Feb. 24	2100	1,560	6.94	Aug. 18	0400	1,330	6.59
Mar. 8	0600	2,130	7.74				

a From high-water mark in well.

Minimum discharge, 2.9 ft<sup>3</sup>/s, Oct. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	18	93	e47	e170	208	366	78	17	10	10	16
2	4.8	15	72	e46	e140	195	276	66	15	9.1	12	12
3	4.3	12	59	51	e120	163	223	59	13	8.1	8.9	9.5
4	4.4	9.8	58	52	113	237	193	91	13	7.7	8.0	8.7
5	4.0	9.1	1590	52	107	601	165	121	12	8.7	11	8.3
6	4.0	9.9	641	52	100	659	155	104	12	8.3	19	8.7
7	3.8	8.5	266	57	92	885	320	115	12	6.9	14	8.8
8	3.9	9.1	175	e310	90	1820	230	1450	13	6.4	9.5	7.4
9	3.9	8.5	133	e200	265	1150	180	482	12	9.7	7.8	7.0
10	3.6	7.9	112	e150	e320	1610	166	279	12	13	6.9	6.6
11	3.1	7.8	99	e130	e220	1200	152	195	12	8.3	6.6	6.4
12	5.0	7.8	81	280	e180	616	134	157	11	7.5	11	6.9
13	8.2	8.4	71	365	e150	471	421	127	13	5.9	19	6.7
14	9.2	11	65	249	132	463	359	106	11	6.6	13	5.6
15	6.6	17	69	e180	132	427	229	93	7.7	7.0	9.8	5.2
16	5.6	14	300	e110	144	362	451	92	8.1	6.6	10	5.2
17	5.7	12	168	e150	193	263	292	76	8.7	7.7	372	5.4
18	5.2	20	125	e230	269	223	218	68	8.6	7.8	579	5.2
19	4.6	24	112	e180	434	199	185	62	8.3	21	104	5.3
20	5.3	18	94	e140	516	166	158	57	15	15	61	4.9
21	6.8	15	104	e120	490	157	136	52	18	9.9	43	4.7
22	7.6	13	103	e100	358	225	125	45	12	8.9	36	6.2
23	10	11	89	e100	441	176	114	40	9.5	21	31	16
24	9.0	11	80	e190	1060	155	101	35	8.6	19	23	14
25	7.2	10	74	e300	895	157	92	38	8.0	11	19	9.5
26	7.1	10	68	e320	538	140	84	40	7.1	28	16	8.4
27	6.6	19	e58	e250	331	489	90	33	7.3	19	15	9.3
28	6.9	1160	e54	e400	245	945	86	27	9.2	23	13	8.9
29	6.6	267	e50	e600	---	2000	78	23	10	22	12	7.3
30	9.0	135	e47	e350	---	899	98	21	9.2	14	11	6.7
31	11	---	e45	e220	---	496	---	19	---	11	10	---
TOTAL	188.9	1898.8	5155	5981	8245	17757	5877	4251	333.3	368.1	1521.5	240.8
MEAN	6.09	63.3	166	193	294	573	196	137	11.1	11.9	49.1	8.03
MAX	11	1160	1590	600	1060	2000	451	1450	18	28	579	16
MIN	3.1	7.8	45	46	90	140	78	19	7.1	5.9	6.6	4.7
CFSM	.07	.72	1.89	2.20	3.35	6.52	2.23	1.56	.13	.14	.56	.09
IN.	.08	.80	2.18	2.53	3.49	7.52	2.49	1.80	.14	.16	.64	.10

e Estimated.



POTOMAC RIVER BASIN

103

01635500 PASSAGE CREEK NEAR BUCKTON, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1933 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	39.3	40.4	66.5	89.3	117	155	137	94.0	49.3	17.8	24.7	21.2
MAX	581	276	235	269	357	573	377	339	609	87.3	437	241
(WY)	1943	1986	1973	1991	1936	1994	1952	1989	1972	1941	1955	1945
MIN	2.85	4.48	4.60	6.25	5.79	20.5	20.9	14.6	6.01	1.87	1.94	2.37
(WY)	1964	1966	1966	1966	1934	1959	1981	1963	1977	1934	1963	1936

SUMMARY STATISTICS

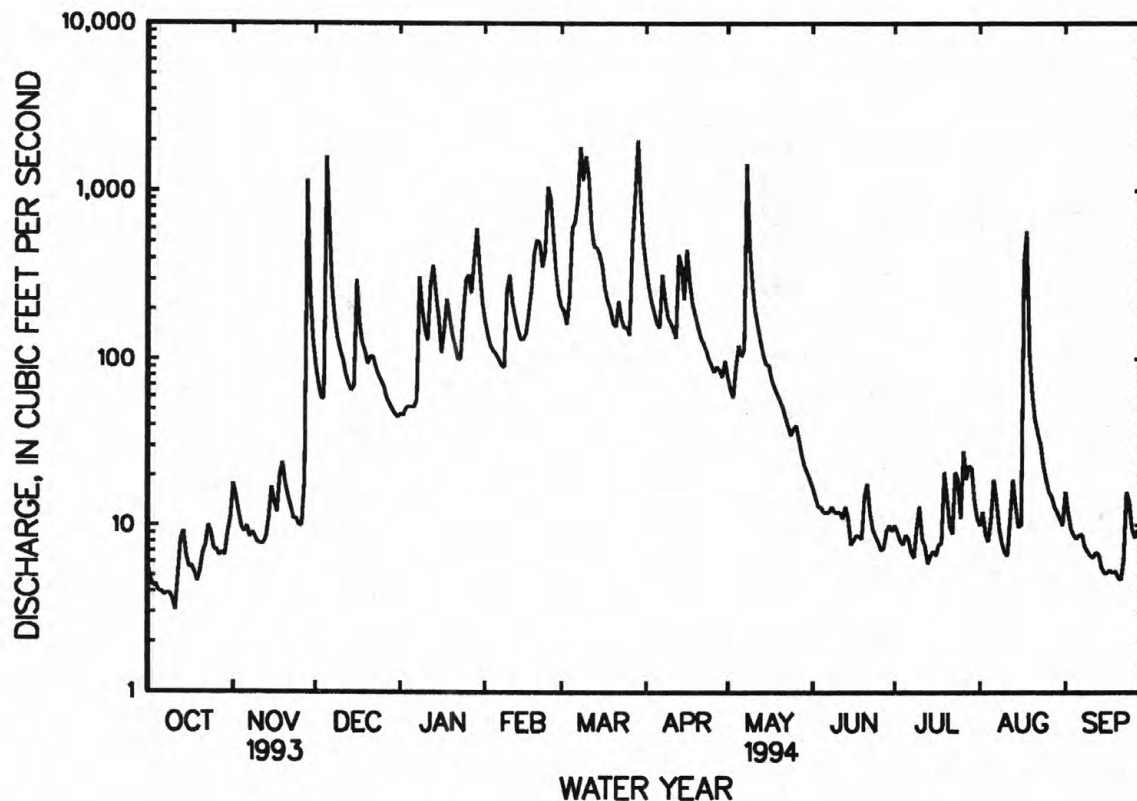
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1933 - 1994

ANNUAL TOTAL	43270.0	51817.4	70.8
ANNUAL MEAN	119	142	142
HIGHEST ANNUAL MEAN			20.0
LOWEST ANNUAL MEAN			1994
HIGHEST DAILY MEAN	1930 Mar 4	2000 Mar 29	9290 Oct 15 1942
LOWEST DAILY MEAN	2.6 Sep 14	3.1 Oct 11	.40 Jul 20 1934
ANNUAL SEVEN-DAY MINIMUM	2.9 Sep 9	3.8 Oct 5	.50 Jul 15 1934
INSTANTANEOUS PEAK FLOW		2420 Dec 5	21000 Oct 15 1942
INSTANTANEOUS PEAK STAGE		8.12 Dec 5	a15.50 Oct 15 1942
INSTANTANEOUS LOW FLOW		2.9 Oct 11	b.10 Aug 5 1932
ANNUAL RUNOFF (CFSM)	1.35	1.62	.81
ANNUAL RUNOFF (INCHES)	18.33	21.95	10.95
10 PERCENT EXCEEDS	298	363	154
50 PERCENT EXCEEDS	30	40	25
90 PERCENT EXCEEDS	4.4	6.7	4.2

a From high-water mark in well.  
b Observed.



## POTOMAC RIVER BASIN

01636500 SHENANDOAH RIVER AT MILLVILLE, WV

LOCATION.--Lat 39°16'55", long 77°47'22", Jefferson County, Hydrologic Unit 02070007, on left bank 0.4 mi downstream from Cattail Run, 1.0 mi upstream from Millville, 5.0 mi upstream from Harpers Ferry, and at mile 5.0.

DRAINAGE AREA.--3,040 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1895 to March 1909, August 1928 to current year.

REVISED RECORDS.--WSP 951: 1936(M). WSP 1432: Drainage area at former site, 1895-99, 1901-2, 1905, 1907-8, 1932(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 293.00 ft above sea level. Apr. 15, 1895, to Mar. 31, 1909, nonrecording gage at site 0.8 mi downstream at datum 0.32 ft higher.

REMARKS.--No estimated daily discharges. Records good. Regulation by hydroelectric plants, particularly that of Potomac Light and Power Company, 0.5 mi upstream from station. National Weather Service gage-height telemeter and U.S. Army Corps of Engineers satellite telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1870 reached practically same stage as flood of Mar. 18, 1936, 26.36 ft, discharge, 151,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 15,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	1130	19,300	9.31	Mar. 9	0700	35,100	12.56
Dec. 6	1700	19,700	9.41	Mar. 11	0930	35,200	12.58
Jan. 30	0315	25,800	10.77	Mar. 30	1215	*38,600	*13.18
Feb. 25	0130	33,300	12.24	May 9	0815	17,000	8.74
Mar. 7	0915	17,000	8.74	Aug. 19	0800	22,100	9.97

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1020	868	5250	1580	8950	8410	16400	3330	1770	1360	1970	1500
2	995	880	3910	1770	6990	7450	12600	3380	1710	1260	2300	1440
3	889	864	3080	1800	5720	7160	10200	3100	1630	1190	2080	1300
4	805	917	2580	1770	4900	6680	8580	3020	1550	1160	1800	1270
5	773	904	5840	1700	4410	7940	7470	3220	1530	1130	1740	1200
6	722	845	17100	1850	4020	13100	6660	4010	1500	1100	1930	1150
7	706	814	14000	1760	3810	16400	6550	4900	1440	1240	1840	1110
8	688	805	8260	2000	3610	24000	7210	8940	1500	1130	1590	1080
9	704	791	6000	3240	3670	33500	6550	15900	1500	1050	1410	1050
10	684	770	4620	4150	5740	29600	5900	11800	1490	1070	1370	1030
11	662	778	3930	3840	9160	34000	5650	8160	1450	1150	1240	1010
12	778	717	3350	3130	7800	25200	5310	6280	1420	1030	1200	976
13	797	747	2910	3930	6380	17300	5130	5220	1410	1010	1340	958
14	792	712	2600	6480	5330	14100	6380	4500	1410	1030	2000	975
15	793	790	2420	6610	4770	12700	5880	4010	1400	1060	1690	974
16	739	796	2680	5320	4520	11400	5850	3760	1320	929	1470	939
17	771	801	3310	4240	4660	9910	6580	3440	1340	973	1660	917
18	729	871	3080	3580	5590	8560	6100	3160	1380	1070	9520	909
19	707	898	2930	5410	7710	7730	5420	2910	1510	1130	18500	862
20	733	892	2700	5270	11100	6990	4950	2750	1430	1130	9850	858
21	758	916	2590	4160	11800	6360	4560	2620	1930	1300	6560	835
22	775	947	2580	3550	11500	6220	4260	2500	1830	1500	5180	907
23	831	890	2490	3840	10600	6440	4050	2400	1450	1400	4020	1230
24	768	834	2360	4020	19800	6230	3990	2290	1380	1620	3360	1220
25	766	832	2220	5690	29400	5930	3800	2190	1310	2180	2690	1040
26	743	757	2110	7530	20700	5810	3580	2200	1240	1950	2290	1030
27	729	927	2000	7300	14100	6000	3440	2150	1300	1720	1990	1060
28	688	5640	1900	6270	10400	10400	3390	2030	1430	1790	1780	1030
29	680	16200	1840	13300	---	25100	3340	1910	1290	1880	1730	1020
30	729	8740	1740	21300	---	37100	3250	1880	1300	1810	1590	946
31	803	---	1700	12500	---	25700	---	1820	---	1890	1550	---
TOTAL	23757	53143	124080	158890	247140	443420	183030	129780	44150	41242	99240	31826
MEAN	766	1771	4003	5125	8826	14300	6101	4186	1472	1330	3201	1061
MAX	1020	16200	17100	21300	29400	37100	16400	15900	1930	2180	18500	1500
MIN	662	712	1700	1580	3610	5810	3250	1820	1240	929	1200	835
CFSM	.25	.58	1.32	1.69	2.90	4.71	2.01	1.38	.48	.44	1.05	.35
IN.	.29	.65	1.52	1.94	3.02	5.43	2.24	1.59	.54	.50	1.21	.39

## POTOMAC RIVER BASIN

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01636500 SHENANDOAH RIVER AT MILLVILLE, WV--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1895 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1950	1823	2468	3057	3825	5033	4434	3365	2361	1426	1633	1317
MAX	16250	13350	8164	7925	13100	17540	12840	8700	10380	4809	10390	6701
(WY)	1943	1986	1973	1991	1897	1936	1901	1901	1972	1972	1955	1945
MIN	343	388	410	503	542	929	992	1001	660	402	388	411
(WY)	1931	1932	1966	1966	1931	1931	1981	1969	1977	1966	1930	1963

## SUMMARY STATISTICS

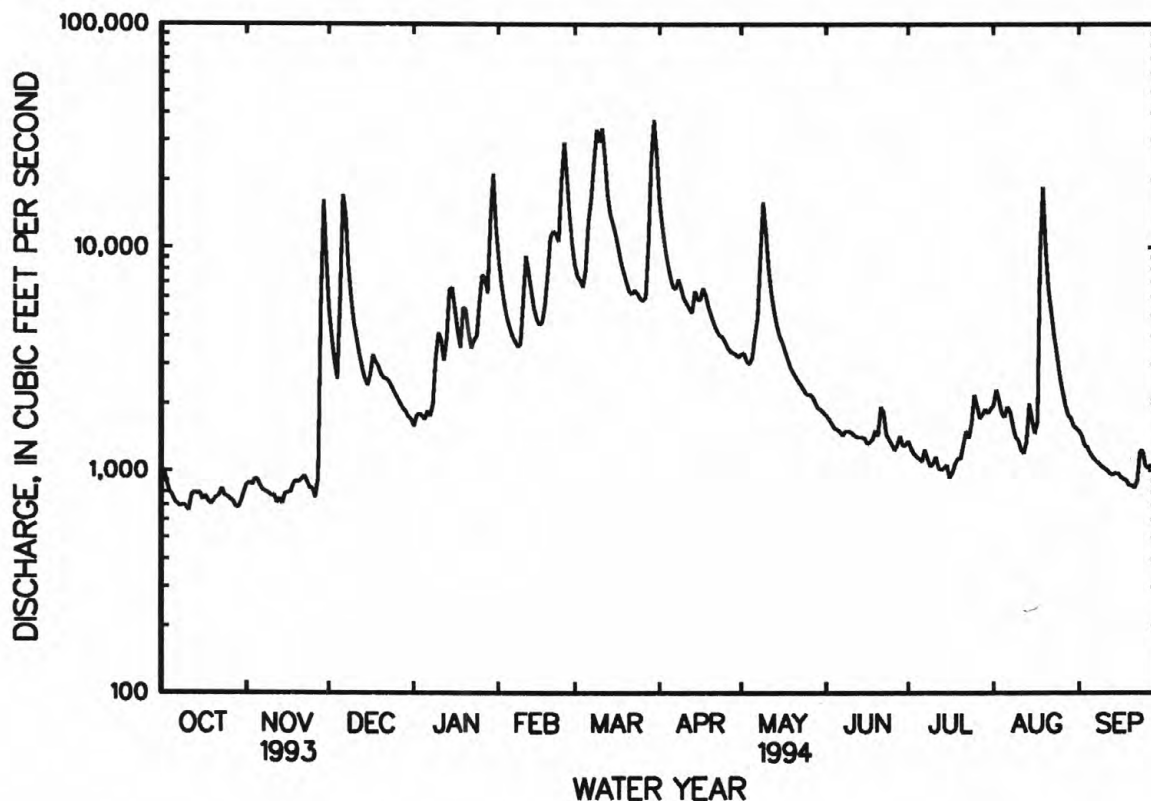
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1895 - 1994

ANNUAL TOTAL	1423876	1579698	
ANNUAL MEAN	3901	4328	2718
HIGHEST ANNUAL MEAN			4838
LOWEST ANNUAL MEAN			1111
HIGHEST DAILY MEAN	46800	Mar 6	192000
LOWEST DAILY MEAN	662	Oct 11	194
ANNUAL SEVEN-DAY MINIMUM	706	Oct 5	240
INSTANTANEOUS PEAK FLOW			38600
INSTANTANEOUS PEAK STAGE			13.18
INSTANTANEOUS LOW FLOW			587
ANNUAL RUNOFF (CFSM)	1.28	1.42	.89
ANNUAL RUNOFF (INCHES)	17.42	19.33	12.15
10 PERCENT EXCEEDS	9750	10000	5510
50 PERCENT EXCEEDS	1890	2000	1600
90 PERCENT EXCEEDS	763	804	610

a From floodmarks.



## POTOMAC RIVER BASIN

01636500 SHENANDOAH RIVER AT MILLVILLE, WV--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-63, 1965, 1969-71, 1979 to current year.

REMARKS.--These data are a part of the Potomac National Water-Quality Assessment (NAWQA) program.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	
OCT 1993												
06...	1100	705	366	8.7	17.0	18.0	767	9.9	102	160	40	
NOV												
03...	1145	852	365	8.2	8.0	9.0	756	12.2	104	180	47	
30...	1200	8320	230	6.9	11.0	10.5	769	10.9	98	87	24	
DEC												
09...	1200	E5780	177	7.5	7.0	11.5	760	10.6	88	86	25	
JAN 1994												
06...	1200	1870	302	7.5	0.5	1.0	754	13.0	91	150	43	
FEB												
15...	1130	4880	188	7.8	2.0	7.0	755	13.4	98	90	26	
MAR												
10...	1530	29000	93	7.5	5.0	6.5	751	--	--	68	20	
APR												
07...	1130	6440	252	7.7	13.5	8.0	755	9.7	94	120	35	
MAY												
03...	1100	2790	308	7.9	17.5	15.0	764	8.5	89	150	40	
JUN												
05...	1000	1590	343	8.2	23.5	28.5	755	10.0	119	160	42	
08...	1800	1530	337	8.2	26.0	21.5	752	9.4	118	160	41	
13...	1000	1410	350	8.0	25.0	30.0	757	8.4	103	160	42	
23...	1045	1430	--	--	--	--	--	--	--	--	--	
JUL												
07...	1000	1240	293	8.2	29.0	30.5	755	9.0	118	140	31	
AUG												
01...	1045	1710	319	7.6	26.5	27.5	757	8.1	102	140	38	
01...	1230	1910	319	7.6	--	--	--	--	--	--	--	
SEP												
14...	1100	963	324	8.2	22.5	29.5	756	8.8	103	150	35	
DATE		MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
OCT 1993												
06...	15	14	3.3	148	168	6	20	16	0.20	0.62	207	
NOV												
03...	16	13	3.5	166	195	4	19	15	0.20	1.6	218	
30...	6.5	5.3	3.5	71	87	--	14	6.7	0.10	5.1	122	
DEC												
09...	5.7	3.3	2.3	66	81	--	14	4.9	<0.10	6.6	119	
JAN 1994												
06...	11	6.9	1.8	130	154	2	16	12	0.10	4.5	199	
FEB												
15...	6.2	4.3	1.6	71	87	--	12	7.0	<0.10	6.0	121	
MAR												
10...	4.5	3.3	2.1	55	67	--	12	5.8	<0.10	5.7	95	
APR												
07...	8.4	4.0	1.8	104	127	--	13	6.9	<0.10	5.9	145	
MAY												
03...	11	5.3	1.8	127	154	4	14	9.2	<0.10	1.9	173	
JUN												
05...	13	7.3	2.4	144	161	7	14	11	0.10	2.6	200	
08...	14	7.2	2.5	140	159	6	14	11	0.10	3.0	198	
13...	14	8.7	2.5	146	166	6	16	12	0.10	3.9	214	
23...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
07...	14	8.6	2.6	122	137	6	14	13	0.20	7.4	165	
AUG												
01...	12	7.7	3.2	112	137	--	15	11	0.10	7.6	184	
01...	--	--	--	111	--	--	--	--	--	--	--	--
SEP												
14...	14	9.8	2.3	108	132	--	18	12	0.10	0.74	182	

< Actual value is known to be less than the value shown.

## 01636500 SHENANDOAH RIVER AT MILLVILLE, WV--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT 1993											
06...	--	<0.010	0.910	0.910	0.030	<0.20	<0.20	0.010	0.020	0.030	8
NOV											
03...	--	<0.010	1.00	1.00	0.020	0.30	<0.20	0.040	0.030	0.020	10
30...	5.7	0.010	1.30	1.30	0.060	0.60	0.30	0.240	0.060	0.090	60
DEC											
09...	--	<0.010	1.40	1.40	0.080	0.40	0.30	0.120	0.060	0.060	17
JAN 1994											
06...	10	0.020	2.30	2.30	0.040	<0.20	<0.20	0.090	0.050	0.030	10
FEB											
15...	7.4	0.020	1.70	1.70	0.080	<0.20	0.20	0.070	0.060	0.040	26
MAR											
10...	--	<0.010	1.30	1.30	0.040	0.60	0.20	0.150	0.060	0.040	37
APR											
07...	7.9	0.010	1.80	1.80	0.020	0.20	<0.20	0.050	0.020	0.020	23
MAY											
03...	6.6	0.020	1.50	1.50	0.030	0.20	<0.20	<0.010	0.020	0.020	19
JUN											
05...	6.1	0.020	1.40	1.40	0.030	0.40	0.20	0.020	0.020	<0.010	11
08...	5.7	0.020	1.30	1.30	<0.010	0.40	0.20	0.020	0.010	<0.010	10
13...	6.2	0.010	1.40	1.40	<0.010	0.60	0.30	0.040	0.010	<0.010	6
23...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	2.0	0.010	0.470	0.470	0.040	0.50	0.30	0.040	0.020	<0.010	10
AUG											
01...	6.6	0.020	1.50	1.50	0.050	0.50	0.20	0.110	0.090	0.080	13
01...	--	--	--	--	--	--	--	--	--	--	--
SEP											
14...	4.4	0.010	1.00	1.00	0.040	<0.20	0.30	0.030	0.020	0.020	15

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C) (00689)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,4-D, DIS- SOLVED (UG/L) (39732)	2,4,5-T DIS- SOLVED (UG/L) (39742)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)
OCT 1993											
06...	2	2.1	0.2	--	--	--	--	--	--	--	--
NOV											
03...	2	2.1	0.2	--	--	--	--	--	--	--	--
30...	2	6.5	4.1	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
DEC											
09...	3	4.6	0.8	--	--	--	--	--	--	--	--
JAN 1994											
06...	4	2.1	0.2	--	--	--	--	--	--	--	--
FEB											
15...	4	5.0	0.8	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
MAR											
10...	2	2.8	2.2	--	--	--	--	--	--	--	--
APR											
07...	3	1.8	0.5	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
MAY											
03...	2	2.0	0.2	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
JUN											
05...	2	2.2	0.3	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
08...	2	2.2	0.4	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
13...	2	2.1	0.5	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
23...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	3	2.5	1.3	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
AUG											
01...	5	--	--	--	--	--	--	--	--	--	--
01...	--	2.9	0.8	--	--	--	--	--	--	--	--
SEP											
14...	7	3.1	0.3	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.



01636500 SHENANDOAH RIVER AT MILLVILLE, WV--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	BRO- MACIL, WATER, DISS, REC (UG/L) (04029)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)
OCT 1993											
06...	--	--	--	--	--	--	--	--	--	--	--
NOV											
03...	--	--	--	--	--	--	--	--	--	--	--
30...	<0.01	<0.01	0.16	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
JAN 1994											
06...	--	--	--	--	--	--	--	--	--	--	--
FEB											
15...	<0.01	<0.01	0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
MAR											
10...	--	--	--	--	--	--	--	--	--	--	--
APR											
07...	<0.01	<0.01	0.02	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.00
MAY											
03...	<0.01	<0.01	0.11	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	0.03	<0.00
JUN											
05...	<0.01	<0.01	0.12	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
08...	<0.01	<0.01	0.15	<0.01	<0.01	--	<0.05	<0.01	<0.00	0.05	<0.00
13...	<0.01	<0.01	0.07	<0.01	<0.01	--	<0.05	<0.01	<0.01	<0.01	<0.00
23...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	<0.01	<0.01	0.17	<0.01	<0.01	--	<0.05	<0.01	<0.00	0.03	<0.00
AUG											
01...	--	--	--	--	--	--	--	--	--	--	--
SEP											
14...	--	--	--	--	--	--	--	--	--	--	--

DATE	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)
OCT 1993											
06...	--	--	--	--	--	--	--	--	--	--	--
NOV											
03...	--	--	--	--	--	--	--	--	--	--	--
30...	<0.01	<0.02	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
JAN 1994											
06...	--	--	--	--	--	--	--	--	--	--	--
FEB											
15...	<0.02	<0.02	<0.01	<0.02	<0.02	<0.01	<0.01	<0.01	<0.01	<0.04	<0.01
MAR											
10...	--	--	--	--	--	--	--	--	--	--	--
APR											
07...	<0.01	<0.02	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
MAY											
03...	<0.01	0.02	<0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
JUN											
05...	<0.01	0.04	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
08...	<0.01	0.04	0.02	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
13...	<0.01	0.03	<0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
23...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	<0.01	0.04	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
AUG											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
SEP											
14...	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## 01636500 SHENANDOAH RIVER AT MILLVILLE, WV--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)
OCT 1993											
06...	--	--	--	--	--	--	--	--	--	--	--
NOV											
03...	--	--	--	--	--	--	--	--	--	--	--
30...	<0.04	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.02
DEC											
09...	--	--	--	--	--	--	--	--	--	--	--
JAN 1994											
06...	--	--	--	--	--	--	--	--	--	--	--
FEB											
15...	<0.08	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.01
MAR											
10...	--	--	--	--	--	--	--	--	--	--	--
APR											
07...	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.01
MAY											
03...	<0.05	<0.03	0.19	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.02
JUN											
05...	<0.04	<0.03	0.06	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.02
08...	<0.04	<0.03	0.30	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.02
13...	<0.05	<0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.01
23...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	<0.04	<0.03	0.08	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.04
AUG											
01...	--	--	--	--	--	--	--	--	--	--	--
SEP											
14...	--	--	--	--	--	--	--	--	--	--	--

DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SILVEX, DIS- SOLVED (UG/L) (39762)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
OCT 1993										
06...	--	--	--	--	--	--	--	--	--	--
NOV										
03...	--	--	--	--	--	--	--	--	--	--
30...	<0.01	<0.02	<0.01	<0.02	<0.05	0.03	0.01	<0.01	<0.01	<0.01
DEC										
09...	--	--	--	--	--	--	--	--	--	--
JAN 1994										
06...	--	--	--	--	--	--	--	--	--	--
FEB										
15...	<0.01	<0.02	<0.01	<0.02	<0.05	<0.01	<0.02	<0.01	<0.01	<0.00
MAR										
10...	--	--	--	--	--	--	--	--	--	--
APR										
07...	<0.01	<0.02	<0.01	<0.02	<0.05	0.01	<0.02	<0.01	<0.01	<0.01
MAY										
03...	<0.01	<0.02	<0.01	<0.02	<0.05	0.05	<0.02	<0.01	<0.01	<0.01
JUN										
05...	<0.01	<0.02	<0.01	<0.02	<0.05	0.06	<0.02	<0.01	<0.01	<0.01
08...	<0.01	<0.02	<0.01	<0.02	--	0.11	0.01	<0.01	<0.01	<0.01
13...	<0.01	<0.02	<0.01	<0.02	--	0.08	<0.02	<0.01	<0.01	<0.01
23...	--	--	--	--	--	--	--	--	--	--
JUL										
07...	<0.01	<0.02	<0.01	<0.02	--	0.24	0.00	<0.01	<0.01	<0.01
AUG										
01...	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--
SEP										
14...	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01638480 CATOCTIN CREEK AT TAYLORSTOWN, VA

LOCATION.--Lat 39°15'18", long 77°34'36", Loudoun County, Hydrologic Unit 02070008, on left bank at downstream side of bridge on State Highway 663 at Taylorstown and 3.2 mi downstream from Milltown Creek.

DRAINAGE AREA.--89.6 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 247.37 ft above sea level. Prior to Nov. 3, 1983, at site 60 ft upstream at datum 1.78 ft higher.

REMARKS.--Records good except those for periods with backwater from leaves, Oct. 3-20, 24-31, and periods with ice effect, Dec. 29 to Jan. 1, Jan. 6, 9-11, 14-22, 24, 26, 28, and Feb. 2-5, 11, which are fair. Maximum discharge, 23,800 ft<sup>3</sup>/s, from rating curve extended above 7,400 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0500	2,700	8.76	Feb. 24	1845	1,900	7.43
Dec. 5	1015	*3,690	*10.41	Mar. 7	2015	1,220	6.23
Feb. 19	1930	1,960	7.54	Mar. 10	1715	2,170	7.89
Feb. 20	1800	1,900	7.43	Mar. 29	1215	1,490	6.71
Feb. 21	1645	1,330	6.43	Aug. 17	2345	1,390	6.54

Minimum daily discharge, 1.3 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	25	130	e63	142	193	344	74	28	18	11	89
2	2.3	19	110	64	e95	198	280	64	25	14	9.4	39
3	e2.2	14	103	68	e80	205	241	59	24	12	8.4	23
4	e2.1	11	104	79	e75	271	213	73	24	23	7.8	18
5	e1.8	12	2380	75	e78	707	190	79	22	20	9.0	16
6	e1.6	10	595	e62	107	699	184	65	24	14	14	14
7	e1.5	9.4	262	67	134	742	301	71	25	21	11	12
8	e1.3	9.1	184	156	120	857	192	270	23	17	8.2	10
9	e1.6	9.3	144	e109	143	561	162	131	20	11	6.7	9.6
10	e2.1	8.5	128	e92	131	1330	161	94	19	13	5.9	9.0
11	e2.1	8.4	119	e84	e60	659	168	80	19	11	5.6	8.8
12	e6.8	8.1	91	126	102	454	144	74	21	7.9	5.6	8.1
13	e15	8.1	80	185	96	394	218	69	20	6.7	5.9	7.9
14	e7.6	9.1	76	e147	93	407	257	62	18	6.4	6.4	7.7
15	e4.5	9.9	86	e104	89	374	174	61	16	6.5	10	7.8
16	e3.6	11	197	e88	85	318	210	72	20	6.8	9.9	9.8
17	e3.3	11	117	e87	122	255	165	55	20	7.5	201	9.5
18	e3.9	15	98	e116	259	243	141	50	17	7.5	439	11
19	e4.2	20	96	e98	794	253	131	49	16	6.7	82	10
20	e6.0	16	88	e95	978	207	119	49	15	6.1	43	8.9
21	11	13	206	e88	833	214	110	48	13	7.3	69	8.3
22	16	11	195	e81	501	326	102	44	13	18	63	9.4
23	18	9.6	135	75	498	235	98	40	12	14	46	39
24	e11	9.3	115	e230	1070	209	92	36	11	10	31	27
25	e7.2	8.8	103	424	613	196	91	42	11	18	24	15
26	e6.8	8.6	93	e600	410	170	82	53	10	28	20	14
27	e6.4	134	82	180	263	489	78	54	13	29	18	17
28	e6.0	1620	73	e370	211	679	79	40	38	106	16	15
29	e6.4	292	e65	497	---	1100	72	34	23	31	16	11
30	e8.1	172	e62	253	---	576	75	32	44	18	14	8.5
31	e23	---	e60	156	---	425	---	30	---	14	14	---
TOTAL	196.3	2522.2	6377	4919	8182	13946	4874	2054	604	529.4	1230.8	493.3
MEAN	6.33	84.1	206	159	292	450	162	66.3	20.1	17.1	39.7	16.4
MAX	23	1620	2380	600	1070	1330	344	270	44	106	439	89
MIN	1.3	8.1	60	62	60	170	72	30	10	6.1	5.6	7.7
CFSM	.07	.94	2.30	1.77	3.26	5.02	1.81	.74	.22	.19	.44	.18
IN.	.08	1.05	2.65	2.04	3.40	5.79	2.02	.85	.25	.22	.51	.20

e Estimated.

POTOMAC RIVER BASIN

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01638480 CATOCTIN CREEK AT TAYLORSTOWN, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	70.1	57.8	115	119	149	188	171	129	96.1	49.0	30.2	44.7
MAX	414	130	313	320	373	580	476	445	706	284	186	281
(WY)	1977	1973	1993	1979	1984	1993	1983	1989	1972	1987	1984	1979
MIN	2.07	5.16	10.1	10.2	40.4	43.7	48.6	31.4	7.53	2.80	2.02	1.05
(WY)	1987	1992	1981	1981	1992	1981	1985	1977	1986	1986	1991	1986

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1972 - 1994

ANNUAL TOTAL	49569.1	45928.0	
ANNUAL MEAN	136	126	101
HIGHEST ANNUAL MEAN			196
LOWEST ANNUAL MEAN			34.6
HIGHEST DAILY MEAN	3060	Mar 4	2380
LOWEST DAILY MEAN	1.3	aSep 14	e1.3
ANNUAL SEVEN-DAY MINIMUM	e1.7	bOct 4	e1.7
INSTANTANEOUS PEAK FLOW			3690
INSTANTANEOUS PEAK STAGE			10.41
INSTANTANEOUS LOW FLOW			(d)
ANNUAL RUNOFF (CFSM)	1.52		1.40
ANNUAL RUNOFF (INCHES)	20.58		19.07
10 PERCENT EXCEEDS	303		296
50 PERCENT EXCEEDS	47		49
90 PERCENT EXCEEDS	3.7		7.4
			23800
			c23.83
			.15
			1.12
			15.28
			205
			48
			8.2
			Jun 22
			Sep 3
			Sep 21
			Jun 22
			fSep 3
			1972
			1981
			1991
			1986
			1972
			1972
			1991

a Also Oct. 8, 1993.

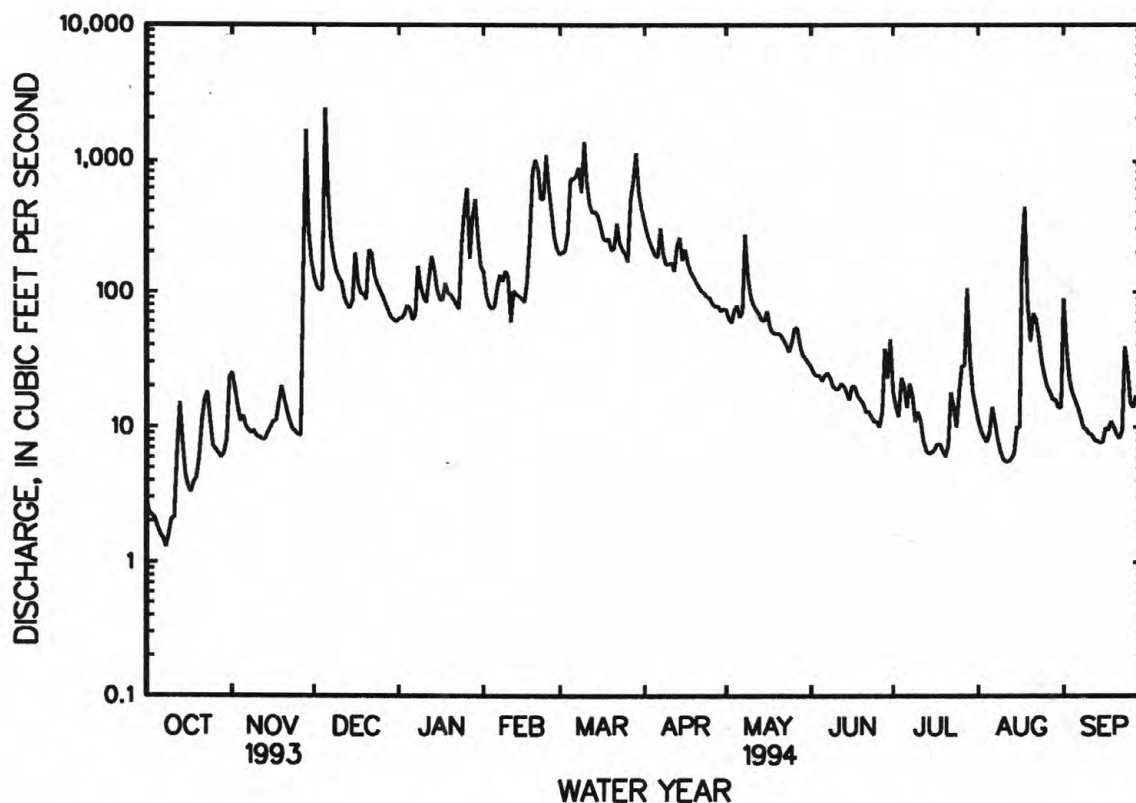
b Also Oct. 5, 1993.

c From floodmarks, site and datum then in use.

d Not determined.

e Estimated.

f Also Sept. 4, 1991.



## POTOMAC RIVER BASIN

01638480 CATOCTIN CREEK AT TAYLORSTOWN, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1993 to current year.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
OCT												
06...	1500	1.1	173	7.5	13.5	23.0	767	10.3	98	63	15	6.2
NOV												
03...	1600	13	177	7.5	7.0	8.5	758	10.9	90	69	17	6.5
DEC												
06...	1200	544	102	7.3	7.0	8.0	753	11.2	93	35	8.8	3.2
JAN												
03...	1025	70	142	7.3	0.0	2.0	759	13.5	93	52	13	4.8
FEB												
15...	1445	90	137	7.3	0.5	11.0	756	13.8	97	49	12	4.5
24...	1300	959	115	6.8	3.0	5.0	746	12.7	96	37	9.5	3.3
MAR												
10...	1130	1230	56	7.4	2.0	7.5	751	--	--	35	8.9	3.0
APR												
07...	1430	346	131	7.1	12.5	11.0	759	10.2	96	47	12	4.2
MAY												
03...	1530	59	143	7.6	14.5	16.0	764	11.2	110	56	14	5.1
JUN												
08...	0800	24	152	7.1	22.5	23.5	750	6.6	78	56	14	5.1
JUL												
07...	1515	20	157	7.7	28.0	31.5	756	8.9	115	60	15	5.4
AUG												
10...	0915	5.9	168	7.2	23.0	23.5	761	8.7	102	62	15	5.9
SEP												
14...	0845	7.6	173	6.9	17.5	26.5	758	7.8	82	68	17	6.3

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LINITY WAT WH TOT IT FIELD MG/L AS CACO3 (00419)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
OCT												
06...	6.0	3.9	49	--	60	14	11	0.20	11	104	--	<0.010
NOV												
03...	6.6	4.9	56	--	68	14	13	0.10	11	114	--	<0.010
DEC												
06...	2.8	2.7	19	--	23	14	5.0	0.10	10	80	--	<0.010
JAN												
03...	5.0	1.1	27	--	33	18	9.0	<0.10	15	88	--	<0.010
FEB												
15...	6.0	1.6	23	--	28	16	10	<0.10	13	88	--	<0.010
24...	4.1	2.6	21	--	26	13	8.2	<0.10	9.4	81	4.8	0.010
MAR												
10...	4.7	2.4	16	--	20	13	8.6	<0.10	8.4	72	--	<0.010
APR												
07...	4.7	1.8	26	--	32	16	8.2	<0.10	12	84	5.2	0.020
MAY												
03...	5.2	1.6	36	--	44	15	8.3	<0.10	11	93	4.1	0.010
JUN												
08...	5.5	2.4	42	--	51	13	9.3	<0.10	12	104	3.8	0.020
JUL												
07...	5.8	3.3	45	20	55	12	11	0.10	14	113	--	<0.010
AUG												
10...	6.8	4.2	43	--	53	11	11	0.20	12	116	--	<0.010
SEP												
14...	6.5	3.0	50	--	61	14	11	0.10	11	112	--	<0.010

< Actual value is known to be less than the value shown.



## POTOMAC RIVER BASIN

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01638480 CATOCTIN CREEK AT TAYLORSTOWN, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS- SOLVED (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDEED TOTAL (MG/L AS C) (00689)
OCT 06...	0.240	0.240	0.020	0.20	<0.20	0.020	0.020	0.010	120	31	3.5	0.2
NOV 03...	0.110	0.110	0.020	0.30	0.20	0.030	0.010	0.020	73	13	3.8	0.2
DEC 06...	1.20	1.20	0.040	0.40	0.40	0.170	0.040	0.040	64	31	5.5	1.8
JAN 03...	2.00	2.00	0.020	<0.20	<0.20	0.020	<0.010	<0.010	38	25	1.4	0.1
FEB 15...	1.70	1.70	0.010	<0.20	<0.20	0.040	0.020	0.010	44	21	1.6	0.3
24...	1.10	1.10	0.100	0.70	0.40	0.230	0.050	0.040	66	29	4.9	1.1
MAR 10...	1.00	1.00	0.070	0.80	0.30	0.300	0.040	0.030	69	20	4.2	2.4
APR 07...	1.20	1.20	0.010	0.60	0.30	0.140	0.020	0.010	240	13	3.9	1.3
MAY 03...	0.940	0.940	0.030	0.30	<0.20	<0.010	<0.010	<0.010	180	20	2.6	0.3
JUN 08...	0.870	0.870	0.060	0.30	0.40	0.030	0.020	<0.010	90	32	3.5	0.3
JUL 07...	0.610	0.610	0.030	0.50	0.20	0.110	0.030	0.020	140	39	3.9	0.5
AUG 10...	0.490	0.490	0.040	0.30	0.20	0.060	0.030	0.020	110	37	3.2	0.3
SEP 14...	0.370	0.370	0.060	<0.20	0.30	0.040	0.030	0.020	110	34	3.5	0.4

DATE	DIMETH- OATE WATER FLTRD 0.7 U GF, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)
OCT 06...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 03...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 15...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--	--
APR 07...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 08...	<0.02	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	0.12	<0.01	<0.01	<0.05
JUL 07...	<0.02	<0.01	<0.01	<0.03	<0.01	<0.01	0.01	<0.01	0.20	<0.01	<0.01	<0.05
AUG 10...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 14...	--	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01638480 CATOCTIN CREEK AT TAYLORSTOWN, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P, P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)
OCT 06...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 03...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 15...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--	--
APR 07...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 08...	<0.01	<0.00	<0.01	<0.00	<0.01	0.06	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01
JUL 07...	<0.01	<0.00	0.02	<0.00	<0.01	0.07	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01
AUG 10...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 14...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	LINDANE DIS- SOLVED (UG/L) (39341)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
OCT 06...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 03...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 15...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--	--
APR 07...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 03...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 08...	<0.01	<0.04	<0.01	<0.04	<0.03	0.15	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
JUL 07...	<0.01	<0.04	<0.01	<0.04	<0.03	0.24	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
AUG 10...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 14...	--	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

01638480 CATOCTIN CREEK AT TAYLORSTOWN, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
OCT 06...	--	--	--	--	--	--	--	--	--	--	--
NOV 03...	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 03...	--	--	--	--	--	--	--	--	--	--	--
FEB 15...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
MAR 10...	--	--	--	--	--	--	--	--	--	--	--
APR 07...	--	--	--	--	--	--	--	--	--	--	--
MAY 03...	--	--	--	--	--	--	--	--	--	--	--
JUN 08...	<0.02	<0.01	<0.01	<0.02	<0.01	<0.02	0.07	<0.02	<0.01	<0.01	<0.01
JUL 07...	<0.02	0.01	<0.01	<0.02	<0.01	<0.02	0.07	<0.02	<0.01	<0.01	<0.01
AUG 10...	--	--	--	--	--	--	--	--	--	--	--
SEP 14...	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01638500 POTOMAC RIVER AT POINT OF ROCKS, MD

LOCATION.--Lat 39°16'25", long 77°32'35", Frederick County, Hydrologic Unit 02070008, on left bank at downstream side of bridge on U.S. Highway 15 at Point of Rocks, 0.3 mi downstream from Catoctin Creek (Virginia), 6 mi upstream from Monocacy River, and at mile 159.5.

DRAINAGE AREA.--9,651 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1895 to current year.

REVISED RECORDS.--WSP 192: 1895-1905. WSP 1432: 1899, 1901-2, 1904-5, 1912, 1914(M), 1915, 1917(M), 1918, 1919(M), 1920, 1921-23(M), 1924, 1925-28(M), 1930(M).

GAGE.--Water-stage recorder. Datum of gage is 200.63 ft above sea level. Prior to Oct. 28, 1929, nonrecording gage at same site. Prior to Sept. 2, 1902, at datum about 0.45 ft higher.

REMARKS.--Records good except those for estimated daily discharges (backwater from grass, ice effect, missing record), which are fair. Low flow affected slightly from 1913 to July 1981 by Stony River Reservoir, since December 1950 by Savage River Reservoir, and since July 1981 by Jennings Randolph Lake. Low flow affected extensively at times by run-of-the-river hydroelectric plants. National Weather Service gage height telemeter at station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 2, 1889, reached a stage of 40.2 ft, from floodmarks, discharge, about 460,000 ft<sup>3</sup>/s from rating curve extended as explained in footnotes.

PEAK DISCHARGES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 35,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	1300	*115,000	*19.25	Mar. 11	1700	102,000	17.78
Dec. 6	2100	85,600	15.70	Mar. 16	2100	60,200	12.34
Jan. 30	1300	57,000	11.89	Mar. 23	2300	47,500	10.50
Feb. 11	0830	61,800	12.56	Mar. 30	1230	113,000	19.00
Feb. 22	1800	66,000	13.15	Apr. 15	0030	44,100	9.98
Feb. 25	1100	88,200	16.03	May 9	1930	71,200	13.84

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
MEAN DAILY VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3800	e2300	26300	6620	32300	27900	55200	9420	4840	3360	5960	4370
2	e3400	e4500	18300	5760	23900	23800	41300	17700	4570	3020	6350	4190
3	e3200	e4200	14100	6200	19600	21800	34600	15800	4420	2880	5310	3950
4	e2900	e4000	11700	6440	16500	20600	30000	13500	4350	2780	5000	3890
5	e2800	e3600	24500	6110	14300	23300	26000	12100	4020	2600	4670	3630
6	e2500	e3400	66500	5810	13100	36500	22400	14800	3890	2550	4380	3430
7	e2200	e3200	63600	5860	12300	46700	20800	18700	3870	2840	4310	3410
8	e1800	e3100	36100	6560	12000	52700	20400	22500	3850	3010	3930	3080
9	e1700	e3000	24700	e7000	12500	84100	18800	58800	3890	2940	4080	3100
10	e1900	e2900	19100	e7000	19900	84900	17100	55400	3660	3000	4070	2990
11	e1900	e2800	16400	e9000	e58000	97800	16700	33400	3540	2840	3320	2820
12	e1800	e2700	14900	e10500	e38000	84000	17700	24700	3510	2640	3000	2680
13	e1700	e2600	13100	e11000	e26000	58800	17500	20200	3390	2500	3000	2630
14	e2600	e2500	11700	e12000	e21000	50400	29400	16800	3360	2460	3610	2530
15	e2500	e2400	10700	e12000	e18000	52200	40300	14100	3510	2610	3430	2620
16	e2400	e2400	10500	e11000	17100	57500	31100	12100	3410	2600	3190	2620
17	e2300	e2500	10900	e10000	16200	54300	27800	10800	3300	2710	4330	2700
18	e2200	e2800	11200	e9000	18300	40600	25300	9990	3510	2650	14200	2800
19	e2100	e3100	11000	e5500	22000	33500	21100	9920	3530	2610	31500	2750
20	e2100	e3400	10600	e7000	30500	30000	17800	9040	3370	2600	25000	2410
21	e2200	e3300	10900	e8500	44500	29200	15900	8010	3400	2660	15900	2570
22	e2400	e3300	10800	e8000	62400	32000	14200	7400	3900	3030	13000	2680
23	e2300	e3400	10900	e7800	59800	43100	12900	7020	3160	3430	14200	2810
24	e2300	e3500	10300	e8500	59500	47200	12000	6800	3100	5300	12100	3370
25	e2300	e3300	9570	11800	84800	46600	11300	6590	3090	5810	9200	3450
26	e2200	e3100	8870	18300	68000	45000	10600	6430	3090	5180	7440	3280
27	e2300	e3300	8150	35000	47000	40000	10100	6270	3190	4450	6890	2960
28	e2400	20700	7470	37700	34900	58800	9680	6100	3710	4300	6050	3670
29	e2600	97800	6910	37800	---	93500	9220	5830	3250	4020	5270	3320
30	e2500	50900	e6200	55400	---	110000	8920	5530	3320	4490	4780	2920
31	e2400	---	e5900	47500	---	85100	---	5150	---	5800	4450	---
TOTAL	73700	254000	521870	436660	902400	1611900	646120	470900	109000	103670	241920	93630
MEAN	2377	8467	16830	14090	32230	52000	21540	15190	3633	3344	7804	3121
MAX	3800	97800	66500	55400	84800	110000	55200	58800	4840	5810	31500	4370
MIN	1700	2300	5900	5500	12000	20600	8920	5150	3090	2460	3000	2410
CFSM	.25	.88	1.74	1.46	3.34	5.39	2.23	1.57	.38	.35	.81	.32
IN.	.28	.98	2.01	1.68	3.48	6.21	2.49	1.82	.42	.40	.93	.36

e Estimated

## POTOMAC RIVER BASIN

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01638500 POTOMAC RIVER AT POINT OF ROCKS, MD--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1895 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5037	5517	8497	11140	14320	19770	16690	12320	7937	4490	4209	3484
MAX	37030	39000	32610	31350	42640	68360	43840	41970	40400	16000	23580	17820
(WY)	1943	1986	1973	1937	1897	1936	1993	1924	1972	1949	1955	1975
MIN	706	840	1253	1703	2661	5400	4368	3276	1932	1056	771	834
(WY)	1931	1931	1966	1981	1934	1931	1915	1930	1969	1966	1930	1930

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1895 - 1994	
ANNUAL TOTAL	4932270		5465770			
ANNUAL MEAN	13510		14970		9436	
HIGHEST ANNUAL MEAN					15840	
LOWEST ANNUAL MEAN					4366	
HIGHEST DAILY MEAN	141000		110000		434000	
LOWEST DAILY MEAN	(e)1500		1700		540	
ANNUAL SEVEN-DAY MINIMUM	1540		1860		593	
INSTANTANEOUS PEAK FLOW			115000		(c)480000	
INSTANTANEOUS PEAK STAGE			19.25		41.03	
INSTANTANEOUS LOW FLOW			UNKNOWN		530	
ANNUAL RUNOFF (CFSM)	1.40		1.55		.98	
ANNUAL RUNOFF (INCHES)	19.01		21.07		13.28	
10 PERCENT EXCEEDS	35300		42000		20400	
50 PERCENT EXCEEDS	5430		6350		5380	
90 PERCENT EXCEEDS	2200		2600		1660	

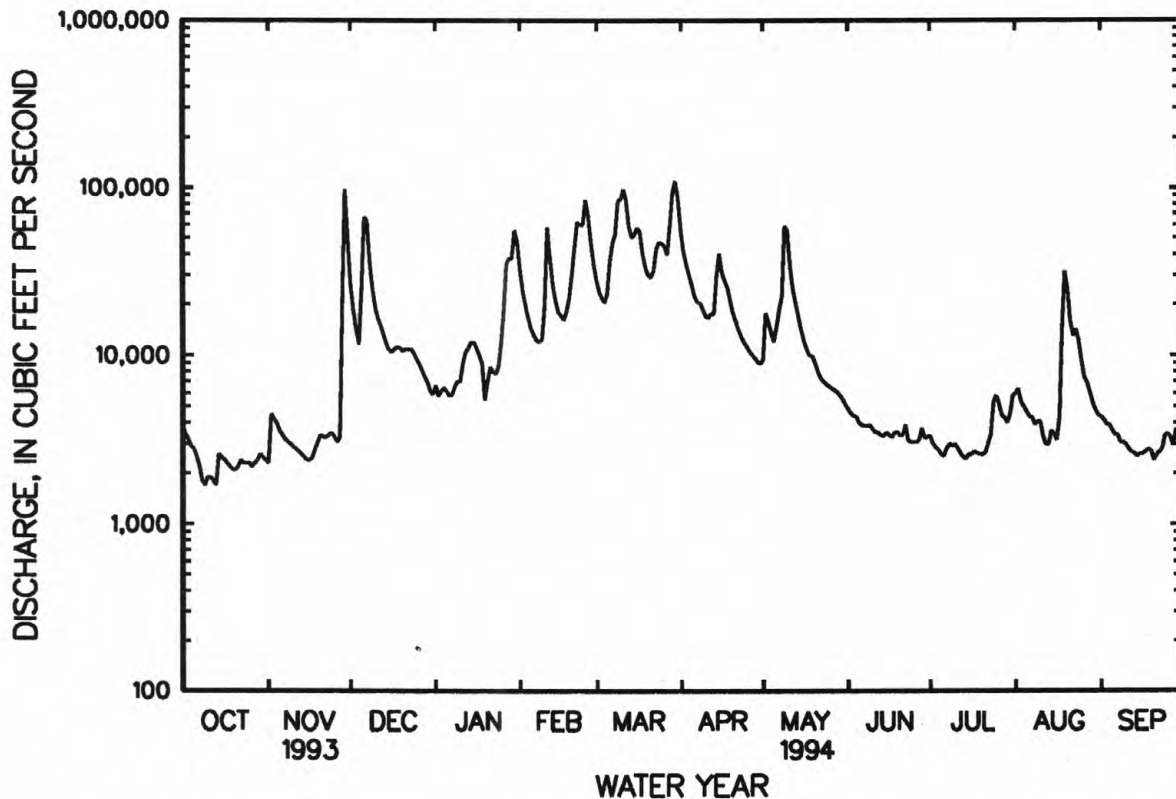
a Sept. 1-4.

b Oct. 9, 13.

c From rating curve extended above 300,000 ft<sup>3</sup>/s, on the basis of adjustment of figure of peak flow at station near Washington for inflow and storage, and slope-area measurement of peak flow.

d September 11, 12, 1966.

e Estimated.





## POTOMAC RIVER BASIN

01643700 GOOSE CREEK NEAR MIDDLEBURG, VA

LOCATION.--Lat 38°59'11", long 77°47'49", Loudoun County, Hydrologic Unit 02070008, on right bank 250 ft upstream from bridge on State Highway 611, 2.0 mi downstream from Panther Skin Creek, and 3.4 mi northwest of Middleburg.

DRAINAGE AREA.--123 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1965 to September 1967, July 1969 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 329.80 ft above sea level. October 1965 to September 1967, at site 300 ft downstream at datum 0.73 ft lower.

REMARKS.--Records good except those for period with backwater from leaves, Oct. 1 to Nov. 27, and periods with ice effect, Dec. 29 to Jan. 2, Jan. 9-11, 15-20, 24-26, and Feb. 3, 4, 10-15, which are fair. Maximum discharge, 19,200 ft<sup>3</sup>/s, from rating curve extended above 2,900 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 14.44 ft and 27.46 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,350 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0730	*2,180	*8.72	Feb. 24	1730	1,530	7.02
Dec. 5	1000	2,150	8.64	Mar. 10	1630	1,850	7.87
Jan. 28	2000	1,570	7.13	Mar. 29	1130	1,650	7.32
Feb. 19	1930	2,060	8.40	Aug. 17	2200	1,630	7.29

Minimum daily discharge, 0.66 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.7	e22	69	e50	226	303	547	80	40	28	23	33
2	e1.3	e17	53	e53	177	305	434	70	37	22	20	23
3	e1.1	e12	43	55	e169	296	372	66	36	20	18	19
4	e.96	e11	46	65	e144	319	325	84	36	21	28	18
5	e.85	e9.9	1250	59	129	623	285	91	35	20	25	.17
6	e.75	e10	532	48	132	721	279	74	35	18	43	16
7	e.70	e11	294	63	145	789	381	93	35	16	25	15
8	e.66	e11	201	212	142	1180	258	552	33	16	20	14
9	e.75	e9.5	146	e130	183	976	231	242	31	16	17	13
10	e2.3	e9.1	118	e96	e156	1610	225	172	29	32	15	12
11	e2.7	e8.6	99	e100	e136	1020	211	132	29	22	14	12
12	e6.9	e8.6	70	184	e268	729	188	114	32	15	20	11
13	e11	e8.2	65	189	e202	602	225	99	29	13	19	10
14	e7.5	e10	60	167	e174	549	209	86	25	13	14	9.6
15	e4.7	e11	68	e134	e148	512	174	106	22	25	14	9.1
16	e3.9	e11	187	e128	139	466	284	218	23	19	15	9.2
17	e3.9	e12	106	e103	271	395	193	100	37	16	354	9.9
18	e3.2	e19	88	e180	508	372	169	87	28	27	531	11
19	e2.7	e23	82	e110	885	358	157	81	23	58	120	11
20	e3.2	e16	70	e102	691	290	143	77	20	26	70	9.6
21	e5.0	e14	126	99	658	279	128	71	23	19	82	8.6
22	e15	e11	122	92	560	323	116	64	36	26	91	11
23	e13	e11	89	92	805	266	109	59	23	22	56	95
24	e9.0	e10	78	e418	1100	257	103	54	23	67	41	36
25	e6.6	e10	71	e390	777	247	95	64	33	30	33	22
26	e4.9	e9.5	67	e388	582	211	89	64	23	41	30	26
27	e4.4	e150	58	147	421	496	89	58	27	36	31	34
28	e4.9	1240	55	666	343	753	82	50	88	186	27	24
29	e5.1	232	e52	662	---	1330	79	47	32	49	25	19
30	e7.1	109	e47	370	---	892	93	44	29	35	23	16
31	e18	---	e45	261	---	654	---	41	---	27	26	---
TOTAL	153.77	2046.4	4457	5813	10271	18123	6273	3240	952	981	1870	574.0
MEAN	4.96	68.2	144	188	367	585	209	105	31.7	31.6	60.3	19.1
MAX	18	1240	1250	666	1100	1610	547	552	88	186	531	95
MIN	.66	8.2	43	48	129	211	79	41	20	13	14	8.6
CFSM	.04	.55	1.17	1.52	2.98	4.75	1.70	.85	.26	.26	.49	.16
IN.	.05	.62	1.35	1.76	3.11	5.48	1.90	.98	.29	.30	.57	.17

e Estimated.

## POTOMAC RIVER BASIN

119

01643700 GOOSE CREEK NEAR MIDDLEBURG, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1967, 1969 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	84.7	88.3	140	156	209	245	230	163	113	53.5	47.4	46.2
MAX	602	233	453	418	609	722	688	463	645	217	206	349
(WY)	1980	1978	1993	1978	1984	1993	1983	1989	1972	1972	1967	1979
MIN	.004	3.41	4.17	7.65	38.0	51.3	43.5	26.1	15.2	2.81	.41	.000
(WY)	1992	1992	1966	1966	1989	1981	1981	1985	1986	1966	1991	1991

## SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1966 - 1967,  
1970 - 1994

ANNUAL TOTAL	63424.02	54754.17	131
ANNUAL MEAN	174	150	228
HIGHEST ANNUAL MEAN			36.5
LOWEST ANNUAL MEAN			1984
HIGHEST DAILY MEAN	3070	Mar 4	1610
LOWEST DAILY MEAN	.04	aSep 11	e.66
ANNUAL SEVEN-DAY MINIMUM	.05	Mar 9	e.82
INSTANTANEOUS PEAK FLOW			2180
INSTANTANEOUS PEAK STAGE			8.72
INSTANTANEOUS LOW FLOW			(d)
ANNUAL RUNOFF (CFSM)	1.41		1.22
ANNUAL RUNOFF (INCHES)	19.18		16.56
10 PERCENT EXCEEDS	479		419
50 PERCENT EXCEEDS	67		55
90 PERCENT EXCEEDS	1.8		9.6

a Also Sept. 12-14, 1993.

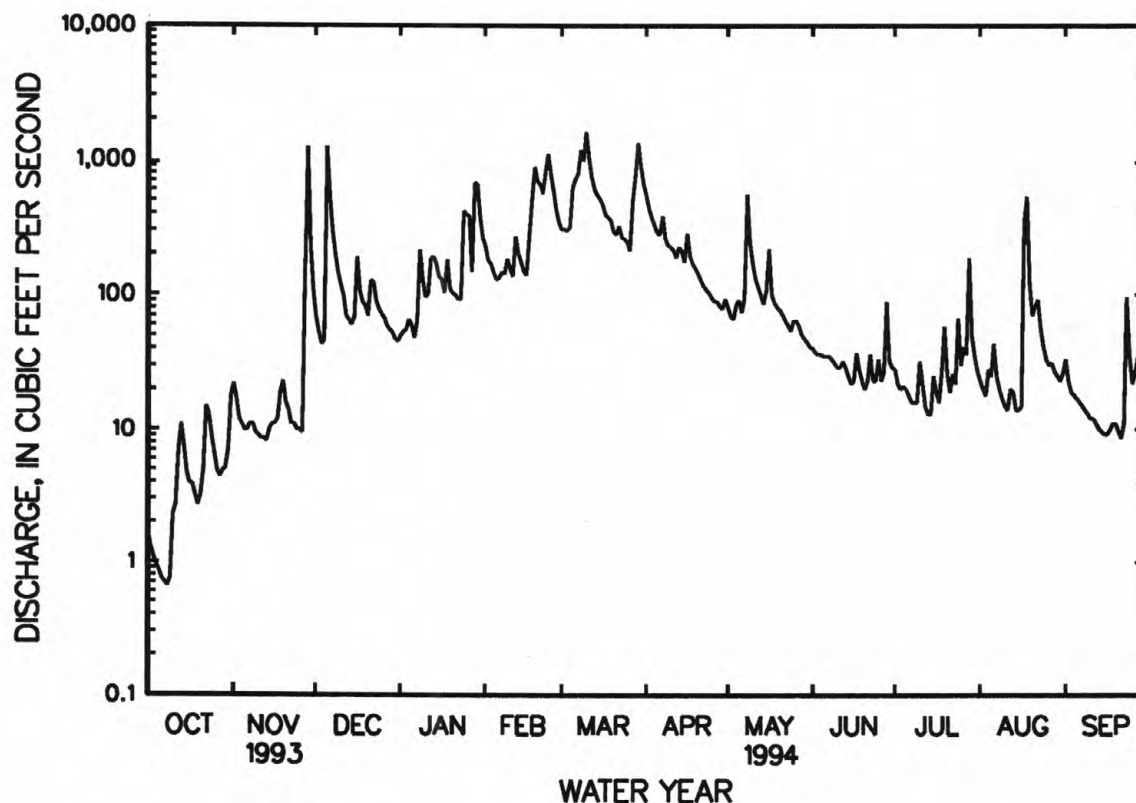
b Also Sept. 22-26, 1985, Sept. 29 to Oct. 3, 1986, and many days in September to November 1991.

c Many periods in September to November 1991.

d Not determined.

e Estimated.

f Also Sept. 21-27, 1985, Sept. 29 to Oct. 3, 1986, and many days in September to November 1991.



## POTOMAC RIVER BASIN

01644000 GOOSE CREEK NEAR LEESBURG, VA

LOCATION.--Lat 39°01'10", long 77°34'40", Loudoun County, Hydrologic Unit 02070008, on left bank 400 ft upstream from bridge on State Highway 621 at Evergreen Mills, 1.4 mi downstream from Little River, 6.7 mi south of Leesburg, and 10.9 mi upstream from mouth.

DRAINAGE AREA.--332 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1909 to April 1911, September 1911 to December 1912, January 1930 to current year.

REVISED RECORDS.--WSP 851: 1935-37. WSP 951: 1933(M), 1937. WSP 1302: 1934-35(M). WSP 2103: Drainage area. WDR VA-72-1: 1937(M), 1943(M), 1951(M), 1956(M). WDR VA-79-1: 1978.

GAGE.--Water-stage recorder. Datum of gage is 248.93 ft above sea level. July 12, 1909, to Dec. 31, 1912, nonrecording gage at site 1,000 ft downstream at different datum. Jan. 21, 1930, to Nov. 28, 1938, nonrecording gage at site 400 ft downstream at datum 4.20 ft lower than present datum.

REMARKS.--Records good except those for period with backwater from beaver dam, Oct. 1-20, and periods with ice effect, Jan. 9-11, 16, 25, 26, and Feb. 3, 4, 10, 11, which are fair. National Weather Service gage-height telemeter at station. Maximum discharge, 78,100 ft<sup>3</sup>/s, from rating curve extended above 11,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May or June 1889 reached a stage of about 29 ft, discharge, about 45,000 ft<sup>3</sup>/s, site and datum in use 1930-38, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0730	*8,000	*11.85	Feb. 24	2000	4,100	6.77
Dec. 5	1600	6,310	9.80	Mar. 10	1900	5,210	8.38
Jan. 29	0100	5,000	8.10	Mar. 29	1400	4,680	7.63
Feb. 19	2330	4,810	7.82	Aug. 18	0230	5,660	8.98

Minimum daily discharge, 5.6 ft<sup>3</sup>/s, Oct, 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e19	70	326	190	552	707	1420	290	118	84	67	123
2	e14	54	250	202	422	714	1120	255	114	71	58	90
3	e11	44	206	204	e366	772	948	231	108	91	51	71
4	e10	38	212	243	e340	862	848	253	105	174	47	65
5	e8.4	33	4190	263	315	1730	756	299	104	70	62	61
6	e6.6	32	1820	218	303	2120	710	262	101	58	72	57
7	e5.6	32	905	236	348	2140	1030	270	103	57	75	52
8	e5.6	30	618	634	344	3160	748	1430	100	49	53	48
9	e6.0	27	483	e496	431	2460	650	694	93	42	44	45
10	e8.4	27	408	e372	e429	4310	621	492	87	62	38	42
11	e7.2	26	369	e368	e177	2840	616	396	86	72	35	40
12	e15	26	280	538	366	1830	554	346	89	50	94	38
13	e29	25	239	734	355	1540	631	310	92	38	57	36
14	e25	26	227	590	321	1390	799	271	83	31	48	34
15	e21	31	249	439	330	1250	587	252	74	31	46	32
16	e15	34	635	e243	303	1130	953	516	73	47	42	31
17	e12	35	441	293	527	938	699	308	106	41	1040	31
18	e11	70	353	595	1170	869	586	257	97	36	2670	32
19	e9.6	69	327	395	2350	876	537	252	76	68	493	32
20	e9.3	63	286	298	2510	741	499	235	67	74	270	30
21	13	48	468	269	1940	690	441	220	64	48	243	28
22	33	40	567	261	1550	840	412	197	86	64	377	30
23	46	36	410	268	2100	705	384	177	86	59	226	152
24	34	33	352	656	3100	658	364	161	68	91	149	131
25	26	32	316	e1530	2210	660	344	177	92	89	116	70
26	20	29	282	e1300	1490	597	320	189	80	76	103	61
27	18	359	250	622	999	1370	321	177	61	150	125	75
28	18	5740	227	1430	796	2190	308	152	166	533	95	68
29	15	983	217	2500	---	3890	277	139	119	204	82	56
30	16	491	183	1190	---	2340	307	131	90	111	79	47
31	47	---	170	634	---	1690	---	123	---	82	72	---
TOTAL	534.7	8583	16266	18211	26444	48009	18790	9462	2788	2753	7029	1708
MEAN	17.2	286	525	587	944	1549	626	305	92.9	88.8	227	56.9
MAX	47	5740	4190	2500	3100	4310	1420	1430	166	533	2670	152
MIN	5.6	25	170	190	177	597	277	123	61	31	35	28
CFSM	.05	.86	1.58	1.77	2.84	4.66	1.89	.92	.28	.27	.68	.17
IN.	.06	.96	1.82	2.04	2.96	5.38	2.11	1.06	.31	.31	.79	.19

e Estimated.

POTOMAC RIVER BASIN

121

01644000 GOOSE CREEK NEAR LEESBURG, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1913, 1930 - 1994 BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	196	214	325	391	508	583	524	371	256	141	155	126
MAX	2265	1155	1316	1200	1490	1892	1766	1322	2887	1207	1188	1054
(WY)	1943	1933	1993	1978	1984	1993	1983	1989	1972	1956	1937	1945
MIN	2.12	3.83	14.8	25.8	26.3	83.6	141	85.5	38.7	9.61	1.86	1.38
(WY)	1931	1931	1966	1966	1931	1931	1981	1969	1986	1966	1930	1985

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1910, 1912,  
1931 - 1994

ANNUAL TOTAL	172183.4		160577.7									
ANNUAL MEAN	472		440							318		
HIGHEST ANNUAL MEAN										664		1972
LOWEST ANNUAL MEAN										55.2		1931
HIGHEST DAILY MEAN	9360	Mar 5	5740	Nov 28					e53600		Jun 22	1972
LOWEST DAILY MEAN	2.3	Sep 15	e5.6	aOct 7						.40	bSep 27	1941
ANNUAL SEVEN-DAY MINIMUM	3.0	Sep 9	6.8	Oct 5						.45	Sep 19	1985
INSTANTANEOUS PEAK FLOW			8000	Nov 28						78100	Jun 22	1972
INSTANTANEOUS PEAK STAGE			11.85	Nov 28						c30.59	Jun 22	1972
INSTANTANEOUS LOW FLOW			(d)							(d)	(f)	
ANNUAL RUNOFF (CFSM)	1.42		1.33							.96		
ANNUAL RUNOFF (INCHES)	19.29		17.99							13.02		
10 PERCENT EXCEEDS	1120		1150							690		
50 PERCENT EXCEEDS	201		190							158		
90 PERCENT EXCEEDS	12		30							17		

a Also Oct. 8, 1993.

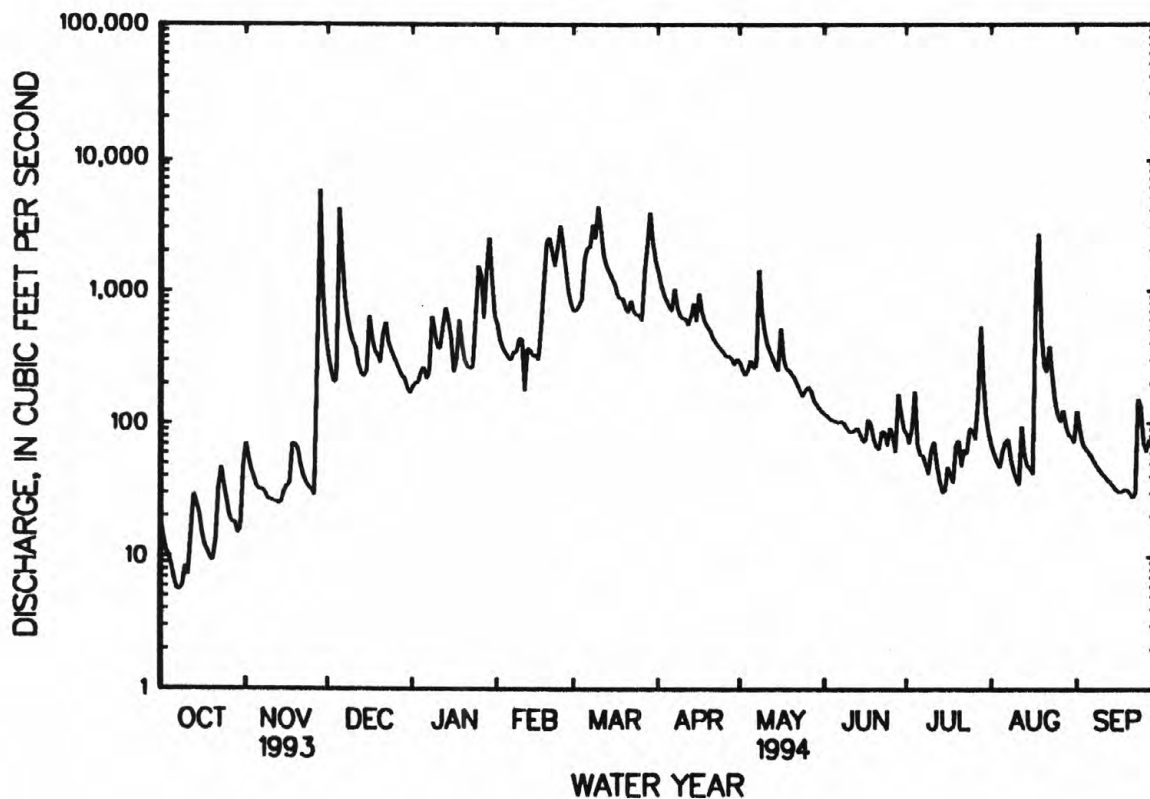
b Also Sept. 28-30, 1941.

c From high-water mark in gage house.

d Not determined.

e Estimated.

f Probably occurred Sept. 27-30, 1941.



## POTOMAC RIVER BASIN

01644000 GOOSE CREEK NEAR LEESBURG, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--June 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, JUNE 1994

DATE	TIME	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
JUN 09...	0715	143	7.7	19.0	13.5	2.3	0.010	0.520	0.520	0.050	0.30

DATE	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)
JUN 09...	0.20	<0.010	0.020	<0.010	<0.02	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01

DATE	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)
JUN 09...	<0.01	0.05	<0.01	<0.01	<0.05	<0.01	<0.00	0.01	<0.00	0.00

< Actual value is known to be less than the value shown.



## POTOMAC RIVER BASIN

123

01664000 GOOSE CREEK NEAR LEESBURG, VA--Continued

## WATER QUALITY DATA, JUNE 1994

DATE	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THON, DIS- SOLVED (UG/L) (39532)
JUN 09...	0.06	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
DATE	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
JUN 09...	<0.04	<0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02
DATE	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
JUN 09...	0.01	<0.01	<0.02	<0.01	<0.02	0.02	0.01	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01646000 DIFFICULT RUN NEAR GREAT FALLS, VA

LOCATION.--Lat 38°58'33", long 77°14'46", Fairfax County, Hydrologic Unit 02070008, on right bank 250 ft downstream from bridge on State Highway 193, 300 ft downstream from Rocky Run, 0.7 mi upstream from mouth, and 1.5 mi southeast of Great Falls.

DRAINAGE AREA.--57.9 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1934 to current year. Monthly discharge only October to December 1934, published in WSP 1302.

REVISED RECORDS.--WSP 951: 1936(M), 1937-38, 1939-40(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 151.30 ft above sea level.

REMARKS.--Records good except those for periods with backwater from beaver dams, Oct. 5-19 and Oct. 27 to Nov. 22, and periods with ice effect, Dec. 30, 31, and Jan. 16, 19-21, which are fair. Maximum discharge, 32,200 ft<sup>3</sup>/s, from rating curve extended above 1,600 ft<sup>3</sup>/s on basis of contracted-opening measurement at gage height 13.18 ft and slope-area measurement at gage height 21.40 ft. Minimum gage height, 1.65 ft, Sept. 9, 10, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0700	*4,720	*12.04	June 24	2230	1,010	7.32
Dec. 5	1030	1,130	7.62	July 28	0230	1,380	8.19
Feb. 23	1830	1,490	8.41	Aug. 18	0100	1,290	8.01
Mar. 27	1600	1,070	7.48	Aug. 21	2130	1,030	7.37
Mar. 28	1230	1,010	7.33				

Minimum daily discharge, 12 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	e30	56	49	74	80	126	58	34	46	32	31
2	19	e21	51	52	65	127	104	53	31	55	44	28
3	18	e19	47	58	61	580	96	52	31	343	37	27
4	17	e18	79	153	58	404	90	72	31	186	27	26
5	e15	e24	781	94	59	324	84	79	30	59	133	25
6	e14	e28	134	68	58	184	94	58	31	44	58	24
7	e13	e19	76	190	59	137	155	82	31	60	32	24
8	e12	e18	62	356	60	168	92	230	29	37	27	22
9	e15	e17	55	104	96	147	83	78	27	42	25	22
10	e19	e17	52	83	84	535	94	63	27	50	23	21
11	e16	e18	56	66	69	169	89	59	27	31	40	20
12	e68	e18	47	192	64	114	79	60	29	27	156	19
13	e24	e19	43	117	59	102	111	53	28	26	39	20
14	e18	e30	44	89	61	97	98	49	27	42	73	19
15	e17	e21	99	71	64	91	81	54	25	115	88	18
16	e16	e19	171	e62	78	86	264	102	194	36	72	18
17	e16	e28	67	67	112	80	106	55	107	58	702	21
18	e15	e95	56	184	172	87	84	50	44	58	494	44
19	e15	e38	60	e87	308	89	78	48	47	31	90	21
20	20	e32	52	e65	288	77	73	51	65	26	60	19
21	38	e28	181	e60	251	90	69	48	68	29	275	18
22	45	e26	90	61	157	144	66	45	131	35	190	93
23	20	25	69	73	817	89	64	42	42	24	67	101
24	17	24	61	194	477	78	63	40	320	23	49	33
25	16	24	58	136	162	139	61	108	243	24	42	26
26	16	23	56	169	115	93	59	59	56	68	53	286
27	e16	225	52	77	90	578	71	45	44	190	38	298
28	e20	2220	52	361	79	723	70	38	47	640	35	55
29	e16	132	53	237	---	667	61	36	42	88	46	39
30	e52	72	e50	111	---	194	62	35	56	52	40	31
31	e62	---	e48	82	---	136	---	34	---	36	33	---
TOTAL	703	3328	2858	3768	4097	6609	2727	1936	1944	2581	3120	1449
MEAN	22.7	111	92.2	122	146	213	90.9	62.5	64.8	83.3	101	48.3
MAX	68	2220	781	361	817	723	264	230	320	640	702	298
MIN	12	17	43	49	58	77	59	34	25	23	23	18
CFSM	.39	1.92	1.59	2.10	2.53	3.68	1.57	1.08	1.12	1.44	1.74	.83
IN.	.45	2.14	1.84	2.42	2.63	4.25	1.75	1.24	1.25	1.66	2.00	.93

e Estimated.

## 01646000 DIFFICULT RUN NEAR GREAT FALLS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	39.4	48.9	59.9	71.3	80.8	88.2	82.0	70.2	68.1	40.9	38.6	35.0
MAX	317	116	165	183	184	227	224	203	1210	115	143	245
(WY)	1980	1973	1973	1978	1979	1993	1973	1989	1972	1975	1955	1975
MIN	4.69	7.75	11.4	16.5	32.4	33.2	31.5	21.8	10.0	4.52	1.88	5.57
(WY)	1942	1942	1966	1966	1942	1981	1985	1955	1986	1955	1966	1986

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1936 - 1994

ANNUAL TOTAL	30204.8	35120	
ANNUAL MEAN	82.8	96.2	60.1
HIGHEST ANNUAL MEAN			184
LOWEST ANNUAL MEAN			28.4
HIGHEST DAILY MEAN	2220	Nov 28	2220
LOWEST DAILY MEAN	<u>e</u> 8.6	Sep 15	<u>e</u> 12
ANNUAL SEVEN-DAY MINIMUM	13	Sep 1	<u>e</u> 15
INSTANTANEOUS PEAK FLOW			4720
INSTANTANEOUS PEAK STAGE			12.04
INSTANTANEOUS LOW FLOW			(d)
ANNUAL RUNOFF (CFSM)	1.43		1.66
ANNUAL RUNOFF (INCHES)	19.41		22.56
10 PERCENT EXCEEDS	147		188
50 PERCENT EXCEEDS	51		58
90 PERCENT EXCEEDS	15		19

a Also Sept. 8, 9, 1966.

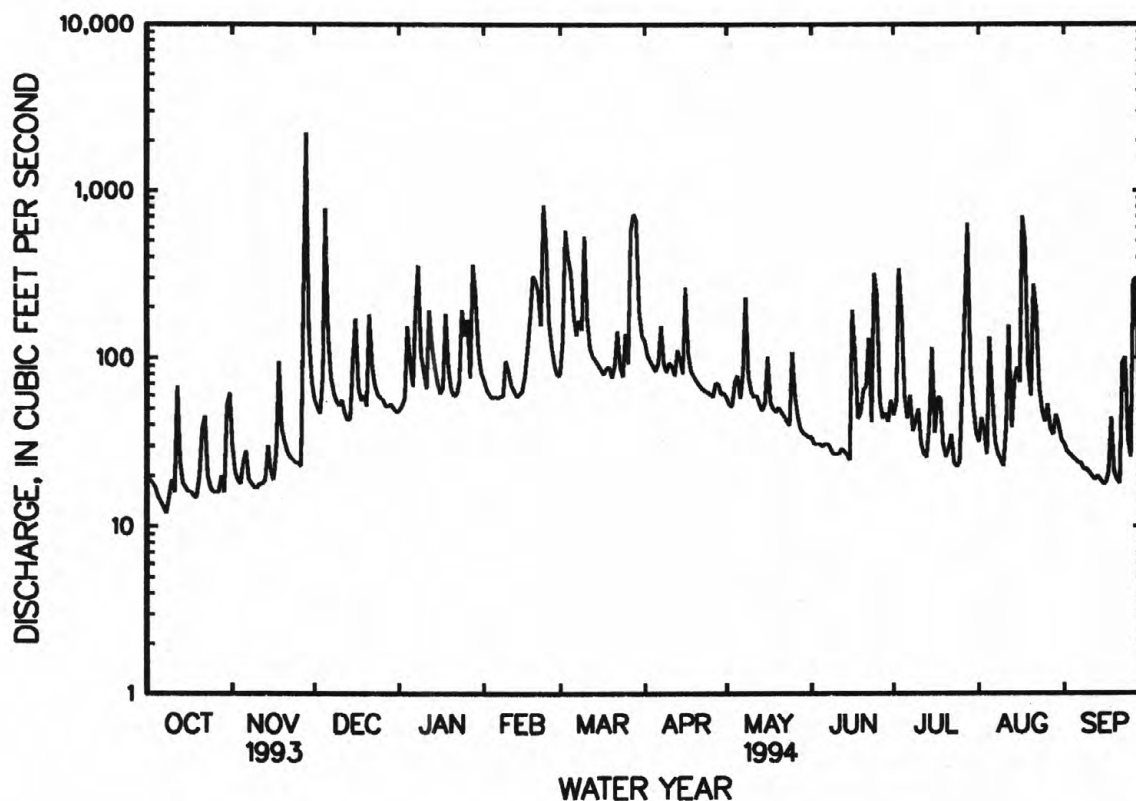
b Also Oct. 5, 1993.

c From floodmarks.

d Not determined.

e Estimated.

f Also Sept. 10, 1966.



## POTOMAC RIVER BASIN

01646500 POTOMAC RIVER NEAR WASHINGTON, DC

LOCATION.--Lat 38°56'58", long 77°07'40", Montgomery County, Md., Hydrologic Unit 02070008, on left bank just upstream from Little Falls Dam, 1 mi upstream from District of Columbia boundary line, 1.2 mi upstream from Chain Bridge, 1.8 mi east of Langley, Fairfax County, Va., and at mile 117.4.  
DRAINAGE AREA.--11,560 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1930 to current year.

REVISED RECORDS.--WSP 726: Drainage area. WDR MD-DE-75-1: 1973-74(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 37.95 ft above sea level. Prior to June 7, 1930, nonrecording gage, and June 7, 1930, to Jan. 22, 1965, water-stage recorder at site 1 mi upstream on right bank at same datum.

REMARKS.--Records good except those for estimated daily discharges (ice effect), which are poor. Diversions at Great Falls through aqueducts, and since June 1959, from gage pool at Little Falls Dam, for municipal supply of Washington, D.C.; since October 1958, at Rockville Filtration Plant, for municipal supply of city of Rockville; since April 1961, at Potomac Filtration Plant for water supply of Washington Suburban Sanitary District; since October 1961, at Fairfax Water Treatment Plant for water supply of city of Fairfax (from Goose Creek); since April 1964, at Violets Lock to Chesapeake and Ohio Canal; and since October 1985, at Fairfax County Water Authority Treatment Plant for water supply of the county. Low flow affected slightly prior to July 1981 by Stony River Reservoir, since December 1950, by Savage River Reservoir, and since July 1981, by Jennings Randolph Lake. Gage-height telemeter at station.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 2, 1889, was of approximately the same magnitude as that of Mar. 19, 1936.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 45,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	2000	136,000	10.09	Mar. 17	0100	76,400	7.93
Dec. 7	0130	105,000	9.05	Mar. 24	2030	62,000	7.29
Jan. 31	0030	67,300	7.53	Mar. 30	1515	*142,000	*10.37
Feb. 11	1615	67,500	7.54	Apr. 2	1345	54,200	6.91
Feb. 25	1715	110,000	9.20	Apr. 15	1015	55,000	6.95
Mar. 11	2345	131,000	9.90	May 10	0400	83,900	8.24

## DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

## MEAN DAILY VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4030	2080	34600	5780	42800	36300	77600	10800	5480	3220	5810	4570
2	3560	3140	22500	6430	29800	31100	55900	15200	4970	3190	5990	4380
3	3180	3950	16500	5930	23700	29500	44600	21600	4830	3160	5900	4080
4	2830	4300	13400	6860	19800	27800	39300	17700	4510	3760	4920	3810
5	2750	3960	34600	6850	16700	30300	33300	15400	4280	2940	4820	3740
6	2590	3440	76900	6090	14900	42800	29400	14900	4010	2440	4510	3410
7	2240	3250	87000	6270	14100	58800	27800	20800	3890	2320	4150	3230
8	1830	3120	48800	8660	13700	64700	27000	27700	3830	2490	3970	3130
9	1490	3040	31500	7300	14100	93200	24800	52900	3790	2620	3610	2760
10	1670	2830	23500	7560	14200	115000	22300	75000	3810	2770	3670	2750
11	1750	2710	19000	10300	50600	124000	21000	45900	3550	2700	3650	2610
12	1710	2680	17300	12700	47600	116000	21500	32100	3480	2480	3700	2490
13	1380	2570	15100	13200	31900	81000	22400	25500	3330	2230	2960	2310
14	2020	2550	13100	13300	25700	66700	29100	21500	3170	2100	2960	2220
15	2530	2410	12000	e14500	21900	66600	51800	17500	3120	2310	3670	2150
16	2200	2200	12200	e12300	19500	72200	42900	15100	4540	2220	3400	2250
17	2070	2540	11700	e11700	18400	72200	35800	13000	3590	2600	4940	2270
18	1970	3000	11700	e11400	20200	55900	32600	11600	3220	2810	12800	2480
19	1920	3070	11600	5740	26600	44800	27900	11000	3450	2700	31800	2640
20	1870	3450	11200	7870	38400	38900	23200	10500	3350	2530	33500	2530
21	1990	3360	12100	9000	54200	38000	20300	9630	3170	2280	22300	2270
22	2260	3260	13400	8830	75800	42000	18100	8690	3610	2480	18200	2440
23	2150	3510	12800	8390	83100	52300	16200	7940	3540	2870	14700	3050
24	2250	3550	11700	9320	79200	60800	14800	7620	3530	3530	16400	2960
25	2170	3300	10600	13000	103000	60000	13700	7740	3700	5340	11300	3570
26	2050	2950	9810	17800	92200	58100	13000	7300	2940	6130	8870	4460
27	2110	3620	8920	28700	64200	55900	12400	7410	2930	5600	7940	4500
28	2440	37400	8040	39800	46700	76500	12100	7360	3110	10900	7370	3200
29	2580	104000	7290	44800	---	118000	11500	6890	3580	6050	5910	3710
30	2460	81300	6130	59100	---	140000	11100	6370	3250	4590	5190	3280
31	2340	---	5840	60500	---	119000	---	5870	---	4710	4700	---
TOTAL	70390	306540	630830	479980	1103000	2088400	833400	558520	111560	108070	273610	93250
MEAN	2271	10220	20350	15480	39390	67370	27780	18020	3719	3486	8826	3108
MAX	4030	104000	87000	60500	103000	140000	77600	75000	5480	10900	33500	4570
MIN	1380	2080	5840	5740	13700	27800	11100	5870	2930	2100	2960	2150
(†)	555	537	507	608	540	520	575	612	733	688	637	630
MEAN#	2825	10770	20860	16100	39940	67860	28350	18630	4451	4175	9460	3737
CFSM#	.24	.93	1.80	1.39	3.45	5.87	2.45	1.61	.39	.36	.82	.32
IN#	.28	1.04	2.08	1.61	3.60	6.77	2.74	1.86	.43	.42	.94	.36

e Estimated

† Diversions, in cubic feet per second, for municipal supply of Washington, D.C., Washington Suburban Sanitary District, city of Rockville, city of Fairfax (from Goose Creek), Fairfax County, and the Chesapeake and Ohio Canal (insignificant diversion to canal during current water year). Records provided by U.S. Army Corps of Engineers, Washington Suburban Sanitary Commission, city of Rockville, city of Fairfax, and Fairfax County Water Authority.

# Adjusted for diversion.

## 01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1958, BY WATER YEAR (WY) (UNREGULATED)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6120	6496	9843	13570	16660	21060	19120	13610	7960	5135	5804	4419
MAX	44100	21040	30900	37190	36790	76510	36430	27780	19090	21040	28210	19940
(WY)	1943	1933	1951	1937	1939	1936	1933	1932	1951	1949	1955	1945
MIN	583	700	1536	2527	2982	6505	7202	3953	2867	1284	569	679
(WY)	1931	1931	1944	1956	1934	1931	1947	1930	1930	1930	1930	1930

## SUMMARY STATISTICS

## WATER YEARS 1930 - 1958

ANNUAL MEAN	10920
HIGHEST ANNUAL MEAN	16100
LOWEST ANNUAL MEAN	5358
HIGHEST DAILY MEAN	426000
LOWEST DAILY MEAN	448
ANNUAL SEVEN-DAY MINIMUM	499
INSTANTANEOUS PEAK FLOW	484000
INSTANTANEOUS PEAK STAGE	(a)28.10
INSTANTANEOUS LOW FLOW	66
ANNUAL RUNOFF (CFSM)	.94
ANNUAL RUNOFF (INCHES)	12.84
10 PERCENT EXCEEDS	23600
50 PERCENT EXCEEDS	6440
90 PERCENT EXCEEDS	1810

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY) (REGULATED, UNADJUSTED)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6027	7414	11270	12780	17150	25280	21440	15350	9142	4571	3770	3908
MAX	36790	42030	35690	35700	39460	67370	57850	40410	46630	17160	11350	25310
(WY)	1977	1986	1973	1991	1984	1994	1993	1989	1972	1972	1984	1975
MIN	908	1097	1038	1682	5703	7403	7058	3921	2216	695	538	791
(WY)	1964	1966	1966	1981	1963	1990	1969	1969	1969	1966	1966	1964

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

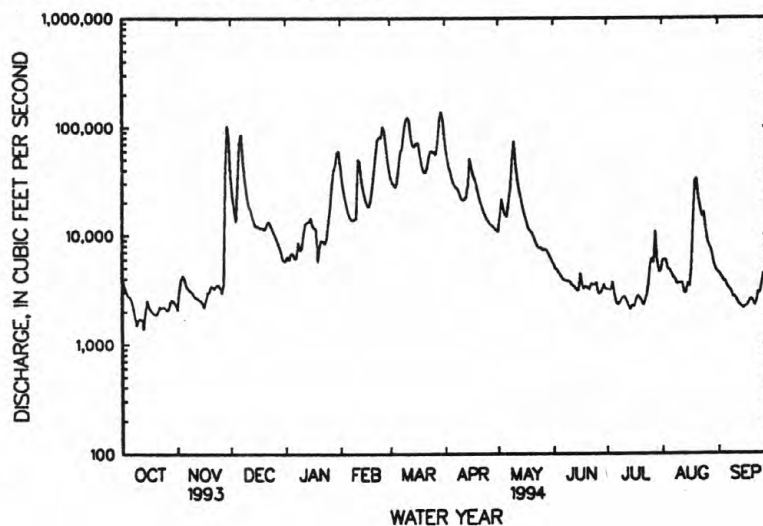
## FOR 1994 WATER YEAR

## WATER YEARS 1959 - 1994

ANNUAL TOTAL	6201353	6657550	
ANNUAL MEAN	16990	18240	11480
ANNUAL MEAN#	17560	18830	11970
HIGHEST ANNUAL MEAN			18580
HIGHEST ANNUAL MEAN#			19030
LOWEST ANNUAL MEAN			4900
LOWEST ANNUAL MEAN#			5306
HIGHEST DAILY MEAN	179000	Mar 6	140000
LOWEST DAILY MEAN	889	Sep 3	1380
LOWEST DAILY MEAN#	1700	Sep 3	1910
ANNUAL SEVEN-DAY MINIMUM	1020	Aug 29	1690
INSTANTANEOUS PEAK FLOW			142000
INSTANTANEOUS PEAK STAGE			10.37
INSTANTANEOUS LOW FLOW			1290
ANNUAL RUNOFF (CFSM)	1.47	1.58	.99
ANNUAL RUNOFF (CFSM)#	1.52	1.63	1.04
ANNUAL RUNOFF (INCHES)	19.96	21.42	13.49
ANNUAL RUNOFF (INCHES)#	20.63	22.13	14.06
10 PERCENT EXCEEDS	48000	53400	26100
50 PERCENT EXCEEDS	6200	7300	6310
90 PERCENT EXCEEDS	1780	2430	1590

# Adjusted for diversion.

a At previous site, 1 mi upstream at same datum.

b Minimum daily discharge observed at gaging station, does not include diversion of 489 ft<sup>3</sup>/s.c Includes diversion of 449 ft<sup>3</sup>/s for municipal use.



## POTOMAC RIVER BASIN

01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1989 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1988 to current year.

WATER TEMPERATURE: October 1988 to current year.

INSTRUMENTATION.--Water-quality monitor October 1988 to current year.

EXTREMES FOR PERIOD OF DAILY RECORD--

SPECIFIC CONDUCTANCE: Maximum, 747 microsiemens, Jan. 11, 1991; minimum, 68 microsiemens, Oct. 23, 1990.

WATER TEMPERATURE (water years 1989-93): Maximum, 33.5°C, July 11, 1993; minimum, 0.0°C, on many days during winter periods.

EXTREMES FOR CURRENT PERIOD.--

SPECIFIC CONDUCTANCE: Maximum, 740 microsiemens, Jan. 28; minimum, 96 microsiemens, Nov. 28.

WATER TEMPERATURE: Maximum, unknown; minimum, 0.0°C, Jan. 24, 27, 28.

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	389	382	384	418	393	407	194	179	186	365	344	353
2	400	389	393	432	414	423	205	194	200	365	358	361
3	411	400	406	432	419	428	221	205	214	371	358	365
4	420	411	416	419	394	404	231	221	225	537	354	435
5	421	415	418	407	398	402	224	129	170	479	433	445
6	420	413	417	424	407	414	200	149	171	450	400	427
7	413	407	410	435	424	432	200	170	181	536	385	441
8	407	405	406	438	433	435	188	176	182	527	345	405
9	407	400	403	445	433	441	200	188	195	345	336	341
10	401	393	398	433	396	415	210	200	204	356	332	342
11	393	384	389	397	374	383	221	210	217	359	345	351
12	385	368	380	375	369	371	234	221	228	388	341	358
13	370	348	358	377	368	372	248	234	240	341	315	327
14	364	351	356	385	377	379	251	248	250	330	310	320
15	385	364	375	393	385	391	256	242	251	324	296	307
16	393	385	391	393	387	391	260	232	246	301	182	270
17	393	385	388	388	381	385	265	259	262	240	177	196
18	394	388	391	382	333	351	280	265	273	578	240	471
19	393	383	388	366	348	358	288	279	283	458	392	420
20	389	384	386	374	365	370	293	288	291	439	382	398
21	394	387	390	385	374	382	288	239	266	394	324	351
22	389	362	378	394	385	390	274	267	271	328	309	316
23	392	379	384	402	394	399	274	272	273	366	327	333
24	395	390	392	404	399	402	283	274	278	729	358	490
25	404	394	399	402	399	400	291	283	288	576	338	386
26	408	403	406	406	398	403	292	289	291	410	315	351
27	407	404	406	409	205	396	294	291	292	315	286	295
28	410	401	406	206	96	161	302	293	296	740	301	442
29	415	402	410	284	162	201	335	302	321	393	238	271
30	418	413	416	181	164	174	333	319	325	244	225	233
31	413	373	389	---	---	---	345	324	332	225	207	214
MONTH	421	348	394	445	96	375	345	129	248	740	177	355

## POTOMAC RIVER BASIN

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01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
FEBRUARY			MARCH			APRIL			MAY			
1	207	193	199	213	196	203	188	175	180	299	292	294
2	201	193	195	302	213	228	199	188	193	303	292	298
3	214	201	207	532	275	341	211	199	207	310	300	306
4	227	214	221	275	250	260	226	211	218	300	252	271
5	239	227	233	250	238	241	240	224	230	260	246	253
6	249	239	243	241	231	236	241	237	239	265	256	259
7	258	249	253	246	226	235	245	240	242	289	265	277
8	261	258	260	226	209	215	250	242	245	283	240	249
9	472	261	365	213	194	206	259	250	255	253	229	246
10	437	312	349	194	170	180	264	259	262	229	165	181
11	312	216	272	180	172	177	266	260	263	177	165	171
12	216	197	204	183	175	177	269	263	265	193	177	186
13	224	209	213	193	183	187	272	269	270	205	191	195
14	260	224	234	202	193	198	271	250	260	213	205	211
15	268	259	263	208	202	206	260	205	242	231	213	224
16	330	259	275	208	199	205	205	194	198	239	222	229
17	325	268	290	199	190	195	216	200	210	247	239	245
18	308	267	281	202	192	196	228	216	223	257	245	249
19	276	243	259	217	202	211	232	223	225	267	257	264
20	243	227	234	231	217	225	237	232	235	273	262	266
21	237	224	231	238	229	231	245	237	242	286	270	274
22	228	188	206	238	226	230	249	244	247	288	273	280
23	260	179	195	234	222	227	257	249	253	290	267	279
24	191	180	184	222	192	206	263	256	259	292	268	278
25	191	185	189	196	191	193	267	263	265	290	250	265
26	191	180	184	193	186	190	273	265	270	283	264	275
27	191	184	187	195	167	184	277	271	274	299	283	290
28	196	191	194	191	173	183	280	276	277	309	296	302
29	---	---	---	194	176	184	290	276	280	321	304	313
30	---	---	---	178	171	175	294	284	287	333	316	323
31	---	---	---	175	168	171	---	---	---	336	318	326
MONTH	472	179	236	532	167	210	294	175	244	336	165	261

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	325	311	316	356	332	341	356	340	350	299	288	294
2	316	297	305	341	322	330	356	327	337	303	287	294
3	310	296	302	333	292	316	342	327	336	295	290	293
4	309	293	299	301	283	291	344	325	332	298	292	295
5	308	295	301	303	274	290	344	314	327	306	298	302
6	312	302	307	299	279	285	331	308	316	313	306	309
7	316	309	313	305	285	292	331	311	317	320	311	316
8	321	316	318	308	285	290	318	309	313	326	313	319
9	330	318	324	321	290	300	318	306	309	323	310	316
10	338	324	330	318	291	298	315	306	310	323	311	315
11	340	331	335	307	290	301	323	311	317	323	309	315
12	342	331	337	308	286	295	313	292	304	332	310	321
13	354	340	345	309	283	296	319	296	309	335	310	323
14	352	342	346	310	285	292	318	301	310	336	310	319
15	404	328	375	321	283	300	308	295	300	339	318	326
16	355	318	337	302	279	288	317	305	313	347	322	334
17	370	290	339	302	280	291	317	244	289	347	322	332
18	391	345	364	300	273	285	270	226	250	350	330	339
19	405	356	379	300	271	279	323	220	279	350	329	345
20	405	383	393	292	270	279	289	222	254	362	327	341
21	385	347	361	292	261	272	233	198	222	362	340	347
22	374	354	363	285	253	263	251	215	243	353	342	346
23	357	352	354	283	251	261	248	235	239	345	306	321
24	356	327	351	283	257	267	260	236	247	343	320	332
25	332	313	320	290	263	275	268	254	262	354	336	345
26	354	332	346	293	264	279	267	250	256	359	302	336
27	356	339	349	295	286	292	270	250	259	310	239	288
28	382	347	361	288	223	239	280	260	269	319	296	312
29	382	352	360	285	237	266	289	272	278	341	315	327
30	358	351	354	308	285	295	293	283	288	352	341	347
31	---	---	---	340	308	325	299	293	297	---	---	---
MONTH	405	290	339	356	223	289	356	198	291	362	239	322

## POTOMAC RIVER BASIN

01646500 POTOMAC RIVER NEAR WASHINGTON, DC--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	17.7	16.0	16.9	12.3	10.4	11.3	8.4	7.7	7.9	.4	.2	.3
2	18.1	15.7	17.0	10.8	9.6	10.1	7.7	7.2	7.5	.8	.2	.4
3	18.4	17.0	17.7	10.1	8.7	9.1	7.7	7.0	7.3	1.2	.5	.8
4	18.8	16.9	18.0	10.0	8.4	9.1	8.1	7.3	7.5	1.7	1.0	1.3
5	18.1	16.7	17.5	10.2	9.0	9.4	10.1	8.1	9.0	1.6	.9	1.2
6	18.1	16.4	17.4	10.3	9.9	10.0	8.5	7.9	8.3	1.4	.6	1.1
7	18.1	16.8	17.5	10.0	9.1	9.5	8.3	7.9	8.1	2.0	1.2	1.5
8	18.0	17.5	17.7	9.6	8.5	8.9	8.0	7.6	7.8	2.6	1.3	2.1
9	19.2	17.7	18.4	9.3	8.1	8.6	7.7	7.2	7.4	1.3	.1	.6
10	18.9	18.0	18.3	8.9	8.3	8.6	7.3	6.8	7.0	.5	.1	.3
11	18.0	16.8	17.3	9.0	7.9	8.3	7.3	5.8	6.7	.5	.1	.2
12	17.2	15.5	16.1	9.2	8.5	8.8	5.8	4.0	4.7	1.0	.3	.5
13	15.7	14.3	15.1	9.3	8.9	9.1	4.1	3.5	3.8	1.0	.7	.8
14	15.7	14.9	15.1	10.9	9.3	10.0	4.4	3.2	4.0	1.5	1.0	1.2
15	16.2	14.9	15.5	13.0	10.8	11.8	5.2	4.4	4.6	1.1	.2	.4
16	16.3	15.4	15.8	13.5	12.6	13.0	5.5	5.0	5.2	.4	.1	.2
17	16.3	15.9	16.0	13.4	13.1	13.3	5.1	4.5	4.7	.3	.1	.2
18	17.1	16.1	16.5	13.3	12.8	13.1	4.8	4.5	4.7	.4	.1	.2
19	16.9	16.4	16.6	12.9	12.0	12.3	5.4	4.8	5.0	.3	.2	.2
20	17.0	16.7	16.9	12.3	10.8	11.4	5.2	4.8	5.0	.3	.2	.2
21	18.0	17.0	17.4	10.9	9.4	9.8	5.7	4.7	5.3	.3	.1	.2
22	17.5	16.5	17.0	9.6	8.0	8.7	4.9	3.9	4.2	.2	.1	.1
23	16.9	15.8	16.3	9.2	7.8	8.6	4.1	3.7	3.9	.2	.1	.1
24	16.1	14.8	15.3	9.1	7.8	8.3	3.9	3.5	3.6	.4	.0	.1
25	15.4	14.4	14.9	8.8	7.8	8.2	3.6	3.0	3.4	.3	.0	.1
26	15.3	14.8	14.9	8.0	7.3	7.6	3.0	1.7	2.5	.2	.1	.1
27	15.5	14.7	15.1	11.3	7.6	8.0	2.1	1.5	1.8	.3	.0	.2
28	15.4	14.4	14.8	14.1	11.3	12.4	1.5	.7	1.1	.3	.0	.2
29	14.7	13.7	14.3	11.3	9.1	10.1	.7	.4	.5	.2	.1	.2
30	14.4	13.0	13.7	9.6	8.4	9.0	.5	.1	.3	.2	.1	.2
31	13.1	12.2	12.7	---	---	---	.5	.2	.3	.3	.2	.2
MONTH	19.2	12.2	16.2	14.1	7.3	9.9	10.1	.1	4.9	2.6	.0	.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	1.1	.3	.6	3.6	3.2	3.3	9.5	8.4	8.9	22.0	20.1	21.0
2	1.5	.8	1.1	3.3	2.1	2.6	10.3	8.7	9.5	20.1	18.9	19.6
3	1.7	.6	1.1	2.1	1.7	1.9	11.3	9.8	10.5	19.5	18.1	18.6
4	1.9	1.1	1.5	3.7	1.8	2.5	11.8	10.5	11.2	18.2	15.7	16.8
5	1.9	1.4	1.6	4.2	2.9	3.4	12.8	10.7	11.7	17.0	15.4	16.1
6	2.4	1.3	1.9	4.6	3.2	3.9	13.1	11.9	12.5	16.8	15.9	16.4
7	3.0	2.0	2.5	5.6	4.0	4.7	13.3	12.6	12.9	16.5	14.9	15.6
8	3.1	1.9	2.5	6.1	5.3	5.7	13.0	11.4	12.3	14.9	14.2	14.5
9	2.2	1.8	2.0	5.9	5.4	5.7	13.4	11.5	12.5	15.2	13.6	14.3
10	1.9	.9	1.2	5.4	4.7	5.0	13.4	12.7	12.9	14.0	13.3	13.5
11	.9	.3	.4	4.8	4.3	4.5	13.2	12.6	12.9	15.2	13.2	14.1
12	1.6	.3	.8	5.0	4.2	4.6	13.6	12.6	13.1	16.0	14.6	15.3
13	1.9	1.6	1.7	6.0	4.8	5.4	14.1	13.1	13.5	16.5	14.7	15.7
14	2.2	1.3	1.7	7.1	5.8	6.5	15.2	13.5	14.3	17.6	15.2	16.3
15	2.3	1.4	1.9	7.2	6.7	6.9	15.1	14.0	14.6	18.3	16.7	17.4
16	3.1	1.8	2.4	7.3	6.6	6.9	16.0	14.6	15.3	19.1	18.2	18.6
17	3.9	2.5	3.2	6.6	5.8	6.1	15.8	14.7	15.2	18.7	17.1	17.8
18	4.4	3.2	3.8	6.0	5.4	5.6	15.9	14.4	15.2	17.1	16.3	16.5
19	5.1	3.2	4.5	6.0	4.8	5.4	16.5	14.8	15.7	16.5	15.8	16.1
20	5.7	4.1	4.9	6.9	5.2	6.0	16.9	15.4	16.2	16.3	15.8	16.1
21	5.4	5.0	5.1	6.7	5.9	6.4	16.9	15.6	16.3	17.9	15.7	16.6
22	5.5	4.6	5.1	7.9	6.4	7.0	16.8	15.6	16.3	20.1	17.1	18.5
23	5.2	4.1	4.6	8.5	7.0	7.7	17.0	15.6	16.4	22.2	18.8	20.5
24	4.9	4.3	4.5	9.2	8.1	8.6	17.4	16.0	16.8	23.6	20.8	22.1
25	4.8	4.2	4.4	9.9	8.9	9.4	18.4	16.6	17.5	23.9	21.2	22.7
26	4.4	4.2	4.3	9.6	8.6	9.1	19.7	18.1	18.8	23.2	22.3	22.7
27	4.2	3.7	3.9	9.3	8.4	8.8	21.0	19.7	20.4	22.3	20.2	21.3
28	4.0	3.2	3.6	8.6	8.2	8.4	21.7	20.7	21.0	21.7	19.5	20.4
29	---	---	---	8.3	8.0	8.2	21.2	20.1	20.9	22.6	19.6	21.0
30	---	---	---	8.8	8.2	8.5	21.3	20.0	20.6	23.9	20.9	22.3
31	---	---	---	8.6	8.4	8.5	---	---	---	24.6	22.0	23.4
MONTH	5.7	.3	2.7	9.9	1.7	6.0	21.7	8.4	14.9	24.6	13.2	18.1

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WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]

## POTOMAC RIVER BASIN

01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC  
(National stream-quality accounting network station)

LOCATION.--Lat 38°55'46", long 77°07'02", Arlington County, Va., Hydrologic Unit 02070010, under right downstream side of bridge on Virginia State Highway 123, and at river mile 115.9.

DRAINAGE AREA.--11,570 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1973 to current year. Prior to October 1977, published as "at Great Falls."

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1978 to September 1981.

pH: June 1978 to September 1981.

WATER TEMPERATURE: June 1978 to September 1981.

DISSOLVED OXYGEN: June 1978 to September 1981.

SUSPENDED-SEDIMENT DISCHARGE: October 1978 to September 1981.

INSTRUMENTATION.--Water-quality monitor June 1978 to September 1981.

REMARKS.--High flows are sampled from the George Mason Memorial Bridge (14th Street) located 6 mi downstream from Chain Bridge. Duplicate samples taken on some days for quality-assurance checks.

## EXTREMES FOR PERIOD OF DAILY RECORD--

SPECIFIC CONDUCTANCE (water years 1979, 1981): Maximum, 598 microsiemens, Sept. 12, 1981; minimum, 116 microsiemens, Jan. 25, 1979.

pH (water years 1979, 1981): Maximum, 9.3 units, Mar. 29, 1981; minimum, 6.7 units, June 2, 1981.

WATER TEMPERATURE (water years 1979, 1981): Maximum, 31.0°C, July 23-24, 1978; minimum, 0.0°C on many days during winter periods.

DISSOLVED OXYGEN (water years 1979, 1981): Maximum, 16.4 mg/L, on many days in 1979; minimum, 5.6 mg/L, June 2, 1981.

SEDIMENT CONCENTRATION: Maximum daily mean, 812 mg/L, Sept. 6, 1979; minimum daily mean, 1 mg/L on many days during winter periods.

SEDIMENT LOAD: Maximum daily, 281,000 tons, Feb. 27, 1979; minimum daily, 3.2 tons, Jan. 5, 1981.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TEMPER- ATURE AIR (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)
OCT 1993												
04...	1015	2830	416	8.1	17.5	21.0	767	--	9.8	102	--	--
NOV												
01...	1110	1890	404	7.8	12.0	7.5	759	--	11.1	103	--	--
16...	1400	2210	393	8.5	13.0	16.0	770	0.60	10.9	102	E1	110
DEC												
01...	1400	32400	175	7.6	8.0	9.0	782	--	13.2	109	--	--
07...	1400	82700	169	7.7	8.0	11.0	768	45	12.5	105	--	--
FEB 1994												
07...	1200	14300	221	7.7	2.0	11.0	766	--	14.6	105	--	--
MAR												
01...	1515	35100	200	7.1	3.0	2.0	768	9.0	14.2	105	38	E19
16...	1130	71300	220	7.5	7.0	7.0	754	--	12.5	104	--	--
APR												
05...	1030	33200	214	7.6	11.0	20.0	762	--	11.1	101	--	--
MAY												
03...	1115	22100	315	8.2	16.5	17.0	771	15	10.0	101	58	--
JUN												
09...	1400	3860	291	8.4	26.5	26.0	763	--	7.9	98	--	--
JUL												
08...	0930	2490	308	7.6	30.0	34.0	764	--	7.1	94	--	--
AUG												
04...	0930	4910	303	8.2	28.0	26.5	763	--	7.7	98	--	--
SEP												
13...	1200	2160	324	8.7	23.0	24.0	759	2.0	9.0	106	E15	E50
19...	1000	2600	344	8.0	24.0	19.0	765	--	8.4	100	--	--

E Estimated value.



## POTOMAC RIVER BASIN

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01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	HARD- NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3	BICAR- BONATE WATER WH FET FIELD MG/L AS HCO3	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3	CAR- BONATE WATER WH FET FIELD MG/L AS CO3	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT 1993												
04...	170	49	12	16	3.4	123	150	--	1	--	48	20
NOV												
01...	170	49	12	16	3.8	122	140	--	4	--	50	25
16...	160	47	11	15	3.3	120	--	--	--	--	41	19
DEC												
01...	72	21	4.7	5.3	3.1	46	--	--	--	--	21	6.4
07...	68	20	4.3	4.3	2.2	42	--	--	--	--	23	5.5
FEB 1994												
07...	98	29	6.2	6.8	1.7	62	--	76	--	--	28	11
MAR												
01...	81	24	5.1	4.7	1.7	54	--	65	--	--	20	8.4
16...	84	25	5.3	4.7	1.8	54	--	66	--	--	21	7.3
APR												
05...	97	29	5.9	4.3	1.3	65	--	79	--	--	22	7.3
MAY												
03...	140	41	8.7	6.3	2.0	94	--	--	--	--	30	11
JUN												
09...	130	34	11	9.2	2.5	94	--	105	--	5	32	15
JUL												
08...	120	30	10	11	2.9	88	--	107	--	--	33	17
AUG												
04...	130	37	9.1	9.2	3.0	102	--	124	--	--	28	13
SEP												
13...	140	39	11	10	2.8	86	--	105	--	--	34	15
19...	140	36	11	12	3.0	101	--	116	--	4	33	17

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)
OCT 1993											
04...	0.20	3.0	248	--	<0.010	1.60	1.60	0.050	0.30	<0.20	0.040
NOV											
01...	0.20	0.91	248	--	<0.010	1.30	1.30	0.030	0.30	<0.20	0.030
16...	0.20	0.38	223	4.8	0.020	1.10	1.10	0.020	0.20	--	0.020
DEC											
01...	0.20	6.4	112	--	<0.010	1.60	1.60	0.040	0.90	0.30	0.200
07...	0.10	6.7	104	--	<0.010	1.20	1.20	0.040	0.80	--	0.180
FEB 1994											
07...	<0.10	6.7	141	7.9	0.020	1.80	1.80	0.050	<0.20	<0.20	0.040
MAR											
01...	<0.10	6.9	111	6.6	0.020	1.50	1.50	0.050	<0.20	<0.20	0.040
16...	<0.10	6.6	117	5.7	0.020	1.30	1.30	0.080	0.40	<0.20	0.080
APR											
05...	<0.10	6.5	121	7.0	0.020	1.60	1.60	0.040	0.30	<0.20	0.050
MAY											
03...	<0.10	2.0	176	6.2	0.010	1.40	1.40	0.020	0.50	<0.20	0.040
JUN											
09...	0.10	0.94	192	4.4	0.010	1.00	1.00	<0.010	0.60	0.20	0.040
JUL											
08...	0.20	5.2	188	2.2	0.020	0.520	0.520	0.060	0.50	0.30	0.030
AUG											
04...	0.10	4.8	190	4.3	0.010	0.980	0.980	0.020	0.50	0.30	0.060
SEP											
13...	0.10	1.4	187	4.4	0.010	1.00	1.00	0.010	0.30	<0.20	0.010
19...	0.10	0.81	190	4.8	0.010	1.10	1.10	0.040	0.40	<0.20	0.030

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ANTI- MONY, DIS- SOLVED (UG/L AS SB)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)
OCT 1993											
04...	0.040	0.040	--	--	--	--	--	--	--	--	--
NOV											
01...	0.010	0.010	--	--	--	--	--	--	--	--	--
16...	0.020	0.010	9	<1	<1	41	<1	<1.0	<1	<1	<2
DEC											
01...	0.030	0.030	--	--	--	--	--	--	--	--	--
07...	0.030	0.040	--	--	--	--	--	--	--	--	--
FEB 1994											
07...	0.020	0.020	--	--	--	--	--	--	--	--	--
MAR											
01...	0.020	0.020	30	<1	--	30	<1	<1.0	2	<1	<1
16...	0.010	0.020	--	--	--	--	--	--	--	--	--
APR											
05...	0.010	<0.010	--	--	--	--	--	--	--	--	--
MAY											
03...	<0.010	<0.010	10	<1	--	44	<1	<1.0	1	<1	3
JUN											
09...	<0.010	<0.010	--	--	--	--	--	--	--	--	--
JUL											
08...	0.010	<0.010	--	--	--	--	--	--	--	--	--
AUG											
04...	0.020	<0.010	--	--	--	--	--	--	--	--	--
SEP											
13...	0.010	<0.010	10	<1	--	42	<1	<1.0	2	<1	2
19...	<0.010	<0.010	--	--	--	--	--	--	--	--	--

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)
OCT 1993											
04...	9	--	--	6	--	--	--	--	--	--	--
NOV											
01...	34	--	--	6	--	--	--	--	--	--	--
16...	32	<1	5	6	<0.1	--	1	<1	<1.0	230	<6
DEC											
01...	100	--	--	4	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
FEB 1994											
07...	7	--	--	19	--	--	--	--	--	--	--
MAR											
01...	41	<1	<4	10	--	<1	<1	<1	<1.0	93	<6
16...	66	--	--	11	--	--	--	--	--	--	--
APR											
05...	41	--	--	8	--	--	--	--	--	--	--
MAY											
03...	9	<1	<4	1	--	<1	2	<1	<1.0	170	<6
JUN											
09...	8	--	--	<1	--	--	--	--	--	--	--
JUL											
08...	25	--	--	5	--	--	--	--	--	--	--
AUG											
04...	17	--	--	<1	--	--	--	--	--	--	--
SEP											
13...	7	<1	<4	1	--	2	<1	<1	<1.0	200	6
19...	13	--	--	3	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	2,4-D, DIS- SOLVED (UG/L)	2,4,5-T DIS- SOLVED (UG/L)
OCT 1993											
04...	--	--	3.3	0.2	--	--	--	--	--	--	--
NOV											
01...	--	--	3.4	0.2	--	--	--	--	--	--	--
16...	<3	3.5	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	5.8	3.3	--	--	--	--	--	--	--
07...	--	--	4.9	3.1	--	--	--	--	--	--	--
FEB 1994											
07...	--	--	2.0	0.3	--	--	--	--	--	--	--
MAR											
01...	2	15	--	--	--	--	--	--	--	--	--
16...	--	--	2.2	1.2	--	--	--	--	--	--	--
APR											
05...	--	--	1.7	0.7	--	--	--	--	--	--	--
MAY											
03...	2	5.8	--	2.1	--	--	--	--	--	--	--
JUN											
09...	--	--	2.7	1.2	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05
JUL											
08...	--	--	3.1	0.9	<0.02	<0.01	<0.01	<0.03	<0.01	--	--
AUG											
04...	--	--	3.4	1.0	--	--	--	--	--	--	--
SEP											
13...	1	3.9	--	--	--	--	--	--	--	--	--
19...	--	--	4.7	0.6	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	ALA-CHLOR, WATER, DISS, REC, (UG/L)	ALPHA BHC DIS-SOLVED (UG/L)	ATRA-ZINE, WATER, DISS, REC (UG/L)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYL-ATE, WATER, DISS, REC (UG/L)	BRO-MACIL, WATER, DISS, REC (UG/L)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR-PYRIFOS DIS-SOLVED (UG/L)	CYANA-ZINE, WATER, DISS, REC (UG/L)
JUN 1994 09...	<0.01	<0.01	<0.01	0.17	<0.01	<0.01	<0.05	<0.05	<0.01	<0.005	0.02
JUL 08...	<0.01	0.02	<0.01	0.39	<0.01	<0.01	--	<0.05	<0.01	<0.01	<0.01
DATE	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	P, P' DDE DISSOLV (UG/L)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L)	DI-AZINON, DIS-SOLVED (UG/L)	DI-ELDRIN DIS-SOLVED (UG/L)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	LINDANE DIS-SOLVED (UG/L)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L)
JUN 1994 09...	<0.004	<0.01	0.07	0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01	<0.04
JUL 08...	<0.004	<0.01	0.05	<0.01	<0.01	<0.06	<0.005	<0.01	<0.01	<0.01	0.02
DATE	MALA-THION, DIS-SOLVED (UG/L)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L)	METO-LACHLOR WATER DISSOLV (UG/L)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PARA-THION, DIS-SOLVED (UG/L)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)
JUN 1994 09...	<0.01	<0.04	<0.03	0.08	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02
JUL 08...	<0.01	<0.05	<0.03	0.28	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02
DATE	PRO-METON, WATER, DISS, REC (UG/L)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PROP-CHLOR, WATER, DISS, REC (UG/L)	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	SILVEX, DIS-SOLVED (UG/L)	SI-MAZINE, WATER, DISS, REC (UG/L)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L)
JUN 1994 09...	0.02	<0.01	<0.02	<0.01	<0.02	<0.05	0.08	<0.02	<0.01	<0.01	<0.01
JUL 08...	0.03	<0.01	<0.02	<0.01	<0.02	--	0.12	<0.02	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

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01646580 POTOMAC RIVER AT CHAIN BRIDGE AT WASHINGTON, DC--Continued

## RADIOCHEMICAL ANALYSES

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	RA-226 2 SIGMA WATER, DISS, (PCI/L)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L)
MAY 1994						
03...	1115	22100	0.05	0.010	0.21	<1.0
SEP						
13...	1200	2160	0.05	0.010	0.29	<1.0

## SUSPENDED-SEDIMENT DISCHARGE

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 1993					
04...	1015	2830	8	61	--
NOV					
01...	1110	1890	6	31	--
16...	1400	2210	4	24	81
DEC					
01...	1400	32400	110	9620	--
07...	1400	82700	120	26800	93
MAR 1994					
01...	1515	35100	31	2940	95
16...	1130	71300	56	10800	--
APR					
05...	1030	33200	26	2330	--
MAY					
03...	1115	22100	38	2270	95
JUN					
09...	1400	3860	8	83	--
JUL					
08...	0930	2490	10	67	--
AUG					
04...	0930	4910	18	239	--
SEP					
13...	1200	2160	10	58	97

&lt; Actual value is known to be less than the value shown.



## POTOMAC RIVER BASIN

01653000 CAMERON RUN AT ALEXANDRIA, VA

LOCATION.--Lat 38°48'23", long 77°06'36", Fairfax County, Hydrologic Unit 02070010, on left downstream side of Norfolk Southern Railway bridge at Alexandria, 800 ft downstream from confluence of Holmes Run and Backlick Run, 0.5 mi east of the U.S. Army Quartermaster Depot, and 3.4 mi upstream from mouth.

DRAINAGE AREA.--33.7 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1955 to March 1979, October 1979 to September 1980, October 1980 to September 1986 (annual maximum only), October 1986 to current year.

GAGE.--Water-stage recorder. Gage reinstalled Nov. 8, 1979. Datum of gage is 31.07 ft above sea level. Prior to Sept. 20, 1965, at present site at datum 7.78 ft higher. Sept. 20, 1965, to Jan. 19, 1976, at present site at datum 5.44 ft higher. Jan. 20, 1976, to Nov. 8, 1976, at site 1,200 ft downstream at datum 10.00 ft lower. Nov. 9, 1976, to Mar. 31, 1979, at site 0.5 mi downstream at datum 7.22 ft lower.

REMARKS.--Records good except those for period with ice effect, Jan. 19-23, and periods of doubtful or no gage-height record, Mar. 28 to Apr. 26 and Aug. 30 to Sept. 16, which are fair. Some regulation by Lake Barcroft, formerly Alexandria Reservoir, on Holmes Run 3.6 mi upstream, usable capacity 2,092 acre-ft. Maximum discharge, 19,900 ft<sup>3</sup>/s, from rating curve extended above 2,500 ft<sup>3</sup>/s on basis of culvert computations of peak flow for main channel and bypass channels. Several measurements of water temperature were made during the year. Water-quality records for some periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,900 ft<sup>3</sup>/s, Nov. 28, gage height, 8.50 ft; minimum daily, 4.4 ft<sup>3</sup>/s, Sept. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	27	22	18	25	35	e40	19	12	18	11	e7.6
2	7.4	16	20	28	21	213	e35	18	10	55	9.2	e7.0
3	7.9	14	19	22	20	383	e32	15	9.6	67	8.2	e6.6
4	6.5	13	117	132	19	197	e30	55	11	16	8.2	e6.4
5	6.9	21	735	35	19	112	e28	55	12	13	161	e6.2
6	6.4	16	70	22	18	61	e31	21	12	11	26	e6.0
7	6.1	11	33	129	18	51	e70	59	12	11	16	e5.8
8	7.7	9.5	25	212	24	75	e33	99	13	8.2	12	e5.6
9	16	10	21	39	127	83	e28	25	9.9	20	9.2	e5.4
10	13	10	19	26	41	413	e24	19	11	10	8.2	e5.2
11	5.1	11	21	24	31	82	e30	19	10	6.6	176	e5.0
12	119	11	17	159	25	49	e27	22	9.8	9.4	129	e4.9
13	16	19	16	47	26	40	e40	18	10	11	23	e4.7
14	9.9	19	15	34	40	37	e30	17	10	98	87	e4.6
15	8.2	16	102	30	46	32	e26	25	9.5	136	49	e4.4
16	7.4	14	76	27	78	31	e60	40	19	7.1	78	e8.0
17	7.4	74	23	64	82	25	e36	17	28	6.7	221	38
18	7.2	61	19	87	99	32	e28	15	15	9.0	93	28
19	6.5	21	23	e34	135	30	e25	14	11	7.1	23	11
20	36	14	21	e24	119	24	e24	15	8.2	6.9	18	7.6
21	65	11	154	e22	111	88	e23	15	14	31	23	6.0
22	25	9.2	31	e20	60	65	e22	15	13	18	27	258
23	11	9.4	22	e30	492	32	e21	14	44	9.4	15	110
24	8.9	9.2	19	122	255	26	e21	13	100	6.7	11	20
25	7.8	9.2	19	64	73	97	e21	33	30	7.4	9.9	14
26	7.0	8.9	18	97	47	30	e20	28	14	152	114	136
27	13	380	16	28	35	426	24	16	30	205	19	65
28	15	1130	15	226	29	e500	22	11	19	152	13	17
29	8.2	55	15	83	---	e200	21	11	95	25	10	13
30	142	27	18	36	---	e50	19	12	77	17	e9.2	11
31	60	---	16	27	---	e45	---	11	---	13	e8.2	---
TOTAL	671.7	2056.4	1757	1948	2115	3564	891	766	679.0	1163.5	1425.3	828.0
MEAN	21.7	68.5	56.7	62.8	75.5	115	29.7	24.7	22.6	37.5	46.0	27.6
MAX	142	1130	735	226	492	500	70	99	100	205	221	258
MIN	5.1	8.9	15	18	18	24	19	11	8.2	6.6	8.2	4.4
CFSM	.64	2.03	1.68	1.86	2.24	3.41	.88	.73	.67	1.11	1.36	.82
IN.	.74	2.27	1.94	2.15	2.33	3.93	.98	.85	.75	1.28	1.57	.91

e Estimated.

## POTOMAC RIVER BASIN

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01653000 CAMERON RUN AT ALEXANDRIA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1978, 1980, 1987 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	31.7	30.8	40.0	42.9	47.1	55.8	42.1	38.5	36.4	49.2	38.4	29.7
MAX	147	80.5	99.2	157	128	132	81.8	117	265	662	364	172
(WY)	1984	1964	1970	1978	1979	1993	1970	1989	1972	1981	1981	1975
MIN	4.52	4.40	3.47	10.0	15.6	19.9	10.6	8.59	7.93	2.51	3.85	5.31
(WY)	1964	1966	1966	1966	1968	1966	1969	1956	1956	1957	1957	1977

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

WATER YEARS 1956 - 1978,  
1980,  
1987 - 1994

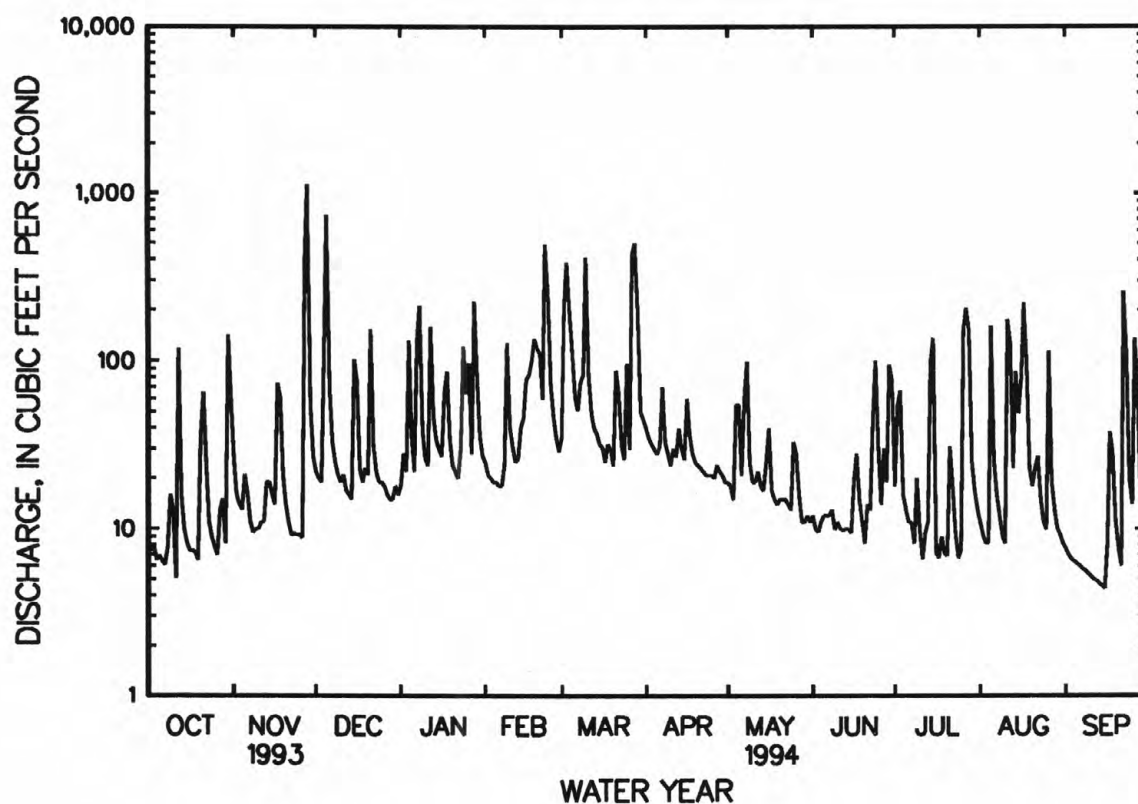
ANNUAL TOTAL	16414.7	17864.9	
ANNUAL MEAN	45.0	48.9	36.9
HIGHEST ANNUAL MEAN			64.4
LOWEST ANNUAL MEAN			22.2
HIGHEST DAILY MEAN	1130	Nov 28	3680
LOWEST DAILY MEAN	4.4	Sep 2	1.1
ANNUAL SEVEN-DAY MINIMUM	5.5	Jun 24	1.3
INSTANTANEOUS PEAK FLOW			19900
INSTANTANEOUS PEAK STAGE			18.14
INSTANTANEOUS LOW FLOW			1.1
ANNUAL RUNOFF (CFSM)	1.33		1.09
ANNUAL RUNOFF (INCHES)	18.12		14.87
10 PERCENT EXCEEDS	86		79
50 PERCENT EXCEEDS	19		16
90 PERCENT EXCEEDS	6.0		4.7

a Also Sept. 23-25, 1964.

b Unknown.

c Also Sept. 22-25, 1964.

e Estimated.



## POTOMAC RIVER BASIN

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA

LOCATION.--Lat 38°48'46", long 77°13'43", Fairfax County, Hydrologic Unit 02070010, on left bank 800 ft upstream from bridge on State Highway 620, 0.2 mi upstream from Long Branch, and 2.3 mi southwest of Annandale.

DRAINAGE AREA.--23.5 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1947 to current year (fragmentary prior to October 1947).

REVISED RECORDS.--WSP 1502: 1952. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 191.24 ft above sea level (levels by Stone and Webster Engineering Corporation). Prior to May 12, 1949, nonrecording gage at site 800 ft downstream at datum 0.33 ft lower. May 12, 1949, to June 4, 1970, water-stage recorder at site 800 ft downstream at datum 0.33 ft lower.

REMARKS.--Records good except those for periods with ice effect, Dec. 29-31 and Jan. 16, and periods of no gage-height record, Jan. 19, 20, and May 17, 18, which are fair. Maximum discharge, 12,000 ft<sup>3</sup>/s, from rating curve extended above 6,600 ft<sup>3</sup>/s on basis of contracted-opening and flow-over-road measurement of peak flow.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0315	*4,040	*11.13	July 3	0100	1,580	8.19
Dec. 5	0315	1,400	7.88	Aug. 17	1115	1,530	8.10
Feb. 23	1500	1,680	8.35	Sept. 27	0400	1,420	7.91

Minimum discharge, 1.3 ft<sup>3</sup>/s, Oct. 5, 6, 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	9.1	9.9	8.6	16	22	40	17	8.2	14	6.3	7.0
2	2.4	3.7	8.6	12	14	117	30	12	8.2	108	17	6.2
3	2.3	3.4	7.7	13	13	321	26	12	8.0	157	11	5.8
4	1.6	3.0	78	100	12	167	26	37	7.8	23	6.6	5.5
5	1.4	10	522	21	12	92	23	41	7.4	8.5	182	5.4
6	1.4	6.2	33	13	12	42	40	14	7.1	7.6	17	5.6
7	1.4	2.8	16	119	12	32	96	45	7.1	6.9	8.2	5.6
8	1.5	2.4	12	188	14	58	26	72	7.1	5.5	6.7	4.7
9	2.5	2.6	11	21	78	50	23	15	6.9	4.9	5.8	4.7
10	4.1	2.8	11	14	26	349	46	13	6.4	10	5.1	4.7
11	1.9	2.8	15	13	16	50	26	14	6.2	4.3	135	4.5
12	74	2.7	8.3	121	14	31	22	17	6.2	3.7	89	3.9
13	4.0	3.2	8.3	27	15	27	58	12	6.2	3.7	11	3.9
14	2.1	11	8.5	21	23	25	27	11	6.2	160	105	4.2
15	1.7	2.9	92	14	25	23	22	19	11	48	37	3.7
16	1.9	2.4	68	e9.9	49	20	52	37	71	9.3	59	3.8
17	2.0	61	14	28	58	19	21	e14	17	40	454	23
18	2.3	42	12	81	82	25	19	e12	8.5	32	94	29
19	1.9	7.0	17	e23	124	22	19	11	9.6	7.5	19	5.0
20	10	5.4	10	e14	104	18	18	14	18	5.5	13	3.9
21	52	4.4	132	12	94	58	17	11	40	9.2	83	3.6
22	11	4.2	19	15	42	57	17	10	26	8.7	30	122
23	2.5	4.3	13	28	533	22	16	9.8	12	4.7	13	62
24	2.0	4.3	11	114	186	20	16	10	79	4.2	9.7	8.8
25	2.1	4.2	11	42	42	102	16	34	23	4.1	8.5	6.3
26	2.3	4.0	9.9	87	28	26	15	17	9.3	84	82	135
27	6.3	363	9.2	15	20	415	21	11	8.7	118	10	233
28	16	1500	8.9	226	18	456	17	9.1	14	139	8.5	12
29	2.4	25	e8.6	65	---	303	14	8.8	34	15	11	8.1
30	79	13	e7.8	25	---	56	14	8.4	49	8.8	9.3	6.9
31	19	---	e7.5	18	---	40	---	8.1	---	6.9	7.3	---
TOTAL	317.4	2112.8	1200.2	1508.5	1682	3065	823	576.2	529.1	1062.0	1554.0	737.8
MEAN	10.2	70.4	38.7	48.7	60.1	98.9	27.4	18.6	17.6	34.3	50.1	24.6
MAX	79	1500	522	226	533	456	96	72	79	160	454	233
MIN	1.4	2.4	7.5	8.6	12	18	14	8.1	6.2	3.7	5.1	3.6
CFSM	.44	3.00	1.65	2.07	2.56	4.21	1.17	.79	.75	1.46	2.13	1.05
IN.	.50	3.34	1.90	2.39	2.66	4.85	1.30	.91	.84	1.68	2.46	1.17

e Estimated.

POTOMAC RIVER BASIN

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01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	17.5	23.7	28.9	31.3	35.9	42.3	36.0	32.6	24.7	20.5	22.7	19.4
MAX	76.6	70.4	71.4	84.5	97.2	114	94.5	125	212	74.5	123	101
(WY)	1980	1984	1968	1978	1979	1993	1983	1989	1972	1969	1967	1979
MIN	2.03	3.25	5.48	4.53	12.1	10.6	8.40	8.46	2.83	1.81	1.94	.45
(WY)	1955	1955	1966	1981	1978	1981	1985	1986	1986	1955	1957	1954

SUMMARY STATISTICS

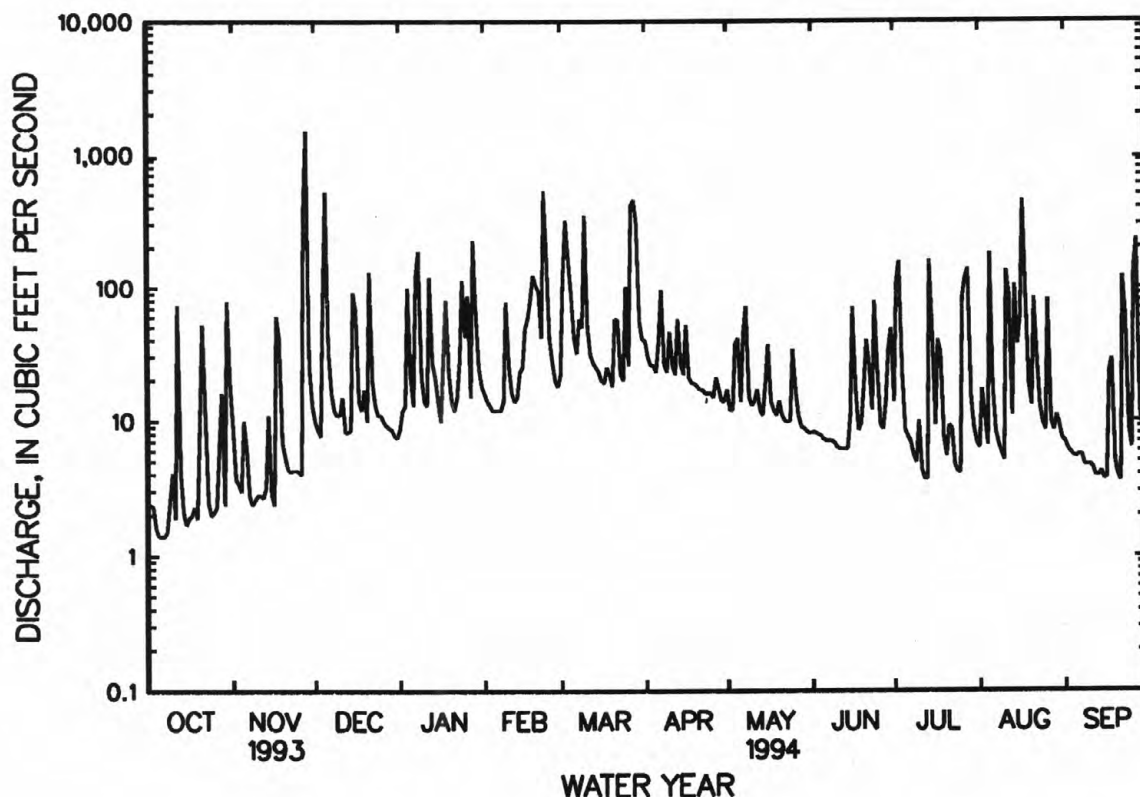
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1948 - 1994

ANNUAL TOTAL	13850.66		15168.0									
ANNUAL MEAN	37.9		41.6							27.9		
HIGHEST ANNUAL MEAN										49.4		1972
LOWEST ANNUAL MEAN										14.3		1954
HIGHEST DAILY MEAN	1500	Nov 28				1500	Nov 28			e3300	Jun 22	1972
LOWEST DAILY MEAN	.82	Sep 15				1.4	aOct 5			.02	bOct 10	1986
ANNUAL SEVEN-DAY MINIMUM	1.4	Jul 28				1.7	Oct 2			.11	Oct 14	1988
INSTANTANEOUS PEAK FLOW						4040	Nov 28			12000	Jun 22	1972
INSTANTANEOUS PEAK STAGE						11.13	Nov 28			c15.96	Jun 22	1972
INSTANTANEOUS LOW FLOW						1.3	aOct 5			.02	dOct 9	1986
ANNUAL RUNOFF (CFSM)	1.61					1.77				1.19		
ANNUAL RUNOFF (INCHES)	21.93					24.01				16.14		
10 PERCENT EXCEEDS	78					94				50		
50 PERCENT EXCEEDS	11					14				12		
90 PERCENT EXCEEDS	2.0					3.7				3.7		

- a Also Oct. 6, 7, 1993.
- b Also Oct. 11, 12, 1986.
- c From high-water mark in gage house.
- d Also Oct. 10-13, 1986, and Oct. 18, 1988.
- e Estimated.



## POTOMAC RIVER BASIN

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1993 to current year.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
OCT											
04...	1400	1.5	213	7.1	14.5	23.0	755	9.4	93	56	15
NOV											
01...	1500	5.7	135	6.9	10.0	7.5	758	10.7	95	41	11
DEC											
08...	1120	13	173	7.0	7.0	7.5	754	10.4	87	57	15
FEB											
07...	1530	12	296	7.2	4.0	12.5	760	12.8	98	63	16
MAR											
16...	1500	20	269	7.2	9.5	6.5	749	11.5	102	68	17
30...	1130	53	178	6.8	8.5	11.0	767	11.1	94	49	13
APR											
06...	1100	44	242	7.0	13.0	16.0	753	9.5	91	66	17
12...	1215	21	218	7.6	13.5	22.0	766	11.9	114	56	14
20...	1100	18	240	7.8	16.0	18.5	--	--	--	68	17
25...	0800	16	183	7.6	14.0	18.5	--	--	--	70	17
MAY											
02...	0700	13	154	7.6	14.0	9.0	--	--	--	75	19
02...	0701	13	--	--	--	--	--	--	--	--	--
04...	2000	65	240	7.3	--	--	--	--	--	70	17
07...	1506	51	103	7.3	--	--	--	--	--	53	14
16...	0700	34	168	7.1	17.0	16.0	--	--	--	48	12
23...	0645	9.9	125	7.4	16.0	19.0	--	--	--	70	18
31...	0645	8.1	230	7.5	17.0	18.5	--	--	--	71	18
JUN											
06...	0645	7.1	238	7.4	19.0	21.0	--	--	--	72	18
13...	0645	6.2	237	7.4	20.0	21.5	--	--	--	74	18
20...	0700	23	197	7.4	22.0	20.0	--	--	--	58	15
27...	0715	9.5	170	7.3	22.0	20.5	--	--	--	44	12
JUL											
03...	--	--	81	6.6	--	--	--	--	--	21	5.8
05...	0730	8.8	174	7.3	24.0	20.0	--	--	--	46	12
11...	0700	4.5	183	7.4	22.0	17.0	--	--	--	--	--
17...	1803	210	148	7.0	--	--	--	--	--	--	--
17...	2003	93	144	6.9	--	--	--	--	--	--	--
25...	0630	4.0	213	7.5	22.0	20.5	--	--	--	67	17
26...	1345	220	82	6.8	20.5	--	--	--	--	19	5.2
27...	2243	571	--	6.9	--	--	--	--	--	19	5.2
AUG											
17...	1255	1370	50	6.3	21.5	30.5	--	8.2	--	16	4.4
23...	0745	13	142	6.7	19.5	20.5	762	8.2	89	40	11
23...	0746	13	--	--	--	--	--	--	--	--	--
23...	0747	13	--	--	--	--	--	--	--	--	--
SEP											
12...	0830	3.8	--	--	--	--	--	--	--	75	19
22...	1613	229	140	7.4	--	--	--	--	--	41	11



## POTOMAC RIVER BASIN

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01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3) (00419)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)
OCT											
04...	4.5	17	2.6	37	--	45	11	28	0.20	11	127
NOV											
01...	3.3	7.6	3.4	31	--	38	9.4	13	0.10	7.7	81
DEC											
08...	4.7	12	2.6	23	61	28	13	22	0.10	13	123
FEB											
07...	5.6	33	2.4	35	--	43	12	65	<0.10	15	176
MAR											
16...	6.2	23	2.1	33	--	40	14	47	<0.10	15	155
30...	4.0	15	2.1	27	--	33	15	23	<0.10	11	112
APR											
06...	5.8	18	1.8	36	--	44	13	38	<0.10	13	152
12...	5.2	17	1.8	34	--	41	11	33	<0.10	12	139
20...	6.2	17	1.9	41	--	50	10	37	0.10	8.8	148
25...	6.7	17	1.8	42	--	51	10	39	0.10	5.7	142
MAY											
02...	6.6	17	2.5	--	--	59	11	40	0.10	8.9	146
02...	--	--	--	--	--	--	--	--	--	--	--
04...	6.6	16	2.8	40	--	49	9.6	35	0.10	11	148
07...	4.3	16	2.5	31	--	38	9.2	31	0.10	9.9	126
16...	4.3	12	2.4	--	--	39	8.3	24	0.10	9.1	117
23...	6.2	15	2.1	42	--	51	8.8	35	<0.10	16	163
31...	6.4	15	2.4	46	--	56	8.7	34	0.10	16	143
JUN											
06...	6.5	15	2.4	44	--	54	8.8	36	0.10	16	140
13...	7.0	16	2.2	--	--	--	9.1	37	0.10	17	168
20...	5.1	13	3.1	--	--	--	11	26	0.20	14	125
27...	3.5	12	2.8	--	--	--	9.9	20	0.10	10	114
JUL											
03...	1.6	5.7	2.5	--	--	--	7.4	8.8	0.10	4.9	62
05...	3.8	13	2.9	--	--	--	11	23	0.10	11	112
11...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	5.9	15	2.8	--	--	--	9.9	32	0.20	13	139
26...	1.5	5.5	2.3	--	--	--	6.5	8.4	0.10	3.9	46
27...	1.5	4.6	2.4	10	--	13	6.0	6.3	0.20	3.9	51
AUG											
17...	1.1	3.0	2.1	--	--	--	4.6	3.5	0.10	3.8	41
23...	3.1	9.8	3.0	30	--	37	8.0	16	0.10	10	98
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
SEP											
12...	6.8	20	2.4	--	--	--	8.2	44	0.20	12	162
22...	3.2	8.0	2.7	--	--	--	8.0	15	0.10	7.6	88

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT											
04...	--	<0.010	0.680	0.680	0.040	0.30	<0.20	0.020	<0.010	<0.010	150
NOV											
01...	--	<0.010	0.260	0.260	0.020	0.50	0.30	0.060	<0.010	<0.010	330
DEC											
08...	--	<0.010	0.980	0.980	0.030	0.20	<0.20	0.060	0.010	0.020	250
FEB											
07...	7.3	0.040	1.70	1.70	0.150	0.30	0.40	0.020	<0.010	<0.010	55
MAR											
16...	--	--	--	--	--	--	--	--	--	--	270
30...	5.2	0.020	1.20	1.20	0.040	0.40	0.20	0.030	0.030	0.010	330
APR											
06...	5.6	0.030	1.30	1.30	0.080	0.40	0.20	0.030	<0.010	<0.010	270
12...	4.8	0.020	1.10	1.10	0.020	0.20	0.30	0.020	0.010	<0.010	350
20...	3.9	0.010	0.890	0.890	<0.010	0.20	<0.20	<0.010	<0.010	<0.010	330
25...	4.2	0.030	0.980	0.980	<0.010	<0.20	0.30	<0.010	<0.010	<0.010	270
MAY											
02...	3.5	0.020	0.810	0.810	0.030	0.30	<0.20	<0.010	<0.010	<0.010	300
02...	--	--	--	--	--	--	--	--	--	--	--
04...	4.0	0.040	0.940	0.940	0.040	0.80	0.30	0.070	0.020	<0.010	310
07...	--	--	--	--	--	--	--	--	--	--	290
16...	--	--	--	--	--	--	--	--	--	--	270
23...	4.7	0.030	1.10	1.10	0.050	0.40	0.20	0.020	0.010	<0.010	400
31...	3.6	0.030	0.840	0.840	0.090	0.30	0.30	0.020	<0.010	<0.010	480
JUN											
06...	4.0	0.040	0.940	0.940	0.070	0.30	<0.20	<0.010	<0.010	<0.010	300
13...	3.3	0.020	0.770	0.770	0.060	0.30	0.30	0.040	<0.010	<0.010	260
20...	3.1	0.040	0.730	0.730	0.090	0.50	0.40	0.040	0.010	<0.010	360
27...	--	--	--	--	--	--	--	--	--	--	390
JUL											
03...	4.2	0.020	0.960	0.960	0.080	0.30	0.30	0.020	0.030	0.020	290
05...	2.7	0.030	0.640	0.640	0.130	2.5	0.40	0.830	<0.010	<0.010	310
11...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	350
26...	--	--	--	--	--	--	--	--	--	--	170
27...	3.0	0.020	0.700	0.700	0.160	1.6	0.40	0.500	0.050	0.040	85
AUG											
17...	1.9	0.020	0.450	0.450	0.100	1.4	0.50	0.450	0.040	0.030	330
23...	3.0	0.010	0.680	0.680	0.050	0.40	0.30	0.060	0.030	0.020	320
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
SEP											
12...	--	<0.010	0.760	0.760	0.020	0.30	0.30	0.020	0.020	<0.010	280
22...	2.4	0.010	0.560	0.560	0.040	1.2	0.30	0.320	0.020	0.020	250

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

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01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C) (00689)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,4-D, DIS- SOLVED (UG/L) (39732)	2,4,5-T DIS- SOLVED (UG/L) (39742)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)
OCT 04...	65	2.9	0.4	--	--	--	--	--	--	--	--
NOV 01...	56	5.9	0.6	--	--	--	--	--	--	--	--
DEC 08...	140	3.5	0.4	--	--	--	--	--	--	--	--
FEB 07...	220	1.7	0.2	--	--	--	--	--	--	--	--
MAR 16...	170	2.2	0.2	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
30...	120	3.9	0.5	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
APR 06...	140	3.5	0.4	<0.02	<0.01	<0.02	<0.03	<0.01	0.22	<0.05	<0.01
12...	95	3.2	0.3	<0.05	<0.03	<0.02	<0.07	<0.03	0.25	<0.10	<0.01
20...	78	2.4	0.4	<0.02	<0.01	<0.02	<0.03	<0.01	<0.05	<0.05	<0.01
25...	90	2.1	0.4	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
MAY 02...	87	2.9	0.3	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
02...	--	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	0.23	<0.05	<0.01
04...	94	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
07...	97	--	--	<0.02	<0.01	<0.01	<0.03	0.00	<0.05	<0.05	<0.01
16...	63	7.3	2.0	<0.02	<0.01	<0.01	<0.03	<0.01	0.59	<0.05	<0.01
23...	110	2.2	--	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
31...	170	2.6	0.3	<0.02	<0.01	<0.01	<0.03	<0.01	E0.22	<0.10	<0.01
JUN 06...	120	2.3	0.4	<0.02	<0.01	<0.01	--	<0.01	<0.05	<0.05	<0.01
13...	110	2.4	0.3	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
20...	150	4.6	0.5	<0.02	<0.01	<0.01	<0.03	<0.01	1.2	<0.05	<0.01
27...	160	5.0	0.7	<0.02	<0.01	<0.01	<0.03	<0.01	E0.39	<0.05	<0.01
JUL 03...	230	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	0.71	<0.05	<0.01
05...	140	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
11...	--	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
17...	--	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
17...	--	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
25...	100	3.7	0.3	--	--	--	--	--	0.18	<0.05	--
26...	48	--	--	--	--	--	--	--	--	--	--
27...	40	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
AUG 17...	47	5.7	--	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
23...	79	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
23...	--	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
23...	--	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01
SEP 12...	63	1.9	0.1	--	<0.01	<0.01	<0.03	<0.01	<0.05	<0.05	<0.01
22...	6	--	--	<0.02	<0.01	<0.01	<0.03	<0.01	--	--	<0.01

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	BRO- MACIL, WATER, DISS, REC (UG/L) (04029)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)
OCT											
04...	--	--	--	--	--	--	--	--	--	--	--
NOV											
01...	--	--	--	--	--	--	--	--	--	--	--
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
FEB											
07...	--	--	--	--	--	--	--	--	--	--	--
MAR											
16...	<0.01	<0.01	0.00	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
30...	<0.01	<0.01	<0.02	<0.01	<0.01	<0.05	<0.05	<0.01	0.02	<0.01	<0.00
APR											
06...	<0.01	<0.01	0.02	0.01	<0.01	<0.05	0.02	<0.01	0.01	<0.01	<0.00
12...	<0.02	<0.02	0.01	<0.03	<0.02	<0.10	<0.11	<0.03	<0.02	<0.03	<0.01
20...	<0.01	<0.01	0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.00
25...	<0.01	<0.01	0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.00
MAY											
02...	<0.01	<0.01	0.03	<0.01	<0.01	<0.05	0.02	0.03	<0.01	<0.01	<0.00
02...	<0.01	<0.01	0.02	<0.01	<0.01	<0.05	0.03	<0.01	<0.01	<0.01	<0.00
04...	<0.01	<0.01	0.05	<0.01	<0.01	<0.05	0.32	<0.01	<0.01	<0.01	<0.00
07...	0.01	<0.01	0.03	<0.01	<0.01	<0.05	0.05	<0.01	<0.01	<0.01	0.01
16...	0.04	<0.01	0.12	<0.01	<0.01	<0.05	0.07	<0.01	<0.01	<0.01	0.00
23...	0.01	<0.01	0.04	<0.01	<0.01	<0.05	0.02	<0.01	0.01	<0.01	<0.00
31...	<0.01	<0.01	0.05	<0.01	<0.01	<0.05	0.03	<0.01	0.01	<0.01	0.00
JUN											
06...	<0.01	<0.01	0.03	<0.01	<0.01	<0.05	<0.05	<0.01	0.01	<0.01	<0.00
13...	<0.01	<0.01	0.05	<0.01	<0.01	<0.05	0.01	<0.01	0.01	<0.01	0.00
20...	<0.01	<0.01	0.03	<0.01	<0.01	<0.05	0.13	<0.01	0.01	<0.01	<0.00
27...	<0.01	<0.01	0.02	<0.01	<0.01	<0.05	0.08	<0.01	0.02	<0.01	<0.00
JUL											
03...	<0.01	<0.01	0.19	<0.01	<0.01	<0.05	0.87	<0.01	<0.01	<0.01	0.05
05...	<0.01	<0.01	0.02	<0.01	<0.01	<0.05	0.07	<0.01	0.01	<0.01	<0.00
11...	<0.01	<0.01	0.02	<0.01	<0.01	<0.05	<0.05	<0.01	<0.01	<0.01	<0.00
17...	<0.01	<0.01	0.00	<0.01	<0.01	<0.05	0.13	<0.01	0.01	<0.01	<0.00
17...	<0.01	<0.01	0.00	<0.01	<0.01	<0.05	0.14	<0.01	0.00	<0.01	<0.00
25...	--	--	--	--	--	<0.05	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
27...	<0.01	<0.01	<0.02	<0.01	<0.01	--	2.0	<0.01	<0.01	<0.01	<0.00
AUG											
17...	<0.01	<0.01	<0.02	<0.01	<0.01	--	0.18	<0.01	0.04	<0.01	0.00
23...	<0.01	<0.01	<0.02	<0.01	<0.01	--	0.19	<0.01	0.01	<0.01	<0.00
23...	<0.01	<0.01	<0.02	<0.01	<0.01	--	0.15	<0.01	0.01	<0.01	<0.00
23...	<0.01	<0.01	<0.02	<0.01	<0.01	--	0.18	<0.01	0.01	<0.01	<0.00
SEP											
12...	<0.01	<0.01	E0.01	<0.01	<0.01	<0.05	<0.05	<0.01	<0.00	<0.01	<0.00
22...	<0.01	<0.01	<0.02	<0.01	<0.01	--	E0.05	<0.01	<0.01	<0.01	<0.00

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

147

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	P, P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U (UG/L) (82677)	EPTC WATER FLTRD 0.7 U (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)	LIN- URON WATER FLTRD 0.7 U (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)
OCT											
04...	--	--	--	--	--	--	--	--	--	--	--
NOV											
01...	--	--	--	--	--	--	--	--	--	--	--
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
FEB											
07...	--	--	--	--	--	--	--	--	--	--	--
MAR											
16...	<0.01	<0.02	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
30...	<0.01	<0.02	0.03	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
APR											
06...	<0.01	<0.02	<0.01	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
12...	<0.02	<0.02	0.04	<0.02	<0.02	<0.01	<0.03	<0.02	<0.02	<0.09	<0.03
20...	<0.01	<0.02	0.02	<0.02	<0.02	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
25...	<0.01	0.00	0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
MAY											
02...	<0.01	0.00	0.03	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
02...	<0.01	0.00	0.03	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
04...	<0.01	0.01	0.04	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
07...	<0.01	0.01	0.02	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
16...	<0.01	0.02	0.31	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	0.03
23...	<0.01	0.01	0.05	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
31...	<0.01	0.01	0.15	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
JUN											
06...	<0.01	0.00	0.05	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
13...	<0.01	0.01	0.03	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
20...	<0.01	0.01	0.08	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
27...	<0.01	<0.00	0.25	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
JUL											
03...	<0.01	<0.00	1.4	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	0.33
05...	<0.01	0.01	0.15	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
11...	<0.01	0.01	0.07	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	<0.01
17...	<0.01	<0.00	0.16	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	0.05
17...	<0.01	<0.00	0.16	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	0.05
25...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
27...	<0.01	<0.00	0.95	0.02	<0.06	<0.00	<0.01	<0.01	<0.01	<0.04	0.41
AUG											
17...	<0.01	<0.01	0.24	<0.01	<0.01	<0.00	<0.01	0.08	<0.01	<0.04	<0.01
23...	<0.01	<0.00	0.61	<0.01	<0.06	<0.00	<0.01	0.02	<0.01	<0.04	<0.01
23...	<0.01	<0.00	0.51	<0.01	<0.06	<0.00	<0.01	0.02	<0.01	<0.04	<0.01
23...	<0.01	<0.00	0.58	<0.01	<0.06	<0.00	<0.01	0.02	<0.01	<0.04	<0.01
SEP											
12...	<0.01	0.00	0.02	<0.01	<0.06	<0.00	<0.01	0.02	<0.01	<0.04	<0.01
22...	<0.01	<0.00	0.07	<0.01	<0.06	<0.00	<0.01	0.01	<0.01	<0.04	<0.01

&lt; Actual value is known to be less than the value shown.



## POTOMAC RIVER BASIN

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD GF, REC (UG/L) (82671)	NAFROP- AMIDE WATER FLTRD GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)
OCT											
04...	--	--	--	--	--	--	--	--	--	--	--
NOV											
01...	--	--	--	--	--	--	--	--	--	--	--
DEC											
08...	--	--	--	--	--	--	--	--	--	--	--
FEB											
07...	--	--	--	--	--	--	--	--	--	--	--
MAR											
16...	<0.04	<0.03	0.00	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.03
30...	<0.04	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	0.05	<0.02	0.05
APR											
06...	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	0.16	<0.02	0.04
12...	<0.11	<0.08	0.02	<0.03	<0.02	<0.02	<0.02	<0.05	0.15	<0.04	0.04
20...	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	0.07	<0.02	0.03
25...	<0.05	<0.03	0.00	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.03
MAY											
02...	<0.05	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.05
02...	<0.05	<0.03	0.02	0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	<0.01
04...	<0.05	<0.03	0.04	0.06	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.06
07...	<0.05	<0.03	0.05	0.09	<0.01	<0.01	<0.01	<0.02	0.05	<0.02	0.08
16...	<0.05	<0.03	0.09	0.07	<0.01	<0.01	<0.01	<0.02	0.08	<0.02	0.08
23...	<0.05	<0.03	0.07	<0.01	<0.01	<0.01	<0.01	<0.02	0.02	<0.02	0.04
31...	<0.04	<0.03	0.04	<0.01	<0.01	<0.01	<0.01	<0.02	0.02	<0.02	0.08
JUN											
06...	--	<0.03	0.02	0.00	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.04
13...	<0.05	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	0.01	<0.02	0.05
20...	<0.05	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.14
27...	<0.05	<0.03	0.06	<0.01	<0.01	<0.01	<0.01	<0.02	0.03	<0.02	0.44
JUL											
03...	<0.05	<0.03	0.49	<0.01	<0.01	<0.01	<0.01	<0.02	0.32	<0.02	1.7
05...	<0.05	<0.03	0.05	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.12
11...	<0.05	<0.03	0.03	0.04	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.08
17...	<0.05	<0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.02	0.05	<0.02	0.17
17...	<0.05	<0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.02	0.05	<0.02	0.18
25...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
27...	<0.05	<0.03	0.04	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.35
AUG											
17...	<0.04	<0.03	0.02	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.13
23...	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.08
23...	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.06
23...	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.07
SEP											
12...	<0.04	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.04
22...	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02	<0.02	0.11

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

149

01654000 ACCOTINK CREEK NEAR ANNANDALE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SILVEX, DIS- SOLVED (UG/L) (39762)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
OCT										
04...	--	--	--	--	--	--	--	--	--	--
NOV										
01...	--	--	--	--	--	--	--	--	--	--
DEC										
08...	--	--	--	--	--	--	--	--	--	--
FEB										
07...	--	--	--	--	--	--	--	--	--	--
MAR										
16...	<0.01	<0.02	<0.01	<0.02	<0.05	0.10	<0.02	<0.01	<0.01	<0.01
30...	<0.01	<0.02	<0.01	<0.02	<0.05	0.10	<0.02	<0.01	<0.01	<0.01
APR										
06...	<0.01	<0.02	<0.01	<0.02	<0.05	2.5	<0.02	<0.01	<0.01	<0.01
12...	<0.02	<0.03	<0.02	<0.04	<0.10	0.44	<0.03	<0.03	<0.02	<0.02
20...	<0.01	<0.02	<0.01	<0.02	<0.05	0.69	<0.02	<0.01	<0.01	<0.01
25...	<0.01	<0.02	<0.01	<0.02	<0.05	0.21	<0.02	<0.01	<0.01	<0.01
MAY										
02...	<0.01	<0.02	<0.01	<0.02	<0.05	4.0	<0.02	<0.01	<0.01	<0.01
02...	<0.01	<0.02	<0.01	<0.02	<0.05	4.4	<0.02	<0.01	<0.01	<0.01
04...	<0.01	<0.02	<0.01	<0.02	<0.05	3.0	<0.02	<0.01	<0.01	<0.01
07...	<0.01	<0.02	<0.01	<0.02	<0.05	0.83	<0.02	<0.01	<0.01	<0.01
16...	<0.01	<0.02	<0.01	<0.02	<0.05	0.64	<0.02	<0.01	<0.01	<0.01
23...	<0.01	<0.02	<0.01	<0.02	<0.05	1.0	<0.02	<0.01	<0.01	<0.01
31...	<0.01	<0.02	<0.01	<0.02	<0.10	0.51	<0.02	<0.01	<0.01	<0.01
JUN										
06...	<0.01	<0.02	<0.01	<0.02	<0.05	1.3	<0.02	<0.01	<0.01	<0.01
13...	<0.01	<0.02	<0.01	<0.02	<0.05	3.5	<0.02	<0.01	<0.01	<0.01
20...	<0.01	<0.02	<0.01	<0.02	<0.05	0.79	<0.02	<0.01	<0.01	<0.01
27...	<0.01	<0.02	<0.01	<0.02	<0.05	0.22	<0.02	<0.01	<0.01	<0.01
JUL										
03...	<0.01	<0.02	<0.01	<0.02	<0.05	2.0	<0.02	<0.01	<0.01	<0.01
05...	<0.01	<0.02	<0.01	<0.02	<0.05	0.11	<0.02	<0.01	<0.01	<0.01
11...	<0.01	<0.02	<0.01	<0.02	<0.05	0.12	<0.02	<0.01	<0.01	<0.01
17...	<0.01	<0.02	<0.01	<0.02	<0.05	0.05	<0.02	<0.01	<0.01	<0.01
17...	<0.01	<0.02	<0.01	<0.02	<0.05	0.05	<0.02	<0.01	<0.01	<0.01
25...	--	--	--	--	<0.05	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
27...	<0.01	<0.02	<0.01	<0.02	--	0.03	<0.02	<0.01	<0.01	<0.01
AUG										
17...	<0.01	<0.02	<0.01	<0.02	--	0.01	<0.02	<0.01	<0.01	<0.01
23...	<0.01	<0.02	<0.01	<0.02	--	0.02	<0.02	<0.01	<0.01	<0.01
23...	<0.01	<0.02	<0.01	<0.02	--	0.02	<0.02	<0.01	<0.01	<0.01
23...	<0.01	<0.02	<0.01	<0.02	--	0.02	<0.02	<0.01	<0.01	<0.01
SEP										
12...	<0.01	<0.02	<0.01	<0.02	<0.05	0.03	<0.02	<0.01	<0.01	<0.01
22...	<0.01	<0.02	<0.01	<0.02	--	0.10	<0.02	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01656000 CEDAR RUN NEAR CATLETT, VA

LOCATION.--Lat 38°38'12", long 77°37'31", Fauquier County, Hydrologic Unit 02070010, on right bank 100 ft downstream from bridge on State Highway 806, 0.9 mi downstream from Licking Run, and 1.4 mi southeast of Catlett.

DRAINAGE AREA.--93.4 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1950 to December 1986, January 1986 to September 1989 (annual maximum only), October 1989 to current year.

REVISED RECORDS.--WSP 2103: Drainage area. WDR VA-79-1: 1973-77(P).

GAGE.--Water-stage recorder. Datum of gage is 199.15 ft above sea level. July 1950 to December 1986, water-stage recorder at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 28 to Jan. 1, Jan. 4, 16-18, 23-26, and Feb. 3, 11, 12, and period of no gage-height record, Jan. 19-22, which are fair. Maximum discharge, 38,600 ft<sup>3</sup>/s, from rating curve extended above 5,000 ft<sup>3</sup>/s, on basis of contracted-opening measurement of peak flow. No flow at times in many years. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct 15, 1942, reached a stage of about 22 ft, discharge not determined, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0500	*5,870	*14.03	Mar. 28	1100	2,070	8.94
Dec. 5	1330	2,310	9.38	Mar. 29	1230	2,070	8.94
Jan. 28	2030	1,850	8.51	July 26	1930	2,120	9.05
Feb. 23	1600	2,710	9.99	July 28	0100	2,470	9.65
Mar. 4	2030	1,840	8.49	Aug. 18	0700	4,350	12.24

Minimum discharge, 0.25 ft<sup>3</sup>/s, Oct. 8-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	8.1	69	e26	106	125	278	40	4.8	44	40	30
2	1.0	4.8	48	26	70	205	196	36	4.4	19	37	23
3	.90	3.3	34	36	e50	1220	155	30	3.9	38	35	16
4	1.5	2.9	63	e181	43	1140	131	33	3.6	28	19	13
5	.65	3.3	1690	142	37	992	110	41	3.4	6.4	25	11
6	.43	3.8	454	91	35	666	115	34	3.2	4.3	22	12
7	.34	3.3	190	182	38	479	160	31	21	3.1	15	9.9
8	.26	3.3	115	709	39	510	116	68	53	2.4	9.6	8.8
9	.38	2.8	79	236	165	405	97	46	8.6	3.3	7.2	7.6
10	.52	2.5	61	117	134	1080	89	36	5.4	2.3	5.8	7.4
11	.44	2.3	51	80	e159	491	89	31	4.4	1.9	5.0	7.6
12	1.7	2.3	35	423	e206	285	85	23	5.9	1.8	678	7.6
13	6.0	2.3	26	316	87	216	117	17	12	1.5	105	8.8
14	3.0	2.6	27	232	37	182	142	14	8.4	1.9	51	5.3
15	1.5	4.1	40	139	46	155	98	13	4.6	13	66	4.8
16	1.2	3.8	175	e96	141	135	130	18	3.8	5.4	49	4.8
17	2.2	5.2	85	e118	339	109	100	16	3.3	3.1	1220	5.4
18	.86	19	58	e417	473	102	79	14	4.4	6.9	2570	16
19	.79	9.0	49	e225	516	106	70	12	3.9	21	585	10
20	5.3	4.8	38	e145	422	89	64	13	2.9	9.5	330	6.7
21	9.6	3.9	259	e93	441	86	66	13	3.3	4.2	351	22
22	7.1	3.2	162	e95	334	162	65	11	12	2.6	646	142
23	5.3	2.9	100	e120	1590	111	61	8.4	6.0	3.1	225	224
24	4.4	2.8	69	e520	1180	91	56	7.4	4.0	33	115	150
25	1.8	2.6	55	e868	463	99	50	7.0	4.3	25	74	52
26	1.3	2.5	44	e498	278	91	46	16	4.5	666	57	153
27	.96	117	34	136	178	759	45	11	2.7	740	58	101
28	1.3	3560	e31	625	136	1490	48	9.3	12	1510	46	33
29	1.8	426	e32	625	---	1650	43	6.4	14	380	38	24
30	5.3	138	e31	284	---	574	42	5.4	168	123	34	18
31	14	---	e29	147	---	323	---	6.6	---	58	28	---
TOTAL	83.23	4352.4	4233	7948	7743	14128	2943	667.5	395.7	3761.7	7546.6	1134.7
MEAN	2.68	145	137	256	277	456	98.1	21.5	13.2	121	243	37.8
MAX	14	3560	1690	868	1590	1650	278	68	168	1510	2570	224
MIN	.26	2.3	26	26	35	86	42	5.4	2.7	1.5	5.0	4.8
CFSM	.03	1.55	1.46	2.75	2.96	4.88	1.05	.23	.14	1.30	2.61	.40
IN.	.03	1.73	1.69	3.17	3.08	5.63	1.17	.27	.16	1.50	3.01	.45

e Estimated.

POTOMAC RIVER BASIN

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01656000 CEDAR RUN NEAR CATLETT, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1987, 1990 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	44.3	60.5	109	140	167	176	128	72.0	72.2	31.4	47.8	35.1
MAX	450	248	379	467	431	531	544	210	917	323	407	388
(WY)	1980	1973	1993	1978	1979	1993	1983	1971	1972	1956	1955	1975
MIN	.40	3.15	3.53	4.64	28.0	22.3	19.6	9.41	2.90	.74	.58	.37
(WY)	1987	1966	1966	1981	1954	1981	1985	1956	1954	1963	1966	1954

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1951 - 1986,  
1990 - 1994

ANNUAL TOTAL	48504.16	54936.83	90.0	
ANNUAL MEAN	133	151	171	1972
HIGHEST ANNUAL MEAN			27.6	1954
LOWEST ANNUAL MEAN			18500	Jun 22 1972
HIGHEST DAILY MEAN	3560 Nov 28	3560 Nov 28	.00	(b)
LOWEST DAILY MEAN	.00 <sup>a</sup> Sep 7	.26 Oct 8	.00	(b)
ANNUAL SEVEN-DAY MINIMUM	.01 Sep 5	.43 Oct 5	.00	(b)
INSTANTANEOUS PEAK FLOW		5870 Nov 28	38600	Jun 22 1972
INSTANTANEOUS PEAK STAGE		14.03 Nov 28	27.66	Jun 22 1972
INSTANTANEOUS LOW FLOW		.25 <sup>d</sup> Oct 8	.00	(f)
ANNUAL RUNOFF (CFSM)	1.42	1.61	.96	
ANNUAL RUNOFF (INCHES)	19.32	21.88	13.09	
10 PERCENT EXCEEDS	338	424	189	
50 PERCENT EXCEEDS	27	36	27	
90 PERCENT EXCEEDS	.55	2.7	1.9	

a Also Sept. 8, 9, 11, 1993.

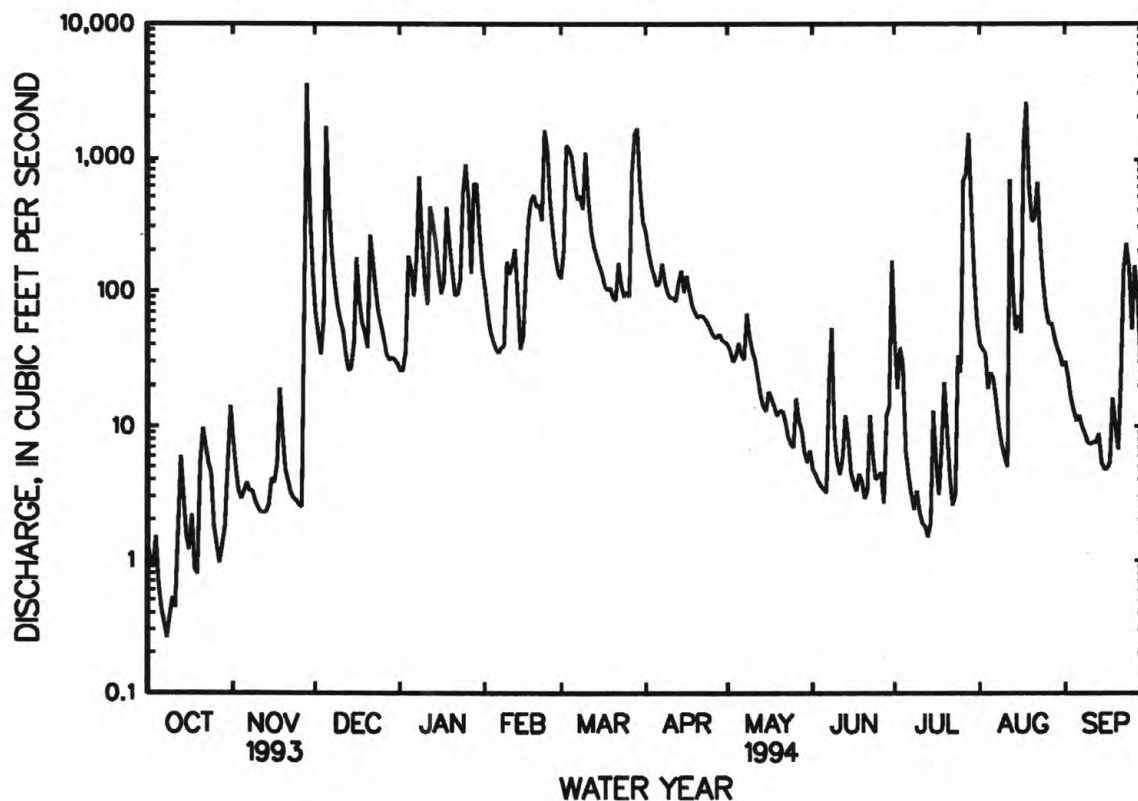
b Many days in 1954, 1957, 1959, 1963-64, 1966, and 1983.

c From floodmarks.

d Also Oct. 9, 1993.

e Estimated.

f Many days in 1954, 1957, 1959, 1963-64, 1966, 1983, and Sept. 3, 4, 1991, Sept. 3, 4, 6-12, 1993.



## POTOMAC RIVER BASIN

01658500 SOUTH FORK QUANTICO CREEK NEAR INDEPENDENT HILL, VA

LOCATION.--Lat 38°35'14", long 77°25'44", Prince William County, Hydrologic Unit 02070011, on left bank at upstream side of bridge on State Highway 619, 3.4 mi south of Independent Hill, 5.6 mi west of Dumfries, and 6.5 mi upstream from mouth.

DRAINAGE AREA.--7.64 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1951 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 238.88 ft above sea level.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 14-19 and July 5, 6, and periods with ice effect, Dec. 25 to Jan. 3, Jan. 9, 10, 15-24, Feb. 2-8, 10-14, and Feb. 27 to Mar. 1, which are fair. No flow at times in 1954, 1957, 1962-66, 1983, 1985, 1987, 1988, 1991, and 1993.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0500	*1,290	*8.82	Mar. 28	0600	411	6.51
Feb. 23	1500	426	6.58	June 30	0300	370	6.31
Mar. 3	0245	386	6.39	July 28	0100	251	5.51
Mar. 10	1300	230	5.35				

Minimum discharge, 23 ft<sup>3</sup>/s, Oct. 19-20; minimum gage height, 1.31 ft, June 27, 28-29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.2	3.3	e2.1	6.7	e7.0	17	3.8	1.1	8.9	3.1	1.0
2	.84	.68	2.6	e2.9	e4.8	49	13	3.4	1.0	3.0	12	.90
3	.62	.48	2.3	e4.0	e4.1	160	11	3.1	.83	3.7	15	.79
4	.49	.38	4.0	18	e3.8	54	10	3.7	.77	7.6	4.4	.76
5	.41	.39	110	10	e3.7	42	9.2	5.6	.74	e2.9	2.9	.71
6	.33	.50	19	5.9	e3.6	23	11	4.1	.76	e2.0	2.4	.72
7	.30	.58	7.5	7.4	e3.5	16	26	3.8	.84	1.5	2.0	.73
8	.27	.51	4.7	40	e4.0	17	13	7.2	1.7	1.2	1.7	.67
9	.29	.44	3.7	e9.0	12	16	11	4.5	1.2	1.5	1.6	.63
10	.37	.43	3.2	e5.0	e9.0	95	9.9	3.6	.86	2.4	1.5	.62
11	.40	.40	3.0	4.7	e7.0	29	9.1	3.3	.78	1.4	1.5	.65
12	.70	.44	2.5	29	e5.2	17	8.5	2.9	.83	1.1	2.0	.60
13	.95	.45	2.3	17	e4.6	14	12	2.6	.77	.90	1.9	.57
14	e.64	.78	2.3	10	e4.4	12	11	2.5	.64	.90	3.9	.58
15	e.50	.90	3.3	e6.0	5.4	11	8.3	2.3	.54	6.5	4.9	.57
16	e.39	.72	12	e3.5	8.1	9.4	8.8	2.7	.60	5.0	3.0	.64
17	e.33	.98	5.1	e3.8	11	8.3	7.6	2.4	.62	2.6	51	.80
18	e.29	3.3	3.6	e10	17	8.6	6.6	2.1	.62	3.6	44	1.4
19	e.27	1.4	3.2	e4.0	27	8.6	6.3	2.1	.54	2.2	8.0	1.1
20	.55	.94	2.8	e3.1	30	7.4	5.9	2.3	.45	1.6	4.4	.82
21	1.0	.68	15	e2.7	26	8.4	5.4	2.3	.51	1.5	3.3	.75
22	1.5	.54	8.2	e2.8	18	12	6.6	2.1	.83	1.8	4.1	3.4
23	.48	.48	4.9	e2.9	153	8.8	5.9	1.9	.67	1.8	3.7	5.5
24	.36	.44	3.8	e4.0	74	7.8	5.4	1.6	1.7	1.8	2.5	1.9
25	.35	.39	e3.3	6.1	25	9.9	4.9	1.5	.72	1.9	2.1	1.4
26	.33	.37	e2.8	12	15	8.4	4.5	1.7	.50	9.8	2.1	4.8
27	.37	29	e2.6	6.3	e8.6	68	4.2	1.8	.42	36	4.1	16
28	.47	391	e2.5	29	e7.5	200	4.3	1.5	.43	79	2.1	2.6
29	.47	14	e2.4	25	---	107	3.8	1.3	15	15	1.6	1.5
30	1.4	5.4	e2.3	13	---	31	4.1	1.3	82	7.0	1.3	1.1
31	2.3	---	e2.2	8.4	---	20	---	1.2	---	4.2	1.1	---
TOTAL	19.07	458.20	250.4	307.6	502.0	1085.6	264.3	86.2	118.97	220.30	199.2	54.21
MEAN	.62	15.3	8.08	9.92	17.9	35.0	8.81	2.78	3.97	7.11	6.43	1.81
MAX	2.3	391	110	40	153	200	26	7.2	82	79	51	16
MIN	.27	.37	2.2	2.1	3.5	7.0	3.8	1.2	.42	.90	1.1	.57
CFSM	.08	2.00	1.06	1.30	2.35	4.58	1.15	.36	.52	.93	.84	.24
IN.	.09	2.23	1.22	1.50	2.44	5.29	1.29	.42	.58	1.07	.97	.26

e Estimated.



01658500 SOUTH FORK QUANTICO CREEK NEAR INDEPENDENT HILL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3.10	5.38	7.93	9.41	11.4	13.7	11.8	8.06	4.94	2.35	2.71	2.99
MAX	23.9	19.2	22.5	25.4	28.4	35.0	33.0	42.8	48.8	15.1	24.5	37.2
(WY)	1980	1953	1975	1978	1979	1994	1983	1989	1972	1975	1955	1975
MIN	.070	.34	.58	1.01	3.60	1.77	2.90	1.57	.40	.055	.010	.000
(WY)	1989	1955	1966	1981	1968	1981	1969	1956	1991	1963	1963	1964

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

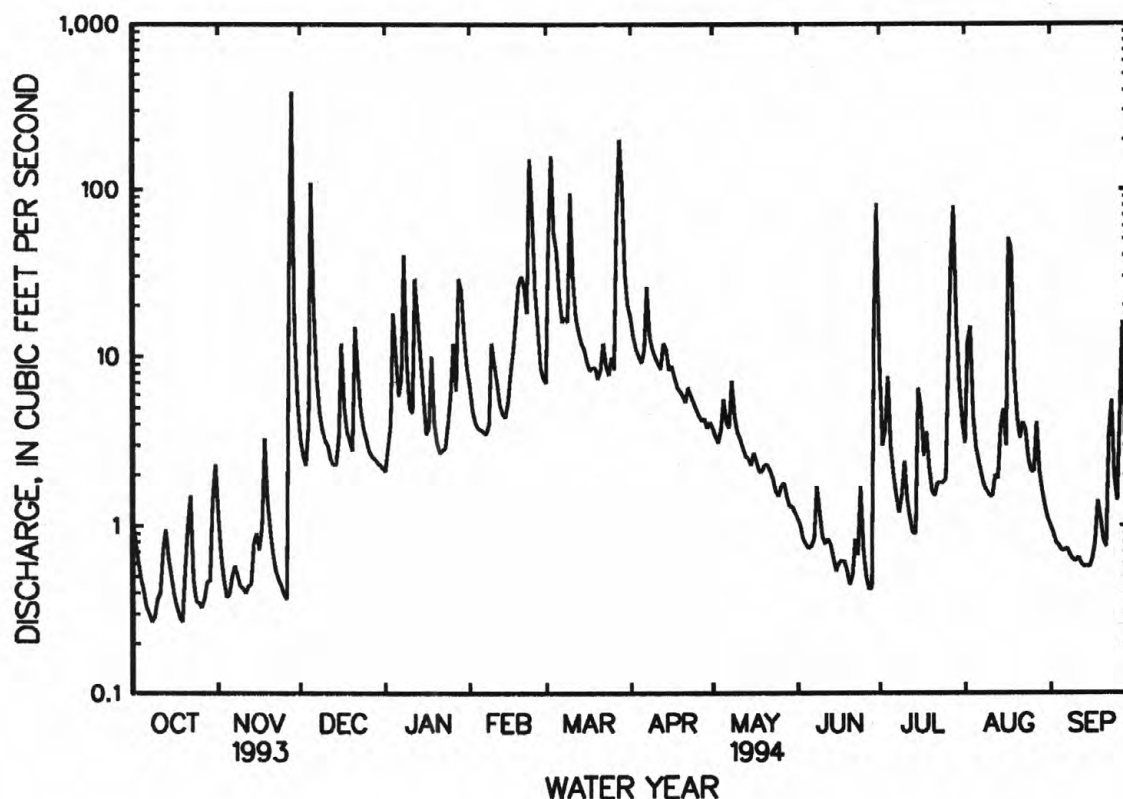
## WATER YEARS 1951 - 1994

ANNUAL TOTAL	3584.46	3566.05	6.94
ANNUAL MEAN	9.82	9.77	11.9
HIGHEST ANNUAL MEAN			2.55
LOWEST ANNUAL MEAN			1972
HIGHEST DAILY MEAN	391	391	770
LOWEST DAILY MEAN	.00	.27	.00
ANNUAL SEVEN-DAY MINIMUM	.01	.34	.00
INSTANTANEOUS PEAK FLOW		1290	4160
INSTANTANEOUS PEAK STAGE		8.82	11.62
INSTANTANEOUS LOW FLOW		.23	.00
ANNUAL RUNOFF (CFSM)	1.29	1.28	.91
ANNUAL RUNOFF (INCHES)	17.45	17.36	12.33
10 PERCENT EXCEEDS	19	17	14
50 PERCENT EXCEEDS	3.0	3.0	2.6
90 PERCENT EXCEEDS	.25	.50	.20

a Also Oct. 19, 1993.

b No flow at times many years. See REMARKS.

c Also Oct. 20, 1993.



## POTOMAC RIVER BASIN

01658500 SOUTH FORK QUANTICO CREEK NEAR INDEPENDENT HILL, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951, 1953, 1955-56, 1969, 1973-75, 1983-85, 1994.

REMARKS.--These data are a part of the National Water-Quality Assessment (NAWQA) Program of the Potomac River Basin and a study for the U.S. Marine Corps Base, Quantico, Va.

WATER-QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE WATER (DEG C) (00010)	TEMPER-ATURE AIR (DEG C) (00020)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED SATUR-ATION (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
AUG 23...	0930	3.9	49	6.5	19.0	23.0	760	7.8	84	15	3.3	1.7

DATE	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3) (00452)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
AUG 23...	3.7	0.90	19	23	--	3.5	2.5	0.10	16	52	<0.010	0.054

DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)
AUG 23...	0.054	0.020	--	<0.20	--	0.020	<0.010	--	--	--	--	--

< Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

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01658500 SOUTH FORK QUANTICO CREEK NEAR INDEPENDENT HILL, VA--Continued

WATER-QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, TOTAL RECOV- ERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, TOTAL RECOV- ERABLE (UG/L AS MN) (01055)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)
AUG 23...	--	--	--	--	--	1200	--	--	--	--	110	--

DATE	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
AUG 23...	--	--	--	--	--	--	--	--	--	<0.02	<0.01	<0.01

DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)
AUG 23...	<0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.05	<0.01	<0.00

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

01658500 SOUTH FORK QUANTICO CREEK NEAR INDEPENDENT HILL, VA--Continued

WATER-QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U (UG/L) (82677)	EPTC WATER FLTRD 0.7 U (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
AUG 23...	<0.01	<0.00	<0.01	<0.01	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
AUG 23...	<0.04	<0.01	<0.04	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
AUG 23...	<0.02	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## POTOMAC RIVER BASIN

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01658500 SOUTH FORK QUANTICO CREEK NEAR INDEPENDENT HILL, VA--Continued

WATER-QUALITY DATA (U.S. MARINE CORPS STUDY), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	HARD- NESS TOTAL (MG/L AS CA) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
SEP 21...	1030	0.79	61	6.1	19.5	16.0	760	6.9	70	18	4.0	2.0
DATE		SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
SEP 21...		4.7	24	0	20	1.7	<0.10	18	<0.010	<0.050	0.010	<0.20
DATE		NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
SEP 21...		<0.20	0.020	0.010	<0.010	21	<0.5	<1.0	<5	<3	<10	810
DATE		LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	SEDI- MENT, SUS- PENDEED (MG/L) (80154)
SEP 21...		<10	<4	56	<0.1	<10	<10	<1.0	30	<6	7	--

&lt; Actual value is known to be less than the value shown.



## POTOMAC RIVER BASIN

01660400 AQUIA CREEK NEAR GARRISONVILLE, VA

LOCATION.--Lat 38°29'25", long 77°26'02", Stafford County, Hydrologic Unit 02070011, on right bank at bridge on State Highway 641, 1.1 mi northwest of Garrisonville, and 3.0 mi upstream from Beaverdam Run.

DRAINAGE AREA.--34.9 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1971 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 120 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods with ice effect, Dec. 30 to Jan. 3, Jan. 10, 11, 16, 17, 23-25, 28, 29, and Feb. 3, 14, 15, and period of no gage-height record, Jan. 18-22, which are fair, and periods with backwater from beaver dam, Oct. 1 to Nov. 28, May 19 to June 1, June 4 to July 3, July 18-26, Aug. 5-17, and Aug. 25 to Sept. 30, which are poor. Maximum discharge, 11,600 ft<sup>3</sup>/s, from rating curve extended above 1,600 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. No flow part or all of each day Sept. 15-17, 1980, Aug. 24-27, 1983, Aug. 13-19, Sept. 21-24, 1988, and Sept. 17, 18, 1991. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0830	*3,750	*8.76	Mar. 27	1430	522	3.48
Dec. 5	0930	826	4.21	Mar. 28	0230	1,660	5.97
Feb. 23	1400	1,160	4.94	Mar. 29	1100	774	4.09
Mar. 3	0230	1,300	5.24	Aug. 18	0100	646	3.79
Mar. 10	1230	705	3.93				

Minimum daily discharge, 0.60 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e5.6	e19	34	e22	43	45	91	24	e7.4	e2.8	18	e3.7
2	e3.5	e11	28	e25	36	314	72	21	6.8	e3.8	25	e3.5
3	e3.8	e9.0	26	e34	e32	820	59	19	6.0	e11	13	e3.3
4	e2.5	e8.0	35	93	29	240	51	24	e5.7	29	9.7	e3.1
5	e1.7	e8.6	539	63	29	182	48	42	e5.4	10	e8.5	e2.9
6	e1.1	e9.6	115	41	29	97	54	26	e5.2	8.5	e8.0	e2.7
7	e.74	e11	56	42	28	72	101	24	e5.4	14	e7.4	e2.5
8	e.60	e9.7	41	178	28	66	62	41	e4.7	4.1	e6.5	e2.6
9	e.70	e7.7	34	68	47	69	50	29	e4.1	13	e5.8	e2.3
10	e1.0	e6.6	31	e41	56	377	48	22	e3.7	13	e5.4	e2.1
11	e.90	e6.3	30	e35	38	146	43	20	e3.5	6.4	e5.2	e2.1
12	e12	e6.1	26	148	37	83	41	18	e3.7	4.0	e6.0	e1.9
13	e9.2	e6.6	26	96	32	67	55	16	e3.9	3.1	e7.0	e1.9
14	e6.6	e8.0	24	62	e30	57	53	16	e3.3	1.8	e40	e1.7
15	e4.7	e12	31	47	e31	51	41	15	e4.2	15	e36	e1.4
16	e3.3	e18	64	e35	52	46	40	15	e3.3	9.7	e18	e1.2
17	e4.0	e28	37	e44	75	40	36	14	e4.8	4.8	e158	e2.9
18	e2.4	e44	29	e91	98	41	32	13	e4.5	e4.0	231	e6.5
19	e2.0	e30	27	e58	124	40	30	e12	e3.8	e3.5	45	e4.0
20	e4.5	e12	26	e31	129	36	28	e13	e2.9	e3.1	27	e2.8
21	e12	e10	67	e30	117	38	27	e13	e3.5	e2.8	20	e1.9
22	e20	e9.0	47	e32	88	51	32	e12	e4.4	e4.5	22	e13
23	e15	e8.2	35	e43	626	38	31	e11	e4.0	e7.0	25	e33
24	e10	e7.6	29	e62	367	35	27	e10	e3.4	e11	20	e12
25	e6.0	e7.2	27	e58	135	46	25	e9.5	e3.2	e11	e15	e8.0
26	e3.3	e7.0	25	82	77	41	23	e9.8	e3.0	e25	e12	e44
27	e2.3	e57	23	49	54	272	24	e9.3	e2.5	89	e10	e49
28	e4.5	e1590	25	e141	45	1130	23	e8.8	e2.0	145	e8.0	e16
29	e15	108	31	e136	---	587	21	e8.4	e1.6	52	e6.4	e9.3
30	e30	52	e27	70	---	179	25	e8.0	e1.3	23	e5.4	e7.0
31	e25	---	e24	50	---	104	---	e7.7	---	13	e4.3	---
TOTAL	213.94	2127.2	1619	2007	2512	5410	1293	531.5	121.2	547.9	828.6	248.3
MEAN	6.90	70.9	52.2	64.7	89.7	175	43.1	17.1	4.04	17.7	26.7	8.28
MAX	30	1590	539	178	626	1130	101	42	7.4	145	231	49
MIN	.60	6.1	23	22	28	35	21	7.7	1.3	1.8	4.3	1.2
CFSM	.20	2.03	1.50	1.86	2.57	5.00	1.23	.49	.12	.51	.77	.24
IN.	.23	2.27	1.73	2.14	2.68	5.77	1.38	.57	.13	.58	.88	.26

Estimated.

## POTOMAC RIVER BASIN

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01660400 AQUIA CREEK NEAR GARRISONVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	22.0	31.3	44.0	51.0	54.3	63.1	55.5	40.7	27.1	15.0	12.1	17.4
MAX	138	91.3	105	118	123	175	141	144	234	103	65.8	174
(WY)	1980	1973	1975	1978	1979	1994	1973	1989	1972	1975	1984	1975
MIN	.42	1.95	7.17	3.93	20.8	8.71	11.6	10.8	2.84	1.41	.15	.058
(WY)	1981	1992	1989	1981	1991	1981	1981	1986	1986	1977	1983	1980

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1972 - 1994

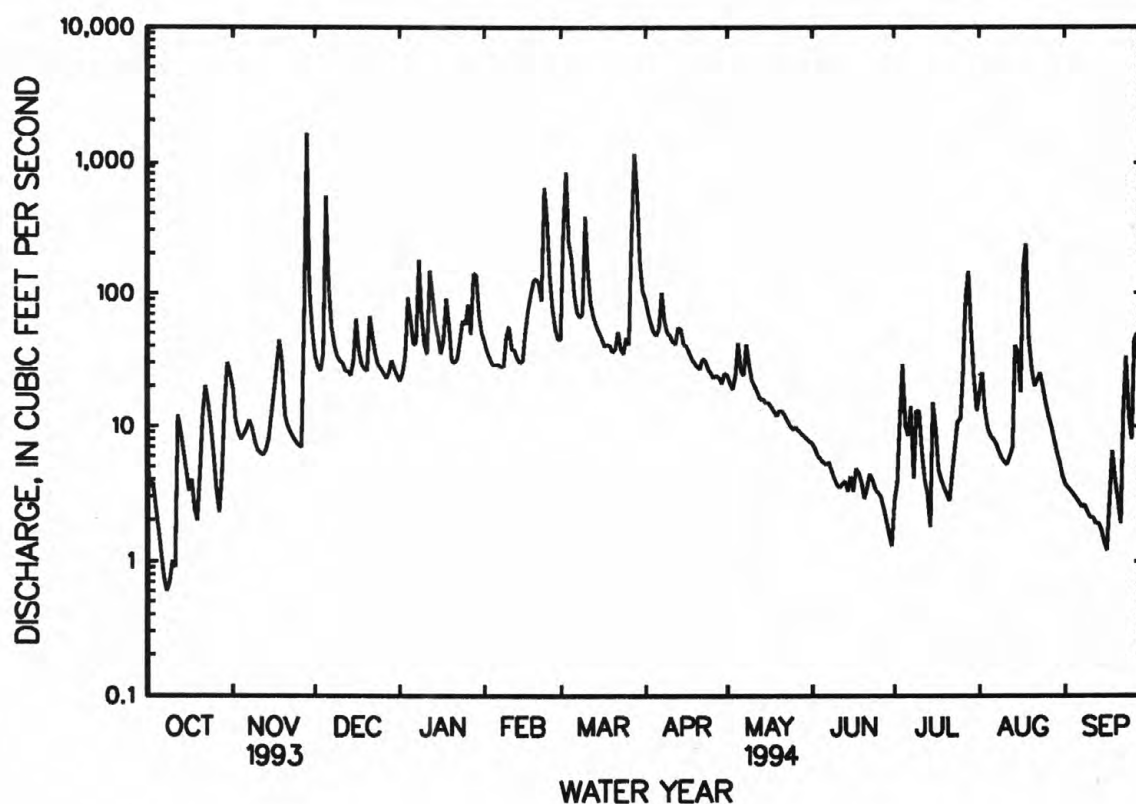
ANNUAL TOTAL	18373.05	17459.64	
ANNUAL MEAN	50.3	47.8	36.1
HIGHEST ANNUAL MEAN			58.6
LOWEST ANNUAL MEAN			12.2
HIGHEST DAILY MEAN	e1590	Nov 28	3900
LOWEST DAILY MEAN	e.29	Sep 14	.00
ANNUAL SEVEN-DAY MINIMUM	e.42	Sep 11	.01
INSTANTANEOUS PEAK FLOW			11600
INSTANTANEOUS PEAK STAGE			16.32
INSTANTANEOUS LOW FLOW			.00
ANNUAL RUNOFF (CFSM)	1.44	1.37	1.03
ANNUAL RUNOFF (INCHES)	19.58	18.61	14.04
10 PERCENT EXCEEDS	113	88	69
50 PERCENT EXCEEDS	26	22	18
90 PERCENT EXCEEDS	1.0	3.1	1.5

a Also Sept. 16, 17, 1980, Aug. 24-27, 1983, Aug. 14, 15, Sept. 22, 1988, and Sept. 17, 1991.

b Not determined.

c Part or all of each day Sept. 15-17, 1980, Aug. 24-27, 1983, Aug. 13-19, Sept. 21-24, 1988, and Sept. 17, 18, 1991.

e Estimated.



## RAPPAHANNOCK RIVER BASIN

01662800 BATTLE RUN NEAR LAUREL MILLS, VA

LOCATION.--Lat 38°39'20", long 78°04'27", Rappahannock County, Hydrologic Unit 02080103, on left bank just upstream from bridge on State Highway 729, 0.8 mi upstream from mouth, and 1.0 mi northeast of Laurel Mills.

DRAINAGE AREA.--27.6 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1958 to current year.

REVISED RECORDS.--WSP 2103: Drainage area. WDR VA-72-1: 1971. WDR VA-74-1: 1972.

GAGE.--Water-stage recorder. Datum of gage is 374.62 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 30, 31, and Jan. 5, 8-11, 14-17, and periods of no gage-height record, Jan. 1, 2, 19-21, which are fair. Maximum discharge, 9,120 ft<sup>3</sup>/s, from rating curve extended above 2,500 ft<sup>3</sup>/s on basis of velocity-area study. No flow many days in September 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 310 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0100	1,790	8.97	Mar. 29	0900	351	5.00
Dec. 5	0630	913	6.94	Apr. 15	2400	634	6.09
Jan. 24	1600	496	5.60	June 16	1830	1,310	7.95
Jan. 28	1100	795	6.60	July 27	1900	1,640	8.67
Jan. 29	1530	320	4.86	Aug. 11	2300	*2,430	*10.14
Feb. 23	1200	445	5.40	Aug. 17	1930	2,400	10.09
Mar. 10	0630	378	5.12				

Minimum discharge, 1.2 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	6.3	27	e16	43	34	87	30	11	13	27	20
2	2.0	4.9	23	e16	36	37	75	27	10	10	24	19
3	1.8	4.4	20	18	37	53	63	26	9.7	9.3	27	18
4	1.6	4.3	23	24	29	64	57	33	9.6	8.5	21	18
5	1.6	4.8	269	e20	28	124	53	31	9.3	8.0	25	17
6	1.4	5.4	78	19	26	148	54	27	10	7.5	21	17
7	1.5	4.9	49	25	25	165	56	31	13	7.5	17	16
8	1.6	4.4	38	e40	25	206	46	56	15	6.4	15	15
9	1.7	4.3	32	e30	60	163	44	34	9.9	8.0	14	14
10	1.7	4.3	28	e27	38	286	43	29	8.8	9.3	13	15
11	1.6	4.4	25	e24	32	170	41	26	9.1	6.4	394	15
12	5.0	4.3	21	64	30	121	41	25	9.9	5.5	267	13
13	3.7	5.1	20	50	27	98	44	23	8.8	5.1	62	13
14	2.6	6.8	19	e34	28	84	40	22	7.5	4.9	42	12
15	2.7	5.4	24	e29	31	74	69	22	6.6	7.3	33	11
16	2.4	5.0	32	e26	58	65	190	22	200	8.6	32	11
17	2.8	5.1	24	e30	83	56	81	20	52	15	517	11
18	3.1	11	22	49	89	54	62	19	22	49	200	12
19	2.9	5.7	21	e28	76	50	56	20	15	23	87	9.8
20	4.7	5.2	20	e24	57	45	49	20	12	13	59	9.1
21	6.7	4.4	28	e23	57	47	46	19	12	11	68	9.0
22	7.0	4.1	27	25	46	53	45	17	10	11	57	25
23	4.6	4.1	24	28	196	44	44	16	8.8	26	42	39
24	4.2	4.0	22	120	152	41	39	15	9.8	26	35	15
25	4.2	4.1	22	52	88	41	36	15	9.7	50	32	13
26	4.1	3.9	22	69	62	38	34	15	8.0	39	32	29
27	4.5	197	19	34	45	92	36	14	13	288	30	19
28	4.5	607	19	231	37	140	32	13	15	140	27	15
29	4.2	57	19	140	---	261	33	13	21	60	25	13
30	7.1	35	e21	69	---	142	34	12	20	42	23	12
31	9.7	---	e17	51	---	105	---	12	---	32	21	---
TOTAL	109.2	1026.6	1055	1435	1541	3101	1630	704	576.5	950.3	2289	474.9
MEAN	3.52	34.2	34.0	46.3	55.0	100	54.3	22.7	19.2	30.7	73.8	15.8
MAX	9.7	607	269	231	196	286	190	56	200	288	517	39
MIN	1.4	3.9	17	16	25	34	32	12	6.6	4.9	13	9.0
CFSM	.13	1.24	1.23	1.68	1.99	3.62	1.97	.82	.70	1.11	2.68	.57
IN.	.15	1.38	1.42	1.93	2.08	4.18	2.20	.95	.78	1.28	3.09	.64

e Estimated.

## RAPPAHANNOCK RIVER BASIN

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01662800 BATTLE RUN NEAR LAUREL MILLS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	17.8	23.1	27.4	33.2	40.2	48.5	42.3	32.4	21.0	11.7	12.2	11.6
MAX	119	106	79.9	116	108	144	149	85.9	91.8	39.9	73.8	102
(WY)	1980	1986	1993	1978	1984	1993	1983	1988	1972	1972	1994	1979
MIN	.92	2.36	1.82	1.45	7.92	12.5	9.31	8.31	3.61	1.23	.42	.63
(WY)	1992	1966	1966	1966	1989	1981	1981	1969	1986	1966	1966	1985

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1959 - 1994

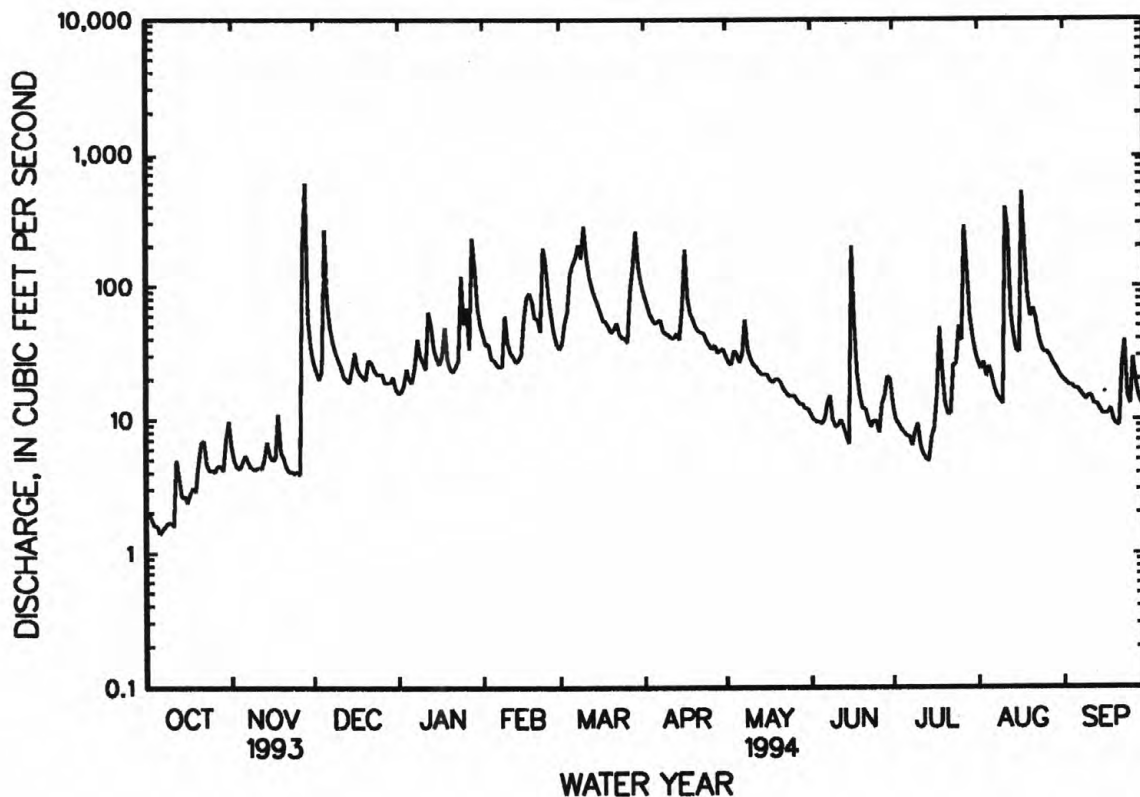
ANNUAL TOTAL	14107.84	14892.5	26.7
ANNUAL MEAN	38.7	40.8	48.4
HIGHEST ANNUAL MEAN			9.17
LOWEST ANNUAL MEAN			2000
HIGHEST DAILY MEAN	1250	607	Nov 28
LOWEST DAILY MEAN	.72	1.4	Oct 6
ANNUAL SEVEN-DAY MINIMUM	.94	1.6	Oct 4
INSTANTANEOUS PEAK FLOW		2430	Aug 11
INSTANTANEOUS PEAK STAGE		10.14	Aug 11
INSTANTANEOUS LOW FLOW		1.2	Oct 8
ANNUAL RUNOFF (CFSM)	1.40	1.48	.97
ANNUAL RUNOFF (INCHES)	19.01	20.07	13.14
10 PERCENT EXCEEDS	81	82	55
50 PERCENT EXCEEDS	21	23	15
90 PERCENT EXCEEDS	1.9	4.5	2.7

a Also Sept. 6-13, 1966.

b Also Oct. 5, 1993.

c Also Sept. 7, 1966.

d From floodmarks.



## RAPPAHANNOCK RIVER BASIN

01664000 RAPPAHANNOCK RIVER AT REMINGTON, VA

LOCATION.--Lat 38°31'50", long 77°48'50", Fauquier County, Hydrologic Unit 02080103, on left bank 80 ft upstream from bridge on alternate U.S. Highway 29, at Remington, 0.3 mi upstream from Tinpot Run, 0.4 mi downstream from Ruffans Run, and 2.5 mi downstream from Hazel River.

DRAINAGE AREA.--620 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1942 to current year.

REVISED RECORDS.--WSP 1171: 1944. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252.53 ft above sea level. Prior to Nov. 21, 1951, nonrecording gage at bridge 80 ft downstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 2 and Jan. 16-23, and period of doubtful gage-height record, June 17-28, which are fair. National Weather Service gage-height telemeter at station. Maximum discharge, 90,000 ft<sup>3</sup>/s, from rating curve extended above 43,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 2.31 ft, Sept. 13, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum flood since at least 1828, that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	2100	*21,600	*18.50	Mar. 29	1730	9,260	13.88
Dec. 5	1815	9,840	14.29	July 28	0815	13,500	15.97
Jan. 28	2400	7,550	12.60	Aug. 12	0930	8,070	13.00
Feb. 23	2300	9,390	13.97	Aug. 18	1030	18,800	17.72
Mar. 10	1715	7,890	12.86				

Minimum discharge, 46 ft<sup>3</sup>/s, Oct. 7, 8, 11, gage height, 2.74 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	191	1100	e440	1350	1380	2720	651	216	694	597	358
2	60	166	820	e470	1130	1430	2170	556	206	336	504	345
3	57	135	662	491	965	1930	1860	504	191	250	441	301
4	52	118	592	627	899	2100	1660	541	183	209	394	288
5	51	110	6330	756	839	3030	1490	700	180	191	367	277
6	48	109	3910	583	791	3520	1420	607	176	177	402	266
7	47	109	1900	598	766	3510	1550	533	182	167	337	264
8	46	107	1380	1530	743	5440	1360	1180	276	172	274	249
9	48	101	1110	1280	1030	4910	1220	1120	245	154	246	231
10	49	95	945	905	1400	6530	1180	828	190	228	228	220
11	47	89	841	938	967	5500	1170	694	170	189	214	215
12	52	85	701	1380	936	3380	1090	604	175	149	5010	208
13	80	81	620	1730	854	2690	1160	541	328	130	1020	197
14	104	80	586	1270	829	2340	1280	484	205	117	596	187
15	83	84	575	1050	884	2110	1060	453	162	131	493	179
16	71	89	941	e640	1020	1920	2050	531	165	150	401	174
17	66	91	858	e680	1650	1690	1580	457	e897	176	3070	175
18	65	142	703	e900	1930	1560	1300	391	e391	1040	14500	257
19	64	220	648	e720	2220	1510	1180	381	e227	872	2940	209
20	72	177	593	e620	2180	1330	1100	379	e175	369	1550	174
21	197	145	761	e570	2020	1260	995	373	e163	239	1440	160
22	147	126	952	e600	2030	1550	977	347	e233	215	2670	185
23	133	118	759	e700	4900	1350	942	317	e171	283	1190	851
24	116	114	663	1070	6340	1270	872	293	e150	1510	838	497
25	99	110	608	1980	3640	1270	821	290	e163	545	673	300
26	91	108	560	2020	2470	1230	771	294	e188	1270	577	318
27	87	275	511	1160	1850	2450	802	297	e152	2320	630	572
28	85	12100	482	2930	1530	4850	771	270	e363	8950	506	359
29	83	7090	e450	4490	---	7910	603	249	e360	1860	438	277
30	85	1630	e420	2610	---	5210	715	243	837	1160	399	233
31	116	---	e400	1600	---	3230	---	229	---	785	361	---
TOTAL	2475	24195	32381	37338	48163	89390	37869	15337	7720	25038	43306	8526
MEAN	79.8	806	1045	1204	1720	2884	1262	495	257	808	1397	284
MAX	197	12100	6330	4490	6340	7910	2720	1180	897	8950	14500	851
MIN	46	80	400	440	743	1230	603	229	150	117	214	160
CFSM	.13	1.30	1.68	1.94	2.77	4.65	2.04	.80	.42	1.30	2.25	.46
IN.	.15	1.45	1.94	2.24	2.89	5.36	2.27	.92	.46	1.50	2.60	.51

e Estimated.



# RAPPAHANNOCK RIVER BASIN

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01664000 RAPPAHANNOCK RIVER AT REMINGTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	497	568	717	811	987	1187	1066	832	565	334	374	329
MAX	4895	2575	2172	2344	2819	3751	3784	2177	3520	974	2926	2743
(WY)	1943	1986	1951	1978	1984	1993	1983	1989	1972	1949	1955	1979
MIN	27.3	61.8	61.1	78.3	212	292	248	198	71.8	30.1	13.2	15.4
(WY)	1987	1966	1966	1966	1989	1981	1981	1977	1977	1966	1966	1985

## SUMMARY STATISTICS

### FOR 1993 CALENDAR YEAR

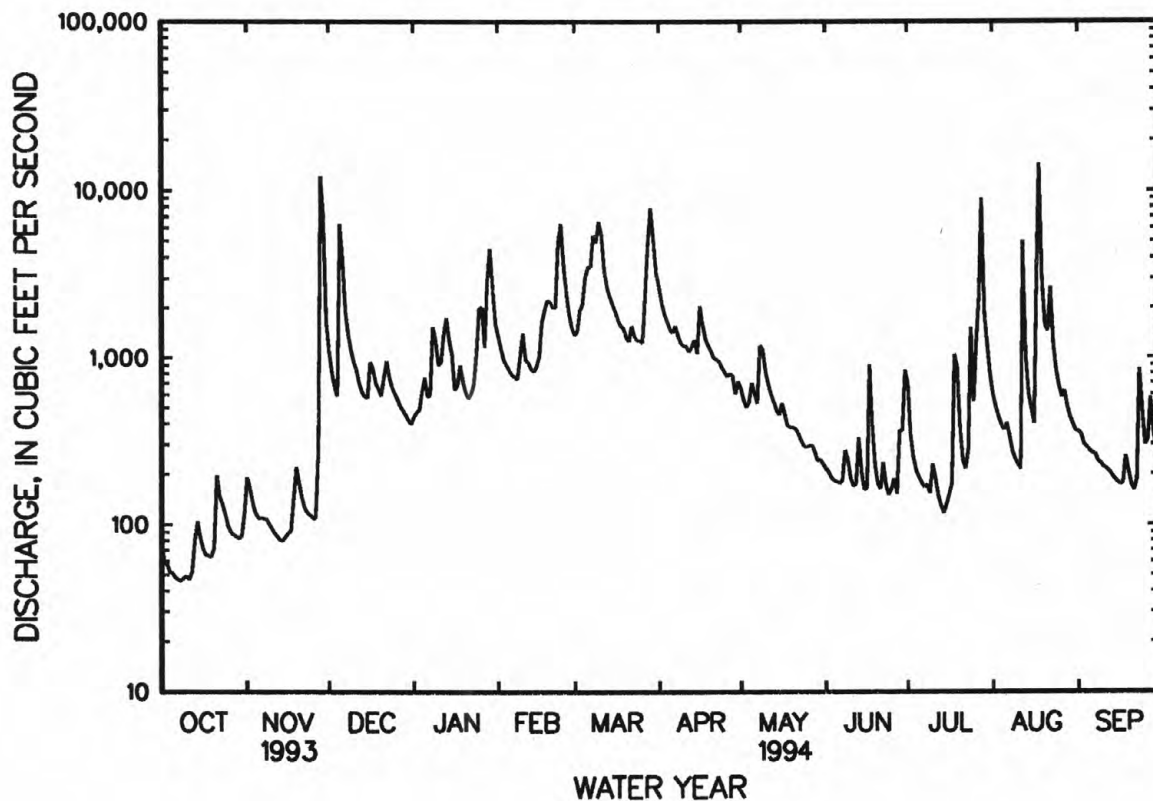
### FOR 1994 WATER YEAR

### WATER YEARS 1943 - 1994

ANNUAL TOTAL	364409	371738	
ANNUAL MEAN	998	1018	687
HIGHEST ANNUAL MEAN			1198
LOWEST ANNUAL MEAN			251
HIGHEST DAILY MEAN	27400	Mar 5	14500
LOWEST DAILY MEAN	32	Sep 15	46
ANNUAL SEVEN-DAY MINIMUM	36	Aug 31	48
INSTANTANEOUS PEAK FLOW			21600
INSTANTANEOUS PEAK STAGE			18.50
INSTANTANEOUS LOW FLOW			46
ANNUAL RUNOFF (CFSM)	1.61		1.64
ANNUAL RUNOFF (INCHES)	21.86		22.30
10 PERCENT EXCEEDS	2260		2170
50 PERCENT EXCEEDS	511		560
90 PERCENT EXCEEDS	60		108
			64000
			2.9
			3.2
			90000
			30.00
			1.1
			1.11
			15.06
			1390
			411
			75
			1993
			1981
			Oct 16 1942
			Sep 12 1966
			Sep 7 1966
			Oct 16 1942
			Oct 16 1942
			Sep 10 1966

a From floodmarks.

b Also Oct. 8, 11, 1993.



## RAPPAHANNOCK RIVER BASIN

01665000 MOUNTAIN RUN NEAR CULPEPER, VA

LOCATION.--Lat 38°28'50", long 78°03'10", Culpeper County, Hydrologic Unit 02080103, on left bank 30 ft upstream from bridge on State Highway 641, 1.5 mi downstream from Mountain Run Lake (revised), and 3.0 mi west of Culpeper.

DRAINAGE AREA.--15.9 mi<sup>2</sup>, of which 10.9 mi<sup>2</sup> are above flood-detention structures.

PERIOD OF RECORD.--September 1949 to current year.

REVISED RECORDS.--WSP 1332: 1950-51. WSP 2103: Drainage area. WDR VA-89-1: 1951 (M).

GAGE.--Water-stage recorder. Datum of gage is 389.46 ft above sea level.

REMARKS.--Records good except those for periods with backwater from beaver dams, May 16 to June 2 and June 6-8, 12-25, 27-30, which are fair. Some regulation since 1959 by two reservoirs, combined flood storage, 2,240 acre-ft; 531 acre-ft additional storage used for low-water regulation for municipal supply for town of Culpeper. Maximum discharge, 5,940 ft<sup>3</sup>/s, from rating curve extended above 910 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 10.52 ft and 11.00 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0130	1,280	7.87	July 27	1800	*1,570	*8.41
Dec. 5	0700	304	4.92	Aug. 17	1815	1,150	7.62
July 23	1900	631	6.32				

Minimum discharge, 1.9 ft<sup>3</sup>/s, Oct. 4, 5, 6, gage height, 1.30 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	8.0	76	11	21	24	43	13	e5.5	17	30	7.2
2	2.3	6.5	62	11	18	34	34	12	e4.9	8.6	17	6.4
3	2.1	5.6	21	12	16	44	29	11	4.7	6.0	14	6.0
4	2.0	5.4	19	19	15	47	27	13	4.5	4.8	11	5.8
5	2.1	5.6	204	19	14	88	25	17	4.5	4.2	11	5.5
6	2.1	6.3	111	16	14	104	25	15	e4.4	5.3	10	5.3
7	2.2	6.1	54	17	13	111	29	14	e5.0	10	8.7	5.3
8	2.2	5.6	23	44	13	127	24	19	e6.4	5.6	7.9	5.1
9	2.2	5.3	18	28	19	97	22	16	5.0	3.9	7.6	4.9
10	2.2	5.2	16	20	21	131	22	13	4.1	3.8	7.4	4.7
11	2.3	5.4	15	17	22	93	21	12	3.9	3.2	7.2	4.7
12	4.5	5.6	13	58	19	49	21	11	e12	2.7	7.1	4.4
13	4.3	5.9	11	48	16	39	36	10	e9.2	2.7	7.1	4.2
14	3.3	8.4	11	30	15	34	38	9.7	e6.0	2.7	6.9	3.9
15	2.9	8.3	13	22	18	30	28	9.9	e4.2	2.7	8.4	3.8
16	2.7	7.3	18	16	32	27	25	e12	e5.1	2.8	9.9	4.0
17	4.3	7.7	15	19	50	24	21	e9.8	e6.7	2.9	163	5.8
18	4.4	13	13	39	49	24	19	e8.6	e5.1	5.9	136	9.7
19	3.2	9.5	12	21	43	23	19	e8.1	e4.2	11	68	6.8
20	3.4	7.9	11	15	37	21	18	e8.2	e3.5	6.9	20	5.6
21	4.6	6.5	18	13	40	22	16	e8.4	e3.7	5.3	21	5.0
22	5.8	5.5	18	13	37	24	19	e7.8	e5.2	5.0	27	12
23	5.5	5.3	16	18	160	22	17	e7.4	e4.0	93	16	21
24	5.1	5.1	14	36	137	20	16	e7.2	e3.6	135	12	12
25	4.9	4.9	13	32	93	21	15	e7.6	e3.2	53	10	8.8
26	4.9	5.5	12	40	46	20	14	e8.2	2.7	31	11	15
27	5.2	104	11	23	30	73	14	e8.3	e3.2	253	16	16
28	5.1	340	12	97	25	128	13	e7.4	e4.0	209	11	11
29	4.6	169	13	108	---	197	13	e6.9	e5.0	136	9.4	8.4
30	7.0	122	12	48	---	108	14	e6.4	e21	85	8.4	6.8
31	9.0	---	11	26	---	74	---	e5.8	---	69	7.6	---
TOTAL	118.7	906.4	886	936	1033	1880	677	323.7	164.5	1187.0	707.6	225.1
MEAN	3.83	30.2	28.6	30.2	36.9	60.6	22.6	10.4	5.48	38.3	22.8	7.50
MAX	9.0	340	204	108	160	197	43	19	21	253	163	21
MIN	2.0	4.9	11	11	13	20	13	5.8	2.7	2.7	6.9	3.8
CFSM	.24	1.90	1.80	1.90	2.32	3.81	1.42	.66	.34	2.41	1.44	.47
IN.	.28	2.12	2.07	2.19	2.42	4.40	1.58	.76	.38	2.78	1.66	.53

e Estimated.

## 01665000 MOUNTAIN RUN NEAR CULPEPER, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1958, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	9.06	14.6	19.5	16.6	21.7	26.1	21.5	14.6	11.8	8.31	14.2	10.8
MAX	15.7	54.0	48.7	31.2	32.5	45.8	35.6	26.0	31.9	23.4	74.2	46.9
(WY)	1951	1953	1951	1953	1951	1953	1952	1952	1951	1958	1955	1950
MIN	2.36	2.87	5.63	5.00	7.64	15.7	10.6	4.79	2.81	1.12	.41	.56
(WY)	1954	1954	1956	1956	1954	1956	1956	1956	1956	1957	1957	1954

## SUMMARY STATISTICS

## WATER YEARS 1950 - 1958

ANNUAL TOTAL	
ANNUAL MEAN	15.7
HIGHEST ANNUAL MEAN	21.5
LOWEST ANNUAL MEAN	6.59
HIGHEST DAILY MEAN	1150 Aug 18 1955
LOWEST DAILY MEAN	.10 aSep 28 1954
ANNUAL SEVEN-DAY MINIMUM	.11 Sep 26 1954
INSTANTANEOUS PEAK FLOW	5940 Dec 4 1950
INSTANTANEOUS PEAK STAGE	11.20 Dec 4 1950
INSTANTANEOUS LOW FLOW	.09 bSep 30 1954
ANNUAL RUNOFF (CFSM)	.99
ANNUAL RUNOFF (INCHES)	13.41
10 PERCENT EXCEEDS	28
50 PERCENT EXCEEDS	9.5
90 PERCENT EXCEEDS	2.4

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	13.0	16.5	19.2	21.9	26.0	28.9	23.9	18.8	13.2	10.7	8.89	10.9
MAX	74.5	58.3	50.2	59.8	50.4	96.5	94.9	47.5	80.4	49.1	37.7	63.0
(WY)	1977	1986	1993	1978	1984	1993	1983	1993	1972	1989	1984	1987
MIN	1.54	1.30	1.19	2.09	7.65	9.60	8.65	5.47	2.14	1.92	1.67	1.29
(WY)	1992	1966	1966	1966	1989	1981	1985	1977	1986	1966	1963	1985

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1959 - 1994

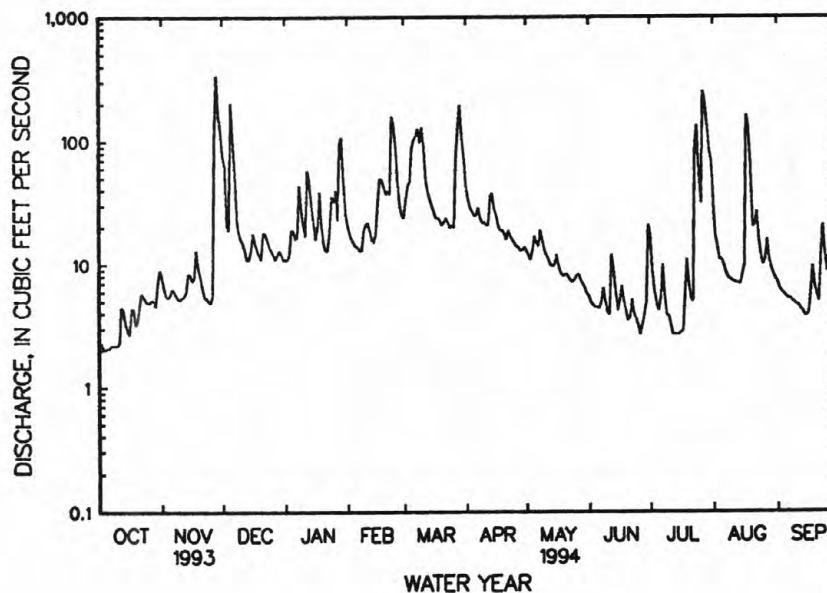
ANNUAL TOTAL	10237.3	9045.0	
ANNUAL MEAN	28.0	24.8	17.6
HIGHEST ANNUAL MEAN			31.6
LOWEST ANNUAL MEAN			8.28
HIGHEST DAILY MEAN	495 Mar 4	340 Nov 28	555 Jun 21 1972
LOWEST DAILY MEAN	1.7 Sep 14	2.0 Oct 4	.48 Sep 6 1983
ANNUAL SEVEN-DAY MINIMUM	2.0 Aug 28	2.1 Oct 3	.69 Sep 2 1983
INSTANTANEOUS PEAK FLOW		1570 Jul 27	4510 May 5 1993
INSTANTANEOUS PEAK STAGE		8.41 Jul 27	11.87 May 5 1993
INSTANTANEOUS LOW FLOW		1.9 aOct 4	.30 Aug 31 1965
ANNUAL RUNOFF (CFSM)	1.76	1.56	1.11
ANNUAL RUNOFF (INCHES)	23.95	21.16	15.05
10 PERCENT EXCEEDS	65	56	32
50 PERCENT EXCEEDS	15	12	10
90 PERCENT EXCEEDS	2.7	4.0	2.5

a Also Sept. 29 to Oct. 1, 1954, and Aug. 14, 1957.

b Also Oct. 1, 1954.

c Also Oct. 5, 6, 1993.

e Estimated.



## RAPPAHANNOCK RIVER BASIN

01665500 RAPIDAN RIVER NEAR RUCKERSVILLE, VA

LOCATION.--Lat 38°16'50", long 78°20'25", Madison County, Hydrologic Unit 02080103, on left bank 250 ft downstream from bridge on U.S. Highway 29, 0.2 mi downstream from Elk Run, 1.7 mi upstream from White Run, 3.6 mi northeast of Ruckersville, and at mile 63.5.

DRAINAGE AREA.--114 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1942 to current year.

REVISED RECORDS.--WSP 1171: 1944-45(M). WSP 1382: 1943(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 439.44 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 10, 16-24, and periods with backwater from beaver dams, June 1-6, July 4-6, and Aug. 29 to Sept. 30, which are fair. Diversion 0.4 mi upstream from station since 1973 by Rapidan Service Authority for municipal water supply of Greene County and town of Stanardsville averaged about 0.53 ft<sup>3</sup>/s. Maximum discharge, 30,700 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 17.78 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0400	*4,760	*8.94	Mar. 29	0800	1,630	4.77
Dec. 5	0530	2,900	6.64	July 31	2030	1,700	4.88
Jan. 28	1030	2,490	6.08	Aug. 17	1800	1,940	5.27
Feb. 23	1200	1,680	4.85				

Minimum discharge, 9.8 ft<sup>3</sup>/s, July 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	62	231	e110	329	302	466	126	e49	49	259	e69
2	19	55	185	113	287	309	391	115	e45	34	135	e62
3	18	50	159	112	254	337	344	110	e42	29	100	e56
4	17	50	187	165	232	453	308	131	e41	e29	80	e51
5	18	50	1370	146	216	670	279	139	e40	e25	71	e48
6	19	53	587	135	201	515	270	127	e39	e23	64	e45
7	20	50	419	142	188	476	253	126	38	24	58	e42
8	21	48	334	230	179	607	225	149	44	20	52	e40
9	20	46	281	189	240	619	210	134	40	17	49	e39
10	22	46	248	e170	224	899	202	127	35	21	45	e37
11	21	45	219	157	291	703	192	122	40	16	46	e44
12	29	46	193	292	244	563	189	119	41	14	49	e40
13	29	47	180	272	190	477	233	114	50	13	50	e35
14	25	50	169	240	199	417	223	106	41	13	47	e31
15	24	50	169	204	220	371	197	104	39	43	46	e29
16	26	51	178	e160	275	333	200	104	50	44	57	e29
17	30	52	157	e200	277	300	185	94	58	68	526	e28
18	32	70	148	e330	270	280	176	89	39	407	433	e40
19	30	59	144	e210	267	257	171	89	32	277	230	e32
20	32	53	140	e170	269	237	163	89	29	106	286	e29
21	43	48	160	e150	282	229	158	85	31	76	328	e29
22	42	48	154	e140	273	224	172	76	36	94	310	e36
23	41	46	144	e200	869	203	156	72	30	74	215	e60
24	40	46	139	e300	739	196	148	67	31	65	174	e41
25	39	46	136	267	582	204	142	68	37	53	154	e39
26	38	45	130	201	478	194	138	66	29	69	139	e62
27	39	488	126	169	390	338	134	73	56	139	125	e55
28	39	2100	134	1040	335	535	128	62	60	266	115	e41
29	40	539	e140	661	---	1190	126	59	37	154	e100	e37
30	51	320	e120	476	---	729	135	56	56	117	e88	e36
31	71	---	e105	385	---	561	---	52	---	249	e77	---
TOTAL	954	4759	7186	7736	8800	13728	6314	3050	1235	2628	4508	1262
MEAN	30.8	159	232	250	314	443	210	98.4	41.2	84.8	145	42.1
MAX	71	2100	1370	1040	869	1190	466	149	60	407	526	69
MIN	17	45	105	110	179	194	126	52	29	13	45	28
CFSM	.27	1.39	2.03	2.19	2.76	3.88	1.85	.86	.36	.74	1.28	.37
IN.	.31	1.55	2.34	2.52	2.87	4.48	2.06	1.00	.40	.86	1.47	.41

e Estimated.

RAPPAHANNOCK RIVER BASIN

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01665500 RAPIDAN RIVER NEAR RUCKERSVILLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	134	142	162	172	200	248	232	181	139	80.3	90.5	79.5
MAX	976	798	465	483	485	570	692	376	800	378	760	598
(WY)	1943	1986	1951	1978	1984	1993	1983	1978	1972	1949	1955	1979
MIN	9.44	25.3	20.4	21.0	52.4	79.7	72.8	48.0	23.3	6.99	6.32	5.83
(WY)	1964	1966	1966	1981	1989	1981	1981	1977	1977	1977	1966	1954

SUMMARY STATISTICS

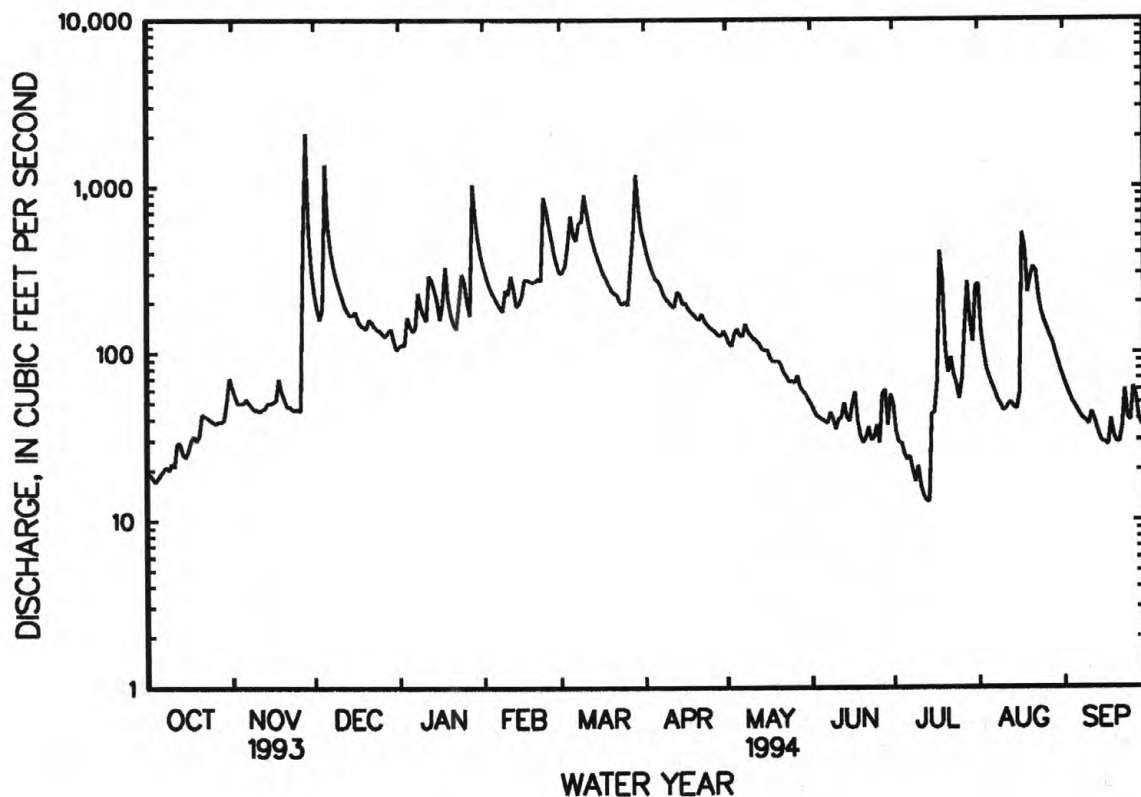
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1943 - 1994

ANNUAL TOTAL	70868	62160	155
ANNUAL MEAN	194	170	337
HIGHEST ANNUAL MEAN			70.6
LOWEST ANNUAL MEAN			1949
HIGHEST DAILY MEAN	2190	Mar 4	2100
LOWEST DAILY MEAN	e12	aSep 14	13
ANNUAL SEVEN-DAY MINIMUM	14	Aug 26	16
INSTANTANEOUS PEAK FLOW			4760
INSTANTANEOUS PEAK STAGE			8.94
INSTANTANEOUS LOW FLOW			9.8
ANNUAL RUNOFF (CFSM)	1.70		1.49
ANNUAL RUNOFF (INCHES)	23.13		20.28
10 PERCENT EXCEEDS	483		355
50 PERCENT EXCEEDS	126		115
90 PERCENT EXCEEDS	21		30

- a Also Sept. 15, 1993.  
b Also July 14, 1994.  
c From high-water mark in well.  
d Not determined.  
e Estimated.  
f Probably occurred Sept. 12, 1966.





## RAPPAHANNOCK RIVER BASIN

01666500 ROBINSON RIVER NEAR LOCUST DALE, VA

LOCATION.--Lat 38°19'30", long 78°05'45", Madison County, Hydrologic Unit 02080103, on right bank 100 ft upstream from bridge on State Highway 614, 1.1 mi upstream from Great Run, 1.7 mi upstream from mouth, 2.0 mi southeast of Locust Dale, and 3.4 mi downstream from Crooked Run.

DRAINAGE AREA.--179 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1943 to current year. Prior to October 1965, published as Robertson River near Locust Dale.

REVISED RECORDS.--WSP 1171: 1948(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 283.70 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 2 and Jan. 19-23, which are fair. Maximum discharge, 24,500 ft<sup>3</sup>/s, from rating curve extended above 9,100 ft<sup>3</sup>/s on basis of records for other stations in Rappahannock River basin. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 15, 1942, reached a stage of 23.9 ft, from floodmarks, discharge, about 44,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0900	*9,370	*16.81	Mar. 10	1130	2,170	8.72
Dec. 5	1000	3,980	12.19	Mar. 29	1100	3,050	10.63
Jan. 28	1730	2,900	10.35	July 27	2200	2,190	8.78
Feb. 23	1530	3,380	11.25	Aug. 17	2200	3,530	11.52

Minimum discharge, 42 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	92	381	e150	401	382	643	213	92	113	164	104
2	50	79	310	e155	343	405	537	193	86	79	184	96
3	49	73	264	159	307	504	474	184	82	70	138	92
4	46	71	264	235	279	575	427	206	82	68	121	91
5	44	69	2220	222	264	982	392	242	79	67	110	87
6	42	72	800	192	250	947	381	215	78	63	106	85
7	43	70	532	198	234	976	384	204	77	71	95	85
8	44	66	417	409	222	1220	338	263	115	58	90	79
9	45	64	350	300	283	997	319	233	91	53	86	77
10	44	64	310	254	311	1600	311	211	79	58	83	74
11	44	62	279	237	255	1040	299	197	81	54	81	77
12	63	62	242	515	270	762	295	186	86	51	86	72
13	67	61	226	449	256	639	341	173	145	48	80	69
14	54	66	215	357	235	564	346	165	85	46	73	67
15	52	66	215	288	271	509	298	158	79	48	74	64
16	51	64	242	258	360	464	331	175	81	70	77	64
17	52	65	216	383	458	416	317	153	108	59	858	64
18	56	105	202	594	463	394	295	146	112	256	1090	83
19	51	86	196	e430	457	369	282	142	80	367	362	67
20	52	79	186	e350	440	338	265	141	71	119	303	62
21	74	72	224	e300	462	327	248	139	77	87	322	60
22	74	69	234	e240	445	345	265	130	96	91	477	76
23	66	67	204	e350	1730	318	248	123	72	136	259	123
24	62	66	191	515	1170	309	234	116	67	337	196	85
25	59	65	186	394	767	314	223	117	76	120	166	76
26	58	64	177	373	601	298	211	123	63	191	151	132
27	60	637	168	260	484	661	208	128	69	575	140	115
28	57	5840	167	1430	418	1230	200	109	119	1240	129	80
29	56	869	e175	1030	---	2280	196	105	84	354	121	68
30	63	515	e155	618	---	1060	230	100	134	224	116	61
31	108	---	e140	473	---	759	---	95	---	167	107	---
TOTAL	1738	9700	10088	12118	12436	21984	9538	5085	2646	5340	6445	2435
MEAN	56.1	323	325	391	444	709	318	164	88.2	172	208	81.2
MAX	108	5840	2220	1430	1730	2280	643	263	145	1240	1090	132
MIN	42	61	140	150	222	298	196	95	63	46	73	60
CFSM	.31	1.81	1.82	2.18	2.48	3.96	1.78	.92	.49	.96	1.16	.45
IN.	.36	2.02	2.10	2.52	2.58	4.57	1.98	1.06	.55	1.11	1.34	.51

e Estimated.

## RAPPAHANNOCK RIVER BASIN

169

01666500 ROBINSON RIVER NEAR LOCUST DALE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	173	215	232	258	294	346	315	250	196	126	143	145
MAX	783	1350	624	752	704	980	989	625	1081	522	1063	1064
(WY)	1991	1986	1973	1978	1979	1993	1983	1989	1972	1949	1955	1979
MIN	18.5	35.1	32.0	47.5	105	105	89.3	70.9	35.7	21.3	12.2	8.05
(WY)	1964	1966	1966	1966	1977	1981	1981	1977	1977	1944	1963	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

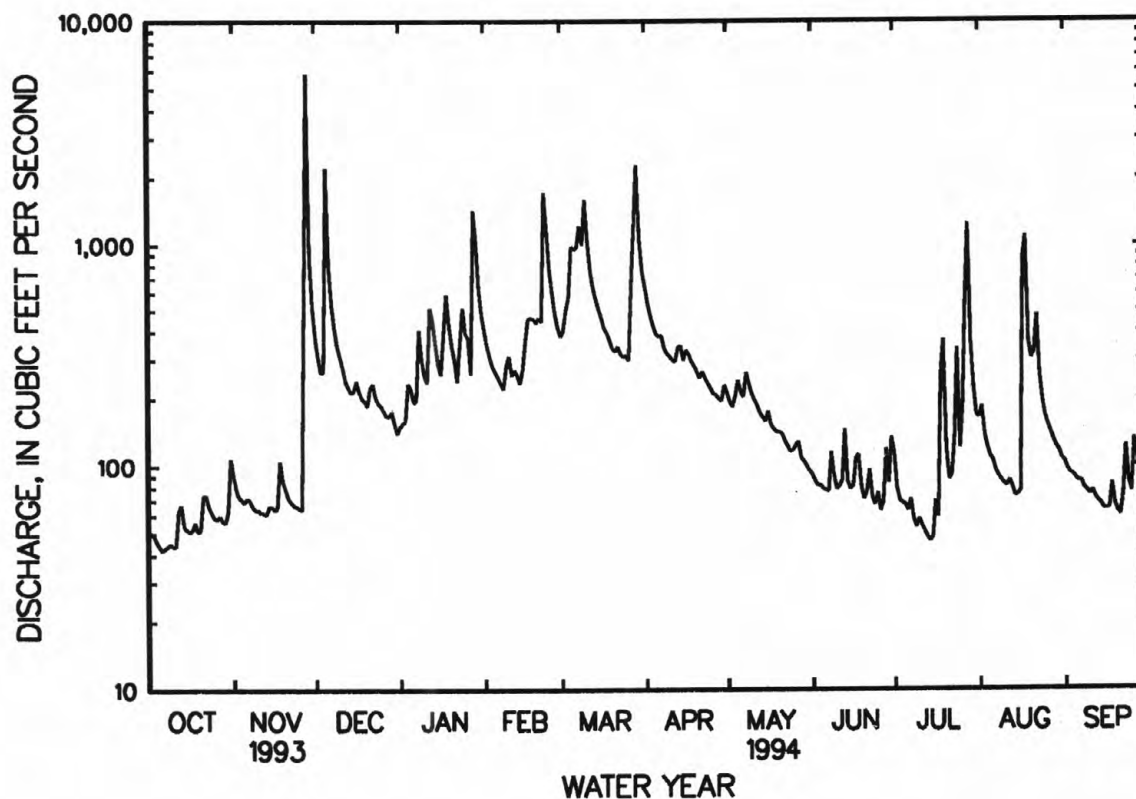
## WATER YEARS 1944 - 1994

ANNUAL TOTAL	112862	99553	224
ANNUAL MEAN	309	273	445
HIGHEST ANNUAL MEAN			95.6
LOWEST ANNUAL MEAN			1973
HIGHEST DAILY MEAN	6120	5840	14700
LOWEST DAILY MEAN	36	42	1.8
ANNUAL SEVEN-DAY MINIMUM	40	44	3.0
INSTANTANEOUS PEAK FLOW		9370	24500
INSTANTANEOUS PEAK STAGE		16.81	20.92
INSTANTANEOUS LOW FLOW		42	1.2
ANNUAL RUNOFF (CFSM)	1.73	1.52	1.25
ANNUAL RUNOFF (INCHES)	23.46	20.69	17.01
10 PERCENT EXCEEDS	638	522	426
50 PERCENT EXCEEDS	196	166	148
90 PERCENT EXCEEDS	52	62	40

a Also Sept. 15, 1993.

b Also Sept. 27, 1954.

c Also Sept. 13, 1954.



## RAPPAHANNOCK RIVER BASIN

01667500 RAPIDAN RIVER NEAR CULPEPER, VA

LOCATION.--Lat 38°21'01", long 77°58'31", Culpeper County, Hydrologic Unit 02080103, on left bank 0.7 mi upstream from Cedar Run and bridge on U.S. Highway 522, 8.5 mi south of Culpeper, and at mile 29.6.

DRAINAGE AREA.--472 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 741: 1931. WSP 801: 1934(M), 1936(M). WSP 1081: 1943-46. WSP 1171: 1932(M), 1933-35. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 241.36 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Jan. 1, 2, 18-24, and Feb. 11, 12, which are fair. Prior to 1977, diurnal fluctuation at low flow caused by mill at Rapidan, and since July 1986, by powerplant at same site. National Weather Service gage-height telemeter at station. Maximum discharge, 58,100 ft<sup>3</sup>/s, from rating curve extended above 43,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1600	*10,900	*14.58	Mar. 28	1215	5,390	8.13
Dec. 5	1500	6,880	10.22	Mar. 29	1500	6,650	9.93
Jan. 28	2145	5,990	8.98	July 28	0745	5,870	8.81
Feb. 23	2100	6,790	10.11	Aug. 18	0145	6,720	10.02
Mar. 10	1430	5,000	7.58				

Minimum discharge, 54 ft<sup>3</sup>/s, Oct. 12, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	88	176	879	e300	1030	1020	1720	479	194	191	535	212
2	82	145	695	e320	889	1100	1430	435	184	143	550	198
3	82	124	574	328	777	1730	1250	402	171	124	312	187
4	79	119	539	543	695	2010	1120	437	167	107	250	183
5	70	114	4590	649	640	3180	1030	557	165	102	210	177
6	64	115	2130	478	601	2750	998	498	162	99	194	172
7	67	120	1360	475	556	2190	1020	451	158	102	173	169
8	69	114	1040	1110	524	2420	895	547	183	89	159	161
9	62	106	863	874	714	2160	826	527	180	79	144	147
10	73	103	740	611	908	3690	795	461	155	80	137	145
11	70	102	651	576	e633	2620	769	429	154	81	130	182
12	73	101	539	1210	e671	1870	750	402	171	72	133	163
13	131	100	481	1350	682	1600	797	379	228	64	129	142
14	104	105	450	972	698	1420	931	360	172	60	120	134
15	90	116	439	776	759	1270	766	347	145	70	118	126
16	83	110	542	462	927	1150	769	361	150	158	122	123
17	83	107	465	600	1350	1040	741	332	228	120	1330	123
18	90	179	410	e900	1390	978	681	309	218	584	3430	151
19	88	184	390	e790	1420	935	646	306	158	936	983	150
20	83	146	365	e650	1340	853	613	306	136	345	784	124
21	99	129	455	e520	1290	815	571	304	120	191	589	114
22	114	115	558	e450	1260	867	601	287	191	169	1150	143
23	112	114	448	e580	3720	781	599	270	151	247	672	327
24	103	111	401	e800	3690	736	545	252	125	490	489	223
25	92	110	378	1110	2070	741	515	245	123	198	399	169
26	89	108	353	900	1620	722	485	257	114	262	355	285
27	91	408	323	674	1300	1380	473	265	102	698	326	373
28	89	8770	308	2480	1110	4510	464	241	185	3670	289	237
29	86	2180	312	2970	---	5640	438	224	166	993	265	178
30	93	1240	308	1670	---	2920	505	215	185	540	247	153
31	171	---	289	1220	---	1970	---	204	---	366	223	---
TOTAL	2770	15771	22275	27348	33264	57068	23743	11089	4941	11430	14947	5371
MEAN	89.4	526	719	882	1188	1841	791	358	165	369	482	179
MAX	171	8770	4590	2970	3720	5640	1720	557	228	3670	3430	373
MIN	62	100	289	300	524	722	438	204	102	60	118	114
CFSM	.19	1.11	1.52	1.87	2.52	3.90	1.68	.76	.35	.78	1.02	.38
IN.	.22	1.24	1.76	2.16	2.62	4.50	1.87	.87	.39	.90	1.18	.42

e Estimated.

RAPPAHANNOCK RIVER BASIN

171

01667500 RAPIDAN RIVER NEAR CULPEPER, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	428	463	548	637	718	837	790	572	448	294	341	331
MAX	3163	2690	1653	1732	1693	2236	2615	1603	2804	1206	2323	2084
(WY)	1943	1986	1949	1978	1984	1993	1937	1989	1972	1949	1955	1979
MIN	8.10	29.4	62.4	93.6	91.5	179	210	166	86.2	68.0	22.5	14.0
(WY)	1931	1931	1931	1966	1931	1931	1981	1956	1977	1957	1957	1954

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1931 - 1994

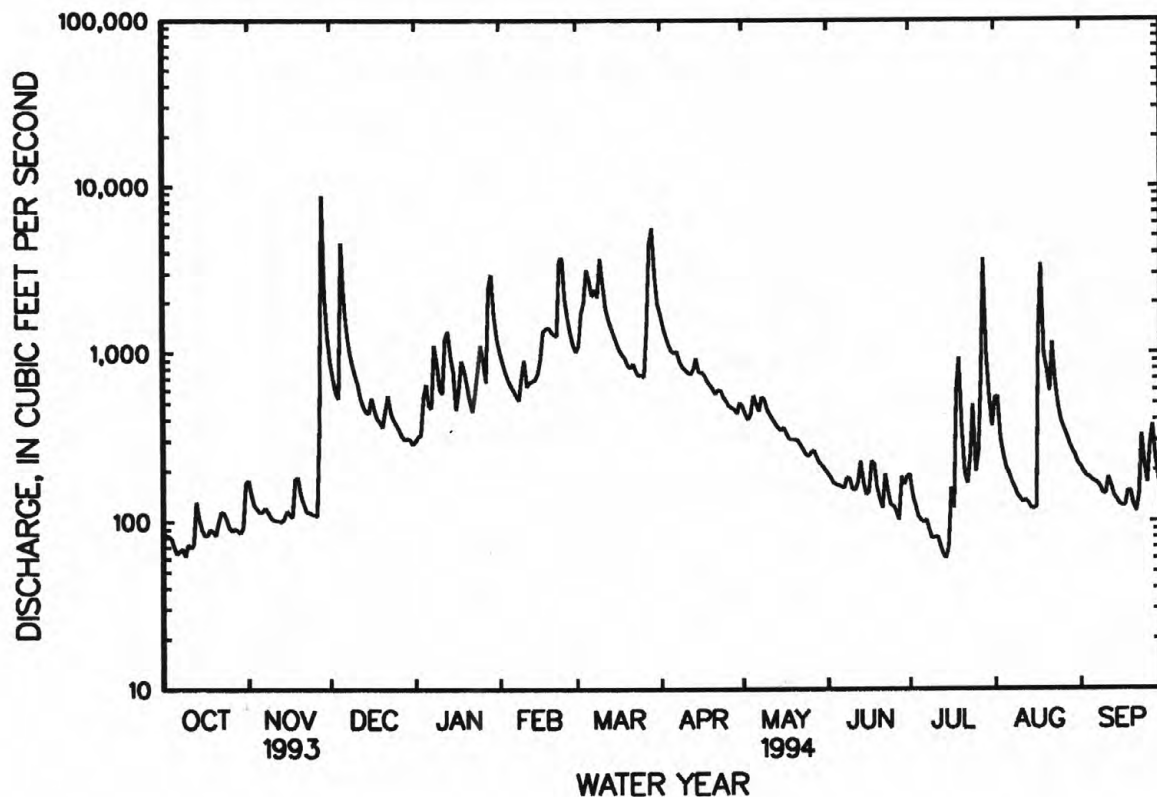
ANNUAL TOTAL	257348		230017									
ANNUAL MEAN	705		630									
HIGHEST ANNUAL MEAN												1973
LOWEST ANNUAL MEAN												1931
HIGHEST DAILY MEAN	10000	Mar 5	8770	Nov 28								1972
LOWEST DAILY MEAN	57	Sep 15	60	Jul 14								1954
ANNUAL SEVEN-DAY MINIMUM	68	aAug 26	68	Oct 5								1954
INSTANTANEOUS PEAK FLOW			10900	Nov 28								1942
INSTANTANEOUS PEAK STAGE			14.58	Nov 28								1942
INSTANTANEOUS LOW FLOW			54	Oct 12								1954
ANNUAL RUNOFF (CFSM)	1.49		1.34									
ANNUAL RUNOFF (INCHES)	20.28		18.13									
10 PERCENT EXCEEDS	1640		1350									
50 PERCENT EXCEEDS	416		353									
90 PERCENT EXCEEDS	88		102									

a Also Oct. 5, 1993.

b From floodmark.

c Result of regulation.

d Also Oct. 5, 11, 1954.





## RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA

LOCATION.--Lat 38°19'20", long 77°31'05", Spotsylvania County, Hydrologic Unit 02080104, on right bank 1.6 mi upstream from Virginia Power dam, 2.2 mi downstream from Motts Run, and 3.8 mi upstream from Fredericksburg.

DRAINAGE AREA.--1,596 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1907 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 801: 1924(M). WSP 951: 1937(M). WSP 1302: 1907-12, 1913(M), 1916(M), 1918(M), 1920-21(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 55.18 ft above sea level. Prior to Jan. 15, 1922, nonrecording gage, and Jan. 15, 1922, to Aug. 2, 1966, water-stage recorder at same site at datum 1.00 ft higher.

REMARKS.--Records good except those for periods with ice effect, Dec. 29-31, Jan. 16-27, and Feb. 12-14, which are fair. Maximum discharge, 140,000 ft<sup>3</sup>/s, from rating curve extended above 76,000 ft<sup>3</sup>/s on basis of flow-over-dam and slope-area measurements at gage heights 26.1 ft and 26.9 ft, present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1889 was probably several feet lower than that of Oct. 16, 1942.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 16,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0830	*43,100	*13.22	Mar. 10	2130	19,200	8.96
Dec. 5	2400	22,700	9.66	Mar. 28	1330	25,400	10.17
Jan. 29	0300	16,900	8.44	July 28	2130	20,900	9.30
Feb. 24	0930	25,000	10.09	Aug. 18	1700	22,400	9.60
Mar. 3	0600	18,700	8.84				

Minimum discharge, 151 ft<sup>3</sup>/s, Oct. 8, gage height, 1.44 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	290	360	3060	1160	3310	3290	6390	1570	557	1230	1360	660
2	240	467	2270	1270	2760	3940	5080	1400	533	856	1330	644
3	213	386	1810	1320	2320	14200	4220	1270	506	582	1230	608
4	196	326	1590	1740	2090	9820	3630	1240	471	583	938	553
5	191	303	12300	2760	1950	11100	3240	1460	459	464	808	529
6	181	298	13200	1960	1860	9710	3010	1580	451	394	729	509
7	167	292	5010	1640	1770	7550	3250	1390	439	372	719	491
8	156	290	3440	4170	1710	8320	3190	1420	443	346	630	485
9	157	288	2690	4260	1790	8840	2650	2340	565	353	563	469
10	166	275	2230	2500	3170	12800	2460	1710	530	376	530	438
11	161	264	1950	2140	2670	13300	2390	1460	451	421	507	423
12	184	258	1690	3040	e2800	7220	2270	1310	441	361	3580	416
13	194	257	1440	6010	e2500	5640	2250	1220	518	312	2250	422
14	217	265	1340	3660	e2200	4870	2780	1140	705	281	1000	394
15	289	269	1310	2930	2050	4380	2430	1070	528	311	793	377
16	241	289	1750	e1800	2350	3960	2460	1050	440	410	691	365
17	215	307	2080	e1900	4080	3540	3150	1110	743	377	1930	366
18	204	343	1570	e2600	5110	3210	2420	984	1070	978	19200	412
19	198	415	1410	e2100	5910	3110	2190	920	739	2080	9290	459
20	203	508	1320	e1800	5970	2840	2050	915	544	1660	2950	432
21	209	411	1530	e1600	5260	2610	1850	913	464	782	2180	368
22	349	358	2650	e1680	5420	2900	1760	884	433	559	3580	399
23	321	320	1960	e2000	9580	2920	1830	822	637	523	2500	891
24	310	303	1590	e3000	20200	2610	1720	758	528	2790	1630	1340
25	276	294	1410	e5400	10200	2570	1630	705	433	2080	1260	766
26	256	287	1310	e3800	6210	2650	1540	692	389	1520	1080	790
27	239	377	1200	e3200	4680	3750	1440	704	408	2760	1030	1370
28	227	35100	1160	3490	3770	22700	1510	703	341	14700	986	1100
29	222	23400	e1110	13100	---	22100	1430	656	564	7940	865	717
30	242	4760	e1060	6560	---	15800	1400	612	736	2960	780	555
31	274	---	e1040	4140	---	7580	---	588	---	1850	722	---
TOTAL	6988	72070	79480	98730	123690	229830	77620	34596	16066	51211	67641	17748
MEAN	225	2402	2564	3185	4417	7414	2587	1116	536	1652	2182	592
MAX	349	35100	13200	13100	20200	22700	6390	2340	1070	14700	19200	1370
MIN	156	257	1040	1160	1710	2570	1400	588	341	281	507	365
CFSM	.14	1.51	1.61	2.00	2.77	4.65	1.62	.70	.34	1.04	1.37	.37
IN.	.16	1.68	1.85	2.30	2.88	5.36	1.81	.81	.37	1.19	1.58	.41

e Estimated.



## RAPPAHANNOCK RIVER BASIN

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01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1907 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1152	1306	1664	2142	2472	2682	2523	1905	1383	906	1032	904
MAX	11090	6522	5357	6203	6550	8505	9484	10310	7112	3368	7190	5911
(WY)	1943	1986	1949	1978	1979	1993	1983	1924	1972	1949	1955	1979
MIN	15.3	75.4	147	268	224	526	587	492	224	78.6	21.1	46.5
(WY)	1931	1931	1931	1966	1931	1931	1981	1956	1977	1930	1930	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

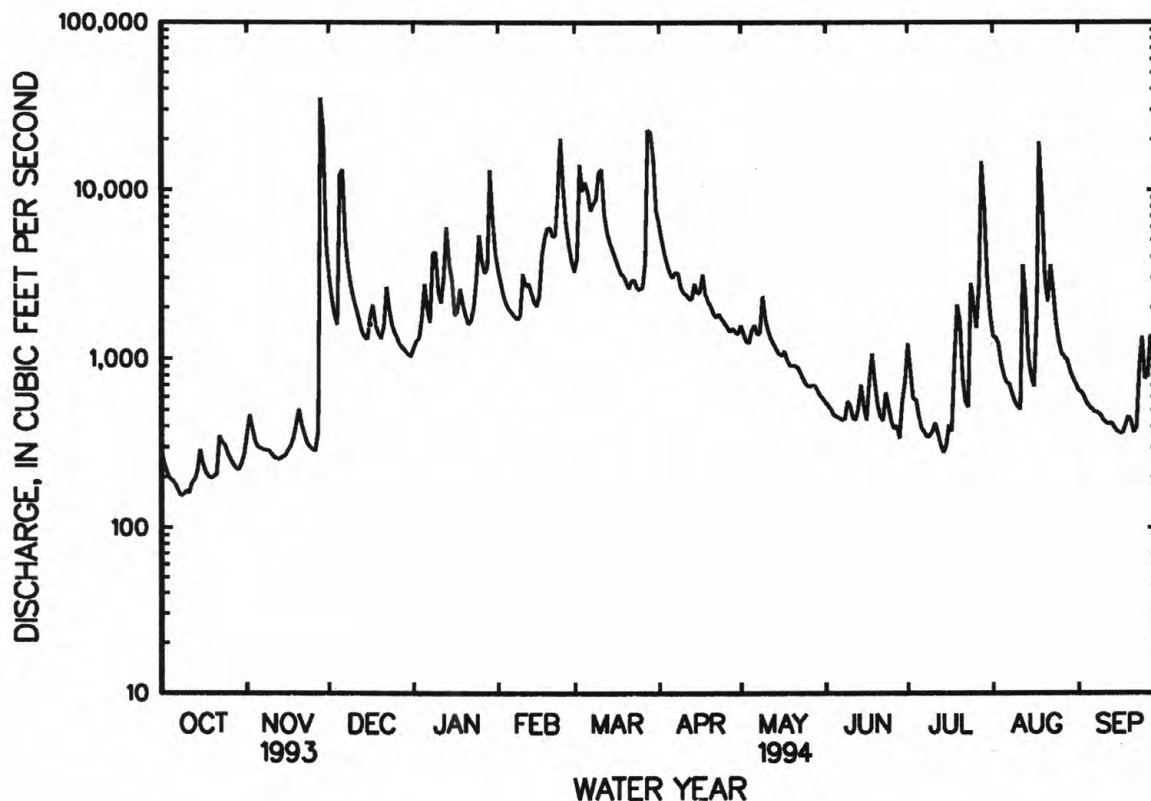
## FOR 1994 WATER YEAR

## WATER YEARS 1907 - 1994

ANNUAL TOTAL	872193	875670	
ANNUAL MEAN	2390	2399	1668
HIGHEST ANNUAL MEAN			3066
LOWEST ANNUAL MEAN			440
HIGHEST DAILY MEAN	51500	Mar 5	127000
LOWEST DAILY MEAN	138	Sep 16	5.0
ANNUAL SEVEN-DAY MINIMUM	163	Aug 28	8.3
INSTANTANEOUS PEAK FLOW			140000
INSTANTANEOUS PEAK STAGE			26.90
INSTANTANEOUS LOW FLOW			5.0
ANNUAL RUNOFF (CFSM)	1.50	1.50	1.05
ANNUAL RUNOFF (INCHES)	20.33	20.41	14.20
10 PERCENT EXCEEDS	5450	5170	3300
50 PERCENT EXCEEDS	1220	1270	986
90 PERCENT EXCEEDS	205	289	235

a Also Oct. 12, 1930.

b From floodmarks.



## RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1929-30, 1956, 1967-74, 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1955 to September 1956, April 1968 to August 1974. October 1991 to current year.

WATER TEMPERATURE: October 1955 to September 1956, April 1968 to August 1974.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT												
13...	0800	195	85	7.0	9.0	13.5	764	VDCLS	2.3	8.9	85	--
27...	0815	243	115	6.7	16.0	13.5	759	VDCLS	1.5	8.9	85	--
NOV												
09...	0900	291	98	7.3	2.0	6.0	776	VDCLS	1.5	12.3	97	--
23...	0900	326	98	7.8	2.0	6.0	773	USGS	0.60	12.2	97	19
23...	0901	326	98	7.8	2.0	6.0	773	VDCLS	1.7	12.2	97	--
30...	0845	4890	68	7.5	0.5	8.0	775	VDCLS	84	12.0	100	--
30...	0900	4960	68	7.5	0.5	8.0	775	VDCLS	81	12.0	100	--
DEC												
01...	1100	3070	67	6.7	5.0	6.0	778	VDCLS	38	11.9	94	--
07...	1015	5070	66	7.7	11.0	8.0	762	VDCLS	54	10.8	91	--
22...	0845	2890	85	6.8	0.0	3.5	759	VDCLS	6.5	12.7	96	--
JAN												
04...	0900	1480	82	7.6	2.0	0.5	744	VDCLS	6.2	13.6	97	--
FEB												
01...	0900	3350	66	7.5	0.0	2.5	770	USGS	5.3	13.8	100	120
01...	0901	3350	66	7.5	0.0	2.5	770	VDCLS	20	13.8	100	--
MAR												
16...	0900	3980	64	7.5	6.0	8.0	755	USGS	8.0	11.0	94	K11
16...	0901	3980	64	7.5	6.0	8.0	755	VDCLS	9.9	11.2	95	--
26...	0845	2700	68	7.0	12.0	9.0	766	VDCLS	--	11.0	95	--
APR												
01...	1030	6590	62	7.1	16.0	10.0	767	VDCLS	24	--	--	--
28...	1100	1530	71	7.7	23.0	21.0	771	USGS	0.90	9.0	100	K12
28...	1101	1530	71	7.7	23.0	21.0	771	VDCLS	2.9	9.0	100	--
MAY												
10...	0845	1750	71	6.7	15.0	15.0	760	VDCLS	14	9.0	89	--
23...	0930	826	70	7.9	21.0	19.5	760	VDCLS	4.4	8.4	92	--
JUN												
17...	1230	421	87	7.7	28.0	27.5	769	USGS	0.70	7.7	97	27
17...	1231	421	87	7.7	28.0	27.5	769	VDCLS	1.3	7.7	97	--
27...	0930	421	85	7.5	25.5	26.0	758	VDCLS	1.6	6.8	84	--
JUL												
08...	0930	344	81	7.6	27.0	29.5	767	VDCLS	4.0	6.5	85	--
20...	0900	1830	78	7.2	24.0	27.0	769	VDCLS	70	6.8	85	--
29...	0900	7760	69	6.7	23.0	22.0	760	VDCLS	170	7.4	85	--
AUG												
08...	0900	643	87	7.3	19.0	23.0	770	VDCLS	3.6	8.8	102	--
23...	0930	2590	65	7.0	19.0	22.0	770	USGS	38	8.3	95	--
23...	0931	2590	65	7.0	19.0	22.0	770	VDCLS	90	8.3	95	--
SEP												
07...	1000	490	83	8.1	24.0	20.5	764	VDCLS	1.8	8.6	95	--
21...	0900	374	87	7.4	16.0	19.0	770	VDCLS	1.5	8.7	93	--
21...	0915	374	87	7.4	16.0	19.0	770	VDCLS	2.0	8.7	93	--

K Results based on colony count outside the acceptance range (non-ideal colony count).

## RAPPAHANNOCK RIVER BASIN

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01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
OCT											
13...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
09...	--	--	--	--	--	--	--	--	--	--	--
23...	38	29	7.4	2.5	5.8	2.8	--	--	--	7.0	6.4
23...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
JAN											
04...	--	--	--	--	--	--	--	--	--	--	--
FEB											
01...	330	20	4.9	1.8	3.2	1.7	12	0	10	5.5	4.2
01...	--	--	--	--	--	--	--	--	--	--	--
MAR											
16...	K10	19	4.9	1.7	2.7	1.1	17	0	14	6.9	3.8
16...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
APR											
01...	--	--	--	--	--	--	--	--	--	--	--
28...	15	23	6.0	2.0	3.7	1.4	23	0	19	5.5	3.9
28...	--	--	--	--	--	--	--	--	--	--	--
MAY											
10...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
JUN											
17...	44	26	6.7	2.3	5.4	2.1	31	0	26	5.5	6.5
17...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
JUL											
08...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
AUG											
08...	--	--	--	--	--	--	--	--	--	--	--
23...	--	22	5.6	2.0	2.7	2.4	21	0	17	5.1	3.5
23...	--	--	--	--	--	--	--	--	--	--	--
SEP											
07...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--

K Results based on colony count outside the acceptance range (non-ideal colony count).

## RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L) (00530)	RESIDUE FIXED NON FILTER- ABLE (MG/L) (00540)	RESIDUE VOLA- TILE, SUS- PENDED (MG/L) (00535)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618) (*)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613) (*)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630) (*)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631) (*)
OCT											
13...	--	4.3	--	--	<3	<3	<3	<0.040	<0.010	--	<0.040
27...	--	6.8	--	--	<3	<3	<3	<0.040	<0.010	--	<0.040
NOV											
09...	--	8.2	--	--	<3	<3	<3	<0.040	<0.010	--	<0.040
23...	0.10	6.1	53	56	3	2	1	--	--	--	--
23...	--	6.2	--	--	<3	<3	<3	<0.040	<0.010	--	<0.040
30...	--	8.5	--	--	76	65	11	0.910	<0.010	0.910	0.910
30...	--	8.5	--	--	63	54	9	0.930	<0.010	0.930	0.930
DEC											
01...	--	9.4	--	--	30	25	5	0.900	<0.010	0.900	0.900
07...	--	9.2	--	--	50	44	6	0.720	0.010	0.730	0.730
22...	--	12	--	--	22	19	3	0.840	<0.010	0.840	0.840
JAN											
04...	--	6.5	--	--	6	4	2	0.950	<0.010	0.950	0.950
FEB											
01...	<0.10	8.5	38	39	32	21	11	0.750	0.050	0.800	0.800
01...	--	10	--	--	35	28	7	0.764	0.003	0.767	0.767
MAR											
16...	<0.10	9.8	48	43	23	13	10	0.770	0.020	0.790	0.790
16...	--	10	--	--	--	--	--	0.710	0.002	0.712	0.712
26...	--	11	--	--	35	30	5	0.700	<0.010	0.700	0.700
APR											
01...	--	10	--	--	46	41	5	0.622	0.002	0.624	0.624
28...	<0.10	8.1	42	43	5	2	3	--	<0.010	0.260	0.260
28...	--	8.0	--	--	<3	<3	<3	0.259	0.002	0.261	0.261
MAY											
10...	--	11	--	--	48	41	7	0.476	0.003	0.479	0.479
23...	--	9.6	--	--	16	13	3	0.313	0.003	0.316	0.316
JUN											
17...	<0.10	9.3	28	55	<5	--	6	0.430	0.010	0.440	0.440
17...	--	8.7	--	--	<3	<3	<3	0.450	0.005	0.455	0.455
27...	--	8.9	--	--	<3	<3	<3	0.498	0.005	0.503	0.503
JUL											
08...	--	9.0	--	--	<3	<3	<3	0.372	0.005	0.377	0.377
20...	--	8.9	--	--	83	71	12	0.724	0.017	0.741	0.741
29...	--	9.3	--	--	174	151	23	0.547	0.008	0.555	0.555
AUG											
08...	--	13	--	--	33	10	23	0.516	0.003	0.519	0.519
23...	<0.10	11	47	46	82	64	18	--	<0.010	0.520	0.520
23...	--	11	--	--	88	76	12	0.469	0.003	0.472	0.472
SEP											
07...	--	11	--	--	<3	<3	<3	0.091	<0.002	0.091	0.091
21...	--	8.3	--	--	<3	<3	<3	0.005	<0.002	0.005	0.005
21...	--	8.4	--	--	4	<3	4	<0.004	<0.002	--	<0.004

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.

## RAPPAHANNOCK RIVER BASIN

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01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608) (*)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671) (*)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
OCT											
13...	--	<0.040	0.20	0.020	0.010	<0.010	--	--	--	--	--
27...	--	<0.040	0.20	0.030	0.020	<0.010	--	--	--	--	--
NOV											
09...	--	<0.040	0.20	0.020	<0.010	0.010	--	--	--	--	--
23...	--	--	--	--	--	--	<10	24	<3	110	<4
23...	--	<0.040	0.20	0.010	<0.010	<0.010	--	--	--	--	--
30...	--	0.040	0.60	0.200	0.020	0.020	--	--	--	--	--
30...	--	0.040	0.60	0.210	0.020	0.020	--	--	--	--	--
DEC											
01...	--	<0.040	0.40	0.100	0.020	0.020	--	--	--	--	--
07...	--	<0.040	0.50	0.160	0.030	0.030	--	--	--	--	--
22...	--	<0.040	0.30	0.050	0.020	0.020	--	--	--	--	--
JAN											
04...	--	<0.040	--	--	0.010	0.020	--	--	--	--	--
FEB											
01...	--	0.040	0.40	0.080	0.030	0.020	--	--	--	--	--
01...	--	0.031	0.30	0.060	0.030	0.014	--	--	--	--	--
MAR											
16...	--	0.010	<0.20	0.010	<0.010	<0.010	80	14	<3	83	<4
16...	--	0.005	0.30	0.060	0.020	0.009	--	--	--	--	--
26...	--	<0.040	0.30	0.080	0.020	0.030	--	--	--	--	--
APR											
01...	--	0.007	0.40	0.090	0.020	0.013	--	--	--	--	--
28...	--	0.010	<0.20	<0.010	<0.010	<0.010	40	16	<3	130	<4
28...	--	0.006	0.20	0.020	0.010	0.003	--	--	--	--	--
MAY											
10...	--	0.012	0.50	0.080	0.010	0.006	--	--	--	--	--
23...	--	0.018	0.30	0.030	<0.010	0.005	--	--	--	--	--
JUN											
17...	--	0.030	0.30	<0.010	0.010	<0.010	--	--	--	--	--
17...	--	0.049	0.30	0.010	<0.010	0.002	--	--	--	--	--
27...	--	0.023	0.30	0.030	0.020	0.007	--	--	--	--	--
JUL											
08...	--	0.008	0.30	0.040	0.020	0.003	--	--	--	--	--
20...	--	0.116	1.3	0.180	0.080	0.035	--	--	--	--	--
29...	0.050	0.041	0.80	0.100	0.070	0.047	--	--	--	--	--
AUG											
08...	<0.040	0.021	0.40	0.040	0.030	0.021	--	--	--	--	--
23...	--	0.040	0.50	0.190	0.030	0.030	120	17	<3	260	<4
23...	--	0.037	0.40	0.070	0.050	0.025	--	--	--	--	--
SEP											
07...	--	0.013	0.20	0.010	0.010	0.009	--	--	--	--	--
21...	--	0.006	0.30	0.020	0.010	0.004	--	--	--	--	--
21...	--	0.006	0.20	0.020	0.010	0.003	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.



## RAPPAHANNOCK RIVER BASIN

01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
13...	--	--	--	--	--	--	--	2.2	--	--	--
27...	--	--	--	--	--	--	--	2.8	--	--	--
NOV											
09...	--	--	--	--	--	--	--	1.8	--	--	--
23...	5	<10	<1	<1	<1.0	51	<6	2.7	--	1	77
23...	--	--	--	--	--	--	--	3.0	--	--	--
30...	--	--	--	--	--	--	--	5.9	--	--	--
30...	--	--	--	--	--	--	--	6.4	--	--	--
DEC											
01...	--	--	--	--	--	--	--	4.0	--	--	--
07...	--	--	--	--	--	--	--	6.4	--	--	--
22...	--	--	--	--	--	--	--	3.8	--	--	--
JAN											
04...	--	--	--	--	--	--	--	4.2	1.1	--	--
FEB											
01...	--	--	--	--	--	--	--	3.3	--	33	98
01...	--	--	--	--	--	--	--	3.4	--	--	--
MAR											
16...	6	<10	<1	<1	<1.0	24	<6	2.2	--	25	95
16...	--	--	--	--	--	--	--	2.1	--	--	--
26...	--	--	--	--	--	--	--	11	--	--	--
APR											
01...	--	--	--	--	--	--	--	2.6	--	--	--
28...	7	<10	<1	<1	<1.0	33	<6	2.4	--	4	85
28...	--	--	--	--	--	--	--	2.5	--	--	--

&lt; Actual value is known to be less than the value shown.

RAPPAHANNOCK RIVER BASIN

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01668000 RAPPAHANNOCK RIVER NEAR FREDERICKSBURG, VA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAY											
10...	--	--	--	--	--	--	--	3.7	--	--	--
23...	--	--	--	--	--	--	--	7.2	--	--	--
JUN											
17...	--	--	--	--	--	--	--	3.0	--	3	91
17...	--	--	--	--	--	--	--	3.3	--	--	--
27...	--	--	--	--	--	--	--	2.8	--	--	--
JUL											
08...	--	--	--	--	--	--	--	2.8	--	--	--
20...	--	--	--	--	--	--	--	6.6	--	--	--
29...	--	--	--	--	--	--	--	11	--	--	--
AUG											
08...	--	--	--	--	--	--	--	2.5	--	--	--
23...	5	<10	1	<1	<1.0	27	<6	6.6	--	78	99
23...	--	--	--	--	--	--	--	--	--	--	--
SEP											
07...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--

< Actual value is known to be less than the value shown.

## RAPPAHANNOCK RIVER BASIN

01668500 CAT POINT CREEK NEAR MONTROSS, VA

LOCATION.--Lat 38°02'23", long 76°49'38", Richmond County, Hydrologic Unit 02080104, on right bank 200 ft upstream from bridge on State Highway 637, 1.7 mi west of Farmers Fork, 3.8 mi south of Montross, and 11.4 mi upstream from mouth.

DRAINAGE AREA.--45.6 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1943 to current year.

REVISED RECORDS.--WSP 1382: 1944(M), 1945, 1946-51(M), 1952(P), 1953-54(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 3.04 ft above sea level. Prior to Aug. 19, 1953, nonrecording gage near right bank at downstream side of highway bridge at same datum.

REMARKS.--Records good except for period of no gage-height record, Jan. 16-22, which is fair. Prior to 1980, slight diurnal fluctuation at low flow caused by gristmill upstream from station. Maximum discharge, 6,820 ft<sup>3</sup>/s (revised), from rating curve extended above 1,400 ft<sup>3</sup>/s. No flow at times in 1943, 1957, 1959-60, 1966, and 1977. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in September 1935 exceeded 9.3 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 250 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	2400	450	5.95	Mar. 3	0800	*1,430	*7.52
Feb. 24	0600	734	6.50	Mar. 29	1100	835	6.63

Minimum discharge, 3.2 ft<sup>3</sup>/s, Sept. 14.

REVISIONS.--The peak discharges above base of 250 ft<sup>3</sup>/s and annual maximum (\*) reported for water years 1979, 1985, and 1992 have been revised as shown in the following table. They supersede figures published in the reports for 1979, 1985, and 1992.

Water Year	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage Height (ft)
1979	Feb. 25, 1979	0330	1,950	8.12
	Sept. 6, 1979	0400	*3,310	*9.41
1985	Sept. 27, 1985	1600	*1,870	*8.03
1992	Sept. 6, 1992	2100	*5,240	*10.86

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	41	47	35	45	85	210	96	22	5.4	32	7.8
2	6.4	32	41	53	41	235	171	58	63	6.2	45	5.5
3	5.2	27	37	68	41	1080	141	44	59	9.8	69	4.3
4	4.7	24	35	88	39	403	128	54	32	104	40	4.0
5	4.3	25	84	98	41	230	116	98	24	52	32	4.1
6	3.9	27	151	62	51	169	127	97	19	24	33	4.1
7	3.7	33	80	49	46	142	146	63	18	13	27	4.1
8	4.3	33	51	61	41	128	126	54	18	8.6	18	3.8
9	4.8	31	42	67	54	117	101	49	17	7.2	13	3.7
10	6.1	29	39	53	74	155	94	45	14	16	9.2	4.0
11	7.4	28	42	49	97	214	91	38	14	12	7.2	4.2
12	8.8	28	40	54	203	134	90	34	17	9.2	5.9	4.5
13	9.7	28	41	73	158	112	105	31	42	6.4	5.9	3.9
14	11	28	34	61	114	105	124	28	37	4.6	5.4	3.5
15	12	29	38	53	109	98	97	27	24	12	36	3.6
16	11	28	65	e44	109	92	105	32	18	29	50	3.9
17	12	29	62	e40	110	84	107	29	17	37	45	4.0
18	11	47	47	e45	99	83	86	25	15	102	46	8.1
19	12	50	45	e40	99	88	72	25	12	43	33	8.3
20	12	42	40	e37	102	80	65	30	8.8	27	23	7.8
21	14	36	87	e38	102	79	61	33	7.6	19	17	7.1
22	18	33	96	e42	95	106	58	32	10	17	32	28
23	20	30	60	51	216	89	57	29	16	13	55	148
24	19	29	46	54	577	74	54	26	23	12	43	117
25	18	28	42	54	266	94	54	27	13	11	27	44
26	18	28	38	53	148	115	48	39	7.9	63	17	71
27	20	30	35	53	106	141	45	35	11	117	13	60
28	21	162	34	75	89	505	42	27	8.8	55	11	40
29	21	249	34	123	---	793	57	23	5.6	39	12	25
30	27	74	34	77	---	453	145	21	5.0	37	13	18
31	40	---	34	54	---	252	---	20	---	37	10	---
TOTAL	395.6	1338	1601	1804	3272	6535	2923	1269	598.7	948.4	825.6	655.3
MEAN	12.8	44.6	51.6	58.2	117	211	97.4	40.9	20.0	30.6	26.6	21.8
MAX	40	249	151	123	577	1080	210	98	63	117	69	148
MIN	3.7	24	34	35	39	74	42	20	5.0	4.6	5.4	3.5
CFSM	.28	.98	1.13	1.28	2.56	4.62	2.14	.90	.44	.67	.58	.48
IN.	.32	1.09	1.31	1.47	2.67	5.33	2.38	1.04	.49	.77	.67	.53

e Estimated.

## RAPPAHANNOCK RIVER BASIN

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01668500 CAT POINT CREEK NEAR MONTROSS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	25.6	36.8	46.7	57.8	63.0	77.5	68.3	51.2	36.0	25.9	29.3	25.8
MAX	134	119	126	175	175	211	164	149	232	124	153	209
(WY)	1980	1980	1984	1978	1979	1994	1983	1990	1972	1945	1969	1979
MIN	1.47	6.70	11.6	12.9	24.1	23.2	20.7	11.1	4.59	1.13	.89	.41
(WY)	1955	1992	1955	1955	1955	1945	1985	1955	1945	1957	1963	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1944 - 1994

ANNUAL TOTAL	18662.8	22165.6	
ANNUAL MEAN	51.1	60.7	45.2
HIGHEST ANNUAL MEAN			89.4
LOWEST ANNUAL MEAN			18.7
HIGHEST DAILY MEAN	564	Mar 5	2390
LOWEST DAILY MEAN	1.5	Aug 3	.00
ANNUAL SEVEN-DAY MINIMUM	1.7	Jul 30	.00
INSTANTANEOUS PEAK FLOW			1430
INSTANTANEOUS PEAK STAGE			7.52
INSTANTANEOUS LOW FLOW			3.2
ANNUAL RUNOFF (CFSM)	1.12		1.33
ANNUAL RUNOFF (INCHES)	15.22		18.08
10 PERCENT EXCEEDS	115		117
50 PERCENT EXCEEDS	37		38
90 PERCENT EXCEEDS	4.8		7.2
			4.6

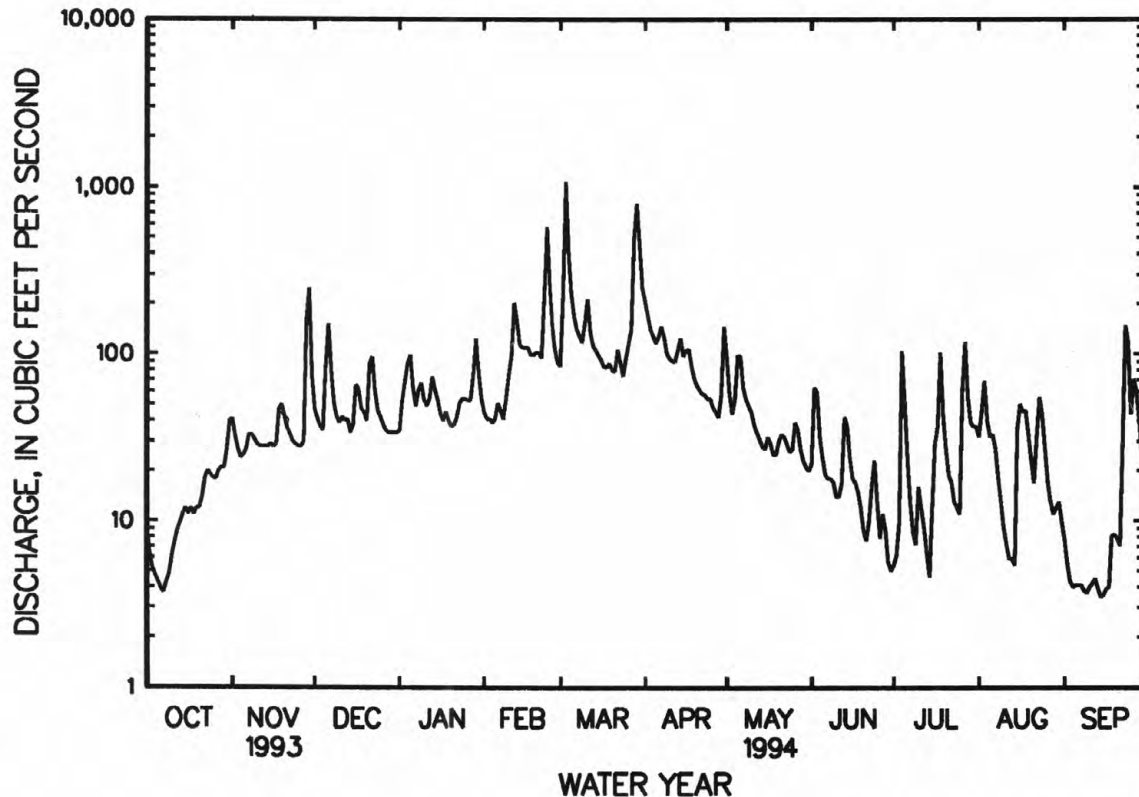
a Many days in 1943 (partial year), 1957, 1959, 1966, and 1977.

b Also Aug. 9, 10, 1957, and Aug. 31 to Sept. 7, 1966.

c Revised.

 d Result of Chandlers Millpond dam washout. Revised discharge, 5,240 ft<sup>3</sup>/s from rating curve extended above 1,750 ft<sup>3</sup>/s.

f At times in 1943 (partial year), 1957, 1959-60, 1966, and 1977.



## RAPPAHANNOCK RIVER BASIN

01669000 PISCATAWAY CREEK NEAR TAPPAHANNOCK, VA

LOCATION.--Lat 37°52'37", long 76°54'03", Essex County, Hydrologic Unit 02080104, on right bank at upstream side of bridge on State Highway 691, 0.6 mi south of Hensley Fork, 2.3 mi downstream from Sturgeon Swamp, and 4.2 mi southwest of Tappahannock.

DRAINAGE AREA.--28.0 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1951 to current year.

REVISED RECORDS.--WSP 2103: Drainage area. WDR VA-79-1: 1970-76(P), 1978(P).

GAGE.--Water-stage recorder. Datum of gage is 2.50 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 30, 31, and Jan. 16, 18, 19, and period of no gage-height record, May 19 to June 7, which are fair. Maximum discharge, 2,380 ft<sup>3</sup>/s, from rating curve extended above 1,400 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 250 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 3	0315	*548	*4.70	Mar. 29	1030	390	4.03

Minimum discharge, 1.5 ft<sup>3</sup>/s, Sept. 13-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	31	21	21	29	56	123	85	e25	25	24	5.8
2	6.2	24	18	36	27	200	103	63	e24	18	19	4.7
3	5.6	20	17	42	26	406	94	54	e23	15	17	3.3
4	4.6	17	16	52	25	179	88	66	e22	13	17	2.9
5	4.4	17	30	48	27	117	82	98	e21	11	16	2.7
6	4.0	20	50	34	30	94	88	78	e20	9.8	16	2.8
7	3.8	24	30	29	28	86	97	64	e20	8.6	17	2.8
8	4.4	22	22	35	27	84	83	60	24	8.0	13	2.7
9	4.7	20	19	35	39	84	77	56	20	6.7	10	2.5
10	8.7	17	18	29	48	99	74	50	17	5.9	9.1	2.2
11	8.3	16	19	25	66	122	71	47	16	5.6	8.0	2.1
12	10	15	17	33	105	84	70	47	17	4.6	7.6	1.8
13	9.5	15	16	43	71	77	80	41	17	5.0	8.7	1.6
14	8.1	15	16	34	63	75	94	38	16	5.0	10	1.6
15	7.5	15	19	29	58	71	72	37	14	7.2	14	1.6
16	7.1	15	27	e26	58	67	94	45	15	15	14	1.9
17	7.3	15	25	24	57	64	88	45	23	31	15	1.9
18	7.5	24	21	e40	56	65	67	38	23	81	15	3.5
19	7.6	26	20	e36	56	64	61	e35	18	51	13	3.9
20	9.5	20	19	29	57	61	58	e35	14	22	11	4.3
21	12	17	56	26	54	63	55	e38	12	14	9.1	3.4
22	18	16	56	25	51	89	56	e37	13	11	9.6	19
23	18	15	36	27	82	73	57	e34	14	11	9.7	55
24	16	14	29	33	172	63	54	e31	34	11	8.2	39
25	13	13	26	32	97	71	58	e33	30	23	6.6	27
26	12	12	23	30	72	78	51	e42	16	61	5.9	111
27	14	15	21	26	62	84	49	e37	15	75	6.0	105
28	16	67	21	40	57	267	59	e31	17	47	5.7	56
29	15	62	25	60	---	370	62	e27	15	30	5.6	26
30	22	31	e23	41	---	217	155	e24	22	28	6.3	16
31	33	---	e24	33	---	141	---	e23	---	27	5.9	---
TOTAL	325.8	650	780	1053	1600	3671	2320	1439	577	686.4	353.0	514.0
MEAN	10.5	21.7	25.2	34.0	57.1	118	77.3	46.4	19.2	22.1	11.4	17.1
MAX	33	67	56	60	172	406	155	98	34	81	24	111
MIN	3.8	12	16	21	25	56	49	23	12	4.6	5.6	1.6
CFSM	.38	.77	.90	1.21	2.04	4.23	2.76	1.66	.69	.79	.41	.61
IN.	.43	.86	1.04	1.40	2.13	4.88	3.08	1.91	.77	.91	.47	.68

e Estimated.



RAPPAHANNOCK RIVER BASIN

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01669000 PISCATAWAY CREEK NEAR TAPPAHANNOCK, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	19.0	26.9	30.8	37.8	43.8	53.0	49.4	37.6	25.6	17.6	18.0	15.6
MAX	63.4	74.1	66.8	88.4	99.8	118	109	87.0	111	105	88.0	70.4
(WY)	1980	1980	1958	1978	1961	1994	1958	1958	1972	1975	1955	1979
MIN	1.30	6.30	9.20	7.93	14.0	13.5	13.4	7.41	4.20	2.01	1.00	.28
(WY)	1955	1955	1966	1955	1955	1981	1985	1955	1986	1954	1954	1954

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1952 - 1994

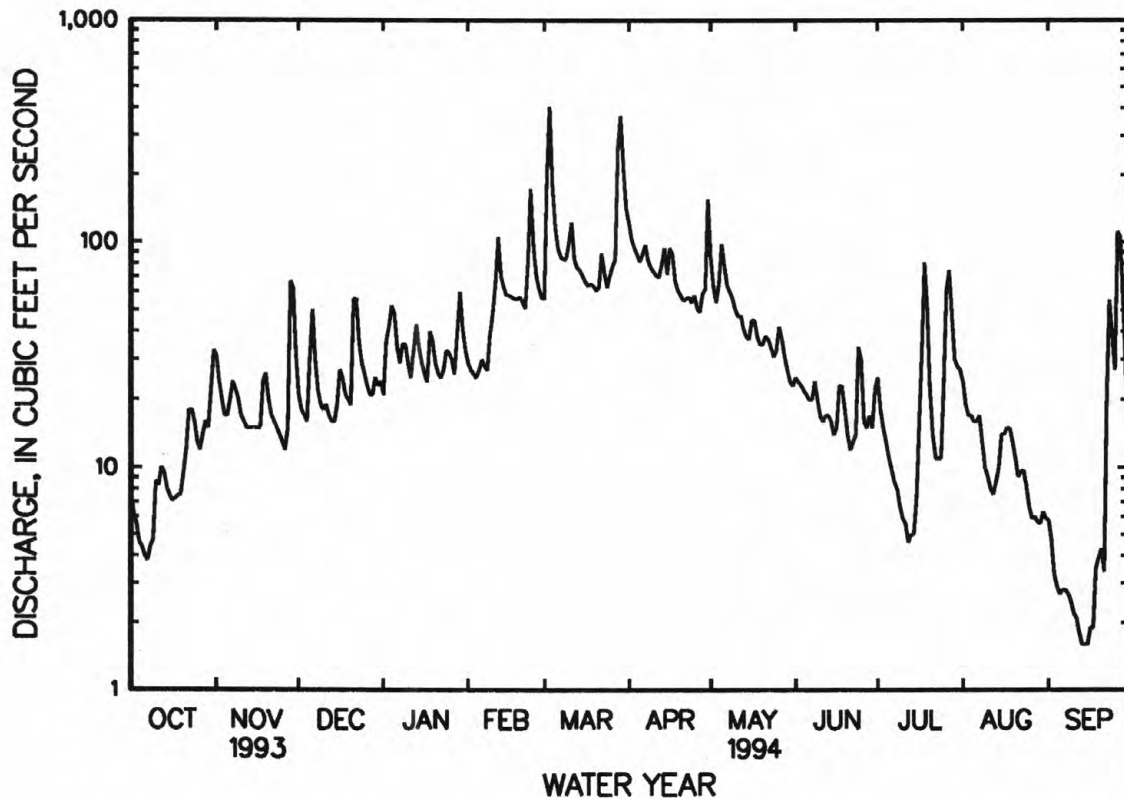
ANNUAL TOTAL	10757.8		13969.2									
ANNUAL MEAN	29.5		38.3							31.2		
HIGHEST ANNUAL MEAN										56.8		1958
LOWEST ANNUAL MEAN										12.1		1954
HIGHEST DAILY MEAN	177	Mar 5				406	Mar 3			1080	Aug 13	1955
LOWEST DAILY MEAN	1.1	aAug 2				1.6	bSep 13			.02	Oct 1	1954
ANNUAL SEVEN-DAY MINIMUM	1.4	Jul 28				1.8	Sep 11			.13	Sep 25	1954
INSTANTANEOUS PEAK FLOW						548	Mar 3			2380	Aug 20	1969
INSTANTANEOUS PEAK STAGE						4.70	Mar 3			c7.52	Aug 20	1969
INSTANTANEOUS LOW FLOW						1.5	dSep 13			.01	Oct 2	1954
ANNUAL RUNOFF (CFSM)	1.05					1.37				1.11		
ANNUAL RUNOFF (INCHES)	14.29					18.56				15.13		
10 PERCENT EXCEEDS	62					82				63		
50 PERCENT EXCEEDS	24					25				23		
90 PERCENT EXCEEDS	4.0					5.9				5.3		

a Also Aug. 3, 1993.

b Also Sept. 14, 15, 1994.

c From high-water mark in well.

d Also Sept. 14, 1994.



## PIANKATANK RIVER BASIN

01669520 DRAGON SWAMP AT MASCOT, VA

LOCATION.--Lat 37°38'01", long 76°41'48", King and Queen County, Hydrologic Unit 02080102, on right bank at upstream side of bridge on State Highway 603, 0.8 mi east of Mascot, 2.1 mi downstream from Church Swamp, and 3.3 mi west of Warner.

DRAINAGE AREA.--108 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1981 to current year.

GAGE.--Water-stage recorder. Datum of gage is 21.60 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Jan. 10, 11, 16, 18, 19, and Feb. 3, 4, which are fair. Maximum discharge, 2,750 ft<sup>3</sup>/s, from rating curve extended above 1,400 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 26	0100	748	6.72	Mar. 30	1500	1,280	7.67
Mar. 4	0400	*2,750	*9.00				

Minimum discharge, 4.5 ft<sup>3</sup>/s, Sept. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	76	136	81	206	331	706	148	48	29	226	12
2	23	81	125	121	187	479	526	153	52	26	161	11
3	21	79	117	144	e170	2180	424	162	46	21	143	10
4	19	77	112	190	e150	2530	366	202	42	55	161	9.1
5	17	79	152	233	148	1320	324	294	36	80	156	8.2
6	15	90	196	236	145	684	299	288	33	86	164	7.6
7	14	105	186	209	139	496	294	296	27	105	132	7.2
8	13	99	167	199	134	408	276	295	23	109	99	6.9
9	13	93	154	187	138	378	259	265	20	80	74	6.6
10	12	85	134	e160	152	365	250	239	18	55	57	6.1
11	12	79	131	e140	173	393	242	204	16	34	47	5.8
12	11	73	114	152	217	392	227	174	15	22	38	5.6
13	11	65	102	161	248	378	272	156	15	16	31	5.3
14	11	59	93	161	320	356	303	134	13	13	25	5.1
15	10	54	92	156	412	315	261	120	12	11	62	4.9
16	10	47	131	e140	424	278	248	128	11	14	74	4.9
17	11	41	149	108	367	250	225	127	17	22	113	4.8
18	11	45	154	e150	334	234	206	112	16	51	140	6.1
19	11	48	153	e140	315	233	192	102	12	134	132	5.6
20	12	47	148	128	293	225	177	100	10	207	116	5.3
21	13	53	177	117	268	222	163	96	11	234	95	5.0
22	16	57	180	110	251	253	152	92	8.3	221	71	60
23	15	56	176	118	302	265	144	93	49	187	52	166
24	14	53	174	137	523	258	136	84	127	154	39	146
25	14	50	173	151	687	274	129	83	120	119	30	147
26	16	47	162	172	714	288	123	103	136	90	25	156
27	31	46	143	172	558	308	116	95	122	87	21	134
28	41	121	126	202	414	446	110	72	80	77	18	99
29	40	157	106	253	---	795	105	59	43	203	16	69
30	53	149	105	250	---	1210	128	52	28	319	15	48
31	70	---	104	225	---	1020	---	50	---	307	13	---
TOTAL	607	2211	4372	5103	8389	17564	7383	4578	1206.3	3168	2546	1168.1
MEAN	19.6	73.7	141	165	300	567	246	148	40.2	102	82.1	38.9
MAX	70	157	196	253	714	2530	706	296	136	319	226	166
MIN	10	41	92	81	134	222	105	50	8.3	11	13	4.8
CFSM	.18	.68	1.31	1.52	2.77	5.25	2.28	1.37	.37	.95	.76	.36
IN.	.21	.76	1.51	1.76	2.89	6.05	2.54	1.58	.42	1.09	.88	.40

e Estimated.

## PIANKATANK RIVER BASIN

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01669520 DRAGON SWAMP AT MASCOT, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	49.8	79.4	112	150	174	239	200	124	78.2	43.6	56.7	39.0
MAX	247	290	179	340	300	567	450	215	166	102	200	170
(WY)	1986	1986	1986	1993	1994	1994	1983	1993	1984	1994	1992	1985
MIN	7.97	22.3	39.5	45.9	76.5	58.8	31.2	28.5	6.23	3.15	4.90	5.47
(WY)	1982	1982	1989	1989	1991	1985	1985	1985	1986	1993	1987	1984

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

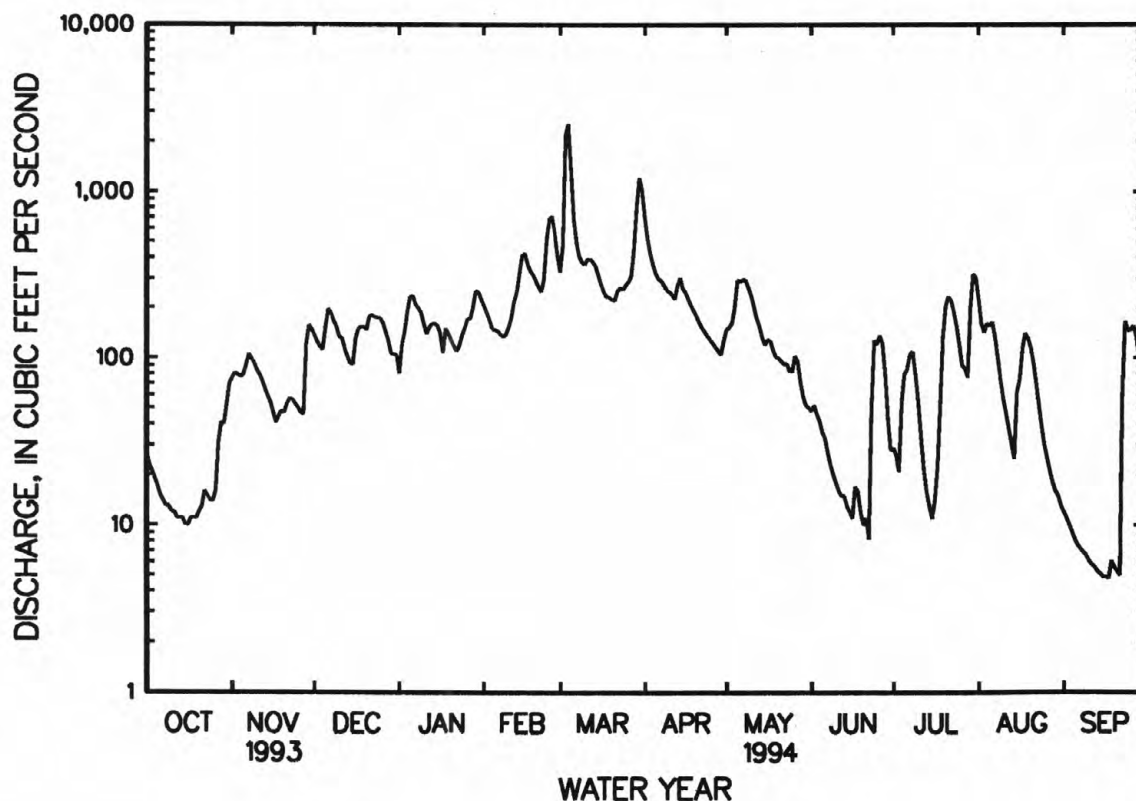
## WATER YEARS 1982 - 1994

ANNUAL TOTAL	57882.36	58295.4	112
ANNUAL MEAN	159	160	164
HIGHEST ANNUAL MEAN			56.4
LOWEST ANNUAL MEAN			1993
HIGHEST DAILY MEAN	1080	Mar 6	2530
LOWEST DAILY MEAN	.14	Aug 5	4.8
ANNUAL SEVEN-DAY MINIMUM	.21	Jul 30	5.2
INSTANTANEOUS PEAK FLOW			2750
INSTANTANEOUS PEAK STAGE			9.00
INSTANTANEOUS LOW FLOW			4.5
ANNUAL RUNOFF (CFSM)	1.47	1.48	1.04
ANNUAL RUNOFF (INCHES)	19.94	20.08	14.07
10 PERCENT EXCEEDS	369	311	253
50 PERCENT EXCEEDS	131	118	74
90 PERCENT EXCEEDS	6.8	12	7.4

a Also Sept. 16, 17, 1991.

b Also probably occurred Sept. 15-17, 1991, during period of estimated record.

e Estimated.



## YORK RIVER BASIN

01670400 NORTH ANNA RIVER NEAR PARTLOW, VA

LOCATION.--Lat 38°00'46", long 77°42'06", Spotsylvania County, Hydrologic Unit 02080106, on left downstream side of bridge on State Highway 601, 1.1 mi upstream from Northeast Creek, and 3.8 mi southwest of Partlow.

DRAINAGE AREA.--344 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is 168.25 ft above sea level.

REMARKS.--Records good except for period of no gage-height record, July 22 to Aug. 11, which is fair. Flow regulated since January 1972 by Lake Anna, capacity, 373,000 acre-ft, 0.5 mi upstream. Maximum discharge, 11,700 ft<sup>3</sup>/s, from rating curve extended above 7,200 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 22, 1972, reached a stage of 36.32 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,690 ft<sup>3</sup>/s, Nov. 28, gage height, 21.48 ft; minimum, 36 ft<sup>3</sup>/s, May 14-15; minimum daily, 42 ft<sup>3</sup>/s, Oct. 2, 17-25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	52	1140	210	466	341	2190	407	132	68	e350	47
2	42	45	369	210	356	1540	1290	319	130	75	e300	47
3	43	50	405	210	286	5200	499	259	130	74	e200	48
4	43	46	418	384	219	3960	500	532	130	73	e150	47
5	43	46	2330	225	420	2710	499	572	128	74	e100	47
6	43	46	2250	402	317	2190	500	238	127	76	e70	65
7	43	46	536	409	310	1310	1120	219	127	75	e50	72
8	43	46	492	1080	311	521	287	220	125	73	e47	48
9	43	46	469	496	399	521	345	220	121	83	e45	46
10	43	46	335	442	530	1780	344	219	118	91	e47	47
11	43	46	315	374	1630	2090	345	220	107	93	e44	48
12	43	46	201	1170	867	942	345	221	65	91	44	218
13	43	46	197	1370	377	396	412	222	66	87	46	197
14	43	46	198	529	378	396	346	176	66	86	47	46
15	43	46	307	529	379	397	346	54	65	83	47	46
16	43	46	288	364	941	398	341	152	68	82	48	48
17	42	47	204	265	668	397	346	153	73	82	726	64
18	42	49	204	529	1760	397	346	150	72	83	3940	227
19	42	51	204	528	764	396	346	145	71	87	2470	194
20	42	57	204	378	1770	396	345	143	71	88	696	47
21	42	56	260	277	1400	408	342	143	69	88	374	47
22	42	55	323	277	984	483	287	143	72	e95	366	430
23	42	55	236	237	2870	387	219	142	72	e100	227	226
24	42	54	207	272	5110	372	220	141	72	e130	226	165
25	42	53	209	486	3270	237	219	139	71	e140	208	154
26	48	53	209	486	2090	230	219	141	67	e150	93	712
27	52	63	200	387	1050	1400	231	142	67	e350	207	1100
28	50	5970	90	703	311	6630	226	138	66	e2000	47	168
29	45	5820	212	2190	---	8330	189	136	65	e1300	47	168
30	45	2430	211	555	---	6310	570	132	64	e500	47	167
31	45	---	188	529	---	3570	---	132	---	e400	47	---
TOTAL	1350	15558	13411	16503	30233	54635	13814	6370	2677	6877	11356	4986
MEAN	43.5	519	433	532	1080	1762	460	205	89.2	222	366	166
MAX	52	5970	2330	2190	5110	8330	2190	572	132	2000	3940	1100
MIN	42	45	90	210	219	230	189	54	64	68	44	46
CFSM	.13	1.51	1.26	1.55	3.14	5.12	1.34	.60	.26	.64	1.06	.48
IN.	.15	1.68	1.45	1.78	3.27	5.91	1.49	.69	.29	.74	1.23	.54

e Estimated.

01670400 NORTH ANNA RIVER NEAR PARTLOW, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	143	256	272	402	526	611	507	340	180	123	136	113
MAX	1085	1230	682	926	1362	1762	1378	947	595	563	478	530
(WY)	1980	1986	1993	1979	1979	1994	1983	1989	1979	1984	1984	1979
MIN	42.4	44.0	45.4	45.2	55.6	51.8	55.7	53.5	46.1	45.7	49.1	44.3
(WY)	1992	1992	1989	1989	1981	1981	1981	1981	1991	1980	1993	1992

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1979 - 1994

ANNUAL TOTAL	158405	177770	
ANNUAL MEAN	434	487	299
HIGHEST ANNUAL MEAN			527
LOWEST ANNUAL MEAN			52.1
HIGHEST DAILY MEAN	7930	Mar 5	8330
LOWEST DAILY MEAN	42	aSep 23	42
ANNUAL SEVEN-DAY MINIMUM	42	Oct 17	42
INSTANTANEOUS PEAK FLOW			8690
INSTANTANEOUS PEAK STAGE			21.48
INSTANTANEOUS LOW FLOW			36
ANNUAL RUNOFF (CFSM)	1.26	1.42	.87
ANNUAL RUNOFF (INCHES)	17.13	19.22	11.83
10 PERCENT EXCEEDS	1150	1130	583
50 PERCENT EXCEEDS	181	204	71
90 PERCENT EXCEEDS	44	46	45

a Also Sept. 24, 25, 28-30, and Oct. 2, 17-25, 1993.

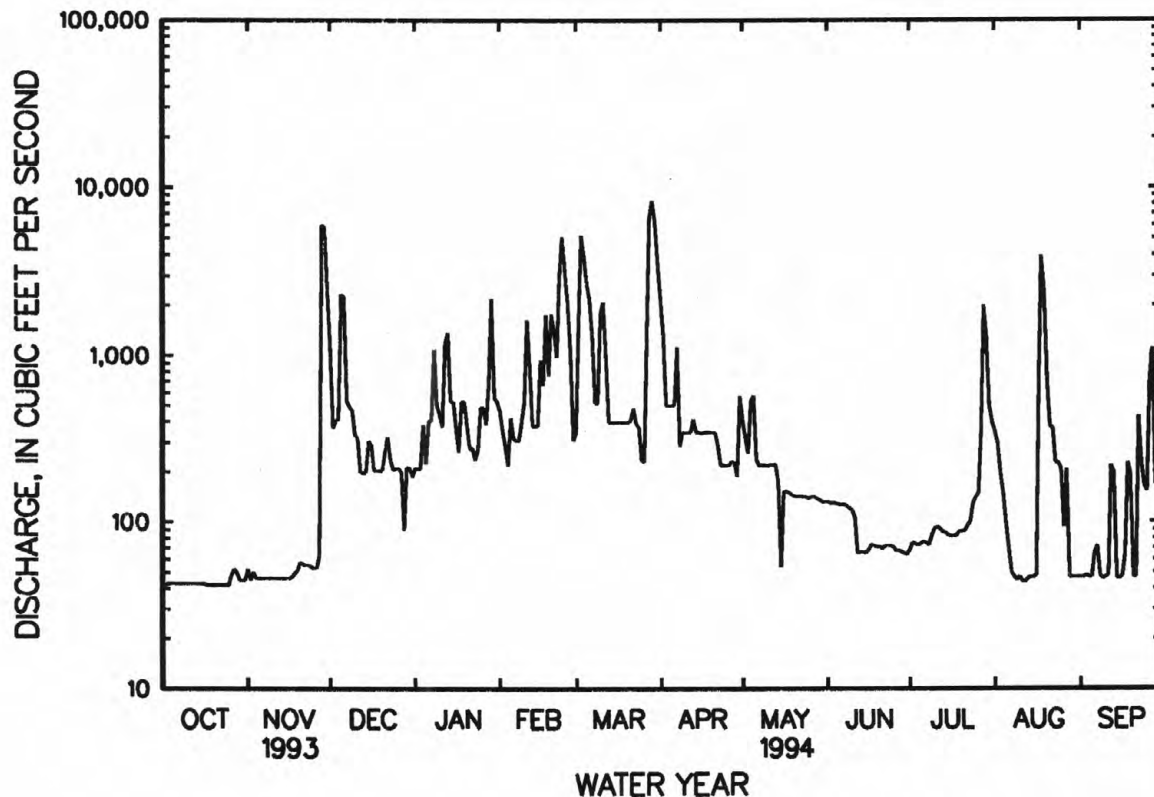
b Also Oct. 17-25, 1993.

c Also Jan. 17, 1989, and Dec. 8, 9, 1992.

d From floodmarks.

e Estimated.

f Also May 15, 1994.





## YORK RIVER BASIN

01671020 NORTH ANNA RIVER AT HART CORNER, NEAR DOSWELL, VA

LOCATION.--Lat 37°51'00", long 77°25'41", Hanover County, Hydrologic Unit 02080106, on right bank at downstream side of bridge on State Highway 30, 0.3 mi west of Hart Corner, 2.1 mi east of Doswell, and 5.4 mi upstream from confluence with South Anna River.

DRAINAGE AREA.--463 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 43 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods of doubtful gage-height record, Nov. 29 to Dec. 1 and Dec. 6, which are fair. Flow regulated since January 1972 by Lake Anna, capacity, 373,000 acre-ft, 27.7 mi upstream. At a point 0.8 mi upstream from station, there is diversion for municipal water supply by Hanover County Department of Public Utilities since June 1975. Maximum discharge, 12,000 ft<sup>3</sup>/s, from rating curve extended above 10,100 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1969 reached a stage of 28.02 ft, from floodmark, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,000 ft<sup>3</sup>/s, Mar. 29, gage height, 21.80 ft; minimum, 49 ft<sup>3</sup>/s, Oct. 6; minimum daily, 49 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	78	e2540	251	707	600	3700	720	149	86	433	69
2	53	83	1320	290	512	1320	2490	452	146	113	444	66
3	51	73	534	314	436	5490	1300	320	142	169	377	64
4	51	69	509	529	329	6220	869	458	141	164	255	61
5	50	71	1750	661	340	3950	780	770	140	105	207	60
6	49	68	e3300	488	584	3020	767	588	140	96	119	60
7	50	77	1940	520	346	2230	1950	316	140	93	100	68
8	50	75	834	990	379	1130	1500	306	142	91	91	91
9	51	70	654	1070	438	848	468	293	163	90	86	64
10	53	68	495	657	736	1560	506	283	137	122	93	59
11	53	66	413	558	1330	2660	482	272	144	124	94	60
12	66	63	350	680	1940	2150	466	264	141	111	74	59
13	65	64	276	2000	968	846	510	254	105	102	75	176
14	63	68	262	1160	760	668	595	250	97	95	73	167
15	58	66	272	727	760	635	484	197	94	96	78	68
16	56	63	493	635	1060	608	510	145	103	107	79	56
17	54	66	346	347	1250	586	472	202	101	92	105	55
18	55	77	299	591	1670	569	448	195	101	96	2270	80
19	57	73	290	705	1710	562	426	188	109	114	3200	218
20	61	77	276	643	1890	547	411	187	103	140	1550	174
21	59	77	471	377	2290	547	400	184	96	105	539	74
22	62	70	524	342	1720	698	397	179	94	105	456	95
23	58	67	446	348	2090	619	315	176	94	101	349	760
24	56	65	314	319	5390	562	287	174	99	181	245	261
25	55	64	297	470	5430	499	282	179	100	172	229	178
26	58	63	289	668	3260	402	275	172	93	196	198	227
27	63	76	276	548	2140	865	271	179	93	358	123	1350
28	95	2050	251	555	1050	4250	283	171	90	387	189	517
29	90	e4090	187	1970	---	10300	299	162	87	2450	87	265
30	68	e3580	271	1810	---	10900	741	157	84	1390	73	224
31	77	---	265	753	---	6860	---	150	---	527	71	---
TOTAL	1844	11617	20744	21976	41515	72701	22684	8543	3468	8178	12362	5726
MEAN	59.5	387	669	709	1483	2345	756	276	116	264	399	191
MAX	95	4090	3300	2000	5430	10900	3700	770	163	2450	3200	1350
MIN	49	63	187	251	329	402	271	145	84	86	71	55
(†)	4.25	4.05	3.94	4.33	4.52	4.53	4.74	4.99	5.34	5.47	5.71	5.53
MEAN#	63.8	391	673	713	1488	2350	761	281	121	269	405	197
CFSM#	.14	.84	1.45	1.54	3.21	5.08	1.64	.61	.26	.58	.87	.43
IN.#	.16	.94	1.68	1.78	3.35	5.85	1.83	.70	.29	.67	1.01	.47

CAL YR 1993 TOTAL 211860 MEAN 580 MAX 9900 MIN 46 MEAN# 585 CFSM# 1.26 IN.# 17.16  
WTR YR 1994 TOTAL 231358 MEAN 634 MAX 10900 MIN 49 MEAN# 639 CFSM# 1.38 IN.# 18.74

† Average diversion, equivalent in cubic feet per second; provided by Hanover County Department of Public Utilities.

# Adjusted for diversion.

e Estimated.

## YORK RIVER BASIN

189

01671020 NORTH ANNA RIVER AT HART CORNER, NEAR DOSWELL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	200	327	378	489	633	844	722	485	215	154	181	102
MAX	1428	1561	738	1157	1483	2345	1887	1217	539	591	614	275
(WY)	1980	1986	1984	1980	1994	1994	1983	1990	1989	1984	1984	1989
MIN	43.7	46.7	75.2	71.9	122	90.5	108	110	51.1	66.3	57.7	50.2
(WY)	1992	1992	1981	1981	1981	1981	1981	1991	1991	1980	1983	1991

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

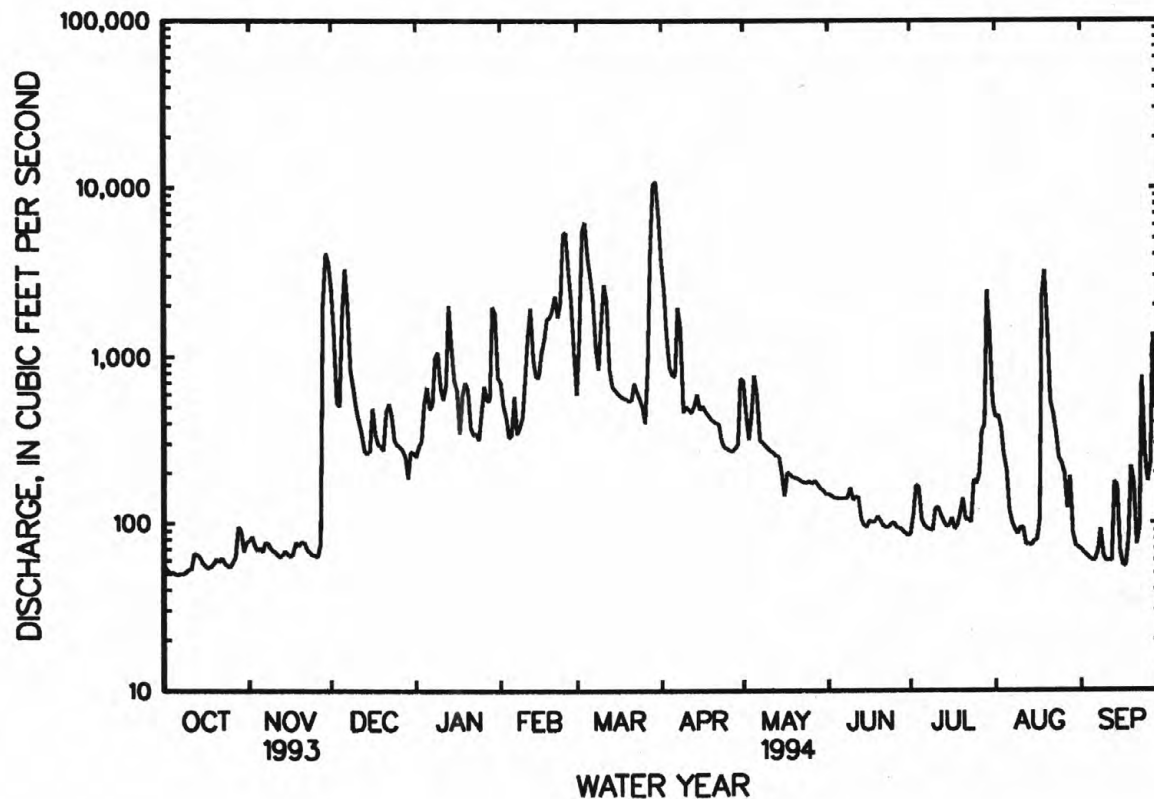
## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	211860	231358	
ANNUAL MEAN	580	634	393
HIGHEST ANNUAL MEAN			712
LOWEST ANNUAL MEAN			85.7
HIGHEST DAILY MEAN	9900	Mar 6	10900
LOWEST DAILY MEAN	46	aAug 28	49
ANNUAL SEVEN-DAY MINIMUM	47	Aug 26	50
INSTANTANEOUS PEAK FLOW			12000
INSTANTANEOUS PEAK STAGE			21.80
INSTANTANEOUS LOW FLOW			49
ANNUAL RUNOFF (CFSM)	1.25	1.37	.85
ANNUAL RUNOFF (INCHES)	17.02	18.59	11.53
10 PERCENT EXCEEDS	1560	1710	838
50 PERCENT EXCEEDS	244	255	140
90 PERCENT EXCEEDS	52	64	58

a Also Aug. 29 to Sept. 1 and Sept. 16, 1993.

b Observed.



## YORK RIVER BASIN

01671100 LITTLE RIVER NEAR DOSWELL, VA

LOCATION.--Lat 37°52'21", long 77°30'48", Hanover County, Hydrologic Unit 02080106, on left bank at downstream side of bridge on State Highway 685, 0.8 mi southwest of Verdon, 2.9 mi west of Doswell, and 9.6 mi upstream from mouth.

DRAINAGE AREA.--107 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WDR VA-70-1: 1969.

GAGE.--Water-stage recorder. Datum of gage is 132.30 ft above sea level (levels by La Prade Bros., Engineers).

REMARKS.--Records good except those for period with ice effect, Jan. 16, and period of no gage-height record, Jan. 19-22, which are fair. Maximum discharge, 12,000 ft<sup>3</sup>/s, from rating curve extended above 7,600 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	1300	1,790	5.81	Mar. 3	2100	2,820	6.66
Dec. 6	2200	1,060	4.96	Mar. 11	1900	650	4.26
Feb. 24	1830	1,680	5.71	Mar. 29	1800	*3,910	*7.46

Minimum discharge, 3.9 ft<sup>3</sup>/s, Oct. 6, gage height, 1.87 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	28	236	55	140	165	659	253	36	15	197	16
2	11	29	136	64	114	411	543	137	32	14	121	15
3	9.5	27	110	86	98	1960	356	100	28	12	129	14
4	7.2	29	90	149	93	1960	244	109	26	11	91	13
5	4.9	24	349	268	88	814	199	176	23	15	82	12
6	4.5	23	841	220	92	389	181	203	22	18	65	11
7	5.1	27	695	134	92	252	202	166	24	17	51	10
8	5.1	29	206	161	89	197	209	130	24	12	38	9.5
9	4.8	27	114	226	109	172	180	111	28	13	32	8.6
10	4.4	26	85	174	170	268	152	96	23	105	28	8.0
11	4.5	24	73	119	191	603	137	84	30	175	25	8.2
12	8.1	21	61	130	310	479	128	74	36	107	22	8.0
13	7.5	18	53	250	373	262	135	65	29	60	20	7.6
14	5.8	17	48	257	370	201	156	59	25	50	18	7.3
15	6.2	19	53	162	358	173	156	56	22	44	19	7.1
16	10	19	96	e94	405	156	158	59	26	38	20	7.0
17	9.2	18	109	85	436	139	134	59	34	42	36	7.1
18	9.0	25	95	130	409	128	120	57	27	49	98	7.4
19	8.3	25	80	e110	419	127	106	52	23	46	131	7.2
20	8.2	24	67	e100	471	123	96	50	30	52	168	7.3
21	9.9	24	152	e92	484	121	88	49	29	51	117	7.3
22	11	23	205	e82	435	157	84	46	25	38	71	20
23	11	21	158	80	572	164	83	43	21	34	47	60
24	11	19	110	94	1380	141	80	41	20	37	35	94
25	7.1	19	87	116	1270	132	76	60	19	31	31	90
26	6.3	18	72	124	577	139	70	69	21	124	28	96
27	6.5	29	62	111	289	241	66	65	24	82	24	174
28	10	574	58	128	198	935	81	60	22	52	21	147
29	11	1540	57	369	---	3320	87	59	19	120	19	106
30	14	856	56	350	---	2710	248	52	17	451	18	86
31	26	---	56	202	---	1020	---	42	---	398	17	---
TOTAL	269.1	3602	4670	4722	10032	18059	5214	2682	765	2313	1819	1071.6
MEAN	8.68	120	151	152	358	583	174	86.5	25.5	74.6	58.7	35.7
MAX	26	1540	841	369	1380	3320	659	253	36	451	197	174
MIN	4.4	17	48	55	88	121	66	41	17	11	17	7.0
CFSM	.08	1.12	1.41	1.42	3.35	5.44	1.62	.81	.24	.70	.55	.33
IN.	.09	1.25	1.62	1.64	3.49	6.28	1.81	.93	.27	.80	.63	.37

e Estimated.

## YORK RIVER BASIN

191

01671100 LITTLE RIVER NEAR DOSWELL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	55.2	73.3	103	144	158	192	149	102	69.0	41.0	54.6	35.3
MAX	264	340	249	491	419	583	391	311	532	288	653	404
(WY)	1980	1973	1974	1978	1979	1994	1993	1990	1972	1975	1969	1975
MIN	1.03	3.25	18.2	20.5	46.6	33.0	44.2	22.0	5.45	2.78	1.35	.70
(WY)	1969	1992	1966	1981	1968	1981	1968	1969	1991	1968	1977	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

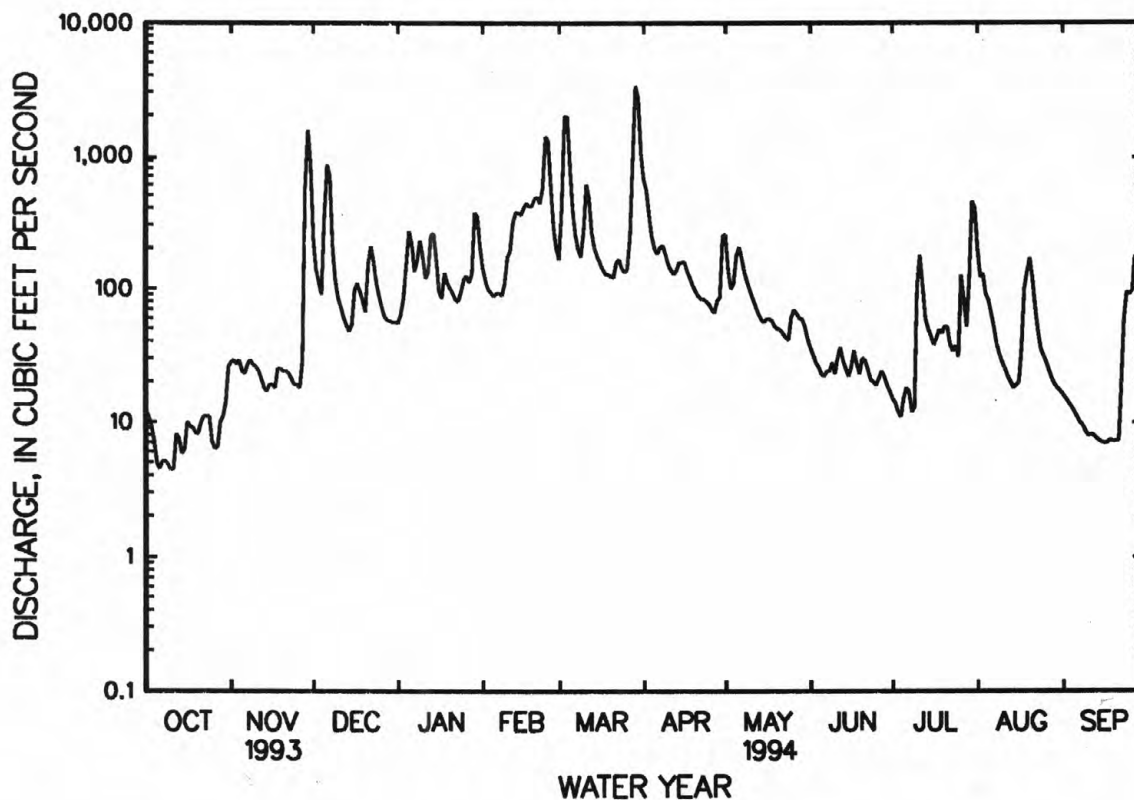
## WATER YEARS 1962 - 1994

ANNUAL TOTAL	49504.5	55218.7	
ANNUAL MEAN	136	151	97.8
HIGHEST ANNUAL MEAN			176
LOWEST ANNUAL MEAN			29.8
HIGHEST DAILY MEAN	2560	Mar 5	9800
LOWEST DAILY MEAN	1.2	<sup>a</sup> Aug 31	.10
ANNUAL SEVEN-DAY MINIMUM	1.3	<sup>b</sup> Aug 31	.21
INSTANTANEOUS PEAK FLOW			12000
INSTANTANEOUS PEAK STAGE			11.09
INSTANTANEOUS LOW FLOW			.10
ANNUAL RUNOFF (CFSM)	1.27	1.41	.91
ANNUAL RUNOFF (INCHES)	17.21	19.20	12.42
10 PERCENT EXCEEDS	323	352	194
50 PERCENT EXCEEDS	56	65	51
90 PERCENT EXCEEDS	5.1	10	6.6

a Also Sept. 1, 3, 4, 7, 1993.

b Also Sept. 1, 1993.

c Also Sept. 26, 1968.



## 01672500 SOUTH ANNA RIVER NEAR ASHLAND, VA

LOCATION.--Lat 37°47'48", long 77°32'57", Hanover County, Hydrologic Unit 02080106, on right bank at downstream side of bridge on State Highway 54, 4.5 mi northwest of Ashland, and 7.6 mi upstream from Newfound River.

DRAINAGE AREA.--394 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1930 to current year.

REVISED RECORDS.--WSP 801: 1935(M). WSP 1502: 1935, 1939. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 83.74 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 22-24, and periods of doubtful gage-height record, Apr. 15, 17-19, which are fair. Since 1966, diversion 150 ft upstream from station for town of Ashland water supply has averaged less than 0.6 ft<sup>3</sup>/s. Capacity of the diversion pickup is about 1.5 ft<sup>3</sup>/s. Small diurnal fluctuation at low flow in some years caused by gristmills upstream from station. Maximum discharge, 17,100 ft<sup>3</sup>/s, from rating curve extended above 12,600 ft<sup>3</sup>/s. Minimum discharge, 0.10 ft<sup>3</sup>/s, caused by diversion upstream from station. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 15, 1928, reached a stage of about 24 ft, discharge, about 14,500 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	0400	*7,630	*17.41	Mar. 31	0630	6,850	16.51
Dec. 6	1630	2,530	9.24	Apr. 29	2200	3,690	11.66
Feb. 26	1800	3,410	11.09	Aug. 21	0230	3,390	11.06
Mar. 3	0130	4,760	13.61				

Minimum discharge, 12 ft<sup>3</sup>/s, Oct. 9, gage height, 1.15 ft, caused by diversion upstream from station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	70	7170	e230	598	656	5550	946	125	55	368	113
2	42	92	3920	263	471	1770	2960	530	118	53	357	101
3	36	86	577	305	392	4090	1150	387	113	60	352	89
4	29	68	347	504	340	3420	877	554	99	68	250	83
5	26	54	1200	737	316	3440	725	1000	95	87	176	77
6	22	60	2380	658	322	3460	658	916	94	78	140	72
7	20	63	2210	454	323	2210	706	627	102	81	115	69
8	19	62	805	543	309	947	729	497	100	59	100	66
9	17	69	453	1010	349	784	614	437	109	48	86	63
10	19	64	336	740	534	1000	531	385	97	52	77	62
11	20	54	290	455	709	1600	498	330	113	115	70	63
12	26	50	250	447	838	1630	479	295	135	107	61	62
13	32	53	220	1060	836	929	490	264	110	93	65	88
14	32	46	200	1300	832	723	574	239	104	74	62	105
15	38	46	210	677	871	619	e555	221	98	62	84	85
16	36	39	328	468	1040	550	581	368	89	60	146	74
17	42	34	374	300	1180	487	e500	280	92	63	198	66
18	36	45	328	460	1200	448	e440	253	99	141	1150	64
19	32	56	272	550	1330	447	e375	225	104	200	1910	137
20	30	70	242	433	1640	428	346	214	82	226	2800	185
21	28	99	652	356	1810	425	326	207	72	156	2720	109
22	31	73	606	e320	1690	810	311	199	86	115	460	147
23	34	61	524	e295	2070	590	308	188	128	110	303	552
24	33	55	378	e330	2920	494	314	174	111	112	243	794
25	36	51	308	416	3010	463	296	178	112	108	180	391
26	38	48	268	466	3280	460	281	217	83	326	146	380
27	36	73	238	431	2670	821	258	193	77	536	128	947
28	41	1900	223	493	832	2980	285	192	69	278	199	1330
29	41	2700	e210	1120	---	5350	846	168	63	1290	164	591
30	43	5780	e190	1670	---	6240	1590	151	58	1400	131	342
31	56	---	e200	913	---	6720	---	137	---	568	115	---
TOTAL	1018	12021	25909	18404	32712	54991	24153	10972	2937	6781	13356	7307
MEAN	32.8	401	836	594	1168	1774	805	354	97.9	219	431	244
MAX	56	5780	7170	1670	3280	6720	5550	1000	135	1400	2800	1330
MIN	17	34	190	230	309	425	258	137	58	48	61	62
CFSM	.08	1.02	2.12	1.51	2.97	4.50	2.04	.90	.25	.56	1.09	.62
IN.	.10	1.13	2.45	1.74	3.09	5.19	2.28	1.04	.28	.64	1.26	.69

e Estimated.



## YORK RIVER BASIN

193

01672500 SOUTH ANNA RIVER NEAR ASHLAND, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	222	269	384	530	579	655	581	357	242	192	243	169
MAX	1434	1389	1375	1850	1436	1774	1968	963	1998	820	2349	1098
(WY)	1973	1986	1949	1978	1979	1994	1937	1990	1972	1945	1969	1975
MIN	10.5	25.7	50.2	67.7	87.5	117	166	95.1	56.7	24.5	12.2	6.53
(WY)	1931	1931	1931	1966	1931	1981	1985	1969	1977	1977	1932	1932

## SUMMARY STATISTICS

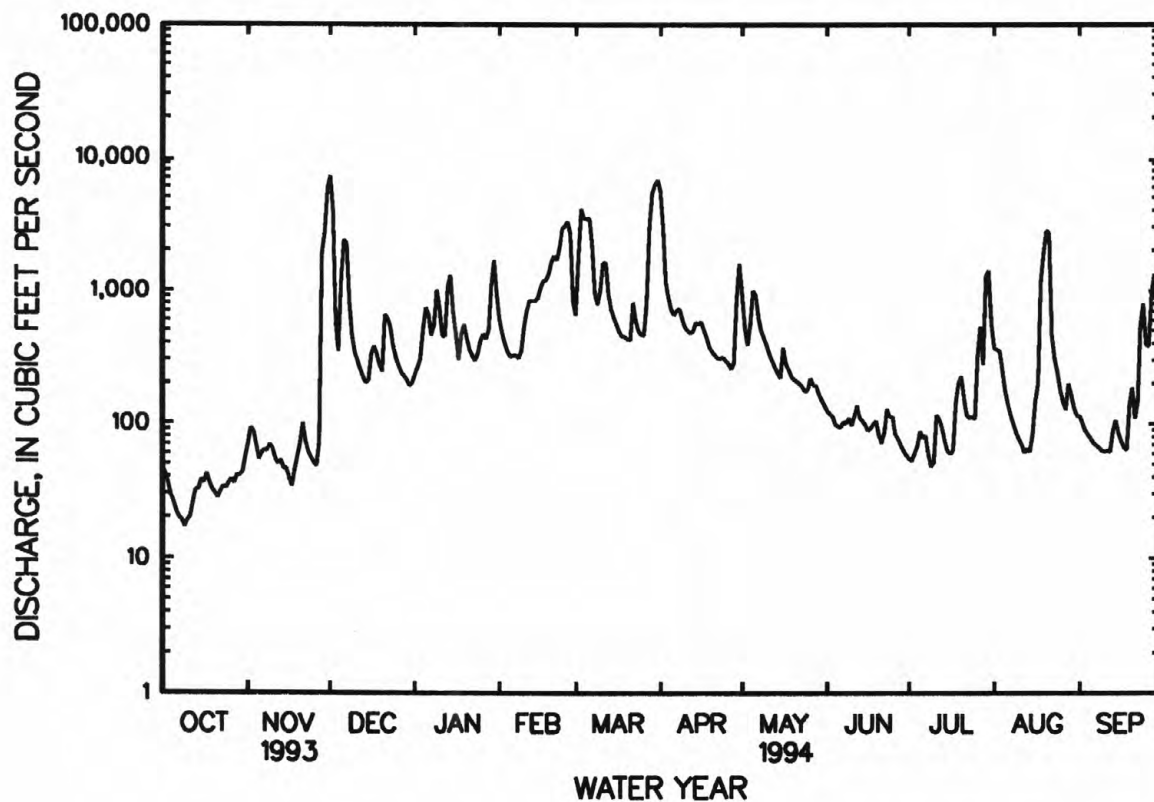
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1931 - 1994

ANNUAL TOTAL	182099			210561								
ANNUAL MEAN	499			577						368		
HIGHEST ANNUAL MEAN										689		1973
LOWEST ANNUAL MEAN										107		1981
HIGHEST DAILY MEAN				7170	Dec 1		7170	Dec 1		16000		Aug 23 1969
LOWEST DAILY MEAN				12	Sep 5		17	Oct 9		2.3		Sep 13 1966
ANNUAL SEVEN-DAY MINIMUM				14	Sep 1		20	Oct 5		4.4		Sep 16 1932
INSTANTANEOUS PEAK FLOW							7630	Dec 1		17100		Aug 23 1969
INSTANTANEOUS PEAK STAGE							17.41	Dec 1		24.99		Aug 23 1969
INSTANTANEOUS LOW FLOW							a12	Oct 9		a.10		Sep 12 1966
ANNUAL RUNOFF (CFSM)				1.27			1.46			.93		
ANNUAL RUNOFF (INCHES)				17.19			19.88			12.67		
10 PERCENT EXCEEDS				1250			1330			805		
50 PERCENT EXCEEDS				210			250			190		
90 PERCENT EXCEEDS				26			48			46		

a Caused by diversion upstream from station.



## YORK RIVER BASIN

01673000 PAMUNKEY RIVER NEAR HANOVER, VA

LOCATION.--Lat 37°46'03", long 77°19'57", Hanover County, Hydrologic Unit 02080106, on right bank 100 ft downstream from bridge on State Highway 614, 0.3 mi upstream from Mechumps Creek, 2.0 mi east of Hanover, and 7.0 mi upstream from Millpond Creek.

DRAINAGE AREA.--1,081 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1941 to current year. Monthly discharge only for some periods, published in WSP 1302.

REVISED RECORDS.--WSP 1302: 1944(M). WSP 1382: 1949. WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 14.72 ft above sea level. Prior to Oct. 15, 1976, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Nov. 29, 30, Jan. 10-12, and June 15-17, which are fair. Some regulation since January 1972 by Lake Anna, capacity, 373,000 acre-ft, and occasional diurnal fluctuation at low flow caused by mill upstream from station. Unknown amount of diversion for irrigation upstream from gage. Maximum discharge, 40,300 ft<sup>3</sup>/s, from rating curve extended above 22,000 ft<sup>3</sup>/s.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1928 reached a stage of 32.6 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,200 ft<sup>3</sup>/s, Mar. 31, gage height, 25.16 ft; minimum, 76 ft<sup>3</sup>/s, Oct. 8-10, gage height, 2.65 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	112	176	12700	644	2080	4070	16300	3390	471	248	1520	210
2	113	186	11600	774	1540	2890	12100	2050	441	229	1250	201
3	107	219	8360	924	1210	7340	8870	1310	431	268	1340	177
4	97	194	3620	1220	1050	12500	5640	1230	408	631	975	165
5	89	178	2260	2080	903	12600	3070	2440	391	337	736	157
6	81	165	5330	1860	1100	10600	2180	2760	382	289	582	151
7	78	178	7020	1550	1060	9200	2200	1910	380	271	430	146
8	77	185	6530	1560	959	7300	2830	1410	391	255	364	154
9	76	177	2930	2780	1020	4220	1860	1230	458	224	319	158
10	77	176	1360	e2380	1470	2770	1600	1090	422	306	289	134
11	79	170	1020	e1580	2110	4650	1490	997	383	520	287	130
12	85	157	908	e1350	3780	5670	1400	913	463	591	259	132
13	108	146	727	2850	3390	5260	1420	846	427	431	234	167
14	111	152	659	4030	2700	2700	1710	785	352	341	230	310
15	107	144	642	2550	2670	1890	1590	748	e330	296	245	244
16	106	141	920	1590	2960	1680	1640	798	e345	340	268	152
17	107	133	1100	1100	3860	1540	1710	831	e365	312	413	134
18	113	164	954	1170	3840	1440	1430	744	349	411	1510	137
19	111	177	848	1520	4610	1420	1290	697	337	447	4750	212
20	111	168	759	1430	4570	1380	1190	659	332	500	5680	407
21	111	181	1500	1120	5190	1330	1110	645	300	492	5750	310
22	108	208	1950	881	5600	2030	1070	631	281	419	3650	215
23	109	175	1610	896	5440	2100	1030	611	300	347	1130	732
24	105	160	1220	943	6960	1630	931	578	320	451	706	1260
25	105	150	950	1080	10700	1500	906	564	316	485	558	1070
26	108	143	837	1420	11100	1420	866	669	300	423	477	615
27	111	155	755	1440	9660	1600	832	635	272	1720	353	1590
28	118	2430	709	1320	7640	4990	828	602	260	914	358	2890
29	146	e5720	615	2740	---	11100	890	574	247	1920	406	1680
30	151	e10900	642	4720	---	19100	3700	540	238	4340	267	858
31	163	---	644	3890	---	20400	---	500	---	2950	227	---
TOTAL	3280	23608	81679	55392	109172	168320	83683	33387	10692	21708	35563	14898
MEAN	106	787	2635	1787	3899	5430	2789	1077	356	700	1147	497
MAX	163	10900	12700	4720	11100	20400	16300	3390	471	4340	5750	2890
MIN	76	133	615	644	903	1330	828	500	238	224	227	130
CFSM	.10	.73	2.44	1.65	3.61	5.02	2.58	1.00	.33	.65	1.06	.46
IN.	.11	.81	2.81	1.91	3.76	5.79	2.88	1.15	.37	.75	1.22	.51

e Estimated.

## 01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1971, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	474	633	996	1242	1450	1712	1327	925	578	490	818	355
MAX	2492	1910	3782	3051	3288	3585	2743	2570	2493	2697	6381	1123
(WY)	1943	1953	1949	1949	1961	1962	1948	1946	1971	1945	1969	1944
MIN	60.6	112	166	207	552	816	523	321	223	91.9	63.1	30.3
(WY)	1942	1942	1966	1966	1968	1959	1968	1969	1970	1957	1966	1954

## SUMMARY STATISTICS

## WATER YEARS 1942 - 1971

ANNUAL MEAN	915
HIGHEST ANNUAL MEAN	1606
LOWEST ANNUAL MEAN	434
HIGHEST DAILY MEAN	39300
LOWEST DAILY MEAN	13
ANNUAL SEVEN-DAY MINIMUM	15
INSTANTANEOUS PEAK FLOW	40300
INSTANTANEOUS PEAK STAGE	a31.12
INSTANTANEOUS LOW FLOW	12
ANNUAL RUNOFF (CFSM)	.85
ANNUAL RUNOFF (INCHES)	11.50
10 PERCENT EXCEEDS	1960
50 PERCENT EXCEEDS	511
90 PERCENT EXCEEDS	130

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	721	855	1307	1627	1720	2056	1856	1227	835	533	484	473
MAX	3461	3505	2782	4334	3899	5430	5009	2821	4293	2747	2025	2939
(WY)	1980	1986	1973	1978	1994	1994	1984	1978	1972	1975	1985	1975
MIN	86.2	113	216	197	521	248	434	265	140	128	92.8	76.3
(WY)	1992	1992	1981	1981	1981	1981	1981	1991	1991	1977	1983	1983

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

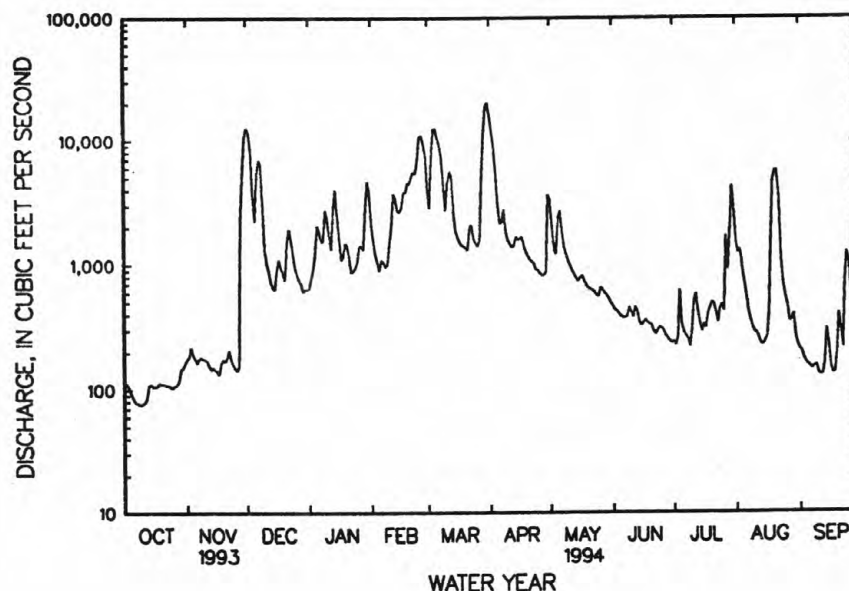
## FOR 1994 WATER YEAR

## WATER YEARS 1972 - 1994

ANNUAL TOTAL	542051	641382	
ANNUAL MEAN	1485	1757	1138
HIGHEST ANNUAL MEAN			1757
LOWEST ANNUAL MEAN			265
HIGHEST DAILY MEAN	13200	Mar 7	20400
LOWEST DAILY MEAN	55	Sep 2	76
ANNUAL SEVEN-DAY MINIMUM	59	Aug 27	79
INSTANTANEOUS PEAK FLOW			21200
INSTANTANEOUS PEAK STAGE			25.16
INSTANTANEOUS LOW FLOW			76
ANNUAL RUNOFF (CFSM)	1.37	1.63	1.05
ANNUAL RUNOFF (INCHES)	18.65	22.07	14.31
10 PERCENT EXCEEDS	4300	4680	2670
50 PERCENT EXCEEDS	662	755	622
90 PERCENT EXCEEDS	79	144	123

a From floodmarks.

b Also Oct. 9, 10, 1993.



## YORK RIVER BASIN

01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1946, 1952, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to January 1976, October 1981 to current year.

WATER TEMPERATURE: October 1945 to September 1946, April 1968 to January 1976.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
OCT											
06...	1015	80	242	7.3	--	15.0	--	VDCLS	--	9.2	--
13...	0900	111	208	7.0	12.0	12.5	767	VDCLS	1.8	9.5	89
13...	0915	111	208	7.0	12.0	12.5	767	VDCLS	1.9	9.5	89
NOV											
18...	0800	157	148	6.8	11.0	14.0	769	USGS	2.7	8.8	85
18...	0801	157	148	6.8	11.0	14.0	769	VDCLS	6.0	8.8	85
23...	0830	179	149	6.8	--	7.0	--	VDCLS	4.2	10.7	--
29...	1200	5570	62	6.7	9.5	11.5	769	VDCLS	110	8.6	78
30...	0845	10600	57	6.9	4.0	11.0	776	VDCLS	68	8.8	78
30...	0900	10600	57	6.9	4.0	11.0	776	VDCLS	68	8.8	78
DEC											
01...	1200	12800	48	6.7	14.0	9.0	780	VDCLS	54	9.0	76
03...	1200	8500	54	6.6	16.5	8.0	772	VDCLS	31	10.0	83
05...	0915	1500	90	7.4	7.0	10.0	761	VDCLS	50	10.0	89
06...	1145	5340	68	7.2	10.5	11.5	753	VDCLS	110	9.6	89
06...	1200	5360	68	7.2	10.5	11.5	753	USGS	--	9.6	89
07...	0900	6880	54	7.1	6.0	10.0	771	VDCLS	56	10.0	88
17...	1200	1110	79	7.3	5.0	7.5	773	VDCLS	7.5	11.5	95
JAN											
09...	1100	2970	72	6.1	0.5	5.0	778	VDCLS	31	12.4	95
13...	0830	2510	73	6.6	5.0	5.5	760	USGS	22	10.4	83
13...	0831	2510	73	6.6	5.0	5.5	760	VDCLS	--	10.4	83
14...	1000	4270	68	5.7	7.0	4.0	755	VDCLS	29	13.0	100
29...	1100	2550	85	6.0	8.5	2.0	766	VDCLS	38	14.0	101
31...	0830	4310	78	6.9	1.0	3.0	768	VDCLS	62	13.4	98
FEB											
15...	1000	2690	80	7.1	5.5	2.0	770	USGS	10	13.9	99
15...	1001	2690	80	7.1	5.5	2.0	770	VDCLS	14	13.9	99
16...	1200	3000	78	7.1	9.0	3.0	774	VDCLS	12	13.8	101
16...	1215	3000	78	7.1	9.0	3.0	774	VDCLS	13	13.8	101
19...	1000	4610	67	6.5	8.5	3.0	779	VDCLS	20	12.9	94
22...	1000	5650	88	6.8	6.0	7.0	764	VDCLS	24	11.2	92
25...	0945	10700	52	7.1	4.0	7.0	768	VDCLS	22	10.9	89
27...	0750	9900	41	6.9	-5.0	3.0	767	VDCLS	8.4	12.6	93
MAR											
01...	1200	3960	66	7.2	8.0	6.0	773	USGS	--	12.5	99
01...	1201	3960	66	7.2	8.0	6.0	773	VDCLS	14	12.5	99
03...	1100	6630	49	6.9	2.0	4.0	747	VDCLS	68	12.0	93
04...	1030	12600	44	6.7	11.0	4.0	751	VDCLS	40	11.8	91
06...	0800	10800	50	6.9	1.5	6.0	772	VDCLS	20	11.4	90
09...	1100	4240	64	7.2	6.0	10.0	772	VDCLS	38	10.6	93
09...	1115	4240	64	7.2	6.0	10.0	772	VDCLS	24	10.6	93
11...	1100	4700	57	7.0	8.0	8.0	771	VDCLS	40	11.6	97
14...	1200	2580	66	7.1	17.0	9.0	762	VDCLS	27	11.0	95
28...	1015	4870	62	7.0	13.0	13.5	761	VDCLS	75	11.2	107
29...	1100	10800	52	6.7	7.5	8.0	770	VDCLS	60	10.2	85
31...	1300	17000	45	6.7	16.0	11.5	769	VDCLS	38	9.6	87

## YORK RIVER BASIN

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01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
APR											
02...	1200	12000	50	7.4	19.5	12.0	761	VDCLS	29	9.8	91
04...	1050	5790	63	7.2	14.0	12.0	767	VDCLS	19	8.6	79
26...	0900	867	80	7.4	25.0	17.5	764	USGS	4.3	8.6	90
26...	0901	867	80	7.4	25.0	17.5	764	VDCLS	4.6	8.6	90
26...	0903	867	90	7.0	--	17.5	--	VDCLS	4.3	8.3	--
30...	0845	3940	53	6.0	22.0	19.0	770	VDCLS	--	7.6	81
MAY											
01...	0800	3520	65	5.9	21.5	20.0	760	VDCLS	--	7.3	81
17...	0830	842	93	7.4	15.0	19.5	762	VDCLS	12	7.6	83
24...	0905	580	97	7.0	--	19.5	--	VDCLS	6.3	7.8	--
JUN											
14...	1130	228	116	7.4	32.0	25.0	767	USGS	2.2	6.9	83
14...	1131	228	116	7.4	32.0	25.0	767	VDCLS	1.7	6.9	83
23...	0900	276	148	7.1	--	26.5	--	VDCLS	2.0	6.3	--
JUL											
21...	0915	511	120	7.1	--	27.0	--	VDCLS	6.2	6.2	--
21...	1000	505	105	7.2	28.0	27.0	768	VDCLS	8.3	6.3	79
AUG											
09...	1030	319	122	7.2	22.0	23.0	770	USGS	3.1	7.2	83
09...	1031	319	122	7.2	22.0	23.0	770	VDCLS	8.8	7.2	83
22...	0900	4280	65	6.7	22.0	24.0	760	VDCLS	28	6.1	73
23...	0900	1140	94	6.6	--	23.5	--	VDCLS	16	6.6	--
SEP											
13...	1130	136	172	7.1	25.0	19.5	770	VDCLS	1.9	8.7	94



01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP-TOCOCCHI, FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARDNESS, TOTAL (MG/L AS CACO3) (00900)	CALCIUM, DIS-SOLVED (MG/L AS CA) (00915)	MAGNESIUM, DIS-SOLVED (MG/L AS MG) (00925)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	POTASSIUM, DIS-SOLVED (MG/L AS K) (00935)	BICARBONATE, WATER, DIS IT FIELD (MG/L AS HCO3) (00453)	CARBONATE, WATER, DIS IT FIELD (MG/L AS CO3) (00452)	ALKALINITY, WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	SULFATE, DIS-SOLVED (MG/L AS SO4) (00945)
OCT											
06...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
NOV											
18...	K190	K280	32	8.0	2.9	13	3.2	33	0	27	28
18...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
JAN											
09...	--	--	--	--	--	--	--	--	--	--	--
13...	620	690	18	3.9	2.0	4.6	1.9	14	0	11	11
13...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
FEB											
15...	110	170	18	4.1	1.8	6.2	1.8	11	0	9	10
15...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
MAR											
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
APR											
02...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
26...	60	33	22	5.1	2.3	5.3	1.7	22	0	18	9.2
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	23	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
MAY											
01...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	43	--	--	--	--	--	--	--	--
JUN											
14...	31	32	28	6.9	2.7	10	2.2	29	0	23	16
14...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	32	--	--	--	--	--	--	--	--
JUL											
21...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
AUG											
09...	38	96	29	6.9	2.8	11	2.5	22	0	18	18
09...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
SEP											
13...	--	--	--	--	--	--	--	--	--	--	--

K Results based on colony count outside the acceptance range (non-ideal colony count).

01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	RESIDUE FIXED NON FILTER- ABLE (MG/L) (00540)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L) (00535)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618) (*)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613) (*)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630) (*)
OCT											
06...	--	--	7.5	--	--	<3	<3	<3	0.100	<0.010	0.100
13...	--	--	6.9	--	--	<3	<3	<3	0.200	<0.010	0.200
13...	--	--	6.8	--	--	<3	<3	<3	0.200	<0.010	0.200
NOV											
18...	6.3	0.10	9.7	96	89	--	--	--	0.090	0.030	0.120
18...	--	--	9.4	--	--	7	5	2	0.070	0.010	0.080
23...	--	--	12	--	--	10	6	4	0.050	<0.010	0.050
29...	--	--	8.2	--	--	97	83	14	0.160	<0.010	0.160
30...	--	--	7.6	--	--	43	35	8	0.080	<0.010	0.080
30...	--	--	7.6	--	--	51	42	9	0.080	<0.010	0.080
DEC											
01...	--	--	6.1	--	--	24	20	4	0.070	<0.010	0.070
03...	--	--	7.0	--	--	22	18	4	0.110	<0.010	0.110
05...	--	--	9.5	--	--	65	56	9	0.240	0.010	0.250
06...	--	--	8.2	--	--	77	63	14	0.150	0.010	0.160
06...	--	--	8.7	--	--	68	0	88	--	<0.010	1.10
07...	--	--	8.3	--	--	32	28	4	0.100	0.010	0.110
17...	--	--	11	--	--	10	8	2	0.230	<0.010	0.230
JAN											
09...	--	--	9.8	--	--	72	64	8	0.300	<0.010	0.300
13...	5.1	<0.10	11	64	48	40	28	12	0.250	0.010	0.260
13...	--	--	9.5	--	--	44	38	6	0.240	<0.010	0.240
14...	--	--	11	--	--	52	46	6	0.220	<0.010	0.220
29...	--	--	9.9	--	--	73	65	8	0.272	0.004	0.276
31...	--	--	8.5	--	--	73	64	9	0.274	0.005	0.279
FEB											
15...	7.6	<0.10	9.9	53	49	19	9	10	--	<0.010	0.310
15...	--	--	10	--	--	24	21	3	0.290	<0.002	0.290
16...	--	--	9.6	--	--	28	24	4	0.294	0.002	0.296
16...	--	--	9.7	--	--	29	25	4	0.293	<0.002	0.293
19...	--	--	8.7	--	--	18	15	3	0.230	<0.002	0.230
22...	--	--	8.4	--	--	36	32	4	0.214	<0.002	0.214
25...	--	--	6.4	--	--	33	28	5	0.169	0.003	0.172
27...	--	--	5.8	--	--	11	8	3	0.088	<0.002	0.088
MAR											
01...	--	--	10	--	--	16	6	10	--	<0.010	0.280
01...	--	--	9.2	--	--	17	14	3	0.284	0.002	0.286
03...	--	--	6.2	--	--	90	80	10	0.258	0.003	0.261
04...	--	--	5.8	--	--	38	32	6	0.181	0.003	0.184
06...	--	--	6.6	--	--	15	12	3	0.194	0.003	0.197
09...	--	--	8.7	--	--	19	16	3	0.282	0.002	0.284
09...	--	--	8.7	--	--	20	18	2	0.274	0.002	0.276
11...	--	--	8.6	--	--	47	41	6	0.230	0.004	0.234
14...	--	--	10	--	--	29	19	10	0.276	<0.002	0.276
28...	--	--	8.2	--	--	98	87	11	0.252	0.004	0.256
29...	--	--	6.8	--	--	79	68	11	0.208	0.004	0.212
31...	--	--	6.2	--	--	24	20	4	0.161	0.003	0.164
APR											
02...	--	--	7.2	--	--	11	9	2	0.158	0.005	0.163
04...	--	--	8.7	--	--	17	15	2	0.223	0.003	0.226
26...	4.3	<0.10	10	51	50	10	6	4	0.170	0.010	0.180
26...	--	--	25	--	--	8	6	2	0.185	<0.002	0.185
26...	--	--	10	--	--	8	6	2	0.191	0.003	0.194
30...	--	--	--	--	--	--	--	--	--	--	--
MAY											
01...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	11	--	--	14	11	3	0.279	0.022	0.301
24...	--	--	13	--	--	9	6	3	0.293	0.017	0.310
JUN											
14...	5.8	<0.10	13	78	73	5	0	6	--	<0.010	0.480
14...	--	--	13	--	--	<3	<3	<3	0.517	0.004	0.521
23...	--	--	13	--	--	8	6	2	0.521	0.004	0.525
JUL											
21...	--	--	12	--	--	10	8	2	0.260	0.005	0.265
21...	--	--	12	--	--	15	13	2	0.260	0.005	0.265
AUG											
09...	5.5	0.10	13	87	74	9	3	6	--	<0.010	0.350
09...	--	--	13	--	--	5	4	1	0.331	0.005	0.336
22...	--	--	9.0	--	--	29	24	5	0.152	0.003	0.155
23...	--	--	10	--	--	18	15	3	0.247	0.002	0.249
SEP											
13...	--	--	11	--	--	<3	<3	<3	0.537	0.002	0.539

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.

## 01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631) (*)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608) (*)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671) (*)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT											
06...	0.100	--	<0.040	0.40	0.030	0.020	0.010	--	--	--	--
13...	0.200	--	<0.040	0.30	0.040	0.020	0.020	--	--	--	--
13...	0.200	--	<0.040	0.30	0.040	0.020	0.020	--	--	--	--
NOV											
18...	0.120	--	0.010	0.40	0.050	0.050	0.030	50	22	<3	320
18...	0.080	--	<0.040	0.30	0.040	0.020	0.030	--	--	--	--
23...	0.050	--	<0.040	0.30	0.040	0.030	0.030	--	--	--	--
29...	0.160	--	<0.040	0.80	0.200	0.010	0.010	--	--	--	--
30...	0.080	--	<0.040	0.60	0.120	0.010	0.010	--	--	--	--
30...	0.080	--	<0.040	0.80	0.150	0.010	0.010	--	--	--	--
DEC											
01...	0.070	--	<0.040	0.60	0.100	0.010	0.010	--	--	--	--
03...	0.110	--	<0.040	0.50	0.080	0.020	0.020	--	--	--	--
05...	0.250	--	<0.040	0.50	0.120	0.020	0.020	--	--	--	--
06...	0.160	--	<0.040	0.60	0.160	0.030	0.030	--	--	--	--
06...	1.10	--	0.060	<0.20	0.150	--	0.020	--	--	--	--
07...	0.110	--	<0.040	0.50	0.080	0.020	0.020	--	--	--	--
17...	0.230	--	0.070	0.30	0.040	0.020	0.010	--	--	--	--
JAN											
09...	0.300	--	<0.040	0.60	0.080	0.030	0.020	--	--	--	--
13...	0.260	--	0.040	0.30	0.060	0.020	0.020	--	--	--	--
13...	0.240	--	0.050	0.40	0.080	0.030	0.020	--	--	--	--
14...	0.220	--	<0.040	0.60	0.080	0.020	0.020	--	--	--	--
29...	0.276	--	0.054	0.40	0.090	0.020	0.015	--	--	--	--
31...	0.279	--	0.051	0.50	0.110	0.030	0.010	--	--	--	--
FEB											
15...	0.310	--	0.040	0.30	0.040	0.020	0.010	300	27	<3	280
15...	0.290	--	0.018	0.30	0.050	0.020	0.010	--	--	--	--
16...	0.296	--	0.033	0.40	0.070	0.030	0.016	--	--	--	--
16...	0.293	--	0.033	0.40	0.070	0.030	0.018	--	--	--	--
19...	0.230	--	0.020	0.30	0.060	0.020	0.008	--	--	--	--
22...	0.214	--	0.013	0.20	0.060	0.010	0.006	--	--	--	--
25...	0.172	--	0.007	0.40	0.060	0.030	0.016	--	--	--	--
27...	0.088	--	--	0.40	0.040	0.020	0.007	--	--	--	--
MAR											
01...	0.280	--	0.010	0.20	0.040	--	<0.010	--	--	--	--
01...	0.286	--	0.009	0.30	0.050	0.020	0.008	--	--	--	--
03...	0.261	--	0.037	0.60	0.140	0.040	0.024	--	--	--	--
04...	0.184	--	0.013	0.40	0.080	0.020	0.010	--	--	--	--
06...	0.197	--	0.008	0.30	0.050	0.020	0.006	--	--	--	--
09...	0.284	--	0.011	0.30	0.040	0.020	0.007	--	--	--	--
09...	0.276	--	0.016	0.30	0.050	0.020	0.008	--	--	--	--
11...	0.234	--	0.015	0.40	0.070	0.020	0.009	--	--	--	--
14...	0.276	--	<0.004	0.30	0.050	0.010	0.007	--	--	--	--
28...	0.256	--	0.034	0.60	0.140	0.030	0.018	--	--	--	--
29...	0.212	--	0.026	0.60	0.100	0.040	0.020	--	--	--	--
31...	0.164	--	<0.004	0.50	0.070	0.050	0.010	--	--	--	--
APR											
02...	0.163	--	--	0.50	0.060	0.030	0.006	--	--	--	--
04...	0.226	--	0.016	0.50	0.060	0.020	0.011	--	--	--	--
26...	0.180	--	0.030	<0.20	0.030	0.030	0.020	80	27	7	640
26...	0.185	--	0.009	0.30	0.040	0.030	0.018	--	--	--	--
26...	0.194	--	0.016	--	--	--	0.020	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
MAY											
01...	--	--	--	--	--	--	--	--	--	--	--
17...	0.301	--	0.022	0.40	0.060	0.040	0.028	--	--	--	--
24...	0.310	--	0.039	--	--	--	0.026	--	--	--	--
JUN											
14...	0.480	--	0.050	0.40	0.040	0.040	0.040	--	--	--	--
14...	0.521	--	0.039	0.30	0.060	0.050	0.046	--	--	--	--
23...	0.525	--	0.037	--	--	--	0.074	--	--	--	--
JUL											
21...	0.265	--	0.049	--	--	0.040	0.030	--	--	--	--
21...	0.265	<0.040	0.040	0.40	0.060	0.050	0.029	--	--	--	--
AUG											
09...	0.350	--	0.050	0.40	0.070	0.060	0.040	60	30	5	1100
09...	0.336	0.050	0.049	0.50	0.070	0.060	0.052	--	--	--	--
22...	0.155	--	0.024	0.70	0.060	0.060	0.019	--	--	--	--
23...	0.249	--	0.032	--	--	0.040	0.023	--	--	--	--
SEP											
13...	0.539	--	0.014	0.30	0.070	0.070	0.053	--	--	--	--

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.

## YORK RIVER BASIN

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01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)
OCT								
06...	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--
NOV								
18...	<4	77	<10	<1	<1	<1.0	45	<6
18...	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--
DEC								
01...	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--
JAN								
09...	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--
FEB								
15...	<4	26	<10	<1	<1	<1.0	27	<6
15...	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--
MAR								
01...	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--
APR								
02...	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--
26...	<4	27	<10	<1	<1	<1.0	33	<6
26...	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--
MAY								
01...	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--
JUN								
14...	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--
JUL								
21...	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--
AUG								
09...	<4	64	<10	<1	<1	<1.0	46	<6
09...	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--
SEP								
13...	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## YORK RIVER BASIN

01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT				
06...	5.0	--	--	--
13...	5.4	--	--	--
13...	5.9	--	--	--
NOV				
18...	4.0	--	6	88
18...	6.4	--	--	--
23...	5.5	--	--	--
29...	9.6	--	--	--
30...	10	--	--	--
30...	10	--	--	--
DEC				
01...	11	--	--	--
03...	17	--	--	--
05...	7.1	--	--	--
06...	9.8	--	--	--
06...	12	--	--	--
07...	9.6	--	--	--
17...	5.5	--	--	--
JAN				
09...	5.0	3.2	--	--
13...	6.1	--	56	75
13...	4.7	4.3	--	--
14...	7.9	7.1	--	--
29...	4.7	--	--	--
31...	6.4	--	--	--
FEB				
15...	5.2	--	25	91
15...	5.5	--	--	--
16...	5.0	--	--	--
16...	5.6	--	--	--
19...	4.4	--	--	--
22...	4.5	--	--	--
25...	6.8	--	--	--
27...	6.5	--	--	--
MAR				
01...	5.2	--	--	--
01...	<5.0	--	--	--
03...	7.6	--	--	--
04...	6.2	--	--	--
06...	5.2	--	--	--
09...	4.2	--	--	--
09...	4.0	--	--	--
11...	4.8	--	--	--
14...	3.9	--	--	--
28...	7.5	--	--	--
29...	9.1	--	--	--
31...	7.8	--	--	--
APR				
02...	6.0	--	--	--
04...	6.2	--	--	--
26...	4.7	--	9	87
26...	5.7	--	--	--
26...	7.7	--	--	--
30...	--	--	--	--
MAY				
01...	--	--	--	--
17...	0.0	--	--	--
24...	4.2	--	--	--
JUN				
14...	4.2	--	7	85
14...	4.9	--	--	--
23...	5.2	--	--	--
JUL				
21...	5.4	--	--	--
21...	6.7	--	--	--
AUG				
09...	6.8	--	8	99
09...	5.9	--	--	--
22...	--	--	--	--
23...	7.4	--	--	--
SEP				
13...	--	--	--	--

&lt; Actual value is known to be less than the value shown.



## YORK RIVER BASIN

203

01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	75	65	---	66	---	---	74	---
2	---	155	58	---	81	69	51	---	---	---	76	---
3	169	---	46	106	82	53	---	---	110	---	78	145
4	---	---	59	96	84	44	---	78	---	---	86	---
5	---	148	---	89	88	45	65	---	---	---	90	---
6	193	---	68	81	84	50	---	---	114	---	95	162
7	---	---	60	80	82	54	---	71	---	---	110	---
8	---	160	58	---	87	57	62	---	---	---	121	---
9	212	---	57	85	82	63	---	---	116	---	122	161
10	---	---	---	81	79	65	---	79	---	---	130	---
11	---	160	---	---	---	58	72	---	---	---	140	---
12	---	---	---	---	---	58	---	---	119	---	132	177
13	200	---	---	---	---	61	---	83	---	---	143	---
14	---	164	---	---	---	66	74	84	---	113	158	---
15	---	---	---	---	77	66	---	89	119	---	---	112
16	174	---	---	---	77	69	---	93	125	---	---	---
17	---	---	---	---	72	---	72	93	---	123	---	---
18	---	149	---	---	72	---	---	---	---	---	57	159
19	173	---	---	---	68	73	---	---	---	---	---	---
20	---	---	83	---	70	---	77	---	---	116	---	---
21	---	151	84	---	63	---	---	94	---	---	---	111
22	144	---	76	---	61	73	---	---	---	---	70	---
23	---	---	72	---	61	69	78	---	---	114	77	---
24	---	145	74	---	58	72	---	---	---	---	83	87
25	---	---	84	---	---	---	---	94	---	---	89	79
26	---	---	85	---	---	---	80	---	136	109	97	81
27	201	155	90	---	---	77	---	---	---	95	98	97
28	---	110	101	---	57	---	---	92	---	74	122	66
29	---	64	---	---	---	---	86	---	---	73	---	70
30	169	---	---	---	---	46	62	---	---	56	---	72
31	---	---	---	74	---	---	---	102	---	66	126	---

## YORK RIVER BASIN

01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

RESIDUE, TOTAL NON FILTERABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	107	48	---	84	---	---	192	---
2	---	8	70	---	125	148	16	---	---	---	232	---
3	<3	---	51	32	55	100	---	---	69	---	209	35
4	---	---	28	76	71	60	---	91	---	---	330	---
5	---	<3	---	101	61	28	57	---	---	---	224	---
6	<3	---	51	90	56	17	---	---	38	---	285	36
7	---	---	119	77	39	14	---	54	---	---	249	---
8	---	12	72	---	20	18	79	---	---	---	153	---
9	<3	---	94	66	20	31	---	---	40	---	138	24
10	---	---	---	39	68	10	---	43	---	---	102	---
11	---	15	---	---	---	61	42	---	---	---	199	---
12	---	---	---	---	---	84	---	---	59	---	121	19
13	11	---	---	---	---	56	---	67	---	---	75	---
14	---	11	---	---	---	76	27	177	---	111	86	---
15	---	---	---	---	33	47	---	62	55	---	---	30
16	10	---	---	---	63	42	---	135	71	---	---	---
17	---	---	---	---	111	---	32	47	---	67	---	---
18	---	<3	---	---	16	---	---	---	---	---	144	20
19	10	---	---	---	48	21	---	---	---	---	---	---
20	---	---	219	---	128	---	63	---	---	85	---	---
21	---	<3	157	---	151	---	---	33	---	---	---	43
22	<3	---	95	---	58	54	---	---	---	---	38	---
23	---	---	64	---	84	76	94	---	---	120	268	---
24	---	<3	31	---	296	30	---	---	---	---	172	58
25	---	---	115	---	---	---	---	50	---	---	123	110
26	---	---	62	---	---	---	70	---	59	108	108	249
27	<3	<3	52	---	---	47	---	---	---	352	175	49
28	---	516	22	---	20	---	---	75	---	414	165	49
29	---	198	---	---	---	---	39	---	---	334	---	109
30	<3	---	---	---	---	41	436	---	---	138	---	158
31	---	---	---	181	---	---	---	58	---	290	80	---

RESIDUE, VOLATILE NONFILTRABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	13	8	---	12	---	---	25	---
2	---	2	11	---	12	17	4	---	---	---	32	---
3	<3	---	8	5	5	13	---	---	10	---	32	4
4	---	---	4	9	7	8	---	14	---	---	46	---
5	---	<3	---	12	7	6	8	---	---	---	32	---
6	<3	---	8	12	7	3	---	---	7	---	36	5
7	---	---	18	10	4	3	---	8	---	---	36	---
8	---	3	9	---	3	3	11	---	---	---	23	---
9	<3	---	8	7	3	4	---	---	8	---	19	4
10	---	---	---	5	8	6	---	6	---	---	16	---
11	---	3	---	---	---	7	6	---	---	---	26	---
12	---	---	---	---	---	8	---	---	9	---	18	3
13	3	---	---	---	---	7	---	9	---	---	12	---
14	---	3	---	---	---	8	5	19	---	12	15	---
15	---	---	---	---	8	6	---	8	10	---	---	4
16	3	---	---	---	7	6	---	19	13	---	---	---
17	---	---	---	---	10	---	5	7	---	10	---	---
18	---	<3	---	---	2	---	---	---	---	---	19	4
19	3	---	---	---	5	3	---	---	---	---	---	---
20	---	---	33	---	12	---	10	---	---	13	---	---
21	---	<3	26	---	13	---	---	5	---	---	---	5
22	<3	---	22	---	6	6	---	---	---	---	8	---
23	---	---	17	---	8	9	12	---	---	16	33	---
24	---	<3	10	---	28	4	---	---	---	---	23	8
25	---	---	32	---	---	---	---	9	---	---	17	15
26	---	---	13	---	---	---	8	---	5	16	15	111
27	<3	<3	10	---	---	8	---	---	---	48	20	8
28	---	63	4	---	4	---	---	10	---	56	18	6
29	---	26	---	---	---	---	5	---	---	48	---	13
30	<3	---	---	---	---	5	49	---	---	18	---	19
31	---	---	---	17	---	---	---	9	---	48	10	---

&lt; Actual value is known to be less than the value shown.

## YORK RIVER BASIN

205

01673000 PAMUNKEY RIVER NEAR HANOVER, VA--Continued

RESIDUE, FIXED NON FILTERABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	94	40	---	72	---	---	167	---
2	---	6	59	---	113	131	12	---	---	---	200	---
3	<3	---	43	27	50	87	---	---	59	---	177	31
4	---	---	24	67	60	52	---	77	---	---	284	---
5	---	<3	---	89	58	22	49	---	---	---	192	---
6	<3	---	43	78	49	14	---	---	31	---	249	31
7	---	---	101	67	35	11	---	46	---	---	213	---
8	---	9	63	---	17	15	68	---	---	---	130	---
9	<3	---	86	59	17	27	---	---	32	---	119	20
10	---	---	---	34	60	4	---	37	---	---	86	---
11	---	12	---	---	---	54	36	---	---	---	173	---
12	---	---	---	---	---	76	---	---	50	---	103	16
13	8	---	---	---	---	49	---	58	---	---	63	---
14	---	8	---	---	---	68	22	158	---	99	71	---
15	---	---	---	---	25	41	---	54	45	---	---	26
16	7	---	---	---	56	36	---	116	58	---	---	---
17	---	---	---	---	101	---	27	40	---	57	---	---
18	---	<3	---	---	14	---	---	---	---	---	125	16
19	7	---	---	---	43	18	---	---	---	---	---	---
20	---	---	186	---	116	---	53	---	---	72	---	---
21	---	<3	131	---	138	---	---	28	---	---	---	38
22	<3	---	73	---	52	48	---	---	---	---	30	---
23	---	---	47	---	76	67	82	---	---	104	235	---
24	---	<3	21	---	268	26	---	---	---	---	149	50
25	---	---	83	---	---	---	---	41	---	---	106	95
26	---	---	49	---	---	---	62	---	54	92	93	138
27	<3	<3	42	---	---	39	---	---	---	304	155	41
28	---	453	18	---	16	---	---	65	---	358	147	43
29	---	172	---	---	---	---	34	---	---	288	---	96
30	<3	---	---	---	---	36	387	---	---	120	---	139
31	---	---	---	164	---	---	---	49	---	242	70	---

&lt; Actual value is known to be less than the value shown.

## YORK RIVER BASIN

01673550 TOTOPOTOMOY CREEK NEAR STUDLEY, VA

LOCATION.--Lat 37°39'44", long 77°15'29", Hanover County, Hydrologic Unit 02080106, on right bank at downstream side of bridge on State Highway 606, 2.0 mi southeast of Studley, 2.4 mi downstream from Hawes millrace, and 4.1 mi upstream from mouth.

DRAINAGE AREA.--26.2 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is 38.36 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 30, 31, and Jan. 16-18, and period of no gage-height record, Jan. 19-22, which are fair. Maximum discharge, 802 ft<sup>3</sup>/s, from rating curve extended above 783 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 160 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	2000	514	7.63	Mar. 29	0700	472	7.47
Feb. 24	1630	248	5.80	Aug. 2	2230	182	5.12
Mar. 3	0900	*568	*7.79				

Minimum discharge, 1.8 ft<sup>3</sup>/s, Sept. 12, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	16	26	18	25	38	110	54	13	9.4	15	3.4
2	3.9	11	21	30	23	175	106	31	12	9.3	38	3.1
3	3.1	8.4	18	40	21	497	73	25	12	8.9	75	3.0
4	3.3	7.2	20	44	20	232	61	38	12	8.5	48	2.6
5	2.8	7.5	26	47	21	88	54	93	11	9.4	25	2.6
6	2.7	11	77	31	22	64	55	83	11	14	15	2.6
7	2.6	12	39	24	22	53	64	49	12	8.9	10	2.6
8	2.9	12	23	28	22	50	54	38	12	6.4	9.3	2.3
9	3.0	9.7	19	34	25	57	46	33	12	4.9	7.6	2.1
10	3.1	8.8	18	27	31	71	43	28	12	4.3	6.5	2.3
11	3.5	7.9	18	23	37	94	41	26	13	3.9	6.2	2.8
12	3.6	7.5	16	28	57	59	39	24	13	3.4	5.8	2.2
13	4.3	7.3	15	35	64	48	45	22	12	3.9	5.5	2.2
14	3.9	7.4	15	31	63	44	50	21	11	4.7	5.9	2.0
15	3.7	7.6	18	23	71	41	40	21	12	5.8	12	1.9
16	3.5	7.5	32	e23	76	38	44	40	22	7.2	13	2.2
17	3.8	7.5	32	e22	65	36	62	38	29	6.6	18	2.8
18	4.1	12	23	e45	52	36	43	25	18	9.0	21	4.3
19	4.1	15	22	e40	47	37	35	21	15	8.0	25	4.0
20	4.9	12	22	e30	44	35	32	21	12	7.3	19	5.0
21	5.6	9.0	68	e23	40	37	30	21	10	5.7	13	4.7
22	6.1	8.0	81	e21	38	54	29	20	9.6	6.1	9.7	12
23	5.5	7.6	35	21	76	53	28	18	12	8.8	8.1	27
24	5.6	7.5	25	23	206	39	27	17	11	7.8	7.0	42
25	5.3	7.2	22	23	128	42	25	17	9.3	12	5.5	24
26	5.2	7.4	19	22	63	45	23	21	8.5	13	4.9	24
27	6.2	12	18	20	47	66	22	20	11	13	4.7	27
28	7.0	194	18	36	40	252	23	17	13	9.4	4.4	28
29	6.7	251	18	65	---	438	26	16	13	12	4.0	16
30	10	43	e21	41	---	285	49	15	9.9	13	3.6	11
31	14	---	e23	29	---	114	---	15	---	14	3.4	---
TOTAL	147.7	742.0	848	947	1446	3218	1379	928	383.3	258.6	449.1	271.7
MEAN	4.76	24.7	27.4	30.5	51.6	104	46.0	29.9	12.8	8.34	14.5	9.06
MAX	14	251	81	65	206	497	110	93	29	14	75	42
MIN	2.6	7.2	15	18	20	35	22	15	8.5	3.4	3.4	1.9
CFSM	.18	.94	1.04	1.17	1.97	3.96	1.75	1.14	.49	.32	.55	.35
IN.	.21	1.05	1.20	1.34	2.05	4.57	1.96	1.32	.54	.37	.64	.39

e Estimated.

01673550 TOTOPOTOMOY CREEK NEAR STUDLEY, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	13.4	23.4	25.8	35.9	37.5	52.1	44.4	31.4	18.5	12.2	15.5	10.4
MAX	54.0	80.8	50.8	114	81.9	127	106	68.4	43.2	22.5	49.7	44.4
(WY)	1980	1986	1978	1978	1979	1984	1984	1978	1979	1984	1985	1979
MIN	2.93	6.44	10.5	10.3	15.5	12.7	12.3	8.46	4.95	6.05	3.15	2.31
(WY)	1982	1982	1981	1981	1991	1981	1985	1985	1986	1985	1983	1981

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1978 - 1994

ANNUAL TOTAL	9833.7	11018.4	
ANNUAL MEAN	26.9	30.2	26.7
HIGHEST ANNUAL MEAN			45.1
LOWEST ANNUAL MEAN			11.8
HIGHEST DAILY MEAN	464	Mar 5	612
LOWEST DAILY MEAN	1.6	<sup>a</sup> Jul 31	1.9
ANNUAL SEVEN-DAY MINIMUM	1.7	Jul 30	2.2
INSTANTANEOUS PEAK FLOW			568
INSTANTANEOUS PEAK STAGE			7.79
INSTANTANEOUS LOW FLOW			1.8
ANNUAL RUNOFF (CFSM)	1.03		1.15
ANNUAL RUNOFF (INCHES)	13.96		15.64
10 PERCENT EXCEEDS	58		60
50 PERCENT EXCEEDS	16		18
90 PERCENT EXCEEDS	2.3		3.9

a Also Aug. 1, 5, 1993.

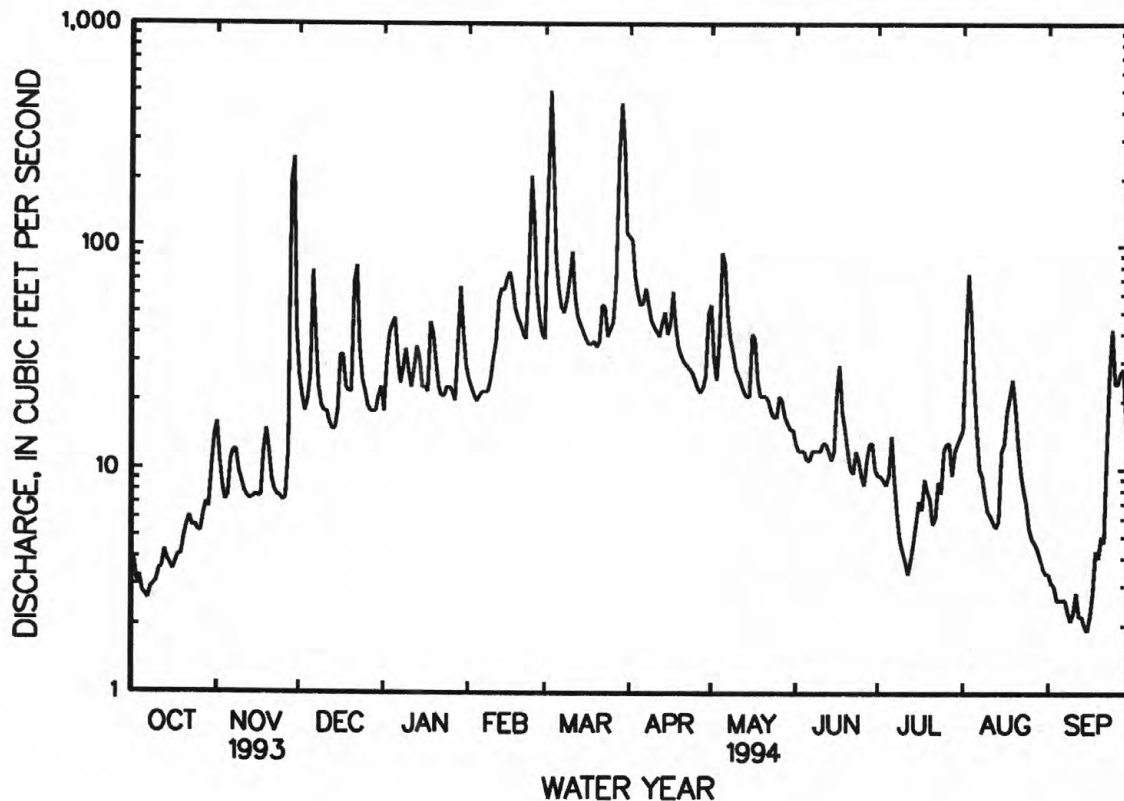
b Also Oct. 2-7, 1977.

c Also Sept. 15, 1994.

d Not determined.

e Estimated.

f Probably occurred Oct. 1-7, 1977.





## YORK RIVER BASIN

01673800 PO RIVER NEAR SPOTSYLVANIA, VA

LOCATION.--Lat 38°10'17", long 77°35'42", Spotsylvania County, Hydrologic Unit 02080105, on right bank at upstream side of bridge on State Highway 208, 1.6 mi north of Snell, 2.0 mi south of Spotsylvania, 4.8 mi downstream from Gladys Run, and 4.9 mi upstream from U.S. Highway 1.

DRAINAGE AREA.--77.4 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 183.76 ft above sea level. Prior to Sept. 30, 1964, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Jan. 18-21, 31, and May 29-31, which are fair. Maximum discharge, 10,900 ft<sup>3</sup>/s, from rating curve extended above 3,400 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 900 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	2300	*8,070	*17.10	Mar. 3	2130	3,280	12.40
Dec. 6	1300	1,260	8.45	Mar. 29	0030	4,860	14.32
Feb. 24	1400	2,700	11.50				

Minimum discharge, 1.5 ft<sup>3</sup>/s, Oct. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	28	110	39	111	112	332	128	11	6.9	60	7.8
2	3.7	17	74	43	93	359	267	78	12	5.9	45	6.7
3	3.3	9.6	57	60	80	2290	174	56	11	5.3	29	5.4
4	2.7	6.5	51	163	72	2050	139	55	11	4.9	21	4.8
5	2.5	6.3	478	258	69	602	120	89	10	4.0	16	4.2
6	2.0	7.9	1040	121	76	296	116	83	10	3.8	13	4.1
7	1.8	12	224	93	73	184	152	63	9.5	3.6	11	3.4
8	1.8	12	105	259	68	149	148	69	9.1	3.2	9.3	3.0
9	1.7	12	76	294	110	140	109	74	8.7	3.4	8.2	2.8
10	2.0	9.0	63	114	225	273	99	56	7.8	6.3	7.6	3.2
11	2.1	10	57	84	154	551	92	47	7.2	7.7	7.5	3.9
12	6.4	5.5	49	182	143	218	87	42	7.6	6.2	6.8	2.9
13	7.2	5.7	42	489	115	150	97	36	7.6	4.8	6.3	3.5
14	7.5	6.2	38	193	112	128	131	33	7.2	3.8	5.8	2.5
15	6.5	7.4	40	123	117	114	101	30	6.7	3.3	5.8	2.3
16	4.4	8.2	78	80	155	103	91	30	21	7.3	5.6	2.2
17	3.6	8.0	84	67	204	91	86	28	122	11	19	3.4
18	3.0	25	58	e120	239	85	72	25	45	11	201	13
19	2.4	26	49	e110	339	89	66	24	23	8.7	159	12
20	2.8	22	43	e84	418	82	62	24	13	7.3	46	9.9
21	3.5	16	82	e70	406	77	56	26	10	6.3	84	6.8
22	4.7	11	134	63	329	109	55	28	16	7.1	50	24
23	5.1	9.3	82	68	627	107	58	24	21	8.0	30	56
24	7.0	8.1	61	94	2120	87	59	22	20	26	21	42
25	3.7	7.0	53	145	1070	94	51	20	15	33	16	22
26	3.9	6.7	48	138	282	111	45	19	11	25	12	33
27	4.7	72	41	119	169	239	42	18	10	132	10	233
28	5.5	3410	38	140	127	2840	39	16	9.3	436	9.1	97
29	5.0	4210	40	447	---	3680	63	e15	8.0	166	8.4	43
30	11	355	45	233	---	1700	259	e14	7.1	72	8.0	26
31	28	---	42	e137	---	430	---	e12	---	62	8.1	---
TOTAL	155.7	8349.4	3482	4630	8103	17540	3268	1284	487.8	1091.8	939.5	683.8
MEAN	5.02	278	112	149	289	566	109	41.4	16.3	35.2	30.3	22.8
MAX	28	4210	1040	489	2120	3680	332	128	122	436	201	233
MIN	1.7	5.5	38	39	68	77	39	12	6.7	3.2	5.6	2.2
CFSM	.06	3.60	1.45	1.93	3.74	7.31	1.41	.54	.21	.46	.39	.29
IN.	.07	4.01	1.67	2.23	3.89	8.43	1.57	.62	.23	.52	.45	.33

e Estimated.

## YORK RIVER BASIN

209

01673800 PO RIVER NEAR SPOTSYLVANIA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	40.9	63.9	86.8	112	129	154	117	80.3	52.6	28.7	25.9	23.8
MAX	275	278	206	326	370	566	397	221	490	145	207	268
(WY)	1980	1994	1974	1978	1979	1994	1983	1972	1972	1984	1969	1975
MIN	.24	.85	11.1	10.4	37.3	25.2	27.1	19.1	4.62	1.68	.25	.26
(WY)	1992	1992	1966	1981	1968	1981	1981	1986	1986	1963	1963	1991

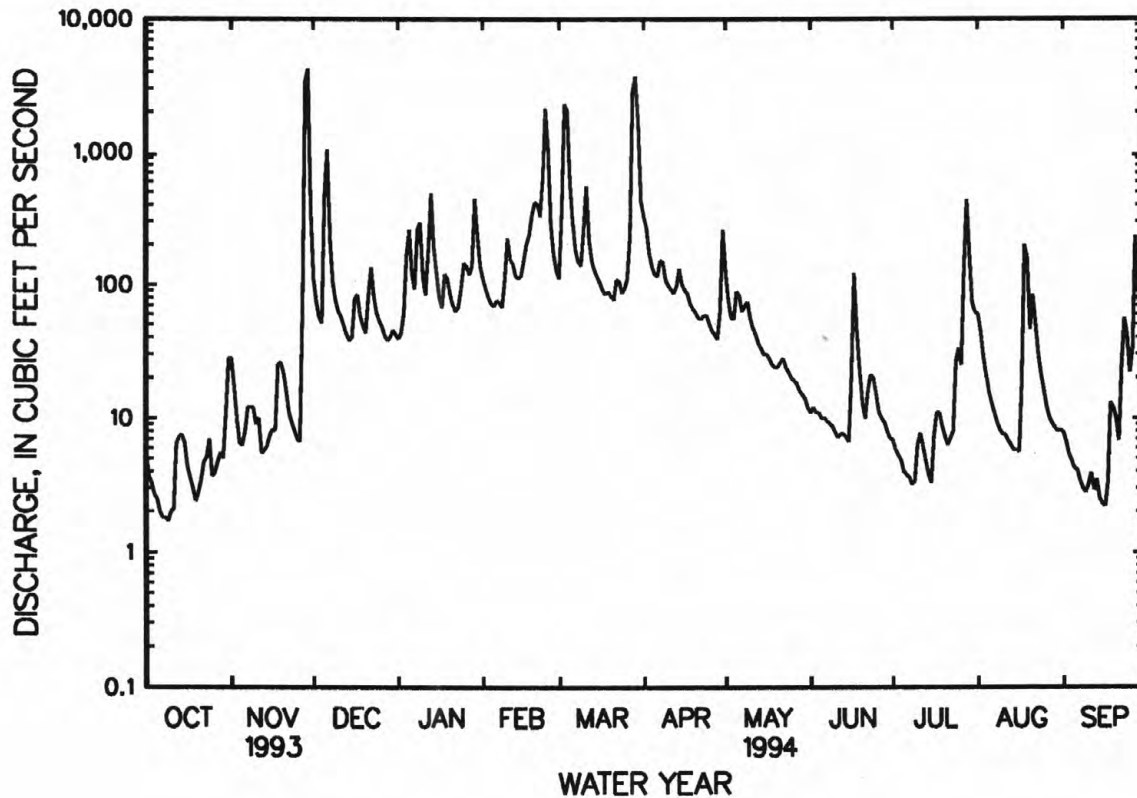
## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1963 - 1994

ANNUAL TOTAL	44303.67		50015.0									
ANNUAL MEAN	121		137							76.0		
HIGHEST ANNUAL MEAN										164		1972
LOWEST ANNUAL MEAN										18.7		1981
HIGHEST DAILY MEAN	4210	Nov 29		4210	Nov 29				8160		Jun 22	1972
LOWEST DAILY MEAN	.90	Sep 15		1.7	Oct 9				.04		Sep 23	1991
ANNUAL SEVEN-DAY MINIMUM	1.3	Sep 11		2.0	Oct 5				.06		Oct 6	1986
INSTANTANEOUS PEAK FLOW				8070	Nov 28				10900		Jun 22	1972
INSTANTANEOUS PEAK STAGE				17.10	Nov 28				19.03		Jun 22	1972
INSTANTANEOUS LOW FLOW				1.5	Oct 9				.03		Sep 23	1991
ANNUAL RUNOFF (CFSM)	1.57			1.77					.98			
ANNUAL RUNOFF (INCHES)	21.29			24.04					13.34			
10 PERCENT EXCEEDS	228			233					148			
50 PERCENT EXCEEDS	42			39					35			
90 PERCENT EXCEEDS	2.4			4.2					2.8			



## YORK RIVER BASIN

01674000 MATTAPONI RIVER NEAR BOWLING GREEN, VA

LOCATION.--Lat 38°03'42", long 77°23'10", Caroline County, Hydrologic Unit 02080105, on right bank 0.1 mi upstream from bridge on State Highway 605, 2.2 mi northwest of Bowling Green, 2.4 mi upstream from South River, and 7.1 mi downstream from confluence of Matta and Poni Rivers.

DRAINAGE AREA.--257 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1942 to current year.

REVISED RECORDS.--WSP 1382: 1943, 1945(M), 1948(M), 1949, 1953(M). WSP 2103: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 85.14 ft above sea level. Prior to Aug. 17, 1978, gage located on left bank at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 30 to Jan. 1 and Jan. 20-22, and period of doubtful gage-height record, Apr. 4, which are fair. Some diurnal fluctuation from gristmill upstream on Po River. Maximum discharge, 13,400 ft<sup>3</sup>/s, from rating curve extended above 8,100 ft<sup>3</sup>/s. No flow at times in September and October 1954 and September 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1928 reached a stage of 19.5 ft based on relative difference in stage between this flood and flood of Oct. 17, 1942, at Milford 4 mi downstream, discharge, 15,000 ft<sup>3</sup>/s, from rating curve extended above 8,100 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 30	0500	6,450	14.38	Mar. 4	1100	5,910	13.92
Feb. 25	1100	4,590	12.69	Mar. 29	2300	*8,080	*15.63

Minimum discharge, 7.3 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	63	2580	e155	601	674	2290	442	45	64	455	39
2	23	57	842	162	427	644	1540	505	40	58	438	35
3	17	47	413	202	339	1930	1200	315	36	52	409	30
4	12	38	258	280	298	5680	e850	232	34	41	266	25
5	9.6	33	373	421	273	4450	644	294	32	35	153	22
6	10	31	796	579	275	2280	544	325	30	29	100	19
7	8.4	38	1770	532	276	1340	517	308	30	21	70	18
8	7.6	40	1300	435	263	916	527	266	30	19	53	17
9	7.9	36	632	515	278	701	518	250	30	17	43	16
10	8.4	34	357	666	384	675	461	234	30	32	37	14
11	8.3	34	277	548	551	920	402	207	29	31	33	13
12	12	30	225	420	643	1420	372	172	33	29	31	13
13	24	28	185	511	666	1150	360	144	31	27	29	13
14	28	25	160	765	643	778	388	123	28	24	26	12
15	25	20	157	811	633	610	406	111	23	22	28	12
16	21	19	208	515	640	518	407	103	22	23	28	12
17	18	20	248	366	699	451	375	100	39	23	45	12
18	15	28	245	364	775	400	337	91	105	22	226	36
19	13	54	209	396	854	375	296	83	89	32	326	65
20	11	62	174	e390	1020	356	263	81	54	32	343	51
21	13	51	234	e340	1230	340	237	81	39	29	223	39
22	12	44	326	e300	1320	359	220	81	32	26	252	46
23	12	35	347	293	1410	385	216	78	36	30	607	224
24	12	31	306	306	2680	384	213	63	63	97	629	271
25	11	28	242	357	4480	374	204	55	54	136	226	195
26	14	25	200	410	3140	410	185	66	39	119	134	156
27	15	30	171	411	1530	465	167	67	32	176	97	301
28	20	300	153	390	931	964	149	63	27	218	72	346
29	19	1990	134	499	---	6270	143	55	24	468	58	349
30	21	5850	e140	729	---	7140	285	51	26	1060	53	221
31	46	---	e160	840	---	4390	---	49	---	892	45	---
TOTAL	504.2	9121	13822	13908	27259	47749	14716	5095	1162	3884	5535	2622
MEAN	16.3	304	446	449	974	1540	491	164	38.7	125	179	87.4
MAX	46	5850	2580	840	4480	7140	2290	505	105	1060	629	349
MIN	7.6	19	134	155	263	340	143	49	22	17	26	12
CFSM	.06	1.18	1.73	1.75	3.79	5.99	1.91	.64	.15	.49	.69	.34
IN.	.07	1.32	2.00	2.01	3.95	6.91	2.13	.74	.17	.56	.80	.38

e Estimated.

## YORK RIVER BASIN

211

01674000 MATTAPONI RIVER NEAR BOWLING GREEN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	121	167	270	353	393	477	384	258	141	106	121	78.9
MAX	860	721	1041	1174	1062	1540	1163	707	1111	853	939	714
(WY)	1943	1973	1949	1978	1961	1994	1983	1972	1972	1945	1955	1975
MIN	1.44	6.04	33.1	34.7	113	79.8	104	56.5	17.5	9.24	1.18	.43
(WY)	1992	1992	1966	1981	1968	1981	1968	1955	1977	1977	1977	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1943 - 1994

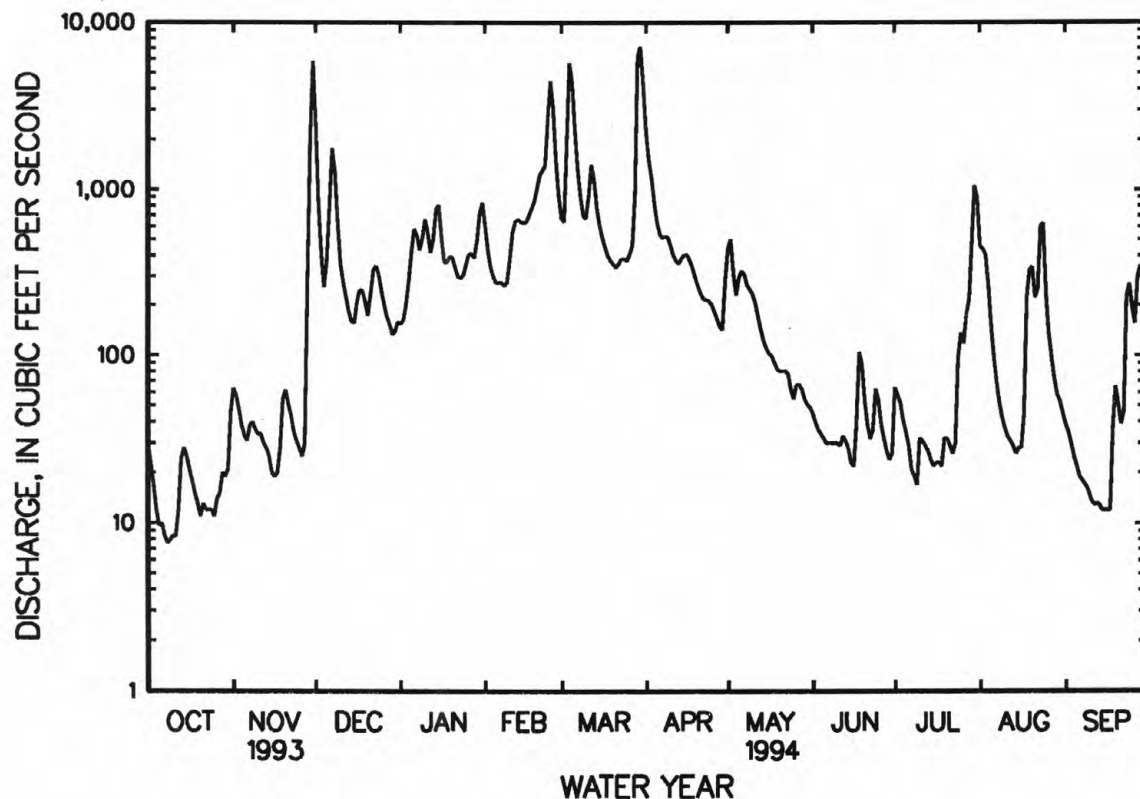
ANNUAL TOTAL	123255.1	145377.2	
ANNUAL MEAN	338	398	
HIGHEST ANNUAL MEAN			239
LOWEST ANNUAL MEAN			516
HIGHEST DAILY MEAN	5850	7140	12200
LOWEST DAILY MEAN	4.4	7.6	.00
ANNUAL SEVEN-DAY MINIMUM	4.7	8.6	.00
INSTANTANEOUS PEAK FLOW		8080	13400
INSTANTANEOUS PEAK STAGE		15.63	18.95
INSTANTANEOUS LOW FLOW		7.3	.00
ANNUAL RUNOFF (CFSM)	1.31	1.55	.93
ANNUAL RUNOFF (INCHES)	17.84	21.04	12.61
10 PERCENT EXCEEDS	830	823	538
50 PERCENT EXCEEDS	140	160	125
90 PERCENT EXCEEDS	11	19	12

a Also Sept. 3, 1993.

b Many days in September and October 1954, and September 1966.

c Many days in September and October 1954.

d From floodmark in well.



## YORK RIVER BASIN

01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA

LOCATION.--Lat 37°53'02", long 77°09'55", King and Queen County, Hydrologic Unit 02080105, on upstream side of bridge on State Highway 628, 2.4 mi north of Beulahville, and 3.3 mi downstream from Maracossic Creek.

DRAINAGE AREA.--601 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1941 to September 1987, October 1989 to current year.

REVISED RECORDS.--WSP 2103: Drainage area.

GAGE.--Nonrecording gage, once-daily observer readings. Datum of gage is 12.43 ft above sea level (levels by Virginia Department of Transportation). Prior to Oct. 14, 1942, nonrecording gage. Oct. 14, 1942, to Aug. 8, 1974, water-stage recorder on right bank at site 0.6 mi upstream at same datum. Aug. 8, 1974, to Sept. 8, 1987, water-stage recorder on left bank 80 ft downstream from previous site, at same datum. Sept. 8, 1987, to Aug. 31, 1989, nonrecording gage at present site and datum, water-stage recorder, Sept. 1, 1989, to Mar. 31, 1994.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 14-25, and period of doubtful or no gage-height record, Apr. 1 to Sept. 30, which are fair. Diurnal fluctuation at times during low flow caused by gristmill on Po River. Maximum discharge, 16,900 ft<sup>3</sup>/s, from rating curve extended above 11,760 ft<sup>3</sup>/s. Minimum gage height, 0.94 ft, Sept. 14, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,910 ft<sup>3</sup>/s, Apr. 1, gage height, 19.59 ft; minimum, 42 ft<sup>3</sup>/s, Oct. 9, gage height, 2.01 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	187	1550	e340	1170	3610	e7780	e1430	e218	e145	e1230	e150
2	122	208	1810	450	1250	2910	e7160	e1500	e204	e158	e2200	e130
3	100	209	2950	517	1160	2880	e4980	e1560	e192	e173	e2000	e115
4	82	189	3080	655	845	3160	e3540	e1350	e181	e166	e1100	e105
5	68	164	2350	821	647	3580	e3000	e1110	e168	e218	e790	e93
6	57	152	1600	886	614	4870	e2350	e1110	e160	e211	e560	e85
7	50	162	1450	928	606	5320	e2040	e1110	e162	e156	e400	e79
8	44	160	1450	1000	590	4500	e1810	e1010	e168	e120	e300	e73
9	42	165	1550	1060	614	3390	e1620	e867	e179	e100	e260	e69
10	44	158	1790	993	742	2630	e1510	e747	e199	e97	e232	e64
11	48	143	1780	974	871	2200	e1420	e660	e200	e106	e220	e60
12	51	127	1110	1030	1130	1920	e1290	e610	e212	e127	e205	e58
13	72	123	553	1080	1430	1840	e1170	e530	e229	e122	e190	e56
14	87	118	439	e1000	1590	1950	e1180	e470	e212	e108	e180	e54
15	101	113	406	e930	1660	2090	e1200	e421	e192	e112	e170	e51
16	103	108	482	e880	1730	1980	e1220	e302	e166	e145	e160	e49
17	95	101	554	e1150	1750	1700	e1250	e319	e233	e181	e168	e48
18	104	128	568	e1100	1720	1380	e1210	e415	e194	e234	e335	e52
19	100	150	544	e990	1710	1120	e1070	e385	e177	e206	e500	e68
20	99	158	488	e910	1750	982	e890	e367	e192	e167	e710	e170
21	93	161	624	e870	1810	911	e763	e357	e171	e147	e850	e114
22	92	162	821	e840	1870	947	e706	e348	e142	e126	e880	e105
23	92	144	870	e920	2070	1000	e676	e326	e116	e136	e620	e310
24	85	130	826	e820	2600	994	e662	e312	e211	e155	e660	e570
25	83	120	715	e720	2990	971	e627	e324	e211	e218	e1300	e670
26	78	110	584	707	3490	1030	e597	e338	e197	e309	e1400	e432
27	82	113	485	732	4160	1100	e559	e315	e171	e394	e500	e405
28	88	639	430	782	4270	1590	e552	e308	e150	e520	e290	e383
29	91	1170	e385	939	---	2640	e590	e286	e125	e604	e230	e800
30	100	1530	e360	1010	---	3730	e1100	e250	e109	e693	e190	e462
31	161	---	e345	1080	---	5670	---	e231	---	e881	e170	---
TOTAL	2661	7302	32949	27114	46839	74595	54522	19668	5441	7235	19000	5880
MEAN	85.8	243	1063	875	1673	2406	1817	634	181	233	613	196
MAX	161	1530	3080	1150	4270	5670	7780	1560	233	881	2200	800
MIN	42	101	345	340	590	911	552	231	109	97	160	48
CFSM	.14	.40	1.77	1.46	2.78	4.00	3.02	1.06	.30	.39	1.02	.33
IN.	.16	.45	2.04	1.68	2.90	4.62	3.37	1.22	.34	.45	1.18	.36

e Estimated.



## YORK RIVER BASIN

213

01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1987, 1989 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	318	424	631	804	902	1082	973	661	412	296	345	232
MAX	1801	1461	2115	2418	1837	2483	3291	1912	3217	2119	2409	1287
(WY)	1980	1973	1949	1978	1961	1979	1984	1978	1972	1945	1969	1975
MIN	26.1	49.9	96.8	131	286	229	301	130	46.3	43.5	20.3	17.4
(WY)	1942	1992	1966	1981	1992	1981	1985	1942	1991	1966	1977	1980

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

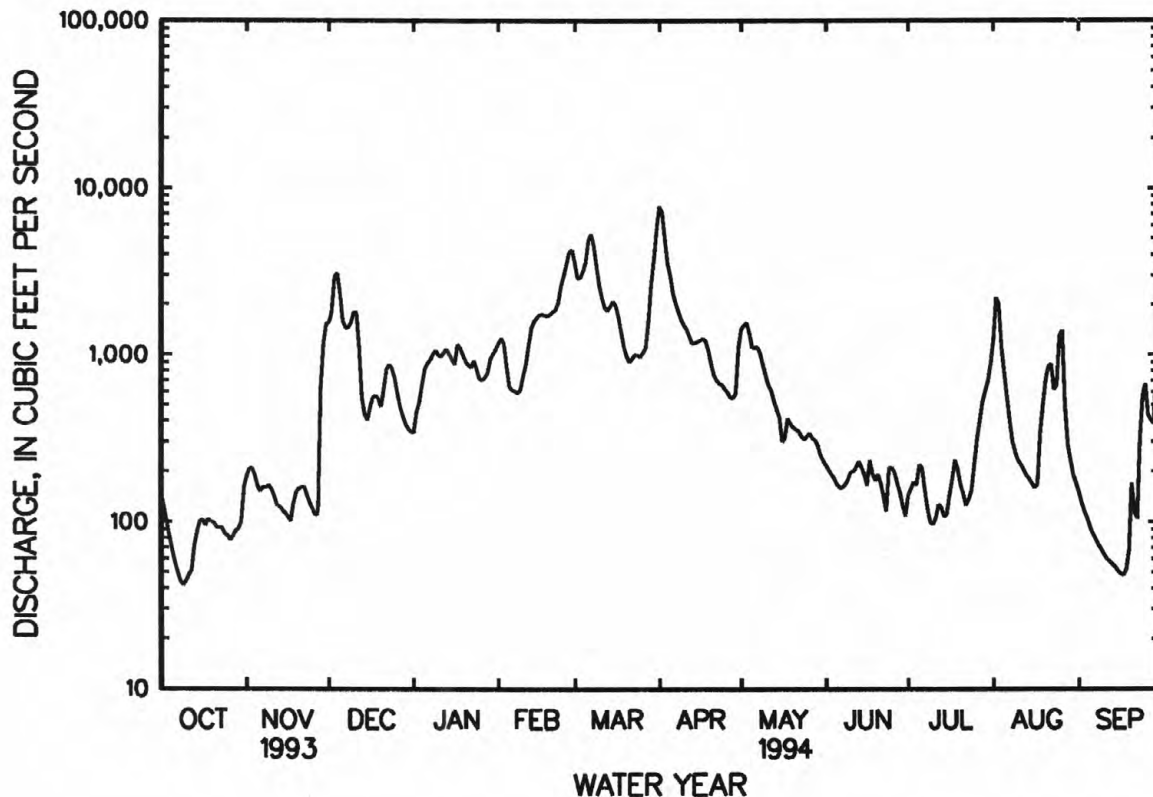
WATER YEARS 1942 - 1987,  
1989 - 1994

ANNUAL TOTAL	271436		303206									
ANNUAL MEAN	744		831									
HIGHEST ANNUAL MEAN									588			
LOWEST ANNUAL MEAN									1210			1972
HIGHEST DAILY MEAN									185			1981
LOWEST DAILY MEAN	4740	Mar 9		e7780	Apr 1				16200		Jun 25	1972
ANNUAL SEVEN-DAY MINIMUM	26	Aug 2		42	Oct 9				6.3		Sep 13	1966
INSTANTANEOUS PEAK FLOW	28	Jul 30		48	Oct 6				7.8		Sep 7	1966
INSTANTANEOUS PEAK STAGE				7910	Apr 1				16900		Jun 25	1972
INSTANTANEOUS LOW FLOW				a19.59	Apr 1				24.09		Aug 23	1969
ANNUAL RUNOFF (CFSM)	1.24			b42	Oct 9				5.9		Sep 14	1966
ANNUAL RUNOFF (INCHES)	16.80			1.38					.98			
10 PERCENT EXCEEDS	2020			18.77					13.29			
50 PERCENT EXCEEDS	439			1890					1320			
90 PERCENT EXCEEDS	51			462					376			
				96					66			

a From floodmarks.

b Lowest recorded discharge; may have been lower during period of no gage-height record Aug. 1 to Sept. 30, 1994.

e Estimated.



## YORK RIVER BASIN

01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968, 1969, 1979 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1991 to current year.

WATER TEMPERATURE: October 1991 to current year.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (000061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (000095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (000400)	TEMPER- ATURE AIR (DEG C) (000020)	TEMPER- ATURE WATER (DEG C) (000010)	BARO- METRIC PRES- SURE (MM OF HG) (000025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (000028)	TUR- BID- ITY (NTU) (000076)	OXYGEN, DIS- SOLVED (MG/L) (000300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (000301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT												
06...	1125	57	74	6.7	--	14.0	--	VDCLS	3.0	9.4	--	--
14...	0800	82	50	6.9	12.0	12.5	770	VDCLS	3.2	8.6	79	--
NOV												
19...	0830	149	56	6.8	10.0	12.5	765	USGS	2.4	9.6	90	82
19...	0831	149	56	6.8	10.0	12.5	765	VDCLS	5.0	9.6	90	--
23...	1020	146	72	6.4	--	7.0	--	VDCLS	4.3	10.7	--	--
29...	0900	1120	49	6.4	5.5	10.0	771	VDCLS	46	8.3	73	--
30...	1015	1540	53	6.3	5.0	9.0	779	VDCLS	33	9.4	79	--
30...	1030	1540	53	6.3	5.0	9.0	779	VDCLS	33	9.4	79	--
DEC												
01...	1400	1540	54	6.4	10.0	8.0	780	VDCLS	44	10.1	83	--
03...	1000	2910	44	6.4	12.5	7.0	773	VDCLS	37	9.7	79	--
05...	1040	2440	80	7.6	8.5	7.0	761	VDCLS	21	10.0	82	--
07...	1315	1450	51	7.0	5.0	9.0	761	VDCLS	17	9.7	84	--
17...	1100	556	55	7.3	6.0	5.0	774	VDCLS	5.4	11.6	89	--
JAN												
09...	0900	1150	56	5.5	-1.5	2.0	778	VDCLS	11	12.9	91	--
12...	0830	1010	56	7.0	4.5	3.0	767	USGS	7.2	10.8	80	36
12...	0831	1010	56	7.0	4.5	3.0	767	VDCLS	--	10.8	80	--
13...	0830	1730	61	5.9	--	1.5	--	VDCLS	--	12.8	--	--
29...	0900	931	55	6.4	7.0	0.0	766	VDCLS	8.6	14.2	97	--
31...	0945	1070	74	6.8	1.0	3.0	762	VDCLS	12	12.8	95	--
FEB												
02...	0930	1250	57	7.1	-4.0	1.0	772	VDCLS	12	13.9	96	--
03...	0930	1200	57	7.1	1.0	1.0	768	VDCLS	11	13.8	96	--
04...	0900	881	58	7.1	2.0	1.0	774	VDCLS	9.9	14.0	97	--
04...	0915	881	58	7.1	2.0	1.0	774	VDCLS	13	14.0	97	--
15...	0800	1650	62	7.1	-1.0	0.5	770	VDCLS	7.7	14.0	96	--
16...	0900	1730	60	7.1	3.0	1.0	775	USGS	3.0	13.6	94	33
16...	0901	1730	60	7.1	3.0	1.0	775	VDCLS	2.2	13.6	94	--
19...	0900	1710	60	5.4	6.5	0.5	779	VDCLS	2.5	13.1	89	--
22...	1215	1870	53	6.6	8.0	7.0	764	VDCLS	3.8	11.4	94	--
25...	0830	2930	43	6.8	3.0	6.5	768	VDCLS	6.1	10.3	83	--
27...	1000	4150	52	7.1	-2.0	3.5	775	VDCLS	23	12.4	92	--
MAR												
01...	1000	3690	41	6.8	5.0	4.0	775	USGS	--	12.6	94	--
01...	1001	3690	41	6.8	5.0	4.0	775	VDCLS	9.5	12.6	94	--
03...	0900	2840	41	6.8	1.5	4.0	746	VDCLS	9.2	11.9	93	--
04...	0900	3160	38	7.1	7.5	3.5	751	VDCLS	6.7	11.2	86	--
04...	0915	3160	38	7.1	7.5	3.5	751	VDCLS	6.7	11.2	86	--
06...	0900	4750	39	6.6	7.0	2.0	772	VDCLS	14	12.8	91	--
09...	0830	3520	40	7.0	9.0	4.0	774	VDCLS	26	10.6	80	--
11...	0900	2240	44	6.9	7.0	3.0	772	VDCLS	11	11.0	81	--
13...	0900	1830	50	7.0	10.0	6.5	773	VDCLS	9.2	11.8	95	--
28...	1000	1490	46	6.6	12.0	11.5	760	VDCLS	22	9.8	90	--
29...	0900	2500	59	6.4	8.0	9.0	770	VDCLS	18	9.8	84	--
31...	1000	5630	36	6.2	15.0	10.0	771	VDCLS	18	10.2	89	--
APR												
02...	0930	7160	33	6.4	15.0	10.5	771	VDCLS	30	9.3	82	--
04...	0915	3750	49	7.0	14.0	13.5	767	VDCLS	12	8.2	78	--
06...	1000	2420	47	6.2	17.0	15.0	761	VDCLS	9.4	8.1	80	--
26...	1000	602	55	6.6	--	17.5	--	VDCLS	5.0	8.0	--	--
26...	1400	592	49	6.9	32.0	18.0	765	USGS	3.5	8.3	88	44
26...	1401	592	49	6.9	32.0	18.0	765	VDCLS	4.7	8.3	88	--
30...	0930	966	48	7.6	24.0	19.5	765	VDCLS	--	6.4	69	--

## YORK RIVER BASIN

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01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
MAY												
01...	0800	1390	44	6.4	20.0	20.0	761	VDCLS	--	7.0	77	--
17...	1100	296	47	7.0	16.0	19.0	763	VDCLS	7.8	7.9	85	--
24...	1000	315	48	6.5	--	18.0	--	VDCLS	8.0	8.0	--	--
JUN												
14...	0830	222	49	7.0	25.0	23.0	768	USGS	--	7.0	81	56
14...	0831	222	49	7.0	25.0	23.0	768	VDCLS	2.6	7.0	81	--
23...	0955	120	62	6.8	--	26.0	--	VDCLS	3.5	6.5	--	--
JUL												
21...	0830	151	47	7.0	26.0	26.0	769	VDCLS	3.8	6.3	76	--
21...	1015	151	55	6.6	--	26.5	--	VDCLS	4.2	6.4	--	--
AUG												
10...	1030	232	54	6.8	26.0	23.0	770	USGS	2.5	7.3	84	31
10...	1031	232	54	6.8	26.0	23.0	770	VDCLS	5.6	7.3	84	--
SEP												
13...	0845	56	57	6.6	14.0	18.0	771	VDCLS	3.2	7.7	80	--

01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	STREP- TOCOCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)
OCT												
06...	--	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
19...	90	13	2.8	1.5	3.4	2.4	11	0	9	5.5	5.7	0.10
19...	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	10	0	8	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
01...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
09...	--	--	--	--	--	--	--	--	--	--	--	--
12...	58	13	2.7	1.5	3.8	1.3	7	0	5	8.6	5.9	<0.10
12...	--	--	--	--	--	--	--	--	--	--	--	--
13...	--	32	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
02...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
16...	58	12	2.6	1.3	5.0	1.2	3	0	3	8.0	8.0	<0.10
16...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
01...	--	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
APR												
02...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--	--
26...	32	13	2.8	1.5	3.2	1.3	13	0	11	4.5	4.2	<0.10
26...	--	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--	--
MAY												
01...	--	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
24...	--	9	--	--	--	--	--	--	--	--	--	--
JUN												
14...	170	--	--	--	--	--	10	0	8	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--	--
23...	--	17	--	--	--	--	--	--	--	--	--	--
JUL												
21...	--	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--	--
AUG												
10...	99	15	3.3	1.7	3.1	1.4	13	0	11	3.4	4.7	<0.10
10...	--	--	--	--	--	--	--	--	--	--	--	--
SEP												
13...	--	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## 01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	RESIDUE FIXED NON FILTER- ABLE (MG/L) (00540)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L) (00535)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618) (*)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613) (*)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630) (*)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631) (*)
OCT											
06...	8.2	--	--	<3	--	<3	<3	0.130	<0.010	0.130	0.130
14...	6.7	--	--	<3	--	<3	<3	0.120	<0.010	0.120	0.120
NOV											
19...	7.2	40	35	11	--	0	13	0.052	0.010	0.062	0.062
19...	7.1	--	--	10	--	7	3	<0.040	0.010	--	<0.040
23...	7.2	--	--	<3	--	<3	<3	<0.040	<0.010	--	<0.040
29...	5.8	--	--	40	--	34	6	0.060	<0.010	0.060	0.060
30...	6.7	--	--	19	--	15	4	0.040	<0.010	0.040	0.040
30...	6.7	--	--	21	--	16	5	0.040	<0.010	0.040	0.040
DEC											
01...	7.4	--	--	21	--	15	6	0.040	<0.010	0.040	0.040
03...	5.8	--	--	18	--	14	4	<0.040	<0.010	--	<0.040
05...	7.2	--	--	16	--	12	4	<0.040	<0.010	--	<0.040
07...	7.4	--	--	10	--	8	2	0.050	0.010	0.060	0.060
17...	9.3	--	--	7	--	6	1	0.150	<0.010	0.150	0.150
JAN											
09...	9.5	--	--	7	--	5	2	0.200	<0.010	0.200	0.200
12...	10	50	38	12	--	4	8	--	<0.010	0.200	0.200
12...	9.5	--	--	9	--	7	2	0.190	<0.010	0.190	0.190
13...	9.2	--	--	10	--	8	2	0.190	<0.010	0.190	0.190
29...	8.3	--	--	11	--	9	2	0.241	0.002	0.243	0.243
31...	8.1	--	--	12	--	10	2	0.234	0.002	0.236	0.236
FEB											
02...	8.3	--	--	11	--	9	2	0.212	0.002	0.214	0.214
03...	8.1	--	--	8	--	5	3	0.207	0.003	0.210	0.210
04...	8.4	--	--	6	--	5	1	0.217	0.002	0.219	0.219
04...	8.4	--	--	6	--	5	1	0.217	0.003	0.220	0.220
15...	7.5	--	--	7	--	5	2	0.228	<0.002	0.228	0.228
16...	7.5	44	37	11	--	3	8	--	<0.010	0.240	0.240
16...	7.6	--	--	<3	--	<3	<3	0.231	0.003	0.234	0.234
19...	7.4	--	--	<3	--	<3	<3	0.206	<0.002	0.206	0.206
22...	7.0	--	--	<3	--	<3	<3	0.142	<0.002	0.142	0.142
25...	5.9	--	--	8	--	6	2	0.104	<0.002	0.104	0.104
27...	7.0	--	--	19	--	15	4	0.191	0.003	0.194	0.194
MAR											
01...	6.5	--	--	4	--	2	2	--	<0.010	0.082	0.082
01...	6.3	--	--	6	--	5	1	0.083	<0.002	0.083	0.083
03...	5.3	--	--	14	--	11	3	0.167	<0.002	0.167	0.167
04...	4.8	--	--	9	--	7	2	0.168	<0.002	0.168	0.168
04...	4.8	--	--	9	--	7	2	0.168	<0.002	0.168	0.168
06...	5.2	--	--	12	--	10	2	0.120	<0.002	0.120	0.120
09...	5.5	--	--	4	--	3	1	0.090	<0.002	0.090	0.090
11...	5.3	--	--	4	--	2	2	0.144	0.003	0.147	0.147
13...	5.9	--	--	5	--	3	2	0.139	<0.002	0.139	0.139
28...	4.1	--	--	24	--	20	4	0.158	0.002	0.160	0.160
29...	3.8	--	--	14	--	10	4	0.143	0.002	0.145	0.145
31...	4.9	--	--	12	--	9	3	0.072	0.002	0.074	0.074
APR											
02...	4.9	--	--	9	--	7	2	0.039	0.003	0.042	0.042
04...	5.2	--	--	<3	--	<3	<3	0.052	<0.002	0.052	0.052
06...	4.3	--	--	<3	--	<3	<3	0.063	0.001	0.064	0.064
26...	5.9	--	--	9	--	7	2	0.175	0.002	0.177	0.177
26...	5.7	41	32	8	--	4	4	0.160	0.010	0.170	0.170
26...	5.8	--	--	8	--	6	2	0.174	0.002	0.176	0.176
30...	--	--	--	--	--	--	--	--	--	--	--
MAY											
01...	--	--	--	--	--	--	--	--	--	--	--
17...	6.8	--	--	8	--	5	3	0.216	0.004	0.220	0.220
24...	7.1	--	--	7	--	4	3	0.243	0.003	0.246	0.246
JUN											
14...	--	--	--	13	--	5	8	--	<0.010	0.200	0.200
14...	5.4	--	--	4	--	3	1	0.202	0.003	0.205	0.205
23...	7.8	--	--	6	--	4	2	0.228	0.003	0.231	0.231
JUL											
21...	6.3	--	--	<3	--	<3	<3	0.115	0.002	0.117	0.117
21...	6.4	--	--	4	--	2	2	0.118	0.002	0.120	0.120
AUG											
10...	9.7	61	37	11	--	2	9	--	<0.010	0.200	0.200
10...	9.6	--	--	<3	--	<3	<3	0.182	0.003	0.185	0.185
SEP											
13...	9.4	--	--	<3	--	<3	<3	0.162	<0.002	0.162	0.162

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.



## 01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN, AMMONIA + DIS- SOLVED (MG/L AS N) (00608) (*)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671) (*)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
OCT											
06...	--	<0.040	0.40	0.040	0.020	0.010	--	--	--	--	--
14...	--	<0.040	0.30	0.030	0.010	0.010	--	--	--	--	--
NOV											
19...	--	0.020	0.30	0.030	0.010	0.010	40	24	<3	450	<4
19...	--	<0.040	0.20	0.040	<0.010	0.020	--	--	--	--	--
23...	--	<0.040	0.40	0.040	0.010	0.010	--	--	--	--	--
29...	--	<0.040	0.60	0.150	0.010	0.010	--	--	--	--	--
30...	--	<0.040	0.60	0.110	0.010	0.010	--	--	--	--	--
30...	--	<0.040	0.60	0.100	0.010	0.010	--	--	--	--	--
DEC											
01...	--	<0.040	0.70	0.110	0.010	0.010	--	--	--	--	--
03...	--	<0.040	0.70	0.100	0.020	0.020	--	--	--	--	--
05...	--	<0.040	0.60	0.070	0.020	0.020	--	--	--	--	--
07...	--	<0.040	0.40	0.060	0.020	0.020	--	--	--	--	--
17...	--	0.070	0.40	0.040	0.010	0.010	--	--	--	--	--
JAN											
09...	--	0.040	0.40	0.040	0.020	0.010	--	--	--	--	--
12...	--	0.020	0.30	0.050	0.020	0.020	--	--	--	--	--
12...	--	<0.040	0.40	0.040	0.020	0.010	--	--	--	--	--
13...	--	<0.040	--	--	--	0.020	--	--	--	--	--
29...	--	0.030	0.30	0.030	0.020	0.007	--	--	--	--	--
31...	--	0.026	0.30	0.040	0.020	0.008	--	--	--	--	--
FEB											
02...	--	0.009	0.30	0.030	0.020	0.009	--	--	--	--	--
03...	--	0.008	0.30	0.030	0.020	0.009	--	--	--	--	--
04...	--	<0.004	0.30	0.030	0.020	0.004	--	--	--	--	--
04...	--	<0.004	0.30	0.030	0.020	0.005	--	--	--	--	--
15...	--	0.012	0.20	0.030	0.020	0.006	--	--	--	--	--
16...	--	0.010	0.20	0.020	0.020	<0.010	140	30	<3	350	<4
16...	--	0.009	0.20	0.030	0.020	0.006	--	--	--	--	--
19...	--	<0.004	0.20	0.030	0.010	0.005	--	--	--	--	--
22...	--	0.006	0.20	0.040	0.020	0.007	--	--	--	--	--
25...	--	0.004	0.30	0.040	0.020	0.005	--	--	--	--	--
27...	--	0.006	0.40	0.060	0.030	0.007	--	--	--	--	--
MAR											
01...	--	0.010	0.20	0.030	--	<0.010	--	--	--	--	--
01...	--	--	0.30	0.040	0.020	0.004	--	--	--	--	--
03...	--	0.007	0.30	0.050	0.020	0.005	--	--	--	--	--
04...	--	0.005	0.30	0.040	0.020	0.005	--	--	--	--	--
04...	--	0.007	0.30	0.040	0.020	0.008	--	--	--	--	--
06...	--	--	0.30	0.090	0.020	0.004	--	--	--	--	--
09...	--	<0.004	0.30	0.030	0.010	0.005	--	--	--	--	--
11...	--	0.009	0.30	0.030	0.010	0.006	--	--	--	--	--
13...	--	0.004	0.40	0.020	0.010	0.005	--	--	--	--	--
28...	--	0.019	0.40	0.060	0.020	0.009	--	--	--	--	--
29...	--	0.011	0.50	0.050	0.050	0.010	--	--	--	--	--
31...	--	--	0.50	0.060	0.030	0.009	--	--	--	--	--
APR											
02...	--	--	0.50	0.030	0.020	0.005	--	--	--	--	--
04...	--	--	0.40	0.030	0.020	0.008	--	--	--	--	--
06...	--	--	0.40	0.030	0.020	0.007	--	--	--	--	--
26...	--	0.025	--	--	--	0.019	--	--	--	--	--
26...	--	0.040	0.40	0.040	0.030	0.020	60	28	<3	1100	<4
26...	--	0.024	0.50	0.050	0.040	0.019	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
MAY											
01...	--	--	--	--	--	--	--	--	--	--	--
17...	--	0.025	0.70	0.060	0.040	0.026	--	--	--	--	--
24...	--	0.039	--	--	--	0.028	--	--	--	--	--
JUN											
14...	--	0.030	0.40	0.060	0.030	0.030	--	--	--	--	--
14...	--	0.027	0.40	0.060	0.030	0.021	--	--	--	--	--
23...	--	0.035	--	--	--	0.033	--	--	--	--	--
JUL											
21...	<0.040	0.024	0.40	0.060	0.050	0.032	--	--	--	--	--
21...	--	0.035	--	--	0.050	0.031	--	--	--	--	--
AUG											
10...	--	0.030	0.40	0.070	0.060	0.030	90	32	20	2500	<4
10...	0.060	0.044	0.50	0.050	0.040	0.041	--	--	--	--	--
SEP											
13...	--	0.018	0.30	0.040	0.040	0.027	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.

## YORK RIVER BASIN

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01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC SOLVED (MG/L AS C) (00681)	SEDI- MENT, SUS- PENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
06...	--	--	--	--	--	--	--	5.3	--	--	--
14...	--	--	--	--	--	--	--	5.1	--	--	--
NOV											
19...	39	<10	<1	<1	<1.0	21	<6	6.7	--	6	82
19...	--	--	--	--	--	--	--	6.3	--	--	--
23...	--	--	--	--	--	--	--	6.0	--	--	--
29...	--	--	--	--	--	--	--	12	--	--	--
30...	--	--	--	--	--	--	--	11	--	--	--
30...	--	--	--	--	--	--	--	11	--	--	--
DEC											
01...	--	--	--	--	--	--	--	13	--	--	--
03...	--	--	--	--	--	--	--	18	--	3	--
05...	--	--	--	--	--	--	--	12	--	--	--
07...	--	--	--	--	--	--	--	8.8	--	--	--
17...	--	--	--	--	--	--	--	8.5	--	--	--
JAN											
09...	--	--	--	--	--	--	--	5.4	4.2	--	--
12...	--	--	--	--	--	--	--	6.0	--	25	44
12...	--	--	--	--	--	--	--	5.8	4.4	--	--
13...	--	--	--	--	--	--	--	5.3	--	--	--
29...	--	--	--	--	--	--	--	4.7	--	--	--
31...	--	--	--	--	--	--	--	4.6	--	--	--
FEB											
02...	--	--	--	--	--	--	--	5.0	--	--	--
03...	--	--	--	--	--	--	--	4.7	--	--	--
04...	--	--	--	--	--	--	--	4.2	--	--	--
04...	--	--	--	--	--	--	--	4.4	--	--	--
15...	--	--	--	--	--	--	--	4.9	--	--	--
16...	80	<10	<1	<1	<1.0	19	<6	4.4	--	8	89
16...	--	--	--	--	--	--	--	5.1	--	--	--
19...	--	--	--	--	--	--	--	3.2	--	--	--
22...	--	--	--	--	--	--	--	3.9	--	--	--
25...	--	--	--	--	--	--	--	5.6	--	--	--
27...	--	--	--	--	--	--	--	6.7	--	--	--
MAR											
01...	--	--	--	--	--	--	--	6.8	--	--	--
01...	--	--	--	--	--	--	--	6.4	--	--	--
03...	--	--	--	--	--	--	--	5.7	--	--	--
04...	--	--	--	--	--	--	--	5.4	--	--	--
04...	--	--	--	--	--	--	--	5.9	--	--	--
06...	--	--	--	--	--	--	--	6.7	--	--	--
09...	--	--	--	--	--	--	--	5.5	--	--	--
11...	--	--	--	--	--	--	--	5.3	--	--	--
13...	--	--	--	--	--	--	--	5.6	--	--	--
28...	--	--	--	--	--	--	--	8.0	--	--	--
29...	--	--	--	--	--	--	--	8.4	--	--	--
31...	--	--	--	--	--	--	--	9.2	--	--	--
APR											
02...	--	--	--	--	--	--	--	7.9	--	--	--
04...	--	--	--	--	--	--	--	7.7	--	--	--
06...	--	--	--	--	--	--	--	9.0	--	--	--
26...	--	--	--	--	--	--	--	10	--	--	--
26...	71	<10	1	<1	<1.0	22	<6	7.7	--	7	69
26...	--	--	--	--	--	--	--	7.4	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
MAY											
01...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	6.4	--	--	--
JUN											
14...	--	--	--	--	--	--	--	8.3	--	7	93
14...	--	--	--	--	--	--	--	8.4	--	--	--
23...	--	--	--	--	--	--	--	7.6	--	--	--
JUL											
21...	--	--	--	--	--	--	--	8.6	--	--	--
21...	--	--	--	--	--	--	--	7.8	--	--	--
AUG											
10...	110	<10	<1	<1	<1.0	27	<6	10	--	4	89
10...	--	--	--	--	--	--	--	10	--	--	--
SEP											
13...	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## YORK RIVER BASIN

01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	59	---	60	57	65	39	36	---	47	51	45	---
2	---	---	49	57	64	39	36	46	---	---	---	---
3	---	62	46	68	64	39	35	---	---	---	---	---
4	60	---	52	58	61	37	38	---	47	---	50	---
5	---	---	54	69	57	38	40	48	---	56	---	---
6	---	59	52	55	59	38	42	---	---	---	---	---
7	58	---	53	56	59	38	44	---	49	---	54	---
8	---	---	49	68	53	46	45	48	---	49	---	---
9	---	59	49	60	54	46	45	---	---	---	---	---
10	58	---	50	59	53	46	46	---	48	---	54	---
11	---	61	---	60	57	47	46	48	---	51	---	---
12	---	---	---	58	57	48	47	---	---	---	---	---
13	55	61	62	61	58	48	48	---	48	---	52	---
14	---	---	60	61	58	48	48	48	---	51	---	---
15	---	61	57	59	63	46	---	---	---	---	---	---
16	59	---	57	60	62	46	---	---	48	---	52	---
17	---	---	59	56	62	49	49	47	---	49	---	---
18	58	60	59	60	65	48	---	---	---	---	---	---
19	---	---	59	59	62	49	---	---	47	---	51	---
20	---	---	58	71	59	59	51	47	---	47	---	---
21	---	59	52	71	55	59	---	---	---	---	---	---
22	58	---	50	72	56	51	---	---	54	---	49	---
23	---	---	54	69	51	54	50	49	---	51	---	---
24	---	62	54	70	45	53	---	---	---	---	---	---
25	58	---	55	67	45	51	---	---	50	---	48	---
26	---	---	55	67	43	50	49	47	---	50	---	---
27	---	61	56	68	44	53	---	---	---	51	---	---
28	54	54	56	60	45	52	---	---	52	51	52	---
29	---	64	55	74	---	40	49	46	---	49	---	---
30	---	60	56	59	---	37	---	---	---	48	48	---
31	53	---	57	67	---	36	---	---	---	46	---	---

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	---	8.0	2.0	3.0	7.0	13.0	---	18.0	25.0	25.0	---
2	---	---	10.0	3.0	3.0	7.0	13.0	20.0	---	---	---	---
3	---	12.0	10.0	3.0	3.0	7.0	13.0	---	---	---	---	---
4	16.0	---	10.0	3.0	3.0	8.0	13.0	---	22.0	---	25.0	---
5	---	---	10.0	3.0	3.0	8.0	13.0	14.0	---	27.0	---	---
6	---	12.0	10.0	3.0	4.0	8.0	15.0	---	---	---	---	---
7	10.0	---	10.0	2.0	5.0	8.0	16.0	---	22.0	---	22.0	---
8	---	---	8.0	2.0	3.5	8.0	15.0	15.0	---	28.0	---	---
9	---	13.0	8.0	2.0	3.0	8.0	15.0	---	---	---	---	---
10	15.0	---	8.0	2.0	2.0	8.0	17.0	---	20.0	---	23.0	---
11	---	13.0	---	2.0	3.0	9.0	16.0	14.0	---	26.0	---	---
12	---	---	---	2.0	3.0	9.0	15.0	---	---	---	---	---
13	14.0	13.0	8.0	2.0	2.0	9.0	17.0	---	25.0	---	25.0	---
14	---	---	8.0	2.0	3.0	7.0	16.0	19.0	---	26.0	---	---
15	---	---	8.0	2.0	3.0	8.0	---	---	---	---	---	---
16	15.0	---	8.0	2.0	3.0	8.0	---	---	25.0	---	24.0	---
17	---	---	8.0	2.0	3.0	8.0	16.0	18.0	---	26.0	---	---
18	---	14.0	7.0	2.0	3.0	10.0	---	---	---	---	---	---
19	15.0	---	7.0	2.0	4.0	10.0	---	---	28.0	---	24.0	---
20	---	---	7.0	2.0	7.0	13.0	18.0	15.0	---	26.0	---	---
21	---	12.0	6.0	2.0	7.0	10.0	---	---	---	---	---	---
22	14.0	---	5.0	2.0	7.0	12.0	---	---	22.0	---	23.0	---
23	---	---	4.0	2.0	7.0	13.0	16.0	21.0	---	27.0	---	---
24	---	12.0	4.0	4.0	7.0	15.0	---	---	---	---	---	---
25	14.0	---	3.0	3.0	7.0	13.0	---	---	27.0	---	24.0	---
26	---	---	3.0	3.0	7.0	17.0	17.0	20.0	---	27.0	---	---
27	---	12.0	1.0	3.0	6.0	13.0	---	---	---	25.0	---	---
28	14.0	14.0	1.0	2.0	7.0	13.0	---	---	25.0	25.0	24.0	---
29	---	14.0	1.0	4.0	---	13.0	19.0	18.0	---	25.0	---	---
30	---	10.0	1.0	3.0	---	13.0	---	---	---	25.0	23.0	---
31	14.0	---	2.0	3.0	---	13.0	---	---	---	24.0	---	---

## YORK RIVER BASIN

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01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

RESIDUE, TOTAL NON FILTERABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	<3	---	22	<3	<3	<3	18	---	<3	<3	15	---
2	---	---	13	<3	<3	<3	11	16	---	---	---	---
3	---	<3	13	<3	<3	<3	7	---	---	---	---	---
4	<3	---	<3	11	<3	13	5	---	<3	---	<3	---
5	---	---	12	<3	23	14	5	9	---	<3	---	---
6	---	<3	10	17	<3	<3	5	---	---	---	---	---
7	<3	---	12	20	<3	10	5	---	<3	---	<3	---
8	---	---	<3	<3	15	5	5	10	---	<3	---	---
9	---	<3	12	<3	18	5	6	---	---	---	---	---
10	<3	---	<3	<3	13	9	6	---	<3	---	<3	---
11	---	<3	---	<3	<3	5	6	8	---	<3	---	---
12	---	---	---	<3	<3	<3	8	---	---	---	---	---
13	<3	<3	8	11	<3	3	26	---	<3	---	<3	---
14	---	---	10	<3	<3	5	8	7	---	<3	---	---
15	---	<3	<3	<3	<3	5	---	---	---	---	---	---
16	<3	---	<3	<3	<3	4	---	---	<3	---	<3	---
17	---	---	<3	29	<3	7	9	8	---	<3	---	---
18	---	<3	<3	<3	<3	11	---	---	---	---	---	---
19	<3	---	<3	<3	<3	7	---	---	<3	---	10	---
20	---	---	<3	<3	<3	5	7	7	---	<3	---	---
21	---	<3	14	<3	<3	4	---	---	---	---	---	---
22	<3	---	14	<3	15	7	---	---	<3	---	<3	---
23	---	---	9	<3	37	9	8	6	---	<3	---	---
24	---	<3	<3	<3	33	11	---	---	---	---	---	---
25	<3	---	<3	10	13	9	---	---	<3	---	<3	---
26	---	---	<3	<3	27	10	6	11	---	<3	---	---
27	---	<3	<3	18	<3	34	---	---	---	<3	---	---
28	<3	83	<3	<3	<3	45	---	---	<3	14	<3	---
29	---	21	<3	<3	---	14	8	<3	---	11	---	---
30	---	48	22	<3	---	22	---	---	---	14	<3	---
31	<3	---	15	<3	---	29	---	---	---	21	---	---

&lt; Actual value is known to be less than the value shown.

## YORK RIVER BASIN

01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

RESIDUE, VOLATILE NONFILTRABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	<3	---	5	<3	<3	<3	5	---	<3	<3	5	---
2	---	---	4	<3	<3	<3	3	6	---	---	---	---
3	---	<3	3	<3	<3	<3	2	---	---	---	---	---
4	<3	---	<3	3	<3	3	2	---	<3	---	<3	---
5	---	---	3	<3	3	3	2	3	---	<3	---	---
6	---	<3	3	4	<3	<3	2	---	---	---	---	---
7	<3	---	3	7	<3	2	2	---	<3	---	<3	---
8	---	---	3	<3	2	3	2	2	---	<3	---	---
9	---	<3	3	<3	3	2	2	---	---	---	---	---
10	<3	---	<3	<3	3	6	3	---	<3	---	<3	---
11	---	<3	---	<3	<3	2	2	2	---	<3	---	---
12	---	---	---	<3	<3	<3	2	---	---	---	---	---
13	<3	<3	2	3	<3	2	4	---	<3	---	<3	---
14	---	---	3	<3	<3	3	2	2	---	<3	---	---
15	---	<3	<3	<3	<3	2	---	---	---	---	---	---
16	<3	---	<3	<3	<3	2	---	---	<3	---	<3	---
17	---	---	<3	6	<3	3	3	2	---	<3	---	---
18	---	<3	<3	<3	<3	3	---	---	---	---	---	---
19	<3	---	<3	<3	<3	2	---	---	<3	---	3	---
20	---	---	<3	<3	<3	2	3	2	---	<3	---	---
21	---	<3	4	<3	<3	2	---	---	---	---	---	---
22	<3	---	3	<3	4	3	---	---	<3	---	<3	---
23	---	---	2	<3	7	4	3	2	---	<3	---	---
24	---	<3	<3	<3	8	3	---	---	---	---	---	---
25	<3	---	<3	2	2	3	---	---	<3	---	<3	---
26	---	---	<3	<3	4	4	2	2	---	<3	---	---
27	---	<3	<3	2	<3	7	---	---	---	<3	---	---
28	<3	12	<3	<3	<3	8	---	---	<3	4	<3	---
29	---	6	<3	<3	---	3	3	<3	---	3	---	---
30	---	8	5	<3	---	4	---	---	---	3	<3	---
31	<3	---	2	<3	---	3	---	---	---	5	---	---

&lt; Actual value is known to be less than the value shown.



01674500 MATTAPONI RIVER NEAR BEULAHVILLE, VA--Continued

RESIDUE, FIXED NON FILTERABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	<3	---	17	<3	<3	<3	13	---	<3	<3	10	---
2	---	---	9	<3	<3	<3	8	10	---	---	---	---
3	---	<3	10	<3	<3	<3	5	---	---	---	---	---
4	<3	---	<3	8	<3	10	3	---	<3	---	<3	---
5	---	---	9	<3	20	11	3	6	---	<3	---	---
6	---	<3	7	13	<3	<3	3	---	---	---	---	---
7	<3	---	9	13	<3	8	3	---	<3	---	<3	---
8	---	---	<3	<3	13	2	3	8	---	<3	---	---
9	---	<3	9	<3	15	3	4	---	---	---	---	---
10	<3	---	<3	<3	10	3	3	---	<3	---	<3	---
11	---	<3	---	<3	<3	3	4	6	---	<3	---	---
12	---	---	---	<3	<3	<3	6	---	---	---	---	---
13	<3	<3	6	8	<3	1	22	---	<3	---	<3	---
14	---	---	7	<3	<3	2	6	5	---	<3	---	---
15	---	<3	<3	<3	<3	3	---	---	---	---	---	---
16	<3	---	<3	<3	<3	2	---	---	<3	---	<3	---
17	---	---	<3	23	<3	4	6	6	---	<3	---	---
18	---	<3	<3	<3	<3	8	---	---	---	---	---	---
19	<3	---	<3	<3	<3	5	---	---	<3	---	7	---
20	---	---	<3	<3	<3	3	4	5	---	<3	---	---
21	---	<3	10	<3	<3	2	---	---	---	---	---	---
22	<3	---	11	<3	11	4	---	---	<3	---	<3	---
23	---	---	7	<3	30	5	5	4	---	<3	---	---
24	---	<3	<3	<3	25	8	---	---	---	---	---	---
25	<3	---	<3	8	11	6	---	---	<3	---	<3	---
26	---	---	<3	<3	23	6	4	9	---	<3	---	---
27	---	<3	<3	16	<3	27	---	---	---	<3	---	---
28	<3	71	<3	<3	<3	37	---	---	<3	10	<3	---
29	---	15	<3	<3	---	11	5	<3	---	8	---	---
30	---	40	17	<3	---	18	---	---	---	11	<3	---
31	<3	---	13	<3	---	26	---	---	---	16	---	---

&lt; Actual value is known to be less than the value shown.

## YORK RIVER BASIN

01677000 WARE CREEK NEAR TOANO, VA

LOCATION.--Lat 37°26'17", long 76°47'12", New Kent County, Hydrologic Unit 02080107, on left bank at upstream side of bridge on State Highway 600, 0.8 mi upstream from France Swamp, and 4.9 mi north of Toano.

DRAINAGE AREA.--6.29 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to October 1981, March 1982 to current year.

REVISED RECORDS.--WDR VA-83-1: 1981.

GAGE.--Water-stage recorder. Elevation of gage is 10 ft above sea level, from topographic map. October 1979 to October 1981, water-stage recorder at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Jan. 16, 17, 19-22, 27, 28, which are fair. Maximum discharge, 260 ft<sup>3</sup>/s, from rating curve extended above 120 ft<sup>3</sup>/s. No flow at times September 1980 and July to September 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 258 ft<sup>3</sup>/s, Mar. 3, gage height, 2.59 ft; minimum, 1.3 ft<sup>3</sup>/s, July 9-10, gage height, 0.65 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	8.6	4.3	3.6	4.7	5.4	17	12	4.0	4.2	8.7	2.2
2	2.4	5.4	3.9	11	4.3	50	13	11	3.8	4.0	6.6	2.5
3	2.2	4.3	3.9	10	3.7	98	11	6.5	3.5	2.8	7.6	2.9
4	2.2	3.9	3.7	8.9	3.6	21	10	25	3.2	3.4	6.3	2.7
5	2.1	5.3	9.5	7.1	4.2	14	9.6	34	3.0	3.4	6.6	2.2
6	2.0	9.7	12	4.9	5.5	12	10	15	3.8	2.8	13	2.0
7	1.8	11	6.3	4.2	5.1	11	12	11	5.3	2.5	6.9	2.8
8	1.8	7.4	4.5	5.5	4.3	10	12	12	4.5	2.1	4.7	2.9
9	2.3	5.3	3.9	5.9	4.9	12	11	10	4.1	1.6	3.9	2.6
10	2.5	4.4	3.6	4.3	7.5	24	8.8	7.9	3.5	2.6	3.4	2.5
11	2.4	3.7	5.6	3.4	9.0	26	8.3	7.2	3.4	7.7	3.3	2.4
12	2.2	3.6	4.7	5.8	16	13	8.3	6.7	4.0	4.0	3.1	1.9
13	2.2	3.6	3.7	8.6	9.6	11	11	6.1	3.8	2.8	2.9	1.8
14	2.2	4.0	3.7	5.9	9.7	10	16	5.6	3.3	2.7	2.8	1.8
15	2.2	4.6	5.1	4.5	8.7	9.5	10	5.7	2.9	2.5	33	1.8
16	2.2	5.0	9.6	e3.1	7.8	8.6	9.6	8.5	2.6	10	14	2.0
17	2.5	5.3	7.4	e2.7	7.2	7.6	8.1	6.5	2.8	25	8.0	2.1
18	3.0	5.6	4.8	12	6.2	7.9	7.4	5.1	3.6	16	16	6.8
19	3.2	5.7	4.5	e7.3	5.9	9.6	7.1	5.2	3.2	8.9	9.1	6.2
20	3.1	5.6	4.1	e3.5	5.8	8.0	6.9	5.5	2.7	5.2	5.9	3.6
21	3.4	4.9	9.0	e2.7	6.1	7.8	6.6	5.6	2.4	4.0	4.7	2.8
22	5.3	4.8	7.9	e2.9	7.0	13	6.8	5.3	2.5	3.9	4.5	20
23	5.4	4.2	5.2	3.5	13	9.3	7.2	5.5	3.2	3.6	4.4	41
24	4.2	3.5	4.6	4.8	25	7.5	7.0	4.8	12	3.6	4.3	11
25	3.4	3.1	4.1	5.5	14	20	6.8	4.4	5.2	3.5	3.5	5.8
26	3.7	3.0	3.6	5.2	8.0	15	6.2	6.5	3.0	4.1	3.1	4.4
27	11	4.6	3.3	e4.5	5.8	19	5.7	6.5	2.2	14	3.0	3.8
28	11	19	3.4	e8.0	5.3	22	5.6	4.7	2.7	9.7	3.0	3.0
29	7.1	14	3.8	12	---	27	5.6	4.3	2.5	27	2.9	2.4
30	7.8	6.1	4.5	6.5	---	17	16	4.2	2.6	44	2.8	2.1
31	13	---	3.8	5.1	---	13	---	4.0	---	14	2.5	---
TOTAL	122.4	179.2	162.0	182.9	217.9	539.2	280.6	262.3	109.3	245.6	204.5	152.0
MEAN	3.95	5.97	5.23	5.90	7.78	17.4	9.35	8.46	3.64	7.92	6.60	5.07
MAX	13	19	12	12	25	98	17	34	12	44	33	41
MIN	1.8	3.0	3.3	2.7	3.6	5.4	5.6	4.0	2.2	1.6	2.5	1.8
CFSM	.63	.95	.83	.94	1.24	2.77	1.49	1.35	.58	1.26	1.05	.81
IN.	.72	1.06	.96	1.08	1.29	3.19	1.66	1.55	.65	1.45	1.21	.90

e Estimated.

## YORK RIVER BASIN

225

01677000 WARE CREEK NEAR TOANO, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1981, 1982 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4.90	6.27	5.83	7.27	6.93	8.24	7.50	7.25	4.93	4.05	4.28	3.69
MAX	9.58	9.44	8.43	10.6	10.2	17.4	13.8	15.1	9.18	11.3	9.19	10.5
(WY)	1981	1986	1981	1987	1986	1994	1984	1980	1987	1984	1986	1985
MIN	2.03	1.19	3.65	3.34	3.91	1.88	3.42	2.65	1.99	1.00	.39	1.26
(WY)	1992	1992	1992	1992	1992	1981	1985	1991	1986	1988	1981	1980

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

WATER YEARS 1980 - 1981,  
1982 - 1994

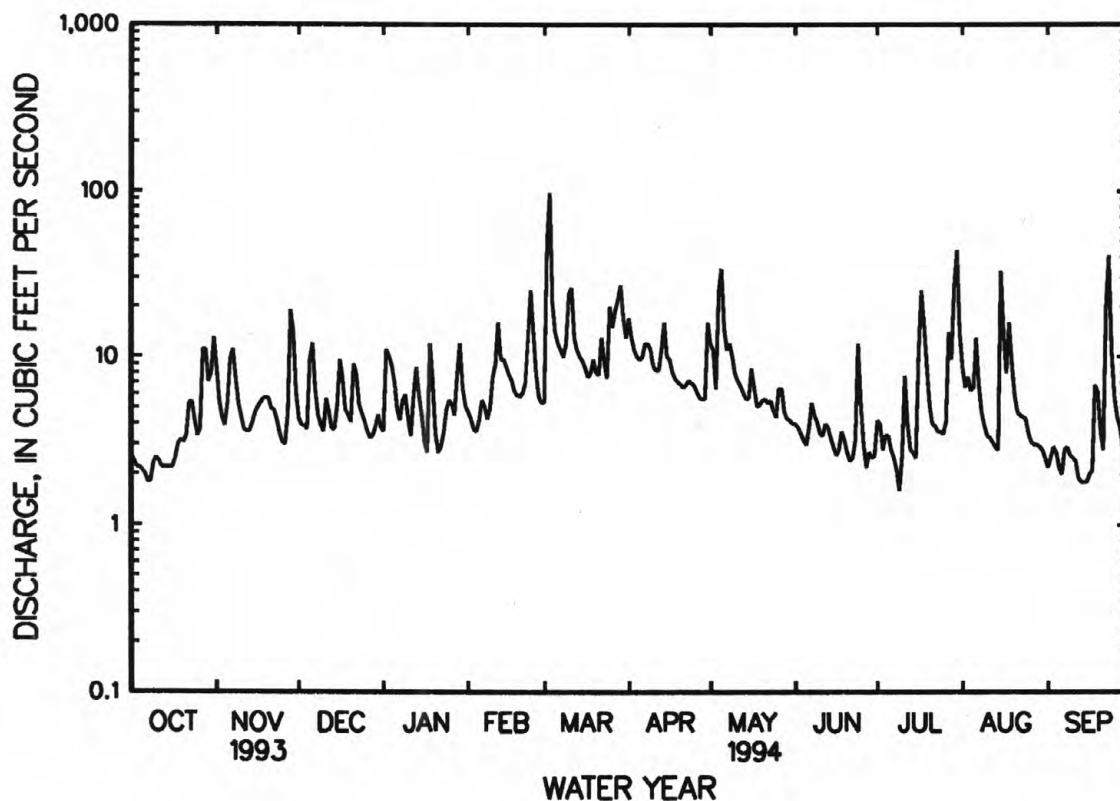
ANNUAL TOTAL	2392.38	2657.9	
ANNUAL MEAN	6.55	7.28	5.98
HIGHEST ANNUAL MEAN			9.10
LOWEST ANNUAL MEAN			3.74
HIGHEST DAILY MEAN	50 Mar 5	98 Mar 3	e150 Sep 27 1985
LOWEST DAILY MEAN	.45 Aug 29	1.6 Jul 9	a.00 Sep 14 1980
ANNUAL SEVEN-DAY MINIMUM	.54 Aug 25	2.0 Sep 11	a.00 Sep 14 1980
INSTANTANEOUS PEAK FLOW		258 Mar 3	260 Sep 27 1985
INSTANTANEOUS PEAK STAGE		2.59 Mar 3	b2.60 Sep 27 1985
INSTANTANEOUS LOW FLOW		1.3 cJul 9	a.00 Sep 14 1980
ANNUAL RUNOFF (CFSM)	1.04	1.16	.95
ANNUAL RUNOFF (INCHES)	14.15	15.72	12.92
10 PERCENT EXCEEDS	12	13	11
50 PERCENT EXCEEDS	5.2	5.2	4.6
90 PERCENT EXCEEDS	2.1	2.5	1.5

a No flow at times September 1980 and July to September 1981.

b From floodmarks.

c Also July 10, 1994.

e Estimated.



## YORK RIVER BASIN

01677000 WARE CREEK NEAR TOANO, VA--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1979-81, October 1985 to current year.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
NOV 23...	0945	4.2	145	7.4	10.0	11.0	764	9.0	81	35	<0.010
JAN 10...	1000	4.2	102	7.7	5.0	2.0	767	11.9	85	26	<0.010
APR 14...	0900	18	98	7.3	14.0	16.0	771	8.9	89	32	0.020
JUN 07...	1030	5.2	112	7.4	26.5	24.0	768	7.2	85	38	<0.010
JUL 26...	0930	2.7	110	7.3	23.5	25.0	769	7.0	84	36	<0.010

&lt; Actual value is known to be less than the value shown.

## YORK RIVER BASIN

227

01677000 WARE CREEK NEAR TOANO, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
NOV 23...	--	--	<0.050	<0.010	0.30	0.020	<0.010	250	<10	7.1
JAN 10...	--	0.320	0.320	0.050	0.20	0.030	<0.010	380	30	4.4
APR 14...	0.053	0.073	0.073	0.090	0.40	0.050	0.010	580	30	6.7
JUN 07...	--	--	<0.050	0.040	0.60	0.040	<0.010	500	30	8.0
JUL 26...	--	--	<0.050	0.010	0.70	0.040	0.030	6400	10	11

&lt; Actual value is known to be less than the value shown.



## SOUTH ATLANTIC SLOPE BASINS

## JAMES RIVER BASIN

02011400 JACKSON RIVER NEAR BACOVA, VA

LOCATION.--Lat 38°02'32", long 79°52'54", Bath County, Hydrologic Unit 02080201, on left bank 0.1 mi downstream from ford, 1.8 mi upstream from Back Creek, and 2.2 mi southwest of Bacova.

DRAINAGE AREA.--158 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,639.20 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 to Jan. 2 and Jan. 17, 18, 21-23, which are fair. U.S. Army Corps of Engineers satellite water temperature, precipitation and gage-height telemeter at station. Maximum discharge, 30,000 ft<sup>3</sup>/s, from rating curve extended above 1,300 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 8.88 ft, 11.40 ft, 13.88 ft, and 22.25 ft. Minimum gage height, 2.42 ft, Aug. 18, 19, 1988.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 11.40 ft, discharge, 4,800 ft<sup>3</sup>/s, and flood of Dec. 26, 1973, reached a stage of 13.88 ft, discharge, 7,560 ft<sup>3</sup>/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0830	2,730	9.13	Mar. 8	1915	1,540	7.41
Jan. 28	2245	2,010	8.13	Mar. 10	1015	1,880	7.93
Feb. 9	2015	2,370	8.65	Mar. 27	1730	1,670	7.62
Feb. 23	1500	1,960	8.06	May 8	0830	*3,760	*10.35

Minimum discharge, 27 ft<sup>3</sup>/s, Oct. 9, 11-12, 16-19, Sept. 30; minimum gage height, 2.64 ft, Oct. 9, 11-12, 16-19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	41	62	141	e68	408	333	583	135	74	43	74	48
2	37	51	113	e70	314	315	454	128	71	41	70	45
3	35	44	96	72	266	283	377	121	68	39	77	42
4	32	41	167	83	225	293	327	329	66	38	69	41
5	31	42	1900	79	205	589	286	298	64	38	69	40
6	30	46	733	78	189	620	272	261	62	37	68	39
7	29	47	407	80	172	794	341	607	79	37	59	38
8	29	42	287	193	165	1430	288	2730	79	38	53	37
9	28	38	225	180	1570	1260	262	1160	70	37	49	36
10	29	36	197	131	1410	1610	250	701	65	41	46	35
11	28	35	202	136	866	1280	237	496	62	37	43	35
12	33	33	169	590	648	819	224	390	60	35	41	33
13	35	32	146	733	513	626	357	316	56	35	39	33
14	32	41	133	508	454	522	437	265	53	38	39	32
15	29	54	155	346	400	447	361	234	51	36	40	32
16	28	47	199	244	375	390	339	220	50	35	43	31
17	27	44	167	e190	353	328	290	189	54	40	316	32
18	28	74	151	e150	341	304	255	171	59	91	488	34
19	28	74	147	135	354	313	230	156	51	59	235	32
20	30	65	133	124	385	266	209	145	49	91	165	31
21	41	57	132	e125	434	284	190	134	54	108	131	30
22	40	50	118	e130	426	437	213	123	56	149	110	30
23	35	45	108	e140	1410	376	194	117	61	122	91	30
24	33	42	98	154	1460	337	178	109	53	88	77	30
25	31	40	91	295	1010	348	170	105	52	69	68	29
26	30	38	85	617	695	312	163	105	49	62	63	31
27	30	88	e80	595	489	1020	159	102	55	68	58	31
28	29	533	e74	1240	385	1340	151	93	52	125	57	30
29	28	276	e72	1400	---	1420	142	86	46	120	53	29
30	32	188	e70	795	---	1030	141	82	45	107	50	28
31	52	---	e65	544	---	739	---	77	---	81	49	---
TOTAL	1000	2305	6861	10225	15922	20465	8080	10185	1766	1985	2890	1024
MEAN	32.3	76.8	221	330	569	660	269	329	58.9	64.0	93.2	34.1
MAX	52	533	1900	1400	1570	1610	583	2730	79	149	488	48
MIN	27	32	65	68	165	266	141	77	45	35	39	28
CFSM	.20	.49	1.40	2.09	3.60	4.18	1.70	2.08	.37	.41	.59	.22
IN.	.24	.54	1.62	2.41	3.75	4.82	1.90	2.40	.42	.47	.68	.24

e Estimated.

## JAMES RIVER BASIN

229

02011400 JACKSON RIVER NEAR BACOVA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	94.8	130	170	217	254	378	299	229	129	59.2	58.7	60.5
MAX	367	762	314	478	569	767	814	508	388	130	282	342
(WY)	1980	1986	1984	1991	1994	1993	1987	1989	1982	1989	1984	1979
MIN	19.7	27.6	36.6	31.6	101	68.0	81.1	61.1	37.1	29.7	20.6	23.8
(WY)	1989	1979	1981	1981	1978	1981	1988	1977	1977	1988	1988	1983

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1975 - 1994

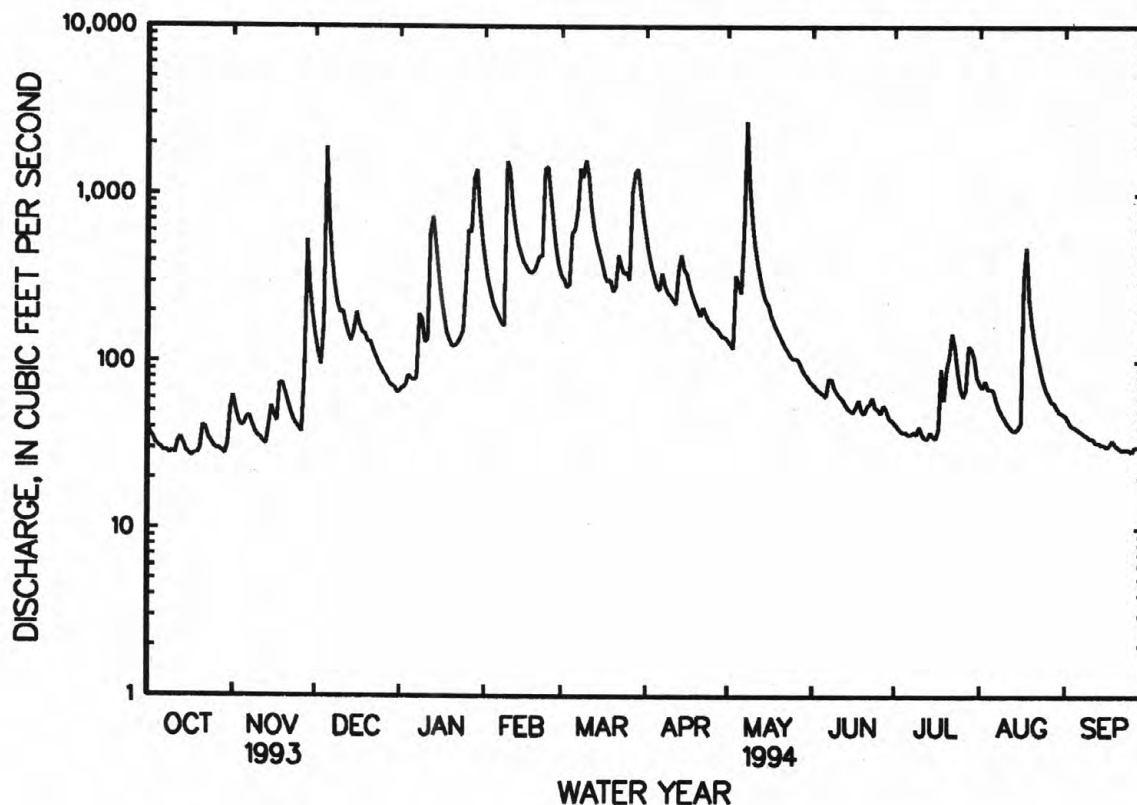
ANNUAL TOTAL	71812	82708	173	
ANNUAL MEAN	197	227	227	1994
HIGHEST ANNUAL MEAN			86.9	1981
LOWEST ANNUAL MEAN			7500	Nov 5 1985
HIGHEST DAILY MEAN	3130	Apr 16	2730	May 8
LOWEST DAILY MEAN	23	<sup>a</sup> Sep 14	27	Oct 17
ANNUAL SEVEN-DAY MINIMUM	25	Sep 10	29	Oct 14
INSTANTANEOUS PEAK FLOW			3760	May 8
INSTANTANEOUS PEAK STAGE			10.35	May 8
INSTANTANEOUS LOW FLOW			27	<sup>c</sup> Oct 9
ANNUAL RUNOFF (CFSM)	1.25	1.43	15	<sup>d</sup> Aug 17 1988
ANNUAL RUNOFF (INCHES)	16.91	19.47	1.09	
10 PERCENT EXCEEDS	417	560	370	
50 PERCENT EXCEEDS	78	91	89	
90 PERCENT EXCEEDS	29	32	29	

a Also Sept. 15, 1993.

b From floodmark.

c Also Oct. 11, 12, 16-19, 1993, and Sept. 30, 1994.

d Also Aug. 18, 19, and Sept. 16, 17, 23, 1988.



## JAMES RIVER BASIN

02011400 JACKSON RIVER NEAR BACOVA, VA--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: March 1978 to September 1981, October 1982 to current year.

INSTRUMENTATION.--Water-temperature recorder March 1978 to September 1981, and since October 1982.

REMARKS.--Some record in prior years fragmentary due to instrument malfunction. Records represent water temperature at sensor within 0.5°C. Temperature at the sensor was compared with the average for the river by temperature cross section on July 21. A maximum variation of 0.5°C was found within the cross section.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded (water years 1978-81, 1983-94), 31.0°C, July 16, 1988; minimum recorded (water years 1978-81, 1984-94), 0.0°C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 29.0°C, July 6-8; minimum, 0.0°C on many days during winter period.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	14.0	10.0	12.0	6.5	5.0	6.0	6.5	4.0	5.0	.0	.0	.0
2	15.5	11.0	13.0	7.0	4.0	5.5	5.5	2.5	4.0	.0	.0	.0
3	16.5	13.0	15.0	7.0	5.0	6.0	7.0	4.0	5.5	1.0	.0	.5
4	15.5	11.0	13.5	8.5	4.5	6.5	9.0	7.0	7.5	.5	.0	.0
5	16.5	12.0	14.5	11.5	8.0	10.0	9.5	8.0	9.0	.5	.0	.0
6	15.5	13.0	14.0	10.5	8.0	9.5	8.5	6.5	7.5	1.0	.0	.5
7	16.0	12.0	14.0	8.5	6.0	7.0	7.5	6.0	7.0	2.5	1.0	1.5
8	17.5	14.0	15.5	6.5	3.5	5.0	7.0	5.0	6.0	3.0	1.0	2.5
9	17.0	14.0	15.5	6.5	3.0	5.0	6.5	5.0	5.5	1.5	.0	.0
10	17.0	14.0	16.0	7.0	4.0	5.5	7.0	5.5	6.0	.0	.0	.0
11	14.0	11.0	12.0	6.5	3.0	5.0	6.5	3.5	6.0	1.0	.0	.5
12	12.5	11.0	11.5	7.0	4.0	5.5	3.5	1.5	2.5	3.5	.0	2.0
13	12.0	10.0	11.0	8.5	6.0	7.0	3.5	.5	2.0	5.0	3.5	4.5
14	13.5	10.0	12.0	11.5	8.0	9.5	3.5	2.0	2.5	5.5	2.5	4.5
15	14.5	11.0	12.5	13.5	11.0	12.0	4.5	3.5	4.0	2.5	.0	.5
16	14.5	12.0	13.5	13.5	12.0	12.5	6.5	4.0	5.0	.5	.0	.0
17	15.5	13.5	14.5	13.5	12.0	13.0	5.5	4.5	5.0	.0	.0	.0
18	17.0	14.0	15.5	12.5	11.0	11.5	6.0	4.5	5.5	.0	.0	.0
19	16.5	15.0	16.0	11.0	10.0	10.5	6.0	5.0	5.5	.5	.0	.0
20	19.5	16.0	17.5	10.5	7.0	8.5	5.5	4.0	4.5	.0	.0	.0
21	18.5	15.0	17.0	7.0	4.5	6.0	4.0	3.0	3.0	.5	.0	.0
22	15.0	12.0	13.5	6.5	3.5	5.0	3.0	1.5	2.5	.5	.0	.0
23	13.5	9.5	12.0	6.5	3.0	5.0	3.5	2.0	2.5	.0	.0	.0
24	12.5	9.0	11.0	7.0	4.0	5.5	2.5	1.5	2.0	.5	.0	.0
25	12.5	8.0	11.0	7.5	6.0	6.5	2.0	.5	1.5	.5	.0	.5
26	11.5	10.0	11.0	7.0	6.0	6.0	1.0	.0	.0	4.5	.5	3.0
27	13.5	10.5	11.5	9.5	6.0	7.0	.5	.0	.0	4.5	3.5	4.0
28	12.0	9.0	10.5	9.5	7.0	8.5	.5	.0	.0	5.5	4.0	4.5
29	10.0	6.5	8.5	7.5	5.0	6.0	1.5	.0	.5	5.5	4.5	5.0
30	10.5	9.0	9.5	6.5	5.0	5.5	.5	.0	.0	5.5	4.0	4.5
31	9.5	6.5	8.0	---	---	---	.0	.0	.0	5.0	4.0	4.5
MONTH	19.5	6.5	13.0	13.5	3.0	7.5	9.5	.0	4.0	5.5	.0	1.5

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	4.5	2.0	3.5	5.0	3.5	4.5	10.5	6.5	8.5	21.0	17.0	19.0
2	3.0	1.0	2.0	3.5	.0	1.5	11.0	7.5	9.5	19.0	13.5	16.5
3	2.5	1.0	1.5	2.5	.0	1.0	11.5	9.5	10.5	16.0	12.5	14.0
4	3.5	1.0	2.0	7.5	1.5	4.5	13.5	9.0	11.0	13.0	11.0	11.5
5	4.5	2.0	3.0	7.5	5.0	5.5	13.0	9.0	11.0	12.5	10.0	11.0
6	6.0	3.0	4.0	7.5	4.0	5.5	13.0	11.0	12.0	12.0	10.5	11.5
7	5.5	2.5	4.0	8.0	5.0	6.5	12.5	9.0	11.0	12.5	11.5	12.0
8	5.0	3.0	4.0	7.5	6.0	7.0	12.0	7.0	9.0	11.5	10.5	11.0
9	6.5	5.0	5.5	6.5	4.5	5.5	13.0	8.0	10.5	13.5	9.0	11.5
10	5.5	3.0	4.0	6.0	5.0	5.5	12.5	10.5	11.5	13.5	11.5	12.5
11	4.0	2.0	3.0	6.5	4.0	5.5	11.5	10.0	11.0	14.5	10.0	12.5
12	4.5	4.0	4.5	7.0	4.0	6.0	13.5	9.0	11.5	15.0	12.0	14.0
13	5.5	4.0	5.0	7.0	5.0	6.0	15.5	12.0	13.5	15.5	12.0	13.5
14	5.5	3.0	4.0	9.5	6.0	7.5	15.0	12.0	13.5	17.0	12.0	14.0
15	5.5	3.0	4.5	9.5	7.0	8.0	15.5	12.0	13.5	18.5	14.0	16.0
16	6.5	4.0	5.0	7.5	5.0	7.0	14.5	12.0	14.0	19.5	15.0	17.0
17	6.5	4.0	5.0	6.5	3.0	5.0	15.0	11.0	12.5	16.0	14.0	15.0
18	7.5	4.0	5.5	6.5	4.5	5.5	15.5	11.0	13.0	15.0	12.0	13.5
19	8.5	5.0	6.5	8.5	4.5	6.5	16.5	11.5	14.0	13.0	11.0	12.0
20	8.5	6.0	7.0	10.5	5.5	7.5	18.5	13.0	15.5	14.5	11.5	13.0
21	8.5	7.0	7.5	9.0	8.0	8.5	16.0	12.0	14.0	18.0	11.0	14.5
22	8.5	6.0	7.5	10.5	7.0	8.5	14.5	12.0	13.0	17.5	13.0	15.5
23	7.5	5.5	6.0	11.5	7.0	9.0	15.5	9.5	12.5	20.5	14.0	17.0
24	6.5	5.0	6.0	11.5	9.0	10.0	17.5	10.0	13.5	20.5	15.5	18.5
25	6.5	4.0	5.5	11.5	9.0	11.0	19.5	12.0	15.5	21.5	16.5	19.0
26	6.5	4.0	5.0	9.5	7.0	8.5	20.0	14.0	17.0	19.5	17.0	18.0
27	4.5	2.0	3.5	10.5	8.0	9.0	19.5	15.0	17.5	18.0	15.0	16.5
28	4.5	2.0	3.5	10.5	9.0	9.5	21.5	15.0	18.0	18.5	13.0	16.0
29	---	---	---	9.5	8.0	8.5	20.0	16.0	18.5	20.5	13.0	17.0
30	---	---	---	9.0	6.0	8.0	21.0	16.5	19.0	21.0	16.0	18.5
31	---	---	---	8.5	7.0	7.5	---	---	---	23.0	16.5	20.0
MONTH	8.5	1.0	4.5	11.5	.0	7.0	21.5	6.5	13.0	23.0	9.0	15.0
	JUNE			JULY			AUGUST			SEPTEMBER		
1	22.5	18.0	20.0	26.0	20.0	23.0	24.5	22.0	23.5	23.5	20.0	21.5
2	22.5	17.5	20.0	27.0	21.5	24.0	23.5	22.0	22.5	22.5	20.0	21.5
3	22.5	16.0	19.5	27.0	22.5	24.5	23.5	21.0	22.5	21.5	19.0	20.5
4	21.5	17.0	19.5	26.5	22.0	24.5	26.5	21.5	23.5	19.5	18.0	18.5
5	24.5	18.5	21.5	28.0	23.0	25.5	25.0	22.0	23.5	20.5	17.0	18.5
6	24.0	20.0	22.0	29.0	23.5	26.0	24.5	19.5	22.0	21.0	18.0	19.5
7	24.0	21.0	22.5	29.0	23.5	26.5	23.5	19.0	21.5	21.5	17.0	19.0
8	23.0	21.0	22.0	29.0	24.0	26.5	24.5	20.5	22.5	20.5	17.0	19.0
9	22.0	19.0	20.0	27.5	24.5	25.5	26.5	22.0	24.0	21.5	17.0	19.0
10	19.5	18.0	18.5	27.0	23.5	25.0	27.0	23.0	25.0	20.5	17.5	19.0
11	21.0	17.5	19.0	25.5	21.5	23.5	26.5	22.0	24.5	22.0	18.0	19.5
12	24.5	19.0	21.0	25.5	21.0	23.5	27.5	23.0	25.5	20.5	16.0	18.5
13	25.5	20.0	22.5	25.0	22.0	23.5	28.5	23.0	25.5	21.0	16.0	19.0
14	28.0	22.0	24.5	25.5	22.5	24.0	27.0	24.0	25.0	21.5	17.0	19.0
15	27.0	23.0	25.0	27.0	22.5	24.5	26.0	22.0	24.0	22.5	18.0	20.0
16	26.0	23.0	24.5	26.0	23.0	24.5	23.5	20.5	21.5	23.5	20.0	21.5
17	28.0	22.0	24.5	24.5	21.5	22.5	20.5	19.0	20.0	22.0	20.0	21.0
18	28.0	23.0	25.5	24.5	21.5	22.5	20.5	18.0	19.0	22.5	19.0	20.5
19	27.0	23.0	25.0	25.5	21.5	23.5	21.5	18.0	19.5	21.0	17.0	19.0
20	28.0	22.0	25.0	26.0	22.5	24.0	23.5	19.0	21.0	20.5	16.0	18.0
21	28.0	24.0	26.0	24.5	22.0	23.0	21.5	20.0	20.5	19.5	16.0	18.0
22	27.0	23.0	25.0	23.5	21.0	22.5	20.5	18.0	19.0	18.0	16.0	17.0
23	25.0	23.0	24.0	25.5	21.0	23.0	22.5	17.0	19.5	20.5	15.0	17.5
24	26.0	22.5	24.5	24.5	21.0	23.0	23.5	18.5	21.0	20.5	18.0	19.5
25	25.0	22.0	23.5	26.5	22.0	24.0	23.5	20.0	21.5	21.5	19.0	20.0
26	25.0	20.0	22.5	24.5	21.5	22.5	24.5	21.0	22.5	21.5	19.0	20.0
27	24.0	21.0	22.0	22.0	20.0	21.0	22.5	20.5	21.5	19.5	17.5	18.5
28	25.0	20.0	22.5	22.5	19.0	20.5	23.5	20.0	22.0	18.5	16.0	17.0
29	27.0	21.5	24.0	23.5	20.0	21.5	23.5	21.0	22.5	17.5	14.0	16.0
30	25.0	22.0	23.0	24.5	20.0	22.0	24.0	20.0	22.0	17.5	13.0	15.5
31	---	---	---	25.5	21.0	23.5	22.0	20.0	21.0	---	---	---
MONTH	28.0	16.0	22.5	29.0	19.0	23.5	28.5	17.0	22.0	23.5	13.0	19.0
YEAR	29.0	.0	12.5									



## JAMES RIVER BASIN

02011460 BACK CREEK NEAR SUNRISE, VA

LOCATION.--Lat 38°14'43", long 79°46'08", Bath County, Hydrologic Unit 02080201, on right bank 900 ft upstream from bridge on State Highway 600, 0.8 mi upstream from Gap Run, and 4.8 mi northeast of Sunrise.

DRAINAGE AREA.--60.1 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1974 to current year.

REVISED RECORDS.--WDR VA-85-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2,200.02 ft above sea level (levels by Virginia Department of Transportation). July 2 to Sept. 6, 1990, nonrecording gage at present site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 to Jan. 2 and Jan. 8-11, 17-22, which are poor. Virginia Power gage-height transmitter at station, receiver at Back Creek Dam. Maximum discharge, 17,500 ft<sup>3</sup>/s, from rating curve extended above 3,800 ft<sup>3</sup>/s. Minimum gage height, 0.07 ft, July 21, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	2345	1,360	4.32	Mar. 8	0645	940	3.47
Dec. 5	0500	2,400	5.24	Mar. 10	0930	1,110	3.74
Jan. 12	1415	916	3.43	Mar. 27	1615	1,220	3.89
Jan. 28	1145	1,830	4.66	May 8	0230	*4,240	*6.31
Feb. 9	1815	1,920	4.77	Aug. 17	1705	1,150	3.80
Feb. 24	0915	976	3.53				

Minimum discharge, 5.8 ft<sup>3</sup>/s, Sept. 24-30, gage height, 0.80 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	57	103	e30	214	143	262	67	18	9.3	63	15
2	21	49	79	e31	153	129	194	64	17	8.4	50	14
3	18	42	65	33	126	105	160	60	17	7.6	47	12
4	16	42	128	35	103	122	139	103	16	7.3	37	11
5	13	43	1510	39	92	239	117	185	15	7.0	37	11
6	12	58	499	38	82	311	104	177	15	7.6	39	10
7	12	65	264	52	72	480	168	544	16	19	31	9.2
8	11	54	172	e84	79	918	195	2110	21	11	27	9.2
9	9.9	43	124	e74	1370	696	174	606	17	9.8	23	8.8
10	9.4	37	105	e66	880	989	147	357	16	12	20	8.4
11	9.4	32	118	e78	460	667	124	241	15	11	17	8.2
12	14	30	120	563	307	389	109	181	14	8.5	15	7.4
13	18	28	113	562	243	277	255	138	12	7.1	13	7.3
14	15	109	102	344	209	220	354	109	11	7.1	12	6.5
15	14	90	97	214	195	190	251	91	10	7.2	14	6.5
16	12	63	106	138	201	175	217	83	11	6.6	13	6.5
17	12	56	118	e100	199	145	177	71	11	45	403	6.1
18	11	177	117	e80	195	134	143	64	12	128	479	6.9
19	11	135	106	e60	216	134	118	57	9.6	39	205	6.9
20	22	97	87	e50	258	122	100	50	9.7	30	110	6.8
21	38	69	82	e52	335	153	87	45	10	68	74	6.5
22	34	54	70	e54	346	445	97	38	9.1	323	57	6.1
23	29	46	61	57	612	340	100	33	8.2	161	43	6.1
24	26	40	54	80	904	266	100	31	8.6	87	33	6.0
25	23	36	47	160	551	259	96	28	13	53	27	5.8
26	21	33	42	555	346	205	85	31	10	65	23	5.8
27	20	200	e38	489	226	664	77	29	17	143	21	5.8
28	18	701	e35	1250	166	820	70	26	15	352	20	5.8
29	17	248	e33	952	---	734	63	23	12	274	18	5.8
30	20	150	e31	459	---	557	66	21	10	151	17	5.8
31	44	---	e29	295	---	367	---	19	---	88	16	---
TOTAL	576.7	2884	4655	7074	9140	11395	4349	5682	396.2	2153.5	2004	237.2
MEAN	18.6	96.1	150	228	326	368	145	183	13.2	69.5	64.6	7.91
MAX	44	701	1510	1250	1370	989	354	2110	21	352	479	15
MIN	9.4	28	29	30	72	105	63	19	8.2	6.6	12	5.8
CFSM	.31	1.60	2.50	3.80	5.43	6.12	2.41	3.05	.22	1.16	1.08	.13
IN.	.36	1.79	2.88	4.38	5.66	7.05	2.69	3.52	.25	1.33	1.24	.15

e Estimated.



## JAMES RIVER BASIN

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02011460 BACK CREEK NEAR SUNRISE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	49.2	84.7	112	126	150	208	147	121	55.0	26.3	24.7	21.2
MAX	256	512	208	309	326	394	330	210	162	69.5	80.6	148
(WY)	1977	1986	1984	1979	1994	1993	1987	1989	1982	1994	1984	1979
MIN	4.08	9.63	20.1	8.49	45.4	54.5	45.9	31.8	13.2	6.81	4.41	2.48
(WY)	1992	1992	1981	1981	1978	1988	1986	1991	1994	1988	1987	1983

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

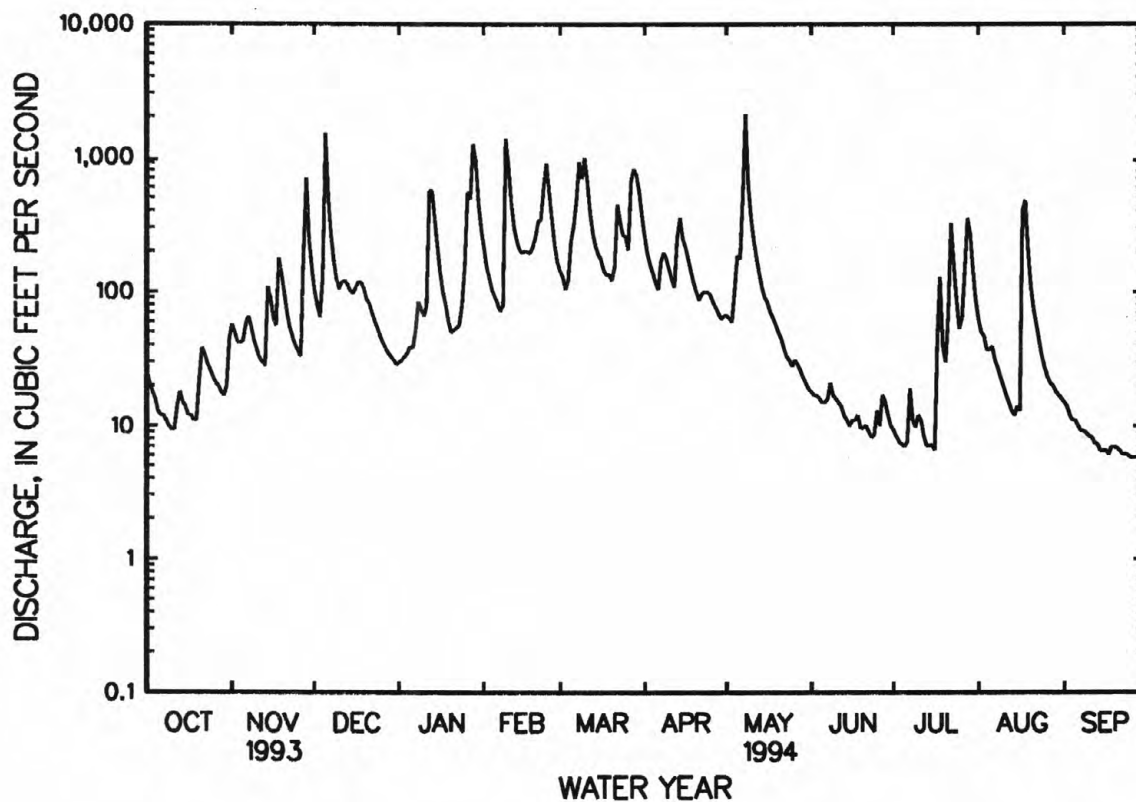
## WATER YEARS 1974 - 1994

ANNUAL TOTAL	37908.8	50546.6	
ANNUAL MEAN	104	138	93.5
HIGHEST ANNUAL MEAN			138
LOWEST ANNUAL MEAN			51.6
HIGHEST DAILY MEAN	1690	2110	6280
LOWEST DAILY MEAN	2.9	5.8	1.7
ANNUAL SEVEN-DAY MINIMUM	4.1	5.8	2.1
INSTANTANEOUS PEAK FLOW		4240	17500
INSTANTANEOUS PEAK STAGE		6.31	10.01
INSTANTANEOUS LOW FLOW		5.8	1.5
ANNUAL RUNOFF (CFSM)	1.73	2.30	1.56
ANNUAL RUNOFF (INCHES)	23.46	31.29	21.13
10 PERCENT EXCEEDS	227	348	210
50 PERCENT EXCEEDS	43	57	43
90 PERCENT EXCEEDS	5.8	9.2	6.5

a Also Sept. 26-30, 1994.

b Also Sept. 25-30, 1994.

c Also Sept. 14, 1980.



02011460 BACK CREEK NEAR SUNRISE, VA--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1984 to current year.

INSTRUMENTATION.--Water-temperature recorder Oct. 1, 1984, to July 1, 1990, and since Sept. 7, 1990.

REMARKS.--Fragmentary record for 1990 water year was caused by replacement of instrument shelter. Records represent water temperature at sensor within 0.5°C. Temperature at the sensor was compared with the average for the creek by temperature cross section on July 19. No variation of temperature was found within the cross section.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum (water years 1985-89, 1991-94), 27.5°C, July 7, 1991, July 27, 1993; minimum (water years 1985-94), 0.0°C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 27.0°C, June 21, July 5, 7; minimum, 0.0°C on many days during winter period.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	13.5	8.0	10.5	5.5	4.0	5.0	5.0	2.5	3.5	.0	.0	.0
2	15.0	9.5	12.0	6.0	2.5	4.5	4.5	2.0	3.5	.5	.0	.0
3	15.5	11.0	13.0	7.0	4.5	5.5	6.5	4.0	5.0	1.0	.0	.5
4	15.0	9.0	11.5	8.0	4.0	6.0	7.0	6.0	6.5	.0	.0	.0
5	16.5	11.0	13.0	10.5	7.5	9.0	7.5	6.0	7.0	.0	.0	.0
6	14.5	10.5	12.0	9.0	6.0	7.5	6.5	5.0	6.0	.5	.0	.0
7	16.0	10.5	12.5	6.0	3.5	5.0	6.0	4.5	5.5	2.0	.5	1.0
8	16.5	11.0	13.5	5.5	2.0	3.5	6.0	3.5	4.5	1.0	.0	.5
9	15.0	12.5	13.5	6.0	2.0	4.0	5.5	3.0	4.0	.5	.0	.0
10	15.5	11.0	13.5	6.5	2.5	4.5	5.5	4.5	5.0	.0	.0	.0
11	11.0	8.5	9.5	6.0	2.0	4.0	5.5	1.0	3.5	1.5	.0	.5
12	10.0	9.0	9.5	7.0	3.0	5.0	2.0	.0	1.0	3.5	.5	2.0
13	11.0	8.0	9.0	7.0	5.5	6.5	3.0	.0	1.5	4.0	3.5	4.0
14	11.5	9.0	10.0	10.0	6.5	8.0	3.5	2.0	3.0	3.5	.5	3.0
15	14.0	8.5	10.5	11.5	9.0	10.0	3.5	3.0	3.5	.5	.0	.0
16	13.0	10.0	11.5	10.5	9.0	9.5	5.5	3.5	4.5	.0	.0	.0
17	13.5	12.0	12.5	10.5	9.5	10.0	3.5	2.0	3.0	.0	.0	.0
18	15.5	11.5	13.0	9.5	7.5	8.5	4.5	3.5	4.0	.0	.0	.0
19	14.0	12.0	13.5	8.5	7.0	8.0	4.0	3.0	3.5	.0	.0	.0
20	17.5	13.5	15.0	8.0	4.0	6.5	3.5	2.5	3.0	.0	.0	.0
21	15.5	11.5	14.0	5.5	3.0	4.0	3.0	.5	2.0	.0	.0	.0
22	13.0	9.5	11.0	6.0	2.5	4.0	1.5	.0	.5	.0	.0	.0
23	12.0	7.0	9.5	5.5	2.5	4.0	2.0	.5	1.5	.5	.0	.0
24	11.0	6.5	9.0	6.0	3.5	4.5	1.5	.0	.5	3.0	.5	1.5
25	12.0	6.5	9.0	6.5	5.5	6.0	1.0	.0	.5	2.0	1.0	1.5
26	10.0	8.0	9.5	5.5	5.0	5.0	.0	.0	.0	3.5	.5	2.0
27	11.5	9.0	10.0	7.5	5.0	6.0	1.0	.0	.5	3.0	2.5	3.0
28	10.0	7.0	8.5	8.0	5.0	7.0	1.0	.0	.5	5.5	3.0	4.0
29	9.0	5.0	7.0	6.0	4.0	5.0	.5	.0	.0	5.0	3.5	4.0
30	8.5	8.0	8.0	5.5	3.5	4.5	.0	.0	.0	3.5	3.0	3.0
31	8.0	5.5	6.5	---	---	---	.0	.0	.0	3.5	2.0	3.0
MONTH	17.5	5.0	11.0	11.5	2.0	6.0	7.5	.0	3.0	5.5	.0	1.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

[illegible]

## JAMES RIVER BASIN

## 02011470 BACK CREEK AT SUNRISE, VA

LOCATION.--Lat 38°11'25", long 79°48'43", Bath County, Hydrologic Unit 02080201, on left bank 75 ft upstream from bridge on State Highway 600 at Sunrise, 180 ft upstream from Beaver Run, 0.5 mi downstream from Back Creek Dam, and 7.6 mi northeast of Mountain Grove.

DRAINAGE AREA.--76.1 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1984 to current year.

GAGE.--Water-stage recorder. Concrete control since Oct. 24, 1984. Datum of gage is 1,968.52 ft above sea level (Virginia Power bench mark). Nov. 5, 1992, to Jan. 5, 1993, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since October 1984 by Back Creek Lake 0.5 mi upstream, amount unknown. Virginia Power gage-height transmitter at station, receiver at Back Creek Dam. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Maximum discharge, 5,100 ft<sup>3</sup>/s, from rating curve extended above 960 ft<sup>3</sup>/s on basis of release from Back Creek Lake at peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,430 ft<sup>3</sup>/s, May 8, gage height, 10.55 ft, from rating curve extended as explained above; minimum, 13 ft<sup>3</sup>/s, many days in July, August, and September, gage height, 3.96 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	15	118	72	276	166	292	72	16	14	59	14
2	14	15	81	20	147	140	213	78	16	14	60	14
3	14	15	82	17	138	149	189	70	16	13	61	14
4	14	15	182	19	128	191	149	123	15	14	51	14
5	14	15	2250	28	134	355	126	228	15	14	57	14
6	15	15	652	49	76	357	121	218	16	13	55	14
7	15	15	230	63	69	580	170	719	15	13	47	14
8	15	14	211	224	68	1190	220	3030	15	13	33	14
9	15	14	149	163	1870	860	224	675	15	14	21	14
10	15	14	115	125	1300	1400	149	361	15	13	20	14
11	14	14	113	154	679	908	122	371	15	13	18	14
12	15	14	132	851	481	514	123	207	15	13	14	13
13	15	14	132	620	214	265	332	147	15	14	14	13
14	14	14	107	411	191	235	420	87	15	14	14	13
15	14	14	97	294	251	204	289	101	15	14	14	14
16	14	14	121	157	249	205	266	99	14	13	15	14
17	15	15	123	125	217	173	203	92	14	19	426	14
18	15	17	138	108	203	170	166	80	14	146	546	14
19	15	95	117	93	213	169	131	68	14	49	249	13
20	15	102	78	74	272	147	121	65	14	40	97	13
21	15	83	92	81	398	164	103	45	14	78	69	13
22	15	29	82	97	348	428	107	39	14	444	57	14
23	14	19	74	57	917	501	123	21	14	255	46	14
24	14	31	73	64	1320	250	114	20	14	125	40	13
25	14	19	54	178	608	281	102	20	14	72	24	14
26	14	18	35	609	450	282	104	27	14	62	21	14
27	14	246	26	592	257	912	98	39	14	161	22	13
28	14	971	31	1630	181	1090	97	38	14	395	21	14
29	14	323	44	1430	---	964	77	26	14	282	21	14
30	15	215	48	451	---	866	69	20	14	132	19	14
31	15	---	50	303	---	393	---	17	---	96	13	---
TOTAL	449	2414	5837	9159	11655	14509	5020	7203	439	2572	2224	412
MEAN	14.5	80.5	188	295	416	468	167	232	14.6	83.0	71.7	13.7
MAX	15	971	2250	1630	1870	1400	420	3030	16	444	546	14
MIN	14	14	26	17	68	140	69	17	14	13	13	13

## JAMES RIVER BASIN

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02011470 BACK CREEK AT SUNRISE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	40.0	84.7	135	156	169	267	195	176	62.8	32.3	31.9	23.1
MAX	150	371	233	305	416	616	496	399	222	83.0	88.8	88.6
(WY)	1990	1986	1991	1991	1994	1993	1987	1989	1989	1994	1989	1989
MIN	9.31	12.0	14.9	14.8	58.2	61.4	51.1	37.5	14.6	12.7	13.6	11.5
(WY)	1985	1985	1985	1985	1993	1988	1986	1991	1994	1985	1987	1985

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

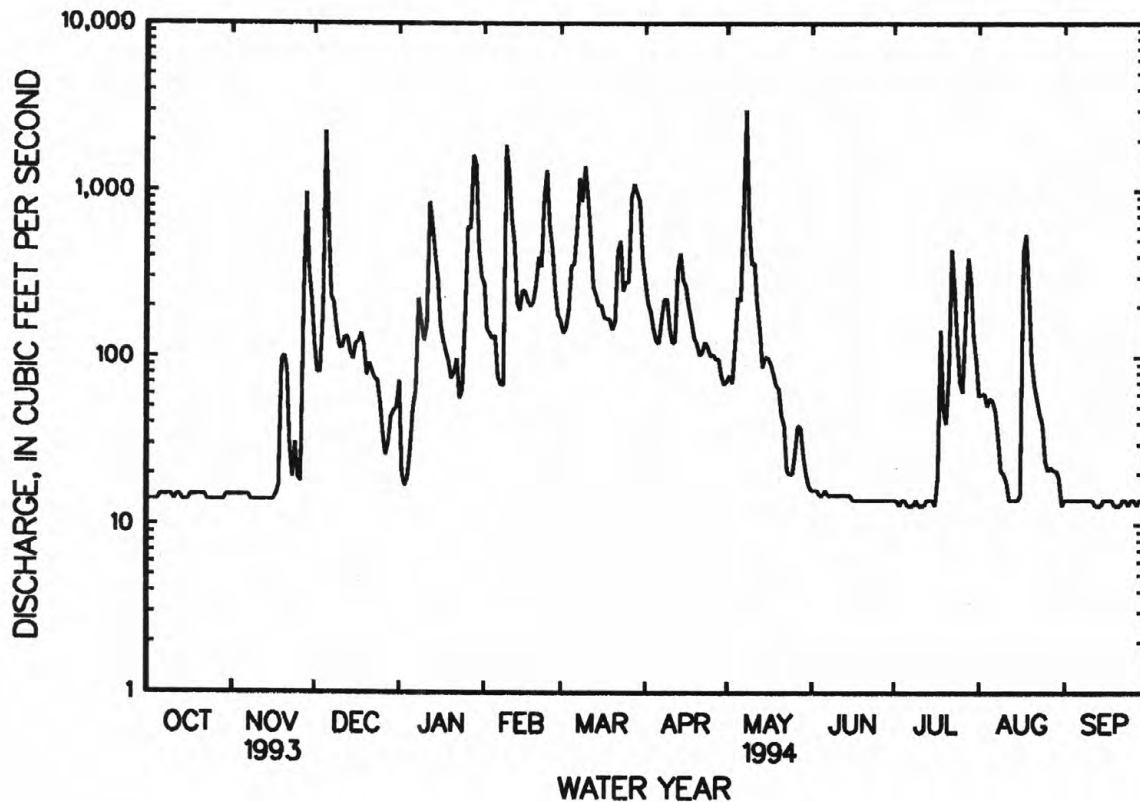
## WATER YEARS 1985 - 1994

ANNUAL TOTAL	50238	61893	
ANNUAL MEAN	138	170	114
HIGHEST ANNUAL MEAN			170
LOWEST ANNUAL MEAN			55.8
HIGHEST DAILY MEAN	2770	3030	3160
LOWEST DAILY MEAN	13	13	5.2
ANNUAL SEVEN-DAY MINIMUM	13	13	5.6
INSTANTANEOUS PEAK FLOW		4430	5100
INSTANTANEOUS PEAK STAGE		10.55	11.37
INSTANTANEOUS LOW FLOW		13	(c)
ANNUAL RUNOFF (CFSM)	1.81	2.23	1.50
ANNUAL RUNOFF (INCHES)	24.56	30.26	20.34
10 PERCENT EXCEEDS	280	422	243
50 PERCENT EXCEEDS	35	61	39
90 PERCENT EXCEEDS	14	14	14

a Also June 19-21, 23, 24, and July 11, 12, 1993.

b Many days in July, August, and September 1994.

c Not determined.





## JAMES RIVER BASIN

02011470 BACK CREEK AT SUNRISE, VA--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1984 to November 1992, January 1993 to current year.

INSTRUMENTATION.--Water-temperature recorder Oct. 1, 1984, to Nov. 4, 1992, and since Jan. 6, 1993.

REMARKS.--Some record in prior years fragmentary due to instrument malfunction. Fragmentary record for 1993 water year was caused by replacement of instrument shelter. Records represent water temperature at sensor within 0.5°C. Temperature at the sensor was compared with the average for the creek by temperature cross section on July 19. A maximum variation of 0.5°C was found within the cross section.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded (water years 1985-94), 27.5°C, Aug. 10, 1985; minimum (water years 1985-92, 1994), 0.0°C, Jan. 20, 21, 1985.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 26.0°C, Aug. 13; minimum, 2.5°C, on several days during winter period.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	21.0	16.5	18.0	12.0	11.0	11.5	11.5	10.5	11.0	6.0	5.0	5.5
2	21.0	17.0	18.5	15.0	11.0	12.5	11.5	10.5	11.0	6.0	5.5	6.0
3	20.5	16.5	18.5	13.5	12.0	12.5	11.0	10.5	11.0	5.5	4.5	5.0
4	20.5	16.0	18.0	15.0	12.0	13.5	11.0	10.0	11.0	5.5	3.0	4.5
5	21.5	17.0	18.5	15.5	13.5	14.0	11.0	10.0	10.5	6.0	4.0	5.0
6	20.5	16.5	18.0	13.5	12.0	12.5	10.5	10.0	10.5	5.5	5.0	5.0
7	21.5	17.0	18.5	12.0	10.0	11.5	10.0	10.0	10.0	5.5	5.0	5.5
8	21.5	17.0	18.5	13.5	10.0	11.5	10.0	9.5	10.0	5.0	4.5	5.0
9	20.5	17.5	18.5	13.5	10.0	11.5	10.0	9.5	10.0	5.0	4.0	4.5
10	20.5	15.5	18.0	14.5	10.5	12.0	10.0	9.5	10.0	4.5	4.0	4.5
11	17.5	15.0	16.0	13.5	10.0	11.5	9.5	8.5	9.0	5.0	4.0	4.5
12	17.0	15.5	16.0	13.5	10.5	12.0	9.0	8.5	9.0	5.5	3.0	4.5
13	19.0	15.5	16.5	13.0	11.5	12.5	9.0	8.5	9.0	4.5	4.5	4.5
14	18.0	16.0	16.5	15.5	12.0	13.0	9.0	8.5	9.0	4.5	4.5	4.5
15	20.0	16.0	17.0	15.0	12.5	13.5	9.0	8.5	8.5	4.5	3.5	4.0
16	19.0	16.0	17.0	14.0	12.5	13.0	9.0	8.0	8.5	4.0	3.5	3.5
17	18.5	17.0	17.5	14.0	12.5	13.0	8.5	8.0	8.5	3.5	3.0	3.5
18	20.0	16.0	17.5	13.5	11.5	12.5	8.5	8.0	8.5	3.5	2.5	3.0
19	18.0	16.5	17.5	13.5	11.5	13.0	8.0	7.0	7.5	3.0	2.5	2.5
20	20.0	17.0	18.0	13.5	12.5	13.0	7.5	7.0	7.5	3.0	2.5	2.5
21	18.0	15.0	17.0	13.0	11.5	12.5	8.0	7.5	7.5	3.0	2.5	2.5
22	18.5	15.0	16.0	13.0	10.5	11.5	8.0	7.5	7.5	3.5	2.5	2.5
23	19.0	14.5	16.0	12.5	10.0	11.0	8.0	7.0	7.5	3.0	2.5	3.0
24	18.0	14.0	15.5	12.5	11.5	12.0	7.5	7.0	7.0	3.5	3.0	3.0
25	18.5	14.0	15.5	12.0	11.0	11.5	7.0	5.5	6.5	3.0	3.0	3.0
26	16.5	14.5	15.5	11.0	11.0	11.0	6.0	5.0	5.5	3.0	3.0	3.0
27	17.0	14.5	15.5	12.0	11.0	11.5	6.5	5.0	5.5	3.0	3.0	3.0
28	16.0	13.5	14.5	11.5	10.5	11.0	6.0	5.5	6.0	5.5	3.0	3.5
29	16.5	13.0	14.5	11.5	9.5	10.5	6.0	6.0	6.0	3.5	3.0	3.5
30	14.5	13.5	14.5	11.5	10.5	11.0	6.0	5.0	5.5	3.0	3.0	3.0
31	14.0	11.5	12.5	---	---	---	6.5	5.0	5.5	3.5	3.0	3.0
MONTH	21.5	11.5	17.0	15.5	9.5	12.0	11.5	5.0	8.5	6.0	2.5	4.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	3.0	2.5	3.0	4.0	3.5	3.5	6.5	5.5	6.0	12.5	11.0	11.5
2	3.0	2.5	3.0	3.5	2.5	3.0	7.0	5.5	6.0	12.5	11.0	11.5
3	3.0	2.5	2.5	3.0	2.5	3.0	6.5	6.0	6.5	12.0	11.0	11.5
4	3.5	2.5	3.0	4.0	3.0	3.5	7.5	6.0	6.5	11.5	11.0	11.0
5	3.0	2.5	3.0	4.0	3.0	3.5	8.0	6.5	7.0	11.5	11.0	11.5
6	4.0	2.5	3.0	4.0	3.5	3.5	7.5	7.0	7.0	11.5	11.0	11.0
7	4.0	2.5	3.0	4.0	3.5	3.5	7.5	6.5	7.0	11.5	11.0	11.0
8	3.5	3.0	3.0	4.5	3.5	4.0	7.5	6.5	7.0	11.0	10.0	10.5
9	5.0	3.0	3.5	4.0	4.0	4.0	7.5	6.5	7.0	11.0	10.0	10.5
10	3.5	3.0	3.0	5.0	4.0	4.0	7.5	7.0	7.5	11.5	11.0	11.0
11	3.0	2.5	3.0	4.0	3.5	4.0	7.5	7.0	7.5	11.5	11.0	11.5
12	3.0	3.0	3.0	4.0	3.5	4.0	8.0	7.0	7.5	12.0	11.0	11.5
13	3.0	2.5	3.0	4.5	4.0	4.0	8.0	7.5	7.5	12.5	11.0	11.5
14	3.5	2.5	3.0	5.0	4.0	4.5	8.5	7.5	8.0	13.5	11.5	12.0
15	3.5	2.5	3.0	5.0	4.0	4.5	9.0	7.5	8.5	12.5	11.5	12.0
16	3.5	3.0	3.0	5.0	4.0	4.5	9.0	8.0	8.5	13.5	12.0	12.5
17	3.5	3.0	3.0	5.0	3.5	4.0	9.0	8.0	8.5	12.5	12.0	12.0
18	3.5	3.0	3.0	4.5	4.0	4.0	9.5	8.0	9.0	13.5	12.0	12.0
19	4.0	3.0	3.5	5.0	4.0	4.5	10.0	8.5	9.0	12.5	12.0	12.0
20	4.0	3.0	3.5	5.0	4.0	4.5	10.5	9.0	9.5	12.5	12.0	12.0
21	3.5	3.5	3.5	4.5	4.5	4.5	10.5	9.0	9.5	14.5	11.5	12.5
22	4.5	3.5	4.0	4.5	4.5	4.5	10.0	9.0	9.5	13.5	12.0	12.5
23	5.0	3.5	4.0	5.0	4.5	4.5	10.0	8.5	9.5	17.0	12.0	14.0
24	4.5	3.5	4.0	6.0	5.0	5.0	10.5	9.0	9.5	17.0	12.0	14.0
25	4.0	3.5	4.0	6.0	5.0	5.5	11.5	9.0	10.0	17.0	12.5	14.0
26	4.0	3.5	3.5	5.5	5.0	5.5	11.5	9.5	10.5	15.0	13.0	13.5
27	4.0	3.0	3.5	6.0	5.0	5.5	11.5	10.0	10.5	15.0	13.0	13.5
28	4.0	3.0	3.5	6.0	5.0	5.5	12.0	10.5	11.0	15.5	12.5	13.5
29	---	---	---	6.0	5.5	6.0	12.5	10.5	11.0	16.5	12.0	14.0
30	---	---	---	6.0	5.5	6.0	12.5	11.0	11.5	17.5	13.0	15.0
31	---	---	---	6.0	5.5	6.0	---	---	---	19.0	13.0	15.5
MONTH	5.0	2.5	3.5	6.0	2.5	4.5	12.5	5.5	8.5	19.0	10.0	12.5
	JUNE			JULY			AUGUST			SEPTEMBER		
1	18.0	13.5	15.5	23.5	17.5	20.0	22.5	21.5	22.0	24.0	20.5	22.0
2	18.5	13.5	15.5	23.5	18.0	20.0	23.0	21.5	22.0	24.0	20.0	21.5
3	19.0	13.0	15.5	23.5	18.0	20.0	22.5	21.5	22.0	22.0	20.0	21.0
4	18.5	13.5	15.5	25.0	18.5	20.5	23.5	21.5	22.5	22.5	19.5	20.5
5	19.5	14.5	16.5	24.0	19.0	21.0	22.5	21.5	22.0	23.0	19.0	20.5
6	19.0	15.0	16.5	24.5	19.0	21.0	23.5	21.5	22.0	23.0	19.5	20.5
7	19.5	15.5	17.0	24.5	19.5	21.5	23.5	21.0	22.0	24.0	19.5	21.0
8	18.5	15.5	16.5	25.0	19.5	21.5	23.5	21.5	22.0	23.0	19.0	20.5
9	17.5	15.5	16.0	24.5	19.5	21.0	25.0	21.5	22.5	24.0	19.0	20.5
10	16.0	15.5	15.5	23.5	19.5	21.0	25.0	21.0	22.5	22.5	19.5	20.5
11	19.0	15.5	16.5	23.5	19.0	20.5	25.0	21.0	22.5	23.5	19.0	20.5
12	20.0	15.5	17.5	23.0	18.5	20.5	25.5	21.0	22.5	24.0	18.0	20.0
13	21.5	15.0	17.5	23.0	19.5	21.0	26.0	21.0	23.0	23.5	18.0	20.5
14	21.5	16.0	18.5	24.0	20.0	21.5	25.0	21.0	22.5	24.0	18.5	20.5
15	21.5	16.5	18.5	24.5	20.0	21.5	25.0	21.0	22.5	24.0	19.5	21.0
16	21.0	16.5	18.0	24.5	20.0	21.5	21.5	20.5	21.0	24.0	20.0	21.5
17	22.0	16.5	19.0	21.0	19.5	20.5	23.0	21.0	22.0	22.0	19.5	20.5
18	23.0	17.5	19.5	22.0	21.0	21.5	23.0	20.5	22.0	23.5	19.0	20.5
19	21.5	17.0	18.5	23.0	21.0	22.0	22.5	21.5	22.5	23.5	18.5	20.0
20	23.5	17.0	19.5	24.0	21.5	22.0	23.0	22.0	22.5	23.5	18.0	20.0
21	22.5	18.0	19.5	22.5	20.5	21.5	22.5	22.0	22.5	22.5	18.0	20.0
22	22.5	17.5	19.5	22.0	21.5	22.0	22.5	21.5	22.0	19.5	18.5	19.0
23	22.5	18.0	19.5	22.5	21.5	22.0	24.0	21.5	22.5	23.0	18.5	20.5
24	21.5	18.0	19.5	22.5	21.5	22.0	24.0	21.5	22.5	22.5	19.0	20.5
25	21.0	17.5	19.0	23.0	21.5	22.0	24.5	21.5	22.5	23.0	20.0	20.5
26	21.5	17.0	19.0	22.5	21.0	22.0	24.5	21.5	22.5	22.0	19.5	20.5
27	20.5	18.0	19.0	22.0	21.5	22.0	23.5	21.5	22.0	20.5	18.5	19.5
28	23.0	17.5	19.5	22.5	21.0	22.0	24.0	21.5	22.5	20.5	18.0	19.0
29	23.0	18.0	20.0	22.0	21.0	22.0	24.0	21.0	22.0	21.5	17.5	19.0
30	22.0	18.0	19.5	22.0	21.5	22.0	24.5	20.5	22.0	22.0	17.5	19.0
31	---	---	---	22.5	21.5	22.0	23.0	20.0	21.0	---	---	---
MONTH	23.5	13.0	18.0	25.0	17.5	21.5	26.0	20.0	22.0	24.0	17.5	20.5
YEAR	26.0	2.5	12.5									

## JAMES RIVER BASIN

02011490 LITTLE BACK CREEK NEAR SUNRISE, VA

LOCATION.--Lat 38°12'52", long 79°50'16", Bath County, Hydrologic Unit 02080201, in George Washington National Forest, on right bank 600 ft downstream from Long Spring Run, 1.2 mi downstream from Little Back Creek Dam, and 8.5 mi northeast of Mountain Grove.

DRAINAGE AREA.--4.91 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1984 to current year.

GAGE.--Water-stage recorder. Concrete control with rectangular weir plate. Datum of gage is 2,638.48 ft above sea level (Virginia Power bench mark). Nov. 5, 1992, to Jan. 5, 1993, nonrecording gage at present site and datum.

REMARKS.--Records good except those for periods with ice effect, Jan. 8-11, 16-24, and Feb. 2-7, which are poor. Flow regulated since January 1985 by Little Back Creek Lake 1.2 mi upstream, amount unknown. Maximum discharge, 580 ft<sup>3</sup>/s, from rating curve extended above 30 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 0.66 ft, Oct. 12, 13, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 96 ft<sup>3</sup>/s, May 8, gage height, 2.95 ft, from rating curve extended as explained above; minimum, 1.9 ft<sup>3</sup>/s, Oct. 4, gage height, 0.74 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	3.3	5.2	3.7	8.4	6.0	8.7	4.3	3.4	3.3	5.0	3.3
2	2.8	3.2	4.6	3.6	e6.6	5.8	7.3	4.1	3.3	3.1	5.1	3.1
3	2.8	3.2	4.2	3.9	e5.6	5.3	6.5	4.2	3.2	3.1	5.0	3.0
4	2.6	3.2	8.7	4.3	e5.0	5.3	5.9	5.0	3.2	3.1	4.6	3.0
5	2.8	3.2	55	4.0	e4.6	8.8	5.5	6.2	3.1	3.2	4.7	3.1
6	2.8	3.3	20	3.8	e4.4	11	5.4	6.6	3.3	3.2	4.4	3.3
7	2.6	3.4	11	4.4	e4.3	16	5.8	18	3.3	3.1	4.2	3.2
8	2.7	3.4	7.9	e5.6	5.3	28	6.0	57	3.2	3.1	4.0	3.1
9	2.6	3.2	5.7	e5.0	56	21	6.1	18	3.2	3.4	3.9	3.0
10	2.6	3.0	5.5	e4.5	36	25	6.1	11	3.1	3.2	3.8	2.9
11	2.7	2.8	6.0	e5.8	16	20	5.8	8.0	3.1	3.2	3.6	2.9
12	3.0	2.8	6.2	23	12	12	5.4	6.5	3.0	3.3	3.5	3.0
13	2.8	2.8	5.8	20	10	9.0	7.8	5.5	3.1	3.3	3.3	3.1
14	2.7	3.2	5.3	13	9.0	7.8	11	4.9	3.2	3.3	3.2	3.2
15	2.6	3.3	5.8	10	8.8	7.0	9.5	4.7	3.2	3.2	3.2	3.1
16	2.6	3.3	7.8	e8.0	9.1	6.7	9.2	4.7	3.2	3.1	3.4	3.0
17	2.6	3.7	8.6	e6.8	8.5	5.9	8.8	4.3	3.2	4.6	8.5	3.0
18	2.8	5.4	7.7	e6.0	7.9	5.6	7.7	4.1	3.3	6.3	12	2.9
19	3.0	4.8	6.7	e5.4	8.9	5.5	6.6	4.0	3.3	4.3	7.9	2.8
20	3.2	4.2	6.1	e5.0	11	5.2	5.8	3.8	3.3	3.8	5.7	2.9
21	3.1	3.8	5.7	e5.2	14	6.2	5.3	3.7	3.3	5.4	4.8	3.1
22	3.0	3.6	4.9	e5.4	13	12	6.0	3.6	3.2	12	4.4	3.0
23	2.8	3.4	4.5	e5.8	22	12	5.8	3.6	3.2	8.8	4.1	3.0
24	2.6	3.3	4.3	e6.2	32	9.4	5.9	3.6	3.2	6.4	3.9	2.8
25	3.7	3.1	4.2	7.6	18	8.7	5.9	3.6	3.2	5.1	3.7	2.8
26	2.9	3.0	4.1	12	11	7.9	5.5	3.6	3.1	4.5	3.5	2.9
27	2.7	9.4	4.1	15	8.3	22	5.1	3.5	3.3	5.2	3.5	2.9
28	2.6	23	4.2	36	6.8	28	4.8	3.4	3.3	7.3	3.3	2.7
29	2.6	11	3.9	31	---	23	4.5	3.3	3.4	13	3.4	2.8
30	3.0	7.1	3.8	15	---	17	4.3	3.3	3.4	9.3	3.3	2.8
31	3.2	---	3.7	11	---	12	---	3.4	---	6.2	3.3	---
TOTAL	87.5	139.4	241.2	296.0	362.5	375.1	194.0	223.5	96.8	153.4	140.2	89.7
MEAN	2.82	4.65	7.78	9.55	12.9	12.1	6.47	7.21	3.23	4.95	4.52	2.99
MAX	3.7	23	55	36	56	28	11	57	3.4	13	12	3.3
MIN	2.6	2.8	3.7	3.6	4.3	5.2	4.3	3.3	3.0	3.1	3.2	2.7

e Estimated.

## JAMES RIVER BASIN

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02011490 LITTLE BACK CREEK NEAR SUNRISE, VA--Continued

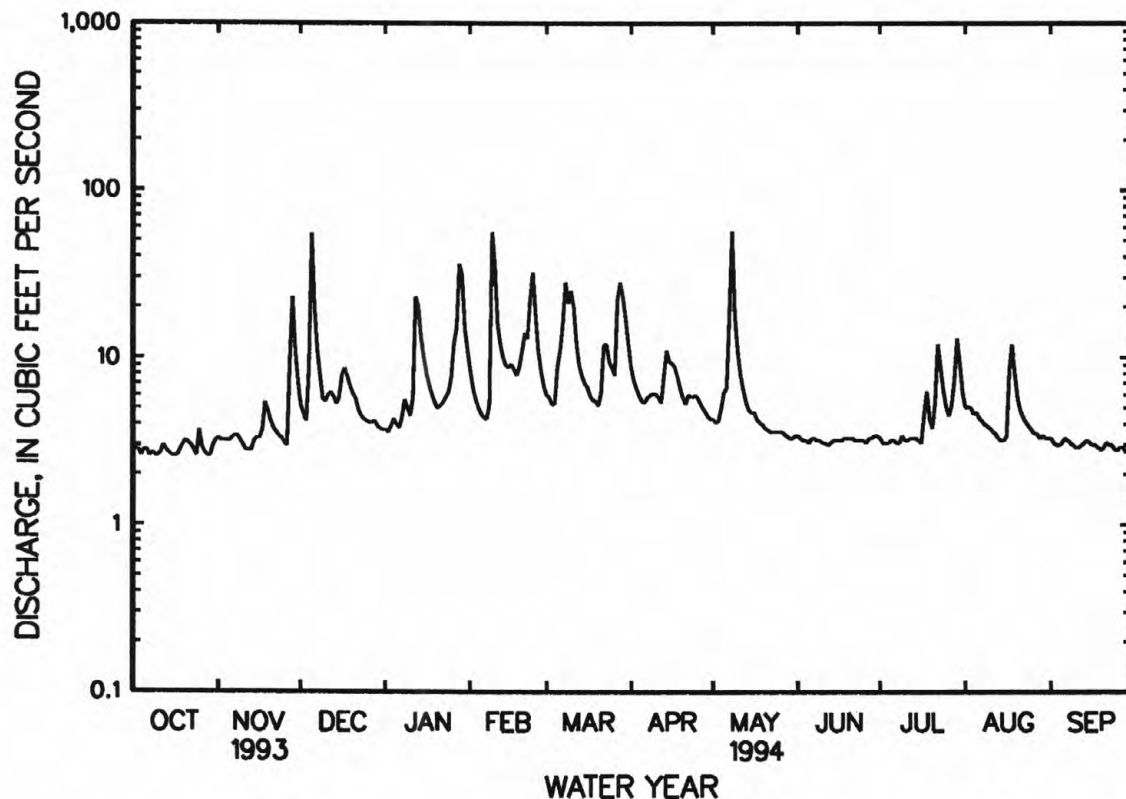
## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3.66	5.32	6.08	6.54	6.79	8.57	7.13	7.10	3.89	3.22	3.29	3.13
MAX	7.46	12.6	8.64	9.82	12.9	16.4	13.1	14.8	7.83	4.95	5.13	5.43
(WY)	1990	1986	1991	1991	1994	1993	1987	1985	1989	1994	1989	1989
MIN	2.17	2.72	4.07	3.56	3.78	3.91	3.37	3.37	2.79	2.46	2.33	2.28
(WY)	1987	1992	1990	1985	1993	1985	1986	1991	1991	1987	1986	1985

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1985 - 1994
ANNUAL TOTAL	2120.2	2399.3	
ANNUAL MEAN	5.81	6.57	5.39
HIGHEST ANNUAL MEAN			6.57
LOWEST ANNUAL MEAN			4.37
HIGHEST DAILY MEAN	66 Mar 24	57 May 8	158 Nov 4 1985
LOWEST DAILY MEAN	2.6 aOct 4	2.6 aOct 4	.90 Oct 13 1984
ANNUAL SEVEN-DAY MINIMUM	2.7 Oct 4	2.7 Oct 4	1.2 Jan 24 1985
INSTANTANEOUS PEAK FLOW		96 May 8	580 Nov 4 1985
INSTANTANEOUS PEAK STAGE		2.95 May 8	4.06 Nov 4 1985
INSTANTANEOUS LOW FLOW		1.9 Oct 4	.89 bOct 12 1984
ANNUAL RUNOFF (CFSM)	1.18	1.34	1.10
ANNUAL RUNOFF (INCHES)	16.06	18.18	14.91
10 PERCENT EXCEEDS	9.2	12	9.2
50 PERCENT EXCEEDS	3.6	4.3	3.7
90 PERCENT EXCEEDS	2.8	2.9	2.5

a Also Oct. 7, 9, 10, 15-17, 24, 28, 29, 1993.

b Also Oct. 13, 1984.



## JAMES RIVER BASIN

02011490 LITTLE BACK CREEK NEAR SUNRISE, VA--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1984 to November 1992, January 1993 to current year.

INSTRUMENTATION.--Water-temperature recorder Oct. 1, 1984, to Nov. 4, 1992, and since Jan. 6, 1993.

REMARKS.--Interruption in the record was due to malfunction of the instrument. Some record in prior years fragmentary due to instrument malfunction. Fragmentary record for 1993 water year was caused by replacement of instrument shelter. Records represent water temperature at sensor within 0.5°C. Temperature at the sensor was compared with the average for the creek by temperature cross section on July 19. No variation of temperature was found within the cross section.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded (water years 1985-94), 25.0°C, July 18, 1986, July 24, 1987, Aug. 17, 1988; minimum (water years 1985-92, 1994), 0.0°C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded (more than 20 percent missing record), 23.0°C, July 20; minimum recorded, 0.0°C, Mar. 2, 3, but may have been on other days during instrument malfunction, Dec. 9-15 and Jan. 13-15.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.5	13.5	14.0	8.5	7.0	7.5	5.5	5.0	5.0	2.5	2.0	2.0
2	15.0	13.5	14.5	8.0	7.5	7.5	5.5	4.5	5.0	3.0	2.5	2.5
3	14.5	13.5	14.0	8.0	7.0	7.5	6.5	5.5	6.0	2.5	2.0	2.5
4	14.5	12.5	13.5	9.0	8.0	8.5	7.5	6.5	7.0	2.5	1.5	2.5
5	15.0	14.0	14.5	---	---	---	7.5	7.0	7.5	2.5	2.0	2.0
6	14.5	14.0	14.0	---	---	---	7.0	6.0	7.0	2.5	2.0	2.0
7	15.5	13.5	14.5	7.5	6.5	7.0	6.5	5.5	6.0	2.5	2.5	2.5
8	15.5	14.0	15.0	7.0	6.0	6.5	6.0	5.0	5.5	2.5	2.0	2.5
9	15.0	14.5	15.0	7.0	6.0	6.5	---	---	---	2.5	1.5	2.0
10	15.0	13.5	14.0	7.0	6.0	6.5	---	---	---	2.5	1.5	2.0
11	13.5	12.5	13.0	7.0	6.0	6.5	---	---	---	3.0	1.5	2.5
12	12.5	12.0	12.0	7.5	6.5	7.0	---	---	---	2.5	1.0	2.0
13	12.5	12.0	12.5	8.0	7.0	7.5	---	---	---	---	---	---
14	13.5	11.5	12.0	9.5	7.5	8.5	---	---	---	---	---	---
15	13.0	12.5	13.0	10.0	9.0	10.0	---	---	---	---	---	---
16	13.5	13.0	13.0	11.0	10.0	10.5	5.0	4.0	4.5	1.0	.5	.5
17	14.0	12.5	13.0	11.0	9.5	10.5	4.5	4.0	4.5	1.5	.5	1.0
18	14.0	13.5	13.5	9.5	8.5	9.5	5.0	4.5	4.5	1.5	.5	1.0
19	14.5	13.5	14.0	9.0	8.5	8.5	4.5	4.0	4.5	1.0	.5	1.0
20	15.0	13.5	14.5	8.5	6.5	7.5	4.5	3.5	4.0	1.5	1.0	1.0
21	13.5	12.0	12.5	7.0	6.5	6.5	3.5	3.0	3.5	1.5	1.0	1.0
22	13.0	11.5	12.0	7.0	6.0	6.5	3.5	2.5	3.0	2.0	1.0	1.5
23	12.5	11.0	12.0	7.5	6.0	6.5	3.0	2.5	2.5	2.5	1.5	2.0
24	13.0	11.0	12.0	7.5	6.5	7.0	2.5	1.5	2.0	2.5	2.0	2.5
25	12.5	11.5	12.0	7.0	6.5	7.0	2.0	1.0	1.5	2.5	2.0	2.5
26	12.0	11.5	11.5	6.5	6.5	6.5	2.0	1.0	1.5	3.5	2.5	3.0
27	11.5	10.5	11.0	7.5	6.5	7.0	2.5	2.0	2.5	3.5	3.0	3.5
28	11.0	10.0	10.5	7.5	6.0	7.0	2.5	2.0	2.5	4.5	3.0	4.0
29	10.5	10.0	10.5	6.5	6.0	6.0	2.5	1.5	2.0	4.5	4.0	4.0
30	10.0	9.0	9.5	6.0	5.5	5.5	1.5	1.0	1.5	4.0	3.5	3.5
31	9.0	8.0	8.5	---	---	---	2.0	1.5	2.0	3.5	3.0	3.5
MONTH	15.5	8.0	13.0	11.0	5.5	7.5	7.5	1.0	4.0	4.5	.5	2.0



TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	3.0	2.0	2.5	3.0	2.0	2.5	7.5	5.0	6.0	15.0	13.0	14.5
2	2.0	1.5	1.5	2.0	.0	1.0	8.0	5.0	6.5	14.0	12.0	13.0
3	2.0	1.5	1.5	1.5	.0	1.0	8.0	6.5	7.5	12.5	11.0	12.0
4	2.5	1.0	1.5	3.0	1.0	2.0	9.0	6.0	7.5	11.0	10.0	10.5
5	2.5	1.5	2.0	3.5	2.0	2.5	9.5	7.0	8.0	10.5	9.5	10.0
6	3.0	2.0	2.0	4.5	2.5	3.5	9.0	8.5	9.0	10.0	9.5	10.0
7	3.0	2.0	2.5	5.0	3.5	4.5	9.0	7.0	7.5	9.5	9.0	9.5
8	3.0	2.5	2.5	5.5	4.5	5.0	9.5	6.0	7.5	9.0	8.0	8.5
9	4.0	2.5	3.5	4.5	3.5	4.0	9.0	7.0	8.0	10.0	7.5	9.0
10	3.5	2.0	3.0	4.5	3.5	4.0	9.0	8.0	8.5	10.5	9.0	9.5
11	3.0	2.0	2.5	4.5	3.0	3.5	8.5	8.0	8.5	11.0	8.5	10.0
12	3.0	2.5	3.0	4.5	3.0	4.0	9.5	7.5	8.5	11.5	10.0	10.5
13	3.0	2.0	3.0	4.5	3.5	4.0	10.0	9.0	9.5	12.0	9.5	10.5
14	3.0	2.0	2.5	5.5	4.0	4.5	10.5	8.0	9.5	12.5	10.0	11.5
15	3.5	2.0	2.5	5.5	4.5	5.0	11.5	9.0	10.0	13.5	12.0	13.0
16	3.5	2.5	3.0	5.0	3.5	4.5	10.5	9.0	10.0	13.5	12.5	13.0
17	4.0	2.5	3.0	4.5	2.5	3.5	10.5	8.5	9.0	12.5	11.0	12.0
18	4.5	3.0	3.5	4.0	3.0	3.5	11.0	8.0	9.5	11.5	10.5	11.0
19	5.0	3.5	4.0	5.0	3.0	3.5	11.5	9.5	10.5	11.0	10.5	10.5
20	5.5	4.0	5.0	5.5	3.0	4.5	12.5	10.0	11.0	11.5	10.5	11.0
21	5.5	5.0	5.0	5.0	5.0	5.0	11.5	10.0	10.5	---	---	---
22	6.0	4.5	5.5	6.0	4.0	5.0	11.5	9.5	10.0	---	---	---
23	5.0	4.5	4.5	7.0	4.5	5.5	11.5	8.5	10.0	---	---	---
24	5.0	4.0	4.5	7.5	6.0	7.0	12.5	9.0	10.5	---	---	---
25	5.0	3.5	4.0	8.0	6.0	7.0	13.5	10.5	12.0	---	---	---
26	4.5	2.5	3.5	7.0	5.5	6.0	13.5	11.5	12.5	---	---	---
27	3.0	1.5	2.5	7.0	5.5	6.5	14.0	12.0	13.0	---	---	---
28	3.0	1.5	2.0	7.0	6.5	7.0	16.0	12.5	14.0	---	---	---
29	---	---	---	6.5	5.5	6.0	15.0	14.0	14.5	---	---	---
30	---	---	---	6.5	5.0	6.0	15.5	14.0	14.5	---	---	---
31	---	---	---	6.0	5.5	5.5	---	---	---	---	---	---
MONTH	6.0	1.0	3.0	8.0	.0	4.5	16.0	5.0	10.0	15.0	7.5	11.0
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	---	---	---	18.5	17.5	18.0	---	---	---
2	17.5	16.0	16.5	---	---	---	18.5	17.5	18.0	---	---	---
3	17.5	15.0	16.5	---	---	---	18.5	17.0	18.0	---	---	---
4	18.0	16.0	17.0	---	---	---	19.0	17.5	18.5	---	---	---
5	19.0	17.5	18.0	---	---	---	19.0	17.5	18.5	---	---	---
6	19.0	18.0	18.5	---	---	---	19.5	16.5	18.0	---	---	---
7	20.0	18.0	19.0	---	---	---	19.0	17.0	18.0	---	---	---
8	19.5	18.5	19.0	---	---	---	19.5	18.0	19.0	---	---	---
9	19.0	18.0	18.0	---	---	---	20.5	18.5	19.5	---	---	---
10	18.0	17.0	17.5	---	---	---	20.5	19.5	20.0	---	---	---
11	18.0	17.0	17.5	---	---	---	20.5	19.0	20.0	---	---	---
12	19.0	17.5	18.0	---	---	---	21.0	20.0	20.5	---	---	---
13	20.0	17.5	19.0	---	---	---	21.0	20.0	20.5	---	---	---
14	21.0	19.0	20.0	---	---	---	20.5	19.0	20.0	19.0	17.0	18.0
15	22.5	19.5	20.5	---	---	---	---	---	---	19.5	17.5	18.5
16	21.5	20.0	20.5	---	---	---	---	---	---	20.0	18.5	19.5
17	22.0	19.5	20.5	---	---	---	---	---	---	19.5	18.5	19.0
18	22.0	19.5	21.0	---	---	---	---	---	---	19.0	18.0	18.5
19	---	---	---	---	---	---	---	---	---	18.5	17.0	17.5
20	---	---	---	23.0	20.5	21.5	---	---	---	18.5	17.0	17.5
21	---	---	---	21.0	17.5	20.0	---	---	---	18.5	17.0	17.5
22	---	---	---	19.0	16.5	18.0	---	---	---	17.5	17.0	17.0
23	---	---	---	18.5	17.0	18.0	---	---	---	18.0	16.5	17.5
24	---	---	---	19.0	17.0	18.0	18.5	17.0	18.0	18.0	17.5	18.0
25	---	---	---	19.5	18.0	18.5	19.0	17.5	18.5	18.5	18.0	18.0
26	---	---	---	19.0	18.5	18.5	20.5	18.0	19.0	18.5	18.0	18.0
27	---	---	---	18.5	16.0	17.5	19.5	18.0	18.5	18.0	17.0	17.5
28	---	---	---	17.5	16.0	16.5	---	---	---	17.0	16.0	16.5
29	---	---	---	16.5	15.5	16.0	---	---	---	16.0	15.5	16.0
30	---	---	---	17.5	15.5	16.5	---	---	---	16.5	15.0	15.5
31	---	---	---	18.5	16.5	17.5	---	---	---	---	---	---
MONTH	22.5	15.0	18.5	23.0	15.5	18.0	21.0	16.5	19.0	20.0	15.0	17.5
YEAR	23.0	.0	9.5									

## JAMES RIVER BASIN

02011500 BACK CREEK NEAR MOUNTAIN GROVE, VA

LOCATION.--Lat 38°04'10", long 79°53'50", Bath County, Hydrologic Unit 02080201, on left bank 0.3 mi downstream from Cummings Run, 0.8 mi downstream from bridge on State Highway 39, and 2.1 mi south of Mountain Grove.

DRAINAGE AREA.--134 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1951 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,701.45 ft above sea level.

REMARKS.--Records good except for period with ice effect, Jan. 18-23, which is poor. Flow regulated since October 1984 by Back Creek Lake 11.3 mi upstream, amount unknown, and since January 1985 by Little Back Creek Lake 14.4 mi upstream, amount unknown. Diversion 10.5 mi upstream from station by Virginia Power for recreation lakes, net averages 0.5 ft<sup>3</sup>/s. U.S. Army Corps of Engineers satellite water temperature and gage-height telemeter at station. Maximum discharge, 14,200 ft<sup>3</sup>/s, from rating curve extended above 4,000 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 7.39 ft, 9.05 ft, and 9.35 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,750 ft<sup>3</sup>/s, May 8, gage height, 8.59 ft, from rating curve extended as explained above; minimum, 16 ft<sup>3</sup>/s, many days in July and September; minimum daily, 16 ft<sup>3</sup>/s, July 11; minimum gage height, 2.32 ft, July 9, 11, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	39	167	85	445	279	502	115	32	23	88	23
2	27	35	105	65	283	249	378	119	31	23	102	21
3	26	34	102	47	233	234	327	113	30	21	157	21
4	25	33	195	54	204	293	260	211	30	19	104	20
5	24	34	2640	52	197	601	213	367	29	20	100	20
6	24	39	850	73	138	666	199	357	29	18	99	19
7	24	39	417	93	113	849	252	985	33	17	83	19
8	24	36	336	388	103	1410	318	4170	33	18	64	18
9	24	32	244	332	2000	1150	330	1040	34	17	43	18
10	24	30	181	221	1690	1640	252	590	32	18	36	18
11	23	29	179	236	898	1230	204	517	31	16	32	18
12	28	28	191	1160	715	750	189	353	29	17	25	18
13	25	27	194	1020	444	484	400	244	28	18	22	18
14	25	27	165	654	384	389	614	167	27	22	22	17
15	25	26	162	502	447	341	466	139	26	19	21	17
16	24	25	264	398	442	315	426	146	25	17	23	17
17	25	28	253	331	402	270	346	126	26	26	330	18
18	25	44	247	e200	366	252	279	111	26	112	660	19
19	25	89	211	e150	369	251	223	93	32	69	358	17
20	28	120	144	e110	433	220	194	90	36	49	154	17
21	28	97	145	e113	550	235	162	74	34	67	97	17
22	28	60	131	e120	550	549	173	66	63	519	86	17
23	28	37	112	e90	1380	631	181	49	79	372	65	18
24	28	43	106	121	1670	421	184	43	58	179	59	18
25	27	34	92	227	919	436	168	43	36	108	43	17
26	28	32	74	774	666	434	152	44	27	72	34	18
27	27	118	57	866	441	1290	158	56	28	150	33	18
28	26	1120	60	1820	321	1520	141	56	25	525	32	18
29	26	456	69	1850	---	1320	129	47	24	369	30	18
30	31	291	75	775	---	1120	117	41	28	214	27	18
31	37	---	78	529	---	653	---	34	---	132	24	---
TOTAL	818	3082	8246	13456	16803	20482	7937	10606	1001	3266	3053	550
MEAN	26.4	103	266	434	600	661	265	342	33.4	105	98.5	18.3
MAX	37	1120	2640	1850	2000	1640	614	4170	79	525	660	23
MIN	23	25	57	47	103	220	117	34	24	16	21	17

e Estimated.

## 02011500 BACK CREEK NEAR MOUNTAIN GROVE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1984, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	83.1	107	221	246	320	455	303	230	128	56.3	53.5	32.4
MAX	512	526	694	578	689	980	561	449	396	369	408	308
(WY)	1977	1973	1974	1979	1971	1963	1980	1967	1982	1972	1969	1979
MIN	7.21	10.4	15.2	14.3	87.6	103	90.9	74.2	13.0	7.91	7.18	4.05
(WY)	1954	1954	1961	1981	1978	1981	1963	1977	1964	1964	1964	1968

## SUMMARY STATISTICS

## WATER YEARS 1952 - 1984

ANNUAL MEAN	186
HIGHEST ANNUAL MEAN	320
LOWEST ANNUAL MEAN	111
HIGHEST DAILY MEAN	7110
LOWEST DAILY MEAN	1.5
ANNUAL SEVEN-DAY MINIMUM	2.3
INSTANTANEOUS PEAK FLOW	12700
INSTANTANEOUS PEAK STAGE	10.77
INSTANTANEOUS LOW FLOW	1.5
ANNUAL RUNOFF (CFSM)	1.39
ANNUAL RUNOFF (INCHES)	18.85
10 PERCENT EXCEEDS	425
50 PERCENT EXCEEDS	79
90 PERCENT EXCEEDS	12

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	61.3	151	214	253	277	406	302	254	93.7	49.4	45.1	37.0
MAX	246	696	340	483	600	833	824	510	273	105	127	123
(WY)	1990	1986	1991	1991	1994	1993	1987	1989	1989	1994	1989	1989
MIN	19.5	26.0	99.4	77.7	107	92.8	83.5	62.9	32.7	20.4	17.9	16.5
(WY)	1986	1992	1989	1986	1993	1988	1986	1991	1991	1993	1987	1985

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1985 - 1994

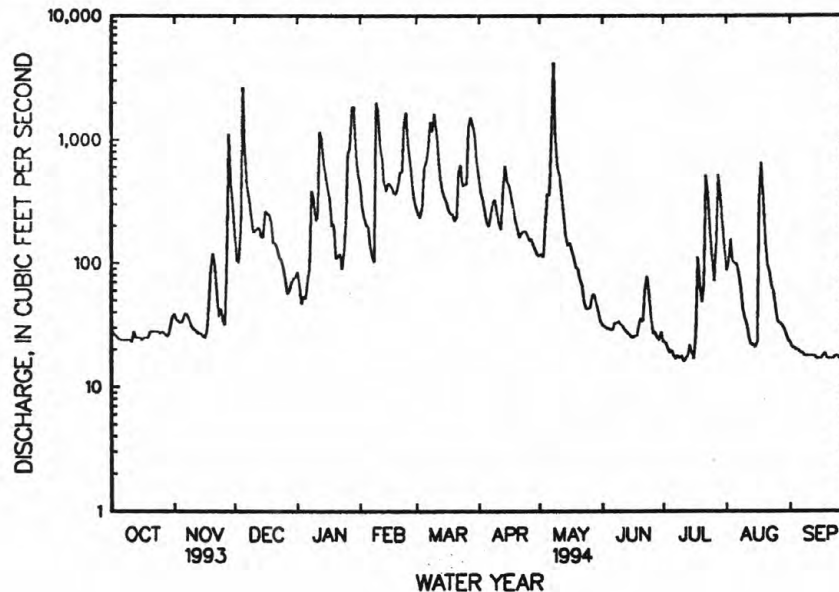
ANNUAL TOTAL	70740	89300	
ANNUAL MEAN	194	245	178
HIGHEST ANNUAL MEAN			245
LOWEST ANNUAL MEAN			109
HIGHEST DAILY MEAN	3490	Mar 24	4170
LOWEST DAILY MEAN	18	aJul 28	16
ANNUAL SEVEN-DAY MINIMUM	18	Jul 26	17
INSTANTANEOUS PEAK FLOW			6750
INSTANTANEOUS PEAK STAGE			8.59
INSTANTANEOUS LOW FLOW			16
ANNUAL RUNOFF (CFSM)	1.45	1.83	1.33
ANNUAL RUNOFF (INCHES)	19.64	24.79	18.04
10 PERCENT EXCEEDS	442	621	417
50 PERCENT EXCEEDS	57	92	74
90 PERCENT EXCEEDS	20	20	20

a Also July 29 to Aug. 1 and Aug. 23, 24, 1993.

b Also Aug. 12, 13, and Sept. 3, 4, 1987.

c Many days in July and September 1994.

d Result of freezeup.



## JAMES RIVER BASIN

02011500 BACK CREEK NEAR MOUNTAIN GROVE, VA--Continued

## WATER-QUALITY RECORDS

## PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1978 to current year.

INSTRUMENTATION.--Water-temperature recorder since June 1978.

REMARKS.--Some record in prior years fragmentary due to instrument malfunction. Records represent water temperature at sensor within 0.5°C. Temperature at the sensor was compared with the average for the creek by temperature cross section on July 20. A maximum variation of 0.5°C was found within the cross section.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 33.5°C, Aug. 14, 1988; minimum recorded, 0.0°C on many days during winter periods.

## EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum, 29.5°C, July 6, 8; minimum, 0.0°C on many days during winter period.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	14.5	9.0	11.5	6.5	5.0	6.0	9.0	7.0	7.5	3.5	.0	1.0
2	16.0	10.5	13.0	7.0	3.5	5.5	8.0	5.0	6.5	4.0	3.0	3.5
3	16.0	13.0	14.5	7.5	5.5	6.5	9.5	7.0	8.5	3.5	2.0	3.0
4	15.5	9.5	12.5	9.5	5.0	7.0	9.5	9.0	9.0	2.0	.0	1.0
5	16.5	11.0	14.0	12.5	9.5	11.0	10.5	8.5	9.5	1.5	.0	.5
6	15.0	11.5	13.5	11.5	7.5	9.5	9.5	8.5	9.0	2.5	.0	1.0
7	16.5	11.5	14.0	7.5	4.5	6.5	9.0	7.5	8.5	4.0	2.5	3.5
8	17.5	13.0	15.0	6.5	2.5	4.5	9.5	7.0	8.0	4.0	1.5	3.0
9	17.0	13.0	15.0	7.0	3.0	5.0	9.0	6.5	7.5	3.0	1.0	1.5
10	16.5	13.0	15.0	7.5	4.0	5.5	8.0	7.5	8.0	2.5	.0	1.0
11	13.0	9.0	10.5	7.0	3.0	5.0	8.0	4.0	6.5	4.5	1.0	2.5
12	11.0	9.5	10.0	7.5	3.5	5.5	6.0	3.5	4.5	4.5	3.0	3.5
13	11.5	8.5	10.0	9.0	6.5	7.5	6.5	4.0	5.5	5.0	4.5	4.5
14	13.0	10.0	11.0	12.5	8.5	10.0	6.0	5.5	6.0	4.5	2.0	4.0
15	15.0	10.5	12.5	14.0	11.0	12.5	6.5	6.0	6.0	2.0	.0	1.0
16	15.0	11.5	13.0	13.0	11.5	12.5	7.5	6.0	6.5	1.0	.0	.5
17	15.5	13.5	14.5	13.0	11.5	12.5	6.5	5.5	6.0	.5	.0	.0
18	17.0	13.5	15.5	11.5	9.5	11.0	7.5	6.0	6.5	.5	.0	.0
19	16.0	14.0	15.0	11.0	8.5	10.0	6.5	5.5	6.0	.0	.0	.0
20	19.0	15.0	17.0	11.0	7.5	9.5	5.5	4.0	5.0	.0	.0	.0
21	17.5	14.0	16.0	9.0	6.0	7.5	5.5	3.5	4.5	.0	.0	.0
22	14.0	11.0	12.5	8.0	5.0	6.5	4.5	3.0	4.0	2.0	.0	.5
23	12.5	8.0	10.5	7.0	4.0	5.5	5.0	3.5	4.0	2.5	.0	1.5
24	12.0	7.5	10.0	8.0	5.0	6.5	4.0	2.5	3.5	4.0	2.5	3.5
25	12.5	7.5	10.0	9.0	7.5	8.0	3.5	2.0	2.5	3.5	2.5	3.0
26	11.5	9.0	10.5	7.5	6.5	7.0	2.0	.0	.5	3.5	2.5	3.0
27	13.0	10.0	11.5	10.0	6.5	7.5	3.0	.0	1.5	3.0	2.5	3.0
28	11.0	8.0	9.5	11.0	8.5	10.5	3.0	1.5	2.0	4.0	3.0	3.5
29	9.5	5.5	8.0	9.0	8.0	8.5	2.0	1.0	1.5	4.0	3.0	3.5
30	9.5	9.0	9.0	9.5	7.5	8.5	1.5	.0	.0	3.5	3.0	3.0
31	9.0	6.5	7.5	---	---	---	.5	.0	.0	3.5	2.0	3.0
MONTH	19.0	5.5	12.5	14.0	2.5	8.0	10.5	.0	5.5	5.0	.0	2.0

02011500 BACK CREEK NEAR MOUNTAIN GROVE, VA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	3.5	.5	2.0	3.5	2.0	3.0	10.5	5.0	7.0	18.5	13.5	15.5
2	3.0	.5	1.5	2.0	.5	1.5	11.0	4.5	7.0	17.0	9.5	13.0
3	2.5	.0	1.0	3.0	.0	1.5	9.5	6.0	7.5	14.0	9.5	11.5
4	3.5	.0	1.5	7.5	1.5	4.0	12.0	5.5	8.0	11.0	9.5	10.0
5	3.5	1.0	2.0	7.0	2.5	4.0	12.0	5.0	8.5	12.5	10.0	11.0
6	5.0	1.0	3.0	7.0	2.5	4.5	10.0	7.5	8.5	11.5	10.0	10.5
7	4.0	.5	2.5	7.0	3.0	4.5	9.5	6.5	8.0	11.0	10.5	11.0
8	3.5	1.5	2.5	5.0	4.0	4.5	11.5	4.5	7.5	10.5	9.5	10.5
9	4.0	3.0	3.5	4.0	3.5	4.0	11.5	5.5	8.0	13.5	9.0	11.0
10	3.0	1.5	2.5	5.0	3.5	4.0	9.5	7.0	8.0	13.5	10.0	11.5
11	3.0	1.5	2.5	5.5	3.0	4.0	8.5	7.5	8.0	15.5	9.5	12.0
12	3.5	2.5	3.0	6.5	2.5	4.0	12.0	7.0	9.0	15.5	10.0	12.5
13	4.0	1.5	3.0	5.5	3.0	4.0	12.5	8.5	10.0	16.0	9.5	12.5
14	5.0	1.5	3.0	8.0	3.5	5.0	13.0	7.5	9.5	17.5	9.5	13.5
15	5.0	1.5	3.0	8.0	3.5	5.5	13.0	7.5	10.0	17.0	12.0	15.0
16	5.5	2.0	3.0	6.5	3.0	4.5	12.5	8.5	10.0	18.5	12.5	15.0
17	5.5	1.5	3.0	7.0	1.0	3.5	14.0	7.5	10.0	15.0	11.5	12.5
18	6.5	1.5	3.5	4.5	2.5	3.5	13.5	7.0	10.0	14.5	10.5	12.5
19	7.0	2.0	4.0	8.0	2.5	5.0	16.0	8.0	11.5	12.5	10.0	11.5
20	6.5	2.5	4.0	9.5	2.5	5.5	16.0	9.0	12.0	13.5	11.0	12.5
21	5.0	3.5	4.0	6.5	4.5	5.5	14.0	8.0	10.5	18.5	10.0	14.0
22	7.0	3.5	4.5	8.0	4.0	5.5	13.0	9.0	10.5	16.0	11.5	14.5
23	4.5	4.0	4.5	9.0	3.5	5.5	15.0	6.5	10.5	20.5	12.5	16.5
24	5.0	3.5	4.5	9.0	4.5	6.5	16.5	7.0	11.5	20.0	14.0	17.5
25	6.0	3.0	4.0	7.5	5.0	6.5	17.5	8.5	13.0	21.0	15.0	17.5
26	5.0	2.0	3.5	8.0	4.0	5.5	17.5	10.0	13.5	17.5	15.5	16.5
27	5.0	1.0	2.5	8.5	5.5	6.5	17.0	10.5	13.0	17.5	13.5	15.0
28	5.0	.5	2.5	7.0	6.0	6.5	19.0	11.0	14.5	19.0	10.5	14.5
29	---	---	---	7.5	5.5	6.5	16.5	11.5	14.5	21.0	11.5	16.0
30	---	---	---	8.0	5.0	6.0	19.5	13.0	16.0	22.0	14.0	18.0
31	---	---	---	6.5	5.0	6.0	---	---	---	23.5	14.5	19.0
MONTH	7.0	.0	3.0	9.5	.0	4.5	19.5	4.5	10.0	23.5	9.0	13.5
	JUNE			JULY			AUGUST			SEPTEMBER		
1	22.5	15.5	19.0	26.5	18.5	22.0	23.5	20.5	22.0	23.5	19.0	21.0
2	23.0	15.5	19.0	27.5	19.0	23.0	22.5	20.0	21.5	23.5	18.5	20.5
3	23.0	13.5	18.0	26.5	20.0	23.5	22.0	19.0	20.5	21.0	18.5	19.5
4	22.0	15.5	18.5	27.5	20.5	23.5	24.5	19.0	21.5	19.0	17.0	18.0
5	25.0	17.0	20.5	29.0	22.0	25.0	23.0	20.0	21.5	20.5	15.5	18.0
6	23.5	18.5	21.0	29.5	22.0	25.5	23.5	17.5	20.0	21.0	17.5	19.0
7	24.5	19.5	21.5	29.0	22.5	25.5	23.0	17.0	20.0	22.0	16.0	19.0
8	22.5	19.0	20.5	29.5	23.0	26.0	24.0	19.0	21.5	21.0	15.5	18.0
9	20.5	17.5	18.5	26.5	22.5	24.5	26.5	20.0	23.0	20.5	15.5	18.0
10	17.5	17.0	17.5	27.0	22.0	24.0	26.0	21.0	23.0	20.0	16.0	18.5
11	21.5	16.5	18.5	26.5	20.0	22.5	26.0	20.0	23.0	22.5	16.5	19.0
12	25.0	18.0	21.0	25.5	19.5	22.5	27.0	21.5	24.0	20.5	14.0	17.5
13	26.0	17.5	22.0	24.5	20.5	22.5	27.5	21.5	24.5	20.5	14.5	17.5
14	28.5	20.5	24.0	27.0	21.5	23.5	26.0	21.5	23.5	20.5	15.5	18.0
15	27.5	21.0	24.0	27.0	21.5	24.0	26.0	20.5	22.5	22.5	16.5	19.5
16	26.0	21.0	23.5	26.0	22.0	24.0	22.0	19.0	20.0	24.0	19.0	21.5
17	28.5	20.5	24.0	23.5	20.0	21.0	22.0	18.5	20.0	22.0	18.5	20.0
18	29.0	22.0	25.0	25.5	20.0	22.5	23.5	21.0	22.0	22.5	17.5	19.5
19	26.5	20.5	23.5	25.5	20.5	23.0	24.0	20.5	22.0	20.0	15.0	17.5
20	27.5	19.0	22.5	27.0	21.5	24.0	24.5	20.0	22.0	20.0	14.0	17.0
21	27.0	21.0	24.0	24.5	21.5	22.5	22.5	20.5	21.0	18.5	14.5	17.0
22	25.5	18.5	22.0	23.0	20.0	21.5	21.0	18.5	19.5	17.0	15.0	16.0
23	20.5	18.0	19.0	24.0	21.0	22.5	23.5	18.0	20.5	20.0	14.0	17.0
24	22.5	18.5	20.0	24.0	20.0	22.0	24.0	18.5	21.5	20.0	16.5	18.5
25	22.5	19.0	20.5	25.0	20.0	22.5	24.5	20.0	22.0	23.0	18.0	20.0
26	23.5	17.0	20.0	23.0	19.5	21.0	24.5	20.0	22.0	21.5	18.0	19.5
27	22.5	19.0	20.5	21.0	19.0	20.0	22.5	19.5	21.0	19.0	16.5	17.5
28	26.0	18.5	22.0	23.5	19.0	21.5	23.5	19.5	21.5	17.0	14.5	15.5
29	26.0	20.0	22.5	23.5	20.0	21.5	23.5	20.0	21.5	17.5	12.5	15.0
30	23.0	19.5	21.5	24.5	19.5	22.0	24.0	18.5	21.0	16.5	11.0	14.0
31	---	---	---	25.0	19.5	22.0	21.0	18.5	19.5	---	---	---
MONTH	29.0	13.5	21.0	29.5	18.5	23.0	27.5	17.0	21.5	24.0	11.0	18.0
YEAR	29.5	.0	12.0									



## JAMES RIVER BASIN

## 02011795 LAKE MOOMAW NEAR HOT SPRINGS, VA

LOCATION.--Lat 37°57'04", long 79°59'21", Alleghany County, Hydrologic Unit 02080201, in control tower at Gathright Dam on Jackson River, 0.9 mi upstream from Cedar Creek, 7.6 mi southwest of Hot Springs, and 19 mi upstream from Covington.

DRAINAGE AREA.--344 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level (U.S. Army Corps of Engineers bench mark).

REMARKS.--Lake is formed by rolled rockfill dam with an impervious compacted earth (clay) core. Spillway with crest at elevation 1,667.5 ft is in a divide about 2.5 mi south of the dam, ungated, and 2,450 ft long with a base width of 100 ft. Except for flood flows, all discharge will be through a diversion tunnel with the invert of the entrance being in an intake tower 260 ft high. Elevation of invert is 1,430.5 ft. Portals in the tower at nine levels permit oxygenated water from the surface and cold water from the bottom of the lake to be mixed for water-quality control. Sluice gates in the tower control flood flow releases. Storage began Dec. 10, 1979. Total capacity at top of dam, elevation 1,684.5 ft, is 502,600 acre-ft of which 81,100 acre-ft is above spillway crest. Capacity at maximum conservation pool, elevation 1,582.0 ft, is 123,700 acre-ft; capacity at minimum conservation pool, elevation 1,554.0 ft, is 63,000 acre-ft. Lake is used for flood control, low-water augmentation for water-quality control, and recreation. U.S. Army Corps of Engineers satellite precipitation and elevation telemeter at station.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

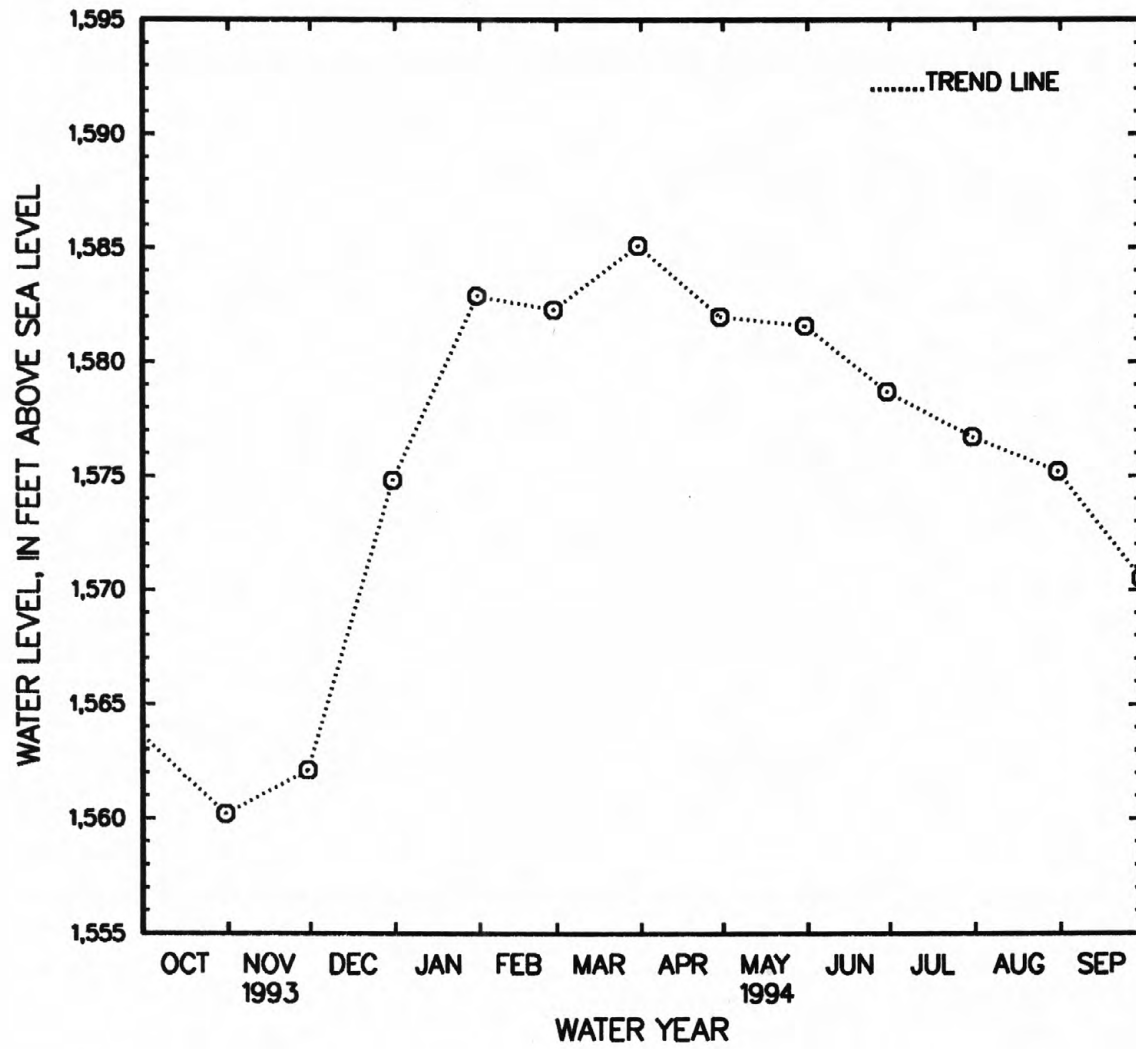
EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 160,300 acre-ft, Apr. 18, 1987, elevation, 1,595.6 ft; minimum, (after first filling to minimum conservation pool), 71,900 acre-ft, Nov. 30, Dec. 1, 1991, elevation, 1,558.8 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 140,400 acre-ft, Mar. 30, elevation, 1,588.4 ft; minimum, 72,500 acre-ft, Nov. 27, elevation, 1,559.1 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,563.7	81,700	-
Oct. 31.....	1,560.2	74,600	-7,100
Nov. 30.....	1,562.1	78,400	+3,800
Dec. 31.....	1,574.8	106,200	+27,800
CAL YR 1993.....	-	-	+4,000
Jan. 31.....	1,582.9	126,000	+19,800
Feb. 28.....	1,582.3	124,500	-1,500
Mar. 31.....	1,585.1	131,700	+7,200
Apr. 30.....	1,582.0	123,700	-8,000
May 31.....	1,581.6	122,700	-1,000
June 30.....	1,578.7	115,500	-7,200
July 31.....	1,576.7	110,700	-4,800
Aug. 31.....	1,575.2	107,100	-3,600
Sept. 30.....	1,570.5	96,300	-10,800
WTR YR 1994.....	-	-	+14,600

02011795 LAKE MOOMAW NEAR HOT SPRINGS, VA--Continued



## JAMES RIVER BASIN

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA

LOCATION.--Lat 37°56'54", long 79°56'58", Alleghany County, Hydrologic Unit 02080201, on right bank 0.4 mi upstream from Cedar Creek, 0.5 mi downstream from Gathright Dam and Lake Moomaw, and 7.3 mi southwest of Hot Springs.

DRAINAGE AREA.--345 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1973 to current year.

REVISED RECORDS.--WDR VA-81-1: 1980.

GAGE.--Water-stage recorder. Datum of gage is 1,400.00 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to Dec. 20, 1973, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1979 by Lake Moomaw (station 02011795) 0.5 mi upstream; since October 1984 by Back Creek Lake 28.5 mi upstream, amount unknown; and since January 1985 by Little Back Creek Lake 31.6 mi upstream, amount unknown. U.S. Army Corps of Engineers satellite water-quality and gage-height telemeter at station. Maximum discharge, 29,000 ft<sup>3</sup>/s, result of cofferdam failure during construction of Gathright Dam, from rating curve extended above 9,200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 3.0 ft<sup>3</sup>/s, July 12, 1979, result of gate closure at Gathright Dam, gage height, 7.78 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 17.20 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,500 ft<sup>3</sup>/s, Mar. 30, gage height, 13.60 ft; minimum, 7.7 ft<sup>3</sup>/s, Oct. 21, gage height, 7.83 ft; minimum daily, 160 ft<sup>3</sup>/s, Mar. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	222	187	173	164	1680	1310	3400	380	242	292	292	260
2	204	178	164	164	1060	1050	2350	328	246	292	292	249
3	204	178	164	164	744	800	1160	292	246	292	292	253
4	203	178	164	164	492	615	702	424	246	292	292	253
5	203	178	167	164	492	876	621	633	247	292	292	253
6	202	178	167	164	492	1060	621	859	248	292	292	253
7	203	178	167	164	492	1060	653	1070	249	292	292	253
8	201	178	165	164	492	1070	679	2610	227	292	292	253
9	202	178	162	164	842	1070	679	3800	249	292	292	253
10	202	178	162	164	1930	2800	679	2990	249	292	292	253
11	204	178	162	164	2500	4690	679	2660	249	290	292	253
12	204	178	162	167	2490	4410	679	2200	248	288	292	253
13	204	178	162	168	2480	2900	679	992	247	288	292	253
14	203	178	162	170	2090	1660	899	226	246	289	292	253
15	201	178	162	170	1790	953	1060	426	250	288	292	253
16	202	178	162	170	1190	797	1060	576	256	294	292	253
17	201	178	162	475	841	695	817	574	256	299	293	253
18	201	178	164	700	767	608	612	450	256	297	292	253
19	202	178	164	697	767	576	545	331	256	293	292	253
20	202	178	164	540	946	574	484	306	256	292	292	253
21	187	178	164	397	1060	576	414	277	256	295	292	253
22	204	178	164	397	1060	897	380	235	256	296	292	253
23	204	178	164	397	479	1060	380	220	256	295	292	252
24	204	178	164	397	1050	1060	380	220	256	294	291	253
25	204	178	164	398	3280	1060	380	220	256	292	292	252
26	204	178	164	845	3830	932	380	220	256	292	292	251
27	203	178	164	1130	2420	462	380	228	256	293	292	250
28	202	178	164	1670	1890	160	380	236	255	292	292	249
29	203	178	164	3620	---	1210	380	236	253	292	292	250
30	204	180	164	3690	---	3870	380	236	270	292	292	249
31	204	---	164	2360	---	4710	---	236	---	292	292	---
TOTAL	6293	5351	5085	20362	39646	45571	22892	24691	7539	9063	9052	7575
MEAN	203	178	164	657	1416	1470	763	796	251	292	292	252
MAX	222	187	173	3690	3830	4710	3400	3800	270	299	293	260
MIN	187	178	162	164	479	160	380	220	227	288	291	249
(†)	-115	+64	+452	+322	-27	+117	-134	-16	-121	-78	-59	-181
MEAN#	88	242	616	979	1389	1587	629	780	130	214	233	71.5
CFSM#	.26	.70	1.79	2.84	4.03	4.60	1.82	2.26	.38	.62	.68	.21
IN.#	.29	.78	2.06	3.27	4.19	5.30	2.03	2.61	.42	.72	.78	.23

CAL YR 1993 TOTAL 183598 MEAN 503 MAX 5980 MIN 162 MEAN# 509 CFSM# 1.48 IN.# 20.03  
WTR YR 1994 TOTAL 203120 MEAN 556 MAX 4710 MIN 160 MEAN# 576 CFSM# 1.67 IN.# 22.69

† Change in contents, equivalent in cubic feet per second, in Lake Moomaw; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

## 02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1979, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	350	255	643	858	605	1050	561	579	374	153	130	222
MAX	1043	388	1584	1306	1096	1656	1134	925	650	180	172	754
(WY)	1977	1978	1974	1979	1979	1978	1977	1975	1974	1979	1978	1979
MIN	67.6	84.3	287	145	241	408	313	191	115	91.5	92.5	76.3
(WY)	1979	1979	1976	1977	1978	1976	1976	1977	1977	1977	1977	1978

## SUMMARY STATISTICS

## WATER YEARS 1974 - 1979

ANNUAL MEAN	482
HIGHEST ANNUAL MEAN	585
LOWEST ANNUAL MEAN	357
HIGHEST DAILY MEAN	12600
LOWEST DAILY MEAN	63
ANNUAL SEVEN-DAY MINIMUM	65
INSTANTANEOUS PEAK FLOW	a29000
INSTANTANEOUS PEAK STAGE	a18.77
INSTANTANEOUS LOW FLOW	b3.0
ANNUAL RUNOFF (CFSM)	1.40
ANNUAL RUNOFF (INCHES)	18.97
10 PERCENT EXCEEDS	962
50 PERCENT EXCEEDS	245
90 PERCENT EXCEEDS	92

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	245	307	250	433	646	933	811	598	421	259	274	232
MAX	829	1235	617	1297	1416	1881	2052	1477	1017	307	644	454
(WY)	1980	1986	1984	1991	1994	1993	1987	1989	1982	1993	1984	1989
MIN	70.8	64.1	60.8	74.5	114	74.4	172	230	202	123	71.4	57.5
(WY)	1981	1982	1982	1981	1981	1981	1981	1991	1980	1980	1981	1981

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

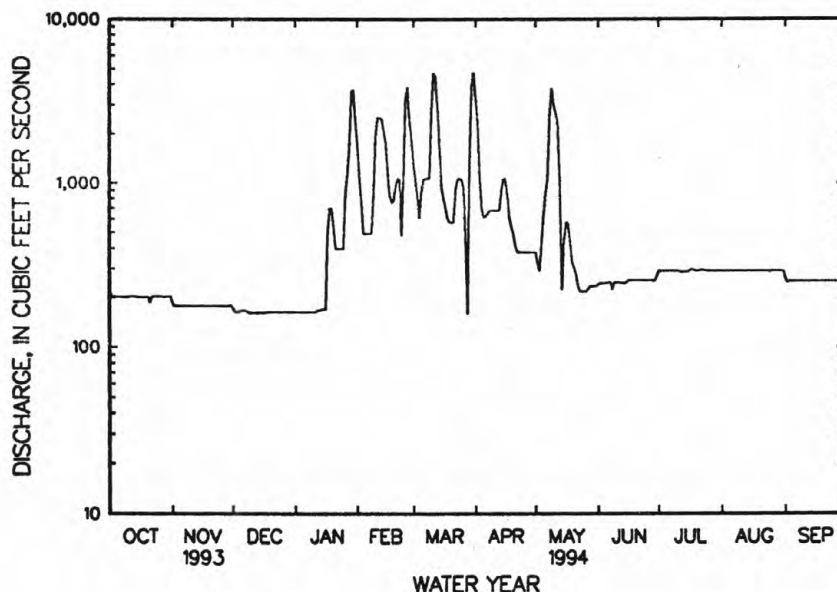
## WATER YEARS 1980 - 1994

ANNUAL TOTAL	183598	203120	
ANNUAL MEAN	503	556	449
HIGHEST ANNUAL MEAN			568
LOWEST ANNUAL MEAN			196
HIGHEST DAILY MEAN	5980	Mar 30	4710
LOWEST DAILY MEAN	162	cDec 9	160
ANNUAL SEVEN-DAY MINIMUM	162	Dec 9	162
INSTANTANEOUS PEAK FLOW			5500
INSTANTANEOUS PEAK STAGE			13.60
INSTANTANEOUS LOW FLOW			7.7
ANNUAL RUNOFF (CFSM)	1.46		1.61
ANNUAL RUNOFF (INCHES)	19.80		21.90
10 PERCENT EXCEEDS	974		1070
50 PERCENT EXCEEDS	277		288
90 PERCENT EXCEEDS	178		164

a Result of cofferdam failure during construction of Gathright Dam.

b Result of gate closure at Gathright Dam.

c Also Dec. 10-17, 1993.



02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1979 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1978 to current year.

pH: October 1978 to current year.

WATER TEMPERATURE: October 1978 to current year.

DISSOLVED OXYGEN: October 1978 to current year.

INSTRUMENTATION.--Water-quality monitor since October 1978.

REMARKS.--Interruptions in the record were due to malfunction of the instruments. Some record in prior years fragmentary due to instrument malfunction. The intake tower at Gathright Dam permits selective withdrawal of water from one or more reservoir depths. Records represent conductance, pH within 0.5 units, water temperature within 0.5°C, and dissolved oxygen within 0.5 mg/L at the intake to the monitor. All four parameters were compared at the intake with the average for the river by a cross section on July 20. A maximum variation of 5 microsiemens was found for specific conductance, a maximum of 0.2 units for pH, no variation for water temperature, and 0.2 mg/L for dissolved oxygen was found within the cross section.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE (water years 1979, 1981-94): Maximum recorded, 249 microsiemens, Nov. 5, 1985; minimum recorded, 78 microsiemens, May 14, 1979.

pH (water years 1979, 1981-94): Maximum recorded, 8.6 units, Jan. 29, 1982, Jan. 13, 1983; minimum recorded, 6.7 units, Oct. 22, 1989.

WATER TEMPERATURE (water years 1979, 1981-94): Maximum recorded, 28.0°C, Aug. 1, 2, 1979; minimum recorded, 0.0°C, Feb. 16-19, 1979.

DISSOLVED OXYGEN (water years 1979, 1981, 1984-94): Maximum recorded, 19.5 mg/L, Jan. 16, 1979; minimum recorded, 5.7 mg/L, Aug. 1, 3, 1987.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum recorded, 160 microsiemens, Dec. 4, 5; minimum recorded, 100 microsiemens, on several days during March and April.

pH: Maximum recorded, 7.8 units, on several days during February and May; minimum recorded, 7.0 units, Oct. 6.

WATER TEMPERATURE: Maximum recorded, 15.5°C, on several days during May to July; minimum recorded, 3.5°C, on several days during winter period.

DISSOLVED OXYGEN: Maximum recorded, 14.9 mg/L, Feb. 25; minimum recorded, 8.3 mg/L, July 25.

## SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	134	132	133	151	144	147	159	158	158	149	147	148
2	135	134	135	151	149	150	159	158	158	148	147	147
3	136	133	135	151	148	150	159	158	159	147	147	147
4	136	134	135	148	145	147	160	158	158	147	146	147
5	137	135	136	146	142	144	160	158	159	147	147	147
6	137	136	136	145	141	143	158	157	158	147	146	147
7	137	136	137	144	142	143	158	157	158	147	146	147
8	138	136	137	144	141	142	158	157	157	148	147	147
9	138	137	138	145	143	144	157	155	156	148	147	147
10	139	137	137	148	143	146	156	154	155	147	146	147
11	139	137	138	149	147	148	156	154	155	147	146	147
12	139	136	138	150	148	149	155	154	155	148	146	147
13	138	137	138	153	150	152	155	154	154	147	145	146
14	138	137	138	154	152	153	154	153	154	147	145	146
15	139	137	138	155	152	154	154	153	154	147	144	145
16	139	138	139	157	155	156	153	151	152	146	144	144
17	140	138	139	156	153	154	151	149	150	144	140	142
18	141	139	140	156	153	155	149	147	148	140	139	139
19	141	139	140	156	155	155	148	147	148	140	139	139
20	141	139	140	155	154	154	151	148	150	141	132	136
21	143	137	140	156	155	156	151	149	149	141	133	135
22	140	138	140	156	156	156	149	148	149	134	131	132
23	141	140	140	157	156	156	148	147	148	137	133	136
24	142	140	141	157	156	156	148	147	148	139	137	138
25	142	140	141	156	156	156	148	147	147	141	139	140
26	142	140	141	157	156	156	148	147	147	140	138	139
27	143	141	141	158	156	157	147	147	147	139	139	139
28	143	141	142	157	150	156	147	146	147	139	137	139
29	142	141	142	158	157	158	147	147	147	138	137	137
30	143	140	142	158	158	158	148	147	147	138	137	137
31	144	142	143	---	---	---	148	147	147	138	138	138
MONTH	144	132	139	158	141	152	160	146	152	149	131	142



## SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	138	137	137	108	106	107	100	100	100	107	105	106
2	137	136	137	109	108	109	101	100	100	108	106	107
3	136	134	136	109	108	108	101	101	101	108	107	108
4	135	134	135	108	107	108	103	101	101	109	107	107
5	135	135	135	107	105	105	102	100	100	107	105	106
6	136	134	135	105	105	105	103	100	101	110	104	105
7	135	133	134	106	105	105	104	102	103	104	104	104
8	134	133	134	107	106	107	104	103	103	105	102	104
9	134	132	133	108	107	107	104	103	103	102	102	102
10	136	132	135	108	105	107	104	103	103	103	102	102
11	135	131	133	105	104	104	104	103	103	104	103	104
12	131	129	130	104	104	104	103	103	103	105	104	104
13	129	126	127	104	103	103	104	102	103	112	104	107
14	128	125	127	104	103	104	104	101	103	113	111	111
15	128	126	127	104	104	104	102	101	101	111	106	109
16	127	121	124	104	101	102	106	101	102	109	107	108
17	124	123	124	102	101	101	104	103	103	109	107	108
18	124	123	124	102	101	101	104	103	104	110	108	109
19	123	123	123	102	101	102	105	103	104	110	109	109
20	123	122	123	102	101	101	105	103	104	110	110	110
21	123	121	122	103	102	103	105	104	105	111	110	110
22	127	119	121	103	101	102	109	105	105	112	110	111
23	134	124	129	102	102	102	106	104	105	112	111	111
24	131	107	119	102	102	102	105	104	105	111	110	111
25	110	107	108	102	102	102	106	104	105	112	111	111
26	107	102	104	102	102	102	105	105	105	112	111	111
27	106	105	106	113	102	107	106	105	105	112	111	112
28	106	106	106	111	110	110	107	105	106	112	110	111
29	---	---	---	111	101	106	106	104	105	111	111	111
30	---	---	---	101	100	100	106	105	106	111	111	111
31	---	---	---	101	100	100	---	---	---	111	111	111
MONTH	138	102	126	113	100	104	109	100	103	113	102	108
	JUNE			JULY			AUGUST			SEPTEMBER		
1	114	111	112	118	117	117	119	117	118	126	123	124
2	115	113	114	118	117	117	119	114	117	126	125	125
3	115	115	115	118	117	117	120	116	118	126	125	125
4	116	115	115	118	117	117	118	117	118	126	125	126
5	115	115	115	118	117	117	119	118	118	126	125	126

## JAMES RIVER BASIN

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	7.2	7.1	7.1	7.4	7.1	7.2	7.5	7.5	7.5	7.7	7.5	7.6
2	7.1	7.1	7.1	7.5	7.3	7.4	7.5	7.5	7.5	7.7	7.5	7.6
3	7.2	7.1	7.1	7.4	7.4	7.4	7.6	7.5	7.5	7.6	7.6	7.6
4	7.1	7.1	7.1	7.4	7.4	7.4	7.6	7.5	7.5	7.7	7.6	7.6
5	7.1	7.1	7.1	7.4	7.3	7.3	7.6	7.5	7.5	7.7	7.6	7.6
6	7.2	7.0	7.1	7.4	7.3	7.3	7.6	7.5	7.6	7.7	7.6	7.6
7	7.2	7.1	7.1	7.4	7.3	7.3	7.6	7.5	7.6	7.7	7.6	7.6
8	7.2	7.1	7.1	7.3	7.2	7.3	7.6	7.5	7.6	7.7	7.6	7.6
9	7.2	7.1	7.1	7.3	7.2	7.3	7.6	7.5	7.6	7.6	7.6	7.6
10	7.2	7.1	7.1	7.3	7.2	7.3	7.6	7.5	7.6	7.7	7.6	7.6
11	7.2	7.1	7.2	7.3	7.2	7.3	7.6	7.5	7.6	7.7	7.6	7.6
12	7.2	7.1	7.2	7.3	7.3	7.3	7.6	7.5	7.6	7.7	7.6	7.6
13	7.2	7.1	7.2	7.3	7.3	7.3	7.6	7.5	7.6	7.7	7.6	7.6
14	7.2	7.1	7.2	7.3	7.3	7.3	7.6	7.5	7.6	7.7	7.6	7.6
15	7.2	7.1	7.2	7.4	7.3	7.4	7.6	7.5	7.6	7.7	7.6	7.6
16	7.2	7.1	7.2	7.4	7.3	7.4	7.6	7.5	7.6	7.7	7.6	7.6
17	7.2	7.1	7.2	7.4	7.4	7.4	7.6	7.5	7.6	7.6	7.6	7.6
18	7.2	7.1	7.2	7.4	7.4	7.4	7.6	7.5	7.6	7.6	7.6	7.6
19	7.2	7.1	7.1	7.5	7.4	7.5	7.6	7.5	7.6	7.6	7.6	7.6
20	7.2	7.1	7.1	7.5	7.4	7.5	7.6	7.5	7.6	7.6	7.6	7.6
21	7.2	7.1	7.1	7.5	7.5	7.5	7.6	7.5	7.6	7.6	7.6	7.6
22	7.2	7.1	7.1	7.5	7.5	7.5	7.7	7.5	7.6	7.6	7.6	7.6
23	7.1	7.1	7.1	7.6	7.5	7.5	7.6	7.5	7.6	7.6	7.6	7.6
24	7.1	7.1	7.1	7.6	7.5	7.5	7.7	7.5	7.6	7.6	7.6	7.6
25	7.1	7.1	7.1	7.6	7.5	7.5	7.6	7.5	7.6	7.6	7.6	7.6
26	7.1	7.1	7.1	7.5	7.5	7.5	7.6	7.5	7.6	7.6	7.6	7.6
27	7.1	7.1	7.1	7.5	7.5	7.5	7.7	7.5	7.6	7.6	7.5	7.6
28	7.1	7.1	7.1	7.6	7.5	7.5	7.6	7.5	7.6	7.6	7.5	7.6
29	7.1	7.1	7.1	7.5	7.5	7.5	7.7	7.5	7.6	7.6	7.5	7.5
30	7.1	7.1	7.1	7.5	7.5	7.5	7.6	7.5	7.6	7.6	7.5	7.5
31	7.1	7.1	7.1	---	---	---	7.6	7.5	7.6	7.5	7.5	7.5
MONTH	7.2	7.0	7.1	7.6	7.1	7.4	7.7	7.5	7.6	7.7	7.5	7.6
FEBRUARY			MARCH			APRIL			MAY			
1	7.6	7.5	7.6	7.5	7.4	7.5	7.4	7.4	7.4	7.7	7.5	7.6
2	7.6	7.6	7.6	7.5	7.5	7.5	7.4	7.4	7.4	7.7	7.5	7.6
3	---	---	---	7.5	7.5	7.5	7.5	7.4	7.5	7.7	7.5	7.6
4	---	---	---	7.5	7.5	7.5	7.5	7.4	7.5	7.6	7.5	7.6
5	---	---	---	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.5
6	---	---	---	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
7	---	---	---	7.5	7.5	7.5	7.6	7.5	7.5	7.5	7.5	7.5
8	---	---	---	7.5	7.5	7.5	7.6	7.4	7.5	7.5	7.2	7.4
9	---	---	---	7.5	7.5	7.5	7.5	7.4	7.5	7.2	7.2	7.2
10	7.7	7.7	7.7	7.5	7.4	7.5	7.5	7.4	7.5	7.3	7.2	7.2
11	7.7	7.7	7.7	7.5	7.4	7.5	7.5	7.4	7.5	7.3	7.2	7.3
12	7.7	7.7	7.7	7.5	7.4	7.5	7.6	7.4	7.5	7.4	7.3	7.3
13	7.7	7.7	7.7	7.5	7.4	7.5	7.6	7.4	7.5	7.6	7.3	7.5
14	7.7	7.7	7.7	7.5	7.5	7.5	7.5	7.4	7.5	7.7	7.5	7.6
15	7.7	7.7	7.7	7.5	7.5	7.5	7.5	7.4	7.5	7.6	7.5	7.6
16	7.8	7.7	7.7	7.6	7.5	7.5	7.6	7.4	7.5	7.8	7.5	7.6
17	7.8	7.7	7.8	7.6	7.5	7.5	7.6	7.4	7.5	7.7	7.5	7.6
18	7.8	7.7	7.7	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.6
19	7.8	7.7	7.8	7.6	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.6
20	7.7	7.7	7.7	7.6	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.6
21	7.7	7.7	7.7	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.6
22	7.7	7.7	7.7	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.5
23	7.8	7.7	7.8	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.6
24	7.8	7.5	7.6	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.4	7.5
25	7.5	7.5	7.5	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.4	7.5
26	7.5	7.5	7.5	7.5	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.5
27	7.5	7.5	7.5	7.6	7.5	7.5	7.6	7.4	7.5	7.7	7.5	7.6
28	7.5	7.5	7.5	7.6	7.5	7.5	7.6	7.4	7.5	7.6	7.5	7.5
29	---	---	---	7.6	7.4	7.4	7.6	7.4	7.5	7.6	7.5	7.5
30	---	---	---	7.4	7.4	7.4	7.6	7.5	7.6	7.6	7.5	7.5
31	---	---	---	7.4	7.4	7.4	---	---	---	7.6	7.5	7.5
MONTH	7.8	7.5	7.7	7.6	7.4	7.5	7.6	7.4	7.5	7.8	7.2	7.5



## JAMES RIVER BASIN

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER				NOVEMBER			DECEMBER			JANUARY		
1	14.5	14.0	14.5	14.0	13.0	13.5	10.5	10.5	10.5	6.5	6.0	6.5
2	14.5	14.0	14.5	14.0	14.0	14.0	10.5	10.0	10.5	6.5	6.0	6.5
3	14.5	14.0	14.5	14.0	13.5	14.0	10.5	10.0	10.5	6.0	6.0	6.0
4	14.5	14.0	14.0	14.0	13.5	13.5	10.5	10.0	10.0	6.0	5.5	6.0
5	14.5	14.0	14.0	13.5	13.5	13.5	10.0	10.0	10.0	6.0	6.0	6.0
6	14.5	14.0	14.0	13.5	13.0	13.5	10.0	10.0	10.0	6.0	6.0	6.0
7	14.5	14.0	14.0	13.0	12.5	13.0	10.0	9.5	10.0	6.0	6.0	6.0
8	14.5	14.0	14.0	13.0	12.5	12.5	9.5	9.5	9.5	6.0	5.5	5.5
9	14.5	14.0	14.0	12.5	12.5	12.5	9.5	9.5	9.5	5.5	5.5	5.5
10	14.5	14.0	14.0	12.5	12.0	12.5	9.5	9.5	9.5	5.5	5.5	5.5
11	14.0	14.0	14.0	12.5	12.0	12.0	9.5	9.0	9.0	5.5	5.5	5.5
12	14.0	14.0	14.0	12.5	12.0	12.0	9.0	9.0	9.0	5.5	5.5	5.5
13	14.0	13.5	14.0	12.5	12.0	12.0	9.0	8.5	9.0	5.5	5.5	5.5
14	14.0	13.5	14.0	12.5	12.0	12.0	9.0	8.5	9.0	5.5	5.0	5.5
15	14.0	13.5	14.0	13.0	12.0	12.5	9.0	8.5	9.0	5.0	4.5	4.5
16	14.0	13.5	14.0	12.5	12.0	12.0	9.0	8.5	8.5	4.5	4.5	4.5
17	14.0	13.5	14.0	12.5	12.0	12.0	8.5	8.5	8.5	4.5	4.0	4.5
18	14.0	13.5	14.0	12.5	12.0	12.5	8.5	8.5	8.5	4.0	4.0	4.0
19	14.0	14.0	14.0	12.5	12.0	12.0	8.5	8.5	8.5	4.5	4.0	4.5
20	14.0	14.0	14.0	12.0	11.5	12.0	8.5	8.0	8.5	4.5	4.0	4.0
21	14.0	13.5	14.0	12.0	11.5	11.5	8.0	8.0	8.0	4.0	4.0	4.0
22	14.0	13.5	13.5	11.5	11.5	11.5	8.0	7.5	8.0	4.0	4.0	4.0
23	13.5	13.5	13.5	11.5	11.0	11.5	8.0	7.5	7.5	4.0	4.0	4.0
24	13.5	13.5	13.5	11.5	11.0	11.5	7.5	7.5	7.5	4.0	4.0	4.0
25	13.5	13.5	13.5	11.5	11.0	11.5	7.5	7.0	7.5	4.0	4.0	4.0
26	13.5	13.5	13.5	11.0	11.0	11.0	7.0	7.0	7.0	4.0	4.0	4.0
27	13.5	13.5	13.5	11.0	11.0	11.0	7.0	7.0	7.0	4.0	4.0	4.0
28	13.5	13.0	13.5	11.0	10.5	11.0	7.0	7.0	7.0	4.0	4.0	4.0
29	13.5	13.0	13.5	11.0	10.5	10.5	7.0	6.5	7.0	4.0	3.5	4.0
30	13.5	13.0	13.5	10.5	10.5	10.5	6.5	6.0	6.5	4.0	3.5	3.5
31	13.0	13.0	13.0	---	---	---	6.5	6.0	6.5	4.0	3.5	4.0
MONTH	14.5	13.0	14.0	14.0	10.5	12.0	10.5	6.0	8.5	6.5	3.5	5.0
FEBRUARY				MARCH			APRIL			MAY		
1	4.0	3.5	3.5	4.5	4.5	4.5	6.5	6.0	6.5	13.5	11.0	12.5
2	4.0	3.5	4.0	4.5	4.0	4.5	6.5	6.0	6.0	12.5	12.0	12.5
3	4.0	3.5	4.0	4.5	4.5	4.5	7.5	6.0	7.0	12.5	12.0	12.0
4	4.0	4.0	4.0	4.5	4.5	4.5	7.5	7.0	7.0	13.0	12.0	12.5
5	4.0	4.0	4.0	4.5	4.0	4.5	8.5	7.0	8.0	12.5	11.5	12.0
6	4.0	4.0	4.0	4.5	4.5	4.5	8.5	8.0	8.5	12.0	11.5	12.0
7	4.0	4.0	4.0	4.5	4.5	4.5	9.5	8.5	9.0	12.0	11.5	12.0
8	4.0	4.0	4.0	5.0	4.5	4.5	9.0	8.5	9.0	12.0	6.5	9.5
9	4.0	4.0	4.0	5.0	4.5	5.0	9.0	8.0	8.5	7.5	7.0	7.5
10	4.0	3.5	4.0	5.0	4.5	5.0	9.0	8.0	8.5	7.5	7.0	7.5
11	4.0	3.5	4.0	5.0	5.0	5.0	9.5	8.0	9.0	9.5	7.5	9.0
12	3.5	3.5	3.5	5.0	5.0	5.0	9.5	8.5	9.5	10.5	9.0	10.0
13	4.0	3.5	4.0	5.0	5.0	5.0	10.0	8.5	9.0	13.0	9.5	11.5
14	4.0	3.5	4.0	5.5	5.0	5.5	10.0	8.0	9.0	14.0	12.5	13.0
15	4.0	4.0	4.0	5.5	5.5	5.5	10.0	9.0	9.5	13.5	13.0	13.0
16	4.0	4.0	4.0	6.0	5.5	6.0	12.0	9.0	10.5	15.5	13.0	14.0
17	4.0	4.0	4.0	6.0	5.5	6.0	11.5	9.5	10.5	15.0	13.5	14.5
18	4.0	4.0	4.0	6.0	5.5	6.0	11.0	10.0	10.5	14.0	13.5	14.0
19	4.0	4.0	4.0	6.0	5.5	6.0	11.5	9.5	10.5	14.0	13.5	14.0
20	4.0	4.0	4.0	6.0	5.5	6.0	12.5	9.5	11.0	14.0	13.5	13.5
21	4.0	4.0	4.0	5.5	5.5	5.5	11.0	10.5	11.0	14.0	13.5	14.0
22	4.0	4.0	4.0	6.0	5.5	6.0	11.5	10.5	11.5	14.5	13.5	14.0
23	5.0	4.0	4.5	6.0	6.0	6.0	11.5	10.5	11.0	14.5	13.5	14.0
24	5.0	4.0	4.5	6.0	6.0	6.0	12.5	10.5	11.5	14.5	13.5	14.0
25	4.5	4.0	4.0	6.5	6.0	6.0	12.0	11.0	11.0	14.5	13.5	14.0
26	4.5	4.5	4.5	6.5	6.0	6.5	12.0	10.5	11.0	14.0	13.5	14.0
27	4.5	4.5	4.5	7.0	6.0	6.5	12.5	11.0	11.5	15.0	13.5	14.5
28	4.5	4.5	4.5	7.0	6.5	6.5	11.5	11.0	11.5	14.5	13.5	14.0
29	---	---	---	7.0	5.5	6.0	12.0	11.0	11.5	15.0	13.5	14.5
30	---	---	---	6.5	6.0	6.0	12.0	10.5	11.5	15.0	14.0	14.5
31	---	---	---	6.5	6.0	6.5	---	---	---	15.0	14.0	14.5
MONTH	5.0	3.5	4.0	7.0	4.0	5.5	12.5	6.0	9.5	15.5	6.5	12.5





## JAMES RIVER BASIN

02011800 JACKSON RIVER BELOW GATHRIGHT DAM, NEAR HOT SPRINGS, VA--Continued

OXYGEN, DISSOLVED (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	9.3	9.2	9.2	9.3	9.0	9.1	9.8	9.6	9.7	11.0	10.6	10.7
2	9.3	9.2	9.3	9.5	9.1	9.3	9.8	9.6	9.7	11.0	10.6	10.7
3	9.4	9.3	9.3	9.5	9.1	9.3	9.9	9.7	9.8	10.9	10.4	10.6
4	9.5	9.3	9.4	9.6	9.1	9.3	9.9	9.6	9.8	10.7	10.2	10.5
5	9.6	9.4	9.5	9.1	8.8	9.0	9.9	9.6	9.8	10.9	10.5	10.7
6	9.6	9.4	9.5	9.2	8.8	9.0	10.1	9.8	9.9	10.9	10.5	10.7
7	9.8	9.4	9.5	9.3	8.9	9.1	10.2	10.0	10.1	10.8	10.4	10.5
8	9.6	9.2	9.4	9.2	8.9	9.1	10.2	10.0	10.1	10.8	10.4	10.5
9	9.5	9.1	9.3	9.2	8.9	9.0	10.3	10.0	10.2	10.8	10.5	10.6
10	9.5	9.2	9.4	9.2	9.0	9.0	10.3	10.1	10.1	10.8	10.5	10.6
11	9.7	9.4	9.5	9.2	9.0	9.1	10.5	10.1	10.3	10.8	10.5	10.6
12	9.6	9.3	9.4	9.3	9.1	9.2	10.6	10.4	10.5	10.5	10.2	10.4
13	9.8	9.4	9.5	9.3	9.1	9.2	10.8	10.5	10.6	10.6	10.3	10.4
14	9.9	9.5	9.6	9.2	9.0	9.1	10.8	10.5	10.6	10.7	10.4	10.5
15	9.9	9.6	9.7	9.2	9.0	9.1	10.8	10.5	10.6	10.7	10.4	10.5
16	10.0	9.6	9.8	9.4	9.2	9.3	10.8	10.6	10.7	10.7	10.4	10.5
17	9.8	9.5	9.6	9.3	9.0	9.2	11.1	10.7	10.9	10.8	10.3	10.5
18	9.9	9.5	9.7	9.3	8.7	9.0	11.2	10.7	11.0	10.6	10.5	10.6
19	10.0	9.7	9.8	8.8	8.4	8.6	11.2	10.8	11.0	10.6	10.5	10.5
20	10.0	9.6	9.8	8.7	8.4	8.6	11.2	10.9	11.0	10.6	10.4	10.5
21	10.0	9.5	9.8	8.9	8.6	8.7	11.2	10.8	11.0	10.5	10.4	10.4
22	10.2	9.8	9.9	8.9	8.8	8.8	11.1	10.7	11.0	10.4	10.3	10.4
23	10.1	9.7	9.9	9.1	8.9	9.0	11.1	10.8	10.9	10.5	10.4	10.4
24	10.0	9.5	9.7	9.1	8.9	9.0	11.1	10.7	10.8	10.5	10.4	10.5
25	9.8	9.4	9.6	9.3	9.0	9.1	11.0	10.6	10.7	10.6	10.4	10.5
26	9.7	9.3	9.5	9.3	9.1	9.2	11.1	10.7	10.8	10.9	10.4	10.7
27	9.5	9.2	9.4	9.3	9.1	9.2	11.1	10.7	10.9	10.9	10.8	10.9
28	9.5	9.1	9.3	9.3	9.1	9.2	11.0	10.7	10.8	11.3	10.7	10.9
29	9.4	9.1	9.2	9.6	9.3	9.4	11.0	10.6	10.8	12.2	11.2	11.7
30	9.2	9.0	9.1	9.7	9.4	9.6	11.0	10.6	10.8	12.2	11.3	11.8
31	9.1	8.9	9.0	---	---	---	10.9	10.6	10.7	11.3	11.2	11.3
MONTH	10.2	8.9	9.5	9.7	8.4	9.1	11.2	9.6	10.5	12.2	10.2	10.7
FEBRUARY			MARCH			APRIL			MAY			
1	11.3	10.7	11.0	13.4	12.8	13.1	12.1	11.6	11.8	10.1	9.7	9.9
2	10.7	10.6	10.7	12.8	12.4	12.6	11.8	11.3	11.5	10.2	9.7	10.0
3	10.8	10.5	10.6	12.5	12.1	12.3	11.3	10.5	10.9	10.2	9.8	10.0
4	10.9	10.7	10.8	12.4	12.1	12.3	10.8	10.5	10.6	10.1	9.7	9.9
5	11.1	10.9	11.0	12.8	12.3	12.6	10.5	10.3	10.4	10.3	9.9	10.1
6	11.3	11.1	11.2	12.8	12.7	12.7	10.4	10.0	10.2	10.4	9.9	10.2
7	11.4	11.2	11.3	12.7	12.5	12.6	10.4	10.1	10.2	10.3	10.1	10.2
8	11.4	11.2	11.3	12.7	12.6	12.6	10.5	10.2	10.3	12.5	10.1	11.2
9	11.9	11.3	11.6	12.6	12.4	12.6	10.5	10.3	10.4	12.4	11.7	12.0
10	12.7	11.9	12.3	14.0	12.4	13.3	10.6	10.4	10.5	11.8	11.6	11.7
11	12.7	12.5	12.6	14.1	13.9	14.0	10.6	10.4	10.5	11.8	11.2	11.4
12	12.8	12.6	12.7	14.1	13.4	13.8	10.5	10.3	10.4	11.2	10.7	10.9
13	12.8	12.7	12.7	13.4	12.8	13.1	10.5	10.2	10.4	10.8	9.4	10.1
14	12.9	12.6	12.7	12.9	11.9	12.4	10.9	10.5	10.7	9.6	9.3	9.5
15	12.8	12.6	12.6	12.0	11.7	11.8	10.9	10.7	10.7	9.9	9.4	9.7
16	12.7	12.4	12.5	11.8	11.3	11.5	10.8	10.4	10.6	9.9	9.5	9.7
17	12.6	12.4	12.5	11.5	11.2	11.4	10.8	10.3	10.5	9.7	9.5	9.6
18	12.7	12.5	12.6	11.2	11.0	11.1	10.7	10.4	10.5	9.7	9.1	9.5
19	12.8	12.6	12.7	11.4	11.1	11.2	10.7	10.4	10.5	9.5	9.2	9.4
20	13.1	12.7	12.9	11.4	11.1	11.3	10.8	10.4	10.5	9.4	9.1	9.3
21	13.2	13.0	13.1	11.2	11.0	11.2	10.7	10.4	10.5	9.4	9.1	9.3
22	13.3	13.1	13.2	11.6	11.1	11.4	10.6	10.2	10.4	9.3	9.0	9.2
23	13.2	12.4	12.8	11.6	11.3	11.5	10.8	10.5	10.6	9.4	9.0	9.2
24	13.9	12.3	13.1	11.5	11.3	11.4	10.7	10.4	10.6	9.4	9.0	9.2
25	14.9	13.8	14.3	11.5	11.2	11.4	10.8	10.5	10.6	9.4	9.0	9.3
26	14.8	13.9	14.4	11.3	10.8	11.1	10.9	10.5	10.7	9.6	9.2	9.4
27	13.9	13.4	13.7	10.9	10.2	10.5	10.8	10.5	10.6	9.9	9.2	9.5
28	13.5	13.4	13.4	10.6	10.1	10.3	10.7	10.5	10.6	10.0	9.5	9.7
29	---	---	---	12.0	10.2	11.1	10.6	10.0	10.3	9.9	9.4	9.7
30	---	---	---	12.8	11.8	12.2	10.3	10.0	10.2	10.1	9.6	9.9
31	---	---	---	12.7	12.0	12.4	---	---	---	10.1	9.7	9.9
MONTH	14.9	10.5	12.4	14.1	10.1	12.0	12.1	10.0	10.6	12.5	9.0	10.0



## JAMES RIVER BASIN

02012800 JACKSON RIVER AT FILTRATION PLANT, AT COVINGTON, VA

LOCATION.--Lat 37°48'39", long 79°59'19", Covington City, Hydrologic Unit 02080201, on left bank 50 ft upstream from Dry Run and 1.7 mi upstream from Dunlap Creek and bridge on U.S. Highway 60.

DRAINAGE AREA.--439 mi<sup>2</sup>.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: June 1978 to current year.

INSTRUMENTATION.--Water-temperature recorder since June 1978.

REMARKS.--Interruptions in the record were due to malfunction of the instrument. Some record in prior years fragmentary due to instrument malfunction. Records represent water temperature at sensor within 0.5°C. U.S. Army Corps of Engineers satellite water-temperature telemeter at station.

EXTREMES FOR PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: Maximum recorded, 30.5°C, July 21, 1980; minimum recorded, 0.0°C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

WATER TEMPERATURE: Maximum recorded, 22.5°C, June 15, but may have been higher during instrument malfunction, May 22 to June 1; minimum, 0.0°C, Jan. 15-17, 19, but may have occurred on other days during instrument malfunction, Dec. 25 to Jan. 3.

## TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	14.0	11.5	12.5	9.0	8.0	8.5	7.5	6.0	6.5	---	---	---
2	15.5	12.5	14.0	9.0	7.0	8.0	6.5	5.0	6.0	---	---	---
3	17.0	14.0	15.5	10.0	8.5	9.0	8.5	6.5	7.5	---	---	---
4	15.5	12.5	14.0	11.0	8.5	9.5	10.0	8.5	9.5	4.0	2.5	3.0
5	16.5	13.0	14.5	14.0	11.0	13.0	10.0	9.0	9.5	3.5	2.0	2.5
6	15.5	13.5	14.0	13.5	10.0	12.0	9.0	8.0	8.5	4.0	2.5	3.0
7	15.5	13.0	14.0	10.0	8.0	9.0	8.5	7.5	8.0	5.0	4.0	4.5
8	16.5	14.0	15.0	8.5	6.5	7.5	7.5	6.5	7.0	5.0	2.5	4.0
9	16.5	14.0	15.0	8.5	7.0	8.0	7.5	6.0	6.5	2.5	1.5	2.0
10	16.0	14.0	15.5	9.5	7.5	8.5	8.0	7.0	7.5	2.0	.5	1.5
11	14.0	11.0	12.0	9.0	7.0	8.0	8.0	4.5	7.0	3.5	1.5	2.5
12	11.5	11.0	11.0	9.5	7.5	8.5	4.5	3.0	3.5	4.5	3.5	4.0
13	12.5	10.5	11.5	11.0	9.0	10.0	4.5	3.0	3.5	5.5	4.5	5.0
14	13.5	12.0	12.5	13.0	10.5	12.0	5.0	4.0	4.5	5.5	3.5	5.0
15	14.5	12.0	13.0	15.0	13.0	14.0	6.0	5.0	5.5	3.5	.0	1.0
16	14.5	13.0	14.0	14.0	13.5	14.0	7.5	6.0	6.5	.0	.0	.0
17	15.5	14.0	14.5	13.5	12.5	13.0	7.0	6.0	6.5	.5	.0	.0
18	16.5	14.5	15.0	12.5	11.0	12.0	6.5	6.0	6.5	2.5	.5	2.0
19	15.5	15.0	15.5	11.5	10.5	11.0	6.5	6.0	6.0	1.5	.0	.5
20	17.0	15.0	15.5	11.0	8.0	10.0	6.0	5.0	5.5	2.5	1.0	2.0
21	16.0	14.0	16.0	8.0	6.5	7.5	5.0	4.0	4.5	2.5	.5	1.5
22	14.0	12.0	13.0	8.0	6.0	7.0	4.5	3.5	4.0	3.0	.5	1.5
23	13.0	10.5	11.5	8.5	6.5	7.5	5.0	4.0	4.5	4.0	2.0	3.0
24	12.5	10.5	11.5	9.0	7.0	8.0	5.0	3.5	4.5	4.5	4.0	4.5
25	13.0	10.0	11.5	10.0	9.0	9.5	---	---	---	4.5	3.5	4.0
26	12.5	11.5	12.0	9.5	8.5	9.0	---	---	---	4.5	4.0	4.0
27	13.5	12.0	12.5	9.5	8.5	9.0	---	---	---	4.0	3.5	3.5
28	13.0	10.0	12.0	10.0	8.5	9.5	---	---	---	5.0	3.5	4.0
29	11.0	8.5	10.0	8.5	6.5	7.0	---	---	---	4.5	3.0	4.0
30	12.0	11.0	11.5	7.5	6.0	7.0	---	---	---	3.5	3.0	3.0
31	11.0	9.0	10.0	---	---	---	---	---	---	4.0	3.0	3.5
MONTH	17.0	8.5	13.0	15.0	6.0	9.5	10.0	3.0	6.0	5.5	.0	3.0

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	3.5	2.5	3.0	---	---	---	8.0	5.5	6.5	16.5	14.0	15.0
2	3.5	2.0	3.0	---	---	---	8.0	5.5	6.5	15.5	12.0	14.0
3	4.0	2.0	3.0	4.5	2.5	3.5	8.5	6.0	7.0	15.0	12.0	13.0
4	4.0	2.0	3.0	6.5	3.5	5.0	10.5	7.0	8.5	12.0	11.0	11.5
5	4.0	3.0	3.5	6.5	4.0	5.0	11.0	6.5	9.0	13.0	11.5	12.0
6	4.5	3.0	4.0	6.5	3.5	5.0	10.5	8.5	9.5	12.0	11.0	11.5
7	4.5	2.5	4.0	7.0	4.0	5.5	10.5	8.5	9.5	12.0	11.5	12.0
8	4.5	3.0	3.5	6.0	5.5	6.0	11.0	7.0	9.0	12.0	7.0	11.0
9	5.5	4.5	5.0	5.5	4.5	5.0	11.5	7.5	9.5	9.5	7.0	8.0
10	4.5	2.5	3.5	5.5	4.5	5.0	11.0	9.0	10.0	9.0	7.0	8.0
11	3.5	2.0	3.0	5.5	4.0	4.5	10.0	9.0	9.0	11.5	7.0	9.0
12	3.5	3.5	3.5	5.5	4.0	4.5	12.5	8.5	10.5	12.0	9.0	10.0
13	4.0	3.0	3.5	5.5	4.0	5.0	13.0	10.0	11.5	12.5	9.0	10.5
14	4.5	3.0	3.5	7.0	5.0	6.0	12.5	9.5	11.0	15.5	11.5	13.5
15	4.5	3.0	3.5	7.5	5.0	6.0	12.5	8.5	10.5	16.5	14.5	15.5
16	5.0	3.0	4.0	6.5	5.0	5.5	12.5	9.5	11.0	16.5	13.5	15.0
17	5.0	3.0	4.0	6.5	3.5	5.5	13.0	10.0	11.5	16.0	13.5	14.5
18	5.5	3.0	4.5	7.0	4.5	5.5	13.5	9.5	12.0	15.5	12.5	14.0
19	6.5	3.5	5.0	8.0	5.0	6.5	14.0	10.0	12.0	14.0	12.0	13.0
20	6.0	4.0	5.0	8.5	4.5	7.0	14.5	11.0	13.0	14.0	13.0	13.5
21	5.0	4.5	4.5	8.5	6.0	7.0	13.5	10.5	12.0	17.0	13.0	15.0
22	6.0	4.0	5.0	8.5	6.0	7.0	12.5	10.5	11.5	---	---	---
23	6.0	4.5	5.0	9.0	5.0	7.0	13.5	10.0	12.0	---	---	---
24	---	---	---	8.0	6.0	7.0	14.5	10.5	13.0	---	---	---
25	---	---	---	7.0	6.0	7.0	16.0	12.0	14.0	---	---	---
26	---	---	---	8.0	5.5	6.5	16.0	12.5	14.5	---	---	---
27	---	---	---	9.5	6.5	7.5	16.0	13.0	14.5	---	---	---
28	---	---	---	9.5	9.0	9.5	16.5	13.0	15.0	---	---	---
29	---	---	---	9.0	6.0	8.0	16.5	13.5	14.5	---	---	---
30	---	---	---	7.5	5.5	6.0	17.0	13.0	15.0	---	---	---
31	---	---	---	6.5	6.0	6.0	---	---	---	---	---	---
MONTH	6.5	2.0	4.0	9.5	2.5	6.0	17.0	5.5	11.0	17.0	7.0	12.5
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	20.5	16.5	18.5	19.5	18.0	18.5	18.5	16.5	17.0
2	19.5	16.5	18.0	21.0	18.5	20.0	18.5	17.5	18.0	19.0	17.5	18.0
3	19.5	15.5	17.5	20.5	19.0	20.0	19.0	17.0	18.0	18.0	16.5	17.5
4	18.0	17.0	17.5	21.0	18.5	19.5	20.5	17.5	19.0	16.5	15.5	16.0
5	20.5	17.0	18.5	21.0	19.0	20.0	19.5	17.0	18.0	17.5	15.0	16.0
6	19.5	18.5	19.0	22.0	19.5	20.5	19.0	16.0	17.5	18.5	16.5	17.5
7	20.0	18.0	19.0	21.0	19.5	20.0	19.0	16.5	18.0	18.0	16.0	17.0
8	19.0	18.0	18.5	21.0	19.0	20.0	19.0	17.5	18.5	17.5	15.5	16.5
9	18.0	16.0	17.0	20.5	19.0	19.5	20.0	17.5	19.0	18.0	16.0	17.0
10	16.0	15.5	16.0	20.0	18.0	19.0	20.0	18.5	19.0	18.5	16.0	17.0
11	18.0	15.5	16.5	20.0	17.5	19.0	19.5	17.5	18.5	19.0	16.5	17.5
12	20.5	17.5	19.0	19.0	18.0	18.5	19.5	18.0	18.5	18.0	15.5	16.5
13	21.0	18.0	19.5	19.0	18.0	18.5	20.0	18.0	19.0	18.5	15.5	17.0
14	22.0	19.5	20.5	19.5	17.5	18.5	19.5	18.5	19.0	18.0	16.0	17.0
15	22.5	20.0	21.0	19.5	18.0	19.0	19.5	18.0	18.5	18.5	16.5	17.5
16	21.5	19.5	20.0	20.0	18.5	19.0	18.5	16.0	17.0	19.0	17.5	18.0
17	21.5	18.0	20.0	19.0	17.5	18.0	17.0	16.0	16.5	18.0	16.5	17.5
18	21.5	19.5	20.5	20.0	17.0	18.5	19.0	16.5	17.5	18.5	16.0	17.0
19	21.0	19.0	20.0	20.0	18.5	19.5	19.0	17.0	18.5	17.5	15.5	16.5
20	21.0	18.5	20.0	21.0	18.5	20.0	19.0	17.5	18.5	17.5	15.0	16.0
21	22.0	20.0	21.0	20.5	18.5	19.5	19.0	17.0	18.0	16.5	15.5	16.0
22	22.0	19.5	20.5	19.0	17.5	18.0	17.0	16.0	16.5	16.0	15.0	15.5
23	21.0	19.0	20.0	20.0	17.5	18.5	18.5	15.5	17.0	17.5	14.5	15.5
24	20.5	18.5	19.5	20.5	18.0	19.5	19.0	17.0	18.0	17.5	16.5	17.0
25	20.5	18.5	19.5	20.0	18.5	19.5	18.5	17.5	18.0	18.5	16.5	17.5
26	20.5	17.5	19.0	19.5	17.0	18.0	18.5	17.0	18.0	18.0	17.0	17.5
27	20.0	18.5	19.0	17.0	16.0	16.5	18.0	16.5	17.5	17.0	16.0	16.5
28	21.0	18.0	19.5	19.0	15.5	17.5	18.5	16.5	17.5	16.0	14.5	15.5
29	21.5	19.0	20.0	19.5	18.0	19.0	19.0	17.5	18.0	16.0	14.0	15.0
30	20.5	18.0	19.0	20.0	17.5	19.0	19.0	16.5	18.0	16.0	13.5	14.5
31	---	---	---	20.0	18.5	19.5	18.5	16.5	17.5	---	---	---
MONTH	22.5	15.5	19.0	22.0	15.5	19.0	20.5	15.5	18.0	19.0	13.5	16.5
YEAR	22.5	.0	12.0									



## JAMES RIVER BASIN

02013000 DUNLAP CREEK NEAR COVINGTON, VA

LOCATION.--Lat 37°48'10", long 80°02'50", Alleghany County, Hydrologic Unit 02080201, on right bank 20 ft downstream from bridge on U.S. Highway 60, 2.2 mi downstream from Ogle Creek, and 3.0 mi west of Covington.

DRAINAGE AREA.--164 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1929-30, 1932-34, 1942. WSP 1303: 1929-35(M), 1937-38(M), 1941-48(M). WSP 2104: Drainage area. WDR VA-74-1: 1969(M), 1972, 1973(P).

GAGE.--Water-stage recorder. Datum of gage is 1,294.70 ft above sea level. Prior to Dec. 8, 1949, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Occasional diurnal fluctuation caused by dam 7.9 mi upstream from station. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Maximum discharge, 27,400 ft<sup>3</sup>/s, from rating curve extended above 4,500 ft<sup>3</sup>/s on basis of step-backwater computations and contracted-opening measurement at gage height 15.65 ft. Minimum gage height, 0.69 ft, June 6, July 14, 1969. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 18 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0800	2,090	5.43	Feb. 23	1700	*3,640	*7.00
Jan. 12	1630	2,020	5.35	Mar. 27	1615	2,720	6.12
Feb. 9	2330	3,220	6.61	Aug. 17	1600	2,330	5.70

Minimum discharge, 5.9 ft<sup>3</sup>/s, July 3, Sept. 3; minimum daily, 19 ft<sup>3</sup>/s, Oct. 6-9; minimum gage height, 1.07 ft, Sept. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	38	58	93	291	253	518	156	37	25	58	56
2	22	37	47	91	226	254	424	157	35	24	44	55
3	21	34	41	95	190	228	358	149	34	21	70	43
4	20	32	87	134	162	302	304	458	33	21	54	41
5	20	32	1460	141	148	1040	255	506	32	22	44	38
6	19	31	466	134	143	1000	238	368	31	21	39	36
7	19	31	221	150	125	842	510	323	31	21	35	34
8	19	30	142	485	116	856	508	629	35	21	30	32
9	19	29	106	387	1590	638	390	480	36	22	29	30
10	20	28	91	254	1840	693	327	338	36	22	27	29
11	20	27	87	196	982	654	281	250	35	21	26	28
12	24	27	81	1160	873	460	245	201	33	20	63	26
13	23	26	76	1130	700	361	292	166	30	21	118	25
14	22	26	72	617	755	307	376	138	28	25	42	25
15	22	25	78	382	627	259	327	122	27	22	32	24
16	21	25	156	245	510	222	280	124	25	21	31	24
17	21	27	199	227	514	187	232	106	25	23	863	26
18	22	31	177	233	471	173	197	94	25	24	458	32
19	23	37	148	135	474	169	173	86	26	23	181	28
20	24	36	125	150	541	147	156	80	26	21	114	26
21	24	33	119	134	570	148	139	73	27	31	87	25
22	26	31	105	120	472	430	136	67	25	48	73	25
23	25	29	94	113	2220	411	124	62	34	42	61	25
24	25	28	89	155	1770	327	112	57	30	34	52	24
25	25	28	84	337	895	294	105	55	28	29	46	25
26	26	27	75	789	557	262	99	59	27	27	45	28
27	26	51	73	742	383	1460	100	62	29	39	54	30
28	25	273	75	1160	296	2050	99	55	29	58	72	24
29	25	130	87	1120	---	2020	101	48	27	44	57	23
30	31	79	88	582	---	1120	139	44	26	41	48	22
31	37	---	87	390	---	668	---	41	---	92	45	---
TOTAL	719	1318	4894	12081	18441	18235	7545	5554	902	926	2998	909
MEAN	23.2	43.9	158	390	659	588	251	179	30.1	29.9	96.7	30.3
MAX	37	273	1460	1160	2220	2050	518	629	37	92	863	56
MIN	19	25	41	91	116	147	99	41	25	20	26	22
CFSM	.14	.27	.96	2.38	4.02	3.59	1.53	1.09	.18	.18	.59	.18
IN.	.16	.30	1.11	2.74	4.18	4.14	1.71	1.26	.20	.21	.68	.21



## JAMES RIVER BASIN

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02013000 DUNLAP CREEK NEAR COVINGTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	68.4	108	170	237	306	404	289	210	99.4	48.5	58.3	38.0
MAX	431	659	694	715	659	1053	1071	536	584	358	514	336
(WY)	1990	1986	1974	1937	1994	1993	1987	1989	1972	1972	1984	1989
MIN	13.4	15.7	21.5	24.2	21.5	59.1	54.7	43.7	24.3	14.3	12.5	11.0
(WY)	1942	1932	1956	1981	1934	1988	1986	1930	1934	1966	1932	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

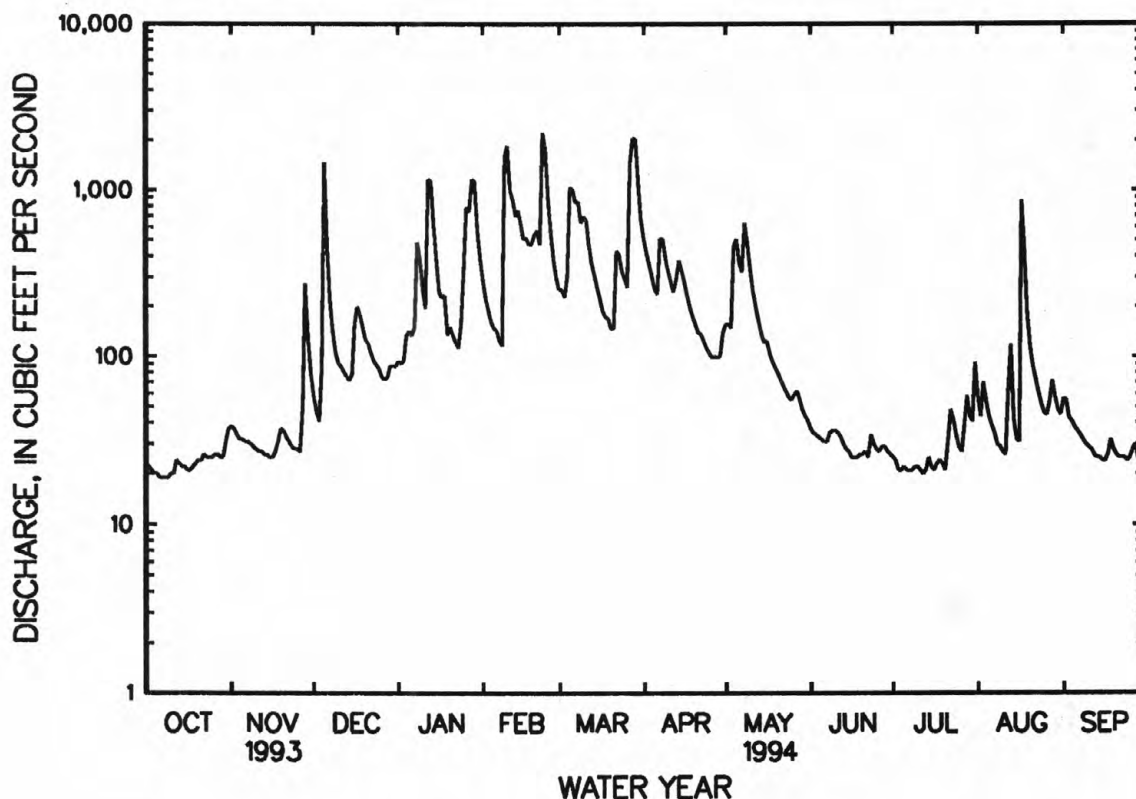
## WATER YEARS 1929 - 1994

ANNUAL TOTAL	67945	74522	
ANNUAL MEAN	186	204	169
HIGHEST ANNUAL MEAN			320
LOWEST ANNUAL MEAN			67.3
HIGHEST DAILY MEAN	4370	Mar 4	10200
LOWEST DAILY MEAN	17	aAug 22	7.0
ANNUAL SEVEN-DAY MINIMUM	18	Sep 9	7.6
INSTANTANEOUS PEAK FLOW			27400
INSTANTANEOUS PEAK STAGE			15.65
INSTANTANEOUS LOW FLOW			2.0
ANNUAL RUNOFF (CFSM)	1.14	1.24	1.03
ANNUAL RUNOFF (INCHES)	15.41	16.90	13.99
10 PERCENT EXCEEDS	328	527	365
50 PERCENT EXCEEDS	54	67	67
90 PERCENT EXCEEDS	20	24	18

a Also Aug. 23, 24, Aug. 29 to Sept. 1, and Sept. 12-15, 1993.

b Also Oct. 7-9, 1993.

c Also Sept. 3, 1994.



## 02013100 JACKSON RIVER BELOW DUNLAP CREEK, AT COVINGTON, VA

LOCATION.--Lat 37°47'19", long 80°00'03", Covington City, Hydrologic Unit 02080201, on left bank in city recreation park and 0.5 mi downstream from Dunlap Creek.

DRAINAGE AREA.--614 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1974 to current year.

REVISED RECORDS.--WDR VA-76-1: 1975(M).

GAGE.--Water-stage recorder. Datum of gage is 1,206.53 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Small diurnal fluctuation at low flow caused by Westvaco plant 0.8 mi upstream and occasionally by dam on Dunlap Creek 12.7 mi upstream. Flow regulated since December 1979 by Lake Moomaw (station 02011795) 19.9 mi upstream; since October 1984 by Back Creek Lake 47.9 mi upstream, amount unknown; and since January 1985 by Little Back Creek Lake 51.0 mi upstream, amount unknown. Diversion by Westvaco plant averages 47 ft<sup>3</sup>/s for industrial use of which approximately 42 ft<sup>3</sup>/s is returned upstream from station. Diversion 2.0 mi upstream from station for city of Covington water supply averages less than 4.0 ft<sup>3</sup>/s. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 31,300 ft<sup>3</sup>/s, from rating curve extended above 19,000 ft<sup>3</sup>/s. Minimum discharge, 41 ft<sup>3</sup>/s, Jan. 5, 1981, gage height, 4.38 ft, result of freezeup. Several measurements of water temperature were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 24.36 ft, discharge, 34,000 ft<sup>3</sup>/s, from floodmarks, and flood of Dec. 27, 1973, reached a stage of 22.09 ft, from floodmarks, discharge, 28,300 ft<sup>3</sup>/s, from rating curve extended above 19,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,240 ft<sup>3</sup>/s, Mar. 30, gage height, 10.14 ft; minimum, 142 ft<sup>3</sup>/s, Oct. 21, gage height, 4.57 ft; minimum daily, 194 ft<sup>3</sup>/s, Nov. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	273	235	278	264	2470	1970	4310	628	306	344	393	362
2	222	211	248	269	1470	1530	3260	597	311	338	392	318
3	222	218	237	274	1230	1330	1980	512	309	337	404	315
4	219	200	292	339	789	1110	1280	1000	307	334	393	307
5	219	207	2580	342	765	2360	1080	1300	307	332	386	307
6	217	202	943	323	750	2660	1050	1330	306	326	376	302
7	217	201	534	353	720	2490	1440	1590	310	326	362	294
8	216	199	401	866	710	2700	1490	2890	300	328	359	294
9	216	199	334	691	2660	2360	1330	4500	332	339	358	291
10	219	198	309	492	3970	3380	1240	3420	324	334	353	297
11	217	196	296	425	3900	5360	1180	3100	319	322	350	293
12	232	198	280	1820	3790	5110	1120	2680	313	322	351	286
13	222	194	268	1880	3490	3650	1180	1650	310	329	495	287
14	220	195	261	1160	3350	2520	1420	480	303	336	384	289
15	216	195	277	790	2830	1500	1590	545	301	326	364	283
16	217	195	398	532	2210	1260	1530	799	309	325	377	288
17	218	204	427	650	1670	1090	1320	768	312	339	1280	308
18	217	209	391	1020	1500	976	994	687	313	340	1010	307
19	220	208	356	881	1490	913	886	497	314	332	604	296
20	222	211	324	822	1680	867	799	451	314	330	485	293
21	207	206	324	592	1920	875	705	423	324	376	434	293
22	224	199	298	562	1810	1420	647	367	316	431	407	296
23	223	199	280	557	3640	1690	626	330	361	397	385	293
24	220	198	270	620	3340	1570	600	319	333	366	374	292
25	222	196	264	920	4150	1550	586	315	320	352	367	290
26	221	195	256	1880	4790	1420	575	327	314	351	363	296
27	222	239	253	2280	3240	2680	586	327	325	373	377	296
28	221	605	256	3040	2460	3100	573	329	316	412	398	288
29	221	390	261	4680	---	3620	575	320	307	385	381	286
30	235	312	261	4730	---	4900	616	311	309	376	368	284
31	245	---	250	3050	---	5650	---	307	---	415	370	---
TOTAL	6902	6814	12407	37104	66794	73611	36568	33099	9445	10873	13700	8931
MEAN	223	227	400	1197	2385	2375	1219	1068	315	351	442	298
MAX	273	605	2580	4730	4790	5650	4310	4500	361	431	1280	362
MIN	207	194	237	264	710	867	573	307	300	322	350	283
(†)	-115	+64	+452	+322	-27	+117	-134	-16	-121	-78	-59	-181
MEAN*	108	291	852	1519	2358	2492	1085	1052	194	273	383	117
CFSM*	.18	.47	1.39	2.47	3.84	4.06	1.77	1.71	.32	.44	.62	.19
IN.*	.20	.53	1.60	2.85	4.00	4.68	1.97	1.98	.35	.51	.72	.21
CAL YR 1993	TOTAL 277218	MEAN 760	MAX 6570	MIN 194	MEAN*	766	CFSM*	1.25	IN.*	16.93		
WTR YR 1994	TOTAL 316248	MEAN 866	MAX 5650	MIN 194	MEAN*	886	CFSM*	1.44	IN.*	19.60		

† Change in contents, equivalent in cubic feet per second, in Lake Moomaw; provided by U.S. Army Corps of Engineers.

\* Adjusted for change in contents.

## 02013100 JACKSON RIVER BELOW DUNLAP CREEK, AT COVINGTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1979, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	572	425	712	1258	1079	1794	971	946	529	231	200	350
MAX	1495	853	1020	1930	1757	2762	1790	1600	906	304	270	1058
(WY)	1977	1978	1978	1979	1979	1978	1977	1975	1979	1979	1978	1979
MIN	97.2	118	370	208	450	690	472	296	187	144	135	123
(WY)	1979	1979	1976	1977	1978	1976	1976	1977	1977	1977	1977	1978

## SUMMARY STATISTICS

## WATER YEARS 1975 - 1979

ANNUAL MEAN	755
HIGHEST ANNUAL MEAN	905
LOWEST ANNUAL MEAN	536
HIGHEST DAILY MEAN	18800
LOWEST DAILY MEAN	88
ANNUAL SEVEN-DAY MINIMUM	92
INSTANTANEOUS PEAK FLOW	23200
INSTANTANEOUS PEAK STAGE	19.85
INSTANTANEOUS LOW FLOW	80
ANNUAL RUNOFF (CFSM)	1.23
ANNUAL RUNOFF (INCHES)	16.70
10 PERCENT EXCEEDS	1620
50 PERCENT EXCEEDS	380
90 PERCENT EXCEEDS	135

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	376	535	527	758	1109	1551	1316	923	582	339	384	321
MAX	1302	2363	1089	2007	2385	3189	3540	2223	1403	430	1285	938
(WY)	1980	1986	1984	1991	1984	1993	1987	1989	1982	1989	1984	1989
MIN	111	114	130	119	283	211	356	397	303	190	117	87.3
(WY)	1981	1982	1981	1981	1981	1981	1986	1991	1980	1981	1981	1981

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

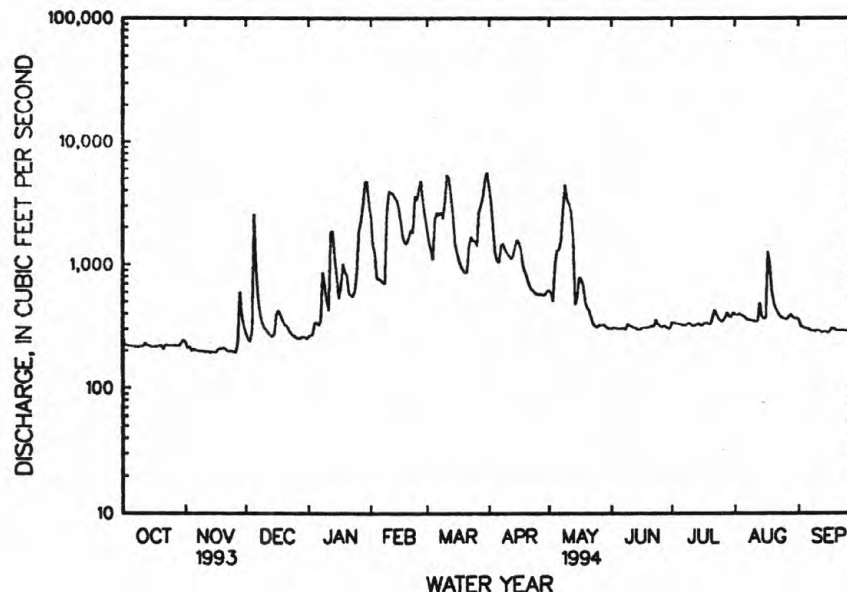
## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	277218	316248	
ANNUAL MEAN	760	866	724
HIGHEST ANNUAL MEAN			954
LOWEST ANNUAL MEAN			348
HIGHEST DAILY MEAN	6570	Mar 30	10800
LOWEST DAILY MEAN	194	Nov 13	67
ANNUAL SEVEN-DAY MINIMUM	196	Nov 10	71
INSTANTANEOUS PEAK FLOW			6240
INSTANTANEOUS PEAK STAGE			10.14
INSTANTANEOUS LOW FLOW			142
ANNUAL RUNOFF (CFSM)	1.24	1.41	1.18
ANNUAL RUNOFF (INCHES)	16.80	19.16	16.01
10 PERCENT EXCEEDS	1700	2500	1600
50 PERCENT EXCEEDS	337	358	358
90 PERCENT EXCEEDS	219	219	208

a Also Sept. 27-29, 1981.

b Result of freezeup.



## JAMES RIVER BASIN

02014000 POTTS CREEK NEAR COVINGTON, VA

LOCATION.--Lat 37°43'44", long 80°02'33", Alleghany County, Hydrologic Unit 02080201, on left bank at downstream side of bridge on State Highway 18, 0.8 mi downstream from Blue Spring Creek, and 5.2 mi southwest of Covington.

DRAINAGE AREA.--153 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to September 1956, October 1965 to current year.

REVISED RECORDS.--WSP 1723: 1935, 1936(M), 1940(M), 1942(M), 1948-49(M), 1951-52(M), 1954(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,273.93 ft above sea level. Prior to Sept. 30, 1956, nonrecording gage at site 1.3 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Maximum discharge, 15,400 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 28	1115	2,610	7.21	Aug. 17	1630	*2,640	*7.23

Minimum discharge, 22 ft<sup>3</sup>/s, Oct. 6; minimum gage height, 2.33 ft, Aug. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	58	51	93	406	357	680	368	67	36	76	55
2	24	45	39	101	320	355	549	331	64	33	58	48
3	24	37	33	101	268	331	467	286	59	32	56	40
4	23	33	61	117	230	345	408	506	57	33	48	37
5	23	33	1090	117	207	827	354	528	56	32	45	35
6	23	34	521	105	205	861	331	446	55	30	42	35
7	23	34	283	133	180	784	440	387	56	29	38	34
8	23	32	191	336	164	731	419	398	65	29	35	31
9	24	29	148	281	445	621	382	357	66	29	34	30
10	28	29	127	189	837	574	352	313	65	29	32	29
11	26	28	120	175	701	516	321	269	63	29	30	29
12	34	26	106	714	737	444	281	237	59	29	31	28
13	34	25	88	941	639	397	315	208	54	31	43	27
14	32	25	89	641	676	363	396	182	50	32	29	26
15	29	25	92	435	572	320	356	166	47	29	26	26
16	26	26	123	278	501	280	350	159	44	31	29	25
17	26	30	158	271	503	243	310	144	42	31	954	27
18	26	45	139	455	505	226	274	133	44	32	647	34
19	28	35	125	272	545	217	248	125	41	31	277	32
20	29	32	116	238	620	190	225	120	40	32	171	30
21	31	30	118	208	645	199	203	113	39	54	150	28
22	33	28	108	185	594	419	193	105	38	111	125	27
23	32	26	99	171	1120	355	182	99	43	94	98	27
24	32	25	91	240	1210	314	166	92	42	52	79	27
25	32	25	83	316	869	299	155	88	43	38	66	28
26	30	24	74	464	652	265	149	89	39	34	57	31
27	29	89	73	546	501	643	163	91	44	40	68	34
28	29	293	85	1120	410	2050	168	86	47	61	79	31
29	28	127	88	1100	---	1690	216	79	43	55	62	29
30	34	79	92	709	---	1130	416	74	38	108	52	28
31	47	---	82	521	---	809	---	70	---	109	48	---
TOTAL	887	1407	4693	11573	15262	17155	9469	6649	1510	1375	3585	948
MEAN	28.6	46.9	151	373	545	553	316	214	50.3	44.4	116	31.6
MAX	47	293	1090	1120	1210	2050	680	528	67	111	954	55
MIN	23	24	33	93	164	190	149	70	38	29	26	25
CFSM	.19	.31	.99	2.44	3.56	3.62	2.06	1.40	.33	.29	.76	.21
IN.	.22	.34	1.14	2.81	3.71	4.17	2.30	1.62	.37	.33	.87	.23

JAMES RIVER BASIN

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02014000 POTTS CREEK NEAR COVINGTON, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1956, 1966 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	99.3	129	176	237	297	382	297	224	130	66.9	68.7	59.9
MAX	548	766	643	788	577	1078	1184	519	650	288	461	516
(WY)	1990	1986	1949	1937	1972	1955	1987	1971	1972	1938	1940	1989
MIN	20.7	23.8	24.7	29.8	26.9	75.7	80.5	51.4	29.4	22.1	21.9	18.4
(WY)	1940	1940	1940	1956	1934	1988	1986	1934	1934	1966	1930	1968

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

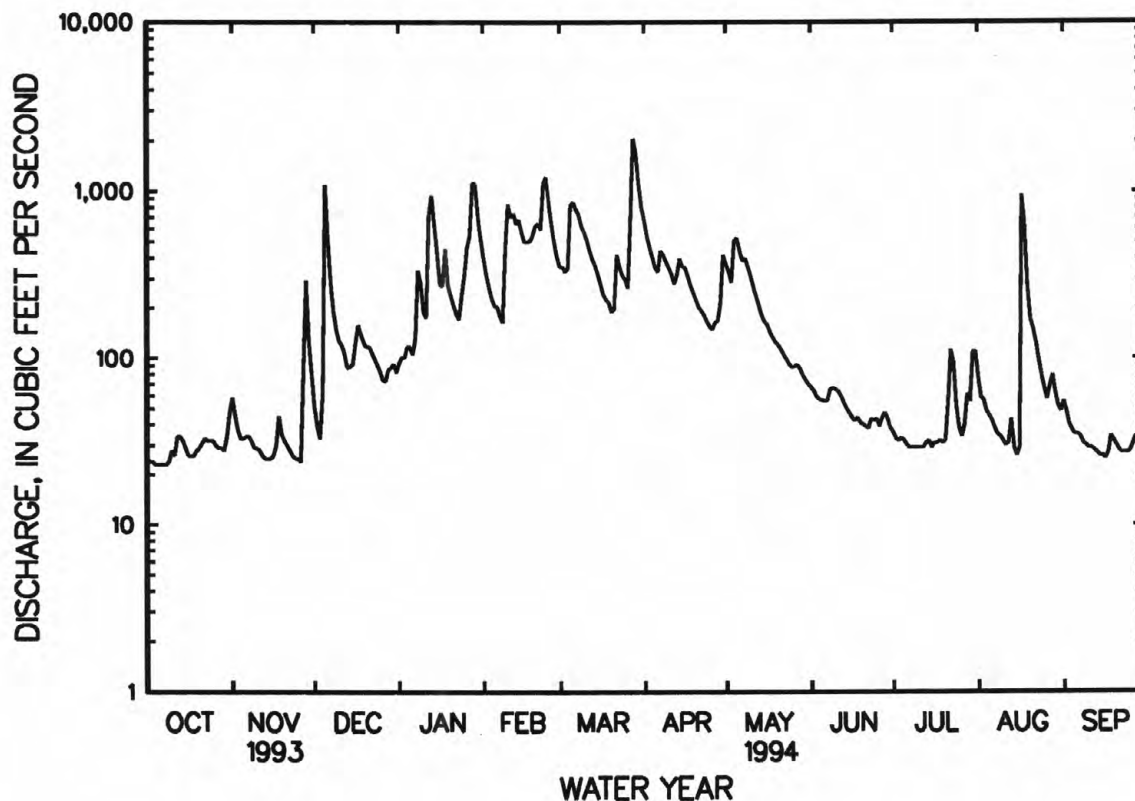
FOR 1994 WATER YEAR

WATER YEARS 1929 - 1956,  
1966 - 1994

ANNUAL TOTAL	64446	74513	
ANNUAL MEAN	177	204	180
HIGHEST ANNUAL MEAN			320
LOWEST ANNUAL MEAN			77.2
HIGHEST DAILY MEAN	3670	Mar 24	2050
LOWEST DAILY MEAN	20	Aug 27	23
ANNUAL SEVEN-DAY MINIMUM	22	Aug 24	23
INSTANTANEOUS PEAK FLOW			2640
INSTANTANEOUS PEAK STAGE			7.23
INSTANTANEOUS LOW FLOW			22
ANNUAL RUNOFF (CFSM)	1.15		1.33
ANNUAL RUNOFF (INCHES)	15.67		18.12
10 PERCENT EXCEEDS	376		545
50 PERCENT EXCEEDS	70		88
90 PERCENT EXCEEDS	26		28

a Also Oct. 5-8, 1993.

b Minimum observed.





## JAMES RIVER BASIN

02015700 BULLPASTURE RIVER AT WILLIAMSVILLE, VA

LOCATION.--Lat 38°11'43", long 79°34'14", Bath County, Hydrologic Unit 02080201, on left bank 15 ft downstream from bridge on State Highway 614 at Williamsville and 0.62 mi upstream from mouth.

DRAINAGE AREA.--110 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORDS.--WSP 2104: Drainage area. WRD VA-62-1: 1961.

GAGE.--Water-stage recorder. Datum of gage is 1,610.14 ft above sea level. Prior to July 12, 1974, at site 700 ft upstream at datum 11.84 ft higher.

REMARKS.--Records good except those for periods with ice effect, Dec. 27, 28, and Dec. 31 to Jan. 4, which are fair. Maximum discharge, 22,900 ft<sup>3</sup>/s, from rating curve extended above 3,300 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 19 ft<sup>3</sup>/s, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	2330	2,020	4.63	Mar. 29	0830	2,100	4.69
Dec. 5	0330	4,220	6.20	May 8	0330	*5,270	*6.87
Jan. 28	1930	2,020	4.63	Aug. 17	1600	2,870	5.28
Feb. 9	0430	2,860	5.27				

Minimum discharge, 31 ft<sup>3</sup>/s, Oct. 16-19, gage height, 1.36 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45	90	120	e54	284	240	392	127	70	42	68	50
2	42	65	101	e58	221	223	308	120	68	40	70	48
3	40	57	91	e58	193	200	272	114	63	39	80	47
4	39	51	206	e61	166	253	242	213	62	44	73	45
5	39	52	2220	70	160	532	221	248	62	44	66	43
6	36	57	500	65	148	526	213	232	65	44	70	43
7	36	57	281	77	143	670	266	1030	72	50	58	42
8	36	51	208	166	181	1130	210	2830	66	44	54	40
9	36	48	166	122	2090	836	196	894	62	43	158	40
10	36	47	150	101	1050	1500	190	490	60	44	88	39
11	36	44	153	103	588	914	180	348	60	42	68	39
12	40	44	122	510	420	532	176	290	58	40	62	38
13	42	43	114	515	368	412	557	240	56	39	56	36
14	35	63	107	360	336	344	438	213	54	40	52	36
15	32	63	105	232	316	305	330	193	56	42	54	35
16	32	56	116	158	305	272	305	178	56	40	52	35
17	31	54	116	138	287	226	254	158	56	48	878	35
18	31	97	110	138	281	218	226	143	60	85	562	36
19	31	80	105	143	302	218	208	134	54	59	221	35
20	36	68	97	107	333	186	188	127	60	127	150	34
21	47	60	95	107	380	196	173	118	54	98	118	34
22	39	52	91	110	348	284	204	112	51	147	99	35
23	35	48	86	107	1260	248	183	105	50	86	86	35
24	34	47	80	126	1290	234	168	97	48	68	73	36
25	34	44	72	305	732	234	160	95	50	58	68	38
26	34	42	66	582	465	210	150	95	47	56	65	39
27	34	260	e62	420	322	907	146	93	52	81	60	39
28	34	752	e60	1240	263	1030	138	84	50	144	58	39
29	34	229	68	1050	---	1530	132	78	44	123	56	38
30	43	156	58	537	---	780	134	75	43	82	52	36
31	93	---	e54	368	---	500	---	72	---	65	50	---
TOTAL	1192	2877	5980	8188	13232	15890	6960	9346	1709	2004	3725	1165
MEAN	38.5	95.9	193	264	473	513	232	301	57.0	64.6	120	38.8
MAX	93	752	2220	1240	2090	1530	557	2830	72	147	878	50
MIN	31	42	54	54	143	186	132	72	43	39	50	34
CFSM	.35	.87	1.75	2.40	4.30	4.66	2.11	2.74	.52	.59	1.09	.35
IN.	.40	.97	2.02	2.77	4.47	5.37	2.35	3.16	.58	.68	1.26	.39

e Estimated.

## 02015700 BULLPASTURE RIVER AT WILLIAMSVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	88.0	121	164	181	224	316	231	188	114	65.8	65.3	60.0
MAX	295	746	543	423	497	655	663	431	376	245	272	248
(WY)	1977	1986	1974	1974	1982	1993	1987	1989	1982	1972	1969	1979
MIN	30.1	35.9	31.9	34.7	63.8	62.2	74.9	65.4	41.4	32.9	27.7	28.5
(WY)	1989	1992	1966	1981	1963	1981	1981	1977	1964	1966	1964	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1961 - 1994

ANNUAL TOTAL	63387	72268	151
ANNUAL MEAN	174	198	245
HIGHEST ANNUAL MEAN			71.2
LOWEST ANNUAL MEAN			1973
HIGHEST DAILY MEAN	2440	Mar 4	2830
LOWEST DAILY MEAN	31	aAug 28	31
ANNUAL SEVEN-DAY MINIMUM	33	Oct 14	33
INSTANTANEOUS PEAK FLOW			5270
INSTANTANEOUS PEAK STAGE			6.87
INSTANTANEOUS LOW FLOW			31
ANNUAL RUNOFF (CFSM)	1.58	1.80	1.38
ANNUAL RUNOFF (INCHES)	21.44	24.44	18.68
10 PERCENT EXCEEDS	330	449	302
50 PERCENT EXCEEDS	78	86	80
90 PERCENT EXCEEDS	36	39	34

a Also Oct. 17-19, 1993.

b Also Oct. 18, 19, 1993

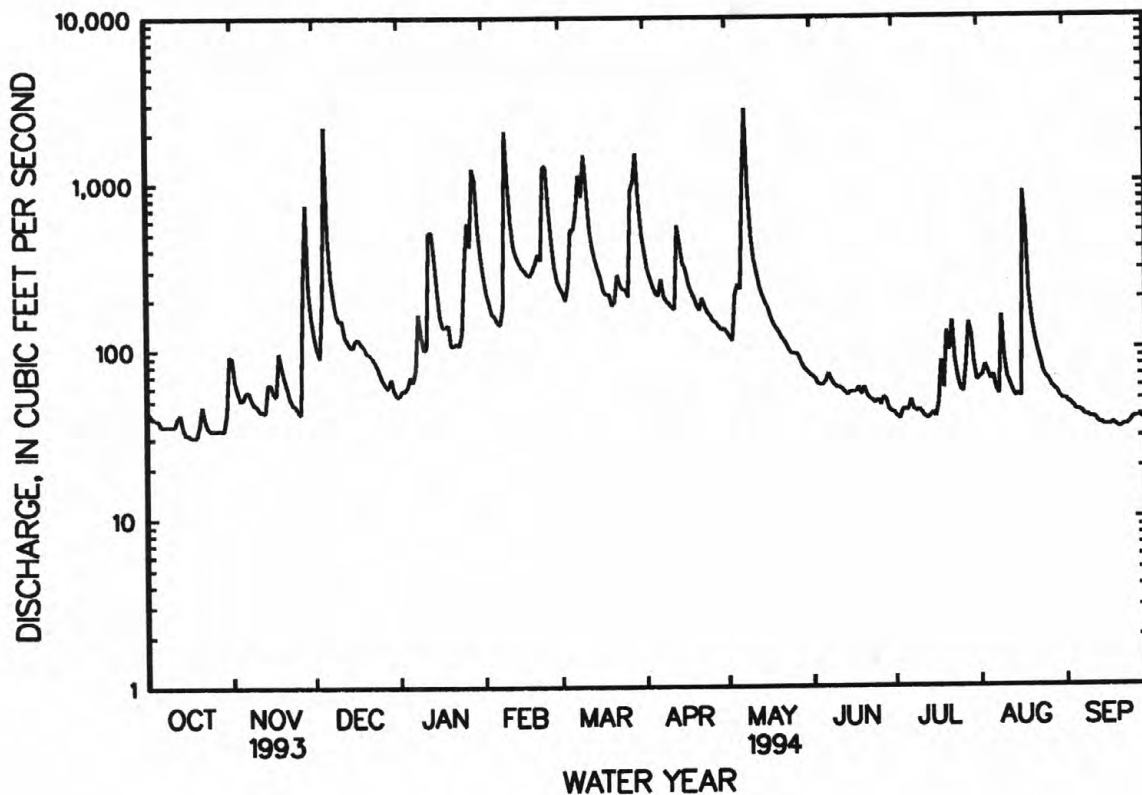
c Also Sept. 9, 1964.

d From floodmarks.

e Estimated.

f Also Oct. 17-19, 1993.

g Result of freezeup.



## JAMES RIVER BASIN

02016000 COWPASTURE RIVER NEAR CLIFTON FORGE, VA

LOCATION.--Lat 37°47'30", long 79°45'35", Alleghany County, Hydrologic Unit 02080201, on left bank 100 ft downstream from bridge on State Highway 633, 2.5 mi upstream from confluence with Jackson River, and 4.0 mi southeast of Clifton Forge.

DRAINAGE AREA.--461 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1925 to current year. Records for May 1907 to August 1908, published in WSP 242, are unreliable and should not be used.

REVISED RECORDS.--WSP 952: 1925-41. WSP 2104: Drainage area. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 1,006.93 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to October 1934, nonrecording gage at site 100 ft upstream at present datum.

REMARKS.--No estimated daily discharges. Records good. Low flow affected by springs and by occasional regulation from unknown source. Maximum discharge, 40,900 ft<sup>3</sup>/s, from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 15.70 ft and 19.15 ft. Minimum gage height, 1.43 ft, Jan. 31, 1981, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 20.8 ft, from floodmarks, discharge, about 45,000 ft<sup>3</sup>/s, from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of records for other stations in James River Basin.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	2000	9,560	10.01	Mar. 28	0915	8,070	9.25
Jan. 29	0330	6,030	8.08	Mar. 29	2345	6,560	8.40
Feb. 10	0530	6,490	8.36	May 8	2030	*9,580	*10.02
Feb. 24	0030	7,570	8.98				

Minimum discharge, 86 ft<sup>3</sup>/s, Sept. 30, gage height, 1.61 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	126	145	401	223	1160	904	1670	434	175	114	190	135
2	112	173	304	224	887	859	1280	398	167	109	165	131
3	105	154	251	208	718	789	1030	367	159	105	183	122
4	101	138	322	266	619	819	880	680	153	103	181	116
5	97	136	6570	287	550	2390	763	1190	150	101	172	114
6	98	135	3290	265	508	2830	695	1100	147	102	160	112
7	93	133	1290	299	471	2680	1150	954	148	102	148	108
8	92	134	787	688	448	3760	1160	6000	175	100	139	104
9	92	128	577	703	2440	3540	926	3730	212	107	128	103
10	93	123	473	484	5120	3350	817	1840	197	108	178	101
11	91	118	428	446	2520	3930	741	1240	188	102	179	99
12	99	115	391	1620	2000	2280	657	943	169	100	146	97
13	102	113	326	2920	1470	1610	833	775	157	99	130	95
14	101	112	295	1830	1540	1300	1510	643	147	101	130	94
15	99	113	301	1230	1440	1090	1210	561	138	103	118	93
16	93	132	472	705	1240	965	1250	519	133	100	126	92
17	91	139	491	553	1270	848	959	459	145	101	1280	94
18	91	164	425	496	1170	740	790	408	152	108	2840	104
19	91	156	396	502	1160	708	682	373	140	130	1170	96
20	92	171	371	496	1300	641	609	350	151	163	624	93
21	93	154	364	482	1440	598	543	326	140	519	466	90
22	94	146	341	390	1450	961	519	302	154	667	370	89
23	102	139	304	395	3830	1040	546	282	143	657	296	87
24	97	133	280	455	5740	905	488	263	148	360	241	88
25	93	128	257	960	3860	858	455	246	154	247	202	89
26	92	125	238	1840	2160	817	448	242	130	191	178	97
27	93	243	229	2100	1460	2570	503	239	142	175	167	97
28	91	1650	225	2680	1080	6590	474	224	140	194	160	92
29	90	1150	227	4890	---	5500	444	207	130	279	149	89
30	96	587	192	2560	---	4460	453	194	121	394	141	86
31	109	---	160	1600	---	2330	---	184	---	248	133	---
TOTAL	3009	7187	20978	32797	49051	62662	24485	25673	4605	6089	10890	3007
MEAN	97.1	240	677	1058	1752	2021	816	828	153	196	351	100
MAX	126	1650	6570	4890	5740	6590	1670	6000	212	667	2840	135
MIN	90	112	160	208	448	598	444	184	121	99	118	86
CFSM	.21	.52	1.47	2.29	3.80	4.38	1.77	1.80	.33	.43	.76	.22
IN.	.24	.58	1.69	2.65	3.96	5.06	1.98	2.07	.37	.49	.88	.24

## JAMES RIVER BASIN

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02016000 COWPASTURE RIVER NEAR CLIFTON FORGE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	285	378	568	708	871	1111	862	645	372	218	237	201
MAX	1474	2745	1883	2154	1844	2531	2878	2342	1484	1213	1531	1244
(WY)	1938	1986	1974	1937	1971	1993	1987	1989	1982	1972	1969	1950
MIN	45.4	62.8	82.9	95.3	89.9	203	255	147	98.1	64.9	64.9	60.3
(WY)	1931	1932	1966	1981	1934	1981	1986	1930	1964	1930	1930	1932

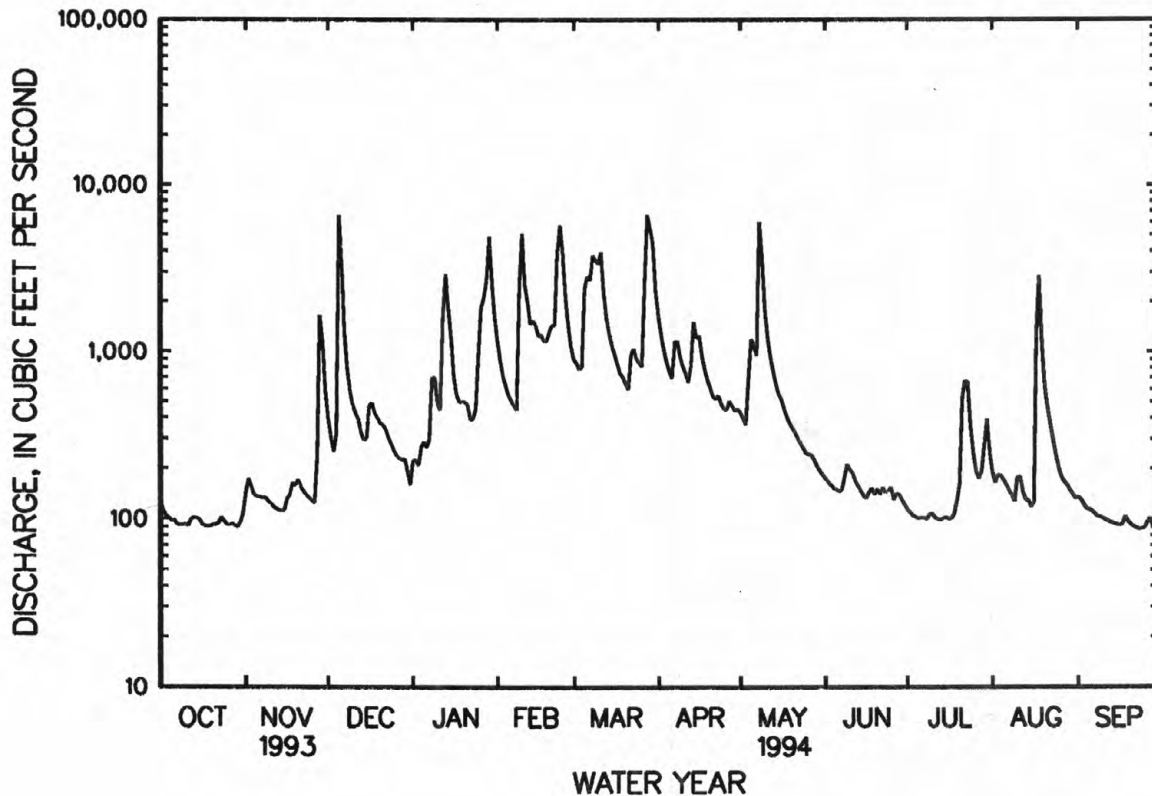
## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1925 - 1994

ANNUAL TOTAL	222217		250433									
ANNUAL MEAN	609		686							536		
HIGHEST ANNUAL MEAN										935		1973
LOWEST ANNUAL MEAN										248		1981
HIGHEST DAILY MEAN	9620	Mar 5		6590	Mar 28		33900	Nov 5	1985			
LOWEST DAILY MEAN	77	Aug 29		86	Sep 30		40	Sep 1	1932			
ANNUAL SEVEN-DAY MINIMUM	80	Aug 23		90	Sep 19		43	Oct 8	1930			
INSTANTANEOUS PEAK FLOW				9580	May 8		40900	Nov 5	1985			
INSTANTANEOUS PEAK STAGE				10.02	May 8		19.15	Nov 5	1985			
INSTANTANEOUS LOW FLOW				86	Sep 30		38	Sep 2	1932			
ANNUAL RUNOFF (CFSM)	1.32		1.49				1.16					
ANNUAL RUNOFF (INCHES)	17.93		20.21				15.79					
10 PERCENT EXCEEDS	1310		1630				1160					
50 PERCENT EXCEEDS	241		248				260					
90 PERCENT EXCEEDS	91		97				86					





## 02016500 JAMES RIVER AT LICK RUN, VA

LOCATION.--Lat 37°46'25", long 79°47'05", Botetourt County, Hydrologic Unit 02080201, on right bank at community of Lick Run, 1,000 ft downstream from bridge on U.S. Highway 220, 0.9 mi downstream from confluence of Cowpasture and Jackson Rivers, 1.8 mi south of Iron Gate, and at mile 342.3.

DRAINAGE AREA.--1,373 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1925 to current year.

REVISED RECORDS.--WSP 852: 1936-37. WSP 972: 1927, 1930(M), 1932(M), 1935-36. WSP 1303: 1927-28(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 978.30 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Oct. 26, 1928, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since December 1979 by Lake Moomaw (station 02011795) 43.7 mi upstream from station; since October 1984 by Back Creek Lake 71.7 mi upstream; and since January 1985 by Little Back Creek Lake 74.8 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Maximum discharge, 87,500 ft<sup>3</sup>/s, from rating curve extended above 66,000 ft<sup>3</sup>/s. Minimum discharge, 133 ft<sup>3</sup>/s, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in November 1877 reached a stage of about 33 ft, discharge, about 120,000 ft<sup>3</sup>/s. Flood in March 1913 reached a stage of 30.4 ft, from floodmarks, discharge, about 98,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 16,800 ft<sup>3</sup>/s, Feb. 23, gage height, 11.78 ft; minimum, 333 ft<sup>3</sup>/s, Oct. 22, gage height, 1.70 ft; minimum daily, 375 ft<sup>3</sup>/s, Nov. 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	522	505	889	590	4650	3640	7960	1590	638	583	785	644
2	457	494	700	677	2950	2980	5750	1500	626	583	707	581
3	435	457	606	655	2560	2810	3950	1320	607	572	763	550
4	422	422	742	826	1850	2400	2870	2140	596	566	725	529
5	416	437	11700	891	1700	5930	2430	3270	589	565	688	519
6	415	415	5980	826	1630	7610	2270	3060	585	558	665	514
7	409	412	2490	880	1530	6770	3260	3040	588	556	627	503
8	407	418	1660	1950	1470	8160	3470	8900	661	553	612	488
9	406	420	1280	2030	5030	7470	2940	10200	699	582	600	485
10	422	390	1090	1420	11900	7480	2670	6030	702	583	628	480
11	404	383	995	1240	8250	11300	2460	4900	679	556	630	483
12	447	376	914	4040	7760	9150	2270	4060	639	547	598	464
13	437	375	800	7150	6130	6440	2560	3060	606	548	689	458
14	430	375	737	4280	6460	4720	3500	1610	583	563	627	453
15	425	376	773	2870	5340	3190	3400	1350	559	553	579	448
16	413	393	1090	1820	4490	2750	3380	1590	553	543	598	444
17	408	420	1240	1670	3780	2380	2930	1500	566	559	3190	459
18	407	514	1140	2130	3480	2120	2300	1400	582	578	5690	511
19	405	463	1040	1820	3470	2000	2040	1150	568	581	2320	470
20	420	480	956	1740	3780	1850	1850	1050	585	587	1480	454
21	412	448	947	1380	4290	1790	1670	992	579	1080	1210	445
22	392	427	882	1240	4160	2700	1550	909	578	1350	1060	441
23	421	413	800	1230	9580	3270	1530	834	619	1380	917	439
24	413	410	743	1400	12800	2960	1430	782	707	918	802	439
25	407	400	697	2310	10300	2850	1370	757	664	739	730	439
26	407	394	647	4050	9280	2710	1340	771	598	673	687	471
27	408	619	609	5450	5860	6280	1430	773	641	672	677	464
28	402	2740	642	7230	4200	15100	1390	740	616	749	721	455
29	401	2010	657	13100	---	13100	1330	708	598	815	678	441
30	433	1190	610	10100	---	12700	1650	682	571	939	637	431
31	473	---	515	5780	---	10800	---	658	---	858	612	---
TOTAL	13076	17576	44571	92775	148680	175410	78950	71326	18382	21489	31932	14402
MEAN	422	586	1438	2993	5310	5658	2632	2301	613	693	1030	480
MAX	522	2740	11700	13100	12800	15100	7960	10200	707	1380	5690	644
MIN	392	375	515	590	1470	1790	1330	658	553	543	579	431
(†)	-115	+64	+452	+322	-27	+117	-134	-16	-121	-78	-59	-181
MEAN#	307	650	1890	3315	5283	5775	2498	2285	492	615	971	299
CFSM#	.22	.47	1.38	2.41	3.85	4.21	1.82	1.66	.36	.45	.71	.22
IN.#	.26	.53	1.59	2.78	4.01	4.85	2.03	1.92	.40	.52	.82	.24

CAL YR 1993 TOTAL 675721 MEAN 1851 MAX 21700 MIN 375 MEAN# 1857 CFSM# 1.35 IN.# 18.37  
WTR YR 1994 TOTAL 728569 MEAN 1996 MAX 15100 MIN 375 MEAN# 2016 CFSM# 1.47 IN.# 19.94

† Change in contents, equivalent in cubic feet per second, in Lake Moomaw; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.



## 02016500 JAMES RIVER AT LICK RUN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1979, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	777	1014	1695	2193	2717	3425	2542	1923	1086	653	685	548
MAX	3670	3988	5458	6362	5613	8393	5307	4882	4349	3346	3949	2839
(WY)	1938	1973	1974	1937	1971	1963	1958	1942	1972	1972	1969	1950
MIN	178	209	265	291	277	1264	832	476	331	209	204	183
(WY)	1931	1932	1966	1956	1934	1940	1942	1941	1964	1930	1930	1930

## SUMMARY STATISTICS

## WATER YEARS 1925 - 1979

ANNUAL MEAN	1606
HIGHEST ANNUAL MEAN	2693
LOWEST ANNUAL MEAN	794
HIGHEST DAILY MEAN	50500
LOWEST DAILY MEAN	156
ANNUAL SEVEN-DAY MINIMUM	162
INSTANTANEOUS PEAK FLOW	66600
INSTANTANEOUS PEAK STAGE	27.01
INSTANTANEOUS LOW FLOW	148
ANNUAL RUNOFF (CFSM)	1.17
ANNUAL RUNOFF (INCHES)	15.88
10 PERCENT EXCEEDS	3530
50 PERCENT EXCEEDS	820
90 PERCENT EXCEEDS	260

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	913	1447	1513	1902	2611	3649	3218	2164	1283	671	733	658
MAX	3495	7206	2910	4980	5310	8083	9349	5639	3660	1135	2704	2654
(WY)	1990	1986	1984	1991	1994	1993	1987	1989	1982	1989	1984	1989
MIN	270	326	328	268	949	623	755	940	561	479	264	269
(WY)	1981	1982	1981	1981	1981	1981	1986	1991	1988	1981	1981	1981

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

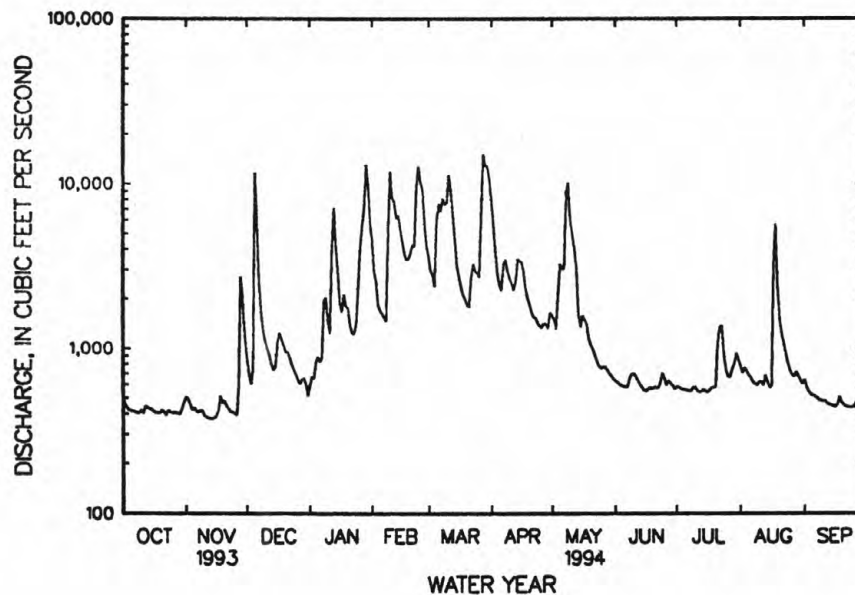
## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	675721	728569	
ANNUAL MEAN	1851	1996	1725
HIGHEST ANNUAL MEAN			2234
LOWEST ANNUAL MEAN			789
HIGHEST DAILY MEAN	21700	Mar 5	15100
LOWEST DAILY MEAN	375	aNov 13	375
ANNUAL SEVEN-DAY MINIMUM	381	Nov 10	381
INSTANTANEOUS PEAK FLOW			16800
INSTANTANEOUS PEAK STAGE			11.78
INSTANTANEOUS LOW FLOW			333
ANNUAL RUNOFF (CFSM)	1.35	1.45	1.26
ANNUAL RUNOFF (INCHES)	18.31	19.74	17.06
10 PERCENT EXCEEDS	3610	5710	3790
50 PERCENT EXCEEDS	742	757	827
90 PERCENT EXCEEDS	421	422	391

a Also Nov. 14, 1993.

b Result of freezeup.



## JAMES RIVER BASIN

02017500 JOHNS CREEK AT NEW CASTLE, VA

LOCATION.--Lat 37°30'22", long 80°06'25", Craig County, Hydrologic Unit 02080201, on right bank 20 ft downstream from bridge on State Highway 615 at New Castle and 1,700 ft upstream from mouth.

DRAINAGE AREA.--104 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1926 to current year.

REVISED RECORDS.--WSP 972: 1935-36(M), 1940(M). WSP 1203: 1928, 1935. WSP 1303: 1927(M), 1928, 1929-34(M), 1935. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,254.30 ft above sea level. Prior to June 7, 1937, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 to Jan. 2 and Jan. 20-23, and periods of doubtful gage-height record, Aug. 26 to Sept. 16 and Sept. 21-24, 27-30, which are fair. Maximum discharge, 8,000 ft<sup>3</sup>/s, from rating curve extended above 3,200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 6.0 ft<sup>3</sup>/s, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0830	2,410	8.66	Aug. 17	1100	*5,190	*10.76
July 30	0700	2,230	8.47				

Minimum discharge, 11 ft<sup>3</sup>/s, Oct. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	23	68	e58	403	338	595	280	31	20	105	e29
2	13	20	51	e72	345	346	496	236	29	19	76	e28
3	13	19	42	84	297	334	432	210	28	19	79	e27
4	13	18	111	118	251	423	387	396	26	20	53	e26
5	12	19	1540	116	218	674	342	374	25	19	44	e25
6	12	19	524	102	197	557	322	319	25	19	38	e24
7	12	19	351	105	168	476	384	287	27	18	32	e23
8	12	20	271	292	151	429	350	328	33	17	29	e22
9	12	20	215	242	284	383	327	287	33	16	30	e21
10	12	20	170	195	430	372	304	249	32	16	25	e21
11	11	19	139	183	495	340	278	215	32	17	29	e20
12	14	19	106	837	589	297	249	187	31	15	44	e20
13	15	18	88	751	562	275	295	160	28	16	29	e19
14	14	19	76	543	588	256	326	135	26	18	23	e19
15	13	18	84	409	501	231	310	118	24	18	21	e18
16	13	18	128	325	470	204	296	108	23	16	36	e18
17	13	18	143	311	492	177	259	91	23	17	2000	21
18	13	20	123	439	506	162	232	82	22	20	584	24
19	13	20	107	283	560	147	207	73	21	19	296	22
20	14	20	95	e230	635	129	183	70	21	17	196	20
21	15	20	96	e200	640	133	158	65	21	33	144	e19
22	15	19	85	e170	525	234	146	59	22	115	103	e18
23	15	19	77	e160	1010	197	130	54	26	40	77	e17
24	15	18	71	238	872	180	114	48	32	28	60	e17
25	15	18	66	267	632	173	101	44	33	23	50	20
26	14	18	63	333	515	156	93	42	25	20	e38	22
27	14	108	e60	396	432	573	106	44	30	25	e37	e20
28	16	267	e57	910	377	1370	114	41	29	44	e36	e18
29	16	132	e55	848	---	1140	178	38	24	34	e33	e17
30	19	96	e53	589	---	799	344	35	22	755	e32	e16
31	24	---	e52	476	---	658	---	33	---	189	e31	---
TOTAL	436	1101	5167	10282	13145	12163	8058	4708	804	1662	4410	631
MEAN	14.1	36.7	167	332	469	392	269	152	26.8	53.6	142	21.0
MAX	24	267	1540	910	1010	1370	595	396	33	755	2000	29
MIN	11	18	42	58	151	129	93	33	21	15	21	16
CFSM	.14	.35	1.60	3.19	4.51	3.77	2.58	1.46	.26	.52	1.37	.20
IN.	.16	.39	1.85	3.68	4.70	4.35	2.88	1.68	.29	.59	1.58	.23

e Estimated.

JAMES RIVER BASIN

275

02017500 JOHNS CREEK AT NEW CASTLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	59.2	89.3	133	181	223	278	228	160	85.9	41.0	43.8	39.2
MAX	396	445	514	510	471	730	820	398	471	291	364	353
(WY)	1930	1986	1949	1937	1927	1955	1987	1989	1972	1941	1940	1989
MIN	9.81	14.0	15.7	16.2	18.0	51.9	48.4	33.5	20.2	8.90	9.39	9.07
(WY)	1992	1931	1940	1956	1934	1988	1986	1930	1970	1930	1930	1930

SUMMARY STATISTICS

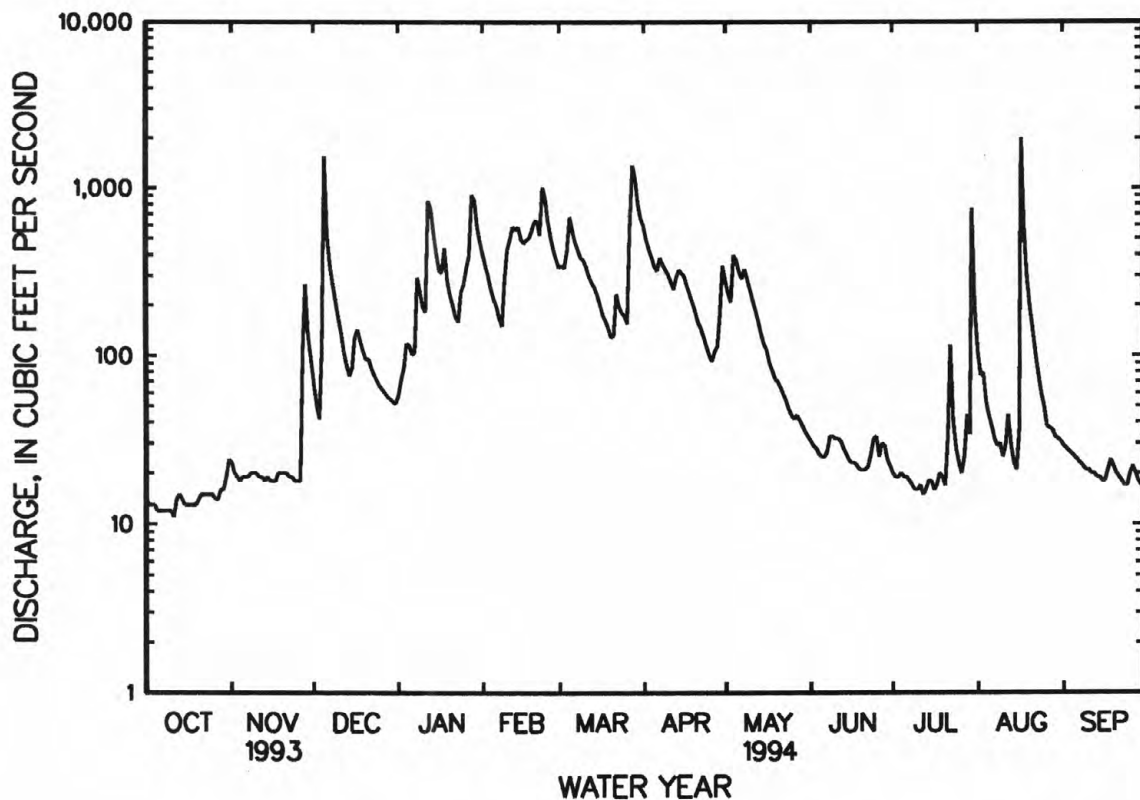
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1927 - 1994

ANNUAL TOTAL	56730	62567	
ANNUAL MEAN	155	171	130
HIGHEST ANNUAL MEAN			235
LOWEST ANNUAL MEAN			66.1
HIGHEST DAILY MEAN	2350	Mar 24	6040
LOWEST DAILY MEAN	11	Oct 11	6.6
ANNUAL SEVEN-DAY MINIMUM	12	aOct 5	7.1
INSTANTANEOUS PEAK FLOW			8000
INSTANTANEOUS PEAK STAGE			12.48
INSTANTANEOUS LOW FLOW			c6.0
ANNUAL RUNOFF (CFSM)	1.49		1.25
ANNUAL RUNOFF (INCHES)	20.29		16.94
10 PERCENT EXCEEDS	394		297
50 PERCENT EXCEEDS	42		59
90 PERCENT EXCEEDS	14		14

- a Also Oct. 6, 1993.  
b Also Oct. 11, 1993.  
c Result of freezeup.



## JAMES RIVER BASIN

02018000 CRAIG CREEK AT PARR, VA

LOCATION.--Lat 37°39'57", long 79°54'42", Botetourt County, Hydrologic Unit 02080201, on right bank 12 ft upstream from abandoned railway bridge, 700 ft downstream from Stony Run, 0.2 mi northeast of Horton, 0.4 mi northwest of Parr, and at mile 12.0.

DRAINAGE AREA.--329 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1925 to current year.

REVISED RECORDS.--WSP 852: 1937. WSP 892: 1935-36. WSP 1303: 1929-30(M), 1932-35(M), 1937-38(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 992.50 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to June 7, 1937, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Dec. 30 to Jan. 3, which is fair. Maximum discharge, 58,500 ft<sup>3</sup>/s, from rating curve extended above 11,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 20 ft<sup>3</sup>/s, probably occurred Dec. 21, 25, 1980, and Jan. 4, 1981, gage height, 3.20 ft, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	2000	7,660	11.26	Aug. 18	0330	*11,300	*13.06
Mar. 28	1945	4,770	9.58				

Minimum discharge, 46 ft<sup>3</sup>/s, Oct. 7-9, 11, 12, gage height, 3.49 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	61	78	226	e190	1010	820	1550	845	111	72	270	224
2	56	83	174	e210	803	801	1260	679	104	67	194	152
3	52	72	143	e200	675	924	1040	570	96	64	183	126
4	50	64	157	298	588	918	898	811	92	61	192	112
5	49	64	4540	400	521	2300	765	1210	88	62	155	104
6	48	63	2330	343	489	2030	700	966	87	64	129	99
7	47	63	1020	325	437	1600	742	781	113	59	108	94
8	47	63	664	615	397	1370	723	782	144	56	95	88
9	47	61	515	789	474	1160	659	735	138	56	87	82
10	48	62	424	561	1050	1040	623	637	119	54	85	77
11	47	60	368	485	1210	969	593	555	112	53	77	74
12	52	60	305	1510	1990	847	549	485	110	52	74	70
13	55	58	259	2850	1540	752	620	428	102	51	111	67
14	57	57	231	1660	1890	695	1090	375	93	52	101	65
15	57	57	239	1140	1560	634	924	334	86	53	91	63
16	53	58	400	707	1320	570	782	306	81	56	94	61
17	52	59	431	642	1470	508	674	276	76	55	2260	63
18	51	64	393	795	1430	457	588	249	73	58	5340	69
19	51	66	349	599	1550	435	530	230	72	60	1370	67
20	53	72	308	554	1720	392	480	218	71	65	753	65
21	54	68	295	532	1760	373	430	207	68	72	564	60
22	55	64	275	486	1490	510	397	195	67	141	441	58
23	55	62	245	468	1980	549	377	182	67	304	348	57
24	55	60	224	511	3020	507	339	169	106	185	280	57
25	54	60	208	756	2010	490	311	158	130	128	235	57
26	54	59	197	865	1540	454	290	151	113	96	204	62
27	55	107	178	998	1180	850	324	150	93	89	187	67
28	54	1000	186	1780	958	3620	411	148	88	101	193	65
29	54	481	193	3080	---	3570	428	138	90	152	179	60
30	60	298	e180	1790	---	2660	906	129	78	571	156	55
31	68	---	e160	1300	---	1840	---	121	---	484	141	---
TOTAL	1651	3543	15817	27439	36062	34645	20003	13220	2868	3493	14697	2420
MEAN	53.3	118	510	885	1288	1118	667	426	95.6	113	474	80.7
MAX	68	1000	4540	3080	3020	3620	1550	1210	144	571	5340	224
MIN	47	57	143	190	397	373	290	121	67	51	74	55
CFSM	.16	.36	1.55	2.69	3.91	3.40	2.03	1.30	.29	.34	1.44	.25
IN.	.19	.40	1.79	3.10	4.08	3.92	2.26	1.49	.32	.39	1.66	.27

e Estimated.

## JAMES RIVER BASIN

277

02018000 CRAIG CREEK AT PARR, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	197	288	393	539	657	800	667	461	254	137	164	139
MAX	1093	2112	1519	1642	1466	2116	2427	1202	1134	979	1290	974
(WY)	1938	1986	1949	1937	1927	1993	1987	1942	1972	1941	1940	1928
MIN	34.9	45.9	48.9	51.2	55.6	141	157	93.2	66.2	33.5	35.6	34.1
(WY)	1931	1931	1966	1956	1934	1988	1986	1930	1926	1966	1964	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1925 - 1994

ANNUAL TOTAL	165206		175858									
ANNUAL MEAN	453		482									
HIGHEST ANNUAL MEAN										391		
LOWEST ANNUAL MEAN										655		1973
HIGHEST DAILY MEAN	7110	Mar 24	5340	Aug 18						185		1981
LOWEST DAILY MEAN	40	<sup>a</sup> Aug 23	47	<sup>b</sup> Oct 7						21000	Nov 4	1985
ANNUAL SEVEN-DAY MINIMUM	42	Aug 18	48	Oct 5						27	Aug 22	1964
INSTANTANEOUS PEAK FLOW			11300	Aug 18						58500	Nov 4	1985
INSTANTANEOUS PEAK STAGE			13.06	Aug 18						<sup>c</sup> 24.76	Nov 4	1985
INSTANTANEOUS LOW FLOW			46	<sup>d</sup> Oct 7						<sup>f</sup> 20	<sup>g</sup> Dec 21	1980
ANNUAL RUNOFF (CFSM)	1.38		1.46							1.19		
ANNUAL RUNOFF (INCHES)	18.68		19.88							16.14		
10 PERCENT EXCEEDS	1030		1280							866		
50 PERCENT EXCEEDS	143		194							181		
90 PERCENT EXCEEDS	48		56							49		

a Also Aug. 24, 1993.

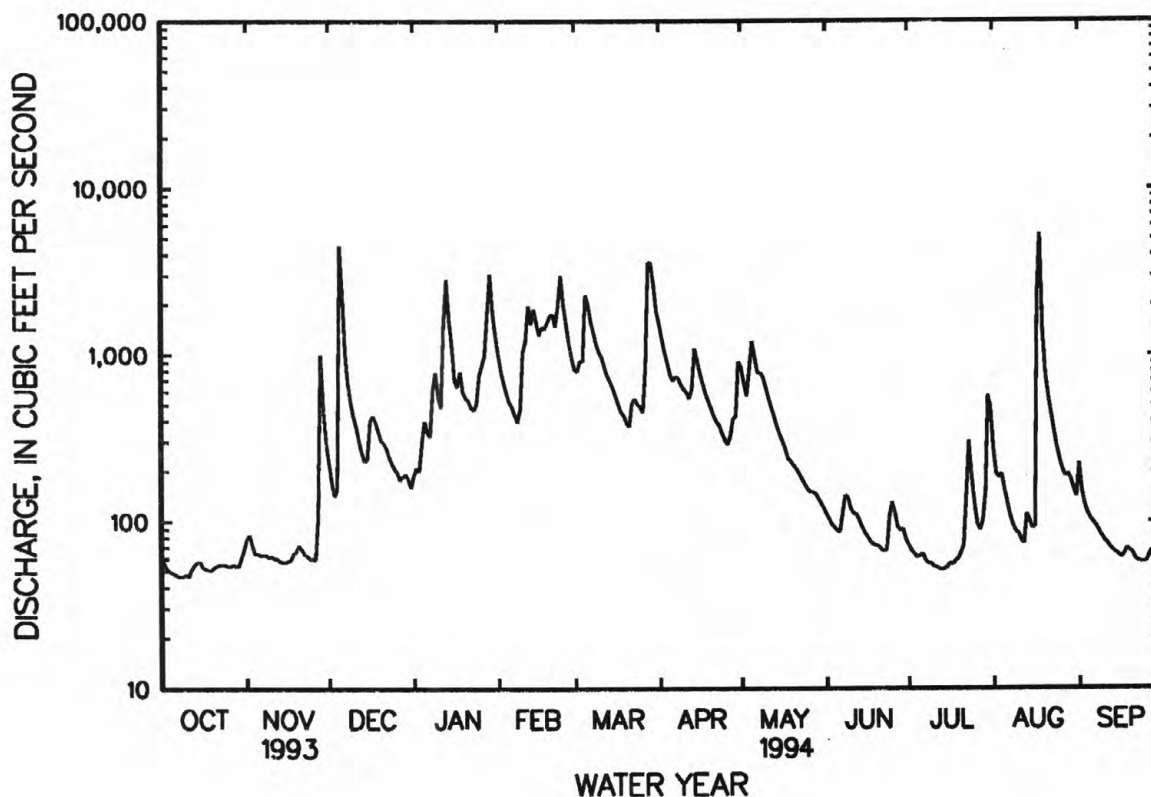
b Also Oct. 8, 9, 11, 1993.

c From floodmarks.

d Also Oct. 8, 9, 11, 12, 1993.

f Result of freezeup.

g Also probably occurred Dec. 25, 1980, and Jan. 4, 1981.





## 02018500 CATAWBA CREEK NEAR CATAWBA, VA

LOCATION.--Lat 37°28'05", long 80°00'20", Botetourt County, Hydrologic Unit 02080201, on right bank 80 ft upstream from bridge on State Highway 779, 1.0 mi downstream from Little Catawba Creek, 1.9 mi west of Haymakertown, and 8.2 mi northeast of Catawba.

DRAINAGE AREA.--34.3 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1943 to current year.

REVISED RECORDS.--WSP 1303: 1944-45(M). WSP 2104: Drainage area. WDR VA-72-1: 1954, 1955(P), 1957-58(P), 1959, 1960-62(P), 1963, 1964(M), 1965-67(P), 1968(M), 1969, 1970(M), 1971.

GAGE.--Water-stage recorder. Datum of gage is 1,299.96 ft above sea level. Prior to Aug. 1, 1953, nonrecording gage at site 80 ft downstream at same datum.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 5-14, Nov. 29 to Dec. 1, Jan. 19-21, and Sept. 14-16, 19-25, 27-30, and periods with ice effect, Dec. 27 to Jan. 1 and Jan. 18, 23, which are fair. At a point 5.3 mi upstream from station, there has been transmountain diversion through a tunnel into Roanoke River Basin for municipal water supply of city of Roanoke since December 1974. From October 1953 to October 1976, monthly means adjusted for pumpage by Citadel Cement Corporation. Maximum discharge, 21,200 ft<sup>3</sup>/s, from rating curve extended above 1,700 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 10.35 ft and 19.19 ft. Minimum discharge, 0.28 ft<sup>3</sup>/s, Aug. 21, 1987, gage height, 0.99 ft, cause unknown. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 13.26 ft, from information by observer.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,630 ft<sup>3</sup>/s, Aug. 17, gage height, 5.36 ft; minimum daily, 3.2 ft<sup>3</sup>/s, Oct. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	3.9	12	e8.6	e7.0	24	73	124	48	12	8.5	12	11		
2	3.9	10	8.0	7.9	19	92	99	40	11	8.3	13	9.5		
3	3.5	10	7.4	8.6	15	114	84	37	11	8.2	17	9.1		
4	3.6	9.6	26	12	14	241	75	85	12	8.9	15	9.0		
5	e3.5	10	382	11	13	348	66	88	12	8.6	14	8.9		
6	e3.3	9.8	33	9.7	12	227	63	75	12	8.6	11	8.7		
7	e3.2	11	19	10	11	161	58	63	13	8.0	9.5	8.4		
8	e3.3	11	17	18	11	130	51	57	13	7.8	9.2	8.2		
9	e3.5	10	18	15	20	110	47	49	12	7.5	9.5	8.0		
10	e4.0	10	15	12	25	100	45	42	12	7.5	8.5	7.0		
11	e4.5	9.9	12	15	57	87	44	37	12	7.4	10	7.4		
12	e4.8	9.8	10	161	89	77	40	34	12	7.4	13	6.9		
13	e5.4	9.7	9.5	49	160	70	77	31	11	7.5	11	6.9		
14	e4.8	9.6	8.6	31	169	65	88	28	11	9.2	10	e6.7		
15	4.3	10	15	21	138	59	74	27	10	8.3	9.4	e6.5		
16	4.3	10	17	27	136	53	69	26	8.7	7.3	15	e6.4		
17	4.6	11	15	18	153	49	60	24	9.1	9.0	567	8.1		
18	4.6	11	13	e17	152	48	54	23	10	11	81	8.4		
19	5.1	9.5	12	e15	170	42	52	22	9.9	10	34	e7.4		
20	5.8	9.1	11	e13	193	39	48	21	10	8.9	25	e7.2		
21	7.0	9.2	11	e12	188	40	42	20	9.8	12	21	e7.0		
22	6.6	8.9	12	11	142	42	40	19	9.7	13	18	e6.6		
23	6.8	7.9	10	e13	355	37	37	19	10	15	17	e6.2		
24	7.1	7.9	8.4	15	308	30	34	17	10	14	15	e6.2		
25	7.4	8.8	8.2	15	180	15	31	15	10	11	13	e6.6		
26	8.3	8.7	7.6	16	128	14	31	15	9.1	9.7	12	7.6		
27	9.1	18	e7.4	19	98	39	36	14	12	13	13	e6.6		
28	9.4	17	e7.1	57	80	456	30	14	10	14	12	e6.2		
29	9.5	e15	e6.9	54	---	409	40	13	9.4	19	13	e6.0		
30	13	e11	e6.8	32	---	237	55	13	8.9	24	14	e5.9		
31	14	---	e6.6	26	---	161	---	13	---	18	12	---		
TOTAL	182.1	315.4	749.1	748.2	3060	3665	1694	1029	322.6	330.6	1054.1	224.6		
MEAN	5.87	10.5	24.2	24.1	109	118	56.5	33.2	10.8	10.7	34.0	7.49		
MAX	14	18	382	161	355	456	124	88	13	24	567	11		
MIN	3.2	7.9	6.6	7.0	11	14	30	13	8.7	7.3	8.5	5.9		
(†)	0	.30	8.63	15.8	2.36	0	0	.37	.01	2.77	20.4	2.83		
MEAN#	5.87	10.8	32.8	39.9	111	118	56.5	33.6	10.8	13.5	54.4	10.3		
CFSM#	.17	.31	.96	1.16	3.24	3.44	1.65	1.98	.31	.39	1.59	.30		
IN.#	.20	.35	1.10	1.34	3.37	3.97	1.84	1.13	.35	.45	1.83	.34		
CAL YR 1993	TOTAL	18432.4	MEAN	50.5	MAX	1320	MIN	1.3	MEAN#	51.8	CFSM#	1.51	IN.#	20.50
WTR YR 1994	TOTAL	13374.7	MEAN	36.6	MAX	567	MIN	3.2	MEAN#	41.1	CFSM#	1.20	IN.#	16.27

† Average diversion, equivalent in cubic feet per second, provided by city of Roanoke.

# Adjusted for diversion.

e Estimated.

## 02018500 CATAWBA CREEK NEAR CATAWBA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1952, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	23.7	27.4	40.1	52.2	65.6	69.0	67.0	47.1	33.3	24.4	20.0	22.9
MAX	106	93.2	134	104	104	103	152	114	108	107	46.5	62.2
(WY)	1948	1948	1949	1947	1948	1951	1951	1950	1949	1949	1949	1945
MIN	5.00	5.89	7.70	15.1	20.0	35.1	23.1	21.5	7.93	4.95	3.91	5.94
(WY)	1952	1944	1944	1951	1947	1950	1945	1945	1944	1944	1944	1951

## SUMMARY STATISTICS

## WATER YEARS 1944 - 1952

ANNUAL MEAN	40.9
HIGHEST ANNUAL MEAN	75.5
LOWEST ANNUAL MEAN	22.3
HIGHEST DAILY MEAN	1540
LOWEST DAILY MEAN	a2.2
ANNUAL SEVEN-DAY MINIMUM	a2.4
INSTANTANEOUS PEAK FLOW	3300
INSTANTANEOUS PEAK STAGE	c5.80
INSTANTANEOUS LOW FLOW	a2.2
ANNUAL RUNOFF (CFSM)	1.19
ANNUAL RUNOFF (INCHES)	16.21
10 PERCENT EXCEEDS	84
50 PERCENT EXCEEDS	21
90 PERCENT EXCEEDS	6.1

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	18.1	29.4	28.2	37.6	57.2	82.7	67.7	41.2	24.6	11.6	12.6	13.3
MAX	82.2	390	127	103	138	278	337	138	160	52.2	75.5	105
(WY)	1990	1986	1973	1991	1957	1993	1987	1958	1972	1989	1985	1979
MIN	2.63	2.01	3.16	3.45	5.82	6.20	6.78	9.75	5.06	2.59	2.28	2.30
(WY)	1964	1982	1982	1981	1981	1981	1981	1963	1966	1966	1981	1981

## SUMMARY STATISTICS

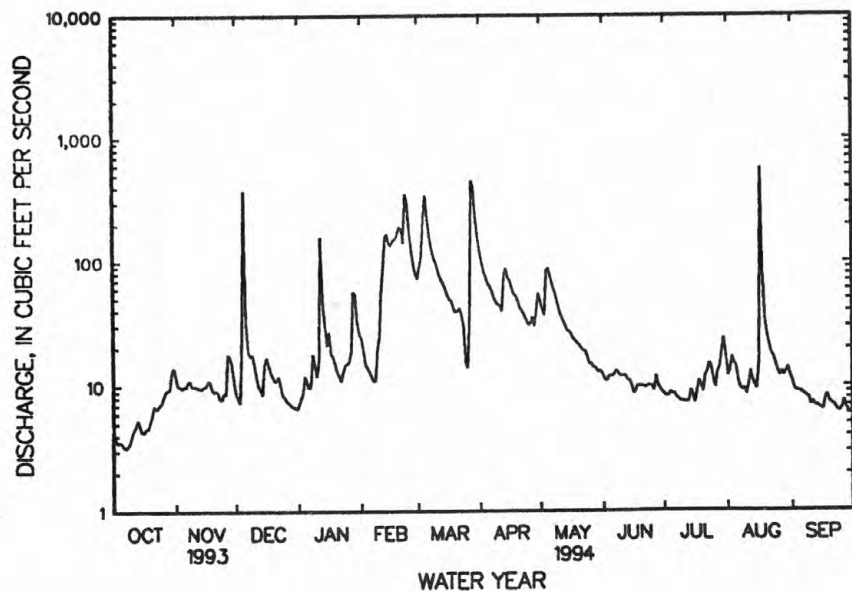
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1953 - 1994

ANNUAL TOTAL	18432.4	13374.7	
ANNUAL MEAN	50.5	36.6	35.2
HIGHEST ANNUAL MEAN			66.6
LOWEST ANNUAL MEAN			6.16
HIGHEST DAILY MEAN	1320	Mar 4	567
LOWEST DAILY MEAN	1.3	Aug 24	e3.2
ANNUAL SEVEN-DAY MINIMUM	2.5	fAug 20	e3.4
INSTANTANEOUS PEAK FLOW			1630
INSTANTANEOUS PEAK STAGE			5.36
INSTANTANEOUS LOW FLOW			(j)
ANNUAL RUNOFF (CFSM)	1.47		1.07
ANNUAL RUNOFF (INCHES)	19.99		14.51
10 PERCENT EXCEEDS	117		87
50 PERCENT EXCEEDS	12		12
90 PERCENT EXCEEDS	3.6		6.9

- a Observed.  
b Also Sept. 10, 1944.  
c From floodmark or crest-stage indicator.  
d Also Sept. 8-11, 1944.  
e Estimated.  
f Also Oct. 21-23, 1993.  
g Also Nov. 17, 1963.  
h From high-water mark.  
j Not determined.  
k Probably occurred Oct. 7, 1993.  
m Regulation from unknown source.



## JAMES RIVER BASIN

02019500 JAMES RIVER AT BUCHANAN, VA

LOCATION.--Lat 37°31'50", long 79°40'45", Botetourt County, Hydrologic Unit 02080201, on left bank 300 ft upstream from bridge on U.S. Highway 11 at Buchanan, 1,000 ft upstream from Purgatory Creek, 1.5 mi downstream from Looney Creek, and at mile 306.4.

DRAINAGE AREA.--2,075 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1898 to current year. Monthly discharge only for some periods, published in WSP 1303. Records for August 1895 to Feb. 11, 1898, published in WSP 11, 15, and 27 are in error and should not be used. Gage-height records collected at this site since 1893 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 602: 1917-24. WSP 972: 1935-36. WSP 1303: 1898-1916, 1917-20(M), 1922(M), 1924(M). WSP 1383: 1927. WSP 2104: Drainage area. WDR VA-72-1: 1913(M). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 802.90 ft above sea level. Prior to July 1, 1927, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Jan. 17-23, which is fair. Flow regulated since December 1979 by Lake Moomaw (station 02011795) 79.6 mi upstream; since October 1984 by Back Creek Lake 107.6 mi upstream, amount unknown; and since January 1985 by Little Back Creek Lake 110.7 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Maximum discharge, 179,000 ft<sup>3</sup>/s, from rating curve extended above 110,000 ft<sup>3</sup>/s. Minimum gage height, 1.44 ft, Sept. 8, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in November 1877 reached a stage of 34.9 ft, from floodmark, discharge, about 142,000 ft<sup>3</sup>/s, from rating curve extended above 110,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,000 ft<sup>3</sup>/s, Dec. 6, gage height, 14.19 ft; minimum, 469 ft<sup>3</sup>/s, Oct. 23, gage height, 2.25 ft; minimum daily, 496 ft<sup>3</sup>/s, Oct. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	740	660	1430	781	7420	6050	12100	3280	890	734	1390	1030		
2	670	723	1120	965	5360	5170	9340	2940	861	742	1160	1000		
3	580	865	919	976	4300	5140	7250	2570	841	732	1510	879		
4	547	699	890	1270	3540	4770	5410	3090	816	716	1190	834		
5	527	598	14600	1620	3020	10200	4520	5680	808	705	1160	799		
6	516	613	16100	1500	2860	13000	4130	5460	815	698	1050	790		
7	510	571	5080	1410	2670	10900	4580	4890	874	691	958	772		
8	505	562	3120	2400	2490	11200	5580	7550	902	677	898	745		
9	502	571	2310	3670	3370	11000	4790	13000	957	676	858	733		
10	512	565	1870	2680	14000	9700	4360	8520	993	723	827	717		
11	511	529	1640	2110	11900	13400	4070	6860	951	698	870	722		
12	541	519	1450	4590	12900	12100	3770	5700	902	675	839	692		
13	584	510	1280	14000	10200	9530	3960	4760	856	674	811	675		
14	566	507	1140	8820	10700	7370	5710	3220	816	691	949	665		
15	554	505	1110	5890	9530	5450	5690	2200	783	694	834	659		
16	543	501	1500	3820	8200	4530	5380	2200	753	683	838	648		
17	529	528	1910	e3000	7430	3990	4850	2220	749	702	4770	650		
18	521	646	1810	e3100	6930	3570	4030	2030	764	741	16700	720		
19	517	683	1620	e2900	6880	3340	3500	1800	769	784	6160	710		
20	524	630	1480	e2700	7450	3120	3160	1550	829	749	3420	665		
21	540	628	1420	e2400	8210	2950	2850	1440	783	988	2630	646		
22	528	593	1340	e2200	7860	3680	2610	1330	773	1370	2160	631		
23	501	564	1220	e2100	10900	4950	2500	1210	766	2290	1720	624		
24	529	544	1120	2550	21000	4550	2360	1130	860	1520	1430	621		
25	518	539	1050	3580	15600	4310	2180	1080	944	1100	1240	624		
26	514	521	969	5200	13000	4130	2080	1050	859	951	1130	641		
27	515	600	885	7920	9730	6110	2220	1080	863	1030	1060	657		
28	511	3450	917	10200	7160	22100	2390	1030	870	1090	1090	641		
29	496	4030	949	19200	---	22100	2270	1000	803	1080	1080	621		
30	533	2060	914	14700	---	20000	2990	958	773	1900	998	599		
31	621	---	819	9830	---	15300	---	920	---	2040	963	---		
TOTAL	16805	25514	73982	148082	234610	263710	130630	101748	25223	29544	62693	21410		
MEAN	542	850	2387	4777	8379	8507	4354	3282	841	953	2022	714		
MAX	740	4030	16100	19200	21000	22100	12100	13000	993	2290	16700	1030		
MIN	496	501	819	781	2490	2950	2080	920	749	674	811	599		
(†)	-115	+64	+452	+322	-27	+117	-134	-16	-121	-78	-59	-181		
MEAN#	427	914	2839	5099	8352	8624	4220	3266	720	875	1963	533		
CFSM#	.21	.44	1.37	2.46	4.02	4.16	2.03	1.57	.35	.42	.95	.26		
IN.#	.24	.49	1.58	2.83	4.19	4.79	2.27	1.82	.39	.49	1.09	.29		
CAL YR 1993	TOTAL	1048462	MEAN	2872	MAX	46300	MIN	496	MEAN#	2878	CFSM#	1.39	IN.#	18.83
WTR YR 1994	TOTAL	1133951	MEAN	3107	MAX	22100	MIN	496	MEAN#	3127	CFSM#	1.51	IN.#	20.46

† Change in contents, equivalent in cubic feet per second, in Lake Moomaw; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

e Estimated.

## 02019500 JAMES RIVER AT BUCHANAN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 1979, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1261	1488	2488	3426	4035	5103	3873	2897	1923	1180	1192	921
MAX	6980	5807	8377	10140	8459	11460	8920	7186	7606	5080	6187	4507
(WY)	1907	1973	1949	1937	1927	1955	1901	1942	1972	1905	1940	1979
MIN	294	329	351	371	412	1779	1097	685	525	263	289	281
(WY)	1931	1932	1966	1956	1934	1940	1915	1930	1970	1966	1964	1968

## SUMMARY STATISTICS

## WATER YEARS 1898 - 1979

ANNUAL MEAN	2475
HIGHEST ANNUAL MEAN	4138
LOWEST ANNUAL MEAN	1318
HIGHEST DAILY MEAN	92200
LOWEST DAILY MEAN	207
ANNUAL SEVEN-DAY MINIMUM	212
INSTANTANEOUS PEAK FLOW	115000
INSTANTANEOUS PEAK STAGE	a31.00
INSTANTANEOUS LOW FLOW	202
ANNUAL RUNOFF (CFSM)	1.19
ANNUAL RUNOFF (INCHES)	16.20
10 PERCENT EXCEEDS	5220
50 PERCENT EXCEEDS	1300
90 PERCENT EXCEEDS	410

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1401	2154	2315	3015	4007	5504	5178	3303	1921	1024	1109	1020
MAX	5679	10190	4554	7631	8379	12790	16170	8908	5251	2236	3834	4239
(WY)	1990	1986	1984	1991	1994	1993	1987	1989	1982	1989	1984	1989
MIN	419	453	453	396	1260	922	1126	1515	841	651	338	361
(WY)	1981	1982	1981	1981	1981	1981	1986	1991	1994	1981	1981	1981

## SUMMARY STATISTICS

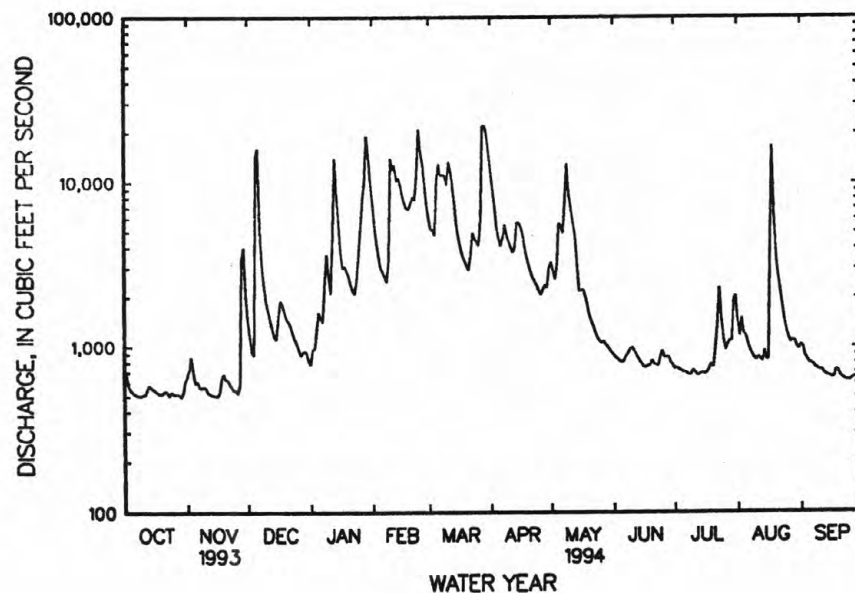
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	1048462	1133951	2653
ANNUAL MEAN	2872	3107	3664
HIGHEST ANNUAL MEAN			1092
LOWEST ANNUAL MEAN			102000
HIGHEST DAILY MEAN	46300	Mar 5	22100
LOWEST DAILY MEAN	496	Oct 29	496
ANNUAL SEVEN-DAY MINIMUM	512	Oct 5	512
INSTANTANEOUS PEAK FLOW			27000
INSTANTANEOUS PEAK STAGE			14.19
INSTANTANEOUS LOW FLOW			469
ANNUAL RUNOFF (CFSM)	1.38	1.50	1.28
ANNUAL RUNOFF (INCHES)	18.80	20.33	17.37
10 PERCENT EXCEEDS	6150	8640	5850
50 PERCENT EXCEEDS	1060	1130	1320
90 PERCENT EXCEEDS	547	563	541

- a From floodmarks.  
b Result of freezeup.  
c Also Jan. 12, 1981.





## JAMES RIVER BASIN

02020500 CALFPASTURE RIVER ABOVE MILL CREEK, AT GOSHEN, VA

LOCATION.--Lat 37°59'16", long 79°29'38", Rockbridge County, Hydrologic Unit 02080202, on left bank 20 ft upstream from bridge on State Highway 42 at Goshen and 400 ft upstream from Mill Creek.

DRAINAGE AREA.--144 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,384.84 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 26, 27, 30, 31, and period of no gage-height record, Jan. 15-23, which are fair. Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 56,300 ft<sup>3</sup>/s, from rating curve extended above 9,200 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 12.78 ft and 20.23 ft. No flow Sept. 5, 6, 1957, Sept. 28, 1959, result of diversion. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1130	*4,390	*6.73	Mar. 29	1600	3,550	5.99
Jan. 28	2100	2,810	5.23	May 8	1030	2,870	5.30
Feb. 24	1700	3,140	5.60	Aug. 17	2300	2,940	5.38

Minimum discharge, 6.4 ft<sup>3</sup>/s, Sept. 29-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	14	138	71	395	283	596	98	30	12	62	24
2	16	13	106	65	288	260	390	93	28	11	57	20
3	15	14	86	60	247	232	299	88	24	14	50	16
4	13	15	91	68	200	240	249	161	23	11	41	15
5	12	21	2750	113	169	914	207	410	20	9.7	33	14
6	12	24	1240	92	152	1080	190	400	17	9.4	30	14
7	11	21	516	72	137	1240	608	418	16	13	25	13
8	10	20	297	202	129	1960	549	2180	23	10	20	12
9	10	19	217	347	1320	1640	405	1140	38	9.3	17	12
10	10	18	173	286	1720	1570	321	570	35	10	15	12
11	10	16	152	228	958	1610	264	338	31	8.9	15	11
12	11	16	126	854	554	920	222	247	27	7.9	14	11
13	11	16	111	1290	405	571	242	190	23	7.7	13	10
14	11	16	100	769	386	420	348	153	19	8.8	13	10
15	9.7	16	96	e430	398	345	339	132	16	8.6	12	9.6
16	9.5	15	104	e180	391	304	300	119	15	7.5	14	9.5
17	8.9	16	103	e160	410	262	242	101	59	20	836	9.7
18	8.8	19	106	e240	385	224	202	90	52	16	1600	9.7
19	9.1	19	111	e190	382	204	175	82	41	11	475	9.5
20	9.5	18	109	e150	432	172	155	77	36	13	231	8.4
21	9.4	25	114	e130	539	164	137	71	27	49	157	8.2
22	9.0	28	108	e120	549	214	147	64	24	641	136	8.2
23	8.8	26	100	e100	1600	241	140	59	22	255	103	8.2
24	8.8	24	92	168	2560	242	131	54	21	163	80	8.0
25	9.1	23	98	400	1740	257	129	50	18	112	65	8.0
26	9.0	21	e90	773	921	244	125	49	16	101	55	8.2
27	8.9	37	e85	790	514	978	121	47	16	86	47	8.0
28	8.8	870	73	1560	346	2320	119	44	15	104	40	7.7
29	8.8	421	80	2030	---	2830	108	40	14	101	35	6.9
30	11	208	e70	1080	---	1810	104	37	13	96	30	6.4
31	14	---	e62	618	---	975	---	33	---	82	26	---
TOTAL	333.1	2029	7704	13636	18227	24726	7564	7635	759	2008.8	4347	328.2
MEAN	10.7	67.6	249	440	651	798	252	246	25.3	64.8	140	10.9
MAX	20	870	2750	2030	2560	2830	608	2180	59	641	1600	24
MIN	8.8	13	62	60	129	164	104	33	13	7.5	12	6.4
CFSM	.07	.47	1.73	3.05	4.52	5.54	1.75	1.71	.18	.45	.97	.08
IN.	.09	.52	1.99	3.52	4.71	6.39	1.95	1.97	.20	.52	1.12	.08

e Estimated.



02020500 CALFPASTURE RIVER ABOVE MILL CREEK, AT GOSHEN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	78.5	129	194	219	269	367	272	221	129	47.6	58.8	47.8
MAX	469	1540	768	570	651	849	992	638	600	352	458	501
(WY)	1977	1986	1974	1979	1994	1993	1987	1942	1982	1972	1940	1979
MIN	3.90	6.21	9.45	7.82	47.7	50.9	55.1	29.0	10.2	3.77	3.85	2.08
(WY)	1942	1942	1966	1981	1977	1981	1967	1977	1964	1966	1964	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

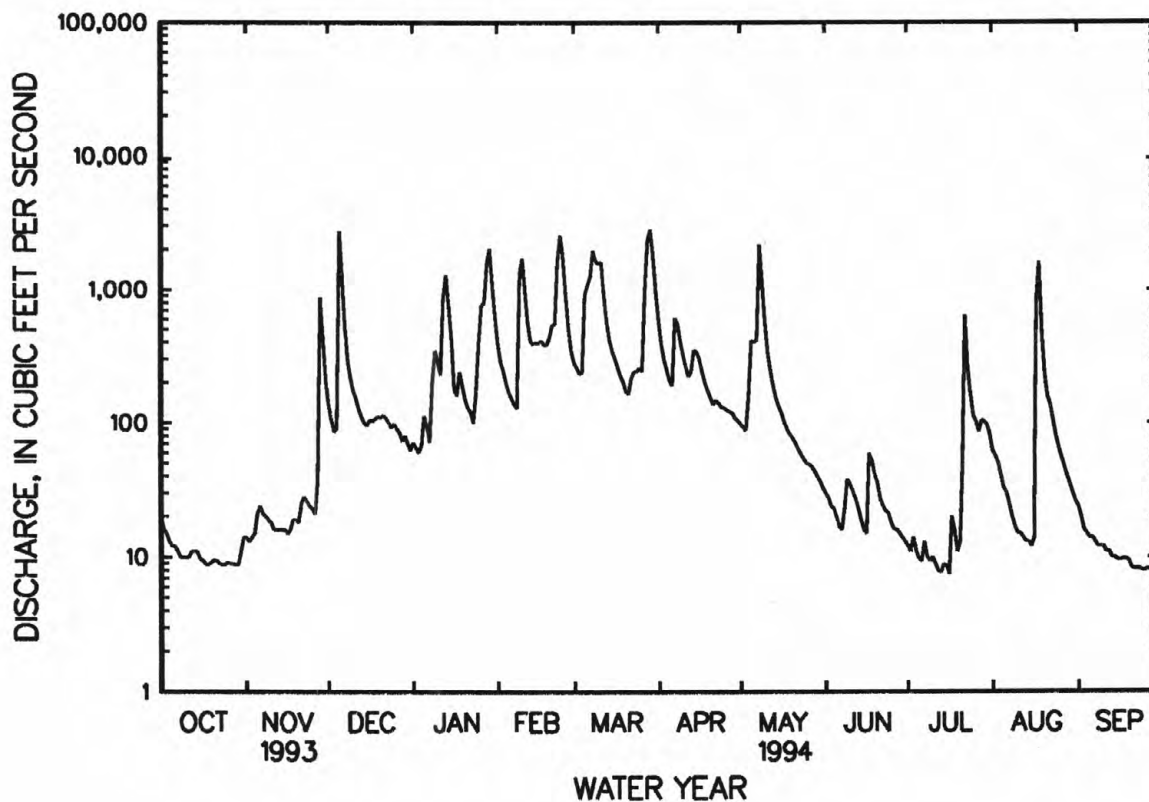
## WATER YEARS 1939 - 1994

ANNUAL TOTAL	66441.2		89297.1									
ANNUAL MEAN	182		245									
HIGHEST ANNUAL MEAN										169		
LOWEST ANNUAL MEAN										303		1973
HIGHEST DAILY MEAN										65.3		1956
LOWEST DAILY MEAN	3620	Mar 4		2830	Mar 29					21900	Nov 5	1985
ANNUAL SEVEN-DAY MINIMUM	3.0	Aug 25		6.4	Sep 30					a.00	bSep 5	1957
INSTANTANEOUS PEAK FLOW	3.4	Aug 19		7.6	Sep 24					.93	Sep 19	1970
INSTANTANEOUS PEAK STAGE				4390	Dec 5					56300	Nov 4	1985
INSTANTANEOUS LOW FLOW				6.73	Dec 5					20.23	Nov 4	1985
ANNUAL RUNOFF (CFSM)	1.26			6.4	cSep 29					a.00	bSep 5	1957
ANNUAL RUNOFF (INCHES)	17.16			1.70						1.17		
10 PERCENT EXCEEDS	431			23.07						15.94		
50 PERCENT EXCEEDS	51			627						380		
90 PERCENT EXCEEDS	5.9			80						64		
				9.7						7.8		

a Result of diversion.

b Also Sept. 6, 1957, and Sept. 28, 1959.

c Also Sept. 30, 1994.



## JAMES RIVER BASIN

02021500 MAURY RIVER AT ROCKBRIDGE BATHS, VA

LOCATION.--Lat 37°54'26", long 79°25'20", Rockbridge County, Hydrologic Unit 02080202, on right bank at Rockbridge Baths, 1,200 ft upstream from bridge on State Highway 39, and 1.0 mi upstream from Hays Creek.

DRAINAGE AREA.--329 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to October 1945, published as North River at Rockbridge Baths.

REVISED RECORDS.--WSP 972: 1929-40, 1941(M). WSP 1002: 1930(m). WSP 1553: 1931(m).

GAGE.--Water-stage recorder. Datum of gage is 1,100.33 ft above sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except for period with ice effect, Jan. 16-23, which is fair. Since 1966, some regulation at times by Lake Merriweather on Little Calpasture River. National Weather Service gage-height telemeter at station. Maximum discharge, 87,700 ft<sup>3</sup>/s, from rating curve extended above 16,000 ft<sup>3</sup>/s on basis of slope-area measurement at peak flow. Minimum gage height, 0.79 ft, Sept. 10, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1230	6,770	7.52	Mar. 28	1130	6,220	7.28
Jan. 28	2100	5,310	6.85	Mar. 29	1630	6,870	7.56
Feb. 23	1830	5,510	6.95	Aug. 17	2330	*8,350	*8.12

Minimum discharge, 25 ft<sup>3</sup>/s, July 13, 17, gage height, 1.06 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	46	201	110	920	748	1380	217	66	42	137	82
2	68	41	149	106	702	715	1020	198	60	39	250	73
3	64	38	122	102	566	642	831	179	55	38	280	65
4	71	37	132	125	473	667	707	523	49	110	135	60
5	99	43	4240	123	422	1940	598	859	49	49	118	57
6	99	48	1940	126	381	2180	555	882	47	43	109	54
7	95	47	882	148	342	2360	1130	943	46	41	92	51
8	102	44	542	526	317	3620	1090	2710	49	43	78	48
9	72	42	379	515	1670	3000	876	1820	61	37	68	46
10	54	41	298	364	2500	2880	748	1120	68	41	60	45
11	76	40	260	328	1560	2870	643	755	63	37	55	44
12	107	39	207	1440	1150	1780	551	568	58	33	51	42
13	92	39	174	2200	940	1290	671	469	53	27	49	40
14	72	40	156	1390	1000	1040	848	378	48	29	51	39
15	45	39	158	907	1010	877	779	322	46	31	48	38
16	34	39	213	e450	943	764	1120	306	46	27	75	38
17	30	40	201	e400	998	652	853	241	70	95	3240	40
18	30	54	192	e520	970	579	601	211	96	295	3400	43
19	28	53	197	e300	993	537	468	188	82	67	1150	39
20	30	47	188	e280	1100	453	410	173	103	57	587	37
21	29	46	199	e260	1220	439	323	158	85	93	442	36
22	29	48	182	e240	1170	608	349	146	70	756	373	35
23	27	46	162	e220	3390	605	326	130	61	699	275	35
24	27	45	149	395	4600	582	290	117	58	283	212	34
25	27	44	135	882	3030	610	269	103	60	258	160	35
26	27	43	120	1330	1750	574	244	92	52	327	134	34
27	28	65	126	1420	1160	1930	287	92	55	318	128	34
28	28	1070	120	2940	878	5200	262	85	55	258	117	33
29	27	620	116	3570	---	5650	231	79	49	255	102	40
30	34	316	101	1950	---	3400	225	74	45	658	89	60
31	46	---	114	1260	---	1930	---	70	---	368	82	---
TOTAL	1682	3200	12355	24927	36155	51122	18685	14208	1805	5454	12147	1357
MEAN	54.3	107	399	804	1291	1649	623	458	60.2	176	392	45.2
MAX	107	1070	4240	3570	4600	5650	1380	2710	103	756	3400	82
MIN	27	37	101	102	317	439	225	70	45	27	48	33
CFSM	.16	.32	1.21	2.44	3.92	5.01	1.89	1.39	.18	.53	1.19	.14
IN.	.19	.36	1.40	2.82	4.09	5.78	2.11	1.61	.20	.62	1.37	.15

e Estimated.

## JAMES RIVER BASIN

285

02021500 MAURY RIVER AT ROCKBRIDGE BATHS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	203	274	406	516	616	851	638	470	256	119	142	121
MAX	1254	2689	1450	1540	1416	2017	2245	1463	1344	807	1016	954
(WY)	1980	1986	1974	1937	1982	1936	1987	1989	1982	1972	1969	1950
MIN	16.5	24.1	26.6	32.3	50.9	117	155	81.0	34.7	14.6	14.9	16.1
(WY)	1931	1931	1966	1981	1934	1981	1981	1930	1964	1966	1964	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

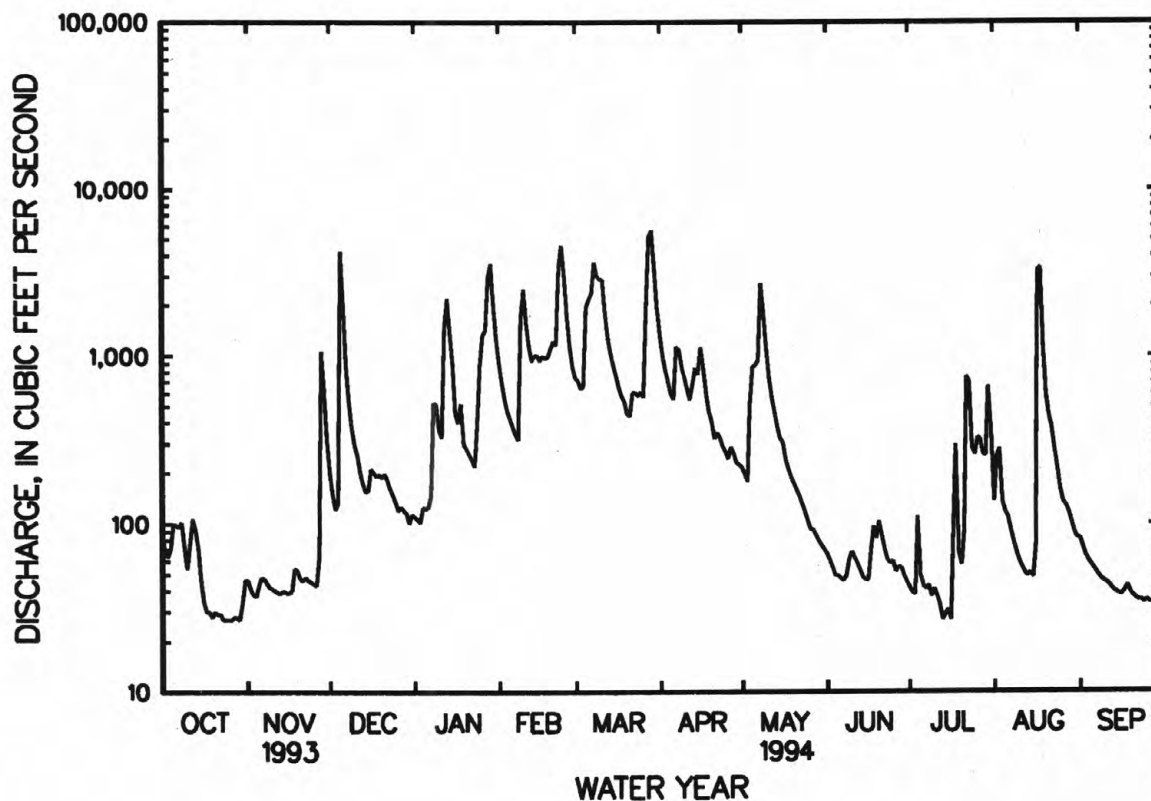
## WATER YEARS 1929 - 1994

ANNUAL TOTAL	154416	183097	383	
ANNUAL MEAN	423	502	685	1973
HIGHEST ANNUAL MEAN			157	1981
LOWEST ANNUAL MEAN			41500	Nov 5 1985
HIGHEST DAILY MEAN	6920	Mar 4	7.1	Sep 10 1966
LOWEST DAILY MEAN	16	Aug 25	8.2	Sep 7 1966
ANNUAL SEVEN-DAY MINIMUM	18	Aug 20	8350	Aug 17
INSTANTANEOUS PEAK FLOW			8.12	Aug 17
INSTANTANEOUS PEAK STAGE			25	cJul 13
INSTANTANEOUS LOW FLOW			1.52	1.17
ANNUAL RUNOFF (CFSM)	1.29		20.70	15.83
ANNUAL RUNOFF (INCHES)	17.46		897	155
10 PERCENT EXCEEDS	1060		146	30
50 PERCENT EXCEEDS	115		39	
90 PERCENT EXCEEDS	25			

a Also Oct. 24-26, 29, 1993, and July 13, 16, 1994.

b From floodmarks.

c Also July 17, 1994.



## 02022500 KERRS CREEK NEAR LEXINGTON, VA

LOCATION.--Lat 37°49'32", long 79°26'36", Rockbridge County, Hydrologic Unit 02080202, on right bank 100 ft upstream from bridge on Interstate Highway 64, 1.4 mi upstream from mouth, and 2.9 mi north of Lexington.

DRAINAGE AREA.--35.0 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1926 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 1203: 1927-29, 1930-34(M), 1935-40, 1941(M), 1942, 1943-48(M), 1949. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 980.32 ft above sea level (levels by U.S. Army Corps of Engineers). Jan. 27, 1927, to Sept. 30, 1953, nonrecording gage at site 1,000 ft downstream at different datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 27, 28, 31, and Jan. 1, which are fair. Maximum discharge, 23,000 ft<sup>3</sup>/s, from rating curve extended above 800 ft<sup>3</sup>/s on basis of contracted-opening and slope-area measurements of peak flow. Minimum discharge, 0.90 ft<sup>3</sup>/s, July 22, 1966, result of temporary dam upstream. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0215	880	5.50	Mar. 27	1115	858	5.46
Jan. 12	1000	655	5.07	Mar. 29	0700	730	5.22
Jan. 28	1530	715	5.19	Aug. 17	1245	*8,590	*10.94
Feb. 23	1000	994	5.69				

Minimum discharge, 8.0 ft<sup>3</sup>/s, Oct. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.6	11	11	e10	53	61	106	36	14	12	20	14
2	8.8	10	10	12	44	61	85	31	14	12	50	13
3	8.5	10	10	12	37	55	72	30	13	12	56	12
4	8.3	9.8	33	15	33	104	64	94	13	12	30	12
5	8.3	10	336	14	31	252	57	84	13	11	24	12
6	8.3	10	58	14	29	197	56	64	13	11	19	12
7	8.3	9.9	33	20	27	193	64	57	14	11	16	11
8	8.3	9.7	25	55	26	201	54	62	14	11	15	11
9	8.5	9.5	20	33	146	163	50	51	14	14	14	11
10	9.2	9.5	19	27	104	197	49	45	15	14	13	11
11	8.9	9.5	17	22	84	146	46	40	16	12	13	10
12	11	9.5	15	220	68	106	43	36	14	11	13	10
13	9.8	9.5	14	111	61	87	152	33	13	11	13	9.8
14	9.2	9.5	13	72	64	75	118	30	12	12	12	9.7
15	9.0	9.5	15	44	66	65	82	28	12	11	12	9.6
16	8.8	9.3	20	41	78	57	68	28	12	11	19	9.4
17	8.9	10	16	61	94	50	57	24	12	13	1500	10
18	9.0	13	16	54	104	49	50	23	12	13	213	12
19	9.0	10	15	36	124	44	46	22	36	13	76	9.8
20	9.3	10	14	33	144	40	42	21	24	11	52	9.5
21	9.4	9.4	15	25	128	44	39	20	16	47	46	9.4
22	9.3	9.3	14	24	94	59	38	19	14	37	35	9.4
23	9.3	9.3	13	29	510	49	35	18	14	27	28	9.4
24	9.3	9.1	13	61	307	46	32	17	15	18	24	9.3
25	9.3	9.0	13	42	172	46	30	17	16	15	22	9.3
26	9.3	9.0	12	52	112	41	31	19	13	14	19	9.5
27	9.3	22	e11	46	82	318	45	18	16	17	18	9.4
28	9.8	37	e11	376	67	412	39	16	14	18	17	9.0
29	9.5	15	12	185	---	458	39	15	13	29	16	8.8
30	11	12	11	94	---	209	38	15	13	85	15	8.6
31	12	---	e9.3	67	---	141	---	15	---	28	14	---
TOTAL	285.5	340.3	844.3	1907	2889	4026	1727	1028	444	573	2434	310.9
MEAN	9.21	11.3	27.2	61.5	103	130	57.6	33.2	14.8	18.5	78.5	10.4
MAX	12	37	336	376	510	458	152	94	36	85	1500	14
MIN	8.3	9.0	9.3	10	26	40	30	15	12	11	12	8.6
CFSM	.26	.32	.78	1.76	2.95	3.71	1.64	.95	.42	.53	2.24	.30
IN.	.30	.36	.90	2.03	3.07	4.28	1.84	1.09	.47	.61	2.59	.33

e Estimated.

## 02022500 KERRS CREEK NEAR LEXINGTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	24.0	24.7	32.9	43.7	54.7	74.7	59.8	39.2	25.2	17.6	24.4	19.3
MAX	141	209	129	163	140	357	306	159	114	99.5	162	188
(WY)	1938	1986	1949	1937	1948	1936	1987	1989	1972	1972	1969	1950
MIN	5.24	6.50	5.88	5.15	8.86	14.5	10.3	12.0	8.59	5.56	5.85	5.31
(WY)	1964	1966	1966	1966	1931	1981	1942	1956	1945	1966	1981	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1927 - 1994

ANNUAL TOTAL	15181.6	16809.0	
ANNUAL MEAN	41.6	46.1	36.6
HIGHEST ANNUAL MEAN			75.5
LOWEST ANNUAL MEAN			14.1
HIGHEST DAILY MEAN	e1000	1500	e4840
LOWEST DAILY MEAN	6.7	8.3	4.0
ANNUAL SEVEN-DAY MINIMUM	6.9	8.4	4.2
INSTANTANEOUS PEAK FLOW		8590	23000
INSTANTANEOUS PEAK STAGE		10.94	d13.80
INSTANTANEOUS LOW FLOW		8.0	f.90
ANNUAL RUNOFF (CFSM)	1.19	1.32	1.05
ANNUAL RUNOFF (INCHES)	16.14	17.87	14.21
10 PERCENT EXCEEDS	82	94	68
50 PERCENT EXCEEDS	16	16	18
90 PERCENT EXCEEDS	8.3	9.4	7.7

a Also Sept. 12-15, 1993.

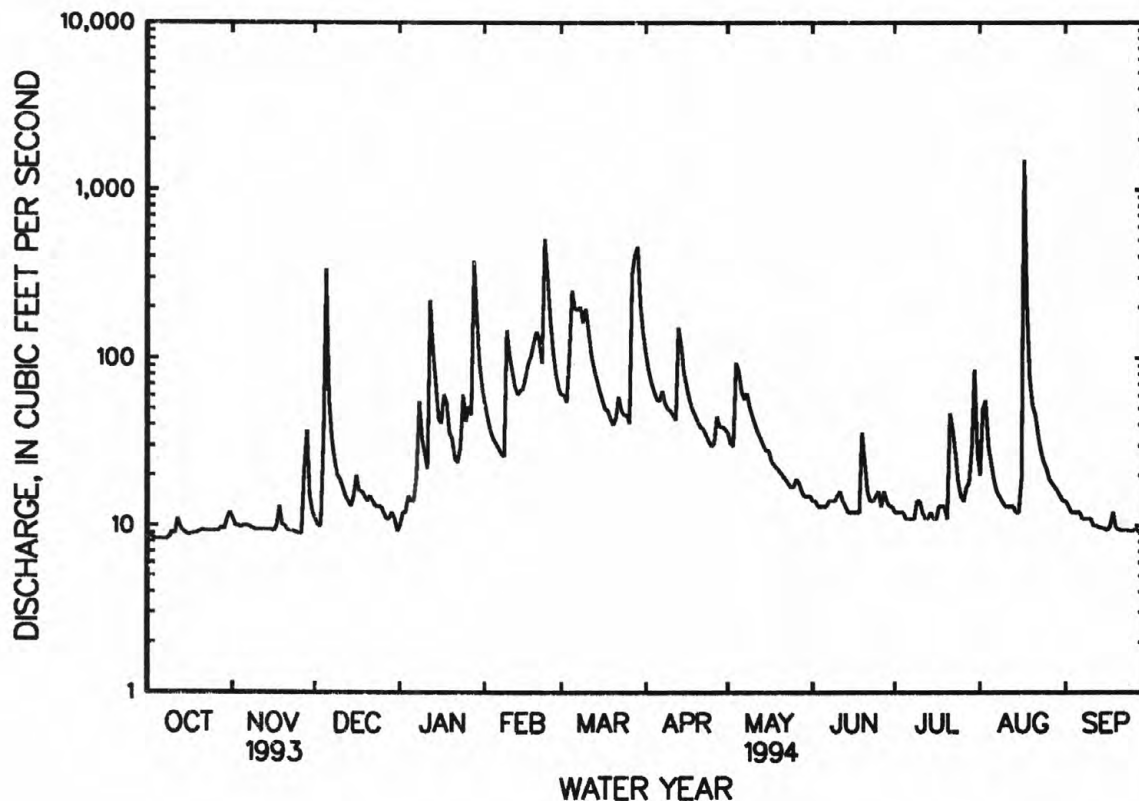
b Also Oct. 5-8, 1993.

c Also many days in September 1932, Nov. 21, 1938, and July 22, 1966.

d From floodmarks.

e Estimated.

f Result of temporary dam upstream.





## JAMES RIVER BASIN

02024000 MAURY RIVER NEAR BUENA VISTA, VA

LOCATION.--Lat 37°45'45", long 79°23'30", Rockbridge County, Hydrologic Unit 02080202, on right bank 0.5 mi downstream from South River and 2.8 mi northwest of Buena Vista.

DRAINAGE AREA.--646 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to October 1945, published as North River near Buena Vista.

REVISED RECORDS.--WSP 952: 1940-41. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 846.58 ft above sea level.

REMARKS.--Records good except those for period with ice effect, Jan. 16-23, and period of no gage-height record, Aug. 12, 13, which are fair. Since 1966, some regulation at times by Lake Merriweather on Little Calpasture River. Maximum discharge, 105,000 ft<sup>3</sup>/s, from rating curve extended above 17,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 20 ft<sup>3</sup>/s, occurred during filling of a small reservoir 2 mi upstream. Unqualified minimum discharge, 37 ft<sup>3</sup>/s, Sept. 9, 1966. Minimum gage height, 0.98 ft, Jan. 5, 1981. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Mar. 18, 1936, reached a stage of about 22 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1600	8,540	9.03	Mar. 29	1730	9,740	9.74
Jan. 28	2200	7,620	8.46	Aug. 17	2100	*10,300	*10.04
Feb. 23	2100	7,900	8.63				

Minimum discharge, 70 ft<sup>3</sup>/s, Oct. 25, 29, gage height, 1.31 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	146	117	409	245	1550	1430	2690	527	234	179	349	240
2	126	102	306	237	1200	1400	2100	495	226	168	331	222
3	117	89	254	228	988	1270	1740	463	215	160	664	206
4	107	85	322	283	850	1270	1500	755	208	212	356	196
5	131	91	5610	281	762	2970	1310	1190	203	197	311	186
6	144	98	3330	274	707	3610	1220	1210	201	171	287	178
7	151	99	1480	296	640	3750	1570	1210	200	161	251	170
8	150	93	932	761	595	5440	1710	2730	198	154	224	162
9	158	87	680	877	1640	5010	1430	2390	210	181	208	155
10	128	86	553	662	3380	4730	1260	1520	226	246	198	153
11	107	85	489	577	2330	4860	1130	1110	242	173	189	151
12	165	83	418	1870	1830	3210	1010	845	219	154	e185	143
13	181	82	361	3340	1490	2430	1230	737	203	146	e180	140
14	154	83	329	2130	1580	2020	1540	641	192	149	177	137
15	127	83	333	1470	1610	1740	1330	588	184	145	180	136
16	100	81	381	e880	1550	1540	1530	591	194	143	199	134
17	90	85	386	e760	1690	1340	1360	501	202	146	3750	142
18	90	127	360	e1100	1730	1200	1100	455	239	398	5550	177
19	86	119	356	e780	1880	1110	874	426	257	263	1880	151
20	90	102	347	e680	2080	982	825	407	286	189	1010	138
21	85	90	361	e580	2210	940	708	384	247	262	789	133
22	86	85	343	e520	2090	1140	709	360	224	664	689	130
23	84	87	318	e500	4810	1100	693	341	207	998	551	131
24	79	85	300	968	6780	1050	633	320	208	496	457	131
25	77	84	281	1320	5030	1070	599	305	234	421	452	129
26	76	81	262	1590	3030	1040	564	310	204	433	530	132
27	79	180	251	1850	2140	2490	637	319	247	548	435	131
28	76	1480	263	4740	1670	7140	598	280	244	555	361	126
29	75	1080	252	5570	---	8600	554	265	205	477	314	122
30	87	585	240	3080	---	6180	556	254	189	757	264	131
31	111	---	223	2050	---	3640	---	243	---	690	243	---
TOTAL	3463	5714	20730	40499	57842	85702	34710	22172	6548	10036	21564	4613
MEAN	112	190	669	1306	2066	2765	1157	715	218	324	696	154
MAX	181	1480	5610	5570	6780	8600	2690	2730	286	998	5550	240
MIN	75	81	223	228	595	940	554	243	184	143	177	122
CFSM	.17	.29	1.04	2.02	3.20	4.28	1.79	1.11	.34	.50	1.08	.24
IN.	.20	.33	1.19	2.33	3.33	4.94	2.00	1.28	.38	.58	1.24	.27

e Estimated.

## JAMES RIVER BASIN

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02024000 MAURY RIVER NEAR BUENA VISTA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	375	472	697	845	1049	1370	1083	820	510	272	335	268
MAX	1997	3400	2430	2113	2334	3187	3672	2373	1950	1351	3060	1445
(WY)	1980	1986	1949	1949	1939	1993	1987	1989	1982	1972	1969	1950
MIN	72.1	83.3	76.4	100	273	240	281	224	120	53.7	63.4	75.2
(WY)	1942	1966	1966	1981	1977	1981	1981	1941	1964	1966	1964	1963

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

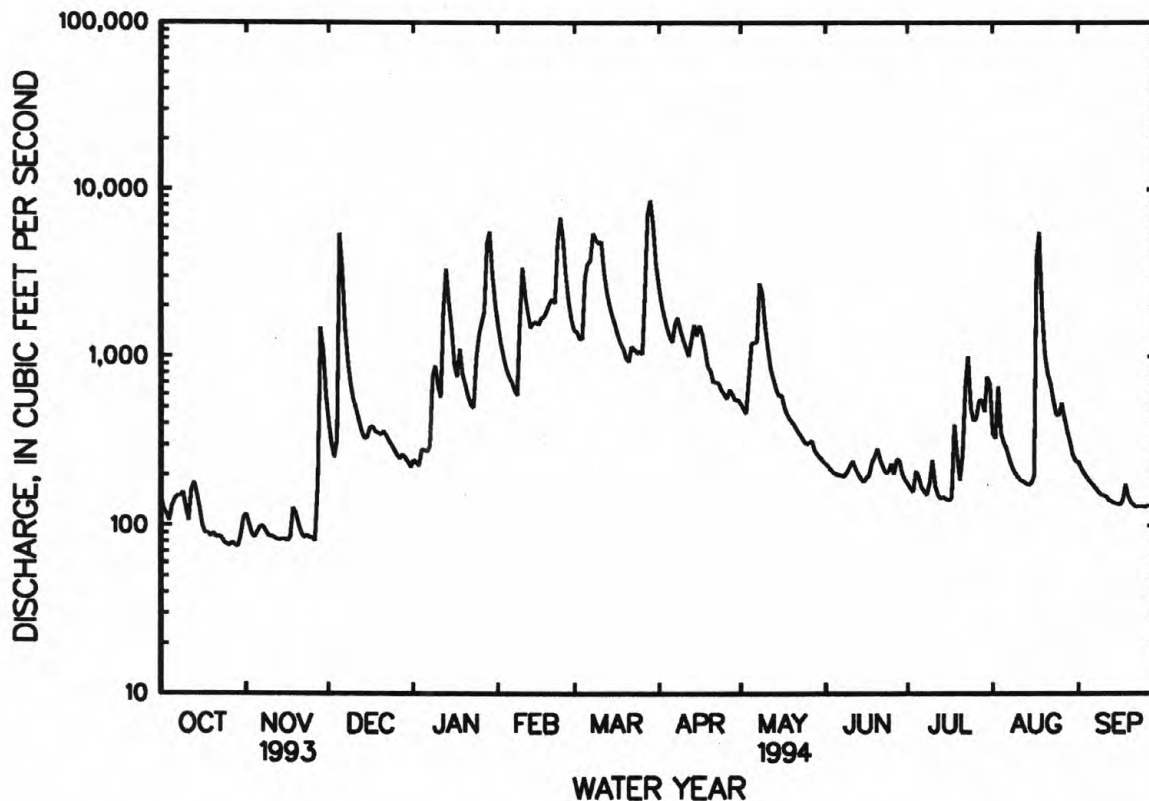
## WATER YEARS 1939 - 1994

ANNUAL TOTAL	284124		313593									
ANNUAL MEAN	778		859									
HIGHEST ANNUAL MEAN										673		
LOWEST ANNUAL MEAN										1181		1973
HIGHEST DAILY MEAN	9980	Mar 5	8600	Mar 29						269		1981
LOWEST DAILY MEAN	75	Oct 29	75	Oct 29						56000	Aug 20	1969
ANNUAL SEVEN-DAY MINIMUM	78	Oct 23	78	Oct 23						22	Oct 10	1941
INSTANTANEOUS PEAK FLOW			10300	Aug 17						40	Sep 7	1966
INSTANTANEOUS PEAK STAGE			10.04	Aug 17						105000	Aug 20	1969
INSTANTANEOUS LOW FLOW			70	Oct 25						a31.23	Aug 20	1969
ANNUAL RUNOFF (CFSM)	1.20		1.33							c20	Oct 10	1941
ANNUAL RUNOFF (INCHES)	16.36		18.06							1.04		
10 PERCENT EXCEEDS	1940		2080							14.15		
50 PERCENT EXCEEDS	318		333							1500		
90 PERCENT EXCEEDS	87		101							344		
										106		

a From floodmarks.

b Also Oct. 29, 1993.

c Occurred during the filling of a small reservoir 2 mi upstream.



## JAMES RIVER BASIN

02025500 JAMES RIVER AT HOLCOMB ROCK, VA

LOCATION.--Lat 37°30'04", long 79°15'46", Bedford County, Hydrologic Unit 02080203, on right bank at Holcomb Rock, 0.9 mi downstream from Pedlar River, and at mile 268.6.

DRAINAGE AREA.--3,259 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1900 to September 1915 (gage heights only), October 1926 to current year. Monthly discharge only for some periods, published in WSP 1303. Published as "at Salt Creek" December 1926 to June 1931 and as "at Holcombs Rock" June 1931 to September 1990.

REVISED RECORDS.--WSP 972: 1913(M), 1932-33, 1935(M), 1936. WSP 1303: 1928(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 548.53 ft above sea level. January 1900 to September 1915, nonrecording gage in powerhouse of Owens Illinois Glass Company 1,000 ft upstream at different datum. December 1926 to June 1931, water-stage recorder at site 2 mi downstream at different datum.

REMARKS.--Records good except for period with ice effect, Jan. 17-23, which is fair. Some diurnal fluctuation caused by powerplants upstream from station. Flow regulated since December 1979 by Lake Moomaw (station 02011795) 117.4 mi upstream; since October 1984 by Back Creek Lake 145.4 mi upstream; and since January 1985 by Little Back Creek Lake 148.5 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Maximum discharge, 207,000 ft<sup>3</sup>/s, from rating curve extended above 73,000 ft<sup>3</sup>/s on basis of records for other stations in James River Basin. Minimum gage height, 2.80 ft, Oct. 29, 1987. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in March 1913 reached a stage of 31.3 ft, from floodmarks, discharge, 118,000 ft<sup>3</sup>/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 25,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 6	0130	31,400	16.10	Mar. 29	1915	*34,300	*16.83
Jan. 29	1545	26,800	14.91	Aug. 18	1045	28,400	15.33
Feb. 24	1015	31,500	16.13				

Minimum discharge, 161 ft<sup>3</sup>/s, Nov. 13, 16, gage height, 3.25 ft; minimum daily, 681 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1030	940	2120	1240	9820	8410	16300	3920	1400	1260	2390	1470
2	987	892	1560	1330	7820	8020	12900	3590	1370	953	1820	1490
3	826	902	1380	1490	5930	8110	10500	3250	1290	1050	2120	1310
4	874	872	1460	1990	5100	7500	8290	3480	1260	1030	1980	1260
5	795	846	17100	2290	4050	12700	6870	6510	1200	1100	1750	1200
6	681	881	24100	2170	3740	18100	6180	7230	1290	1080	1610	1150
7	729	854	9110	2040	3400	16200	6160	6500	1310	928	1470	1140
8	795	816	5360	2800	3200	17500	7780	7720	1290	1060	1290	1060
9	791	804	3640	5080	3690	17800	6940	14900	1380	930	1260	1060
10	819	809	2900	4290	14100	15800	6230	11100	1450	1080	1220	1050
11	793	799	2430	3150	15100	18000	5750	8400	1490	1060	1080	1000
12	818	774	2190	5410	15000	16400	5290	7020	1440	988	1230	1140
13	870	764	1940	16400	12700	13400	5280	6010	1340	936	1070	994
14	867	772	1770	12700	12400	10800	7290	4710	1300	974	1120	890
15	840	761	1750	8720	12200	8720	7730	3100	1210	975	1180	924
16	806	747	1940	5730	10700	7090	7230	2860	1080	945	1240	934
17	785	771	2310	e3900	10300	6250	6840	2810	1140	961	6430	944
18	773	851	2400	e4700	9730	5560	5850	2660	1220	1130	24600	1030
19	757	943	2220	e4400	9720	5080	4860	2600	1210	1830	11000	1040
20	765	925	2050	e3700	10600	4630	4280	2280	1320	1200	5650	988
21	767	870	2080	e3200	11500	4290	3870	2110	1260	1250	4050	936
22	783	851	1940	e3000	11300	4920	3510	2000	1250	2040	3710	941
23	758	838	1810	e2800	14100	6200	3370	1980	1170	3120	2870	911
24	731	823	1650	3400	29100	6180	3220	1760	1190	2640	2380	927
25	745	815	1600	4590	22900	5850	3000	1670	1380	1840	2080	904
26	738	809	1520	6000	17100	5600	2860	1660	1400	1680	2050	968
27	743	1060	1430	8960	13600	6970	2920	1710	1350	1770	1910	955
28	735	3870	1400	14800	10300	27600	3150	1640	1430	3050	1750	933
29	735	6010	1460	25000	---	33700	2990	1570	1220	2170	1650	883
30	784	3320	1380	19000	---	29400	3260	1520	1150	2210	1600	923
31	870	---	1230	13500	---	20300	---	1450	---	3000	1480	---
TOTAL	24790	35989	107230	197780	309200	377080	180700	129720	38790	46240	97040	31355
MEAN	800	1200	3459	6380	11040	12160	6023	4185	1293	1492	3130	1045
MAX	1030	6010	24100	25000	29100	33700	16300	14900	1490	3120	24600	1490
MIN	681	747	1230	1240	3200	4290	2860	1450	1080	928	1070	883
(†)	-115	+64	+452	+322	-27	+117	-134	-16	-121	-78	-59	-181
MEAN#	685	1264	3911	6702	11013	12277	5889	4169	1172	1414	3071	864
CFSM#	.21	.39	1.20	2.06	3.38	3.77	1.81	1.28	.36	.43	.94	.27
IN.#	.24	.43	1.38	2.37	3.52	4.34	2.02	1.48	.40	.50	1.09	.30

CAL YR 1993	TOTAL	1484662	MEAN	4068	MAX	57400	MIN	634	MEAN#	4074	CFSM#	1.25	IN.#	16.97
WTR YR 1994	TOTAL	1575914	MEAN	4318	MAX	33700	MIN	681	MEAN#	4338	CFSM#	1.33	IN.#	18.07

† Change in contents, equivalent in cubic feet per second, in Lake Moomaw; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

e Estimated.

## 02025500 JAMES RIVER AT HOLCOMB ROCK, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 1979, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2031	2352	3690	4904	5803	7376	5785	4270	2701	1606	1953	1572
MAX	10050	8975	12750	14490	11260	15510	11840	10020	11320	6610	9834	7414
(WY)	1938	1973	1949	1937	1939	1936	1935	1942	1972	1972	1940	1979
MIN	432	511	580	631	690	2741	1798	1188	910	415	458	421
(WY)	1931	1932	1966	1956	1934	1940	1942	1930	1964	1966	1930	1930

## SUMMARY STATISTICS

## WATER YEARS 1927 - 1979

ANNUAL MEAN	3663
HIGHEST ANNUAL MEAN	6241
LOWEST ANNUAL MEAN	1947
HIGHEST DAILY MEAN	118000
LOWEST DAILY MEAN	223
ANNUAL SEVEN-DAY MINIMUM	306
INSTANTANEOUS PEAK FLOW	150000
INSTANTANEOUS PEAK STAGE	35.50
INSTANTANEOUS LOW FLOW	71
ANNUAL RUNOFF (CFSM)	1.12
ANNUAL RUNOFF (INCHES)	15.26
10 PERCENT EXCEEDS	7910
50 PERCENT EXCEEDS	2100
90 PERCENT EXCEEDS	655

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2183	3298	3381	4196	5401	7544	7359	4548	2709	1464	1605	1454
MAX	7966	17270	6850	10560	11040	16910	21670	12380	8209	2812	5640	5146
(WY)	1980	1986	1984	1991	1994	1993	1987	1989	1982	1989	1984	1989
MIN	690	785	890	730	2139	1472	1812	2205	1234	1009	595	674
(WY)	1992	1992	1981	1981	1981	1981	1986	1991	1988	1986	1981	1983

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

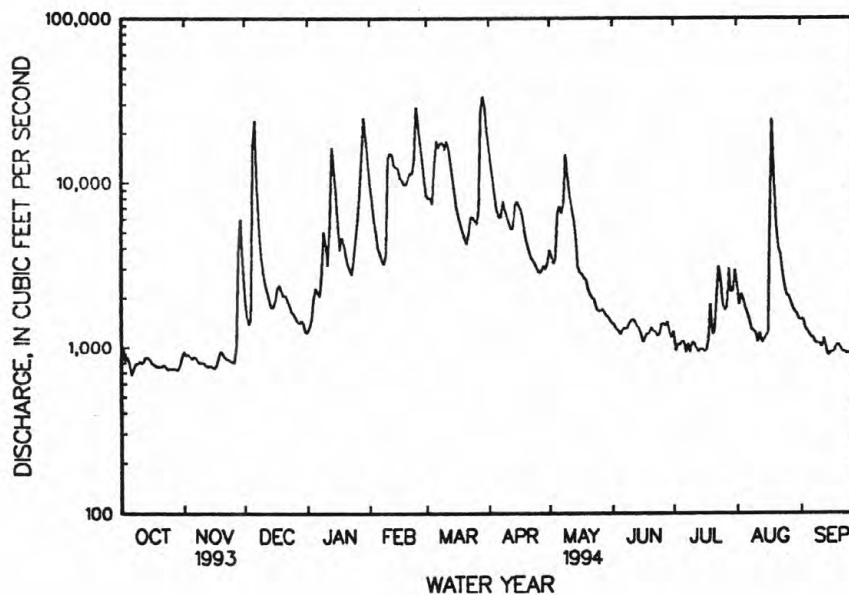
## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	1484662	1575914	
ANNUAL MEAN	4068	4318	3750
HIGHEST ANNUAL MEAN			5048
LOWEST ANNUAL MEAN			1613
HIGHEST DAILY MEAN	57400	Mar 5	33700
LOWEST DAILY MEAN	634	Aug 1	681
ANNUAL SEVEN-DAY MINIMUM	741	Oct 23	741
INSTANTANEOUS PEAK FLOW			34300
INSTANTANEOUS PEAK STAGE			16.83
INSTANTANEOUS LOW FLOW			161
ANNUAL RUNOFF (CFSM)	1.25		1.32
ANNUAL RUNOFF (INCHES)	16.95		17.99
10 PERCENT EXCEEDS	9380		11800
50 PERCENT EXCEEDS	1570		1830
90 PERCENT EXCEEDS	789		825

a From high-water mark in gage house.

b Also Nov. 16, 1993.





## JAMES RIVER BASIN

## 02026000 JAMES RIVER AT BENT CREEK, VA

LOCATION.--Lat 37°32'10", long 78°49'30", Nelson County, Hydrologic Unit 02080203, on left bank at town of Bent Creek, 150 ft downstream from Bent Creek, 525 ft upstream from bridge on U.S. Highway 60, 1.3 mi southeast of Gladstone, and at mile 227.8.

DRAINAGE AREA.--3,683 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1924 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to 1926, published as "at Bent Creek, near Gladstone."

REVISED RECORDS.--WSP 742: 1931(m). WSP 972: 1935-36. WSP 1066: 1940. WSP 1203: 1942. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 381.39 ft above sea level. Prior to Sept. 12, 1930, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Jan. 17-23, which is fair. Large diurnal fluctuation caused by powerplants upstream from station. Flow regulated since December 1979 by Lake Moomaw (station 02011795) 158.3 mi upstream; since October 1984 by Back Creek Lake 186.3 mi upstream; and since January 1985 by Little Back Creek Lake 189.4 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Maximum discharge, 226,000 ft<sup>3</sup>/s, from rating curve extended above 177,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 2.21 ft, Oct. 13, 14, 1930. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 26,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 6	0800	31,600	11.26	Mar. 29	1030	*41,900	*12.98
Jan. 29	2215	26,700	10.36	Aug. 18	1815	28,900	10.78
Feb. 24	1645	32,900	11.49				

Minimum daily discharge, 742 ft<sup>3</sup>/s, Nov. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1450	1000	3410	1760	11000	9680	18200	4860	1740	1390	4480	2410
2	1210	1140	2540	1490	9290	10100	14400	4820	1580	1440	3170	2140
3	1140	1100	1790	2080	7280	13000	11700	4430	1580	973	2520	1890
4	1040	1140	1860	3510	6440	10200	9690	4620	1560	1310	3590	1710
5	1000	1060	13500	3900	5670	11700	8130	6130	1500	1130	2550	1650
6	1010	1200	28100	3610	5040	18500	7420	8020	1320	1260	2270	1630
7	838	1040	12300	3340	4840	17700	7070	7580	1640	1360	2210	1630
8	869	1080	7320	4200	4540	17600	8010	7290	1560	879	2080	1510
9	965	1180	5660	5300	4680	19100	8230	13300	1520	1210	1720	1480
10	1020	893	4390	6100	10400	17500	7180	12600	1900	1210	1710	1430
11	1000	1040	3700	5000	17800	17700	6790	9400	1910	1290	1780	1350
12	995	941	3330	5920	17400	17900	6480	8060	1660	1220	1420	1360
13	1090	849	2890	14700	14900	14800	6080	7130	1700	1060	1700	1520
14	1010	964	2770	15100	13300	11700	7320	6210	1570	1160	1510	1320
15	1060	1210	2790	10700	14000	10000	8320	4690	1590	1230	2270	1200
16	1020	742	2730	7640	12400	8220	7980	4180	1190	1200	1820	1280
17	1020	929	3460	e5300	11500	7490	7870	3870	1330	976	3540	1240
18	855	1130	3300	e6000	11000	6460	6940	3920	1480	1380	23700	1370
19	1020	1090	3410	e5800	10600	6160	6480	3640	1930	2790	15400	1450
20	939	1290	3330	e5300	11200	5780	5490	3500	900	2410	8000	1460
21	964	1110	3170	e5100	11800	5520	5140	3220	1650	1880	5530	1290
22	928	995	2780	e5000	12200	5770	4460	2870	1320	2450	5310	1200
23	1030	1220	2720	e4500	13900	6520	4530	2620	1520	3640	4650	1290
24	876	919	2560	4590	28700	7130	4420	2490	2040	4480	3750	1210
25	853	1130	2190	5210	25800	6850	4170	2180	1720	3150	3220	1300
26	956	877	2160	6270	19300	6590	4000	2060	1590	2440	3010	1700
27	852	1300	2010	8560	15600	7450	3980	2230	2310	3260	2910	1810
28	940	5430	2030	13100	11700	29200	4190	2000	1800	5830	2480	1330
29	866	6570	1870	24600	---	39900	4170	1820	1730	4340	2370	1270
30	1180	5060	1900	21800	---	33100	4560	1910	1400	3180	2360	1240
31	1200	---	1840	15600	---	22800	---	1760	---	4110	2050	---
TOTAL	31196	45629	137810	231080	342280	422120	213400	153410	48240	65638	125080	44670
MEAN	1006	1521	4445	7454	12220	13620	7113	4949	1608	2117	4035	1489
MAX	1450	6570	28100	24600	28700	39900	18200	13300	2310	5830	23700	2410
MIN	838	742	1790	1490	4540	5520	3980	1760	900	879	1420	1200
(†)	-115	+64	+452	+322	-27	+117	-134	-16	-121	-78	-59	-181
MEAN#	891	1585	4897	7776	12193	13737	6979	4933	1487	2039	3976	1308
CFSM#	.24	.43	1.33	2.11	3.31	3.73	1.89	1.34	.40	.55	1.08	.36
IN.#	.28	.48	1.53	2.43	3.45	4.30	2.11	1.54	.45	.64	1.24	.40

CAL YR 1993	TOTAL	1821601	MEAN	4996	MAX	61600	MIN	742	MEAN#	4997	CFSM#	1.36	IN.#	18.42
WTR YR 1994	TOTAL	1860553	MEAN	5097	MAX	39900	MIN	742	MEAN#	5117	CFSM#	1.39	IN.#	18.86

† Change in contents, equivalent in cubic feet per second, in Lake Moomaw; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

e Estimated.



## 02026000 JAMES RIVER AT BENT CREEK, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1979, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2388	2739	4200	5569	6661	8137	6592	4811	3149	1933	2325	1926
MAX	11180	9718	13990	15920	12630	17410	13490	10790	13360	7286	11930	7642
(WY)	1938	1973	1949	1937	1939	1936	1958	1942	1972	1972	1940	1979
MIN	424	581	710	782	889	3227	1893	1509	1045	419	475	450
(WY)	1931	1931	1966	1956	1934	1940	1942	1930	1964	1966	1966	1930

## SUMMARY STATISTICS

## WATER YEARS 1925 - 1979

ANNUAL MEAN	4192
HIGHEST ANNUAL MEAN	7514
LOWEST ANNUAL MEAN	2228
HIGHEST DAILY MEAN	130000
LOWEST DAILY MEAN	222
ANNUAL SEVEN-DAY MINIMUM	256
INSTANTANEOUS PEAK FLOW	176000
INSTANTANEOUS PEAK STAGE	a27.13
INSTANTANEOUS LOW FLOW	222
ANNUAL RUNOFF (CFSM)	1.14
ANNUAL RUNOFF (INCHES)	15.46
10 PERCENT EXCEEDS	8910
50 PERCENT EXCEEDS	2500
90 PERCENT EXCEEDS	831

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2559	3613	4075	4973	6296	8582	8309	5387	3295	1860	1965	1879
MAX	9173	16910	8127	11680	12220	18860	24090	13990	9444	3841	6027	6531
(WY)	1980	1986	1984	1991	1994	1993	1987	1989	1982	1989	1984	1989
MIN	743	967	987	858	2521	1626	2216	2788	1496	1128	725	841
(WY)	1987	1992	1981	1981	1981	1981	1981	1982	1986	1986	1981	1980

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

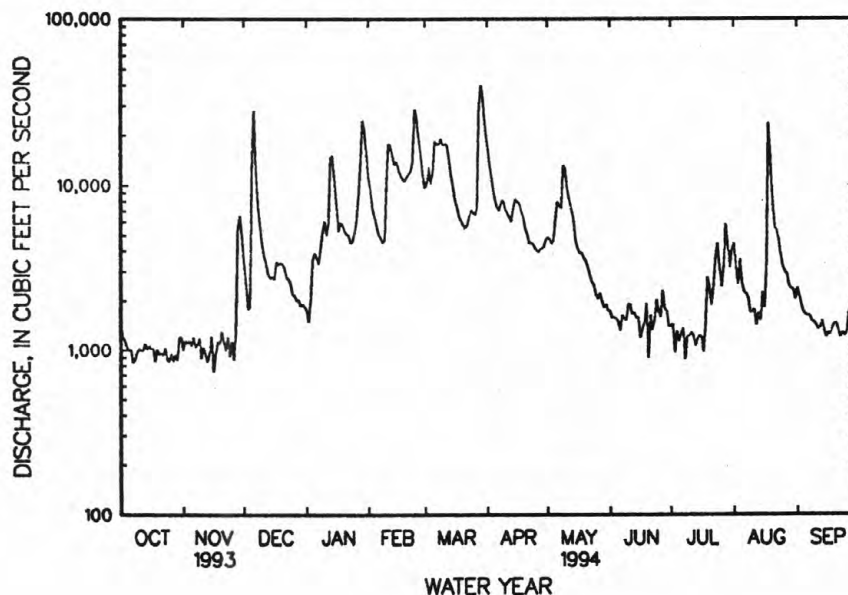
## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	1821601	1860553	
ANNUAL MEAN	4991	5097	4387
HIGHEST ANNUAL MEAN			5735
LOWEST ANNUAL MEAN			1791
HIGHEST DAILY MEAN	61600	Mar 5	39900
LOWEST DAILY MEAN	742	Nov 16	742
ANNUAL SEVEN-DAY MINIMUM	910	Oct 23	910
INSTANTANEOUS PEAK FLOW			41900
INSTANTANEOUS PEAK STAGE			12.98
INSTANTANEOUS LOW FLOW			673
ANNUAL RUNOFF (CFSM)	1.36	1.38	1.19
ANNUAL RUNOFF (INCHES)	18.40	18.79	16.18
10 PERCENT EXCEEDS	11200	12800	9480
50 PERCENT EXCEEDS	2570	2770	2520
90 PERCENT EXCEEDS	1010	1030	933

a From high-water mark.

b Also Oct. 14, 1930.



## JAMES RIVER BASIN

02027000 TYE RIVER NEAR LOVINGSTON, VA

LOCATION.--Lat 37°42'55", long 78°58'55", Nelson County, Hydrologic Unit 02080203, on right bank at downstream side of bridge on State Highway 158, 3.5 mi downstream from Hat Creek, 4.8 mi upstream from Piney River, and 6.8 mi southwest of Lovingston.

DRAINAGE AREA.--92.8 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1938 to current year.

REVISED RECORDS.--WSP 892: 1938. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 578.39 ft above sea level. Sept. 15, 1969, to Oct. 15, 1970, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Jan. 1, 20-22, which are fair. Maximum discharge, 80,000 ft<sup>3</sup>/s, from rating curve extended above 7,600 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	2330	1,660	4.52	Mar. 28	0030	1,620	4.42
Dec. 5	0500	*2,780	*6.46	Aug. 17	1700	1,640	4.48
Jan. 28	1130	2,260	5.72				

Minimum discharge, 13 ft<sup>3</sup>/s, Oct. 6, 7, gage height, 0.04 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	36	98	e58	371	348	607	120	61	39	94	58
2	14	29	86	61	306	348	520	113	57	34	88	49
3	14	25	82	61	245	337	457	109	54	39	90	45
4	14	24	193	98	203	395	402	160	52	38	78	41
5	14	26	1630	88	181	521	356	178	52	31	71	40
6	13	28	699	80	166	488	348	166	52	30	66	37
7	14	28	426	82	146	520	321	160	55	26	55	33
8	14	26	294	135	135	699	268	187	52	23	48	31
9	15	24	210	116	238	699	245	163	55	23	43	29
10	17	23	166	109	249	850	227	151	55	45	39	27
11	18	22	141	104	337	759	213	141	58	30	38	26
12	23	22	120	377	340	619	193	130	57	23	35	26
13	25	22	111	364	298	536	294	123	49	22	31	24
14	22	22	100	302	298	480	264	116	44	22	30	22
15	19	22	100	220	306	434	227	116	39	22	30	22
16	18	23	104	157	310	398	234	123	62	21	33	22
17	18	24	98	236	318	348	210	106	94	22	500	23
18	19	46	92	417	325	325	193	102	58	26	510	45
19	19	35	88	210	348	294	184	98	45	28	272	27
20	21	29	84	e180	383	257	175	98	39	22	187	23
21	22	25	88	e165	414	260	163	96	33	41	191	21
22	23	24	82	e157	406	294	157	90	51	106	196	21
23	24	23	78	151	759	249	149	86	55	78	149	22
24	24	22	76	181	856	238	138	82	80	58	123	22
25	23	22	73	154	695	242	133	78	66	45	111	24
26	22	295	66	151	567	220	128	78	48	63	98	64
27	22	678	68	143	465	431	133	92	88	182	90	39
28	23	667	66	1110	398	972	130	76	76	294	82	30
29	23	193	64	824	---	1200	120	73	57	149	75	27
30	32	120	60	579	---	912	125	68	48	113	66	24
31	46	---	54	453	---	723	---	64	---	100	60	---
TOTAL	631	2605	5697	7523	10063	15396	7314	3543	1692	1795	3579	944
MEAN	20.4	86.8	184	243	359	497	244	114	56.4	57.9	115	31.5
MAX	46	678	1630	1110	856	1200	607	187	94	294	510	64
MIN	13	22	54	58	135	220	120	64	33	21	30	21
CFSM	.22	.94	1.98	2.62	3.87	5.35	2.63	1.23	.61	.62	1.24	.34
IN.	.25	1.04	2.28	3.02	4.03	6.17	2.93	1.42	.68	.72	1.43	.38

e Estimated.

## 02027000 TYE RIVER NEAR LOVINGSTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	105	131	169	178	212	263	242	184	132	77.3	112	83.6
MAX	550	765	461	392	433	568	692	492	676	382	1541	556
(WY)	1943	1986	1949	1978	1973	1993	1987	1989	1972	1972	1969	1979
MIN	8.69	15.3	23.7	14.7	69.7	64.0	63.1	53.1	30.8	15.1	7.07	6.87
(WY)	1942	1942	1981	1981	1963	1981	1966	1941	1956	1966	1966	1954

## SUMMARY STATISTICS

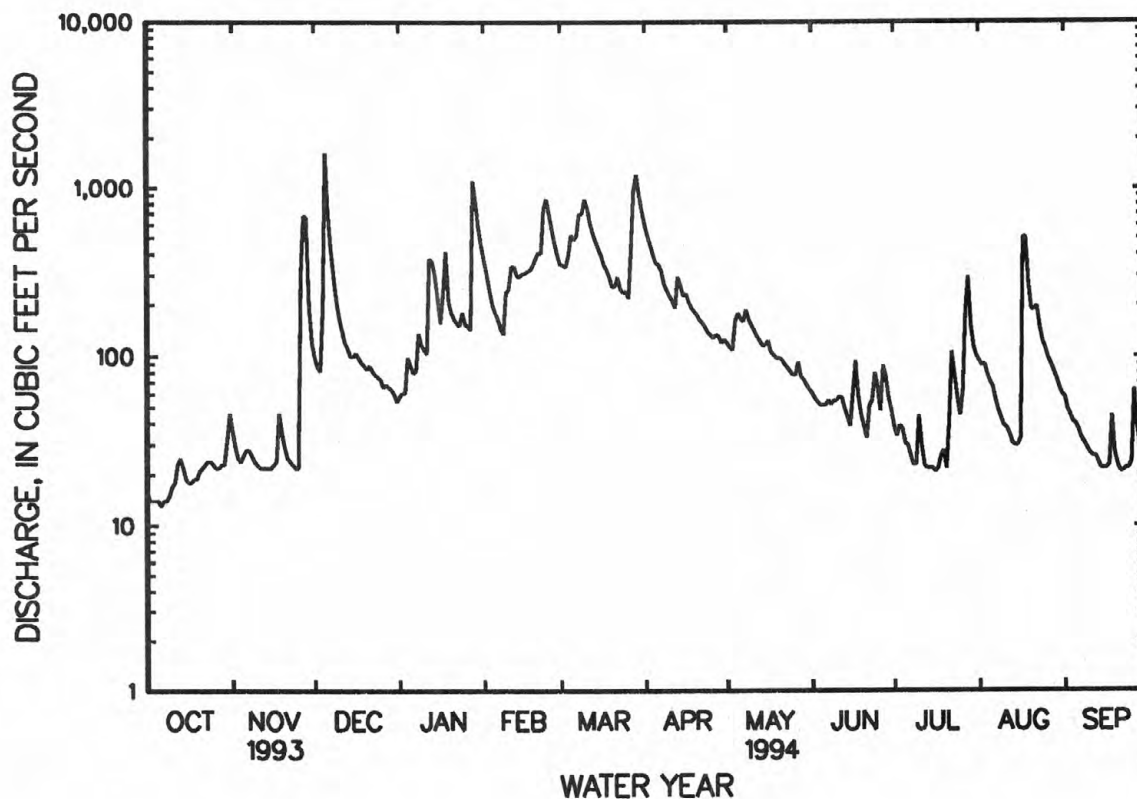
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1939 - 1994

ANNUAL TOTAL	68954.5		60782									
ANNUAL MEAN	189		167							157		
HIGHEST ANNUAL MEAN										280		1973
LOWEST ANNUAL MEAN										61.7		1956
HIGHEST DAILY MEAN	1630	Dec 5								e32600	Aug 20	1969
LOWEST DAILY MEAN	9.0	aAug 24								.60	bSep 9	1966
ANNUAL SEVEN-DAY MINIMUM	9.9	Aug 21								.73	cSep 7	1966
INSTANTANEOUS PEAK FLOW										80000	Aug 20	1969
INSTANTANEOUS PEAK STAGE										d29.00	Aug 20	1969
INSTANTANEOUS LOW FLOW										.50	gSep 10	1966
ANNUAL RUNOFF (CFSM)	2.04									1.69		
ANNUAL RUNOFF (INCHES)	27.64									22.99		
10 PERCENT EXCEEDS	494									318		
50 PERCENT EXCEEDS	88									102		
90 PERCENT EXCEEDS	16									23		

- a Also Aug. 25-27, 1993.  
b Also Sept. 10, 11, 1966.  
c Also Oct. 3, 4, 1993.  
d From floodmarks.  
e Estimated.  
f Also Oct. 7, 1993.  
g Also Sept. 11, 1966.



## JAMES RIVER BASIN

## 02027500 PINEY RIVER AT PINEY RIVER, VA

LOCATION.--Lat 37°42'08", long 79°01'40", Nelson County, Hydrologic Unit 02080203, on left bank at upstream side of bridge on State Highway 151, 0.2 mi southwest of Piney River Post Office, 1.7 mi downstream from Indian Creek, and 2.5 mi southeast of Lowesville.

DRAINAGE AREA.--47.6 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1949 to current year.

REVISED RECORDS.--WSP 2104: Drainage area. WDR VA-72-1: 1971(M).

GAGE.--Water-stage recorder. Datum of gage is 633.58 ft above sea level. Prior to May 27, 1969, water-stage recorder, and Nov. 4, 1969, to Feb. 26, 1970, nonrecording gage at site 20 ft downstream from former highway bridge at same datum. Feb. 26, 1970, to Sept. 20, 1973, on right bank 20 ft upstream from bridge at same datum.

REMARKS.--Records good except those for period of no gage-height record, Dec. 27-29, and periods with ice effect, Dec. 30 to Jan. 1 and Jan. 10, 11, 20-23, which are fair. Periodic dewatering of upstream quarries adds small amount of inflow. Maximum discharge, 38,000 ft<sup>3</sup>/s, from rating curve extended above 6,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1949 reached a stage of 9.9 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	2300	677	2.84	Mar. 28	0045	858	3.19
Dec. 5	0600	*1,700	*4.55	Mar. 29	0615	811	3.10
Jan. 28	1145	749	2.98	Aug. 17	1800	863	3.20

Minimum discharge, 5.5 ft<sup>3</sup>/s, Oct. 6-10, gage height, -0.07 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.1	18	80	e38	247	214	323	68	32	20	79	54
2	8.0	15	66	40	213	221	268	64	30	18	73	49
3	7.4	14	56	40	185	244	230	62	28	17	66	46
4	6.7	13	120	92	161	265	201	81	28	16	58	43
5	6.4	15	1190	71	147	279	179	82	27	16	53	40
6	5.8	17	515	64	134	270	170	78	26	14	49	37
7	5.5	16	303	64	122	266	153	81	27	12	43	34
8	5.5	15	229	98	112	312	137	94	26	11	40	32
9	5.5	14	182	102	152	338	128	90	26	11	36	29
10	6.6	13	150	e92	153	391	125	87	26	19	33	26
11	7.9	13	126	e85	230	385	118	84	27	13	32	25
12	11	13	105	213	225	335	110	80	26	11	30	25
13	12	13	91	237	212	292	144	76	22	9.3	27	23
14	9.7	11	81	218	218	258	141	72	21	8.2	26	21
15	8.7	11	79	185	226	228	138	70	21	7.7	25	20
16	7.9	12	78	150	225	202	143	72	24	7.4	41	19
17	7.8	13	70	175	224	181	135	64	32	8.3	347	20
18	8.0	20	66	195	218	165	129	61	27	17	390	34
19	8.0	18	63	149	217	149	124	58	23	42	240	23
20	8.2	15	58	e135	221	137	116	57	21	21	184	19
21	8.9	13	61	e125	229	135	109	54	20	58	173	16
22	9.2	13	58	e115	232	136	106	50	20	97	166	17
23	9.5	13	54	e106	383	124	98	48	20	80	148	16
24	9.7	13	53	119	412	119	92	46	25	62	132	14
25	9.2	13	50	102	373	119	88	44	24	50	117	16
26	9.0	13	46	99	319	114	82	44	20	44	103	39
27	9.1	138	e43	94	275	191	80	46	36	95	91	26
28	9.0	316	e42	507	239	427	77	41	33	156	80	21
29	9.0	146	e40	483	---	720	72	39	25	122	70	19
30	13	103	e39	354	---	570	71	37	22	102	62	16
31	19	---	e37	291	---	408	---	34	---	86	58	---
TOTAL	269.3	1070	4231	4838	6304	8195	4087	1964	765	1250.9	3072	819
MEAN	8.69	35.7	136	156	225	264	136	63.4	25.5	40.4	99.1	27.3
MAX	19	316	1190	507	412	720	323	94	36	156	390	54
MIN	5.5	11	37	38	112	114	71	34	20	7.4	25	14
CFSM	.18	.75	2.87	3.28	4.73	5.55	2.86	1.33	.54	.85	2.08	.57
IN.	.21	.84	3.31	3.78	4.93	6.40	3.19	1.53	.60	.98	2.40	.64

e Estimated.

## 02027500 PINEY RIVER AT PINEY RIVER, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	66.2	91.6	107	107	128	162	150	110	85.1	39.1	64.3	43.3
MAX	313	644	272	249	278	311	417	352	541	213	1239	362
(WY)	1991	1986	1974	1978	1973	1993	1987	1989	1972	1972	1969	1979
MIN	4.75	10.7	14.2	7.94	34.4	37.8	38.4	35.8	15.9	9.04	4.92	4.37
(WY)	1964	1954	1981	1981	1977	1981	1966	1963	1956	1964	1987	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1950 - 1994

ANNUAL TOTAL	38460.0	36865.2	96.1
ANNUAL MEAN	105	101	188
HIGHEST ANNUAL MEAN			35.9
LOWEST ANNUAL MEAN			1969
HIGHEST DAILY MEAN	1190	Dec 5	25000
LOWEST DAILY MEAN	e5.0	Aug 27	Aug 20 1969
ANNUAL SEVEN-DAY MINIMUM	e5.9	Aug 29	13.80
INSTANTANEOUS PEAK FLOW			1700
INSTANTANEOUS PEAK STAGE			Dec 5
INSTANTANEOUS LOW FLOW			5.5
ANNUAL RUNOFF (CFSM)	2.21	2.12	2.02
ANNUAL RUNOFF (INCHES)	30.06	28.81	27.44
10 PERCENT EXCEEDS	261	238	201
50 PERCENT EXCEEDS	55	61	60
90 PERCENT EXCEEDS	7.9	11	11

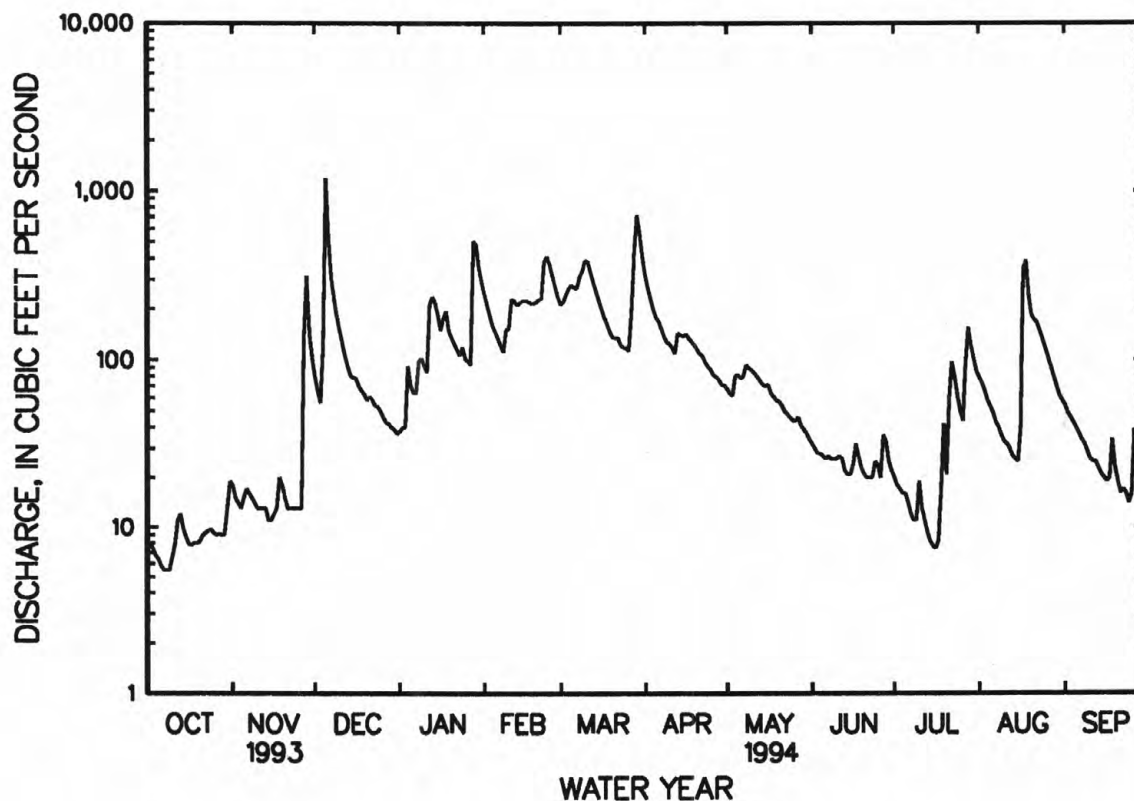
a Also Oct. 8, 9, 1993.

b Dewatering of upstream quarry at a rate of 300 gallons per minute or 0.67 ft<sup>3</sup>/s included in flow.

c From floodmarks.

d Also Oct. 7-10, 1993.

e Estimated.





## JAMES RIVER BASIN

02027800 BUFFALO RIVER NEAR TYE RIVER, VA

LOCATION.--Lat 37°36'20", long 78°55'25", Nelson County, Hydrologic Unit 02080203, on right bank 35 ft upstream from bridge on State Highway 657, 2.1 mi upstream from mouth, and 3.5 mi southeast of town of Tye River.

DRAINAGE AREA.--147 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1960 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 444.39 ft above sea level.

REMARKS.--Records good except those for periods of doubtful gage-height record, Dec. 12 to Jan. 3 and May 24 to June 16, which are fair. Maximum discharge, 45,000 ft<sup>3</sup>/s, from rating curve extended above 1,800 ft<sup>3</sup>/s on basis of computation of flow over dam at gage height 11.03 ft and slope-area measurement at gage height 27.95 ft. Minimum gage height, 0.28 ft, Sept. 9-13, 1964. Several measurements of water temperature were made during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1245	*4,790	*9.89	Mar. 28	0930	4,100	9.18
Jan. 28	1530	1,700	6.03	Mar. 29	1145	3,830	8.88
Feb. 11	2115	2,070	6.61	Aug. 17	2000	1,550	5.76
Feb. 23	1745	1,720	6.05				

Minimum discharge, 34 ft<sup>3</sup>/s, Oct. 6, gage height, 0.90 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	66	100	e110	304	314	564	177	e86	116	127	81
2	38	56	89	e130	269	393	461	170	e83	107	112	76
3	38	51	83	e145	247	971	398	166	e80	102	106	72
4	36	50	109	285	228	854	355	211	e76	112	95	70
5	35	51	2720	239	218	858	329	218	e73	103	91	69
6	35	59	778	181	214	592	328	193	e70	97	87	69
7	35	59	372	165	195	484	317	183	e74	92	81	67
8	36	54	239	233	187	431	279	191	e72	87	79	64
9	36	51	194	190	246	394	269	178	e68	83	82	62
10	40	49	170	189	279	504	265	171	e66	96	78	61
11	50	49	157	180	503	444	254	168	e80	95	77	60
12	54	48	e148	691	682	385	240	164	e76	87	75	58
13	54	48	e135	511	451	356	266	157	e72	84	73	58
14	47	49	e130	320	459	333	301	153	e68	81	71	57
15	45	50	e140	250	465	313	277	150	e65	85	87	55
16	43	49	e160	248	489	291	274	150	e84	82	95	54
17	43	53	e147	345	473	271	240	140	124	79	511	55
18	46	76	e140	e450	432	264	221	138	120	91	488	70
19	45	65	e130	e330	430	254	226	136	113	218	202	63
20	49	57	e125	e290	424	243	226	136	105	95	152	56
21	48	52	e130	e280	407	249	217	136	103	83	131	55
22	53	49	e120	e260	374	289	214	131	108	108	143	55
23	47	49	e115	e240	916	248	209	126	113	117	122	56
24	45	58	e110	e250	869	240	199	e117	131	124	111	56
25	44	49	e107	e230	572	243	195	e110	134	109	104	58
26	44	47	e105	e210	451	233	191	e105	118	109	102	92
27	45	98	e100	194	380	395	184	e115	136	302	100	79
28	44	650	e107	915	337	2910	189	e110	124	675	93	62
29	43	181	e100	751	---	2740	178	e100	120	261	88	55
30	54	123	e95	450	---	1250	191	e93	115	163	84	51
31	81	---	e92	353	---	761	---	e90	---	128	80	---
TOTAL	1392	2446	7447	9615	11501	18507	8057	4583	2857	4171	3927	1896
MEAN	44.9	81.5	240	310	411	597	269	148	95.2	135	127	63.2
MAX	81	650	2720	915	916	2910	564	218	136	675	511	92
MIN	35	47	83	110	187	233	178	90	65	79	71	51
CFSM	.31	.55	1.63	2.11	2.79	4.06	1.83	1.01	.65	.92	.86	.43
IN.	.35	.62	1.88	2.43	2.91	4.68	2.04	1.16	.72	1.06	.99	.48

e Estimated.

## 02027800 BUFFALO RIVER NEAR TYE RIVER, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	137	141	173	196	235	286	244	194	168	96.7	105	99.1
MAX	758	731	455	492	482	752	658	568	1161	463	1023	774
(WY)	1973	1986	1973	1978	1984	1993	1987	1989	1972	1972	1969	1979
MIN	17.7	41.3	35.5	43.9	89.1	78.3	76.9	52.4	39.1	20.8	11.9	9.17
(WY)	1964	1992	1966	1966	1977	1981	1966	1981	1964	1977	1964	1964

## SUMMARY STATISTICS

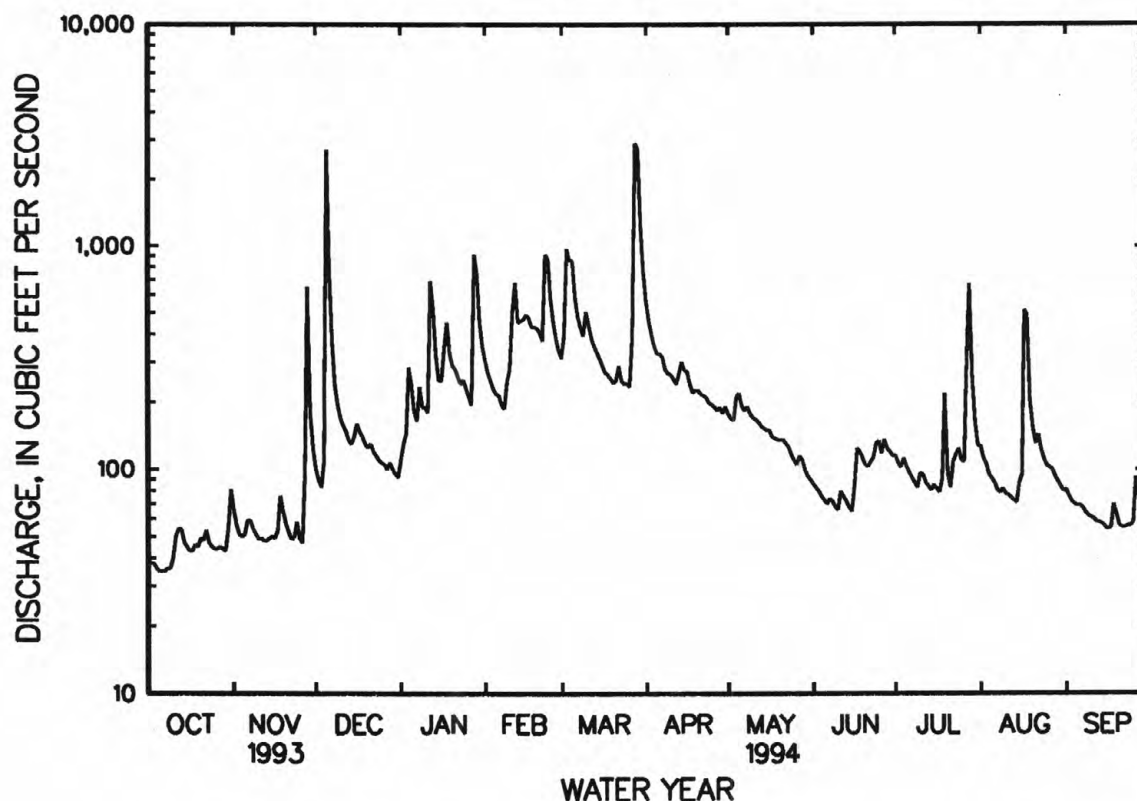
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1960 - 1994

ANNUAL TOTAL	79996		76399									
ANNUAL MEAN	219		209							173		
HIGHEST ANNUAL MEAN										340		1973
LOWEST ANNUAL MEAN										70.3		1981
HIGHEST DAILY MEAN	3700	Mar 4				2910	Mar 28			22500	Aug 20	1969
LOWEST DAILY MEAN	29	Sep 1				35	aOct 5			3.2	bSep 9	1966
ANNUAL SEVEN-DAY MINIMUM	32	Aug 26				36	Oct 3			3.3	Sep 7	1966
INSTANTANEOUS PEAK FLOW						4790	Dec 5			45000	Aug 20	1969
INSTANTANEOUS PEAK STAGE						9.89	Dec 5			c27.95	Aug 20	1969
INSTANTANEOUS LOW FLOW						34	Oct 6			3.2	dSep 8	1966
ANNUAL RUNOFF (CFSM)	1.49					1.42				1.18		
ANNUAL RUNOFF (INCHES)	20.24					19.33				15.97		
10 PERCENT EXCEEDS	476					437				322		
50 PERCENT EXCEEDS	135					120				114		
90 PERCENT EXCEEDS	42					50				34		

- a Also Oct. 6, 7, 1993.  
b Also Sept. 10-12, 1966.  
c From floodmarks.  
d Also Sept. 9-13, 1966.



## JAMES RIVER BASIN

## 02028500 ROCKFISH RIVER NEAR GREENFIELD, VA

LOCATION.--Lat 37°52'10", long 78°49'25", Nelson County, Hydrologic Unit 02080203, on left bank 50 ft downstream from bridge on State Highway 634, 2.8 mi downstream from confluence of North and South Forks, and 4.1 mi south of Greenfield.

DRAINAGE AREA.--94.6 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1943 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 530.29 ft above sea level. Prior to Aug. 21, 1943, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 30 to Jan. 1 and Jan. 10, 11, 16, 20-23, which are fair. Maximum discharge, 70,000 ft<sup>3</sup>/s, from rating curve extended above 8,500 ft<sup>3</sup>/s on basis of contracted-opening measurement at gage height 18.11 ft, slope-area measurements at gage heights 17.2 ft, 23.4 ft, and 31.2 ft, and peak runoff comparison with nearby stations. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 15, 1942, reached a stage of 23.4 ft, from floodmarks, discharge, about 30,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1330	1,880	5.79	Feb. 23	1230	2,180	5.97
Dec. 5	0600	*3,520	*7.75	Mar. 29	0800	2,020	5.73
Jan. 28	1130	2,470	6.42	Aug. 17	1130	2,720	6.77

Minimum daily discharge, 8.5 ft<sup>3</sup>/s, Oct. 9-11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	17	71	e53	301	283	535	112	43	24	116	54
2	13	13	62	55	241	286	438	102	39	21	96	47
3	12	12	56	55	205	254	380	98	38	23	81	45
4	12	12	85	147	181	310	335	152	37	27	70	43
5	11	12	1750	112	165	593	292	181	37	23	64	40
6	10	12	530	98	151	583	271	168	36	20	61	39
7	10	12	286	100	136	682	238	157	35	18	50	35
8	9.5	12	202	142	128	915	215	165	35	18	46	31
9	8.5	12	161	124	161	790	197	146	35	18	41	31
10	8.5	10	138	e102	153	1150	188	132	35	22	38	30
11	8.5	10	116	e99	165	872	176	124	36	18	38	30
12	16	10	94	395	179	634	168	112	37	15	39	29
13	15	14	90	323	163	508	234	104	33	15	34	26
14	12	13	84	249	170	417	200	98	30	15	29	23
15	12	12	84	183	188	357	181	94	28	15	28	22
16	11	12	94	e138	222	314	188	104	63	16	49	21
17	10	13	84	225	249	268	172	84	64	29	837	23
18	11	30	81	254	274	249	161	79	35	29	580	43
19	11	19	77	179	317	220	159	77	30	69	277	26
20	11	16	70	e165	360	195	148	77	27	27	195	22
21	12	14	77	e148	383	188	146	75	40	26	236	20
22	12	13	72	e136	360	186	146	70	78	170	212	23
23	12	12	69	e134	1260	163	140	64	35	67	157	36
24	12	12	64	170	996	159	130	58	34	47	130	28
25	12	12	62	151	703	157	126	57	32	44	116	27
26	12	12	58	144	523	146	120	58	26	66	104	70
27	12	220	55	136	400	356	118	64	63	299	90	44
28	12	775	55	1260	326	836	116	58	49	368	77	32
29	12	157	53	834	---	1480	112	54	34	174	69	26
30	23	96	e52	516	---	940	136	50	28	124	61	23
31	29	---	e50	380	---	677	---	46	---	113	57	---
TOTAL	384.0	1596	4882	7207	9060	15168	6166	3020	1172	1960	4078	989
MEAN	12.4	53.2	157	232	324	489	206	97.4	39.1	63.2	132	33.0
MAX	29	775	1750	1260	1260	1480	535	181	78	368	837	70
MIN	8.5	10	50	53	128	146	112	46	26	15	28	20
CFSM	.13	.56	1.66	2.46	3.42	5.17	2.17	1.03	.41	.67	1.39	.35
IN.	.15	.63	1.92	2.83	3.56	5.96	2.42	1.19	.46	.77	1.60	.39

e Estimated.

## 02028500 ROCKFISH RIVER NEAR GREENFIELD, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	96.9	126	150	161	190	248	227	162	114	71.0	91.3	81.6
MAX	394	733	445	358	458	629	698	369	614	327	1246	506
(WY)	1991	1986	1951	1949	1973	1993	1983	1990	1972	1972	1969	1979
MIN	8.65	17.9	18.5	23.1	62.0	55.9	52.5	44.7	23.1	8.82	4.10	3.34
(WY)	1964	1954	1966	<u>a</u> 1966	1944	1981	1981	1981	1956	1966	1966	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1943 - 1994

ANNUAL TOTAL	69051.9		55682.0									
ANNUAL MEAN	189		153							143		
HIGHEST ANNUAL MEAN										290		1973
LOWEST ANNUAL MEAN										45.9		1981
HIGHEST DAILY MEAN	2510	Mar 4				1750	Dec 5			<u>e</u> 28800	Aug 20	1969
LOWEST DAILY MEAN	7.7	<u>b</u> Sep 1				8.5	<u>c</u> Oct 9			.20	<u>d</u> Sep 8	1966
ANNUAL SEVEN-DAY MINIMUM	8.6	Aug 28				9.4	Oct 5			.30	Sep 6	1966
INSTANTANEOUS PEAK FLOW						3520	Dec 5			70000	Aug 20	1969
INSTANTANEOUS PEAK STAGE						7.75	Dec 5			<u>f</u> 31.20	Aug 20	1969
INSTANTANEOUS LOW FLOW						8.5	<u>g</u> Oct 9			.20	<u>h</u> Sep 8	1966
ANNUAL RUNOFF (CFSM)	2.00					1.61				1.51		
ANNUAL RUNOFF (INCHES)	27.15					21.90				20.58		
10 PERCENT EXCEEDS	496					358				298		
50 PERCENT EXCEEDS	81					71				87		
90 PERCENT EXCEEDS	12					12				19		

a Also 1981.

b Also Sept. 2, 1993.

c Also Oct. 10, 11, 1993.

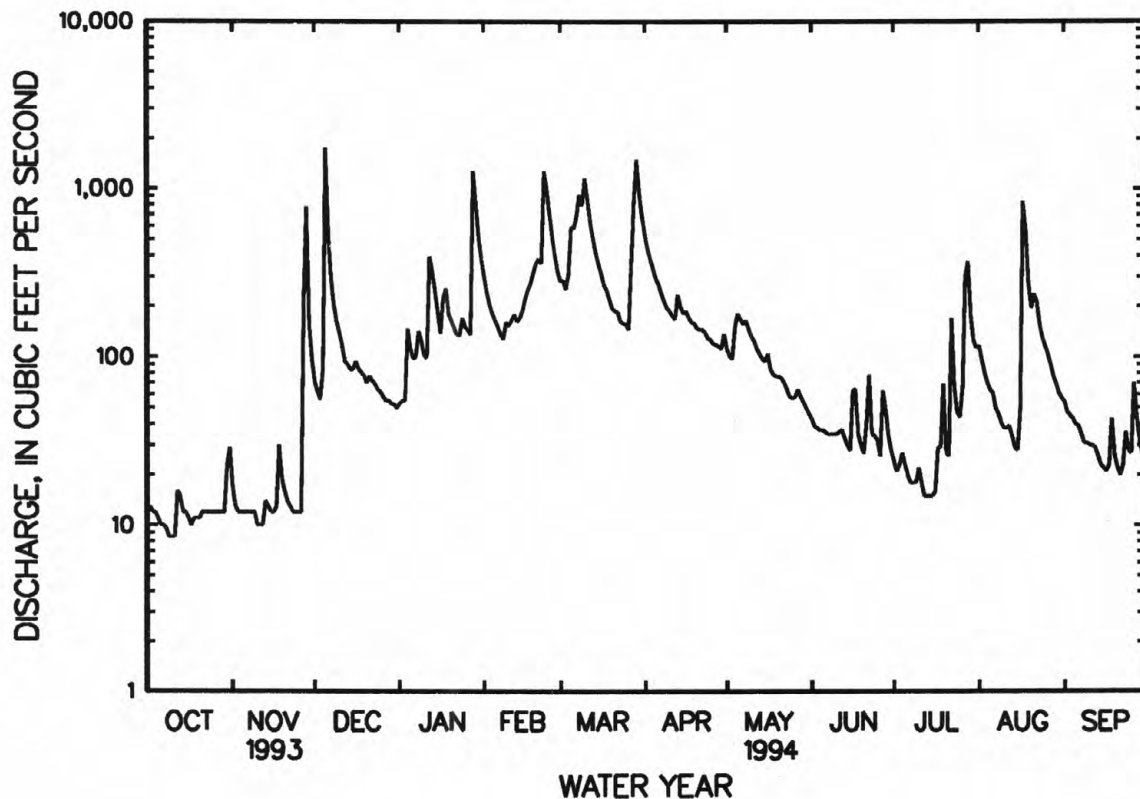
d Also Sept. 9-11, 1966.

e Estimated.

f From floodmarks.

g Also Oct. 10-12, 1993.

h Also Sept. 9-12, 1966.





## 02029000 JAMES RIVER AT SCOTTSVILLE, VA

LOCATION.--Lat 37°47'50", long 78°29'30", Albemarle County, Hydrologic Unit 02080203, on left bank 900 ft downstream from bridge on State Highway 20 at Scottsville, 6.8 mi upstream from Hardware River, and at mile 188.6.

DRAINAGE AREA.--4,584 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1924 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 727: 1931(M). WSP 972: 1936(M), 1940(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 253.18 ft above sea level. Prior to Nov. 28, 1928, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Jan. 18-24, which is fair. Large diurnal fluctuation caused by powerplants upstream from station. Flow regulated since December 1979 by Lake Moomaw (station 02011795) 197.5 mi upstream; since October 1984 by Back Creek Lake 225.5 mi upstream; and since January 1985 by Little Back Creek Lake 228.6 mi upstream, amount unknown. National Weather Service gage-height telemeter at station. Maximum discharge, 301,000 ft<sup>3</sup>/s, from rating curve extended above 120,000 ft<sup>3</sup>/s on basis of slope-conveyance study. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1870 reached a stage of 30.7 ft, discharge, about 215,000 ft<sup>3</sup>/s, and flood in November 1877 reached a stage of 27.9 ft, discharge, about 160,000 ft<sup>3</sup>/s, from information by local resident. Flood in March 1913 reached a stage of 25.16 ft, from floodmarks, discharge, 121,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 35,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 6	1530	36,300	14.67	Mar. 29	1645	*60,900	*18.87
Feb. 25	0030	38,700	15.18				

Minimum discharge, 710 ft<sup>3</sup>/s, Oct. 8; minimum daily, 863 ft<sup>3</sup>/s, Oct. 8; minimum gage height, 2.71 ft, July 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1770	1650	4910	2430	15500	13300	25300	5710	2410	1840	4940	2610
2	1710	1300	3850	2480	12200	12700	20400	6230	2280	1910	4680	2590
3	1400	1420	2890	2240	10100	20600	16600	5610	2220	1800	3420	2320
4	1320	1350	2690	3320	8180	16900	14000	5780	2090	1440	3320	2100
5	1200	1420	16400	5660	7360	16600	11800	6700	2130	1710	3390	1980
6	1050	1400	34400	4520	6250	21600	10500	9490	2070	1530	2840	1930
7	1150	1540	21200	4330	5980	23000	9880	9610	1970	1600	2550	1880
8	863	1350	11100	4780	5440	21500	9790	9160	2150	1590	2310	1790
9	930	1360	7790	5590	5530	23300	11100	12000	2190	1190	2080	1750
10	1080	1460	6220	7240	7500	24000	9800	16800	2240	1630	1840	1690
11	1160	1130	4970	6350	19800	22800	9250	12500	2790	1710	1950	1630
12	1190	1300	4080	6780	22300	23800	8540	10300	2700	1680	1850	1560
13	1170	1220	3920	13200	19200	20000	8220	8860	2230	1480	1650	1580
14	1280	1120	3440	19600	17000	16700	8750	7930	2160	1380	1790	1710
15	1140	1250	3370	14400	17500	14100	10600	6680	2090	1460	1760	1450
16	1190	1520	3700	10500	16900	11700	10600	5280	2050	1550	2460	1360
17	1160	1000	3510	7760	15400	10100	10100	4790	1880	1510	3690	1440
18	1150	1330	3990	e6900	14700	9110	9470	4560	2100	1360	21500	1480
19	939	1640	3730	e7200	14500	8350	8360	4410	2280	2470	24200	1650
20	1190	1540	3670	e6400	14700	7860	7740	4270	2050	3750	11900	1600
21	1090	1650	3910	e6000	15500	7220	6960	4020	1450	2320	7590	1610
22	1130	1440	3580	e5600	15900	7560	6180	3890	2170	2240	6170	1500
23	1070	1330	3520	e5400	19700	7880	5890	3440	1890	3300	5870	1490
24	1200	1570	3200	e5500	32000	8940	5830	3460	2530	4300	4910	1500
25	979	1190	3070	5760	33800	8740	5630	3060	2690	4180	4000	1410
26	971	1500	2580	6860	25600	8510	5210	3180	2160	2840	3510	1720
27	1120	1620	2640	8300	20600	9190	5120	2780	2470	3230	3500	2610
28	979	14100	2690	12500	16100	38500	5180	2890	3010	9860	3100	1950
29	1100	8150	2580	27600	---	55200	5570	2750	2550	7070	2890	1540
30	1070	8050	2700	28400	---	45600	5990	2670	2060	4400	2700	1420
31	1630	---	2260	21100	---	32400	---	2460	---	3980	2500	---
TOTAL	36381	67900	182560	274700	435240	567760	288360	191270	67060	82310	150860	52850
MEAN	1174	2263	5889	8861	15540	18310	9612	6170	2235	2655	4866	1762
MAX	1770	14100	34400	28400	33800	55200	25300	16800	3010	9860	24200	2610
MIN	863	1000	2260	2240	5440	7220	5120	2460	1450	1190	1650	1360
(†)	-115	+64	+452	+322	-27	+117	-134	-16	-121	-78	-59	-181
MEAN#	1059	2327	6341	9183	15513	18427	9478	6154	2114	2577	4807	1581
CFSM#	.23	.51	1.38	2.00	3.38	4.02	2.07	1.34	.46	.56	1.05	.34
IN.#	.27	.57	1.60	2.31	3.52	4.64	2.31	1.55	.51	.65	1.21	.38

CAL YR	TOTAL	MEAN	MAX	MIN	MEAN#	CFSM#	IN.#
YR 1993	2307638	6322	69400	851	6328	1.38	18.74
YR 1994	2399151	6568	55200	863	6588	1.44	19.51

† Change in contents, equivalent in cubic feet per second, in Lake Moomaw; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

e Estimated.



## 02029000 JAMES RIVER AT SCOTTSVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1979, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3139	3440	5208	6854	8040	9495	7988	5805	4024	2453	2992	2521
MAX	14550	12920	18620	19350	15810	20320	16600	12480	18960	9225	15330	11690
(WY)	1938	1973	1949	1937	1939	1936	1935	1942	1972	1972	1940	1979
MIN	499	792	844	1002	1335	3942	2571	2007	1202	527	594	502
(WY)	1931	1931	1966	1956	1934	1925	1942	1930	1964	1966	1930	1930

## SUMMARY STATISTICS

## WATER YEARS 1925 - 1979

ANNUAL MEAN	5149
HIGHEST ANNUAL MEAN	9317
LOWEST ANNUAL MEAN	2477
HIGHEST DAILY MEAN	208000
LOWEST DAILY MEAN	300
ANNUAL SEVEN-DAY MINIMUM	321
INSTANTANEOUS PEAK FLOW	301000
INSTANTANEOUS PEAK STAGE	a34.02
INSTANTANEOUS LOW FLOW	b302
ANNUAL RUNOFF (CFSM)	1.12
ANNUAL RUNOFF (INCHES)	15.26
10 PERCENT EXCEEDS	10600
50 PERCENT EXCEEDS	3190
90 PERCENT EXCEEDS	1000

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3254	4787	5131	6124	7745	10590	10590	6848	4144	2399	2584	2395
MAX	11990	25090	10230	14550	15540	23820	28930	18230	11450	5582	7934	8432
(WY)	1980	1986	1984	1991	1994	1993	1987	1989	1982	1989	1984	1989
MIN	963	1251	1318	1165	3198	1961	2636	3610	1799	1262	934	843
(WY)	1987	1992	1981	1981	1981	1981	1981	1982	1986	1986	1987	1983

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

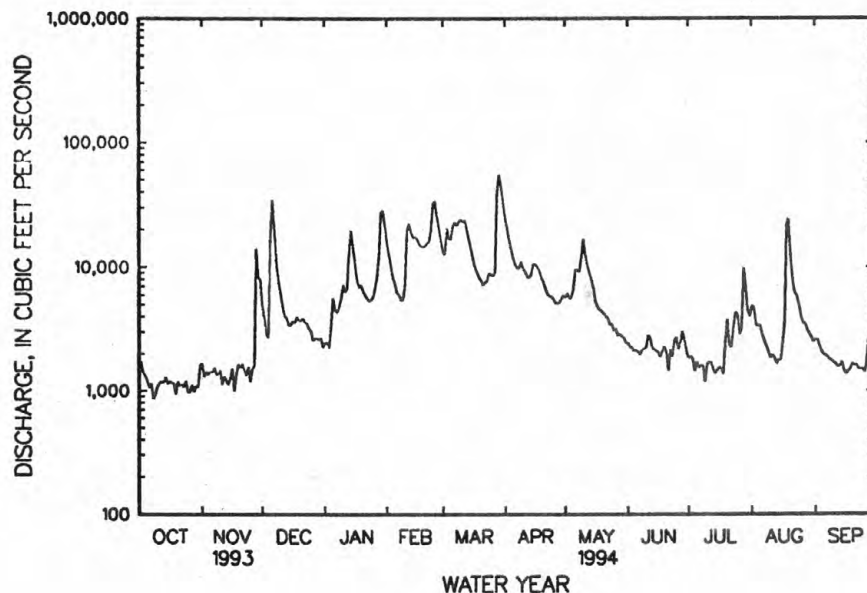
## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	2307638	2397251	
ANNUAL MEAN	6322	6568	5533
HIGHEST ANNUAL MEAN			7483
LOWEST ANNUAL MEAN			2217
HIGHEST DAILY MEAN	69400	Mar 5	55200
LOWEST DAILY MEAN	851	Sep 16	863
ANNUAL SEVEN-DAY MINIMUM	1050	Aug 26	1060
INSTANTANEOUS PEAK FLOW			60900
INSTANTANEOUS PEAK STAGE			18.87
INSTANTANEOUS LOW FLOW			710
ANNUAL RUNOFF (CFSM)	1.38	1.43	1.21
ANNUAL RUNOFF (INCHES)	18.73	19.45	16.40
10 PERCENT EXCEEDS	15200	16700	11900
50 PERCENT EXCEEDS	3150	3440	3220
90 PERCENT EXCEEDS	1170	1330	1140

a From floodmarks.

b Probably lower during period of doubtful record in September 1966.



## 02030000 HARDWARE RIVER BELOW BRIERY CREEK, NEAR SCOTTSVILLE, VA

LOCATION.--Lat 37°48'45", long 78°27'20", Fluvanna County, Hydrologic Unit 02080203, on left bank 75 ft upstream from bridge on State Highway 637, 0.8 mi downstream from Briery Creek, 2.4 mi northeast of Scottsville, and 10.8 mi upstream from mouth.

DRAINAGE AREA.--116 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1303. Published as "below Briery Run" prior to October 1990.

REVISED RECORDS.--WSP 952: 1941(M). WSP 1002: 1940, 1943. WSP 1032: 1940, 1944.

GAGE.--Water-stage recorder. Datum of gage is 294.96 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 16-26, and period of no gage-height record, May 24 to July 29, which are fair. Maximum discharge, 52,000 ft<sup>3</sup>/s, from rating curve extended above 18,000 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 23.8 ft and 31.0 ft. Minimum gage height, 0.81 ft, Sept. 8, 1966. Several measurements of water temperature were made during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0800	3,820	13.20	Mar. 28	1130	*4,520	*14.02
Dec. 5	1530	2,360	10.69	July 28	Unknown	3,280	a12.49
Jan. 28	2100	2,030	9.95	Aug. 18	0530	2,730	11.51
Feb. 23	2130	2,870	11.82				

a From tape indicator.

Minimum discharge, 22 ft<sup>3</sup>/s, Oct. 5, 6-7, gage height, 1.56 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	52	110	e72	184	217	449	119	e57	e40	99	51
2	26	40	94	78	139	383	365	109	e54	e39	87	47
3	25	36	88	82	122	958	322	104	e50	e38	75	45
4	24	35	103	250	111	760	294	153	e49	e47	71	44
5	23	35	1510	205	110	854	274	175	e48	e40	65	44
6	22	38	431	169	107	690	269	130	e48	e38	62	43
7	23	38	224	146	99	556	258	119	e47	e38	57	42
8	23	35	169	273	96	545	225	126	e50	e37	54	41
9	24	33	135	183	126	411	213	112	e54	e38	52	39
10	28	33	118	134	141	756	209	106	e48	e39	50	38
11	32	32	107	119	134	535	194	103	e49	e46	49	42
12	41	32	93	528	247	371	190	99	e51	e41	48	40
13	43	32	87	417	210	312	224	93	e46	e37	47	38
14	33	36	85	253	236	277	229	91	e42	e70	48	36
15	30	35	94	158	284	243	187	93	e41	e66	68	37
16	29	33	121	e120	309	217	198	112	e44	e50	61	36
17	30	35	94	e130	347	192	172	90	e56	e54	609	35
18	32	64	86	e150	367	187	158	86	e46	e70	1380	44
19	30	49	82	e135	483	177	154	87	e42	e58	205	39
20	30	41	77	e125	505	158	150	94	e45	e50	121	35
21	31	36	97	e120	460	156	139	88	e51	e68	96	34
22	40	35	106	e118	389	171	141	81	e61	e57	88	52
23	33	34	91	e130	1590	142	138	78	e54	e52	75	85
24	30	34	85	e127	1250	132	136	e80	e45	e49	64	48
25	29	33	82	e124	540	144	126	e74	e39	e55	61	58
26	29	33	77	e121	379	130	121	e70	e46	e200	59	145
27	30	296	71	122	286	399	120	e72	e78	e450	56	80
28	31	2540	71	876	240	3200	122	e65	e53	e1800	54	55
29	29	318	e71	746	---	2540	122	e64	e45	e400	52	47
30	42	154	e70	339	---	891	133	e62	e44	160	51	45
31	74	---	e68	234	---	543	---	e60	---	105	48	---
TOTAL	972	4277	4797	6784	9491	17247	6032	2995	1483	4332	4012	1465
MEAN	31.4	143	155	219	339	556	201	96.6	49.4	140	129	48.8
MAX	74	2540	1510	876	1590	3200	449	175	78	1800	1380	145
MIN	22	32	68	72	96	130	120	60	39	37	47	34
CFSM	.27	1.23	1.33	1.89	2.92	4.80	1.73	.83	.43	1.20	1.12	.42
IN.	.31	1.37	1.54	2.18	3.04	5.53	1.93	.96	.48	1.39	1.29	.47

e Estimated.

02030000 HARDWARE RIVER BELOW BRIERY CREEK, NEAR SCOTTSVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	92.2	101	133	151	183	215	186	137	106	76.7	102	84.0
MAX	370	514	514	443	380	613	604	398	560	273	1155	749
(WY)	1977	1986	1949	1978	1952	1993	1983	1989	1972	1975	1969	1944
MIN	11.4	17.5	20.5	25.0	50.3	35.1	39.5	36.0	24.2	9.45	4.71	7.93
(WY)	1942	1942	1966	1966	1954	1981	1981	1981	1956	1966	1966	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1939 - 1994

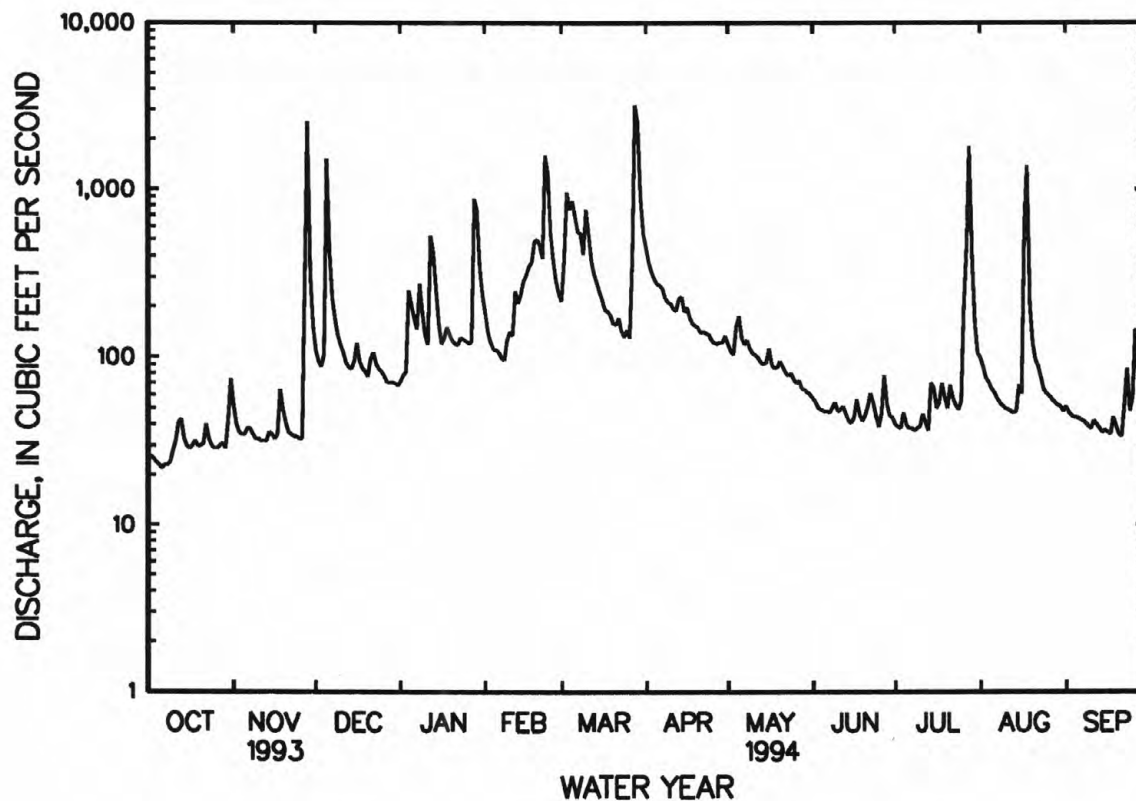
ANNUAL TOTAL	65926		63887									
ANNUAL MEAN	181		175									
HIGHEST ANNUAL MEAN										130		
LOWEST ANNUAL MEAN										249		1973
HIGHEST DAILY MEAN										39.0		1981
LOWEST DAILY MEAN	3290	Mar 4		3200	Mar 28					28400	Aug 20	1969
ANNUAL SEVEN-DAY MINIMUM	19	bSep 14		22	Oct 6					.10	Sep 5	1966
INSTANTANEOUS PEAK FLOW	22	Sep 10		23	Oct 3					.16	Sep 1	1966
INSTANTANEOUS PEAK STAGE				4520	Mar 28					52000	Aug 20	1969
INSTANTANEOUS LOW FLOW				14.02	Mar 28					c31.00	Aug 20	1969
ANNUAL RUNOFF (CFSM)	1.56			22	dOct 5					.10	fSep 5	1966
ANNUAL RUNOFF (INCHES)	21.14			1.51						1.12		
10 PERCENT EXCEEDS	378			20.49						15.27		
50 PERCENT EXCEEDS	95									237		
90 PERCENT EXCEEDS	29									82		
										26		

b Also Sept. 15, 1993.

c From floodmarks.

d Also Oct. 6, 7, 1993.

f Also Sept. 6-8, 1966.



## JAMES RIVER BASIN

02030500 SLATE RIVER NEAR ARVONIA, VA

LOCATION.--Lat 37°42'10", long 78°22'40", Buckingham County, Hydrologic Unit 02080203, on left bank 250 ft upstream from bridge on State Highway 676, 1.8 mi northwest of Arvonias, 2.9 mi upstream from Hunts Creek, and 3.8 mi upstream from mouth.

DRAINAGE AREA.--226 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1926 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1928-29, 1932, 1933-34(M), 1935. WSP 2104: 1928(M), 1935-37(M), 1940(M), 1944(M), 1949(M), 1955(M), drainage area. WDR VA-72-1: 1935, 1937, 1944, 1949, 1971(M).

GAGE.--Water-stage recorder. Datum of gage is 238.78 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Feb. 15, 1936, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 30 to Jan. 2 and Jan. 17-23, and period of doubtful gage-height record, Apr. 2-27, which are fair. Maximum discharge, 42,200 ft<sup>3</sup>/s, from rating curve extended above 5,900 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 1.35 ft, Sept. 12, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0500	*9,690	*15.95	Mar. 3	0430	5,400	12.67
Dec. 5	1500	3,490	10.51	Mar. 29	1200	5,450	12.72
Feb. 23	2130	2,930	9.77				

Minimum discharge, 35 ft<sup>3</sup>/s, Oct. 6-7, gage height, 2.31 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44	109	537	e130	287	283	1020	398	117	96	115	71
2	41	79	297	e140	240	1570	e602	265	113	87	221	70
3	41	64	161	195	210	4800	e437	219	107	84	196	66
4	40	58	151	470	194	2730	e375	398	104	115	135	64
5	38	58	2230	614	190	1330	e338	620	107	92	105	62
6	36	72	1410	344	204	706	e333	411	114	88	91	62
7	36	97	419	263	193	466	e376	309	117	82	82	61
8	37	89	248	583	182	389	e329	276	149	74	75	59
9	38	70	191	459	244	345	e289	250	290	68	71	57
10	41	63	163	269	323	594	e276	222	194	73	69	55
11	47	60	154	214	433	760	e267	208	249	85	67	54
12	60	58	137	499	1070	449	e256	197	306	82	66	53
13	75	57	125	706	641	370	e263	186	185	72	64	52
14	62	57	120	385	801	329	e277	176	143	70	62	50
15	51	58	134	271	818	302	e247	174	122	67	76	49
16	46	58	275	169	955	280	e244	239	110	68	96	47
17	46	58	221	e190	796	257	e241	193	109	66	491	54
18	47	72	171	e260	673	249	e225	168	107	86	1070	86
19	49	75	159	e225	686	254	e221	162	103	86	313	75
20	49	69	147	e200	637	238	e220	164	97	116	162	62
21	49	63	275	e190	543	238	e218	165	112	113	123	54
22	53	58	330	e200	457	365	e211	158	278	92	132	77
23	54	56	227	e200	1590	320	e224	151	122	94	125	163
24	52	56	187	208	2340	266	e215	144	122	122	99	117
25	50	56	165	220	982	260	e201	142	169	102	86	83
26	49	55	151	212	524	263	e190	136	128	88	82	96
27	49	527	135	202	376	732	e180	136	107	123	80	191
28	51	7640	130	533	308	4330	189	131	116	197	78	131
29	50	3810	138	1080	---	5020	458	131	108	215	77	91
30	59	779	e122	546	---	2490	860	125	97	267	75	75
31	114	---	e120	359	---	1100	---	120	---	148	71	---
TOTAL	1554	14481	9430	10536	16897	32085	9782	6774	4302	3218	4655	2287
MEAN	50.1	483	304	340	603	1035	326	219	143	104	150	76.2
MAX	114	7640	2230	1080	2340	5020	1020	620	306	267	1070	191
MIN	36	55	120	130	182	238	180	120	97	66	62	47
CFSM	.22	2.14	1.35	1.50	2.67	4.58	1.44	.97	.63	.46	.66	.34
IN.	.26	2.38	1.55	1.73	2.78	5.28	1.61	1.12	.71	.53	.77	.38

e Estimated.

## JAMES RIVER BASIN

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02030500 SLATE RIVER NEAR ARVONIA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	150	181	239	282	340	376	335	225	178	128	143	145
MAX	778	867	998	992	969	1035	895	912	2009	498	800	872
(WY)	1977	1986	1949	1978	1979	1994	1937	1971	1972	1975	1955	1944
MIN	11.7	38.8	36.7	47.2	67.0	80.2	91.8	67.6	37.6	19.7	14.7	7.43
(WY)	1931	1966	1966	1966	1931	1981	1981	1981	1981	1966	1930	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1926 - 1994

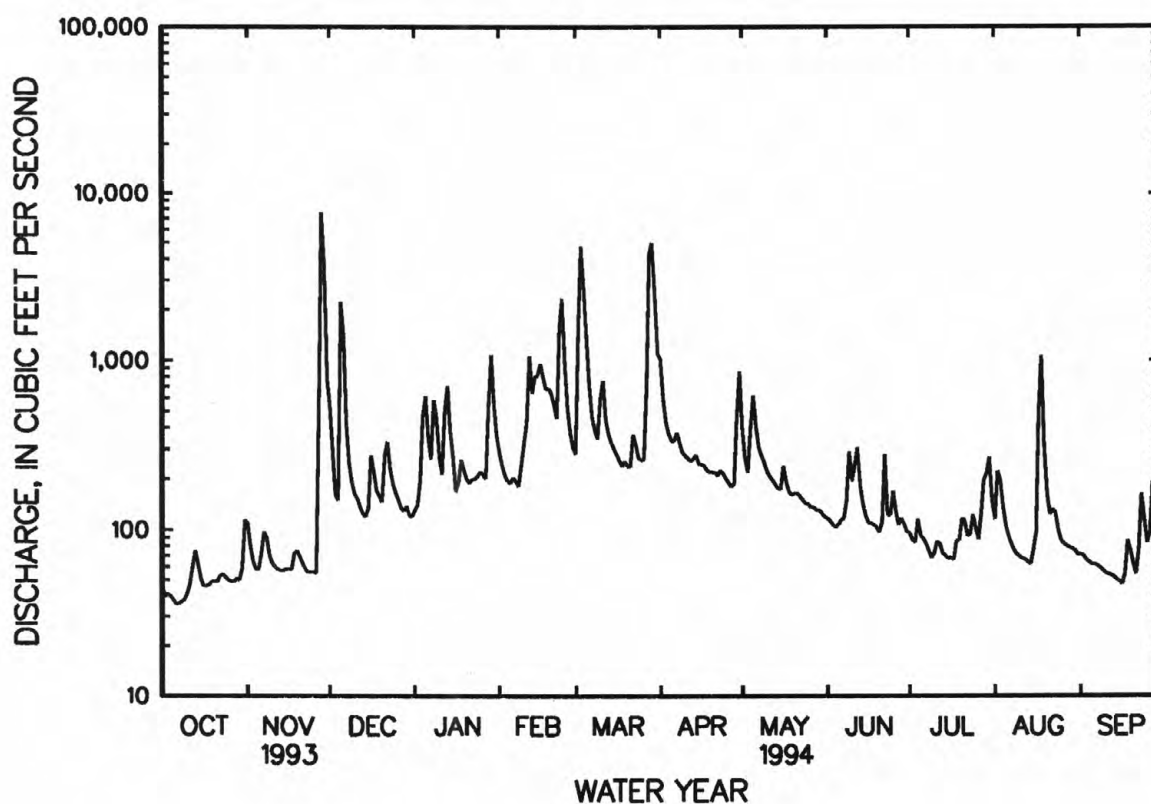
ANNUAL TOTAL	107343		116001									
ANNUAL MEAN	294		318							227		
HIGHEST ANNUAL MEAN										511		1972
LOWEST ANNUAL MEAN										78.9		1981
HIGHEST DAILY MEAN	7640	Nov 28		7640	Nov 28				33100		Jun 22	1972
LOWEST DAILY MEAN	26	Sep 1		36	<sup>a</sup> Oct 6				2.0		<sup>b</sup> Sep 29	1930
ANNUAL SEVEN-DAY MINIMUM	29	Aug 27		38	Oct 3				2.4		Sep 28	1930
INSTANTANEOUS PEAK FLOW				9690	Nov 28				42200		Jun 22	1972
INSTANTANEOUS PEAK STAGE				15.95	Nov 28				<sup>c</sup> 25.10		Jun 22	1972
INSTANTANEOUS LOW FLOW				35	<sup>a</sup> Oct 6				2.0		<sup>d</sup> Sep 28	1930
ANNUAL RUNOFF (CFSM)	1.30			1.41					1.00			
ANNUAL RUNOFF (INCHES)	17.67			19.09					13.64			
10 PERCENT EXCEEDS	554			597					396			
50 PERCENT EXCEEDS	145			151					126			
90 PERCENT EXCEEDS	45			56					41			

a Also Oct. 7, 1993.

b Also Sept. 30 to Oct. 2, 1930.

c From high-water mark.

d Also Sept. 29 to Oct. 2, 1930.





## JAMES RIVER BASIN

02031000 MECHUMS RIVER NEAR WHITE HALL, VA

LOCATION.--Lat 38°06'09", long 78°35'35", Albemarle County, Hydrologic Unit 02080204, on right bank 20 ft downstream from bridge on State Highway 614, 1.5 mi downstream from Rocky Run, 4.0 mi southeast of White Hall, and 4.9 mi upstream from confluence with Moormans River.

DRAINAGE AREA.--95.4 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1942 to September 1951, October 1979 to current year. Prior to September 1951, published as Mechum River near Ivy.

GAGE.--Water-stage recorder. Datum of gage is 429.75 ft above sea level. Oct. 1, 1942, to Sept. 30, 1951, on right bank 20 ft downstream from former highway bridge at different datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 10, 11, 16, 20-22, and period of no gage-height record, Sept. 5-30, which are fair. Maximum discharge, 20,000 ft<sup>3</sup>/s, from rating curve extended above 8,000 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 6, 1979, reached a stage of 24.5 ft, from floodmarks, discharge, about 13,500 ft<sup>3</sup>/s, from rating curve extended above 8,300 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1530	2,240	10.88	Feb. 23	1500	1,950	10.32
Dec. 5	0830	*2,360	*11.12	Mar. 29	0900	1,440	9.28
Jan. 28	1330	2,060	10.52	Aug. 17	1930	1,500	9.42

Minimum discharge, 15 ft<sup>3</sup>/s, Oct. 7, gage height, 4.36 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	36	81	e51	163	168	278	109	46	35	45	33
2	18	28	70	55	138	185	231	94	44	32	42	31
3	18	27	63	56	122	254	202	90	41	31	41	29
4	17	24	68	168	113	340	185	118	40	32	57	28
5	16	26	1080	138	105	651	172	136	41	33	40	e27
6	16	26	302	109	98	525	166	123	41	31	39	e26
7	16	26	167	100	91	454	160	116	41	28	31	e26
8	17	23	129	140	86	505	143	126	40	26	31	e25
9	17	23	105	118	116	414	138	109	40	27	28	e25
10	19	24	91	e105	113	660	134	99	40	31	27	e24
11	19	25	82	e92	118	456	128	92	46	26	26	e24
12	30	24	68	276	140	324	126	90	47	24	26	e21
13	27	24	65	226	123	265	145	81	41	23	24	e20
14	22	25	64	169	129	226	138	77	37	24	24	e19
15	20	26	65	129	149	196	125	83	34	24	24	e18
16	20	26	75	e115	173	174	123	112	33	23	32	e18
17	21	27	67	195	210	154	112	80	55	24	369	e25
18	22	66	60	376	215	147	109	74	40	36	284	e35
19	20	37	58	146	238	140	105	71	35	50	118	e22
20	21	30	55	e125	247	130	102	70	32	30	83	e18
21	22	27	68	e100	238	128	97	68	31	24	130	e17
22	25	25	67	e97	210	134	104	64	112	38	154	e19
23	22	25	61	118	925	119	99	62	59	35	95	e32
24	20	26	58	171	565	114	97	61	43	32	63	e24
25	20	26	57	132	358	112	94	59	40	28	55	e40
26	20	25	52	120	278	105	92	59	34	90	50	e58
27	22	307	53	109	219	200	92	61	57	132	43	e34
28	22	958	49	963	187	441	89	54	56	212	40	e27
29	20	170	e50	562	---	984	110	50	45	87	37	e23
30	37	104	e48	292	---	500	140	49	40	61	34	e21
31	57	---	e47	202	---	341	---	47	---	53	32	---
TOTAL	681	2266	3425	5755	5867	9546	4036	2584	1331	1382	2124	789
MEAN	22.0	75.5	110	186	210	308	135	83.4	44.4	44.6	68.5	26.3
MAX	57	958	1080	963	925	984	278	136	112	212	369	58
MIN	16	23	47	51	86	105	89	47	31	23	24	17
CFSM	.23	.79	1.16	1.95	2.20	3.23	1.41	.87	.47	.47	.72	.28
IN.	.27	.88	1.34	2.24	2.29	3.72	1.57	1.01	.52	.54	.83	.31

e Estimated.

## JAMES RIVER BASIN

309

02031000 MECHUMS RIVER NEAR WHITE HALL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1951, 1979 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	94.5	106	118	112	140	170	181	122	79.2	60.9	61.7	79.4
MAX	606	636	329	250	338	473	703	289	211	192	245	422
(WY)	1943	1986	1949	1991	1984	1993	1983	1989	1982	1991	1949	1987
MIN	8.65	19.7	20.7	24.0	55.4	45.2	37.1	34.9	23.9	8.95	13.2	8.29
(WY)	1944	1944	1944	1981	1947	1981	1981	1981	1944	1944	1943	1943

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

WATER YEARS 1942 - 1951,  
1979 - 1994

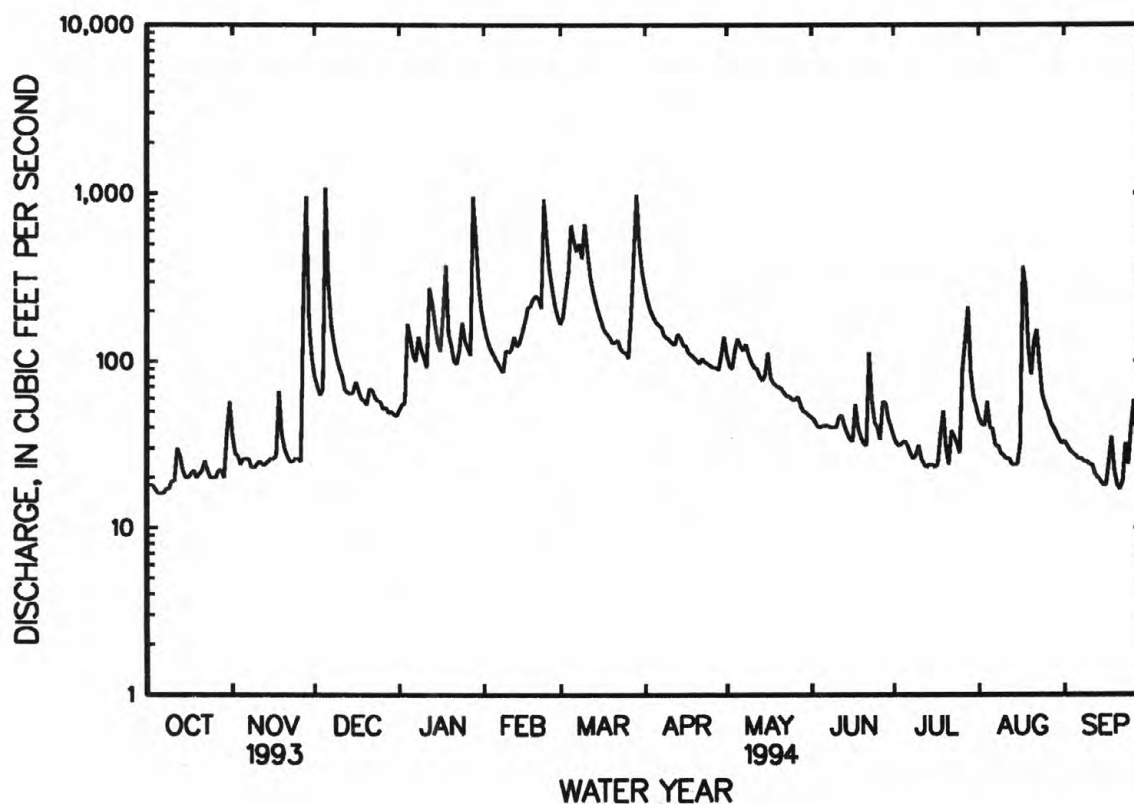
ANNUAL TOTAL	52144	39786	
ANNUAL MEAN	143	109	110
HIGHEST ANNUAL MEAN			176
LOWEST ANNUAL MEAN			41.6
HIGHEST DAILY MEAN	3220	1080	10600
LOWEST DAILY MEAN	15	16	.70
ANNUAL SEVEN-DAY MINIMUM	17	17	1.2
INSTANTANEOUS PEAK FLOW		2360	20000
INSTANTANEOUS PEAK STAGE		11.12	d30.30
INSTANTANEOUS LOW FLOW		15	.60
ANNUAL RUNOFF (CFSM)	1.50	1.14	1.15
ANNUAL RUNOFF (INCHES)	20.33	15.51	15.68
10 PERCENT EXCEEDS	314	226	195
50 PERCENT EXCEEDS	74	59	70
90 PERCENT EXCEEDS	20	23	21

a Also Sept. 14, 15, 1993.

b Also Oct. 6, 7, 1993.

c Also Oct. 4, 5, 1993.

d From floodmarks, datum then in use.



## JAMES RIVER BASIN

02032250 MOORMANS RIVER NEAR FREE UNION, VA

LOCATION.--Lat 38°08'26", long 78°33'22", Albemarle County, Hydrologic Unit 02080204, on right bank 130 ft upstream from bridge on State Highway 601, 0.4 mi upstream from confluence with Mechums River, 0.8 mi downstream from Wards Creek, and 1.1 mi southeast of Free Union.

DRAINAGE AREA.--74.6 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 403.11 ft above sea level.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Dec. 2, Jan. 13-15, 29-31, Feb. 3 to Mar. 24, and Aug. 20, 21, and periods with ice effect, Dec. 29-31 and Jan. 9-11, 16, 20-25, which are fair. Flow regulated by Rivanna Water and Sewer Authority at Sugar Hollow Reservoir 12.0 mi upstream from station, capacity, 1,320 acre-ft, from which an average of 5.6 ft<sup>3</sup>/s is diverted for industrial use. Maximum discharge, 16,300 ft<sup>3</sup>/s, from rating curve extended above 5,600 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 20.41 ft. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of 20.2 ft, from floodmarks, discharge, 15,100 ft<sup>3</sup>/s, and flood of Sept. 6, 1979, reached a stage of 21.55 ft, from floodmarks, discharge, about 16,500 ft<sup>3</sup>/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0200	*2,320	*8.47	Mar. 29	0900	1,260	6.53
Dec. 5	0600	1,990	7.87	Aug. 17	1600	1,970	7.83
Jan. 28	1100	1,350	6.70				

Minimum daily discharge, 3.8 ft<sup>3</sup>/s, Oct. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	23	59	31	209	e135	340	75	15	14	16	16
2	5.1	18	e50	32	158	e140	279	76	13	11	17	16
3	4.8	17	43	34	e135	e215	212	65	12	9.1	20	14
4	4.4	16	48	112	e100	e380	176	83	11	8.2	34	13
5	4.1	15	917	91	e92	e540	155	101	11	7.7	22	13
6	4.1	15	421	71	e84	e420	148	115	11	7.7	18	13
7	3.8	15	218	65	e78	e350	141	105	11	7.3	13	12
8	4.1	14	145	122	e72	e420	119	101	11	7.3	9.5	10
9	4.4	13	111	e105	e138	e405	109	82	11	5.1	8.2	8.8
10	5.1	13	93	e97	e130	e550	105	73	10	7.7	7.3	8.8
11	5.1	13	82	e87	e120	e400	101	62	14	9.5	6.9	9.8
12	10	13	66	209	e140	e330	100	58	15	6.0	6.9	8.8
13	11	13	55	e185	e115	e260	113	51	13	4.4	6.4	8.4
14	7.7	13	50	e140	e125	e210	123	47	9.5	4.1	6.0	7.5
15	7.3	14	52	e110	e150	e185	105	44	7.7	4.8	6.9	7.0
16	6.9	14	61	e94	e190	e165	113	42	6.9	4.4	10	6.6
17	6.9	15	50	136	e215	e150	103	37	18	6.0	468	7.0
18	8.2	27	44	243	e190	e140	94	35	10	32	593	11
19	9.1	20	43	136	e185	e130	100	35	7.7	17	215	9.8
20	8.6	16	40	e110	e180	e120	85	33	6.0	9.5	e74	7.5
21	10	13	56	e89	e200	e105	79	32	8.6	6.9	e100	6.6
22	10	13	51	e80	e175	e110	86	30	16	12	108	12
23	10	11	41	e96	e680	e103	78	27	24	11	62	28
24	10	11	38	e140	e530	e97	71	24	14	8.2	44	15
25	11	11	38	e118	e360	101	65	25	15	8.6	36	13
26	11	11	38	100	e255	96	58	22	9.5	31	31	35
27	11	309	36	89	e200	166	54	22	22	50	27	24
28	12	872	32	660	e160	302	47	21	29	80	24	13
29	12	152	e32	e450	---	982	48	18	17	36	21	8.8
30	22	86	e31	e330	---	669	75	17	15	25	19	6.2
31	30	---	e29	e250	---	450	---	16	---	18	17	---
TOTAL	275.2	1806	3070	4612	5366	8826	3482	1574	393.9	469.5	2047.1	369.6
MEAN	8.88	60.2	99.0	149	192	285	116	50.8	13.1	15.1	66.0	12.3
MAX	30	872	917	660	680	982	340	115	29	80	593	35
MIN	3.8	11	29	31	72	96	47	16	6.0	4.1	6.0	6.2
CFSM	.12	.81	1.33	1.99	2.57	3.82	1.56	.68	.18	.20	.89	.17
IN.	.14	.90	1.53	2.30	2.68	4.40	1.74	.78	.20	.23	1.02	.18

e Estimated.

JAMES RIVER BASIN

311

02032250 MOORMANS RIVER NEAR FREE UNION, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	73.1	135	101	99.6	133	193	224	120	62.8	38.3	36.5	42.1
MAX	319	814	260	238	348	513	641	399	266	172	97.6	214
(WY)	1991	1986	1984	1991	1984	1993	1987	1989	1982	1991	1989	1987
MIN	4.86	13.0	13.1	6.64	45.0	23.9	20.2	36.6	9.52	7.49	1.02	2.71
(WY)	1992	1992	1981	1981	1989	1981	1981	1986	1986	1987	1987	1980

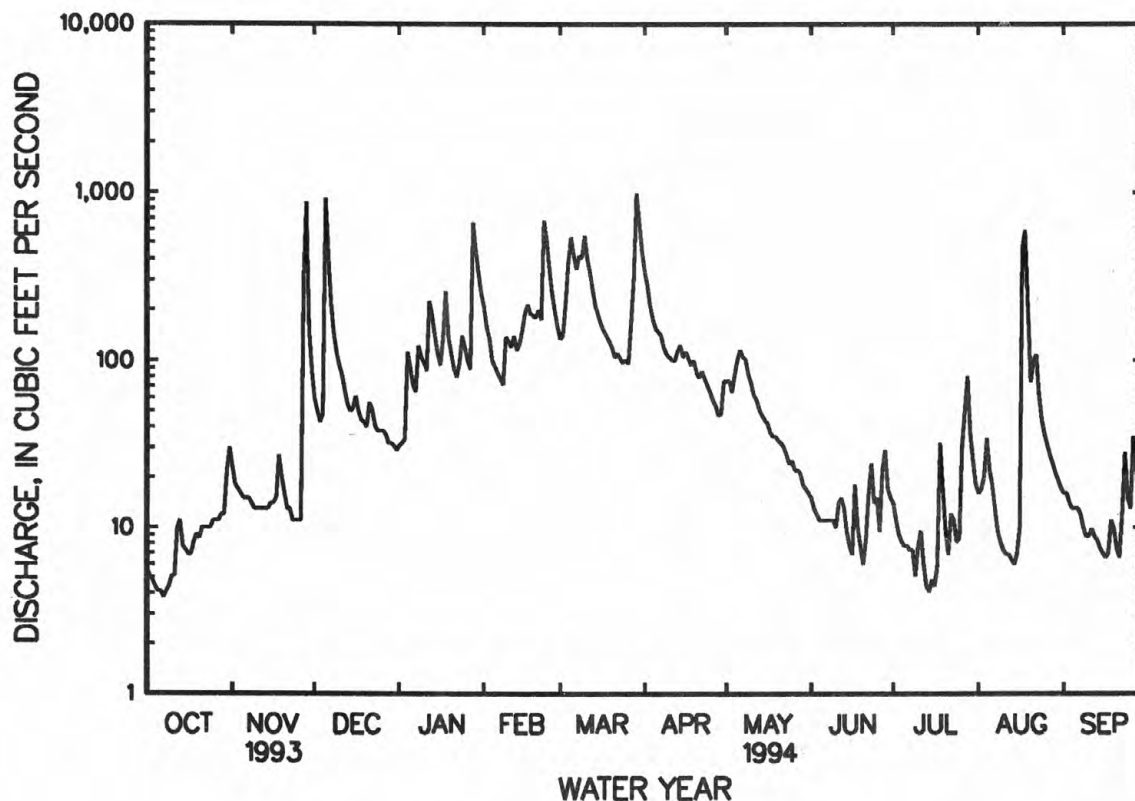
SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1980 - 1994

ANNUAL TOTAL	45348.0	32291.3	105
ANNUAL MEAN	124	88.5	170
HIGHEST ANNUAL MEAN			28.1
LOWEST ANNUAL MEAN			1993
HIGHEST DAILY MEAN	3300	Mar 4	982
LOWEST DAILY MEAN	2.3	Sep 1	3.8
ANNUAL SEVEN-DAY MINIMUM	3.2	Aug 26	4.2
INSTANTANEOUS PEAK FLOW			2320
INSTANTANEOUS PEAK STAGE			8.47
INSTANTANEOUS LOW FLOW			3.8
ANNUAL RUNOFF (CFSM)	1.67	1.19	1.40
ANNUAL RUNOFF (INCHES)	22.61	16.12	19.04
10 PERCENT EXCEEDS	331	213	230
50 PERCENT EXCEEDS	43	33	43
90 PERCENT EXCEEDS	7.5	7.3	6.4



## JAMES RIVER BASIN

02032400 BUCK MOUNTAIN CREEK NEAR FREE UNION, VA

LOCATION.--Lat 38°09'16", long 78°32'22", Albemarle County, Hydrologic Unit 02080204, on left bank at downstream side of bridge on State Highway 665, 0.2 mi downstream from Piney Creek, 1.6 mi east of Free Union, and 2.0 mi upstream from mouth.

DRAINAGE AREA.--37.0 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 408.71 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 29-31 and Jan. 16, 22, and periods of doubtful or no gage-height record, Jan. 19-21, Mar. 13-26, Aug. 20, Aug. 23 to Sept. 17, and Sept. 19-22, 25, 27-30, which are fair. Maximum discharge, 6,920 ft<sup>3</sup>/s, from rating curve extended above 1,500 ft<sup>3</sup>/s on basis of contracted-opening measurements at gage heights 9.30 ft and 9.61 ft. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 22, 1979, reached a stage of 11.12 ft, from floodmarks, discharge, about 6,600 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0215	*2,510	*7.88	Feb. 23	1200	864	5.49
Dec. 5	0545	2,170	7.53	Mar. 29	0800	757	5.19
Jan. 28	1100	1,160	6.17	Aug. 17	1830	1,010	5.84

Minimum discharge, 3.8 ft<sup>3</sup>/s, Oct. 6, gage height, 0.29 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	9.3	35	13	77	70	117	29	11	7.7	9.3	e10
2	4.7	7.3	27	14	61	79	99	25	9.5	7.1	12	e9.5
3	4.5	6.8	21	16	49	120	87	24	9.0	6.8	15	e8.7
4	4.2	6.6	41	71	41	209	77	36	9.2	9.3	33	e8.0
5	4.0	6.7	586	48	37	291	69	37	9.1	7.9	14	e7.4
6	4.0	7.0	134	34	34	198	70	32	9.2	6.9	10	e7.3
7	4.0	6.7	84	34	30	172	65	31	9.3	6.8	7.4	e7.0
8	4.1	6.1	59	72	29	193	55	35	9.2	6.0	8.0	e6.4
9	4.2	6.0	44	52	69	172	52	28	8.7	5.9	7.5	e5.6
10	4.5	6.0	35	43	63	270	50	26	9.1	14	5.9	e5.5
11	4.2	5.9	29	35	67	184	47	24	11	6.8	5.1	e7.0
12	7.8	5.9	23	112	69	143	48	24	11	6.5	5.0	e6.0
13	6.2	6.1	21	99	60	e120	66	22	9.2	6.0	4.7	e5.3
14	5.3	6.6	20	78	65	e100	69	20	7.8	6.1	4.9	e4.7
15	5.1	6.5	22	52	77	e88	61	20	8.2	6.2	5.6	e4.4
16	5.0	6.1	22	e46	95	e78	58	19	6.9	8.0	7.9	e4.3
17	5.3	7.2	18	40	105	e72	51	17	7.5	12	211	e6.0
18	5.5	15	17	73	105	e67	45	17	7.9	18	131	13
19	5.2	8.4	17	e40	106	e61	43	17	6.7	13	65	e6.5
20	5.3	7.5	15	e37	107	e53	40	17	6.3	7.7	e47	e4.7
21	5.5	6.6	22	e34	108	e50	37	17	7.4	7.1	86	e4.2
22	5.3	6.3	21	e32	99	e52	43	15	17	10	65	e7.6
23	5.3	6.2	18	45	405	e46	37	14	11	8.4	e40	29
24	5.2	6.1	17	94	238	e42	35	16	11	7.4	e32	19
25	5.2	6.1	17	55	151	e43	32	16	10	7.0	e26	e16
26	5.3	5.8	15	52	116	e41	30	14	7.4	13	e21	50
27	5.4	239	14	39	93	106	29	14	16	40	e18	e27
28	5.3	706	14	443	77	168	27	12	14	39	e16	e12
29	5.3	101	e14	208	---	480	31	12	9.4	15	e14	e8.2
30	9.9	56	e13	126	---	204	37	12	8.1	9.8	e12	e6.0
31	13	---	e12	95	---	142	---	11	---	8.0	e11	---
TOTAL	168.5	1282.8	1447	2232	2633	4114	1607	653	287.1	333.4	950.3	316.3
MEAN	5.44	42.8	46.7	72.0	94.0	133	53.6	21.1	9.57	10.8	30.7	10.5
MAX	13	706	586	443	405	480	117	37	17	40	211	50
MIN	4.0	5.8	12	13	29	41	27	11	6.3	5.9	4.7	4.2
CFSM	.15	1.16	1.26	1.95	2.54	3.59	1.45	.57	.26	.29	.83	.28
IN.	.17	1.29	1.45	2.24	2.65	4.14	1.62	.66	.29	.34	.96	.32

e Estimated.



## JAMES RIVER BASIN

313

02032400 BUCK MOUNTAIN CREEK NEAR FREE UNION, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	35.0	55.7	43.7	43.5	58.9	73.6	84.9	50.5	31.3	19.7	19.3	25.4
MAX	144	264	104	91.1	144	191	238	208	147	55.1	83.1	169
(WY)	1991	1986	1984	1991	1984	1993	1983	1989	1982	1989	1984	1987
MIN	3.91	6.11	8.45	7.23	20.1	15.2	12.0	14.0	4.61	4.93	1.33	1.33
(WY)	1987	1992	1981	1981	1989	1981	1981	1986	1986	1985	1987	1991

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

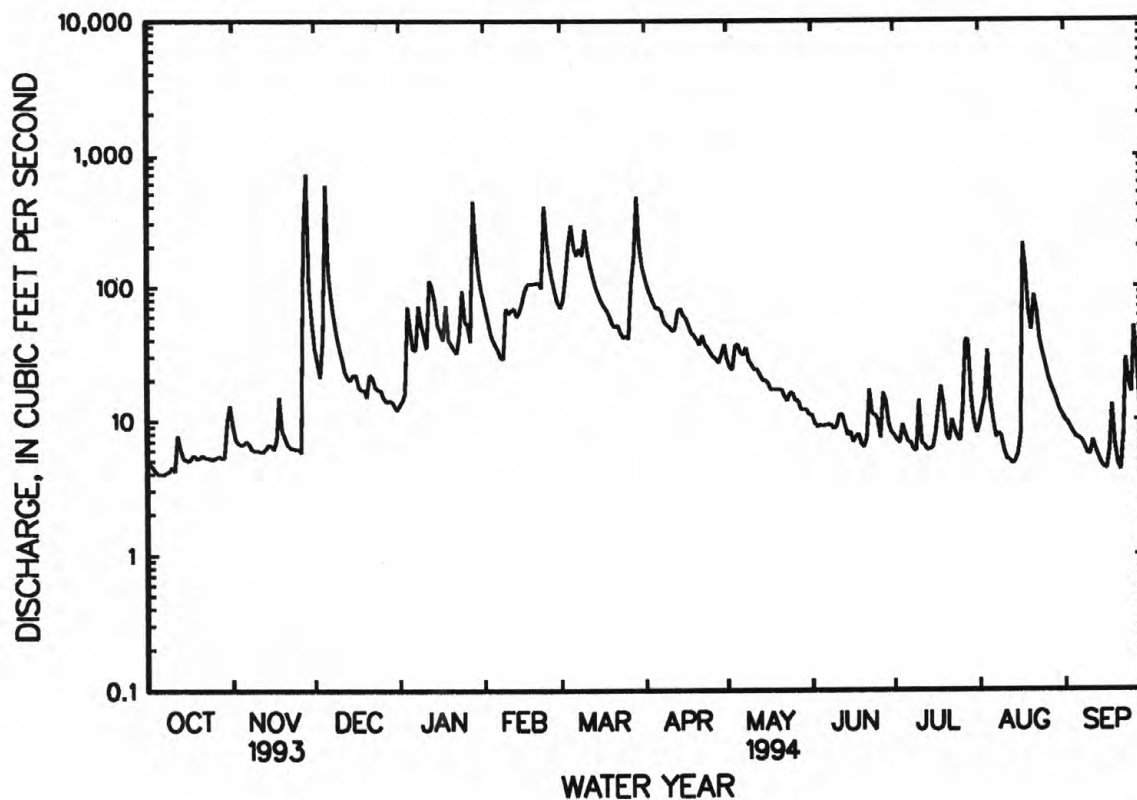
## WATER YEARS 1980 - 1994

ANNUAL TOTAL	19999.1	16024.4	
ANNUAL MEAN	54.8	43.9	45.0
HIGHEST ANNUAL MEAN			73.5
LOWEST ANNUAL MEAN			16.1
HIGHEST DAILY MEAN	1610	Mar 4	2980
LOWEST DAILY MEAN	e2.1	Sep 1	e.45
ANNUAL SEVEN-DAY MINIMUM	e2.9	Aug 26	.56
INSTANTANEOUS PEAK FLOW			6920
INSTANTANEOUS PEAK STAGE			10.57
INSTANTANEOUS LOW FLOW			.35
ANNUAL RUNOFF (CFSM)	1.48		1.22
ANNUAL RUNOFF (INCHES)	20.11		16.51
10 PERCENT EXCEEDS	118		87
50 PERCENT EXCEEDS	23		22
90 PERCENT EXCEEDS	5.3		4.5

a Also Oct. 6, 7, 1993.

b Also Oct. 4, 5, 1993.

e Estimated.



## JAMES RIVER BASIN

## 02032515 SOUTH FORK RIVANNA RIVER NEAR CHARLOTTESVILLE, VA

LOCATION.--Lat 38°06'06", long 78°27'39", Albemarle County, Hydrologic Unit 02080204, on left bank at downstream side of bridge on U.S. Highway 29, 0.4 mi downstream from South Fork Rivanna River dam, 2.5 mi northeast of Charlottesville city limits, and 2.9 mi upstream from mouth.

DRAINAGE AREA.--260 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1979 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 330 ft above sea level, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Rivanna Water and Sewer Authority at South Fork Rivanna and Sugar Hollow Reservoirs, combined capacity, 6,540 acre-ft, from which an average of 17.4 ft<sup>3</sup>/s is diverted for industrial and municipal use. Maximum discharge, 15,200 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s. Minimum discharge, 1.1 ft<sup>3</sup>/s, result of regulation. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,760 ft<sup>3</sup>/s, Nov. 28, gage height, 14.52 ft; minimum, 9.3 ft<sup>3</sup>/s, June 23, result of regulation; minimum daily, 11 ft<sup>3</sup>/s, July 16, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	95	264	111	562	491	929	274	107	84	59	76
2	30	66	208	152	444	545	724	264	68	51	118	80
3	13	54	159	143	400	805	611	255	51	76	120	18
4	55	84	200	377	341	975	539	303	82	14	266	34
5	33	74	2750	410	332	1910	484	351	50	75	113	51
6	43	58	1160	260	304	1620	471	261	115	36	94	107
7	15	66	607	310	311	1350	468	312	90	65	64	79
8	31	17	415	352	266	1660	404	334	83	44	72	41
9	54	37	326	336	363	1540	377	288	86	15	63	41
10	15	83	289	328	381	2000	366	258	77	72	54	56
11	54	19	196	319	376	1630	356	278	48	63	61	82
12	61	42	209	632	502	1170	351	242	79	12	65	77
13	55	44	205	778	413	912	373	213	105	19	33	46
14	54	49	152	488	390	749	420	186	97	66	58	46
15	40	49	160	401	439	634	418	189	62	59	56	41
16	40	79	212	286	498	553	256	274	22	11	64	52
17	51	64	189	316	637	483	317	192	111	33	806	51
18	56	159	127	496	659	408	366	121	83	147	1700	65
19	30	104	151	300	724	469	350	134	64	53	572	62
20	33	41	165	316	758	389	251	161	17	94	290	75
21	52	30	171	267	775	373	259	159	92	46	244	19
22	87	109	156	261	714	394	224	155	279	58	542	80
23	13	67	174	331	2340	358	275	162	114	37	209	216
24	25	47	136	521	1990	334	261	149	78	88	181	96
25	53	45	130	524	1330	322	245	132	60	46	73	47
26	29	47	146	377	978	310	234	112	77	238	157	206
27	42	668	137	271	697	541	229	147	131	328	108	140
28	79	3550	94	2160	563	1450	215	113	110	863	113	98
29	15	679	140	1900	---	2950	214	104	100	276	61	89
30	66	361	119	1070	---	1820	338	128	56	123	100	31
31	141	---	111	709	---	1200	---	106	---	130	74	---
TOTAL	1403	6887	9658	15502	18487	30345	11325	6357	2594	3322	6590	2202
MEAN	45.3	230	312	500	660	979	377	205	86.5	107	213	73.4
MAX	141	3550	2750	2160	2340	2950	929	351	279	863	1700	216
MIN	13	17	94	111	266	310	214	104	17	11	33	18
†FT <sup>3</sup> /S	17.0	15.8	15.0	16.6	17.1	16.5	17.3	18.3	19.6	18.3	18.1	18.7
CAL YR 1993	TOTAL	138723	MEAN	380	MAX	6590	MIN	12	†FT <sup>3</sup> /S	16.6		
WTR YR 1944	TOTAL	114672	MEAN	314	MAX	3550	MIN	11	†FT <sup>3</sup> /S	17.4		

† Average diversion, in cubic feet per second, at South Fork Rivanna and Sugar Hollow Reservoirs; provided by Rivanna Water and Sewer Authority.

02032515 SOUTH FORK RIVANNA RIVER NEAR CHARLOTTESVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	212	329	301	314	402	527	566	334	207	153	141	206
MAX	790	1483	723	705	903	1290	1517	856	710	505	423	1209
(WY)	1991	1986	1984	1991	1984	1993	1983	1989	1982	1991	1984	1979
MIN	23.6	59.7	61.7	52.4	144	106	85.8	121	58.8	48.4	9.86	25.7
(WY)	1989	1989	1989	1981	1989	1981	1981	1981	1986	1987	1987	1988

## SUMMARY STATISTICS

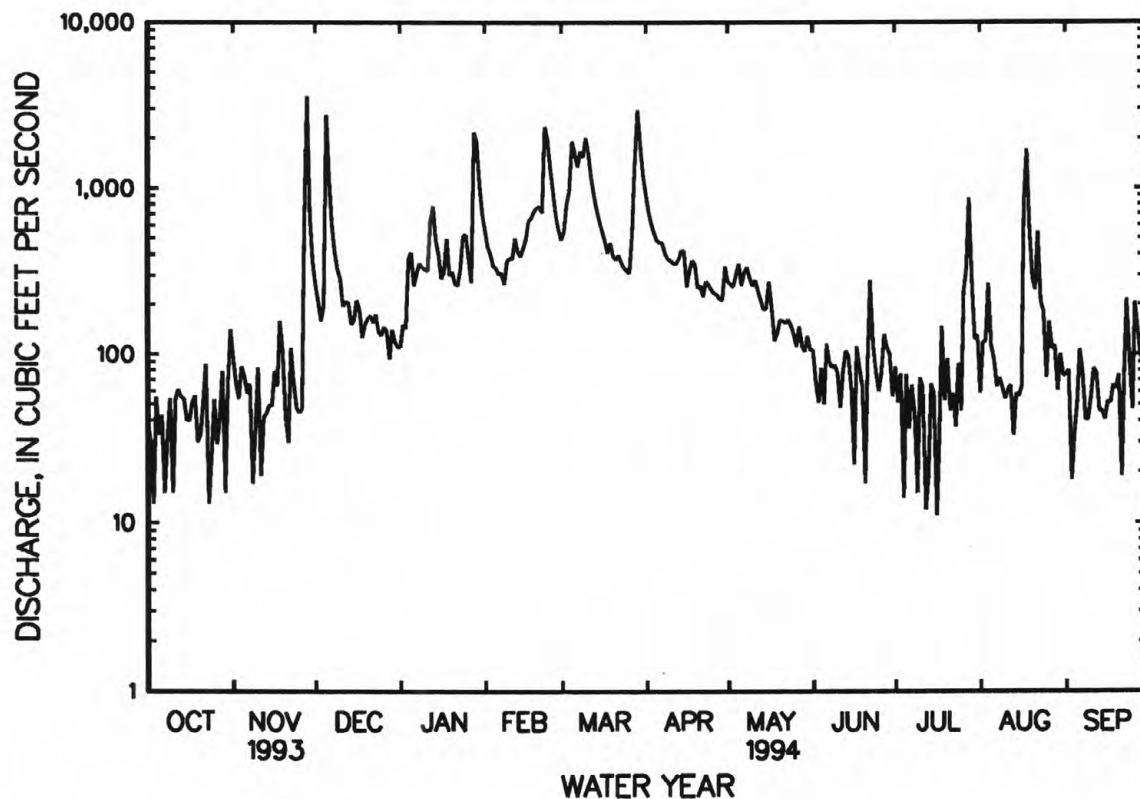
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1980 - 1994

ANNUAL TOTAL	138723		114672									
ANNUAL MEAN	380		314									
HIGHEST ANNUAL MEAN												1984
LOWEST ANNUAL MEAN												1981
HIGHEST DAILY MEAN	6590	Mar 4										1985
LOWEST DAILY MEAN	a12	bJul 31										1987
ANNUAL SEVEN-DAY MINIMUM	a27	Sep 10										1987
INSTANTANEOUS PEAK FLOW												1979
INSTANTANEOUS PEAK STAGE												1979
INSTANTANEOUS LOW FLOW												1990
ANNUAL RUNOFF (CFSM)	1.46											
ANNUAL RUNOFF (INCHES)	19.85											
10 PERCENT EXCEEDS	951											
50 PERCENT EXCEEDS	180											
90 PERCENT EXCEEDS	34											

- a Result of regulation.  
b Also Aug. 15 and Sept. 15, 1993.  
c During year of partial record.  
d From floodmarks.



## JAMES RIVER BASIN

02032640 NORTH FORK RIVANNA RIVER NEAR EARLYSVILLE, VA

LOCATION.--Lat 38°09'48", long 78°25'30", Albemarle County, Hydrologic Unit 02080204, on right bank at downstream side of bridge on State Highway 606, 0.4 mi upstream from mouth of Jacobs Run, 1.9 mi downstream from mouth of Marsh Run, and 2.1 mi southeast of Advance Mills.

DRAINAGE AREA.--108 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1993 to September 1994.

GAGE.--Water-stage recorder. Elevation of gage is 365 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 1, Jan. 15-25, June 16-20, June 30 to July 2, July 5-10, 12-14, 20-25, Aug. 5-10, and Sept. 11-30, and periods with ice effect, Dec. 29 to Jan. 1 and Jan. 10, 11, which are fair. Maximum discharge, 5,370 ft<sup>3</sup>/s, from rating curve extended above 2,150 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in April 1992 reached a stage of 19.92 ft, from floodmark, by the Virginia Department of Highways, discharge unknown.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0400	*5,370	*11.20	Feb. 23	1330	2,480	7.51
Dec. 5	0700	4,220	9.85	Mar. 29	0900	2,340	7.29
Jan. 28	1200	2,710	7.87				

Minimum daily discharge, 10 ft<sup>3</sup>/s, July 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e15	36	119	e48	225	209	356	88	33	e23	184	31
2	14	29	91	51	183	217	286	80	32	e31	108	28
3	14	27	76	56	152	319	254	75	30	45	64	26
4	13	25	106	170	130	547	234	92	29	34	54	24
5	13	26	1870	139	119	852	220	109	28	e25	e43	22
6	12	27	492	105	110	592	213	97	28	e20	e39	22
7	13	26	269	101	99	495	205	89	27	e18	e32	21
8	14	25	190	201	94	630	170	97	27	e15	e27	19
9	14	24	145	162	195	576	157	80	27	e13	e25	18
10	15	24	115	e120	186	897	150	72	27	e15	e23	23
11	15	23	93	e105	184	613	143	67	28	24	23	e25
12	25	23	76	300	192	428	140	64	30	e17	22	e21
13	23	24	69	300	168	340	175	60	28	e13	21	e17
14	19	25	64	230	176	286	204	57	26	e10	21	e16
15	18	25	70	e150	212	247	174	56	30	45	23	e14
16	18	24	83	e135	272	221	165	59	e24	62	27	e13
17	18	27	71	e122	297	203	150	54	e33	49	410	e20
18	19	56	64	e200	285	190	139	50	e25	720	486	e35
19	19	33	61	e130	282	174	132	49	e23	241	171	e21
20	19	28	58	e120	279	150	124	49	e21	e48	432	e15
21	20	24	77	e110	282	145	116	49	29	e30	330	e14
22	20	23	83	e102	262	149	128	45	50	e37	296	e29
23	20	23	72	e148	1240	130	121	42	36	e33	158	e72
24	20	22	66	e260	854	119	110	41	33	e29	100	e60
25	20	22	63	e180	528	123	104	43	38	e27	76	e52
26	19	22	58	122	377	116	98	41	29	41	63	e94
27	20	494	54	89	279	281	94	40	50	103	54	e66
28	21	2290	54	1240	229	522	88	37	56	253	47	e35
29	20	348	e52	754	---	1610	84	35	36	124	40	e22
30	31	180	e51	413	---	752	95	34	e30	78	36	e17
31	45	---	e50	286	---	468	---	34	---	60	33	---
TOTAL	586	4005	4862	6649	7891	12601	4829	1885	943	2283	3468	892
MEAN	18.9	133	157	214	282	406	161	60.8	31.4	73.6	112	29.7
MAX	45	2290	1870	1240	1240	1610	356	109	56	720	486	94
MIN	12	22	50	48	94	116	84	34	21	10	21	13
CFSM	.17	1.23	1.45	1.98	2.61	3.76	1.49	.56	.29	.68	1.03	.27
IN.	.20	1.38	1.67	2.29	2.71	4.33	1.66	.65	.32	.79	1.19	.31

e Estimated.

## JAMES RIVER BASIN

317

02032640 NORTH FORK RIVANNA RIVER NEAR EARLYSVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEAR 1994, BY WATER YEAR (WY)

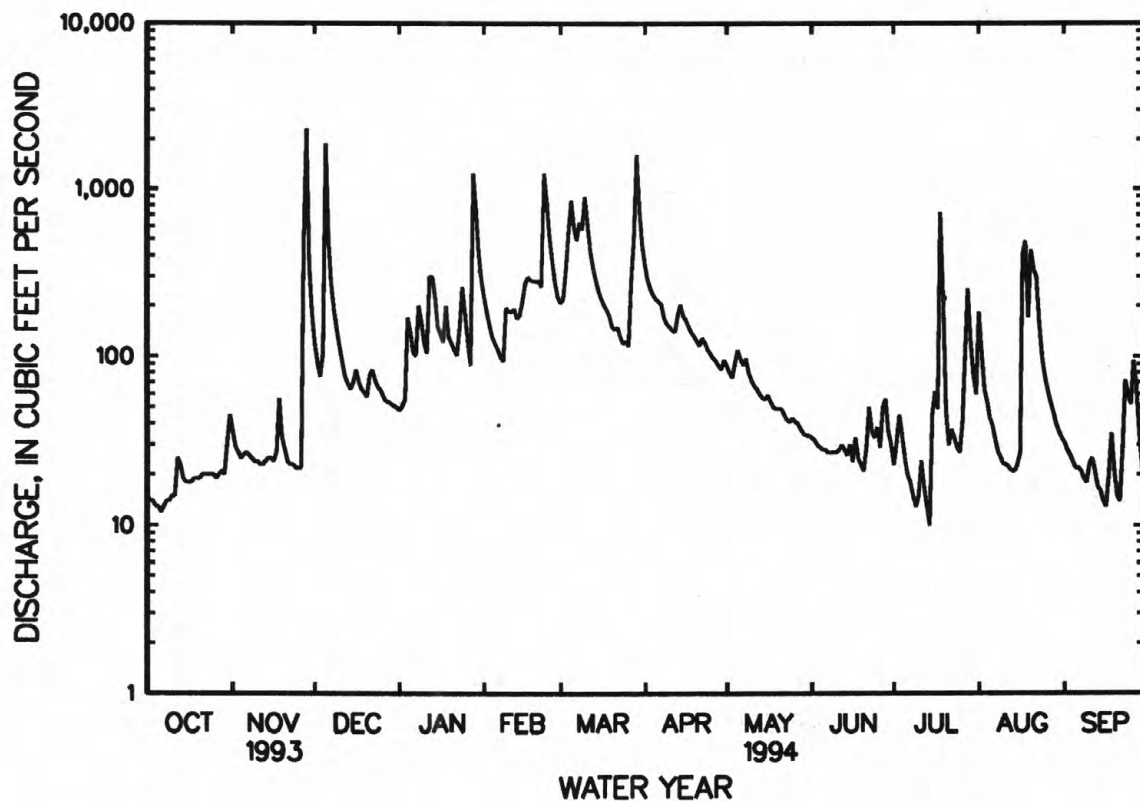
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	18.9	133	157	214	282	406	161	60.8	31.4	73.6	112	29.7
MAX	18.9	133	157	214	282	406	161	60.8	31.4	73.6	112	29.7
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994
MIN	18.9	133	157	214	282	406	161	60.8	31.4	73.6	112	29.7
(WY)	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994 WATER YEAR

ANNUAL TOTAL	50894	
ANNUAL MEAN	139	
HIGHEST DAILY MEAN	2290	Nov 28
LOWEST DAILY MEAN	a10	Jul 14
ANNUAL SEVEN-DAY MINIMUM	13	aOct 2
INSTANTANEOUS PEAK FLOW	5370	Nov 28
INSTANTANEOUS PEAK STAGE	11.20	Nov 28
INSTANTANEOUS LOW FLOW	(b)	(c)
ANNUAL RUNOFF (CFSM)	1.29	
ANNUAL RUNOFF (INCHES)	17.50	
10 PERCENT EXCEEDS	296	
50 PERCENT EXCEEDS	60	
90 PERCENT EXCEEDS	20	

- a Also Oct. 3, 4, 1993.  
b Not determined.  
c Probably occurred July 14, 1994.  
e Estimated.





## 02034000 RIVANNA RIVER AT PALMYRA, VA

LOCATION.--Lat 37°51'28", long 78°15'58", Fluvanna County, Hydrologic Unit 02080204, on left bank 10 ft upstream from bridge on U.S. Highway 15 at Palmyra, 0.5 mi upstream from Cunningham Creek, and 15 mi upstream from mouth.

DRAINAGE AREA.--664 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1933 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 802: 1936(M). WSP 852: 1937. WSP 892: 1934-35. WSP 1303: 1945-46(M). WSP 1503: 1956. WSP 2104: Drainage area. WDR VA-72-1: 1969(M).

GAGE.--Water-stage recorder. Datum of gage is 210.39 ft above sea level. Prior to Oct. 24, 1942, water-stage recorder at site 200 ft downstream at same datum. Oct. 24, 1942, to Dec. 18, 1947, nonrecording gage 10 ft downstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 29, 30, and Jan. 16-23, which are fair. Some diurnal fluctuation at times mostly at low and medium flow by South Fork Rivanna River Reservoir. Combined diversion of water supply and discharge from waste-water treatment plant upstream at Charlottesville results in an average gain of about 1.3 ft<sup>3</sup>/s upstream from the gage. National Weather Service gage-height telemeter at station. Maximum discharge, 86,000 ft<sup>3</sup>/s, from rating curve extended above 76,000 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow and velocity-area study. Minimum gage height, 2.13 ft, Sept. 9-11, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 6,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0900	*19,800	*22.48	Mar. 28	1400	16,400	20.93
Dec. 5	1830	9,670	16.23	July 28	0430	7,630	13.63
Jan. 29	0100	7,770	13.83	Aug. 18	0400	9,260	15.80
Feb. 24	0030	12,000	18.30				

Minimum discharge, 71 ft<sup>3</sup>/s, Oct. 9, gage height, 2.48 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	279	614	291	1160	1050	2250	626	271	190	399	198
2	95	195	479	291	888	1600	1680	563	259	198	371	199
3	89	159	421	340	804	4520	1440	518	209	150	351	188
4	90	146	381	743	661	3400	1210	644	189	205	494	138
5	98	162	5640	1120	590	4880	1090	834	216	125	357	136
6	91	168	3430	743	575	4160	1050	676	187	155	281	153
7	92	159	1400	611	522	2920	1100	634	239	124	225	198
8	87	156	951	1180	521	2960	951	668	216	127	189	170
9	77	117	705	1060	595	2870	836	662	215	116	180	129
10	107	124	599	740	914	4230	802	586	210	146	162	130
11	98	158	527	701	797	3930	777	553	208	148	157	230
12	131	118	382	1620	1050	2460	775	596	187	133	157	214
13	182	130	387	2100	952	1810	874	507	232	90	151	175
14	137	135	380	1230	936	1480	1050	457	222	81	138	139
15	125	136	375	960	1050	1270	880	432	196	257	216	130
16	98	137	537	e540	1220	1130	864	635	170	165	213	122
17	110	159	492	e520	1550	998	656	559	140	152	1260	137
18	118	266	435	e750	1660	922	692	408	218	737	6190	186
19	121	324	362	e490	2010	851	727	360	186	718	1460	169
20	99	219	364	e500	2110	815	692	387	162	302	865	142
21	110	151	426	e480	1960	773	531	398	111	269	672	146
22	128	127	519	e580	1730	893	606	405	398	190	855	193
23	153	191	436	e720	5590	720	602	364	396	249	640	567
24	101	152	420	803	7460	667	584	374	197	349	408	356
25	89	133	358	1150	3350	647	558	392	177	213	370	221
26	128	132	340	847	2250	668	536	346	164	759	256	734
27	98	690	337	705	1580	1530	524	344	204	1530	309	704
28	110	15300	304	2540	1230	11900	524	345	306	5870	250	375
29	141	2710	e280	5180	---	10300	497	306	237	1460	268	273
30	116	1020	e300	2480	---	5470	676	290	222	645	180	223
31	277	---	295	1520	---	3000	---	297	---	409	216	---
TOTAL	3605	24053	22876	33535	45715	84824	26034	15166	6544	16262	18240	7075
MEAN	116	802	738	1082	1633	2736	868	489	218	525	588	236
MAX	277	15300	5640	5180	7460	11900	2250	834	398	5870	6190	734
MIN	77	117	280	291	521	647	497	290	111	81	138	122
CFSM	.18	1.21	1.11	1.63	2.46	4.12	1.31	.74	.33	.79	.89	.36
IN.	.20	1.35	1.28	1.88	2.56	4.75	1.46	.85	.37	.91	1.02	.40

e Estimated.

## JAMES RIVER BASIN

319

02034000 RIVANNA RIVER AT PALMYRA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	573	585	767	904	1031	1210	1072	760	573	393	487	439
MAX	3535	3521	2667	2620	2314	3415	3662	2472	4473	1524	3404	2915
(WY)	1943	1986	1949	1936	1984	1993	1937	1989	1972	1975	1969	1979
MIN	46.4	79.8	88.9	104	302	225	214	212	121	39.0	20.2	19.1
(WY)	1942	1942	1966	1966	1954	1981	1981	1956	1956	1966	1966	1954

## SUMMARY STATISTICS

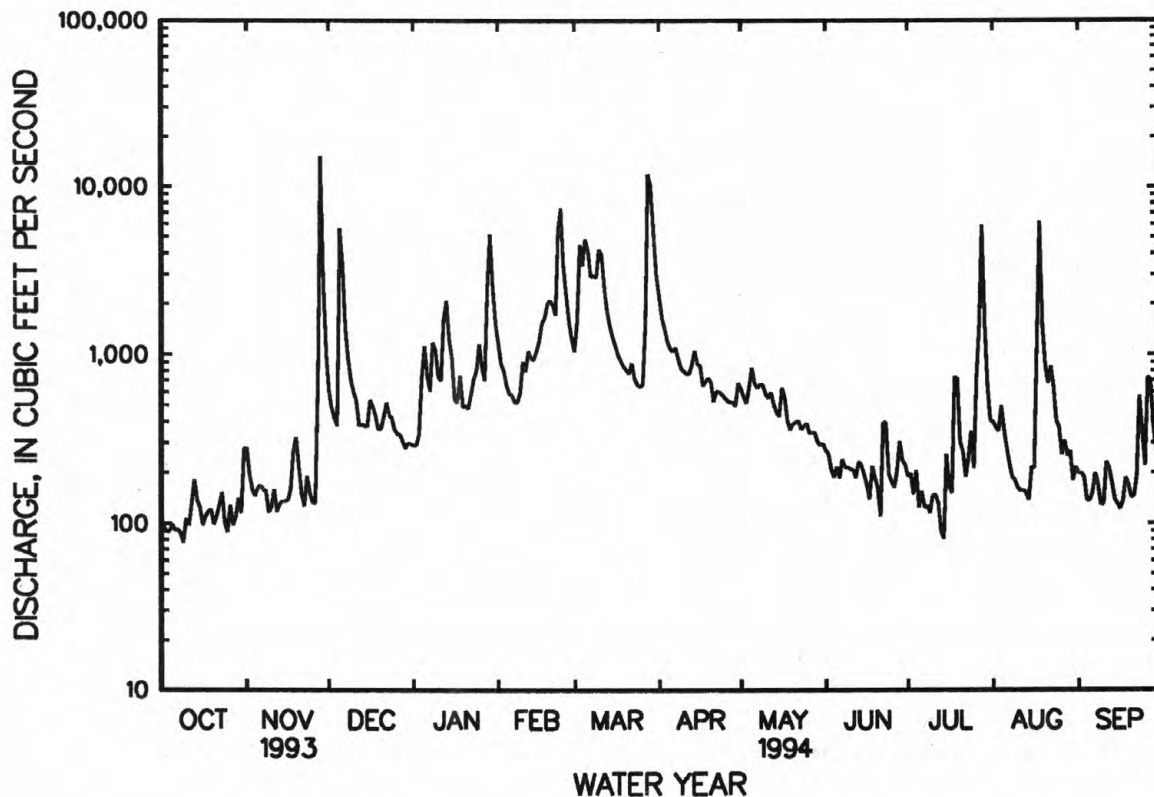
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1935 - 1994

ANNUAL TOTAL	344050		303929									
ANNUAL MEAN	943		833							731		
HIGHEST ANNUAL MEAN										1401		1973
LOWEST ANNUAL MEAN										241		1981
HIGHEST DAILY MEAN		22800		Mar 5		15300		Nov 28		68000		Jun 22 1972
LOWEST DAILY MEAN		67		Aug 31		77		Oct 9		5.2		aSep 9 1966
ANNUAL SEVEN-DAY MINIMUM		82		Aug 26		89		Oct 3		5.6		Sep 7 1966
INSTANTANEOUS PEAK FLOW						19800		Nov 28		86000		Aug 20 1969
INSTANTANEOUS PEAK STAGE						22.48		Nov 28		39.85		Aug 20 1969
INSTANTANEOUS LOW FLOW						71		Oct 9		5.2		aSep 9 1966
ANNUAL RUNOFF (CFSM)		1.42				1.25				1.10		
ANNUAL RUNOFF (INCHES)		19.28				17.03				14.96		
10 PERCENT EXCEEDS		2070				1640				1410		
50 PERCENT EXCEEDS		421				387				419		
90 PERCENT EXCEEDS		102				128				110		

a Also Sept. 10, 11, 1966.



## JAMES RIVER BASIN

02035000 JAMES RIVER AT CARTERSVILLE, VA

LOCATION.--Lat 37°40'15", long 78°05'10", Goochland County, Hydrologic Unit 02080205, on left bank 200 ft downstream from bridge on State Highway 45 at Cartersville, 1.8 mi downstream from Willis River, and at mile 156.4.

DRAINAGE AREA.--6,257 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1898 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1936(M). WSP 1203: 1901-2(M), 1923-25(M), 1928(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 163.90 ft above sea level. Prior to June 4, 1927, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Moderate diurnal fluctuation caused by powerplants upstream from station. National Weather Service gage-height telemeter at station. Maximum discharge, 362,000 ft<sup>3</sup>/s, from rating curve extended above 160,000 ft<sup>3</sup>/s on basis of slope-conveyance study. Minimum gage height, 0.02 ft, Sept. 13, 14, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 40,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1800	64,300	18.92	Feb. 24	0900	51,500	16.40
Dec. 6	0500	47,900	15.67	Mar. 3	1330	44,600	14.96
Jan. 29	1300	41,600	14.29	Mar. 30	0200	*85,100	*22.29

Minimum discharge, 888 ft<sup>3</sup>/s, Oct. 9, gage height, 0.80 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2020	2370	10600	3150	20600	17200	35700	7960	2940	2440	5820	3000
2	1980	2090	7280	3650	15600	19100	28200	7320	2860	2190	6130	3040
3	1820	1590	5640	3770	13100	41800	22800	7040	2610	2290	4920	2910
4	1540	1630	4330	4760	10500	33500	19000	7390	2560	1990	4140	2730
5	1460	1550	18800	8790	9230	29700	15800	9590	2510	1910	4310	2520
6	1300	1670	45600	7840	8420	29700	13800	10800	2500	1910	3590	2380
7	1220	1820	33100	6440	7590	31100	13300	12100	2570	1910	3210	2310
8	1260	1730	16900	7650	7250	28000	12400	11200	2520	1900	2940	2280
9	996	1610	11000	9030	7070	29200	13100	11100	2800	1550	2680	2040
10	1070	1470	8350	8560	8190	31800	12700	18900	2840	1600	2370	2070
11	1270	1520	6650	8720	9120	33900	11600	15500	2960	1970	2160	1970
12	1460	1260	5680	9010	18100	30300	10800	12400	3600	1990	2290	2100
13	1590	1370	5030	18000	26300	26400	10400	10600	3330	1870	2080	1940
14	1630	1300	4710	24400	24000	21900	10800	9170	2920	1570	2080	1910
15	1560	1220	4480	19200	21400	18400	12000	7980	2560	1700	2340	1960
16	1410	1300	5470	13900	21400	15600	12900	6900	2490	1820	2720	1640
17	1420	1560	5460	10400	21900	13100	12200	6080	2290	1840	5220	1620
18	1380	1200	5250	9140	20400	12000	11800	5390	2370	2400	28600	2000
19	1370	1790	5120	10100	20000	10700	10300	5200	2470	3120	33800	2030
20	1180	1890	5020	9130	20300	10100	9620	4970	2580	4090	17800	2010
21	1360	1780	5950	7830	20500	9410	8230	4950	2230	3700	10900	1850
22	1290	1580	6340	7590	20300	9790	7680	4640	2530	2700	7580	2030
23	1330	1420	5380	7380	25800	9980	7040	4340	3140	2910	7380	4490
24	1320	1490	5000	7450	49500	10500	7020	4070	2580	4310	6150	2950
25	1300	1450	4430	8070	47900	10900	6800	3940	3300	5070	5030	2230
26	1080	1210	4190	8290	35900	10700	6490	3790	3020	4050	4420	2880
27	1130	2030	3860	9240	27400	12100	6110	3700	2570	4800	3840	5530
28	1230	53600	3660	13800	21700	49100	6100	3460	3290	14100	3860	4340
29	1100	35600	3620	38500	---	81900	6680	3520	3280	15200	3590	2800
30	1340	15400	3480	37400	---	76200	9580	3240	2840	7780	3360	2210
31	1520	---	3750	28000	---	49500	---	3160	---	5340	3010	---
TOTAL	42936	147500	264130	369190	559470	813580	370950	230400	83060	112020	198320	75770
MEAN	1385	4917	8520	11910	19980	26240	12360	7432	2769	3614	6397	2526
MAX	2020	53600	45600	38500	49500	81900	35700	18900	3600	15200	33800	5530
MIN	996	1200	3480	3150	7070	9410	6100	3160	2230	1550	2080	1620
CFSM	.22	.79	1.36	1.90	3.19	4.19	1.98	1.19	.44	.58	1.02	.40
IN.	.26	.88	1.57	2.19	3.33	4.84	2.21	1.37	.49	.67	1.18	.45

## JAMES RIVER BASIN

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02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1899 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4283	4772	7743	9383	10750	13150	11200	7954	5948	3780	4101	3425
MAX	20830	28210	25990	26480	22400	31810	33500	23530	30330	15070	20490	16070
(WY)	1907	1986	1949	1936	1899	1993	1987	1989	1972	1919	1969	1979
MIN	528	924	1054	1353	2055	2646	3350	2710	1620	605	652	561
(WY)	1931	1931	1966	1956	1934	1981	1966	1930	1964	1966	1930	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

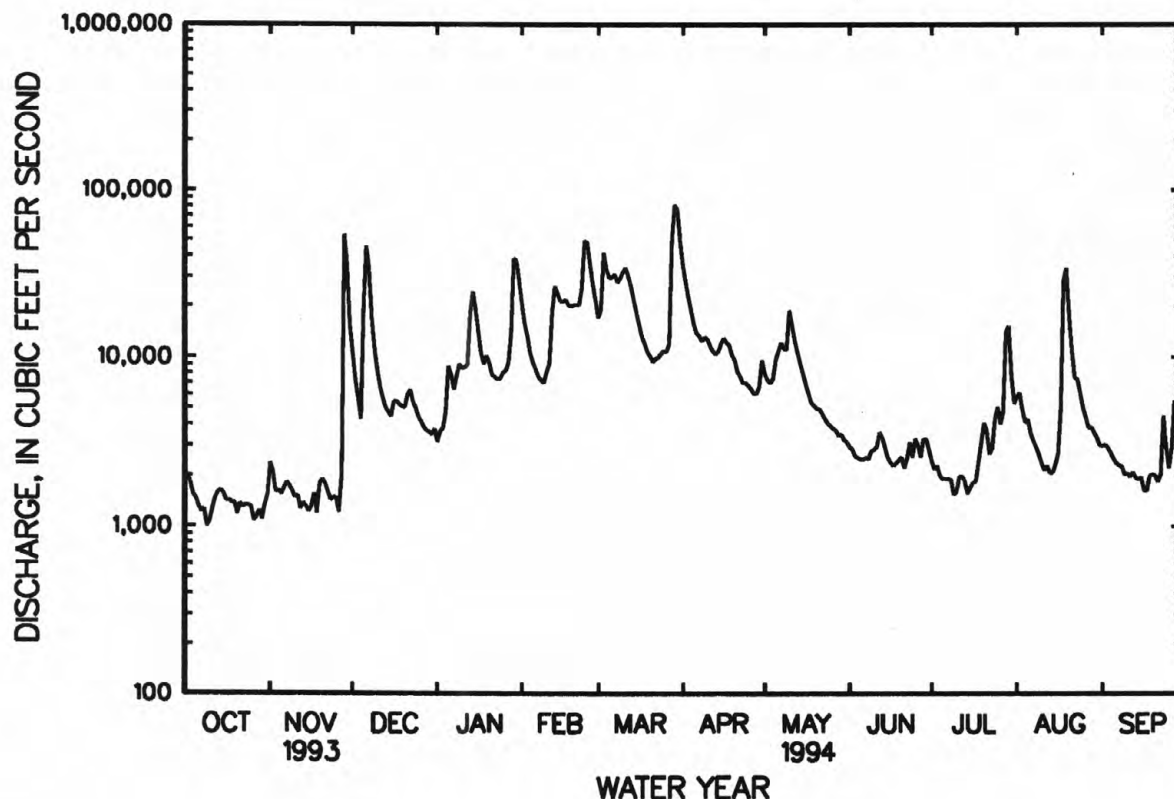
## WATER YEARS 1899 - 1994

ANNUAL TOTAL	3224987	3267326	
ANNUAL MEAN	8836	8952	7096
HIGHEST ANNUAL MEAN			12410
LOWEST ANNUAL MEAN			2981
HIGHEST DAILY MEAN	95200	Mar 5	81900
LOWEST DAILY MEAN	991	Aug 27	a996
ANNUAL SEVEN-DAY MINIMUM	1210	Oct 23	a1210
INSTANTANEOUS PEAK FLOW			85100
INSTANTANEOUS PEAK STAGE			22.29
INSTANTANEOUS LOW FLOW			a888
ANNUAL RUNOFF (CFSM)	1.41	1.43	1.13
ANNUAL RUNOFF (INCHES)	19.17	19.43	15.41
10 PERCENT EXCEEDS	22000	21900	15000
50 PERCENT EXCEEDS	4700	4640	4460
90 PERCENT EXCEEDS	1380	1530	1440

a May have been affected by regulation from Lake Moomaw, 230 mi upstream.

b From floodmarks.

c Also Sept. 14, 1966.



## JAMES RIVER BASIN

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1930, 1948, 1967 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to January 1976, October 1980 to May 1981, October 1991 to current year.

WATER TEMPERATURE: April 1968 to January 1976, October 1980 to May 1981, October 1991 to current year.

SUSPENDED-SEDIMENT DISCHARGE: October 1980 to May 1981.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT												
05...	1545	1520	--	9.1	--	19.5	--	VDCLS	--	10.4	--	--
27...	0900	1100	288	7.2	14.0	14.0	759	VDCLS	0.89	9.2	90	--
NOV												
17...	1430	1530	330	7.7	--	15.5	--	VDCLS	--	9.1	--	--
28...	1500	64200	66	7.2	16.0	12.0	754	VDCLS	230	9.5	89	--
29...	0930	38100	68	7.1	7.0	10.5	761	VDCLS	96	9.2	83	--
30...	1000	15300	114	6.7	6.5	7.0	776	VDCLS	120	10.4	84	--
30...	1015	15300	114	6.7	6.5	7.0	776	VDCLS	110	10.4	84	--
DEC												
02...	0900	7530	222	7.2	5.5	9.5	773	USGS	21	11.8	102	720
02...	0901	7530	222	7.2	5.5	9.5	773	VDCLS	28	11.8	102	--
06...	1200	45200	97	7.4	12.5	9.5	757	VDCLS	230	10.8	95	--
09...	0900	11300	86	7.5	4.0	8.0	766	VDCLS	58	11.4	96	--
JAN												
05...	1030	9070	135	7.7	2.0	2.0	761	VDCLS	21	13.6	98	--
26...	1000	7900	151	6.8	8.0	7.5	768	USGS	2.0	13.9	115	43
26...	1001	7900	151	6.8	8.0	2.5	768	VDCLS	13	13.9	101	--
29...	0900	40200	116	7.1	3.0	4.0	762	VDCLS	200	13.0	99	--
31...	0900	28400	105	7.6	0.0	4.5	765	VDCLS	72	12.8	99	--
FEB												
02...	1230	15300	110	7.8	0.0	3.5	766	VDCLS	25	14.4	108	--
03...	1230	13200	117	7.5	6.0	3.5	763	VDCLS	22	13.2	99	--
15...	0830	21100	112	7.8	3.5	1.0	767	VDCLS	15	14.1	99	--
16...	1030	20600	114	7.8	10.0	3.0	761	VDCLS	5.5	12.0	89	--
17...	1000	22100	119	7.8	11.0	5.0	773	VDCLS	17	13.1	101	--
17...	1015	22100	119	7.8	11.0	5.0	773	VDCLS	17	13.1	101	--
19...	0800	19400	126	7.7	3.0	3.5	774	VDCLS	17	12.0	89	--
24...	0931	51500	76	8.0	6.0	6.0	750	VDCLS	130	10.6	87	--
24...	0945	51500	76	8.0	6.0	6.0	750	USGS	--	10.6	87	--
26...	1100	36300	97	7.6	4.0	7.0	762	VDCLS	48	11.6	96	--
28...	0930	22400	107	7.4	0.0	4.0	773	VDCLS	--	12.4	93	--
MAR												
03...	0930	43700	74	6.7	5.0	0.0	745	VDCLS	78	12.7	89	--
05...	0900	31000	85	7.9	13.0	3.0	757	VDCLS	40	11.6	87	--
10...	1000	29800	111	7.7	3.5	8.0	755	VDCLS	27	11.6	99	--
12...	1000	30800	105	7.6	4.0	7.0	775	VDCLS	22	12.0	97	--
15...	1000	18800	112	7.7	16.0	8.5	752	USGS	--	11.4	99	24
15...	1001	18800	112	7.7	16.0	8.5	752	VDCLS	12	11.4	99	--
28...	0945	43500	70	7.2	13.5	8.0	755	VDCLS	150	11.1	95	--
29...	0900	81500	80	7.2	7.0	10.0	760	VDCLS	210	10.0	89	--
APR												
01...	0845	36300	94	6.3	5.5	10.0	754	VDCLS	32	10.2	91	--
02...	0930	28800	103	7.1	15.5	7.5	766	VDCLS	32	12.2	101	--
05...	1000	16200	118	8.0	11.5	12.5	761	VDCLS	11	10.5	99	--
27...	1100	6130	148	8.0	26.0	21.0	761	USGS	0.80	9.2	103	13
27...	1101	6130	148	8.0	26.0	21.0	761	VDCLS	3.6	9.2	103	--



## JAMES RIVER BASIN

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02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
MAY												
17...	0845	6230	133	6.8	13.0	19.0	754	VDCLS	4.7	7.2	78	--
23...	1525	4200	161	8.7	--	22.0	--	VDCLS	4.0	11.2	--	--
JUN												
09...	1550	2890	217	8.3	--	26.0	--	VDCLS	1.3	9.0	--	--
29...	0900	3340	203	7.9	26.0	27.5	756	USGS	1.1	6.8	87	17
29...	0901	3340	203	7.9	26.0	27.5	756	VDCLS	3.2	6.8	87	--
JUL												
07...	1530	2080	245	8.4	--	32.5	--	VDCLS	2.6	7.9	--	--
27...	1200	5820	177	7.5	23.0	26.0	752	VDCLS	180	5.2	65	--
AUG												
11...	1541	2010	212	8.7	--	29.5	--	VDCLS	3.2	8.3	--	--
29...	0930	3640	149	7.9	24.0	27.0	758	USGS	1.6	7.9	99	K13
29...	0931	3640	149	7.9	24.0	27.0	758	VDCLS	4.7	7.9	99	--
SEP												
28...	1200	4490	216	7.6	22.5	21.5	756	VDCLS	11	7.7	88	--
28...	1215	4460	216	7.6	22.5	21.5	756	VDCLS	9.0	7.7	88	--

K Results based on colony count outside the acceptance range (non-ideal colony count).

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LINITY WAT WH TOT FET FIELD MG/L AS CACO3 (00410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)
OCT											
05...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
NOV											
17...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
DEC											
02...	560	64	19	4.0	15	1.0	65	0	53	--	31
02...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
JAN											
05...	--	--	--	--	--	--	--	--	--	--	--
26...	97	51	15	3.3	8.5	1.8	48	0	40	--	13
26...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
FEB											
02...	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAR											
03...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
15...	K11	--	--	--	--	--	45	0	37	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
APR											
01...	--	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
27...	16	54	16	3.5	7.2	1.6	55	0	45	--	14
27...	--	--	--	--	--	--	--	--	--	--	--
MAY											
17...	--	--	--	--	--	--	--	--	--	--	--
23...	--	62	--	--	--	--	--	--	--	54	--
JUN											
09...	--	68	--	--	--	--	--	--	--	61	--
29...	160	62	17	4.8	16	2.7	62	0	51	--	20
29...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
AUG											
11...	--	--	--	--	--	--	--	--	--	--	--
29...	15	57	17	3.5	7.2	1.9	59	0	49	--	12
29...	--	--	--	--	--	--	--	--	--	--	--
SEP											
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--

K Results based on colony count outside the acceptance range (non-ideal colony count).

## 02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	RESIDUE VOLATILE, SUS- PENDE (MG/L) (00535)	RESIDUE FIXED NON FILTER- ABLE (MG/L) (00540)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618) (*)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613) (*)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630) (*)
OCT											
05...	--	--	3.0	--	--	<3	<3	<3	<0.040	<0.010	--
27...	--	--	3.7	--	--	<3	<3	<3	<0.040	<0.010	--
NOV											
17...	--	--	5.2	--	--	7	1	6	<0.040	0.010	--
28...	--	--	3.8	--	--	278	42	236	0.180	<0.010	0.180
29...	--	--	5.5	--	--	152	23	129	0.250	<0.010	0.250
30...	--	--	5.0	--	--	89	15	74	0.340	<0.010	0.340
30...	--	--	5.0	--	--	86	14	72	0.340	<0.010	0.340
DEC											
02...	13	0.10	6.0	138	123	22	20	2	--	<0.010	0.250
02...	--	--	6.2	--	--	30	5	25	0.220	<0.010	0.220
06...	--	--	6.6	--	--	323	50	273	0.370	0.010	0.380
09...	--	--	7.3	--	--	59	12	47	0.320	0.010	0.330
JAN											
05...	--	--	9.1	--	--	46	8	38	0.320	<0.010	0.320
26...	9.5	<0.10	7.9	106	85	12	9	3	0.430	0.010	0.440
26...	--	--	8.1	--	--	19	3	16	0.447	0.003	0.450
29...	--	--	6.4	--	--	372	40	332	0.378	0.005	0.383
31...	--	--	6.4	--	--	117	15	102	0.278	0.003	0.281
FEB											
02...	--	--	7.2	--	--	37	5	32	0.351	0.003	0.354
03...	--	--	6.7	--	--	23	4	19	0.300	0.003	0.303
15...	--	--	7.8	--	--	28	3	25	0.374	0.002	0.376
16...	--	--	7.3	--	--	34	4	30	0.363	0.003	0.366
17...	--	--	7.3	--	--	25	3	22	0.332	0.003	0.335
17...	--	--	7.3	--	--	26	3	23	0.328	0.003	0.331
19...	--	--	7.8	--	--	31	3	28	0.308	0.002	0.310
24...	--	--	6.5	--	--	238	28	210	0.259	0.003	0.262
24...	--	--	7.8	--	--	206	36	170	0.270	0.020	0.290
26...	--	--	6.6	--	--	104	10	94	0.302	0.003	0.305
28...	--	--	7.1	--	--	35	4	31	0.365	0.002	0.367
MAR											
03...	--	--	5.8	--	--	176	15	161	0.269	0.003	0.272
05...	--	--	7.0	--	--	57	6	51	0.333	0.004	0.337
10...	--	--	6.7	--	--	34	4	30	0.339	0.002	0.341
12...	--	--	7.3	--	--	35	4	31	0.357	<0.002	0.357
15...	--	--	--	--	--	19	7	12	--	<0.010	0.350
15...	--	--	7.7	--	--	19	2	17	0.341	0.002	0.343
28...	--	--	6.2	--	--	344	31	313	0.189	0.004	0.193
29...	--	--	5.7	--	--	248	31	217	0.220	0.005	0.225
APR											
01...	--	--	7.2	--	--	67	8	59	0.270	0.002	0.272
02...	--	--	7.3	--	--	48	5	43	0.307	0.002	0.309
05...	--	--	7.5	--	--	26	4	22	0.337	0.003	0.340
27...	6.0	<0.10	5.9	81	82	7	2	5	0.110	0.020	0.130
27...	--	--	6.0	--	--	8	2	6	0.077	<0.002	0.077
MAY											
17...	--	--	6.8	--	--	--	--	--	0.191	0.003	0.194
23...	--	--	6.5	--	--	9	5	4	0.025	0.004	0.029
JUN											
09...	--	--	4.5	--	--	6	3	3	0.036	0.005	0.041
29...	14	0.10	9.0	123	116	3	4	0	0.350	0.010	0.360
29...	--	--	8.6	--	--	11	2	9	0.360	0.008	0.368
JUL											
07...	--	--	7.1	--	--	--	--	--	0.082	<0.002	0.082
27...	--	--	7.2	--	--	181	26	155	0.533	0.007	0.540
AUG											
11...	--	--	6.9	--	--	<3	<3	<3	0.123	0.002	0.125
29...	6.4	<0.10	8.6	88	87	8	7	1	--	<0.010	0.180
29...	--	--	8.4	--	--	6	1	5	0.204	<0.002	0.204
SEP											
28...	--	--	7.1	--	--	17	3	14	0.197	0.003	0.200
28...	--	--	7.1	--	--	17	3	14	0.197	0.003	0.200

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.

## 02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631) (*)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608) (*)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N) (00610)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671) (*)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
OCT											
05...	<0.040	<0.040	--	0.40	0.160	0.140	0.130	--	--	--	--
27...	<0.040	<0.040	--	0.20	0.110	0.100	0.090	--	--	--	--
NOV											
17...	<0.040	<0.040	--	0.20	0.100	0.080	0.090	--	--	--	--
28...	0.180	<0.040	--	1.2	0.390	0.020	0.020	--	--	--	--
29...	0.250	<0.040	--	1.1	0.340	0.020	0.020	--	--	--	--
30...	0.340	<0.040	--	0.80	0.440	0.020	0.020	--	--	--	--
30...	0.340	<0.040	--	0.70	0.430	0.020	0.020	--	--	--	--
DEC											
02...	0.250	0.030	--	0.30	0.090	0.030	0.040	70	36	<3	150
02...	0.220	<0.040	--	0.30	0.100	0.040	0.030	--	--	--	--
06...	0.380	0.060	--	1.2	0.420	0.030	0.020	--	--	--	--
09...	0.330	<0.040	--	0.20	0.060	0.010	0.020	--	--	--	--
JAN											
05...	0.320	0.070	--	0.20	0.050	0.050	0.040	--	--	--	--
26...	0.440	0.040	--	0.30	0.090	0.070	0.070	--	--	--	--
26...	0.450	0.037	--	0.30	0.100	0.070	0.060	--	--	--	--
29...	0.383	0.075	--	1.0	0.470	0.050	0.029	--	--	--	--
31...	0.281	0.061	--	0.60	0.340	0.040	0.027	--	--	--	--
FEB											
02...	0.354	0.031	--	0.30	0.160	0.030	0.020	--	--	--	--
03...	0.303	0.023	--	0.20	0.070	0.030	0.019	--	--	--	--
15...	0.376	0.034	--	0.20	0.070	0.020	0.031	--	--	--	--
16...	0.366	0.025	--	0.30	0.090	0.040	0.034	--	--	--	--
17...	0.335	0.022	--	--	--	0.070	0.060	--	--	--	--
17...	0.331	0.020	--	0.20	0.110	0.070	0.060	--	--	--	--
19...	0.310	0.011	--	0.10	0.060	0.030	0.015	--	--	--	--
24...	0.262	0.015	--	0.70	0.320	0.050	0.014	--	--	--	--
24...	0.290	0.040	--	0.30	0.070	--	0.020	--	--	--	--
26...	0.305	0.016	--	0.40	0.130	0.040	0.023	--	--	--	--
28...	0.367	0.014	--	0.30	0.070	0.030	0.019	--	--	--	--
MAR											
03...	0.272	0.025	--	0.60	0.190	0.040	0.033	--	--	--	--
05...	0.337	0.010	--	0.30	0.110	0.030	0.019	--	--	--	--
10...	0.341	0.020	--	0.30	0.070	0.030	0.030	--	--	--	--
12...	0.357	0.014	--	0.40	0.070	0.030	0.026	--	--	--	--
15...	0.350	0.040	--	0.30	0.020	0.020	0.030	--	--	--	--
15...	0.343	0.017	--	0.20	0.070	0.040	0.024	--	--	--	--
28...	0.193	0.014	--	0.90	0.290	0.060	0.036	--	--	--	--
29...	0.225	0.014	--	0.90	0.430	0.080	0.048	--	--	--	--
APR											
01...	0.272	0.014	--	0.40	0.140	0.030	0.024	--	--	--	--
02...	0.309	--	--	0.30	0.080	0.030	0.018	--	--	--	--
05...	0.340	0.007	--	0.30	0.070	0.030	0.022	--	--	--	--
27...	0.130	0.030	--	<0.20	0.030	0.030	0.010	20	26	<3	65
27...	0.077	0.005	--	0.20	0.040	0.020	0.020	--	--	--	--
MAY											
17...	0.194	<0.004	--	0.20	0.070	0.050	0.040	--	--	--	--
23...	0.029	0.025	--	--	--	--	0.010	--	--	--	--
JUN											
09...	0.041	0.017	--	--	--	--	0.011	--	--	--	--
29...	0.360	0.050	--	0.30	0.080	0.070	0.060	--	--	--	--
29...	0.368	0.020	--	0.40	0.090	0.070	0.062	--	--	--	--
JUL											
07...	0.082	0.035	--	--	--	--	0.099	--	--	--	--
27...	0.540	0.052	0.040	1.0	0.400	0.070	0.056	--	--	--	--
AUG											
11...	0.125	0.017	--	--	--	0.050	0.050	--	--	--	--
29...	0.180	<0.010	--	<0.20	0.050	0.050	0.040	50	27	<3	140
29...	0.204	0.008	--	0.20	0.070	0.060	0.049	--	--	--	--
SEP											
28...	0.200	0.022	--	0.40	0.080	0.060	0.048	--	--	--	--
28...	0.200	0.020	--	0.30	0.070	0.060	0.048	--	--	--	--

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.

## JAMES RIVER BASIN

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02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
05...	--	--	--	--	--	--	--	--	5.2	--	--
27...	--	--	--	--	--	--	--	--	3.4	--	--
NOV											
17...	--	--	--	--	--	--	--	--	4.4	--	--
28...	--	--	--	--	--	--	--	--	14	--	--
29...	--	--	--	--	--	--	--	--	12	--	--
30...	--	--	--	--	--	--	--	--	9.7	--	--
30...	--	--	--	--	--	--	--	--	10	--	--
DEC											
02...	<4	27	<10	<1	<1	<1.0	90	<6	7.4	33	82
02...	--	--	--	--	--	--	--	--	7.8	--	--
06...	--	--	--	--	--	--	--	--	11	--	--
09...	--	--	--	--	--	--	--	--	7.4	--	--
JAN											
05...	--	--	--	--	--	--	--	--	4.8	--	--
26...	--	--	--	--	--	--	--	--	3.3	16	96
26...	--	--	--	--	--	--	--	--	2.9	--	--
29...	--	--	--	--	--	--	--	--	7.7	--	--
31...	--	--	--	--	--	--	--	--	5.4	--	--
FEB											
02...	--	--	--	--	--	--	--	--	2.9	--	--
03...	--	--	--	--	--	--	--	--	2.0	--	--
15...	--	--	--	--	--	--	--	--	3.5	--	--
16...	--	--	--	--	--	--	--	--	3.3	--	--
17...	--	--	--	--	--	--	--	--	2.8	--	--
17...	--	--	--	--	--	--	--	--	2.5	--	--
19...	--	--	--	--	--	--	--	--	1.9	--	--
24...	--	--	--	--	--	--	--	--	7.6	--	--
24...	--	--	--	--	--	--	--	--	8.5	--	--
26...	--	--	--	--	--	--	--	--	3.8	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAR											
03...	--	--	--	--	--	--	--	--	5.0	--	--
05...	--	--	--	--	--	--	--	--	3.6	--	--
10...	--	--	--	--	--	--	--	--	3.7	--	--
12...	--	--	--	--	--	--	--	--	2.4	--	--
15...	--	--	--	--	--	--	--	--	2.6	18	90
15...	--	--	--	--	--	--	--	--	2.6	--	--
28...	--	--	--	--	--	--	--	--	7.9	--	--
29...	--	--	--	--	--	--	--	--	7.6	--	--
APR											
01...	--	--	--	--	--	--	--	--	3.4	--	--
02...	--	--	--	--	--	--	--	--	6.0	--	--
05...	--	--	--	--	--	--	--	--	2.2	--	--
27...	<4	4	10	<1	<1	<1.0	61	<6	2.5	7	90
27...	--	--	--	--	--	--	--	--	2.0	--	--
MAY											
17...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	3.9	--	--
JUN											
09...	--	--	--	--	--	--	--	--	3.2	--	--
29...	--	--	--	--	--	--	--	--	4.4	10	94
29...	--	--	--	--	--	--	--	--	3.7	--	--
JUL											
07...	--	--	--	--	--	--	--	--	4.9	--	--
27...	--	--	--	--	--	--	--	--	4.6	--	--
AUG											
11...	--	--	--	--	--	--	--	--	4.1	--	--
29...	<4	7	<10	1	<1	<1.0	71	<6	3.4	5	99
29...	--	--	--	--	--	--	--	--	--	--	--
SEP											
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.



## JAMES RIVER BASIN

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	282	193	106	118	---	164	---	200	163	---
2	326	311	281	199	---	111	---	---	---	192	180	192
3	---	---	287	205	---	88	115	---	194	---	172	---
4	---	---	262	189	129	94	---	183	---	---	152	---
5	358	301	187	174	134	90	---	---	---	222	171	197
6	---	---	102	187	138	118	127	---	205	---	228	---
7	341	---	151	201	138	145	---	173	---	---	230	---
8	---	324	102	201	151	115	---	---	---	228	216	227
9	---	---	96	192	153	116	149	---	---	---	---	---
10	330	---	105	187	149	110	---	155	199	---	---	---
11	---	343	111	244	---	98	---	---	---	215	185	249
12	---	---	120	215	---	118	140	---	---	---	---	---
13	320	---	127	129	100	116	---	122	219	---	---	---
14	---	336	137	154	121	113	---	---	---	245	202	259
15	---	---	---	156	117	118	144	---	---	---	---	---
16	316	---	143	111	125	123	---	133	230	---	---	---
17	---	319	149	---	122	127	---	---	---	254	---	275
18	---	---	161	114	122	131	144	---	---	---	---	---
19	302	---	171	---	121	133	---	142	242	---	204	---
20	---	319	186	---	125	138	---	---	---	248	165	182
21	334	---	194	---	128	142	136	---	---	---	124	---
22	---	---	191	162	131	141	---	146	229	---	---	---
23	---	312	205	175	---	---	---	---	---	248	---	183
24	294	---	218	170	82	156	142	---	---	221	123	---
25	---	---	218	168	---	165	---	197	218	269	---	---
26	---	275	212	170	---	171	---	---	---	298	---	259
27	299	276	207	172	102	160	180	---	---	194	148	196
28	---	62	186	190	115	73	---	177	216	129	---	---
29	322	88	---	121	---	79	---	---	---	118	---	---
30	---	201	---	131	---	77	---	---	---	137	171	---
31	---	---	197	105	---	96	---	189	---	170	---	---

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	7.0	1.5	4.0	4.5	---	22.0	---	---	26.0	---
2	19.5	10.5	7.0	2.5	---	3.0	---	---	---	30.0	28.0	24.5
3	---	---	7.5	2.5	---	3.0	12.5	---	25.0	---	28.5	---
4	---	---	9.0	2.5	4.0	6.0	---	16.5	---	---	29.0	---
5	19.5	12.0	9.5	2.5	4.0	7.0	---	---	---	31.0	27.5	24.0
6	---	---	9.0	4.0	5.5	7.0	14.5	---	26.5	---	26.5	---
7	19.0	---	9.0	5.0	5.5	9.5	---	16.0	---	---	26.5	---
8	---	9.5	9.0	4.5	4.0	10.5	---	---	---	30.5	27.5	22.5
9	---	---	8.5	2.5	6.0	7.5	14.5	---	---	---	---	---
10	17.0	---	7.5	2.0	1.5	7.5	---	16.5	22.5	---	---	---
11	---	10.0	7.0	2.0	---	7.5	---	---	---	30.5	29.5	24.0
12	---	---	5.5	3.0	---	7.5	15.5	---	---	---	---	---
13	16.5	---	5.0	3.0	3.5	8.0	---	18.0	28.0	---	---	---
14	---	15.0	4.5	3.5	3.5	9.0	---	---	---	31.0	28.5	25.5
15	---	---	---	1.5	5.0	10.0	18.5	---	---	---	---	---
16	16.0	---	6.0	1.5	6.0	8.0	---	21.0	29.0	---	---	---
17	---	12.5	6.0	---	5.0	8.0	---	---	---	31.0	---	27.0
18	---	---	6.0	0.0	7.0	9.0	19.0	---	---	---	---	---
19	17.5	---	6.5	---	7.0	9.5	---	17.0	30.5	---	24.0	---
20	---	12.5	4.5	---	8.5	9.5	---	---	---	30.0	23.0	24.0
21	18.5	---	4.5	---	8.0	9.5	19.0	---	---	---	24.5	---
22	---	---	3.5	1.5	8.0	11.0	---	21.0	30.0	---	---	---
23	---	10.5	3.5	2.0	---	---	---	---	---	29.0	---	19.5
24	16.0	---	3.0	4.0	6.0	14.0	19.0	---	---	29.5	24.0	---
25	---	---	3.0	3.5	---	13.5	---	25.5	29.0	30.5	---	---
26	---	10.5	1.5	3.0	---	13.0	---	---	---	27.5	---	22.0
27	16.5	8.0	2.5	1.0	6.0	12.0	22.0	---	---	26.0	28.0	21.0
28	---	12.0	1.0	1.0	5.5	11.0	---	23.0	27.5	23.5	---	---
29	15.0	11.0	---	1.5	---	10.0	---	---	---	23.0	---	---
30	---	8.0	---	3.5	---	10.5	---	---	---	25.0	27.0	---
31	---	---	1.5	4.5	---	10.0	---	25.0	---	27.5	---	---

## JAMES RIVER BASIN

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02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

RESIDUE, TOTAL NONFILTERABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	42	<3	53	26	---	18	---	<3	31	---
2	<3	<3	19	<3	---	64	---	---	---	<3	30	4
3	---	---	12	<3	---	102	38	---	<3	---	17	---
4	---	---	<3	<3	18	88	---	16	---	---	15	---
5	<3	<3	62	35	14	84	---	---	---	<3	17	<3
6	---	---	376	<3	14	77	22	---	11	---	9	---
7	<3	---	250	22	8	75	---	43	---	---	<3	---
8	---	3	92	16	9	51	---	---	---	<3	<3	<3
9	---	---	45	24	<3	36	20	---	---	---	---	---
10	<3	---	33	19	16	56	---	58	<3	---	---	---
11	---	<3	25	25	---	47	---	---	---	<3	<3	<3
12	---	---	17	22	---	49	12	---	---	---	---	---
13	<3	---	8	143	76	34	---	20	---	---	---	---
14	---	<3	<3	148	39	28	---	---	---	<3	<3	<3
15	---	---	---	94	30	21	20	---	---	---	---	---
16	<3	---	8	46	29	19	---	10	<3	---	---	---
17	---	<3	<3	---	71	16	---	---	---	<3	---	<3
18	---	---	<3	38	32	14	19	---	---	---	---	---
19	<3	---	<3	---	25	13	---	<3	<3	---	78	---
20	---	<3	<3	---	40	12	---	---	---	20	158	<3
21	<3	---	<3	---	29	11	12	---	---	---	67	---
22	---	---	<3	10	22	11	---	10	<3	---	---	---
23	---	<3	<3	12	---	---	---	---	---	<3	---	73
24	<3	---	<3	11	264	11	7	---	---	12	20	---
25	---	---	<3	19	---	14	---	<3	14	16	---	---
26	---	<3	<3	13	---	15	---	---	---	<3	---	7
27	<3	<3	<3	15	61	20	8	---	---	161	8	42
28	---	328	<3	37	40	200	---	9	<3	501	---	---
29	<3	145	---	352	---	290	---	---	---	225	---	---
30	---	72	---	214	---	149	---	---	---	86	4	<3
31	---	---	<3	125	---	124	---	<3	---	32	---	---

&lt; Actual value is known to be less than the value shown.

## 02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

RESIDUE, VOLATILE NONFILTRABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	8	<3	6	3	---	3	---	<3	4	---
2	<3	<3	4	<3	---	7	---	---	---	<3	5	<3
3	---	---	3	<3	---	9	4	---	<3	---	3	---
4	---	---	<3	<3	3	9	---	3	---	---	3	---
5	<3	<3	9	5	3	9	---	---	---	<3	4	<3
6	---	---	57	<3	3	9	3	---	2	---	2	---
7	<3	---	38	2	2	8	---	7	---	---	<3	---
8	---	<3	15	2	2	6	---	---	---	<3	<3	<3
9	---	---	6	5	<3	4	3	---	---	---	---	---
10	<3	---	4	6	4	5	---	8	<3	---	---	---
11	---	<3	3	4	---	5	---	---	---	<3	<3	<3
12	---	---	3	3	---	6	2	---	---	---	---	---
13	<3	---	2	17	11	4	---	3	---	---	---	---
14	---	<3	<3	18	6	4	---	---	---	<3	<3	<3
15	---	---	2	11	4	3	2	---	---	---	---	---
16	<3	---	<3	5	4	3	---	2	<3	---	---	---
17	---	<3	<3	---	7	2	---	---	---	<3	---	<3
18	---	---	<3	7	5	3	3	---	---	---	---	---
19	<3	---	<3	---	4	3	---	<3	<3	---	9	---
20	---	<3	<3	---	5	4	---	---	---	3	22	<3
21	<3	---	<3	---	3	3	3	---	---	---	10	---
22	---	---	<3	2	3	2	---	4	<3	---	---	---
23	---	<3	<3	2	---	---	---	---	---	<3	---	9
24	<3	---	<3	2	28	3	2	---	---	3	3	---
25	---	---	<3	3	---	4	---	<3	3	3	---	---
26	---	<3	<3	2	---	4	---	---	---	<3	---	<3
27	<3	<3	<3	3	7	4	2	---	---	20	<3	6
28	---	38	<3	5	5	20	---	3	<3	47	---	---
29	<3	21	---	37	---	32	---	---	---	27	---	---
30	---	12	---	23	---	15	---	---	---	11	<3	<3
31	---	---	<3	12	---	14	---	<3	---	5	---	---

< Actual value is known to be less than the value shown.

## JAMES RIVER BASIN

331

02035000 JAMES RIVER AT CARTERSVILLE, VA--Continued

RESIDUE, FIXED NONFILTERABLE (MG/L), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	34	<3	47	23	---	15	---	<3	27	---
2	<3	<3	15	<3	---	57	---	---	---	<3	25	<3
3	---	---	9	<3	---	93	34	---	<3	---	14	---
4	---	---	<3	<3	15	79	---	13	---	---	12	---
5	<3	<3	53	30	11	75	---	---	---	<3	13	<3
6	---	---	319	<3	11	68	19	---	9	---	7	---
7	<3	---	212	20	6	67	---	36	---	---	<3	---
8	---	<3	77	14	7	45	---	---	---	<3	<3	<3
9	---	---	39	19	<3	32	17	---	---	---	---	---
10	<3	---	29	13	12	51	---	50	<3	---	---	---
11	---	<3	22	21	---	42	---	---	---	<3	<3	<3
12	---	---	14	19	---	43	10	---	---	---	---	---
13	<3	---	6	126	65	30	---	17	---	---	---	---
14	---	<3	<3	130	33	24	---	---	---	<3	<3	<3
15	---	---	---	83	26	18	18	---	---	---	---	---
16	<3	---	6	41	25	16	---	8	<3	---	---	---
17	---	<3	<3	---	64	14	---	---	---	<3	---	<3
18	---	---	<3	31	27	11	16	---	---	---	---	---
19	<3	---	<3	---	21	10	---	<3	<3	---	69	---
20	---	<3	<3	---	35	8	---	---	---	17	136	<3
21	<3	---	<3	---	26	8	9	---	---	---	57	---
22	---	---	<3	8	19	9	---	6	<3	---	---	---
23	---	<3	<3	10	---	---	---	---	---	<3	---	64
24	<3	---	<3	9	236	8	5	---	---	9	17	---
25	---	---	<3	16	---	10	---	<3	11	13	---	---
26	---	<3	<3	11	---	11	---	---	---	<3	---	5
27	<3	<3	<3	12	54	16	6	---	---	141	6	36
28	---	290	<3	32	35	180	---	6	<3	454	---	---
29	<3	124	---	315	---	258	---	---	---	198	---	---
30	---	60	---	191	---	134	---	---	---	75	<3	<3
31	---	---	<3	113	---	110	---	<3	---	27	---	---

&lt; Actual value is known to be less than the value shown.

## JAMES RIVER BASIN

02036500 FINE CREEK AT FINE CREEK MILLS, VA

LOCATION.--Lat 37°35'52", long 77°49'12", Powhatan County, Hydrologic Unit 02080205, on right bank 75 ft downstream from bridge on State Highway 711 at Fine Creek Mills, 0.8 mi upstream from mouth, and 6.7 mi northeast of Powhatan.

DRAINAGE AREA.--22.1 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1944 to current year.

REVISED RECORDS.--WSP 1203: 1948. WSP 1303: 1945(M). WSP 1383: 1954. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 156.59 ft above sea level. Prior to Oct. 28, 1953, nonrecording gage and crest-stage gage at site 75 ft upstream at same datum.

REMARKS.--Records good except those for period of doubtful or no gage-height record, Oct. 26 to Dec. 10, and periods with ice effect, Dec. 29-31 and Jan. 20, 21, which are fair. Maximum discharge, 4,180 ft<sup>3</sup>/s, from rating curve extended above 2,600 ft<sup>3</sup>/s. Minimum gage height, 1.53 ft, Sept. 30, Oct. 1, 1970. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 25	0700	358	3.32	Mar. 3	0345	*758	*4.15
Dec. 2	1945	210	2.90	Mar. 29	1415	530	3.70
Feb. 24	0800	267	3.08				

Minimum discharge, 0.42 ft<sup>3</sup>/s, Oct. 14-15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.58	e4.4	e20	13	24	30	79	21	5.1	4.0	70	1.8
2	.61	e3.6	e16	22	20	184	56	17	4.2	3.6	30	1.5
3	.61	e2.4	e14	29	18	553	43	14	3.5	3.4	16	1.3
4	.66	e1.5	e13	38	18	190	37	61	3.7	3.3	12	1.3
5	.70	e1.3	e35	41	18	91	33	91	3.7	3.1	7.4	1.2
6	.69	e2.5	e159	30	20	56	35	59	4.0	3.3	4.4	1.1
7	.66	e3.2	e102	23	19	43	41	35	5.6	3.1	2.9	1.2
8	.68	e1.7	e40	29	18	37	35	28	5.0	2.8	2.0	1.3
9	.69	e1.5	e28	29	26	41	29	23	6.2	2.9	1.6	1.2
10	1.1	e1.3	e21	21	33	83	28	20	6.8	4.3	1.4	1.4
11	.96	e1.8	17	18	36	112	28	17	14	5.0	1.3	3.0
12	1.7	e1.8	13	27	59	59	25	15	19	4.0	1.4	2.2
13	.53	e1.8	11	33	57	43	31	13	14	3.9	1.9	1.6
14	.44	e1.8	9.5	28	60	35	36	12	9.3	4.1	3.7	1.2
15	.46	e1.7	15	21	61	30	29	11	6.9	3.6	9.5	1.1
16	.59	e1.8	27	14	74	27	45	14	5.8	3.5	8.6	1.2
17	.91	e2.0	26	14	74	23	45	12	5.6	4.2	23	1.8
18	1.2	e5.4	20	31	64	22	31	10	5.3	10	41	2.4
19	1.1	e5.2	19	25	61	22	25	9.7	4.7	9.4	31	2.2
20	1.5	e4.3	18	e15	53	20	21	9.9	4.1	10	17	1.9
21	2.4	e3.1	77	e14	46	25	19	9.7	3.7	7.8	9.7	1.5
22	2.4	e2.2	87	15	39	44	18	9.3	3.9	7.3	6.4	24
23	1.7	e2.0	41	18	102	31	19	8.6	3.9	7.4	4.2	31
24	1.6	e1.9	29	22	223	25	18	7.7	4.5	6.3	3.3	18
25	1.6	e1.9	23	22	115	25	17	7.7	4.2	5.2	2.6	8.5
26	e1.5	e2.0	19	21	61	24	16	8.1	3.8	4.9	2.1	4.7
27	e2.0	e122	16	19	42	60	15	7.7	4.4	6.6	2.0	3.3
28	e3.6	e255	14	28	33	306	15	6.8	4.9	8.2	2.4	2.2
29	e3.3	e75	e14	54	---	491	16	6.1	4.4	15	2.1	2.0
30	e3.4	e31	e13	37	---	231	24	5.7	4.2	14	1.9	1.7
31	e5.7	---	e12	28	---	110	---	5.4	---	25	1.8	---
TOTAL	45.57	547.1	968.5	779	1474	3073	909	575.4	178.4	199.2	324.6	128.8
MEAN	1.47	18.2	31.2	25.1	52.6	99.1	30.3	18.6	5.95	6.43	10.5	4.29
MAX	5.7	255	159	54	223	553	79	91	19	25	70	31
MIN	.44	1.3	9.5	13	18	20	15	5.4	3.5	2.8	1.3	1.1
CFSM	.07	.83	1.41	1.14	2.38	4.49	1.37	.84	.27	.29	.47	.19
IN.	.08	.92	1.63	1.31	2.48	5.17	1.53	.97	.30	.34	.55	.22

e Estimated.



## JAMES RIVER BASIN

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02036500 FINE CREEK AT FINE CREEK MILLS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	15.1	17.6	21.9	26.9	31.2	34.6	30.0	20.9	12.0	7.97	12.1	8.23
MAX	119	104	53.9	92.5	92.7	99.1	84.1	54.1	60.8	25.7	83.3	42.9
(WY)	1973	1986	1949	1978	1979	1994	1983	1978	1972	<sup>a</sup> 1949	1955	1975
MIN	.47	3.15	5.60	6.38	8.76	11.4	7.63	3.21	2.87	1.34	.74	.31
(WY)	1969	1992	1966	1955	1991	1985	1985	1991	1970	1993	1977	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

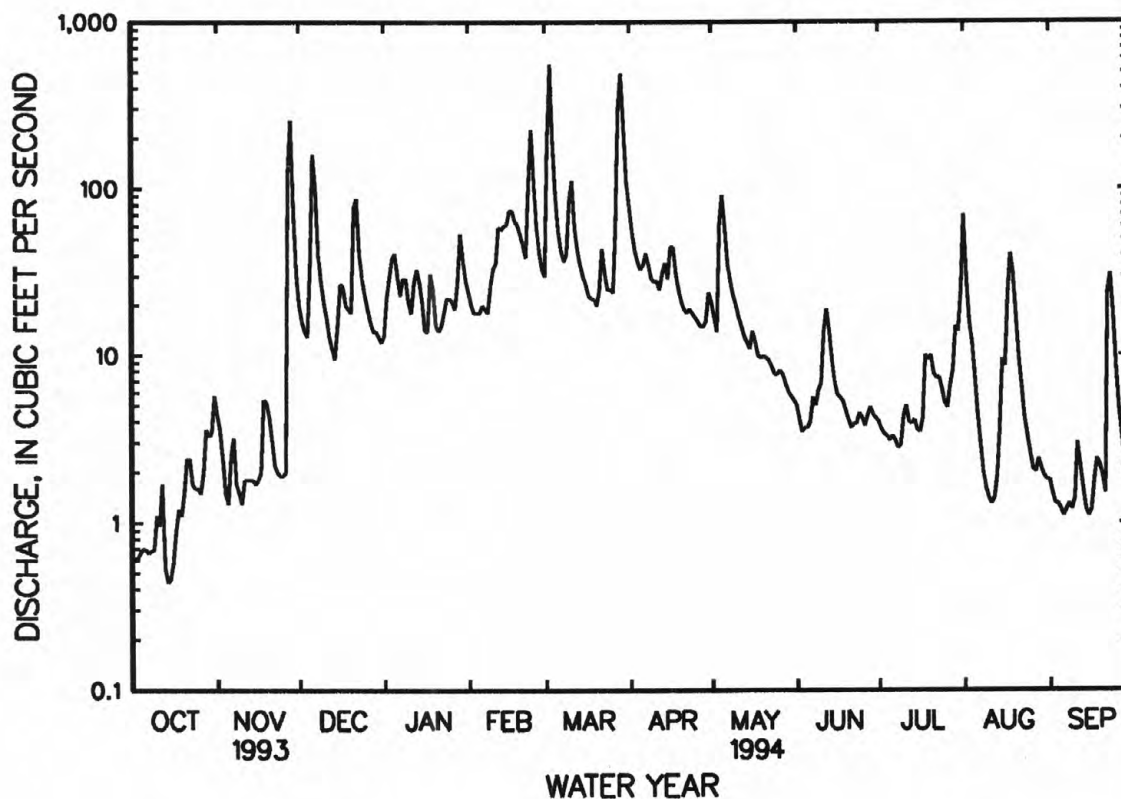
## WATER YEARS 1945 - 1994

ANNUAL TOTAL	8711.88	9202.57	
ANNUAL MEAN	23.9	25.2	19.8
HIGHEST ANNUAL MEAN			40.7
LOWEST ANNUAL MEAN			8.79
HIGHEST DAILY MEAN	371	Mar 5	1880
LOWEST DAILY MEAN	.44	<sup>b</sup> Sep 19	.08
ANNUAL SEVEN-DAY MINIMUM	.49	Aug 22	.10
INSTANTANEOUS PEAK FLOW		758	4180
INSTANTANEOUS PEAK STAGE		4.15	9.02
INSTANTANEOUS LOW FLOW		.42	.08
ANNUAL RUNOFF (CFSM)	1.08	1.14	.90
ANNUAL RUNOFF (INCHES)	14.66	15.49	12.18
10 PERCENT EXCEEDS	57	56	38
50 PERCENT EXCEEDS	9.7	12	11
90 PERCENT EXCEEDS	.57	1.5	2.5

a Also 1975.

b Also Sept. 20, Oct. 14, 1993.

c Also Oct. 15, 1993.



## JAMES RIVER BASIN

## 02037000 JAMES RIVER AND KANAWHA CANAL NEAR RICHMOND, VA

LOCATION.--Lat 37°33'52", long 77°34'28", Henrico County, Hydrologic Unit 02080205, on left bank 75 ft downstream from Canal bridge, 400 ft downstream from head gates, 1,200 ft north of north end of Boshier Dam on James River, 1.6 mi upstream from Huguenot Memorial Bridge, and 2.0 mi west of Richmond city limits.

PERIOD OF RECORD.--September 1936 to current year.

GAGE.--Water-stage recorder. Datum of gage is 106.07 ft above sea level. Prior to Oct. 1, 1938, at datum 3.06 ft higher.

REMARKS.--Records good except for period with ice effect, Jan. 15-21, which is fair. Canal diverts from James River 1,200 ft upstream from Boshier Dam and discharges into river at several points downstream from gaging station near Richmond. Beginning with the 1969 water year, the descriptive statement that above 2,540 ft<sup>3</sup>/s, gage height, 14.5 ft, there is interchange of flow with the James River and that discharge above 2,540 ft<sup>3</sup>/s is included in discharge for the James River near Richmond (station 02037500) has been used. Daily discharges in excess of 2,540 ft<sup>3</sup>/s for water years 1937-68 should be used with caution until historical records of canal construction and modifications can be reviewed. Figures given show flow in canal only. Probably no flow at times when head gates were closed. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,120 ft<sup>3</sup>/s, Mar. 30; maximum gage height, 9.67 ft, Mar. 30; minimum discharge, 11 ft<sup>3</sup>/s, Nov. 23, 24, gage height, 1.35 ft, result of head gates being closed.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	132	171	65	89	187	114	86	157	385	196	242	203
2	134	176	22	93	181	199	129	146	381	214	227	218
3	135	173	21	91	177	97	124	142	379	222	215	222
4	133	168	21	97	174	150	121	202	375	218	190	222
5	130	169	40	94	172	163	117	174	374	212	197	221
6	127	173	28	121	170	160	118	147	348	213	197	218
7	126	174	26	143	168	161	116	142	219	212	193	214
8	124	171	23	143	167	160	114	141	76	328	194	213
9	126	172	21	145	169	160	122	138	90	451	196	214
10	127	179	21	165	169	165	122	143	100	444	196	213
11	128	184	20	175	179	165	118	153	116	459	195	220
12	141	187	20	153	168	161	116	147	99	380	195	229
13	148	190	19	158	124	159	119	140	23	350	197	295
14	147	195	19	165	124	155	119	135	27	350	203	395
15	147	210	20	e155	124	152	124	134	104	346	224	319
16	147	234	20	e150	124	159	174	153	250	352	165	292
17	149	268	20	e145	142	181	169	112	344	357	135	251
18	147	313	20	e142	165	182	164	96	342	371	167	259
19	148	270	20	e141	164	186	162	100	346	369	169	266
20	151	38	54	e140	163	185	158	103	344	381	160	316
21	152	14	104	e155	163	185	155	111	341	395	142	460
22	154	13	89	173	162	162	153	111	336	376	141	359
23	154	12	86	171	183	182	153	106	341	359	152	137
24	151	35	84	169	158	182	151	191	340	368	161	317
25	150	89	77	168	133	185	150	505	340	386	166	310
26	151	89	104	159	126	183	149	401	345	389	181	315
27	160	87	103	149	121	202	147	399	330	233	284	324
28	186	107	103	158	117	186	147	394	232	198	294	303
29	181	61	97	172	---	185	202	393	174	250	259	298
30	169	84	90	203	---	964	234	391	177	233	202	296
31	171	---	89	196	---	187	---	386	---	232	197	---
TOTAL	4526	4406	1546	4578	4374	6017	4233	6193	7678	9844	6036	8119
MEAN	146	147	49.9	148	156	194	141	200	256	318	195	271
MAX	186	313	104	203	187	964	234	505	385	459	294	460
MIN	124	12	19	89	117	97	86	96	23	196	135	137

e Estimated.

## 02037000 JAMES RIVER AND KANAWHA CANAL NEAR RICHMOND, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	625	657	685	704	722	712	727	703	706	636	621	599
MAX	1078	1014	1220	1145	1086	1094	1108	1086	1061	956	1108	937
(WY)	1949	1948	1949	1949	1979	1951	1951	1952	1951	1940	1940	1949
MIN	.60	.60	.60	.60	.60	.60	.60	.60	.60	.60	.60	.60
(WY)	a1981	a1980	a1980	a1980	a1980	a1980	a1980	a1980	a1980	a1980	a1980	a1980

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1937 - 1994

ANNUAL TOTAL	71469.3	67550	675	
ANNUAL MEAN	196	185	1023	1949
HIGHEST ANNUAL MEAN			1.48	1980
LOWEST ANNUAL MEAN			c3860	Aug 18 1940
HIGHEST DAILY MEAN	2540	bMar 6	d12	Nov 23
LOWEST DAILY MEAN	d5.7	May 4	d20	hDec 11
ANNUAL SEVEN-DAY MINIMUM	d14	Jan 1	hDec 11	d.44
INSTANTANEOUS PEAK FLOW			1120	Mar 30
INSTANTANEOUS PEAK STAGE			9.67	Mar 30
INSTANTANEOUS LOW FLOW			d11	mNov 23
10 PERCENT EXCEEDS	297		345	
50 PERCENT EXCEEDS	192		165	
90 PERCENT EXCEEDS	20		89	

a Estimated, leakage through head gates; also 1983.

b Also Mar. 7, 1993.

c See REMARKS.

d Result of headgates being closed.

f Probably no flow at times when head gates were closed prior to 1958.

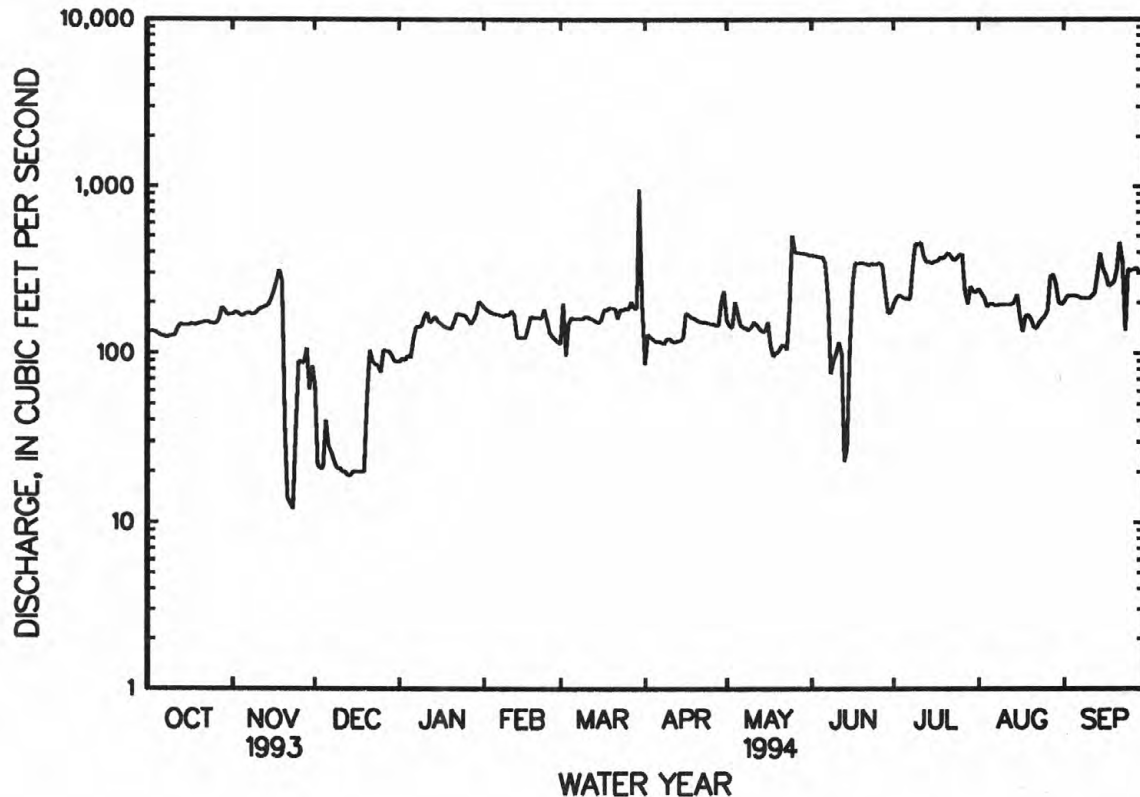
g Many days in 1937-38, 1949-50, 1952, 1954-55, and 1957.

h Also Dec. 12, 1993.

j Interchange of flow with James River makes maximum discharge indeterminate.

k From floodmarks.

m Also Nov. 24, 1993.



## 02037500 JAMES RIVER NEAR RICHMOND, VA

LOCATION.--Lat 37°33'47", long 77°32'50", Henrico County, Hydrologic Unit 02080205, on left bank 0.2 mi upstream from Huguenot Memorial Bridge, 0.5 mi southwest of Richmond city limits, 1.7 mi downstream from Boshier Dam, 3.3 mi upstream from Powhite Creek, and at mile 116.6.

DRAINAGE AREA.--6,758 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1934 to current year. Gage-height records collected in vicinity of Mayo's Bridge, at mile 109.5, 1876-1956, and at mile 108.7 since 1957, are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 972: 1936(M). WSP 1433: 1951(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Control is Williams Island dams which divert flow for city of Richmond water supply. Datum of gage is 98.82 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 30 to Jan. 1 and Jan. 21, 22, which are fair. City of Richmond takes from 40 ft<sup>3</sup>/s to 90 ft<sup>3</sup>/s for water supply from river downstream from gage except during periods of low flow when supply is obtained from James River and Kanawha Canal. Flow regulated by powerplants upstream from station. Above 18.2 ft stage, there is interchange of flow with James River and Kanawha Canal. Records of daily discharge include diversion by city of Richmond but do not include flow in James River and Kanawha Canal (station 02037000) which diverts around station. National Weather Service gage-height telemeter at station. Maximum discharge, 313,000 ft<sup>3</sup>/s, includes canal flow. Minimum daily discharge of James River and James River and Kanawha Canal combined, 214 ft<sup>3</sup>/s, Oct. 5, 1941, caused by recharging of the pool above Boshier Dam after the canal gates were closed. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 50,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	0600	69,600	15.30	Mar. 3	1900	52,100	13.45
Feb. 24	1900	54,500	13.72	Mar. 30	0830	*94,300	*17.48

Minimum discharge, 1,030 ft<sup>3</sup>/s, Oct. 10, gage height, 3.53 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1740	1820	13300	e3100	22500	18300	39600	9490	3010	2770	5970	2600
2	1750	2370	9370	4230	16800	19500	29900	7580	2820	2280	6030	2500
3	1730	2330	7050	4740	13400	44500	23700	7160	2720	2040	5650	2550
4	1630	1980	5650	5180	11200	41400	19400	7770	2540	2250	4210	2370
5	1430	1930	8530	7420	9570	29700	16300	10300	2450	1940	3720	2210
6	1370	1900	43600	9000	9060	27800	13900	10500	2410	1760	3900	1980
7	1290	2000	40400	7070	7970	30000	13000	11500	2450	1730	3080	1860
8	1160	2090	21500	6720	7300	27700	12300	10900	2570	1640	2800	1820
9	1250	2080	13100	8760	7120	27300	11700	10300	2610	1500	2540	1790
10	1060	1940	9220	8140	7910	29400	12400	14400	2780	1260	2330	1590
11	1080	1850	7300	8540	12100	34900	11000	16400	2870	1300	2020	1640
12	1300	1830	5880	7940	25000	29700	10400	12400	3170	1580	1860	1540
13	1470	1600	4860	13700	26200	27400	9910	10600	3510	1570	1930	1620
14	1600	1670	4570	20900	23100	22800	9910	9210	3210	1500	1710	1410
15	1720	1660	4310	21200	21800	18900	10600	8320	2890	1220	2020	1440
16	1690	1580	5040	14800	23400	16000	12100	7470	2440	1300	2170	1420
17	1580	1660	5820	10600	22700	13300	12000	6560	2280	1430	3080	1200
18	1580	1790	5220	9030	21100	11600	11100	5890	2050	1670	15600	1190
19	1540	1440	5320	9180	20800	10600	10300	5390	2170	2040	34100	1280
20	1530	1810	4910	8590	21100	9790	9310	5230	2200	2590	21900	1420
21	1400	2010	6740	e6800	21000	9400	8600	5060	2270	3200	12300	1430
22	1550	1910	7690	e6900	20700	9670	7700	4940	1920	2830	8560	1750
23	1490	1820	6480	6950	23100	9950	7120	4710	2540	2250	6870	3040
24	1510	1630	5440	7040	48400	9630	6780	4380	2740	2840	6340	3880
25	1500	1530	4850	7540	52000	10500	6680	4040	2340	3900	5380	2400
26	1530	1550	4320	8170	40100	10300	6430	3850	2850	4120	4500	2060
27	1370	1380	3800	8730	29100	10900	6040	3690	2610	3580	3830	3530
28	1370	30900	3600	10300	23300	32000	5880	3540	2330	5880	3510	4700
29	1420	58600	3470	28800	---	80700	6100	3390	3030	17100	3370	3710
30	1430	19400	e3300	38200	---	93300	10700	3300	3020	9730	3070	2690
31	1670	---	e3000	30500	---	70200	---	3090	---	5850	2860	---
TOTAL	45740	158060	277640	348770	587830	837140	370860	231360	78800	96650	187210	64620
MEAN	1475	5269	8956	11250	20990	27000	12360	7463	2627	3118	6039	2154
MAX	1750	58600	43600	38200	52000	93300	39600	16400	3510	17100	34100	4700
MIN	1060	1380	3000	3100	7120	9400	5880	3090	1920	1220	1710	1190
(†)	146	147	49.9	148	156	194	141	200	256	318	195	271
MEAN#	1621	5416	9006	11398	21146	27194	12501	7663	2883	3436	6234	2425
CFSM#	.24	.80	1.33	1.69	3.13	4.02	1.85	1.13	.43	.51	.92	.36
IN.#	.28	.89	1.54	1.94	3.26	4.64	2.06	1.31	.48	.59	1.06	.40

CAL YR	TOTAL	MEAN	MAX	MIN	MEAN#	CFSM#	IN.#
1993	3233337	8858	110000	849	9054	1.34	18.19
1994	3284680	8999	93300	1060	9184	1.36	18.45

† Average diversion, in cubic feet per second, by James River and Kanawha Canal.

# Adjusted for diversion.

e Estimated.

## JAMES RIVER BASIN

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02037500 JAMES RIVER NEAR RICHMOND, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4082	4691	6759	8797	10630	12880	11070	7760	5386	3093	3781	3022
MAX	19090	30480	26480	25300	20990	32740	35900	24280	30910	11300	21710	16730
(WY)	1938	1986	1949	1937	1994	1993	1987	1989	1972	1972	1969	1979
MIN	177	338	450	837	3243	2988	2766	2137	904	76.1	149	125
(WY)	1942	1942	1966	1966	1959	1981	1966	1941	1964	1966	1966	1963

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR	FOR 1994 WATER YEAR	WATER YEARS 1937 - 1994
ANNUAL TOTAL	3233337	3284680	
ANNUAL MEAN	8858	8999	6810
HIGHEST ANNUAL MEAN			13540
LOWEST ANNUAL MEAN			2666
HIGHEST DAILY MEAN	110000	Mar 6	93300
LOWEST DAILY MEAN	849	Aug 28	1060
ANNUAL SEVEN-DAY MINIMUM	962	Aug 28	1220
INSTANTANEOUS PEAK FLOW			94300
INSTANTANEOUS PEAK STAGE			17.48
INSTANTANEOUS LOW FLOW			1030
ANNUAL RUNOFF (CFSM)	1.31	1.33	(f)
ANNUAL RUNOFF (INCHES)	17.80	18.08	1.01
10 PERCENT EXCEEDS	21900	22900	14900
50 PERCENT EXCEEDS	4740	4700	4090
90 PERCENT EXCEEDS	1370	1530	910

a Includes canal flow.

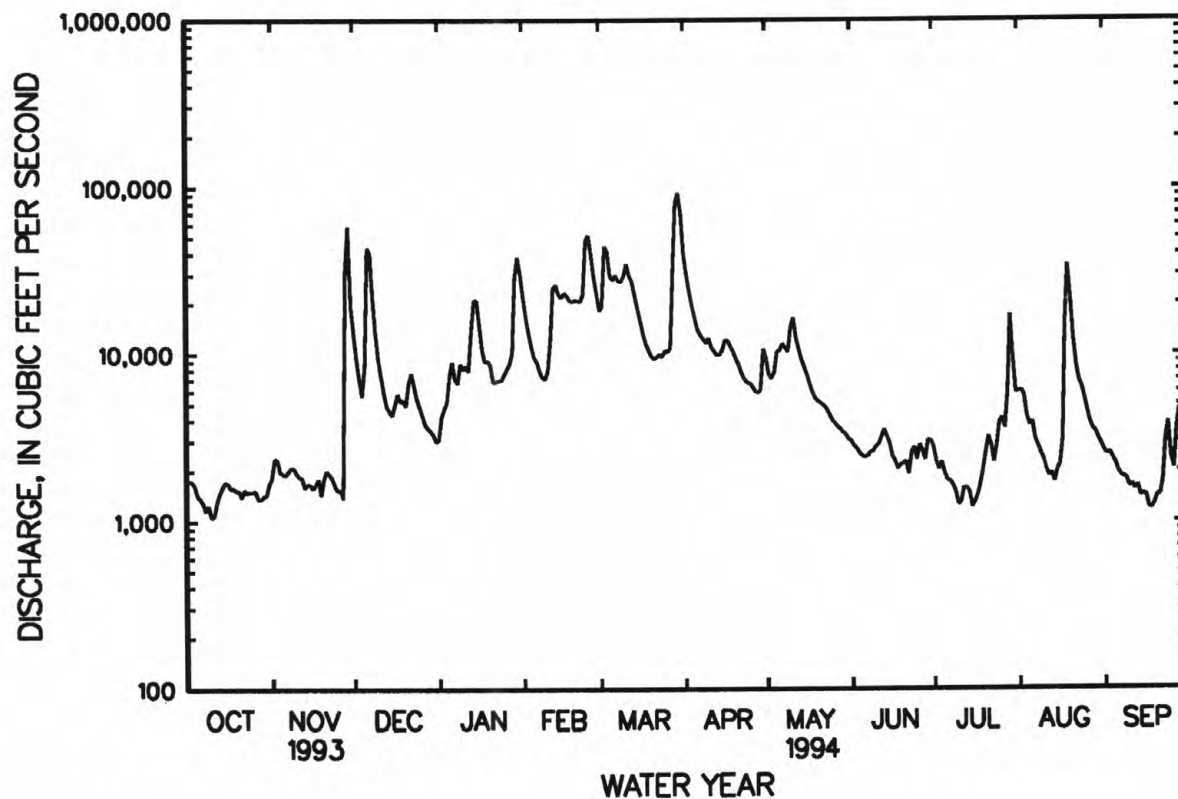
b Result of diversion by Boshier Dam construction.

c Also Sept. 9-15, 1966, Sept. 30, Oct. 5, 6, 1968, and Oct. 8-10, 1970.

d Also Sept. 9, 1966.

f Not determined.

g Probably occurred Sept. 8-15, 1966.





## JAMES RIVER BASIN

## 02038000 FALLING CREEK NEAR CHESTERFIELD, VA

LOCATION.--Lat 37°26'37", long 77°31'21", Chesterfield County, Hydrologic Unit 02080206, on left bank 50 ft upstream from bridge on State Highway 651, 0.8 mi downstream from Licking Creek, 2.8 mi upstream from Pocoshock Creek, and 4.7 mi northwest of Chesterfield.

DRAINAGE AREA.--32.8 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1955 to current year.

REVISED RECORDS.--WSP 1904: 1957(M), 1958-60.

GAGE.--Water-stage recorder. Datum of gage is 126.39 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Maximum discharge, 5,930 ft<sup>3</sup>/s, from rating curve extended above 3,200 ft<sup>3</sup>/s on basis of slope-conveyance study. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 220 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1330	1,400	10.90	Mar. 29	1045	572	8.43
Dec. 21	1845	273	6.60	Apr. 30	1300	602	8.57
Feb. 24	0845	454	7.83	May 5	0200	378	7.38
Mar. 3	0115	*1,500	*11.09	Sept. 23	0915	458	7.85
Mar. 28	0600	470	7.92				

Minimum discharge, 1.6 ft<sup>3</sup>/s, Sept. 11-12, 13; minimum gage height, 2.83 ft, Oct. 5, 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	16	18	15	32	44	109	122	8.2	59	46	3.2
2	2.5	8.5	14	71	27	524	76	83	8.5	19	49	2.9
3	2.1	6.4	11	74	25	1010	62	41	6.8	9.4	19	2.6
4	2.0	4.9	12	107	21	209	52	205	6.4	7.5	14	2.5
5	1.9	4.1	82	92	23	107	45	267	6.7	6.2	14	2.3
6	1.9	9.0	117	40	29	76	56	119	6.7	5.1	14	2.2
7	1.9	12	34	30	24	64	67	72	7.0	4.3	9.8	2.1
8	2.0	12	21	43	20	61	47	57	8.5	3.6	6.8	2.0
9	2.1	8.3	16	39	36	104	38	47	35	3.0	4.8	1.9
10	2.0	6.1	14	24	65	128	36	36	20	2.6	3.8	1.8
11	2.2	4.9	15	21	62	132	33	30	13	20	3.3	1.8
12	3.1	4.2	14	36	119	70	31	26	11	14	2.9	1.7
13	2.7	3.8	12	46	93	56	48	22	9.9	7.3	2.5	1.7
14	4.2	3.7	10	30	119	50	55	19	8.1	6.1	2.8	1.7
15	4.4	3.6	16	24	124	45	34	18	16	4.9	28	1.7
16	3.7	3.8	53	18	118	41	61	23	20	5.4	21	1.8
17	3.4	3.9	28	17	90	35	60	20	8.3	11	39	2.0
18	3.4	9.1	18	90	71	35	34	16	6.7	28	101	4.1
19	3.2	12	21	41	59	44	28	14	5.7	13	43	1.8
20	3.8	11	22	23	49	33	24	14	5.0	8.3	16	2.0
21	3.4	7.5	221	20	44	39	22	14	4.3	5.6	10	2.5
22	8.5	5.5	92	19	42	99	23	14	5.7	16	8.7	106
23	7.0	4.2	38	20	161	53	26	13	5.0	35	7.9	311
24	6.6	3.7	27	22	369	40	22	11	6.4	11	6.4	35
25	4.9	3.7	22	23	146	53	19	12	5.0	7.1	5.4	15
26	4.0	4.4	20	22	80	56	17	26	4.1	5.3	4.7	19
27	6.0	26	17	20	56	131	16	20	11	6.2	8.2	28
28	4.8	800	16	93	45	404	27	13	8.8	7.3	5.7	16
29	4.2	154	19	120	---	533	46	11	5.4	17	4.6	9.5
30	16	31	18	52	---	240	363	9.4	20	23	4.2	6.7
31	35	---	15	38	---	116	---	8.3	---	19	3.5	---
TOTAL	156.4	1187.3	1053	1330	2149	4632	1577	1402.7	293.2	390.2	510.0	592.5
MEAN	5.05	39.6	34.0	42.9	76.7	149	52.6	45.2	9.77	12.6	16.5	19.7
MAX	35	800	221	120	369	1010	363	267	35	59	101	311
MIN	1.9	3.6	10	15	20	33	16	8.3	4.1	2.6	2.5	1.7
CF5M	.15	1.21	1.04	1.31	2.34	4.56	1.60	1.38	.30	.38	.50	.60
IN.	.18	1.35	1.19	1.51	2.44	5.25	1.79	1.59	.33	.44	.58	.67

## JAMES RIVER BASIN

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02038000 FALLING CREEK NEAR CHESTERFIELD, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	22.6	25.7	32.4	44.9	57.3	65.0	52.5	29.8	16.9	14.3	16.2	17.6
MAX	255	128	113	156	178	181	121	78.9	73.8	112	80.1	273
(WY)	1980	1986	1958	1978	1979	1984	1984	1979	1972	1975	1979	1979
MIN	.29	1.38	1.89	6.61	11.2	12.9	8.55	5.24	3.65	1.14	1.54	.092
(WY)	1969	1969	1969	1966	1991	1985	1985	1985	1977	1977	1963	1968

## SUMMARY STATISTICS

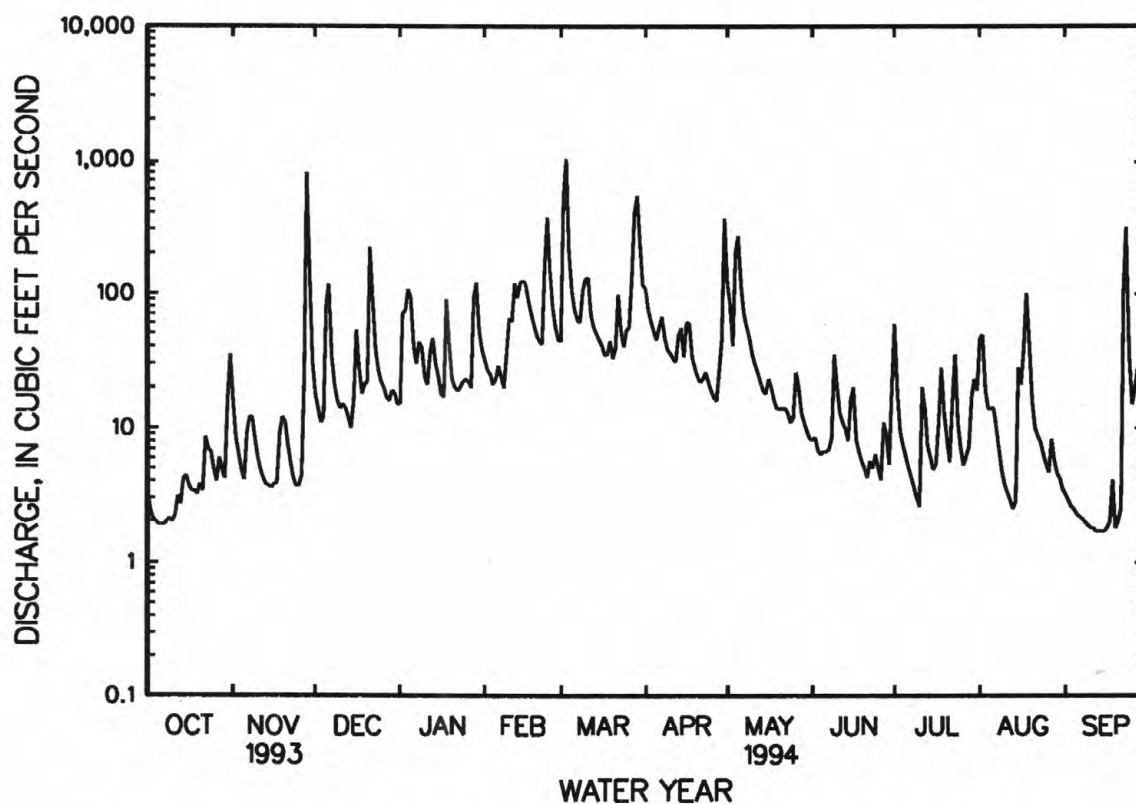
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1956 - 1994

ANNUAL TOTAL	16617.4	15273.3	
ANNUAL MEAN	45.5	41.8	32.8
HIGHEST ANNUAL MEAN			80.8
LOWEST ANNUAL MEAN			11.4
HIGHEST DAILY MEAN	800	1010	3700
LOWEST DAILY MEAN	1.3	1.7	.01
ANNUAL SEVEN-DAY MINIMUM	1.4	1.7	.02
INSTANTANEOUS PEAK FLOW		1500	5930
INSTANTANEOUS PEAK STAGE		11.09	c15.32
INSTANTANEOUS LOW FLOW		1.6	.01
ANNUAL RUNOFF (CFSM)	1.39	1.28	1.00
ANNUAL RUNOFF (INCHES)	18.85	17.32	13.58
10 PERCENT EXCEEDS	116	93	70
50 PERCENT EXCEEDS	16	17	16
90 PERCENT EXCEEDS	1.9	3.2	2.5

- a Also Aug. 4, 5, 1993.  
b Also Sept. 13-15, 1994.  
c From floodmarks.  
d Also Sept. 12, 13, 1994.



## JAMES RIVER BASIN

02038850 HOLIDAY CREEK NEAR ANDERSONVILLE, VA  
(Hydrologic bench-mark station)

LOCATION.--Lat 37°24'55", long 78°38'10", Appomattox County, Hydrologic Unit 02080207, on right bank 350 ft downstream from culvert on State Highway 614, 1.0 mi upstream from Holiday Lake, and 5.2 mi southwest of Andersonville.

DRAINAGE AREA.--8.53 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1966 to current year.

REVISED RECORDS.--WDR VA-72-1: 1967-71(M), 1966-69(P), 1971(P).

GAGE.--Water-stage recorder. Datum of gage is 472.97 ft above sea level.

REMARKS.--Records good except those for periods with backwater from beaver dams, Oct. 1 to Nov. 27 and Dec. 7 to Jan. 1, and period with ice effect, Jan. 16-24, which are fair. Recording rain gage at station. Maximum discharge, 9,640 ft<sup>3</sup>/s, from rating curve extended above 4,200 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 0.73 ft, Aug. 12, 14, 15, 1987.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0115	*1,860	*8.26	Mar. 3	0030	365	3.43
Dec. 5	1015	357	3.39	Mar. 28	0330	431	3.80
Feb. 11	1745	291	3.00	June 10	2145	337	3.28
Feb. 23	1415	245	2.78	July 29	0300	174	2.41

Minimum daily discharge, 1.9 ft<sup>3</sup>/s, Oct. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2.9	e4.9	6.5	e5.7	12	10	22	9.7	4.3	6.0	7.3	5.8
2	e2.6	e4.5	4.9	9.0	10	117	26	8.2	4.1	5.5	16	4.9
3	e2.3	e3.8	4.4	11	9.4	150	25	7.5	3.9	5.7	14	4.5
4	e2.0	e3.3	9.1	28	9.6	66	29	30	4.0	6.9	8.3	4.5
5	e1.9	e3.5	138	21	12	34	23	21	4.1	6.0	6.8	4.3
6	e2.0	e3.8	31	12	12	18	16	14	4.1	5.4	6.2	4.2
7	e2.2	e5.0	e25	11	12	14	17	11	20	4.9	5.4	3.9
8	e2.2	e4.5	e18	32	12	13	13	11	27	4.6	5.1	3.6
9	e2.3	e4.2	e12	15	23	12	12	9.1	12	4.4	5.0	3.6
10	e2.4	e3.8	e10	10	21	29	12	8.3	89	5.4	4.8	3.5
11	e2.5	e3.4	e9.5	9.0	213	19	11	7.7	69	4.7	4.7	3.5
12	e2.9	e3.3	e8.4	30	52	14	11	7.2	21	4.6	4.6	3.4
13	e3.3	e3.2	e7.3	22	30	12	13	6.6	12	4.5	4.7	3.3
14	e3.0	e3.2	e6.7	14	35	11	11	6.5	9.4	4.3	4.5	3.3
15	e2.6	e3.1	e10	10	38	11	10	6.8	8.0	4.2	6.0	3.2
16	e2.3	e3.2	e23	e9.5	41	9.8	12	8.2	7.5	4.0	12	3.0
17	e2.4	e5.1	e11	e9.2	35	9.2	9.7	6.4	8.6	4.1	54	3.3
18	e2.5	e4.3	e10	e15	32	9.6	9.1	6.1	7.6	4.8	24	4.4
19	e2.4	e4.5	e9.2	e12	30	9.2	9.0	6.5	6.9	7.2	10	3.4
20	e2.4	e4.0	e8.8	e10	26	8.7	8.6	6.3	6.3	12	7.7	3.1
21	e2.9	e3.5	e29	e11	22	13	8.3	6.1	6.1	7.1	7.7	3.1
22	e4.2	e3.2	e23	e12	19	15	10	5.7	5.9	6.3	9.0	4.2
23	e3.8	e3.2	e19	e11	114	11	9.4	5.3	23	7.9	6.8	4.5
24	e3.3	e3.1	e13	e10	69	10	8.6	5.2	18	5.9	6.0	3.8
25	e3.0	e3.1	e11	10	24	11	8.1	5.0	9.3	5.0	5.6	3.8
26	e2.9	e15	e9.2	10	15	10	7.5	5.0	7.1	16	5.5	5.9
27	e3.0	e70	e8.1	10	12	69	12	5.1	7.4	12	5.5	4.9
28	e3.2	321	e7.5	38	10	254	14	4.8	7.1	12	5.7	4.0
29	e3.0	24	e7.7	36	---	123	10	4.6	6.3	50	5.2	3.6
30	e3.8	14	e7.3	20	---	49	13	4.5	6.2	14	5.0	3.4
31	e5.2	---	e6.4	15	---	32	---	4.4	---	8.7	4.8	---
TOTAL	87.4	538.7	504.0	478.4	950.0	1173.5	400.3	253.8	425.2	254.1	277.9	117.9
MEAN	2.82	18.0	16.3	15.4	33.9	37.9	13.3	8.19	14.2	8.20	8.96	3.93
MAX	5.2	321	138	38	213	254	29	30	89	50	54	5.9
MIN	1.9	3.1	4.4	5.7	9.4	8.7	7.5	4.4	3.9	4.0	4.5	3.0
CFSM	.33	2.11	1.91	1.81	3.98	4.44	1.56	.96	1.66	.96	1.05	.46
IN.	.38	2.35	2.20	2.09	4.14	5.12	1.75	1.11	1.85	1.11	1.21	.51

e Estimated.

## JAMES RIVER BASIN

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02038850 HOLIDAY CREEK NEAR ANDERSONVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	6.16	7.76	8.89	10.5	12.3	14.1	11.7	9.94	8.70	4.69	4.83	5.66
MAX	25.6	32.3	25.6	30.5	33.9	37.9	32.6	36.0	70.1	15.3	24.9	28.8
(WY)	1972	1986	1974	1978	1994	1994	1973	1971	1972	1972	1973	1975
MIN	1.23	2.40	2.16	2.40	5.38	4.12	4.37	2.93	1.63	.61	.58	.80
(WY)	1987	1982	1989	1989	1989	1981	1967	1981	1966	1966	1987	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1966 - 1994

ANNUAL TOTAL	4436.3	5461.2	
ANNUAL MEAN	12.2	15.0	8.81
HIGHEST ANNUAL MEAN			18.6
LOWEST ANNUAL MEAN			3.28
HIGHEST DAILY MEAN	342	Mar 4	321
LOWEST DAILY MEAN	1.7	aSep 1	e1.9
ANNUAL SEVEN-DAY MINIMUM	1.9	Sep 10	2.1
INSTANTANEOUS PEAK FLOW			1860
INSTANTANEOUS PEAK STAGE			8.26
INSTANTANEOUS LOW FLOW			(e)
ANNUAL RUNOFF (CFSM)	1.42		1.75
ANNUAL RUNOFF (INCHES)	19.35		23.82
10 PERCENT EXCEEDS	23		28
50 PERCENT EXCEEDS	7.1		8.0
90 PERCENT EXCEEDS	2.4		3.2

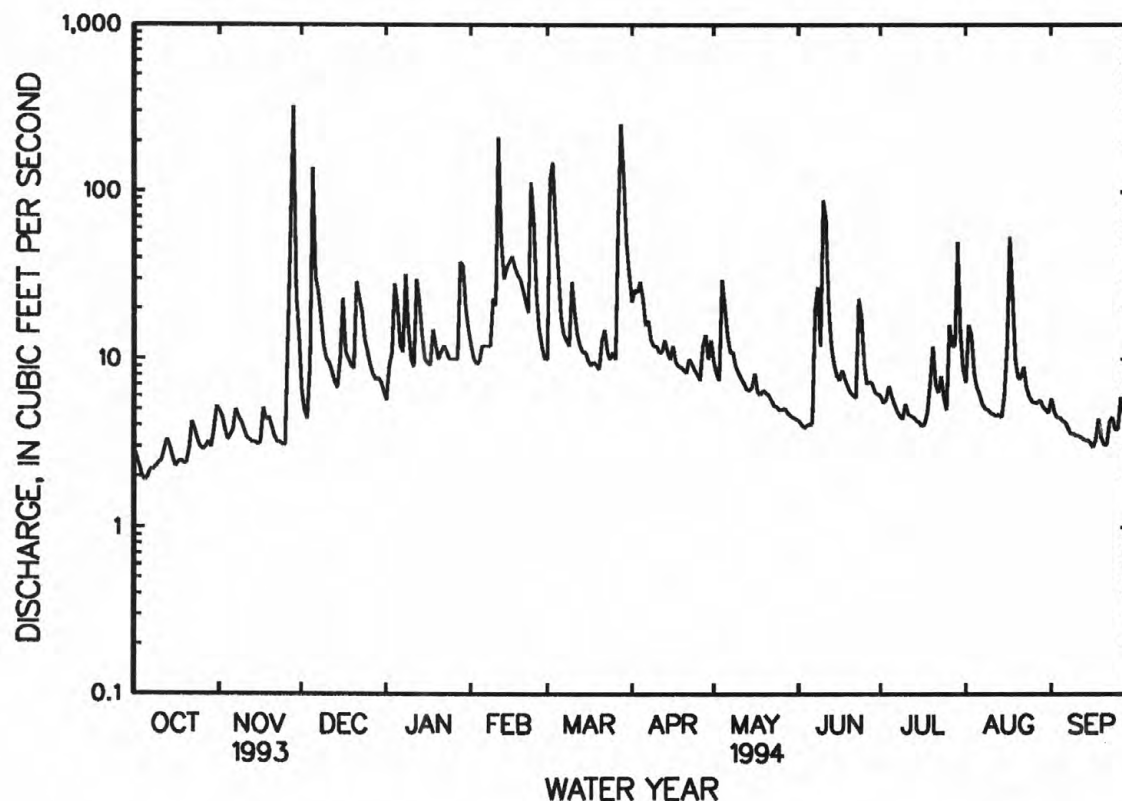
a Also Sept. 13-15, 1993.

b And 11 other days in July and September 1966.

c Not determined.

d Probably occurred during periods estimated due to beaver dams.

f Also Sept. 12, 1966.



## JAMES RIVER BASIN

02038850 HOLIDAY CREEK NEAR ANDERSONVILLE, VA--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1968 to current year.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
NOV 16...	0910	E2.8	37	6.6	17.0	13.0	1.3	756	10.7	102
MAR 23...	1000	12	25	6.9	24.5	9.0	1.2	749	11.5	101
JUN 16...	1200	7.7	30	6.7	27.0	22.0	2.3	754	8.6	99
AUG 25...	1000	6.1	36	6.7	27.0	21.0	1.8	755	8.9	101

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOC- CI, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)
NOV 16...	K5	460	10	2.3	1.1	2.8	0.80	0	18	15
MAR 23...	K6	K10	8	1.6	0.86	2.2	0.50	0	9	7
JUN 16...	100	5500	10	2.2	1.1	2.3	0.60	0	14	12
AUG 25...	K21	270	10	2.2	1.1	2.5	0.60	0	15	12

DATE	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)
NOV 16...	1.5	1.8	0.10	14	38	34	<0.010	--	<0.050	0.010
MAR 23...	2.7	1.8	<0.10	9.0	19	23	0.020	--	<0.050	0.020
JUN 16...	1.6	1.5	<0.10	12	42	29	<0.010	0.120	0.120	0.030
AUG 25...	1.1	1.5	<0.10	12	39	29	<0.010	--	<0.050	0.010

&lt; Actual value is known to be less than the value shown.

E Estimated value.

K Results based on colony count outside the acceptance range (non-ideal colony count).



## JAMES RIVER BASIN

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02038850 HOLIDAY CREEK NEAR ANDERSONVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)
NOV 16...	<0.20	0.020	<0.010	0.010	30	10	<3	560	<4	7
MAR 23...	<0.20	<0.010	<0.010	<0.010	60	11	<3	200	<4	10
JUN 16...	<0.20	<0.010	0.010	<0.010	50	10	<3	430	<4	11
AUG 25...	<0.20	0.020	<0.010	<0.010	40	10	<3	400	<4	9

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L) (09511)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 16...	<10	<1	<1	<1.0	22	<6	--	--	--
MAR 23...	<10	<1	<1	<1.0	15	<6	0.03	6	93
JUN 16...	<10	<1	<1	<1.0	18	<6	--	4	96
AUG 25...	<10	<1	<1	<1.0	20	<6	0.02	--	--

&lt; Actual value is known to be less than the value shown.

## JAMES RIVER BASIN

02039000 BUFFALO CREEK NEAR HAMPDEN SYDNEY, VA

LOCATION.--Lat 37°15'25", long 78°29'12", Prince Edward County, Hydrologic Unit 02080207, on left bank 100 ft upstream from bridge on State Highway 658, 0.8 mi upstream from Locket Creek, 2.0 mi northwest of Hampden Sydney, and 6.0 mi southwest of Farmville.

DRAINAGE AREA.--69.7 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1946 to current year.

REVISED RECORDS.--WSP 1303: 1948-50(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 339.19 ft above sea level (levels by Virginia Department of Transportation). Prior to Aug. 19, 1953, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 16, 22, 23, and periods of doubtful or no gage-height record, Jan. 17, 19-21, Mar. 4-8, 31, and Apr. 1-4, which are fair. Maximum discharge, 9,160 ft<sup>3</sup>/s, from rating curve extended above 1,600 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 11.96 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of about 15 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0900	*4,660	*9.77	Feb. 24	0300	794	6.22
Dec. 5	1800	1,260	7.02	Mar. 3	0130	2,730	8.35
Dec. 21	1800	525	5.48	Mar. 28	1930	1,280	7.04

Minimum discharge, 16 ft<sup>3</sup>/s, Oct. 6-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	41	324	e54	82	88	e210	69	42	41	52	37
2	19	35	173	68	75	834	e160	62	41	39	60	37
3	18	31	80	83	69	1460	e120	57	40	39	50	37
4	18	29	75	162	66	e380	e110	124	39	55	46	36
5	17	31	674	153	68	e260	99	130	40	48	43	35
6	16	34	522	86	70	e150	105	95	40	43	41	35
7	17	36	272	73	66	e115	111	79	42	39	38	35
8	17	31	119	111	64	e95	94	74	42	37	37	34
9	17	28	84	82	78	97	86	66	42	36	36	34
10	20	26	73	66	90	218	82	61	101	35	35	34
11	21	25	68	62	128	252	79	57	301	35	35	34
12	27	24	59	96	260	128	76	55	100	35	35	33
13	25	24	56	107	195	102	85	52	68	35	34	33
14	22	43	54	80	272	96	83	51	57	35	33	33
15	21	150	90	65	277	91	77	50	51	34	33	33
16	20	119	199	e62	270	86	88	51	47	33	40	32
17	22	36	99	e76	216	81	81	49	47	33	146	32
18	23	37	78	139	171	81	74	48	46	34	286	35
19	22	30	78	e98	141	81	70	49	44	34	103	34
20	22	28	70	e75	117	78	67	49	42	33	65	33
21	26	24	398	e66	104	81	64	49	41	37	54	33
22	36	24	302	e55	95	91	65	48	40	43	49	37
23	29	23	126	e58	292	83	65	47	41	57	44	38
24	27	23	85	59	650	79	63	46	43	47	42	36
25	26	23	74	58	421	81	61	49	40	41	40	37
26	26	22	66	59	243	78	59	49	38	40	39	148
27	27	75	60	57	122	202	59	48	38	48	39	71
28	28	2240	58	122	93	764	62	45	39	60	42	45
29	26	588	e55	255	---	951	61	44	38	87	39	34
30	40	439	e52	134	---	562	80	43	39	65	38	29
31	49	---	e48	95	---	e350	---	42	---	52	37	---
TOTAL	744	4319	4571	2816	4795	8095	2596	1838	1669	1330	1711	1194
MEAN	24.0	144	147	90.8	171	261	86.5	59.3	55.6	42.9	55.2	39.8
MAX	49	2240	674	255	650	1460	210	130	301	87	286	148
MIN	16	22	48	54	64	78	59	42	38	33	33	29
CFSM	.34	2.07	2.12	1.30	2.46	3.75	1.24	.85	.80	.62	.79	.57
IN.	.40	2.31	2.44	1.50	2.56	4.32	1.39	.98	.89	.71	.91	.64

e Estimated.

## JAMES RIVER BASIN

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02039000 BUFFALO CREEK NEAR HAMPDEN SYDNEY, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	50.6	65.2	73.1	88.1	98.7	113	93.7	65.9	49.8	40.0	42.3	40.2
MAX	365	315	156	313	295	324	256	173	294	129	260	168
(WY)	1972	1986	1952	1978	1979	1993	1983	1978	1972	1989	1955	1979
MIN	9.94	14.6	18.7	25.3	36.9	37.5	29.4	23.4	11.2	14.0	9.02	6.67
(WY)	1971	1970	1966	1966	1968	1981	1967	1969	1970	1970	1977	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1947 - 1994

ANNUAL TOTAL	38231		35678									
ANNUAL MEAN	105		97.7									
HIGHEST ANNUAL MEAN										68.2		
LOWEST ANNUAL MEAN										134		1972
HIGHEST DAILY MEAN	2520	Mar 4	2240	Nov 28					4940	28.5		1970
LOWEST DAILY MEAN	15	aSep 13	16	Oct 6					e2.7		Aug 18	1955
ANNUAL SEVEN-DAY MINIMUM	16	Sep 10	17	cOct 3					2.9		Oct 4	1970
INSTANTANEOUS PEAK FLOW			4660	Nov 28					9160		Jun 21	1972
INSTANTANEOUS PEAK STAGE			9.77	Nov 28					12.38		Jun 21	1972
INSTANTANEOUS LOW FLOW			16	dOct 6					(f)		(g)	
ANNUAL RUNOFF (CFSM)	1.50		1.40						.98			
ANNUAL RUNOFF (INCHES)	20.40		19.04						13.29			
10 PERCENT EXCEEDS	209		172						119			
50 PERCENT EXCEEDS	52		54						43			
90 PERCENT EXCEEDS	21		28						18			

a Also Sept. 14-16, 1993.

b Also Oct. 8, 1970.

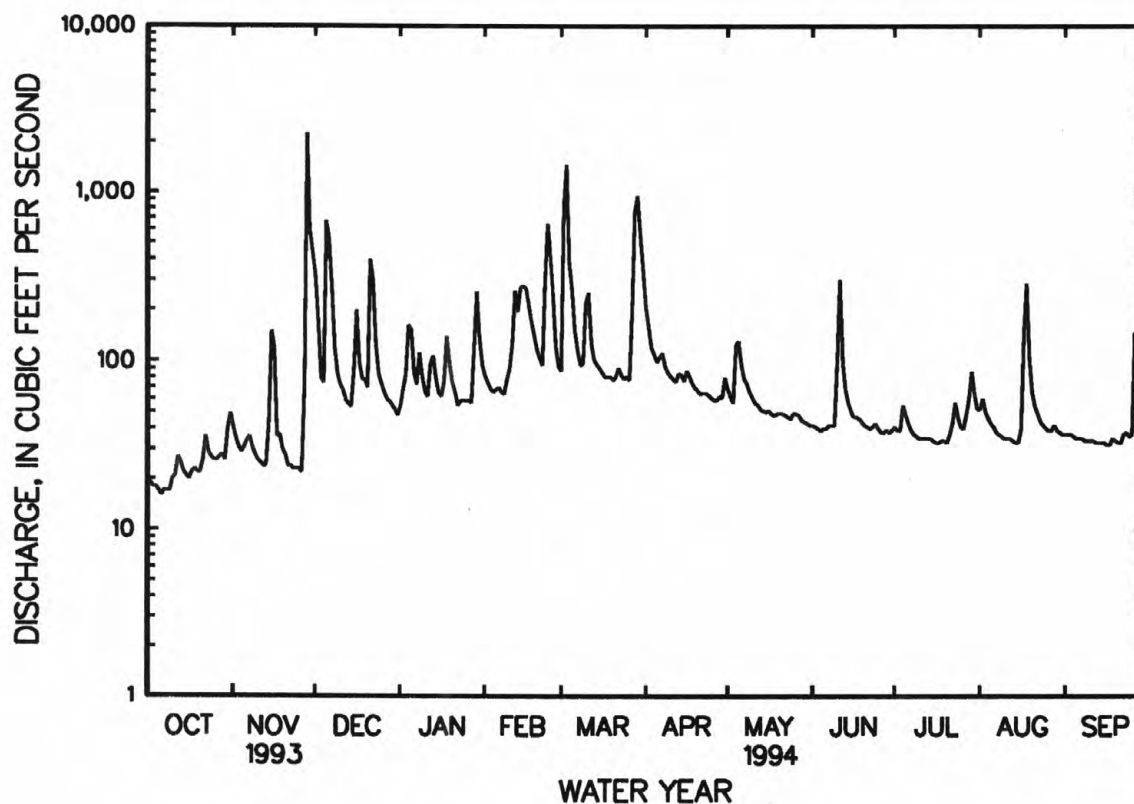
c Also Oct. 4, 1993.

d Also Oct. 7, 8, 1993.

e Estimated.

f Not determined.

g Probably occurred Oct. 7, 8, 1970.



## JAMES RIVER BASIN

02039500 APPOMATTOX RIVER AT FARMVILLE, VA

LOCATION.--Lat 37°18'25", long 78°23'20", Cumberland County, Hydrologic Unit 02080207, on left bank at downstream side of bridge on State Highway 45 at north town limits of Farmville and 1.1 mi downstream from Buffalo Creek.

DRAINAGE AREA.--303 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1926 to current year.

REVISED RECORDS.--WSP 972: 1927-37, 1938(M). WSP 1303: 1927(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 281.93 ft above sea level. Prior to Nov. 29, 1928, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 19-24, which are fair. Maximum discharge, 33,100 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. Diurnal fluctuation at low flow caused by Prince Edward Mill 0.2 mi upstream. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,900 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	0100	*11,700	*20.79	Mar. 29	0900	7,890	18.30
Dec. 6	0900	5,280	16.38	June 11	1830	4,750	15.93
Feb. 24	1430	4,510	15.71	Aug. 18	1100	2,640	13.49
Mar. 3	1300	7,990	18.37				

Minimum discharge, 72 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	91	166	715	e210	370	416	1180	363	170	259	288	146
2	88	120	542	283	317	2010	883	295	163	169	352	187
3	85	100	367	398	282	7230	699	260	157	195	502	138
4	81	94	302	668	260	4150	572	611	152	235	335	125
5	78	95	2610	929	252	1590	501	857	155	195	232	118
6	76	114	4340	531	268	946	498	571	159	159	193	116
7	75	136	1140	384	256	693	582	420	165	142	169	115
8	78	134	570	638	241	526	506	372	333	129	152	110
9	78	112	374	697	381	540	430	338	263	121	144	106
10	81	104	312	390	611	960	405	297	530	125	136	105
11	87	98	287	313	542	1350	393	275	3340	130	131	102
12	106	96	248	422	1350	740	370	258	1700	120	126	100
13	115	94	216	829	1020	534	391	243	485	125	121	99
14	100	94	204	524	1180	468	420	229	350	130	116	97
15	87	126	264	377	1250	424	366	235	280	115	118	95
16	82	206	645	226	1270	389	404	370	241	109	153	93
17	82	172	517	317	1040	351	398	297	249	105	630	93
18	88	145	347	456	834	338	341	235	236	110	2060	104
19	86	159	329	e375	721	344	317	230	206	160	686	108
20	87	124	305	e330	624	318	303	226	188	502	344	96
21	90	107	1110	e270	533	325	286	223	176	325	256	92
22	95	96	1030	e235	471	543	284	218	167	240	218	117
23	100	93	605	e250	1220	458	306	209	216	254	207	130
24	92	92	390	e260	3860	373	287	202	361	215	170	115
25	89	92	318	274	2370	361	273	207	230	162	154	126
26	88	91	276	271	964	372	262	214	170	154	148	450
27	91	265	241	263	629	919	255	208	154	302	142	397
28	94	7300	227	429	460	3960	277	197	155	353	138	212
29	92	7590	e220	1230	---	7080	277	187	153	995	138	141
30	117	1230	e205	723	---	4400	428	180	201	764	136	118
31	175	---	e185	462	---	1590	---	176	---	324	138	---
TOTAL	2854	19445	19441	13964	23576	44698	12894	9203	11505	7423	8833	4151
MEAN	92.1	648	627	450	842	1442	430	297	383	239	285	138
MAX	175	7590	4340	1230	3860	7230	1180	857	3340	995	2060	450
MIN	75	91	185	210	241	318	255	176	152	105	116	92
CFSM	.30	2.14	2.07	1.49	2.78	4.76	1.42	.98	1.27	.79	.94	.46
IN.	.35	2.39	2.39	1.71	2.89	5.49	1.58	1.13	1.41	.91	1.08	.51

e Estimated.

JAMES RIVER BASIN

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02039500 APPOMATTOX RIVER AT FARMVILLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1926 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	194	248	303	391	434	480	411	272	209	162	201	187
MAX	1190	1287	864	1430	1402	1518	1155	872	1866	518	1783	971
(WY)	1972	1986	1949	1978	1979	1993	1983	1978	1972	1972	1940	1975
MIN	30.3	51.0	61.6	96.3	114	126	107	95.2	29.5	40.5	19.6	16.7
(WY)	1931	1932	1966	1966	1934	1981	1966	1969	1970	1966	1930	1968

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

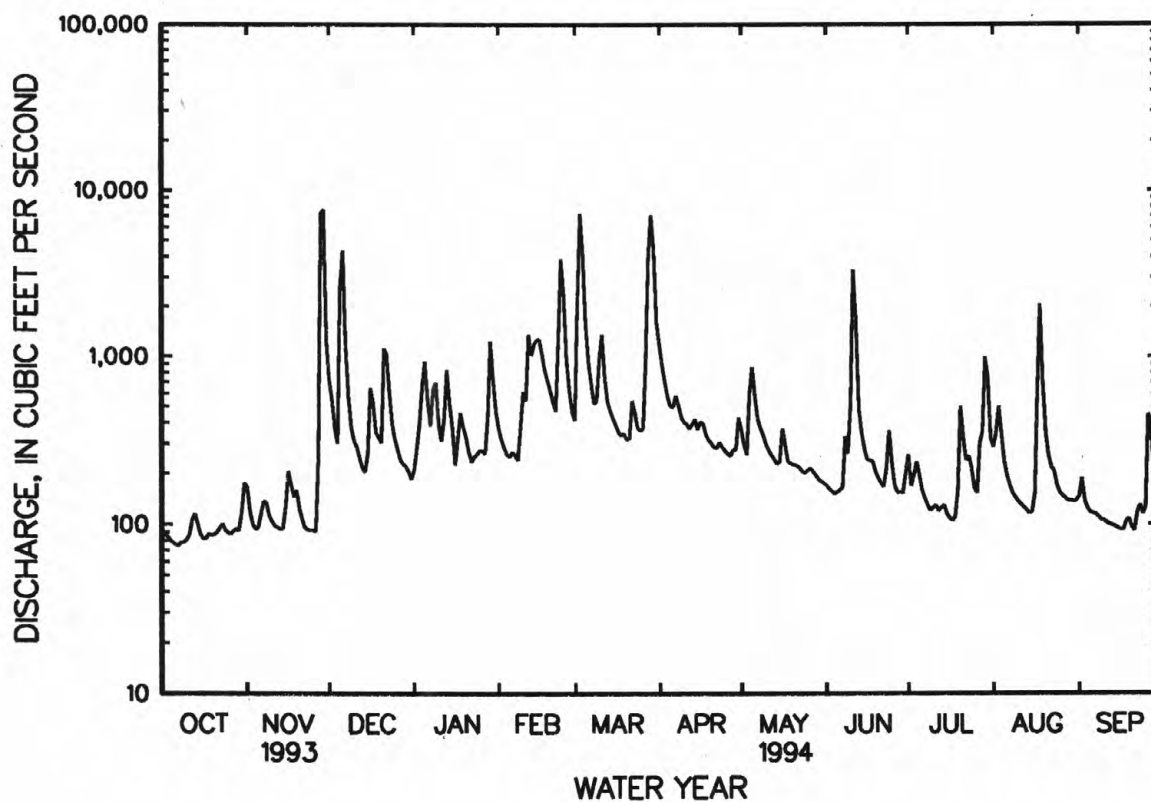
WATER YEARS 1926 - 1994

ANNUAL TOTAL	171833		177987									
ANNUAL MEAN	471		488							291		
HIGHEST ANNUAL MEAN										584		1972
LOWEST ANNUAL MEAN										115		1970
HIGHEST DAILY MEAN	10300	Mar 5	7590	Nov 29						28000	Jun 22	1972
LOWEST DAILY MEAN	61	aAug 31	75	Oct 7						6.3	Oct 5	1968
ANNUAL SEVEN-DAY MINIMUM	65	bAug 27	78	Oct 4						8.1	Sep 30	1968
INSTANTANEOUS PEAK FLOW			11700	Nov 29						33100	Jun 22	1972
INSTANTANEOUS PEAK STAGE			20.79	Nov 29						c29.70	Jun 22	1972
INSTANTANEOUS LOW FLOW			72	Oct 6						3.8	Sep 25	1941
ANNUAL RUNOFF (CFSM)	1.55		1.61							.96		
ANNUAL RUNOFF (INCHES)	21.10		21.85							13.05		
10 PERCENT EXCEEDS	933		923							524		
50 PERCENT EXCEEDS	227		255							165		
90 PERCENT EXCEEDS	83		95							61		

a Also Sept. 1, 14, 1993.

b Also Aug. 28, 1993.

c From floodmarks.





## JAMES RIVER BASIN

## 02040000 APPOMATTOX RIVER AT MATTOAX, VA

LOCATION.--Lat 37°25'17", long 77°51'33", Amelia County, Hydrologic Unit 02080207, on right bank 75 ft upstream from Norfolk Southern Railway bridge at Mattoax, 0.3 mi upstream from Skinquarter Creek, and 3.7 mi upstream from Flat Creek.

DRAINAGE AREA.--726 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1900 to December 1905, March 1926 to current year.

REVISED RECORDS.--WSP 892: 1938. WSP 972: 1928, 1932, 1934-38. WSP 1303: 1901(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 174.51 ft above sea level. August 1900 to December 1905, nonrecording gage at same site, different datum. March 1926 to October 1936, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 30, 31, and Jan. 22, 23, which are fair. National Weather Service gage-height telemeter at station. Maximum discharge, 35,000 ft<sup>3</sup>/s, from rating curve extended above 20,000 ft<sup>3</sup>/s on basis of records for stations at Farmville and near Petersburg. Minimum gage height, 3.52 ft, Oct. 2, 1930. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 1	1330	*12,100	*26.54	Mar. 6	0700	9,030	24.59
Dec. 9	0700	5,750	21.53	Apr. 1	0200	9,240	24.74
Feb. 28	0030	4,760	19.62				

Minimum discharge, 100 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	145	280	11900	480	1080	1330	8820	737	272	227	523	193
2	127	300	10100	627	863	2620	6670	666	265	335	433	197
3	117	248	6140	919	734	5260	4760	540	256	271	504	212
4	113	213	1880	1460	650	5710	1970	1090	247	260	506	205
5	109	194	2570	2230	605	7600	1420	2200	242	308	472	180
6	105	196	4080	2170	600	8770	1260	2050	242	269	331	169
7	103	229	4440	1310	604	6790	1280	1250	244	233	271	164
8	101	260	5210	1080	577	4300	1270	900	247	207	242	160
9	102	253	5650	1330	601	1760	1080	760	310	188	217	155
10	107	232	3250	1260	974	2210	938	674	382	177	204	148
11	112	211	1130	845	1290	3220	864	591	504	183	194	141
12	129	199	945	776	1690	3360	816	529	1870	179	187	138
13	147	192	795	1190	2450	3120	804	482	2360	180	195	133
14	160	188	686	1520	2790	1600	868	445	877	179	182	130
15	160	185	635	1090	2810	1290	852	418	508	197	210	128
16	148	184	1010	766	3150	1120	983	422	409	191	185	126
17	137	226	1600	545	3210	988	1160	512	353	176	304	124
18	132	301	1220	727	2900	887	1020	492	326	171	1500	125
19	135	301	928	1050	2230	845	773	399	321	166	2240	123
20	140	271	840	738	1800	795	677	381	289	174	1220	134
21	138	252	2240	654	1490	757	615	374	265	343	534	138
22	150	222	3190	e595	1260	921	579	365	266	391	395	171
23	160	205	3270	e600	1820	1070	579	350	248	338	324	265
24	169	194	2300	640	3740	938	571	334	298	325	293	270
25	173	190	1150	669	3980	811	540	326	452	295	259	219
26	169	188	922	668	4220	788	506	340	355	246	234	193
27	162	242	770	613	4600	1180	484	361	271	249	220	794
28	159	3050	665	705	4000	3670	474	335	240	347	211	720
29	159	5360	623	1610	---	5210	481	313	225	517	203	428
30	176	10200	e565	2350	---	6160	634	292	224	1160	203	287
31	212	---	e530	1730	---	8370	---	280	---	1080	199	---
TOTAL	4356	24766	81234	32947	56718	93450	43748	19208	13368	9562	13195	6570
MEAN	141	826	2620	1063	2026	3015	1458	620	446	308	426	219
MAX	212	10200	11900	2350	4600	8770	8820	2200	2360	1160	2240	794
MIN	101	184	530	480	577	757	474	280	224	166	182	123
CFSM	.19	1.14	3.61	1.46	2.79	4.15	2.01	.85	.61	.42	.59	.30
IN.	.22	1.27	4.16	1.69	2.91	4.79	2.24	.98	.68	.49	.68	.34

e Estimated.

## JAMES RIVER BASIN

349

02040000 APPOMATTOX RIVER AT MATTOAX, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1926 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	473	546	742	1014	1115	1232	1077	660	487	372	444	378
MAX	3932	2728	2620	3650	2404	3566	2975	1889	4369	1918	4566	2294
(WY)	1972	1986	1984	1978	1979	1993	1983	1978	1972	1938	1940	1975
MIN	32.7	107	123	207	248	309	273	208	95.0	56.5	35.6	30.0
(WY)	1931	1931	1966	1966	1931	1981	1966	1926	1970	1966	1930	1932

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

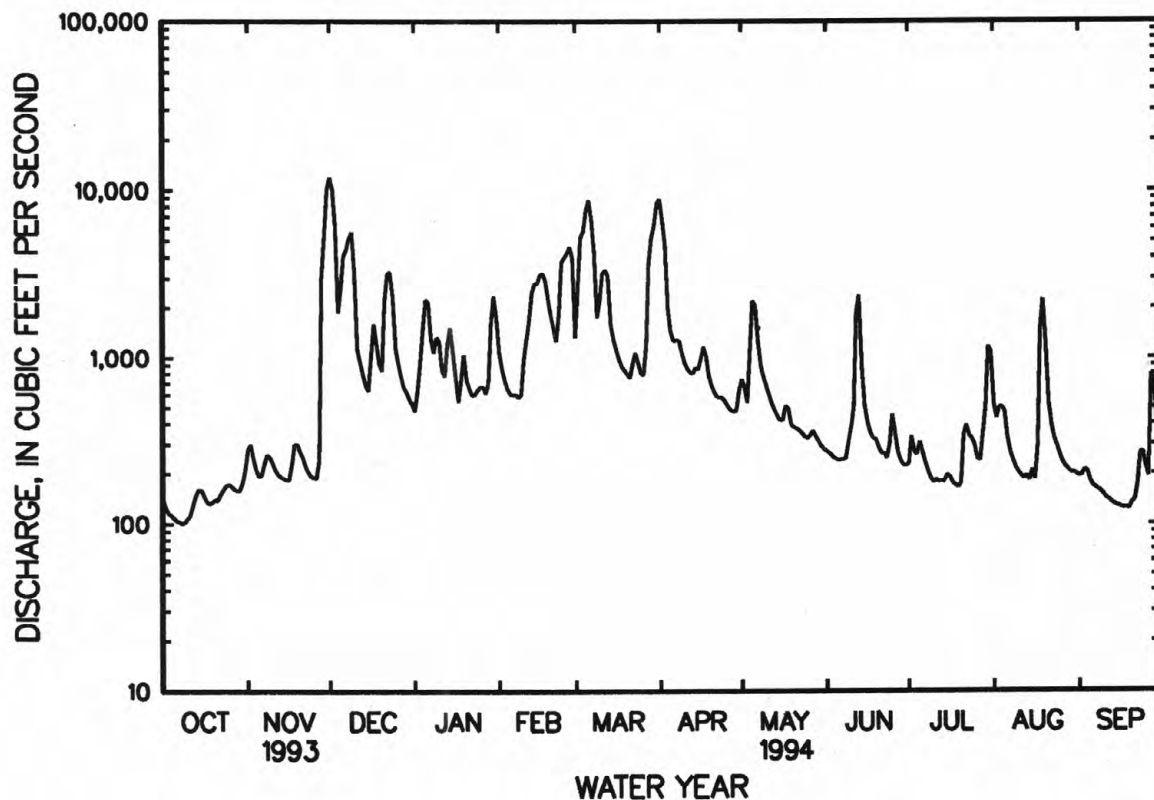
## WATER YEARS 1926 - 1994

ANNUAL TOTAL	425053		399122									
ANNUAL MEAN	1165		1093							712		
HIGHEST ANNUAL MEAN										1553		1972
LOWEST ANNUAL MEAN										285		1981
HIGHEST DAILY MEAN	11900	Dec 1	11900	Dec 1					e34300	Aug 18	1940	
LOWEST DAILY MEAN	76	aSep 2	101	Oct 8					13	Oct 2	1930	
ANNUAL SEVEN-DAY MINIMUM	82	Aug 29	106	Oct 5					16	Aug 28	1932	
INSTANTANEOUS PEAK FLOW			12100	Dec 1					35000	Aug 18	1940	
INSTANTANEOUS PEAK STAGE			26.54	Dec 1					b35.30	Aug 18	1940	
INSTANTANEOUS LOW FLOW			100	Oct 8					11	Oct 2	1930	
ANNUAL RUNOFF (CFSM)	1.60		1.51						.98			
ANNUAL RUNOFF (INCHES)	21.78		20.45						13.32			
10 PERCENT EXCEEDS	3260		2960						1590			
50 PERCENT EXCEEDS	529		482						384			
90 PERCENT EXCEEDS	116		160						116			

a Also Sept. 16, 1993.

b From floodmark in gage house.

e Estimated.



## JAMES RIVER BASIN

02041000 DEEP CREEK NEAR MANNBORO, VA

LOCATION.--Lat 37°16'59", Long 77°52'12", Amelia County, Hydrologic Unit 02080207, on left bank 300 ft upstream from bridge on State Highway 153, 0.9 mi upstream from Sweathouse Creek, 3.4 mi northwest of Mannboro, and 7.5 mi southeast of Amelia.

DRAINAGE AREA.--158 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1946 to current year.

REVISED RECORDS.--WSP 1203: 1948 (calendar year figures only). WSP 2104: Drainage area. WDR VA-79-1: 1973-76(P), 1978.

GAGE.--Water-stage recorder. Datum of gage is 177.20 ft above sea level. Prior to Sept. 2, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 30, 31, and Jan. 20-22, which are fair. Maximum discharge, 15,000 ft<sup>3</sup>/s, from rating curve extended above 3,900 ft<sup>3</sup>/s. Minimum gage height, 0.29 ft, Aug. 9-12, 1957. Several measurements of water temperature were made during the year. Water-quality records for some periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 14.8 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	0800	2,870	9.38	Mar. 3	1300	*6,590	*12.57
Feb. 25	0200	1,800	8.22	Mar. 29	0900	2,360	8.89

Minimum discharge, 3.5 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	58	218	88	165	182	518	162	37	36	65	17
2	7.4	61	128	134	139	632	412	144	33	89	53	16
3	6.7	50	95	243	115	5040	299	109	30	82	48	17
4	5.9	38	83	330	113	2460	240	200	28	50	40	16
5	5.4	32	190	368	108	897	209	410	27	36	34	15
6	4.7	34	496	312	112	460	202	449	27	40	30	14
7	4.3	49	708	185	112	297	215	238	31	32	24	13
8	4.0	54	221	159	105	235	205	178	32	26	21	13
9	4.2	57	137	148	104	280	175	162	36	23	18	12
10	4.9	51	108	123	140	368	158	144	38	21	16	11
11	4.7	42	97	107	169	486	150	116	56	21	24	11
12	6.4	36	86	119	276	493	143	99	113	21	36	9.9
13	8.8	32	77	157	419	275	150	87	114	21	50	9.3
14	9.1	30	71	166	440	221	168	78	69	26	27	9.0
15	8.4	28	87	134	588	195	163	71	49	25	20	8.4
16	7.7	27	173	106	599	174	176	77	39	35	19	8.0
17	7.5	27	254	99	494	155	250	83	34	31	35	7.9
18	7.5	31	188	139	350	143	232	75	31	27	199	9.3
19	7.4	35	141	208	266	142	165	67	29	25	306	12
20	7.3	36	122	e160	216	136	137	61	26	23	214	11
21	7.4	36	356	e115	184	132	120	60	25	24	90	10
22	10	35	914	e94	168	167	109	59	30	25	53	38
23	13	33	650	102	268	185	106	56	43	28	41	87
24	13	31	231	117	987	158	104	52	44	26	35	126
25	13	30	164	138	1540	155	98	50	34	24	31	116
26	13	31	133	135	744	211	92	62	32	23	27	67
27	15	42	112	119	311	278	85	57	27	32	24	52
28	16	503	104	147	215	1000	80	52	26	36	22	39
29	17	2330	100	313	---	2250	77	47	25	62	20	31
30	23	870	e90	389	---	1790	112	43	23	77	18	27
31	52	---	e83	225	---	885	---	40	---	73	17	---
TOTAL	322.9	4749	6617	5379	9447	20482	5350	3588	1188	1120	1657	832.8
MEAN	10.4	158	213	174	337	661	178	116	39.6	36.1	53.5	27.8
MAX	52	2330	914	389	1540	5040	518	449	114	89	306	126
MIN	4.0	27	71	88	104	132	77	40	23	21	16	7.9
CFSM	.07	1.00	1.35	1.10	2.14	4.18	1.13	.73	.25	.23	.34	.18
IN.	.08	1.12	1.56	1.27	2.22	4.82	1.26	.84	.28	.26	.39	.20

e Estimated.

## 02041000 DEEP CREEK NEAR MANNBORO, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	103	137	154	215	253	279	218	133	83.7	66.3	62.0	72.3
MAX	859	821	443	800	793	718	632	406	449	301	309	1002
(WY)	1973	1986	1958	1978	1979	1993	1987	1971	1972	1975	1978	1979
MIN	3.55	26.0	26.4	48.5	52.4	74.8	51.2	36.4	15.4	7.26	3.43	2.19
(WY)	1971	1966	1966	1966	1968	1981	1985	1985	1985	1991	1987	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

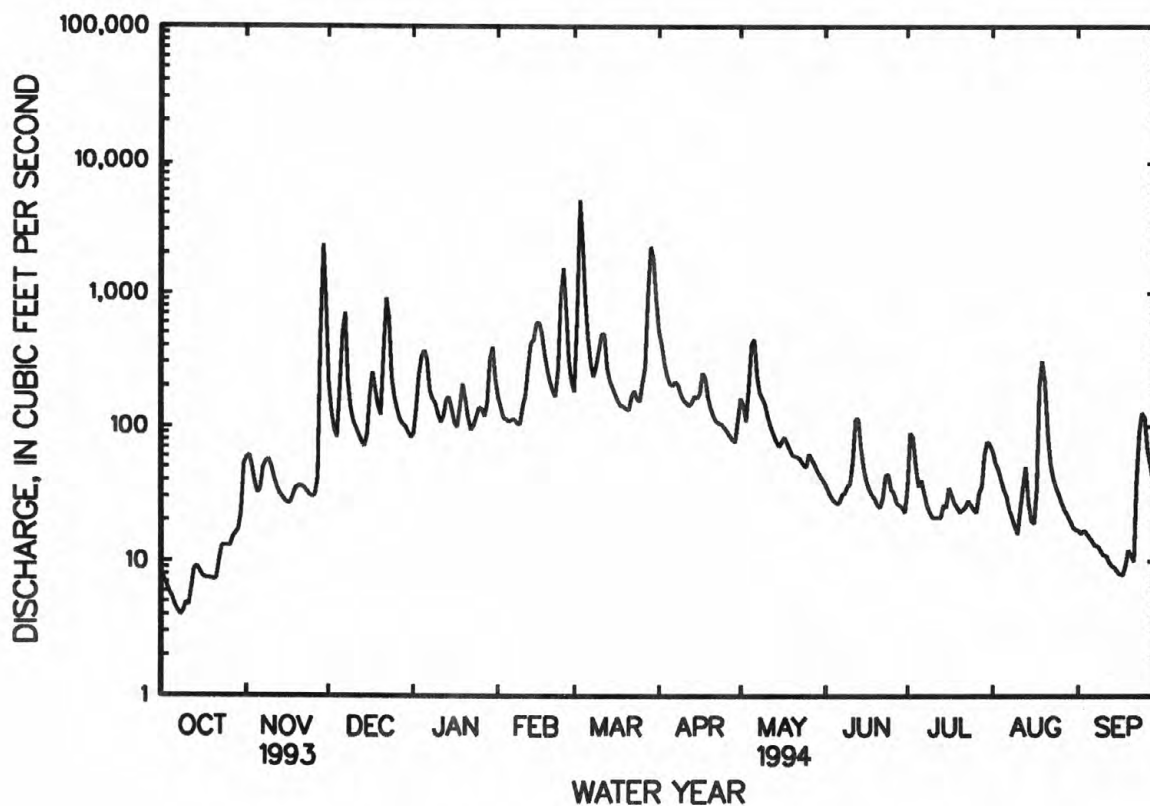
## WATER YEARS 1947 - 1994

ANNUAL TOTAL	68320.01	60732.7	
ANNUAL MEAN	187	166	147
HIGHEST ANNUAL MEAN			319
LOWEST ANNUAL MEAN			67.5
HIGHEST DAILY MEAN	6690	Mar 5	12000
LOWEST DAILY MEAN	.78	a Sep 3	.04
ANNUAL SEVEN-DAY MINIMUM	.81	Aug 31	.16
INSTANTANEOUS PEAK FLOW		5040	Mar 3
INSTANTANEOUS PEAK STAGE		4.0	Oct 8
INSTANTANEOUS LOW FLOW		4.6	Oct 5
ANNUAL RUNOFF (CFSM)	1.18	6590	Mar 3
ANNUAL RUNOFF (INCHES)	16.09	12.57	Mar 3
10 PERCENT EXCEEDS	400	3.5	Oct 8
50 PERCENT EXCEEDS	80	1.05	
90 PERCENT EXCEEDS	4.7	14.30	

a Also Sept. 4, 6, 1993.

b From floodmarks.

c Also Oct. 5, 1968.



## JAMES RIVER BASIN

02041650 APPOMATTOX RIVER AT MATOACA, VA

LOCATION.--Lat 37°13'28", long 77°28'32", Chesterfield County, Hydrologic Unit 02080207, on left bank at upstream side of bridge on State Highway 600, 0.2 mi south of Matoaca, 2.0 mi upstream from Rohoic Creek, 2.8 mi downstream from Lake Chesdin, 3.5 mi west of Petersburg, and at mile 15.9.

DRAINAGE AREA.--1,344 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 68.30 ft above sea level.

REMARKS.--Records good except those for periods of no gage-height record, Dec. 29-31 and Jan. 16-25, which are fair. Flow regulated by Appomattox Water Authority at Lake Chesdin, capacity, 36,000 acre-ft, 2.8 mi upstream from which an average of 37.3 ft<sup>3</sup>/s is diverted for industrial and municipal use. Records do not include flow of Upper Appomattox Canal of city of Petersburg which diverts around station. National Weather Service gage-height telemeter at station.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,200 ft<sup>3</sup>/s, Mar. 4, gage height, 11.10 ft; minimum, 39 ft<sup>3</sup>/s, Nov. 15, result of regulation; minimum daily, 43 ft<sup>3</sup>/s, Oct. 17-20, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	85	255	7740	822	2500	4960	10500	1260	450	310	1460	211
2	73	249	9630	1030	1850	4500	10700	1320	331	374	836	184
3	69	281	10800	1300	1520	10100	10300	1200	337	508	585	124
4	63	262	10100	2010	1290	11700	8830	1430	323	417	611	121
5	69	241	6840	3040	1170	11700	4960	3010	305	392	652	129
6	89	267	4660	3400	1130	10400	2520	3970	328	388	602	131
7	96	334	5450	2970	1110	9810	2190	3310	354	330	423	127
8	76	207	5800	2140	1010	9850	2020	2310	336	274	250	124
9	53	298	5880	1800	1060	8690	1900	1740	387	270	223	117
10	44	527	6000	1830	1190	5270	1710	1470	546	263	222	109
11	59	248	4740	1680	1700	4560	1530	1280	502	244	204	113
12	55	204	1910	1440	2660	5110	1420	1160	981	160	122	110
13	50	262	1270	1450	3480	5020	1440	785	1910	139	127	106
14	111	235	1140	1850	4450	4100	1490	775	2120	145	133	105
15	82	106	1020	2020	4960	2560	1500	724	1450	214	153	101
16	49	141	1090	e1500	5240	2090	1610	1020	750	253	162	91
17	43	136	1480	e1200	5340	1760	1850	918	466	263	189	93
18	43	326	2000	e1050	5080	1560	2000	848	385	241	864	111
19	43	329	1760	e1400	4290	1240	1750	687	403	182	2280	106
20	43	396	1460	e1750	3300	1480	1440	635	366	186	2690	98
21	55	195	2140	e1300	2680	1380	1240	627	365	195	1830	96
22	107	217	4220	e1100	2220	1450	1160	581	334	472	1010	433
23	99	213	5190	e1020	2350	1610	975	537	437	683	512	963
24	96	204	4840	e1060	5480	1710	881	509	312	562	337	637
25	108	199	3040	e1080	7090	1700	915	585	518	522	311	447
26	130	201	1880	1150	7300	1620	807	677	415	409	312	357
27	157	350	1430	1190	6620	1940	783	543	494	483	249	551
28	149	1600	1240	1240	6010	4960	739	557	305	141	236	1030
29	121	4660	e1100	1990	---	8030	741	480	287	475	225	676
30	184	6510	e960	3040	---	9490	1100	427	300	854	210	375
31	222	---	e883	3410	---	10300	---	415	---	1530	210	---
TOTAL	2723	19653	117693	53262	94080	160650	81001	35790	16797	11879	18230	7976
MEAN	87.8	655	3797	1718	3360	5182	2700	1155	560	383	588	266
MAX	222	6510	10800	3410	7300	11700	10700	3970	2120	1530	2690	1030
MIN	43	106	883	822	1010	1240	739	415	287	139	122	91
†FT <sup>3</sup> /S	38.5	33.8	33.7	41.6	33.4	28	32.1	33.2	44.8	40.2	42.6	45.7
CAL YR 1993	TOTAL	670774	MEAN	1838	MAX	12200	MIN	32	†FT <sup>3</sup> /S	35.5		
WTR YR 1994	TOTAL	619734	MEAN	1698	MAX	11700	MIN	43	†FT <sup>3</sup> /S	37.3		

† Average diversion, in cubic feet per second, at Lake Chesdin, provided by Appomattox Water Authority.  
e Estimated.



## JAMES RIVER BASIN

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02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1134	1118	1446	2055	2196	2578	2227	1345	954	541	536	680
MAX	6869	5648	3797	5868	3931	6098	5003	4452	5293	1987	1818	5312
(WY)	1973	1986	1994	1978	1979	1993	1983	1978	1972	1975	1978	1979
MIN	87.8	200	398	384	889	478	498	411	161	99.2	84.5	85.1
(WY)	1994	1970	1981	1981	1977	1981	1985	1985	1970	1986	1987	1993

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

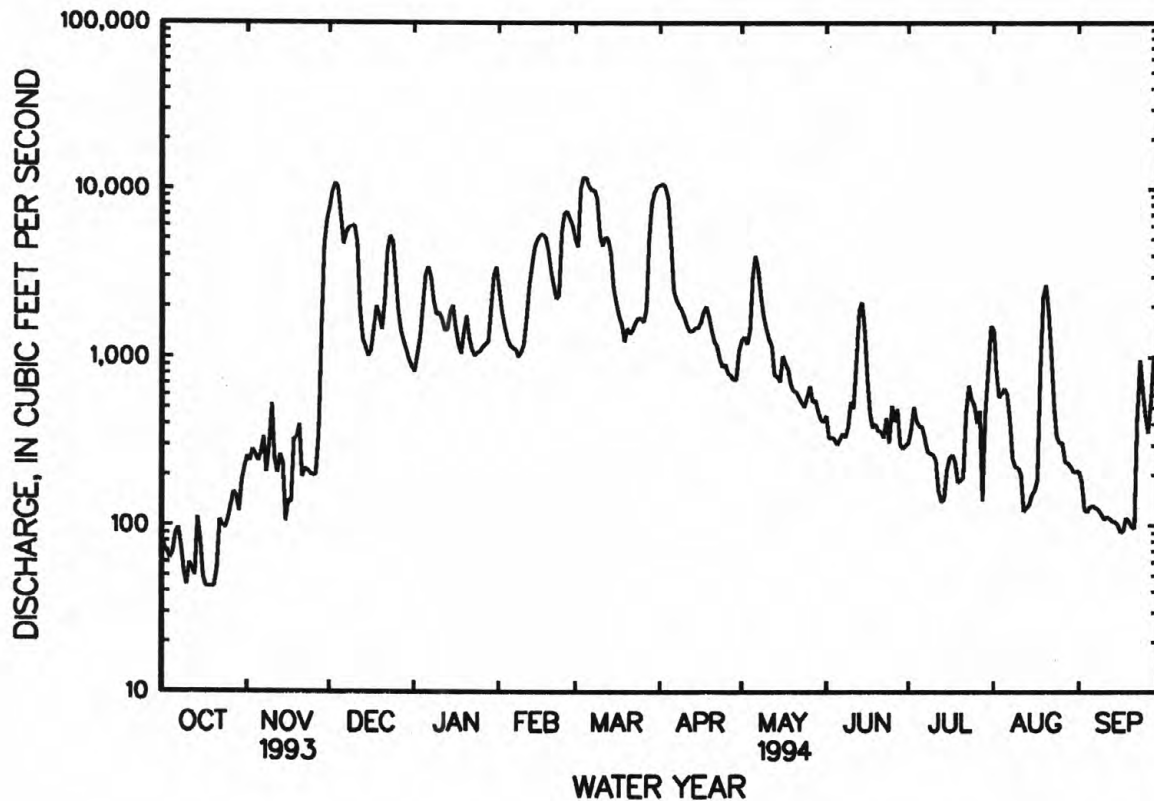
## WATER YEARS 1970 - 1994

ANNUAL TOTAL	670774		619734									
ANNUAL MEAN	1838		1698									
HIGHEST ANNUAL MEAN												1973
LOWEST ANNUAL MEAN												1981
HIGHEST DAILY MEAN	12200	Mar 6	11700	aMar 4					39400	Oct 7	1972	
LOWEST DAILY MEAN	b32	Aug 31	b43	cOct 17					b32	Aug 31	1993	
ANNUAL SEVEN-DAY MINIMUM	b51	Oct 15	b51	Oct 15					b48	Aug 25	1980	
INSTANTANEOUS PEAK FLOW			12200	Mar 4					40800	Oct 7	1972	
INSTANTANEOUS PEAK STAGE			11.10	Mar 4					18.39	Oct 7	1972	
INSTANTANEOUS LOW FLOW			b39	Nov 15					b26	Aug 31	1993	
ANNUAL RUNOFF (CFSM)	1.37		1.26						1.04			
ANNUAL RUNOFF (INCHES)	18.57		17.15						14.12			
10 PERCENT EXCEEDS	5860		4980						3500			
50 PERCENT EXCEEDS	867		783						696			
90 PERCENT EXCEEDS	70		111						167			

a Also Mar. 5, 1994.

b Result of regulation.

c Also Oct. 18-20, 1993.



## JAMES RIVER BASIN

02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1991 to current year.

WATER TEMPERATURE: October 1991 to current year.

COOPERATION.--Chemical data as noted were provided by the Virginia Division of Consolidated Laboratory Services (VDCLS) and reviewed by the U.S. Geological Survey.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
OCT											
12...	0745	59	113	6.7	15.5	15.5	759	VDCLS	1.9	6.3	63
25...	0900	107	99	7.2	10.0	14.0	767	VDCLS	1.6	9.4	91
NOV											
08...	1000	205	100	7.9	8.0	12.0	776	VDCLS	1.9	11.1	101
23...	0800	244	100	6.4	4.0	11.0	767	USGS	0.90	10.4	94
23...	0801	244	100	6.4	4.0	11.0	767	VDCLS	1.8	10.4	94
29...	0900	4420	98	7.6	9.0	12.0	768	VDCLS	20	10.8	99
29...	0915	4430	98	7.6	9.0	12.0	768	VDCLS	9.7	10.8	99
30...	1000	6440	110	8.1	5.5	9.0	772	VDCLS	17	12.0	102
DEC											
01...	0930	7530	80	7.0	4.0	9.0	780	VDCLS	140	11.0	93
02...	1030	9530	61	7.2	9.0	10.0	776	VDCLS	140	11.0	96
04...	0900	10400	47	6.8	10.5	8.5	766	VDCLS	110	12.3	105
07...	1100	5440	57	7.2	9.0	9.0	770	USGS	--	11.1	95
07...	1101	5440	57	7.2	9.0	9.0	770	VDCLS	74	11.1	95
09...	1200	5830	59	7.5	14.0	10.0	770	VDCLS	110	11.5	101
10...	1115	6020	55	7.1	12.0	9.0	761	VDCLS	99	11.5	100
11...	0915	5440	54	7.1	8.0	9.0	755	VDCLS	87	11.7	102
20...	0830	1460	63	7.3	1.0	6.0	766	VDCLS	--	12.4	99
JAN											
06...	1200	3390	71	7.4	9.0	3.0	767	VDCLS	21	13.6	100
25...	0830	1120	76	6.1	4.5	2.5	765	USGS	17	13.9	101
25...	0831	1120	76	6.1	4.5	2.5	765	VDCLS	9.9	13.9	101
31...	1230	3510	82	7.5	2.0	2.0	768	VDCLS	14	14.0	100
FEB											
01...	1100	2520	79	5.6	4.0	1.0	769	VDCLS	3.5	14.2	99
09...	0930	1100	76	7.0	9.0	3.5	756	VDCLS	--	13.2	100
15...	1145	5010	--	--	11.5	2.0	720	VDCLS	16	--	--
17...	1300	5320	69	7.4	13.0	3.0	775	VDCLS	16	13.8	101
17...	1315	5330	69	7.4	13.0	3.0	775	VDCLS	10	13.8	101
19...	1115	4340	67	7.5	12.0	2.0	777	VDCLS	22	13.6	96
23...	0930	2170	65	7.4	4.0	6.0	763	USGS	22	12.4	99
23...	0931	2170	65	7.4	4.0	6.0	763	VDCLS	16	12.4	99
24...	1300	5810	64	7.4	15.0	8.0	755	VDCLS	21	11.6	99
26...	0845	7600	64	7.2	7.0	8.0	763	VDCLS	34	12.2	103
28...	1300	5980	57	7.3	7.0	6.0	774	VDCLS	--	12.5	99
MAR											
03...	1400	10500	59	6.7	7.0	3.0	747	VDCLS	25	12.8	97
04...	0930	11600	50	7.1	12.0	4.5	753	VDCLS	39	13.5	106
05...	0830	11900	45	7.0	1.5	4.5	760	VDCLS	58	13.2	102
10...	1400	5060	48	7.2	10.5	9.5	757	VDCLS	56	11.8	104
12...	0900	5130	56	6.9	5.0	7.0	780	VDCLS	39	12.0	97
14...	0900	4520	57	7.2	11.0	9.0	761	VDCLS	42	11.6	100
14...	0915	4490	57	7.2	11.0	9.0	761	VDCLS	44	11.6	100
21...	1300	1030	60	7.5	9.0	10.0	760	VDCLS	29	11.4	101
28...	1315	5230	75	7.5	17.0	8.5	760	VDCLS	15	--	--
29...	1300	8430	70	7.3	14.0	12.5	765	VDCLS	16	10.6	99
APR											
01...	1100	10500	51	--	13.0	13.0	757	VDCLS	46	10.1	96
02...	1300	10700	50	6.8	24.0	15.0	767	VDCLS	54	10.8	106
05...	1400	4250	53	7.0	22.0	12.0	762	VDCLS	34	10.7	99
14...	1330	1500	63	7.4	26.0	18.0	763	VDCLS	12	10.2	108
29...	1100	795	77	7.8	25.0	19.5	769	USGS	2.6	9.5	103
29...	1101	795	77	7.8	25.0	19.5	769	VDCLS	5.3	9.5	103
MAY											
16...	1230	1200	72	7.8	27.0	20.5	758	VDCLS	9.7	9.7	108
24...	0830	816	74	7.6	24.0	20.0	762	VDCLS	5.8	8.8	97

02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER) (00028)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
JUN											
09...	1300	289	78	8.4	25.0	24.5	765	VDCLS	2.3	9.2	110
22...	1230	347	85	7.5	34.0	28.0	760	USGS	1.0	8.3	106
22...	1231	347	85	7.5	34.0	28.0	760	VDCLS	--	8.3	106
JUL											
07...	1330	502	74	7.6	34.0	30.0	765	VDCLS	2.0	7.4	98
19...	0845	181	93	7.2	25.0	24.0	766	VDCLS	3.0	7.0	83
AUG											
11...	1315	223	82	7.5	31.0	27.5	770	VDCLS	3.2	7.9	99
11...	1337	223	82	7.5	31.0	27.5	770	VDCLS	--	7.9	99
24...	0900	518	81	7.1	22.0	24.0	772	USGS	1.7	7.6	89
24...	0901	518	81	7.1	22.0	24.0	772	VDCLS	5.6	7.6	89
SEP											
08...	1230	117	83	7.6	28.0	24.0	767	VDCLS	5.8	8.6	102
22...	0930	111	90	7.1	17.0	20.5	761	VDCLS	2.9	7.8	87
22...	0945	113	90	7.1	17.0	20.5	761	VDCLS	3.0	7.8	87

02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML) (31625)	STREP-TOCOCCHI, KF AGAR (COLS. PER 100 ML) (31673)	HARDNESS, TOTAL (MG/L AS CaCO3) (00900)	CALCIUM, DIS-SOLVED (MG/L AS Ca) (00915)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg) (00925)	SODIUM, DIS-SOLVED (MG/L AS Na) (00930)	POTASSIUM, DIS-SOLVED (MG/L AS K) (00935)	BICARBONATE, WATER, DIS IT FIELD (MG/L AS HCO3) (00453)	CARBONATE, WATER, DIS IT FIELD (MG/L AS CO3) (00452)	ALKALINITY, WAT DIS TOT IT FIELD (MG/L AS CaCO3) (39086)	SULFATE, DIS-SOLVED (MG/L AS SO4) (00945)
OCT											
12...	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--
NOV											
08...	--	--	--	--	--	--	--	--	--	--	--
23...	14	37	31	7.0	3.2	5.7	2.7	39	0	32	5.4
23...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
DEC											
01...	--	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
JAN											
06...	--	--	--	--	--	--	--	--	--	--	--
25...	27	36	23	5.3	2.3	4.7	1.7	21	0	18	8.3
25...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
FEB											
01...	--	--	--	--	--	--	--	--	--	--	--
09...	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
23...	16	32	18	4.2	1.7	4.2	1.7	15	0	12	8.3
23...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAR											
03...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
21...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
APR											
01...	--	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
29...	K6	15	24	5.5	2.5	4.2	1.9	28	0	23	5.2
29...	--	--	--	--	--	--	--	--	--	--	--
MAY											
16...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
JUN											
09...	--	--	--	--	--	--	--	--	--	--	--
22...	31	40	27	6.0	2.9	5.2	1.6	35	0	29	4.4
22...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--
AUG											
11...	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
24...	K16	190	25	5.2	2.9	4.7	2.5	41	0	33	3.5
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
08...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--

K Results based on colony count outside the acceptance range (non-ideal colony count).

## 02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L) (00530)	RESIDUE FIXED NON FILTER- ABLE (MG/L) (00540)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L) (00535)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618) (*)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613) (*)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630) (*)
OCT											
12...	--	--	16	--	--	<3	<3	<3	0.270	0.010	0.280
25...	--	--	15	--	--	<3	<3	<3	0.140	<0.010	0.140
NOV											
08...	--	--	16	--	--	<3	<3	<3	0.110	0.010	0.120
23...	4.6	0.10	15	61	64	3	1	2	--	<0.010	0.110
23...	--	--	15	--	--	<3	<3	<3	0.090	<0.010	0.090
29...	--	--	16	--	--	29	24	5	<0.040	0.010	--
29...	--	--	16	--	--	28	23	5	<0.040	0.010	--
30...	--	--	17	--	--	18	15	3	<0.040	<0.010	--
DEC											
01...	--	--	12	--	--	70	59	11	0.230	<0.010	0.230
02...	--	--	8.9	--	--	68	56	12	0.220	<0.010	0.220
04...	--	--	6.9	--	--	43	35	8	0.070	0.010	0.080
07...	--	--	10	--	--	28	14	14	--	<0.010	0.130
07...	--	--	9.1	--	--	23	19	4	0.080	0.010	0.090
09...	--	--	10	--	--	65	52	13	0.150	0.010	0.160
10...	--	--	9.3	--	--	56	45	11	0.110	<0.010	0.110
11...	--	--	9.5	--	--	26	21	5	0.100	<0.010	0.100
20...	--	--	12	--	--	26	20	6	0.130	<0.010	0.130
JAN											
06...	--	--	7.5	--	--	8	6	2	0.240	<0.010	0.240
25...	4.6	<0.10	17	20	55	2	--	<1	0.240	0.020	0.260
25...	--	--	15	--	--	8	6	2	0.236	0.003	0.239
31...	--	--	16	--	--	7	6	1	0.252	0.003	0.255
FEB											
01...	--	--	15	--	--	9	7	2	0.258	0.002	0.260
09...	--	--	8.8	--	--	23	18	5	0.270	0.003	0.273
15...	--	--	14	--	--	13	11	2	0.244	0.003	0.247
17...	--	--	12	--	--	15	13	2	0.236	0.002	0.238
17...	--	--	12	--	--	18	15	3	0.240	0.002	0.242
19...	--	--	12	--	--	18	15	3	0.239	0.002	0.241
23...	4.5	<0.10	11	47	45	14	7	7	0.220	0.050	0.270
23...	--	--	12	--	--	21	16	5	0.221	0.003	0.224
24...	--	--	10	--	--	14	11	3	0.201	0.003	0.204
26...	--	--	10	--	--	35	29	6	0.177	0.003	0.180
28...	--	--	9.8	--	--	36	29	7	0.167	0.004	0.171
MAR											
03...	--	--	10	--	--	24	16	8	0.149	0.003	0.152
04...	--	--	8.3	--	--	60	53	7	0.153	0.003	0.156
05...	--	--	7.0	--	--	41	34	7	0.153	0.003	0.156
10...	--	--	8.7	--	--	21	18	3	0.156	0.005	0.161
12...	--	--	11	--	--	18	15	3	0.160	0.003	0.163
14...	--	--	12	--	--	19	16	3	0.178	0.002	0.180
14...	--	--	12	--	--	20	16	4	0.187	0.003	0.190
21...	--	--	11	--	--	13	10	3	0.173	0.003	0.176
28...	--	--	13	--	--	13	11	2	0.140	0.003	0.143
29...	--	--	13	--	--	16	13	3	0.131	0.002	0.133
APR											
01...	--	--	8.8	--	--	28	23	5	0.115	0.004	0.119
02...	--	--	9.0	--	--	21	17	4	0.018	0.003	0.021
05...	--	--	9.6	--	--	15	12	3	0.092	0.003	0.095
14...	--	--	12	--	--	10	8	2	0.061	0.002	0.063
29...	4.0	<0.10	13	57	51	8	6	2	--	<0.010	0.053
29...	--	--	13	--	--	5	3	2	0.040	0.002	0.042
MAY											
16...	--	--	14	--	--	6	4	2	0.092	0.003	0.095
24...	--	--	15	--	--	--	--	--	0.077	0.003	0.080
JUN											
09...	--	--	15	--	--	<3	<3	<3	0.083	0.004	0.087
22...	4.0	0.10	17	60	59	<1	--	4	--	<0.010	0.140
22...	--	--	17	--	--	<3	<3	<3	0.142	0.007	0.149
JUL											
07...	--	--	15	--	--	<3	<3	<3	0.065	0.003	0.068
19...	--	--	16	--	--	<3	<3	<3	0.207	0.016	0.223
AUG											
11...	--	--	17	--	--	<3	<3	<3	0.142	0.005	0.147
11...	--	--	19	--	--	--	--	--	0.143	0.005	0.148
24...	4.0	0.10	17	66	61	7	2	5	--	<0.010	0.140
24...	--	--	17	--	--	<3	<3	<3	0.135	0.005	0.140
SEP											
08...	--	--	19	--	--	<3	<3	<3	0.359	0.015	0.374
22...	--	--	18	--	--	<3	<3	<3	0.333	0.006	0.339
22...	--	--	17	--	--	<3	<3	<3	0.333	0.006	0.339

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.



02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631) (*)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608) (*)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671) (*)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
OCT											
12...	0.280	0.120	0.70	0.020	0.020	<0.010	--	--	--	--	--
25...	0.140	<0.040	0.30	0.020	0.020	<0.010	--	--	--	--	--
NOV											
08...	0.120	0.070	0.40	0.080	0.010	0.010	--	--	--	--	--
23...	0.110	0.020	0.20	<0.010	<0.010	<0.010	<10	17	<3	40	<4
23...	0.090	<0.040	0.20	0.020	<0.010	0.010	--	--	--	--	--
29...	<0.040	0.080	0.50	0.060	<0.010	0.010	--	--	--	--	--
29...	<0.040	0.060	0.50	0.060	<0.010	0.010	--	--	--	--	--
30...	<0.040	0.040	0.30	0.030	<0.010	<0.010	--	--	--	--	--
DEC											
01...	0.230	<0.040	0.70	0.120	0.010	0.010	--	--	--	--	--
02...	0.220	<0.040	0.90	0.200	0.020	0.030	--	--	--	--	--
04...	0.080	0.060	0.70	0.140	0.020	0.020	--	--	--	--	--
07...	0.130	0.060	0.50	0.090	--	0.020	--	--	--	--	--
07...	0.090	0.040	0.50	0.100	0.020	0.030	--	--	--	--	--
09...	0.160	0.060	0.60	0.170	0.020	0.020	--	--	--	--	--
10...	0.110	<0.040	0.60	0.150	0.030	0.020	--	--	--	--	--
11...	0.100	<0.040	0.60	0.130	0.020	0.020	--	--	--	--	--
20...	0.130	0.070	0.50	0.090	0.020	0.020	--	--	--	--	--
JAN											
06...	0.240	0.060	0.30	0.030	0.020	0.020	--	--	--	--	--
25...	0.260	0.020	0.20	0.020	<0.010	<0.010	--	--	--	--	--
25...	0.239	0.111	0.30	0.060	0.040	0.015	--	--	--	--	--
31...	0.255	0.029	0.30	0.040	0.020	0.008	--	--	--	--	--
FEB											
01...	0.260	0.023	0.50	0.040	0.020	0.008	--	--	--	--	--
09...	0.273	0.037	0.40	0.060	0.020	0.008	--	--	--	--	--
15...	0.247	0.021	0.20	0.050	0.020	0.010	--	--	--	--	--
17...	0.238	0.027	0.40	0.060	0.030	0.010	--	--	--	--	--
17...	0.242	0.027	0.30	0.060	0.030	0.009	--	--	--	--	--
19...	0.241	0.016	0.30	0.070	0.030	0.013	--	--	--	--	--
23...	0.270	0.040	0.30	0.040	0.040	0.010	130	21	<3	260	<4
23...	0.224	0.019	0.30	0.050	0.010	0.010	--	--	--	--	--
24...	0.204	0.007	0.30	0.060	0.020	0.008	--	--	--	--	--
26...	0.180	0.007	0.40	0.070	0.030	0.012	--	--	--	--	--
28...	0.171	0.005	0.50	0.090	0.030	0.013	--	--	--	--	--
MAR											
03...	0.152	--	0.40	0.070	0.020	0.008	--	--	--	--	--
04...	0.156	0.014	0.40	0.080	0.040	0.017	--	--	--	--	--
05...	0.156	0.016	0.50	0.110	0.040	0.021	--	--	--	--	--
10...	0.161	0.005	0.50	0.080	0.020	0.009	--	--	--	--	--
12...	0.163	0.010	0.20	0.070	0.030	0.010	--	--	--	--	--
14...	0.180	0.014	0.40	0.070	0.030	0.014	--	--	--	--	--
14...	0.190	0.016	0.40	0.070	0.020	0.015	--	--	--	--	--
21...	0.176	0.015	0.30	0.060	0.030	0.011	--	--	--	--	--
28...	0.143	0.016	0.40	0.050	0.030	0.017	--	--	--	--	--
29...	0.133	0.021	0.30	0.040	0.020	0.006	--	--	--	--	--
APR											
01...	0.119	0.010	0.70	0.100	0.040	0.020	--	--	--	--	--
02...	0.021	--	0.60	0.100	0.050	0.016	--	--	--	--	--
05...	0.095	0.005	0.50	0.070	0.030	0.014	--	--	--	--	--
14...	0.063	0.017	0.30	0.030	0.010	0.007	--	--	--	--	--
29...	0.053	0.030	0.20	0.020	0.010	<0.010	80	21	<3	380	<4
29...	0.042	0.013	0.30	0.020	0.010	0.004	--	--	--	--	--
MAY											
16...	0.095	0.016	0.70	0.040	0.030	0.008	--	--	--	--	--
24...	0.080	0.030	0.40	0.030	0.020	0.007	--	--	--	--	--
JUN											
09...	0.087	0.021	0.40	0.020	0.010	0.009	--	--	--	--	--
22...	0.140	0.020	0.30	0.030	<0.010	<0.010	--	--	--	--	--
22...	0.149	0.025	0.30	0.020	0.010	0.007	--	--	--	--	--
JUL											
07...	0.068	0.028	0.40	0.030	0.020	0.010	--	--	--	--	--
19...	0.223	0.041	0.40	0.030	0.020	0.015	--	--	--	--	--
AUG											
11...	0.147	0.021	0.30	0.030	0.020	0.015	--	--	--	--	--
11...	0.148	0.024	--	--	0.030	0.015	--	--	--	--	--
24...	0.140	0.060	0.30	0.020	0.020	0.020	80	17	<3	370	<4
24...	0.140	0.057	0.40	0.050	0.030	0.012	--	--	--	--	--
SEP											
08...	0.374	0.022	0.40	0.020	0.020	0.014	--	--	--	--	--
22...	0.339	0.019	0.40	0.050	0.040	0.023	--	--	--	--	--
22...	0.339	0.017	0.40	0.050	0.040	0.022	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

\* After Jan. 14, 1994, the minimum constituent reporting level for these constituents was lowered for samples analyzed by VDCLS.

02041650 APPOMATTOX RIVER AT MATOACA, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
12...	--	--	--	--	--	--	--	5.8	--	--	--
25...	--	--	--	--	--	--	--	4.0	--	--	--
NOV											
08...	--	--	--	--	--	--	--	3.2	--	--	--
23...	8	<10	<1	<1	<1.0	54	<6	3.9	--	2	85
23...	--	--	--	--	--	--	--	3.8	--	--	--
29...	--	--	--	--	--	--	--	4.3	--	--	--
29...	--	--	--	--	--	--	--	4.8	--	--	--
30...	--	--	--	--	--	--	--	3.5	--	--	--
DEC											
01...	--	--	--	--	--	--	--	11	--	--	--
02...	--	--	--	--	--	--	--	16	--	--	--
04...	--	--	--	--	--	--	--	13	--	--	--
07...	--	--	--	--	--	--	--	12	--	--	--
07...	--	--	--	--	--	--	--	13	--	--	--
09...	--	--	--	--	--	--	--	12	--	--	--
10...	--	--	--	--	--	--	--	14	--	--	--
11...	--	--	--	--	--	--	--	12	--	--	--
20...	--	--	--	--	--	--	--	9.4	--	--	--
JAN											
06...	--	--	--	--	--	--	--	6.2	4.3	--	--
25...	--	--	--	--	--	--	--	4.6	--	21	51
25...	--	--	--	--	--	--	--	4.2	--	--	--
31...	--	--	--	--	--	--	--	3.6	--	--	--
FEB											
01...	--	--	--	--	--	--	--	3.9	--	--	--
09...	--	--	--	--	--	--	--	5.3	--	--	--
15...	--	--	--	--	--	--	--	4.5	--	--	--
17...	--	--	--	--	--	--	--	5.5	--	--	--
17...	--	--	--	--	--	--	--	4.9	--	--	--
19...	--	--	--	--	--	--	--	4.5	--	--	--
23...	51	<10	<1	<1	<1.0	30	<6	5.2	--	17	93
23...	--	--	--	--	--	--	--	4.3	--	--	--
24...	--	--	--	--	--	--	--	5.8	--	--	--
26...	--	--	--	--	--	--	--	5.1	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
MAR											
03...	--	--	--	--	--	--	--	5.8	--	--	--
04...	--	--	--	--	--	--	--	7.5	--	--	--
05...	--	--	--	--	--	--	--	8.8	--	--	--
10...	--	--	--	--	--	--	--	6.3	--	--	--
12...	--	--	--	--	--	--	--	5.8	--	--	--
14...	--	--	--	--	--	--	--	6.1	--	--	--
14...	--	--	--	--	--	--	--	5.9	--	--	--
21...	--	--	--	--	--	--	--	5.9	--	--	--
28...	--	--	--	--	--	--	--	4.3	--	--	--
29...	--	--	--	--	--	--	--	4.4	--	--	--
APR											
01...	--	--	--	--	--	--	--	9.8	--	--	--
02...	--	--	--	--	--	--	--	8.7	--	--	--
05...	--	--	--	--	--	--	--	6.8	--	--	--
14...	--	--	--	--	--	--	--	6.1	--	--	--
29...	8	<10	<1	<1	<1.0	45	<6	5.4	--	5	93
29...	--	--	--	--	--	--	--	6.1	--	--	--
MAY											
16...	--	--	--	--	--	--	--	7.6	--	--	--
24...	--	--	--	--	--	--	--	5.5	--	--	--
JUN											
09...	--	--	--	--	--	--	--	4.1	--	--	--
22...	--	--	--	--	--	--	--	4.5	--	4	90
22...	--	--	--	--	--	--	--	--	--	--	--
JUL											
07...	--	--	--	--	--	--	--	4.0	--	--	--
19...	--	--	--	--	--	--	--	4.8	--	--	--
AUG											
11...	--	--	--	--	--	--	--	3.9	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--
24...	93	<10	1	<1	<1.0	49	<6	5.2	--	4	98
24...	--	--	--	--	--	--	--	--	--	--	--
SEP											
08...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## JAMES RIVER BASIN

0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA

LOCATION.--Lat 37°40'58", long 77°27'03", Hanover County, Hydrologic Unit 02080206, on downstream end of culvert, under northbound Atlee exit ramp from Interstate Highway 95, 1.6 mi northeast of Greenwood, and 5.7 mi north of Richmond.

DRAINAGE AREA.--0.002 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1993 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 120 ft above sea level, from topographic map.

REMARKS.--Records poor. Maximum discharge, 8.92 ft<sup>3</sup>/s, from rating curve extended above 0.75 ft<sup>3</sup>/s. No flow at times each year.

EXTREMES FOR CURRENT PERIOD.--May to September 1993: Maximum discharge during period, 3.07 ft<sup>3</sup>/s, Aug. 6, gage height, 0.82 ft; no flow part or all of each day June 23-26, July 3, 11-22, July 26 to Aug. 6, Aug. 19 to Sept. 21, and Sept. 23-27.

Water year 1994: Maximum discharge, 8.92 ft<sup>3</sup>/s, Nov. 28, gage height, 0.98 ft; no flow part or all of each day Oct. 2-12, 15-21, 25, 26, Nov. 10-17, 21-27, June 3-6, 22, July 5, Aug. 28, Aug. 31 to Sept. 17, and Sept. 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, MAY TO SEPTEMBER 1993  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	e.0002	.0007	.0001	.0000	.0000
2	---	---	---	---	---	---	---	e.0002	.0003	.0001	.0000	.0000
3	---	---	---	---	---	---	---	e.0003	.0003	.0020	.0000	.0000
4	---	---	---	---	---	---	---	e.0004	.0024	.0003	.0000	.0001
5	---	---	---	---	---	---	---	e.0010	.0107	.0002	.0000	.0000
6	---	---	---	---	---	---	---	e.0003	.0003	.0002	.1037	.0000
7	---	---	---	---	---	---	---	.0003	.0003	.0002	.0006	.0107
8	---	---	---	---	---	---	---	.0004	.0003	.0001	.0003	.0001
9	---	---	---	---	---	---	---	.0004	.0003	.0001	.0002	.0000
10	---	---	---	---	---	---	---	.0003	.0003	.0002	.0001	.0000
11	---	---	---	---	---	---	---	.0002	.0005	.0002	.0001	.0000
12	---	---	---	---	---	---	---	.0012	.0004	.0001	.0002	.0000
13	---	---	---	---	---	---	---	.0019	.0004	.0001	.0002	.0000
14	---	---	---	---	---	---	---	.0005	.0003	.0001	.0001	.0000
15	---	---	---	---	---	---	---	.0003	.0002	.0001	.0001	.0000
16	---	---	---	---	---	---	---	.0027	.0002	.0001	.0001	.0000
17	---	---	---	---	---	---	---	.0006	.0002	.0000	.0001	.0000
18	---	---	---	---	---	---	---	.0257	.0002	.0000	.0001	.0000
19	---	---	---	---	---	---	---	.0193	.0002	.0000	.0000	.0000
20	---	---	---	---	---	---	---	.0022	.0002	.0000	.0000	.0000
21	---	---	---	---	---	---	---	.0004	.0002	.0000	.0000	.0009
22	---	---	---	---	---	---	---	.0004	.0002	.0003	.0000	.0001
23	---	---	---	---	---	---	---	.0005	.0001	.0003	.0000	.0000
24	---	---	---	---	---	---	---	.0003	.0001	.0001	.0000	.0000
25	---	---	---	---	---	---	---	.0003	.0000	.0001	.0000	.0000
26	---	---	---	---	---	---	---	.0010	.0001	.0000	.0000	.0000
27	---	---	---	---	---	---	---	.0005	.0003	.0000	.0000	.0013
28	---	---	---	---	---	---	---	.0003	.0002	.0000	.0000	.0002
29	---	---	---	---	---	---	---	.0004	.0001	.0000	.0000	.0001
30	---	---	---	---	---	---	---	.0004	.0002	.0001	.0000	.0002
31	---	---	---	---	---	---	---	.0030	---	.0000	.0000	---
TOTAL	---	---	---	---	---	---	---	0.0659	0.0202	0.0051	0.1059	0.0137
MEAN	---	---	---	---	---	---	---	.002	.001	<.001	.003	<.001
MAX	---	---	---	---	---	---	---	.0257	.0107	.0020	.1037	.0107
MIN	---	---	---	---	---	---	---	.0002	.0000	.0000	.0000	.0000
CFSM	---	---	---	---	---	---	---	1.06	.34	.08	1.71	.23
IN.	---	---	---	---	---	---	---	1.23	.38	.09	1.97	.25

e Estimated.

< Less than.

## JAMES RIVER BASIN

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0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEAR 1993\*\*

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	---	---	---	---	---	---	---	.002	.001	<.001	.003	<.001
MAX	---	---	---	---	---	---	---	.002	.001	<.001	.003	<.001
(WY)	---	---	---	---	---	---	---	1993	1993	1993	1993	1993
MIN	---	---	---	---	---	---	---	.002	.001	<.001	.003	<.001
(WY)	---	---	---	---	---	---	---	1993	1993	1993	1993	1993

## SUMMARY STATISTICS

## FOR 1993\*\* WATER YEAR

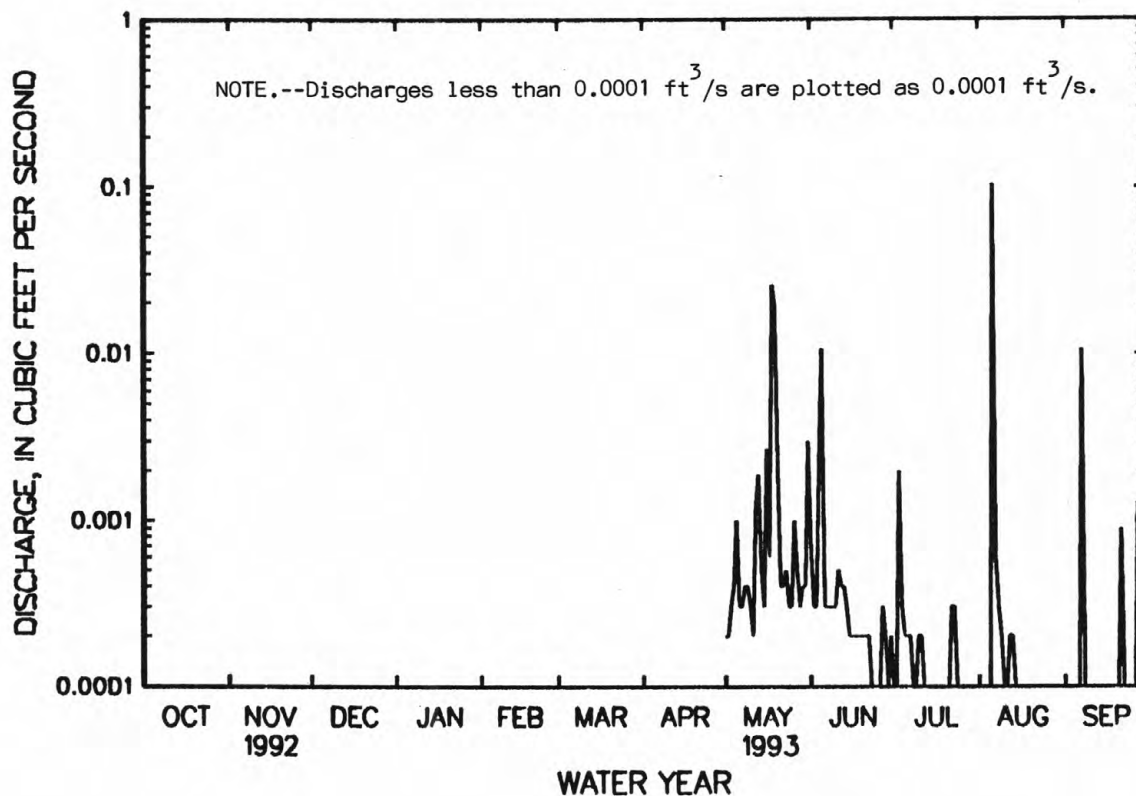
HIGHEST DAILY MEAN	.1037	Aug 6
LOWEST DAILY MEAN	.0000	aJun 25
INSTANTANEOUS PEAK FLOW	3.07	Aug 6
INSTANTANEOUS PEAK STAGE	.82	Aug 6
INSTANTANEOUS LOW FLOW	.0000	bJun 23

\*\* Partial water year, May to September.

&lt; Less than.

a Also July 17-21, 26-29, July 31 to Aug. 5, Aug. 19 to Sept. 3, and Sept. 5, 6, 9-20, 23-26.

b Also part or all of each day June 24-26, July 3, 11-22, July 26 to Aug. 6, Aug. 19 to Sept. 21, and Sept. 23-27.



## JAMES RIVER BASIN

0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0002	.0002	.0002	.0091	.0006	.0053	.0130	.0007	e.0002	.0005	.0022	.0000
2	.0000	.0002	.0002	.0085	.0004	e.0841	.0007	.0004	.0002	.0003	.0133	e.0000
3	.0000	.0001	.0002	.0010	.0004	e.0072	.0004	.0003	.0001	.0555	.0043	e.0000
4	.0001	.0001	.0004	.0168	.0004	.0023	.0004	.0349	.0001	.0007	.0003	e.0000
5	.0000	.0003	.0695	.0013	.0015	.0008	.0004	.0098	.0001	.0002	.0004	e.0000
6	.0000	.0033	.0009	.0006	.0010	.0005	.0074	.0007	.0001	.0002	.0004	e.0000
7	.0000	.0003	.0002	.0004	.0006	.0003	.0060	.0004	.0004	.0002	.0004	e.0000
8	.0000	.0002	.0002	.0146	.0004	.0044	.0008	.0005	.0020	.0002	.0004	e.0000
9	.0000	.0001	.0001	.0008	.0127	.0021	.0005	.0003	.0004	.0002	.0004	e.0000
10	.0002	.0000	.0001	.0004	.0048	.0155	.0004	.0003	.0002	.0004	.0002	e.0000
11	.0000	.0000	.0002	.0004	.0254	.0015	.0004	.0003	.0003	.0005	.0002	e.0000
12	.0011	.0000	.0002	.0121	.0151	.0006	.0004	.0003	.0003	.0004	.0003	e.0000
13	.0001	.0000	.0002	.0017	.0166	.0004	.0012	.0004	.0002	.0004	.0002	e.0000
14	.0001	.0000	.0002	.0009	.0245	.0004	.0008	.0003	.0002	.0003	.0069	e.0000
15	.0000	.0000	.0118	.0005	.0220	.0004	.0009	.0061	.0002	.0003	.0029	e.0000
16	.0000	.0000	.0027	e.0003	.0079	.0003	.0201	.0023	.0056	.0003	.0057	e.0000
17	.0000	.0039	.0003	e.0003	.0030	.0003	.0026	.0004	.0003	.0004	.0781	e.0000
18	.0000	.0011	.0027	e.0006	e.0007	.0005	.0003	.0004	.0002	.0007	.0093	e.0003
19	.0000	.0002	.0007	e.0005	.0004	.0004	.0003	.0003	.0002	.0002	.0003	e.0002
20	.0000	.0001	.0155	e.0005	.0004	.0004	.0003	.0003	.0001	.0002	.0003	.0001
21	.0017	.0001	.0268	e.0004	.0006	.0142	.0003	.0003	.0001	.0002	.0002	.0001
22	.0003	.0000	.0007	e.0004	.0006	.0048	.0003	.0003	.0001	.0002	.0003	.1043
23	.0001	.0000	.0003	e.0003	.0515	.0006	.0003	.0002	.0001	.0003	.0003	.0034
24	.0001	.0000	.0002	.0007	.0770	.0004	.0003	.0001	.0002	.0002	.0002	.0004
25	.0001	.0000	.0002	.0011	.0014	.0041	.0003	.0019	.0002	.0001	.0002	.0003
26	.0001	.0000	.0001	.0009	.0007	.0008	.0003	.0005	.0002	.0007	.0001	.0132
27	.0002	.0306	.0001	.0008	.0005	.0628	.0024	.0004	.0003	.0003	.0002	.0010
28	.0003	e.2004	e.0001	.0353	.0004	e.0400	.0021	.0003	.0002	.0009	.0001	.0003
29	.0001	.0003	e.0002	.0037	---	e.0028	.0149	.0002	.0003	.0034	.0002	.0003
30	.0107	.0002	e.0002	.0014	---	e.0011	.0053	.0002	.0019	.0108	.0002	.0002
31	.0004	---	e.0004	.0008	---	.0027	---	.0002	---	.0929	.0000	---
TOTAL	0.0159	0.2417	0.1358	0.1171	0.2715	0.2620	0.0838	0.0640	0.0150	0.1721	0.1285	0.1241
MEAN	.001	.008	.004	.004	.010	.008	.003	.002	<.001	.006	.004	.004
MAX	.0107	.2004	.0695	.0353	.0770	.0841	.0201	.0349	.0056	.0929	.0781	.1043
MIN	.0000	.0000	.0001	.0003	.0004	.0003	.0003	.0001	.0001	.0001	.0000	.0000
CFSM	.26	4.03	2.19	1.89	4.85	4.23	1.40	1.03	.25	2.78	2.07	2.07
IN.	.30	4.50	2.53	2.18	5.05	4.87	1.56	1.19	.28	3.20	2.39	2.31

e Estimated.  
< Less than.



0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993\*\* - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	.001	.008	.004	.004	.010	.008	.003	.002	.001	.004	.004	.002
MAX	.001	.008	.004	.004	.010	.008	.003	.002	.001	.006	.004	.004
(WY)	1994	1994	1994	1994	1994	1994	1994	(a)	1993	1994	1994	1994
MIN	.001	.008	.004	.004	.010	.008	.003	.002	<.001	<.001	.003	<.001
(WY)	1994	1994	1994	1994	1994	1994	1994	(a)	1994	1993	1993	1993

## SUMMARY STATISTICS

FOR 1993\*\* CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1993\*\* - 1994

ANNUAL TOTAL		1.6315	
ANNUAL MEAN		.004	.004
HIGHEST ANNUAL MEAN			.004 1994
LOWEST ANNUAL MEAN			.004 1994
HIGHEST DAILY MEAN	.1037 Aug 6	.2004 Nov 28	.2004 Nov 28 1993
LOWEST DAILY MEAN	.0000 <u>b</u> Jun 25	.0000 <u>c</u> Oct 2	.0000 (d)
ANNUAL SEVEN-DAY MINIMUM		.00 <u>f</u> Nov 10	.00 (d)
INSTANTANEOUS PEAK FLOW		8.9 Nov 28	8.9 Nov 28 1993
INSTANTANEOUS PEAK STAGE		.98 Nov 28	.98 Nov 28 1993
INSTANTANEOUS LOW FLOW		.00 <u>c</u> Oct 2	.00 (d)
ANNUAL RUNOFF (CFSM)		2.23	2.03
ANNUAL RUNOFF (INCHES)		30.35	27.55
10 PERCENT EXCEEDS		.01	.01
50 PERCENT EXCEEDS		.00	.00
90 PERCENT EXCEEDS		.00	.00

\*\* Partial water year, May to September.

&lt; Less than.

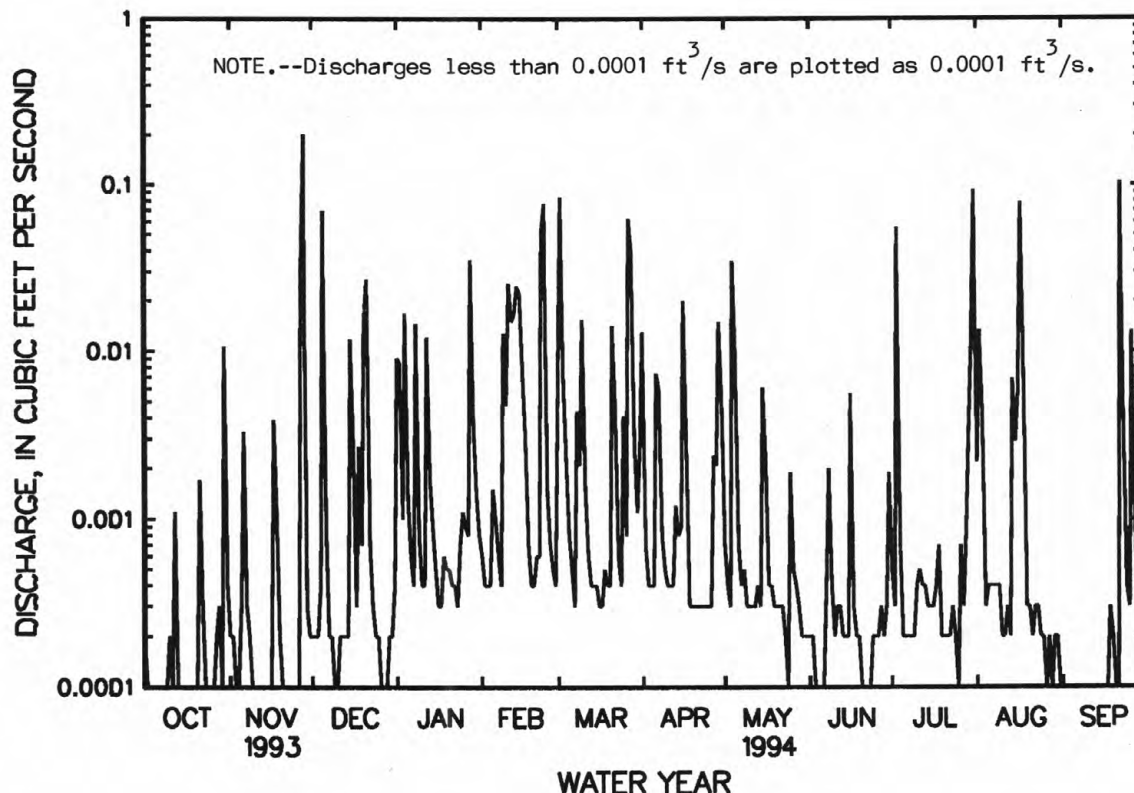
a Monthly mean flow is .002 ft/s in 1993 and 1994.

b Also July 17-21, 26-29, July 31 to Aug. 5, Aug. 19 to Sept. 3, and Sept. 5, 6, 9-20, 23-26, Oct. 3, 5-9, 11, 15-20, and Nov. 10-16, 22-26.

c Also Oct. 3, 5-9, 11, 15-20, Nov. 10-16, 22-26, and Aug. 31 to Sept. 17.

d No flow at times each year.

f Also part or all of each day Oct. 3-12, 15-21, 25, 26, Nov. 10-17, 21-27, June 3-6, 22, July 5, Aug. 28, Aug. 31 to Sept. 17, and Sept. 21, 22.



## JAMES RIVER BASIN

0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--December 1993 to September 1994.

## WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
DEC											
05...	0805	0.04	175	--	7.0	12.0	761	8.0	74	21	6.1
15...	1025	0.00	415	7.4	7.0	8.0	750	9.2	79	53	17
15...	1235	0.02	252	7.3	8.0	7.0	748	10.2	86	39	12
JAN											
04...	1000	0.02	2640	7.3	7.0	5.0	745	10.7	87	290	89
08...	0745	0.02	1970	7.6	6.0	6.0	758	10.6	86	190	59
28...	1300	0.46	2600	6.2	4.5	2.0	747	13.2	98	150	50
FEB											
09...	0915	0.02	519	8.3	8.0	7.0	--	--	--	18	6.6
09...	1000	0.02	2590	7.4	8.0	6.0	756	11.1	91	180	58
23...	0336	0.01	2570	6.7	--	--	--	--	--	160	58
23...	0343	0.02	1730	7.2	--	--	--	--	--	110	37
23...	0351	0.03	1450	7.3	--	--	--	--	--	83	29
23...	0358	0.04	1280	7.4	--	--	--	--	--	60	21
23...	0406	0.04	1130	7.5	--	--	--	--	--	55	19
23...	0413	0.04	1110	7.4	--	--	--	--	--	55	19
23...	0421	0.04	972	7.0	--	--	--	--	--	47	16
23...	0428	0.06	829	7.3	--	--	--	--	--	43	15
23...	0436	0.06	798	7.3	--	--	--	--	--	40	14
23...	0443	0.05	889	6.8	--	--	--	--	--	44	15
23...	0451	0.05	939	6.8	--	--	--	--	--	50	17
23...	0458	0.05	999	7.1	--	--	--	--	--	54	18
23...	0855	0.09	554	7.4	5.0	6.0	755	10.8	88	24	7.7
23...	0930	0.09	571	7.5	5.0	--	755	--	--	14	5.0
23...	1045	0.07	400	7.4	4.0	6.0	--	10.4	--	31	10
23...	1325	0.49	425	7.4	4.0	6.0	752	11.4	93	18	5.5
23...	1500	0.08	585	7.5	--	--	--	--	--	28	9.0
23...	1501	0.07	535	6.4	4.5	7.0	757	10.7	88	27	8.8
23...	1700	0.03	789	7.2	--	--	--	--	--	42	14
23...	1900	0.02	1150	7.1	--	--	--	--	--	68	23
23...	2300	0.01	1190	7.1	--	--	--	--	--	68	23
24...	0300	0.60	1320	7.1	--	--	--	--	--	81	28
24...	1000	0.02	866	7.1	--	--	--	--	--	74	25
24...	1400	0.01	2060	7.2	--	--	--	--	--	130	45

## JAMES RIVER BASIN

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0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)
MAR											
02...	0915	0.10	346	7.2	2.0	0.0	762	12.4	85	16	5.0
08...	1933	<0.01	5680	6.6	--	--	--	--	--	340	120
08...	1948	0.06	462	6.8	--	--	--	--	--	34	12
08...	2003	0.04	490	6.8	--	--	--	--	--	37	13
08...	2018	0.03	691	6.6	--	--	--	--	--	54	19
08...	2033	0.03	897	6.3	--	--	--	--	--	65	23
08...	2048	0.02	832	7.1	--	--	--	0	--	60	21
08...	2103	0.02	1050	6.9	--	--	--	--	--	71	25
08...	2118	0.02	1090	6.9	--	--	--	--	--	76	26
08...	2133	0.02	1070	6.9	--	--	--	--	--	75	25
08...	2148	0.02	1050	6.9	--	--	--	--	--	72	24
08...	2203	0.02	1050	6.9	--	--	--	--	--	72	24
08...	2218	0.02	1070	7.1	--	--	--	--	--	74	25
09...	0930	<0.01	2360	6.7	--	2.0	--	--	--	180	64
10...	0013	<0.01	2620	6.4	--	--	--	--	--	210	74
10...	0213	<0.01	2550	6.6	--	--	--	--	--	180	63
10...	0413	<0.01	2490	6.9	--	--	--	--	--	180	62
10...	0613	0.01	1760	7.0	--	--	--	--	--	120	42
10...	0813	0.01	1640	6.4	--	--	--	--	--	110	39
10...	0925	0.06	582	6.4	2.5	8.5	--	--	--	38	12
10...	0940	0.09	400	6.4	3.5	8.0	--	--	--	25	8.2
10...	1013	0.06	533	7.2	--	--	--	--	--	30	9.6
10...	1145	0.02	595	7.0	--	--	--	--	--	37	12
10...	1300	0.02	720	6.6	--	--	--	--	--	45	15
10...	1400	0.03	819	6.5	--	--	--	--	--	50	17
10...	1500	0.02	750	6.5	--	--	--	--	--	45	15
10...	1700	0.01	875	6.5	--	--	--	--	--	51	17
10...	1900	0.01	1060	6.6	--	--	--	--	--	65	22
10...	2100	0.01	1250	6.6	--	--	--	--	--	76	26
10...	2400	<0.01	1450	6.6	--	--	--	--	--	90	31
18...	1738	<0.01	4160	6.3	4.0	--	--	750	--	260	92
18...	1805	<0.01	1860	6.6	4.0	--	--	--	--	160	58
21...	1312	<0.01	5130	6.2	6.0	--	--	--	--	390	140
21...	1342	0.02	835	6.6	6.0	--	--	--	--	66	23
21...	1442	0.03	835	6.6	6.0	--	--	--	--	63	22
21...	1715	0.03	732	6.1	--	--	--	--	--	45	15
21...	1915	0.02	730	6.4	--	--	--	--	--	47	16
21...	2115	0.06	509	6.6	--	--	--	--	--	32	11
21...	2215	0.03	666	6.6	--	--	--	--	--	42	14
21...	2315	0.05	517	6.5	--	--	--	--	--	32	10
22...	0315	0.01	878	6.5	--	--	--	--	--	56	19
22...	0920	<0.01	1440	6.1	5.5	--	--	--	--	93	32
APR											
06...	0955	0.02	744	6.3	--	--	--	--	--	57	19
JUN											
09...	2042	<0.01	670	5.6	--	--	--	--	--	57	19
09...	2110	0.07	315	6.0	--	--	--	--	--	42	14
09...	2140	0.01	1280	6.1	--	--	--	--	--	120	41
16...	1411	<0.01	1960	6.0	--	--	--	--	--	68	23
16...	1426	0.10	274	6.7	--	--	--	--	--	36	12
16...	1441	0.02	712	6.7	--	--	--	--	--	74	25
16...	1456	0.01	1130	6.7	--	--	--	--	--	110	37
17...	1030	<0.01	3270	7.1	--	--	--	--	--	250	87

&lt; Actual value is known to be less than the value shown.

## JAMES RIVER BASIN

0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)
DEC											
05...	1.3	18	2.6	29	0	24	11	19	0.20	3.1	77
15...	2.6	54	5.5	12	0	10	41	62	0.10	4.0	194
15...	2.3	29	4.2	41	0	34	24	34	0.10	3.8	132
JAN											
04...	16	390	6.9	27	0	22	34	800	<0.10	3.0	1350
08...	9.4	300	5.2	39	0	32	28	540	<0.10	3.3	966
28...	7.1	420	8.2	26	0	21	24	750	<0.10	2.8	1280
FEB											
09...	0.34	89	2.1	25	0	20	22	120	0.20	1.9	258
09...	7.7	440	7.3	44	0	36	40	710	<0.10	4.5	1290
23...	4.7	420	8.8	--	--	--	59	750	0.20	5.3	1330
23...	3.2	320	7.2	--	--	--	45	530	0.20	5.4	975
23...	2.6	250	5.8	--	--	--	35	400	0.20	5.3	752
23...	1.9	200	4.7	--	--	--	29	330	0.20	4.8	614
23...	1.8	180	4.2	--	--	--	25	280	0.20	4.6	538
23...	1.8	180	4.1	--	--	--	24	280	0.20	4.7	537
23...	1.6	160	3.8	--	--	--	21	240	0.10	4.3	469
23...	1.4	140	3.3	--	--	--	19	220	0.10	4.6	424
23...	1.3	130	3.1	--	--	--	18	200	0.10	3.9	390
23...	1.6	140	3.2	--	--	--	18	220	0.10	4.1	423
23...	1.9	160	3.3	--	--	--	19	250	0.10	4.2	477
23...	2.3	160	3.6	--	--	--	18	260	0.10	4.1	487
23...	1.2	88	2.0	27	0	22	12	130	0.10	2.8	259
23...	0.26	97	1.5	20	0	16	12	150	<0.10	1.0	279
23...	1.5	110	2.4	32	0	26	13	160	0.10	2.9	317
23...	0.99	64	1.6	27	0	22	8.9	96	0.10	2.5	194
23...	1.3	87	2.4	29	0	24	11	140	0.10	2.8	269
23...	1.3	85	2.2	--	--	--	10	130	0.10	2.7	256
23...	1.8	130	3.0	--	--	--	14	200	0.10	3.1	383
23...	2.5	190	3.9	--	--	--	19	310	0.10	3.4	570
23...	2.5	180	3.7	--	--	--	19	280	<0.10	3.5	531
24...	2.8	210	4.3	--	--	--	24	350	0.10	4.3	653
24...	2.7	210	4.0	--	--	--	22	330	0.10	3.8	627
24...	4.2	340	6.0	--	--	--	37	580	0.20	4.1	1050

&lt; Actual value is known to be less than the value shown.

## JAMES RIVER BASIN

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0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD (MG/L AS CO3 (00452)	ALKA- LITY WAT DIS TOT IT FIELD (MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)
MAR											
02...	0.77	61	1.4	290	0	238	8.8	84	0.10	2.5	307
08...	8.6	670	11	--	--	--	130	1400	0.20	5.0	2390
08...	0.96	66	2.3	--	--	--	18	100	0.10	3.9	218
08...	1.1	76	2.4	--	--	--	18	110	0.10	4.1	239
08...	1.5	110	2.8	--	--	--	23	170	0.10	4.2	349
08...	1.8	130	3.1	--	--	--	26	210	0.10	4.7	418
08...	1.9	130	2.9	--	--	--	26	220	0.10	4.8	450
08...	2.2	160	3.2	--	--	--	28	260	0.10	4.6	509
08...	2.8	170	3.7	--	--	--	26	280	0.10	3.8	539
08...	3.0	160	3.8	--	--	--	25	270	0.10	3.3	513
08...	3.0	160	3.8	--	--	--	25	260	0.10	3.2	503
08...	2.9	160	3.8	--	--	--	25	260	0.10	3.1	503
08...	2.9	170	3.7	--	--	--	26	270	0.10	3.1	525
09...	5.3	370	6.8	71	0	58	58	630	0.20	4.1	1170
10...	6.5	410	7.8	--	--	--	58	690	0.20	4.9	1300
10...	5.1	390	7.5	--	--	--	63	660	0.20	5.2	1250
10...	5.3	400	7.4	--	--	--	56	590	0.20	4.9	1180
10...	3.7	280	5.4	--	--	--	46	430	0.20	5.2	860
10...	3.9	270	4.6	--	--	--	39	400	0.10	4.1	802
10...	1.9	95	2.2	--	--	--	15	140	0.10	3.3	296
10...	1.2	67	1.7	40	0	33	12	89	0.10	3.3	204
10...	1.5	81	1.9	--	--	--	14	110	0.10	3.4	245
10...	1.6	99	2.1	--	--	--	16	130	0.10	3.3	290
10...	1.8	120	2.3	--	--	--	18	160	0.10	3.3	348
10...	1.9	130	2.5	--	--	--	20	190	0.10	3.9	398
10...	1.8	120	2.3	--	--	--	20	180	0.10	3.6	374
10...	2.0	140	2.5	--	--	--	22	210	0.10	3.7	429
10...	2.4	170	3.1	--	--	--	26	270	0.10	3.7	532
10...	2.7	200	3.6	--	--	--	30	330	0.10	3.7	634
10...	3.1	230	4.2	--	--	--	34	380	0.10	3.7	724
18...	7.0	510	11	--	--	--	110	970	0.20	4.1	1750
18...	4.7	310	8.2	--	--	--	63	490	0.20	4.6	970
21...	9.9	780	13	--	--	--	130	1300	0.20	5.3	2440
21...	2.0	130	4.2	44	0	36	33	190	0.20	4.5	414
21...	1.9	130	3.7	--	--	--	33	180	0.20	4.8	402
21...	1.9	120	3.2	--	--	--	26	170	0.10	4.0	392
21...	1.8	120	2.9	--	--	--	26	170	0.10	3.7	366
21...	1.2	69	2.4	--	--	--	20	88	0.10	4.1	225
21...	1.8	110	2.6	--	--	--	24	150	0.10	3.6	332
21...	1.6	84	2.1	--	--	--	19	110	0.10	3.3	253
22...	2.1	140	3.0	--	--	--	27	190	0.10	3.7	415
22...	3.2	230	4.6	71	0	58	43	360	<0.10	4.1	714
APR											
06...	2.4	110	3.5	--	--	--	25	160	0.10	4.4	360
JUN											
09...	2.3	58	10	--	--	--	33	97	0.10	2.9	244
09...	1.7	40	7.4	--	--	--	20	62	0.10	3.9	165
09...	4.1	210	9.3	--	--	--	79	320	0.20	7.6	718
16...	2.6	110	9.4	--	--	--	47	150	0.20	5.0	423
16...	1.5	45	4.7	--	--	--	18	57	0.10	3.9	155
16...	2.9	130	6.5	--	--	--	43	160	0.20	6.0	400
16...	4.0	210	8.2	--	--	--	69	280	0.20	7.2	657
17...	6.9	590	14	--	--	--	190	740	0.30	12	1780

&lt; Actual value is known to be less than the value shown.



## JAMES RIVER BASIN

0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. TOTAL (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)
DEC											
05...	--	<0.010	0.290	0.290	0.050	0.70	--	--	--	0.090	--
15...	0.260	0.030	0.290	0.290	0.050	0.70	--	--	--	0.060	--
15...	0.250	0.040	0.290	0.290	0.070	0.70	--	--	--	0.120	--
JAN											
04...	0.170	0.010	0.180	0.180	0.030	0.40	--	--	--	0.020	--
08...	0.250	0.010	0.260	0.260	0.040	0.50	--	--	--	0.040	--
28...	0.570	0.040	0.610	0.610	0.940	1.7	--	--	--	0.140	--
FEB											
09...	0.340	0.220	0.560	0.560	0.560	1.4	--	--	--	0.030	--
09...	0.900	0.070	0.970	0.970	0.430	1.4	--	--	--	0.100	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	0.250	0.030	0.280	0.280	0.040	0.70	--	--	--	0.110	--
23...	0.220	0.080	0.300	0.300	0.330	0.90	--	--	--	0.070	--
23...	0.210	0.030	0.240	0.240	0.030	0.70	--	--	--	0.100	--
23...	0.150	0.020	0.170	0.170	0.040	0.60	--	--	--	0.100	--
23...	0.170	0.020	0.190	0.190	0.030	0.70	--	--	--	0.100	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	0.290	0.050	0.340	0.340	0.050	0.80	--	--	--	0.010	--

&lt; Actual value is known to be less than the value shown.

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WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

< Actual value is known to be less than the value shown.

## JAMES RIVER BASIN

0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	MANGANESE, DIS- SOLVED (UG/L AS MN) (01056)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
DEC										
05...	--	9	--	180	10	16	--	30	23	93
15...	--	12	--	180	9	29	--	40	22	95
15...	--	15	--	190	14	18	--	380	25	97
JAN										
04...	--	5	--	67	3	120	--	120	4	97
08...	--	6	--	91	5	92	--	80	10	99
28...	--	8	--	97	11	170	--	90	13	98
FEB										
09...	--	50	--	52	50	26	--	260	57	96
09...	--	12	--	230	8	130	--	120	103	85
23...	--	50	--	230	64	150	--	260	199	--
23...	--	68	--	270	110	93	--	320	193	--
23...	--	50	--	330	65	73	--	210	164	--
23...	--	43	--	320	56	50	--	180	146	--
23...	--	39	--	300	44	47	--	140	111	--
23...	--	39	--	360	46	50	--	140	99	--
23...	--	39	--	290	54	41	--	150	114	--
23...	--	39	--	350	55	40	--	150	129	--
23...	--	33	--	290	43	37	--	120	104	--
23...	--	31	--	310	38	41	--	110	68	--
23...	--	25	--	310	27	49	--	90	62	--
23...	--	21	--	340	25	50	--	80	44	--
23...	--	13	--	240	13	27	--	50	29	91
23...	--	180	--	150	520	23	--	1000	1860	24
23...	--	13	--	230	10	35	--	50	25	94
23...	--	14	--	200	20	19	--	190	51	75
23...	--	10	--	230	9	41	--	40	20	96
23...	--	11	--	210	10	43	--	40	--	--
23...	--	9	--	240	9	54	--	40	17	--
23...	--	9	--	260	6	73	--	40	16	--
23...	--	9	--	280	7	71	--	40	16	--
24...	--	15	--	270	19	76	--	60	32	--
24...	--	10	--	250	6	64	--	30	17	--
24...	--	9	--	290	6	100	--	30	23	98

## JAMES RIVER BASIN

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0204228301 CHICKAHOMINY RIVER TRIBUTARY AT ATLEE EXIT, NEAR GREENWOOD, VA--Continued

## WATER-QUALITY DATA, DECEMBER 1993 TO SEPTEMBER 1994

DATE	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)	IRON, TOTAL RECOVERABLE (UG/L AS FE) (01045)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	MANGANESE, DIS- SOLVED (UG/L AS MN) (01056)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)	SEDIMENT, SUSPENDED (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
MAR										
02...	--	12	--	210	16	16	--	50	35	86
08...	--	55	--	200	200	190	--	310	84	--
08...	--	44	--	280	73	29	--	170	211	--
08...	--	30	--	340	40	31	--	100	115	--
08...	--	24	--	330	27	38	--	70	75	--
08...	--	24	--	360	31	46	--	70	76	--
08...	--	22	--	380	21	45	--	70	52	--
08...	--	21	--	380	22	58	--	60	35	--
08...	--	16	--	370	14	73	--	50	27	--
08...	--	14	--	350	11	78	--	50	22	--
08...	--	14	--	360	10	78	--	50	23	--
08...	--	14	--	340	12	79	--	50	29	--
08...	--	13	--	340	10	81	--	50	28	--
09...	--	10	--	510	8	180	--	40	11	96
10...	--	22	--	580	44	300	--	130	35	--
10...	--	14	--	410	10	160	--	50	26	--
10...	--	12	--	500	10	170	--	50	25	--
10...	--	15	--	390	11	91	--	50	27	--
10...	--	12	--	470	6	100	--	40	15	--
10...	--	12	--	350	12	36	--	50	23	96
10...	--	17	--	320	22	24	--	60	49	88
10...	--	12	--	350	11	31	--	40	23	--
10...	--	11	--	300	11	36	--	30	18	--
10...	--	11	--	280	9	41	--	30	24	--
10...	--	14	--	300	16	50	--	40	28	--
10...	--	12	--	300	9	33	--	30	31	--
10...	--	11	--	360	6	46	--	20	18	--
10...	--	10	--	330	6	63	--	20	19	--
10...	--	11	--	340	6	75	--	30	16	--
10...	--	10	--	340	5	88	--	20	13	--
18...	15	49	14000	150	85	150	7	250	388	--
18...	7	26	2600	210	23	140	4	80	79	--
21...	7	20	6500	150	17	220	4	100	93	--
21...	5	25	2100	280	26	52	4	80	62	99
21...	5	28	2700	300	34	43	4	90	80	--
21...	3	16	910	390	14	47	3	50	40	--
21...	3	15	790	330	13	48	2	40	36	--
21...	6	27	2900	270	40	19	4	100	164	--
21...	3	14	1400	370	18	40	3	60	31	--
21...	2	12	710	320	13	33	2	50	46	--
22...	2	12	720	370	8	63	2	40	38	--
22...	1	10	910	500	6	110	2	30	16	93
APR										
06...	2	16	1400	560	18	80	3	50	44	97
JUN										
09...	12	51	10000	190	130	42	9	270	846	--
09...	7	26	3100	250	34	22	4	90	166	--
09...	2	15	150	1600	2	77	3	30	76	--
16...	39	65	37000	280	310	81	14	510	50	--
16...	5	13	2200	300	29	14	3	70	153	--
16...	5	17	1200	350	18	25	3	50	63	--
16...	4	17	1400	290	17	39	3	50	52	--
17...	2	4	570	31	3	99	1	20	50	62

## JAMES RIVER BASIN

02042287 CHICKAHOMINY RIVER NEAR ATLEE, VA

LOCATION.--Lat 37°38'30", long 77°25'19", Hanover County, Hydrologic Unit 02080206, on left bank at upstream side of bridge on U.S. Highway 301, 1.3 mi southwest of Atlee, and 2.5 mi upstream from Upham Brook.

DRAINAGE AREA.--62.2 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1990 to current year.

REVISED RECORDS.--WDR VA-93-1: 1990(M).

GAGE.--Water-stage recorder. Elevation of gage is 95 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods with backwater from beaver dam or debris, Oct. 1-6 and Nov. 11-17, and periods of doubtful or no gage-height record, Dec. 28 to Jan. 3 and Jan. 10, 15-28, which are fair. Maximum discharge, 4,220 ft<sup>3</sup>/s, from rating curve extended above 2,900 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,970 ft<sup>3</sup>/s, Mar. 3; minimum discharge observed, 0.002 ft<sup>3</sup>/s, Oct. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.23	24	65	e26	53	90	348	533	7.3	1.8	117	5.2
2	e.16	17	39	e65	63	317	403	169	6.3	1.6	167	4.2
3	e.10	13	28	e130	54	2850	232	71	5.4	4.2	92	3.5
4	e.06	10	24	199	47	1100	142	126	4.8	70	42	2.8
5	e.03	11	127	300	46	388	106	408	4.4	46	20	2.1
6	e.01	14	556	209	55	217	109	487	4.1	15	10	1.4
7	<.01	15	371	90	55	138	165	238	4.5	7.6	6.4	.90
8	.03	17	96	106	47	113	151	107	4.3	4.8	4.2	.54
9	.19	21	52	185	56	136	98	76	18	3.0	3.0	.33
10	.21	19	38	e110	115	191	80	57	31	2.6	2.3	.26
11	.18	e18	34	69	146	328	71	44	17	2.3	1.8	.19
12	.17	e17	31	79	260	262	63	36	13	2.1	2.2	.20
13	.45	e16	26	147	394	133	66	30	13	1.9	1.8	.21
14	.39	e16	22	136	335	106	93	25	9.3	2.2	1.6	.22
15	.48	e15	30	e78	349	92	83	24	7.2	1.5	8.4	.24
16	.71	e14	77	e46	379	80	121	51	6.8	1.5	20	.20
17	1.2	e14	85	e35	397	69	261	77	10	1.6	39	.20
18	1.5	33	56	e100	329	63	160	42	7.9	3.0	93	.30
19	1.8	31	52	e80	274	68	81	29	5.4	7.1	73	.20
20	1.5	30	54	e56	253	68	62	24	4.3	8.5	26	.19
21	1.6	21	219	e45	208	68	49	22	3.4	4.8	13	.21
22	2.4	17	552	e34	153	179	43	20	3.2	3.1	8.2	21
23	2.6	15	264	e36	235	312	42	18	2.8	3.0	6.1	137
24	3.2	14	94	e37	994	153	40	15	2.7	3.5	5.3	160
25	4.2	14	63	e34	687	107	36	19	2.2	3.1	5.0	37
26	6.0	15	49	e32	317	118	33	20	1.7	2.6	4.6	18
27	9.2	26	40	e31	165	168	30	17	2.0	7.4	4.1	23
28	11	317	e33	e70	106	889	41	13	1.8	14	3.5	12
29	12	934	e28	140	---	2360	43	11	1.6	12	2.8	6.8
30	15	264	e27	138	---	1280	253	9.3	1.7	44	2.4	4.0
31	19	---	e26	66	---	436	---	8.2	---	28	3.0	---
TOTAL	95.60	2002	3258	2909	6572	12879	3505	2826.5	207.1	313.8	788.7	442.39
MEAN	3.08	66.7	105	93.8	235	415	117	91.2	6.90	10.1	25.4	14.7
MAX	19	934	556	300	994	2850	403	533	31	70	167	160
MIN	<.01	10	22	26	46	63	30	8.2	1.6	1.5	1.6	.19
CFSM	.05	1.07	1.69	1.51	3.77	6.68	1.88	1.47	.11	.16	.41	.24
IN.	.06	1.20	1.95	1.74	3.93	7.70	2.10	1.69	.12	.19	.47	.26

e Estimated.  
< Less than.



## JAMES RIVER BASIN

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02042287 CHICKAHOMINY RIVER NEAR ATLEE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	5.94	27.0	61.4	89.4	106	211	104	64.3	16.7	9.82	16.6	7.07
MAX	9.21	66.7	105	122	235	415	165	144	37.5	19.0	28.9	14.7
(WY)	1991	1994	1994	1993	1994	1994	1993	1990	1992	1992	1992	1994
MIN	3.08	6.52	38.2	33.1	23.8	67.4	31.7	5.88	6.90	1.84	3.13	.11
(WY)	1994	1992	1992	1992	1991	1990	1992	1991	1994	1993	1991	1993

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1991 - 1994

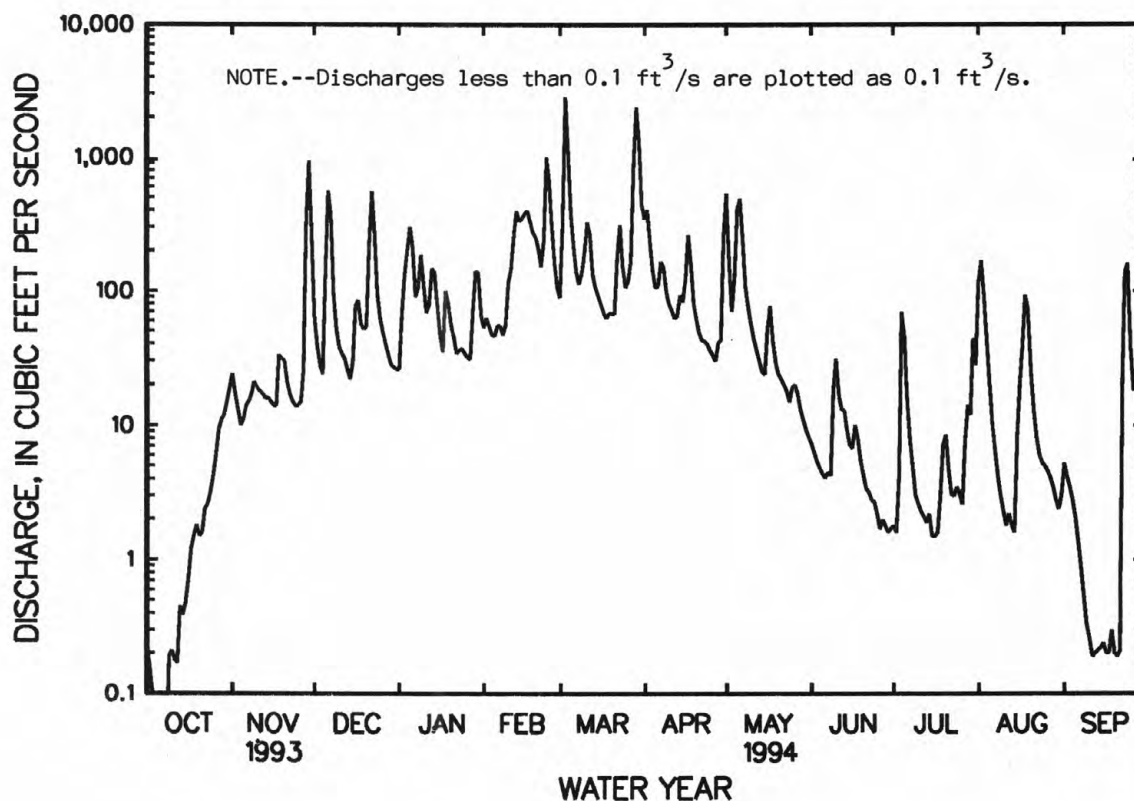
ANNUAL TOTAL	29230.67	35799.09	
ANNUAL MEAN	80.1	98.1	59.5
HIGHEST ANNUAL MEAN			98.1
LOWEST ANNUAL MEAN			31.5
HIGHEST DAILY MEAN	2960	Mar 5	2960
LOWEST DAILY MEAN	.00	aAug 2	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jul 30	.00
INSTANTANEOUS PEAK FLOW			3970
INSTANTANEOUS PEAK STAGE			8.51
INSTANTANEOUS LOW FLOW			(b)
ANNUAL RUNOFF (CFSM)	1.29	1.58	.96
ANNUAL RUNOFF (INCHES)	17.48	21.41	13.00
10 PERCENT EXCEEDS	196	256	146
50 PERCENT EXCEEDS	24	28	18
90 PERCENT EXCEEDS	.05	1.5	1.1

&lt; Less than.

a Also Aug. 3-5, 1993.

b Minimum discharge observed, 0.002 ft<sup>3</sup>/s.

c No flow part or all of each day Aug. 1-6, 1993.



## JAMES RIVER BASIN

02042426 UPHAM BROOK NEAR RICHMOND, VA

LOCATION.--Lat 37°36'47", long 77°25'28", Henrico County, Hydrologic Unit 02080206, on left bank at downstream side of culvert on Wilkinson Road, 1.6 mi northeast of Richmond, and 1.2 mi upstream from mouth.

DRAINAGE AREA.--37.6 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1989 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 90 ft above sea level, from topographic map.

REMARKS.--Records poor. Maximum discharge, 2,410 ft<sup>3</sup>/s, from rating curve extended above 565 ft<sup>3</sup>/s. Minimum gage height, 4.34 ft, Sept. 17, 1994. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,410 ft<sup>3</sup>/s, Nov. 28, gage height, 8.66 ft; minimum, 0.79 ft<sup>3</sup>/s, Sept. 30; minimum gage height, 4.34 ft, Sept. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	8.3	20	e20	26	34	190	61	5.9	48	305	2.3
2	1.1	3.6	17	166	22	861	87	26	5.3	8.2	48	2.1
3	1.1	2.3	15	95	19	1070	57	17	4.6	19	83	2.0
4	1.0	1.9	18	214	18	200	42	278	4.4	268	12	1.7
5	1.1	2.3	492	96	25	92	33	254	4.4	17	10	1.5
6	1.0	38	164	38	32	60	75	89	5.2	8.3	9.9	1.5
7	1.0	35	38	29	19	45	88	38	13	5.7	5.3	1.4
8	.93	7.7	25	106	17	41	40	29	5.6	3.7	3.7	1.4
9	.96	4.9	20	49	63	113	28	22	48	3.0	3.0	1.5
10	1.4	2.9	17	26	69	176	25	18	9.4	9.7	2.8	1.3
11	1.5	2.3	20	22	60	124	22	16	9.2	12	2.6	2.3
12	9.7	2.2	14	84	234	57	21	14	12	4.2	13	2.3
13	2.6	2.3	13	68	142	41	52	13	5.8	5.7	11	1.3
14	1.5	2.1	12	33	203	35	33	12	4.6	15	3.7	1.2
15	1.3	1.9	52	23	207	31	20	12	16	5.4	108	1.2
16	1.2	2.1	94	e19	198	28	150	117	105	6.3	25	1.1
17	1.4	2.7	25	e18	129	24	59	19	12	8.2	117	1.3
18	2.0	90	26	e60	96	27	25	14	7.5	64	197	29
19	1.6	9.8	45	e45	79	36	19	12	6.7	10	38	5.4
20	4.0	3.1	24	e36	60	23	17	12	4.4	5.0	31	3.4
21	5.5	1.8	509	e30	47	49	15	11	4.2	3.8	9.5	2.4
22	28	1.8	98	e26	44	151	15	9.8	4.3	4.5	7.0	331
23	3.3	2.1	39	e23	446	47	15	9.0	3.7	7.4	6.0	513
24	1.9	2.4	27	e22	515	31	13	11	3.9	3.8	4.6	10
25	1.6	1.8	22	e21	134	72	12	38	3.1	12	3.7	2.7
26	1.5	1.6	19	20	72	48	11	20	2.5	3.3	3.6	19
27	3.8	56	16	18	43	282	12	12	16	9.1	8.9	65
28	8.7	1280	19	208	32	949	27	8.2	6.8	9.3	22	2.9
29	5.3	120	e20	161	---	914	37	7.0	3.1	21	6.1	1.2
30	77	30	e18	52	---	227	390	6.5	16	75	3.8	1.0
31	56	---	e17	33	---	101	---	6.0	---	12	2.7	---
TOTAL	229.99	1722.9	1955	1861	3051	5989	1630	1211.5	352.6	687.6	1106.9	1013.4
MEAN	7.42	57.4	63.1	60.0	109	193	54.3	39.1	11.8	22.2	35.7	33.8
MAX	77	1280	509	214	515	1070	390	278	105	268	305	513
MIN	.93	1.6	12	18	17	23	11	6.0	2.5	3.0	2.6	1.0
CFSM	.19	1.49	1.63	1.56	2.82	5.01	1.41	1.01	.30	.57	.93	.88
IN.	.22	1.66	1.88	1.79	2.94	5.77	1.57	1.17	.34	.66	1.07	.98

e Estimated.

JAMES RIVER BASIN

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02042426 UPHAM BROOK NEAR RICHMOND, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1990 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	12.4	25.4	45.7	56.7	51.8	111	50.6	35.3	19.1	18.5	27.7	16.9
MAX	19.3	57.4	63.1	71.9	109	193	79.4	67.0	41.9	32.2	44.7	33.8
(WY)	1991	1994	1994	1990	1994	1994	1993	1990	1991	1991	1990	1994
MIN	7.42	7.49	35.8	27.1	8.41	29.4	17.9	10.1	6.84	1.07	15.9	4.27
(WY)	1994	1992	1993	1992	1991	1990	1991	1991	1993	1993	1993	1993

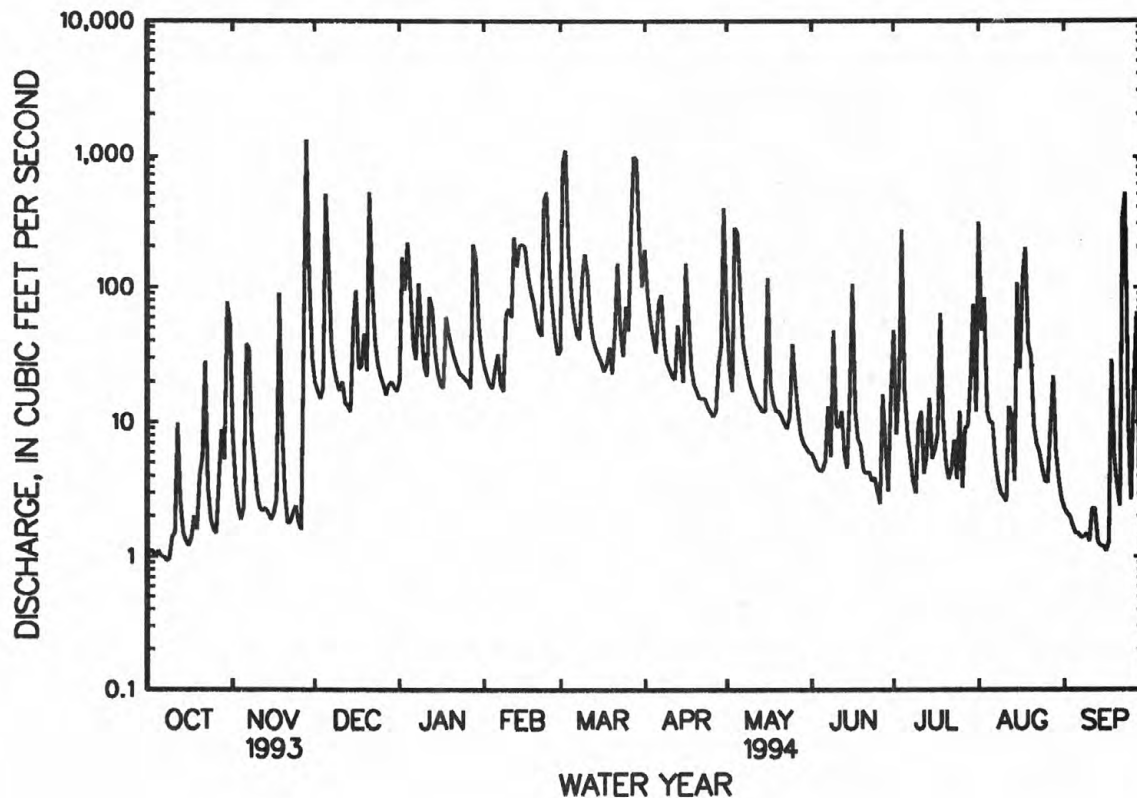
SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1990 - 1994

ANNUAL TOTAL	16717.90	20810.89	
ANNUAL MEAN	45.8	57.0	39.4
HIGHEST ANNUAL MEAN			57.0
LOWEST ANNUAL MEAN			28.5
HIGHEST DAILY MEAN	1280	Nov 28	1280
LOWEST DAILY MEAN	.24	Jun 25	.24
ANNUAL SEVEN-DAY MINIMUM	.27	Jun 24	.27
INSTANTANEOUS PEAK FLOW			2410
INSTANTANEOUS PEAK STAGE			8.66
INSTANTANEOUS LOW FLOW			.79
ANNUAL RUNOFF (CFSM)	1.19	1.48	1.02
ANNUAL RUNOFF (INCHES)	16.11	20.06	13.88
10 PERCENT EXCEEDS	120	126	89
50 PERCENT EXCEEDS	4.0	17	11
90 PERCENT EXCEEDS	.72	1.9	1.5



## JAMES RIVER BASIN

02042500 CHICKAHOMINY RIVER NEAR PROVIDENCE FORGE, VA

LOCATION.--Lat 37°26'10", long 77°03'40", New Kent County, Hydrologic Unit 02080206, on left bank 100 ft downstream from bridge on State Highway 618, 1.1 mi southwest of Providence Forge, and 1.7 mi downstream from Schiminoe Creek.

DRAINAGE AREA.--252 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1942 to current year.

REVISED RECORDS.--WSP 1553: 1956. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 6.07 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 10, 11, 15-25, and period of no gage-height record, Apr. 16-19, which are fair. Maximum discharge, 7,710 ft<sup>3</sup>/s, from rating curve extended above 5,520 ft<sup>3</sup>/s. Minimum gage height, 1.53 ft, Sept. 13, 1965. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,960 ft<sup>3</sup>/s, Mar. 6, gage height, 9.88 ft; minimum, 1.0 ft<sup>3</sup>/s, Sept. 14, gage height, 1.73 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	66	309	e165	414	1060	2630	212	65	17	188	20
2	28	73	802	196	496	996	1890	288	56	25	172	18
3	23	70	1070	220	457	1650	1330	298	47	25	141	15
4	18	69	891	257	372	2270	1030	446	40	23	119	12
5	12	73	683	302	279	2580	865	881	34	34	116	8.8
6	7.2	78	469	355	238	2740	776	931	30	36	129	6.3
7	5.3	92	312	427	209	1860	681	792	27	32	153	4.8
8	4.4	86	249	468	193	1240	554	687	24	43	195	3.6
9	4.0	85	257	504	188	948	457	756	23	54	223	3.0
10	3.8	79	464	e460	211	783	387	758	20	56	205	2.6
11	3.5	72	639	e380	236	707	366	653	19	41	145	2.2
12	3.7	70	534	322	355	638	360	488	22	35	81	1.9
13	3.7	64	350	342	434	658	366	345	29	47	51	1.4
14	4.1	60	225	347	557	699	461	255	35	47	36	1.2
15	4.3	54	174	e330	666	681	378	200	36	38	47	4.2
16	4.3	48	184	e295	852	602	e340	169	33	36	48	8.0
17	4.8	48	180	e255	955	481	e370	139	31	47	62	5.9
18	5.2	53	184	e235	961	376	e320	120	28	133	80	5.1
19	5.2	52	190	e245	909	324	e290	125	30	105	85	3.2
20	5.2	58	198	e290	843	291	275	146	41	105	92	2.2
21	6.0	60	274	e395	771	270	302	164	45	118	99	1.9
22	9.2	59	327	e370	690	277	324	169	39	112	107	6.0
23	10	60	389	e305	658	285	299	151	31	97	121	29
24	14	61	427	e270	898	298	248	123	27	91	135	64
25	14	57	552	e235	1140	335	203	101	23	99	138	91
26	16	51	673	244	1240	447	171	109	21	103	112	119
27	23	53	620	239	1420	580	148	109	18	120	66	149
28	30	112	460	249	1350	832	131	106	15	142	43	205
29	30	166	e300	294	---	1220	118	96	12	190	34	325
30	38	222	e215	321	---	1600	171	85	12	217	29	347
31	56	---	e170	365	---	2480	---	75	---	212	24	---
TOTAL	428.9	2251	12771	9682	17992	30208	16241	9977	913	2480	3276	1466.3
MEAN	13.8	75.0	412	312	643	974	541	322	30.4	80.0	106	48.9
MAX	56	222	1070	504	1420	2740	2630	931	65	217	223	347
MIN	3.5	48	170	165	188	270	118	75	12	17	24	1.2
CFSM	.05	.30	1.63	1.24	2.55	3.87	2.15	1.28	.12	.32	.42	.19
IN.	.06	.33	1.89	1.43	2.66	4.46	2.40	1.47	.13	.37	.48	.22

e Estimated.

JAMES RIVER BASIN

377

02042500 CHICKAHOMINY RIVER NEAR PROVIDENCE FORGE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	141	204	286	375	418	476	389	239	168	148	170	106
MAX	794	768	1043	1214	844	1025	1152	676	757	1081	1445	737
(WY)	1980	1986	1958	1978	1961	1993	1984	1978	1972	1945	1955	1979
MIN	3.81	17.5	28.0	58.7	94.4	108	108	34.9	14.1	12.5	5.84	5.78
(WY)	1969	1966	1966	1955	1942	1981	1985	1985	1977	1968	1983	1983

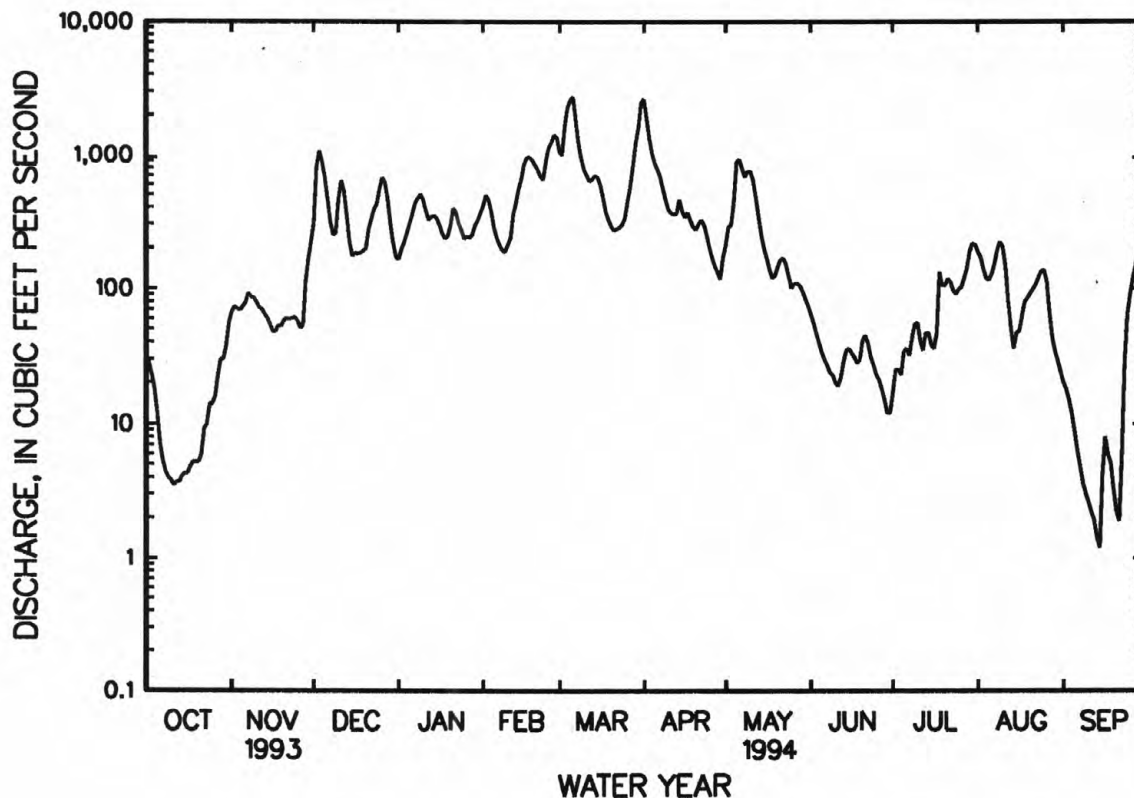
SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1942 - 1994

ANNUAL TOTAL	112029.2	107686.2	262
ANNUAL MEAN	307	295	482
HIGHEST ANNUAL MEAN			91.4
LOWEST ANNUAL MEAN			1958
HIGHEST DAILY MEAN	2500	Mar 8	6680
LOWEST DAILY MEAN	3.2	Aug 4	1.4
ANNUAL SEVEN-DAY MINIMUM	3.9	Oct 9	.99
INSTANTANEOUS PEAK FLOW			2.3
INSTANTANEOUS PEAK STAGE			2960
INSTANTANEOUS LOW FLOW			9.88
ANNUAL RUNOFF (CFSM)	1.22		1.0
ANNUAL RUNOFF (INCHES)	16.54		1.17
10 PERCENT EXCEEDS	802		15.90
50 PERCENT EXCEEDS	159		773
90 PERCENT EXCEEDS	5.6		148
			11
			23





## GREAT DISMAL SWAMP BASIN

02043500 CYPRESS SWAMP AT CYPRESS CHAPEL, VA

LOCATION.--Lat 36°37'24", long 76°36'07", Suffolk City, Hydrologic Unit 03010205, near center of span on downstream side of bridge on State Highway 32, 0.5 mi downstream from Dragon Swamp, 0.8 mi northwest of Cypress Chapel, and 6.5 mi south of downtown Suffolk.

DRAINAGE AREA.--23.8 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1953 to September 1971, March 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is 28.65 ft above sea level. October 1953 to September 1971, recording gage on right bank 30 ft upstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 25 to Jan. 1 and Jan. 16-25, and for period of doubtful gage-height record, Feb. 6, 7, which are fair. Maximum discharge, 1,330 ft<sup>3</sup>/s, from rating curve extended above 1,100 ft<sup>3</sup>/s. No flow at times each year. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 12	1330	366	4.89	Mar. 11	0300	*1,150	*6.41
Mar. 3	0400	833	5.95				

No flow many days October to December and June to September.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	e2.1	29	14	81	.21	.01	.00	1.2	.00
2	.00	.00	.00	9.1	27	213	77	.23	.00	.00	.48	.00
3	.00	.00	.00	17	21	709	57	.25	.00	.00	.18	.00
4	.00	.00	.00	21	17	309	42	1.9	.00	.00	.05	.00
5	.00	.00	.00	17	16	148	32	3.6	.00	.00	.11	.00
6	.00	.00	.00	13	e37	86	26	4.6	.00	.00	.93	.00
7	.00	.00	.00	9.6	e44	57	24	3.4	.00	.00	.14	.00
8	.00	.00	.00	8.0	34	42	20	3.0	.86	.00	.08	.00
9	.00	.00	.00	4.4	24	135	17	2.9	3.9	.00	.04	.00
10	.00	.00	.00	3.6	24	407	14	2.1	2.6	.00	.02	.00
11	.00	.00	.00	3.2	29	830	12	1.5	.96	.00	.01	.00
12	.00	.00	.00	5.5	270	315	9.8	.69	.68	.00	.01	.00
13	.00	.00	.00	21	221	159	11	.40	.28	.00	.01	.00
14	.00	.00	.00	24	109	110	32	.24	.08	.00	.00	.00
15	.00	.00	.00	20	71	95	34	.11	.03	.00	.60	.00
16	.00	.00	.00	e15	51	75	23	.12	.02	.00	1.4	.00
17	.00	.00	.00	e10	36	55	15	.08	.02	.00	.71	.00
18	.00	.00	.00	e16	26	41	13	.05	.08	.00	1.2	.00
19	.00	.00	.00	e18	21	38	8.0	.04	.03	.00	.71	.00
20	.00	.00	.00	e16	18	34	4.7	.04	.02	1.1	.21	.00
21	.00	.00	.00	e14	16	29	3.0	.04	.01	37	.06	.00
22	.00	.00	.01	e12	14	30	2.3	.04	.01	7.3	.05	.00
23	.00	.00	.15	e11	12	31	2.6	.02	.00	.67	.04	.00
24	.00	.00	1.5	e13	21	30	2.3	.01	.00	.17	.03	.00
25	.00	.00	e2.6	e18	44	27	2.3	.01	.00	.05	.03	.00
26	.00	.00	e2.7	14	39	48	1.5	.01	.00	.05	.02	.00
27	.00	.00	e2.6	10	24	90	1.1	.11	.00	.04	.06	.00
28	.00	.00	e2.4	21	17	73	.66	.05	.00	.05	.02	.00
29	.00	.00	e2.5	46	---	96	.43	.02	.00	.09	.01	.00
30	.00	.00	e2.4	46	---	161	.28	.01	.00	.03	.01	.00
31	.00	---	e2.2	35	---	105	---	.01	---	.24	.00	---
TOTAL	0.00	0.00	19.06	493.5	1312	4592	568.97	25.79	9.59	46.79	8.42	0.00
MEAN	.000	.000	.61	15.9	46.9	148	19.0	.83	.32	1.51	.27	.000
MAX	.00	.00	2.7	46	270	830	81	4.6	3.9	37	1.4	.00
MIN	.00	.00	.00	2.1	12	14	.28	.01	.00	.00	.00	.00
CFSM	.00	.00	.03	.67	1.97	6.22	.80	.03	.01	.06	.01	.00
IN.	.00	.00	.03	.77	2.05	7.18	.89	.04	.01	.07	.01	.00

e Estimated.

## GREAT DISMAL SWAMP BASIN

379

02043500 CYPRESS SWAMP AT CYPRESS CHAPEL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1971, 1978 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	15.1	15.9	27.8	46.8	57.6	54.4	33.0	18.2	10.9	6.10	17.5	13.6
MAX	122	69.5	87.2	108	135	148	84.0	120	56.6	26.4	116	138
(WY)	1965	1986	1958	1962	1957	1994	1984	1958	1963	1962	1967	1955
MIN	.000	.000	.000	2.31	3.87	6.62	3.68	.013	.000	.000	.000	.000
(WY)	(a)	(a)	1991	1981	1991	1981	1967	1963	(a)	(a)	(a)	(a)

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

WATER YEARS 1954 - 1971,  
1978 - 1994

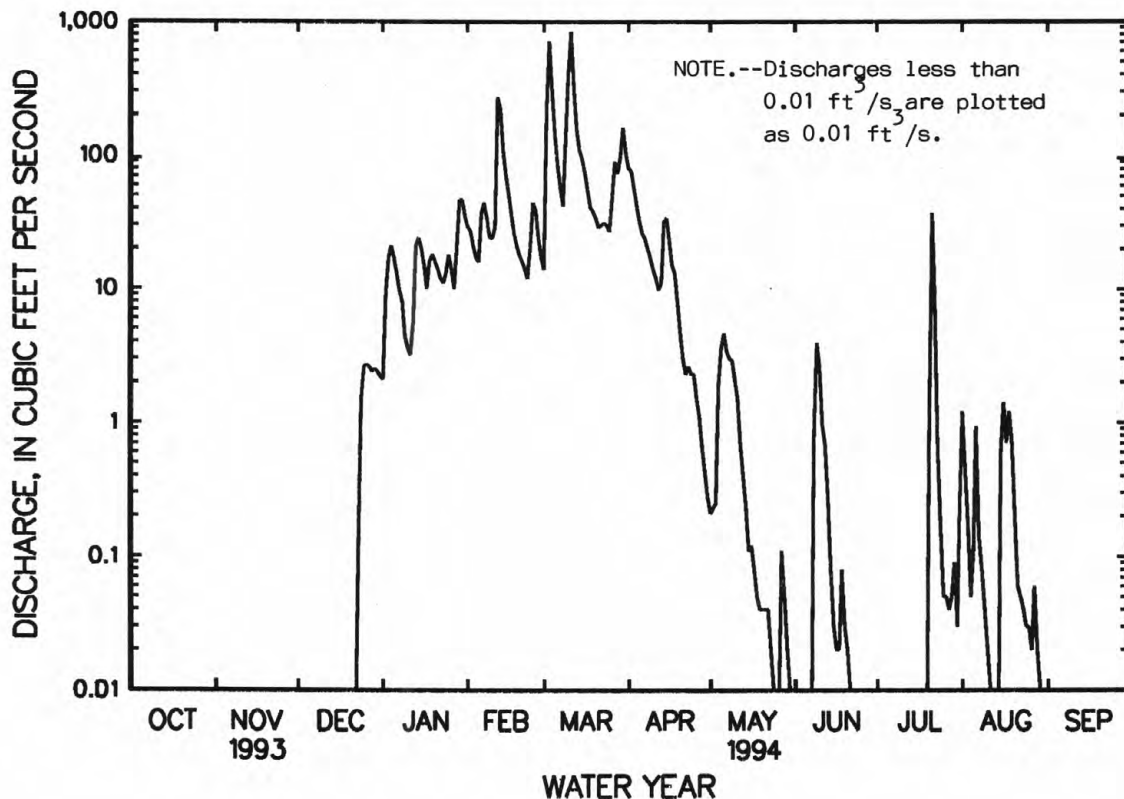
ANNUAL TOTAL	8075.54	7076.12	26.2	
ANNUAL MEAN	22.1	19.4	46.1	1958
HIGHEST ANNUAL MEAN			6.44	1981
LOWEST ANNUAL MEAN			1100	May 7 1958
HIGHEST DAILY MEAN	359 Mar 14	830 Mar 11	.00	(d)
LOWEST DAILY MEAN	.00 <u>h</u> Jun 19	.00 <u>c</u> Oct 1	.00	(d)
ANNUAL SEVEN-DAY MINIMUM	.00 <u>h</u> Jun 19	.00 <u>c</u> Oct 1	.00	(d)
INSTANTANEOUS PEAK FLOW		1150 Mar 11	1330	Aug 11 1967
INSTANTANEOUS PEAK STAGE		6.41 Mar 11	6.85	Aug 11 1967
INSTANTANEOUS LOW FLOW		.00 <u>c</u> Oct 1	.00	(d)
ANNUAL RUNOFF (CFSM)	.93	.81	1.10	
ANNUAL RUNOFF (INCHES)	12.62	11.06	14.93	
10 PERCENT EXCEEDS	64	40	68	
50 PERCENT EXCEEDS	.03	.05	6.0	
90 PERCENT EXCEEDS	.00	.00	.00	

a Monthly mean flow is 0.0 ft<sup>3</sup>/s many years.

b No flow many days June to December.

c No flow many days October to December and June to September.

d No flow at times each year.



## GREAT DISMAL SWAMP BASIN

## 02043600 LAKE DRUMMOND IN GREAT DISMAL SWAMP, VA

LOCATION.--Lat 36°35'42", long 76°26'23", Chesapeake City, Hydrologic Unit 03010205, on right bank in outlet canal, 200 ft upstream from dam and gates, 0.5 mi downstream from Lake Drummond, 3.1 mi north of North Carolina State line, and 20 mi southwest of Norfolk.

PERIOD OF RECORD.--May 1926 to current year. Prior to October 1973, published as Lake Drummond in Dismal Swamp.

REVISED RECORDS.--WSP 1032: 1934-43.

GAGE.--Nonrecording gage. Datum of gage is 12.16 ft above sea level. Aug. 22, 1978, to Oct. 1, 1981, water-stage recorder at same site and datum.

REMARKS.--Mean daily gage heights are shown in table below. Maximum gage height, 6.68 ft, Sept. 17, 1960. Minimum gage height, -0.67 ft, Nov. 3, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum instantaneous gage height, 5.70 ft, Mar. 13; minimum instantaneous gage height, 3.52 ft, Oct. 22.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

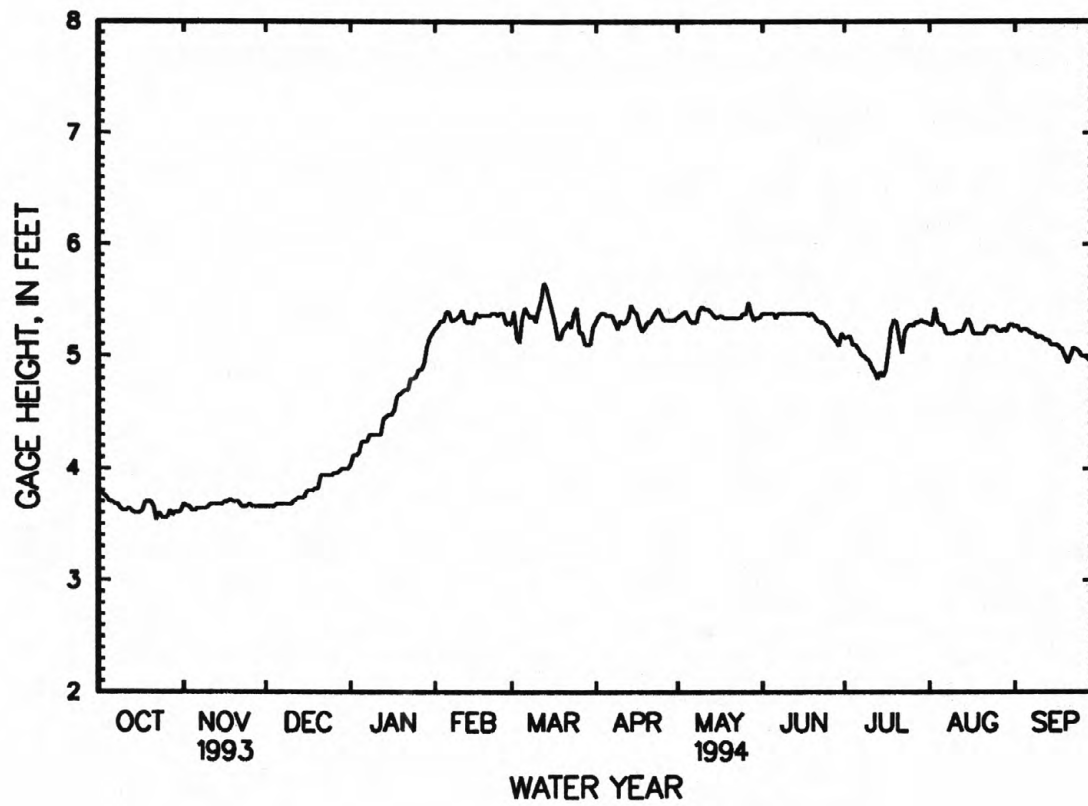
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.80	3.68	3.66	4.04	5.24	5.28	5.30	5.34	5.38	5.16	5.28	5.26
2	3.78	3.66	3.66	4.12	5.26	5.40	5.35	5.36	5.38	5.16	5.28	5.27
3	3.76	3.66	3.66	4.12	5.31	5.16	5.38	5.38	5.38	5.18	5.43	5.22
4	3.74	3.62	3.66	4.14	5.30	5.12	5.38	5.40	5.38	5.10	5.30	5.24
5	3.70	3.62	3.68	4.24	5.38	5.33	5.36	5.34	5.38	5.10	5.28	5.24
6	3.70	3.64	3.68	4.24	5.40	5.43	5.36	5.30	5.34	5.07	5.28	5.22
7	3.68	3.64	3.68	4.24	5.31	5.38	5.36	5.30	5.38	5.02	5.20	5.20
8	3.68	3.64	3.68	4.30	5.32	5.34	5.30	5.30	5.38	5.00	5.20	5.20
9	3.64	3.64	3.68	4.30	5.33	5.36	5.24	5.41	5.38	4.98	5.20	5.16
10	3.62	3.66	3.68	4.30	5.36	5.30	5.31	5.44	5.38	4.96	5.20	5.18
11	3.62	3.68	3.70	4.30	5.41	5.41	5.29	5.42	5.38	4.90	5.22	5.16
12	3.64	3.68	3.72	4.30	5.30	5.50	5.30	5.42	5.38	4.86	5.22	5.14
13	3.62	3.68	3.74	4.44	5.30	5.65	5.34	5.40	5.38	4.80	5.22	5.14
14	3.60	3.68	3.74	4.46	5.30	5.60	5.45	5.37	5.38	4.86	5.28	5.10
15	3.60	3.68	3.74	4.48	5.29	5.50	5.40	5.34	5.38	4.82	5.33	5.10
16	3.60	3.70	3.80	4.48	5.38	5.40	5.38	5.35	5.38	4.87	5.28	5.10
17	3.62	3.70	3.80	4.52	5.35	5.30	5.28	5.36	5.38	5.04	5.20	5.08
18	3.70	3.72	3.80	4.64	5.36	5.15	5.22	5.34	5.36	5.24	5.20	5.06
19	3.70	3.70	3.82	4.66	5.36	5.15	5.25	5.34	5.38	5.32	5.20	5.00
20	3.70	3.70	3.82	4.68	5.36	5.23	5.30	5.34	5.36	5.30	5.20	4.94
21	3.66	3.70	3.94	4.70	5.36	5.26	5.30	5.34	5.32	5.15	5.20	5.00
22	3.54	3.66	3.94	4.70	5.38	5.30	5.35	5.34	5.30	5.03	5.26	5.07
23	3.60	3.66	3.94	4.80	5.38	5.25	5.39	5.34	5.30	5.22	5.26	5.06
24	3.56	3.66	3.94	4.80	5.36	5.38	5.42	5.34	5.28	5.26	5.26	5.04
25	3.56	3.68	3.94	4.82	5.38	5.43	5.37	5.38	5.25	5.28	5.26	5.00
26	3.56	3.66	3.96	4.88	5.38	5.20	5.32	5.37	5.19	5.27	5.22	5.00
27	3.62	3.66	3.96	4.88	5.28	5.21	5.32	5.48	5.16	5.30	5.22	4.98
28	3.58	3.66	3.98	4.94	5.30	5.10	5.32	5.38	5.13	5.30	5.24	4.96
29	3.61	3.66	4.00	5.08	---	5.10	5.32	5.32	5.09	5.32	5.22	4.96
30	3.60	3.66	4.00	5.16	---	5.10	5.32	5.34	5.20	5.30	5.28	4.95
31	3.62	---	4.00	5.20	---	5.26	---	5.34	---	5.30	5.28	---
MEAN	3.65	3.67	3.81	4.55	5.34	5.31	5.33	5.36	5.32	5.11	5.25	5.10
MAX	3.80	3.72	4.00	5.20	5.41	5.65	5.45	5.48	5.38	5.32	5.43	5.27
MIN	3.54	3.62	3.66	4.04	5.24	5.10	5.22	5.30	5.09	4.80	5.20	4.94

CAL YR 1993 MEAN 4.65 MAX 5.96 MIN 3.54  
WTR YR 1994 MEAN 4.81 MAX 5.65 MIN 3.54

GREAT DISMAL SWAMP BASIN

381

02043600 LAKE DRUMMOND IN GREAT DISMAL SWAMP, VA--Continued



## 02044500 NOTTOWAY RIVER NEAR RAWLINGS, VA

LOCATION.--Lat 36°59'00", long 77°48'00", Brunswick County, Hydrologic Unit 03010201, on right bank at downstream side of bridge on State Highway 612 at Harpers Bridge, 0.1 mi upstream from Beaver Pond Creek, and 2.6 mi northwest of Rawlings.

DRAINAGE AREA.--309 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1950 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 184.88 ft above sea level.

REMARKS.--Records good except those for periods of no gage-height record, Dec. 29 and Jan. 19-23, and period with ice effect, Dec. 30, 31, which are fair. Maximum discharge, 29,900 ft<sup>3</sup>/s, from rating curve extended above 16,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 1.83 ft, Oct. 15, 1954. Several measurements of water temperature were made during the year. Water-quality records for some periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 20.8 ft, discharge, about 19,000 ft<sup>3</sup>/s, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 30	0300	2,540	7.39	Mar. 30	0700	2,950	8.28
Mar. 3	2330	*6,660	*12.87				

Minimum discharge, 9.5 ft<sup>3</sup>/s, Oct. 7, 8, gage height, 2.15 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	82	328	121	336	357	749	389	132	171	194	65
2	16	66	202	224	288	1180	667	271	126	223	147	67
3	14	51	146	448	254	4910	523	218	116	149	118	66
4	14	39	117	479	228	5260	445	309	109	169	99	62
5	12	37	150	646	216	1570	394	701	104	266	87	64
6	11	47	848	451	230	618	398	590	105	197	83	59
7	9.8	62	757	314	234	492	423	425	115	134	77	59
8	9.9	64	321	274	214	427	386	355	115	103	70	59
9	11	60	218	258	205	410	331	374	110	89	65	57
10	12	53	163	225	259	457	303	322	112	83	61	53
11	12	45	151	188	369	691	287	267	420	79	59	53
12	12	41	129	208	617	603	276	239	494	77	59	50
13	17	38	108	299	763	439	319	216	278	79	66	47
14	19	37	97	326	767	384	437	202	196	171	64	45
15	21	37	124	259	915	354	362	193	156	400	96	44
16	20	35	355	167	873	326	395	198	134	185	117	43
17	20	34	539	152	765	292	770	200	208	125	148	44
18	21	39	313	297	602	272	544	189	215	105	442	67
19	22	43	238	e463	488	268	365	175	147	111	392	70
20	22	48	207	e400	419	254	297	172	122	97	251	62
21	23	44	477	e250	368	249	255	172	108	94	197	54
22	25	41	1230	e165	334	328	234	170	100	99	155	79
23	26	38	628	e180	375	373	221	167	100	103	137	190
24	27	73	361	191	1310	314	213	159	108	105	109	208
25	30	48	278	204	2220	373	206	152	115	97	90	127
26	31	34	230	205	1070	603	190	166	104	85	79	80
27	33	43	188	199	532	550	179	226	92	87	73	62
28	34	653	165	256	407	1420	173	202	98	138	71	54
29	36	1910	e155	685	---	2730	174	168	95	156	77	53
30	43	1590	e130	687	---	2850	314	149	93	230	70	49
31	73	---	e115	426	---	1480	---	137	---	247	65	---
TOTAL	695.7	5432	9468	9647	15658	30834	10830	7873	4527	4454	3818	2092
MEAN	22.4	181	305	311	559	995	361	254	151	144	123	69.7
MAX	73	1910	1230	687	2220	5260	770	701	494	400	442	208
MIN	9.8	34	97	121	205	249	173	137	92	77	59	43
CFSM	.07	.59	.99	1.01	1.81	3.22	1.17	.82	.49	.46	.40	.23
IN.	.08	.65	1.14	1.16	1.89	3.71	1.30	.95	.54	.54	.46	.25

e Estimated.



## CHOWAN RIVER BASIN

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02044500 NOTTOWAY RIVER NEAR RAWLINGS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	233	249	295	416	497	556	468	303	211	153	136	150
MAX	2024	1560	893	1289	1248	1309	1201	893	1359	965	650	1436
(WY)	1973	1986	1958	1978	1979	1993	1987	1958	1972	<sup>a</sup> 1949	1955	1979
MIN	13.0	50.5	65.0	95.0	123	126	124	98.3	55.8	25.2	8.60	3.62
(WY)	1964	1968	1966	1966	1968	1981	1966	1991	1964	1966	1963	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1951 - 1994

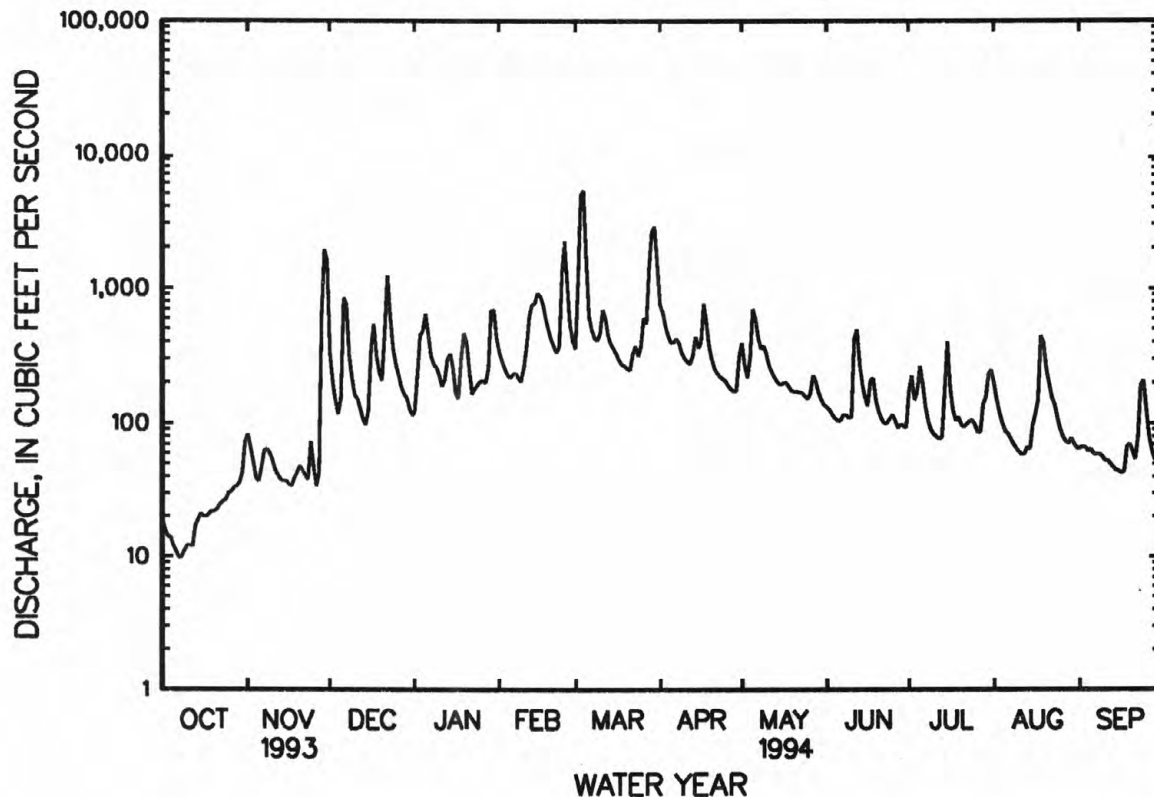
ANNUAL TOTAL	121618.0	105328.7	305
ANNUAL MEAN	333	289	619
HIGHEST ANNUAL MEAN			1973
LOWEST ANNUAL MEAN			144
HIGHEST DAILY MEAN	9040	Mar 5	27400
LOWEST DAILY MEAN	7.0	Sep 15	.40
ANNUAL SEVEN-DAY MINIMUM	9.6	Sep 11	1.0
INSTANTANEOUS PEAK FLOW			29900
INSTANTANEOUS PEAK STAGE			23.25
INSTANTANEOUS LOW FLOW			.40
ANNUAL RUNOFF (CFSM)	1.08	.93	.99
ANNUAL RUNOFF (INCHES)	14.64	12.68	13.39
10 PERCENT EXCEEDS	725	595	579
50 PERCENT EXCEEDS	155	170	172
90 PERCENT EXCEEDS	15	38	44

a Also 1975.

b Also Oct. 6, 1993.

c Also Oct. 8, 1993.

d Also Oct. 15, 1954.



## CHOWAN RIVER BASIN

02045500 NOTTOWAY RIVER NEAR STONY CREEK, VA

LOCATION.--Lat 36°54'00", long 77°24'00", Sussex County, Hydrologic Unit 03010201, on left bank 15 ft downstream from bridge on U.S. Highway 301, 1.8 mi upstream from Island Swamp, 3.3 mi south of town of Stony Creek, and 4.4 mi upstream from Stony Creek.

DRAINAGE AREA.--579 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1929 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 802: 1935(M). WSP 972: 1931(M), 1932, 1934-35, 1939. WSP 2104: Drainage area. WDR VA-74-1: 1972.

GAGE.--Water-stage recorder. Datum of gage is 58.42 ft above sea level. Prior to Oct. 11, 1934, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of no gage-height record, Dec. 28, 29, and periods with ice effect, Dec. 30 to Jan. 1 and Jan. 17, 20-25, which are fair. Diurnal fluctuation at low flow caused by Baskerville Mill, 33 mi upstream. Maximum discharge, 25,200 ft<sup>3</sup>/s, from rating curve extended above 13,000 ft<sup>3</sup>/s. Minimum gage height, 0.62 ft, Sept. 2, 5, 1932. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 5	1900	*7,770	*17.31	Mar. 30	1300	4,220	14.64

Minimum discharge, 8.8 ft<sup>3</sup>/s, Oct. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	90	1280	e260	665	707	2470	611	154	92	333	72
2	25	102	396	428	550	1850	1420	572	144	134	247	68
3	23	100	267	721	471	5860	1110	430	136	204	178	69
4	21	82	209	898	420	7240	906	535	125	145	143	69
5	18	74	264	944	394	7570	789	1000	117	140	139	67
6	16	74	448	961	414	5790	721	1150	113	238	118	63
7	14	77	1220	681	433	1490	773	776	112	177	131	64
8	13	94	713	539	411	952	748	558	119	127	109	58
9	13	99	380	483	383	872	656	473	124	97	93	58
10	12	94	273	433	409	926	590	462	122	81	80	59
11	11	86	232	386	554	1180	554	374	130	75	70	55
12	9.7	79	213	374	945	1290	522	309	565	70	63	50
13	9.1	71	190	523	1300	961	532	270	514	69	59	47
14	9.6	63	169	612	1480	789	942	237	301	74	57	44
15	9.8	60	175	565	1570	715	831	215	207	143	73	41
16	10	59	335	424	1580	659	751	220	176	372	166	38
17	16	59	662	e315	1370	600	916	246	176	179	177	37
18	20	59	654	527	1110	548	1160	227	219	129	223	37
19	21	57	427	954	896	536	766	203	222	102	536	36
20	20	58	347	e700	756	517	604	187	156	103	428	56
21	21	63	607	e450	664	493	511	183	128	107	394	67
22	25	67	1230	e300	594	603	459	182	111	92	271	104
23	25	64	1580	e325	577	736	430	176	102	118	194	212
24	23	58	837	e360	1710	678	408	169	104	178	162	315
25	24	57	580	e390	3050	721	392	160	101	123	132	289
26	27	92	462	407	2950	1240	370	160	106	106	110	190
27	31	73	390	399	1350	1300	341	324	105	94	96	136
28	42	316	e315	428	855	2180	320	340	91	90	87	103
29	41	1500	e275	887	---	3460	306	244	91	196	80	90
30	53	2340	e235	1220	---	4160	441	193	95	726	81	80
31	67	---	e210	905	---	3950	---	168	---	517	80	---
TOTAL	697.2	6167	15575	17799	27861	60573	21739	11354	4966	5098	5110	2674
MEAN	22.5	206	502	574	995	1954	725	366	166	164	165	89.1
MAX	67	2340	1580	1220	3050	7570	2470	1150	565	726	536	315
MIN	9.1	57	169	260	383	493	306	160	91	69	57	36
CFSM	.04	.36	.87	.99	1.72	3.37	1.25	.63	.29	.28	.28	.15
IN.	.04	.40	1.00	1.14	1.79	3.89	1.40	.73	.32	.33	.33	.17

e Estimated.

## CHOWAN RIVER BASIN

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02045500 NOTTOWAY RIVER NEAR STONY CREEK, VA --Continued

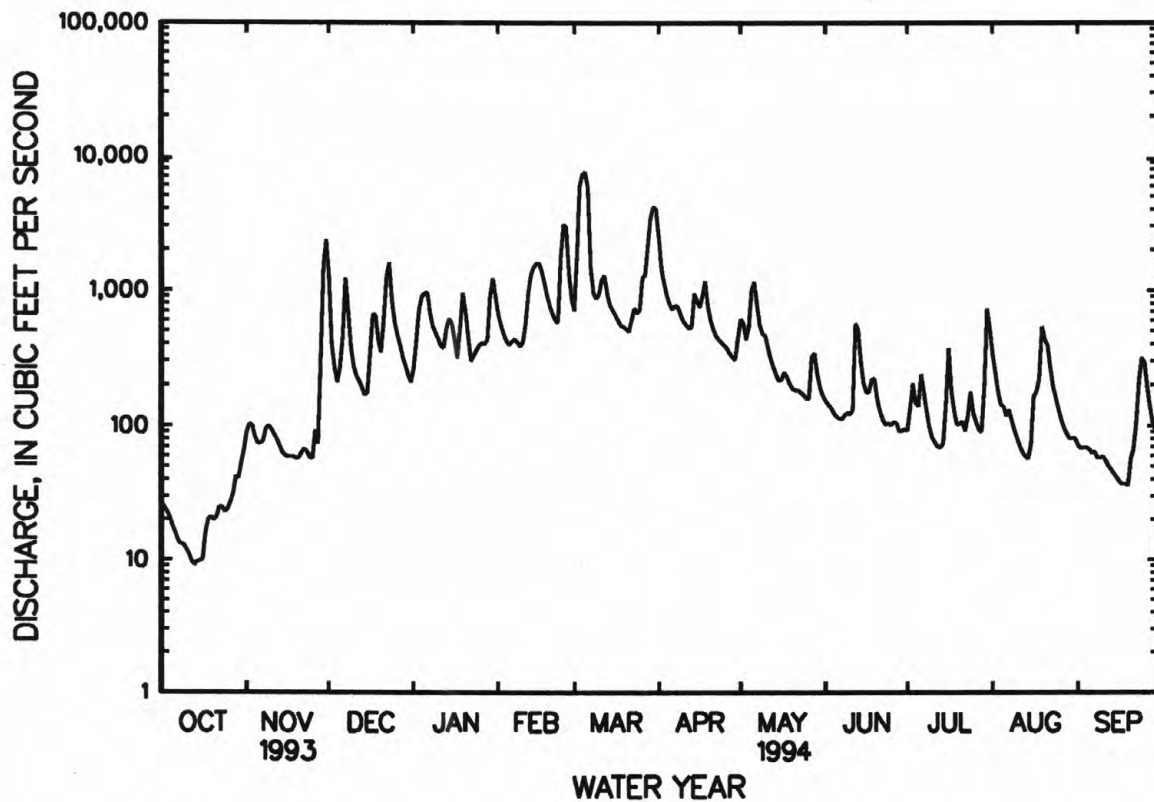
## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	307	410	521	824	935	1030	870	534	335	357	312	269
MAX	2666	2800	1783	2578	2355	2565	2261	1878	1612	2423	3057	2191
(WY)	1973	1986	1958	1936	1979	1975	1987	1958	1938	1938	1940	1979
MIN	14.0	43.1	65.7	109	176	196	192	129	74.6	46.6	14.9	9.40
(WY)	1931	1942	1966	1966	1931	1981	1966	1942	1942	1966	1963	1932

## SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1931 - 1994	
ANNUAL TOTAL	211450.2		179613.2		557	
ANNUAL MEAN	579		492		1100	
HIGHEST ANNUAL MEAN					191	
LOWEST ANNUAL MEAN					24000	
HIGHEST DAILY MEAN	9720	Mar 7	7570	Mar 5	Aug 17 1940	
LOWEST DAILY MEAN	9.1	Oct 13	9.1	Oct 13	4.3	
ANNUAL SEVEN-DAY MINIMUM	10	Oct 10	10	Oct 10	6.0	
INSTANTANEOUS PEAK FLOW			7770	Mar 5	25200	
INSTANTANEOUS PEAK STAGE			17.31	Mar 5	23.66	
INSTANTANEOUS LOW FLOW			8.8	Oct 13	3.4	
ANNUAL RUNOFF (CFSM)	1.00		.85		.96	
ANNUAL RUNOFF (INCHES)	13.59		11.54		13.06	
10 PERCENT EXCEEDS	1340		1040		1170	
50 PERCENT EXCEEDS	273		223		303	
90 PERCENT EXCEEDS	19		49		61	

a Also Aug. 16, 1977.



## CHOWAN RIVER BASIN

02046000 STONY CREEK NEAR DINWIDDIE, VA

LOCATION.--Lat 37°04'01", long 77°36'10", Dinwiddie County, Hydrologic Unit 03010201, on right bank at upstream side of upstream bridge on U.S. Highway 1, 1.2 mi southwest of Dinwiddie, 1.7 mi downstream from Chamberlains Bed Creek, and 5.7 mi downstream from confluence of White Oak and Butterwood Creeks.

DRAINAGE AREA.--112 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1946 to current year. Published as "at Dinwiddie" September 1946 to September 1947 and October 1949 to September 1950.

REVISED RECORDS.--WSP 1303: 1947(M). WSP 1433: 1951(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 129.94 ft above sea level. Prior to June 12, 1957, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 1-15, Nov. 18-23, Dec. 29, and Jan. 19, 20, and periods with ice effect, Dec. 30, 31, and Jan. 18, 21, 22, which are fair. Maximum discharge, 11,400 ft<sup>3</sup>/s, from rating curve extended above 5,800 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. No flow part of Oct. 13, 1954. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 3	1030	*3,090	*11.85	No other peak equal to or greater than base discharge			

Minimum daily discharge, 0.04 ft<sup>3</sup>/s, Oct. 7-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.40	5.7	56	26	97	116	332	81	17	7.7	28	5.0
2	e.23	5.7	41	56	82	851	285	87	15	7.9	22	5.0
3	e.15	5.4	30	116	72	2840	214	66	13	7.8	18	4.9
4	e.14	5.6	24	139	65	1520	169	147	12	8.3	14	4.7
5	e.10	7.2	24	159	61	592	140	302	11	8.4	12	4.6
6	e.05	16	39	102	64	306	132	219	10	8.1	11	4.3
7	e.04	19	43	75	65	225	138	141	10	8.6	9.0	4.3
8	e.04	22	39	66	61	186	118	115	9.8	14	7.7	4.1
9	e.04	24	29	62	67	173	100	102	9.9	11	6.9	3.9
10	e.05	23	23	53	81	173	89	80	11	9.3	6.4	3.9
11	e.05	20	22	44	107	247	82	63	15	8.7	5.9	3.9
12	e.05	19	19	49	312	211	78	52	21	8.9	5.7	3.9
13	e.06	18	17	84	294	162	117	44	24	8.1	5.5	3.9
14	e.07	17	16	79	363	142	340	38	22	7.7	5.1	4.1
15	e.08	16	19	64	367	131	198	34	17	7.2	6.5	4.2
16	.09	17	47	43	331	122	183	33	20	6.7	6.0	4.2
17	.10	18	63	38	262	104	192	32	30	7.0	7.1	4.6
18	.11	e22	53	e69	196	96	149	28	25	8.0	7.5	6.0
19	.34	e23	42	e100	152	94	109	26	20	8.4	7.5	6.2
20	.26	e24	35	e63	124	89	88	25	16	10	7.3	6.0
21	.21	e22	173	e47	108	88	74	25	13	11	15	5.9
22	.23	e20	203	e41	101	144	64	24	13	12	15	24
23	.27	e19	121	44	164	160	59	23	11	36	11	117
24	.31	21	81	46	805	123	55	21	9.6	32	8.5	87
25	.32	22	61	52	766	333	50	19	9.1	19	7.3	53
26	.43	23	49	52	387	335	46	21	8.6	14	6.5	35
27	.68	26	40	52	198	392	42	33	7.9	12	6.2	22
28	.87	75	34	85	139	808	38	33	7.4	13	6.9	14
29	1.3	139	e31	294	---	1050	36	28	7.9	36	6.5	9.9
30	3.3	101	e27	203	---	854	62	23	7.9	71	5.7	7.8
31	5.7	---	e25	124	---	467	---	20	---	39	5.3	---
TOTAL	16.07	795.6	1526	2527	5891	13134	3779	1985	424.1	466.8	293.0	467.3
MEAN	.52	26.5	49.2	81.5	210	424	126	64.0	14.1	15.1	9.45	15.6
MAX	5.7	139	203	294	805	2840	340	302	30	71	28	117
MIN	.04	5.4	16	26	61	88	36	19	7.4	6.7	5.1	3.9
CFSM	.00	.24	.44	.73	1.88	3.78	1.12	.57	.13	.13	.08	.14
IN.	.01	.26	.51	.84	1.96	4.36	1.26	.66	.14	.16	.10	.16

e Estimated.

## 02046000 STONY CREEK NEAR DINWIDDIE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	66.6	89.5	108	167	198	217	165	95.1	59.7	48.7	48.9	54.3
MAX	554	510	426	549	541	538	377	351	156	560	288	774
(WY)	1973	1986	1958	1978	1979	1975	1952	1958	1981	1975	1955	1979
MIN	.12	2.99	5.68	15.5	37.5	27.7	27.0	20.9	14.1	2.62	.97	.18
(WY)	1955	1966	1966	1966	1968	1981	1966	1991	1994	1986	1963	1954

## SUMMARY STATISTICS

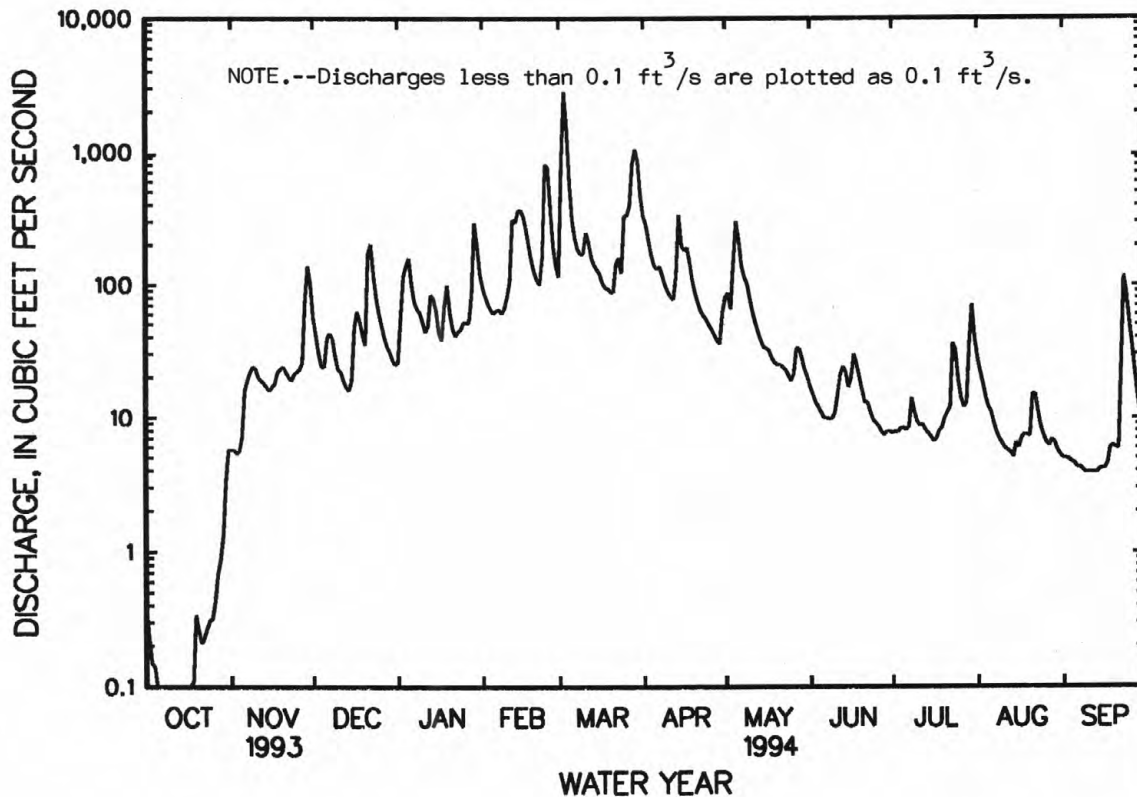
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1947 - 1994

ANNUAL TOTAL	38611.41	31304.87	
ANNUAL MEAN	106	85.8	109
HIGHEST ANNUAL MEAN			231
LOWEST ANNUAL MEAN			34.1
HIGHEST DAILY MEAN	2530 Mar 5	2840 Mar 3	7050 Oct 6 1972
LOWEST DAILY MEAN	e.04 aOct 7	e.04 aOct 7	e.04 aOct 7 1993
ANNUAL SEVEN-DAY MINIMUM	e.05 bOct 6	e.05 bOct 6	e.05 bOct 6 1993
INSTANTANEOUS PEAK FLOW		3090 Mar 3	11400 Oct 6 1972
INSTANTANEOUS PEAK STAGE		11.85 Mar 3	20.84 Oct 6 1972
INSTANTANEOUS LOW FLOW		(c) (d)	f.00 Oct 13 1954
ANNUAL RUNOFF (CFSM)	.94	.77	.98
ANNUAL RUNOFF (INCHES)	12.82	10.40	13.26
10 PERCENT EXCEEDS	263	194	244
50 PERCENT EXCEEDS	34	25	49
90 PERCENT EXCEEDS	.48	4.1	5.7

- a Also Oct. 8, 9, 1993.  
b Also Oct. 7, 8, 1993.  
c Not determined.  
d Probably occurred Oct. 7, 1993.  
e Estimated.  
f Observed.





## CHOWAN RIVER BASIN

02047000 NOTTOWAY RIVER NEAR SEBRELL, VA

LOCATION.--Lat 36°46'13", long 77°09'59", Southampton County, Hydrologic Unit 03010201, on right bank 1,000 ft upstream from bridge on State Highway 653, 1 mi downstream from Three Creek, 2.5 mi southwest of Sebrell, and 5.5 mi upstream from Assamoosick Swamp.

DRAINAGE AREA.--1,421 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1941 to current year.

REVISED RECORDS.--WSP 1333: 1942, 1944, 1948-49. WSP 2104: Drainage area. WDR-91-1: 1982(m).

GAGE.--Water-stage recorder. Datum of gage is 5.94 ft above sea level. Prior to Aug. 23, 1950, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of doubtful gage-height record, Oct. 1-26, and for periods with ice effect, Jan. 16-18, 21-24, which are fair. Maximum discharge, 26,000 ft<sup>3</sup>/s, from rating curve extended above 25,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 12,200 ft<sup>3</sup>/s, Mar. 7, gage height, 19.66 ft; minimum daily, 21 ft<sup>3</sup>/s, Oct. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e33	99	1900	667	2300	5560	7520	720	355	121	886	97
2	e31	113	2070	767	1890	5140	8080	929	311	117	676	98
3	e30	124	1160	1020	1530	6040	7830	990	283	114	571	90
4	e28	146	683	1470	1300	7270	6770	914	260	201	479	82
5	e26	142	566	1830	1150	8480	5270	1100	237	234	387	79
6	e27	137	581	2010	1110	10700	3790	1690	219	175	343	78
7	e28	131	733	2050	1120	12100	2850	2100	208	217	301	76
8	e29	122	1250	1800	1120	11400	2410	2050	200	269	276	71
9	e30	125	1220	1450	1090	9590	2180	1610	194	217	250	69
10	e29	141	835	1240	1070	7260	1940	1290	204	172	198	67
11	e27	149	685	1100	1180	5330	1660	1100	201	138	158	64
12	e26	138	605	1010	1660	4270	1480	942	198	121	130	63
13	e24	126	552	1020	2300	3910	1390	785	396	111	110	60
14	e23	114	510	1190	2900	3720	1410	682	670	104	98	58
15	e22	101	481	1340	3320	3310	1830	603	489	100	93	54
16	e21	90	528	e1250	3620	2810	2150	544	358	106	94	52
17	e23	83	703	e1010	3780	2380	2070	512	283	316	116	50
18	e26	79	1070	e980	3830	2020	2000	511	262	347	242	51
19	e27	76	1190	1140	3680	1770	2070	497	251	231	256	46
20	e25	74	991	1690	3230	1640	1850	460	332	185	466	44
21	e27	72	927	e2010	2650	1530	1450	425	270	148	566	43
22	e33	71	1160	e1900	2120	1510	1210	402	212	146	487	59
23	e32	73	1810	e1580	1790	1660	1060	387	178	155	425	98
24	e30	77	2240	e1280	1990	1850	961	371	154	139	309	171
25	e28	78	2060	1170	2910	1880	893	350	139	221	254	466
26	e32	74	1450	1080	3770	2100	834	333	136	255	217	527
27	42	76	1150	1050	4550	2680	780	398	133	210	176	452
28	42	149	972	1070	5290	3380	724	591	136	181	145	340
29	43	315	854	1290	---	4300	664	645	132	171	123	254
30	57	1230	777	1790	---	5590	630	520	120	202	109	195
31	85	---	702	2270	---	6620	---	423	---	695	99	---
TOTAL	986	4525	32415	42524	68250	147800	75756	24874	7521	6119	9040	3954
MEAN	31.8	151	1046	1372	2437	4768	2525	802	251	197	292	132
MAX	85	1230	2240	2270	5290	12100	8080	2100	670	695	886	527
MIN	21	71	481	667	1070	1510	630	333	120	100	93	43
CFSM	.02	.11	.74	.97	1.72	3.36	1.78	.56	.18	.14	.21	.09
IN.	.03	.12	.85	1.11	1.79	3.87	1.98	.65	.20	.16	.24	.10

e Estimated.

## CHOWAN RIVER BASIN

389

02047000 NOTTOWAY RIVER NEAR SEBRELL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1941 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	645	867	1335	2071	2464	2787	2136	1322	775	730	638	532
MAX	4491	4854	4310	6115	4710	5867	5127	5180	2246	5782	2831	4631
(WY)	1973	1986	1958	1978	1957	1975	1987	1978	1972	1975	1955	1979
MIN	27.4	59.5	98.8	196	516	389	427	300	131	48.9	43.3	27.8
(WY)	1955	1942	1966	1966	1981	1981	1966	1942	1942	1966	1963	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

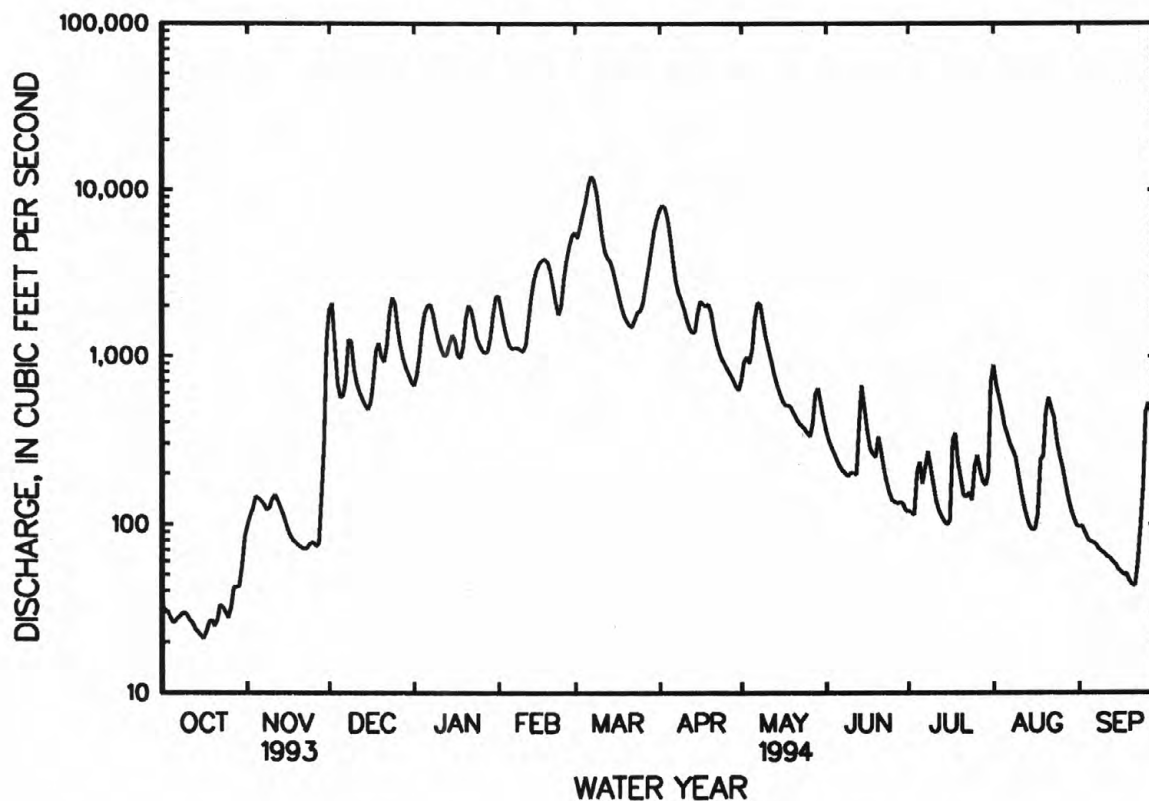
## WATER YEARS 1941 - 1994

ANNUAL TOTAL	523123		423764									
ANNUAL MEAN	1433		1161							1353		
HIGHEST ANNUAL MEAN										2671		1978
LOWEST ANNUAL MEAN										366		1981
HIGHEST DAILY MEAN	11500	Mar 9	12100	Mar 7						25500	Jul 19	1975
LOWEST DAILY MEAN	e21	Oct 16	e21	Oct 16						14	Oct 14	1954
ANNUAL SEVEN-DAY MINIMUM	24	Oct 12	24	Oct 12						15	Oct 8	1954
INSTANTANEOUS PEAK FLOW			12200	Mar 7						26000	Jul 19	1975
INSTANTANEOUS PEAK STAGE			19.66	Mar 7						24.43	Jul 19	1975
INSTANTANEOUS LOW FLOW			(a)							b12	Oct 23	1941
ANNUAL RUNOFF (CFSM)	1.01		.82							.95		
ANNUAL RUNOFF (INCHES)	13.69		11.09							12.94		
10 PERCENT EXCEEDS	3830		2870							3380		
50 PERCENT EXCEEDS	732		481							738		
90 PERCENT EXCEEDS	31		56							104		

a Not determined.

b Observed.

e Estimated.



## CHOWAN RIVER BASIN

02047000 NOTTOWAY RIVER NEAR SEBRELL, VA--Continued  
 (National stream-quality accounting network station)  
 (National water-quality assessment station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1947, 1978 to current year.

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1946 to September 1947.

REMARKS.--These data are a part of the National Stream-Quality Accounting Network (NASQAN) and the Albemarle-Pimlico National Water-Quality Assessment (NAWQA) program.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) (31673)
OCT												
15...	0930	22	128	7.1	9.0	14.5	774	--	9.1	88	--	37
NOV												
17...	1000	83	138	7.0	17.0	14.5	770	1.0	8.6	83	19	46
DEC												
02...	1200	2160	81	6.8	10.0	7.5	780	--	9.7	79	K1600	1200
JAN												
07...	1130	2070	88	6.5	16.0	2.5	775	--	12.6	91	K140	200
FEB												
18...	1100	3830	73	7.1	14.0	5.0	778	4.0	12.0	92	44	150
MAR												
23...	1030	1640	70	7.2	26.0	10.0	763	--	10.0	88	--	--
APR												
20...	1100	1880	69	6.7	22.5	18.0	766	--	7.2	76	--	--
MAY												
18...	1000	510	76	7.1	16.0	20.0	764	4.4	7.9	87	25	59
JUN												
13...	0930	275	94	6.8	34.5	22.0	768	--	7.4	84	--	--
JUL												
19...	0945	235	89	6.9	28.5	26.0	770	--	6.2	76	--	--
AUG												
16...	1000	93	92	7.1	20.0	24.0	771	13	6.6	78	74	270
SEP												
14...	1100	58	94	7.0	20.5	18.0	770	--	8.9	93	--	--

< Actual value is known to be less than the value shown.

K Results based on colony count outside the acceptance range (non-ideal colony count).

## CHOWAN RIVER BASIN

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02047000 NOTTOWAY RIVER NEAR SEBRELL, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM PERCENT (00932)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
OCT 15...	39	10	3.4	7.7	28	0.5	2.6	47	--	39	8.5	7.7
NOV 17...	35	9.0	3.0	11	38	0.8	3.2	42	0	35	12	13
DEC 02...	21	5.0	2.0	4.7	29	0.4	3.8	14	--	12	13	5.9
JAN 07...	23	5.9	2.0	5.8	33	0.5	1.9	11	--	9	15	7.6
FEB 18...	17	4.3	1.4	5.2	38	0.6	1.7	5	0	5	12	6.8
MAR 23...	18	4.9	1.5	4.4	32	0.4	1.8	12	--	10	9.4	5.9
APR 20...	21	5.1	1.9	4.3	29	0.4	1.8	19	--	16	6.0	5.1
MAY 18...	23	5.9	2.1	4.7	29	0.4	1.6	21	0	18	4.8	5.0
JUN 13...	29	7.3	2.7	6.3	30	0.5	1.6	36	--	29	5.1	5.5
JUL 19...	27	6.5	2.7	6.1	31	0.5	1.9	37	--	30	2.8	4.6
AUG 16...	28	7.2	2.5	5.8	29	0.5	2.1	32	0	26	4.8	5.2
SEP 14...	29	7.2	2.6	6.3	30	0.5	2.3	35	--	29	4.8	5.5

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	NITRO- GEN, NITRATE TOTAL (MG/L AS N) (00620)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N) (00605)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT 15...	0.10	10	72	74	0.130	<0.010	0.130	0.130	0.050	0.15	--	0.20
NOV 17...	0.10	12	94	84	--	<0.010	--	<0.050	0.020	0.18	--	0.20
DEC 02...	0.10	12	84	55	0.170	<0.010	0.170	0.170	0.030	0.37	0.27	0.40
JAN 07...	<0.10	14	79	59	0.170	<0.010	0.170	0.170	0.020	0.28	0.28	0.30
FEB 18...	<0.10	9.7	58	45	0.150	0.030	0.180	0.180	0.040	0.26	--	0.30
MAR 23...	<0.10	8.3	57	43	0.130	<0.010	0.130	0.130	0.180	0.32	0.32	0.50
APR 20...	<0.10	10	62	45	0.085	<0.010	0.085	0.085	0.040	0.46	0.36	0.50
MAY 18...	<0.10	14	54	51	0.190	<0.010	0.190	0.190	0.040	0.36	--	0.40
JUN 13...	<0.10	11	74	58	0.130	<0.010	0.130	0.130	0.030	0.27	0.17	0.30
JUL 19...	0.10	16	72	60	0.110	<0.010	0.110	0.110	0.040	0.26	--	0.30
AUG 16...	<0.10	14	63	59	0.160	<0.010	0.160	0.160	0.050	0.25	--	0.30
SEP 14...	<0.10	12	64	58	--	<0.010	--	<0.050	0.020	--	--	<0.20

&lt; Actual value is known to be less than the value shown.

## CHOWAN RIVER BASIN

02047000 NOTTOWAY RIVER NEAR SEBRELL, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO- GEN, TOTAL (MG/L AS N) (00600)	NITRO- GEN DIS- SOLVED (MG/L AS N) (00602)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
OCT 15...	<0.20	0.33	--	0.030	<0.010	0.020	--	--	--	220	--
NOV 17...	--	0.20	--	0.020	0.030	0.020	10	28	<3	170	<4
DEC 02...	0.30	0.57	0.47	0.100	<0.010	0.010	--	--	--	300	--
JAN 07...	0.30	0.47	0.47	0.030	0.010	<0.010	--	--	--	350	--
FEB 18...	--	0.48	--	0.020	0.020	<0.010	430	30	<3	250	<4
MAR 23...	0.50	0.63	0.63	0.070	0.020	0.020	--	--	--	380	--
APR 20...	0.40	0.59	0.48	0.060	0.030	0.020	--	--	--	1000	--
MAY 18...	--	0.59	--	0.030	0.020	0.030	60	30	8	1100	<4
JUN 13...	0.20	0.43	0.33	0.030	<0.010	<0.010	--	--	--	470	--
JUL 19...	<0.20	0.41	--	0.050	0.010	0.010	--	--	--	270	--
AUG 16...	--	0.46	--	0.030	0.040	0.030	30	28	<3	640	<4
SEP 14...	<0.20	--	--	0.020	0.010	0.020	--	--	--	250	--

&lt; Actual value is known to be less than the value shown.



## CHOWAN RIVER BASIN

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02047000 NOTTOWAY RIVER NEAR SEBRELL, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT											
15...	100	--	--	--	--	--	--	2.3	0.2	10	34
NOV											
17...	38	<10	<1	<1	<1.0	74	<6	--	--	5	38
DEC											
02...	43	--	--	--	--	--	--	10	2.2	44	96
JAN											
07...	57	--	--	--	--	--	--	6.9	0.4	--	--
FEB											
18...	37	<10	<1	<1	<1.0	32	<6	6.6	0.4	15	91
MAR											
23...	50	--	--	--	--	--	--	7.0	0.3	11	100
APR											
20...	67	--	--	--	--	--	--	9.4	0.3	12	93
MAY											
18...	60	10	<1	<1	<1.0	51	<6	--	--	11	97
JUN											
13...	63	--	--	--	--	--	--	4.5	0.2	3	100
JUL											
19...	85	--	--	--	--	--	--	4.0	0.1	4	82
AUG											
16...	100	<10	<1	<1	<1.0	67	<6	6.4	0.2	5	95
SEP											
14...	84	--	--	--	--	--	--	4.1	0.1	5	100

&lt; Actual value is known to be less than the value shown.

## CHOWAN RIVER BASIN

02047500 BLACKWATER RIVER NEAR DENDRON, VA

LOCATION.--Lat 37°01'30", long 76°52'30", Surry County, Hydrologic Unit 03010202, on left bank 10 ft upstream from Walls Bridge on State Highway 617, 1.2 mi downstream from Cypress Swamp, and 3.5 mi southeast of Dendron.

DRAINAGE AREA.--294 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1941 to December 1986, July 1988 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 30.99 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to Aug. 13, 1980, at site 25 ft upstream at same datum.

REMARKS.--Records good except for period of no gage-height record, Aug. 1, which is fair. Maximum discharge, 5,850 ft<sup>3</sup>/s, from rating curve extended above 4,900 ft<sup>3</sup>/s. No flow at times most years. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 13.1 ft, from U.S. Army Corps of Engineers floodmarks, discharge, 10,000 ft<sup>3</sup>/s, from rating curve extended above 4,900 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,440 ft<sup>3</sup>/s, Mar. 4, gage height, 8.12 ft; no flow part or all of each day Oct. 1 to Nov. 8, June 23 to July 21, and Aug. 31 to Sept. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	33	73	341	1090	2090	71	40	.00	e32	.00
2	.00	.00	35	133	319	1290	1930	70	31	.00	20	.00
3	.00	.00	32	207	265	2910	1690	68	24	.00	13	.00
4	.00	.00	29	314	249	4260	1320	90	20	.00	7.7	.00
5	.00	.00	30	339	247	3250	1030	143	17	.00	8.0	.00
6	.00	.00	35	329	252	2830	858	205	16	.00	13	.00
7	.00	.00	38	298	252	2560	710	238	32	.00	9.8	.00
8	.00	.05	42	280	211	2000	624	258	29	.00	8.9	.00
9	.00	.15	47	241	191	1530	537	283	23	.00	8.3	.00
10	.00	.40	50	209	193	1230	413	341	18	.00	6.3	.00
11	.00	1.1	56	202	259	1280	362	366	15	.00	4.1	.00
12	.00	1.7	56	199	449	1340	349	323	14	.00	2.0	.00
13	.00	2.0	49	201	562	1300	303	235	13	.00	.63	.00
14	.00	2.3	44	201	669	1110	299	167	9.6	.00	.10	.00
15	.00	2.4	46	206	748	869	278	126	6.8	.00	1.4	.00
16	.00	2.5	65	193	769	714	266	108	4.3	.00	2.6	.00
17	.00	2.3	72	139	796	590	245	91	2.8	.00	2.9	.00
18	.00	2.5	82	220	790	506	221	78	2.5	.00	6.8	.00
19	.00	2.4	88	257	757	469	240	69	3.4	.00	6.6	.00
20	.00	2.3	77	255	736	403	291	65	1.5	.00	8.0	.00
21	.00	2.3	96	237	672	331	284	60	.17	4.0	8.6	.00
22	.00	2.3	108	185	596	347	244	54	.04	31	8.5	.00
23	.00	2.3	120	175	528	438	205	47	.01	22	6.8	.00
24	.00	2.4	128	211	661	488	168	41	.00	20	4.4	2.7
25	.00	2.5	127	203	990	483	135	36	.00	22	2.5	39
26	.00	2.5	120	218	1160	555	115	37	.00	19	1.1	44
27	.00	2.7	107	234	1080	698	100	65	.00	17	.27	30
28	.00	6.8	102	215	1020	1030	88	64	.00	15	.09	18
29	.00	12	102	251	---	1540	80	59	.00	22	.04	10
30	.00	18	93	317	---	2050	76	55	.00	36	.02	6.7
31	.00	---	79	341	---	2150	---	47	---	40	.00	---
TOTAL	0.00	75.90	2188	7083	15762	41641	15551	3960	323.12	248.00	194.45	150.40
MEAN	.000	2.53	70.6	228	563	1343	518	128	10.8	8.00	6.27	5.01
MAX	.00	18	128	341	1160	4260	2090	366	40	40	32	44
MIN	.00	.00	29	73	191	331	76	36	.00	.00	.00	.00
CFSM	.00	.01	.24	.78	1.91	4.57	1.76	.43	.04	.03	.02	.02
IN.	.00	.01	.28	.90	1.99	5.27	1.97	.50	.04	.03	.02	.02

e Estimated.

## 02047500 BLACKWATER RIVER NEAR DENDRON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1942 - 1986, 1989 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	145	205	317	495	565	654	463	260	151	144	173	139
MAX	1128	1108	1240	1473	1205	1501	1271	879	988	1364	912	1329
(WY)	1973	1980	1958	1978	1957	1975	1989	1958	1963	1945	1969	1979
MIN	.000	.000	2.65	21.1	70.8	79.5	87.2	25.8	2.62	.32	.000	.000
(WY)	(a)	(b)	1981	1981	1942	1981	1981	1991	1944	1957	(c)	(d)

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

WATER YEARS 1942 - 1986,  
1989 - 1994

ANNUAL TOTAL	108922.65	87176.87	309
ANNUAL MEAN	298	239	622
HIGHEST ANNUAL MEAN			57.5
LOWEST ANNUAL MEAN			1958
HIGHEST DAILY MEAN	2540 Mar 8	4260 Mar 4	5540 Sep 28 1985
LOWEST DAILY MEAN	.00 fJul 17	.00 gOct 1	.00 (h)
ANNUAL SEVEN-DAY MINIMUM	.00 iJul 17	.00 kOct 1	.00 (h)
INSTANTANEOUS PEAK FLOW		4440 Mar 4	5850 Sep 28 1985
INSTANTANEOUS PEAK STAGE		8.12 Mar 4	9.11 Sep 28 1985
INSTANTANEOUS LOW FLOW		.00 (m)	
ANNUAL RUNOFF (CFSM)	1.02	.81	1.05
ANNUAL RUNOFF (INCHES)	13.78	11.03	14.28
10 PERCENT EXCEEDS	923	712	780
50 PERCENT EXCEEDS	65	35	160
90 PERCENT EXCEEDS	.00	.00	2.2

a Monthly mean flow is 0.0 ft<sup>3</sup>/s in 1955, 1969, 1981, 1984, 1994.

b Monthly mean flow is 0.0 ft<sup>3</sup>/s in 1955, 1981.

c Monthly mean flow is 0.0 ft<sup>3</sup>/s in 1976, 1980, 1993.

d Monthly mean flow is 0.0 ft<sup>3</sup>/s in 1944, 1954, 1980, 1983, 1993.

f Also July 18 to Nov. 7, 1993.

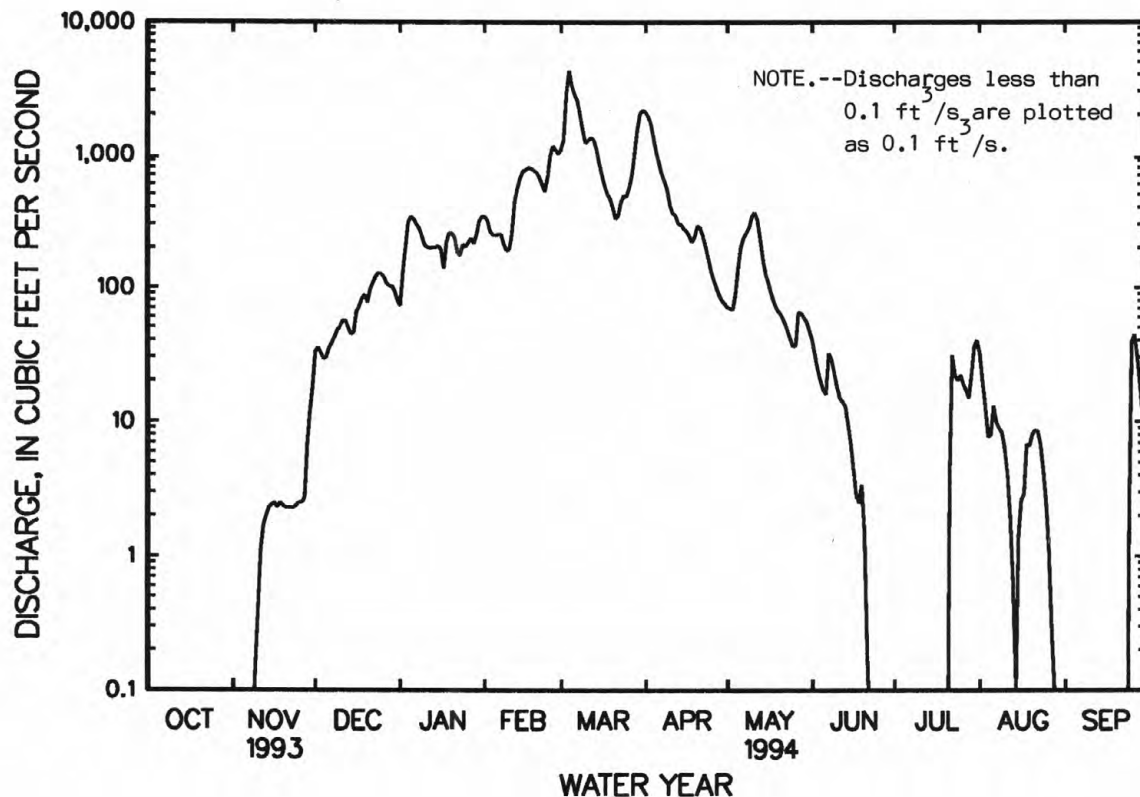
g Also Oct. 2 to Nov. 7, 1993, and June 24 to July 20, Aug. 31 to Sept. 23, 1994.

h No flow at times most years.

j Also July 18 to Nov. 1, 1993.

k Also Oct. 2 to Nov. 1, 1993, and June 24 to July 14, Aug. 31 to Sept. 17, 1994.

m No flow part or all of each day Oct. 1 to Nov. 8, 1993, and June 23 to July 21, Aug. 31 to Sept. 23, 1994.



## CHOWAN RIVER BASIN

02049500 BLACKWATER RIVER NEAR FRANKLIN, VA

LOCATION.--Lat 36°45'45", long 76°53'55", Southampton County, Hydrologic Unit 03010202, on right bank 0.4 mi south of Burdette, 0.5 mi upstream from Black Creek, 3.3 mi downstream from Corrowaugh Swamp, and 6.0 mi north of Franklin.

DRAINAGE AREA.--617 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1944 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1.56 ft above sea level.

REMARKS.--Records good except those for period with ice effect, Jan. 16-22, which is fair, and periods of tidal effect below 25 ft<sup>3</sup>/s October, November, and June to September, which are poor. Low flow reversed by tide some years. Diversion upstream from station by city of Norfolk for municipal water supply most years. Maximum discharge, 9,420 ft<sup>3</sup>/s, from rating curve extended above 9,400 ft<sup>3</sup>/s.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of about 22 ft, discharge, 21,000 ft<sup>3</sup>/s, from rating curve extended above 9,400 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,750 ft<sup>3</sup>/s, Mar. 5, gage height, 13.83 ft; minimum daily, 0.53 ft<sup>3</sup>/s, Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.58	6.4	23	211	682	2050	3400	173	92	5.6	418	1.5		
2	.53	2.2	21	233	676	2090	3380	144	74	3.8	382	2.9		
3	1.0	2.0	21	271	639	3430	3240	121	56	2.6	278	1.9		
4	1.6	2.0	28	328	594	4940	3020	121	38	1.8	180	1.6		
5	1.9	3.0	41	406	557	5670	2740	156	22	1.1	106	1.6		
6	1.3	4.1	58	482	551	5620	2410	207	20	.73	100	1.6		
7	.80	3.0	65	539	544	5060	2060	261	19	.73	105	1.8		
8	1.7	1.9	65	567	532	4390	1730	303	14	.77	82	2.0		
9	3.2	1.7	62	561	521	3890	1450	338	20	.62	58	2.1		
10	4.5	1.5	51	520	519	3540	1220	359	16	.62	33	2.0		
11	1.7	1.5	47	471	550	3910	1040	364	14	.64	16	1.8		
12	.70	1.7	46	432	850	3790	891	359	11	.78	6.7	1.6		
13	1.8	3.0	52	415	1360	3420	773	362	6.7	.80	5.0	1.4		
14	6.2	4.4	57	406	1660	3020	700	373	4.2	1.4	4.5	1.5		
15	4.1	5.2	63	405	1850	2680	665	368	3.0	2.1	5.6	1.4		
16	5.2	5.0	78	e385	1880	2380	643	335	5.5	5.2	15	1.4		
17	14	4.4	114	e360	1800	2070	614	284	12	16	25	1.6		
18	13	4.5	156	e375	1680	1770	579	231	39	4.7	25	2.1		
19	11	4.5	196	e400	1550	1510	545	199	42	3.8	18	1.5		
20	15	4.7	222	e440	1390	1290	507	147	28	5.2	9.3	1.1		
21	13	5.0	246	e445	1260	1120	464	107	7.6	8.8	4.4	1.1		
22	10	5.1	258	e425	1150	1030	433	85	2.1	12	2.4	4.7		
23	4.3	5.1	275	370	1050	1000	425	73	2.4	13	1.4	22		
24	2.1	5.1	293	358	1140	986	429	63	4.5	13	1.3	27		
25	2.0	5.1	306	365	1550	1040	415	55	5.0	29	2.8	27		
26	2.9	5.1	309	381	2010	1210	364	50	6.0	20	4.1	25		
27	2.4	5.3	300	389	2240	1430	318	77	9.0	20	3.6	25		
28	2.0	22	282	411	2220	1910	276	116	9.7	32	1.0	14		
29	6.5	13	266	504	---	2430	234	135	9.0	64	.93	5.4		
30	20	10	249	590	---	2910	195	147	10	295	2.3	2.6		
31	23	---	223	650	---	3210	---	125	---	460	1.5	---		
TOTAL	178.01	147.5	4473	13095	33005	84796	35160	6238	601.7	1025.79	1897.83	188.2		
MEAN	5.74	4.92	144	422	1179	2735	1172	201	20.1	33.1	61.2	6.27		
MAX	23	22	309	650	2240	5670	3400	373	92	460	418	27		
MIN	.53	1.5	21	211	519	986	195	50	2.1	.62	.93	1.1		
(†)	1.19	1.28	34.1	36.4	37.0	3.08	6.67	34.0	19.3	10.6	76.4	6.67		
MEAN#	6.93	6.20	178	458	1216	2738	1179	235	39.4	43.7	87.6	12.9		
CFSM#	.01	.01	.29	.74	1.97	4.44	1.91	.38	.06	.07	.14	.02		
IN.#	.01	.01	.33	.86	2.05	5.12	2.13	.44	.07	.08	.16	.02		
CAL YR 1993	TOTAL	236509.07	MEAN	648	MAX	3460	MIN	.53	MEAN#	654	CFSM#	1.06	IN.#	14.39
WTR YR 1994	TOTAL	180806.03	MEAN	495	MAX	5670	MIN	.53	MEAN#	513	CFSM#	.83	IN.#	11.29

† Average diversion, in cubic feet per second, by city of Norfolk.

# Adjusted for diversion.

e Estimated.

## CHOWAN RIVER BASIN

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02049500 BLACKWATER RIVER NEAR FRANKLIN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1994, BY WATER YEAR (WY) [UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	281	377	633	1013	1163	1288	944	563	359	296	358	275
MAX	1795	1713	2082	2271	2502	2915	2783	1890	1925	2003	1481	2490
(WY)	1973	1980	1958	1978	1957	1989	1989	1958	1963	1945	1969	1960
MIN	.94	1.69	2.12	12.5	152	158	129	51.4	15.0	3.02	3.37	2.34
(WY)	1988	1981	1981	1981	1981	1981	1966	1985	1986	1986	1993	1944

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1944 - 1994

ANNUAL TOTAL	236509.07	180806.03	
ANNUAL MEAN	648	495	
HIGHEST ANNUAL MEAN			1155
LOWEST ANNUAL MEAN			133
HIGHEST DAILY MEAN	3460	Mar 8	9420
LOWEST DAILY MEAN	.53	Oct 2	.07
ANNUAL SEVEN-DAY MINIMUM	1.1	Oct 1	.26
INSTANTANEOUS PEAK FLOW			9420
INSTANTANEOUS PEAK STAGE			17.14
INSTANTANEOUS LOW FLOW			(c)
ANNUAL RUNOFF (CFSM)	1.05		1.02
ANNUAL RUNOFF (INCHES)	14.26		13.81
10 PERCENT EXCEEDS	2080		1620
50 PERCENT EXCEEDS	156		379
90 PERCENT EXCEEDS	2.3		9.4

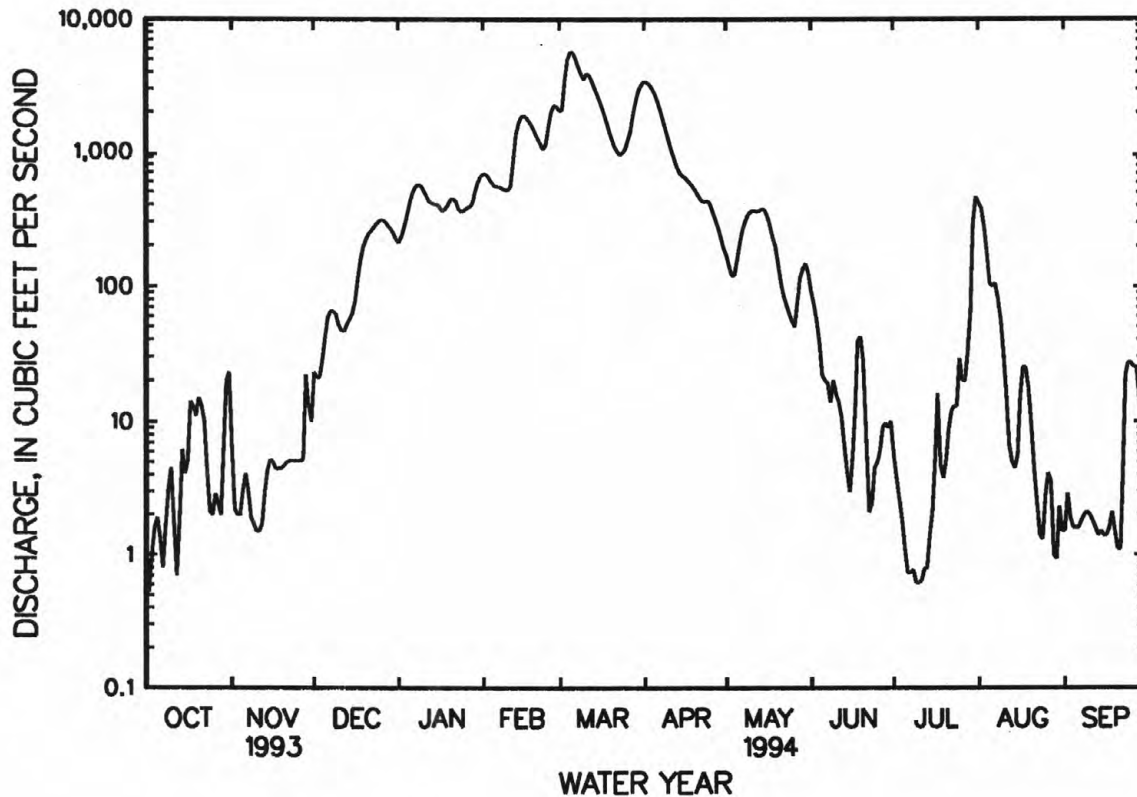
a From floodmarks.

b Also Oct. 2, 1993.

c Not determined, tidally affected most years during periods of extreme low flows; minimum measured flow, 2.4 ft<sup>3</sup>/s (reverse flow), Sept. 17, 1952. The figure published in the 1993 report (.07 ft<sup>3</sup>/s) was in error.

d Not determined. The date published in the 1993 report (Oct. 16, 1981) was in error.

f This figure should have appeared in the 1993 report; erroneously published as not determined.





## CHOWAN RIVER BASIN

02049500 BLACKWATER RIVER NEAR FRANKLIN, VA--Continued  
(National water-quality assessment station)

## WATER-QUALITY RECORDS

LOCATION.--Samples taken at bridge 2.0 mi upstream from discharge station.

PERIOD OF RECORD.--Water years 1947, 1952, 1975 to current year.

REMARKS.--These data are a part of the Albemarle-Pimlico National Water-Quality Assessment (NAWQA) program.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION) (00301)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)
OCT										
14...	0930	0.0	139	6.9	10.0	14.5	771	3.9	38	59
NOV										
10...	0930	1.5	146	7.0	9.0	9.0	774	7.4	63	K8
DEC										
03...	1200	21	208	6.5	18.0	7.5	775	6.3	51	170
JAN										
06...	1130	481	199	5.9	8.0	2.5	781	11.4	81	290
FEB										
16...	1500	1880	111	6.0	14.0	4.0	783	12.3	91	74
MAR										
24...	1030	983	93	6.7	22.5	13.0	762	7.7	73	--
APR										
14...	1030	702	90	6.3	20.5	17.0	764	5.7	59	--
MAY										
11...	1030	365	95	6.4	19.0	15.5	758	6.0	60	--
JUN										
15...	0930	0.0	120	6.7	30.0	24.0	769	4.5	53	--
JUL										
18...	1200	3.9	149	6.7	34.0	26.0	768	3.3	40	--
AUG										
18...	1200	25	123	6.7	27.0	25.0	767	6.0	72	--
SEP										
15...	1100	1.4	150	6.9	31.5	20.5	771	8.6	94	--

DATE	STREP- TOCOC FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
OCT										
14...	55	51	16	2.8	5.4	3.4	49	40	7.3	9.7
NOV										
10...	83	54	17	2.9	6.1	3.2	50	41	10	8.8
DEC										
03...	44	76	25	3.3	6.4	4.2	57	47	31	10
JAN										
06...	490	66	21	3.4	6.6	2.5	2	2	56	14
FEB										
16...	130	33	10	1.9	4.2	2.2	4	3	22	10
MAR										
24...	--	29	9.1	1.6	3.5	1.8	9	7	16	8.0
APR										
14...	--	32	10	1.6	3.3	2.0	15	13	11	7.9
MAY										
11...	--	34	11	1.7	3.9	2.0	20	17	5.8	9.7
JUN										
15...	--	46	15	2.1	4.3	2.0	38	31	6.1	10
JUL										
18...	--	56	18	2.8	4.7	4.4	43	36	14	10
AUG										
18...	--	46	14	2.6	4.1	2.9	20	16	17	10
SEP										
15...	--	54	17	2.9	5.6	2.8	40	33	13	12

K Results based on colony count outside the acceptance range (non-ideal colony count).

## CHOWAN RIVER BASIN

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02049500 BLACKWATER RIVER NEAR FRANKLIN, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)
OCT 14...	0.10	3.8	84	74	--	<0.010	0.190	0.190	0.130	0.70
NOV 10...	0.10	3.0	92	77	--	<0.010	0.350	0.350	0.020	0.40
DEC 03...	<0.10	7.1	135	117	--	<0.010	0.220	0.220	0.030	0.30
JAN 06...	<0.10	11	137	117	--	<0.010	0.210	0.210	0.010	0.40
FEB 16...	<0.10	5.6	78	62	0.760	0.060	0.820	0.820	0.030	0.50
MAR 24...	<0.10	3.5	64	49	--	<0.010	0.200	0.200	0.060	0.40
APR 14...	<0.10	3.7	73	48	--	<0.010	0.130	0.130	0.050	0.70
MAY 11...	<0.10	7.1	95	53	0.120	0.010	0.130	0.130	0.060	0.90
JUN 15...	<0.10	7.5	105	70	--	<0.010	0.330	0.330	0.080	0.80
JUL 18...	0.10	4.6	113	82	--	<0.010	0.120	0.120	0.040	0.80
AUG 18...	0.10	7.9	70	71	--	<0.010	0.270	0.270	0.090	0.70
SEP 15...	0.10	6.8	117	82	--	<0.010	0.120	0.120	0.040	0.60

DATE	NITRO- GEN,AM- MONIA + ORGANIC DIS- (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 14...	0.40	0.050	0.020	0.020	150	130	7.6	0.8	10	71
NOV 10...	0.30	0.040	0.020	0.010	75	45	7.1	0.4	6	78
DEC 03...	0.20	0.090	<0.010	<0.010	230	460	7.4	0.3	4	93
JAN 06...	0.30	0.020	0.010	<0.010	150	420	7.7	0.2	4	85
FEB 16...	0.30	0.020	0.020	<0.010	170	69	7.9	0.3	7	82
MAR 24...	0.40	0.020	0.020	<0.010	310	34	9.8	0.3	5	93
APR 14...	0.50	0.040	<0.010	<0.010	790	89	14	1.3	5	94
MAY 11...	0.90	0.050	0.050	0.040	1600	72	17	0.3	6	85
JUN 15...	0.70	0.050	0.030	0.020	2100	350	15	0.4	8	86
JUL 18...	0.50	0.060	0.010	<0.010	410	780	11	1.0	11	95
AUG 18...	0.60	0.050	0.050	0.030	1200	210	14	0.7	11	100
SEP 15...	0.60	0.030	0.020	0.010	1100	240	15	0.8	7	93

&lt; Actual value is known to be less than the value shown.

## CHOWAN RIVER BASIN

02051000 NORTH MEHERRIN RIVER NEAR LUNENBURG, VA

LOCATION.--Lat 36°59'53", long 78°21'03", Lunenburg County, Hydrologic Unit 03010204, on right bank at upstream side of bridge on State Highway 40, 0.5 mi downstream from Tusekiah Creek, 4.6 mi upstream from Juniper Creek, and 5.2 mi northwest of Lunenburg.

DRAINAGE AREA.--55.6 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1946 to September 1980, October 1981 to current year.

REVISED RECORDS.--WSP 1303: 1947(M), 1949(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 333.7 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to July 5, 1951, nonrecording gage at same site and datum. July 5, 1951, to July 11, 1980, water-stage recorder at site 20 ft downstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 30, 31, and Jan. 16, which are fair. Maximum discharge, 14,400 ft<sup>3</sup>/s, from rating curve extended above 1,700 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 48 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 16	0800	*1,210	*8.86	No peak equal to or greater than base discharge.			

Minimum discharge, 0.28 ft<sup>3</sup>/s, Oct. 5, gage height, 0.31 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.58	4.9	20	17	41	46	138	36	11	12	12	4.7
2	.58	3.0	16	111	34	482	88	33	10	8.0	10	4.9
3	.50	2.2	14	104	29	422	69	27	10	5.9	8.7	4.9
4	.45	2.4	14	197	26	166	59	160	9.2	8.5	8.0	4.3
5	.45	2.7	312	95	28	97	52	103	9.5	6.5	6.8	3.7
6	.38	3.9	139	53	38	69	65	59	9.7	5.3	6.3	4.0
7	.38	6.2	50	40	31	59	69	44	10	4.7	5.1	4.7
8	.45	5.2	30	49	26	53	53	84	9.7	4.2	4.9	3.8
9	.50	3.6	22	40	47	62	46	50	9.7	3.5	4.5	3.5
10	.48	3.1	19	28	84	235	43	36	10	3.2	4.9	3.4
11	.50	3.0	19	26	153	152	40	30	47	5.1	32	3.1
12	1.0	2.8	16	58	180	78	37	27	25	5.5	8.5	2.7
13	1.8	2.8	14	70	151	62	47	24	16	5.3	5.7	2.6
14	1.4	3.0	13	47	197	56	47	22	12	33	4.7	2.4
15	1.2	3.1	72	30	172	48	134	21	11	9.7	4.9	2.3
16	1.1	3.1	162	e27	150	42	467	32	9.5	6.5	13	2.2
17	1.2	3.1	53	24	105	37	125	23	9.5	5.1	38	2.1
18	1.5	3.3	33	129	78	36	76	19	9.5	9.0	90	7.5
19	1.5	4.1	34	87	61	36	59	19	8.5	6.8	18	5.1
20	1.6	3.6	29	47	51	32	50	19	7.7	5.3	16	3.5
21	2.0	3.3	271	26	44	38	42	18	7.0	12	11	2.8
22	4.1	3.0	104	24	40	80	38	17	6.8	13	12	4.9
23	2.7	3.0	56	25	298	51	36	16	6.5	20	9.7	15
24	2.0	3.0	40	28	405	42	34	14	7.7	11	7.2	7.0
25	1.8	3.1	31	30	142	118	32	14	7.5	7.2	6.5	5.3
26	1.8	3.3	26	32	83	74	30	15	6.1	7.0	5.9	5.1
27	2.2	86	21	30	58	210	28	18	5.3	36	5.7	21
28	2.5	319	21	166	48	451	32	18	5.7	17	5.5	8.5
29	2.1	90	22	144	---	209	28	13	5.5	82	5.3	5.3
30	5.2	36	e18	71	---	184	44	12	6.1	75	5.1	4.0
31	8.9	---	e16	51	---	122	---	12	---	18	4.5	---
TOTAL	52.85	618.8	1707	1906	2800	3849	2108	1035	318.7	451.3	380.4	154.3
MEAN	1.70	20.6	55.1	61.5	100	124	70.3	33.4	10.6	14.6	12.3	5.14
MAX	8.9	319	312	197	405	482	467	160	47	82	90	21
MIN	.38	2.2	13	17	26	32	28	12	5.3	3.2	4.5	2.1
CFSM	.03	.37	.99	1.11	1.80	2.23	1.26	.60	.19	.26	.22	.09
IN.	.04	.41	1.14	1.28	1.87	2.58	1.41	.69	.21	.30	.25	.10

e Estimated.

## CHOWAN RIVER BASIN

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02051000 NORTH MEHERRIN RIVER NEAR LUNENBURG, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	34.8	47.2	54.5	71.6	90.7	96.7	78.1	46.3	27.0	20.4	20.0	26.1
MAX	442	299	186	194	249	293	223	161	154	98.6	138	292
(WY)	1972	1986	1949	1978	1979	1975	1978	1971	1968	1975	1955	1979
MIN	1.70	4.37	7.22	12.7	18.7	32.8	16.2	11.2	3.97	2.72	1.83	.16
(WY)	1994	1992	1966	1955	1968	1985	1967	1964	1964	1957	1977	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

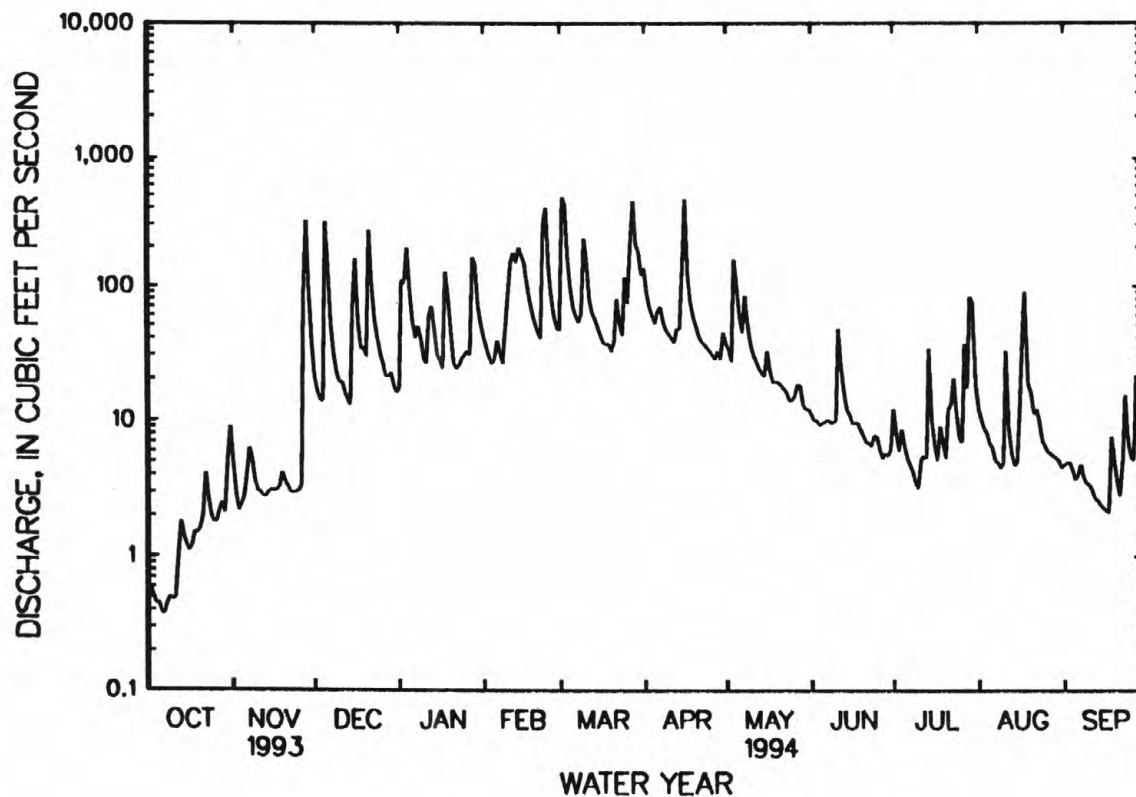
## FOR 1994 WATER YEAR

## WATER YEARS 1947 - 1994

ANNUAL TOTAL	16516.35	15381.35	
ANNUAL MEAN	45.3	42.1	50.9
HIGHEST ANNUAL MEAN			98.8
LOWEST ANNUAL MEAN			21.2
HIGHEST DAILY MEAN	840	482	6710
LOWEST DAILY MEAN	.38	.38	.00
ANNUAL SEVEN-DAY MINIMUM	.44	.44	.00
INSTANTANEOUS PEAK FLOW		1210	14400
INSTANTANEOUS PEAK STAGE		8.86	28.30
INSTANTANEOUS LOW FLOW		.28	.00
ANNUAL RUNOFF (CFSM)	.81	.76	.92
ANNUAL RUNOFF (INCHES)	11.05	10.29	12.43
10 PERCENT EXCEEDS	109	104	94
50 PERCENT EXCEEDS	19	18	20
90 PERCENT EXCEEDS	.95	2.7	3.9

a Also Oct. 7, 1993.

b Also Sept. 6-21 and Oct. 8-14, 1954.



## CHOWAN RIVER BASIN

02051500 MEHERRIN RIVER NEAR LAWRENCEVILLE, VA

LOCATION.--Lat 36°43'00", long 77°49'55", Brunswick County, Hydrologic Unit 03010204, on right bank 50 ft upstream from Gholson Bridge on State Highway 715, 0.6 mi upstream from Allen Creek, and 3.0 mi southeast of Lawrenceville.

DRAINAGE AREA.--552 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1932(M), 1935. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 136.56 ft above sea level. Prior to Nov. 17, 1931, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 28 to Jan. 1 and Jan. 19-24, and for period of no gage-height record, Feb. 2 to Mar. 1, which are fair. Maximum discharge, 38,000 ft<sup>3</sup>/s, from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of velocity-area studies and records for Nottoway River near Stony Creek. Minimum gage height, 0.72 ft, Sept. 23, 24, 1932. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 29	2130	5,130	16.76	Mar. 4	1230	*10,300	*24.60
Feb. 25	0430	4,510	15.46	Mar. 30	1230	5,590	17.65

Minimum discharge, 13 ft<sup>3</sup>/s, Oct. 7-8, gage height, 1.28 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	76	404	e200	505	e580	1250	501	137	103	261	69
2	24	67	264	441	e450	2270	1190	334	133	188	197	115
3	21	55	204	1010	e400	6910	843	266	125	127	136	111
4	18	46	167	855	e365	9900	698	315	119	101	113	83
5	18	42	223	1370	e350	5870	611	729	118	91	103	75
6	17	57	2120	765	e425	1130	559	680	118	80	152	70
7	14	70	880	492	e365	836	588	482	154	74	119	67
8	14	67	434	409	e320	710	597	376	132	69	90	65
9	15	60	291	402	e360	659	502	350	122	63	80	63
10	16	55	226	382	e440	675	451	360	126	58	73	67
11	15	51	213	298	e800	1460	432	279	193	56	68	62
12	16	46	201	305	e2000	1100	413	240	209	59	67	59
13	18	43	173	644	e1800	733	439	215	197	58	75	56
14	19	41	152	686	e2200	631	762	196	157	59	74	53
15	19	39	172	473	e1900	572	631	185	131	63	111	51
16	18	40	846	309	e1600	515	624	228	116	80	178	49
17	19	39	1100	216	e1300	464	2220	264	129	74	218	47
18	23	39	518	594	e1000	429	930	206	145	134	609	50
19	26	42	374	e990	e770	417	621	180	134	131	527	51
20	26	42	331	e520	e650	405	506	169	113	103	351	56
21	24	41	1110	e355	e550	386	433	174	101	157	241	51
22	24	40	2510	e335	e480	504	386	171	111	107	165	76
23	25	40	843	e385	e590	785	358	164	95	124	145	151
24	23	41	539	e400	e2850	563	336	152	117	156	120	121
25	20	41	418	341	e3100	546	322	148	107	118	101	91
26	22	40	342	337	e1700	1250	298	146	85	101	88	89
27	36	57	286	314	e890	971	276	292	80	91	82	73
28	42	1680	e240	406	e660	3410	273	264	78	131	108	60
29	41	4660	e215	1900	---	5100	268	193	79	391	84	55
30	46	2210	e190	1150	---	5450	343	158	82	895	75	65
31	92	---	e175	668	---	2190	---	144	---	398	71	---
TOTAL	772	9867	16161	17952	28820	57421	18160	8561	3743	4440	4882	2151
MEAN	24.9	329	521	579	1029	1852	605	276	125	143	157	71.7
MAX	92	4660	2510	1900	3100	9900	2220	729	209	895	609	151
MIN	14	39	152	200	320	386	268	144	78	56	67	47
CFSM	.05	.60	.94	1.05	1.86	3.36	1.10	.50	.23	.26	.29	.13
IN.	.05	.66	1.09	1.21	1.94	3.87	1.22	.58	.25	.30	.33	.14

e Estimated.



## CHOWAN RIVER BASIN

403

02051500 MEHERRIN RIVER NEAR LAWRENCEVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	306	380	472	725	828	908	755	454	315	317	302	233
MAX	2266	2853	1315	2391	1811	2315	2067	1571	1555	2358	4199	1532
(WY)	1972	1986	1958	1936	1960	1993	1987	1958	1938	1945	1940	1979
MIN	17.1	44.1	64.6	88.8	175	190	162	128	96.5	42.8	38.1	9.70
(WY)	1931	1934	1966	1934	1931	1981	1966	1942	1959	1932	1930	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

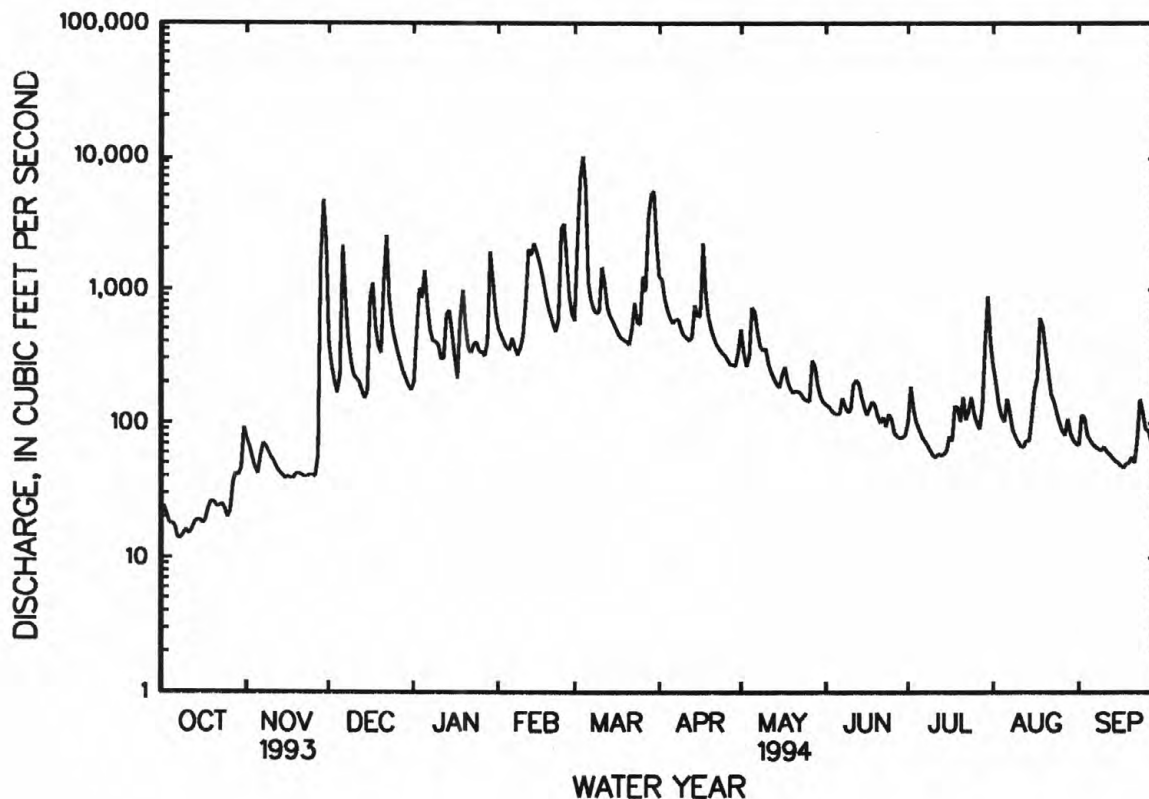
## FOR 1994 WATER YEAR

## WATER YEARS 1929 - 1994

ANNUAL TOTAL	204059	172930	
ANNUAL MEAN	559	474	498
HIGHEST ANNUAL MEAN			916
LOWEST ANNUAL MEAN			202
HIGHEST DAILY MEAN	12400	Mar 6	9900
LOWEST DAILY MEAN	14	Sep 3	14
ANNUAL SEVEN-DAY MINIMUM	15	Oct 6	15
INSTANTANEOUS PEAK FLOW			10300
INSTANTANEOUS PEAK STAGE			24.60
INSTANTANEOUS LOW FLOW			13
ANNUAL RUNOFF (CFSM)	1.01		.86
ANNUAL RUNOFF (INCHES)	13.75		11.65
10 PERCENT EXCEEDS	1230		994
50 PERCENT EXCEEDS	226		188
90 PERCENT EXCEEDS	22		41

a Also Oct. 8, 1993.

b Also Oct. 8, 1954.



## CHOWAN RIVER BASIN

02052000 MEHERRIN RIVER AT EMPORIA, VA

LOCATION.--Lat 36°41'24", long 77°32'27", Emporia City, Hydrologic Unit 03010204, on left bank at downstream side of bridge on U.S. Highway 301 and 1.2 mi upstream from Falling Run.

DRAINAGE AREA.--747 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1951 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 67.17 ft above sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except those for periods of doubtful gage-height record, Oct. 1-11, 14, 15, 17, 18, 24, Nov. 13, 14, 17, 21, and July 11-14, and periods with ice effect, Dec. 28, 30, 31, and Jan. 15-17, which are fair. Prior to November 1965 and since April 1986, low and medium flow regulated by powerplant 0.8 mi upstream from station. Minimum discharge, 5.0 ft<sup>3</sup>/s, Nov. 11, 1954, gage height, 1.00 ft, result of regulation. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 31.5 ft, from floodmarks, discharge, about 40,000 ft<sup>3</sup>/s, from rating curve extended above 18,000 ft<sup>3</sup>/s on basis of record for station near Lawrenceville.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,700 ft<sup>3</sup>/s, Mar. 5, gage height, 22.41 ft; minimum, 12 ft<sup>3</sup>/s, Oct. 12, result of regulation; minimum daily, 20 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e29	149	1220	184	834	745	2580	604	206	110	274	85
2	e36	99	356	392	606	2230	1960	573	197	129	371	121
3	e31	139	330	1200	579	6850	1450	407	187	187	251	138
4	e27	113	189	1380	438	8780	1120	464	135	181	194	146
5	e25	98	275	1400	401	9950	967	694	113	155	194	114
6	e23	115	1390	1470	531	4660	786	1140	126	138	183	99
7	e21	119	2110	720	595	1710	783	589	135	95	163	96
8	e20	148	639	528	378	1140	880	609	196	86	190	92
9	e22	142	382	508	571	1000	770	432	172	72	126	90
10	e24	109	329	452	554	971	614	455	177	63	105	74
11	e22	108	297	421	670	1380	612	444	179	e78	94	77
12	41	118	222	357	1310	1960	599	336	372	e70	112	86
13	39	e94	222	495	2320	1220	548	292	219	e65	100	87
14	e44	e84	200	1030	2130	928	873	285	196	e62	94	77
15	e47	179	202	e640	2530	747	1050	229	189	87	107	77
16	30	105	376	e450	2300	817	935	299	160	72	224	70
17	e31	e83	1650	e280	1850	578	2060	334	209	61	252	59
18	e35	116	877	229	1530	571	1870	333	226	123	484	71
19	58	135	557	1160	1080	640	1020	234	183	195	736	87
20	65	81	378	839	900	507	583	333	186	201	384	83
21	31	e86	644	446	713	413	696	246	150	251	466	72
22	91	131	2910	396	619	738	445	161	153	180	332	205
23	56	143	1950	436	555	912	436	266	131	172	136	316
24	e33	123	848	478	1850	916	478	204	244	199	168	191
25	42	78	598	500	4830	715	454	173	136	182	174	127
26	74	136	448	415	3400	1400	387	220	131	178	148	89
27	73	89	336	375	1510	1730	325	364	115	119	91	117
28	80	952	e315	430	1030	3110	348	433	111	149	69	114
29	80	3790	321	1440	---	5520	375	231	107	560	166	113
30	113	4700	e290	2290	---	6030	376	200	111	1530	134	98
31	113	---	e240	1210	---	5180	---	213	---	1160	92	---
TOTAL	1456	12562	21101	22551	36614	74048	26380	11797	5152	6910	6614	3271
MEAN	47.0	419	681	727	1308	2389	879	381	172	223	213	109
MAX	113	4700	2910	2290	4830	9950	2580	1140	372	1530	736	316
MIN	20	78	189	184	378	413	325	161	107	61	69	59
CFSM	.06	.56	.91	.97	1.75	3.20	1.18	.51	.23	.30	.29	.15
IN.	.07	.63	1.05	1.12	1.82	3.69	1.31	.59	.26	.34	.33	.16

e Estimated.

## CHOWAN RIVER BASIN

405

02052000 MEHERRIN RIVER AT EMPORIA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	420	541	681	1057	1233	1357	1087	658	428	337	300	262
MAX	3057	3711	1772	3063	2730	3235	3077	2244	1399	2647	1536	1810
(WY)	1973	1986	1973	1978	1979	1993	1987	1958	1972	1975	1955	1979
MIN	37.7	60.0	89.9	159	298	261	267	259	137	62.9	60.7	18.7
(WY)	1969	1955	1966	1966	1968	1981	1966	1955	1986	1954	1953	1954

## SUMMARY STATISTICS

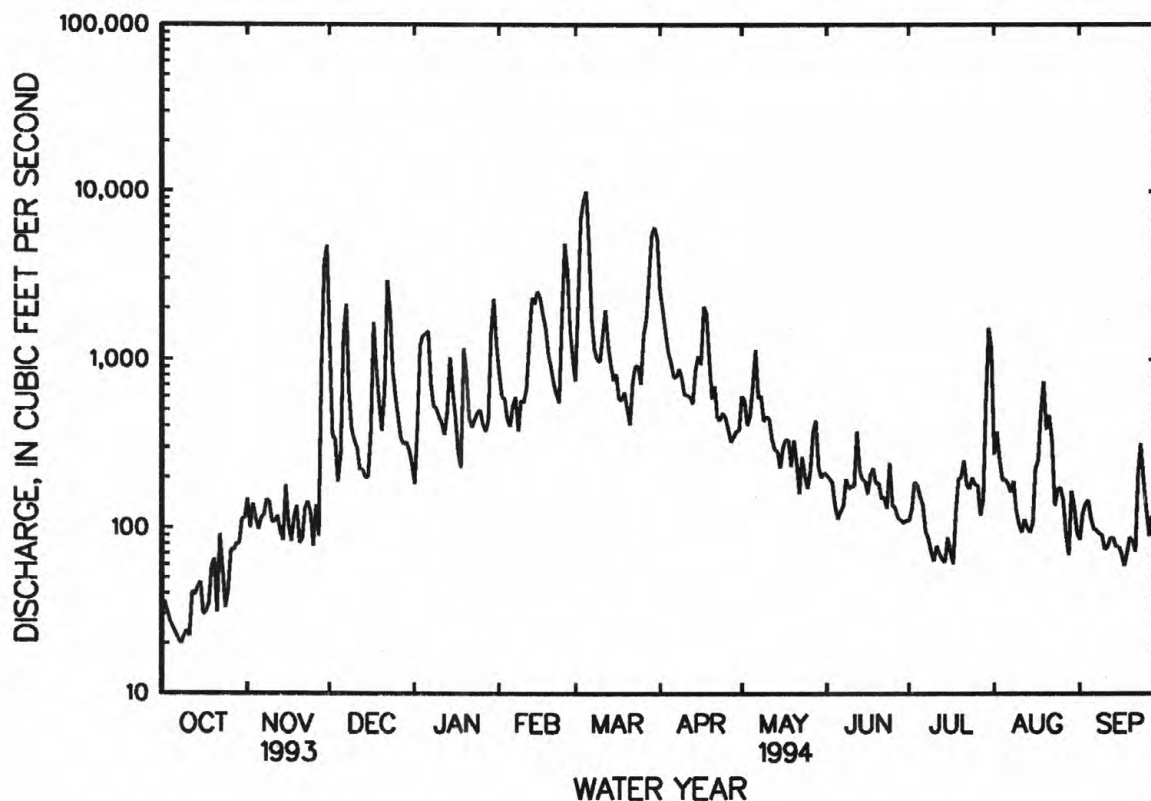
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1952 - 1994

ANNUAL TOTAL	288825		228456									
ANNUAL MEAN	791		626							694		
HIGHEST ANNUAL MEAN										1297		1973
LOWEST ANNUAL MEAN										248		1981
HIGHEST DAILY MEAN	12900	Mar 7		9950	Mar 5				20700	Oct 8	8	1972
LOWEST DAILY MEAN	e20	Oct 8		e20	Oct 8				a7.1	Jul 20	1986	
ANNUAL SEVEN-DAY MINIMUM	e22	Oct 5		e22	Oct 5				a9.1	Nov 4	1954	
INSTANTANEOUS PEAK FLOW				10700	Mar 5				21100	Oct 8	1972	
INSTANTANEOUS PEAK STAGE				22.41	Mar 5				27.38	Oct 8	1972	
INSTANTANEOUS LOW FLOW				a12	Oct 12				a5.0	Nov 11	1954	
ANNUAL RUNOFF (CFSM)	1.06			.84					.93			
ANNUAL RUNOFF (INCHES)	14.38			11.38					12.62			
10 PERCENT EXCEEDS	1950			1440					1440			
50 PERCENT EXCEEDS	291			246					360			
90 PERCENT EXCEEDS	34			73					69			

a Result of regulation.  
e Estimated.



## CHOWAN RIVER BASIN

02052500 FOUNTAINS CREEK NEAR BRINK, VA

LOCATION.--Lat 36°36'55", long 77°42'00", Greensville County, Hydrologic Unit 03010204, on left bank 30 ft upstream from bridge on State Highway 603, 0.3 mi downstream from Quarrel Creek, 3.6 mi west of Brink, and 10 mi southwest of Emporia.

DRAINAGE AREA.--65.2 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1953 to current year. Prior to October 1980, published as Fontaine Creek near Brink.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 152.59 ft above sea level.

REMARKS.--Records good except those for periods of no gage-height record, Oct. 7-14 and Jan. 19-22, and periods with ice effect, Dec. 29-31 and Jan. 23, 24, which are fair. Maximum discharge, 16,000 ft<sup>3</sup>/s, from rating curve extended above 3,000 ft<sup>3</sup>/s. No flow at times most years. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 3	0600	*3,510	*17.33	No other peak equal to or greater than base discharge.			

No flow part or all of each day Oct. 1-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	5.5	36	29	56	74	206	21	4.2	1.3	17	1.9
2	.00	3.5	20	164	48	959	145	19	3.9	1.2	10	2.3
3	.00	2.4	12	163	42	2940	104	16	3.5	.99	7.0	3.9
4	.00	1.9	8.7	117	39	1020	82	32	3.0	1.0	5.1	3.5
5	.00	2.0	56	93	42	258	70	51	2.7	1.4	5.5	3.2
6	.00	4.3	101	66	77	135	67	43	2.5	1.0	26	2.7
7	.00	8.2	69	52	68	97	68	32	2.6	.75	18	2.4
8	.00	6.1	39	48	54	81	57	26	2.8	.56	9.4	2.1
9	.00	4.3	25	46	49	83	49	21	2.8	.36	5.8	1.9
10	.00	3.5	18	39	63	110	45	18	3.0	.28	4.1	1.7
11	.00	2.8	25	35	96	174	42	16	12	.53	3.4	1.5
12	.00	2.4	24	48	227	113	40	15	15	.62	2.9	1.4
13	.00	2.2	18	77	202	82	43	12	10	.63	2.5	1.3
14	.00	2.0	15	68	251	72	50	11	6.9	.80	2.2	1.2
15	.00	2.0	29	54	221	66	44	9.5	5.1	.76	2.2	1.1
16	.00	2.4	151	38	173	59	60	9.6	4.1	.91	2.9	1.0
17	.00	5.5	114	33	123	52	57	8.9	17	1.2	7.2	.97
18	.00	1.8	66	101	94	48	42	7.6	21	1.4	9.3	1.2
19	.00	1.3	50	e80	77	50	35	7.0	12	3.2	7.0	1.1
20	.00	1.3	41	e54	66	47	29	7.4	7.8	2.8	35	1.1
21	.00	1.6	138	e37	60	45	26	7.3	5.3	3.3	22	.91
22	.00	1.9	137	e32	55	81	24	7.3	4.2	2.0	13	29
23	.00	1.8	92	e36	61	74	23	6.6	3.7	3.3	10	59
24	.00	1.9	68	e41	421	57	23	5.8	12	5.1	6.6	23
25	.00	2.2	54	46	430	69	22	5.2	5.0	3.0	4.7	11
26	.00	2.3	44	43	217	107	20	4.6	3.2	2.8	3.5	5.2
27	.00	6.5	36	41	110	156	18	5.1	2.3	2.0	3.1	3.0
28	.64	189	32	76	81	349	17	5.7	1.7	5.1	2.8	2.1
29	1.2	164	e28	132	---	594	16	5.1	1.5	99	2.5	1.7
30	2.0	85	e25	99	---	468	17	4.7	1.5	86	2.3	1.4
31	6.0	---	e22	70	---	233	---	4.5	---	37	2.1	---
TOTAL	9.84	521.6	1593.7	2058	3503	8753	1541	444.9	182.3	270.29	255.1	173.78
MEAN	.32	17.4	51.4	66.4	125	282	51.4	14.4	6.08	8.72	8.23	5.79
MAX	6.0	189	151	164	430	2940	206	51	21	99	35	59
MIN	.00	1.3	8.7	29	39	45	16	4.5	1.5	.28	2.1	.91
CFSM	.00	.27	.79	1.02	1.92	4.33	.79	.22	.09	.13	.13	.09
IN.	.01	.30	.91	1.17	2.00	4.99	.88	.25	.10	.15	.15	.10

e Estimated.

## 02052500 FOUNTAINS CREEK NEAR BRINK, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	43.6	46.4	69.7	108	136	146	98.4	56.3	33.3	22.7	33.7	19.1
MAX	735	430	208	312	333	389	284	250	175	300	188	223
(WY)	1973	1986	1973	1987	1984	1993	1987	1958	1972	1975	1967	1975
MIN	.000	.000	5.45	8.43	34.5	30.4	19.3	10.7	3.79	.39	.010	.000
(WY)	(a)	1955	1955	1955	1991	1981	1985	1991	1991	1981	1987	1980

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1954 - 1994

ANNUAL TOTAL	27299.85	19306.51	
ANNUAL MEAN	74.8	52.9	
HIGHEST ANNUAL MEAN			67.5
LOWEST ANNUAL MEAN			173
HIGHEST DAILY MEAN	2860	Mar 5	12.4
LOWEST DAILY MEAN	.00	hAug 28	e13500
ANNUAL SEVEN-DAY MINIMUM	.00	fAug 28	.00
INSTANTANEOUS PEAK FLOW			.00
INSTANTANEOUS PEAK STAGE			3510
INSTANTANEOUS LOW FLOW			17.33
ANNUAL RUNOFF (CFSM)	1.15		Mar 3
ANNUAL RUNOFF (INCHES)	15.58		cOct 1
10 PERCENT EXCEEDS	163		.00
50 PERCENT EXCEEDS	20		16000
90 PERCENT EXCEEDS	.00		j24.14
			.00
			1.03
			14.06
			146
			25
			1.6

a Monthly mean flow is 0.0 ft<sup>3</sup>/s in 1955 and 1982.

b Also Aug. 29 to Sept. 4 and Sept. 24 to Oct. 27, 1993.

c Also Oct. 2-27, 1993.

d Many days in 1954-55, 1957, 1959, 1966, 1968-71, 1977, 1980-83, and 1987.

e Estimated.

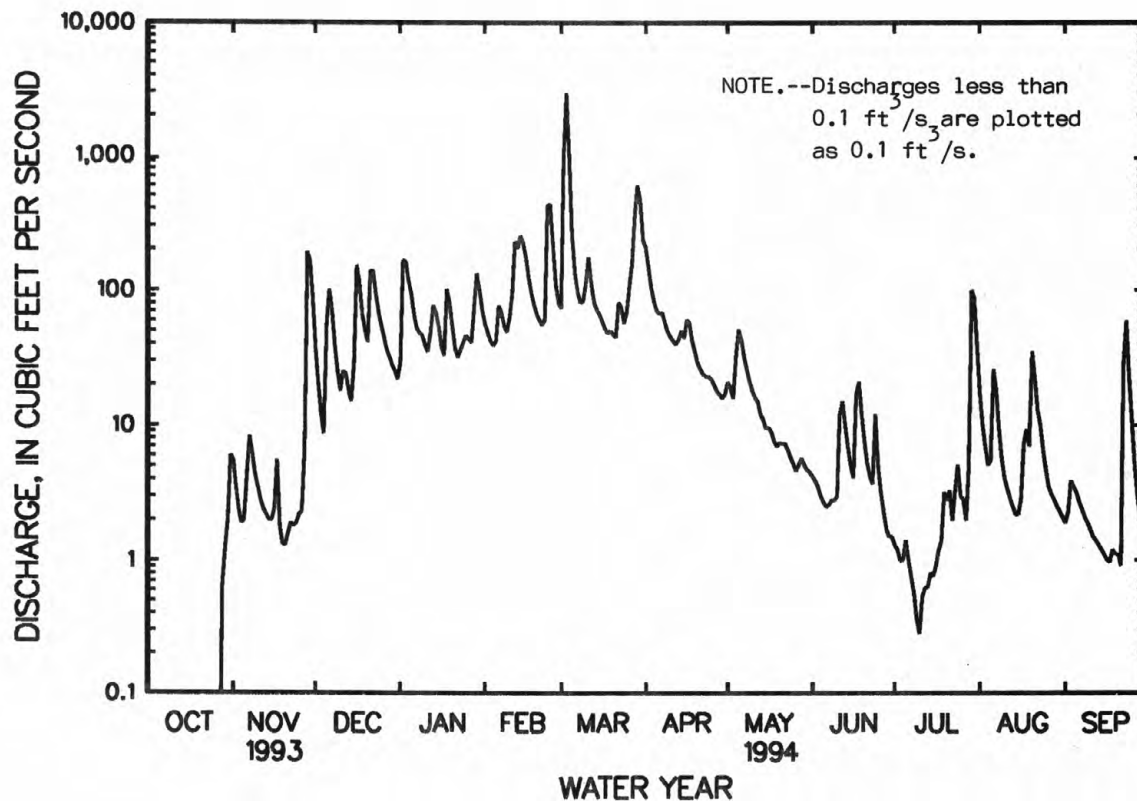
f Also Sept. 24 to Oct. 21, 1993.

g Also Oct. 2-21, 1993.

h Occurred in 1954-55, 1957, 1966, 1968-71, and 1980-83.

j From floodmarks.

k At times most years.





## ROANOKE RIVER BASIN

02053800 SOUTH FORK ROANOKE RIVER NEAR SHAWSVILLE, VA

LOCATION.--Lat 37°08'24", long 80°16'00", Montgomery County, Hydrologic Unit 03010101, on right bank 95 ft downstream from bridge on State Highway 637, 0.3 mi downstream from Georges Run, 1.3 mi downstream from Elliott Creek, and 2.0 mi southwest of Shawsville.

DRAINAGE AREA.--110 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1960 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,361.87 ft above sea level. Prior to Aug. 26, 1974, water-stage recorder, and Aug. 26, 1974, to July 24, 1975, nonrecording gage at site 95 ft upstream at same datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 26 to Jan. 2 and Jan. 19-22, which are fair. Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 14,200 ft<sup>3</sup>/s, from rating curve extended above 3,700 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Sept. 30, 1959, reached a stage of 9.89 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0500	2,640	4.39	Mar. 4	2230	917	2.68
Jan. 12	1130	1,100	2.92	Mar. 28	0330	3,440	5.06
Feb. 11	1630	1,710	3.59	July 17	1730	1,350	3.21
Feb. 23	1700	1,160	3.00	Aug. 17	1200	*3,910	*5.44

Minimum discharge, 26 ft<sup>3</sup>/s, Oct. 5-9, gage height, 0.49 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	41	53	e59	170	245	406	177	68	53	148	66
2	28	36	47	e64	143	377	333	151	65	49	125	64
3	28	35	44	75	133	396	289	144	63	49	121	63
4	27	33	121	139	123	492	258	200	63	54	160	61
5	27	39	1490	119	126	754	231	180	64	53	120	60
6	26	41	381	105	125	584	233	166	72	49	104	60
7	26	38	201	128	112	461	229	159	92	46	88	58
8	27	35	142	309	109	413	195	171	135	44	79	55
9	27	34	113	204	238	354	184	146	102	43	77	54
10	29	33	104	170	300	339	197	134	83	42	66	53
11	29	33	94	137	854	290	232	125	77	42	65	52
12	43	32	77	682	721	255	210	121	70	42	68	51
13	36	32	73	555	545	236	290	115	65	48	63	50
14	31	32	71	347	527	222	298	110	62	53	56	49
15	30	33	89	223	430	205	260	108	61	43	55	49
16	29	32	111	173	364	188	237	105	59	42	101	49
17	30	33	127	262	367	171	203	98	59	341	1670	53
18	30	36	114	246	359	170	184	96	56	194	612	65
19	30	34	105	e170	396	159	171	94	54	85	298	52
20	31	33	95	e130	441	147	161	99	63	66	197	48
21	34	32	99	e115	444	159	151	94	57	164	178	46
22	38	31	84	e105	386	169	150	89	56	244	152	46
23	34	31	80	114	777	145	144	85	63	147	122	46
24	33	31	74	121	904	141	136	81	70	95	105	45
25	32	31	71	119	586	154	131	79	63	72	95	47
26	32	31	e68	135	421	141	127	80	54	63	88	59
27	33	185	e66	126	317	341	129	84	101	238	86	47
28	33	224	e63	303	262	1920	125	75	72	445	82	43
29	33	100	e60	343	---	1230	163	73	57	252	75	42
30	50	67	e57	253	---	743	218	71	54	184	72	39
31	56	---	e55	202	---	522	---	68	---	144	68	---
TOTAL	1000	1458	4429	6233	10680	12123	6275	3578	2080	3486	5396	1572
MEAN	32.3	48.6	143	201	381	391	209	115	69.3	112	174	52.4
MAX	56	224	1490	682	904	1920	406	200	135	445	1670	66
MIN	26	31	44	59	109	141	125	68	54	42	55	39
CFSM	.29	.44	1.30	1.83	3.47	3.56	1.90	1.05	.63	1.02	1.58	.48
IN.	.34	.49	1.50	2.11	3.61	4.10	2.12	1.21	.70	1.18	1.82	.53

e Estimated.

## ROANOKE RIVER BASIN

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02053800 SOUTH FORK ROANOKE RIVER NEAR SHAWSVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	76.2	94.2	101	130	160	216	195	138	98.8	59.0	55.4	57.5
MAX	294	407	232	257	381	571	750	334	483	205	174	347
(WY)	1972	1986	1973	1978	1994	1993	1987	1978	1972	1972	1994	1989
MIN	21.4	24.4	22.1	18.9	70.1	55.6	51.0	50.7	35.2	20.6	17.4	17.8
(WY)	1992	1982	1966	1966	1981	1981	1966	1963	1966	1966	1963	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1961 - 1994

ANNUAL TOTAL	51902	58310	115
ANNUAL MEAN	142	160	205
HIGHEST ANNUAL MEAN			46.5
LOWEST ANNUAL MEAN			1972
HIGHEST DAILY MEAN	2430	Mar 24	6840
LOWEST DAILY MEAN	26	aOct 6	7.5
ANNUAL SEVEN-DAY MINIMUM	27	bOct 3	8.9
INSTANTANEOUS PEAK FLOW			14200
INSTANTANEOUS PEAK STAGE		5.44	c11.12
INSTANTANEOUS LOW FLOW		26	dOct 5
ANNUAL RUNOFF (CFSM)	1.29	1.45	1.04
ANNUAL RUNOFF (INCHES)	17.55	19.72	14.17
10 PERCENT EXCEEDS	240	350	220
50 PERCENT EXCEEDS	81	94	71
90 PERCENT EXCEEDS	32	33	29

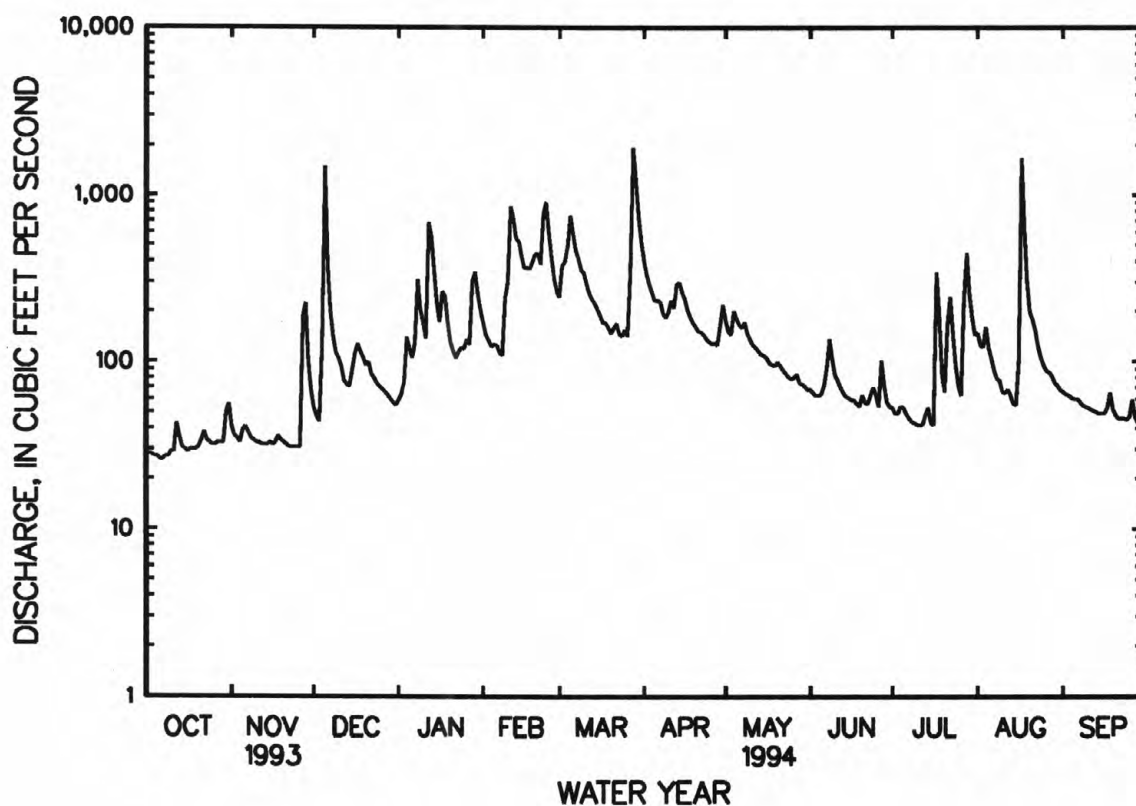
a Also Oct. 7, 1993.

b Also Oct. 4, 5, 1993.

c From high-water mark in well.

d Also Oct. 6-9, 1993.

f Also July 28, 29, 1966.



## ROANOKE RIVER BASIN

02054500 ROANOKE RIVER AT LAFAYETTE, VA

LOCATION.--Lat 37°14'11", long 80°12'34", Montgomery County, Hydrologic Unit 03010101, on right bank 120 ft upstream from bridge on State Highway 603 at Lafayette, 0.4 mi downstream from confluence of North and South Forks, and 1.1 mi upstream from Cove Hollow.

DRAINAGE AREA.--257 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1943 to current year.

REVISED RECORDS.--WSP 1333: 1944-47(M), 1948-49.

GAGE.--Water-stage recorder. Datum of gage is 1,174.47 ft above sea level. Prior to July 30, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 to Jan. 1 and Jan. 20-22, which are fair. Occasional diurnal fluctuation caused by meat-processing plant upstream from station. Virginia Department of Emergency Services gage-height radio transmitter at station. Maximum discharge, 24,500 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 8.0 ft<sup>3</sup>/s, Jan. 19, 1959, gage height, 0.60 ft, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 12.2 ft, from information by local residents, discharge, 19,000 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0630	*6,810	*8.83	Mar. 28	0515	5,730	8.14
Feb. 11	1830	3,880	6.76	Aug. 17	1415	4,730	7.44

Minimum discharge, 42 ft<sup>3</sup>/s, Nov. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	82	120	e125	395	483	837	413	129	101	201	147
2	55	67	101	141	332	826	682	343	124	96	174	141
3	52	62	90	155	294	895	594	309	121	95	170	137
4	49	60	598	314	270	934	532	427	121	99	202	133
5	48	66	4090	278	260	1490	477	423	121	100	168	129
6	47	76	864	232	260	1080	469	383	122	104	152	126
7	47	70	470	262	232	853	461	353	132	100	136	119
8	50	63	328	602	220	761	404	365	182	91	128	114
9	46	60	250	439	401	684	378	316	170	87	127	110
10	49	58	220	325	571	657	385	283	142	86	115	105
11	50	57	201	282	1960	601	477	259	136	85	206	102
12	70	56	167	1710	1820	550	426	243	128	84	182	99
13	72	55	156	1270	1230	519	671	228	120	85	131	95
14	58	55	149	734	1250	498	688	216	115	97	112	92
15	53	55	196	491	995	467	564	207	111	86	105	91
16	51	55	273	340	847	436	517	203	111	82	195	88
17	50	58	257	401	888	404	446	188	112	275	2230	89
18	50	84	230	565	836	395	403	181	108	306	1060	104
19	50	69	209	311	874	374	373	178	105	142	570	92
20	51	62	189	e270	941	350	348	180	109	118	424	86
21	51	57	194	e250	914	361	323	174	106	211	360	84
22	58	54	169	e235	759	403	316	164	105	352	325	83
23	55	53	162	253	1690	357	298	158	103	239	269	81
24	51	53	149	276	1890	343	278	151	121	160	233	81
25	51	53	144	270	1160	358	265	148	115	130	212	85
26	51	51	135	334	817	337	252	149	102	116	196	100
27	50	324	e130	326	625	871	256	155	147	234	194	87
28	49	622	e125	809	529	3800	256	143	133	493	189	76
29	51	237	e122	906	---	2560	286	139	112	325	171	71
30	65	155	e120	594	---	1540	501	135	103	243	163	66
31	105	---	e118	472	---	1060	---	131	---	196	152	---
TOTAL	1692	2929	10726	13972	23260	25247	13163	7345	3666	5018	9252	3013
MEAN	54.6	97.6	346	451	831	814	439	237	122	162	298	100
MAX	105	622	4090	1710	1960	3800	837	427	182	493	2230	147
MIN	46	51	90	125	220	337	252	131	102	82	105	66
CFSM	.21	.38	1.35	1.75	3.23	3.17	1.71	.92	.48	.63	1.16	.39
IN.	.24	.42	1.55	2.02	3.37	3.65	1.91	1.06	.53	.73	1.34	.44

e Estimated.

## ROANOKE RIVER BASIN

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02054500 ROANOKE RIVER AT LAFAYETTE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	141	175	229	301	386	475	427	289	179	115	113	118
MAX	603	770	913	682	869	1309	1497	716	791	590	551	570
(WY)	1977	1978	1949	1947	1957	1993	1987	1978	1972	1949	1948	1989
MIN	36.7	44.1	47.0	52.0	83.4	103	102	99.1	61.6	43.2	37.0	29.4
(WY)	1954	1954	1964	1981	1959	1981	1966	1963	1963	1963	1963	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1944 - 1994

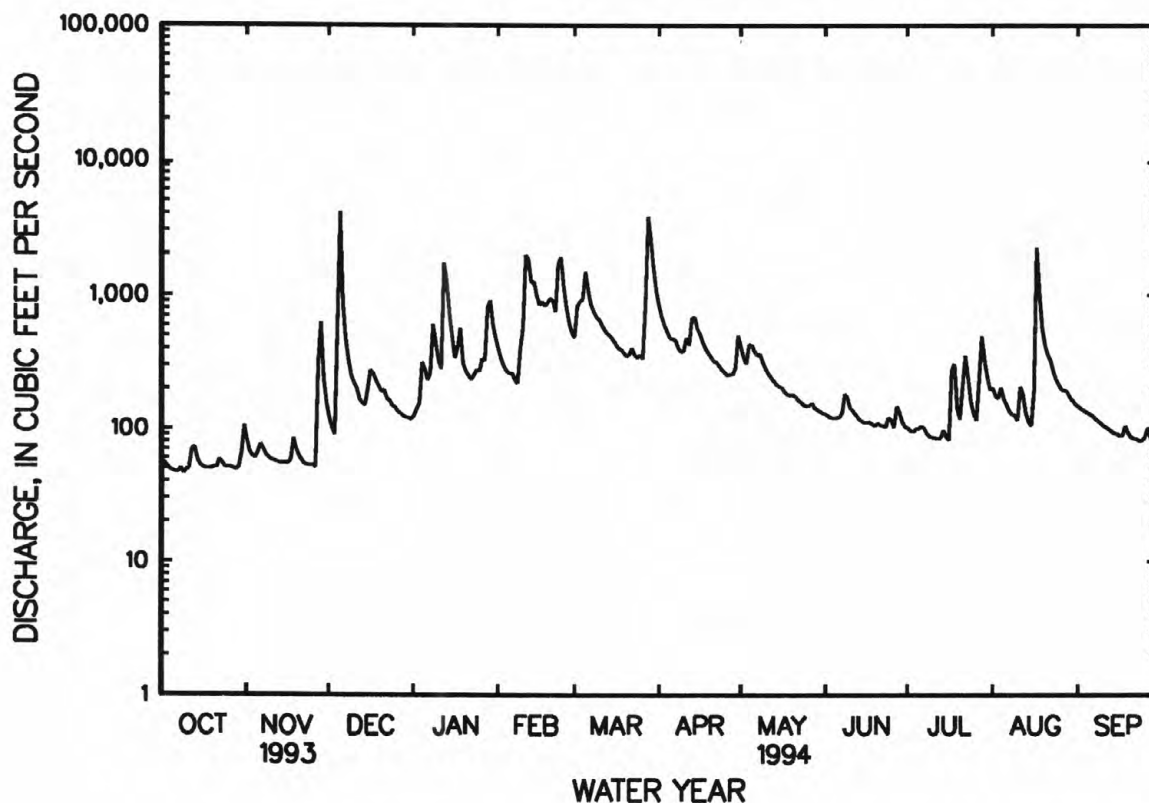
ANNUAL TOTAL	117382		119283									
ANNUAL MEAN	322		327									
HIGHEST ANNUAL MEAN												
LOWEST ANNUAL MEAN												
HIGHEST DAILY MEAN	5050	Mar 24	4090	Dec 5								
LOWEST DAILY MEAN	37	Sep 15	46	Oct 9								
ANNUAL SEVEN-DAY MINIMUM	45	Sep 9	48	Oct 4								
INSTANTANEOUS PEAK FLOW			6810	Dec 5								
INSTANTANEOUS PEAK STAGE			8.83	Dec 5								
INSTANTANEOUS LOW FLOW			42	Nov 23								
ANNUAL RUNOFF (CFSM)	1.25		1.27									
ANNUAL RUNOFF (INCHES)	16.99		17.27									
10 PERCENT EXCEEDS	672		760									
50 PERCENT EXCEEDS	163		178									
90 PERCENT EXCEEDS	51		57									

a Also Jan. 15, 18, 19, 1959.

b Also Oct. 5, 1993.

c From high-water mark in gage house.

d Result of freezeup.



## ROANOKE RIVER BASIN

02054510 ROANOKE RIVER NEAR WABUN, VA

LOCATION.--Lat 37°14'48", long 87°09'55", Hydrologic Unit 03010101, on right bank 150 ft downstream from mouth of Dry Hollow, 0.7 mi downstream from bridge on State Highway 5800, 3 mi upstream from Dry Branch, and 5.9 mi southwest of Salem.

DRAINAGE AREA.--273 mi<sup>2</sup>.

PERIOD OF RECORD.--April to September 1994.

GAGE.--Water-stage recorder. Elevation of gage is 1,140 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods of doubtful gage-height record, Apr. 14 to May 26, June 1-6, 8-27, June 29 to July 16, and Aug. 3-11, 13-15, which are fair. Several observations of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 21, 1992, reached a stage of 13.69 ft, from high-water marks in the gage vicinity, from information by local resident, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period April to September, 5,910 ft<sup>3</sup>/s, Aug. 17, gage height, 8.21 ft; minimum, 35 ft<sup>3</sup>/s, July 21, result of water diversion by Roanoke County.

DISCHARGE, CUBIC FEET PER SECOND, APRIL TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	e460	e122	e90	169	120
2	---	---	---	---	---	---	---	e370	e120	e86	116	136
3	---	---	---	---	---	---	---	e320	e118	e80	e102	133
4	---	---	---	---	---	---	---	e435	e117	e87	e120	131
5	---	---	---	---	---	---	---	e455	e116	e83	e115	127
6	---	---	---	---	---	---	---	e415	e115	e82	e150	127
7	---	---	---	---	---	---	---	e385	99	e79	e130	121
8	---	---	---	---	---	---	---	e390	e115	e72	e125	118
9	---	---	---	---	---	---	---	e290	e122	e70	e120	96
10	---	---	---	---	---	---	---	e285	e135	e71	e110	77
11	---	---	---	---	---	---	---	e275	e130	e72	e170	74
12	---	---	---	---	---	---	---	e255	e125	e70	214	72
13	---	---	---	---	---	---	---	e245	e118	e70	e130	69
14	---	---	---	---	---	---	e819	e230	e112	e71	e110	67
15	---	---	---	---	---	---	e620	e220	e109	e73	e100	66
16	---	---	---	---	---	---	e540	e215	e108	e70	186	65
17	---	---	---	---	---	---	e460	e200	e109	234	2650	66
18	---	---	---	---	---	---	e410	e190	e103	277	1210	86
19	---	---	---	---	---	---	e370	e185	e102	93	512	78
20	---	---	---	---	---	---	e350	e180	e100	105	348	69
21	---	---	---	---	---	---	e320	e178	e100	150	270	66
22	---	---	---	---	---	---	e305	e170	e99	304	245	66
23	---	---	---	---	---	---	e285	e150	e98	249	194	66
24	---	---	---	---	---	---	e270	e125	e110	170	166	65
25	---	---	---	---	---	---	e255	e115	e105	141	148	66
26	---	---	---	---	---	---	e245	e130	e98	128	130	88
27	---	---	---	---	---	---	e247	156	e130	213	141	77
28	---	---	---	---	---	---	e255	147	142	525	138	77
29	---	---	---	---	---	---	e275	141	e100	327	127	89
30	---	---	---	---	---	---	e540	136	e95	247	118	95
31	---	---	---	---	---	---	---	131	---	198	110	---
TOTAL	---	---	---	---	---	---	---	7579	3372	4587	8674	2653
MEAN	---	---	---	---	---	---	---	244	112	148	280	88.4
MAX	---	---	---	---	---	---	---	460	142	525	2650	136
MIN	---	---	---	---	---	---	---	115	95	70	100	65

e Estimated.



## ROANOKE RIVER BASIN

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02054510 ROANOKE RIVER NEAR WABUN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEAR 1994\*\*

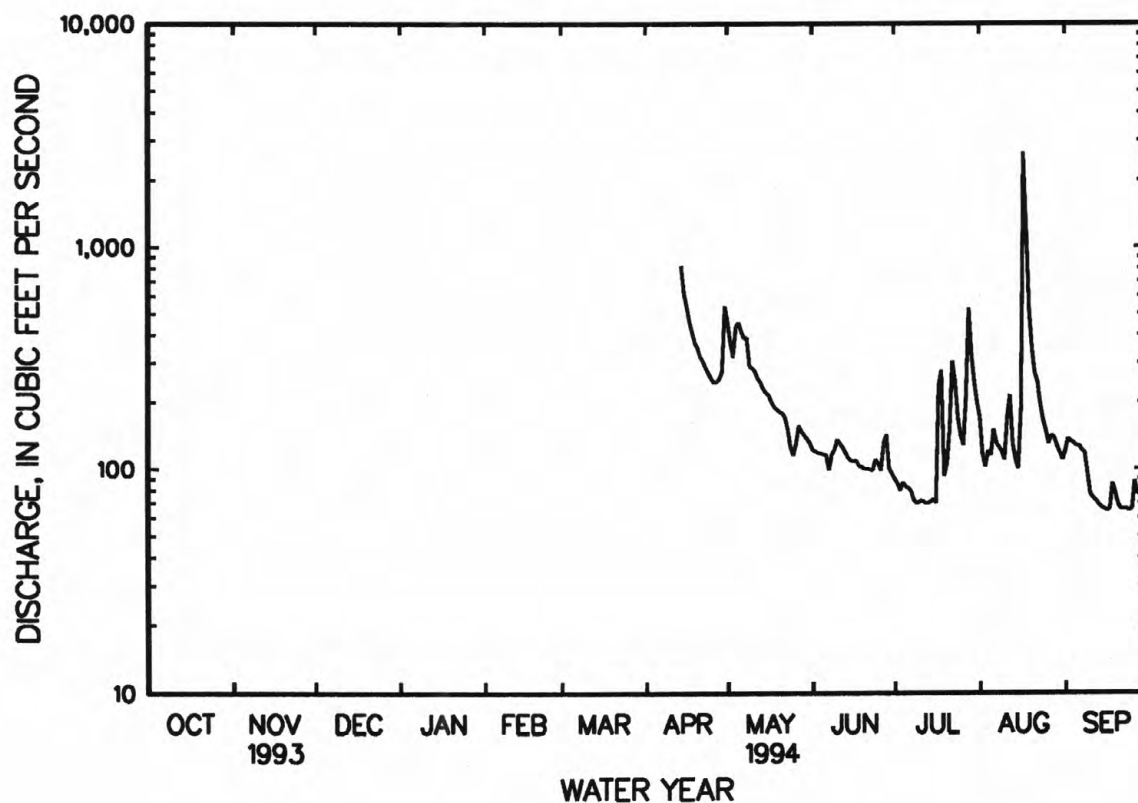
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	---	---	---	---	---	---	---	244	112	148	280	88.4
MAX	---	---	---	---	---	---	---	244	112	148	280	88.4
(WY)	---	---	---	---	---	---	---	1994	1994	1994	1994	1994
MIN	---	---	---	---	---	---	---	244	112	148	280	88.4
(WY)	---	---	---	---	---	---	---	1994	1994	1994	1994	1994

## SUMMARY STATISTICS

## FOR 1994\*\* WATER YEAR

HIGHEST DAILY MEAN	2650	Aug 17
LOWEST DAILY MEAN	65	<sup>a</sup> Sep 16
ANNUAL SEVEN-DAY MINIMUM	3.2	Jun 21
INSTANTANEOUS PEAK FLOW	5910	Aug 17
INSTANTANEOUS PEAK STAGE	8.21	Aug 17
INSTANTANEOUS LOW FLOW	<sup>b</sup> 35	Jul 21
10 PERCENT EXCEEDS	320	
50 PERCENT EXCEEDS	110	
90 PERCENT EXCEEDS	3.4	

\*\* Partial water year, April to September 1994.

<sup>a</sup> Also Sept. 24, 1994.<sup>b</sup> Result of water diversion by Roanoke County.

## ROANOKE RIVER BASIN

02054530 ROANOKE RIVER AT GLENVAR, VA

LOCATION.--Lat 37°16'04", long 80°08'23", Hydrologic Unit 03010101, on left bank 150 ft downstream from bridge on State Highway 1154, 0.2 mi downstream from mouth of Callahan Branch, 0.3 mi south of Glenvar, and 2.5 mi upstream from mouth of Mill Creek.

DRAINAGE AREA.--284 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1991 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,100 ft above sea level, from topographic map.

REMARKS.--Records good except those for periods with ice effect, Dec. 28 to Jan. 1 and Jan. 20-22, which are fair. Roanoke County gage-height transmitter at station. Maximum discharge, 19,800 ft<sup>3</sup>/s, from rating curve extended above 8,400 ft<sup>3</sup>/s. Minimum discharge, 42 ft<sup>3</sup>/s, July 21, 1994, gage height, 1.77 ft, result of water withdrawal by Roanoke County for Spring Hollow Reservoir. Several observations of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 21, 1972, reached a stage of about 20.2 ft, from information by local resident, discharge, about 25,000 ft<sup>3</sup>/s, from rating curve extended above 8,400 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0745	*9,500	*11.76	Mar. 28	0715	7,830	10.81
Jan. 12	1430	3,740	7.73	Aug. 17	1545	5,840	9.47
Feb. 11	2015	4,760	8.65				

Minimum discharge, 42 ft<sup>3</sup>/s, July 21, gage height, 1.77 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	92	139	e125	446	553	1080	483	128	95	184	121
2	66	77	119	139	372	977	847	398	122	90	112	134
3	63	72	108	150	328	1170	720	328	120	86	104	129
4	61	68	547	300	302	1130	634	459	119	91	128	127
5	60	73	5660	300	284	1890	565	479	118	86	120	124
6	59	82	1130	247	287	1290	542	434	119	87	158	123
7	58	79	522	259	257	944	534	396	101	83	139	120
8	60	73	357	658	240	795	456	405	121	74	127	117
9	60	70	275	500	388	699	417	306	128	72	127	102
10	60	68	238	370	640	654	412	305	145	75	114	82
11	62	67	221	329	2200	590	529	288	138	75	161	80
12	72	66	182	2050	2420	559	456	267	129	74	229	78
13	85	65	163	1700	1540	514	751	250	119	75	132	75
14	71	65	154	929	1620	486	842	239	113	74	112	73
15	65	65	183	585	1280	448	662	229	109	77	102	72
16	63	66	283	392	1050	416	590	223	107	72	171	72
17	63	68	263	407	1120	390	490	207	109	187	2720	74
18	62	91	239	685	1040	378	431	198	105	323	1340	90
19	63	82	218	401	1080	360	392	192	103	91	539	82
20	63	74	197	e300	1190	331	365	192	103	93	366	74
21	63	68	201	e270	1160	330	335	188	104	140	287	72
22	68	66	176	e260	956	381	320	177	100	333	267	71
23	69	64	166	279	2080	339	303	167	96	273	212	70
24	64	64	153	301	2560	322	283	126	116	174	180	70
25	62	63	144	294	1540	338	264	117	112	136	159	72
26	62	63	136	359	1050	321	248	132	99	116	137	91
27	62	254	133	361	769	889	248	160	136	189	148	82
28	61	840	e130	870	623	5120	255	147	141	558	143	79
29	63	267	e127	1180	---	3510	286	141	109	368	127	91
30	71	176	e123	722	---	2130	573	137	99	274	120	94
31	106	---	e120	544	---	1400	---	131	---	215	115	---
TOTAL	2035	3388	12807	16266	28822	29654	14830	7901	3468	4756	9080	2741
MEAN	65.6	113	413	525	1029	957	494	255	116	153	293	91.4
MAX	106	840	5660	2050	2560	5120	1080	483	145	558	2720	134
MIN	58	63	108	125	240	321	248	117	96	72	102	70

e Estimated.

## ROANOKE RIVER BASIN

415

02054530 ROANOKE RIVER AT GLENVAR, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEAR 1992 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	70.7	151	314	490	591	1006	648	389	318	153	157	83.2
MAX	75.7	190	413	525	1029	1667	839	610	660	167	293	91.4
(WY)	1993	1993	1994	1994	1994	1993	1992	1992	1992	1992	1994	1994
MIN	65.6	113	215	437	339	393	494	255	116	138	68.5	74.9
(WY)	1994	1994	1993	1993	1992	1992	1994	1994	1994	1993	1993	1993

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

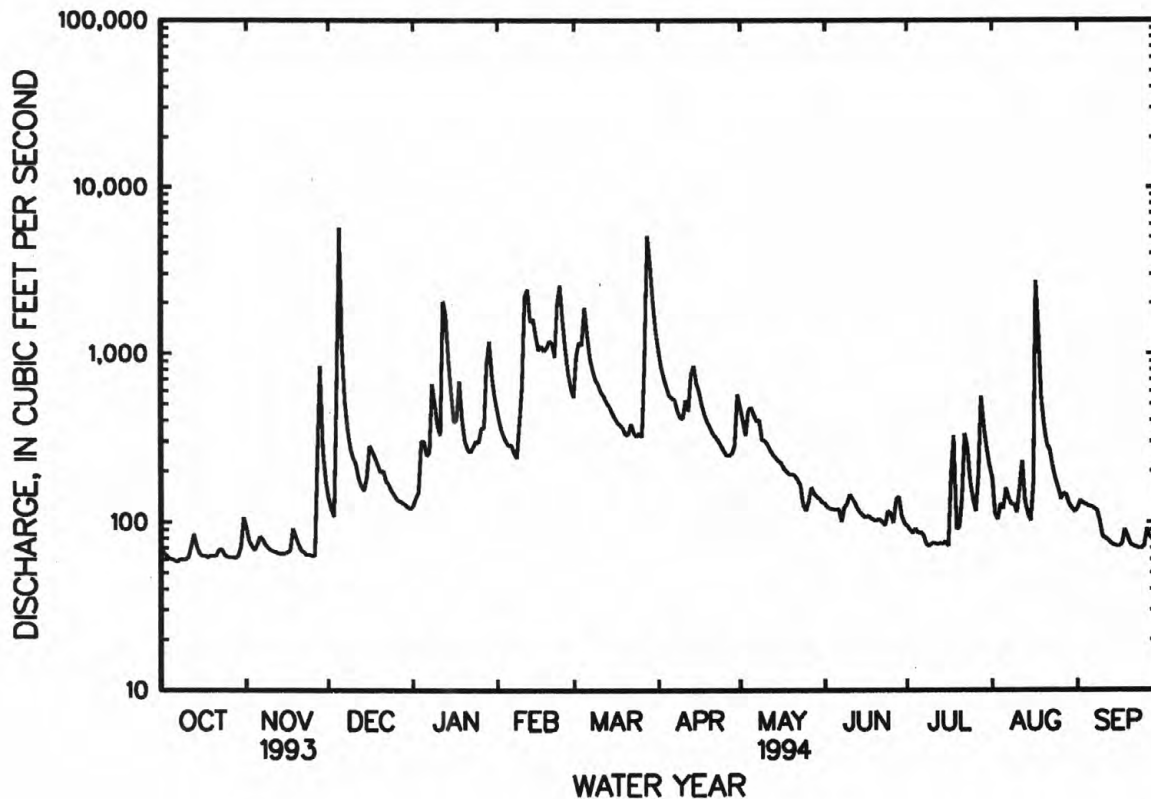
## FOR 1994 WATER YEAR

## WATER YEARS 1992 - 1994

ANNUAL TOTAL	136717	135748	
ANNUAL MEAN	375	372	368
HIGHEST ANNUAL MEAN			372
LOWEST ANNUAL MEAN			365
HIGHEST DAILY MEAN	7800	5660	8380
LOWEST DAILY MEAN	51	58	51
ANNUAL SEVEN-DAY MINIMUM	58	60	58
INSTANTANEOUS PEAK FLOW		9500	19800
INSTANTANEOUS PEAK STAGE		11.76	17.73
INSTANTANEOUS LOW FLOW		b42	b42
10 PERCENT EXCEEDS	715	878	733
50 PERCENT EXCEEDS	175	166	176
90 PERCENT EXCEEDS	63	68	69

a Also Oct. 5, 1993.

b Result of water diversion by Roanoke County.



## ROANOKE RIVER BASIN

02055000 ROANOKE RIVER AT ROANOKE, VA

LOCATION.--Lat 37°15'30", long 79°56'20", Roanoke City, Hydrologic Unit 03010101, on left bank 50 ft downstream from Walnut Avenue bridge, 3.2 mi upstream from Tinker Creek, and at mile 360.6.

DRAINAGE AREA.--395 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1899 to current year. Monthly discharge only for some periods, published in WSP 1303. Records for July 1896 to January 1899 published in WSP 11, 15, 27, and 20th Annual Report, Part 4, are unreliable, due to doubtful gage-height record, and should not be used.

REVISED RECORDS.--WSP 972: 1928, 1930, 1933. WSP 1433: 1899-1904, 1914-17(M), 1918-24, 1925-27(M), 1929-34(M), 1935, 1936-39(M). WSP 2104: Drainage area. WDR VA-72-1: 1928(M), 1940(M). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 906.84 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to June 7, 1937, nonrecording gage on downstream side of highway bridge 50 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Prior to 1949, diurnal fluctuation at low flow caused by powerplants upstream from station. Since March 1994, water withdrawn upstream for municipal use by the city of Roanoke, amount unknown. Appalachian Power Company and Virginia Department of Emergency Services gage-height radio transmitters at station. Maximum discharge, 32,300 ft<sup>3</sup>/s, from rating curve extended above 26,000 ft<sup>3</sup>/s. Practically no flow Dec. 23, 1909, Dec. 19, 1963, when flow was retarded by freezing, gage height, 0.0 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0930	*8,410	*9.94	Mar. 5	0445	2,670	4.97
Jan. 12	1730	3,850	6.22	Mar. 28	1045	7,010	8.92
Feb. 11	2300	4,650	6.98	Apr. 29	1745	3,400	5.77
Feb. 23	2300	3,610	5.98	Aug. 17	1800	6,410	8.46

Minimum discharge, 54 ft<sup>3</sup>/s, Nov. 24, 25, 26, 27; minimum gage height, 0.57 ft, Oct. 5, 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93	105	175	156	638	786	1390	690	183	115	286	156
2	89	86	143	166	521	1540	1120	580	168	113	188	179
3	86	78	126	180	447	1750	959	506	159	128	173	177
4	83	73	516	452	406	1520	847	713	157	124	174	173
5	80	84	5700	429	377	2350	759	743	156	117	169	169
6	78	83	1750	334	376	1700	716	653	156	108	203	165
7	78	85	777	323	338	1320	707	592	165	103	195	162
8	77	78	500	770	313	1100	625	588	149	95	170	155
9	82	73	376	716	427	973	594	509	161	85	162	149
10	84	72	315	503	795	911	593	428	193	87	156	116
11	83	70	289	430	2160	805	650	417	187	90	166	110
12	123	69	243	2150	2890	759	599	386	175	89	334	105
13	103	68	210	2150	1850	689	856	361	159	96	211	101
14	97	68	193	1280	2030	644	1130	341	158	96	162	98
15	87	67	294	858	1680	592	901	328	143	85	143	96
16	83	67	358	558	1420	542	806	320	135	86	272	93
17	83	96	332	541	1520	500	678	302	136	113	3610	112
18	81	107	307	873	1410	478	608	289	142	461	2180	113
19	88	87	278	511	1450	451	587	281	183	175	950	115
20	88	75	252	468	1560	413	556	283	174	138	631	99
21	89	67	267	423	1510	420	521	275	149	282	536	93
22	83	61	232	388	1280	466	503	262	140	623	440	91
23	87	60	209	389	2320	421	479	251	140	448	336	90
24	84	58	196	412	2970	395	445	233	149	277	272	92
25	81	56	184	401	1910	404	420	174	147	203	242	93
26	80	57	173	455	1400	394	402	211	135	161	211	106
27	79	384	160	520	1070	948	407	217	209	506	211	111
28	79	988	170	1050	877	4890	406	226	202	841	213	94
29	78	375	179	1680	---	3670	791	214	146	590	188	109
30	129	232	170	1070	---	2490	838	206	127	443	172	109
31	102	---	138	801	---	1710	---	197	---	333	164	---
TOTAL	2717	3929	15212	21437	35945	36031	20893	11776	4783	7211	13520	3631
MEAN	87.6	131	491	692	1284	1162	696	380	159	233	436	121
MAX	129	988	5700	2150	2970	4890	1390	743	209	841	3610	179
MIN	77	56	126	156	313	394	402	174	127	85	143	90
CFSM	.22	.33	1.24	1.75	3.25	2.94	1.76	.96	.40	.59	1.10	.31
IN.	.26	.37	1.43	2.02	3.39	3.39	1.97	1.11	.45	.68	1.27	.34

## ROANOKE RIVER BASIN

417

02055000 ROANOKE RIVER AT ROANOKE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1899 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	237	250	351	467	560	698	594	423	299	222	229	198
MAX	1080	1626	1425	1353	1423	2521	2558	1466	1206	1190	2140	1569
(WY)	1907	1986	1902	1937	1902	1899	1987	1901	1972	1905	1940	1928
MIN	47.9	43.8	55.2	65.5	52.5	119	108	112	75.3	45.6	43.5	42.6
(WY)	1992	1932	1918	1981	1934	1981	1942	1941	1926	1930	1981	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1899 - 1994

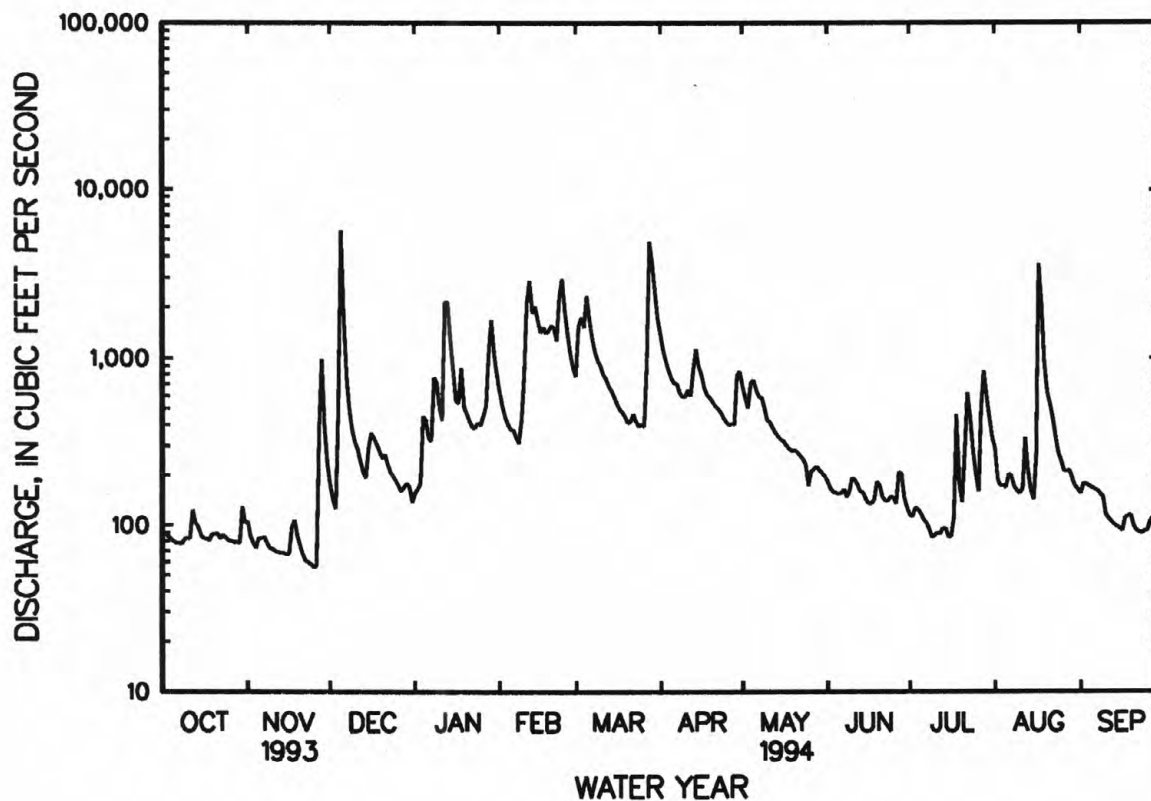
ANNUAL TOTAL	167619		177085									
ANNUAL MEAN	459		485									
HIGHEST ANNUAL MEAN										375		
LOWEST ANNUAL MEAN										836		1901
HIGHEST DAILY MEAN										113		1981
LOWEST DAILY MEAN	7590	Mar 24		5700	Dec 5					18200	Aug 15	1940
ANNUAL SEVEN-DAY MINIMUM	56	Nov 25		56	Nov 25					19	Aug 29	1981
INSTANTANEOUS PEAK FLOW	62	Nov 20		62	Nov 20					22	Aug 24	1981
INSTANTANEOUS PEAK STAGE				8410	Dec 5					32300	Nov 4	1985
INSTANTANEOUS LOW FLOW				9.94	Dec 5					a23.35	Nov 4	1985
ANNUAL RUNOFF (CFSM)				54	bNov 24					(c)	dDec 23	1909
ANNUAL RUNOFF (INCHES)	1.16			1.23						.95		
10 PERCENT EXCEEDS	15.79			16.68						12.89		
50 PERCENT EXCEEDS	903			1120						716		
90 PERCENT EXCEEDS	214			232						202		
	81			84						70		

a From floodmark.

b Also Nov. 25-27, 1993.

c Practically no flow; retarded by freezing.

d Also Dec. 19, 1963.





## ROANOKE RIVER BASIN

02055100 TINKER CREEK NEAR DALEVILLE, VA

LOCATION.--Lat 37°25'03", long 79°56'08", Botetourt County, Hydrologic Unit 03010101, on left bank 1,100 ft downstream from Norfolk Southern Railway bridge, 0.2 mi downstream from unnamed tributary, 0.5 mi south of Glebe Mills, and 1.3 mi northwest of Daleville.

DRAINAGE AREA.--11.7 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1956 to current year.

REVISED RECORDS.--WSP 1904: 1958-60(P). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,217.47 ft above sea level (Norfolk Southern Railway bench mark).

REMARKS.--Records good except for period with ice effect, Jan. 19-21, which is poqr. Virginia Department of Emergency Services radio transmitter at station. Maximum discharge, 10,400 ft<sup>3</sup>/s, from rating curve extended above 130 ft<sup>3</sup>/s on basis of contracted-opening measurement at gage height 9.82 ft and slope-area measurements at gage heights 8.52 ft, 9.82 ft, and 13.36 ft. Minimum discharge, 0.20 ft<sup>3</sup>/s, result of freezeup. Minimum gage height, 0.99 ft, June 12, 24, 1970. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1940 reached a stage of 9.0 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 250 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Aug. 17	0945	*291	*3.85	No other peak equal to or greater than base discharge.			

Minimum discharge, 2.0 ft<sup>3</sup>/s, Oct. 5, 6, 7, Nov. 25; minimum gage height, 1.09 ft, July 11, 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	4.7	4.0	5.0	17	24	35	11	5.5	4.1	7.3	5.3
2	2.5	4.1	3.7	5.2	15	33	31	10	5.4	3.7	8.3	4.8
3	2.3	3.8	3.6	5.6	14	35	27	11	5.1	4.2	16	4.8
4	2.3	3.5	14	12	13	74	25	17	4.6	3.6	14	4.7
5	2.2	4.1	69	10	13	65	23	14	4.9	3.4	11	4.6
6	2.1	3.7	19	9.1	12	48	23	13	4.6	3.6	8.3	4.5
7	2.1	3.3	14	9.5	12	41	22	12	5.3	3.2	7.1	4.2
8	2.1	3.1	9.5	14	12	36	20	12	4.9	3.5	6.4	4.1
9	2.2	3.1	7.8	12	17	35	19	11	4.7	3.3	5.8	4.0
10	2.8	3.0	7.2	9.9	16	34	18	10	5.5	3.4	5.4	3.9
11	2.8	2.8	6.5	9.2	69	29	18	9.8	5.5	3.0	5.3	3.7
12	4.5	2.8	5.9	71	49	26	17	9.4	5.1	3.2	5.2	3.6
13	3.5	2.8	5.8	34	44	25	23	8.9	4.8	3.6	4.9	3.6
14	3.3	3.1	5.6	25	43	23	20	8.5	4.5	3.6	4.5	3.5
15	3.2	3.0	9.1	17	39	22	18	8.4	4.2	3.3	4.4	3.5
16	3.1	2.8	9.2	15	39	21	18	8.0	4.0	3.2	8.2	3.4
17	3.4	3.1	7.5	17	36	19	16	7.7	3.3	5.7	70	4.7
18	3.9	3.4	6.9	21	32	19	16	7.6	3.8	4.8	25	4.7
19	4.1	2.8	6.4	e16	31	18	15	7.7	4.5	8.4	16	3.7
20	4.5	2.7	6.1	e14	31	17	14	7.9	4.5	4.8	13	3.6
21	4.8	2.4	6.8	e15	29	18	14	7.5	4.8	12	12	3.5
22	5.0	2.2	6.0	16	26	19	14	7.2	4.4	11	10	3.5
23	4.6	2.1	5.7	25	63	17	13	7.0	6.3	11	9.2	3.6
24	4.7	2.1	5.5	24	51	16	13	6.8	5.4	6.5	8.4	3.6
25	4.9	2.1	5.4	16	37	16	13	7.0	4.3	5.1	7.9	3.8
26	4.8	2.1	5.2	15	30	15	12	7.1	4.3	4.6	7.5	4.3
27	4.7	12	5.1	17	27	38	13	6.8	7.7	9.5	8.5	3.7
28	4.4	11	5.3	58	24	84	12	6.6	5.5	13	7.3	3.5
29	4.4	5.6	5.7	33	---	74	12	6.3	4.5	18	6.4	3.4
30	7.3	4.5	5.3	25	---	46	12	6.0	4.2	18	5.8	3.4
31	5.9	---	5.0	20	---	40	---	5.7	---	9.3	5.6	---
TOTAL	115.0	111.8	281.8	595.5	841	1027	546	278.9	146.1	197.6	334.7	119.2
MEAN	3.71	3.73	9.09	19.2	30.0	33.1	18.2	9.00	4.87	6.37	10.8	3.97
MAX	7.3	12	69	71	69	84	35	17	7.7	18	70	5.3
MIN	2.1	2.1	3.6	5.0	12	15	12	5.7	3.3	3.0	4.4	3.4
CFSM	.32	.32	.78	1.64	2.57	2.83	1.56	.77	.42	.54	.92	.34
IN.	.37	.36	.90	1.89	2.67	3.27	1.74	.89	.46	.63	1.06	.38

e Estimated.

## ROANOKE RIVER BASIN

419

02055100 TINKER CREEK NEAR DALEVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	8.48	11.6	10.7	13.6	17.9	22.8	20.6	13.1	8.74	6.77	6.62	6.69
MAX	34.2	118	32.6	29.1	36.6	69.3	87.9	33.8	39.0	21.8	29.8	50.4
(WY)	1980	1986	1973	1991	1971	1993	1987	1958	1972	1973	1984	1979
MIN	2.09	1.76	2.00	1.78	3.78	3.16	3.21	3.44	2.01	1.13	2.01	1.36
(WY)	1987	1982	1966	1966	1981	1981	1981	1981	1988	1966	1981	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1956 - 1994

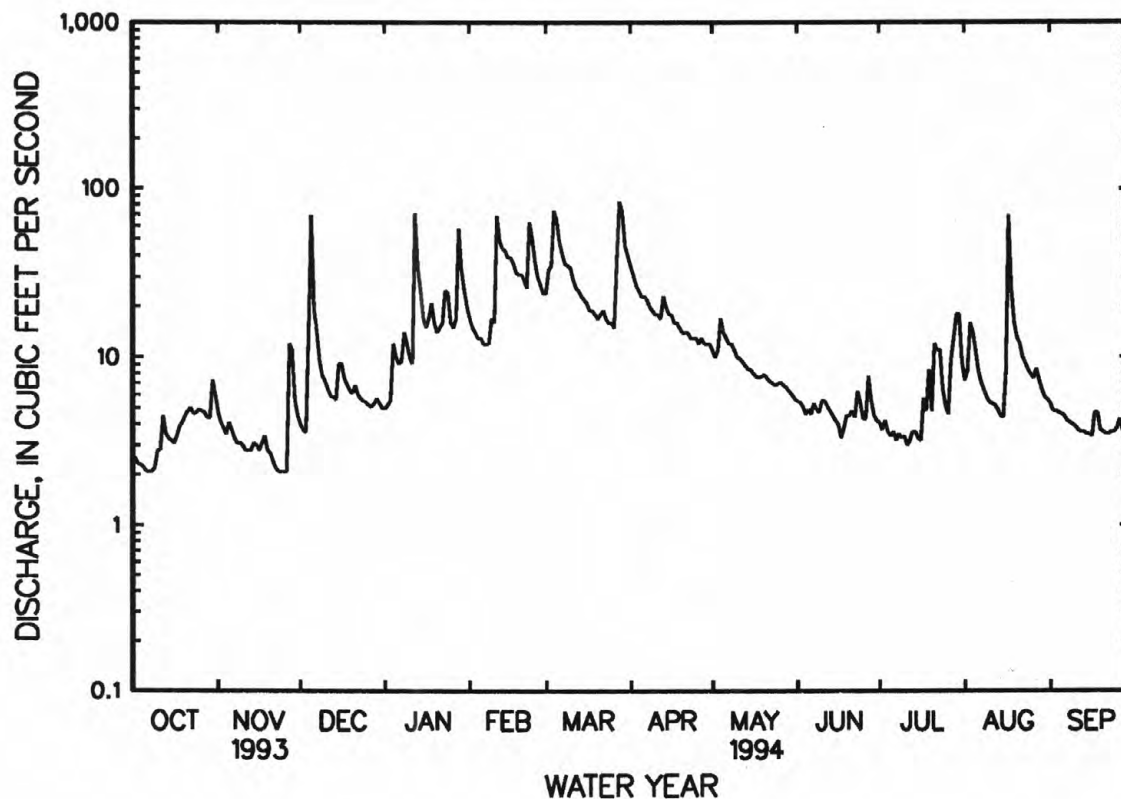
ANNUAL TOTAL	5703.3	4594.6	
ANNUAL MEAN	15.6	12.6	12.3
HIGHEST ANNUAL MEAN			21.6
LOWEST ANNUAL MEAN			3.23
HIGHEST DAILY MEAN	402	84	2560
LOWEST DAILY MEAN	2.1	2.1	.90
ANNUAL SEVEN-DAY MINIMUM	2.2	2.2	.99
INSTANTANEOUS PEAK FLOW		291	10400
INSTANTANEOUS PEAK STAGE		3.85	13.36
INSTANTANEOUS LOW FLOW		2.0	d.20
ANNUAL RUNOFF (CFSM)	1.34	1.08	1.05
ANNUAL RUNOFF (INCHES)	18.13	14.61	14.28
10 PERCENT EXCEEDS	32	29	24
50 PERCENT EXCEEDS	7.2	7.1	7.0
90 PERCENT EXCEEDS	3.0	3.3	2.5

a Also Oct. 7, 8, and Nov. 23-26, 1993.

b From floodmarks.

c Also Oct. 6, 7, and Nov. 25, 1993.

d Result of freezeup.



## ROANOKE RIVER BASIN

02056000 ROANOKE RIVER AT NIAGARA, VA

LOCATION.--Lat 37°15'18", long 79°52'18", Roanoke County, Hydrologic Unit 03010101, on right bank 200 ft downstream from powerplant of Appalachian Power Company at Niagara, 2 mi downstream from Tinker Creek, 2.1 mi southeast of Vinton, and at mile 355.3.

DRAINAGE AREA.--512 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1926 to current year.

REVISED RECORDS.--WSP 972: 1927(M), 1929(M), 1934(M), 1937(M). WSP 1303: 1928, 1930, 1933-38, 1940. WSP 2104: Drainage area. WDR VA-72-1: 1928(M), 1930(M), 1933(M), 1935-36(M), 1938(M), 1940, 1944-45(M), 1948-49(M), 1951(M), 1955(M), 1960(M), 1967(M), 1969(M).

GAGE.--Water-stage recorder. Datum of gage is 820.15 ft above sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except those for period with ice effect, Jan. 19-24, and period of no gage-height record, Mar. 25 to Apr. 5, which are fair. Flow regulated by dam and powerplant 200 ft upstream from station. Maximum discharge, 52,300 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 18.98 ft and 25.30 ft. Minimum gage height, 0.17 ft, Aug. 25, 1971. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1050	*11,300	*12.69	Mar. 5	0715	3,860	8.03
Jan. 12	1815	5,070	9.03	Mar. 28	Unknown	Unknown	Unknown
Feb. 11	2340	6,530	10.07	Apr. 29	1840	6,550	10.08
Feb. 24	0210	5,180	9.11	July 27	1700	3,740	7.92
Mar. 2	1730	3,510	7.71	Aug. 17	1830	7,920	10.93

Minimum discharge, 6.3 ft<sup>3</sup>/s, Nov. 8, gage height, 0.47 ft; minimum daily, 127 ft<sup>3</sup>/s, Nov. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	158	204	284	252	843	1040	e1700	868	255	206	386	237
2	149	170	243	277	723	2330	e1400	714	250	201	293	266
3	150	157	230	282	632	2510	e1200	632	248	231	278	258
4	143	153	683	705	585	2200	e1050	983	237	258	283	248
5	152	179	7940	643	547	3410	e980	949	236	212	276	250
6	132	172	2000	514	544	2430	973	841	233	198	281	248
7	148	168	971	497	501	1830	934	749	260	187	271	241
8	134	159	695	947	467	1510	817	736	222	179	262	230
9	132	145	552	909	587	1340	749	648	263	166	244	228
10	151	147	461	679	958	1270	743	545	264	161	235	199
11	154	145	417	597	2940	1110	836	541	279	167	270	185
12	235	147	372	2920	4180	1040	762	501	250	175	390	183
13	170	139	321	2790	2560	957	1060	479	246	184	287	180
14	167	134	300	1580	2840	898	1380	449	239	183	237	176
15	141	134	508	1070	2350	832	1110	425	234	185	222	174
16	140	147	513	720	1960	766	995	419	214	163	443	170
17	151	172	464	707	2090	713	856	389	218	225	4580	202
18	147	245	449	1070	1900	683	766	369	222	508	2740	193
19	148	177	400	e680	1930	656	704	360	225	320	1080	198
20	157	153	375	e620	2040	610	660	367	265	226	722	175
21	159	149	415	e570	1960	630	623	355	255	459	704	172
22	150	148	354	e540	1630	669	612	339	227	787	548	168
23	146	138	332	e560	3210	612	591	322	267	622	442	169
24	144	139	299	e580	4150	577	548	312	262	395	384	169
25	146	145	298	571	2620	e580	523	245	239	298	353	180
26	129	127	281	614	1860	e560	494	286	222	251	318	185
27	136	627	277	714	1400	e2500	510	291	359	938	324	198
28	137	1150	285	1490	1160	e6600	499	277	302	1110	316	167
29	138	529	283	2190	---	e4000	1310	297	247	726	290	173
30	247	351	280	1350	---	e3000	1110	255	213	558	264	184
31	198	---	247	1020	---	e2200	---	274	---	434	259	---
TOTAL	4789	6750	21529	28658	49167	50063	26495	15217	7453	10913	17982	6006
MEAN	154	225	694	924	1756	1615	883	491	248	352	580	200
MAX	247	1150	7940	2920	4180	6600	1700	983	359	1110	4580	266
MIN	129	127	230	252	467	560	494	245	213	161	222	167
CFSM	.30	.44	1.36	1.81	3.43	3.15	1.72	.96	.49	.69	1.13	.39
IN.	.35	.49	1.56	2.08	3.57	3.64	1.93	1.11	.54	.79	1.31	.44

e Estimated.

## ROANOKE RIVER BASIN

421

02056000 ROANOKE RIVER AT NIAGARA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	362	375	476	619	758	917	845	570	405	292	346	311
MAX	1722	2100	2065	1941	1756	2846	3661	1447	1550	1396	2456	2051
(WY)	1938	1986	1949	1937	1994	1993	1987	1958	1972	1949	1940	1928
MIN	86.0	101	115	110	117	210	157	193	158	109	92.2	84.0
(WY)	1931	1942	1966	1966	1934	1981	1942	1930	1966	1930	1956	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

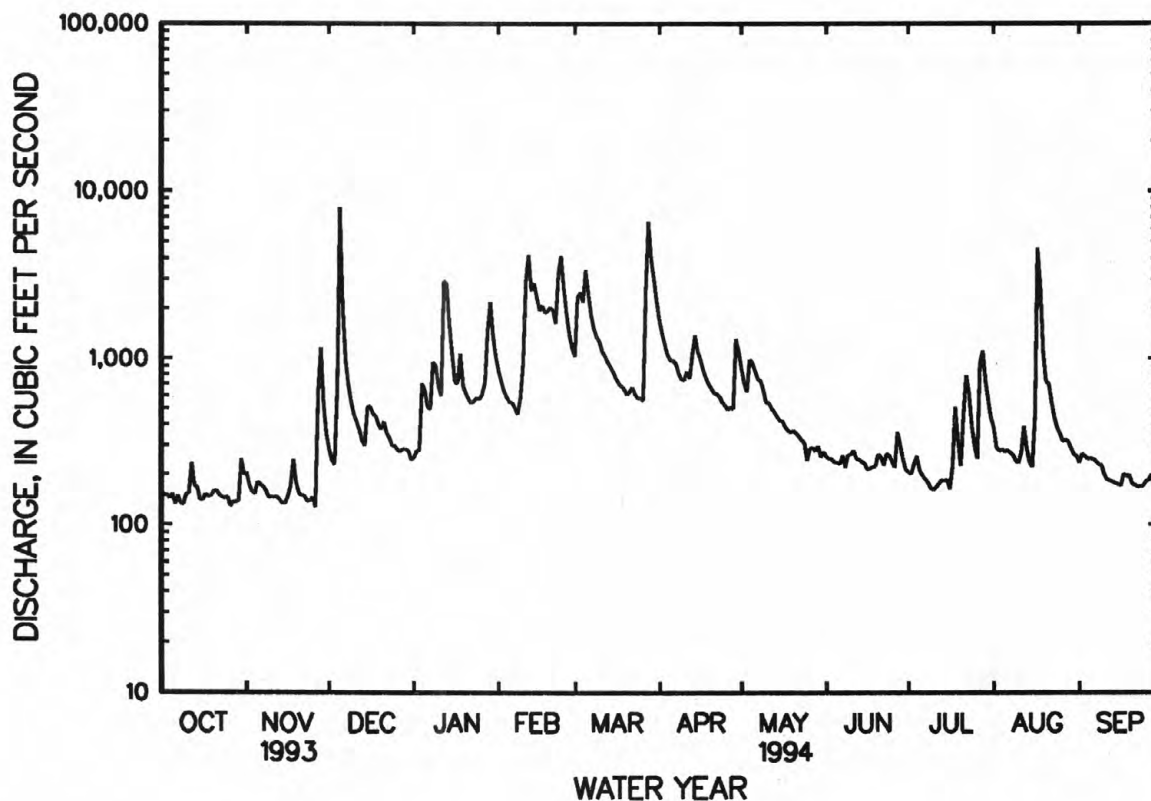
## FOR 1994 WATER YEAR

## WATER YEARS 1927 - 1994

ANNUAL TOTAL	244527	245022	
ANNUAL MEAN	670	671	522
HIGHEST ANNUAL MEAN			984
LOWEST ANNUAL MEAN			198
HIGHEST DAILY MEAN	11200	7940	19700
LOWEST DAILY MEAN	121	127	8.0
ANNUAL SEVEN-DAY MINIMUM	139	139	67
INSTANTANEOUS PEAK FLOW		11300	52300
INSTANTANEOUS PEAK STAGE		12.69	a25.30
INSTANTANEOUS LOW FLOW		6.3	1.0
ANNUAL RUNOFF (CFSM)	1.31	1.31	1.02
ANNUAL RUNOFF (INCHES)	17.77	17.80	13.85
10 PERCENT EXCEEDS	1240	1540	985
50 PERCENT EXCEEDS	332	339	312
90 PERCENT EXCEEDS	147	153	136

a From floodmark.

b Also Oct. 20, 1956, and Nov. 25, 26, 1990.



## ROANOKE RIVER BASIN

02056650 BACK CREEK NEAR DUNDEE, VA

LOCATION.--Lat 37°13'39", long 79°52'06", Roanoke County, Hydrologic Unit 03010101, on right bank 65 ft upstream from bridge on State Highway 660, 0.9 mi upstream from Horseshoe Branch, 1.1 mi southeast of Dundee, 2.8 mi west of Hardy Post Office, and at mile 2.4.

DRAINAGE AREA.--56.8 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1974 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 822.67 ft above sea level. Prior to Apr. 4, 1975, nonrecording gage, and Apr. 4, 1975, to Nov. 4, 1985, water-stage recorder, at site 80 ft downstream at same datum.

REMARKS.--Records good except for period with ice effect, Jan. 19-22, which is poor. Maximum discharge, 20,000 ft<sup>3</sup>/s, from rating curve extended above 5,900 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods of May 30, 1971, and June 21, 1972, reached a stage of 17.5 ft and 20.0 ft, respectively, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0615	910	6.84	Aug. 17	1425	*1,160	*7.48
Mar. 28	0640	824	6.60				

Minimum discharge, 6.1 ft<sup>3</sup>/s, Oct. 6, 7; minimum gage height, 2.52 ft, July 16, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	19	22	23	80	96	171	57	27	20	35	16
2	7.6	14	19	27	68	317	140	51	25	19	31	15
3	7.9	12	17	29	64	306	123	49	22	19	28	14
4	6.9	11	54	156	56	291	109	97	22	21	42	14
5	6.8	13	483	83	54	308	99	87	23	19	31	13
6	6.3	19	134	60	54	230	99	73	24	19	28	13
7	6.6	17	73	58	49	186	92	67	29	17	23	12
8	7.3	13	54	112	47	163	82	67	41	15	20	11
9	7.3	12	45	82	68	142	77	59	48	13	18	11
10	7.7	12	40	76	76	144	77	55	34	12	16	11
11	7.4	12	38	61	211	122	84	51	34	12	17	10
12	18	11	30	256	230	107	75	49	31	13	20	9.7
13	17	11	29	211	175	99	99	46	29	12	16	9.0
14	11	11	28	139	196	94	94	45	25	13	13	8.8
15	9.3	10	53	92	169	87	85	44	27	11	12	8.8
16	9.4	10	64	70	167	81	81	43	22	9.6	37	8.8
17	9.9	11	46	94	172	74	75	40	23	13	432	9.7
18	11	23	41	124	156	74	70	39	21	37	194	15
19	11	18	38	e50	161	70	68	39	18	19	90	12
20	11	12	34	e48	174	66	64	41	36	17	59	9.6
21	14	10	39	e50	176	68	61	40	25	46	49	8.8
22	15	9.9	34	e52	154	78	63	38	21	103	43	9.2
23	15	9.8	32	57	291	67	61	36	75	61	31	10
24	13	10	30	66	333	65	57	34	43	34	26	9.8
25	13	10	28	58	231	67	56	32	36	24	24	12
26	14	9.9	28	64	171	62	54	32	25	19	23	16
27	15	68	36	62	128	149	53	34	39	54	22	13
28	16	112	26	184	106	526	53	31	34	118	23	9.8
29	16	41	28	198	---	407	56	30	26	59	19	9.1
30	27	29	29	126	---	276	70	29	22	46	17	7.9
31	36	---	21	96	---	213	---	28	---	37	17	---
TOTAL	380.5	580.6	1673	2864	4017	5035	2448	1463	907	931.6	1456	337.0
MEAN	12.3	19.4	54.0	92.4	143	162	81.6	47.2	30.2	30.1	47.0	11.2
MAX	36	112	483	256	333	526	171	97	75	118	432	16
MIN	6.3	9.8	17	23	47	62	53	28	18	9.6	12	7.9
CFSM	.22	.34	.95	1.63	2.53	2.86	1.44	.83	.53	.53	.83	.20
IN.	.25	.38	1.10	1.88	2.63	3.30	1.60	.96	.59	.61	.95	.22

e Estimated.



## ROANOKE RIVER BASIN

423

02056650 BACK CREEK NEAR DUNDEE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	37.8	52.9	49.1	62.7	75.6	115	124	69.8	47.3	28.6	26.6	40.5
MAX	154	292	117	132	143	265	396	190	173	110	121	314
(WY)	1977	1986	1987	1978	1994	1993	1987	1978	1992	1989	1985	1979
MIN	5.61	6.58	13.9	11.6	21.6	20.5	22.4	20.8	11.1	6.96	3.47	6.06
(WY)	1992	1982	1981	1981	1989	1981	1981	1981	1986	1981	1981	1983

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

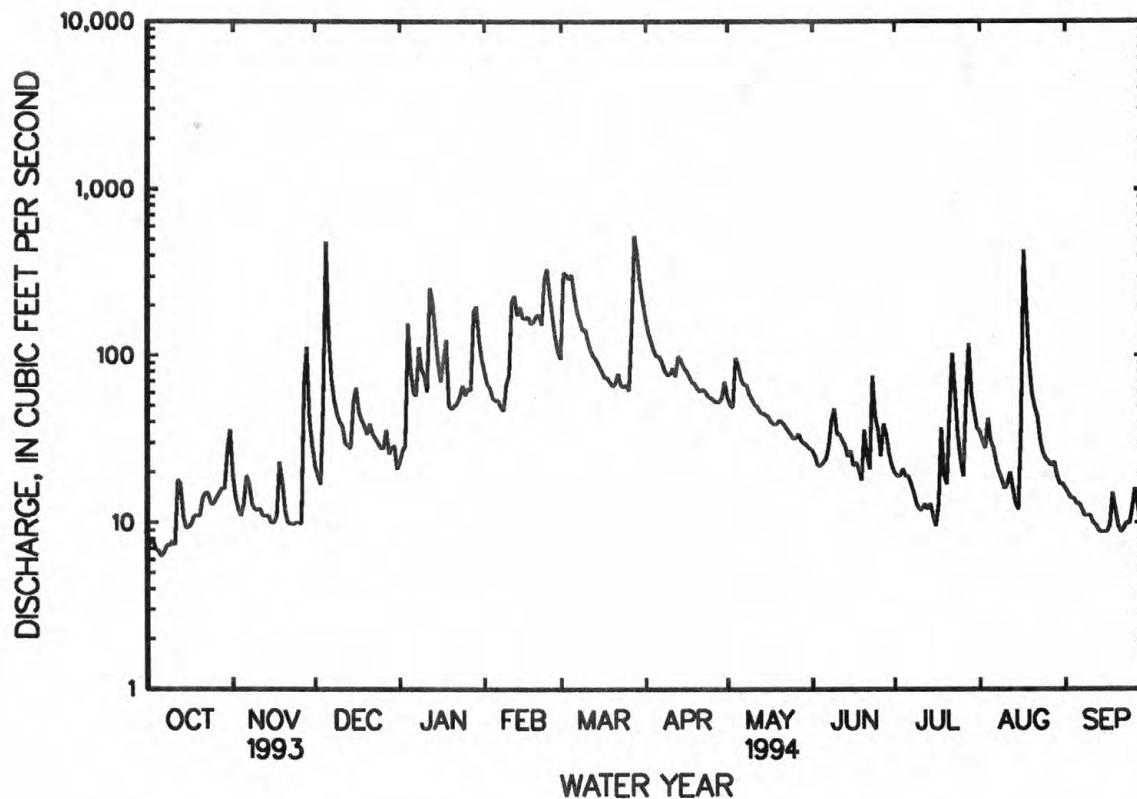
## WATER YEARS 1974 - 1994

ANNUAL TOTAL	25400.3	22092.7	60.8
ANNUAL MEAN	69.6	60.5	108
HIGHEST ANNUAL MEAN			15.9
LOWEST ANNUAL MEAN			4000
HIGHEST DAILY MEAN	1270	526	Nov 4 1985
LOWEST DAILY MEAN	5.4	6.3	Aug 30 1981
ANNUAL SEVEN-DAY MINIMUM	7.0	7.0	Aug 26 1981
INSTANTANEOUS PEAK FLOW		1160	Aug 17 20000
INSTANTANEOUS PEAK STAGE		7.48	Aug 17 a25.1
INSTANTANEOUS LOW FLOW		6.1	Oct 6 b
ANNUAL RUNOFF (CFSM)	1.23	1.07	(c) 1.07
ANNUAL RUNOFF (INCHES)	16.64	14.47	14.54
10 PERCENT EXCEEDS	158	151	115
50 PERCENT EXCEEDS	41	36	32
90 PERCENT EXCEEDS	10	10	10

a From floodmark, present site.

b Also Oct. 7, 1993.

c Not determined.



## ROANOKE RIVER BASIN

02056900 BLACKWATER RIVER NEAR ROCKY MOUNT, VA

LOCATION.--Lat 37°02'42", long 79°50'40", Franklin County, Hydrologic Unit 03010101, on right bank 45 ft downstream from bridge on State Highway 122, 3.0 mi northeast of Rocky Mount, and 4.1 mi upstream from Maggodee Creek.

DRAINAGE AREA.--115 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is 876.45 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 to Jan. 2 and Jan. 19-24, which are fair. Appalachian Power Company gage-height transmitter at station with recorder at Roanoke. Maximum discharge, 20,800 ft<sup>3</sup>/s, from rating curve extended above 7,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 1.13 ft, July 21, 1986. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0830	2,520	7.77	July 26	1600	1,590	6.01
Mar. 28	0900	*4,310	*10.73	Aug. 17	1530	1,920	6.64

Minimum discharge, 33 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	65	71	e75	156	191	362	131	72	55	102	74
2	40	56	66	81	139	626	299	120	68	53	93	70
3	40	53	63	83	127	622	265	117	65	51	112	69
4	38	52	76	396	123	447	241	179	66	64	171	67
5	37	57	993	205	119	443	221	158	68	63	140	68
6	36	67	264	140	119	348	223	137	67	56	92	65
7	36	62	150	132	111	289	213	131	82	50	80	63
8	38	55	119	236	107	257	191	136	118	45	74	59
9	39	53	103	166	121	237	182	125	98	43	69	60
10	39	53	95	141	146	263	180	118	90	41	64	60
11	38	52	91	130	345	235	196	113	90	40	62	58
12	48	52	80	459	483	206	177	110	81	41	61	56
13	56	52	76	321	287	194	198	105	75	47	61	55
14	45	52	74	211	331	187	202	104	73	50	57	54
15	43	52	113	157	299	176	181	103	67	47	59	53
16	43	52	177	101	293	166	186	100	63	40	98	53
17	45	53	118	176	260	156	169	94	68	190	991	54
18	47	63	103	268	237	153	160	92	64	162	465	65
19	45	59	95	e155	231	149	155	92	59	71	204	61
20	44	54	89	e120	228	142	150	94	57	59	151	53
21	44	51	99	e105	223	146	144	95	57	117	130	52
22	44	49	88	e100	211	162	143	90	57	135	127	54
23	44	50	83	e110	408	142	144	86	83	87	103	55
24	43	50	82	e125	598	136	137	82	76	76	94	54
25	43	50	79	129	364	144	132	80	65	62	88	61
26	43	50	76	126	275	138	128	79	56	488	85	80
27	44	103	e74	122	227	283	129	83	95	225	91	63
28	44	289	e71	429	202	2410	126	78	87	440	84	50
29	42	109	e69	395	---	1020	124	76	67	158	77	46
30	57	81	e67	224	---	590	176	74	61	165	75	43
31	91	---	e65	181	---	437	---	72	---	104	75	---
TOTAL	1374	1996	3869	5799	6770	11095	5534	3254	2195	3325	4235	1775
MEAN	44.3	66.5	125	187	242	358	184	105	73.2	107	137	59.2
MAX	91	289	993	459	598	2410	362	179	118	488	991	80
MIN	36	49	63	75	107	136	124	72	56	40	57	43
CFSM	.39	.58	1.09	1.63	2.10	3.11	1.60	.91	.64	.93	1.19	.51
IN.	.44	.65	1.25	1.88	2.19	3.59	1.79	1.05	.71	1.08	1.37	.57

e Estimated.

## ROANOKE RIVER BASIN

425

02056900 BLACKWATER RIVER NEAR ROCKY MOUNT, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	112	126	116	145	159	240	270	148	120	88.3	72.1	92.8
MAX	544	584	204	272	285	585	821	346	416	261	205	375
(WY)	1977	1986	1987	1978	1979	1993	1987	1978	1992	1989	1985	1979
MIN	26.5	29.1	47.9	47.0	66.1	60.1	65.3	53.6	38.2	24.6	12.4	23.0
(WY)	1992	1982	1982	1981	1989	1981	1981	1981	1981	1977	1981	1983

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

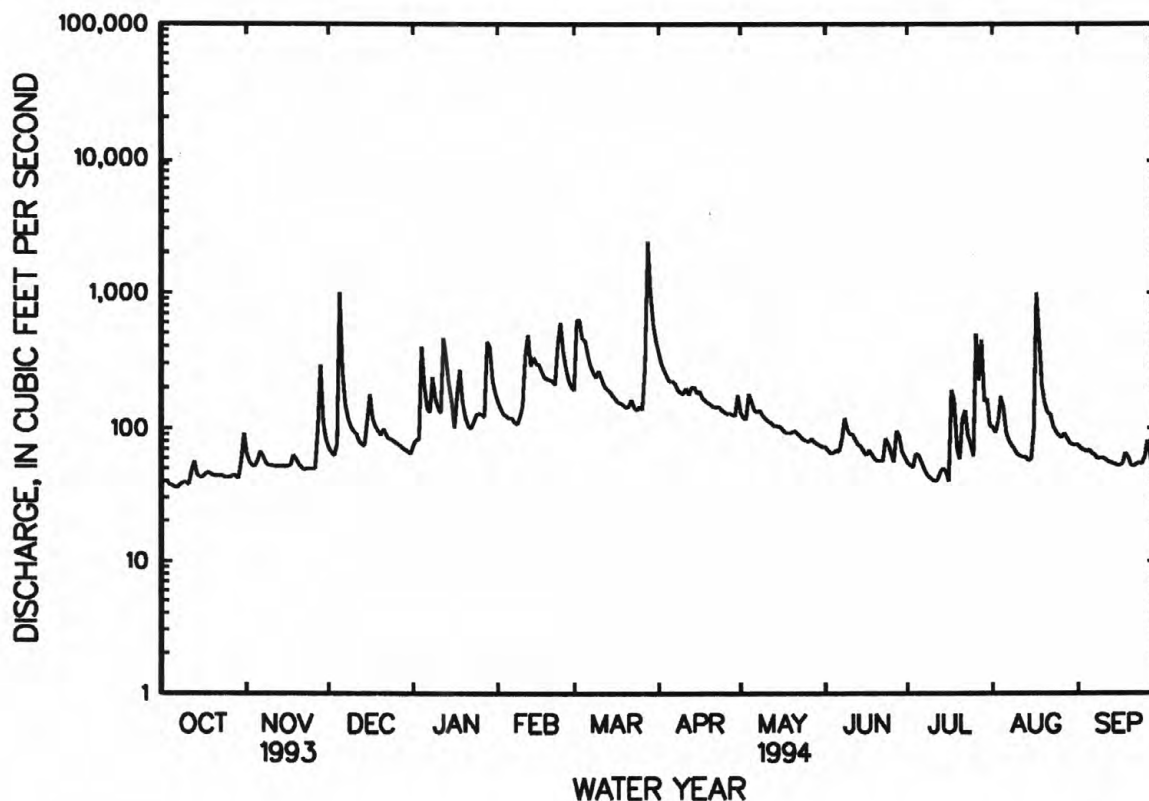
## WATER YEARS 1977 - 1994

ANNUAL TOTAL	61410	51221	
ANNUAL MEAN	168	140	140
HIGHEST ANNUAL MEAN			234
LOWEST ANNUAL MEAN			46.1
HIGHEST DAILY MEAN	2860	Mar 4	5410
LOWEST DAILY MEAN	36	aOct 6	7.4
ANNUAL SEVEN-DAY MINIMUM	38	cOct 4	7.8
INSTANTANEOUS PEAK FLOW			20800
INSTANTANEOUS PEAK STAGE			21.92
INSTANTANEOUS LOW FLOW			6.6
ANNUAL RUNOFF (CFSM)	1.46	1.22	1.22
ANNUAL RUNOFF (INCHES)	19.86	16.57	16.59
10 PERCENT EXCEEDS	334	264	238
50 PERCENT EXCEEDS	103	91	90
90 PERCENT EXCEEDS	45	47	37

a Also Oct. 7, 1993.

b Also Aug. 29, 1981.

c Also Oct. 5, 1993.



## ROANOKE RIVER BASIN

02057400 SMITH MOUNTAIN LAKE NEAR PENHOOK, VA

LOCATION.--Lat 37°02'28", long 79°32'09", Pittsylvania County, Hydrologic Unit 03010101, at dam on Roanoke (Staunton) River 6.5 mi northeast of Penhook and at mile 314.0.

DRAINAGE AREA.--1,024 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1963 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to July 19, 1965, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete dam. Two ungated spillways, one near each end of dam, with crests at elevation 795 ft, are each 105 ft long. Initial filling began in September 1963 during construction; water in reservoir first reached minimum power pool, elevation, 787 ft, in May 1965. Total capacity at maximum pool elevation, 811 ft, is 1,517,000 acre-ft of which 375,000 acre-ft is above the spillway crest; 157,800 acre-ft is normally used for power between elevation 787 ft, minimum power pool, and the spillway crest. Capacity at invert of lowest penstock, elevation, 601 ft, is 100 acre-ft. Figures given herein represent total contents. Reservoir is part of the Smith Mountain Combination Project (pumped storage) which is used for hydroelectric power, flood control, low-water regulation for pollution abatement and water supply, water releases for downstream fish spawning, and recreation.

COOPERATION.--Records were provided by the Appalachian Power Company.

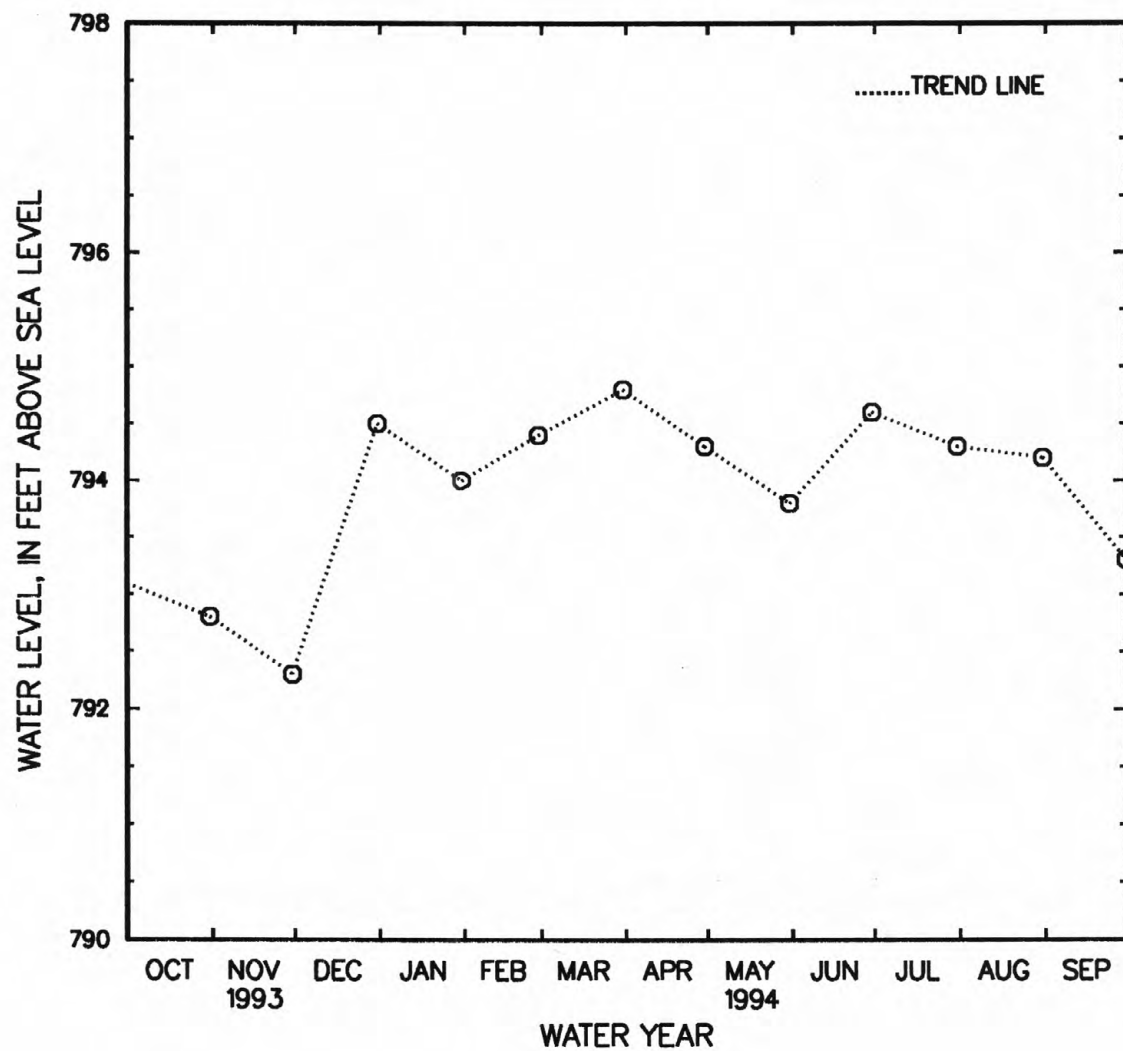
EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,250,200 acre-ft, Apr. 27, 1978, elevation, 799.8 ft; minimum (after first filling to minimum power pool), 995,400 acre-ft, Jan. 23, 1970, elevation, 787.6 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,151,000 acre-ft, Mar. 29, elevation, 795.4 ft; minimum, 1,070,600 acre-ft, Nov. 21, elevation, 791.5 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	793.1	1,103,200	-
Oct. 31.....	792.8	1,097,100	-6,100
Nov. 30.....	792.3	1,086,900	-10,200
Dec. 31.....	794.5	1,131,800	+44,900
CAL YR 1993.....	-	-	-6,100
Jan. 31.....	794.0	1,121,600	-10,200
Feb. 28.....	794.4	1,129,800	+8,200
Mar. 31.....	794.8	1,137,900	+8,100
Apr. 30.....	794.3	1,127,700	-10,200
May 31.....	793.8	1,117,500	-10,200
June 30.....	794.6	1,133,800	+16,300
July 31.....	794.3	1,127,700	-6,100
Aug. 31.....	794.2	1,125,700	-2,000
Sept. 30.....	793.3	1,107,300	-18,400
WTR YR 1994.....	-	-	+4,100

02057400 SMITH MOUNTAIN LAKE NEAR PENHOOK, VA--Continued





## ROANOKE RIVER BASIN

02058400 PIGG RIVER NEAR SANDY LEVEL, VA

LOCATION.--Lat 36°56'45", long 79°31'30", Pittsylvania County, Hydrologic Unit 03010101, on left bank 300 ft downstream from Harpen Creek, 0.5 mi upstream from bridge on State Highway 40, and 1.1 mi south of Sandy Level.

DRAINAGE AREA.--350 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1963 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 617.00 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to Nov. 18, 1963, nonrecording gage at same site and datum.

REMARKS.--Records good except for period with ice effect, Jan. 20-23, which is fair. Appalachian Power Company gage-height transmitter at station, recorder at Roanoke. Maximum discharge, 65,600 ft<sup>3</sup>/s, from rating curve extended above 25,500 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 1.95 ft, Aug. 29, 30, 1981. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 3	0030	6,740	12.20	July 28	1230	4,440	8.74
Mar. 28	1800	*8,370	*14.34				

Minimum discharge, 136 ft<sup>3</sup>/s, Oct. 6-7, gage height, 2.48 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	145	227	222	281	437	459	833	443	242	319	476	245
2	148	182	208	265	380	3010	710	372	235	222	632	266
3	148	174	201	264	343	3750	638	348	225	214	421	239
4	143	174	217	1080	320	1590	599	576	222	410	342	232
5	140	185	1690	968	315	1160	563	621	231	236	298	225
6	138	214	892	497	315	823	574	482	234	230	292	224
7	138	221	404	403	299	643	591	431	289	198	255	225
8	142	194	306	1210	289	556	529	497	275	180	241	213
9	145	182	268	773	298	517	501	434	280	171	232	205
10	148	179	250	446	352	1010	493	378	267	162	220	202
11	154	176	245	371	537	993	564	355	320	158	211	195
12	173	175	222	1160	1330	634	530	338	316	158	207	185
13	183	175	210	1360	823	537	522	326	295	163	204	180
14	171	176	210	650	963	494	534	315	265	175	199	175
15	162	178	336	456	879	458	480	322	230	182	243	172
16	159	180	680	277	773	424	478	459	217	164	292	170
17	163	180	395	320	674	396	458	361	210	255	805	165
18	168	228	306	603	582	383	429	308	220	870	1410	184
19	166	242	285	451	516	372	423	298	204	332	540	204
20	164	198	262	e470	473	355	409	300	191	222	374	192
21	159	184	302	e430	438	363	396	302	184	287	316	178
22	163	176	297	e400	412	424	392	294	190	543	293	175
23	164	176	263	e360	1180	385	396	282	190	572	271	177
24	160	177	256	339	2280	352	388	269	200	325	249	178
25	158	178	247	337	1120	371	374	264	202	353	238	179
26	162	176	233	331	700	381	363	280	183	316	237	303
27	165	251	220	341	546	892	369	327	329	1280	242	657
28	168	822	235	926	480	6250	500	285	502	3150	251	252
29	165	389	249	1680	---	4070	419	262	294	1630	241	196
30	213	257	239	776	---	1740	564	257	290	654	234	174
31	290	---	244	538	---	1010	---	250	---	491	231	---
TOTAL	5065	6626	10594	18763	18054	34802	15019	11036	7532	14622	10697	6567
MEAN	163	221	342	605	645	1123	501	356	251	472	345	219
MAX	290	822	1690	1680	2280	6250	833	621	502	3150	1410	657
MIN	138	174	201	264	289	352	363	250	183	158	199	165
CFSM	.47	.63	.98	1.73	1.84	3.21	1.43	1.02	.72	1.35	.99	.63
IN.	.54	.70	1.13	1.99	1.92	3.70	1.60	1.17	.80	1.55	1.14	.70

e Estimated.

## ROANOKE RIVER BASIN

429

02058400 PIGG RIVER NEAR SANDY LEVEL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	307	316	359	461	497	612	560	417	317	265	247	279
MAX	1220	995	836	1054	1032	1578	2265	989	1200	814	867	1864
(WY)	1991	1986	1974	1978	1979	1993	1987	1978	1972	1972	1985	1987
MIN	110	103	143	160	228	203	201	165	114	85.4	49.3	70.0
(WY)	1982	1982	1966	1981	1968	1981	1985	1981	1981	1967	1981	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

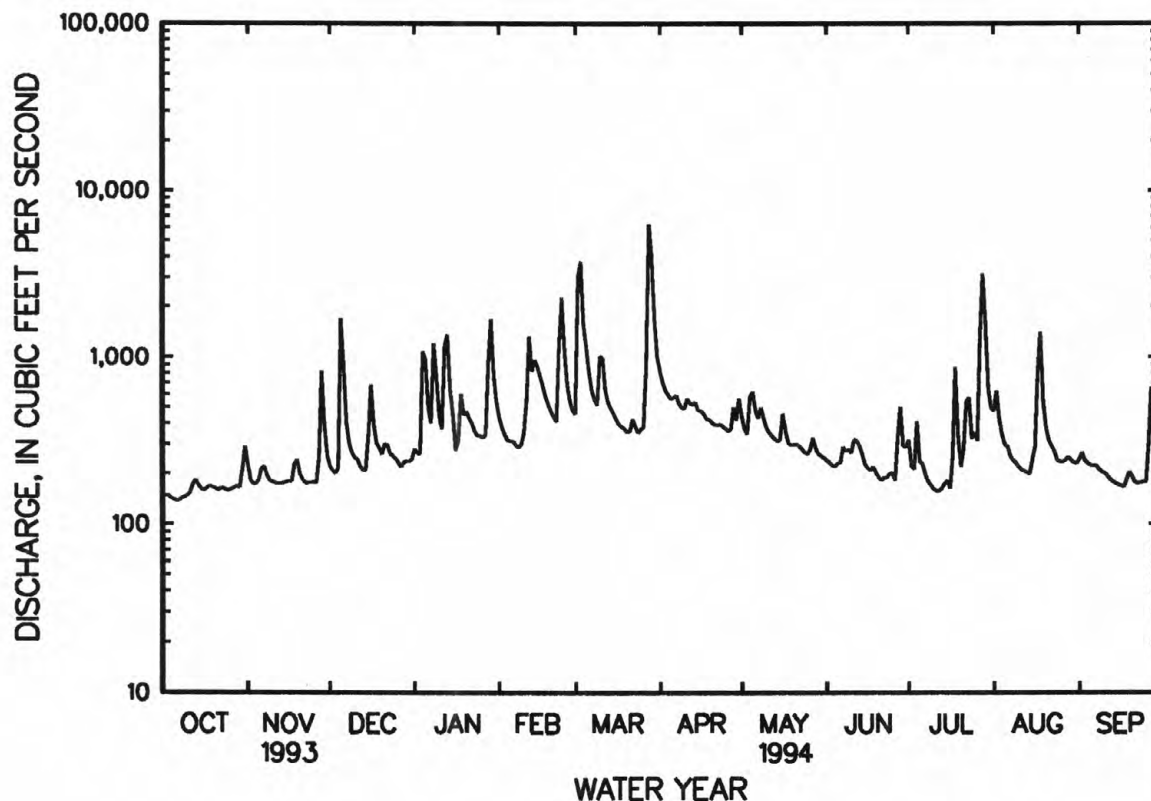
## WATER YEARS 1963 - 1994

ANNUAL TOTAL	173122		159377									
ANNUAL MEAN	474		437							387		
HIGHEST ANNUAL MEAN										709		1987
LOWEST ANNUAL MEAN										155		1981
HIGHEST DAILY MEAN	8830	Mar 4		6250	Mar 28				34900	Sep 8	1987	
LOWEST DAILY MEAN	135	Sep 14		138	<sup>a</sup> Oct 6				25	Aug 29	1981	
ANNUAL SEVEN-DAY MINIMUM	142	Oct 3		142	Oct 3				29	Aug 24	1981	
INSTANTANEOUS PEAK FLOW				8370	Mar 28				65600	Sep 8	1987	
INSTANTANEOUS PEAK STAGE				14.34	Mar 28				<sup>b</sup> 31.12	Sep 8	1987	
INSTANTANEOUS LOW FLOW				136	<sup>a</sup> Oct 6				24	<sup>c</sup> Aug 29	1981	
ANNUAL RUNOFF (CFSM)	1.36			1.25					1.11			
ANNUAL RUNOFF (INCHES)	18.40			16.94					15.04			
10 PERCENT EXCEEDS	805			788					598			
50 PERCENT EXCEEDS	298			293					257			
90 PERCENT EXCEEDS	163			173					122			

a Also Oct. 7, 1993.

b From high-water marks.

c Also Aug. 30, 1981.



## ROANOKE RIVER BASIN

02059400 LEESVILLE LAKE NEAR LEESVILLE, VA

LOCATION.--Lat 37°05'35", long 79°24'09", Campbell County, Hydrologic Unit 03010101, at Leesville Dam on Roanoke (Staunton) River, 2.0 mi south of Leesville, 3.5 mi upstream from Goose Creek, and at mile 296.

DRAINAGE AREA.--1,505 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level. Prior to June 6, 1963, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete dam. Spillway, with crest at elevation 578.0 ft, is equipped with 4 radial gates 35 ft high by 50 ft wide. Storage began on Sept. 29, 1962, during construction, and water in reservoir first reached minimum power pool, elevation, 600.0 ft, on Mar. 5, 1963. Total capacity at maximum pool elevation, 614 ft, is 97,890 acre-ft of which 78,670 acre-ft is above the spillway crest elevation; 38,200 acre-ft is normally used for power between elevations 600.0 ft, minimum power pool, and 613.0 ft. Capacity at invert of lowest penstock, elevation, 579.75 ft, is 21,010 acre-ft. Figures given herein represent total contents. Reservoir is part of the Smith Mountain Combination Project (see station 02057400).

COOPERATION.--Records were provided by the Appalachian Power Company.

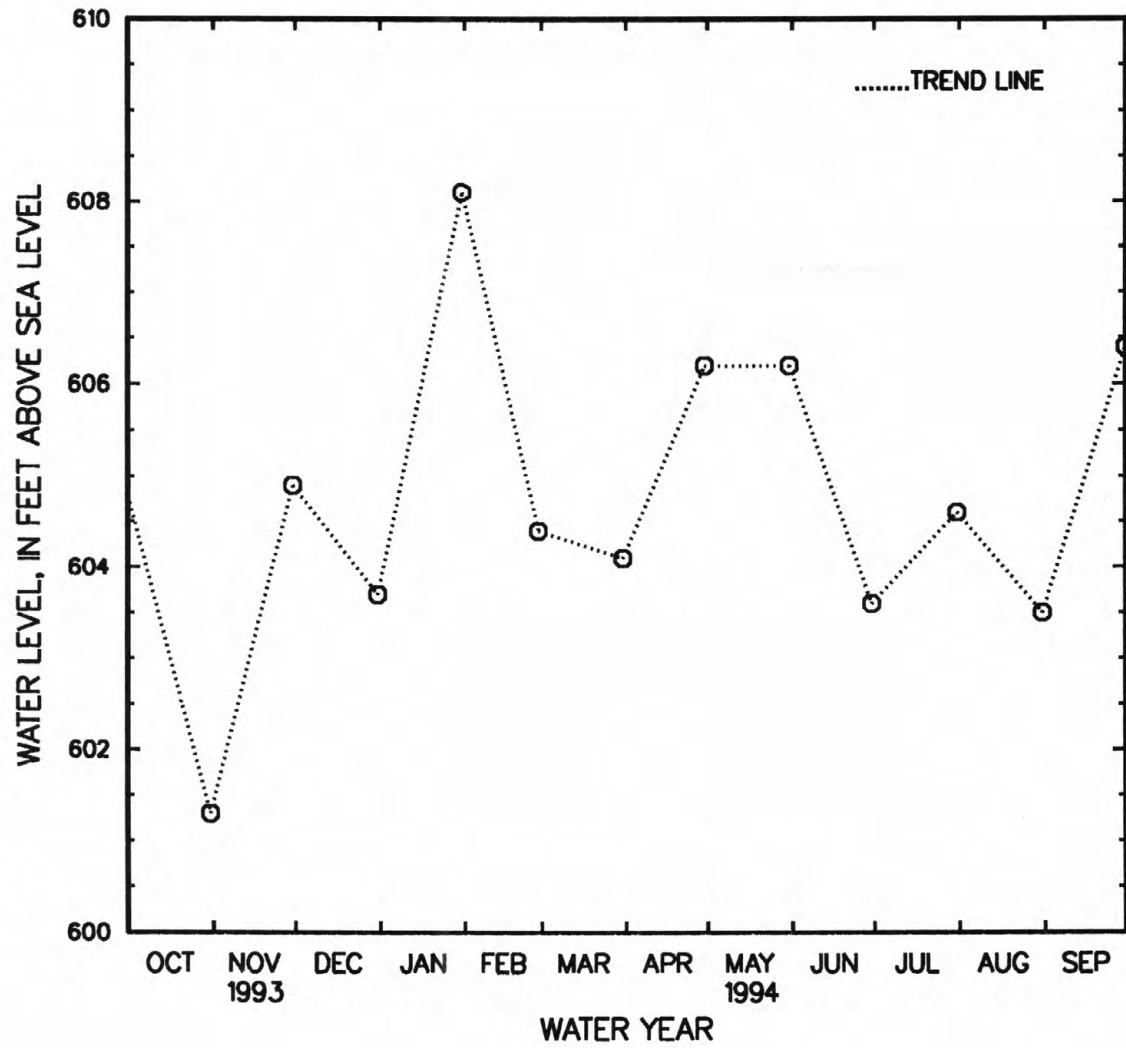
EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 98,180 acre-ft, Feb. 1, 1965, elevation, 614.0 ft; minimum (after first filling to minimum power pool), 39,880 acre-ft, Mar. 19, 1963, elevation, 592.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 94,320 acre-ft, Jan. 26, elevation, 612.8 ft; minimum, 56,740 acre-ft, Apr. 1, elevation, 599.8 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	604.9	70,330	-
Oct. 31.....	601.3	60,680	-9,650
Nov. 30.....	604.9	70,330	+9,650
Dec. 31.....	603.7	67,120	-3,210
CAL YR 1993.....	-	-	+4,830
Jan. 31.....	608.1	79,710	+12,590
Feb. 28.....	604.4	68,990	-10,720
Mar. 31.....	604.1	68,190	-800
Apr. 30.....	606.2	74,130	+5,940
May 31.....	606.2	74,130	0
June 30.....	603.6	66,850	-7,280
July 31.....	604.6	69,530	+2,680
Aug. 31.....	603.5	66,580	-2,950
Sept. 30.....	606.4	74,720	+8,140
WTR YR 1994.....	-	-	+4,390

02059400 LEESVILLE LAKE NEAR LEESVILLE, VA--Continued



## ROANOKE RIVER BASIN

02059500 GOOSE CREEK NEAR HUDDLESTON, VA

LOCATION.--Lat 37°10'23", long 79°31'14", Bedford County, Hydrologic Unit 03010101, on left bank 0.3 mi upstream from Haden Bridge on State Highway 732, 0.4 mi upstream from Rockcastle Creek, and 3.5 mi northwest of Huddleston.

DRAINAGE AREA.--188 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1925 to August 1928 (gage heights only), September 1930 to current year.

REVISED RECORDS.--WSP 892: 1933, 1935(M), 1939. WSP 972: 1931-32(M), 1934(M), 1935-38, 1940, 1941(M). WSP 1082: 1940(P). WSP 1142: 1938-40(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 592.91 ft above sea level. Mar. 15, 1925, to Aug. 4, 1928, nonrecording gage at site 1,300 ft downstream at different datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 to Jan. 1 and Jan. 17-26, which are fair. Prior to October 1954, diurnal fluctuation at low flow caused by mill upstream from station. Appalachian Power Company gage-height transmitter at station with recorder at Roanoke. Maximum discharge, 53,200 ft<sup>3</sup>/s, from rating curve extended above 11,000 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 19.25 ft, 24.1 ft, 24.89 ft, and 37.49 ft. Minimum discharge, 3.0 ft<sup>3</sup>/s, Aug. 31, 1932, and Jan. 30, 1934, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0915	2,330	7.28	Mar. 28	0345	*5,410	*13.15
Mar. 2	2100	2,450	7.56	Aug. 17	1500	3,570	9.88

Minimum discharge, 45 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	65	91	e87	197	198	365	182	102	100	160	105
2	51	56	86	94	170	795	302	167	98	94	140	102
3	51	53	84	93	156	886	271	161	95	93	133	100
4	49	53	120	472	142	552	253	216	95	124	161	100
5	47	60	1420	337	136	652	238	220	97	92	131	98
6	46	64	435	209	134	492	245	190	94	89	118	98
7	47	58	221	180	124	401	234	176	114	86	107	96
8	47	54	163	297	118	353	212	176	162	81	105	90
9	46	52	133	228	165	315	205	161	159	78	101	90
10	48	53	120	182	207	379	205	150	137	79	97	87
11	49	52	113	165	695	329	207	145	245	76	96	86
12	59	52	94	615	753	291	197	141	146	78	96	83
13	58	53	93	451	448	272	208	133	125	77	93	81
14	51	53	88	278	468	260	216	131	111	77	92	81
15	50	53	137	201	438	247	198	134	104	75	109	79
16	49	52	203	194	383	237	198	141	101	71	156	78
17	50	53	135	e215	365	222	188	125	99	138	1110	79
18	52	71	116	e330	321	219	184	122	98	145	565	97
19	51	61	109	e220	301	213	183	121	95	512	253	86
20	51	56	102	e180	286	206	179	122	97	517	192	78
21	53	53	113	e150	264	213	172	122	93	191	168	77
22	59	52	104	e140	239	237	176	118	93	222	241	78
23	52	51	96	e148	477	212	177	115	108	168	170	77
24	50	51	95	e170	659	207	166	111	170	205	143	76
25	50	52	93	e195	404	223	166	111	187	134	130	84
26	50	51	91	e190	306	216	162	113	113	125	123	113
27	50	80	e90	318	242	400	182	120	156	200	118	92
28	51	279	e84	609	212	2530	172	110	171	514	121	74
29	49	141	e80	555	---	1430	170	107	126	350	110	71
30	64	105	e76	316	---	775	207	107	112	263	107	67
31	83	---	e71	240	---	485	---	103	---	197	104	---
TOTAL	1614	2039	5056	8059	8810	14447	6238	4351	3703	4891	5550	2603
MEAN	52.1	68.0	163	260	315	466	208	140	123	158	179	86.8
MAX	83	279	1420	615	753	2530	365	220	245	514	1110	113
MIN	46	51	71	87	118	198	162	103	93	71	92	67
CFM	.28	.36	.87	1.38	1.67	2.48	1.11	.75	.66	.84	.95	.46
IN.	.32	.40	1.00	1.59	1.74	2.86	1.23	.86	.73	.97	1.10	.52

e Estimated.



## ROANOKE RIVER BASIN

433

02059500 GOOSE CREEK NEAR HUDDLESTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	136	139	173	221	243	291	267	202	143	116	137	128
MAX	719	642	616	772	536	909	1319	780	509	466	822	1229
(WY)	1938	1986	1949	1936	1979	1975	1987	1989	1972	1949	1940	1987
MIN	27.9	32.9	45.2	46.6	48.5	80.1	73.2	56.8	50.7	26.3	22.9	28.8
(WY)	1932	1932	1966	1966	1934	1981	1942	1981	1932	1966	1932	1933

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1931 - 1994

ANNUAL TOTAL	65250	67361	
ANNUAL MEAN	179	185	183
HIGHEST ANNUAL MEAN			393
LOWEST ANNUAL MEAN			66.8
HIGHEST DAILY MEAN	2710	Mar 4	2530
LOWEST DAILY MEAN	46	aOct 6	46
ANNUAL SEVEN-DAY MINIMUM	47	bOct 4	47
INSTANTANEOUS PEAK FLOW			5410
INSTANTANEOUS PEAK STAGE			13.15
INSTANTANEOUS LOW FLOW			45
ANNUAL RUNOFF (CFSM)	.95	.98	.97
ANNUAL RUNOFF (INCHES)	12.91	13.33	13.21
10 PERCENT EXCEEDS	341	342	323
50 PERCENT EXCEEDS	106	125	113
90 PERCENT EXCEEDS	52	53	48

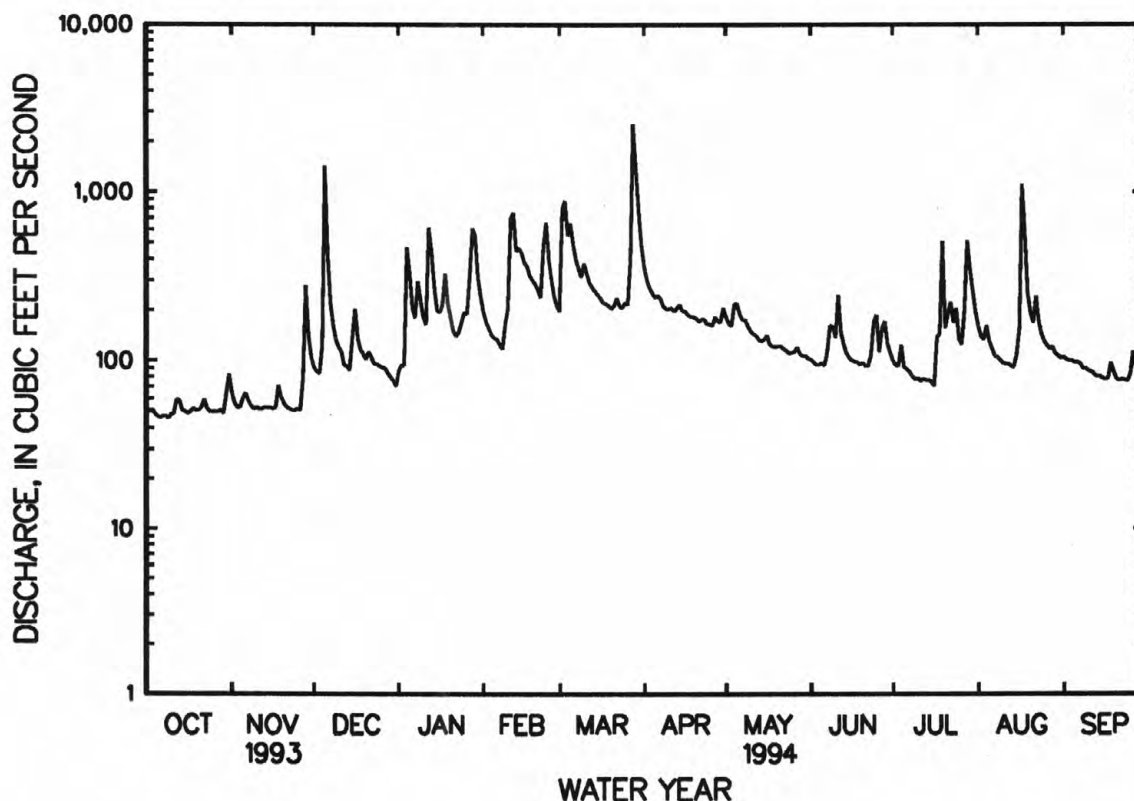
a Also Oct. 9, 1993.

b Also Oct. 5, 1993.

c From floodmarks.

d Also Jan. 30, 1934, result of freezeup.

e Estimated.



## ROANOKE RIVER BASIN

02060500 ROANOKE (STAUNTON) RIVER AT ALTAVISTA, VA

LOCATION.--Lat 37°06'16", long 79°17'44", Pittsylvania County, Hydrologic Unit 03010101, on right bank 12 ft upstream from bridge on alternate U.S. Highway 29, 0.3 mi south of Altavista, 0.3 mi downstream from Sycamore Creek, 3.5 mi upstream from Big Otter River, and at mile 286.5.

DRAINAGE AREA.--1,789 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1930 to current year.

REVISED RECORDS.--WSP 892: 1938(M). WSP 972: 1931-33. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 503.10 ft above sea level. Prior to Feb. 21, 1951, on left bank 50 ft downstream at same datum.

REMARKS.--Records good except for period with ice effect, Jan. 16-23, which is fair. Flow regulated since 1962 by Leesville Lake (station 02059400) 9.5 mi upstream and since 1963 by Smith Mountain Lake (station 02057400) 27.5 mi upstream. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Appalachian Power Company gage-height transmitter at station with recorder at Roanoke. Hadson Power Company gage-height telemeter at station. Maximum discharge, 105,000 ft<sup>3</sup>/s, from rating curve extended above 52,000 ft<sup>3</sup>/s on basis of unit hydrograph and flood-routing studies by U.S. Army Corps of Engineers and records for other stations in Roanoke River Basin. Minimum gage height, 1.53 ft, Jan. 2, 1977, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 18,600 ft<sup>3</sup>/s, Mar. 28, gage height, 18.89 ft; minimum daily, 707 ft<sup>3</sup>/s, Oct. 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	828	909	905	1020	3290	4770	8810	3580	1040	890	1080	1040
2	827	860	886	1010	2490	11100	7580	1810	864	854	972	1060
3	849	888	870	1000	1710	13000	3890	1530	853	875	2340	952
4	833	864	903	3500	1370	8350	3140	2170	849	2190	4760	863
5	826	879	3250	5310	1390	5770	2710	3240	860	2040	1870	855
6	820	889	1760	2730	1380	5710	2730	2680	865	827	871	836
7	821	890	1110	1830	1370	5530	2750	2210	856	818	834	837
8	819	871	1000	3280	1580	5400	2380	2000	938	806	848	828
9	830	879	968	4240	2780	5320	2090	1860	926	798	847	828
10	837	875	1210	1840	4710	5160	2070	1490	947	811	824	866
11	822	875	1390	1290	6690	4230	2770	1180	1080	799	811	848
12	835	868	1500	6040	11500	2710	3470	1170	977	792	831	835
13	859	870	1040	9600	5960	2140	1110	1180	920	798	892	807
14	844	854	1010	3580	5710	2490	1140	1190	859	800	844	805
15	821	843	1340	2300	4810	2550	1550	1360	843	810	834	817
16	800	849	1970	e1450	3050	2530	1710	1750	846	848	3830	821
17	797	868	2040	e1350	3460	2160	1500	1700	924	872	9730	840
18	777	880	2100	e2000	4160	1550	1480	1340	869	908	7050	853
19	775	881	1780	e4000	4120	1470	1470	984	860	1300	1190	827
20	791	870	1280	e6000	4080	1530	1640	991	836	1070	967	834
21	757	900	1070	e1000	4020	1720	1810	1000	846	1420	1590	832
22	740	862	1200	e900	3970	2300	1830	1200	841	1800	1540	826
23	753	862	1170	e840	7430	2130	2100	1650	890	2000	951	810
24	730	857	1110	859	11100	1660	1630	1240	929	1460	895	811
25	707	865	1090	1030	7610	1440	1430	1110	1010	984	873	824
26	746	858	1070	1010	3520	1470	1390	1080	894	1110	869	1000
27	736	938	928	1060	2680	4850	1370	1050	1010	3740	878	931
28	751	1240	919	2550	2320	16200	1400	1040	989	8000	855	847
29	749	1020	914	5850	---	15800	1400	1240	906	8170	824	832
30	802	916	941	3250	---	13800	3450	1640	910	3150	826	828
31	778	---	1000	2910	---	12900	---	1300	---	1540	855	---
TOTAL	24660	26780	39724	84629	118260	167740	73800	48965	27237	53280	53181	25793
MEAN	795	893	1281	2730	4224	5411	2460	1580	908	1719	1716	860
MAX	859	1240	3250	9600	11500	16200	8810	3580	1080	8170	9730	1060
MIN	707	843	870	840	1370	1440	1110	984	836	792	811	805
(†)	-256	-9	+678	+39	-45	+119	-71	-166	+152	-55	-81	-172
MEAN#	539	884	1959	2769	4179	5530	2389	1414	1060	1664	1635	688
CFSM#	.30	.49	1.10	1.55	2.34	3.09	1.34	.79	.59	.93	.91	.38
IN.#	.35	.55	1.26	1.78	2.43	3.56	1.49	.91	.66	1.07	1.05	.43

CAL YR 1993 TOTAL 783491 MEAN 2147 MAX 17400 MIN 702 MEAN# 2146 CFSM# 1.20 IN.# 16.29  
WTR YR 1994 TOTAL 744049 MEAN 2038 MAX 16200 MIN 707 MEAN# 2050 CFSM# 1.15 IN.# 15.56

† Change in contents, equivalent in cubic feet per second, in Smith Mountain and Leesville Lakes; provided by Appalachian Power Company.

# Adjusted for change in contents.

e Estimated.

## 02060500 ROANOKE (STAUNTON) RIVER AT ALTAVISTA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1962, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1431	1366	1845	2321	2615	2949	2831	2042	1592	1388	1630	1307
MAX	6570	3335	5971	7148	5338	5313	4818	4825	3056	5354	10210	3461
(WY)	1938	1948	1949	1936	1960	1936	1951	1958	1950	1949	1940	1945
MIN	324	388	528	543	517	1260	815	827	653	442	314	284
(WY)	1931	1932	1932	1956	1934	1940	1942	1934	1956	1932	1932	1954

## SUMMARY STATISTICS

## WATER YEARS 1931 - 1962

ANNUAL MEAN	1940
HIGHEST ANNUAL MEAN	3424
LOWEST ANNUAL MEAN	915
HIGHEST DAILY MEAN	98300
LOWEST DAILY MEAN	156
ANNUAL SEVEN-DAY MINIMUM	181
INSTANTANEOUS PEAK FLOW	105000
INSTANTANEOUS PEAK STAGE	440.08
INSTANTANEOUS LOW FLOW	94
ANNUAL RUNOFF (CFSM)	1.08
ANNUAL RUNOFF (INCHES)	14.73
10 PERCENT EXCEEDS	3590
50 PERCENT EXCEEDS	1310
90 PERCENT EXCEEDS	542

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1186	1348	1398	2029	2180	2877	2597	1960	1422	1088	1027	1145
MAX	4811	6190	3576	4643	4760	7795	10930	4716	5684	3363	3108	5246
(WY)	1991	1986	1973	1978	1979	1993	1987	1978	1972	1972	1985	1987
MIN	189	396	351	620	581	338	604	484	220	504	311	439
(WY)	1964	1982	1964	1965	1981	1981	1964	1964	1964	1981	1963	1963

## SUMMARY STATISTICS

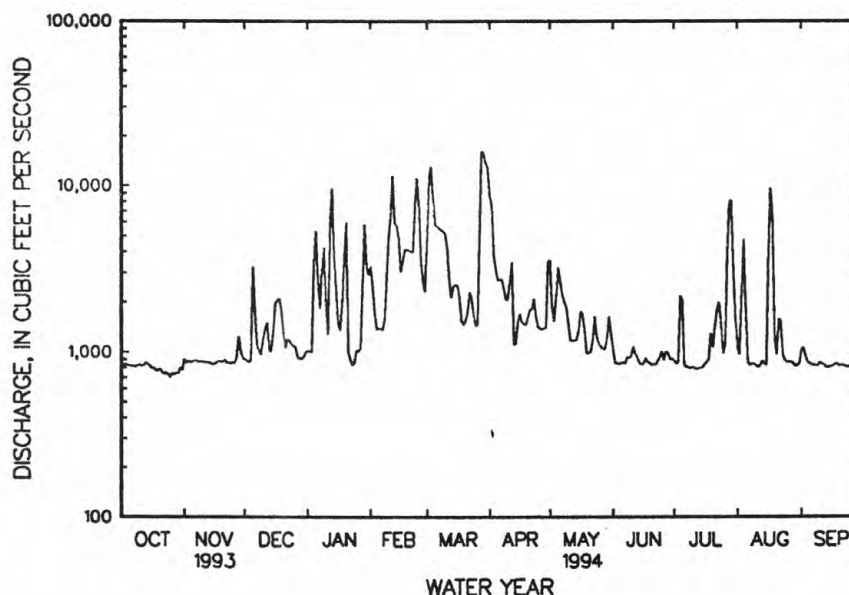
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1963 - 1994

ANNUAL TOTAL	783491	744049	
ANNUAL MEAN	2147	2038	1685
HIGHEST ANNUAL MEAN			2903
LOWEST ANNUAL MEAN			645
HIGHEST DAILY MEAN	17400	Mar 5	16200
LOWEST DAILY MEAN	702	May 5	707
ANNUAL SEVEN-DAY MINIMUM	738	Oct 22	738
INSTANTANEOUS PEAK FLOW			18600
INSTANTANEOUS PEAK STAGE			18.89
INSTANTANEOUS LOW FLOW			590
ANNUAL RUNOFF (CFSM)	1.20	1.14	.94
ANNUAL RUNOFF (INCHES)	16.29	15.47	12.80
10 PERCENT EXCEEDS	4380	4430	3400
50 PERCENT EXCEEDS	1100	1050	1020
90 PERCENT EXCEEDS	808	822	248

a From floodmarks.



## ROANOKE RIVER BASIN

02061500 BIG OTTER RIVER NEAR EVINGTON, VA

LOCATION.--Lat 37°12'30", long 79°18'14", Campbell County, Hydrologic Unit 03010101, on right bank 60 ft upstream from bridge on State Highway 682, 2.0 mi southwest of Evington, and 2.1 mi upstream from Flat Creek.

DRAINAGE AREA.--320 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1936 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to October 1965, published as Otter River near Evington.

REVISED RECORDS.--WSP 852: 1937. WSP 892: 1938-39(M). WSP 972: 1937-39. WSP 1032: 1940. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 544.02 ft above sea level.

REMARKS.--Records good except those for periods with ice effect, Dec. 27-29, 31, and Jan. 21-25, which are fair. Maximum discharge, 41,900 ft<sup>3</sup>/s, from rating curve extended above 24,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in October 1937 and August 1939 reached a stage of 23.1 ft, discharge, 27,500 ft<sup>3</sup>/s, from rating curve extended above 7,000 ft<sup>3</sup>/s on basis of unit hydrograph and flood-routing studies by U.S. Army Corps of Engineers, and records for other stations in Roanoke River Basin.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1230	5,760	12.64	Mar. 28	1100	*10,300	*16.99
Feb. 11	2230	4,810	10.74	Mar. 29	1100	5,270	11.68
Mar. 3	0200	5,140	11.41	Aug. 17	2200	4,450	10.01

Minimum discharge, 76 ft<sup>3</sup>/s, Oct. 1, 2, gage height, 0.30 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76	131	163	159	499	544	865	323	194	178	621	196
2	84	109	149	178	435	1510	714	278	172	142	433	178
3	89	99	144	192	390	3080	639	263	161	132	349	161
4	84	96	210	731	362	1420	577	416	160	126	311	154
5	82	110	3780	712	348	1150	531	438	167	123	297	153
6	81	138	1110	503	354	846	557	359	165	129	272	149
7	81	126	550	424	322	731	548	335	236	121	233	148
8	85	110	400	583	307	671	466	351	300	110	220	145
9	84	105	324	524	407	620	439	319	222	106	205	142
10	86	104	287	417	563	892	427	288	225	116	194	132
11	89	104	271	397	1680	765	422	271	366	121	200	122
12	105	102	228	1430	2330	625	395	264	251	119	198	120
13	113	102	215	1060	1130	571	437	252	213	120	192	117
14	100	102	210	637	1210	565	479	246	182	116	171	113
15	94	102	255	532	1120	559	403	246	161	113	268	110
16	93	102	488	336	977	522	399	313	153	101	368	110
17	89	101	321	361	842	476	358	261	158	169	1530	112
18	88	139	274	717	731	450	336	248	162	315	1570	139
19	87	130	262	386	674	430	328	243	155	822	625	129
20	88	108	236	322	637	399	317	240	142	387	460	110
21	96	100	267	e305	603	408	303	243	136	293	420	107
22	97	96	257	e300	570	527	316	231	135	517	581	108
23	105	96	223	e325	1270	453	324	226	137	390	352	109
24	99	96	219	e370	1740	413	308	215	226	409	285	108
25	99	97	211	e400	1010	422	294	208	268	268	255	113
26	100	95	204	376	756	416	285	207	170	234	236	285
27	101	154	e195	363	630	922	329	219	259	392	233	188
28	97	703	e180	1570	572	6950	343	201	282	961	242	124
29	87	301	e170	1380	---	3930	298	207	190	680	205	118
30	108	198	142	712	---	1690	472	208	175	680	194	115
31	164	---	e135	566	---	1080	---	198	---	434	179	---
TOTAL	2931	4156	12080	17268	22469	34037	12909	8317	5923	8924	11899	4115
MEAN	94.5	139	390	557	802	1098	430	268	197	288	384	137
MAX	164	703	3780	1570	2330	6950	865	438	366	961	1570	285
MIN	76	95	135	159	307	399	285	198	135	101	171	107
CFSM	.30	.43	1.22	1.74	2.51	3.43	1.34	.84	.62	.90	1.20	.43
IN.	.34	.48	1.40	2.01	2.61	3.96	1.50	.97	.69	1.04	1.38	.48

e Estimated.

## ROANOKE RIVER BASIN

437

02061500 BIG OTTER RIVER NEAR EVINGTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	233	258	336	398	482	546	492	383	284	216	249	195
MAX	1163	1200	1192	921	895	1332	2062	1335	891	925	1412	1027
(WY)	1991	1986	1949	1978	1979	1993	1987	1989	1972	1949	1940	1987
MIN	52.5	68.7	68.6	95.7	193	153	127	106	71.0	27.9	33.3	29.9
(WY)	1964	1966	1966	1966	1968	1981	1966	1981	1966	1966	1963	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

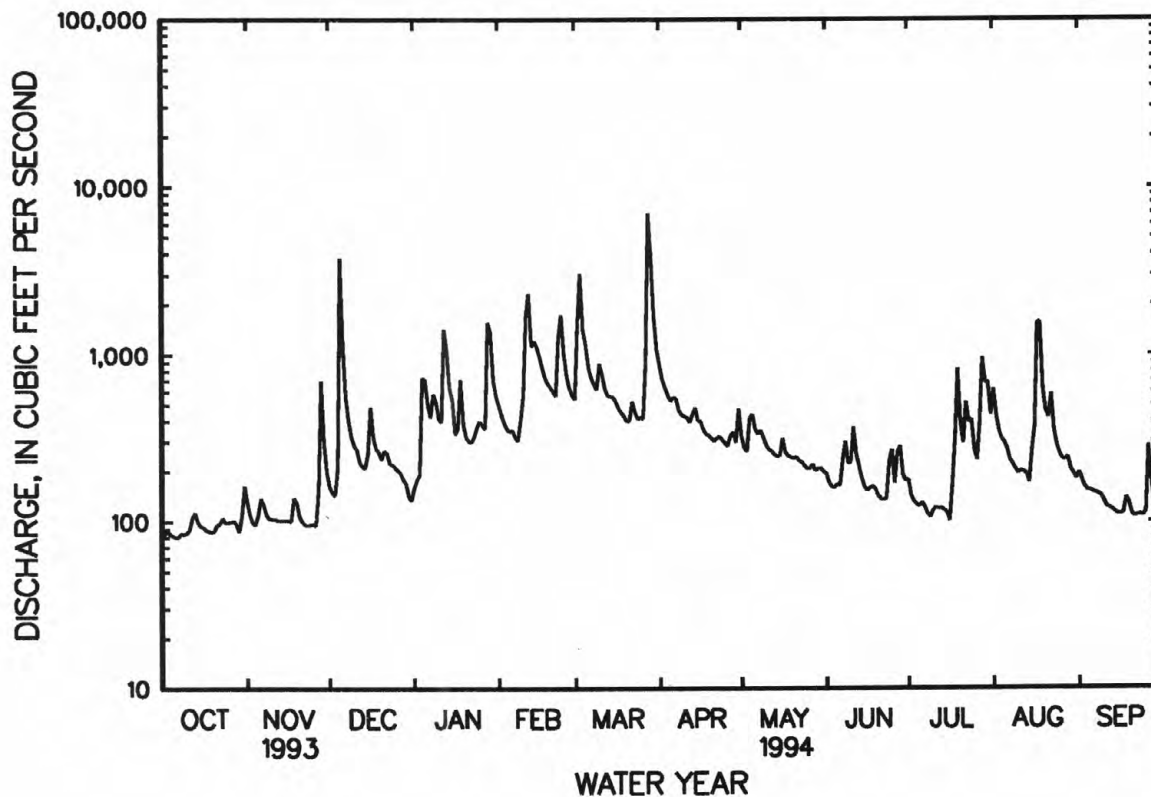
## WATER YEARS 1937 - 1994

ANNUAL TOTAL	153642		145028									
ANNUAL MEAN	421		397									
HIGHEST ANNUAL MEAN										338		
LOWEST ANNUAL MEAN										635		1949
HIGHEST DAILY MEAN										139		1981
LOWEST DAILY MEAN	7070	Mar 4		6950	Mar 28					20200	Sep 8	1987
ANNUAL SEVEN-DAY MINIMUM	66	Sep 1		76	Oct 1					12	aJul 28	1966
INSTANTANEOUS PEAK FLOW	73	Aug 27		82	Oct 1					13	Sep 7	1966
INSTANTANEOUS PEAK STAGE				10300	Mar 28					41900	Sep 8	1987
INSTANTANEOUS LOW FLOW				16.99	Mar 28					24.96	Sep 8	1987
ANNUAL RUNOFF (CFSM)	1.32			76	bOct 1					12	cJul 28	1966
ANNUAL RUNOFF (INCHES)	17.86			1.24						1.06		
10 PERCENT EXCEEDS	830			16.86						14.37		
50 PERCENT EXCEEDS	255									620		
90 PERCENT EXCEEDS	88									219		
										81		

a Also Sept. 12, 13, 1966.

b Also Oct. 2, 1993.

c Also Sept. 12-14, 1966.





## ROANOKE RIVER BASIN

## 02062500 ROANOKE (STAUNTON) RIVER AT BROOKNEAL, VA

LOCATION.--Lat 37°02'28", long 78°57'02", Campbell County, Hydrologic Unit 03010102, on left bank 1,600 ft upstream from bridge on U.S. Highway 501 at Brookneal, 2.9 mi upstream from Falling River, and at mile 255.9.

DRAINAGE AREA.--2,415 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1923 to current year.

REVISED RECORDS.--WSP 892: 1928(M). WSP 972: 1928-34. WSP 1303: 1924-27(M), 1929(M), 1941(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 351.96 ft above sea level. Apr. 30, 1923, to Aug. 29, 1929, nonrecording gage, Aug. 30, 1929, to Aug. 15, 1940, water-stage recorder, and Aug. 16 to Oct. 1, 1940, nonrecording gage at site 1,800 ft downstream at same datum. Oct. 2, 1940, to Sept. 30, 1941, nonrecording gage at site 1,600 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1962 by Leesville Lake (station 02059400) 40.1 mi upstream and since 1963 by Smith Mountain Lake (station 02057400) 58.1 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Maximum discharge, 130,000 ft<sup>3</sup>/s, at present site, from gage-height relation curve, from rating curve extended above 55,000 ft<sup>3</sup>/s on basis of slope-area measurement by Geological Survey, unit hydrograph and flood-routing studies by U.S. Army Corps of Engineers, and records for other stations in Roanoke River Basin. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 37,500 ft<sup>3</sup>/s, Mar. 28, gage height, 28.74 ft; minimum daily, 1,000 ft<sup>3</sup>/s, Oct. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1020	1200	1270	1390	4230	3700	13500	5310	1550	1300	2140	1270		
2	1010	1100	1200	1530	4030	14400	9830	3160	1320	1220	1720	1410		
3	1020	1080	1170	1520	3050	23300	5960	2460	1190	1130	1920	1370		
4	1030	1100	1200	2690	2380	15300	4600	2620	1170	1390	4820	1210		
5	1010	1100	6350	6950	2040	7690	4120	4380	1170	3410	3960	1160		
6	1010	1150	6510	5120	2110	7430	3980	4120	1200	1270	1420	1160		
7	1000	1180	2540	2790	2070	6860	4100	3360	1210	1070	1200	1140		
8	1010	1120	1800	3970	2130	6650	3860	3140	1420	1050	1140	1140		
9	1010	1100	1570	5920	2470	6460	3310	2990	1430	1030	1170	1130		
10	1030	1100	1540	3580	5390	7430	3260	2630	1360	1020	1120	1140		
11	1020	1090	1830	2080	6140	6490	3290	1960	1450	1050	1090	1150		
12	1040	1090	1920	4390	13600	4710	5070	1850	1630	1030	1080	1110		
13	1050	1090	1760	11800	10400	3670	2740	1830	1380	1030	1110	1100		
14	1080	1090	1370	7240	8530	3510	2290	1790	1280	1050	1140	1080		
15	1060	1080	1640	4010	8120	3710	2270	1810	1200	1060	1090	1080		
16	1040	1070	3260	2680	5810	3620	3140	2320	1160	1050	1400	1090		
17	1040	1080	2970	1890	4830	3520	2650	2490	1430	1100	9450	1090		
18	1040	1170	2860	2640	5580	2720	2560	2180	1230	1330	12600	1150		
19	1040	1170	2820	5190	5460	2390	2510	1760	1190	1390	3220	1140		
20	1050	1130	2020	8060	5340	2320	2500	1510	1150	2430	1870	1110		
21	1060	1100	2050	1740	5230	2470	2830	1510	1130	1410	1600	1100		
22	1050	1110	1950	1450	5120	3120	2860	1500	1120	2300	2720	1100		
23	1030	1080	1790	1580	6800	3530	3150	1980	1110	2830	1910	1090		
24	1040	1080	1670	1750	14500	2740	2840	2100	1290	2220	1420	1080		
25	1010	1080	1560	1930	13200	2400	2410	1590	1350	1720	1350	1090		
26	1030	1090	1520	1980	6000	2330	2300	1540	1380	1230	1300	1250		
27	1040	1410	1420	1770	4240	4070	2240	1510	1380	2830	1290	1810		
28	1040	6570	1320	2460	3620	26100	2400	1470	1630	7420	1300	1260		
29	1040	2210	1350	7130	---	31500	2220	1440	1400	10100	1250	1130		
30	1110	1420	1290	5780	---	23500	3200	1950	1280	5620	1190	1110		
31	1200	---	1320	4030	---	17700	---	2110	---	2830	1200	---		
TOTAL	32260	40440	64840	117040	162420	255340	111990	72370	39190	66920	71190	35250		
MEAN	1041	1348	2092	3775	5801	8237	3733	2335	1306	2159	2296	1175		
MAX	1200	6570	6510	11800	14500	31500	13500	5310	1630	10100	12600	1810		
MIN	1000	1070	1170	1390	2040	2320	2220	1440	1110	1020	1080	1080		
(†)	-256	-9	+678	+39	-45	+119	-71	-166	+152	-55	-81	-172		
MEAN#	785	1339	2770	3814	5756	8356	3662	2169	1458	2104	2215	1003		
CFSM#	.33	.55	1.15	1.58	2.38	3.46	1.52	.90	.60	.87	.92	.42		
IN.#	.37	.62	1.32	1.82	2.48	3.99	1.69	1.04	.67	1.00	1.06	.46		
CAL YR 1993	TOTAL	1123484	MEAN	3078	MAX	35400	MIN	981	MEAN#	3077	CFSM#	1.27	IN.#	17.30
WTR YR 1994	TOTAL	1069250	MEAN	2929	MAX	31500	MIN	1000	MEAN#	2941	CFSM#	1.22	IN.#	16.54

† Change in contents, equivalent in cubic feet per second, in Smith Mountain and Leesville Lakes; provided by Appalachian Power Company.

# Adjusted for change in contents.

## 02062500 ROANOKE (STAUNTON) RIVER AT BROOKNEAL, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1962, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1884	1762	2417	3019	3349	3603	3521	2512	1991	1726	2133	1731
MAX	8561	3861	7776	9381	6272	7071	6407	5789	4320	7125	14270	7430
(WY)	1938	1949	1949	1936	1960	1936	1935	1958	1929	1949	1940	1928
MIN	415	527	805	821	754	1666	1083	1132	714	489	384	371
(WY)	1931	1932	1932	1956	1934	1940	1942	1956	1926	1930	1932	1930

## SUMMARY STATISTICS

## WATER YEARS 1924 - 1962

ANNUAL MEAN	2466	
HIGHEST ANNUAL MEAN	4386	1949
LOWEST ANNUAL MEAN	1172	1956
HIGHEST DAILY MEAN	113000	Aug 16 1940
LOWEST DAILY MEAN	<u>a</u> 191	Sep 2 1932
ANNUAL SEVEN-DAY MINIMUM	207	Aug 27 1932
INSTANTANEOUS PEAK FLOW	130000	Aug 15 1940
INSTANTANEOUS PEAK STAGE	46.50	Aug 15 1940
INSTANTANEOUS LOW FLOW	(a)	(b)
ANNUAL RUNOFF (CFSM)	1.02	
ANNUAL RUNOFF (INCHES)	13.88	
10 PERCENT EXCEEDS	4450	
50 PERCENT EXCEEDS	1720	
90 PERCENT EXCEEDS	744	

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1642	1873	2049	2901	3167	4118	3696	2735	1975	1487	1413	1568
MAX	6446	8961	5564	7695	7291	11760	14410	7039	7460	4775	4675	7620
(WY)	1991	1986	1973	1978	1979	1993	1987	1978	1972	1972	1985	1987
MIN	325	553	637	867	953	561	921	836	405	683	411	512
(WY)	1964	1982	1964	1981	1981	1981	1981	1964	1964	1963	1964	1965

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1963 - 1994

ANNUAL TOTAL	1123484	1069250	
ANNUAL MEAN	3078	2929	2381
HIGHEST ANNUAL MEAN			4440
LOWEST ANNUAL MEAN			853
HIGHEST DAILY MEAN	35400	Mar 5	31500
LOWEST DAILY MEAN	981	Sep 1	1000
ANNUAL SEVEN-DAY MINIMUM	997	Aug 28	1010
INSTANTANEOUS PEAK FLOW			37500
INSTANTANEOUS PEAK STAGE			28.74
INSTANTANEOUS LOW FLOW			964
ANNUAL RUNOFF (CFSM)	1.27	1.21	.99
ANNUAL RUNOFF (INCHES)	17.31	16.47	13.39
10 PERCENT EXCEEDS	6160	6060	4740
50 PERCENT EXCEEDS	1600	1600	1400
90 PERCENT EXCEEDS	1040	1060	504

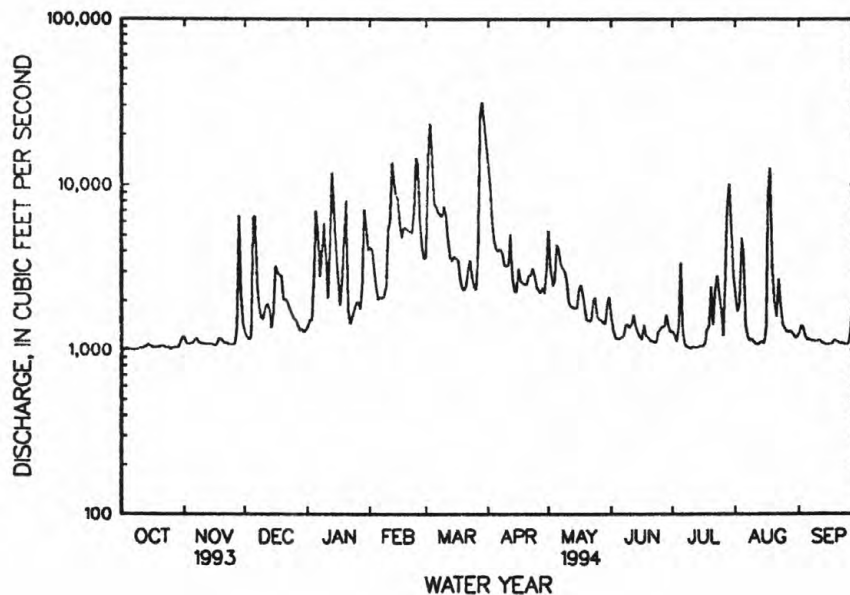
a Probably less than 191 ft<sup>3</sup>/s.

b Probably occurred Sept. 1, 2, 1932.

c Lowest recorded discharge; may have been lower during period of no gage-height record, July 25, 26, 1966.

d Also July 26, 1966.

e Estimated.



## ROANOKE RIVER BASIN

## 02064000 FALLING RIVER NEAR NARUNA, VA

LOCATION.--Lat 37°07'36", long 78°57'36", Campbell County, Hydrologic Unit 03010102, on left bank at upstream side of bridge on State Highway 643, 2.7 mi northeast of Naruna, and 3.2 mi upstream from Little Falling River.

DRAINAGE AREA.--173 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1929 to January 1935, September 1941 to current year.

REVISED RECORDS.--WSP 1333: 1930, 1931-34(M), 1935. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 412.32 ft above sea level. Prior to Jan. 15, 1935, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of doubtful or no gage-height record, Oct. 5-19, and periods with ice effect, Dec. 29 to Jan. 1 and Jan. 19-23, which are fair. Small diurnal fluctuation caused by gristmill at Spring Mills. Maximum discharge, 32,600 ft<sup>3</sup>/s, from rating curve extended above 7,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 2.18 ft, Oct. 9, 1932. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in August 1940 reached a stage of 26.5 ft, from floodmarks, discharge, 22,000 ft<sup>3</sup>/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0445	*5,650	*15.31	Mar. 2	2215	2,820	10.32
Dec. 5	1500	4,230	13.12	Mar. 28	1500	5,160	14.61
Feb. 23	1915	2,320	9.19	Mar. 29	1215	3,380	11.51

Minimum daily discharge, 43 ft<sup>3</sup>/s, Oct. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	79	176	e122	214	228	423	163	85	93	96	83
2	65	62	122	162	185	1520	314	139	81	75	95	76
3	57	58	107	189	166	1820	276	131	78	126	250	67
4	53	57	141	541	154	867	252	309	76	490	112	63
5	e48	63	2570	442	156	473	236	296	79	114	88	61
6	e45	80	748	256	164	338	273	229	81	88	81	61
7	e43	89	324	214	149	285	280	195	108	76	73	60
8	e44	68	212	724	143	265	231	189	278	69	69	58
9	e45	61	170	339	250	254	215	164	139	64	67	57
10	e46	59	153	224	294	572	212	150	162	77	65	55
11	e50	57	149	191	512	430	208	144	213	70	65	54
12	e60	57	123	683	816	295	199	137	132	66	63	54
13	e64	57	112	516	548	259	211	128	108	65	62	52
14	e54	56	109	310	700	241	206	123	94	64	61	51
15	e48	57	207	221	614	223	189	123	86	62	72	50
16	e48	57	378	166	548	208	202	170	81	59	111	50
17	e49	58	215	208	421	193	182	128	86	101	212	50
18	e53	90	176	314	352	193	171	115	80	83	218	66
19	e53	78	179	e170	312	189	167	117	76	76	117	58
20	52	66	151	e158	291	178	161	115	72	112	91	52
21	52	60	293	e148	310	197	155	115	68	99	88	51
22	56	57	260	e142	234	270	160	109	69	89	110	52
23	54	56	197	e155	1110	210	166	105	69	126	81	54
24	51	57	168	163	1130	191	150	101	101	93	73	54
25	51	56	151	165	528	206	143	99	76	73	72	55
26	52	55	135	170	348	196	138	101	66	131	71	113
27	54	256	120	161	267	733	137	103	93	159	70	133
28	54	3610	119	553	234	3790	146	94	106	287	71	72
29	53	500	e117	623	---	2520	156	91	81	166	68	58
30	82	260	e113	339	---	890	218	89	76	126	67	52
31	123	---	e110	254	---	544	---	86	---	100	65	---
TOTAL	1717	6276	8305	9023	11150	18778	6177	4358	3000	3479	2904	1872
MEAN	55.4	209	268	291	398	606	206	141	100	112	93.7	62.4
MAX	123	3610	2570	724	1130	3790	423	309	278	490	250	133
MIN	43	55	107	122	143	178	137	86	66	59	61	50
CFSM	.32	1.21	1.55	1.68	2.30	3.50	1.19	.81	.58	.65	.54	.36
IN.	.37	1.35	1.79	1.94	2.40	4.04	1.33	.94	.65	.75	.62	.40

e Estimated.

## ROANOKE RIVER BASIN

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02064000 FALLING RIVER NEAR NARUNA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	102	125	158	194	231	261	218	163	115	89.6	82.6	103
MAX	399	639	482	636	683	844	552	606	898	334	400	691
(WY)	1973	1986	1949	1978	1979	1975	1987	1971	1972	1972	1985	1987
MIN	24.5	32.2	44.0	47.9	56.5	62.9	60.2	50.7	25.4	29.9	23.9	20.1
(WY)	1970	1970	1966	1966	1931	1981	1966	1981	1970	1970	1932	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

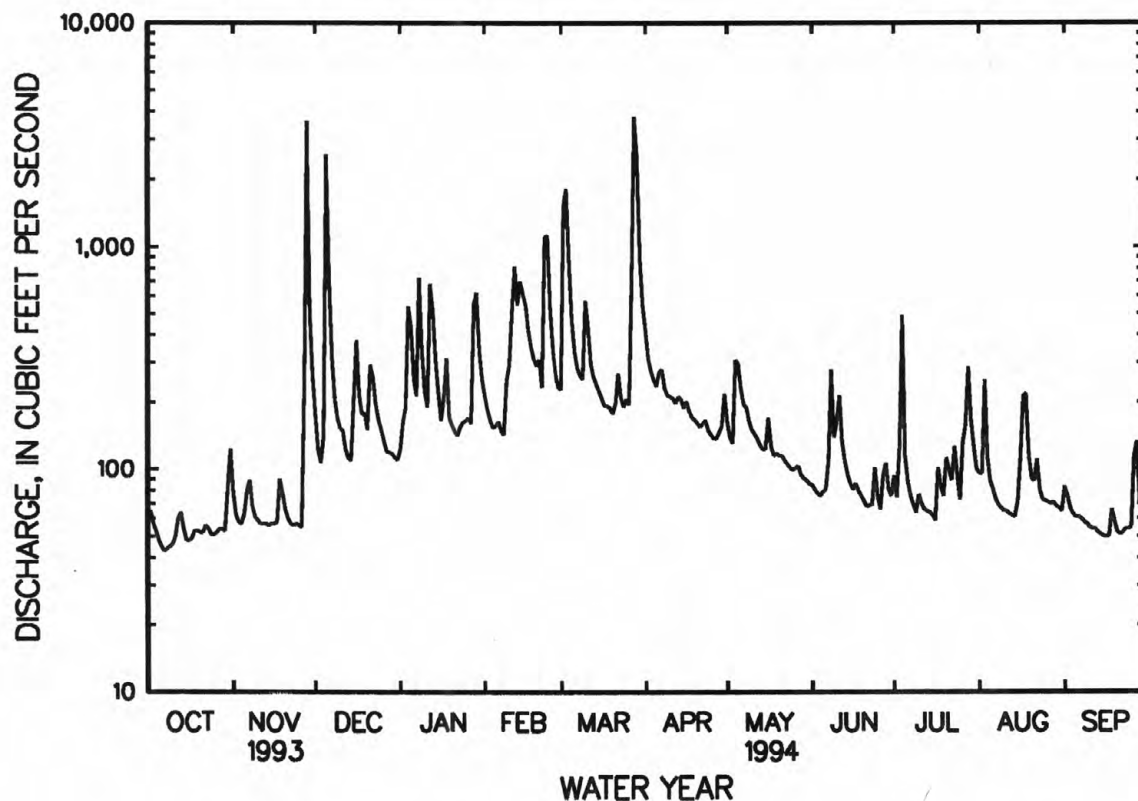
## FOR 1994 WATER YEAR

## WATER YEARS 1930 - 1994

ANNUAL TOTAL	86540	77039	153
ANNUAL MEAN	237	211	287
HIGHEST ANNUAL MEAN			60.9
LOWEST ANNUAL MEAN			1973
HIGHEST DAILY MEAN	6220	Mar 4	3790
LOWEST DAILY MEAN	38	Aug 31	Mar 28
ANNUAL SEVEN-DAY MINIMUM	42	Aug 26	Oct 7
INSTANTANEOUS PEAK FLOW			Oct 5
INSTANTANEOUS PEAK STAGE			Oct 7
INSTANTANEOUS LOW FLOW			Nov 28
ANNUAL RUNOFF (CFSM)	1.37	1.22	29.21
ANNUAL RUNOFF (INCHES)	18.61	16.57	3.0
10 PERCENT EXCEEDS	420	350	12.03
50 PERCENT EXCEEDS	133	120	262
90 PERCENT EXCEEDS	51	55	93
			37

a Also Oct. 9, 14, 1932.

e Estimated.





## ROANOKE RIVER BASIN

02065500 CUB CREEK AT PHENIX, VA

LOCATION.--Lat 37°04'45", long 78°45'50", Charlotte County, Hydrologic Unit 03010102, on right bank 5 ft upstream from bridge on State Highway 40, 0.9 mi west of Phenix, 1.9 mi downstream from Rough Creek, and 6.4 mi upstream from Louse Creek.

DRAINAGE AREA.--98.0 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1946 to current year.

REVISED RECORDS.--WSP 1333: 1947(M), 1948, 1949(M). WSP 2104: Drainage area. WDR VA-76-1: 1975.

GAGE.--Water-stage recorder. Datum of gage is 370.19 ft above sea level. Prior to July 14, 1950, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period with ice effect, Dec. 29 to Jan. 2, and periods of doubtful or no gage-height record, Jan. 19-23 and July 2-13, 26-28, which are fair. Maximum discharge, 10,600 ft<sup>3</sup>/s, from rating curve extended above 5,400 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. Minimum gage height, 0.74 ft, Oct. 6, 1970. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of August 1940 reached a stage of 17.5 ft, from floodmarks, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	1700	*6,460	*15.39	Mar. 3	1300	1,950	9.77
Dec. 6	0800	2,060	9.97	Mar. 29	0400	2,320	10.42
Feb. 24	1500	1,190	7.84				

Minimum discharge, 23 ft<sup>3</sup>/s, Oct. 7-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	45	117	e75	119	128	269	98	59	55	95	48
2	30	34	97	e72	107	355	201	89	58	e47	85	47
3	29	30	88	125	98	1530	164	83	56	e168	130	47
4	27	29	93	162	94	856	149	144	55	e274	101	45
5	25	32	334	220	94	372	138	169	57	e105	79	44
6	24	44	1370	134	102	189	150	124	58	e86	72	44
7	23	50	383	108	94	153	170	108	63	e71	66	44
8	24	38	138	186	90	142	141	106	71	e63	62	43
9	24	32	112	229	111	158	127	95	64	e57	61	42
10	25	31	100	120	154	215	124	88	66	e66	59	41
11	27	30	100	101	149	425	122	85	172	e63	58	41
12	32	30	87	138	287	237	118	82	102	e61	57	40
13	35	30	82	233	315	156	124	78	76	e58	57	40
14	27	30	81	147	274	141	128	76	66	56	55	39
15	24	30	114	111	301	131	114	75	60	55	55	39
16	24	29	257	100	286	123	142	89	57	52	72	39
17	24	29	174	101	251	114	133	80	72	51	154	39
18	25	48	118	151	201	113	113	72	63	58	188	45
19	25	46	123	e140	174	113	106	72	58	92	83	44
20	24	34	108	e105	154	106	102	73	55	145	65	39
21	28	30	264	e93	140	110	98	73	53	136	59	39
22	38	27	298	e90	131	151	97	71	52	94	57	40
23	34	27	142	e93	226	124	102	68	51	95	54	43
24	29	27	112	94	849	112	97	66	54	76	50	43
25	28	27	97	96	685	114	94	69	53	65	49	44
26	30	26	88	93	268	118	90	69	48	e76	49	66
27	30	98	80	88	157	177	89	69	48	e130	48	80
28	32	3400	78	137	133	857	95	64	53	e115	48	40
29	32	1520	e76	326	---	1780	90	62	51	235	48	33
30	48	243	e74	233	---	1160	108	61	49	277	47	31
31	80	---	e72	138	---	426	---	60	---	107	47	---
TOTAL	938	6126	5457	4239	6044	10886	3795	2618	1900	3089	2210	1309
MEAN	30.3	204	176	137	216	351	126	84.5	63.3	99.6	71.3	43.6
MAX	80	3400	1370	326	849	1780	269	169	172	277	188	80
MIN	23	26	72	72	90	106	89	60	48	47	47	31
CFSM	.31	2.08	1.80	1.40	2.20	3.58	1.29	.86	.65	1.02	.73	.45
IN.	.36	2.33	2.07	1.61	2.29	4.13	1.44	.99	.72	1.17	.84	.50

e Estimated.



## ROANOKE RIVER BASIN

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02065500 CUB CREEK AT PHENIX, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	68.1	93.5	103	128	147	163	144	101	74.9	57.3	52.8	61.2
MAX	293	429	273	478	447	443	354	261	518	192	257	322
(WY)	1972	1986	1949	1978	1979	1975	1983	1971	1972	1972	1985	1987
MIN	14.0	22.7	27.9	35.1	56.4	51.7	50.4	37.8	15.7	19.5	16.2	8.03
(WY)	1971	1970	1966	1966	1968	1981	1966	1981	1970	1966	1964	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1947 - 1994

ANNUAL TOTAL	50448		48611									
ANNUAL MEAN	138		133							99.2		
HIGHEST ANNUAL MEAN										188		1972
LOWEST ANNUAL MEAN										36.1		1970
HIGHEST DAILY MEAN	3400	Nov 28				3400	Nov 28			<sup>e</sup> 6300	Jun 22	1972
LOWEST DAILY MEAN	23	Oct 7				23	Oct 7			2.8	<sup>a</sup> Oct 6	1970
ANNUAL SEVEN-DAY MINIMUM	25	<sup>b</sup> Oct 4				25	<sup>b</sup> Oct 4			3.2	Oct 5	1970
INSTANTANEOUS PEAK FLOW						6460	Nov 28			10600	Sep 8	1987
INSTANTANEOUS PEAK STAGE						15.39	Nov 28			<sup>c</sup> 20.37	Jun 22	1972
INSTANTANEOUS LOW FLOW						23	<sup>d</sup> Oct 7			2.6	Oct 6	1970
ANNUAL RUNOFF (CFSM)	1.41					1.36				1.01		
ANNUAL RUNOFF (INCHES)	19.15					18.45				13.75		
10 PERCENT EXCEEDS	241					227				171		
50 PERCENT EXCEEDS	78					82				64		
90 PERCENT EXCEEDS	28					30				26		

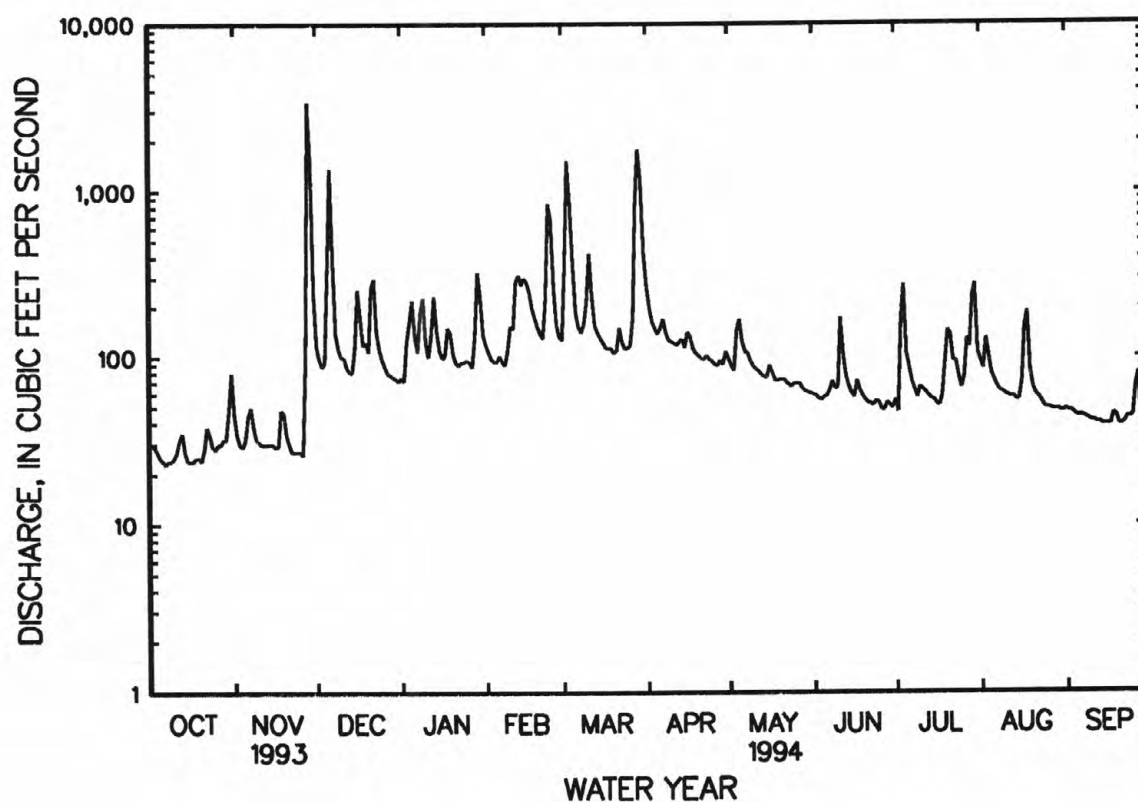
a Also Oct. 7, 1970.

b Also Oct. 5, 1993.

c From high-water mark in gage house, peak discharge, 7,380 ft<sup>3</sup>/s, result of backwater.

d Also Oct. 8, 9, 1993.

e Estimated.



## ROANOKE RIVER BASIN

## 02066000 ROANOKE (STAUNTON) RIVER AT RANDOLPH, VA

LOCATION.--Lat 36°54'54", long 78°44'28", Halifax County, Hydrologic Unit 03010102, on right bank 6 ft downstream from bridge on State Highway 746, 2.8 mi northwest of Randolph, 3.6 mi upstream from Roanoke Creek, and at mile 227.3.

DRAINAGE AREA.--2,977 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1900 to September 1906, October 1927 to September 1930, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1303. Prior to October 1902, published as Staunton River at Randolph. Gage heights collected since 1905 at this site or at former site are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1203: 1928-30. WSP 1303: 1901-6. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 307.59 ft above sea level. Aug. 27, 1900, to Oct. 13, 1902, nonrecording gage at site 3.2 mi downstream at datum about 5.9 ft lower. Oct. 14, 1902, to Aug. 11, 1906, and Oct. 1, 1927, to Mar. 31, 1930, nonrecording gage at site of original gage at datum 3.93 ft lower than present datum.

REMARKS.--Records good except those for period of doubtful gage-height record, Oct. 1 to Nov. 28, and period with ice effect, Jan. 20-27, which are fair. Flow regulated since 1962 by Leesville Lake (station 02059400) 68.7 mi upstream and since 1963 by Smith Mountain Lake (station 02057400) 86.7 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Maximum discharge, 97,000 ft<sup>3</sup>/s, from graph based on gage readings, site and datum then in use. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 16, 1940, reached a stage of 41.6 ft, present site and datum, discharge, 150,000 ft<sup>3</sup>/s, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 36,300 ft<sup>3</sup>/s, Mar. 30, gage height, 27.15 ft; minimum daily, 1,110 ft<sup>3</sup>/s, Oct. 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1180	1380	2220	1550	4760	4090	19600	5220	2140	1690	2770	1450		
2	1160	1330	1750	1820	4790	11400	12800	4550	1830	1650	2430	1610		
3	1140	1240	1550	2030	3730	23700	9020	3020	1560	1530	2380	1670		
4	1160	1230	1490	2530	2860	25600	5960	2970	1500	1810	3800	1540		
5	1160	1240	5710	7520	2410	15300	5250	4340	1510	3370	5460	1400		
6	1130	1270	13900	7160	2450	9370	4840	5010	1540	3020	2710	1370		
7	1120	1330	6140	4130	2400	7930	5050	4140	1570	1520	1670	1370		
8	1110	1330	3270	4190	2300	7450	4840	3750	1660	1430	1540	1320		
9	1110	1260	2330	6660	2590	7240	4230	3480	2050	1370	1480	1310		
10	1120	1250	2020	5590	4800	8110	3920	3200	1760	1340	1470	1290		
11	1140	1240	2120	3170	6540	9380	3860	2720	1980	1340	1420	1330		
12	1160	1230	2250	2730	13300	6780	4810	2290	2230	1360	1380	1310		
13	1190	1230	2260	12100	15600	4890	4730	2210	1970	1340	1380	1260		
14	1210	1230	1790	11000	10400	4110	2890	2180	1760	1340	1420	1240		
15	1210	1230	1780	5250	9830	4330	2820	2160	1620	1370	1420	1220		
16	1170	1230	3810	3580	8030	4230	3290	2400	1540	1350	1480	1220		
17	1170	1220	4120	2580	6160	4080	3490	2910	1620	1350	5990	1230		
18	1170	1260	3460	2360	6240	3580	3040	2740	1790	1490	12700	1270		
19	1170	1330	3430	4260	6290	2930	2910	2350	1560	1760	7450	1370		
20	1160	1310	2980	e10000	6030	2730	2850	1960	1530	2590	2680	1310		
21	1170	1260	4110	e4000	5860	2770	2960	1890	1460	2360	2070	1270		
22	1240	1240	3570	e1900	5700	3300	3150	1900	1450	2280	2520	1260		
23	1200	1230	2780	e1800	6890	4030	3200	2000	1440	3050	2800	1260		
24	1180	1220	2290	e2000	17000	3580	3440	2560	1580	3120	1900	1240		
25	1180	1220	2050	e2300	18500	3040	2930	2160	1690	2480	1670	1240		
26	1130	1220	1910	e2400	10600	2820	2660	1960	1720	1840	1590	1570		
27	1180	1350	1790	e2300	5810	3390	2580	1940	1620	2000	1550	2120		
28	1200	13000	1610	2370	4610	15500	2620	1870	1970	5730	1570	1970		
29	1190	11600	1630	8660	---	32100	2680	1820	1920	10700	1550	1490		
30	1220	4510	1570	8610	---	34700	2840	1950	1680	8590	1460	1360		
31	1390	---	1430	5280	---	26500	---	2500	---	4340	1410	---		
TOTAL	36420	63220	93120	141830	196480	298960	139260	86150	51250	80510	83120	41870		
MEAN	1175	2107	3004	4575	7017	9644	4642	2779	1708	2597	2681	1396		
MAX	1390	13000	13900	12100	18500	34700	19600	5220	2230	10700	12700	2120		
MIN	1110	1220	1430	1550	2300	2730	2580	1820	1440	1340	1380	1220		
(†)	-256	-9	+678	+39	-45	+119	-71	-166	+152	-55	-81	-172		
MEAN≠	919	2098	3682	4614	6972	9763	4571	2613	1860	2542	2600	1224		
CFSM≠	.31	.70	1.24	1.55	2.34	3.28	1.54	.88	.62	.85	.87	.41		
IN.≠	.36	.79	1.43	1.79	2.44	3.78	1.71	1.01	.70	.98	1.01	.46		
CAL YR 1993	TOTAL	1407190	MEAN	3855	MAX	38300	MIN	1110	MEAN≠	3854	CFSM≠	1.29	IN.≠	17.58
WTR YR 1994	TOTAL	1312190	MEAN	3595	MAX	34700	MIN	1110	MEAN≠	3607	CFSM≠	1.21	IN.≠	16.54

† Change in contents, equivalent in cubic feet per second, in Smith Mountain and Leesville Lakes; provided by Appalachian Power Company.

‡ Adjusted for change in contents.

e Estimated.

## 02066000 ROANOKE (STAUNTON) RIVER AT RANDOLPH, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1901-1906, 1928-1930, 1951-1962, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2434	2112	3590	3457	4788	5322	4969	3197	2755	1970	2530	2181
MAX	6861	4104	9620	6419	11120	11010	9620	8793	4829	6484	13185	8928
(WY)	1930	1958	1902	1902	1902	1903	1901	1901	1929	1905	1901	1928
MIN	782	844	1125	1026	2047	2633	2220	1435	1037	620	450	410
(WY)	1954	1954	1956	1956	1959	1956	1930	1956	1956	1930	1930	1930

## SUMMARY STATISTICS

WATER YEARS 1901 - 1906,  
1928 - 1930,  
1951 - 1962

ANNUAL MEAN	3357
HIGHEST ANNUAL MEAN	5727
LOWEST ANNUAL MEAN	1501
HIGHEST DAILY MEAN	75100
LOWEST DAILY MEAN	256
ANNUAL SEVEN-DAY MINIMUM	284
INSTANTANEOUS PEAK FLOW	97000
INSTANTANEOUS PEAK STAGE	35.00
INSTANTANEOUS LOW FLOW	256
ANNUAL RUNOFF (CFSM)	1.13
ANNUAL RUNOFF (INCHES)	15.31
10 PERCENT EXCEEDS	6030
50 PERCENT EXCEEDS	2230
90 PERCENT EXCEEDS	1040

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2087	2364	2568	3609	3929	5087	4477	3414	2440	1812	1686	1952
MAX	7906	11230	6163	9532	9131	13970	17570	10060	10260	5635	5988	9952
(WY)	1991	1986	1973	1978	1979	1975	1987	1978	1972	1972	1985	1987
MIN	428	789	1054	1085	1549	769	1270	1038	491	859	493	662
(WY)	1964	1982	1966	1966	1981	1981	1981	1964	1964	1964	1964	1963

## SUMMARY STATISTICS

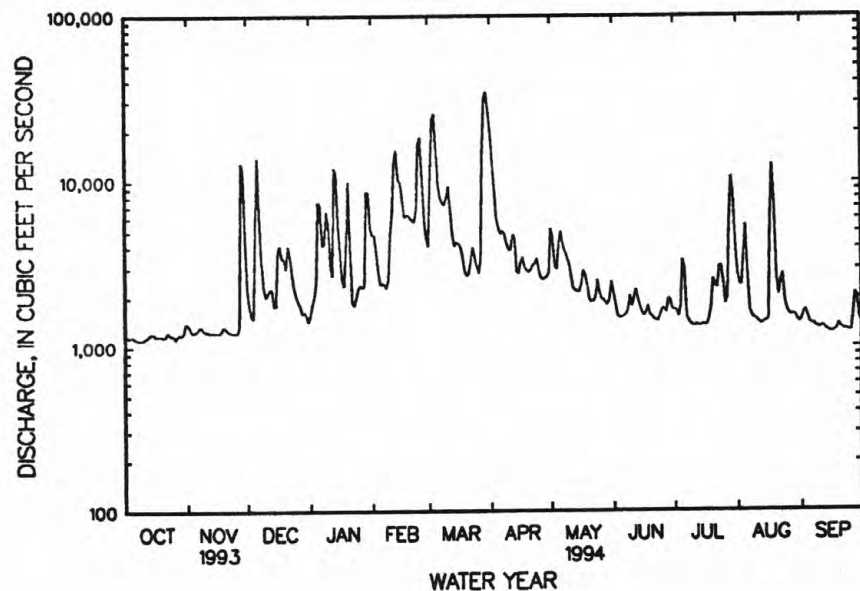
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1963 - 1994

ANNUAL TOTAL	1407190	1312190	
ANNUAL MEAN	3855	3595	2946
HIGHEST ANNUAL MEAN			5102
LOWEST ANNUAL MEAN			1151
HIGHEST DAILY MEAN	38300	Mar 6	70500
LOWEST DAILY MEAN	a1110	bOct 8	179
ANNUAL SEVEN-DAY MINIMUM	1130	Oct 5	238
INSTANTANEOUS PEAK FLOW			76300
INSTANTANEOUS PEAK STAGE			27.15
INSTANTANEOUS LOW FLOW			a1110
ANNUAL RUNOFF (CFSM)	1.30	1.21	.99
ANNUAL RUNOFF (INCHES)	17.58	16.40	13.45
10 PERCENT EXCEEDS	7550	7450	5670
50 PERCENT EXCEEDS	2020	2120	1780
90 PERCENT EXCEEDS	1180	1230	810

- a Occurred during period of doubtful gage-height record.  
b Also Oct. 9, 1993.  
c Also July 7, 1970.  
d Also Oct. 8-10, 26, 1993.  
f Also Sept. 9, 1965.



## ROANOKE RIVER BASIN

02067800; 02067820 TALBOTT AND TOWNES RESERVOIRS NEAR KIBLER, VA

LOCATION.--Talbot Dam: Lat 36°40'39", long 80°23'52", Patrick County, Hydrologic Unit 03010103, on Dan River 4.5 mi northeast of Kibler. Townes Dam: Lat 36°41'10", long 80°25'50", Patrick County, Hydrologic Unit 03010103, on Dan River about 4 mi north of Kibler.

DRAINAGE AREA.--Talbot Dam, 20.2 mi<sup>2</sup>; Townes Dam, 32.9 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1939 to December 1945, January 1948 to September 1960 (published in WSP 1723), and October 1960 to current year.

REMARKS.--The two reservoirs are operated as a unit for storage of water for Pinnacles hydroelectric plant. Total capacity of Talbot Reservoir, 8,040 acre-ft, and Townes Reservoir, 1,380 acre-ft. Storage began in Talbot Reservoir on Feb. 13, 1939, and in Townes Reservoir several months earlier.

COOPERATION.--Records were provided by the city of Danville.

## COMBINED MONTHEND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	6,000	-
Oct. 31.....	5,000	-1,000
Nov. 30.....	4,990	-10
Dec. 31.....	5,660	+670
CAL YR 1993.....	-	-2,640
Jan. 31.....	7,300	+1,640
Feb. 28.....	8,030	+730
Mar. 31.....	8,980	+950
Apr. 30.....	7,420	-1,560
May 31.....	7,960	+540
June 30.....	7,680	-280
July 31.....	7,600	-80
Aug. 31.....	6,710	-890
Sept. 30.....	6,290	-420
WTR YR 1994.....	-	+290

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## ROANOKE RIVER BASIN

02068500 DAN RIVER NEAR FRANCISCO, NC

LOCATION.--Lat 36°30'53", long 80°18'11", Stokes County, Hydrologic Unit 03010103, on left bank 200 ft upstream from bridge on State Highway 704, 700 ft downstream from remains of Georges Mill, 0.2 mi downstream from Elk Creek, 3 mi east of Francisco, and 7.9 mi downstream of Little Dan River.

DRAINAGE AREA.--129 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1924 to September 1987. December 1991 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 1303: 1938-50 (monthly runoff). WSP 1433: 1925-26, 1928-29, 1931, 1942, 1948.  
WDR NC-80-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 831.99 ft above sea level. Prior to Nov. 15, 1929, nonrecording gage at same site and datum.

REMARKS.--Records good except those for discharges above 1,000 ft<sup>3</sup>/s, which are fair, and those for estimated daily discharges, which are poor. Since 1938, considerable diurnal fluctuation and regulation by Talbott and Townes Reservoirs (stations 02067800 and 02067820) and Pinnacles Hydroelectric Plant in Virginia, 28 mi upstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of 1916 reached a stage of about 15 ft, from information by local residents, discharge, 16,000 ft<sup>3</sup>/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	105	81	145	119	198	296	488	176	158	179	552	261
2	90	142	111	91	201	868	458	156	166	173	388	198
3	77	135	88	98	180	482	407	158	108	161	397	185
4	81	120	131	223	140	294	373	213	111	146	263	172
5	117	107	905	206	177	256	349	173	122	178	226	168
6	134	96	264	170	156	272	377	159	124	171	213	165
7	102	87	151	150	166	250	349	184	129	172	392	162
8	96	98	141	372	149	237	298	188	274	152	363	152
9	80	135	137	188	183	230	293	180	173	132	181	148
10	79	105	121	172	218	354	292	165	166	158	160	143
11	84	86	113	141	391	324	330	147	165	142	158	290
12	149	82	135	701	408	305	318	145	158	151	153	233
13	107	75	115	352	288	422	363	143	140	139	157	148
14	95	72	103	217	263	378	335	153	176	144	344	141
15	81	75	156	182	254	274	304	151	166	168	218	139
16	81	74	166	234	236	255	289	169	171	190	198	137
17	75	74	121	e160	227	247	283	151	126	179	1770	300
18	82	80	107	e150	217	246	266	151	111	450	652	228
19	99	77	118	e150	210	241	258	146	110	145	662	147
20	102	76	144	e140	205	242	293	135	110	148	563	137
21	141	73	163	e160	202	246	262	142	145	1400	510	136
22	86	73	160	166	208	246	240	149	132	1030	319	134
23	71	80	140	167	713	236	210	127	123	400	282	126
24	72	82	136	164	688	222	212	157	106	226	213	128
25	81	80	109	231	390	248	197	167	103	191	207	158
26	86	72	90	146	318	236	202	157	114	243	207	192
27	73	310	107	177	261	1100	240	143	259	534	209	137
28	114	363	105	530	262	2260	210	129	188	918	384	129
29	91	142	177	318	---	1440	227	128	131	474	245	124
30	107	140	171	221	---	781	222	126	234	357	183	120
31	97	---	176	175	---	588	---	124	---	450	230	---
TOTAL	2935	3292	5006	6671	7509	14076	8945	4792	4499	9701	10999	5038
MEAN	94.7	110	161	215	268	454	298	155	150	313	355	168
MAX	149	363	905	701	713	2260	488	213	274	1400	1770	300
MIN	71	72	88	91	140	222	197	124	103	132	153	120
(#)	-16	0	+11	+27	+13	+15	-26	+9	-5	-1	-15	-7

# Change in contents, equivalent in cubic feet per second, in Talbott and Townes Reservoirs; provided by city of Danville, Va.  
e Estimated.

# ROANOKE RIVER BASIN

449

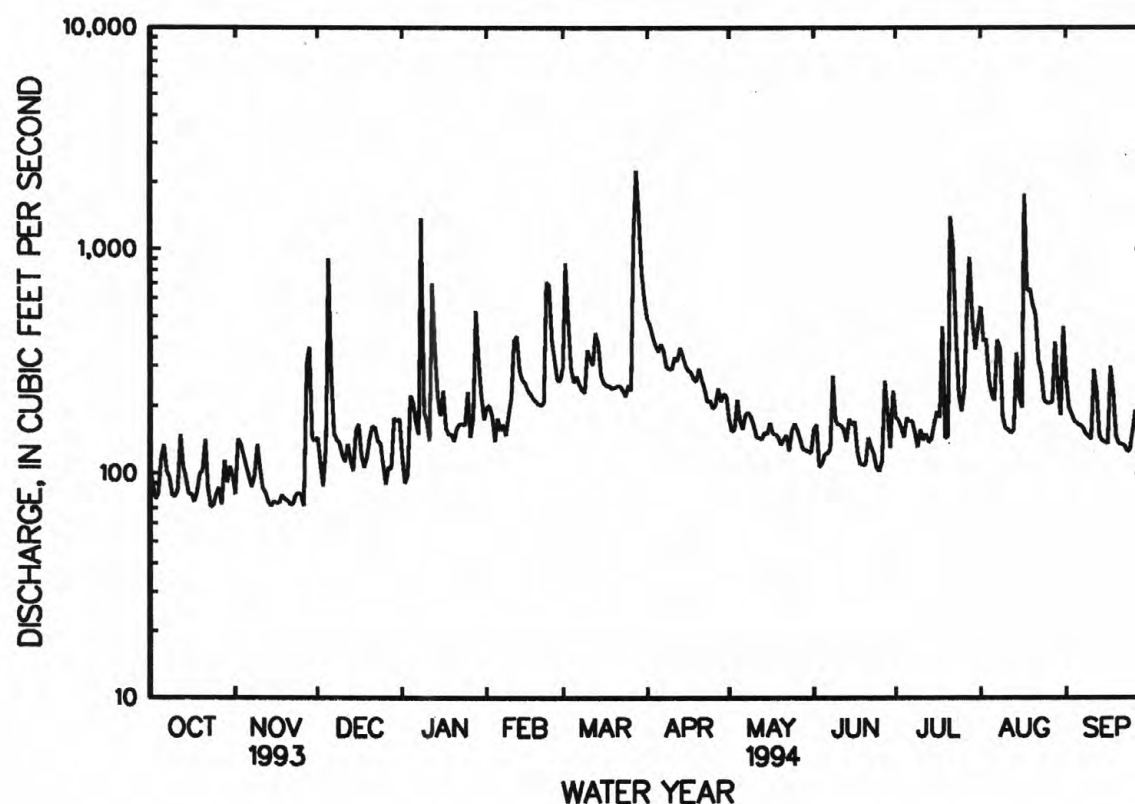
02068500 DAN RIVER NEAR FRANCISCO, NC--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1994<sup>a</sup>, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	154	160	177	196	221	263	275	222	200	171	169	151
MAX	543	327	337	424	463	571	677	405	438	373	514	630
(WY)	1938	1980	1974	1978	1960	1993	1980	1949	1972	1938	1940	1979
MIN	49.7	61.3	85.6	76.2	94.9	94.2	120	109	78.3	54.8	52.5	50.4
(WY)	1964	1954	1961	1956	1956	1981	1967	1986	1967	1986	1981	1968

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1938 - 1994 <sup>b</sup>	
ANNUAL TOTAL	83604		83463		197	
ANNUAL MEAN	229		229		185	
HIGHEST ANNUAL MEAN	229		229		300	
LOWEST ANNUAL MEAN	229		229		97.5	
HIGHEST DAILY MEAN	2700		2260		6830	
LOWEST DAILY MEAN	71		71		27	
ANNUAL SEVEN-DAY MINIMUM	75		75		28	
INSTANTANEOUS PEAK FLOW	10100		10100		21200	
INSTANTANEOUS PEAK STAGE	11.54		11.54		19.50	
INSTANTANEOUS LOW FLOW	60		60		7.1	
10 PERCENT EXCEEDS	406		386		318	
50 PERCENT EXCEEDS	167		166		158	
90 PERCENT EXCEEDS	85		91		85	

\* Adjusted for change in contents.  
 a Regulated period only (1938-1994).  
 b See PERIOD OF RECORD.



## ROANOKE RIVER BASIN

02069700 SOUTH MAYO RIVER NEAR NETTLERIDGE, VA

LOCATION.--Lat 36°34'15", long 80°07'47", Patrick County, Hydrologic Unit 03010103, on right bank 60 ft downstream from bridge on State Highway 700, 1.2 mi southeast of Nettleridge, 1.4 mi downstream from Russell Creek, and 3.6 mi upstream from Spoon Creek.

DRAINAGE AREA.--84.6 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2104: Drainage area. WDR VA-74-1: 1972(M).

GAGE.--Water-stage recorder. Datum of gage is 871.60 ft above sea level. Prior to Oct. 9, 1964, nonrecording gage and crest-stage gage at same site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 to Jan. 1 and Jan. 20-22, and periods of doubtful gage-height record, Mar. 13-16 and Apr. 21-27, which are fair. Maximum discharge, 20,600 ft<sup>3</sup>/s, from rating curve extended above 2,900 ft<sup>3</sup>/s on basis of contracted-opening measurements at gage heights 18.32 ft and 22.00 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location by the Virginia Department of Environmental Quality - Water Division.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 2	1100	1,340	7.20	Mar. 29	0800	1,640	7.85
Mar. 28	0900	*2,240	*9.08				

Minimum discharge, 46 ft<sup>3</sup>/s, Oct. 6, 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51	55	71	e75	142	162	346	123	99	89	236	183
2	51	52	68	81	129	838	291	117	96	86	293	140
3	49	52	67	95	120	561	258	120	94	87	282	131
4	48	52	103	224	114	308	237	174	95	88	218	123
5	47	66	535	152	112	294	221	145	102	304	185	119
6	46	69	167	117	110	247	230	136	101	114	163	117
7	47	61	116	115	105	216	214	133	106	95	151	112
8	48	55	99	314	99	200	196	134	244	86	141	107
9	47	54	90	164	119	190	188	128	117	82	133	106
10	50	53	89	129	128	334	184	126	104	78	126	102
11	48	52	88	115	250	243	197	123	102	77	120	101
12	57	52	78	397	282	203	181	121	96	86	115	98
13	53	52	77	297	218	e190	196	118	94	88	111	97
14	52	51	76	193	211	e180	190	117	88	125	109	95
15	50	52	128	156	190	e170	177	118	85	116	124	93
16	50	51	144	126	173	e161	175	135	82	84	156	92
17	51	51	104	155	161	146	165	115	80	80	468	98
18	52	56	95	219	152	142	160	113	78	124	337	112
19	50	53	90	125	145	137	156	112	77	117	358	95
20	50	52	87	e120	140	133	152	114	75	106	411	90
21	50	50	103	e110	135	138	e145	113	96	395	262	90
22	52	50	89	e115	128	140	e138	109	90	639	218	89
23	49	50	86	121	550	128	e132	107	78	392	183	88
24	49	49	84	111	543	125	e130	105	79	211	161	90
25	50	49	82	109	291	139	e128	104	79	161	151	105
26	50	48	79	117	216	127	e125	111	73	209	143	126
27	50	188	e77	122	180	698	e121	124	212	362	174	83
28	50	226	e76	407	163	1500	130	106	107	821	155	75
29	49	95	e74	308	---	1170	123	104	90	468	136	72
30	73	78	e73	191	---	633	130	103	108	329	132	69
31	71	---	e72	159	---	437	---	100	---	235	156	---
TOTAL	1590	1974	3267	5239	5306	10290	5416	3708	3027	6334	6108	3098
MEAN	51.3	65.8	105	169	189	332	181	120	101	204	197	103
MAX	73	226	535	407	550	1500	346	174	244	821	468	183
MIN	46	48	67	75	99	125	121	100	73	77	109	69
CFSM	.61	.78	1.25	2.00	2.24	3.92	2.13	1.41	1.19	2.42	2.33	1.22
IN.	.70	.87	1.44	2.30	2.33	4.52	2.38	1.63	1.33	2.79	2.69	1.36

e Estimated.

## ROANOKE RIVER BASIN

451

02069700 SOUTH MAYO RIVER NEAR NETTLERIDGE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	105	110	119	141	155	191	188	152	131	114	102	94.8
MAX	304	339	232	261	351	423	497	295	435	303	407	417
(WY)	1990	1986	1973	1993	1990	1993	1987	1990	1972	1989	1985	1979
MIN	37.1	45.0	55.5	48.6	77.6	65.0	69.7	56.5	45.4	43.2	28.0	40.2
(WY)	1964	1982	1981	1981	1981	1981	1967	1981	1986	1977	1981	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

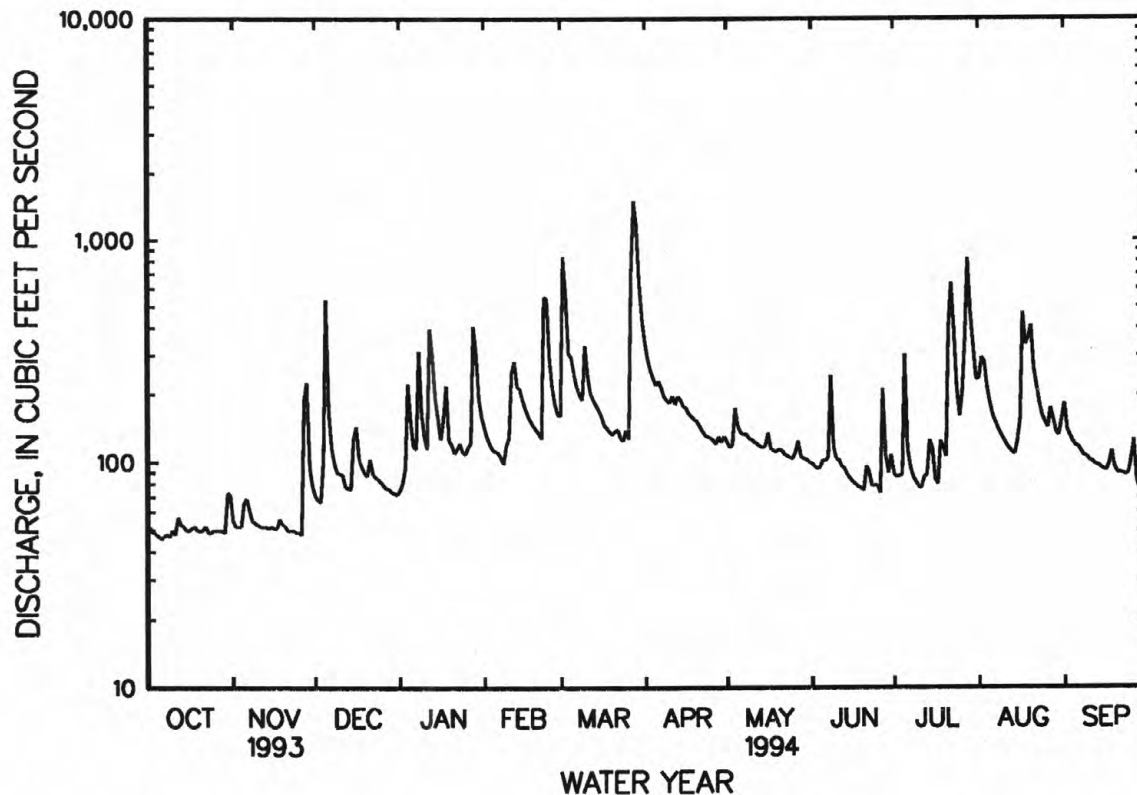
## FOR 1994 WATER YEAR

## WATER YEARS 1963 - 1994

ANNUAL TOTAL	58124		55357									
ANNUAL MEAN	159		152							133		
HIGHEST ANNUAL MEAN										206		1990
LOWEST ANNUAL MEAN										59.3		1981
HIGHEST DAILY MEAN	1680	Mar 24				1500	Mar 28		6820		Jun 21	1972
LOWEST DAILY MEAN	46	Oct 6				46	Oct 6		21		aAug 29	1981
ANNUAL SEVEN-DAY MINIMUM	47	Oct 3				47	Oct 3		22		Aug 25	1981
INSTANTANEOUS PEAK FLOW						2240	Mar 28		20600		Sep 22	1979
INSTANTANEOUS PEAK STAGE						9.08	Mar 28		22.00		Sep 22	1979
INSTANTANEOUS LOW FLOW						46	bOct 6		20		aAug 29	1981
ANNUAL RUNOFF (CFSM)	1.88					1.79				1.58		
ANNUAL RUNOFF (INCHES)	25.56					24.34				21.43		
10 PERCENT EXCEEDS	307					270				219		
50 PERCENT EXCEEDS	122					116				100		
90 PERCENT EXCEEDS	51					52				52		

a Also Aug. 30, 1981.

b Also Oct. 7, 1993.



## ROANOKE RIVER BASIN

02070000 NORTH MAYO RIVER NEAR SPENCER, VA

LOCATION.--Lat 36°34'05", long 79°59'15", Henry County, Hydrologic Unit 03010103, on left bank 800 ft downstream from bridge on State Highway 629 at Moores Mill, 2.1 mi downstream from Horse Pasture Creek, and 3.8 mi southeast of Spencer.

DRAINAGE AREA.--108 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 1303: 1929-32(M), 1934(M).

GAGE.--Water-stage recorder. Datum of gage is 730.94 ft above sea level (levels by U.S. Army Corps of Engineers). Prior to Jan. 23, 1936, nonrecording gage at site 800 ft upstream at datum 1.50 ft higher. July 25 to Sept. 27, 1936, nonrecording gage at present site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 20-22, which are fair. Maximum discharge, 17,200 ft<sup>3</sup>/s, from rating curve extended above 7,200 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 13.41 ft and velocity-area study. Minimum gage height, 1.08 ft, Oct. 8, 1954. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 23	2100	1,460	4.84	Mar. 29	1130	1,720	5.25
Mar. 2	1800	2,440	6.22	Aug. 17	1800	1,510	4.92
Mar. 28	1030	*2,820	*6.69				

Minimum discharge, 65 ft<sup>3</sup>/s, Oct. 4, 6, 7, 9, gage height, 1.57 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	79	84	e95	146	158	267	130	95	93	152	131
2	69	74	81	100	132	1440	234	123	92	92	169	111
3	69	73	80	113	124	938	217	124	89	109	148	107
4	66	74	90	478	119	463	201	198	90	99	131	101
5	67	80	582	259	118	343	190	154	99	100	120	99
6	65	90	205	162	115	270	197	137	96	88	113	98
7	67	84	132	145	111	235	188	130	104	81	108	95
8	67	77	113	467	108	219	172	128	336	78	105	91
9	66	75	103	219	119	211	167	123	149	76	101	90
10	68	75	98	154	131	418	166	121	121	73	98	89
11	69	74	96	135	243	307	177	118	116	73	95	87
12	77	74	88	520	427	234	165	117	110	83	93	85
13	75	74	87	335	259	211	180	113	103	135	91	84
14	71	74	87	194	254	199	175	112	98	93	89	83
15	70	75	144	150	235	189	161	113	94	158	96	83
16	70	74	232	126	203	180	160	138	91	90	111	81
17	72	74	133	173	183	170	150	113	89	82	802	84
18	73	78	115	240	167	167	146	109	86	95	399	99
19	71	77	108	146	155	159	145	108	85	86	185	85
20	70	75	103	e135	147	159	141	109	83	207	152	81
21	71	72	122	e120	140	165	139	109	82	389	135	81
22	79	72	112	e130	133	175	138	106	99	373	129	82
23	72	72	105	133	623	159	138	103	86	254	116	81
24	70	72	103	121	678	155	136	100	89	152	110	80
25	71	73	99	116	298	164	134	100	86	127	107	91
26	72	72	96	120	212	157	132	104	80	151	105	142
27	72	124	94	126	176	749	133	120	129	349	180	90
28	72	244	96	444	160	2070	135	102	105	697	192	79
29	71	109	e94	412	---	1230	128	99	90	289	120	74
30	91	90	e92	207	---	498	142	98	110	220	111	71
31	103	---	e90	166	---	325	---	95	---	163	113	---
TOTAL	2234	2530	3864	6441	5916	12517	4954	3654	3182	5155	4776	2735
MEAN	72.1	84.3	125	208	211	404	165	118	106	166	154	91.2
MAX	103	244	582	520	678	2070	267	198	336	697	802	142
MIN	65	72	80	95	108	155	128	95	80	73	89	71
CFSM	.67	.78	1.15	1.92	1.96	3.74	1.53	1.09	.98	1.54	1.43	.84
IN.	.77	.87	1.33	2.22	2.04	4.31	1.71	1.26	1.10	1.78	1.65	.94

e Estimated.



## ROANOKE RIVER BASIN

453

02070000 NORTH MAYO RIVER NEAR SPENCER, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	119	109	128	146	162	187	173	139	124	108	102	105
MAX	498	391	426	368	414	479	570	329	470	320	446	462
(WY)	1938	1986	1951	1937	1951	1993	1951	1972	1972	1989	1985	1987
MIN	30.4	33.8	43.5	40.6	49.6	85.5	67.1	58.0	45.0	35.2	26.0	25.7
(WY)	1932	1932	1956	1956	1931	1981	1967	1956	1956	1956	1981	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

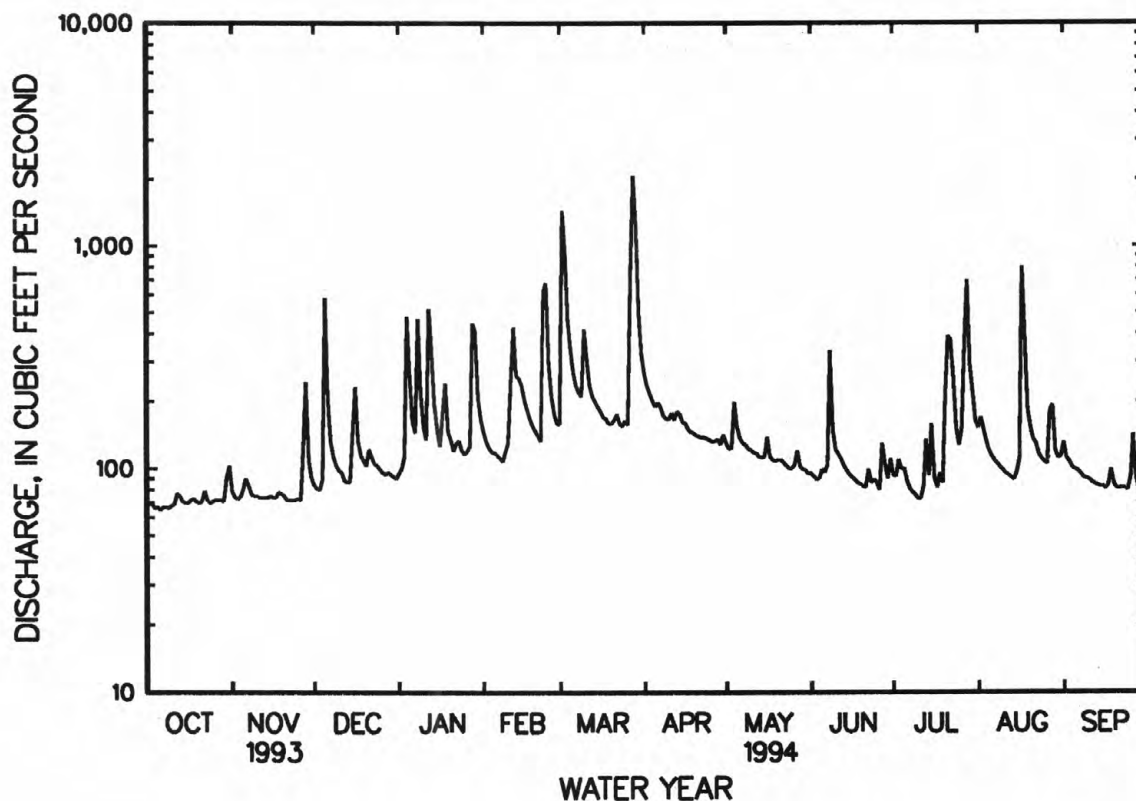
## WATER YEARS 1929 - 1994

ANNUAL TOTAL	64508	57958	
ANNUAL MEAN	177	159	133
HIGHEST ANNUAL MEAN			299
LOWEST ANNUAL MEAN			62.6
HIGHEST DAILY MEAN	2510	Mar 4	7460
LOWEST DAILY MEAN	65	Oct 6	15
ANNUAL SEVEN-DAY MINIMUM	67	aOct 4	18
INSTANTANEOUS PEAK FLOW			17200
INSTANTANEOUS PEAK STAGE			15.80
INSTANTANEOUS LOW FLOW			15
ANNUAL RUNOFF (CFSM)	1.64	1.47	1.24
ANNUAL RUNOFF (INCHES)	22.22	19.96	16.79
10 PERCENT EXCEEDS	296	248	211
50 PERCENT EXCEEDS	125	112	96
90 PERCENT EXCEEDS	72	74	51

a Also Oct. 6, 1993.

b Also Oct. 6, 7, 9, 1993.

c Also Aug. 15, 1956.



## ROANOKE RIVER BASIN

02071510 SMITH RIVER ABOVE ROUTE 615, NEAR WOOLWINE, VA

LOCATION.--Lat 36°45'48", long 80°16'22", Patrick County, Hydrologic Unit 03010103, 100 ft upstream from bridge on State Highway 615, 200 ft south of Jacks Creek Church, and 1.8 mi south of Woolwine.

PERIOD OF RECORD.--September 1994.

## WATER-QUALITY DATA, SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
SEP												
06...	1600	18	51	7.2	22.0	19.0	729	8.2	93	14	3.1	1.4
20...	1000	15	46	7.5	21.5	13.0	735	10.1	99	18	4.0	1.9

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
SEP											
06...	47	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<1
20...	44	<1	<1	<1	<0.1	<1	1	<1	<1	<1	<1

DATE	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, TOTAL (UG/L AS SE) (01147)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
SEP											
06...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	<10	<1	1.4
20...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	<10	1	1.1

< Actual value is known to be less than the value shown.

## ROANOKE RIVER BASIN

455

02071520 SMITH RIVER AT ROUTE 8, NEAR WOOLWINE, VA

LOCATION.--Lat 36°46'05", long 80°16'13", Patrick County, Hydrologic Unit 03010103, at bridge on State Highway 8, 0.6 mi south of Liberty Fabrics, and 1.6 mi south of Woolwine.

PERIOD OF RECORD.--August 1994.

## WATER-QUALITY DATA, AUGUST 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, SATUR-ATION (MG/L) (00301)	HARD-NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
AUG 17...	1000	356	32	8.2	22.0	23.0	726	8.3	102	17	3.7	1.8

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD) (01027)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)
AUG 17...	42	<1	<1	<1	<0.1	<1	<1	<1	<1	<1	<1

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG) (71900)	MERCURY DIS-SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, TOTAL (UG/L AS SE) (01147)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG) (01077)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
AUG 17...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	<10	<1	24

< Actual value is known to be less than the value shown.

## ROANOKE RIVER BASIN

02071900 PHILPOTT LAKE NEAR PHILPOTT, VA

LOCATION.--Lat 36°46'52", long 80°01'40", Henry County, Hydrologic Unit 03010103, at Philpott Dam on Smith River, 1.5 mi west of Philpott, 12.0 mi upstream from Reed Creek, and at mile 44.3.

DRAINAGE AREA.--216 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level.

REMARKS.--Reservoir is formed by concrete dam. Spillway, with crest at elevation 985 ft, is ungated and 120 ft long. Storage began August 1950 during construction; initial filling started in December 1951; water in reservoir first reached rule-curve elevation in July 1953. Total capacity at maximum flood-control pool elevation, 998 ft, is 247,400 acre-ft of which 47,000 acre-ft is above the spillway crest; 34,200 acre-ft is controlled flood storage between elevations 974 ft, maximum power pool, and 985 ft; 57,800 acre-ft is available for power between elevations 951 ft, minimum power pool, and 974 ft; and 108,400 acre-ft is inactive and dead storage below elevation 951 ft. Usable capacity is 92,000 acre-ft between elevations 951 ft and 985 ft. Figures given herein represent total contents. Reservoir is used for flood control, hydroelectric power, water supply, low-water regulation for pollution abatement and industrial water supply, and recreation.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

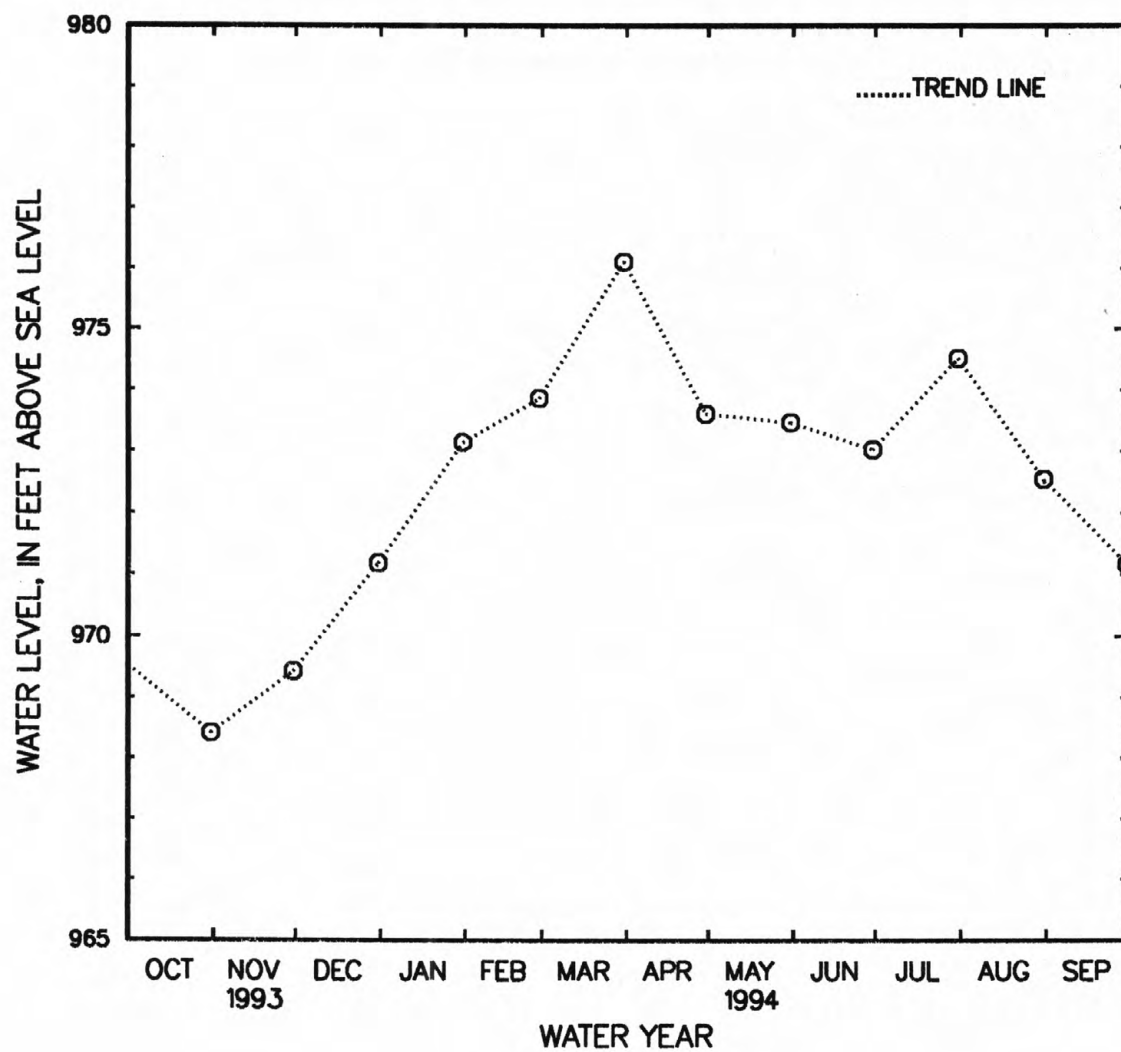
EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 191,700 acre-ft, June 22, 1972, elevation, 983.06 ft; minimum (after first filling to rule curve), 64,540 acre-ft, Sept. 26, 1956, elevation, 927.59 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 177,220 acre-ft, Mar. 29, elevation, 977.71 ft; minimum, 149,430 acre-ft, Nov. 5, elevation, 968.02 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	969.56	153,630	-
Oct. 31.....	968.42	150,520	-3,110
Nov. 30.....	969.43	153,270	+2,750
Dec. 31.....	971.18	158,140	+4,870
CAL YR 1993.....	-	-	-2,440
Jan. 31.....	973.14	163,710	+5,570
Feb. 28.....	973.86	165,790	+2,080
Mar. 31.....	976.11	172,400	+6,610
Apr. 30.....	973.61	165,060	-7,340
May 31.....	973.47	164,660	-400
June 30.....	973.03	163,390	-1,270
July 31.....	974.52	167,710	+4,320
Aug. 31.....	972.55	162,010	-5,700
Sept. 30.....	971.17	158,110	-3,900
WTR YR 1994.....	-	-	+4,480

02071900 PHILPOTT LAKE NEAR PHILPOTT, VA--Continued





## ROANOKE RIVER BASIN

02072000 SMITH RIVER NEAR PHILPOTT, VA

LOCATION.--Lat 36°46'50", long 80°01'30", Franklin County, Hydrologic Unit 03010103, on left bank 900 ft downstream from Philpott Dam, 3.1 mi west of Philpott, 11.6 mi upstream from Reed Creek, and at mile 44.1.

DRAINAGE AREA.--216 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1946 to current year.

REVISED RECORDS.--WSP 1553: 1953(M), 1955-56(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 804.27 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to Oct. 8, 1952, at site 1.9 mi downstream at different datum.

REMARKS.--No estimated daily discharges. Records good. Since August 1950, flow regulated by Philpott Lake (station 02071900) 0.2 mi upstream. Maximum discharge, 17,000 ft<sup>3</sup>/s, at site then in use, from rating curve extended above 9,700 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 18.2 ft and 20.3 ft. Minimum discharge observed, 2.3 ft<sup>3</sup>/s, result of repairs at dam, but may have been less during periods of estimated record. Minimum daily discharge, 20 ft<sup>3</sup>/s, caused by turbines being shut down for repair at Philpott Dam.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,610 ft<sup>3</sup>/s, Mar. 30, gage height, 6.44 ft; minimum, 12 ft<sup>3</sup>/s, Jan. 31, gage height, 1.93 ft; minimum daily, 43 ft<sup>3</sup>/s, Jan. 29, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	264	212	103	50	966	761	1380	50	307	265	560	312		
2	47	212	104	50	518	659	1330	305	256	54	561	311		
3	47	212	103	207	203	952	49	302	205	50	561	52		
4	214	212	52	207	203	1220	984	303	50	153	561	52		
5	213	212	52	362	49	1270	897	304	50	359	563	259		
6	213	51	103	362	49	49	760	304	261	360	50	256		
7	214	52	102	361	406	939	759	50	278	361	50	254		
8	214	105	102	50	408	563	763	50	266	308	512	254		
9	48	103	102	50	408	557	50	457	276	50	512	251		
10	48	105	101	206	414	558	49	456	257	50	513	46		
11	214	105	51	206	443	558	661	457	50	309	514	47		
12	214	104	52	106	49	49	662	458	50	308	515	253		
13	214	52	207	101	49	49	663	458	255	309	50	252		
14	216	52	206	769	211	352	663	50	255	310	50	255		
15	220	105	206	50	767	345	664	50	259	310	309	257		
16	53	104	205	256	761	52	50	305	257	50	310	255		
17	53	105	206	770	764	504	50	305	261	51	308	49		
18	213	105	50	772	764	505	305	305	50	310	909	49		
19	214	105	50	826	49	50	306	306	50	310	1280	256		
20	215	52	205	814	49	49	305	306	262	310	1190	257		
21	210	52	207	665	303	457	306	50	262	311	50	259		
22	211	105	206	52	303	455	306	50	261	309	772	263		
23	50	105	205	52	304	149	50	203	262	50	770	262		
24	50	105	154	205	759	607	50	208	263	50	775	55		
25	211	52	51	205	757	607	458	204	50	309	773	55		
26	212	105	52	201	759	49	458	205	50	311	776	264		
27	212	53	413	198	49	50	458	204	263	310	52	263		
28	212	53	465	199	762	451	458	50	261	308	52	263		
29	212	105	419	43	---	1830	459	50	261	604	312	262		
30	52	160	414	43	---	2220	50	204	266	469	308	262		
31	52	---	404	504	---	1390	---	307	---	50	297	---		
TOTAL	5032	3260	5352	8942	11526	18306	14403	7316	6154	7668	14815	6185		
MEAN	162	109	173	288	412	591	480	236	205	247	478	206		
MAX	264	212	465	826	966	2220	1380	458	307	604	1280	312		
MIN	47	51	50	43	49	49	49	50	50	50	50	46		
(†)	-51	+46	+79	+91	+37	+108	-123	-7	-21	+70	-93	-66		
MEAN#	111	155	252	379	449	699	357	229	184	317	385	140		
CFSM#	.51	.72	1.17	1.75	2.08	3.24	1.65	1.06	.85	1.47	1.78	.65		
IN.#	.59	.80	1.35	2.02	2.17	3.73	1.84	1.22	.95	1.69	2.06	.72		
CAL YR 1993	TOTAL	132803	MEAN	364	MAX	3230	MIN	45	MEAN#	361	CFSM#	1.67	IN.#	22.69
WTR YR 1994	TOTAL	108959	MEAN	299	MAX	2220	MIN	43	MEAN#	305	CFSM#	1.41	IN.#	19.17

† Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

## 02072000 SMITH RIVER NEAR PHILPOTT, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 1950, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	326	318	292	324	339	397	381	442	381	385	338	331
MAX	522	371	507	403	406	474	490	631	562	915	759	531
(WY)	1948	1948	1949	1949	1948	1949	1948	1949	1949	1949	1949	1949
MIN	183	202	166	238	209	303	244	195	284	158	141	166
(WY)	1949	1947	1947	1948	1947	1950	1950	1947	1948	1947	1947	1947

## SUMMARY STATISTICS

## WATER YEARS 1947 - 1950

ANNUAL MEAN	354
HIGHEST ANNUAL MEAN	517
LOWEST ANNUAL MEAN	237
HIGHEST DAILY MEAN	a4500
LOWEST DAILY MEAN	93
ANNUAL SEVEN-DAY MINIMUM	104
INSTANTANEOUS PEAK FLOW	17000
INSTANTANEOUS PEAK STAGE	20.30
INSTANTANEOUS LOW FLOW	21
ANNUAL RUNOFF (CFSM)	1.64
ANNUAL RUNOFF (INCHES)	22.30
10 PERCENT EXCEEDS	560
50 PERCENT EXCEEDS	274
90 PERCENT EXCEEDS	148

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	243	231	251	269	261	336	394	310	279	242	254	258
MAX	755	835	498	526	717	946	1194	796	827	646	479	724
(WY)	1990	1986	1958	1991	1973	1993	1983	1978	1972	1972	1970	1979
MIN	96.1	70.5	88.5	71.1	58.2	60.5	69.2	61.3	67.2	82.2	77.4	126
(WY)	1952	1953	1992	1953	1953	1953	1969	1964	1964	1964	1964	1956

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1951 - 1994

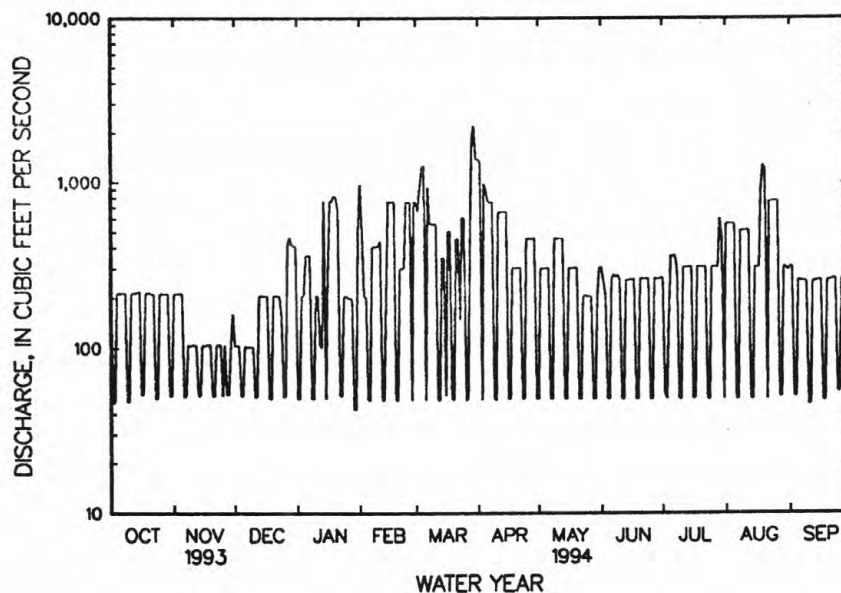
ANNUAL TOTAL	132803	108959	
ANNUAL MEAN	364	299	277
HIGHEST ANNUAL MEAN			441
LOWEST ANNUAL MEAN			123
HIGHEST DAILY MEAN	3230	2220	5710
LOWEST DAILY MEAN	45	43	c20
ANNUAL SEVEN-DAY MINIMUM	82	82	42
INSTANTANEOUS PEAK FLOW		2610	9500
INSTANTANEOUS PEAK STAGE		6.44	15.00
INSTANTANEOUS LOW FLOW		12	d2.3
ANNUAL RUNOFF (CFSM)	1.68	1.38	1.28
ANNUAL RUNOFF (INCHES)	22.87	18.77	17.45
10 PERCENT EXCEEDS	757	758	656
50 PERCENT EXCEEDS	264	251	205
90 PERCENT EXCEEDS	52	50	45

a No gage-height record; discharge computed on basis of records for stations at Bassett and at Martinsville.

b Also Jan. 30, 1994.

c Caused by turbines being shut down for repair at Philpott Dam.

d Result of repair at dam, but may have been less during periods of estimated record.



## ROANOKE RIVER BASIN

02072000 SMITH RIVER NEAR PHILPOTT, VA--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--August to September 1994.

## WATER-QUALITY DATA, AUGUST TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)
AUG 18...	1000	1380	53	7.2	22.0	10.0	742
SEP 07...	0930	16	55	6.8	18.0	11.0	743
21...	0900	22	51	6.7	15.0	12.0	745

DATE	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
AUG 18...	6.6	60	11	2.5	1.2
SEP 07...	5.9	55	19	4.3	2.0
21...	6.1	58	--	<0.10	<0.10

DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)
AUG 18...	430	<1	<1	<1	<0.1	19
SEP 07...	45	<1	<1	<1	<0.1	<1
21...	40	<1	<1	<1	<0.1	<1

&lt; Actual value is known to be less than the value shown.

## ROANOKE RIVER BASIN

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02072000 SMITH RIVER NEAR PHILPOTT, VA--Continued

## WATER-QUALITY DATA, AUGUST TO SEPTEMBER 1994

DATE	CHROMIUM, TOTAL DIS- SOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
AUG 18...	1	13	1	6	<1
SEP 07...	<1	1	<1	<1	<1
21...	<1	<1	<1	<1	<1

DATE	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELENIUM, TOTAL (UG/L AS SE) (01147)	SELENIUM, DIS- SOLVED (UG/L AS SE) (01145)
AUG 18...	<0.10	<0.1	12	<1	<1	<1
SEP 07...	<0.10	<0.1	<1	<1	<1	<1
21...	<0.10	<0.1	1	<1	<1	<1

DATE	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
AUG 18...	<1	<1.0	50	2	1.3
SEP 07...	<1	<1.0	<10	3	1.4
21...	<1	<1.0	<10	2	1.5

&lt; Actual value is known to be less than the value shown.

## ROANOKE RIVER BASIN

02072500 SMITH RIVER AT BASSETT, VA

LOCATION.--Lat 36°46'12", long 80°00'04", Henry County, Hydrologic Unit 03010103, on left bank 25 ft upstream from bridge on State Highway 666 at north edge of North Bassett, 1.0 mi northwest of Bassett, 3.0 mi downstream from Town Creek, 5.6 mi upstream from Reed Creek, 6.2 mi downstream from Philpott Dam, and at mile 38.1.

DRAINAGE AREA.--259 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1939 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 753.09 ft above sea level (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good except for period of doubtful gage-height record, Oct. 1-21, which is fair. Since August 1950, flow regulated by Philpott Lake (station 02071900) 6.2 mi upstream. Diversion upstream from station by Henry County Public Service Authority, since 1985, has averaged less than 1.0 ft<sup>3</sup>/s. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Minimum gage height, 1.06 ft, Sept. 18, 26, 1953. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 19, 1937, reached a stage of about 22.9 ft, from information by local residents, discharge, 38,000 ft<sup>3</sup>/s, from rating curve extended above 23,000 ft<sup>3</sup>/s on basis of backwater studies and records for station at Martinsville.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,110 ft<sup>3</sup>/s, Mar. 29, gage height, 5.83 ft; minimum, 61 ft<sup>3</sup>/s, Oct. 4, Nov. 10, 16-17, Dec. 26-27, 31, Jan. 1, 19, June 15; minimum daily, 66 ft<sup>3</sup>/s, Oct. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	291	234	121	72	1010	858	1560	92	348	293	657	359
2	e69	232	121	74	704	997	1560	355	292	81	668	352
3	e68	231	119	239	237	1200	158	361	237	77	644	81
4	230	232	80	396	236	1470	994	389	80	180	638	80
5	235	236	377	443	78	1590	1130	371	80	397	636	294
6	235	73	154	420	77	138	873	364	294	397	94	284
7	235	70	134	419	446	1050	870	95	318	397	84	280
8	235	118	128	165	447	677	866	100	315	342	566	280
9	e67	117	124	102	463	644	102	519	315	73	572	275
10	e67	117	125	245	470	777	103	523	294	72	571	73
11	235	118	74	243	611	688	766	522	85	340	571	70
12	243	117	72	299	168	110	758	522	80	342	571	274
13	237	68	232	180	124	101	767	522	288	344	90	274
14	237	68	232	864	303	422	760	95	289	348	81	274
15	250	118	257	94	896	414	762	89	294	344	364	276
16	e72	117	258	336	890	92	102	362	292	72	388	273
17	e70	118	242	849	881	575	98	355	295	89	953	72
18	238	126	77	864	872	577	376	354	77	360	975	73
19	230	120	76	889	98	84	364	355	76	346	1430	272
20	230	69	237	903	91	84	365	355	293	346	1420	274
21	231	68	244	742	359	519	361	86	293	406	120	289
22	234	117	237	76	354	521	362	84	294	371	849	287
23	67	117	233	77	642	186	94	242	300	96	855	280
24	66	117	178	236	997	678	94	245	230	89	855	75
25	231	67	75	238	896	691	521	242	144	384	856	79
26	232	118	73	232	870	86	523	248	74	456	860	308
27	232	131	451	232	97	341	529	247	398	534	97	299
28	232	122	511	390	850	1390	534	82	326	946	84	311
29	231	130	458	148	---	2150	529	82	306	753	355	330
30	84	180	452	98	---	2540	98	239	297	714	352	292
31	77	---	452	493	---	1590	---	346	---	111	348	---
TOTAL	5691	3866	6604	11058	14167	23240	16979	8843	7304	10100	17604	7040
MEAN	184	129	213	357	506	750	566	285	243	326	568	235
MAX	291	236	511	903	1010	2540	1560	523	398	946	1430	359
MIN	66	67	72	72	77	84	94	82	74	72	81	70
(†)	-51	+46	+79	+91	+37	+108	-123	-7	-21	+70	-93	-66
MEAN#	133	175	292	448	543	858	443	278	222	396	475	169
CFSM#	.51	.68	1.13	1.73	2.10	3.31	1.71	1.07	.86	1.53	1.83	.65
IN.#	.59	.75	1.30	1.99	2.18	3.82	1.91	1.24	.96	1.76	2.12	.73

CAL YR 1993 TOTAL 163172 MEAN 447 MAX 3600 MIN 66 MEAN# 444 CFSM# 1.71 IN.# 23.28  
WTR YR 1994 TOTAL 132496 MEAN 363 MAX 2540 MIN 66 MEAN# 369 CFSM# 1.42 IN.# 19.34

† Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

e Estimated.



## 02072500 SMITH RIVER AT BASSETT, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1950, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	283	280	324	364	397	415	394	423	352	403	386	370
MAX	616	474	579	752	599	566	593	764	656	1071	1262	970
(WY)	1948	1948	1949	1946	1946	1944	1949	1949	1949	1949	1940	1945
MIN	103	124	157	182	223	201	183	171	160	183	129	133
(WY)	1942	1942	1940	1940	1941	1940	1942	1941	1941	1944	1944	1939

## SUMMARY STATISTICS

## WATER YEARS 1940 - 1950

ANNUAL MEAN	371
HIGHEST ANNUAL MEAN	604
LOWEST ANNUAL MEAN	270
HIGHEST DAILY MEAN	11600
LOWEST DAILY MEAN	82
ANNUAL SEVEN-DAY MINIMUM	85
INSTANTANEOUS PEAK FLOW	26600
INSTANTANEOUS PEAK STAGE	18.28
INSTANTANEOUS LOW FLOW	58
ANNUAL RUNOFF (CFSM)	1.43
ANNUAL RUNOFF (INCHES)	19.47
10 PERCENT EXCEEDS	601
50 PERCENT EXCEEDS	264
90 PERCENT EXCEEDS	147

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	286	276	302	326	328	414	471	372	328	283	294	304
MAX	944	996	587	655	817	1197	1474	902	1004	759	568	912
(WY)	1990	1986	1951	1991	1973	1993	1987	1978	1992	1972	1994	1979
MIN	121	98.4	127	107	110	114	98.6	86.7	84.4	138	124	157
(WY)	1952	1953	1989	1989	1989	1982	1969	1964	1964	1981	1953	1967

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

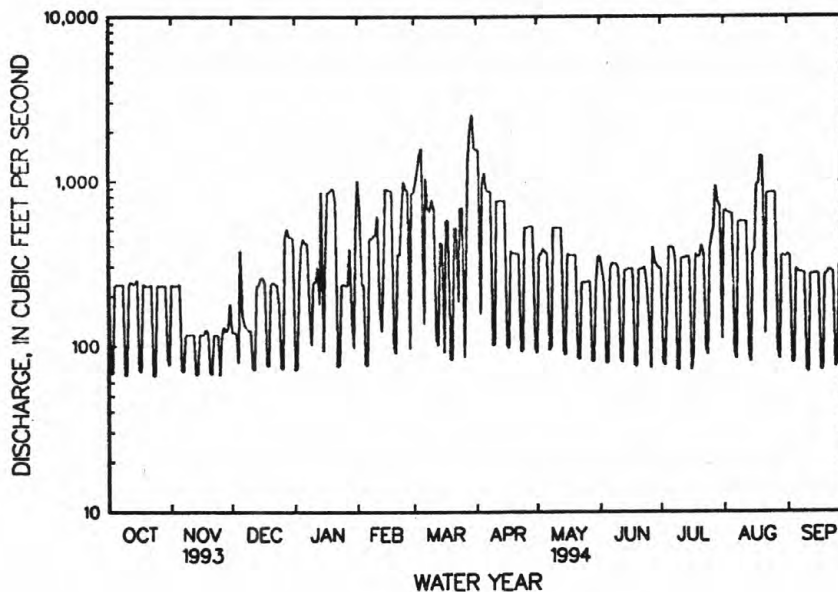
## WATER YEARS 1951 - 1994

ANNUAL TOTAL	163172	132496	
ANNUAL MEAN	447	363	332
HIGHEST ANNUAL MEAN			523
LOWEST ANNUAL MEAN			150
HIGHEST DAILY MEAN	3600	Mar 26	2540
LOWEST DAILY MEAN	66	Oct 24	66
ANNUAL SEVEN-DAY MINIMUM	96	Nov 20	96
INSTANTANEOUS PEAK FLOW			3110
INSTANTANEOUS PEAK STAGE			5.83
INSTANTANEOUS LOW FLOW			661
ANNUAL RUNOFF (CFSM)	1.73	1.40	1.28
ANNUAL RUNOFF (INCHES)	23.44	19.03	17.41
10 PERCENT EXCEEDS	914	855	723
50 PERCENT EXCEEDS	304	274	248
90 PERCENT EXCEEDS	90	77	75

a Also Sept. 9, 1944.

b Occurred during period of doubtful gage-height record.

c Also Nov. 10, 16, 17, Dec. 26, 27, 31, 1993, and Jan. 1, 19, June 15, 1994.



## ROANOKE RIVER BASIN

02073000 SMITH RIVER AT MARTINSVILLE, VA

LOCATION.--Lat 36°39'40", long 79°52'51", Henry County, Hydrologic Unit 03010103, on right bank at south edge of Martinsville, 800 ft downstream from bridge on U.S. Highways 58 and 220, and 5.0 mi downstream from Beaver Creek.

DRAINAGE AREA.--380 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1929 to current year.

REVISED RECORDS.--WSP 1032: 1933-35(M), 1936-39, 1940-41(P). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 657.22 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since August 1950 by Philpott Lake (station 02071900) 19.6 mi upstream from station. Some additional regulation by powerplant, 1,000 ft upstream from station. Maximum discharge, 39,000 ft<sup>3</sup>/s, from rating curve extended above 17,000 ft<sup>3</sup>/s on basis of computations of flow over dam at gage heights 16.76 ft and 21.50 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,320 ft<sup>3</sup>/s, Mar. 28, gage height, 6.25 ft; minimum, 24 ft<sup>3</sup>/s, Nov. 17, 19, 23, 24, 26, Dec. 1-3, result of regulation; minimum daily, 63 ft<sup>3</sup>/s, Oct. 16, result of regulation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	388	348	229	137	1030	1060	1900	232	499	527	819	549		
2	240	336	210	183	1210	3080	1850	463	490	219	957	512		
3	109	328	212	350	350	2240	619	509	437	209	929	232		
4	351	319	190	1160	373	2070	966	692	176	356	871	187		
5	323	418	1180	738	126	2050	1610	557	232	494	861	404		
6	320	103	336	589	189	669	997	526	454	548	374	477		
7	330	166	248	568	472	1020	1040	275	521	611	197	416		
8	321	223	244	867	554	1160	1040	253	659	547	605	421		
9	114	227	229	279	568	826	378	515	515	234	768	416		
10	155	171	220	381	607	1300	260	689	492	180	757	140		
11	346	189	148	380	1090	984	931	684	272	461	769	162		
12	387	190	156	964	775	314	936	682	241	492	762	438		
13	333	142	313	516	386	280	967	682	460	514	324	400		
14	327	151	309	867	630	627	936	421	482	516	183	386		
15	392	221	506	412	1010	531	920	244	476	527	538	387		
16	63	205	474	359	1170	188	284	537	448	224	641	372		
17	156	199	370	915	1120	691	238	501	468	275	1980	157		
18	341	219	123	1150	1080	695	487	501	218	615	1240	180		
19	344	215	182	972	437	194	546	506	203	510	1850	309		
20	357	130	339	1050	240	209	489	510	443	554	1720	466		
21	306	146	400	984	544	666	496	257	484	1120	529	402		
22	424	209	337	312	432	681	504	222	516	766	982	375		
23	73	203	307	182	1470	317	179	446	450	346	1100	388		
24	148	196	283	349	1640	728	229	369	376	253	1100	196		
25	367	125	170	336	1230	824	698	386	358	735	1010	164		
26	311	227	163	383	1100	240	688	417	192	877	1090	647		
27	318	409	576	348	434	1390	676	474	787	1140	434	437		
28	335	398	644	1040	841	3760	707	152	715	2200	221	417		
29	324	280	586	665	---	3120	708	224	498	1140	448	387		
30	254	257	542	239	---	3080	187	385	539	1350	498	388		
31	201	---	527	509	---	1990	---	447	---	323	547	---		
TOTAL	8758	6950	10753	18184	21108	36984	22466	13758	13101	18863	25104	10812		
MEAN	283	232	347	587	754	1193	749	444	437	608	810	360		
MAX	424	418	1180	1160	1640	3760	1900	692	787	2200	1980	647		
MIN	63	103	123	137	126	188	179	152	176	180	183	140		
(†)	-51	+46	+79	+91	+37	+108	-123	-7	-21	+70	-93	-66		
MEAN#	232	278	426	678	791	1301	626	437	416	678	717	294		
CFSM#	.61	.73	1.12	1.78	2.08	3.42	1.65	1.15	1.09	1.78	1.89	.77		
IN.#	.70	.82	1.29	2.06	2.17	3.95	1.84	1.33	1.22	2.06	2.18	.86		
CAL YR 1993	TOTAL	241741	MEAN	662	MAX	5220	MIN	63	MEAN#	659	CFSM#	1.73	IN.#	23.55
WTR YR 1994	TOTAL	206841	MEAN	567	MAX	3760	MIN	63	MEAN#	573	CFSM#	1.51	IN.#	20.47

† Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

## 02073000 SMITH RIVER AT MARTINSVILLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1950, BY WATER YEAR (WY) [UNREGULATED]<sup>a</sup>

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	459	394	446	567	517	569	539	483	410	443	435	393
MAX	1828	940	975	1415	1048	907	953	964	788	1205	1778	1258
(WY)	1938	1933	1933	1937	1939	1936	1936	1949	1949	1949	1940	1945
MIN	107	113	188	200	160	309	275	227	211	123	111	83.1
(WY)	1932	1932	1934	1934	1931	1940	1942	1934	1931	1930	1932	1932

## SUMMARY STATISTICS

## WATER YEARS 1930 - 1950

ANNUAL MEAN	471
HIGHEST ANNUAL MEAN	752
LOWEST ANNUAL MEAN	264
HIGHEST DAILY MEAN	18500
LOWEST DAILY MEAN	b19
ANNUAL SEVEN-DAY MINIMUM	b63
INSTANTANEOUS PEAK FLOW	39000
INSTANTANEOUS PEAK STAGE	21.50
INSTANTANEOUS LOW FLOW	c5.0
ANNUAL RUNOFF (CFSM)	1.24
ANNUAL RUNOFF (INCHES)	16.85
10 PERCENT EXCEEDS	760
50 PERCENT EXCEEDS	346
90 PERCENT EXCEEDS	164

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	407	395	438	488	512	628	660	528	472	412	403	425
MAX	1389	1266	788	1000	1104	1735	2206	1138	1467	1174	1032	1624
(WY)	1990	1986	1973	1991	1973	1993	1987	1978	1992	1989	1985	1987
MIN	163	162	207	206	233	233	206	164	144	195	165	205
(WY)	1952	1953	1957	1957	1968	1981	1969	1964	1964	1981	1953	1951

## SUMMARY STATISTICS

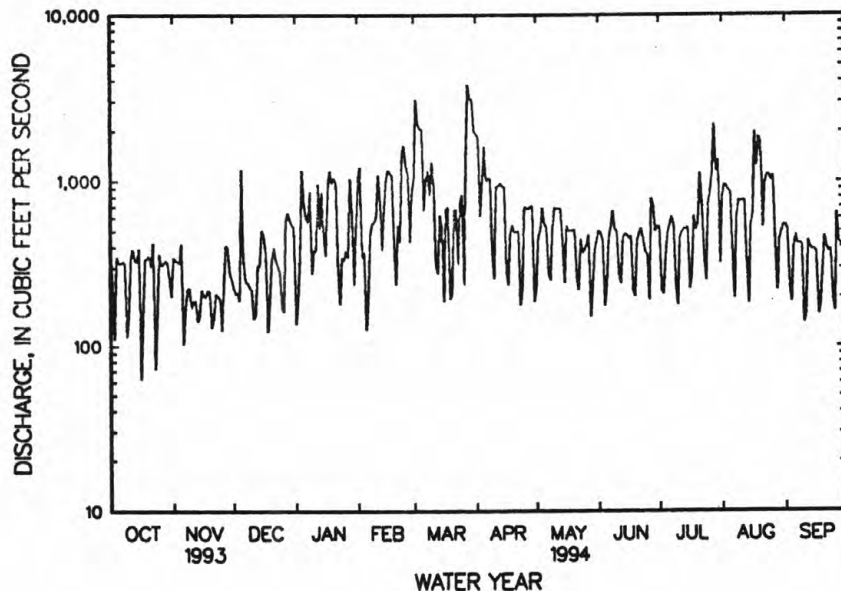
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1951 - 1994

ANNUAL TOTAL	241741	206841	
ANNUAL MEAN	662	567	480
HIGHEST ANNUAL MEAN			817
LOWEST ANNUAL MEAN			243
HIGHEST DAILY MEAN	5220	Mar 4	3760
LOWEST DAILY MEAN	c63	Oct 16	c63
ANNUAL SEVEN-DAY MINIMUM	c175	Nov 19	c175
INSTANTANEOUS PEAK FLOW			5320
INSTANTANEOUS PEAK STAGE			6.25
INSTANTANEOUS LOW FLOW			c24
ANNUAL RUNOFF (CFSM)	1.74		1.49
ANNUAL RUNOFF (INCHES)	23.67		20.25
10 PERCENT EXCEEDS	1210		1090
50 PERCENT EXCEEDS	479		437
90 PERCENT EXCEEDS	196		187

- a Prior to regulation from Philpott Lake.  
b Result of regulation from powerplant upstream.  
c Result of regulation at powerplant 1,000 ft upstream.  
d Also Nov. 19, 23, 24, 26, and Dec. 1-3, 1993.



## ROANOKE RIVER BASIN

02073600 SMITH RIVER NEAR IRISBURG, VA

LOCATION.--Lat 36°36'07", long 79°46'38", Henry County, Hydrologic Unit 03010103, 100 ft upstream from bridge on State Highway 636 and 1.7 mi southwest of Irisburg.

PERIOD OF RECORD.--August to September 1994.

## WATER-QUALITY DATA, AUGUST TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)
AUG						
18...	1500	794	95	7.2	24.0	20.5
SEP						
07...	1430	132	190	9.0	28.0	22.0
21...	1330	131	190	8.3	23.0	17.0
DATE	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
AUG						
18...	748	8.1	92	18	4.1	1.8
SEP						
07...	748	12.0	140	24	5.7	2.3
21...	750	10.6	112	22	5.5	2.0
DATE	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	
AUG						
18...	98	<1	<1	<1	<0.1	
SEP						
07...	112	1	1	<1	<0.1	
21...	122	2	2	<1	<0.1	

< Actual value is known to be less than the value shown.

## ROANOKE RIVER BASIN

467

02073600 SMITH RIVER NEAR IRISBURG, VA--Continued

## WATER-QUALITY DATA, AUGUST TO SEPTEMBER 1994

DATE	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
AUG 18...	2	1	3	2	2	<1
SEP 07...	<1	<1	2	2	<1	<1
21...	<1	<1	2	2	<1	<1

DATE	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, TOTAL SOLVED (UG/L AS SE) (01147)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)
AUG 18...	<0.10	<0.1	2	<1	<1	<1
SEP 07...	<0.10	<0.1	<1	<1	<1	<1
21...	<0.10	<0.1	2	<1	<1	<1

DATE	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)
AUG 18...	<1	<1.0	10	3	5.6
SEP 07...	<1	<1.0	<10	1	2.2
21...	<1	<1.0	<10	3	2.2

&lt; Actual value is known to be less than the value shown.



## ROANOKE RIVER BASIN

02074000 SMITH RIVER AT EDEN, NC

LOCATION.--Lat 36°31'31", long 79°45'57", Rockingham County, Hydrologic Unit 03010103, on right bank at Eden, 0.3 mi downstream from bridge on State Highway 14, 0.8 mi upstream from bridge on Secondary Road 1714, 1.2 mi south of Virginia-North Carolina State line, 1.3 mi downstream from Stuart Creek, and 3.9 mi upstream from mouth.

DRAINAGE AREA.--538 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1939 to current year. Prior to October 1970, published as "at Spray".

REVISED RECORDS.--WSP 1433: 1946.

GAGE.--Water-stage recorder. Datum of gage is 539.56 ft above sea level.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Flow regulated since August 1950 by Philpott Lake (station 02071900) 40 mi upstream, usable capacity, 6,325,000 ft<sup>3</sup>. Additional regulation by hydroelectric plant at Martinsville, Virginia, 18 mi upstream. Maximum discharge prior to regulation, 45,600 ft<sup>3</sup>/s, Aug. 15, 1940, gage height, 19.28 ft, from rating curve extended above 12,000 ft<sup>3</sup>/s on the basis of computation of peak flow over dam 1.5 mi downstream. Water-quality records for some prior periods have been collected at this location.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	459	389	384	591	1190	1310	2440	413	663	654	717	654
2	523	426	320	267	1720	5440	2300	457	658	636	1150	612
3	138	404	316	451	588	3960	1530	691	566	250	1070	637
4	298	432	233	1530	530	2990	909	1040	508	371	1020	209
5	391	455	1690	1240	407	2660	1980	877	319	420	955	271
6	390	383	856	911	338	1690	1290	791	385	714	922	566
7	393	271	508	835	480	1040	1450	756	665	605	244	492
8	401	357	420	1540	748	1680	1310	364	926	685	377	499
9	313	298	382	791	783	1230	1140	468	702	606	826	501
10	232	315	362	634	892	1970	436	902	660	193	827	472
11	313	294	245	623	1200	1530	807	900	666	296	811	183
12	436	297	273	1400	1830	1020	1230	898	317	559	797	291
13	431	203	384	1340	971	572	1280	868	363	587	819	459
14	411	242	439	862	1080	777	1250	929	637	575	208	465
15	403	341	609	1220	1130	866	1210	288	584	651	360	454
16	384	312	872	e255	1540	688	1040	595	529	609	663	456
17	184	303	607	e325	1460	596	428	699	608	192	1760	481
18	345	327	424	e420	1380	965	652	699	586	563	1530	240
19	424	323	330	e490	1140	732	747	686	232	630	1850	294
20	416	210	435	e750	386	369	743	688	317	568	1780	464
21	415	246	667	e765	632	664	738	700	527	1150	1120	449
22	437	332	640	e635	704	970	737	328	653	1220	506	497
23	358	302	504	261	1870	797	527	402	557	849	1130	470
24	188	296	492	473	2590	601	403	551	614	349	1140	550
25	343	200	377	525	1830	1130	644	533	603	631	1070	183
26	406	327	301	516	1530	929	912	589	223	739	1140	735
27	397	375	447	541	1120	1880	914	666	500	1270	1030	762
28	413	894	729	1400	734	7500	955	548	1120	2380	311	510
29	384	472	837	1570	---	4860	910	327	692	1540	367	521
30	413	378	724	693	---	4250	718	387	715	1790	582	498
31	373	---	685	669	---	2760	---	526	---	435	577	---
TOTAL	11412	10404	16492	24523	30803	58426	31630	19566	17095	22717	27659	13875
MEAN	368	347	532	791	1100	1885	1054	631	570	733	892	462
MAX	523	894	1690	1570	2590	7500	2440	1040	1120	2380	1850	762
MIN	138	200	233	255	338	369	403	288	223	192	208	183
(#)	-1	+1	+2	+2	+1	+2	-3	0	-1	+2	-2	-1

# Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by the U.S. Army Corps of Engineers.  
e Estimated.

## ROANOKE RIVER BASIN

469

02074000 SMITH RIVER AT EDEN, NC--Continued

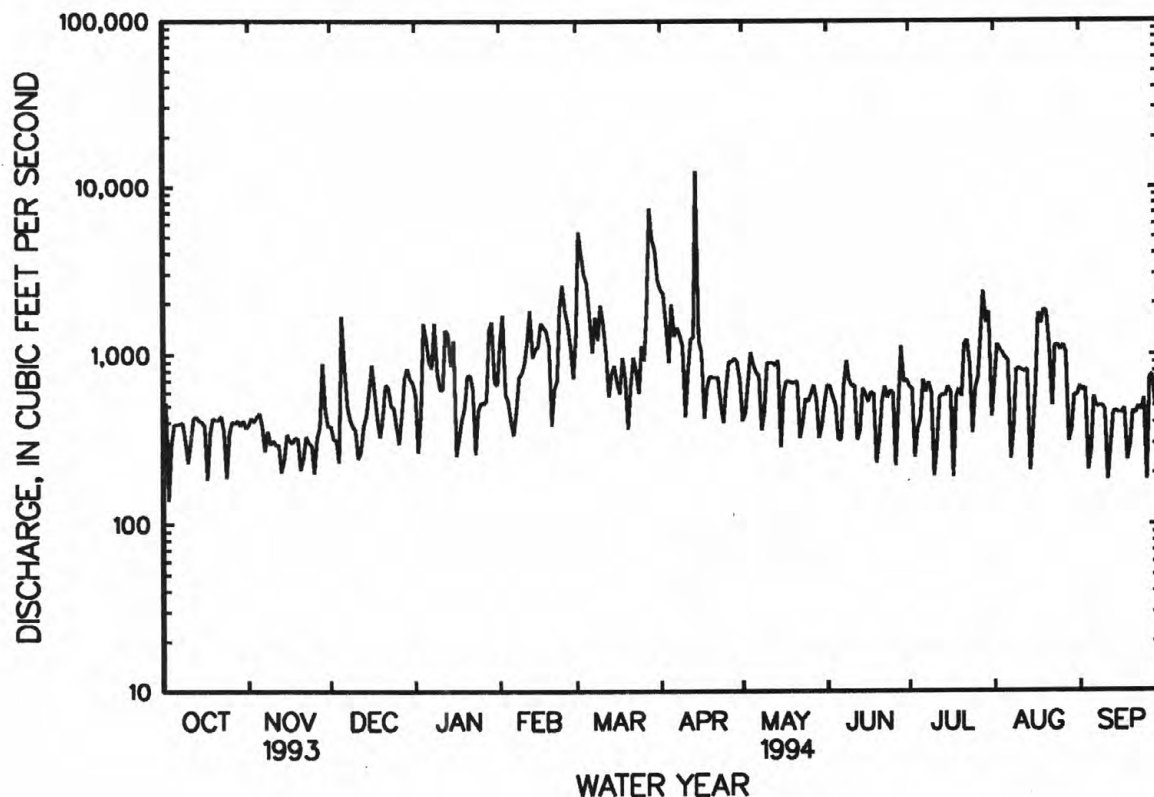
## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1994 BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	518	510	599	678	729	885	876	720	622	542	518	540
MAX	1572	1530	1237	1453	1521	2519	3016	1567	2026	1477	2434	1794
(WY)	1990	1986	1949	1979	1960	1993	1987	1978	1972	1949	1940	1979
MIN	167	203	273	291	325	331	294	266	213	214	194	239
(WY)	1942	1942	1981	1989	1968	1967	1967	1964	1964	1981	1953	1941

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1940 - 1994	
ANNUAL TOTAL	335108		284602			
ANNUAL MEAN	918		780		644	
HIGHEST ANNUAL MEAN	≠917		≠780		1010	
LOWEST ANNUAL MEAN					309	
HIGHEST DAILY MEAN	9790 Mar 4		7500 Mar 28		23300 Aug 15 1940	
LOWEST DAILY MEAN	138 Oct 3		138 Oct 3		46 Aug 14 1967	
ANNUAL SEVEN-DAY MINIMUM	273 Nov 19		273 Nov 19		119 Sep 5 1944	
INSTANTANEOUS PEAK FLOW			10700 Mar 28		a24800 Jun 21 1972	
INSTANTANEOUS PEAK STAGE			10.36 Mar 28		a16.24 Jun 21 1972	
INSTANTANEOUS LOW FLOW			115 Oct 3		38 Aug 7 1967	
10 PERCENT EXCEEDS	1690		1450		1160	
50 PERCENT EXCEEDS	633		601		456	
90 PERCENT EXCEEDS	300		298		231	

≠ Adjusted for change in contents.

a For regulated period only (1951-1994). See REMARKS.



## ROANOKE RIVER BASIN

02074500 SANDY RIVER NEAR DANVILLE, VA

LOCATION.--Lat 36°37'10", long 79°30'16", Pittsylvania County, Hydrologic Unit 03010103, on right bank 200 ft downstream from Hickory Forest Creek, 400 ft upstream from bridge on State Highway 863 between Callahans Store and Mount Cross, 5.5 mi northwest of western city limits of Danville, and 5.8 mi upstream from mouth.

DRAINAGE AREA.--112 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1929 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 972: 1930-41. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 460.38 ft above sea level. Prior to June 26, 1942, at site 1,200 ft downstream at datum 5.57 ft lower.

REMARKS.--Records good except those for periods with ice effect, Dec. 29 to Jan. 1 and Jan. 20-22, and periods of doubtful or no gage-height record, Jan. 26, Mar. 16-25, and Mar. 30 to May 10, which are fair. Diurnal fluctuation at low flow caused by small mill upstream from station. Maximum discharge, 23,000 ft<sup>3</sup>/s, from rating curve extended above 11,000 ft<sup>3</sup>/s. Minimum gage height, 0.40 ft, Sept. 29, 1930. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 23	1330	1,500	4.42	Mar. 28	1130	1,710	4.66
Mar. 2	0630	*4,120	*6.51				

Minimum discharge, 28 ft<sup>3</sup>/s, Sept. 17, gage height, 1.12 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38	52	58	e80	111	221	e220	e96	53	164	220	54
2	39	48	56	90	97	2980	e185	e90	50	72	276	46
3	38	48	55	89	89	872	e145	e84	48	62	162	43
4	37	48	59	213	84	453	e130	e132	50	243	79	39
5	38	52	391	179	85	270	e120	e115	56	84	62	37
6	36	60	153	118	83	193	e119	e104	52	56	56	38
7	37	62	96	108	77	162	e130	e93	56	48	52	39
8	39	52	80	272	76	154	e120	e102	78	44	51	35
9	39	50	72	146	94	158	e110	e95	62	42	47	34
10	40	50	69	107	107	631	e108	e88	58	43	45	34
11	41	49	68	99	219	247	e130	84	62	44	44	33
12	46	50	62	460	337	176	e120	79	60	42	47	31
13	45	49	61	235	284	153	e119	73	56	43	45	31
14	42	49	62	141	289	138	e125	70	51	41	42	30
15	45	49	97	103	233	127	e115	68	48	45	47	30
16	44	49	143	87	188	e116	e114	87	50	39	57	29
17	46	49	93	125	154	e110	e109	68	47	40	85	30
18	47	51	83	126	131	e105	e105	63	45	103	69	38
19	44	50	86	87	118	e102	e100	63	45	51	52	33
20	43	51	100	e84	109	e100	e95	63	42	50	51	30
21	44	49	234	e78	104	e99	e92	63	41	80	48	30
22	48	48	154	e86	105	e115	e90	61	44	72	46	31
23	44	48	111	96	864	e105	e88	58	41	142	43	31
24	42	48	96	94	621	e98	e86	57	56	67	41	30
25	42	49	88	85	249	e102	e84	57	48	54	41	41
26	44	48	81	e85	166	119	e81	60	40	51	41	167
27	45	94	78	86	132	306	e81	72	65	79	39	91
28	46	209	79	367	118	1420	e100	58	132	110	41	53
29	45	85	e78	415	---	969	e93	56	63	212	40	47
30	65	65	e76	182	---	e350	e115	55	71	83	39	44
31	79	---	e73	133	---	e250	---	53	---	63	38	---
TOTAL	1368	1761	3092	4656	5324	11401	3429	2367	1670	2369	2046	1279
MEAN	44.1	58.7	99.7	150	190	368	114	76.4	55.7	76.4	66.0	42.6
MAX	79	209	391	460	864	2980	220	132	132	243	276	167
MIN	36	48	55	78	76	98	81	53	40	39	38	29
CFSM	.39	.52	.89	1.34	1.70	3.28	1.02	.68	.50	.68	.59	.38
IN.	.45	.58	1.03	1.55	1.77	3.79	1.14	.79	.55	.79	.68	.42

e Estimated.

## ROANOKE RIVER BASIN

471

02074500 SANDY RIVER NEAR DANVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	83.2	84.1	108	136	147	176	149	108	84.3	75.9	82.9	76.9
MAX	366	281	249	409	369	738	591	279	376	265	556	512
(WY)	1938	1958	1974	1936	1979	1975	1987	1971	1972	1989	1940	1944
MIN	22.6	32.2	35.2	31.5	40.2	63.9	53.1	52.8	34.1	26.0	17.0	14.2
(WY)	1932	1932	1934	1934	1934	1967	1967	1986	1986	1986	1932	1930

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

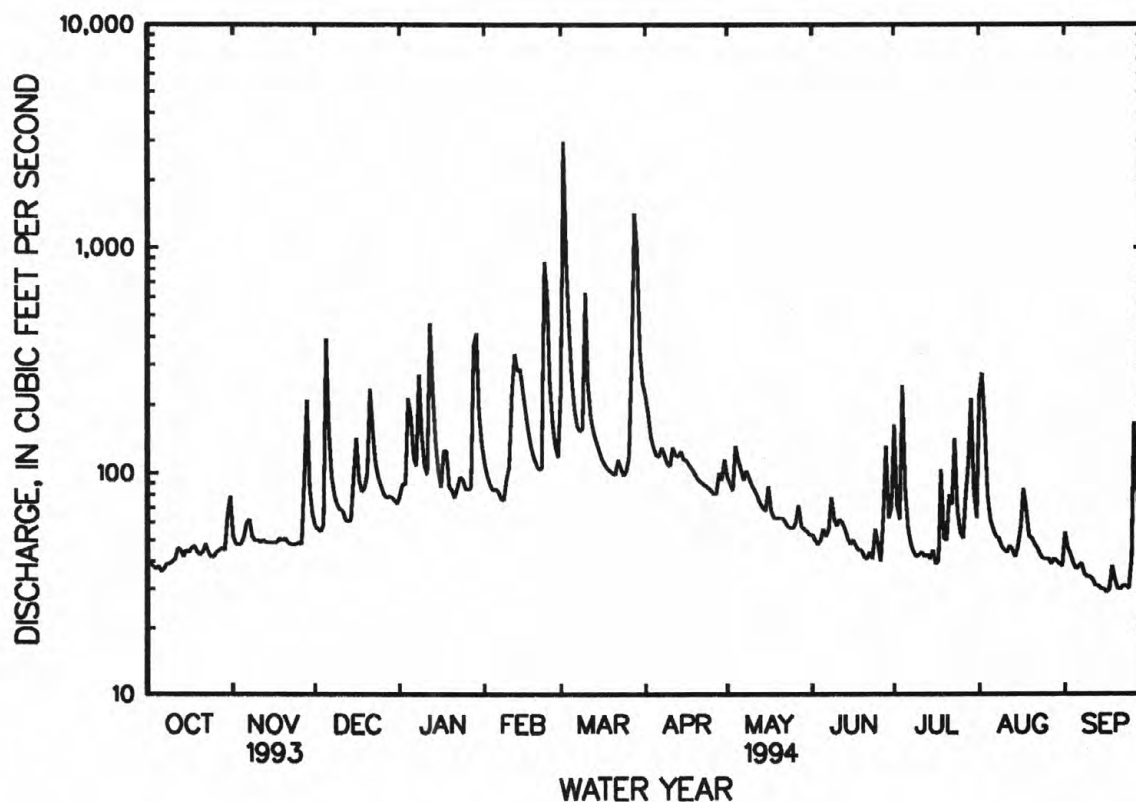
## WATER YEARS 1930 - 1994

ANNUAL TOTAL	54275		40762									
ANNUAL MEAN	149		112							109		
HIGHEST ANNUAL MEAN										175		1975
LOWEST ANNUAL MEAN										58.5		1981
HIGHEST DAILY MEAN	3940	Mar 4		2980	Mar 2					7490	Apr 16	1987
LOWEST DAILY MEAN	36	Oct 6		29	Sep 16					8.0	<sup>a</sup> Aug 29	1932
ANNUAL SEVEN-DAY MINIMUM	38	Oct 1		31	<sup>b</sup> Sep 11					8.6	Aug 27	1932
INSTANTANEOUS PEAK FLOW				4120	Mar 2					23000	Aug 14	1940
INSTANTANEOUS PEAK STAGE				6.51	Mar 2					<sup>c</sup> 14.80	Aug 14	1940
INSTANTANEOUS LOW FLOW				28	Sep 17					3.0	Sep 29	1930
ANNUAL RUNOFF (CFSM)	1.33			1.00						.97		
ANNUAL RUNOFF (INCHES)	18.03			13.54						13.23		
10 PERCENT EXCEEDS	236			186						165		
50 PERCENT EXCEEDS	78			71						72		
90 PERCENT EXCEEDS	45			40						35		

a Also Aug. 31 to Sept. 2, 1932.

b Also Sept. 12, 1994.

c From floodmarks, present datum.



## ROANOKE RIVER BASIN

02075000 DAN RIVER AT DANVILLE, VA

LOCATION.--Lat 36°35'15", long 79°22'55", Danville City, Hydrologic Unit 03010104, on left bank 50 ft downstream from Norfolk Southern Railway bridge, 1,000 ft upstream from Fall Creek, and at mile 62.7.

DRAINAGE AREA.--2,050 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--August 1934 to current year. Gage-height records collected in this vicinity 1890-1934, at same site 1934-49, and at Main Street bridge, 0.25 mi upstream 1949-68, are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 972: 1936.

GAGE.--Water-stage recorder. Datum of gage is 379.29 ft above sea level.

REMARKS.--Records fair except those for periods of doubtful gage-height record, Oct. 1 to Dec. 1 and Apr. 1 to July 21, which are poor. Diurnal fluctuation caused by mills and hydroelectric generating facility at Schoolfield Dam 3.3 mi upstream. Since August 1950, flow regulated by Philpott Lake (station 02071900) 74.7 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Maximum discharge, 75,000 ft<sup>3</sup>/s, from rating curve extended above 56,000 ft<sup>3</sup>/s on the basis of computation of flow over Schoolfield Dam at 80,000 ft<sup>3</sup>/s. Maximum gage height, 21.34 ft, result of backwater from debris. Minimum gage height, 1.18 ft, Sept. 5, 1966. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 35,100 ft<sup>3</sup>/s, Mar. 29, gage height, 16.59 ft; minimum, 605 ft<sup>3</sup>/s, Oct. 25, but may have been lower during periods of doubtful gage-height record; minimum daily, 630 ft<sup>3</sup>/s, Oct. 18, estimated due to doubtful gage-height record.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	961	1310	1330	1370	2480	2550	e5250	e2110	e1230	e2470	2100	1280
2	961	1160	1180	1340	2570	13400	e4300	e1650	e1380	e2160	2570	1670
3	965	1020	1030	1470	2360	26100	e3200	e1670	e1090	e1120	2950	1650
4	e640	1010	1240	2070	1800	15200	e2700	e2220	e1380	e1230	2450	1410
5	918	1250	3220	4200	1560	6550	e3170	e2810	e1070	e1220	2000	1210
6	964	1230	5400	2870	1490	5020	e3100	e2180	e1030	e1420	1790	968
7	954	1190	2620	2210	1510	3300	e2950	e1940	e1450	e1410	1380	1310
8	e680	1010	1750	2630	1660	3580	e2720	e1750	e1470	e1340	1240	1130
9	932	1110	1520	4080	1770	3540	e2590	e1410	e2070	e1070	1530	1160
10	e780	1000	1310	2390	1950	5290	e2080	e1480	e1950	e1090	1540	1090
11	880	1000	1070	2110	2540	6610	e2100	e1690	e1690	e760	1370	956
12	964	1000	1190	2920	4720	4640	e2570	e1800	e1470	e925	1330	888
13	961	1000	1070	6590	4910	3040	e2610	e1540	e1170	e1130	1270	1010
14	970	e740	1320	3680	4340	2880	e2580	e1670	e1230	e1370	1140	1190
15	972	921	1400	2870	4020	2940	e2580	e1610	e965	e1310	1070	946
16	978	1010	2180	2050	3690	2640	e3030	e1130	e1360	e1370	1570	947
17	977	1010	2220	1740	3320	2120	e2610	e1550	e1340	e1180	1780	1060
18	e630	1010	1710	2680	3010	2500	e1980	e1510	e1030	e1070	5580	1040
19	1010	1010	1490	3080	2810	2430	e2030	e1530	e1080	e1410	3420	995
20	978	955	1390	2300	2230	1860	e1910	e1480	e900	e1480	3460	1110
21	981	842	3400	2270	1680	1950	e1860	e1370	e1050	e1760	3170	940
22	1040	e840	3240	2140	1980	2340	e1950	e1370	e1090	3210	1930	990
23	1270	959	2160	1660	2680	2520	e1840	e1100	e1350	5140	1990	1080
24	e680	e850	1850	1420	10400	2250	e1630	e1250	e1440	3010	1870	889
25	e740	973	1540	1690	7130	2320	e1530	e1340	e1170	1980	1790	1140
26	983	839	1410	1700	4270	2800	e1840	e1470	e1000	1710	1680	1450
27	982	1630	1210	1800	3360	5990	e1870	e1490	e900	1700	1690	2130
28	962	3750	1440	2570	2500	25000	e1880	e1710	e1790	2430	1430	1400
29	981	2920	1670	7040	---	33300	e1960	e1220	e1990	5200	1450	1260
30	1180	1900	1690	4010	---	26100	e2310	e830	e1910	4350	1280	1070
31	1290	---	1670	2740	---	13800	---	e1310	---	2870	1280	---
TOTAL	29164	36449	56920	83690	88740	234560	74730	49190	40045	59895	61100	35369
MEAN	941	1215	1836	2700	3169	7566	2491	1587	1335	1932	1971	1179
MAX	1290	3750	5400	7040	10400	33300	5250	2810	2070	5200	5580	2130
MIN	630	740	1030	1340	1490	1860	1530	830	900	760	1070	888
(†)	-51	+46	+79	+91	+37	+108	-123	-7	-21	+70	-93	-66
MEAN#	890	1261	1915	2791	3206	7674	2368	1580	1314	2002	1878	1113
CFSM#	.43	.62	.93	1.36	1.56	3.74	1.16	.77	.64	.98	.92	.54
IN.#	.50	.69	1.08	1.57	1.63	4.32	1.29	.89	.72	1.13	1.06	.61

CAL YR 1993 TOTAL 1099758 MEAN 3013 MAX 30000 MIN 500 MEAN# 3010 CFSM# 1.47 IN.# 19.94  
WTR YR 1994 TOTAL 849852 MEAN 2328 MAX 33300 MIN 630 MEAN# 2334 CFSM# 1.14 IN.# 15.46

† Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

e Estimated.



## 02075000 DAN RIVER AT DANVILLE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1934 - 1950, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2062	1897	2168	3384	3215	3062	2808	2428	1985	2215	2130	2079
MAX	8519	3689	4400	8648	5845	5341	4859	4655	3059	4595	7505	6258
(WY)	1938	1938	1949	1936	1939	1944	1936	1949	1943	1949	1940	1945
MIN	625	736	1085	1184	1503	1825	1129	1197	1079	1126	840	768
(WY)	1942	1942	1944	1942	1947	1940	1942	1941	1941	1936	1944	1936

## SUMMARY STATISTICS

## WATER YEARS 1934 - 1950

ANNUAL MEAN	2447
HIGHEST ANNUAL MEAN	3344
LOWEST ANNUAL MEAN	1816
HIGHEST DAILY MEAN	64800 Aug 15 1940
LOWEST DAILY MEAN	338 Sep 12 1944
ANNUAL SEVEN-DAY MINIMUM	426 Sep 6 1944
INSTANTANEOUS PEAK FLOW	75000 Aug 15 1940
INSTANTANEOUS PEAK STAGE	20.96 Aug 15 1940
INSTANTANEOUS LOW FLOW	40 Dec 8 1946
ANNUAL RUNOFF (CFSM)	1.19
ANNUAL RUNOFF (INCHES)	16.22
10 PERCENT EXCEEDS	3990
50 PERCENT EXCEEDS	1700
90 PERCENT EXCEEDS	870

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1728	1730	2195	2604	3068	3865	3467	2393	1998	1571	1484	1494
MAX	6272	5870	4110	6245	8280	11030	10610	5281	7732	4058	4534	6838
(WY)	1960	1958	1973	1978	1960	1975	1987	1972	1972	1989	1985	1979
MIN	624	711	859	808	1453	1243	1070	1050	743	661	550	458
(WY)	1952	1968	1956	1956	1968	1985	1985	1986	1986	1986	1981	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

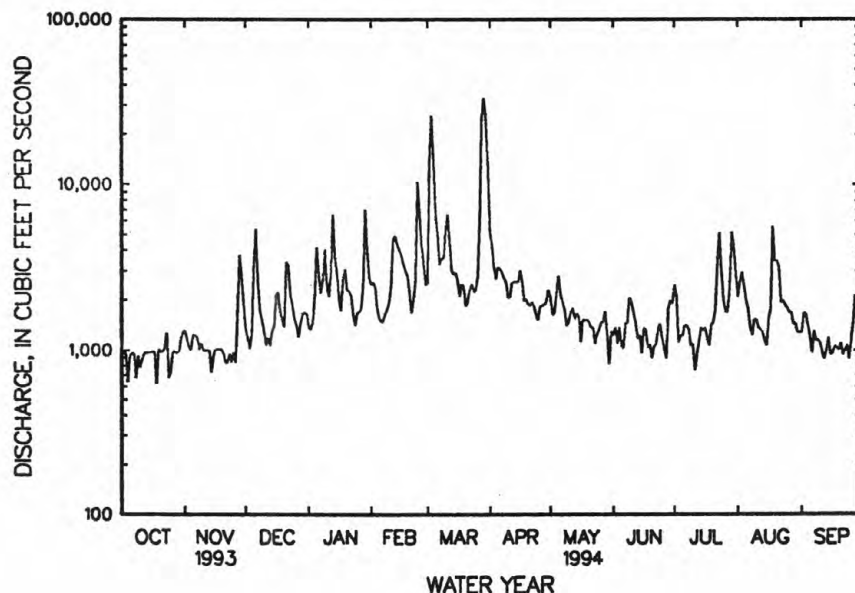
## WATER YEARS 1951 - 1994

ANNUAL TOTAL	1099758	849852	2295
ANNUAL MEAN	3013	2328	3583
HIGHEST ANNUAL MEAN			1102
LOWEST ANNUAL MEAN			57600
HIGHEST DAILY MEAN	30000 Mar 5	33300 Mar 29	Jun 22 1972
LOWEST DAILY MEAN	500 Sep 14	630 Oct 18	110 Sep 5 1966
ANNUAL SEVEN-DAY MINIMUM	838 Oct 4	838 Oct 4	324 Oct 8 1954
INSTANTANEOUS PEAK FLOW		35100 Mar 29	59200 Jun 22 1972
INSTANTANEOUS PEAK STAGE		16.59 Mar 29	21.34 Jun 22 1972
INSTANTANEOUS LOW FLOW		605 Oct 25	11 Sep 5 1966
ANNUAL RUNOFF (CFSM)	1.47	1.14	1.12
ANNUAL RUNOFF (INCHES)	19.96	15.42	15.21
10 PERCENT EXCEEDS	6190	3560	4010
50 PERCENT EXCEEDS	1810	1570	1540
90 PERCENT EXCEEDS	963	965	780

a Result of backwater from debris.

b May have been lower during periods of doubtful gage-height record.

e Estimated.



## ROANOKE RIVER BASIN

02075045 DAN RIVER AT SEWAGE TREATMENT PLANT, NEAR DANVILLE, VA

LOCATION.--Lat 36°33'45", long 79°22'12", Pittsylvania County, Hydrologic Unit 03010104, at pedestrian bridge at Danville sewage treatment plant and 0.7 mi southeast of Danville.

PERIOD OF RECORD.--October 1993 to September 1994.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)
OCT 28...	1035	951	310	7.6	17.5	15.5	755	10.9	110	--
FEB 23...	1230	2600	105	6.9	5.0	8.0	747	11.9	102	--
MAR 24...	1100	2240	107	7.7	17.0	15.0	748	10.1	102	81
APR 20...	1200	2670	105	7.3	22.0	18.5	753	9.0	97	92
MAY 19...	1000	1380	144	7.9	19.0	18.0	750	9.2	99	95
JUN 21...	1100	863	135	7.6	35.0	29.0	752	8.1	107	103
JUL 20...	1100	1480	139	7.0	31.0	27.0	762	6.9	87	130
AUG 16...	1100	1610	120	6.7	19.0	24.0	755	6.0	72	82
SEP 22...	1100	990	209	7.4	23.0	22.0	749	9.6	112	68

DATE	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)
OCT 28...	1	1	<1	<1.0	<1	<1	2	4	<1	<1
FEB 23...	<1	<1	<1	<1.0	2	<1	3	1	3	<1
MAR 24...	<1	<1	<1	<1.0	<1	<1	<1	<1	<1	<1
APR 20...	<1	<1	<1	<1.0	<1	<1	2	1	<1	<1
MAY 19...	<1	<1	<1	<1.0	<1	<1	2	1	<1	<1
JUN 21...	<1	<1	<1	<0.1	<1	<1	3	2	<1	<1
JUL 20...	<1	<1	<1	<0.1	1	<1	6	2	2	<1
AUG 16...	<1	<1	<1	<0.1	<1	<1	3	2	1	<1
SEP 22...	1	<1	<1	<0.1	<1	1	2	2	<1	1

&lt; Actual value is known to be less than the value shown.

## ROANOKE RIVER BASIN

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02075045 DAN RIVER AT SEWAGE TREATMENT PLANT, NEAR DANVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, TOTAL SOLVED (UG/L AS SE) (01147)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)
OCT 28...	<0.10	<0.1	2	<1	<1	<1	<1	<1.0	10	<10
FEB 23...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	20	10
MAR 24...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	<10	<10
APR 20...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	10	<10
MAY 19...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	<10	<10
JUN 21...	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	<10	1
JUL 20...	<0.10	<0.1	7	<1	<1	<1	<1	<1.0	<10	3
AUG 16...	<0.10	<0.1	1	<1	<1	<1	<1	<1.0	<10	2
SEP 22...	<0.10	<0.1	1	<1	<1	<1	<1	<1.0	<10	3

&lt; Actual value is known to be less than the value shown.

## 02075046 DAN RIVER AND SEWAGE TREATMENT PLANT EFFLUENT, NEAR DANVILLE, VA

LOCATION.--Lat 36°33'45", long 79°22'10', Pittsylvania County, Hydrologic Unit 03010104, at Danville sewage treatment plant outfall and 0.7 mi southeast of Danville.

PERIOD OF RECORD.--October 1993 to September 1994.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L) (00500)	ARSENIC TOTAL (UG/L AS AS) (01002)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD) (01027)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR) (01034)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU) (01042)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB) (01051)
OCT											
28...	1035	--	2	2	<1	<1.0	<1	<1	3	5	1
28...	1040	--	2	2	<1	<1.0	<1	<1	3	5	2
FEB											
23...	1235	--	1	1	<1	<1.0	2	<1	5	4	3
23...	1240	--	1	2	<1	<1.0	2	<1	5	4	3
MAR											
24...	1130	166	1	1	<1	<1.0	<1	<1	4	2	<1
24...	1135	176	1	1	<1	<1.0	<1	<1	4	3	<1
APR											
20...	1230	185	1	<1	<1	<1.0	1	<1	2	2	1
20...	1235	179	<1	<1	<1	<1.0	1	<1	2	2	1
MAY											
19...	1030	211	1	1	<1	<1.0	<1	<1	2	<1	3
19...	1035	208	<1	1	<1	<1.0	<1	<1	5	3	<1
JUN											
21...	1130	201	1	1	<1	<0.1	<1	1	4	3	<1
21...	1135	200	2	1	<1	<0.1	2	<1	3	3	<1
JUL											
20...	1130	194	1	1	<1	0.1	1	<1	5	3	2
20...	1135	210	1	1	<1	<0.1	1	<1	5	3	2
AUG											
16...	1130	168	1	1	<1	<0.1	<1	1	4	3	1
16...	1135	172	1	1	<1	<0.1	<1	<1	4	3	1
SEP											
22...	1130	120	1	1	<1	<0.1	<1	<1	4	<1	<1
22...	1135	122	1	1	<1	<0.1	<1	<1	4	<1	<1

< Actual value is known to be less than the value shown.

## ROANOKE RIVER BASIN

477

02075046 DAN RIVER AND SEWAGE TREATMENT PLANT EFFLUENT, NEAR DANVILLE, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG) (71900)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI) (01067)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, TOTAL (UG/L AS SE) (01147)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG) (01077)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN) (01092)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)
OCT											
28...	<1	<0.10	<0.1	2	<1	<1	<1	<1	<1.0	20	30
28...	<1	<0.10	<0.1	2	<1	<1	<1	<1	<1.0	20	30
FEB											
23...	<1	<0.10	<0.1	2	<1	<1	<1	<1	<1.0	20	20
23...	<1	<0.10	<0.1	1	<1	<1	<1	<1	<1.0	20	20
MAR											
24...	<1	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	10	20
24...	<1	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	20	20
APR											
20...	<1	<0.10	<0.1	1	<1	<1	<1	<1	<1.0	20	10
20...	<1	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	20	10
MAY											
19...	<1	0.10	<0.1	<1	<1	<1	<1	<1	<1.0	20	20
19...	<1	0.10	<0.1	2	<1	<1	<1	<1	<1.0	20	20
JUN											
21...	<1	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	30	8
21...	<1	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	20	9
JUL											
20...	1	<0.10	<0.1	2	<1	<1	<1	<1	<1.0	<10	--
20...	1	<0.10	<0.1	1	<1	<1	<1	<1	<1.0	<10	<1
AUG											
16...	<1	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	30	21
16...	1	<0.10	<0.1	2	<1	<1	<1	<1	<1.0	30	22
SEP											
22...	<1	<0.10	<0.1	1	<1	<1	<1	<1	<1.0	20	17
22...	<1	<0.10	<0.1	<1	<1	<1	<1	<1	<1.0	30	17

&lt; Actual value is known to be less than the value shown.



## ROANOKE RIVER BASIN

02075500 DAN RIVER AT PACES, VA

LOCATION.--Lat 36°38'32", long 79°05'23", Halifax County, Hydrologic Unit 03010104, on right bank 100 ft upstream from bridge on State Highway 658, 0.5 mi southeast of Paces, 0.5 mi upstream from Big Toby Creek, 2.7 mi upstream from Birch Creek, and at mile 36.0.

DRAINAGE AREA.--2,550 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--November 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is 322.48 ft above sea level.

REMARKS.--Records good. Diurnal fluctuation by mills 23 mi upstream at Danville. Since August 1950, flow regulated by Philpott Lake (station 02071900) 101.4 mi upstream. Gage-height and U.S. Army Corps of Engineers satellite telemeters at station. Maximum discharge, 64,800 ft<sup>3</sup>/s, from rating curve extended above 32,000 ft<sup>3</sup>/s. Minimum gage height, 1.71 ft, Sept. 4, 1956. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 16, 1940, reached a stage of 32.3 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 34,100 ft<sup>3</sup>/s, Mar. 30, gage height, 25.88 ft; minimum, 595 ft<sup>3</sup>/s, Oct. 5-6, gage height, 2.56 ft; minimum daily, 663 ft<sup>3</sup>/s, Oct. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1190	1440	2070	1830	3170	3080	9570	2930	1480	2400	2650	1540
2	1090	1290	1590	e2090	3040	10900	6930	2260	1480	3950	3000	1940
3	1090	1290	1580	e1930	3150	25900	6140	1880	1390	2500	4030	2030
4	1070	1110	1520	e2350	2360	30000	4870	2240	1280	2340	3480	1990
5	663	1160	2630	e4880	2000	17900	4330	3320	1510	1490	2750	1590
6	961	1370	8360	e4000	2210	7440	4900	2930	1120	1890	2300	1190
7	1070	1510	4280	2930	1790	5290	4320	2430	1390	1570	2060	1450
8	1050	1200	2660	2830	2050	4500	4180	2220	1400	1590	1450	1540
9	727	1150	2050	4740	2140	4670	3700	1940	1890	1520	1610	1240
10	1040	1230	1810	3530	2480	6030	3240	1640	2070	1310	1900	1480
11	820	1110	1620	2670	3110	9460	2620	2060	1900	1120	1750	1170
12	910	1100	1570	2870	6610	6610	3090	2000	1690	822	1570	1130
13	1080	1100	1350	8210	8000	4610	3540	2120	1310	1330	1600	930
14	1080	1090	1510	6100	6500	3790	3700	1840	1350	1410	1480	1420
15	1080	777	1730	3720	5800	3710	3680	1930	1450	1550	1340	1250
16	1070	1140	2530	2990	4750	3420	3960	1480	1380	1520	1530	1120
17	1080	1140	3110	2100	4250	2880	5120	1590	1510	1550	1990	1140
18	1060	1130	2410	2990	3760	2610	3160	1900	1430	1380	5110	1410
19	687	1120	2190	3760	3460	2850	2750	1580	1250	1460	5360	979
20	1220	1110	1830	3120	3140	2550	2630	1770	1000	1640	4190	1410
21	1080	891	4250	2810	2290	2190	2480	1550	945	1670	4540	1170
22	1180	1020	5280	2650	2370	2490	2410	1630	1340	2870	3040	1130
23	1320	876	3290	2450	3040	2890	2350	1380	1220	6750	2110	1280
24	1350	1170	2560	1800	12000	2730	2210	1380	1540	5220	2280	1120
25	724	879	2250	2040	15100	2460	2020	1620	1460	2560	2140	1180
26	869	1200	1880	2140	6820	3170	2140	1520	1180	2020	2010	1370
27	1090	976	1760	2200	4450	5310	2270	1640	1170	2000	1980	2360
28	1080	7920	1470	2870	3580	17400	2310	1840	1210	2690	1960	2030
29	1060	5800	2100	8540	---	28700	2380	1700	2380	7130	1650	1560
30	1170	3570	2050	7040	---	33400	2430	1230	2020	7710	1620	1450
31	1540	---	1990	3810	---	25300	---	1340	---	4650	1540	---
TOTAL	32501	47869	77280	107990	123420	284240	109430	58890	43745	79612	76020	42599
MEAN	1048	1596	2493	3484	4408	9169	3648	1900	1458	2568	2452	1420
MAX	1540	7920	8360	8540	15100	33400	9570	3320	2380	7710	5360	2360
MIN	663	777	1350	1800	1790	2190	2020	1230	945	822	1340	930
(†)	-51	+46	+79	+91	+37	+108	-123	-7	-21	+70	-93	-66
MEAN#	997	1642	2572	3575	4445	9277	3525	1893	1437	2638	2359	1354
CFSM#	.39	.64	1.01	1.40	1.74	3.64	1.38	.74	.56	1.03	.93	.53
IN.#	.45	.72	1.16	1.62	1.82	4.20	1.54	.86	.63	1.19	1.07	.58

CAL YR 1993 TOTAL 1299408 MEAN 3560 MAX 33300 MIN 594 MEAN# 3557 CFSM# 1.39 IN.# 18.94  
WTR YR 1994 TOTAL 1083596 MEAN 2969 MAX 33400 MIN 663 MEAN# 2957 CFSM# 1.17 IN.# 15.84

† Change in contents, equivalent in cubic feet per second, in Philpott Lake; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

e Estimated.

## ROANOKE RIVER BASIN

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02075500 DAN RIVER AT PACES, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1951 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2042	2084	2694	3350	3892	4561	4092	2817	2314	1859	1750	1754
MAX	7253	6184	5166	8407	9141	11190	11500	6505	8987	5091	4833	8269
(WY)	1960	1958	1973	1978	1960	1975	1987	1978	1972	1975	1985	1979
MIN	616	778	1083	1015	1756	1580	1318	1184	860	788	647	452
(WY)	1954	1954	1981	1981	1977	1981	1967	1986	1986	1977	1977	1954

## SUMMARY STATISTICS

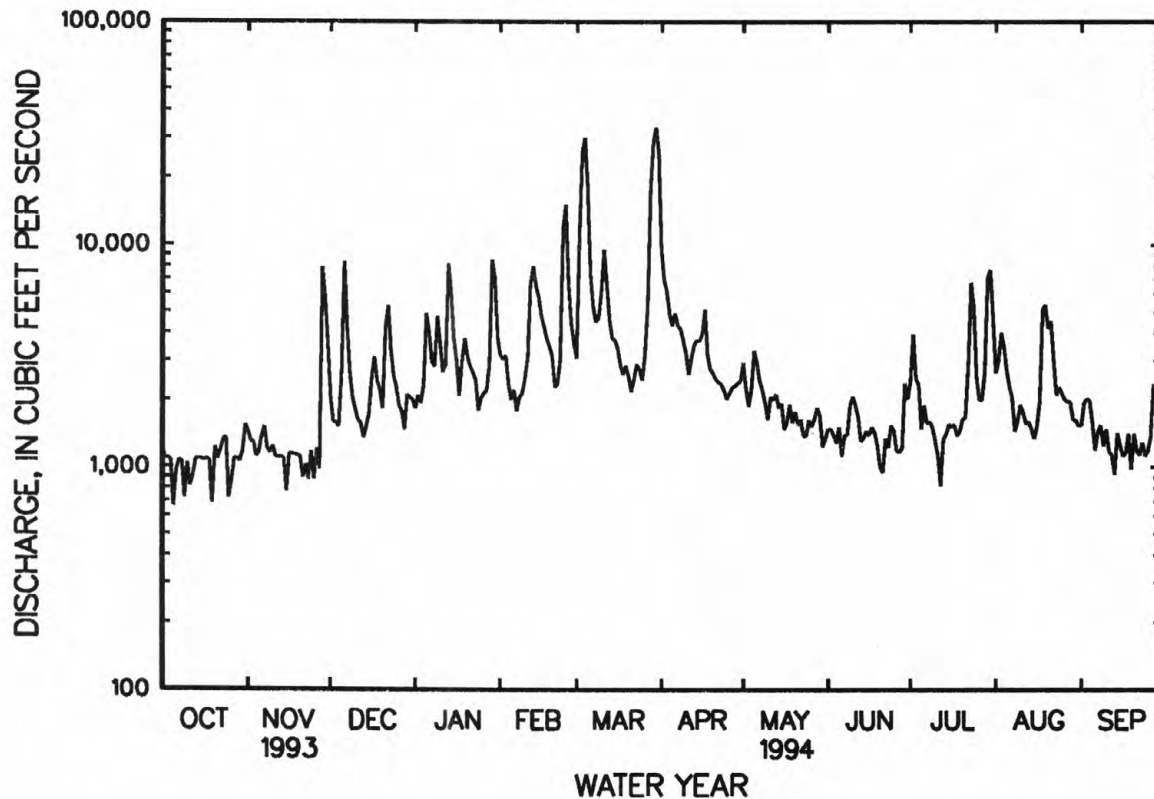
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1951 - 1994

ANNUAL TOTAL	1299408		1083596									
ANNUAL MEAN	3560		2969									
HIGHEST ANNUAL MEAN									2761			
LOWEST ANNUAL MEAN									4050			1979
HIGHEST DAILY MEAN									1310			1981
LOWEST DAILY MEAN				33300	Mar 6		33400	Mar 30	63400		Jun 23	1972
ANNUAL SEVEN-DAY MINIMUM				594	Sep 14		663	Oct 5	244		Sep 4	1956
INSTANTANEOUS PEAK FLOW				904	Oct 5		904	Oct 5	311		Oct 8	1954
INSTANTANEOUS PEAK STAGE							34100	Mar 30	64800		Jun 23	1972
INSTANTANEOUS LOW FLOW							25.88	Mar 30	33.15		Jun 23	1972
ANNUAL RUNOFF (CFSM)				1.40			1.16	Oct 5	193		Sep 4	1956
ANNUAL RUNOFF (INCHES)				18.96			15.81		1.08			
10 PERCENT EXCEEDS				7410			5240		4930			
50 PERCENT EXCEEDS				2050			1990		1880			
90 PERCENT EXCEEDS				1080			1100		904			

a Also Oct. 6, 1993.



## ROANOKE RIVER BASIN

02076500 GEORGES CREEK NEAR GRETNA, VA

LOCATION.--Lat 36°56'11", long 79°18'42", Pittsylvania County, Hydrologic Unit 03010105, on left bank 15 ft downstream from bridge on State Highway 40, 2.8 mi southeast of Gretna, and 5.8 mi upstream from Whitethorn Creek.

DRAINAGE AREA.--9.24 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1949 to current year.

REVISED RECORDS.--WSP 1703: 1950-52. WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 629.54 ft above sea level.

REMARKS.--Records good except those for periods of doubtful or no gage-height record, Oct. 1-13, Jan. 21, and Mar. 13-16, and periods with ice effect, Dec. 29 to Jan. 1 and Jan. 20, 22, which are fair. Occasional regulation at low flow from unknown source. Maximum discharge, 1,480 ft<sup>3</sup>/s, from rating curve extended above 640 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 4.93 ft and 6.22 ft and contracted-opening measurements at gage heights 7.75 ft and 8.50 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 150 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 2	1600	224	3.23	Mar. 28	1030	*461	*4.61
Mar. 28	0330	219	3.19	Mar. 29	0900	407	4.33

Minimum daily discharge, 3.3 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.8	6.7	5.9	e6.9	9.7	12	16	8.4	6.5	8.8	8.4	6.4
2	e3.7	5.9	5.6	9.0	9.0	131	14	7.7	6.2	6.7	10	5.9
3	e3.6	5.9	5.3	8.6	8.5	70	12	8.2	6.0	6.7	7.4	5.4
4	e3.4	5.8	8.0	16	8.1	26	12	14	6.2	13	6.7	5.4
5	e3.5	7.4	44	12	8.2	18	11	10	6.3	7.3	6.1	5.5
6	e3.3	8.2	13	10	8.2	15	13	9.0	6.4	6.6	5.7	5.6
7	e3.5	7.3	9.6	9.7	7.9	13	12	8.7	7.2	6.2	5.5	5.5
8	e3.5	6.2	8.5	27	7.9	13	11	14	7.2	5.9	5.4	5.4
9	e3.6	6.1	7.9	12	8.8	13	11	9.2	7.2	5.6	5.1	5.4
10	e3.7	5.9	7.7	9.8	8.9	27	12	8.4	9.2	5.6	5.1	5.0
11	e4.0	5.9	7.8	9.2	17	18	12	8.0	9.1	5.6	7.1	5.0
12	e4.7	5.8	7.1	32	18	14	12	7.9	7.8	5.6	5.8	5.2
13	e4.5	5.5	6.8	18	17	e13	13	7.5	7.3	5.5	5.3	5.3
14	4.6	5.7	6.8	13	21	e12	12	7.4	6.9	6.8	5.4	5.3
15	4.4	6.1	19	9.7	19	e12	10	9.0	6.6	6.7	6.9	5.1
16	4.0	6.1	16	10	16	e11	11	10	20	5.7	8.8	5.4
17	4.8	6.6	9.8	11	14	11	10	7.9	14	10	28	6.6
18	5.0	9.3	9.3	15	12	12	9.9	7.7	8.4	9.1	12	7.1
19	4.6	6.9	9.3	13	11	10	9.9	7.9	7.6	6.2	8.3	6.3
20	4.9	6.1	8.6	e9.0	10	10	9.7	7.8	7.3	5.9	7.2	6.1
21	5.6	5.8	13	e8.3	9.7	12	9.5	7.7	7.1	6.2	7.0	6.0
22	6.0	6.0	11	e8.5	9.3	12	9.8	7.3	7.0	6.8	6.5	6.3
23	5.1	5.8	9.2	8.7	42	11	9.4	7.1	14	7.1	6.0	5.9
24	5.8	5.6	8.6	8.4	36	11	9.5	7.0	10	6.1	5.8	5.7
25	5.9	5.6	8.3	8.3	18	12	9.5	7.1	7.1	5.7	6.1	6.3
26	5.9	5.5	7.9	8.4	14	11	9.0	7.8	6.9	6.7	5.7	16
27	6.2	21	7.4	8.7	12	34	9.6	7.7	33	9.6	5.7	6.9
28	6.1	25	7.4	28	11	210	9.1	6.9	14	10	5.9	5.3
29	6.0	8.8	e7.1	22	---	141	8.4	7.0	8.1	7.8	5.9	4.8
30	12	6.9	e6.9	14	---	30	8.3	6.8	9.0	6.9	5.6	4.7
31	7.9	---	e6.7	11	---	19	---	6.5	---	6.2	6.2	---
TOTAL	153.6	225.4	309.5	395.2	392.2	964	325.6	257.6	279.6	218.6	226.6	180.8
MEAN	4.95	7.51	9.98	12.7	14.0	31.1	10.9	8.31	9.32	7.05	7.31	6.03
MAX	12	25	44	32	42	210	16	14	33	13	28	16
MIN	3.3	5.5	5.3	6.9	7.9	10	8.3	6.5	6.0	5.5	5.1	4.7
CFSM	.54	.81	1.08	1.38	1.52	3.37	1.17	.90	1.01	.76	.79	.65
IN.	.62	.91	1.25	1.59	1.58	3.88	1.31	1.04	1.13	.88	.91	.73

e Estimated.

## 02076500 GEORGES CREEK NEAR GRETN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	8.15	8.89	9.75	11.1	13.0	14.7	13.9	10.5	8.11	7.27	7.02	6.98
MAX	28.1	28.9	20.7	29.4	36.1	37.2	45.7	23.3	24.5	17.4	27.7	32.5
(WY)	1991	1986	1962	1978	1979	1975	1987	1958	1972	1989	1985	1979
MIN	3.51	3.23	2.95	3.78	7.06	6.69	6.53	4.18	2.64	2.69	2.78	2.06
(WY)	1952	1982	1956	1956	1968	1981	1982	1981	1970	1977	1977	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1950 - 1994

ANNUAL TOTAL	4867.4	3928.7	9.92	
ANNUAL MEAN	13.3	10.8	15.4	1973
HIGHEST ANNUAL MEAN			5.51	1981
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	302	Mar 4	503	Aug 24 1967
LOWEST DAILY MEAN	<sup>a</sup> 3.3	Oct 6	1.0	<sup>a</sup> Mar 12 1956
ANNUAL SEVEN-DAY MINIMUM	3.5	<sup>b</sup> Oct 3	1.4	Jul 22 1966
INSTANTANEOUS PEAK FLOW			461	Mar 28 1979
INSTANTANEOUS PEAK STAGE			4.61	Mar 28 1979
INSTANTANEOUS LOW FLOW			( <sup>c</sup> )	( <sup>d</sup> )
ANNUAL RUNOFF (CFSM)	1.44	1.16	1.07	
ANNUAL RUNOFF (INCHES)	19.60	15.82	14.59	
10 PERCENT EXCEEDS	23	15	15	
50 PERCENT EXCEEDS	9.0	7.9	7.4	
90 PERCENT EXCEEDS	4.5	5.4	3.8	

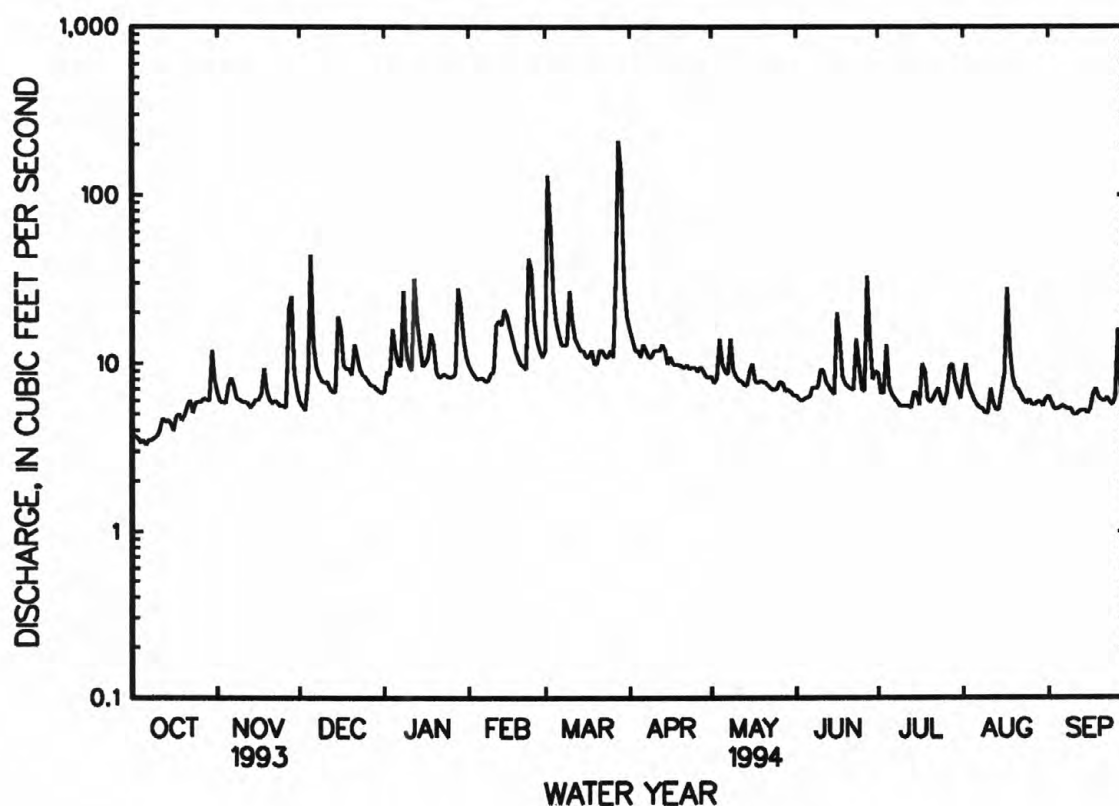
a Also Apr. 5, 1956, and July 28, 1966.

b Also Oct. 4, 1993.

c Not determined.

d Probably occurred Oct. 6, 1993.

e Estimated.



## ROANOKE RIVER BASIN

02077000 BANISTER RIVER AT HALIFAX, VA

LOCATION.--Lat 36°46'35", long 78°54'58", Halifax County, Hydrologic Unit 03010105, on left bank 10 ft downstream from bridge on U.S. Highway 360, 1,700 ft downstream from Terrible Creek, 1 mi northeast of Halifax, and 10 mi upstream from mouth.

DRAINAGE AREA.--547 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1904 to December 1905, October 1928 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 892: 1929-30, 1932-35. WSP 972: 1938(M), 1940. WSP 1112: 1943(M). WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 318.54 ft above sea level (levels by U.S. Army Corps of Engineers). Sept. 28, 1904, to Dec. 31, 1905, nonrecording gage at site 400 ft upstream at different datum. Dec. 9, 1928, to Sept. 20, 1950, water-stage recorder at site 400 ft upstream at present datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated by a reservoir and hydroelectric generating facility 0.5 mi upstream from station. Maximum discharge, 50,000 ft<sup>3</sup>/s, from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow and velocity-area study. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,480 ft<sup>3</sup>/s, Mar. 29, gage height, 21.37 ft; minimum daily, 90 ft<sup>3</sup>/s, Oct. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	112	287	325	189	779	686	1610	432	236	304	376	147
2	132	211	418	525	671	2340	1170	359	230	335	358	231
3	132	172	329	610	487	6560	966	349	207	263	345	224
4	91	131	356	956	538	6500	915	558	207	263	368	211
5	100	244	1400	1450	409	2990	860	712	208	983	254	156
6	122	234	2770	1130	576	1330	729	518	209	518	222	121
7	105	156	1550	635	450	969	804	464	232	222	219	140
8	94	193	664	821	453	863	719	445	295	291	164	197
9	91	219	533	1280	459	874	622	452	159	114	159	120
10	93	132	507	860	515	1120	594	379	266	217	217	118
11	116	192	332	638	729	2410	601	340	283	182	206	119
12	133	193	332	689	1120	1710	595	361	288	179	159	119
13	158	172	291	1460	1380	1120	624	317	270	178	123	118
14	92	207	332	1360	1460	811	627	289	235	177	123	118
15	152	125	477	949	1560	809	560	322	193	179	189	129
16	134	185	1090	509	1410	725	603	483	213	178	195	134
17	149	187	1140	278	1210	596	541	434	339	178	351	119
18	90	180	646	570	1050	645	642	352	286	163	456	121
19	178	172	590	716	765	425	504	365	195	127	324	120
20	112	172	549	365	732	504	493	281	201	243	300	120
21	174	215	1450	399	673	549	430	316	180	195	308	120
22	168	121	1760	503	713	891	445	285	183	225	229	120
23	175	182	1220	374	818	906	424	292	190	212	234	120
24	152	180	585	573	2900	655	437	275	215	244	212	120
25	112	98	716	498	3130	632	407	241	252	223	210	120
26	117	184	424	505	1710	610	397	267	189	180	142	268
27	161	380	466	542	1090	971	375	295	187	166	121	324
28	161	4060	422	716	807	3540	379	291	206	281	212	285
29	159	3050	385	1710	---	7820	397	255	370	538	207	183
30	211	1190	492	1620	---	7410	467	236	322	701	150	180
31	224	---	355	1070	---	4070	---	236	---	425	122	---
TOTAL	4200	13424	22906	24500	28594	62041	18937	11201	7046	8684	7255	4722
MEAN	135	447	739	790	1021	2001	631	361	235	280	234	157
MAX	224	4060	2770	1710	3130	7820	1610	712	370	983	456	324
MIN	90	98	291	189	409	425	375	236	159	114	121	118
CFSM	.25	.82	1.35	1.44	1.87	3.66	1.15	.66	.43	.51	.43	.29
IN.	.29	.91	1.56	1.67	1.94	4.22	1.29	.76	.48	.59	.49	.32



## ROANOKE RIVER BASIN

483

02077000 BANISTER RIVER AT HALIFAX, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1905 - 1906, 1929 - 1994 BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	355	398	506	675	759	847	737	484	375	300	332	349
MAX	1691	1431	1211	2125	1857	2738	2121	1374	1588	1065	2898	3717
(WY)	1938	1973	1949	1937	1979	1975	1983	1978	1972	1938	1940	1944
MIN	34.9	86.1	163	170	185	270	196	178	94.0	80.1	48.8	29.4
(WY)	1931	1932	1966	1981	1934	1981	1967	1981	1970	1986	1977	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

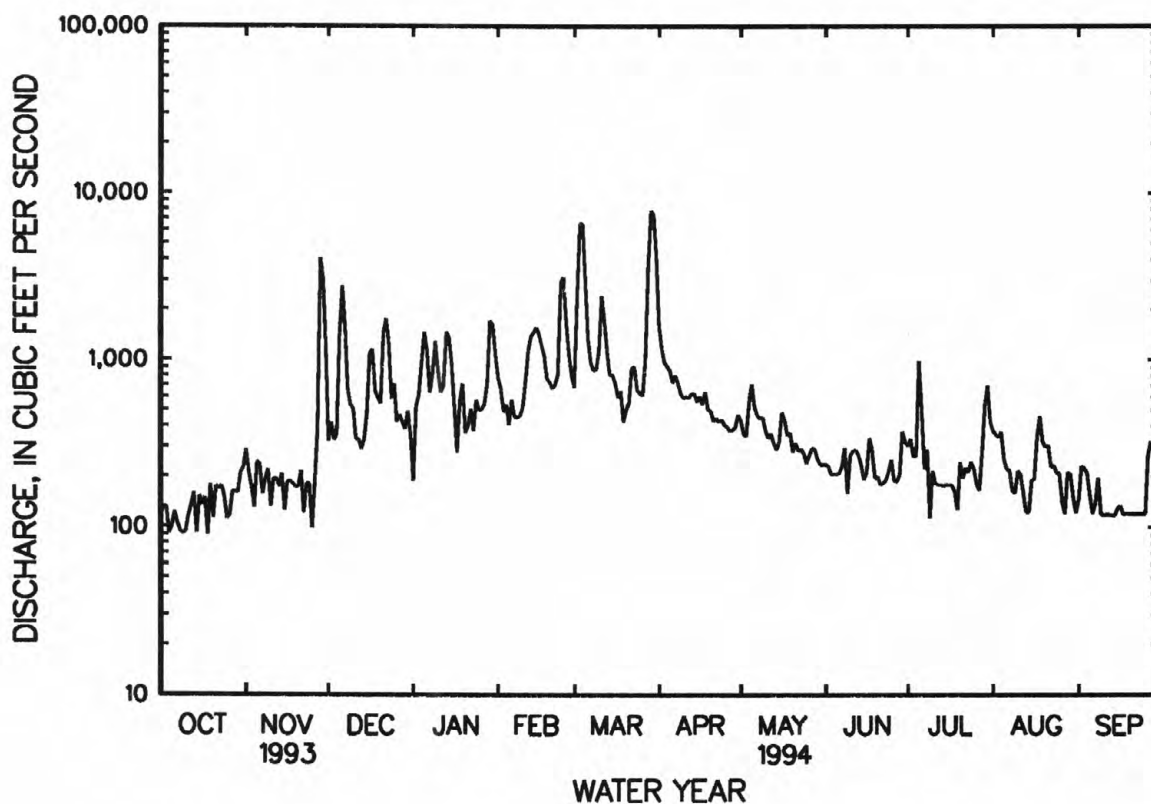
WATER YEARS 1905 - 1906,  
1929 - 1994

ANNUAL TOTAL	256738	213510	
ANNUAL MEAN	703	585	509
HIGHEST ANNUAL MEAN			814
LOWEST ANNUAL MEAN			225
HIGHEST DAILY MEAN	10400	Mar 5	7820
LOWEST DAILY MEAN	90	Oct 18	90
ANNUAL SEVEN-DAY MINIMUM	96	Aug 29	99
INSTANTANEOUS PEAK FLOW			8480
INSTANTANEOUS PEAK STAGE			21.37
INSTANTANEOUS LOW FLOW			89
ANNUAL RUNOFF (CFSM)	1.29		1.07
ANNUAL RUNOFF (INCHES)	17.46		14.52
10 PERCENT EXCEEDS	1560		1150
50 PERCENT EXCEEDS	358		324
90 PERCENT EXCEEDS	110		123

a From floodmarks.

b Also Oct. 21-29 and Nov. 4, 1993.

c Many days in August and September 1932.



## ROANOKE RIVER BASIN

02077500 HYCO RIVER NEAR DENNISTON, VA

LOCATION.--Lat 36°35'16", long 78°53'56", Halifax County, Hydrologic Unit 03010104, on left bank 60 ft upstream from bridge on U.S. Highway 501, 0.8 mi upstream from Mayo Creek, 2.5 mi northeast of Denniston, and 7.3 mi south of South Boston.

DRAINAGE AREA.--289 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to September 1934, October 1950 to current year. Monthly discharge only for some periods, published in WSP 1303.

REVISED RECORDS.--WSP 1383: Drainage area, 1930. WSP 1503: 1930(M). WSP 1723: 1930(m). WDR VA-75-1: 1974.

GAGE.--Water-stage recorder. Datum of gage is 315.24 ft above sea level. July 10, 1929, to Mar. 14, 1934, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of no gage-height record, Nov. 21-29, and periods with ice effect, Dec. 29, 30, and Jan. 17-23, which are poor. Small diurnal fluctuation at low flow in some years caused by mill upstream from station. Since September 1964, flow regulated by Hyco Lake 15.7 mi upstream, capacity 75,480 acre-ft, and since Apr. 26, 1974, by Roxboro Steam-Electric Generating Plant afterbay Reservoir, capacity 12,000 acre-ft. Maximum discharge, 10,800 ft<sup>3</sup>/s, from rating curve extended above 8,200 ft<sup>3</sup>/s. Minimum gage height, 3.58 ft, Sept. 14, 1932. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in August 1928 and September 1945 reached stages of 26.4 ft and 25.6 ft, respectively, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,090 ft<sup>3</sup>/s, Mar. 4, gage height, 18.94 ft; minimum, 17 ft<sup>3</sup>/s, Nov. 15-16; minimum gage height, 4.47 ft, July 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	22	50	50	660	928	1320	186	43	34	727	29
2	24	19	40	136	591	1770	343	71	42	30	615	47
3	22	18	34	117	567	3610	327	63	39	24	80	30
4	21	18	31	296	499	4670	353	89	39	37	57	23
5	22	20	477	347	159	2760	326	86	38	36	49	23
6	22	23	305	427	152	2100	308	80	38	26	81	21
7	22	33	90	471	144	874	297	71	42	24	98	22
8	22	21	67	439	141	264	256	65	34	23	91	21
9	22	18	56	420	145	237	226	61	31	23	79	21
10	21	19	51	383	185	291	212	60	31	22	68	20
11	20	18	51	331	322	329	203	58	39	22	56	20
12	21	18	46	375	815	249	198	56	35	22	46	19
13	22	18	41	426	1310	228	229	53	31	23	40	20
14	21	18	42	390	1510	216	273	51	30	22	35	20
15	20	17	66	458	1480	208	219	50	29	22	55	20
16	20	18	224	425	1370	199	1080	49	28	21	146	20
17	20	19	100	e310	1250	191	2150	50	180	21	470	19
18	19	19	70	e380	1120	187	2460	49	82	37	445	19
19	19	19	74	e330	282	184	793	50	48	27	182	19
20	21	19	66	e320	184	178	256	51	37	23	201	20
21	23	e18	437	e315	169	178	226	50	32	23	166	20
22	23	e18	173	e310	161	191	129	49	29	27	170	20
23	26	e18	97	e250	395	181	112	46	28	45	160	20
24	21	e18	78	153	935	176	138	45	28	31	59	20
25	20	e18	68	148	703	229	226	44	26	26	34	20
26	20	e22	60	147	1150	228	220	47	24	37	32	26
27	22	e20	53	148	1040	410	213	102	23	34	30	32
28	23	e1500	52	459	973	878	213	62	24	35	31	22
29	22	e160	e54	543	---	1640	208	48	25	74	29	21
30	26	76	e52	610	---	3010	211	43	37	109	29	20
31	46	---	50	862	---	2900	---	43	---	662	29	---
TOTAL	699	2262	3155	10776	18412	29694	13725	1928	1192	1622	4390	674
MEAN	22.5	75.4	102	348	658	958	457	62.2	39.7	52.3	142	22.5
MAX	46	1500	477	862	1510	4670	2460	186	180	662	727	47
MIN	19	17	31	50	141	176	112	43	23	21	29	19
CFSM	.08	.26	.35	1.20	2.28	3.31	1.58	.22	.14	.18	.49	.08
IN.	.09	.29	.41	1.39	2.37	3.82	1.77	.25	.15	.21	.57	.09

e Estimated.

## 02077500 HYCO RIVER NEAR DENNISTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1934, 1951 - 1964, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	131	182	268	383	537	532	456	216	134	81.7	133	103
MAX	882	758	847	1113	1363	1000	800	767	360	226	600	890
(WY)	1930	1963	1933	1962	1960	1963	1934	1958	1934	1930	1931	1934
MIN	3.67	8.29	28.6	34.2	59.6	119	106	45.3	33.8	14.5	5.65	.71
(WY)	1934	1954	1934	1934	1934	1930	1963	1964	1963	1932	1953	1954

## SUMMARY STATISTICS

WATER YEARS 1929 - 1934,  
1951 - 1964

ANNUAL MEAN	262
HIGHEST ANNUAL MEAN	390
LOWEST ANNUAL MEAN	160
HIGHEST DAILY MEAN	7490
LOWEST DAILY MEAN	.10
ANNUAL SEVEN-DAY MINIMUM	.10
INSTANTANEOUS PEAK FLOW	7630
INSTANTANEOUS PEAK STAGE	21.88
INSTANTANEOUS LOW FLOW	.004
ANNUAL RUNOFF (CFSM)	b.93
ANNUAL RUNOFF (INCHES)	b12.65
10 PERCENT EXCEEDS	b748
50 PERCENT EXCEEDS	b89
90 PERCENT EXCEEDS	b14

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	103	124	208	471	496	595	371	215	107	132	94.3	122
MAX	805	786	815	1692	1247	1683	1048	1332	647	1492	381	935
(WY)	1972	1973	1973	1978	1979	1993	1983	1978	1982	1975	1982	1974
MIN	11.7	14.8	21.1	28.5	62.1	44.6	38.7	26.2	17.2	15.8	13.1	11.8
(WY)	1969	1968	1966	1966	1991	1981	1981	1986	1986	1966	1977	1967

## SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

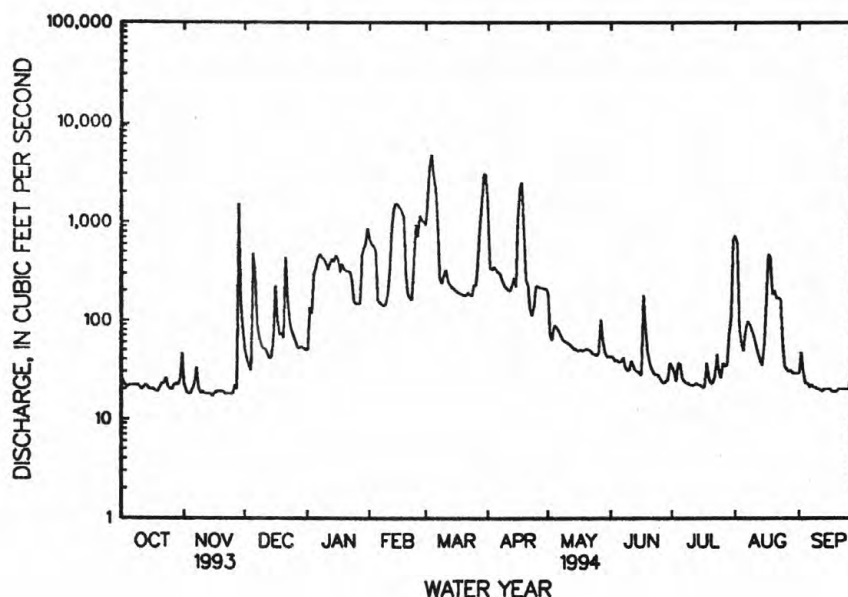
WATER YEARS 1965 - 1994

ANNUAL TOTAL	135583	88529	
ANNUAL MEAN	371	243	252
HIGHEST ANNUAL MEAN			536
LOWEST ANNUAL MEAN			37.1
HIGHEST DAILY MEAN	6390	Mar 5	4670
LOWEST DAILY MEAN	17	Nov 15	17
ANNUAL SEVEN-DAY MINIMUM	18	Nov 9	18
INSTANTANEOUS PEAK FLOW			5090
INSTANTANEOUS PEAK STAGE			18.94
INSTANTANEOUS LOW FLOW			17
ANNUAL RUNOFF (CFSM)	1.29		.84
ANNUAL RUNOFF (INCHES)	17.45		11.40
10 PERCENT EXCEEDS	1130		577
50 PERCENT EXCEEDS	52		52
90 PERCENT EXCEEDS	21		20

a Also Aug. 30 to Sept. 25, 1932.

b For water years 1951 to 1964 only.

c Also Nov. 16, 1993.



## ROANOKE RIVER BASIN

02079490 JOHN H. KERR RESERVOIR NEAR BOYDTON, VA

LOCATION.--Lat 36°35'56", long 78°18'06", Mecklenburg County, Hydrologic Unit 03010102, at John H. Kerr Dam on Roanoke River, 2.7 mi upstream from Allen Creek, 6.7 mi southeast of Boydton, 18 mi upstream from the Virginia-North Carolina State line, and at mile 178.7.

DRAINAGE AREA.--7,780 mi<sup>2</sup>, approximately.

PERIOD OF RECORD.--July 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level.

REMARKS.--Reservoir is formed by concrete dam with earth embankments. Spillway, with crest at elevation 288.0 ft, is equipped with 22 radial gates 32 ft high by 42 ft wide. Storage began in September 1950 during construction; initial filling started June 30, 1952; water in reservoir first reached rule-curve elevation in March 1953. Total capacity at top of gates, elevation, 320 ft, is 2,770,000 acre-ft of which 1,281,400 acre-ft is controlled flood storage between elevations 300 ft, top of power pool, and 320 ft; 316,900 acre-ft is available for power between elevations 293.0 ft, bottom of power pool, and 300 ft; 1,171,700 acre-ft is inactive and dead storage below elevation 293.0 ft. Figures given herein represent total contents. Reservoir is used for flood control, hydroelectric power, low-water regulation for navigation and pollution abatement, release of water for downstream fish spawning, water supply, and recreation.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

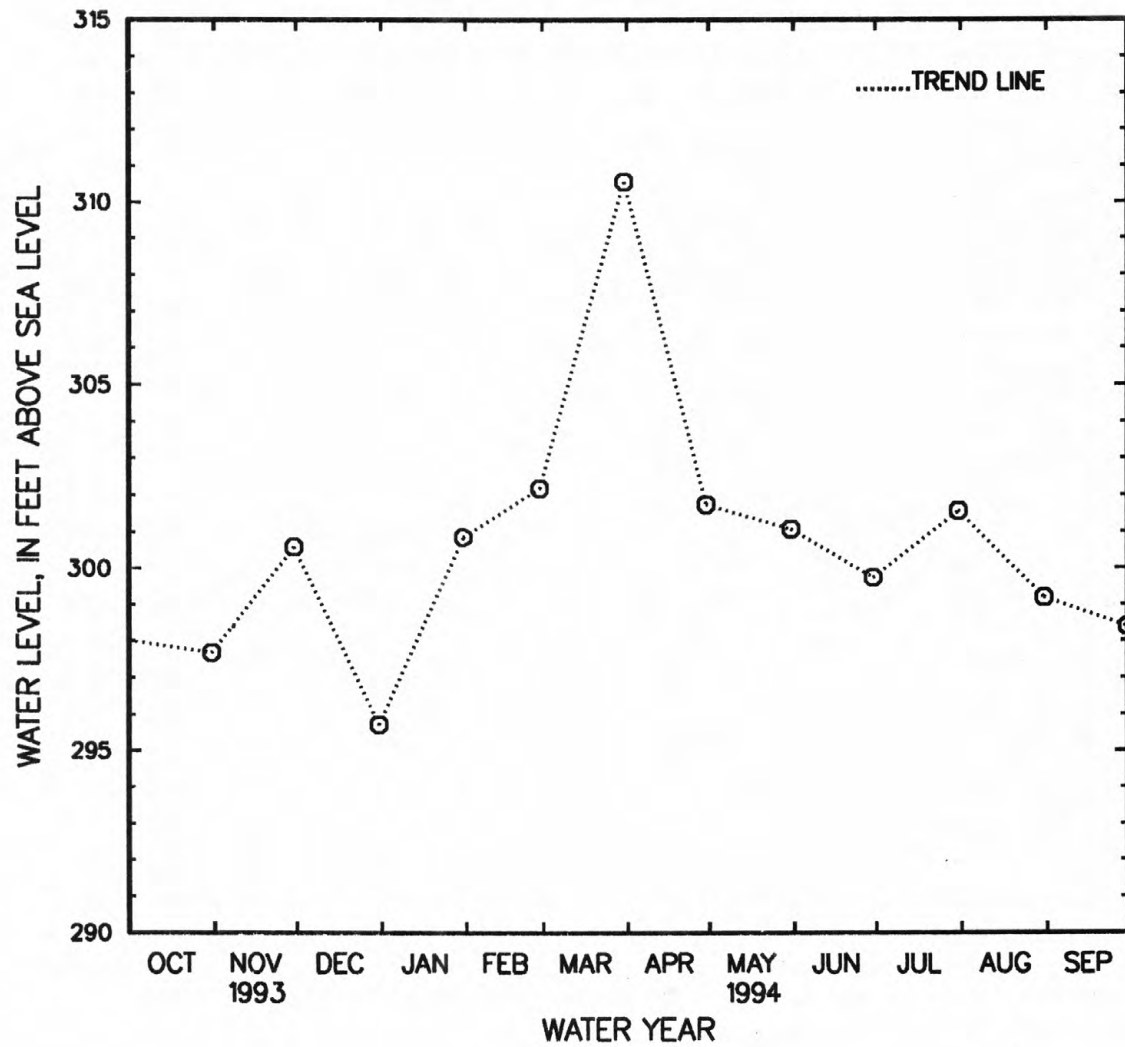
EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,736,460 acre-ft, Apr. 29, 1987, elevation, 319.61 ft; minimum (after first filling to rule curve), 724,700 acre-ft, Feb. 3, 1956, elevation, 280.23 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,183,910 acre-ft, Apr. 3, elevation, 312.21 ft; minimum, 1,287,580 acre-ft, Dec. 31, elevation, 295.72 ft.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	298.02	1,392,660	-
Oct. 31.....	297.68	1,376,790	-15,870
Nov. 30.....	300.58	1,517,890	+141,100
Dec. 31.....	295.72	1,287,580	-230,310
CAL YR 1993.....	-	-	-107,470
Jan. 31.....	300.85	1,531,520	+243,940
Feb. 28.....	302.18	1,600,200	+68,680
Mar. 31.....	310.56	2,079,420	+479,220
Apr. 30.....	301.74	1,577,280	-502,140
May 31.....	301.07	1,542,710	-34,570
June 30.....	299.74	1,475,830	-66,880
July 31.....	301.56	1,568,000	+92,170
Aug. 31.....	299.19	1,448,830	-119,170
Sept. 30.....	298.39	1,410,340	-38,490
WTR YR 1994.....	-	-	+17,680

02079490 JOHN H. KERR RESERVOIR NEAR BOYDTON, VA--Continued





## ROANOKE RIVER BASIN

02079640 ALLEN CREEK NEAR BOYDTON, VA

LOCATION.--Lat 36°40'46", long 78°19'37", Mecklenburg County, Hydrologic Unit 03010106, on left bank at upstream side of bridge on U.S. Highway 58, 0.8 mi upstream from Coleman Creek, 2.3 mi downstream from Layton Creek, 3.7 mi east of Boydton, and 11.8 mi southwest of South Hill.

DRAINAGE AREA.--53.4 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WSP 2104: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 216.50 ft above sea level (levels by Virginia Department of Transportation).

REMARKS.--Records good except those for periods with ice effect, Dec. 30, 31, and Jan. 16, 22, and period of no gage-height record, Jan. 19-22, which are fair. Maximum discharge, 5,620 ft<sup>3</sup>/s, from rating curve extended above 3,100 ft<sup>3</sup>/s. No flow many days in August, September, and October 1968, September and October 1970. Several measurements of water temperature were made during the year.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 28	0930	1,450	14.57	Mar. 27	1900	900	11.61
Mar. 2	2000	*2,900	*18.19	Mar. 29	1230	1,230	13.44

Minimum discharge, 0.80 ft<sup>3</sup>/s, Oct. 6-9, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.90	2.3	19	16	37	43	88	25	6.8	15	10	4.6
2	.90	1.7	16	148	31	1600	58	21	6.5	6.3	8.5	13
3	.88	1.6	15	101	27	941	46	18	6.1	4.8	7.7	6.4
4	.85	1.5	13	154	25	166	40	32	5.8	12	6.8	5.1
5	.85	1.6	180	93	25	99	35	36	6.3	5.7	6.3	4.6
6	.83	2.1	108	43	38	69	36	27	6.2	4.5	5.9	6.5
7	.80	2.6	35	33	31	55	38	23	6.0	4.0	5.5	77
8	.81	2.4	21	34	26	48	30	21	5.7	3.8	5.2	5.3
9	.83	2.1	17	35	38	44	27	19	5.6	3.6	5.0	2.6
10	.85	1.8	14	25	104	83	26	18	5.9	3.4	4.9	2.0
11	.83	1.7	18	23	163	132	24	17	7.1	3.6	4.7	1.7
12	.94	1.6	18	96	388	66	23	16	6.9	3.6	4.6	1.5
13	1.1	1.6	14	121	206	51	76	15	6.2	3.6	4.6	1.4
14	1.1	1.7	13	55	249	46	93	14	5.6	3.6	4.6	1.3
15	1.0	1.7	47	35	192	42	41	14	5.1	3.4	8.4	1.3
16	1.0	1.6	231	e28	144	38	175	18	5.0	3.2	6.2	1.3
17	1.0	1.7	68	23	100	34	84	17	5.5	3.1	14	1.2
18	1.0	1.6	43	205	70	31	49	14	5.5	3.3	13	1.2
19	1.0	1.6	48	e85	53	31	40	15	4.9	3.5	7.4	1.2
20	1.1	1.7	42	e45	44	28	34	15	4.6	89	6.1	1.1
21	.99	1.7	383	e26	38	28	30	14	4.4	21	5.7	1.1
22	1.0	1.7	92	e24	34	81	28	14	4.2	13	5.6	2.0
23	1.1	1.6	46	26	100	55	27	13	4.2	32	5.4	3.8
24	1.1	1.6	38	26	504	39	26	12	4.7	11	5.1	2.5
25	1.1	1.6	30	25	145	81	24	12	4.5	7.1	4.7	1.9
26	1.1	1.6	24	24	86	88	23	18	4.1	6.8	4.6	1.7
27	1.3	53	20	25	57	287	21	40	3.9	27	4.6	1.6
28	1.5	768	18	248	44	373	21	12	4.3	13	4.5	1.4
29	1.4	57	20	186	---	706	23	8.4	4.3	61	4.5	1.4
30	2.2	26	e16	76	---	173	37	7.5	4.5	47	4.3	1.3
31	3.7	---	e15	48	---	90	---	7.0	---	15	4.3	---
TOTAL	35.06	950.0	1682	2132	2999	5648	1323	552.9	160.4	436.9	192.7	159.0
MEAN	1.13	31.7	54.3	68.8	107	182	44.1	17.8	5.35	14.1	6.22	5.30
MAX	3.7	768	383	248	504	1600	175	40	7.1	89	14	77
MIN	.80	1.5	13	16	25	28	21	7.0	3.9	3.1	4.3	1.1
CFSM	.02	.59	1.02	1.29	2.01	3.41	.83	.33	.10	.26	.12	.10
IN.	.02	.66	1.17	1.49	2.09	3.93	.92	.39	.11	.30	.13	.11

e Estimated.

## ROANOKE RIVER BASIN

489

02079640 ALLEN CREEK NEAR BOYDTON, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	25.6	32.8	43.7	78.6	85.4	101	71.5	36.6	25.7	18.5	12.5	15.8
MAX	201	151	107	239	214	289	404	132	125	174	61.9	188
(WY)	1972	1986	1984	1978	1979	1975	1987	1971	1982	1975	1989	1979
MIN	.20	1.61	2.36	7.42	19.4	15.3	10.9	10.3	4.91	1.88	1.16	.022
(WY)	1971	1966	1966	1981	1968	1981	1966	1986	1986	1966	1970	1970

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

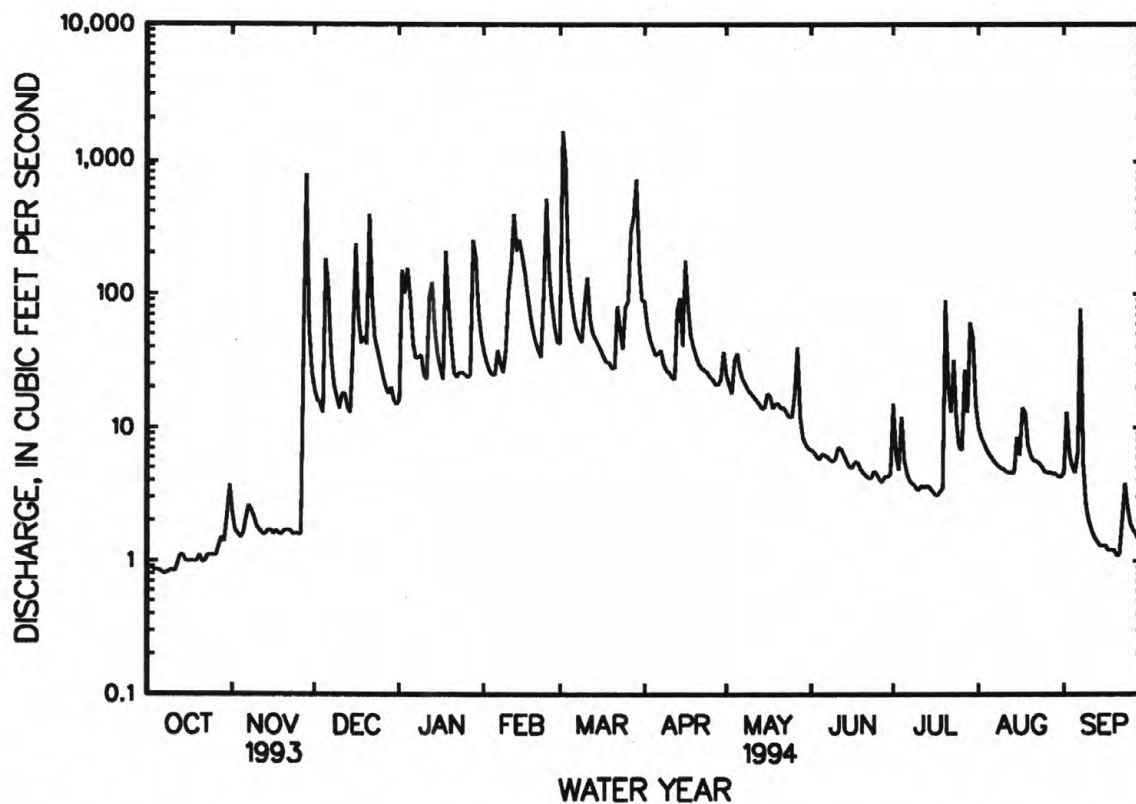
## WATER YEARS 1962 - 1994

ANNUAL TOTAL	20412.38	16270.96	
ANNUAL MEAN	55.9	44.6	45.4
HIGHEST ANNUAL MEAN			80.8
LOWEST ANNUAL MEAN			15.0
HIGHEST DAILY MEAN	2600	1600	3700
LOWEST DAILY MEAN	.80	.80	.00
ANNUAL SEVEN-DAY MINIMUM	.83	.83	.00
INSTANTANEOUS PEAK FLOW		2900	5620
INSTANTANEOUS PEAK STAGE		18.19	21.80
INSTANTANEOUS LOW FLOW		.80	.00
ANNUAL RUNOFF (CFSM)	1.05	.83	.85
ANNUAL RUNOFF (INCHES)	14.22	11.33	11.55
10 PERCENT EXCEEDS	102	92	83
50 PERCENT EXCEEDS	19	14	15
90 PERCENT EXCEEDS	1.0	1.4	2.1

a No flow many days in August, September, and October 1968, September and October 1970.

b Also Oct. 7-9, 11, 1993.

e Estimated.



## OHIO RIVER BASIN

## KANAWHA RIVER BASIN

03161000 SOUTH FORK NEW RIVER NEAR JEFFERSON, NC

LOCATION.--Lat 36°23'35", long 81°24'26", Ashe County, Hydrologic Unit 05050001, on right bank 600 ft upstream from bridge on State Highways 16 and 88, 0.2 mi downstream from Bear Creek, and 4 mi southeast of Jefferson.

DRAINAGE AREA.--205 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1924 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 1275: 1925-26(M), 1928-30(M), 1931-32, 1933-35(M), 1941-42(m), 1944(m). WDR NC-81-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,657.04 ft above sea level. Prior to Oct. 14, 1934, nonrecording gage on bridge 400 ft downstream at same datum. Oct. 14, 1934, to Mar. 25, 1935, nonrecording gage at present site and datum. U.S. Army Corps of Engineers has satellite telemetry at station.

REMARKS.--Records fair except those during period of ice effect, Dec. 12 to Feb. 23, which are poor. Maximum discharge, 52,800 ft<sup>3</sup>/s, from rating curve extended above 5,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 51 ft<sup>3</sup>/s, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 15, 1916, reached a stage of 18.0 ft, from floodmarks witnessed by local resident, discharge, 35,200 ft<sup>3</sup>/s.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	145	206	213	e320	e440	510	867	451	280	349	442	442
2	145	170	194	e330	e390	1030	732	429	272	295	549	532
3	146	159	183	e350	e340	1170	662	421	261	267	964	709
4	141	157	294	e370	e320	774	620	634	260	255	529	522
5	140	209	1990	e350	e330	674	580	543	260	275	433	459
6	138	276	844	e330	e300	604	614	465	266	274	398	442
7	139	214	481	e370	e280	557	636	435	361	239	361	430
8	139	173	370	e540	e270	530	548	433	340	227	340	400
9	138	161	310	e400	e280	514	518	419	349	236	322	382
10	140	155	299	e370	e360	534	514	391	312	278	355	367
11	139	150	349	e330	e560	503	753	378	348	294	463	354
12	153	145	e290	e1200	e540	454	730	368	305	302	500	344
13	160	142	e280	e560	e545	439	1430	360	304	277	364	333
14	149	141	e270	e360	e560	435	1400	352	297	510	324	324
15	141	143	e290	e310	e520	428	918	365	266	368	333	317
16	137	142	e260	e250	e480	408	908	367	289	284	775	314
17	141	144	e250	e230	e420	391	773	347	319	294	10500	318
18	144	161	e240	e220	e380	389	675	325	304	402	5990	353
19	146	160	e245	e200	e370	400	628	317	255	345	1530	339
20	141	149	e245	e180	e360	370	587	316	241	389	1060	306
21	139	140	e310	e175	e350	370	554	315	236	298	923	294
22	139	137	e260	e190	e330	408	536	313	411	299	803	289
23	143	136	e255	e200	e2500	390	525	300	314	307	676	289
24	137	135	e250	e205	1540	356	497	290	261	292	612	290
25	133	133	e240	e210	895	374	479	359	308	273	571	307
26	133	133	e240	e260	694	373	465	386	282	337	535	347
27	134	657	e250	e530	589	543	482	425	350	476	508	345
28	134	778	e260	e1300	530	3700	502	353	430	1220	495	279
29	128	342	e340	e720	---	1950	455	308	329	1050	465	261
30	165	248	e310	e640	---	1240	531	294	373	656	446	253
31	226	---	e300	e540	---	986	---	284	---	513	431	---
TOTAL	4473	6196	10912	12540	15473	21804	20119	11743	9183	11881	32997	10941
MEAN	144	207	352	405	553	703	671	379	306	383	1064	365
MAX	226	778	1990	1300	2500	3700	1430	634	430	1220	10500	709
MIN	128	133	183	175	270	356	455	284	236	227	322	253
CFSM	.70	1.01	1.72	1.97	2.70	3.43	3.27	1.85	1.49	1.87	5.19	1.78
IN.	.81	1.12	1.98	2.28	2.81	3.96	3.65	2.13	1.67	2.16	5.99	1.99

e Estimated.

## KANAWHA RIVER BASIN

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03161000 SOUTH FORK NEW RIVER NEAR JEFFERSON, NC--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	373	410	411	463	520	599	571	467	394	340	364	335
MAX	901	1889	797	966	973	1316	1350	1052	1036	904	2613	1212
(WY)	1991	1978	1958	1946	1983	1979	1983	1973	1992	1941	1940	1979
MIN	117	124	146	140	197	308	275	220	163	111	93.7	99.5
(WY)	1955	1932	1934	1940	1934	1925	1925	1941	1956	1930	1925	1954

## SUMMARY STATISTICS

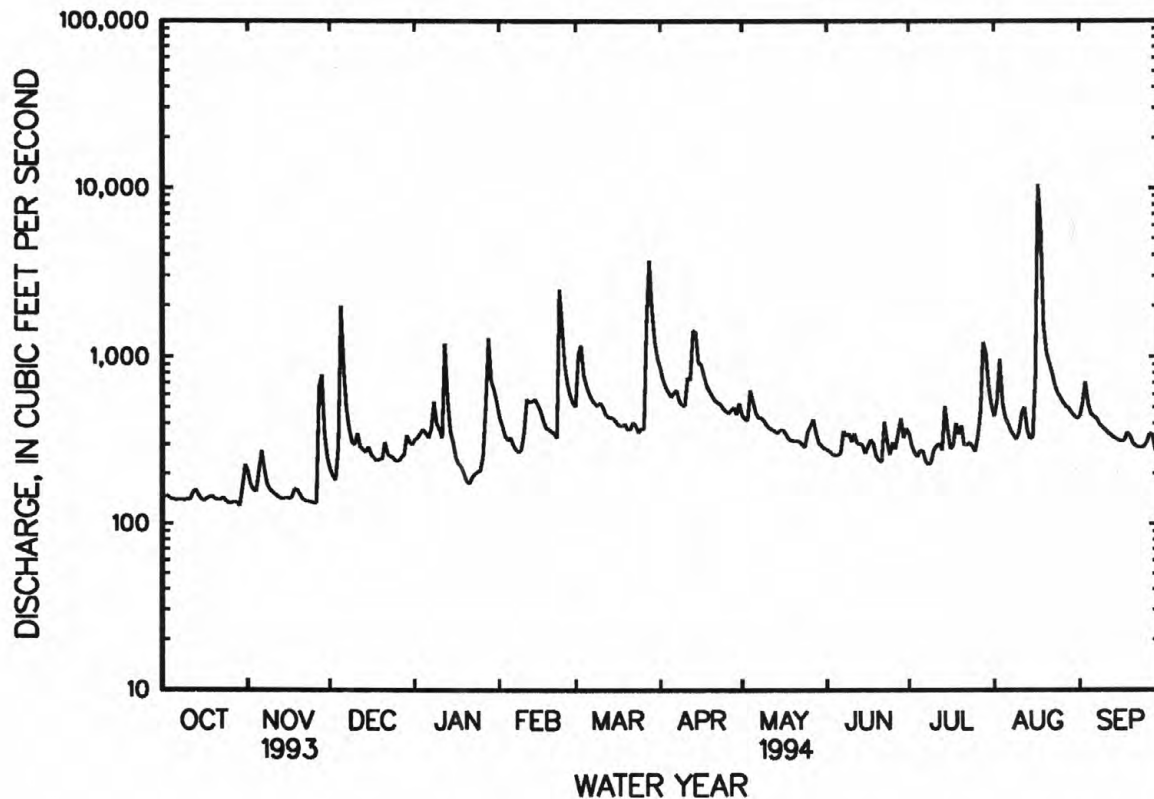
## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1925 - 1994

ANNUAL TOTAL	166660			168262								
ANNUAL MEAN	457			461						437		
HIGHEST ANNUAL MEAN										669		1949
LOWEST ANNUAL MEAN										247		1956
HIGHEST DAILY MEAN	5300	Mar 24		10500	Aug 17				27700		Sep 22	1979
LOWEST DAILY MEAN	128	Oct 29		128	Oct 29				65		Aug 24	1981
ANNUAL SEVEN-DAY MINIMUM	135	Oct 23		135	Oct 23				72		Aug 24	1981
INSTANTANEOUS PEAK FLOW				15600	Aug 17				a52800		Aug 17	1985
INSTANTANEOUS PEAK STAGE				11.85	Aug 17				22.50		Aug 17	1985
INSTANTANEOUS LOW FLOW				e100	Oct 29				a52.1		Sep 8	1932
ANNUAL RUNOFF (CFSM)	2.23			2.25					2.13			
ANNUAL RUNOFF (INCHES)	30.24			30.53					28.94			
10 PERCENT EXCEEDS	851			700					719			
50 PERCENT EXCEEDS	342			345					352			
90 PERCENT EXCEEDS	145			146					174			

a See REMARKS.  
e Estimated.



## KANAWHA RIVER BASIN

03164000 NEW RIVER NEAR GALAX, VA

LOCATION.--Lat 36°38'50", long 80°58'45", Grayson County, Hydrologic Unit 05050001, on left bank at upstream side of bridge on State Highway 94, 500 ft downstream from Meadow Creek, 1.2 mi southwest of Old Town, 3.1 mi southwest of Galax, and 3.6 mi downstream from Elk Creek.

DRAINAGE AREA.--1,131 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1929 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 758: Drainage area, 1933(M). WSP 893: 1930(M), 1935(M).

GAGE.--Water-stage recorder. Datum of gage is 2,208.04 ft above sea level.

REMARKS.--Records good except for period with ice effect, Jan. 16-28, which is fair. Appalachian Power Company gage-height transmitter at station, recorder at Roanoke. National Weather Service gage-height telemeter at station. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Maximum discharge, 141,000 ft<sup>3</sup>/s, from rating curve extended above 32,000 ft<sup>3</sup>/s on basis of computation of peak flow over dam at Fries 6 mi downstream and slope-area measurement of peak flow. Minimum discharge, 193 ft<sup>3</sup>/s, Jan. 9, 1956, gage height, 0.52 ft, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 9,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	2130	10,600	4.32	Mar. 28	1815	18,400	6.07
Feb. 12	0630	10,200	4.23	Aug. 17	1830	*48,500	*11.83

Minimum discharge, 604 ft<sup>3</sup>/s, Oct. 29, gage height, 0.90 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	722	923	1090	1820	2480	2630	5180	2630	1350	1520	1670	1750
2	697	835	959	1570	2030	5130	4200	2310	1300	1360	1710	1750
3	692	770	894	1430	1720	7380	3600	2110	1240	1180	2730	2110
4	678	736	1100	1820	1660	5170	3220	2990	1210	1210	2670	2120
5	665	801	8480	1690	1570	4400	2930	3400	1210	1200	1860	1780
6	654	1070	7790	1440	1770	3760	2840	2840	1180	1070	1740	1650
7	650	1080	3670	1440	1660	3260	3040	2630	1380	1060	1520	1620
8	654	908	2350	2240	1500	2940	2860	2710	1740	1060	1370	1560
9	652	812	1800	2650	2350	2800	2560	2740	1940	1050	1710	1460
10	664	766	1560	2110	6680	2820	2490	2460	1710	1040	1380	1390
11	670	731	1600	1790	7000	2650	3440	2250	1540	1020	1420	1340
12	727	706	1500	4020	9390	2350	3780	2100	1510	1080	1480	1290
13	726	695	1220	5950	7430	2180	5000	1990	1420	1400	1810	1230
14	721	684	1270	4200	5970	2120	6840	1900	1350	1190	1480	1190
15	688	685	1300	2920	4680	2070	4920	1860	1450	1300	1280	1160
16	666	677	1320	e1800	3750	1930	4550	1870	1340	1180	1550	1150
17	655	681	1230	e1700	3160	1780	4180	1780	1300	991	27600	1150
18	664	729	1140	e3200	2820	1730	3490	1670	1710	1550	23700	1230
19	667	777	1090	e2500	2570	1740	3100	1600	1350	1390	7770	1280
20	673	730	1050	e2200	2420	1640	2830	1580	1210	1210	5080	1170
21	661	690	1110	e2000	2330	1590	2600	1570	1160	1350	4120	1080
22	650	671	988	e1900	2210	1670	2440	1540	1340	1760	3570	1050
23	649	649	1040	e1800	3890	1630	2350	1490	1280	1700	2890	1030
24	645	644	974	e1800	8150	1540	2210	1440	1390	1800	2440	1020
25	634	640	937	e1900	6200	1580	2080	1400	1220	1320	2190	1080
26	630	634	853	e2000	4590	1580	2010	1470	1130	1090	2020	1290
27	627	1580	945	e2200	3550	2380	2040	2300	1720	1410	1980	1230
28	624	4140	1190	e3500	2950	14500	2150	2020	2430	3050	2130	1140
29	610	2230	1850	5660	---	13300	2040	1670	1840	3500	1840	1020
30	693	1380	2830	4070	---	8620	2690	1480	1560	2710	1940	978
31	879	---	2250	3070	---	6130	---	1400	---	2140	1840	---
TOTAL	20887	29054	57380	78390	106480	115000	97660	63200	43510	45891	118490	40298
MEAN	674	968	1851	2529	3803	3710	3255	2039	1450	1480	3822	1343
MAX	879	4140	8480	5950	9390	14500	6840	3400	2430	3500	27600	2120
MIN	610	634	853	1430	1500	1540	2010	1400	1130	991	1280	978
CFSM	.60	.86	1.64	2.24	3.36	3.28	2.88	1.80	1.28	1.31	3.38	1.19
IN.	.69	.96	1.89	2.58	3.50	3.78	3.21	2.08	1.43	1.51	3.90	1.33

e Estimated.



## KANAWHA RIVER BASIN

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03164000 NEW RIVER NEAR GALAX, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1994, BY WATER YEAR (WY)

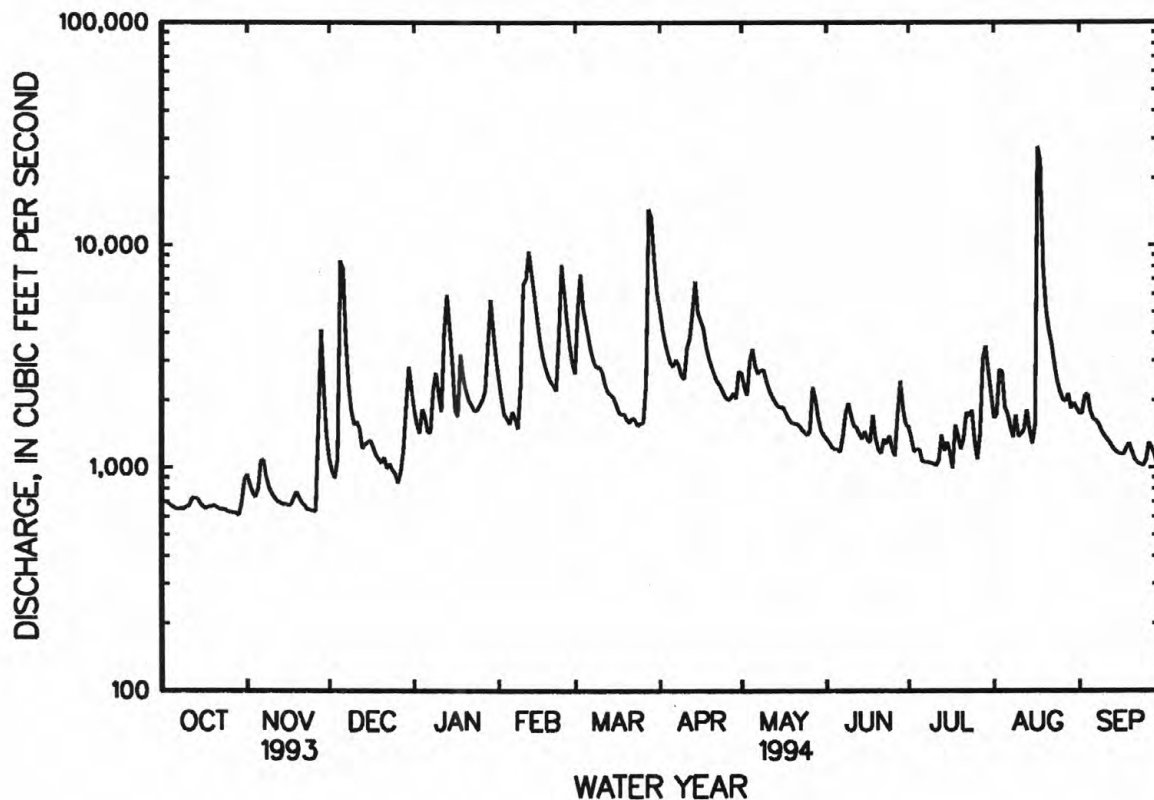
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	1413	1654	1840	2153	2569	2905	2661	2128	1672	1389	1385	1260
MAX	3625	7189	4005	4933	4714	5827	6345	4469	5280	4017	8148	4827
(WY)	1977	1978	1962	1937	1957	1993	1987	1973	1992	1949	1940	1989
MIN	435	504	592	568	630	958	1017	811	614	426	453	381
(WY)	1954	1954	1956	1956	1934	1988	1942	1941	1988	1930	1988	1954

## SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1930 - 1994	
ANNUAL TOTAL	798488		816240		1915	
ANNUAL MEAN	2188		2236		1034	
HIGHEST ANNUAL MEAN					2807	
LOWEST ANNUAL MEAN					1034	
HIGHEST DAILY MEAN	25000		27600		86200	
LOWEST DAILY MEAN	610		610		265	
ANNUAL SEVEN-DAY MINIMUM	631		631		304	
INSTANTANEOUS PEAK FLOW			48500		141000	
INSTANTANEOUS PEAK STAGE			11.83		a25.7	
INSTANTANEOUS LOW FLOW			604		b193	
ANNUAL RUNOFF (CFSM)	1.93		1.98		1.70	
ANNUAL RUNOFF (INCHES)	26.26		26.85		22.99	
10 PERCENT EXCEEDS	4250		4040		3440	
50 PERCENT EXCEEDS	1480		1640		1450	
90 PERCENT EXCEEDS	687		696		666	

a From floodmark.

b Result of freezeup.



## KANAWHA RIVER BASIN

03165000 CHESTNUT CREEK AT GALAX, VA

LOCATION.--Lat 36°38'45", long 80°55'10", Galax City, Hydrologic Unit 05050001, on right bank 200 ft upstream from bridge on State Highway 89 and 1.7 mi downstream from Wards Mill Branch.

DRAINAGE AREA.--39.4 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1944 to current year.

REVISED RECORDS.--WSP 1385: 1953.

GAGE.--Water-stage recorder. Concrete control since Aug. 30, 1979. Datum of gage is 2,344.17 ft above sea level. Prior to June 25, 1948, nonrecording gage, and June 25, 1948, to May 28, 1953, water-stage recorder, at site 200 ft upstream at datum 0.86 ft higher.

REMARKS.--Records good except those for period of no gage-height record, Dec. 19 to Jan. 20, and period with ice effect, Jan. 21-23, which are poor. Maximum discharge, 6,980 ft<sup>3</sup>/s, from rating curve extended above 2,200 ft<sup>3</sup>/s on basis of two slope-area and one contracted-opening measurements at gage heights 9.5 ft, 14.4 ft, and 17.4 ft, respectively, site and datum then in use. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 14, 1940, reached a stage of 17.4 ft, at site and datum used 1944-53, discharge, 11,000 ft<sup>3</sup>/s, by contracted-opening measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 850 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	1830	1,120	3.77	Mar. 28	0615	1,480	4.56
Dec. 5	0130	1,260	4.08	Aug. 17	1130	*4,820	*10.43

Minimum discharge, 23 ft<sup>3</sup>/s, July 10-11, gage height, 1.35 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	41	51	e45	68	89	166	82	42	28	48	56
2	28	36	47	e58	64	496	132	73	40	27	74	56
3	28	35	45	e54	65	247	119	78	39	27	81	55
4	27	34	128	e100	56	168	108	125	39	27	77	52
5	27	50	589	e80	58	136	102	85	40	67	84	51
6	27	48	110	e68	57	112	114	77	41	32	57	50
7	26	43	73	e64	54	101	101	81	41	28	48	47
8	26	37	60	e130	54	94	90	85	44	26	42	46
9	26	36	54	e90	115	95	86	73	44	25	51	44
10	28	35	57	e70	92	127	99	68	44	24	80	43
11	28	35	54	e74	158	95	132	66	43	24	52	43
12	36	34	47	e230	141	86	101	64	40	67	45	41
13	31	34	52	e140	119	84	191	62	38	61	40	41
14	30	34	45	e90	105	81	125	62	36	40	37	40
15	29	34	61	e70	94	77	104	64	34	34	37	40
16	29	34	79	e52	85	74	126	64	34	31	108	40
17	31	35	71	e75	80	71	96	55	33	30	2010	47
18	31	43	58	e130	75	72	88	54	34	32	256	51
19	30	36	e54	e70	73	70	85	53	31	30	125	42
20	30	34	e50	e34	71	68	82	54	30	29	98	40
21	31	33	e54	e45	70	71	79	52	30	79	107	39
22	31	33	e50	e50	67	72	79	49	30	79	86	40
23	30	32	e46	e58	386	66	79	48	29	83	72	39
24	30	31	e44	61	241	65	75	46	32	64	66	39
25	29	31	e42	64	129	92	73	46	30	57	62	64
26	30	31	e42	71	99	72	72	50	28	133	59	64
27	30	499	e45	76	83	243	87	52	72	148	64	45
28	30	203	e56	372	78	946	81	46	37	347	62	41
29	29	75	e58	128	---	378	74	45	36	105	56	39
30	56	58	e46	89	---	200	96	44	31	71	56	38
31	52	---	e38	77	---	205	---	43	---	56	53	---
TOTAL	954	1774	2306	2815	2837	4853	3042	1946	1122	1911	4193	1373
MEAN	30.8	59.1	74.4	90.8	101	157	101	62.8	37.4	61.6	135	45.8
MAX	56	499	589	372	386	946	191	125	72	347	2010	64
MIN	26	31	38	34	54	65	72	43	28	24	37	38
CFSM	.78	1.50	1.89	2.30	2.57	3.97	2.57	1.59	.95	1.56	3.43	1.16
IN.	.90	1.67	2.18	2.66	2.68	4.58	2.87	1.84	1.06	1.80	3.96	1.30

e Estimated.

## KANAWHA RIVER BASIN

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03165000 CHESTNUT CREEK AT GALAX, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	59.9	63.7	65.8	68.0	81.4	94.8	92.7	76.9	67.7	53.3	49.7	54.8
MAX	197	157	112	128	141	301	233	160	172	150	156	254
(WY)	1948	1980	1958	1946	1960	1993	1983	1973	1992	1989	1949	1989
MIN	19.8	27.3	25.8	23.9	35.9	38.1	37.4	34.2	25.5	20.7	15.6	18.6
(WY)	1964	1982	1964	1956	1989	1988	1989	1956	1988	1986	1981	1954

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1945 - 1994

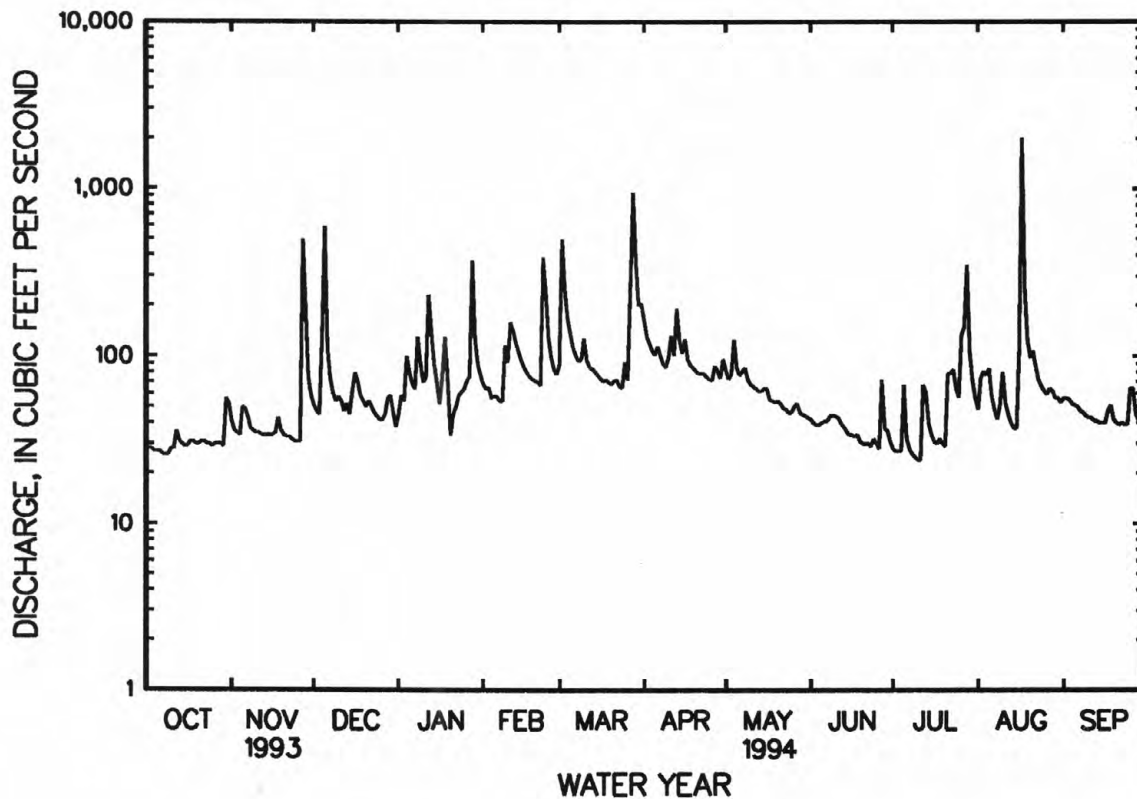
ANNUAL TOTAL	36019		29126									
ANNUAL MEAN	98.7		79.8							69.0		
HIGHEST ANNUAL MEAN										107		1993
LOWEST ANNUAL MEAN										37.3		1981
HIGHEST DAILY MEAN	1140	Mar 23				2010	Aug 17			2050	Apr 21	1992
LOWEST DAILY MEAN	26	<sup>a</sup> Oct 7				24	<sup>b</sup> Jul 10			12	Aug 26	1981
ANNUAL SEVEN-DAY MINIMUM	27	Oct 3				27	Oct 3			13	Aug 23	1981
INSTANTANEOUS PEAK FLOW						4820	Aug 17			6980	Oct 17	1947
INSTANTANEOUS PEAK STAGE						10.43	Aug 17			<sup>c</sup> 14.4	Oct 17	1947
INSTANTANEOUS LOW FLOW						23	<sup>b</sup> Jul 10			12	<sup>d</sup> Aug 25	1981
ANNUAL RUNOFF (CFSM)	2.50					2.03				1.75		
ANNUAL RUNOFF (INCHES)	34.01					27.50				23.78		
10 PERCENT EXCEEDS	193					125				110		
50 PERCENT EXCEEDS	63					56				52		
90 PERCENT EXCEEDS	31					30				28		

a Also Oct. 8, 9, 1993.

b Also July 11, 1994.

c From floodmark, site and datum then in use.

d Also part or all of each day Aug. 26-30, 1981.



## KANAWHA RIVER BASIN

## 03167000 REED CREEK AT GRAHAMS FORGE, VA

LOCATION.--Lat 36°56'22", long 80°53'13", Wythe County, Hydrologic Unit 05050001, on left bank 20 ft downstream from bridge on State Highway 619 at Grahams Forge, 2.2 mi downstream from Glade Creek, and at mile 7.3.

DRAINAGE AREA.--247 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1908 to September 1916, January 1927 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 1235: 1912-13, 1915-16. WSP 1275: 1911, 1927-28(M), 1930-34(M). WSP 1705: 1913(M), 1916(M), 1957 calendar year runoff. WSP 1725: 1915 calendar year runoff. WDR VA-92-1: 1984-86(P), 1987, 1988-89(P), 1990-91.

GAGE.--Water-stage recorder. Datum of gage is 1,924.65 ft above sea level. Prior to Oct. 1, 1916, nonrecording gage at same site at datum 0.68 ft lower. Feb. 3, 1927, to Oct. 28, 1934, and June 11, 1974, to July 22, 1975, nonrecording gage, at present site and datum.

REMARKS.--Records good except those for periods with ice effect, Dec. 27 and Jan. 20-23, and periods above 2,000 ft<sup>3</sup>/s, Feb. 11 and Mar. 28, 29, which are fair. Occasional diurnal fluctuation at low flow caused by mills upstream from station. Maximum discharge, 17,500 ft<sup>3</sup>/s, from rating curve extended above 7,600 ft<sup>3</sup>/s on basis of velocity-area study and slope-area measurement at gage heights 11.4 ft and 10.01 ft, respectively. Minimum discharge observed, about 5 ft<sup>3</sup>/s, Dec. 22, 1909, gage height, 0.49 ft, present datum, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

COOPERATION.--Records were provided by the Virginia Department of Environmental Quality - Water Division.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,300 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 11	2030	2,400	5.49	Mar. 28	1630	*3,000	*6.25

Minimum discharge, 60 ft<sup>3</sup>/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	86	100	112	252	374	506	1100	521	149	130	157	145
2	82	92	102	229	315	1150	915	413	146	123	144	141
3	79	89	96	212	278	1530	762	364	144	120	138	136
4	77	85	227	244	261	1180	661	713	142	120	130	133
5	76	91	1320	224	257	1450	579	744	141	122	128	128
6	74	96	619	200	291	1160	549	540	140	115	126	126
7	75	96	311	229	287	902	562	445	173	132	120	122
8	75	89	223	688	276	756	501	433	205	129	115	118
9	73	86	185	619	857	689	467	404	222	129	108	115
10	83	83	172	383	1720	648	473	364	253	116	106	111
11	78	82	165	314	1950	602	828	328	222	111	103	111
12	84	82	150	970	2160	551	769	296	241	109	101	106
13	81	80	138	1340	1770	513	890	275	201	115	159	103
14	80	80	134	847	1750	489	1110	257	183	117	198	102
15	78	81	156	553	1330	459	811	246	171	111	135	101
16	76	81	211	365	1110	419	710	241	163	106	157	100
17	78	84	206	531	978	386	597	226	151	121	1420	105
18	77	95	183	626	875	370	523	214	143	193	1350	122
19	76	91	168	297	796	363	468	204	137	139	564	110
20	74	87	156	e270	759	338	426	202	133	141	414	103
21	77	84	157	e245	715	329	389	197	130	140	364	100
22	80	81	147	e225	644	362	367	190	131	149	322	98
23	79	79	137	e240	948	368	350	185	132	206	259	98
24	75	79	130	247	1420	357	326	178	139	169	220	96
25	76	78	125	248	1080	357	306	171	157	138	200	100
26	79	78	109	281	827	338	294	177	134	127	185	104
27	78	151	e107	352	655	679	301	193	198	201	176	97
28	78	309	139	584	552	2380	300	179	179	260	171	95
29	80	175	495	751	---	2060	282	167	150	232	168	93
30	86	129	499	576	---	1610	469	161	137	204	158	91
31	101	---	318	453	---	1210	---	156	---	186	152	---
TOTAL	2451	2993	7397	13595	25235	24511	17085	9384	4947	4511	8248	3310
MEAN	79.1	99.8	239	439	901	791	569	303	165	146	266	110
MAX	101	309	1320	1340	2160	2380	1110	744	253	260	1420	145
MIN	73	78	96	200	257	329	282	156	130	106	101	91
CFSM	.32	.40	.97	1.78	3.65	3.20	2.31	1.23	.67	.59	1.08	.45
IN.	.37	.45	1.11	2.05	3.80	3.69	2.57	1.41	.75	.68	1.24	.50

e Estimated.

## KANAWHA RIVER BASIN

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03167000 REED CREEK AT GRAHAMS FORGE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	144	164	246	353	459	514	425	318	209	158	141	118
MAX	626	606	790	911	1411	1406	1374	731	732	867	517	488
(WY)	1938	1930	1973	1936	1957	1955	1987	1958	1992	1916	1916	1989
MIN	45.3	50.7	59.9	61.2	63.5	120	100	91.4	74.6	63.5	60.5	51.4
(WY)	1942	1942	1942	1942	1934	1988	1942	1941	1941	1930	1930	1941

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

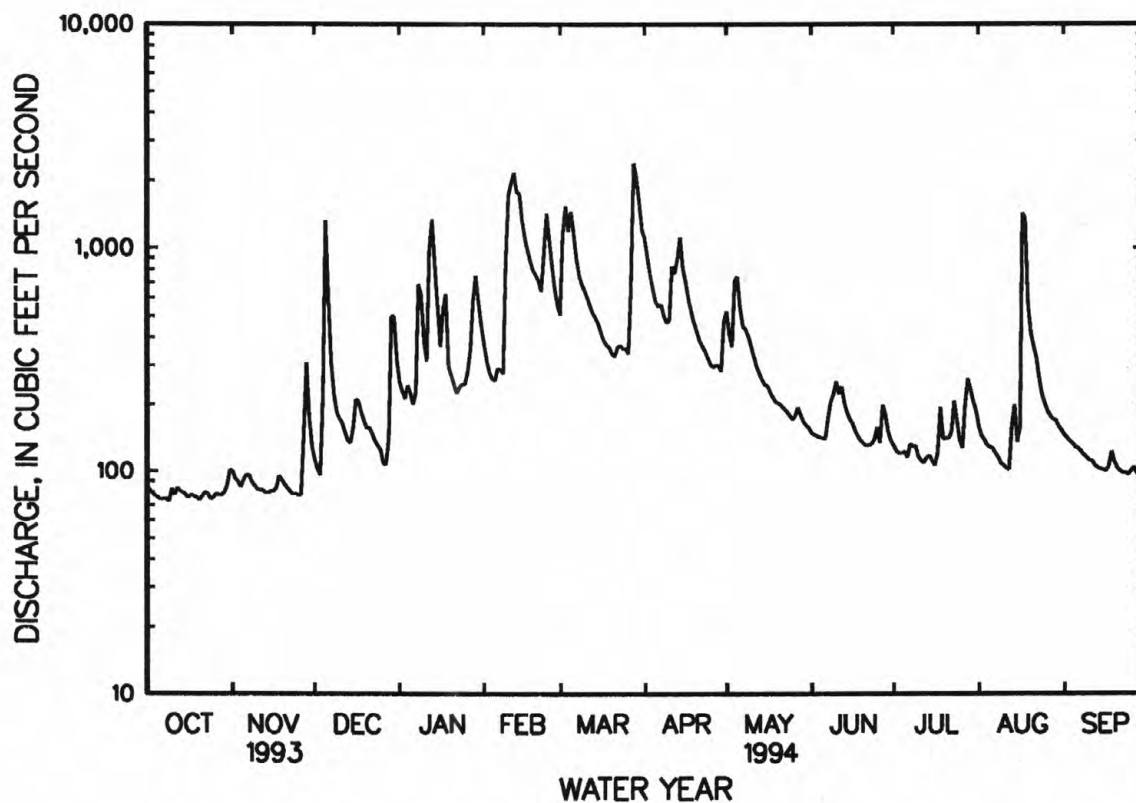
## WATER YEARS 1909 - 1994

ANNUAL TOTAL	106268		123667									
ANNUAL MEAN	291		339							270		
HIGHEST ANNUAL MEAN										424		1972
LOWEST ANNUAL MEAN										118		1941
HIGHEST DAILY MEAN	3280	Mar 24	2380	Mar 28					10600	Apr 5	1977	
LOWEST DAILY MEAN	73	Oct 9	73	Oct 9					22	Jan 30	1934	
ANNUAL SEVEN-DAY MINIMUM	76	aOct 3	76	aOct 3					33	Feb 24	1942	
INSTANTANEOUS PEAK FLOW			3000	Mar 28					17500	Jul 16	1916	
INSTANTANEOUS PEAK STAGE			6.25	Mar 28					b11.40	Jul 16	1916	
INSTANTANEOUS LOW FLOW			60	Oct 8					c5.0	Dec 22	1909	
ANNUAL RUNOFF (CFSM)	1.18		1.37						1.09			
ANNUAL RUNOFF (INCHES)	16.00		18.63						14.83			
10 PERCENT EXCEEDS	606		802						541			
50 PERCENT EXCEEDS	157		183						160			
90 PERCENT EXCEEDS	81		82						74			

a Also Oct. 4, 5, 1993.

b Present datum, from floodmarks.

c Observed, result of freezeup.





## KANAWHA RIVER BASIN

03167500 BIG REED ISLAND CREEK NEAR ALLISONIA, VA

LOCATION.--Lat 36°53'20", long 80°43'40", Pulaski County, Hydrologic Unit 05050001, on left bank 700 ft downstream from bridge on State Highway 693, 3.5 mi southeast of Allisonia, 4 mi upstream from Little Reed Island Creek, and at mile 4.5.

DRAINAGE AREA.--278 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1908 to September 1916, April 1939 to current year.

REVISED RECORDS.--WSP 1033: 1939(P), 1940, 1941-43(P). WSP 1305: 1912(M). WSP 1625: 1940, 1945(M), 1947, 1951, 1952(M).

GAGE.--Water-stage recorder. Datum of gage is 1,902.74 ft above sea level. Prior to Sept. 30, 1916, nonrecording gage at site 4 mi downstream at different datum.

REMARKS.--Records good except for period with ice effect, Jan. 20-24, which is poor. Maximum discharge, 17,900 ft<sup>3</sup>/s, from rating curve extended above 6,000 ft<sup>3</sup>/s on basis of slope-area measurement at gage height 12.54 ft. Minimum discharge, 57 ft<sup>3</sup>/s, Jan. 28, 1986, gage height, 1.58 ft, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	2300	4,290	6.46	Mar. 28	1215	*8,210	*9.04
Dec. 5	0730	6,500	8.00	Aug. 17	1630	6,280	7.86

Minimum discharge, 171 ft<sup>3</sup>/s, Nov. 25-27, gage height, 2.09 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	201	257	317	310	492	579	1040	570	333	272	329	297
2	201	209	285	363	435	1140	881	517	327	246	396	290
3	199	195	269	332	419	1110	801	498	317	239	669	284
4	192	190	388	677	440	857	748	679	310	236	433	272
5	190	223	3840	516	397	1130	703	606	319	264	359	264
6	188	283	1030	423	389	882	744	547	324	250	329	264
7	189	278	591	405	361	748	758	531	329	231	289	256
8	190	222	462	887	349	682	661	566	529	221	267	242
9	189	203	394	602	718	646	631	529	479	214	271	235
10	195	197	375	429	871	730	639	488	384	217	252	230
11	197	191	386	449	1250	703	846	468	362	210	252	225
12	235	186	316	1500	1480	612	719	453	337	215	244	218
13	242	183	311	1140	968	582	926	442	321	272	237	213
14	205	183	326	734	873	565	955	427	306	256	225	209
15	196	186	354	527	755	542	758	433	293	241	259	208
16	193	186	416	314	673	520	783	508	294	216	364	207
17	194	189	538	530	636	493	696	448	326	209	3420	214
18	199	251	449	898	604	493	637	412	290	279	1660	308
19	198	226	428	369	589	485	611	398	278	260	707	248
20	199	196	381	e240	584	465	587	400	272	258	536	216
21	199	184	385	e330	575	475	567	399	271	456	681	210
22	230	178	351	e360	551	560	561	385	269	522	628	208
23	208	177	326	e400	1240	481	559	374	259	419	463	207
24	194	174	296	e440	1630	454	538	362	375	445	390	204
25	191	173	277	479	979	545	540	369	302	333	357	258
26	190	171	272	533	761	540	536	381	269	383	343	468
27	189	1140	275	494	637	861	536	432	551	663	337	311
28	188	1850	346	1450	578	5230	679	387	457	910	330	239
29	185	565	362	995	---	2550	523	356	304	808	306	218
30	233	382	303	669	---	1470	609	348	290	514	299	208
31	375	---	241	557	---	1110	---	338	---	374	290	---
TOTAL	6374	9228	15290	18352	20234	28240	20772	14051	10077	10633	15922	7431
MEAN	206	308	493	592	723	911	692	453	336	343	514	248
MAX	375	1850	3840	1500	1630	5230	1040	679	551	910	3420	468
MIN	185	171	241	240	349	454	523	338	259	209	225	204
CFSM	.74	1.11	1.77	2.13	2.60	3.28	2.49	1.63	1.21	1.23	1.85	.89
IN.	.85	1.23	2.05	2.46	2.71	3.78	2.78	1.88	1.35	1.42	2.13	.99

e Estimated.

## KANAWHA RIVER BASIN

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03167500 BIG REED ISLAND CREEK NEAR ALLISONIA, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1909 - 1916, 1939 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	307	327	388	419	498	558	550	474	401	332	304	291
MAX	862	699	820	903	849	1061	1218	794	931	970	1234	970
(WY)	1977	1980	1974	1978	1960	1993	1983	1958	1989	1916	1940	1989
MIN	108	147	147	151	242	218	214	198	156	137	111	122
(WY)	1964	1982	1964	1981	1942	1988	1942	1941	1988	1986	1981	1963

## SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

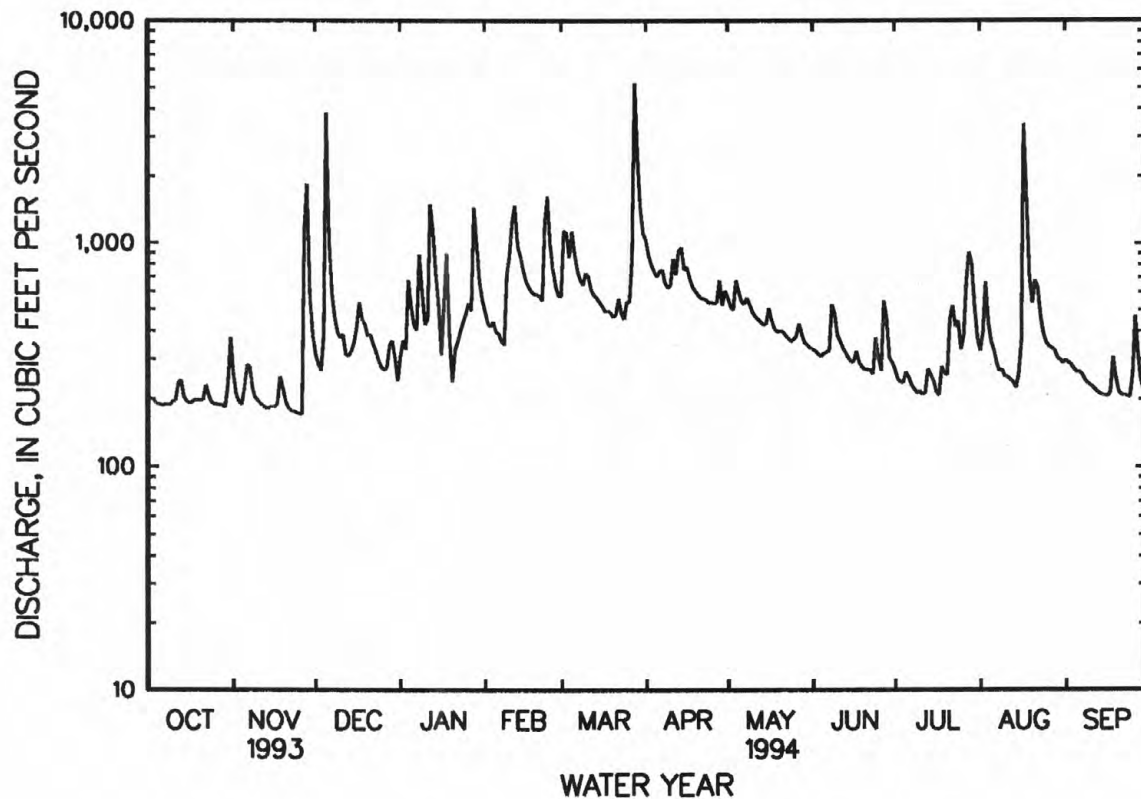
WATER YEARS 1909 - 1916,  
1939 - 1994

ANNUAL TOTAL	177173		176604									
ANNUAL MEAN	485		484						404			
HIGHEST ANNUAL MEAN									545			1949
LOWEST ANNUAL MEAN									216			1981
HIGHEST DAILY MEAN	5450	Mar 24	5230	Mar 28	12300	Aug 14	1940					
LOWEST DAILY MEAN	171	Nov 26	171	Nov 26	75	Jan 5	1981					
ANNUAL SEVEN-DAY MINIMUM	179	Nov 20	179	Nov 20	79	Aug 25	1981					
INSTANTANEOUS PEAK FLOW			8210	Mar 28	17900	Apr 21	1992					
INSTANTANEOUS PEAK STAGE			9.04	Mar 28	14.06	Apr 21	1992					
INSTANTANEOUS LOW FLOW			171	Nov 25	57	Jan 28	1986					
ANNUAL RUNOFF (CFSM)	1.75		1.74		1.45							
ANNUAL RUNOFF (INCHES)	23.71		23.63		19.73							
10 PERCENT EXCEEDS	833		823		669							
50 PERCENT EXCEEDS	382		374		314							
90 PERCENT EXCEEDS	194		199		165							

a Also Jan. 28, 1986.

b Also Nov. 26, 27, 1993.

c Result of freezeup.



## KANAWHA RIVER BASIN

03168000 NEW RIVER AT ALLISONIA, VA

LOCATION.--Lat 36°56'15", long 80°44'45", Pulaski County, Hydrologic Unit 05050001, on left bank on State Highway 653, 0.2 mi downstream from Big Reed Island Creek, and 0.5 mi upstream from Allisonia.

DRAINAGE AREA.--2,202 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1929 to current year.

REVISED RECORDS.--WSP 783: Drainage area. WSP 823: 1936. WSP 1305: 1933(M).

GAGE.--Water-stage recorder. Datum of gage is 1,848.36 ft above sea level.

REMARKS.--Records good except for period with ice effect, Jan. 18-25, which is fair. Large diurnal fluctuation and some regulation by powerplant 25 mi upstream from station. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Appalachian Power Company gage-height transmitter at station. Maximum discharge, 185,000 ft<sup>3</sup>/s, from rating curve extended above 52,000 ft<sup>3</sup>/s on basis of flood records for other stations on New River. Minimum gage height, 0.47 ft, Sept. 7, 1930. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 17,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1545	22,600	6.37	Mar. 28	1430	38,300	8.73
Feb. 11	2330	22,200	6.32	Aug. 17	2230	*70,500	*12.69

Minimum discharge, 802 ft<sup>3</sup>/s, Oct. 11, gage height, 1.09 ft; minimum daily, 891 ft<sup>3</sup>/s, Oct. 28, 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1160	1460	1550	2800	4740	4940	10300	5090	2110	2080	2710	2450
2	1070	1380	1550	2880	4050	8500	8270	4220	2040	1970	2270	2430
3	1110	1280	1490	2640	3450	14500	6950	4020	1930	1860	3890	2510
4	1170	1260	2050	3570	3250	10600	6210	4860	1890	1720	3940	2930
5	1060	1520	17900	3210	2550	10100	5570	5940	1830	1800	3240	2490
6	1050	1230	14000	2630	2920	8350	5450	5000	1920	1780	2590	2300
7	1040	1770	7130	2750	3200	6770	5490	4460	2120	1590	2430	1910
8	1040	1610	4250	4600	2910	6150	5240	4420	2390	1590	2040	2140
9	1050	1300	2670	4860	4230	5690	4740	4400	2980	1580	2310	2010
10	1100	1190	2980	3600	11200	5430	4650	4180	2870	1570	2300	1950
11	1070	1200	2450	3120	15200	5100	6040	4010	2560	1550	2080	1900
12	1110	1150	2480	7740	20100	4660	6600	3720	2420	1540	2150	2490
13	1200	1120	2130	11700	14800	4410	7930	3480	2340	2280	2310	1290
14	1150	1110	2200	8250	12500	4280	11600	3320	2130	1730	2400	1540
15	1130	1120	2420	5450	9780	4180	9100	3200	2020	1740	2010	1670
16	1070	1130	2530	3260	7770	4030	7580	3140	2110	1830	2340	1680
17	1060	1120	2700	3170	6710	3870	7110	3030	1980	1660	30400	1670
18	1090	1240	2450	e6600	5940	3560	5960	2910	1930	1980	41400	1930
19	1060	1280	2340	e4500	5450	3240	5360	2710	2060	2220	14900	1870
20	1060	1230	2210	e3900	5250	3390	4840	2690	1910	1930	7710	1790
21	1090	1210	2060	e3600	4860	3280	4510	2610	1730	2130	6400	1680
22	998	1140	1890	e3400	4660	3460	4320	2620	1910	3370	5630	1590
23	1050	1060	1770	e3300	7250	3350	4230	2630	1870	2820	4540	1580
24	1060	1120	1890	e3300	15100	3160	4200	2370	2150	2990	3800	1570
25	1050	1010	1570	e3500	11600	3280	4190	2280	1990	2450	3370	1640
26	1040	1030	1460	3670	8410	3360	4170	2340	1800	2100	3050	2150
27	998	2760	1320	4650	6550	4480	4100	2650	2430	2670	2360	1960
28	891	8810	1840	8770	5410	28900	4180	3120	3200	4580	3030	1760
29	891	4760	2680	11000	---	27200	4010	2610	2860	5420	2800	1650
30	986	2800	3720	7380	---	17300	4410	2330	2290	4480	2550	1500
31	1360	---	3280	5820	---	11700	---	2190	---	3540	2750	---
TOTAL	33264	51400	102960	149620	209840	231220	177310	106550	65770	72550	175700	58030
MEAN	1073	1713	3321	4826	7494	7459	5910	3437	2192	2340	5668	1934
MAX	1360	8810	17900	11700	20100	28900	11600	5940	3200	5420	41400	2930
MIN	891	1010	1320	2630	2550	3160	4010	2190	1730	1540	2010	1290
CFSM	.49	.78	1.51	2.19	3.40	3.39	2.68	1.56	1.00	1.06	2.57	.88
IN.	.56	.87	1.74	2.53	3.54	3.91	3.00	1.80	1.11	1.23	2.97	.98

e Estimated.

## KANAWHA RIVER BASIN

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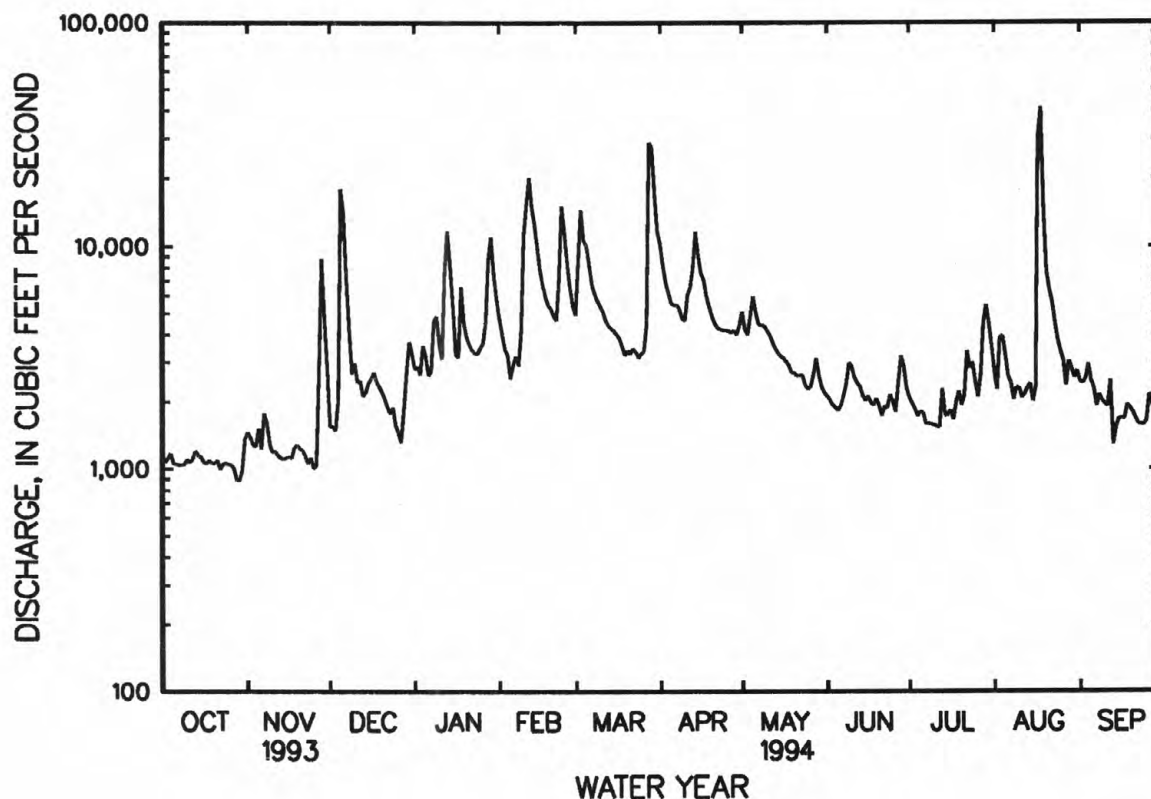
03168000 NEW RIVER AT ALLISONIA, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2324	2636	3028	3670	4424	5048	4627	3709	2835	2295	2219	2041
MAX	6561	9597	6125	7752	8069	10870	11880	7736	8552	6230	11570	8448
(WY)	1990	1978	1962	1937	1957	1993	1987	1973	1992	1949	1940	1989
MIN	726	853	1007	1018	1041	1554	1685	1406	1067	744	850	743
(WY)	1931	1932	1966	1956	1934	1988	1942	1941	1988	1930	1988	1930

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1930 - 1994	
ANNUAL TOTAL	1362624		1434214		3231	
ANNUAL MEAN	3733		3929		4761	
HIGHEST ANNUAL MEAN					1681	
LOWEST ANNUAL MEAN					95000	
HIGHEST DAILY MEAN	50900		41400		Aug 18	
LOWEST DAILY MEAN	891		891		aOct 28	
ANNUAL SEVEN-DAY MINIMUM	988		988		Oct 24	
INSTANTANEOUS PEAK FLOW			70500		Aug 17	
INSTANTANEOUS PEAK STAGE			12.69		Aug 17	
INSTANTANEOUS LOW FLOW			802		Oct 11	
ANNUAL RUNOFF (CFSM)	1.70		1.78		1.47	
ANNUAL RUNOFF (INCHES)	23.02		24.23		19.93	
10 PERCENT EXCEEDS	7300		7630		5830	
50 PERCENT EXCEEDS	2480		2650		2430	
90 PERCENT EXCEEDS	1120		1150		1110	

a Also Oct. 29, 1993.



## KANAWHA RIVER BASIN

03169000 CLAYTOR RESERVOIR NEAR RADFORD, VA

LOCATION.--Lat 37°04'28", long 80°35'05", Pulaski County, Hydrologic Unit 05050001, at Claytor Dam on New River, 0.5 mi upstream from Little River, and 5.5 mi upstream from Radford.

DRAINAGE AREA.--2,382 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1939 to current year (monthly figures only).

REVISED RECORDS.--WSP 2108: 1961-65 monthend contents and change in contents.

GAGE.--Water-stage recorder. Datum of gage is approximately at sea level (levels by Appalachian Power Company). Prior to Sept. 11, 1943, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by gravity overflow concrete dam. Spillway with crest at elevation 1,818.5 ft is equipped with 9 lift gates 30 ft high by 50 ft wide. Dam completed and storage began May 22, 1939; water in reservoir reached minimum pool elevation in January 1940. Total level-pool capacity at elevation 1,847.0 ft, 1.5 ft below top of gates, is 230,100 acre-ft of which about 100,000 acre-ft is controlled storage above minimum pool elevation of 1,820.0 ft. Reservoir is used for hydroelectric power and recreation. U.S. Army Corps of Engineers satellite elevation telemeter at station.

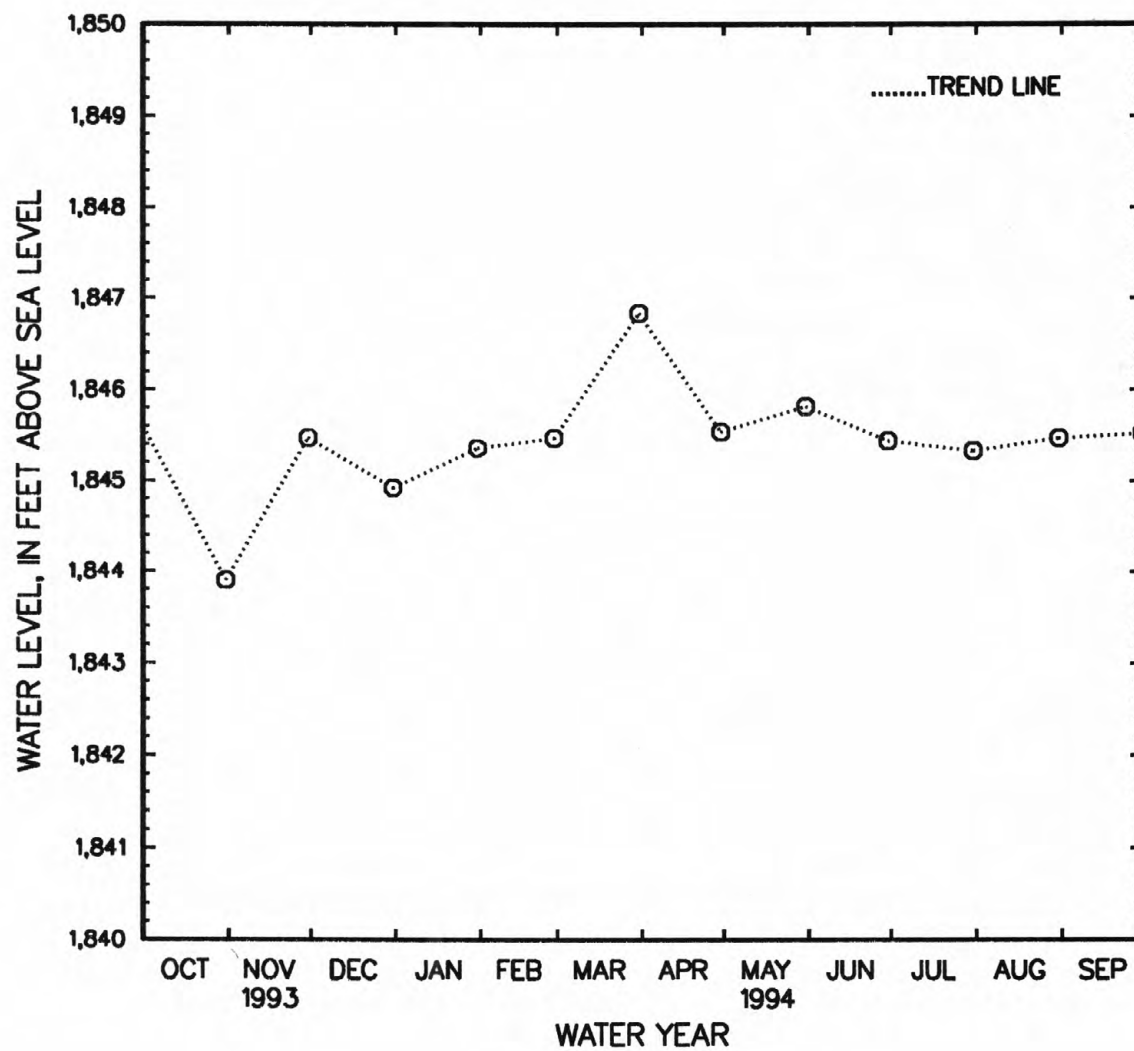
COOPERATION.--Records were provided by the Appalachian Power Company.

## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,845.65	224,000	-
Oct. 31.....	1,843.90	216,500	-7,500
Nov. 30.....	1,845.47	223,200	+6,700
Dec. 31.....	1,844.92	220,900	-2,300
CAL YR 1993.....	-	-	-1,400
Jan. 31.....	1,845.36	222,800	+1,900
Feb. 28.....	1,845.47	223,200	+400
Mar. 31.....	1,846.84	229,400	+6,200
Apr. 30.....	1,845.54	223,500	-5,900
May 31.....	1,845.82	224,700	+1,200
June 30.....	1,845.44	223,100	-1,600
July 31.....	1,845.33	222,600	-500
Aug. 31.....	1,845.47	223,200	+600
Sept. 30.....	1,845.52	223,500	+300
WTR YR 1994.....	-	-	-500



03169000 CLAYTOR RESERVOIR NEAR RADFORD, VA--Continued



## KANAWHA RIVER BASIN

03170000 LITTLE RIVER AT GRAYSONTOWN, VA

LOCATION.--Lat 37°02'15", long 80°33'25", Pulaski County, Hydrologic Unit 05050001, on left bank at upstream side of bridge on State Highway 693 at Snowville, 0.5 mi southeast of Graysontown, 7 mi south of Radford, and at mile 8.6.

DRAINAGE AREA.--300 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1928 to current year. Published as "at Graysontown" prior to October 1990.

REVISED RECORDS.--WSP 823: 1929-36. WSP 1143: 1945. WSP 1305: 1929(M). WSP 1555: Drainage area (at site used 1928-41). WSP 1625: 1951(M). WSP 1725: 1936(M).

GAGE.--Water-stage recorder. Datum of gage is 1,816.04 ft above sea level. Prior to Nov. 20, 1931, nonrecording gage at bridge 1.0 mi downstream at datum 17.99 ft lower. Nov. 20, 1931, to Nov. 12, 1941, water-stage recorder 1.2 mi downstream at datum 20.58 ft lower.

REMARKS.--Records good except for period of no gage-height record, Oct. 1-4, which is fair. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Maximum discharge, 22,800 ft<sup>3</sup>/s, from rating curve extended above 18,000 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 12.76 ft and 13.40 ft. Minimum discharge, 21 ft<sup>3</sup>/s, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1230	5,050	5.38	Aug. 17	2130	*5,240	*5.49
Mar. 28	1715	4,750	5.21				

Minimum discharge, 112 ft<sup>3</sup>/s, Dec. 31, gage height, 0.93 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e150	239	251	252	404	573	854	437	259	206	250	231
2	e145	183	225	295	327	975	729	384	254	195	289	233
3	e145	163	213	304	308	1110	667	368	243	188	386	227
4	e140	160	330	478	330	890	629	489	240	200	297	221
5	137	172	3410	511	342	1510	601	502	243	234	262	216
6	136	194	1070	376	333	1060	597	429	247	236	243	216
7	136	203	549	430	309	847	618	404	291	199	218	211
8	139	178	408	944	295	762	564	429	594	183	206	199
9	140	161	342	623	463	704	539	411	488	179	237	191
10	142	157	315	380	737	701	535	372	324	171	233	187
11	143	154	309	394	1310	711	653	355	288	185	211	183
12	169	150	251	1380	1730	613	579	346	266	174	230	179
13	221	149	212	1230	1020	574	636	337	246	182	240	173
14	176	149	279	706	1030	555	720	326	234	190	205	170
15	158	153	280	462	847	532	592	325	236	182	195	169
16	152	156	346	197	753	504	569	347	223	172	255	168
17	150	153	449	389	756	467	535	321	223	189	2160	171
18	152	204	384	1130	729	463	483	303	225	371	1800	213
19	155	209	341	230	749	462	466	302	207	260	610	212
20	151	167	312	155	772	434	453	305	202	222	447	177
21	154	156	311	223	754	439	437	312	201	331	449	167
22	170	147	265	249	697	517	431	300	212	469	493	166
23	163	145	290	277	1290	462	434	290	218	258	363	168
24	148	145	248	368	1860	425	422	281	236	238	308	169
25	143	143	218	361	1080	450	406	277	229	219	285	174
26	142	142	197	379	806	465	393	278	203	189	271	247
27	142	364	202	379	659	544	390	295	265	387	260	251
28	143	1500	303	939	590	3780	461	284	396	587	256	189
29	140	469	283	1090	---	2170	402	271	252	587	251	171
30	167	305	215	586	---	1330	443	266	213	382	238	162
31	294	---	178	471	---	954	---	261	---	303	232	---
TOTAL	4843	6970	12986	16188	21280	25983	16238	10607	7958	8068	12380	5811
MEAN	156	232	419	522	760	838	541	342	265	260	399	194
MAX	294	1500	3410	1380	1860	3780	854	502	594	587	2160	251
MIN	136	142	178	155	295	425	390	261	201	171	195	162
CFSM	.52	.77	1.40	1.74	2.53	2.79	1.80	1.14	.88	.87	1.33	.65
IN.	.60	.86	1.61	2.01	2.64	3.22	2.01	1.32	.99	1.00	1.54	.72

e Estimated.

## KANAWHA RIVER BASIN

505

03170000 LITTLE RIVER AT GRAYSONTOWN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	304	303	337	397	471	548	513	408	329	269	257	253
MAX	1458	916	860	1050	891	1213	1444	810	942	945	1584	988
(WY)	1930	1986	1949	1937	1936	1993	1987	1958	1972	1949	1940	1989
MIN	86.7	107	115	108	113	220	146	168	137	108	88.3	76.9
(WY)	1954	1932	1966	1966	1934	1940	1942	1941	1964	1930	1981	1932

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

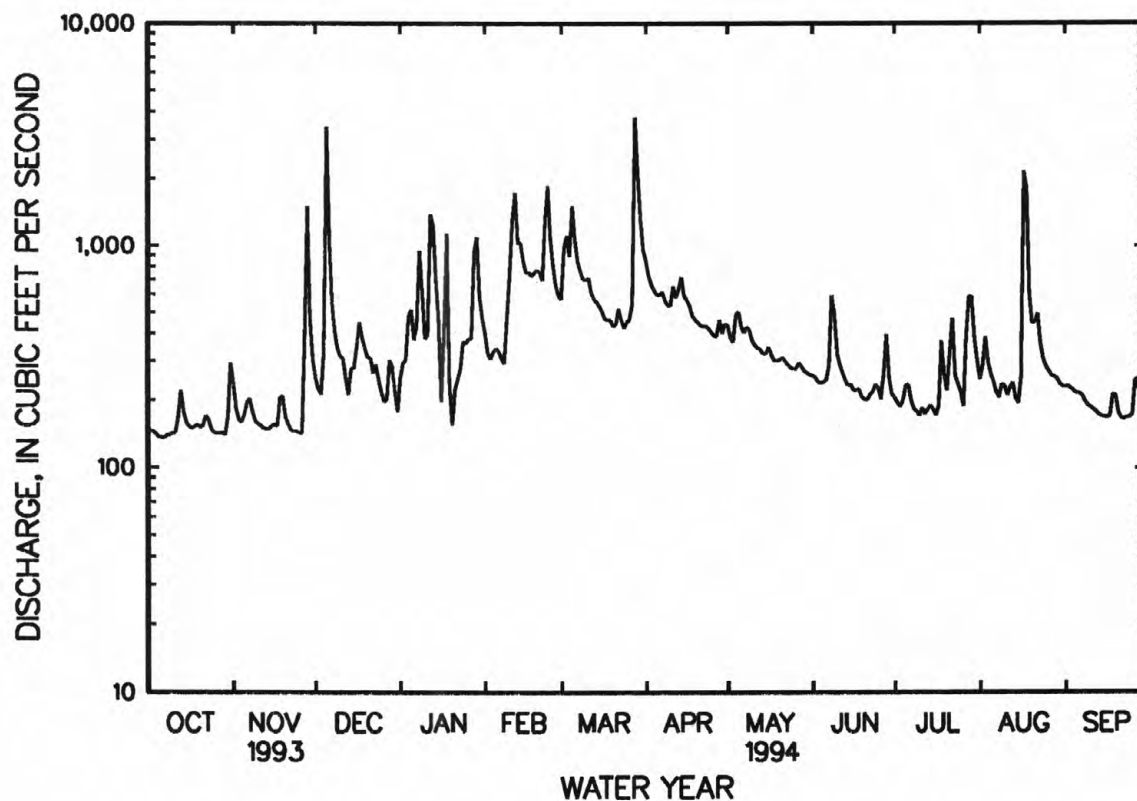
## FOR 1994 WATER YEAR

## WATER YEARS 1929 - 1994

ANNUAL TOTAL	161473	149312	
ANNUAL MEAN	442	409	365
HIGHEST ANNUAL MEAN			631
LOWEST ANNUAL MEAN			191
HIGHEST DAILY MEAN	5410	Mar 24	3780
LOWEST DAILY MEAN	136	aOct 6	136
ANNUAL SEVEN-DAY MINIMUM	139	Oct 4	139
INSTANTANEOUS PEAK FLOW			5240
INSTANTANEOUS PEAK STAGE			5.49
INSTANTANEOUS LOW FLOW			112
ANNUAL RUNOFF (CFSM)	1.47	1.36	1.22
ANNUAL RUNOFF (INCHES)	20.02	18.51	16.52
10 PERCENT EXCEEDS	800	751	620
50 PERCENT EXCEEDS	303	288	270
90 PERCENT EXCEEDS	154	156	128

a Also Oct. 7, 1993.

b Result of freezeup.



## KANAWHA RIVER BASIN

03171000 NEW RIVER AT RADFORD, VA

LOCATION.--Lat 37°08'30", Long 80°34'10", Pulaski County, Hydrologic Unit 05050001, on left bank 2,000 ft downstream from bridge on U.S. Highway 11 at Radford, 5 mi downstream from Little River, and 5.5 mi downstream from Claytor Dam.

DRAINAGE AREA.--2,748 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1907 to September 1915, August 1939 to current year. Records for August 1898 to September 1907, published in WSP 27, 36, 48, 65, 83, 98, 128, 169, 205, 243, and 536, are unreliable and should not be used. Gage-height records collected at same site since 1895 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 873: Drainage area. WSP 953: 1940-41. WSP 1305: 1908-12. See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 1,712.16 ft above sea level. Prior to Aug. 30, 1939, nonrecording gage at highway bridge 2,000 ft upstream at datum 0.85 ft lower.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1939 by Claytor Reservoir (station 03169000). Some additional regulation at low flow by dam and powerplant on Little River. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. National Weather Service gage-height telemeter at station. Maximum discharge, 218,000 ft<sup>3</sup>/s, from rating curve extended above 76,000 ft<sup>3</sup>/s on basis of records for other stations on New River and flow over Claytor Dam, computed by Appalachian Power Company. Minimum gage height, 1.08 ft, Aug. 25, 27, 1944. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of July 16, 1916, reached a stage of 35.7 ft, discharge, 200,000 ft<sup>3</sup>/s, at site and datum used by Geological Survey 1907-15, from reports of the National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 59,300 ft<sup>3</sup>/s, Aug. 18, gage height, 16.12 ft; minimum, 508 ft<sup>3</sup>/s, Nov. 15, gage height, 1.62 ft; minimum daily, 1,010 ft<sup>3</sup>/s, Oct. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1860	4110	1810	3520	6950	9850	12700	6490	2780	2270	2920	2770
2	1640	5170	3170	1740	4230	12600	12300	4390	3150	2230	3280	2590
3	1050	5390	2200	3680	3030	13100	8970	5760	2430	3720	4730	2810
4	1500	4330	4020	6280	5080	12300	7140	6040	2410	3250	4550	3980
5	1670	3100	17800	2910	3180	12200	7520	6930	2360	2210	4380	2950
6	1150	1530	15400	4420	1230	11600	8540	6040	2350	1960	2640	2870
7	1470	1960	8250	5290	5300	10300	5280	5500	3140	2070	3030	2560
8	1070	2020	5590	5270	4800	10500	5310	5340	6200	1310	2300	2330
9	1480	1630	5860	4780	5210	11600	5800	5180	4780	1350	3070	2420
10	1850	1410	5050	4040	11400	5640	6880	4750	3500	2170	2740	2320
11	1440	1640	3000	5180	16200	5070	7410	4530	2970	2120	3250	2320
12	1530	1420	2930	9830	25000	4780	8010	4500	2470	2110	2420	3170
13	1500	1430	2840	12800	17500	1470	9900	3310	3730	2860	2750	2420
14	1580	1500	2670	9990	15700	5620	12400	4400	4950	2280	3110	1280
15	1420	1420	3540	6840	12900	5170	12100	4030	2600	2000	2290	1650
16	1460	1410	2510	4250	11800	4590	7550	3020	1750	2000	5950	2360
17	1400	1480	4240	5520	8910	4640	5680	4400	2370	2490	27000	2250
18	1010	1490	2110	8380	7590	4860	7460	2490	2380	2990	42200	2450
19	1240	1730	2190	4230	7450	3860	7320	3130	3180	3540	17900	2390
20	1490	1590	3330	2890	7640	2950	5560	4410	2430	2420	12400	2300
21	1540	1710	3730	3260	6450	6410	5210	2420	2380	4070	9610	2100
22	1460	1060	2090	4360	7370	3290	4100	2350	2440	4890	4570	1750
23	2020	1030	2320	1520	12200	4260	6060	3770	2580	3610	5400	1750
24	2220	1050	2730	5870	14000	3990	4860	3950	2530	2830	4460	1970
25	1640	1040	1070	4130	13200	4230	3840	2400	2560	2870	4330	2180
26	1430	1040	1720	4560	11100	4450	4530	3190	2490	2850	3130	2820
27	1410	1600	1850	5760	8630	7050	4400	2690	2830	4420	3020	2550
28	1100	2630	2450	9990	6340	29800	4370	3170	4540	5610	4040	2260
29	1580	2220	4050	12600	---	32800	4580	3210	3300	6240	2940	2000
30	2300	2370	4100	7500	---	20500	5330	3120	3180	5330	3150	1900
31	2740	---	3620	8130	---	14500	---	2640	---	4460	3310	---
TOTAL	48250	61510	128240	179520	260390	283980	211110	127550	90760	94530	200870	71470
MEAN	1556	2050	4137	5791	9300	9161	7037	4115	3025	3049	6480	2382
MAX	2740	5390	17800	12800	25000	32800	12700	6930	6200	6240	42200	3980
MIN	1010	1030	1070	1520	1230	1470	3840	2350	1750	1310	2290	1280
(†)	-122	+113	-37	+31	+7	+101	-99	+20	-27	-8	+10	+5
MEAN#	1434	2163	4100	5822	9307	9262	6938	4135	2998	3041	6490	2387
CFSM#	.52	.79	1.49	2.12	3.39	3.37	2.52	1.50	1.09	1.11	2.36	.87
IN.#	.60	.88	1.72	2.44	3.53	3.89	2.82	1.74	1.22	1.28	2.72	.97

CAL YR 1993 TOTAL 1660770 MEAN 4550 MAX 57700 MIN 1010 MEAN# 4548 CFSM# 1.66 IN.# 22.47  
WTR YR 1994 TOTAL 1758180 MEAN 4817 MAX 42200 MIN 1010 MEAN# 4816 CFSM# 1.75 IN.# 23.80

† Change in contents, equivalent in cubic feet per second, in Claytor Reservoir; provided by Appalachian Power Company.

# Adjusted for change in contents.

## 03171000 NEW RIVER AT RADFORD, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1908 - 1915, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2778	2549	4070	5088	5655	6047	5261	4676	3964	2774	2334	2550
MAX	5958	4877	8505	8679	9654	9332	7463	8512	6834	4479	4446	4571
(WY)	1909	1909	1915	1915	1908	1913	1911	1909	1910	1908	1908	1915
MIN	1666	1575	1801	2826	2808	3442	2774	2544	1557	1618	1480	1327
(WY)	1913	1911	1913	1912	1913	1910	1910	1914	1914	1911	1914	1914

## SUMMARY STATISTICS

## WATER YEARS 1908 - 1915

ANNUAL MEAN	3971
HIGHEST ANNUAL MEAN	5522
LOWEST ANNUAL MEAN	2913
HIGHEST DAILY MEAN	38400
LOWEST DAILY MEAN	550
ANNUAL SEVEN-DAY MINIMUM	729
INSTANTANEOUS PEAK FLOW	a46200
INSTANTANEOUS PEAK STAGE	a15.0
INSTANTANEOUS LOW FLOW	(c)
ANNUAL RUNOFF (CFSM)	1.45
ANNUAL RUNOFF (INCHES)	19.62
10 PERCENT EXCEEDS	7360
50 PERCENT EXCEEDS	2930
90 PERCENT EXCEEDS	1500

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	2714	3071	3667	4214	5334	6089	5617	4499	3549	2798	2702	2512
MAX	7619	10300	7426	8999	10450	13130	14490	8875	9627	7545	14170	9855
(WY)	1990	1978	1962	1946	1957	1993	1987	1973	1992	1949	1940	1989
MIN	1068	1156	1144	1064	2437	2016	2203	1721	1244	1208	1081	1126
(WY)	1989	1940	1940	1940	1941	1988	1942	1941	1941	1988	1956	1968

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

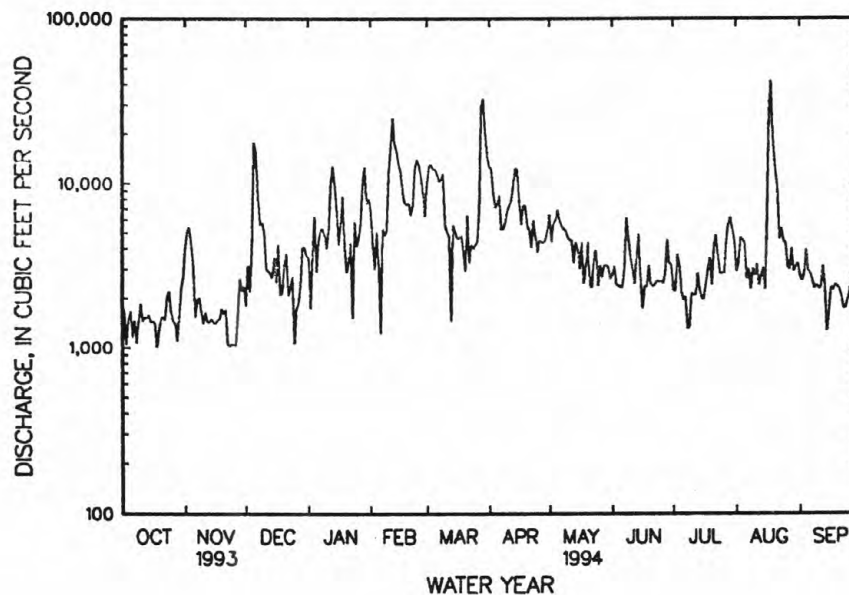
## WATER YEARS 1940 - 1994

ANNUAL TOTAL	1660770	1758180	
ANNUAL MEAN	4550	4817	
HIGHEST ANNUAL MEAN			3889
LOWEST ANNUAL MEAN			5471
HIGHEST DAILY MEAN	57700	Mar 24	2151
LOWEST DAILY MEAN	1010	Oct 18	105000
ANNUAL SEVEN-DAY MINIMUM	1220	Nov 20	627
INSTANTANEOUS PEAK FLOW			813
INSTANTANEOUS PEAK STAGE			218000
INSTANTANEOUS LOW FLOW			16.12
ANNUAL RUNOFF (CFSM)	1.66	1.75	35.96
ANNUAL RUNOFF (INCHES)	22.48	23.80	165
10 PERCENT EXCEEDS	8510	9990	1.42
50 PERCENT EXCEEDS	3100	3250	19.22
90 PERCENT EXCEEDS	1410	1500	7360

a Site and datum then in use.

b Also Mar. 27, 1913.

c Not determined.





## KANAWHA RIVER BASIN

03173000 WALKER CREEK AT BANE, VA

LOCATION.--Lat 37°16'05", long 80°42'35", Giles County, Hydrologic Unit 05050002, on left bank at Bane, 0.2 mi downstream from bridge on State Highway 100, 0.2 mi downstream from Sugar Run, and at mile 7.9.

DRAINAGE AREA.--305 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1938 to current year.

REVISED RECORDS.--WSP 1143: 1939(M), 1940, 1944, 1946. WSP 1305: 1938(M).

GAGE.--Water-stage recorder. Datum of gage is 1,665.92 ft above sea level. Prior to Aug. 1, 1938, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Maximum discharge, 25,000 ft<sup>3</sup>/s, from rating curve extended above 7,200 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 16.50 ft and 19.28 ft. Minimum discharge, 15 ft<sup>3</sup>/s, Dec. 21, 1958, gage height, 2.42 ft, result of freezeup. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in September 1878 reached a stage of about 23.5 ft, discharge, 40,400 ft<sup>3</sup>/s, from rating curve extended as explained above.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 28	1345	*6,930	*11.16	No other peak equal to or greater than base discharge			

Minimum discharge, 44 ft<sup>3</sup>/s, Oct. 7-9, gage height, 2.90 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	61	118	271	624	628	1540	1190	130	113	108	101
2	50	65	100	261	488	974	1190	835	126	105	111	97
3	48	60	82	222	410	1550	967	688	121	99	129	94
4	46	56	80	268	368	1120	818	1050	119	97	108	88
5	45	58	1260	264	332	2050	693	990	117	88	100	83
6	45	58	1240	235	339	1490	628	795	116	84	92	81
7	45	57	544	233	309	1110	618	674	123	79	89	78
8	44	57	326	719	284	927	539	659	293	76	80	74
9	44	55	240	759	403	807	484	579	352	73	74	70
10	47	53	192	495	1130	723	458	505	367	71	69	66
11	46	51	173	405	1810	662	533	438	297	69	65	64
12	50	50	163	1550	2530	589	698	395	325	67	63	62
13	50	50	149	2220	1860	535	680	350	313	68	81	60
14	50	49	130	1320	2060	503	1330	314	241	69	71	58
15	50	51	125	878	1460	467	1260	295	199	73	66	56
16	48	49	146	529	1190	424	1010	276	175	70	73	55
17	46	53	293	542	1110	380	895	247	162	123	897	58
18	45	60	338	918	1020	347	749	231	157	290	1450	63
19	47	59	281	570	994	333	656	218	135	150	605	60
20	48	62	235	496	1050	302	583	209	124	119	381	62
21	47	57	203	438	1020	284	531	197	126	101	290	58
22	48	53	195	369	917	311	467	184	131	92	249	55
23	47	51	171	356	1790	331	425	173	125	94	204	54
24	50	49	153	347	2500	306	398	166	177	112	169	54
25	49	49	130	364	1570	310	363	161	145	101	146	53
26	48	49	112	517	1140	306	311	163	128	87	130	57
27	51	150	109	829	869	576	325	169	138	92	120	56
28	48	402	136	1140	710	4560	397	158	171	114	112	54
29	45	245	318	1540	---	3890	359	147	144	135	130	51
30	48	156	415	1040	---	2540	1780	142	123	130	114	50
31	55	---	293	780	---	1600	---	135	---	126	108	---
TOTAL	1484	2375	8450	20875	30287	30935	21685	12733	5400	3167	6484	1972
MEAN	47.9	79.2	273	673	1082	998	723	411	180	102	209	65.7
MAX	55	402	1260	2220	2530	4560	1780	1190	367	280	1450	101
MIN	44	49	80	222	284	284	311	135	116	67	63	50
CFSM	.16	.26	.89	2.21	3.55	3.27	2.37	1.35	.59	.33	.69	.22
IN.	.18	.29	1.03	2.55	3.69	3.77	2.64	1.55	.66	.39	.79	.24

## KANAWHA RIVER BASIN

509

03173000 WALKER CREEK AT BANE, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	133	188	320	434	597	706	558	414	236	145	132	101
MAX	721	737	941	1102	1577	1800	1806	1044	1125	735	759	639
(WY)	1990	1980	1973	1946	1957	1955	1987	1971	1992	1938	1949	1989
MIN	34.7	43.2	44.9	44.8	95.6	108	126	115	60.6	41.6	33.7	35.6
(WY)	1964	1956	1956	1956	1942	1988	1986	1941	1988	1988	1988	1955

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1938 - 1994

ANNUAL TOTAL	138179	145847	
ANNUAL MEAN	379	400	328
HIGHEST ANNUAL MEAN			553
LOWEST ANNUAL MEAN			135
HIGHEST DAILY MEAN	11700	Mar 24	4560
LOWEST DAILY MEAN	41	aSep 13	44
ANNUAL SEVEN-DAY MINIMUM	43	Sep 10	45
INSTANTANEOUS PEAK FLOW			6930
INSTANTANEOUS PEAK STAGE			11.16
INSTANTANEOUS LOW FLOW			44
ANNUAL RUNOFF (CFSM)	1.24	1.31	1.07
ANNUAL RUNOFF (INCHES)	16.85	17.79	14.60
10 PERCENT EXCEEDS	841	1050	736
50 PERCENT EXCEEDS	135	169	163
90 PERCENT EXCEEDS	48	51	49

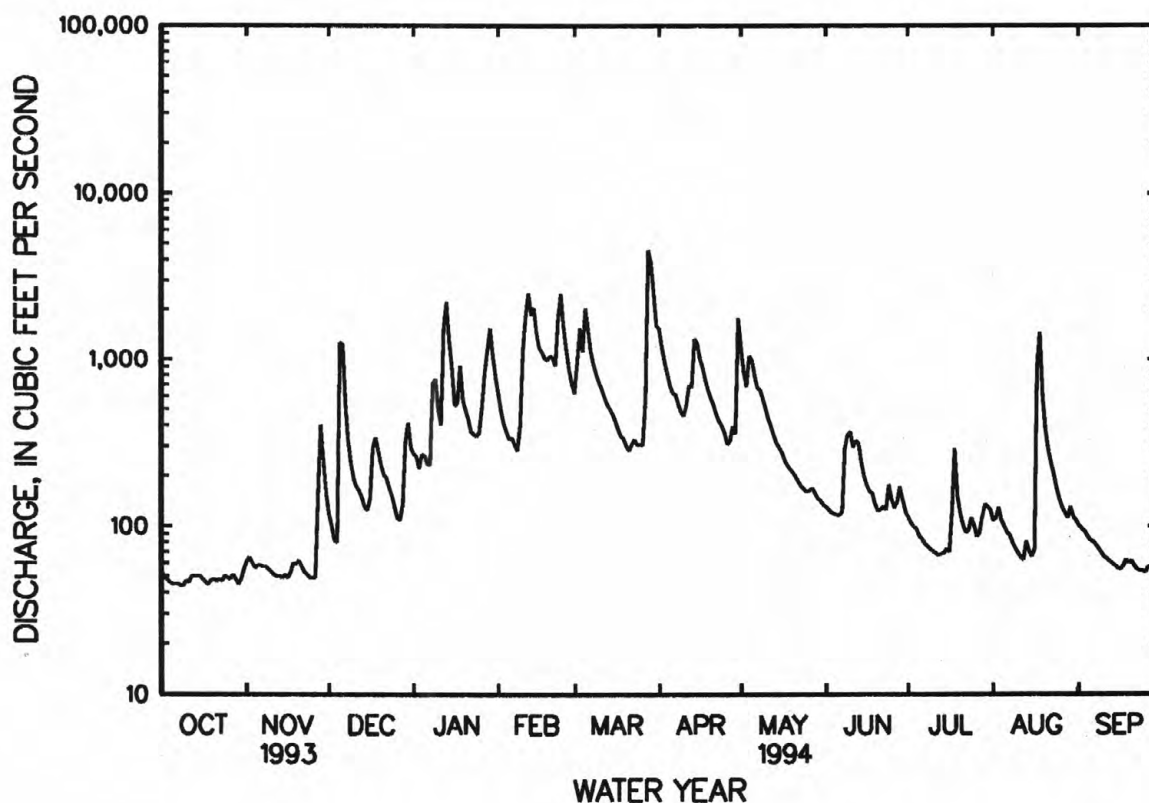
a Also Sept. 14, 15, 1993.

b Also Oct. 9, 1993.

c Also Sept. 28, 1964.

d Also Oct. 8, 9, 1993.

f Result of freezeup.



## KANAWHA RIVER BASIN

03175500 WOLF CREEK NEAR NARROWS, VA

LOCATION.--Lat 37°18'20", long 80°51'00", Giles County, Hydrologic Unit 05050002, on right bank at downstream side of bridge on State Highway 724, 2.8 mi southwest of Narrows, and at mile 3.5.

DRAINAGE AREA.--223 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1908 to September 1916, March 1938 to current year.

REVISED RECORDS.--WSP 973: 1940-41(M). WSP 1235: 1912-13, 1915-16. WSP 1505: 1940, monthly and yearly runoff. WSP 1725: 1913(M), 1915-16(M), 1941 calendar year runoff.

GAGE.--Water-stage recorder. Datum of gage is 1,583.83 ft above sea level. July 22, 1908, to Sept. 30, 1916, and Mar. 31 to Nov. 7, 1938, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good except those for periods with backwater from temporary dam, Oct. 1 to Jan. 12 and June 25 to Sept. 30, which are fair. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Maximum discharge, 12,900 ft<sup>3</sup>/s, from rating curve extended above 5,700 ft<sup>3</sup>/s on basis of contracted-opening measurement of peak flow. Minimum discharge, 8.8 ft<sup>3</sup>/s, result of freezeup. Minimum gage height, 2.19 ft, Dec. 24, 1943. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 12	1700	2,410	6.88	Mar. 28	1115	*4,170	*8.42
Feb. 12	0030	3,660	8.01	Apr. 30	1030	3,180	7.60

Minimum discharge, 28 ft<sup>3</sup>/s, Oct. 9; minimum gage height, 2.90 ft, June 6, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	116	152	277	579	519	1170	1350	96	75	95	65
2	62	95	125	239	475	820	934	976	93	65	94	75
3	50	83	108	218	405	1030	770	746	88	58	96	67
4	41	83	118	237	353	818	659	907	85	70	99	58
5	36	100	1190	194	331	1330	565	862	83	62	94	51
6	32	143	1010	166	389	1110	518	716	82	58	107	51
7	31	143	492	193	354	886	505	613	85	65	103	53
8	30	110	305	1110	332	743	466	645	176	63	85	50
9	29	87	214	830	613	660	428	612	197	47	66	44
10	32	71	172	546	1820	653	414	543	268	47	56	38
11	38	58	171	418	2080	672	635	471	251	47	64	35
12	49	48	147	1440	2980	611	620	410	343	46	57	33
13	58	44	122	1840	2090	550	857	359	286	52	48	31
14	54	40	123	1160	1710	512	1170	315	208	63	41	30
15	50	40	129	783	1250	461	893	287	165	67	40	30
16	43	40	206	539	1020	408	758	274	143	64	67	30
17	39	45	223	574	883	362	619	242	125	104	469	31
18	40	51	208	868	778	339	532	218	108	93	750	42
19	41	72	193	550	711	326	466	199	96	72	390	64
20	42	70	181	530	689	291	412	187	87	58	249	54
21	50	65	179	432	675	280	366	176	83	86	175	41
22	57	58	150	373	640	370	338	162	83	106	160	35
23	64	52	134	351	1010	364	313	148	90	108	132	32
24	67	45	119	383	1610	355	283	137	82	99	105	31
25	65	42	107	475	1230	361	261	131	93	73	86	31
26	58	39	95	854	940	339	242	133	95	66	74	32
27	53	106	92	1100	714	582	232	147	114	139	66	38
28	50	431	112	1230	590	3290	292	137	119	205	78	45
29	45	281	448	1380	---	3100	402	121	100	176	94	38
30	55	197	493	964	---	1980	2370	111	90	149	74	33
31	89	---	349	721	---	1360	---	103	---	116	67	---
TOTAL	1530	2855	7867	20975	27251	25482	18490	12438	4014	2599	4181	1288
MEAN	49.4	95.2	254	677	973	822	616	401	134	83.8	135	42.9
MAX	89	431	1190	1840	2980	3290	2370	1350	343	205	750	75
MIN	29	39	92	166	331	280	232	103	82	46	40	30
CFSM	.22	.43	1.14	3.03	4.36	3.69	2.76	1.80	.60	.38	.60	.19
IN.	.26	.48	1.31	3.50	4.55	4.25	3.08	2.07	.67	.43	.70	.21

## KANAWHA RIVER BASIN

511

03175500 WOLF CREEK NEAR NARROWS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1908 - 1916, 1938 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	112	164	310	437	555	655	494	371	201	137	115	80.0
MAX	621	754	850	1128	1469	1789	1728	1059	748	964	512	576
(WY)	1990	1978	1973	1957	1957	1955	1987	1971	1992	1916	1916	1989
MIN	21.4	28.6	31.1	50.0	122	113	132	99.4	49.3	32.9	26.8	27.4
(WY)	1964	1940	1940	1940	1942	1988	1986	1941	1914	1988	1988	1964

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

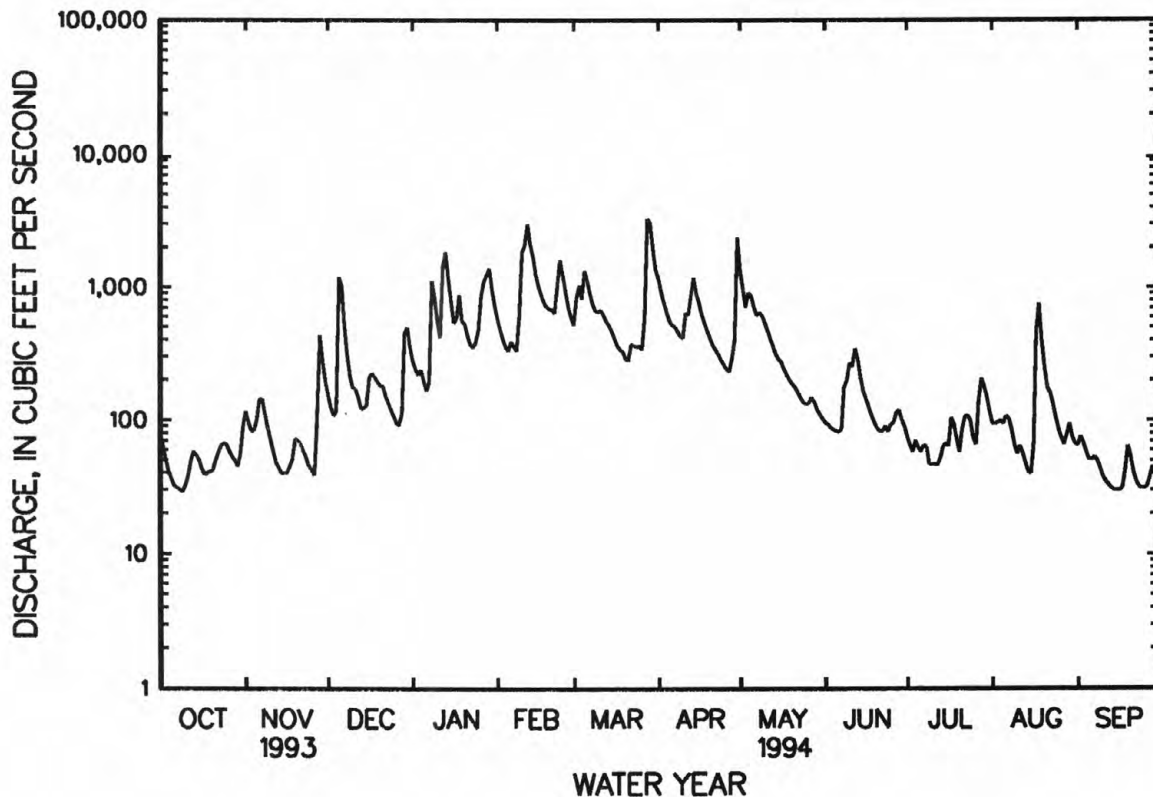
WATER YEARS 1908 - 1916,  
1938 - 1994

ANNUAL TOTAL	111833		128970									
ANNUAL MEAN	306		353							301		
HIGHEST ANNUAL MEAN										475		1972
LOWEST ANNUAL MEAN										126		1988
HIGHEST DAILY MEAN	7460	Mar 24		3290	Mar 28					8380	Apr 5	1977
LOWEST DAILY MEAN	27	Sep 15		29	Oct 9					16	aSep 17	1964
ANNUAL SEVEN-DAY MINIMUM	33	Oct 5		31	Sep 11					17	Sep 13	1964
INSTANTANEOUS PEAK FLOW				4170	Mar 28					12900	Jan 29	1957
INSTANTANEOUS PEAK STAGE				8.42	Mar 28					b12.55	Jan 29	1957
INSTANTANEOUS LOW FLOW				28	Oct 9					c8.8	Dec 25	1953
ANNUAL RUNOFF (CFSM)	1.37			1.58						1.35		
ANNUAL RUNOFF (INCHES)	18.66			21.51						18.33		
10 PERCENT EXCEEDS	680			889						689		
50 PERCENT EXCEEDS	122			147						155		
90 PERCENT EXCEEDS	41			42						40		

a Also Sept. 18, 26-28, 1964.

b From floodmark in well; floodmark on downstream side of bridge was 13.8 ft.

c Result of freezeup.



## KANAWHA RIVER BASIN

03176500 NEW RIVER AT GLEN LYN, VA

LOCATION.--Lat 37°22'22", long 80°51'39", Giles County, Hydrologic Unit 05050002, on right bank 90 ft upstream from bridge on U.S. Highway 460 at Glen Lyn, 0.3 mi upstream from East River, and 6.3 mi downstream from Wolf Creek.

DRAINAGE AREA.--3,768 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1927 to current year.

REVISED RECORDS.--WSP 758: Drainage area. WSP 1305: 1928(M), 1930(M).

GAGE.--Water-stage recorder. Datum of gage is 1,490.11 ft above sea level. Aug. 11, 1927, to Oct. 16, 1934, on left bank opposite present site at same datum, and Oct. 17, 1934, to June 16, 1939, on left bank at site 200 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since 1939 by Claytor Reservoir (station 03169000) 55 mi upstream from station. U.S. Army Corps of Engineers satellite gage-height telemeter at station. Maximum discharge, 226,000 ft<sup>3</sup>/s, from rating curve extended above 89,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 2.10 ft, Sept. 8, 1930.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 62,400 ft<sup>3</sup>/s, Aug. 18, gage height, 13.58 ft; minimum, 799 ft<sup>3</sup>/s, Nov. 16, gage height, 2.41 ft; minimum daily, 1,130 ft<sup>3</sup>/s, Nov. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1830	2850	2710	4590	10800	11500	18900	11500	3050	3020	4470	3390
2	1990	4720	2270	4320	7930	15800	17300	9700	3130	2560	3360	2670
3	1720	4940	3270	2630	5870	18400	15400	7620	3480	2640	4470	2790
4	1180	5200	2710	6400	4470	16900	10400	9590	2810	4570	5150	3540
5	1530	3520	17000	6100	6870	18300	10100	10700	2790	2960	5060	3670
6	1750	3060	24600	3640	4300	17400	13300	10400	2740	2450	4620	3340
7	1270	1740	13000	6570	2610	15500	8110	8010	2750	2290	2900	2760
8	1440	2170	8860	8010	7010	13800	7790	9100	5290	2240	3490	2650
9	1200	2180	6650	8800	6600	15600	8830	7150	6380	1520	2750	2500
10	1540	1770	6540	5650	14400	12300	8120	7360	4920	1590	3750	2510
11	1960	1550	4820	5760	20200	7150	10300	6590	4460	2390	2760	2430
12	1470	1710	3620	13200	33500	7690	11900	6180	3360	2380	3630	2390
13	1650	1560	3490	20500	26000	7060	11700	5340	3220	2390	2740	3370
14	1600	1510	3860	16600	23500	3830	16900	5180	4820	3260	3080	2140
15	1670	1570	3220	11300	18900	7910	16200	5660	5120	2680	3370	1330
16	1490	1490	4070	8740	17200	7470	14100	4540	2940	2420	2730	1680
17	1530	1520	3650	6190	14500	6400	8750	4550	2280	2490	14100	2390
18	1470	1690	5340	12700	11800	6280	9520	4690	2680	3480	50500	2390
19	1170	1690	3140	9760	11700	6350	10800	3230	2690	3600	25500	2480
20	1250	1840	2980	5620	11900	5350	8360	4430	3410	3840	14300	2410
21	1610	1700	4450	4700	11900	5080	6930	4540	2650	2740	12600	2300
22	1630	1780	4190	4130	9900	7520	7010	3060	2690	5100	7480	2130
23	1600	1190	2700	5530	15200	4450	6620	2990	2730	5090	6010	1850
24	2090	1130	2910	3110	21900	5670	7410	4940	2970	3820	5450	1850
25	2300	1210	3280	7230	19200	5480	4540	3880	2930	3150	4770	2070
26	1750	1250	1660	6510	16900	5670	5770	2990	2860	3240	4550	2240
27	1450	1390	2180	8440	13300	7610	5730	3990	2910	3320	3000	2810
28	1470	3650	2490	14200	9620	29100	6110	3100	3870	6130	3930	2530
29	1250	3420	3520	19100	---	49500	5900	4260	4160	6340	4050	2270
30	1800	2750	5990	15100	---	32900	10200	3240	3880	7320	2990	2070
31	2570	---	4910	9970	---	22100	---	3690	---	5330	3950	---
TOTAL	50230	67750	164080	265100	377980	396070	303000	182200	103970	106350	221510	74950
MEAN	1620	2258	5293	8552	13500	12780	10100	5877	3466	3431	7145	2498
MAX	2570	5200	24600	20500	33500	49500	18900	11500	6380	7320	50500	3670
MIN	1170	1130	1660	2630	2610	3830	4540	2990	2280	1520	2730	1330
(†)	-122	+113	-37	+31	+7	+101	-99	+20	-27	-8	+10	+5
MEAN#	1498	2371	5256	8583	13510	12880	10000	5897	3439	3423	7155	2503
CFSM#	.40	.63	1.39	2.28	3.59	3.42	2.65	1.57	.91	.91	1.90	.66
IN.#	.46	.70	1.61	2.63	3.73	3.94	2.96	1.80	1.02	1.05	2.19	.74

CAL YR 1993 TOTAL 2127800 MEAN 5830 MAX 81600 MIN 1110 MEAN# 5828 CFSM# 1.55 IN.# 21.00  
WTR YR 1994 TOTAL 2313190 MEAN 6338 MAX 50500 MIN 1130 MEAN# 6337 CFSM# 1.68 IN.# 22.83

† Change in contents, equivalent in cubic feet per second, in Claytor Reservoir; provided by Appalachian Power Company.

# Adjusted for change in contents.



## 03176500 NEW RIVER AT GLEN LYN, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 1938, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	4319	4112	4543	6919	6141	7665	7007	5225	3920	3322	3436	3343
MAX	11250	9016	7798	13770	10980	13050	11390	7093	8351	7956	8211	10840
(WY)	1938	1930	1928	1937	1936	1936	1936	1933	1929	1938	1928	1928
MIN	1094	1249	1685	1795	1494	3307	3899	2491	1908	1206	1330	1145
(WY)	1931	1932	1934	1934	1934	1931	1930	1934	1930	1930	1930	1932

## SUMMARY STATISTICS

## WATER YEARS 1928 - 1938

ANNUAL MEAN	4992
HIGHEST ANNUAL MEAN	6859
LOWEST ANNUAL MEAN	3208
HIGHEST DAILY MEAN	57600
LOWEST DAILY MEAN	820
ANNUAL SEVEN-DAY MINIMUM	914
INSTANTANEOUS PEAK FLOW	99000
INSTANTANEOUS PEAK STAGE	16.75
INSTANTANEOUS LOW FLOW	770
ANNUAL RUNOFF (CFSM)	1.32
ANNUAL RUNOFF (INCHES)	17.99
10 PERCENT EXCEEDS	9340
50 PERCENT EXCEEDS	3800
90 PERCENT EXCEEDS	1520

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	3265	3765	4748	5742	7371	8446	7562	5948	4433	3327	3233	2914
MAX	9882	12450	10910	12660	15810	18650	20890	11270	12860	9784	16410	11500
(WY)	1990	1978	1949	1946	1957	1993	1987	1984	1992	1949	1940	1989
MIN	1204	1258	1506	1489	3304	2407	2673	2397	1741	1390	1267	1362
(WY)	1989	1982	1940	1966	1941	1988	1986	1941	1988	1988	1981	1963

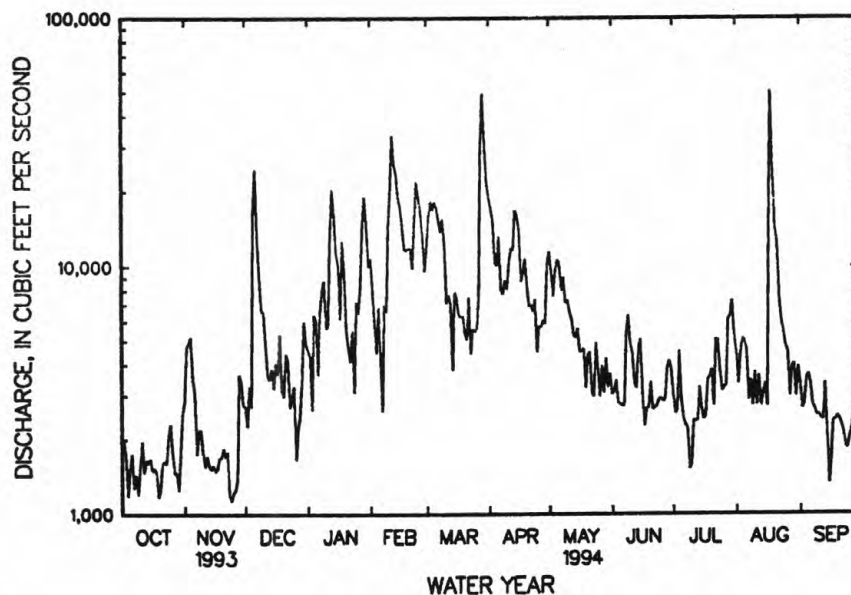
## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1939 - 1994

ANNUAL TOTAL	2127800	2313190	
ANNUAL MEAN	5830	6338	5050
HIGHEST ANNUAL MEAN			7424
LOWEST ANNUAL MEAN			2626
HIGHEST DAILY MEAN	81600	Mar 24	50500
LOWEST DAILY MEAN	1110	Sep 2	1130
ANNUAL SEVEN-DAY MINIMUM	1380	Nov 21	1380
INSTANTANEOUS PEAK FLOW			62400
INSTANTANEOUS PEAK STAGE			13.58
INSTANTANEOUS LOW FLOW			799
ANNUAL RUNOFF (CFSM)	1.55	1.68	1.34
ANNUAL RUNOFF (INCHES)	21.01	22.84	18.20
10 PERCENT EXCEEDS	11000	14300	9660
50 PERCENT EXCEEDS	3620	4050	3700
90 PERCENT EXCEEDS	1530	1680	1570



## KANAWHA RIVER BASIN

03176500 NEW RIVER AT GLEN LYN, VA--Continued  
(National stream-quality accounting network station)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1931, 1950, 1952, 1955-56, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1968 to September 1988.

WATER TEMPERATURE: October 1964 to September 1988.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	TUR- BID- ITY (NTU) (00076)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)
NOV										
17...	1000	1930	170	7.4	19.0	15.0	725	0.60	11.7	122
JAN										
26...	1000	7190	145	7.3	6.0	3.0	727	2.5	13.2	103
MAR										
23...	0915	3930	125	7.5	6.5	9.0	724	0.20	11.0	100
MAY										
11...	0915	6720	135	7.2	8.0	14.0	729	1.6	9.5	96
AUG										
16...	1000	2880	155	7.2	20.0	24.0	725	0.70	7.1	89

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) (31625)	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML) (31673)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD CO3 (00452)	ALKA- LINITY WAT DIS TOT IT FIELD CACO3 (39086)
NOV										
17...	K14	31	76	17	8.1	5.3	1.7	76	0	62
JAN										
26...	170	70	62	16	5.4	4.7	1.6	60	0	49
MAR										
23...	37	K6	64	16	5.8	3.5	1.4	66	0	54
MAY										
11...	59	K14	56	14	5.2	3.2	1.2	59	0	48
AUG										
16...	29	45	62	14	6.6	4.7	1.9	60	0	49

K Results based on colony count outside the acceptance range (non-ideal colony count).

## KANAWHA RIVER BASIN

515

03176500 NEW RIVER AT GLEN LYN, VA--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	SULFATE DIS- SOLVED (MG/L AS SO <sub>4</sub> ) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO <sub>2</sub> ) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NO <sub>2</sub> +NO <sub>3</sub> TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO <sub>2</sub> +NO <sub>3</sub> DIS- SOLVED (MG/L AS N) (00631)
NOV 17...	18	4.8	0.10	5.6	94	101	0.010	0.540	0.550	0.550
JAN 26...	10	6.5	<0.10	7.9	90	86	0.010	0.890	0.900	0.900
MAR 23...	7.6	5.4	<0.10	6.7	83	83	0.020	0.840	0.860	0.860
MAY 11...	8.2	3.9	<0.10	6.3	84	74	0.020	0.610	0.630	0.630
AUG 16...	14	4.7	0.10	8.1	91	86	<0.010	--	0.500	0.500

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)
NOV 17...	0.020	<0.20	0.060	0.050	0.030	10	34	<3	23	<4
JAN 26...	0.060	0.20	0.030	0.020	0.010	--	--	--	--	--
MAR 23...	0.030	0.30	0.020	<0.010	0.010	40	35	<3	56	<4
MAY 11...	0.030	<0.20	0.010	<0.010	<0.010	40	31	<3	27	<4
AUG 16...	0.030	<0.20	0.030	0.030	0.020	30	34	3	64	<4

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	SEDI- MENT, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
NOV 17...	3	<10	<1	<1	<1.0	91	<6	4	64
JAN 26...	--	--	--	--	--	--	--	12	73
MAR 23...	5	<10	2	<1	<1.0	58	<6	7	73
MAY 11...	2	<10	2	<1	<1.0	54	<6	8	62
AUG 16...	4	<10	1	<1	<1.0	70	<6	5	96

&lt; Actual value is known to be less than the value shown.

## KANAWHA RIVER BASIN

03177710 BLUESTONE RIVER AT FALLS MILLS, VA

LOCATION.--Lat 37°16'17", long 81°18'18", Tazewell County, Hydrologic Unit 05050002, on right bank at upstream side of bridge on State Highway 717, 0.3 mi upstream from Brush Fork, and 0.4 mi southeast of Falls Mills.

DRAINAGE AREA.--44.2 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,310.41 ft above sea level.

REMARKS.--No estimated daily discharges. Records fair. Some diurnal fluctuation caused by discharge from sewage treatment plant 2.3 mi upstream. About 65 percent of water discharged from the treatment plant was diverted from another drainage basin for municipal supply. Maximum discharge, 1,050 ft<sup>3</sup>/s, from rating curve extended above 670 ft<sup>3</sup>/s. Minimum discharge, 1.0 ft<sup>3</sup>/s, Jan. 18, 1981, gage height, 0.92 ft, result of freezeup. Several measurements of water temperature were made during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 450 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 8	0115	555	4.92	June 7	2300	566	5.00
Feb. 9	2330	541	4.82	June 9	1415	787	6.58
Feb. 11	2130	*885	*7.27	June 11	0600	628	5.44
Mar. 28	0830	695	5.92				

Minimum discharge, 4.8 ft<sup>3</sup>/s, Oct. 27, 29, Nov. 13, 14, gage height, 1.26 ft; minimum daily, 6.1 ft<sup>3</sup>/s, Oct. 29, Nov. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	18	36	83	90	73	202	97	29	30	24	37
2	18	13	27	92	73	186	164	78	28	28	25	26
3	18	15	23	81	63	197	156	81	27	33	25	23
4	16	13	95	119	57	156	149	135	27	28	24	21
5	15	18	359	105	66	172	127	102	25	26	40	20
6	12	15	199	97	64	137	120	83	26	26	29	24
7	11	12	139	261	59	109	157	73	91	26	25	20
8	12	11	109	393	58	102	154	131	215	25	24	18
9	20	8.5	84	173	253	99	134	99	364	24	22	17
10	24	7.6	76	114	383	155	147	81	195	24	21	17
11	14	7.1	82	87	586	151	191	66	383	24	20	16
12	25	6.6	59	309	619	117	157	60	260	22	21	16
13	16	6.7	45	231	364	98	217	52	150	25	19	15
14	14	6.1	42	166	245	92	179	47	112	24	18	17
15	13	16	67	126	182	77	157	50	112	23	21	16
16	12	18	116	107	157	70	153	58	92	30	24	16
17	13	32	118	119	115	64	130	79	73	24	191	21
18	13	30	92	125	94	62	111	121	62	23	74	31
19	30	25	83	114	81	57	102	88	55	22	49	20
20	14	22	65	111	73	53	93	58	50	20	41	18
21	20	14	81	85	75	66	81	55	47	25	40	16
22	14	11	65	62	68	89	75	50	45	28	38	15
23	8.5	9.9	51	63	116	65	69	44	41	25	31	15
24	7.3	10	44	84	168	56	64	38	42	22	28	14
25	7.5	9.6	40	116	147	61	60	42	38	20	26	14
26	8.4	8.4	31	174	114	52	55	48	37	42	25	30
27	6.8	144	27	157	87	164	58	45	52	65	24	18
28	6.8	108	84	264	73	587	48	36	39	40	24	15
29	6.1	75	164	220	---	458	84	34	34	41	23	15
30	25	52	136	158	---	316	117	31	32	28	22	15
31	25	---	107	114	---	252	---	30	---	26	21	---
TOTAL	467.4	742.5	2746	4510	4530	4393	3711	2092	2783	869	1039	576
MEAN	15.1	24.7	88.6	145	162	142	124	67.5	92.8	28.0	33.5	19.2
MAX	30	144	359	393	619	587	217	135	383	65	191	37
MIN	6.1	6.1	23	62	57	52	48	30	25	20	18	14
(†)	3.27	3.74	5.43	8.22	9.96	8.83	6.99	5.59	5.17	4.05	4.66	3.66

CAL YR 1993 TOTAL 21988.2 MEAN 60.2 MAX 768 MIN 6.1 (†) 4.57  
WTR YR 1994 TOTAL 28458.9 MEAN 78.0 MAX 619 MIN 6.1 (†) 5.80

† Discharge from sewage treatment plant, equivalent in cubic feet per second; provided by the Sanitary Board of Bluefield.

## KANAWHA RIVER BASIN

517

03177710 BLUESTONE RIVER AT FALLS MILLS, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	26.8	30.7	53.8	71.3	107	118	99.4	80.3	55.5	31.6	30.0	26.7
MAX	111	64.4	97.5	145	168	228	310	156	146	70.0	76.0	113
(WY)	1990	1986	1983	1994	1982	1993	1987	1984	1982	1981	1989	1989
MIN	12.5	12.2	12.2	8.64	41.7	21.0	30.5	31.0	13.0	14.2	10.9	13.5
(WY)	1992	1982	1981	1981	1988	1988	1986	1988	1988	1988	1988	1991

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

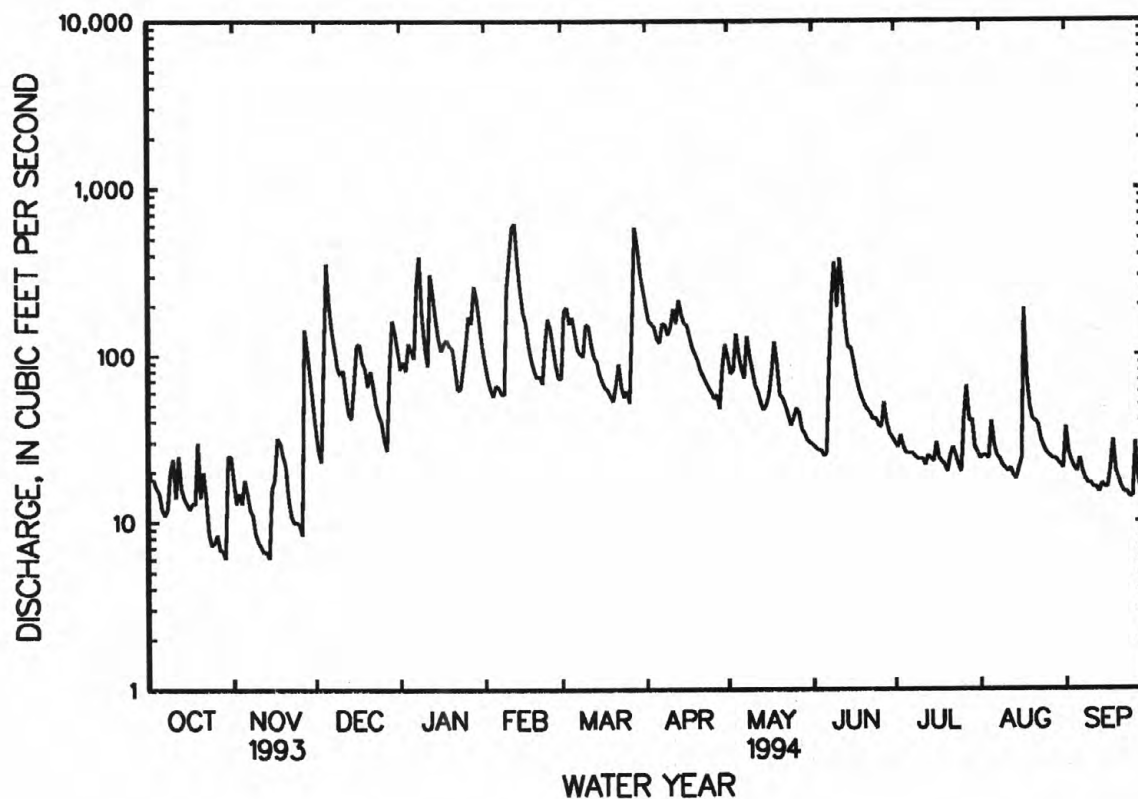
## WATER YEARS 1981 - 1994

ANNUAL TOTAL	21988.2	28458.9	
ANNUAL MEAN	60.2	78.0	60.7
HIGHEST ANNUAL MEAN			79.1
LOWEST ANNUAL MEAN			24.7
HIGHEST DAILY MEAN	768	Mar 24	935
LOWEST DAILY MEAN	6.1	aOct 29	3.9
ANNUAL SEVEN-DAY MINIMUM	7.3	Oct 23	6.0
INSTANTANEOUS PEAK FLOW			885
INSTANTANEOUS PEAK STAGE			7.27
INSTANTANEOUS LOW FLOW			4.8
ANNUAL RUNOFF (CFSM)	1.36	1.76	c1.0
ANNUAL RUNOFF (INCHES)	18.51	23.95	1.37
10 PERCENT EXCEEDS	137	165	135
50 PERCENT EXCEEDS	30	50	36
90 PERCENT EXCEEDS	11	15	13

a Also Nov. 14, 1993.

b Also Oct. 29, Nov. 13, 14, 1993.

c Result of freezeup.





## BIG SANDY RIVER BASIN

03207800 LEVISA FORK AT BIG ROCK, VA

LOCATION.--Lat 37°21'13", long 82°11'45", Buchanan County, Hydrologic Unit 05070202, on left bank at Big Rock, 2,000 ft downstream from Rocklick Creek, and 2,500 ft downstream from bridge on State Highway 645.

DRAINAGE AREA.--297 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 866.37 ft above sea level.

REMARKS.--Records good except those for period with ice effect, Jan. 17-22, and period of doubtful gage-height record, June 17-20, which are fair. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Maximum discharge, 56,000 ft<sup>3</sup>/s, from rating curve extended above 7,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 29, 1957, reached a stage of about 23.0 ft, information from local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0830	6,060	9.44	Feb. 11	1530	*13,800	*13.52
Jan. 7	2300	8,300	10.83	Mar. 28	0515	10,600	12.15
Feb. 10	0030	6,200	9.53	Apr. 13	0730	5,770	9.24

Minimum discharge, 32 ft<sup>3</sup>/s, Oct. 6, 7, 8, 9, gage height, 2.64 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	163	175	393	594	671	1440	580	144	107	118	205
2	42	134	145	370	507	1590	1210	512	137	90	107	167
3	49	118	130	437	464	2290	1020	478	131	83	158	118
4	41	117	389	2030	418	1490	856	560	127	78	117	96
5	37	115	4530	1210	413	1390	737	536	125	72	399	85
6	35	108	1440	778	409	1170	721	506	122	63	434	97
7	33	94	632	2750	364	949	800	569	120	78	268	90
8	32	79	413	4510	349	999	799	1820	117	82	245	76
9	33	69	316	1590	1840	1400	759	1290	129	68	153	68
10	61	64	296	1030	3680	2690	803	884	185	68	123	62
11	54	60	301	781	8150	2000	1250	663	182	61	103	60
12	98	58	259	991	4790	1320	1230	550	302	54	90	54
13	95	55	236	1150	2040	1040	3350	457	217	57	82	48
14	62	56	233	1000	1380	903	1720	400	147	64	78	47
15	51	89	352	764	1090	755	1230	379	139	92	138	45
16	45	124	637	584	878	661	1030	544	132	361	109	45
17	45	180	614	e500	736	581	811	395	e120	162	1280	83
18	43	230	489	e450	643	550	695	347	e110	113	936	236
19	124	169	398	e400	576	499	642	313	e100	102	436	107
20	197	151	329	e370	525	447	591	291	e90	107	277	69
21	142	127	360	e380	696	457	523	274	98	88	285	58
22	172	107	307	e400	907	751	498	253	105	85	267	53
23	117	95	285	423	2340	696	453	230	105	114	185	48
24	89	89	258	517	2560	612	410	211	138	70	141	55
25	73	83	249	1060	1540	688	381	201	120	59	116	121
26	64	83	231	2090	1150	685	381	233	113	112	99	317
27	57	591	212	1480	868	2160	479	297	381	637	147	177
28	52	654	233	1220	725	8150	526	209	282	504	188	115
29	48	339	448	1000	---	4580	587	182	176	354	115	89
30	80	232	547	819	---	2690	643	167	143	231	101	74
31	143	---	466	691	---	1780	---	154	---	152	91	---
TOTAL	2260	4633	15910	32168	40632	46644	26575	14485	4537	4368	7386	2965
MEAN	72.9	154	513	1038	1451	1505	886	467	151	141	238	98.8
MAX	197	654	4530	4510	8150	8150	3350	1820	381	637	1280	317
MIN	32	55	130	370	349	447	381	154	90	54	78	45
CFSM	.25	.52	1.73	3.49	4.89	5.07	2.98	1.57	.51	.47	.80	.33
IN.	.28	.58	1.99	4.03	5.09	5.84	3.33	1.81	.57	.55	.93	.37

e Estimated.

## BIG SANDY RIVER BASIN

519

03207800 LEVISA FORK AT BIG ROCK, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	135	218	383	567	676	735	713	495	266	145	118	86.4
MAX	692	911	1201	1596	1451	2107	2355	1323	1135	630	325	273
(WY)	1990	1978	1973	1974	1994	1975	1987	1984	1979	1979	1971	1989
MIN	6.85	19.3	76.9	82.7	168	139	154	113	40.2	29.1	33.3	12.6
(WY)	1970	1970	1981	1981	1968	1988	1986	1976	1970	1970	1969	1969

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

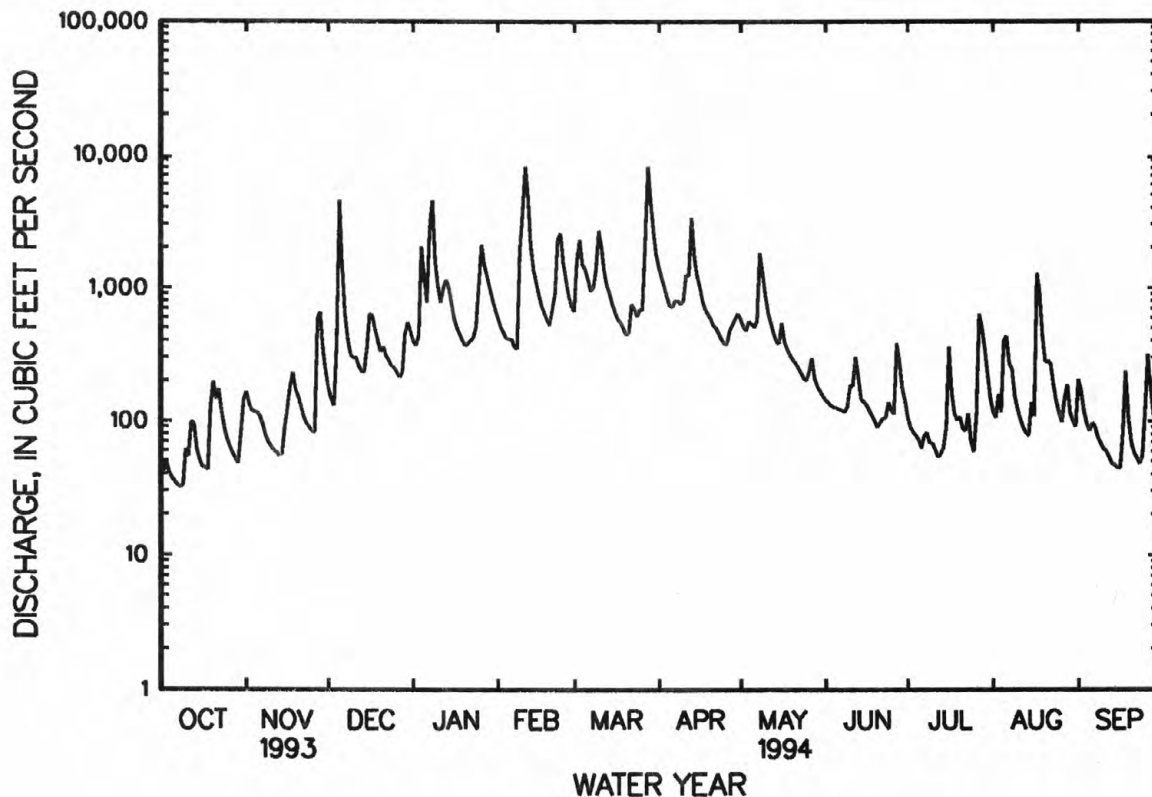
## WATER YEARS 1968 - 1994

ANNUAL TOTAL	118954	202563	
ANNUAL MEAN	326	555	377
HIGHEST ANNUAL MEAN			606
LOWEST ANNUAL MEAN			121
HIGHEST DAILY MEAN	4530	8150	24800
LOWEST DAILY MEAN	28	32	5.1
ANNUAL SEVEN-DAY MINIMUM	31	37	5.5
INSTANTANEOUS PEAK FLOW		13800	56000
INSTANTANEOUS PEAK STAGE		13.52	27.38
INSTANTANEOUS LOW FLOW		32	5.0
ANNUAL RUNOFF (CFSM)	1.10	1.87	1.27
ANNUAL RUNOFF (INCHES)	14.90	25.37	17.24
10 PERCENT EXCEEDS	704	1260	822
50 PERCENT EXCEEDS	148	259	180
90 PERCENT EXCEEDS	45	62	35

a Also Sept. 15, 1993.

b Also Oct. 7-9, 1993.

c Also Oct. 13, 14, 17-20, 1969.



## BIG SANDY RIVER BASIN

03208500 RUSSELL FORK AT HAYSI, VA

LOCATION.--Lat 37°12'25", long 82°17'45", Dickenson County, Hydrologic Unit 05070202, on right bank 180 ft downstream from bridge on State Highway 63, at Haysi, and 700 ft downstream from McClure River.

DRAINAGE AREA.--286 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1926 to current year. Monthly discharge only for some periods, published in WSP 1305.

REVISED RECORDS.--WSP 1003: 1926-43. WSP 1385: 1928(M), 1929, 1933(M), 1935(M), 1937-38(M).

GAGE.--Water-stage recorder. Datum of gage is 1,237.61 ft above sea level. Prior to Dec. 21, 1939, nonrecording gage at highway bridge 180 ft upstream at same datum.

REMARKS.--Records good except those for period with ice effect, Jan. 17-23, and period of doubtful gage-height record, June 17-21, which are fair. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Maximum discharge, 59,000 ft<sup>3</sup>/s, from rating curve extended above 32,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0800	8,830	9.45	Mar. 10	1045	5,610	7.48
Jan. 7	2400	8,520	9.26	Mar. 28	0345	*22,100	*16.25
Feb. 9	2300	8,580	9.30	Apr. 13	0830	8,660	9.35
Feb. 11	1430	19,600	15.11	Aug. 17	1230	5,290	7.27
Feb. 23	1700	7,430	8.61				

Minimum discharge, 15 ft<sup>3</sup>/s, Oct. 9, gage height, 1.87 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	134	131	379	493	536	1300	642	118	68	92	100
2	23	105	104	333	404	2180	1030	551	113	58	115	88
3	25	84	91	355	360	2830	838	488	105	54	296	76
4	22	73	807	2060	311	1560	699	566	96	52	144	69
5	19	70	6430	1110	308	1450	585	540	91	47	176	66
6	18	64	1400	693	300	1090	594	494	87	45	176	75
7	17	56	598	2650	259	833	698	553	90	42	118	72
8	17	47	384	4590	243	909	688	1740	101	39	100	62
9	17	40	279	1360	2730	1690	631	1120	127	40	80	55
10	24	38	253	780	4330	4130	672	736	120	37	68	52
11	27	37	256	574	12200	2120	1080	533	159	36	61	49
12	57	36	217	812	5750	1200	1030	433	147	35	57	46
13	67	34	194	978	2070	886	5130	352	118	36	52	43
14	40	34	189	796	1270	749	2070	295	102	49	57	41
15	28	55	289	568	937	620	1190	274	90	70	114	41
16	24	82	455	444	730	527	1000	311	89	281	79	40
17	22	96	443	e400	600	452	808	233	e80	149	2280	51
18	23	116	374	e360	511	427	681	202	e70	177	1040	93
19	100	103	306	e330	451	387	586	187	e64	189	483	66
20	102	86	248	e320	410	346	506	171	e60	151	347	49
21	92	71	284	e330	560	367	442	160	e58	166	318	43
22	126	58	250	e340	793	439	412	146	105	167	347	39
23	79	51	233	e360	3910	379	366	134	121	114	234	38
24	55	47	206	395	2860	354	325	125	115	74	166	38
25	43	45	196	901	1390	407	296	127	89	68	132	95
26	38	45	174	2150	952	420	279	164	76	77	114	246
27	35	1040	162	1490	698	3320	391	215	324	437	117	106
28	30	643	179	1460	576	13300	572	141	200	436	119	69
29	28	298	438	1220	---	5710	498	121	110	259	96	55
30	50	181	597	832	---	2700	698	120	82	191	90	47
31	123	---	481	622	---	1680	---	120	---	120	82	---
TOTAL	1397	3869	16648	29992	46406	53998	26095	11994	3307	3764	7750	2010
MEAN	45.1	129	537	967	1657	1742	870	387	110	121	250	67.0
MAX	126	1040	6430	4590	12200	13300	5130	1740	324	437	2280	246
MIN	17	34	91	320	243	346	279	120	58	35	52	38
CFSM	.16	.45	1.88	3.38	5.79	6.09	3.04	1.35	.39	.42	.87	.23
IN.	.18	.50	2.17	3.90	6.04	7.02	3.39	1.56	.43	.49	1.01	.26

e Estimated.

## BIG SANDY RIVER BASIN

521

03208500 RUSSELL FORK AT HAYSI, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1926 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	87.4	166	336	513	646	767	581	410	178	147	122	64.8
MAX	838	961	1326	2083	1797	2331	1994	1429	715	566	561	608
(WY)	1990	1978	1927	1937	1939	1955	1977	1958	1989	1938	1966	1989
MIN	.98	2.46	11.1	19.6	57.7	168	64.0	63.4	21.6	3.03	8.81	2.07
(WY)	1954	1954	1954	1940	1941	1988	1942	1941	1966	1930	1953	1943

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1926 - 1994

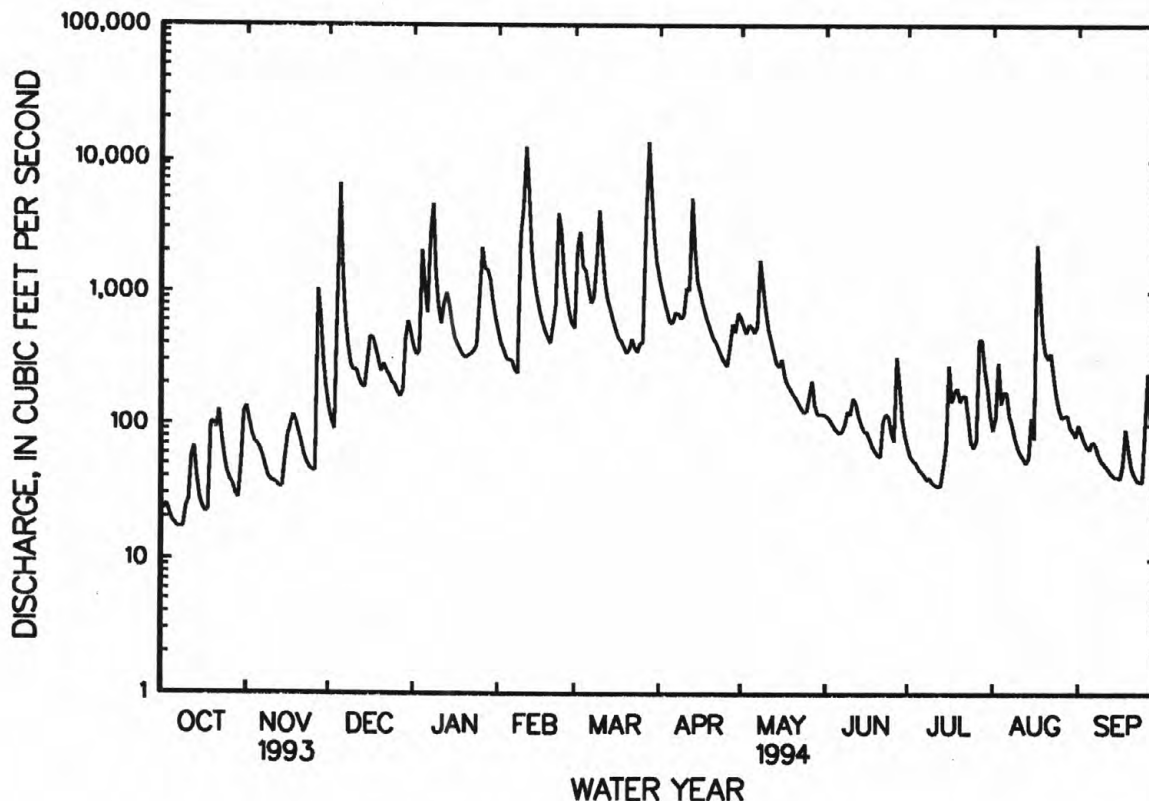
ANNUAL TOTAL	121648		207230									
ANNUAL MEAN	333		568									
HIGHEST ANNUAL MEAN												1994
LOWEST ANNUAL MEAN												1941
HIGHEST DAILY MEAN	6430	Dec 5	13300	Mar 28					30600	Apr 4	1977	
LOWEST DAILY MEAN	14	aSep 14	17	bOct 7					.20	Jun 27	1936	
ANNUAL SEVEN-DAY MINIMUM	17	Sep 9	19	Oct 4					.56	Jun 24	1936	
INSTANTANEOUS PEAK FLOW			22100	Mar 28					59000	Apr 4	1977	
INSTANTANEOUS PEAK STAGE			16.25	Mar 28					28.24	Apr 4	1977	
INSTANTANEOUS LOW FLOW			15	Oct 9					c.20	dJun 27	1936	
ANNUAL RUNOFF (CFSM)	1.17		1.99						1.17			
ANNUAL RUNOFF (INCHES)	15.82		26.95						15.86			
10 PERCENT EXCEEDS	723		1210						734			
50 PERCENT EXCEEDS	131		189						130			
90 PERCENT EXCEEDS	24		41						14			

a Also Sept. 15, 1993.

b Also Oct. 8, 9, 1993.

c Observed.

d Also June 28, 1936.



## BIG SANDY RIVER BASIN

03208680 NORTH FORK OF POUND LAKE AT POUND, VA  
(Formerly published as North Fork Pound River Lake at Pound)

LOCATION.--Lat 37°07'27", long 82°37'52", Wise County, Hydrologic Unit 05070202, in control tower of North Fork Pound Dam at Pound, 1,200 ft upstream from Stacy Branch, and 1.2 mi upstream from South Fork Pound River.

DRAINAGE AREA.--17.2 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1966 to current year. Published as "North Fork Pound River Lake" prior to October 1993.

GAGE.--Water-stage recorder. Datum of gage is at sea level (U.S. Army Corps of Engineers bench mark). Prior to Aug. 29, 1966, nonrecording gage at same site and datum.

REMARKS.--Lake is formed by rockfill dam. Spillway with crest at elevation 1,644.0 ft is in a saddle 350 ft southeast of dam. Except during major floods, all discharge will be through a diversion tunnel, the invert of the entrance of which is at elevation 1,556.5 ft. Storage began in September 1964 during construction with peak discharge affected thereafter; initial filling for regular operation started July 13, 1966. Total capacity at elevation 1,644.0 ft, top of spillway, is 11,290 acre-ft of which 8,110 acre-ft is flood-control storage for summer operations between elevations 1,611.0 ft, top of summer conservation pool, and 1,644.0 ft; an additional 1,290 acre-ft is available for flood control during the period December to March between elevations 1,601.0 ft, top of winter conservation pool, and 1,611.0 ft; contents at established minimum pool, 1,601.0 ft, is 1,900 acre-ft; dead storage is 7 acre-ft below elevation 1,556.5 ft. Figures given herein represent total contents. Lake is used for flood control, low-water augmentation for water-quality control, and recreation. U.S. Army Corps of Engineers satellite precipitation and elevation telemeter at station.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 6,920 acre-ft, Apr. 8, 1977, elevation, 1,629.41 ft; minimum (after initial filling for regular operation), 1,660 acre-ft, Jan. 23, 1969, elevation, 1,598.62 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 4,330 acre-ft, Feb. 13, elevation, 1,617.70 ft; minimum, 1,950 acre-ft, Mar. 12, elevation, 1,601.56 ft.

MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

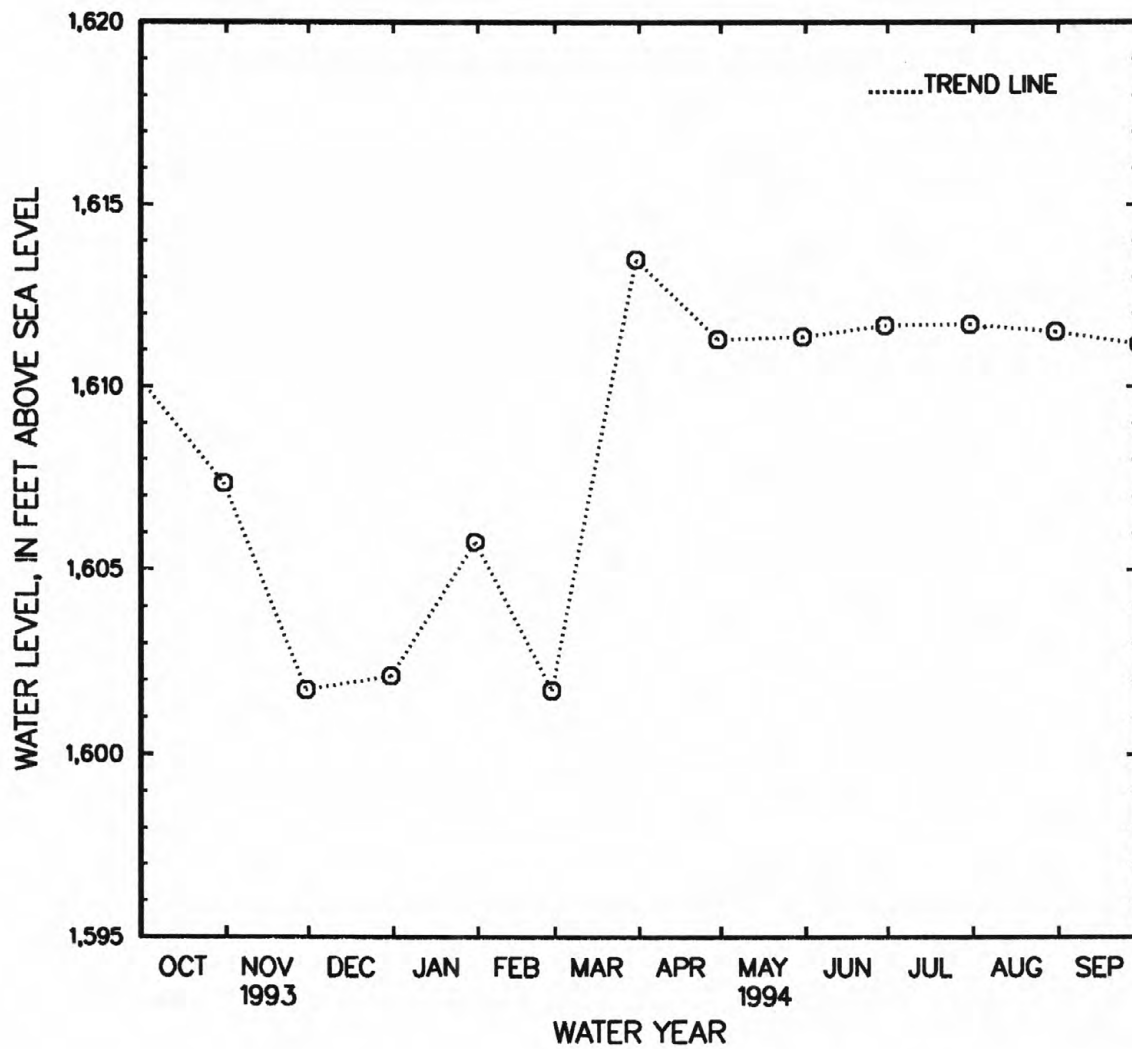
Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,610.25	3,071	-
Oct. 31.....	1,607.35	2,658	-413
Nov. 30.....	1,601.74	1,974	-684
Dec. 31.....	1,602.12	2,016	+42
CAL YR 1993.....	-	-	+36
Jan. 31.....	1,605.75	2,448	+432
Feb. 28.....	1,601.73	1,973	-475
Mar. 31.....	1,613.49	3,584	+1,611
Apr. 30.....	1,611.30	3,231	-353
May 31.....	1,611.37	3,242	+11
June 30.....	1,611.68	3,291	+49
July 31.....	1,611.71	3,295	+4
Aug. 31.....	1,611.51	3,264	-31
Sept. 30.....	1,611.16	3,209	-55
WTR YR 1994.....	-	-	+138



BIG SANDY RIVER BASIN

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03208680 NORTH FORK OF POUND LAKE AT POUND, VA--Continued



## BIG SANDY RIVER BASIN

03208950 CRANES NEST RIVER NEAR CLINTWOOD, VA

LOCATION.--Lat 37°07'26", long 82°26'20", Dickenson County, Hydrologic Unit 05070202, on left bank on State Highway 649, 500 ft downstream from Clinchfield Railway bridge, 1,000 ft downstream from Rush Creek, and 2.1 mi southeast of Clintwood.

DRAINAGE AREA.--66.5 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1963 to current year.

REVISED RECORDS.--WDR VA-77-1: 1967(M). WDR VA-92-1: 1991(P).

GAGE.--Water-stage recorder. Datum of gage is 1,440.30 ft above sea level.

REMARKS.--Records good except for period with ice effect, Jan. 16-22, which is fair. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Maximum discharge, 18,000 ft<sup>3</sup>/s, from rating curve extended above 3,100 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 0.91 ft, Sept. 28, 1964. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 29, 1957, reached a stage of about 20.0 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0700	2,000	9.72	Mar. 10	0715	1,360	7.87
Feb. 9	2130	1,490	8.26	Mar. 28	0315	3,570	13.21
Feb. 11	1500	*4,100	*14.13	Apr. 13	0730	1,900	9.43
Feb. 23	1430	2,080	9.93	Aug. 17	1200	1,760	9.04

Minimum daily discharge, 8.3 ft<sup>3</sup>/s, Oct. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	39	26	81	118	142	310	106	30	24	30	30
2	10	33	20	72	97	540	244	95	30	22	35	28
3	11	28	18	81	87	526	202	88	28	21	33	25
4	9.3	25	366	303	77	339	169	115	26	20	26	23
5	8.6	23	1310	186	78	291	145	105	25	19	30	23
6	8.3	23	296	132	75	229	149	101	24	18	29	26
7	8.4	21	150	390	65	189	208	142	24	17	23	23
8	8.4	18	98	563	62	256	176	380	37	16	21	21
9	8.6	18	73	241	634	442	153	214	38	16	20	20
10	14	17	65	155	694	942	170	147	46	16	19	19
11	15	17	59	121	2630	427	247	112	72	15	18	18
12	30	17	49	182	1050	278	220	96	38	15	17	17
13	20	16	44	185	464	218	1010	81	31	14	17	17
14	14	15	44	157	312	191	418	70	27	25	17	16
15	12	28	65	118	237	159	276	65	24	20	29	17
16	11	35	81	e100	189	138	276	73	24	45	21	16
17	10	33	72	e84	156	119	219	58	24	42	661	21
18	11	44	65	e76	135	111	180	51	22	31	203	34
19	27	33	57	e72	120	101	152	48	21	61	107	20
20	35	29	51	e70	106	91	131	47	20	28	78	18
21	36	24	56	e76	168	92	115	45	41	61	143	17
22	40	21	48	e80	204	109	105	42	49	38	134	16
23	22	20	45	90	1100	92	97	39	33	41	80	15
24	19	19	41	118	557	87	87	37	30	29	56	15
25	17	18	41	240	318	96	81	36	28	24	46	16
26	16	18	41	363	230	89	76	46	25	38	42	18
27	17	336	40	253	175	1020	122	61	105	150	43	17
28	15	132	49	351	148	2170	123	42	49	99	36	15
29	13	60	121	278	---	825	101	36	34	55	32	15
30	27	35	131	193	---	471	104	33	29	45	31	14
31	47	---	100	147	---	386	---	31	---	36	28	---
TOTAL	551.6	1195	3722	5558	10286	11166	6066	2642	1034	1101	2105	590
MEAN	17.8	39.8	120	179	367	360	202	85.2	34.5	35.5	67.9	19.7
MAX	47	336	1310	563	2630	2170	1010	380	105	150	661	34
MIN	8.3	15	18	70	62	87	76	31	20	14	17	14
CFSM	.27	.60	1.81	2.70	5.52	5.42	3.04	1.28	.52	.53	1.02	.30
IN.	.31	.67	2.08	3.11	5.75	6.25	3.39	1.48	.58	.62	1.18	.33

e Estimated.

## BIG SANDY RIVER BASIN

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03208950 CRANES NEST RIVER NEAR CLINTWOOD, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	32.1	49.4	88.5	119	144	166	138	96.1	51.4	32.4	33.0	24.9
MAX	191	164	228	338	367	434	498	262	236	75.7	142	116
(WY)	1990	1978	1992	1972	1994	1975	1977	1984	1989	1991	1966	1982
MIN	1.67	6.33	4.41	5.98	36.6	37.8	28.1	21.2	7.40	5.50	10.0	3.95
(WY)	1964	1966	1966	1966	1968	1988	1986	1976	1966	1970	1964	1965

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

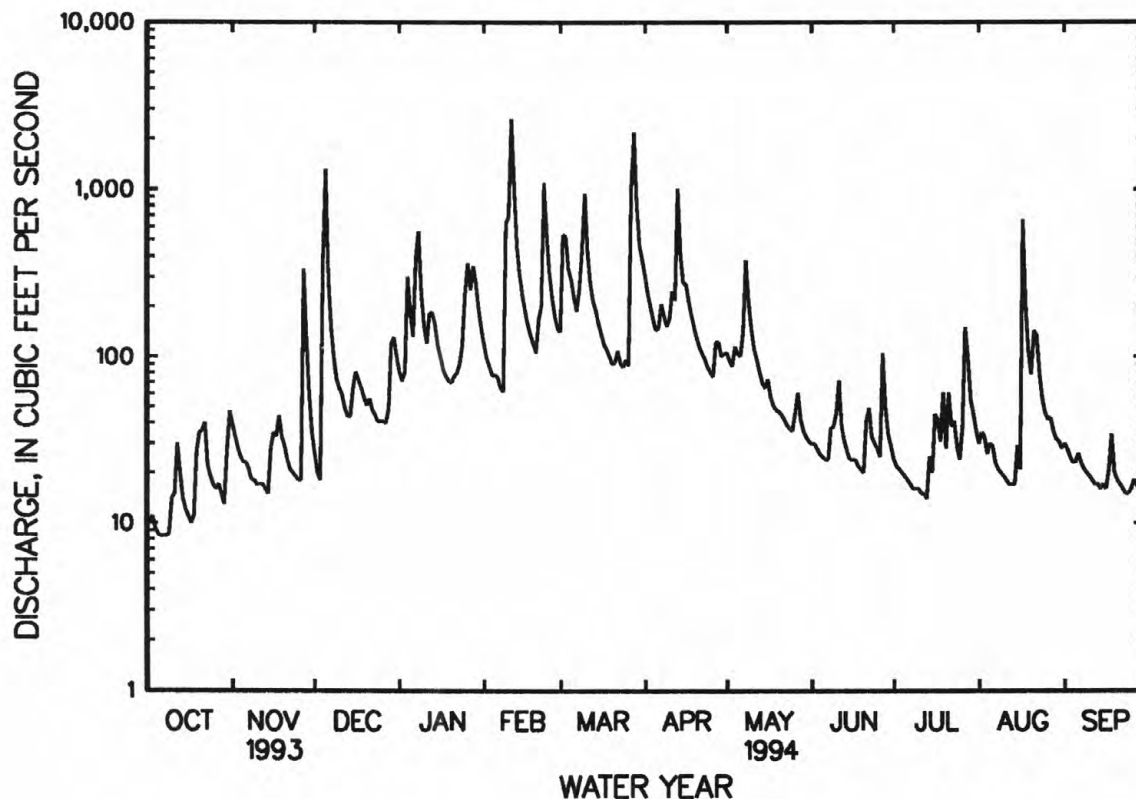
## FOR 1994 WATER YEAR

## WATER YEARS 1964 - 1994

ANNUAL TOTAL	31092.9	46016.6	
ANNUAL MEAN	85.2	126	81.0
HIGHEST ANNUAL MEAN			126
LOWEST ANNUAL MEAN			34.7
HIGHEST DAILY MEAN	1310	Dec 5	2630
LOWEST DAILY MEAN	8.3	Oct 6	8.3
ANNUAL SEVEN-DAY MINIMUM	8.9	Oct 3	8.9
INSTANTANEOUS PEAK FLOW			4100
INSTANTANEOUS PEAK STAGE			14.13
INSTANTANEOUS LOW FLOW			(b)
ANNUAL RUNOFF (CFSM)	1.28		1.90
ANNUAL RUNOFF (INCHES)	17.39		25.74
10 PERCENT EXCEEDS	200		278
50 PERCENT EXCEEDS	36		47
90 PERCENT EXCEEDS	12		17
			16.54
			175
			39
			7.7
			18000
			Feb 11
			Oct 3
			Oct 6
			Feb 11
			Apr 4
			Sep 17
			Sep 12
			Sep 12
			Apr 4
			Apr 4
			Sep 28
			1994
			1988
			1977
			1964
			1964
			1977
			1964

a From floodmark.

b Not determined.



## BIG SANDY RIVER BASIN

03208990 JOHN W. FLANNAGAN RESERVOIR NEAR HAYSI, VA

LOCATION.--Lat 37°14'00", long 82°20'56", Dickenson County, Hydrologic Unit 05070202, in control tower of John W. Flannagan Dam on Pound River, 1.3 mi upstream from Blacklog Branch, and 3.7 mi northwest of Haysi.

DRAINAGE AREA.--221 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is at sea level (U.S. Army Corps of Engineers bench mark). Prior to Mar. 31, 1965, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by rockfill dam. Spillway with crest at elevation 1,410.0 ft is in a saddle 0.3 mi upstream from dam and is equipped with 6 radial gates 36 ft high by 42 ft wide. Except during major floods, all discharge will be through a diversion tunnel, the invert of the entrance of which is at elevation 1,230.0 ft. Storage began in September 1961 during construction with peak discharge affected thereafter; initial filling for regular operations started in March 1965. Total capacity at elevation 1,446.0 ft, top of gates, is 145,700 acre-ft of which 78,600 acre-ft is controlled flood storage for summer operations between elevations 1,396.0 ft, top of summer conservation pool, and 1,446.0 ft; an additional 16,500 acre-ft is available for flood control during the period December to March between elevations 1,380.0 ft, top of winter conservation pool, and 1,396.0 ft; contents at established minimum pool, 1,314.0 ft, is 12,000 acre-ft; dead storage is 300 acre-ft below elevation 1,230.0 ft. Figures given herein represent total contents. Reservoir is used for flood control, low-water augmentation for water-quality control, and recreation. U.S. Army Corps of Engineers satellite precipitation and elevation telemeter at station.

COOPERATION.--Records were provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 116,500 acre-ft, Apr. 7, 1977, elevation, 1,430.80 ft; minimum (after initial filling for regular operation), 11,800 acre-ft, Apr. 1, 1965, elevation, 1,313.42 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 76,300 acre-ft, Mar. 30, elevation, 1,403.71 ft; minimum, 49,700 acre-ft, Jan. 19, elevation, 1,379.02 ft.

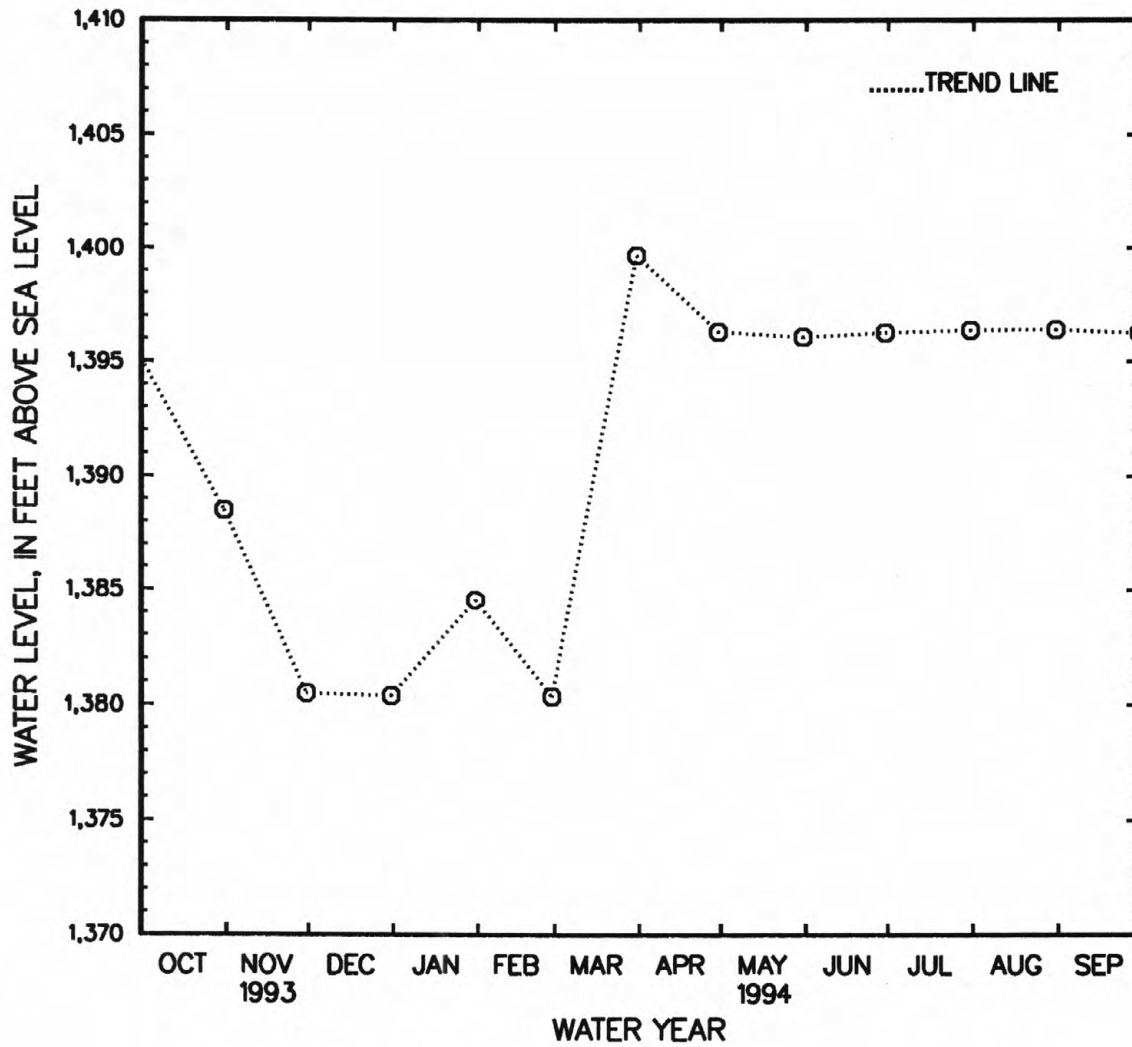
## MONTHEND ELEVATION AND CONTENTS AT 2400, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1,395.31	66,300	-
Oct. 31.....	1,388.49	58,900	-120
Nov. 30.....	1,380.50	51,000	-133
Dec. 31.....	1,380.39	50,900	-2
CAL YR 1993.....	-	-	0
Jan. 31.....	1,384.54	54,900	+65
Feb. 28.....	1,380.35	50,900	-72
Mar. 31.....	1,399.68	71,400	+333
Apr. 30.....	1,396.31	67,400	-67
May 31.....	1,396.08	67,200	-3
June 30.....	1,396.27	67,400	+3
July 31.....	1,396.38	67,500	+2
Aug. 31.....	1,396.40	67,500	0
Sept. 30.....	1,396.24	67,400	-2
WTR YR 1994.....	-	-	+2

BIG SANDY RIVER BASIN

527

03208990 JOHN W. FLANNAGAN RESERVOIR NEAR HAYSI, VA--Continued





## 03209000 POUND RIVER BELOW FLANNAGAN DAM, NEAR HAYSI, VA

LOCATION.--Lat 37°14'13", long 82°20'36", Dickenson County, Hydrologic Unit 05070202, on right bank 1,100 ft upstream from Blacklog Branch, 1,700 ft downstream from John W. Flannagan Dam, 1.4 mi upstream from mouth, and 3.4 mi northwest of Haysi.

DRAINAGE AREA.--221 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1926 to current year. Monthly discharge only for some periods, published in WSP 1305. Prior to October 1963, published as Pound River near Haysi.

REVISED RECORDS.--WSP 953: 1940-41. WSP 1003: 1942, 1943(P). WSP 1275: 1927-30, 1931(M), 1932-39.

GAGE.--Water-stage recorder. Datum of gage is 1,200.00 ft above sea level (U.S. Army Corps of Engineers bench mark). Prior to Dec. 20, 1939, nonrecording gage at site 3.8 mi upstream at different datum. Dec. 20, 1939, to Sept. 30, 1963, water-stage recorder at site 4.6 mi upstream at datum 79.91 ft higher.

REMARKS.--No estimated daily discharges. Records fair. Flow regulated since March 1965 by John W. Flannagan Reservoir (station 03208990) 1,700 ft upstream and since August 1966 by North Fork of Pound Lake (station 03208680) 33 mi upstream. U.S. Army Corps of Engineers satellite precipitation and gage-height telemeter at station. Maximum discharge, about 30,000 ft<sup>3</sup>/s, from rating curve extended above 1,750 ft<sup>3</sup>/s. Maximum discharge since construction of John W. Flannagan Dam in 1965, 4,540 ft<sup>3</sup>/s. Minimum gage height since construction of John W. Flannagan Dam, 1.42 ft, Feb. 16, 1968. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,240 ft<sup>3</sup>/s, Apr. 14, gage height, 7.96 ft; minimum, 10 ft<sup>3</sup>/s, Oct. 23, gage height, 1.78 ft; minimum daily, 46 ft<sup>3</sup>/s, Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	262	268	372	628	527	1990	396	72	94	77	120
2	195	278	184	372	1250	1500	1340	396	65	67	77	106
3	218	254	132	260	1240	2350	1040	400	67	67	127	62
4	48	244	130	1230	703	1390	857	400	67	67	150	63
5	48	217	651	1120	323	968	999	400	67	54	153	64
6	48	203	3150	730	323	968	999	404	66	48	153	75
7	48	203	3170	708	210	855	999	449	65	48	153	79
8	48	175	1500	1260	156	1130	1000	1470	73	49	101	81
9	265	141	528	2620	768	2050	1000	1870	102	50	60	83
10	261	154	311	1580	1360	1740	1000	1160	115	50	48	84
11	48	160	258	606	856	2640	415	472	114	50	50	78
12	126	181	258	620	1070	1990	119	264	86	49	50	50
13	254	192	191	735	2510	752	1130	218	84	48	52	51
14	259	192	161	621	3410	554	3430	218	92	48	53	51
15	192	192	182	566	3850	450	2660	220	92	48	53	53
16	302	240	336	552	3830	450	1330	264	92	165	54	53
17	261	314	319	424	2780	408	780	287	79	166	1260	53
18	94	406	246	340	945	310	595	237	72	165	1640	119
19	115	367	247	127	454	312	596	215	72	145	370	81
20	299	347	247	51	454	312	566	189	72	120	68	81
21	272	347	247	215	454	312	529	178	72	172	586	72
22	234	260	214	404	658	351	310	179	72	177	783	67
23	332	207	168	368	880	372	209	123	71	205	385	60
24	261	177	153	241	1990	372	210	97	162	166	254	58
25	141	163	153	461	2870	376	212	98	206	72	131	56
26	182	163	153	1560	1610	376	254	189	206	73	70	54
27	155	234	119	1360	1390	363	599	231	411	324	71	52
28	143	1170	138	808	632	50	1720	227	374	365	96	51
29	182	1170	324	48	---	50	793	224	203	211	173	50
30	200	585	401	49	---	1800	690	137	150	184	197	46
31	200	---	372	50	---	3240	---	85	---	113	111	---
TOTAL	5488	9198	14911	20458	37604	29318	28371	11697	3541	3660	7606	2053
MEAN	177	307	481	660	1343	946	946	377	118	118	245	68.4
MAX	332	1170	3170	2620	3850	3240	3430	1870	411	365	1640	120
MIN	48	141	119	48	156	50	119	85	65	48	48	46
CFSM	.80	1.39	2.18	2.99	6.08	4.28	4.28	1.71	.53	.53	1.11	.31
IN.	.92	1.55	2.51	3.44	6.33	4.93	4.78	1.97	.60	.62	1.28	.35
(†)	-127	-144	-1	+72	-81	+359	-73	-3	+4	+2	-1	-3
MEAN#	50.0	163	480	588	1262	587	873	374	114	116	244	65.4
CFSM#	.23	.74	2.17	2.66	5.71	2.66	3.95	1.69	.52	.52	1.10	.30
IN.#	.26	.82	2.50	3.07	5.95	3.06	4.41	1.95	.58	.61	1.28	.33
CAL YR 1993	TOTAL 104846	MEAN 287	MAX 3170	MIN 45	MEAN# 287	CFSM# 1.30	IN.# 17.65					
WTR YR 1994	TOTAL 173905	MEAN 476	MAX 3850	MIN 46	MEAN# 474	CFSM# 2.14	IN.# 29.15					

† Change in contents, equivalent in cubic feet per second, in North Fork of Pound Lake and John W. Flannagan Reservoir; provided by U.S. Army Corps of Engineers.

# Adjusted for change in contents.

## 03209000 POUND RIVER BELOW FLANNAGAN DAM, NEAR HAYSI, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1926 - 1964, BY WATER YEAR (WY) [UNREGULATED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	48.6	132	272	431	534	640	440	287	126	146	93.5	38.8
MAX	362	678	1064	1242	1118	1968	974	892	392	692	400	211
(WY)	1938	1930	1927	1937	1957	1963	1927	1958	1938	1942	1942	1928
MIN	1.00	2.33	8.34	16.0	35.0	226	57.7	45.1	11.3	3.07	4.22	.51
(WY)	1954	1940	1940	1940	1941	1931	1942	1941	1941	1930	1932	1932

## SUMMARY STATISTICS

## WATER YEARS 1926 - 1964

ANNUAL MEAN	265
HIGHEST ANNUAL MEAN	420
LOWEST ANNUAL MEAN	76.6
HIGHEST DAILY MEAN	16100
LOWEST DAILY MEAN	.10
ANNUAL SEVEN-DAY MINIMUM	.10
INSTANTANEOUS PEAK FLOW	30000
INSTANTANEOUS PEAK STAGE	16.5
INSTANTANEOUS LOW FLOW	<.10
ANNUAL RUNOFF (CFSM)	1.20
ANNUAL RUNOFF (INCHES)	16.28
10 PERCENT EXCEEDS	630
50 PERCENT EXCEEDS	94
90 PERCENT EXCEEDS	8.0

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1994, BY WATER YEAR (WY) [REGULATED, UNADJUSTED]

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	249	310	354	443	500	521	301	350	179	115	108	101
MAX	927	679	1003	1171	1343	1181	1004	1074	756	320	245	405
(WY)	1990	1978	1992	1972	1994	1975	1977	1975	1989	1989	1994	1982
MIN	48.9	24.8	16.1	31.8	92.3	110	49.0	47.4	9.66	5.49	7.13	32.5
(WY)	1989	1966	1966	1966	1992	1988	1982	1982	1966	1965	1965	1967

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1965 - 1994

ANNUAL TOTAL	104846	173905	
ANNUAL MEAN	287	476	294
HIGHEST ANNUAL MEAN			481
LOWEST ANNUAL MEAN			120
HIGHEST DAILY MEAN	3170	Dec 7	4410
LOWEST DAILY MEAN	45	Aug 18	2.3
ANNUAL SEVEN-DAY MINIMUM	49	Aug 17	2.5
INSTANTANEOUS PEAK FLOW			4240
INSTANTANEOUS PEAK STAGE			7.96
INSTANTANEOUS LOW FLOW			10
ANNUAL RUNOFF (CFSM)	1.30		2.16
ANNUAL RUNOFF (INCHES)	17.65		29.27
10 PERCENT EXCEEDS	547		1260
50 PERCENT EXCEEDS	158		218
90 PERCENT EXCEEDS	52		53

&lt; Less than.

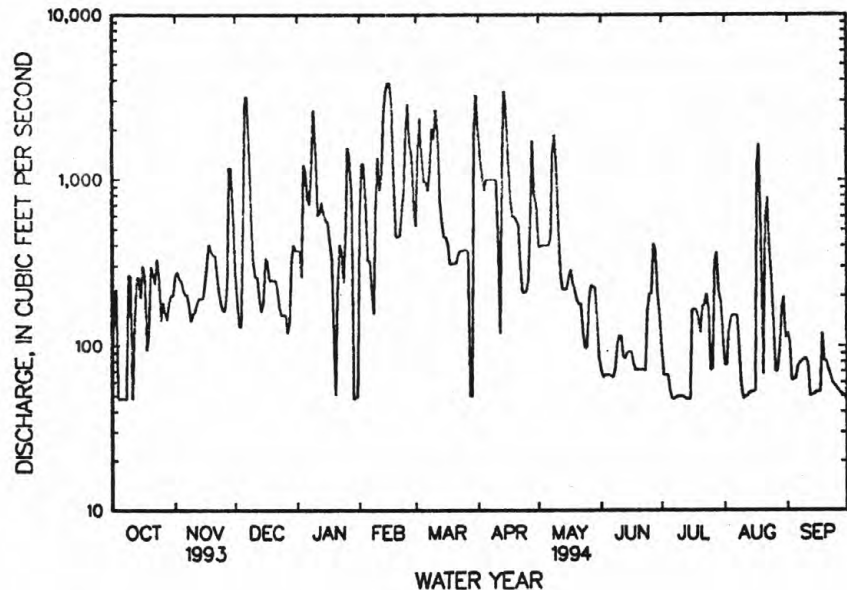
a Also Sept. 10, 12-22, 28-30, 1932.

b From floodmarks, site and datum then in use.

c On several days in September 1932.

d Also June 27-29, 1965.

f Also Aug. 26, 1986.



## BIG SANDY RIVER BASIN

03209500 LEVISA FORK AT PIKEVILLE, KY

LOCATION.--Lat 37°27'51", long 82°31'35", Pike County, Hydrologic Unit 05070203, on right bank 20 ft downstream from bridge on State Highway 1426, 0.75 mi downstream from Lanks Branch, 1.0 mi south of Pikeville, 1.5 mi upstream from Harolds Branch, and at mile 90.5.

DRAINAGE AREA.--1,232 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1937 to current year. Gage-height records collected in this vicinity since 1907 are contained in reports of the National Weather Service.

REVISED RECORDS.--WRD KY 78-1: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 631.98 ft above sea level. Prior to Sept. 23, 1944, nonrecording gage at site 2.3 mi downstream at datum 2.65 ft higher. Sept. 23, 1944, to Sept. 30, 1952, water-stage recorder 2.3 mi downstream at datum 1.65 ft higher. Oct. 1, 1952, to Sept. 30, 1979, at site 2.1 mi downstream at same datum.

REMARKS.--Estimated daily discharges: Dec. 29, Jan. 9-19, and Aug. 18-22. Records good except those for periods of estimated record, which are poor. Flow regulated since October 1968 by Fishtrap Lake, since August 1966 by North Fork Pound River Lake (station 03208680), and since March 1965 by John W. Flannagan Lake (station 03208990).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	627	709	1070	1560	2100	2680	9060	2510	468	439	410	467
2	625	709	730	1660	5120	6320	7560	2110	446	347	539	614
3	519	759	589	1700	3800	10700	5890	1850	418	315	452	427
4	310	766	932	6250	2170	8280	4790	2060	346	311	548	377
5	180	754	12500	6360	1350	6750	4800	1960	354	301	1750	360
6	171	737	10200	4060	1340	5450	4560	1890	371	273	1360	320
7	167	649	7430	4530	1360	4490	4420	2170	451	251	895	327
8	166	620	4060	3660	1090	4840	3750	8240	493	253	680	317
9	168	566	1900	3400	3530	9160	2540	6100	437	260	500	303
10	405	539	1300	3300	11500	12400	2710	4250	512	272	336	292
11	400	547	1040	3100	19700	10100	4380	2670	526	261	298	284
12	248	546	958	2900	14500	7930	4390	1910	573	244	283	274
13	353	575	959	2800	8280	4690	15100	1420	636	282	271	233
14	450	577	933	2500	8960	3790	11300	1260	534	298	264	228
15	449	632	976	2300	10800	3020	8210	1210	434	331	331	226
16	466	758	1420	1900	11300	2640	5790	1720	389	564	330	224
17	508	971	1950	1800	9920	2330	4370	1370	364	656	4480	271
18	454	1330	1620	1750	5020	2030	3580	1100	337	579	3800	462
19	365	1170	1410	1600	2730	1800	3820	986	323	488	1900	402
20	749	1050	1190	1500	2570	1670	3080	912	317	495	900	308
21	807	988	1260	1550	3050	1710	2280	845	316	432	1300	284
22	717	945	1270	1600	3960	2130	2110	767	356	691	1800	266
23	747	778	1040	1700	10200	2220	1570	738	365	775	1440	259
24	588	677	836	2000	10400	2060	1230	639	440	618	934	304
25	538	551	801	2900	9130	2790	1000	573	526	427	677	455
26	442	537	778	5600	6000	3040	970	621	502	315	452	695
27	458	1540	825	7540	5180	8850	1460	975	1640	757	420	787
28	389	2960	863	5450	3330	21600	3870	859	1540	2080	619	733
29	321	2660	1100	2660	---	9910	2460	720	994	1400	630	626
30	410	2990	1780	1840	---	7940	2720	638	553	941	564	441
31	573	---	1620	1400	---	10900	---	497	---	661	484	---
TOTAL	13770	29590	65340	92870	178390	184220	133770	55570	15961	16317	29647	11566
MEAN	444	986	2108	2996	6371	5943	4459	1793	532	526	956	386
MAX	807	2990	12500	7540	19700	21600	15100	8240	1640	2080	4480	787
MIN	166	537	589	1400	1090	1670	970	497	316	244	264	224

## BIG SANDY RIVER BASIN

531

03209500 LEVISA FORK AT PIKEVILLE, KY--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	848	1177	1689	2364	2866	2954	2370	1945	987	570	484	490
MAX	3939	3991	5385	6861	6371	8081	7646	6067	3492	1855	1022	1606
(WY)	1990	1978	1973	1974	1994	1975	1977	1984	1979	1979	1971	1989
MIN	158	353	300	278	814	529	388	349	210	200	203	168
(WY)	1970	1970	1981	1981	1992	1988	1986	1976	1988	1988	1969	1969

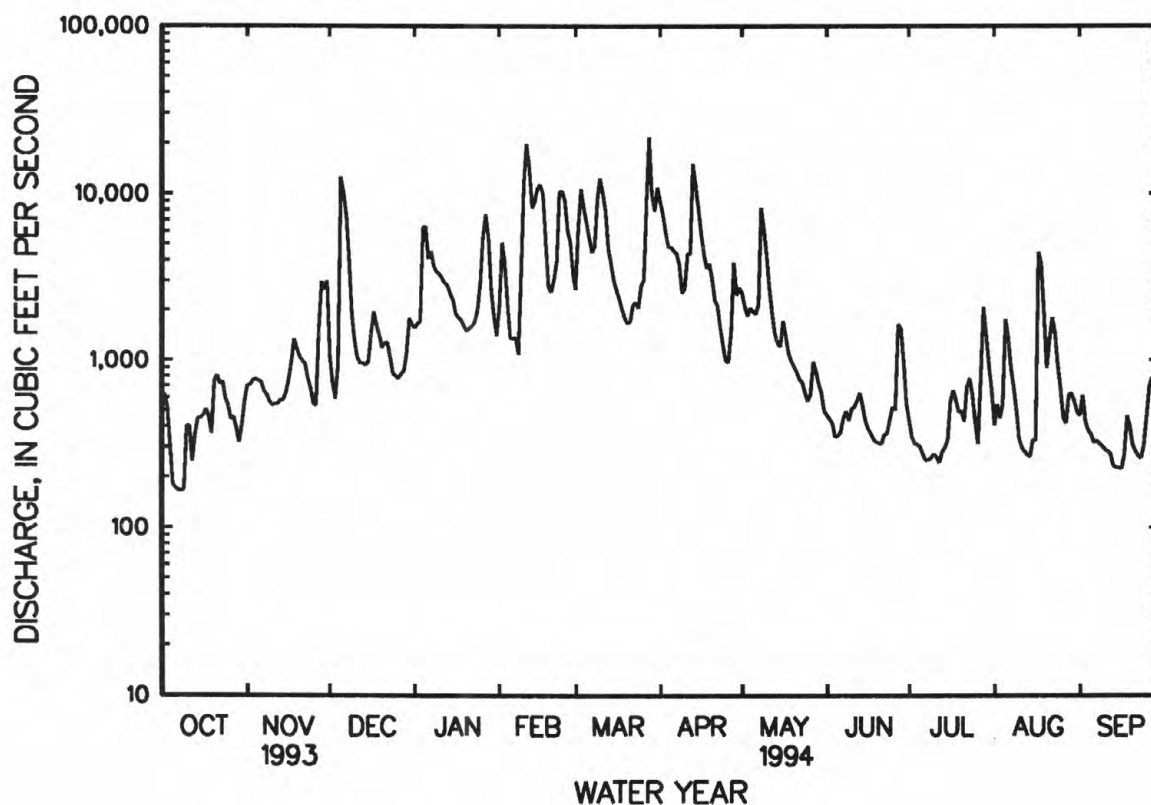
## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

## WATER YEARS 1969 - 1994

ANNUAL TOTAL	498942	827011	1555
ANNUAL MEAN	1367	2266	2459
HIGHEST ANNUAL MEAN			1979
LOWEST ANNUAL MEAN			522
HIGHEST DAILY MEAN	14200	21600	69300
LOWEST DAILY MEAN	166	166	66
ANNUAL SEVEN-DAY MINIMUM	183	224	103
INSTANTANEOUS PEAK FLOW		25600	85500
INSTANTANEOUS PEAK STAGE		35.09	52.72
INSTANTANEOUS LOW FLOW		166	66
10 PERCENT EXCEEDS	2840	6160	3600
50 PERCENT EXCEEDS	643	959	769
90 PERCENT EXCEEDS	213	313	231





## TENNESSEE RIVER BASIN

03471500 SOUTH FORK HOLSTON RIVER AT RIVERSIDE, NEAR CHILHOWIE, VA

LOCATION.--Lat 36°45'37", long 81°37'53", Smyth County, Hydrologic Unit 06010102, on right bank 400 ft upstream from highway bridge at Riverside, 900 ft upstream from Spring Branch, 3.2 mi downstream from Redstone Branch, 4.0 mi southeast of Chilhowie, and at mile 97.2.

DRAINAGE AREA.--76.1 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1920 to December 1931, July 1942 to current year. Monthly discharge only for some periods, published in WSP 1306. Prior to October 1924, published as "near Chilhowie." June 1907 to December 1909, at site 4.5 mi downstream also published as "near Chilhowie"; records not equivalent.

REVISED RECORDS.--WSP 1033: 1943-44(m). WSP 1306: Drainage area, 1921-31(M).

GAGE.--Water-stage recorder. Datum of gage is 2,106.77 ft above sea level. Nov. 1, 1920, to Nov. 14, 1931, nonrecording gage at site 400 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Prior to August 1951, diurnal fluctuation at low flow caused by mill 500 ft upstream from station. Maximum discharge, 9,600 ft<sup>3</sup>/s, from rating curve extended above 3,700 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge recorded, 2 ft<sup>3</sup>/s, but may have been less in 1925 and 1926 before installation of water-stage recorder. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 650 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	0900	964	4.24	Mar. 28	0545	*2,530	*6.22
Feb. 9	1900	1,770	5.39	Aug. 17	1430	2,470	6.16
Feb. 11	1800	2,450	6.14				

Minimum discharge, 24 ft<sup>3</sup>/s, Oct. 6-9; minimum gage height, 1.25 ft, Oct. 7, 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	31	48	125	164	171	401	311	65	72	99	70
2	26	29	44	110	140	228	331	231	63	64	89	67
3	26	29	42	99	125	284	278	201	61	58	93	64
4	26	31	71	99	115	252	239	252	59	56	81	61
5	25	36	728	84	124	299	206	256	58	54	89	58
6	25	38	355	76	143	273	195	214	57	53	90	58
7	24	34	187	90	139	231	238	221	71	57	81	57
8	24	32	131	319	134	209	240	276	89	50	75	54
9	24	31	104	232	884	193	215	275	108	49	67	51
10	27	30	96	167	1180	189	204	224	105	47	61	49
11	27	29	88	139	2080	179	252	182	94	46	57	48
12	28	29	77	384	1540	167	251	158	89	46	60	46
13	27	28	71	439	900	159	370	139	91	47	105	44
14	26	28	67	311	607	154	386	125	203	47	84	42
15	26	29	66	215	437	141	297	116	150	58	73	42
16	25	31	64	175	335	130	257	118	146	62	76	41
17	25	31	60	194	276	120	210	103	114	51	1250	42
18	26	34	59	259	239	117	186	98	96	49	653	46
19	26	33	59	201	214	112	170	93	85	47	305	43
20	26	32	58	168	201	105	155	91	78	45	241	40
21	27	31	60	147	191	104	143	87	75	43	234	39
22	28	30	56	129	175	124	134	82	71	54	212	37
23	27	29	54	119	253	121	126	78	65	86	169	37
24	26	29	51	124	421	119	117	74	93	81	137	37
25	26	28	50	133	353	118	111	71	82	64	117	37
26	26	28	47	228	277	110	106	84	72	83	105	40
27	25	69	48	293	217	250	118	94	106	135	99	40
28	25	73	61	312	184	1860	119	79	115	140	98	38
29	25	60	216	311	---	1250	161	74	98	117	88	35
30	28	53	206	245	---	764	420	70	84	151	85	35
31	31	---	154	196	---	515	---	67	---	121	75	---
TOTAL	810	1055	3478	6123	12048	9048	6636	4544	2743	2133	5148	1398
MEAN	26.1	35.2	112	198	430	292	221	147	91.4	68.8	166	46.6
MAX	31	73	728	439	2080	1860	420	311	203	151	1250	70
MIN	24	28	42	76	115	104	106	67	57	43	57	35
CFSM	.34	.46	1.47	2.60	5.65	3.84	2.91	1.93	1.20	.90	2.18	.61
IN.	.40	.52	1.70	2.99	5.89	4.42	3.24	2.22	1.34	1.04	2.52	.68



TENNESSEE RIVER BASIN

533

03471500 SOUTH FORK HOLSTON RIVER AT RIVERSIDE, NEAR CHILHOWIE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1932, 1942 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	50.8	70.3	112	150	203	211	172	137	88.9	58.9	56.0	45.9
MAX	162	409	272	350	508	512	570	278	322	172	168	254
(WY)	1990	1978	1973	1957	1957	1955	1987	1945	1923	1989	1958	1989
MIN	19.9	19.9	25.8	28.8	57.2	51.3	52.6	49.1	31.1	22.5	17.5	20.6
(WY)	1954	1954	1956	1956	1931	1988	1986	1926	1988	1988	1988	1988

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

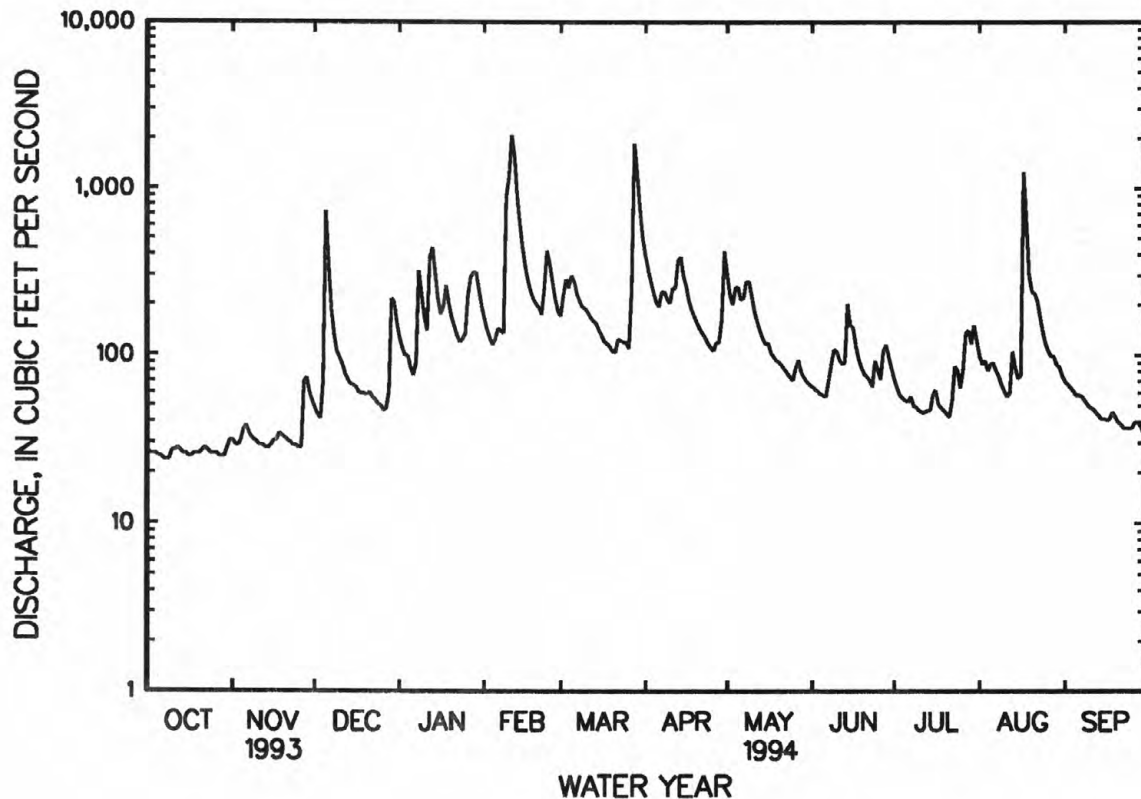
WATER YEARS 1921 - 1932,  
1942 - 1994

ANNUAL TOTAL	41849	55164	113
ANNUAL MEAN	115	151	162
HIGHEST ANNUAL MEAN			53.8
LOWEST ANNUAL MEAN			1974
HIGHEST DAILY MEAN	2070	Mar 24	2080
LOWEST DAILY MEAN	24	aOct 7	24
ANNUAL SEVEN-DAY MINIMUM	25	Oct 3	25
INSTANTANEOUS PEAK FLOW			2530
INSTANTANEOUS PEAK STAGE			6.22
INSTANTANEOUS LOW FLOW			24
ANNUAL RUNOFF (CFSM)	1.51	1.99	1.48
ANNUAL RUNOFF (INCHES)	20.46	26.97	20.16
10 PERCENT EXCEEDS	230	277	227
50 PERCENT EXCEEDS	58	89	71
90 PERCENT EXCEEDS	27	29	27

a Also Oct. 8, 9, 1993.

b Also Oct. 7-9, 1993.

c Also Oct. 15, 1943, Aug. 9, 11, 1944, and Oct. 19, 1945.



## TENNESSEE RIVER BASIN

03473000 SOUTH FORK HOLSTON RIVER NEAR DAMASCUS, VA

LOCATION.--Lat 36°39'06", long 81°50'39", Washington County, Hydrologic Unit 06010102, on right bank 500 ft upstream from bridge on U.S. Highway 58, 0.7 mi downstream from Laurel Creek, 3.2 mi northwest of Damascus, 4.9 mi upstream from Middle Fork, and at mile 77.2.

DRAINAGE AREA.--301 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1931 to current year. Monthly discharge only for some periods, published in WSP 1306. Published as "at Vestal" prior to October 1978.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1306: 1932-33(M).

GAGE.--Water-stage recorder. Datum of gage is 1,792.30 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Prior to 1980, some diurnal fluctuation at low flow caused by powerplant upstream from station. Tennessee Valley Authority satellite gage-height telemeter at station. Maximum discharge, 22,000 ft<sup>3</sup>/s, from rating curve extended above 10,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 2.07 ft, Aug. 19, 1988. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1000	5,500	9.41	Mar. 28	0330	10,800	12.69
Feb. 9	2000	7,150	10.60	Aug. 17	1900	3,570	7.25
Feb. 11	0845	*12,500	*13.63				

Minimum discharge, 75 ft<sup>3</sup>/s, Oct. 9, gage height, 2.21 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	131	201	732	697	722	1690	888	294	394	308	231
2	91	118	175	611	596	1030	1350	709	280	333	295	225
3	87	121	162	525	536	1220	1140	652	261	299	282	215
4	85	131	386	544	485	1100	990	956	250	363	252	202
5	82	237	3950	446	575	1150	855	945	238	312	499	191
6	80	267	1900	395	716	1060	863	795	228	289	493	217
7	78	197	1010	568	675	909	1090	767	254	310	372	247
8	77	161	683	2070	647	843	1080	1030	550	258	318	200
9	77	142	522	1350	4080	806	934	1020	429	234	277	182
10	95	131	495	927	4800	783	894	846	409	229	244	171
11	98	122	530	736	10400	726	1370	690	368	217	223	163
12	111	115	464	1770	5560	669	1350	593	332	232	223	156
13	108	111	423	1920	3050	627	1780	518	311	274	386	149
14	94	108	394	1410	2030	627	1760	460	524	240	294	143
15	87	115	379	1010	1470	569	1300	430	456	242	251	141
16	84	118	362	753	1150	523	1260	448	435	290	247	138
17	84	122	330	858	948	476	1040	378	360	258	1910	146
18	90	155	317	1060	817	464	900	352	314	250	1850	193
19	94	136	323	793	722	441	786	335	280	223	910	154
20	89	138	311	730	660	404	693	326	279	264	652	138
21	91	132	370	632	633	394	617	311	299	215	599	131
22	115	122	329	550	586	441	572	293	270	301	538	127
23	101	118	310	518	979	401	525	277	239	399	434	125
24	93	114	282	555	2010	391	479	266	310	428	362	125
25	90	110	267	598	1730	410	449	255	286	316	318	123
26	88	107	248	1100	1240	390	423	463	253	299	292	145
27	87	429	248	1370	935	1520	437	851	625	529	292	137
28	86	444	395	1320	776	7710	447	523	577	564	305	126
29	84	311	1830	1200	---	5160	482	412	506	441	263	121
30	106	243	1530	995	---	3270	998	355	490	405	292	116
31	133	---	988	824	---	2220	---	317	---	358	239	---
TOTAL	2860	5006	20114	28870	49503	37456	28554	17461	10707	9766	14220	4878
MEAN	92.3	167	649	931	1768	1208	952	563	357	315	459	163
MAX	133	444	3950	2070	10400	7710	1780	1030	625	564	1910	247
MIN	77	107	162	395	485	390	423	255	228	215	223	116
CFSM	.31	.55	2.16	3.09	5.87	4.01	3.16	1.87	1.19	1.05	1.52	.54
IN.	.35	.62	2.49	3.57	6.12	4.63	3.53	2.16	1.32	1.21	1.76	.60

TENNESSEE RIVER BASIN

535

03473000 SOUTH FORK HOLSTON RIVER NEAR DAMASCUS, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	220	289	492	656	844	889	728	560	355	285	258	182
MAX	938	1258	1203	1490	2022	2075	1995	1162	792	1079	1193	790
(WY)	1978	1978	1973	1957	1957	1955	1987	1984	1992	1938	1940	1989
MIN	76.5	85.3	93.6	101	200	228	224	155	129	100	89.6	79.0
(WY)	1953	1940	1940	1940	1941	1988	1942	1941	1988	1988	1988	1954

SUMMARY STATISTICS

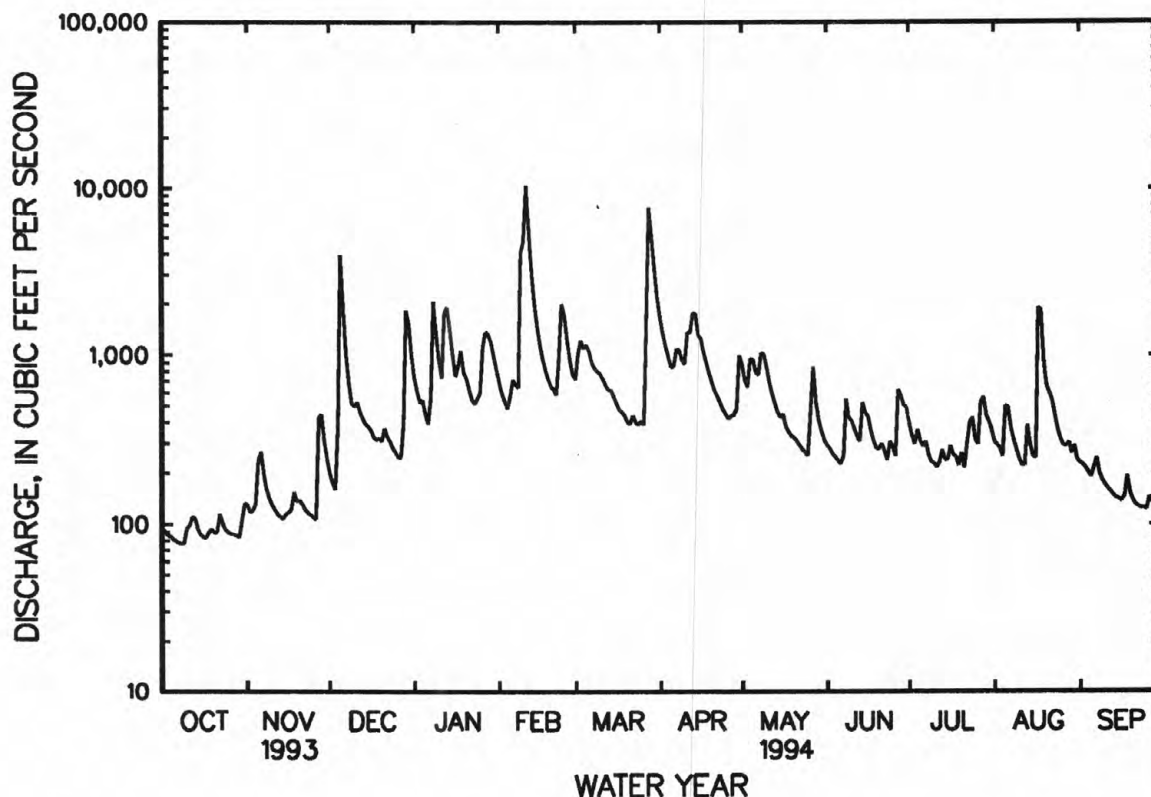
FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1932 - 1994

ANNUAL TOTAL	167833	229395	
ANNUAL MEAN	460	628	479
HIGHEST ANNUAL MEAN			712
LOWEST ANNUAL MEAN			245
HIGHEST DAILY MEAN	5680	Mar 24	12800
LOWEST DAILY MEAN	74	Sep 15	40
ANNUAL SEVEN-DAY MINIMUM	81	Oct 3	63
INSTANTANEOUS PEAK FLOW			22000
INSTANTANEOUS PEAK STAGE			17.11
INSTANTANEOUS LOW FLOW			30
ANNUAL RUNOFF (CFSM)	1.53	2.09	1.59
ANNUAL RUNOFF (INCHES)	20.74	28.35	21.61
10 PERCENT EXCEEDS	964	1230	991
50 PERCENT EXCEEDS	281	386	305
90 PERCENT EXCEEDS	92	115	112

a Also Oct. 9, 1993.  
b Also Dec. 24, 1943.



## TENNESSEE RIVER BASIN

03475000 MIDDLE FORK HOLSTON RIVER NEAR MEADOWVIEW, VA

LOCATION.--Lat 36°42'47", long 81°49'08", Washington County, Hydrologic Unit 06010102, on left bank 48 ft downstream from bridge on State Highway 803, 0.9 mi upstream from Cedar Creek, 4.1 mi southeast of Meadowview, and at mile 13.2.

DRAINAGE AREA.--211 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1931 to September 1953, May 1976 to current year. Monthly discharge only for October 1931, published in WSP 1306.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1276: 1932-34.

GAGE.--Water-stage recorder. Datum of gage is 1,820.22 ft above sea level.

REMARKS.--Records good except for period with ice effect, Jan. 20, which is fair. Prior to 1954, flow regulated by powerplant 0.9 mi upstream from station. Maximum discharge, 12,500 ft<sup>3</sup>/s, from rating curve extended above 12,000 ft<sup>3</sup>/s. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Jan. 29, 1957, reached a stage of 11.8 ft, from floodmark, discharge, 10,000 ft<sup>3</sup>/s, and flood of Dec. 10, 1972, reached a stage of 11.0 ft, from floodmark, discharge, 8,540 ft<sup>3</sup>/s, from information by Tennessee Valley Authority. Flood of Mar. 30, 1975, reached a stage of 10.37 ft, discharge, 7,410 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 10	0130	4,830	8.61	Mar. 28	1230	*6,920	*10.08
Feb. 11	2000	6,730	9.96				

Minimum discharge, 55 ft<sup>3</sup>/s, Oct. 6, 7-9, 19, gage height, 1.94 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64	135	81	293	324	421	1030	315	142	113	157	106
2	61	125	74	246	280	786	859	292	138	106	145	101
3	60	110	72	218	255	946	720	280	135	100	141	95
4	59	86	199	219	236	741	625	472	131	97	129	91
5	58	105	1340	197	250	781	543	505	126	99	136	88
6	57	128	589	173	333	680	537	405	124	94	141	93
7	56	106	302	214	321	560	549	377	151	92	122	101
8	56	90	215	1180	304	513	516	502	233	87	113	88
9	55	73	174	692	1670	526	478	501	316	85	107	83
10	61	70	166	427	3230	512	462	412	336	84	104	78
11	63	67	179	333	5170	476	856	346	249	83	99	76
12	70	66	160	695	4130	433	756	305	201	102	94	74
13	68	64	145	899	2070	401	1170	273	178	114	91	73
14	61	64	135	608	1530	387	1220	247	166	97	88	71
15	59	68	132	434	1040	359	822	235	161	99	88	70
16	58	69	137	345	823	333	712	258	145	133	94	70
17	59	76	131	334	682	307	579	221	134	113	519	74
18	59	105	124	429	594	295	509	203	126	109	781	86
19	60	87	125	331	531	286	457	194	121	107	322	87
20	58	79	120	e310	487	267	416	189	123	98	215	76
21	62	74	146	273	462	260	381	182	124	89	185	72
22	84	68	139	241	440	340	357	174	152	88	190	70
23	70	66	129	228	581	310	337	167	125	182	153	69
24	63	64	121	251	1080	298	315	160	129	158	135	68
25	62	63	116	262	912	297	298	156	132	119	124	68
26	61	62	111	381	676	279	282	194	120	264	117	86
27	77	140	104	503	528	716	286	254	164	583	127	82
28	117	168	133	537	452	4700	287	193	149	486	125	72
29	114	117	889	560	---	2940	267	169	133	276	114	69
30	127	93	691	461	---	1900	333	157	120	213	115	67
31	138	---	401	378	---	1220	---	149	---	180	108	---
TOTAL	2177	2688	7580	12652	29391	23270	16959	8487	4784	4650	5179	2404
MEAN	70.2	89.6	245	408	1050	751	565	274	159	150	167	80.1
MAX	138	168	1340	1180	5170	4700	1220	505	336	583	781	106
MIN	55	62	72	173	236	260	267	149	120	83	88	67
CFSM	.33	.42	1.16	1.93	4.97	3.56	2.68	1.30	.76	.71	.79	.38
IN.	.38	.47	1.34	2.23	5.18	4.10	2.99	1.50	.84	.82	.91	.42

e Estimated.

03475000 MIDDLE FORK HOLSTON RIVER NEAR MEADOWVIEW, VA--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1953, 1976 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	117	134	215	341	456	456	358	294	189	145	149	99.4
MAX	479	739	526	692	1050	899	1158	677	485	420	649	357
(WY)	1977	1978	1943	1937	1994	1993	1987	1990	1981	1938	1940	1989
MIN	45.3	44.3	49.9	52.6	64.0	114	98.3	74.2	61.5	55.5	50.5	50.0
(WY)	1934	1942	1940	1940	1934	1988	1942	1941	1988	1988	1988	1952

## SUMMARY STATISTICS

## FOR 1993 CALENDAR YEAR

## FOR 1994 WATER YEAR

WATER YEARS 1932 - 1953,  
1976 - 1994

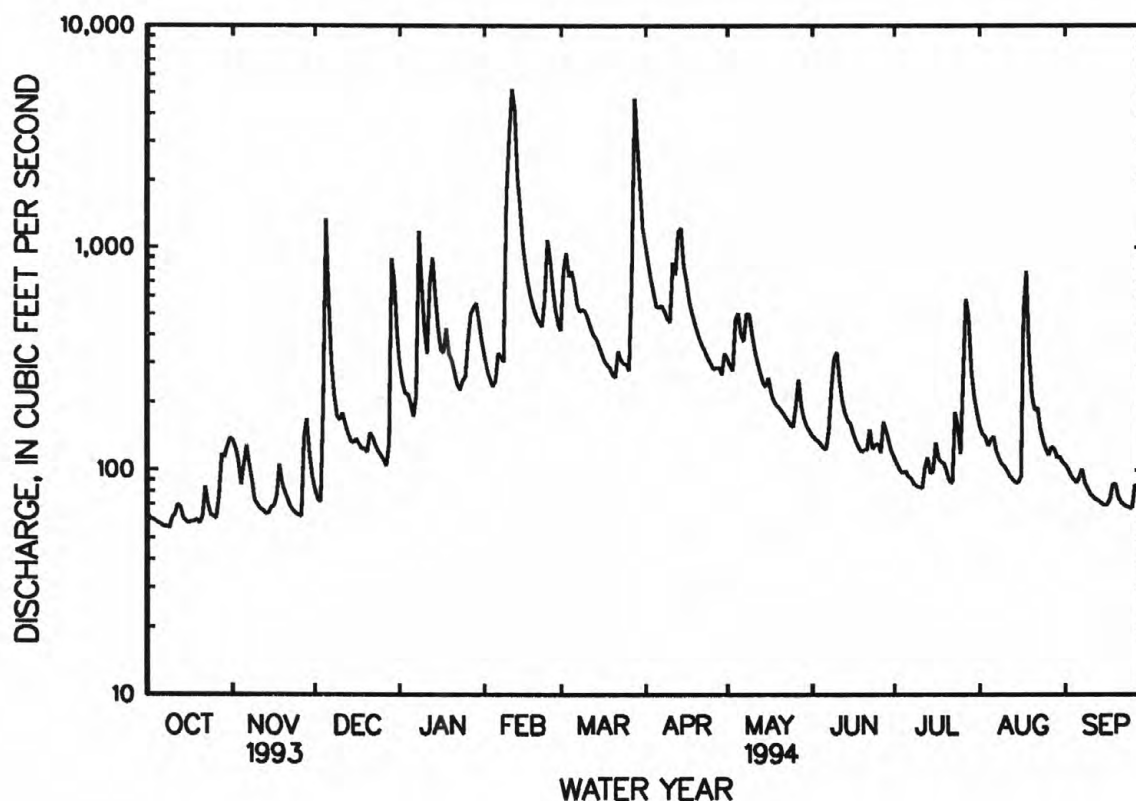
ANNUAL TOTAL	90248	120221	
ANNUAL MEAN	247	329	246
HIGHEST ANNUAL MEAN			356
LOWEST ANNUAL MEAN			105
HIGHEST DAILY MEAN	3410	5170	8220
LOWEST DAILY MEAN	52	55	7.0
ANNUAL SEVEN-DAY MINIMUM	55	57	37
INSTANTANEOUS PEAK FLOW		6920	12500
INSTANTANEOUS PEAK STAGE		10.08	13.41
INSTANTANEOUS LOW FLOW		55	6.0
ANNUAL RUNOFF (CFSM)	1.17	1.56	1.16
ANNUAL RUNOFF (INCHES)	15.91	21.20	15.83
10 PERCENT EXCEEDS	517	686	496
50 PERCENT EXCEEDS	131	160	146
90 PERCENT EXCEEDS	62	69	62

a Also Sept. 15, 1993.

b Flow was regulated by powerplant.

c Also Oct. 7-9, 19, 1993.

d Also Dec. 4, 1936, Jan. 21, 22, Feb. 1, 1940, Jan. 8, 1942, and Oct. 15, 16, 31, 1943.





## TENNESSEE RIVER BASIN

03478400 BEAVER CREEK AT BRISTOL, VA

LOCATION.--Lat 36°37'54", long 82°08'02", Bristol City, Hydrologic Unit 06010102, on right bank 50 ft upstream from bridge on State Highway 1405, 75 ft downstream from Goose Creek, 0.9 mi downstream from Clear Creek, 3.7 mi northeast of Bristol, VA post office, and at mile 20.6.

DRAINAGE AREA.--27.7 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1957 to current year. Published as "near Bristol" prior to October 1974.

GAGE.--Water-stage recorder. Datum of gage is 1,780.98 ft above sea level.

REMARKS.--No estimated daily discharges. Records good. Small diurnal fluctuation at low flow caused by withdrawal of water, which is returned to stream 600 ft upstream from station, for car-washing operation. Since September 1965, some regulation at high flow by flood-control reservoirs, capacity, 7,600 acre-ft. Maximum discharge, 1,600 ft<sup>3</sup>/s, from rating curve extended above 390 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1936 reached a stage of about 12 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 618 ft<sup>3</sup>/s, Feb. 11, gage height, 7.36 ft; minimum, 12 ft<sup>3</sup>/s, Nov. 25-26, gage height, 2.69 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	16	27	45	55	87	144	52	35	28	20	20
2	15	15	25	44	52	125	122	48	34	26	20	19
3	14	14	23	44	50	124	110	52	33	25	20	18
4	14	14	117	53	49	108	100	53	32	24	20	18
5	14	23	272	46	59	97	92	47	31	24	26	18
6	14	19	126	44	55	89	102	45	31	23	20	19
7	14	17	85	86	51	83	89	45	30	23	19	17
8	14	15	71	123	53	90	80	54	31	23	19	16
9	14	15	63	84	206	89	76	44	31	22	19	16
10	15	14	63	76	231	107	85	42	37	22	18	15
11	14	14	59	67	534	92	92	40	32	22	18	15
12	18	14	53	96	380	85	84	39	30	23	17	15
13	15	14	52	82	299	81	120	37	29	23	17	15
14	14	13	47	75	212	79	99	36	30	23	17	15
15	14	15	46	67	138	75	96	39	29	22	17	15
16	14	16	43	61	114	71	108	40	30	22	19	15
17	14	16	41	67	101	67	89	35	30	25	34	17
18	14	16	40	65	93	66	84	35	27	23	24	17
19	14	15	39	58	85	63	79	34	27	21	20	15
20	13	15	40	55	80	61	74	33	27	21	23	14
21	18	14	53	53	81	64	70	33	26	21	42	14
22	16	13	45	51	75	63	67	32	25	23	26	14
23	14	13	43	51	127	58	65	31	26	22	22	14
24	14	13	40	52	122	56	61	30	27	21	20	14
25	13	13	39	59	103	55	58	30	25	20	20	17
26	14	17	37	68	94	53	55	47	29	30	19	21
27	13	96	36	65	86	172	57	43	56	37	26	16
28	13	48	47	74	81	353	53	38	32	28	23	15
29	13	35	59	67	---	320	51	36	35	24	22	14
30	17	30	52	63	---	233	53	35	31	22	22	14
31	17	---	47	59	---	182	---	34	---	21	20	---
TOTAL	449	602	1830	2000	3666	3348	2515	1239	928	734	669	482
MEAN	14.5	20.1	59.0	64.5	131	108	83.8	40.0	30.9	23.7	21.6	16.1
MAX	18	96	272	123	534	353	144	54	56	37	42	21
MIN	13	13	23	44	49	53	51	30	25	20	17	14
CFSTM	.52	.72	2.13	2.33	4.73	3.90	3.03	1.44	1.12	.85	.78	.58
IN.	.60	.81	2.46	2.69	4.92	4.50	3.38	1.66	1.25	.99	.90	.65

TENNESSEE RIVER BASIN

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03478400 BEAVER CREEK AT BRISTOL, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	18.8	20.1	32.6	42.3	54.9	59.6	52.4	41.0	32.2	25.0	21.3	18.2
MAX	76.1	58.0	128	141	131	130	111	129	73.1	53.4	64.5	48.9
(WY)	1973	1978	1973	1974	1994	1963	1977	1958	1972	1972	1982	1982
MIN	8.08	10.3	9.13	8.92	19.5	19.7	19.3	17.7	13.0	10.2	9.96	9.23
(WY)	1970	1970	1966	1966	1981	1988	1985	1985	1988	1988	1988	1969

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

WATER YEARS 1958 - 1994

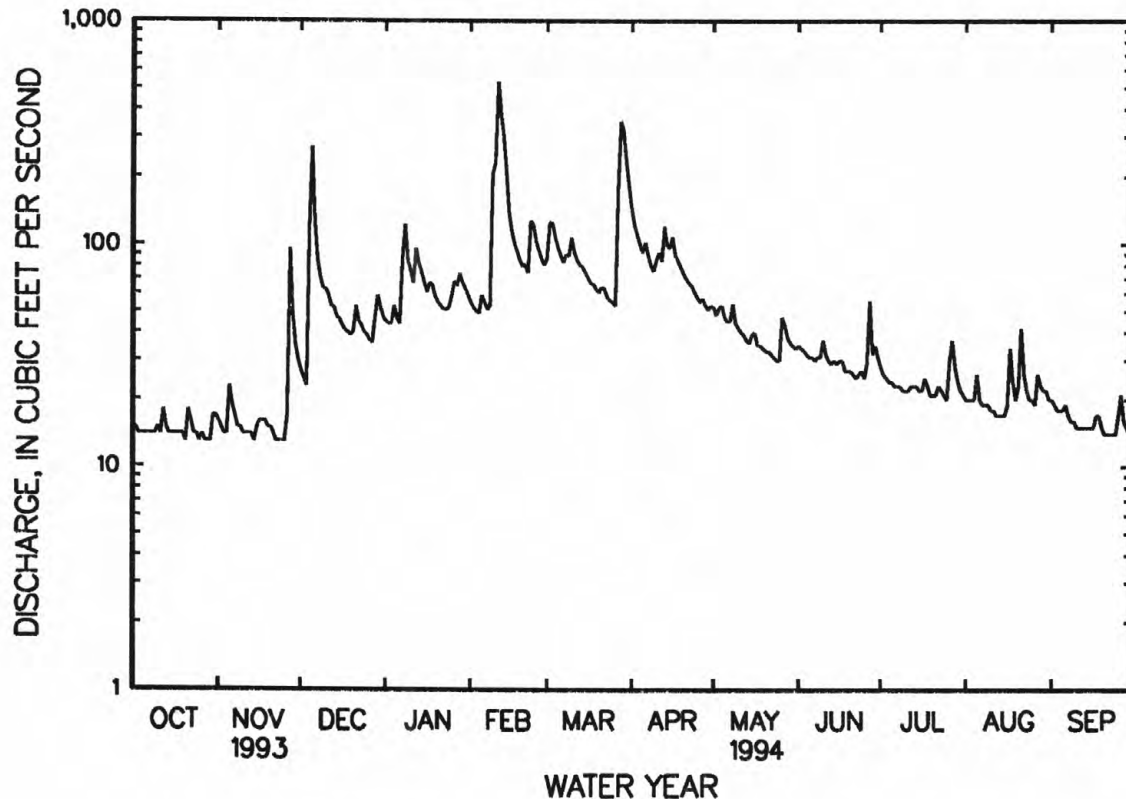
ANNUAL TOTAL	13710	18462	
ANNUAL MEAN	37.6	50.6	34.8
HIGHEST ANNUAL MEAN			62.8
LOWEST ANNUAL MEAN			16.2
HIGHEST DAILY MEAN	272	534	580
LOWEST DAILY MEAN	12	13	7.4
ANNUAL SEVEN-DAY MINIMUM	12	13	7.6
INSTANTANEOUS PEAK FLOW		618	1600
INSTANTANEOUS PEAK STAGE		7.36	9.94
INSTANTANEOUS LOW FLOW		12	3.4
ANNUAL RUNOFF (CFSM)	1.36	1.83	1.25
ANNUAL RUNOFF (INCHES)	18.41	24.79	17.06
10 PERCENT EXCEEDS	74	96	63
50 PERCENT EXCEEDS	31	34	27
90 PERCENT EXCEEDS	14	14	12

a Also Sept. 3, 7, 8, 10-14, 1993.

b Also Oct. 25, 27-29, and Nov. 14, 22-25, 1993.

c Also Sept. 29 and Oct. 5, 15, 18, 19, 23, 24, 1969.

d Also Nov. 26, 1993.



## TENNESSEE RIVER BASIN

03488000 NORTH FORK HOLSTON RIVER NEAR SALTVILLE, VA

LOCATION.--Lat 36°53'48", long 81°44'47", Smyth County, Hydrologic Unit 06010101, on right bank 0.5 mi upstream from Cedar Branch bridge, 1.5 mi northeast of Saltville, 7.8 mi downstream from Laurel Creek, and at mile 85.0.

DRAINAGE AREA.--222 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1907 to December 1908 (published as "at Saltville"), October 1920 to current year. Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 758: Drainage area. WSP 1113: 1944-47. WSP 1306: 1907(M), 1921-22(M), 1924-30(M), 1932-34(M), drainage area at site used 1907-8. WSP 1726: 1947, monthly and yearly runoff.

GAGE.--Water-stage recorder. Datum of gage is 1,703.53 ft above sea level. June 11, 1907, to Nov. 12, 1908, nonrecording gage on highway bridge 2.1 mi downstream at different datum. Nov. 2, 1920, to May 23, 1934, nonrecording gage on highway bridge 0.5 mi downstream at datum 7.74 ft lower.

REMARKS.--Records good except for period with ice effect, Jan. 20-22, which is fair. National Weather Service gage-height telemeter at station. Maximum discharge, 16,500 ft<sup>3</sup>/s, from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum discharge, 1.0 ft<sup>3</sup>/s, Oct. 15, 16, 1947, gage height, 0.13 ft, flow retarded by mine cave-in. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 3,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1100	3,220	5.59	Mar. 28	0930	*8,910	*9.83
Feb. 9	2230	5,180	7.27	Apr. 30	0630	3,760	6.09
Feb. 11	2330	8,510	9.58				

Minimum discharge, 23 ft<sup>3</sup>/s, Oct. 8, 9, gage height, 0.48 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	54	90	371	423	416	1020	1280	111	72	95	77
2	31	59	73	307	336	804	813	796	107	67	84	83
3	29	51	63	261	290	1090	678	598	103	63	88	79
4	28	48	221	271	260	810	575	755	99	61	82	71
5	26	63	2570	237	256	854	480	701	96	59	91	66
6	26	94	1100	201	296	761	468	567	93	58	112	66
7	25	85	509	269	280	620	525	479	97	56	101	71
8	24	69	317	1590	273	548	515	569	109	55	84	66
9	24	56	234	888	2810	541	473	557	134	54	74	57
10	30	49	204	545	3490	696	473	474	154	52	67	53
11	31	44	208	404	5810	721	894	389	132	50	61	48
12	41	41	189	1210	4890	594	793	334	123	51	58	45
13	39	40	166	1410	2000	500	1780	292	116	57	55	43
14	37	39	159	890	1330	453	1730	257	103	65	51	41
15	35	39	172	592	943	397	1010	238	98	61	54	41
16	31	40	219	409	712	348	785	242	101	71	60	40
17	30	41	232	440	567	305	611	213	91	71	527	41
18	31	44	228	583	472	286	521	192	83	69	1120	53
19	29	49	223	405	403	270	459	180	78	59	510	67
20	31	53	204	e370	361	243	413	172	76	74	305	53
21	35	48	209	e340	356	249	366	165	76	70	233	44
22	44	45	186	e300	360	449	332	155	96	73	214	40
23	50	42	165	287	813	398	308	146	84	90	166	37
24	50	39	149	272	1530	362	277	139	92	75	135	37
25	38	37	137	285	1120	347	257	133	87	63	113	37
26	34	36	123	566	808	312	241	149	80	107	100	53
27	32	204	135	784	590	1360	321	187	102	263	94	56
28	33	372	164	1050	471	6420	481	155	108	327	100	51
29	30	191	1030	1040	---	3510	838	132	90	220	103	44
30	38	121	887	722	---	2010	3060	123	78	157	93	38
31	46	---	528	541	---	1270	---	116	---	117	84	---
TOTAL	1045	2193	11094	17840	32250	27944	21497	10885	2997	2787	5114	1598
MEAN	33.7	73.1	358	575	1152	901	717	351	99.9	89.9	165	53.3
MAX	50	372	2570	1590	5810	6420	3060	1280	154	327	1120	83
MIN	24	36	63	201	256	243	241	116	76	50	51	37
CFSM	.15	.33	1.61	2.59	5.19	4.06	3.23	1.58	.45	.40	.74	.24
IN.	.18	.37	1.86	2.99	5.40	4.68	3.60	1.82	.50	.47	.86	.27

e Estimated.

## TENNESSEE RIVER BASIN

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03488000 NORTH FORK HOLSTON RIVER NEAR SALTVILLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1907 - 1909, 1921 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	117	170	333	465	573	605	452	369	223	126	118	88.7
MAX	916	1077	1178	1317	1500	1735	1311	858	837	353	584	474
(WY)	1977	1978	1927	1957	1957	1955	1987	1990	1923	1938	1940	1989
MIN	24.9	27.5	32.4	49.9	98.0	121	120	80.4	46.3	33.6	25.2	25.8
(WY)	1954	1940	1940	1966	1934	1988	1942	1941	1930	1988	1988	1930

## SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

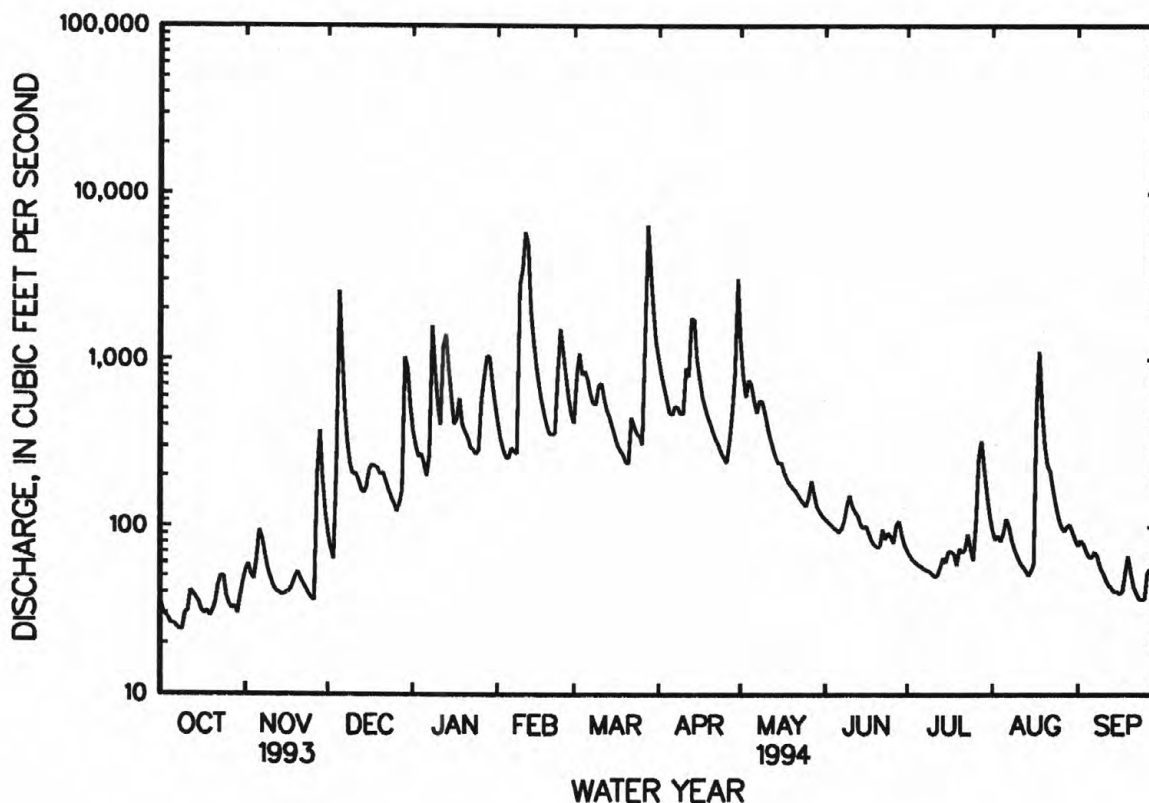
 WATER YEARS 1907 - 1909,  
1921 - 1994

ANNUAL TOTAL	105777	137244	
ANNUAL MEAN	290	376	301
HIGHEST ANNUAL MEAN			457
LOWEST ANNUAL MEAN			135
HIGHEST DAILY MEAN	5810	Mar 24	10900
LOWEST DAILY MEAN	24	aOct 8	2.0
ANNUAL SEVEN-DAY MINIMUM	26	Oct 3	21
INSTANTANEOUS PEAK FLOW			8910
INSTANTANEOUS PEAK STAGE			9.83
INSTANTANEOUS LOW FLOW			23
ANNUAL RUNOFF (CFSM)	1.31	1.69	1.35
ANNUAL RUNOFF (INCHES)	17.72	23.00	18.41
10 PERCENT EXCEEDS	682	823	646
50 PERCENT EXCEEDS	137	154	156
90 PERCENT EXCEEDS	37	40	39

a Also Oct. 9, 1993.

b Flow retarded by mine cave-in.

c Also Oct. 16, 1947.



## TENNESSEE RIVER BASIN

03524000 CLINCH RIVER AT CLEVELAND, VA

LOCATION.--Lat 36°56'41", long 82°09'18", Russell County, Hydrologic Unit 06010205, on right bank 500 ft upstream from highway bridge at Cleveland, 0.5 mi downstream from Muddy Hollow, 2.3 mi downstream from Weaver Creek, 4.4 mi downstream from Thompson Creek, and at mile 271.6.

DRAINAGE AREA.--528 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1920 to current year. Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1306: 1921-23(M), 1926(M), 1929-31(M). WSP 1706: 1927(M).

GAGE.--Water-stage recorder. Datum of gage is 1,500.24 ft above sea level. Prior to Nov. 1, 1931, nonrecording gage on highway bridge 500 ft downstream at datum 1.0 ft lower.

REMARKS.--Records good except for period with ice effect, Jan. 18-23, which is poor. National Weather Service gage-height telemeter at station. Tennessee Valley Authority gage-height Automatic Data Acquisition System at station, called at 6-hour intervals by computer at Knoxville, Tennessee. Maximum discharge, 34,500 ft<sup>3</sup>/s, from rating curve extended above 26,000 ft<sup>3</sup>/s on basis of contracted-opening measurement at gage height 24.40 ft. Minimum gage height, 0.96 ft, Feb. 10, 1934. Several measurements of water temperature made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1630	5,850	9.62	Feb. 11	2200	*17,100	*18.54
Jan. 8	0800	6,350	10.15	Mar. 28	1630	13,000	15.85

Minimum discharge, 75 ft<sup>3</sup>/s, Oct. 9, gage height, 1.27 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	128	143	305	964	1180	1040	2760	1450	234	172	302	203
2	110	155	240	761	934	1930	2170	1290	224	156	261	237
3	99	146	204	667	788	3000	1770	977	215	147	421	249
4	92	140	326	1280	684	2150	1520	1120	208	139	281	206
5	88	144	4580	1310	637	1920	1310	1120	200	133	271	185
6	85	156	3510	976	698	1710	1190	969	194	127	307	178
7	82	159	1520	1480	673	1440	1230	926	190	126	282	178
8	79	164	922	5710	615	1320	1230	1320	250	134	223	169
9	77	144	651	3110	4160	1390	1110	1450	447	127	189	156
10	89	130	532	1750	8200	2120	1090	1150	363	119	169	144
11	91	120	516	1280	13200	2270	1900	913	358	115	155	136
12	115	111	487	1600	12900	1780	1780	759	350	119	143	129
13	145	107	418	2370	5130	1470	1870	658	491	145	134	125
14	125	104	376	1870	2880	1310	2100	582	365	132	132	120
15	110	112	412	1410	2010	1130	1720	538	298	141	142	121
16	98	118	743	989	1580	966	1530	572	324	287	165	113
17	92	127	927	979	1300	836	1270	520	269	246	1160	114
18	88	160	799	e840	1080	757	1060	450	224	210	2050	139
19	87	193	665	e740	924	707	925	410	199	171	1070	195
20	87	203	568	e680	811	637	822	385	187	152	661	174
21	95	174	605	e600	793	612	732	365	246	183	539	140
22	109	155	625	e620	891	765	677	345	242	190	525	125
23	126	141	533	e640	2140	735	636	322	302	146	423	117
24	113	129	464	683	3820	668	584	302	233	142	334	113
25	104	121	408	1050	2630	669	540	287	200	135	278	117
26	100	115	358	2120	1920	658	507	301	194	291	245	150
27	95	440	334	2200	1460	2050	509	414	267	467	225	169
28	91	1010	364	2390	1190	11200	572	359	270	896	218	145
29	87	659	1480	2790	---	9570	543	299	228	1160	238	131
30	99	423	1990	1940	---	5740	1120	269	196	752	220	118
31	116	---	1360	1480	---	3600	---	249	---	438	204	---
TOTAL	3102	6203	27222	47279	75228	66150	36777	21071	7968	7898	11967	4596
MEAN	100	207	878	1525	2687	2134	1226	680	266	255	386	153
MAX	145	1010	4580	5710	13200	11200	2760	1450	491	1160	2050	249
MIN	77	104	204	600	615	612	507	249	187	115	132	113
CFSM	.19	.39	1.66	2.89	5.09	4.04	2.32	1.29	.50	.48	.73	.29
IN.	.22	.44	1.92	3.33	5.30	4.66	2.59	1.48	.56	.56	.84	.32

e Estimated.



TENNESSEE RIVER BASIN

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03524000 CLINCH RIVER AT CLEVELAND, VA--Continued

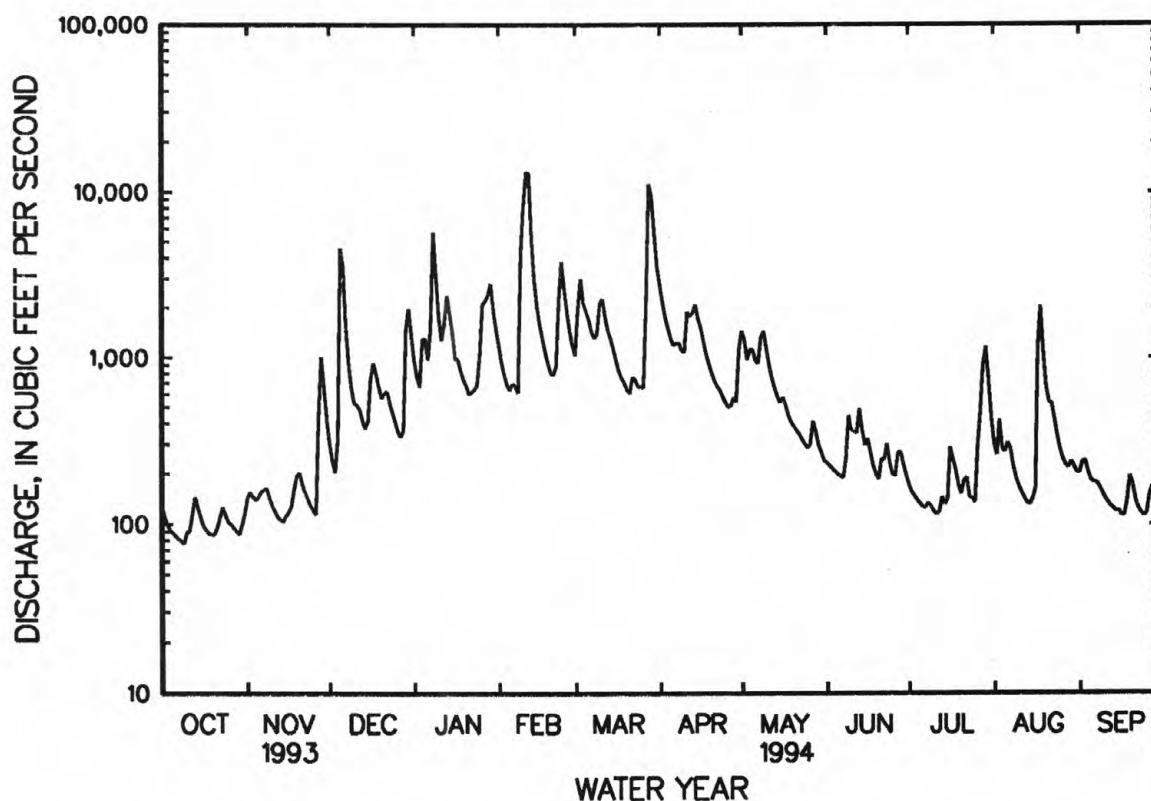
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1921 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	267	399	784	1128	1370	1426	1018	791	479	330	318	214
MAX	1389	2011	3043	2817	3360	4572	3414	2254	2016	972	1640	1003
(WY)	1977	1978	1927	1937	1957	1955	1987	1958	1923	1938	1940	1989
MIN	53.8	64.0	80.7	92.1	206	309	228	195	79.7	78.2	63.2	55.3
(WY)	1931	1940	1940	1940	1941	1988	1942	1941	1930	1930	1988	1930

SUMMARY STATISTICS

	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1921 - 1994	
ANNUAL TOTAL	231983		315461		707	
ANNUAL MEAN	636		864		1076	
HIGHEST ANNUAL MEAN					287	
LOWEST ANNUAL MEAN					27800	
HIGHEST DAILY MEAN	9130	Mar 24	13200	Feb 11	Apr 5	1977
LOWEST DAILY MEAN	68	Sep 15	77	Oct 9	37	aSep 13 1964
ANNUAL SEVEN-DAY MINIMUM	73	Sep 11	84	Oct 5	40	Sep 13 1964
INSTANTANEOUS PEAK FLOW			17100	Feb 11	34500	Apr 5 1977
INSTANTANEOUS PEAK STAGE			18.54	Feb 11	26.40	Apr 5 1977
INSTANTANEOUS LOW FLOW			75	Oct 9	35	Sep 28 1964
ANNUAL RUNOFF (CFSM)	1.20		1.64		1.34	
ANNUAL RUNOFF (INCHES)	16.34		22.23		18.18	
10 PERCENT EXCEEDS	1520		1920		1560	
50 PERCENT EXCEEDS	313		385		373	
90 PERCENT EXCEEDS	92		117		98	

a Also Sept. 28, 1964.



## TENNESSEE RIVER BASIN

## 03528000 CLINCH RIVER ABOVE TAZEWEILL, TN

LOCATION.--Lat 36°25'30", long 83°23'54", Claiborne County, Hydrologic Unit 06010205, on right bank 0.4 mi upstream from Grissom Island, 4.6 mi downstream from Big War Creek, 10 mi east of Tazewell, and at mile 159.8.

DRAINAGE AREA.--1,474 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1918 to current year. Published as "near Lone Mountain" October 1918 to September 1927; as "near Tazewell" August 1927 to December 1936; and as "above Tazewell" July 1935 to current year. Prior to April 1919 monthly discharge only, published in WSP 1306. Gage-height record "near Tazewell" January 1937 to July 1941.

REVISED RECORDS.--WSP 803: Drainage area at site "near Tazewell". WSP 1306: Drainage area at site "near Lone Mountain". WSP 1336: 1928.

GAGE.--Water-stage recorder. Datum of gage is 1,060.7 ft above sea level. Apr. 1, 1919, to Sept. 30, 1927, nonrecording gage on railroad bridge 23.3 mi downstream at datum 102.7 ft lower. Aug. 8, 1927, to July 16, 1941, water-stage recorder at site 8.0 mi downstream at datum 47.2 ft lower. Water-stage recorder at present site and datum since July 29, 1935.

REMARKS.--No estimated daily discharges. Records good. Maximum discharge, 98,100 ft<sup>3</sup>/s, from floodmarks. Minimum gage height, at present site and datum, 0.33 ft, Sept. 20, 1955. Several measurements of water temperature were made during the year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in February 1862 reached a stage of about 24 ft, present site and datum, from information by local resident, discharge, about 66,000 ft<sup>3</sup>/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 14,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	2330	23,400	12.98	Mar. 29	0030	*42,500	*18.46
Dec. 12	0830	41,800	18.27	Mar. 31	0830	15,800	10.23
Feb. 24	1030	23,100	12.88	Apr. 14	0500	14,500	9.71

Minimum discharge, 195 ft<sup>3</sup>/s, Oct. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	439	301	1460	3370	3860	3460	9080	2020	682	658	1230	711
2	394	333	1070	2580	3090	5220	6930	2810	638	558	903	681
3	320	357	858	2260	2560	10700	5580	2580	601	495	893	658
4	271	353	4080	4360	2200	9880	4680	2390	572	452	1030	614
5	243	404	18300	5880	2090	6710	3990	2530	546	417	1590	618
6	226	503	19400	4380	2260	5240	4480	2520	559	388	1250	586
7	214	534	9080	3620	2140	4430	4670	2260	568	363	1050	552
8	204	497	4330	7300	2040	3860	4270	2560	562	341	922	524
9	203	442	2790	12300	5870	3910	3860	3170	556	330	781	488
10	222	398	2290	7510	21700	8640	3540	3240	753	326	669	456
11	227	370	2200	4440	35400	11400	5120	2620	1050	328	622	429
12	250	341	1920	4140	40800	7490	6840	2160	843	330	522	403
13	290	317	1680	5630	32100	5340	9210	1840	761	333	466	381
14	287	301	1490	5830	14400	4320	12500	1610	681	376	437	361
15	308	329	1340	4590	7400	3690	7560	1460	770	389	470	347
16	308	363	1270	3430	5370	3190	7430	1510	747	502	438	344
17	288	387	1320	2660	4290	2740	5600	1500	652	684	2220	357
18	263	574	1680	2550	3590	2420	4350	1330	656	1210	6880	412
19	251	558	1680	2580	3020	2210	3570	1170	639	984	5060	373
20	238	544	1500	2370	2590	2020	3070	1050	544	1010	2930	355
21	234	522	1520	1920	2550	1880	2670	973	517	945	2330	363
22	260	505	1600	1960	3170	2030	2370	916	549	955	2360	389
23	275	465	1620	1920	9500	2620	2150	861	530	914	2170	362
24	273	418	1460	1760	21200	2370	1960	813	571	701	1610	336
25	285	382	1290	1980	13100	2150	1800	772	554	569	1240	336
26	276	364	1170	4430	7710	2000	1650	859	565	516	1000	397
27	270	2510	1050	6330	5420	6180	1540	1640	1460	831	859	411
28	252	6780	1040	7700	4090	33900	1480	1110	1150	1370	830	421
29	236	3510	2210	9280	---	39300	1560	992	1000	1900	784	388
30	250	2200	4080	7340	---	28100	2080	850	805	2100	720	366
31	283	---	4650	5120	---	14800	---	746	---	1770	686	---
TOTAL	8340	25862	101428	141520	263510	242200	135590	52862	21081	23045	44952	13419
MEAN	269	862	3272	4565	9411	7813	4520	1705	703	743	1450	447
MAX	439	6780	19400	12300	40800	39300	12500	3240	1460	2100	6880	711
MIN	203	301	858	1760	2040	1880	1480	746	517	326	437	336
CFSM	.18	.58	2.22	3.10	6.38	5.30	3.07	1.16	.48	.50	.98	.30
IN.	.21	.65	2.56	3.57	6.65	6.11	3.42	1.33	.53	.58	1.13	.34

TENNESSEE RIVER BASIN

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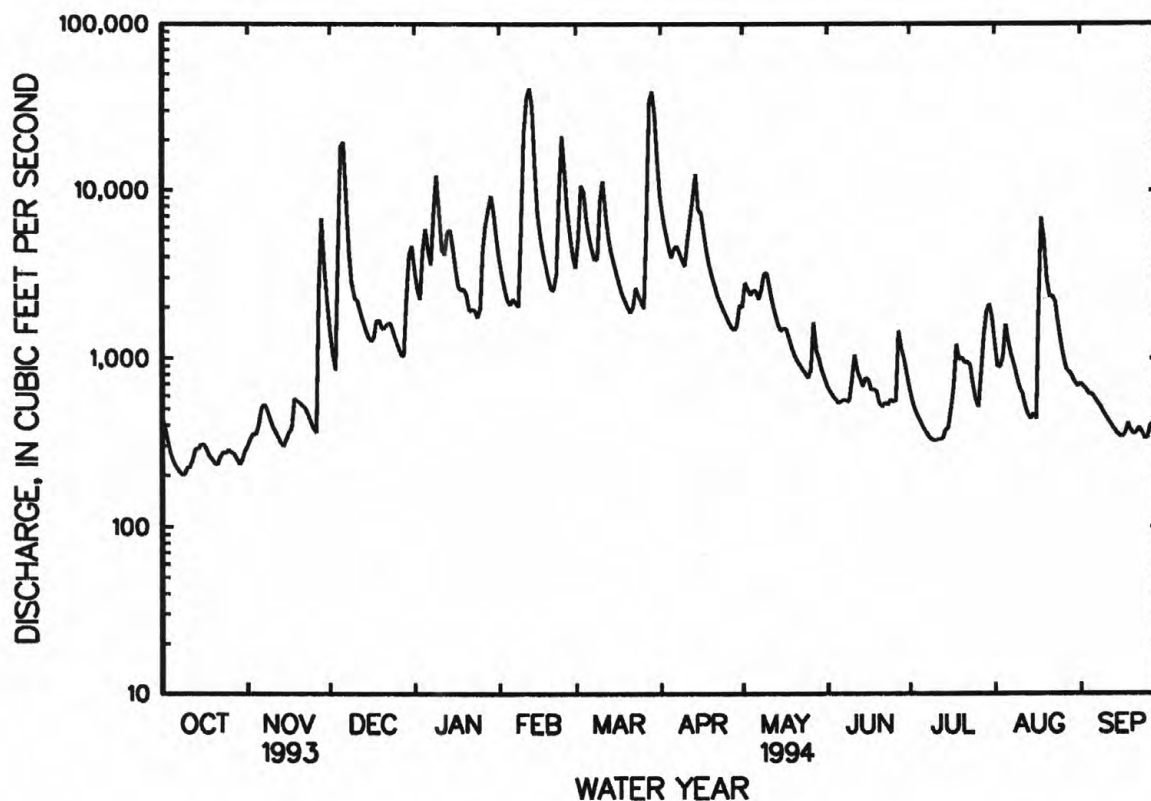
03528000 CLINCH RIVER ABOVE TAZEWEEL, TN--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	675	1117	2381	3450	4166	4284	3081	2269	1276	970	866	544
MAX	2871	4794	9107	9500	9426	11950	8860	6382	3865	3251	4411	2939
(WY)	1990	1978	1927	1937	1957	1963	1977	1929	1989	1938	1942	1989
MIN	145	159	217	285	571	990	711	547	301	239	169	136
(WY)	1964	1940	1940	1940	1941	1988	1986	1941	1988	1988	1925	1955

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1919 - 1994	
ANNUAL TOTAL	700287		1073809			
ANNUAL MEAN	1919		2942		2081	
HIGHEST ANNUAL MEAN					3269	
LOWEST ANNUAL MEAN					850	
HIGHEST DAILY MEAN	20300		40800		83300	
LOWEST DAILY MEAN	177		203		108	
ANNUAL SEVEN-DAY MINIMUM	192		220		116	
INSTANTANEOUS PEAK FLOW			42500		98100	
INSTANTANEOUS PEAK STAGE			18.46		a29.32	
INSTANTANEOUS LOW FLOW			195		108	
ANNUAL RUNOFF (CFSM)	1.30		2.00		1.41	
ANNUAL RUNOFF (INCHES)	17.67		27.10		19.18	
10 PERCENT EXCEEDS	4490		6800		4670	
50 PERCENT EXCEEDS	841		1270		1110	
90 PERCENT EXCEEDS	251		330		272	

a From floodmarks.



## TENNESSEE RIVER BASIN

03530500 NORTH FORK POWELL RIVER AT PENNINGTON GAP, VA

LOCATION.--Lat 36°46'26", long 83°01'59", Lee County, Hydrologic Unit 06010206, near right bank on downstream side of abandoned highway bridge, 75 ft east of U.S. Highway 421, 1,000 ft upstream from bridge on State Highway 621, 0.8 mi north of Pennington Gap, 1.3 mi downstream from Straight Creek, and at mile 4.7.

DRAINAGE AREA.--71.4 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1944 to September 1951, October 1951 to September 1977 (annual maximum only), October 1978 to September 1981, October 1981 to September 1993 (annual maximum only), October 1993 to September 1994.

REVISED RECORDS.--WSP 1436: 1945-48, 1949(M), 1950, 1951(M).

GAGE.--Water-stage recorder. Datum of gage is 1,363.02 ft above sea level. Prior to Dec. 7, 1949, staff gage, Dec. 7, 1949, to Sept. 30, 1951, wire-weight gage, Oct. 1, 1951, to Sept. 30, 1977, and Oct. 1, 1981, to Sept. 30, 1993, crest-stage gage, at same site and datum.

REMARKS.--Records fair except those for period with ice effect, Jan. 20-23, and periods of doubtful gage-height record, May 30 to June 26, July 4-8, and Sept. 18-20, which are poor. Prior to October 1951, diurnal fluctuation at low flow caused by powerplant 2.1 mi above station. Maximum discharge, 17,000 ft<sup>3</sup>/s, Apr. 5, 1977, gage height, 16.14 ft, from rating curve extended above 710 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 8.70 ft, 9.45 ft, 12.1 ft, and 16.14 ft. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum(\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	1115	1,820	5.28	Feb. 23	1030	4,310	8.48
Dec. 4	a1925	5,160	9.22	Mar. 10	0430	2,620	6.38
Jan. 7	2300	1,250	4.31	Mar. 27	a2205	4,650	8.79
Feb. 9	0715	4,130	8.27	Apr. 13	a0510	5,510	9.51
Feb. 11	1100	*7,520	*10.99	June 27	0815	1,420	4.61

a Approximate.

Minimum discharge, 10 ft<sup>3</sup>/s, Oct. 7-9, Sept. 23-24; minimum gage height, 0.70 ft, Sept. 23-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	37	96	157	174	177	343	210	e38	99	23	35
2	15	35	80	137	137	599	269	152	e35	67	26	29
3	14	33	71	251	116	678	215	127	e34	51	25	25
4	13	32	1720	754	101	419	179	137	e32	e45	20	23
5	12	66	2470	436	106	286	153	115	e30	e37	41	21
6	12	82	745	261	101	212	202	103	e31	e32	39	26
7	11	62	345	585	87	181	386	109	e33	e27	26	23
8	10	48	206	941	85	243	315	346	e32	e25	22	20
9	17	40	152	462	3100	558	229	239	e34	24	21	17
10	41	35	191	264	3550	1770	301	168	e56	25	18	15
11	24	31	201	194	4450	690	598	123	e43	23	16	14
12	47	29	174	576	1410	377	477	100	e37	23	15	14
13	35	27	148	497	648	255	2610	84	e34	24	14	13
14	25	26	134	318	376	210	775	74	e32	57	17	13
15	21	77	123	200	257	167	482	108	e31	64	34	12
16	18	86	104	137	192	137	684	267	e40	85	23	11
17	17	119	91	142	160	113	452	152	e66	149	337	11
18	24	133	84	120	133	107	289	109	e70	117	161	e13
19	21	91	79	80	115	95	209	88	e50	108	79	e15
20	19	72	74	e74	104	84	168	76	e37	67	55	e12
21	37	56	90	e70	229	124	139	66	e37	59	408	11
22	54	47	75	e72	322	244	119	57	e45	49	284	11
23	36	41	68	e74	2370	194	103	51	e37	43	127	10
24	29	38	62	80	1100	163	90	47	e35	34	78	11
25	25	35	61	184	569	142	82	47	e40	29	58	19
26	22	76	55	739	337	114	74	78	e41	26	49	27
27	20	1330	53	775	225	2600	87	102	778	57	52	16
28	18	529	110	901	180	2690	83	59	199	53	38	14
29	17	213	503	591	---	1050	175	47	138	37	31	13
30	29	134	363	343	---	564	363	e42	167	32	32	13
31	38	---	211	228	---	446	---	e40	---	27	33	---
TOTAL	738	3660	8939	10643	20734	15689	10651	3523	2312	1595	2202	507
MEAN	23.8	122	288	343	740	506	355	114	77.1	51.5	71.0	16.9
MAX	54	1330	2470	941	4450	2690	2610	346	778	149	408	35
MIN	10	26	53	70	85	84	74	40	30	23	14	10
CFSM	.33	1.71	4.04	4.81	10.4	7.09	4.97	1.59	1.08	.72	.99	.24
IN.	.38	1.91	4.66	5.55	10.80	8.17	5.55	1.84	1.20	.83	1.15	.26

e Estimated.

## TENNESSEE RIVER BASIN

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03530500 NORTH FORK POWELL RIVER AT PENNINGTON GAP, VA --Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1945 - 1951, 1979 - 1981, 1994 BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	16.0	73.0	167	325	331	255	188	124	80.2	52.9	41.6	15.6
MAX	45.9	177	322	610	740	506	355	239	160	215	150	27.8
(WY)	1950	1980	1950	1950	1994	1994	1994	1950	1945	1949	1947	1981
MIN	2.65	14.4	15.8	11.4	76.5	117	74.5	34.7	9.65	9.18	1.94	6.51
(WY)	1949	1981	1981	1981	1947	1981	1950	1948	1948	1946	1951	1946

## SUMMARY STATISTICS

FOR 1994 WATER YEAR

 WATER YEARS 1945 - 1951,  
1979 - 1981,  
1994

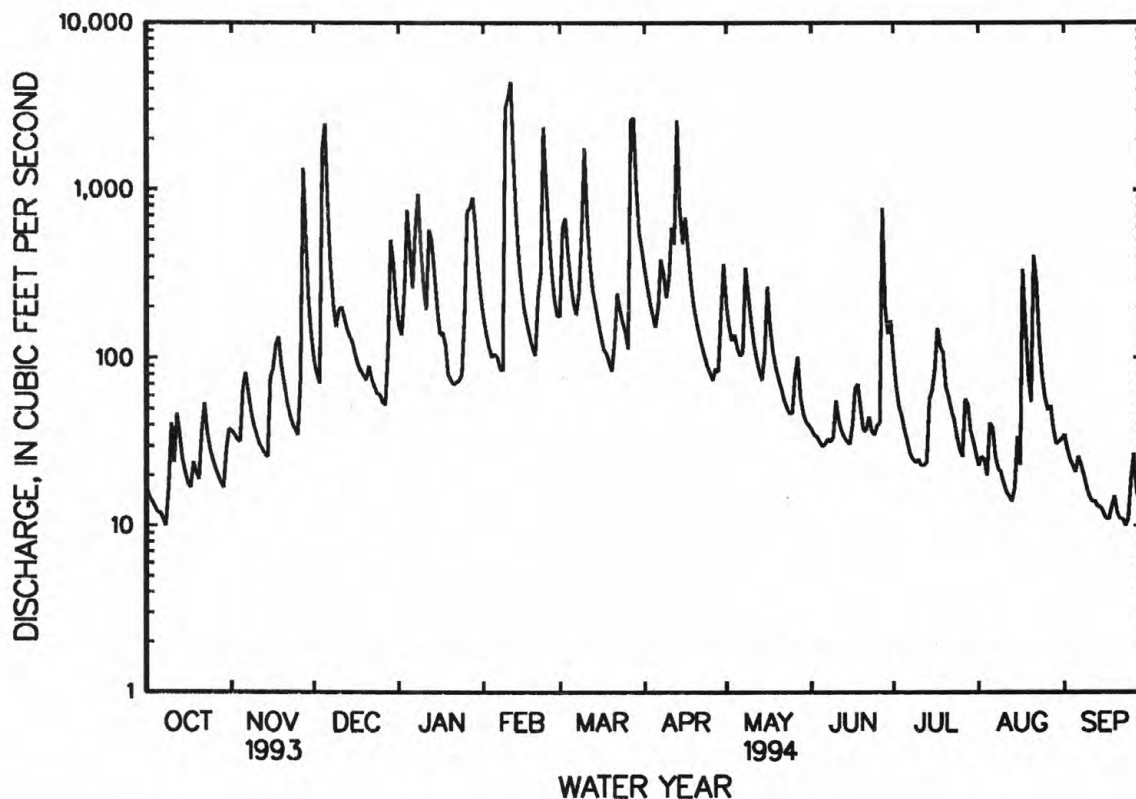
ANNUAL TOTAL	81193		
ANNUAL MEAN	222	136	
HIGHEST ANNUAL MEAN		222	1994
LOWEST ANNUAL MEAN		65.5	1981
HIGHEST DAILY MEAN	4450	Feb 11	6360
LOWEST DAILY MEAN	10	bOct 8	.00
ANNUAL SEVEN-DAY MINIMUM	12	Sep 17	.69
INSTANTANEOUS PEAK FLOW	7520	Feb 11	d16000
INSTANTANEOUS PEAK STAGE	10.99	Feb 11	d12.1
INSTANTANEOUS LOW FLOW	10	fOct 7	.00
ANNUAL RUNOFF (CFSM)	3.12		1.94
ANNUAL RUNOFF (INCHES)	42.30		25.87
10 PERCENT EXCEEDS	499		315
50 PERCENT EXCEEDS	78		55
90 PERCENT EXCEEDS	18		6.8

b Also Sept. 23, 1994.

c Also Sept. 5, 1951.

 d Higher maximum occurred during period of non-continuous record; 17,000 ft<sup>3</sup>/s, Apr. 5, 1977, gage height, 16.14 ft, from rating curve extended above 710 ft<sup>3</sup>/s on basis of slope-area measurements at gage heights 8.70 ft, 9.45 ft, 12.1 ft, and 16.14 ft.

f Also Oct. 8, 9, 1993, and Sept. 23, 24, 1994.





## TENNESSEE RIVER BASIN

03531500 POWELL RIVER NEAR JONESVILLE, VA

LOCATION.--Lat 36°39'43", long 83°05'42", Lee County, Hydrologic Unit 06010206, on right bank 175 ft downstream from highway bridge, 2 mi southeast of Jonesville, 10 mi upstream from Wallen Creek, and at mile 143.1.

DRAINAGE AREA.--319 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1931 to current year. Monthly discharge only for some periods, published in WSP 1306.

REVISED RECORDS.--WSP 823: Drainage area. WSP 1033: 1932-44. WSP 1436: 1946(M), 1948(M).

GAGE.--Water-stage recorder. Datum of gage is 1,259.08 ft above sea level.

REMARKS.--Records good except for period with ice effect, Jan. 20-23, which is fair. National Weather Service gage-height telemeter at station. Tennessee Valley Authority gage-height Automatic Data Acquisition System at station, called at 6-hour intervals by computer at Knoxville, Tennessee. Maximum discharge, 57,000 ft<sup>3</sup>/s, from rating curve extended above 20,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow. Minimum gage height, 0.68 ft, Oct. 18, 1961, result of storage behind temporary dam. Several measurements of water temperature were made during the year. Water-quality records for some prior periods have been collected at this location.

EXTREMES FOR CURRENT YEAR.--Peak discharges equal to or greater than base discharge of 5,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 5	1130	13,000	20.88	Mar. 10	1430	7,660	14.21
Feb. 10	0100	10,100	17.78	Mar. 28	1115	15,500	23.13
Feb. 11	2345	*19,700	*26.59	Apr. 13	1515	10,600	18.36
Feb. 23	2200	11,100	18.88				

Minimum discharge, 56 ft<sup>3</sup>/s, Oct. 8-9, gage height, 1.12 ft.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	92	147	425	684	868	894	1900	739	201	399	204	288
2	80	142	336	577	699	1850	1580	629	193	293	178	241
3	74	130	289	570	601	2780	1300	543	187	236	218	191
4	69	124	1800	1890	524	1990	1090	578	177	200	171	167
5	65	146	10700	1540	496	1600	911	541	171	171	170	153
6	63	270	3720	1020	508	1280	987	499	173	151	241	158
7	62	233	1780	1160	443	1040	1450	529	176	133	197	168
8	59	180	1110	3570	406	1060	1390	1070	174	123	158	145
9	60	147	783	2090	5300	1700	1150	1120	184	121	143	127
10	115	128	754	1350	7480	5880	1060	811	284	118	157	117
11	130	115	791	982	12700	3460	2140	631	269	116	124	110
12	136	107	674	1540	11500	2010	1940	530	227	113	111	106
13	208	101	578	1770	3400	1490	7260	464	184	114	107	101
14	132	97	522	1370	2170	1220	4060	409	168	166	104	97
15	101	142	485	982	1610	991	2220	392	161	260	140	95
16	86	238	456	683	1230	822	2330	739	172	310	133	91
17	81	246	407	672	978	699	1910	535	400	733	1560	95
18	85	375	379	657	818	633	1500	432	434	865	1710	122
19	90	325	362	450	711	588	1190	376	249	802	845	138
20	82	251	339	e370	634	521	972	340	193	618	521	111
21	93	207	388	e340	847	521	812	317	190	425	838	102
22	193	171	383	e350	1500	1230	718	294	236	396	1560	96
23	175	149	335	e360	6120	919	646	274	181	330	831	93
24	126	135	306	367	6220	743	577	256	174	272	547	95
25	105	126	288	496	2660	661	527	243	214	209	402	103
26	96	128	274	2090	1830	585	485	275	213	249	321	126
27	87	2800	254	2370	1340	4690	471	412	1500	566	309	117
28	82	2360	282	2790	1050	13800	558	315	1130	912	270	102
29	77	957	1290	2490	---	6110	600	256	548	527	225	92
30	84	594	1480	1650	---	2940	1040	231	552	349	218	87
31	117	---	939	1150	---	2250	---	214	---	260	236	---
TOTAL	3105	11271	32909	38380	74643	66957	44774	14994	9315	10537	12949	3834
MEAN	100	376	1062	1238	2666	2160	1492	484	310	340	418	128
MAX	208	2800	10700	3570	12700	13800	7260	1120	1500	912	1710	288
MIN	59	97	254	340	406	521	471	214	161	113	104	87
CFSM	.31	1.18	3.33	3.88	8.36	6.77	4.68	1.52	.97	1.07	1.31	.40
IN.	.36	1.31	3.84	4.48	8.70	7.81	5.22	1.75	1.09	1.23	1.51	.45

e Estimated.

TENNESSEE RIVER BASIN

549

03531500 POWELL RIVER NEAR JONESVILLE, VA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1994, BY WATER YEAR (WY)

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
MEAN	156	315	669	936	1086	1136	811	549	311	238	200	119
MAX	1086	1405	2026	2765	2666	3423	2542	1436	1601	825	1187	603
(WY)	1978	1974	1973	1937	1994	1963	1977	1984	1989	1941	1942	1982
MIN	22.9	29.7	46.5	57.8	123	281	169	108	46.7	47.7	49.0	24.5
(WY)	1955	1954	1966	1940	1941	1988	1986	1941	1936	1944	1953	1955

SUMMARY STATISTICS

FOR 1993 CALENDAR YEAR

FOR 1994 WATER YEAR

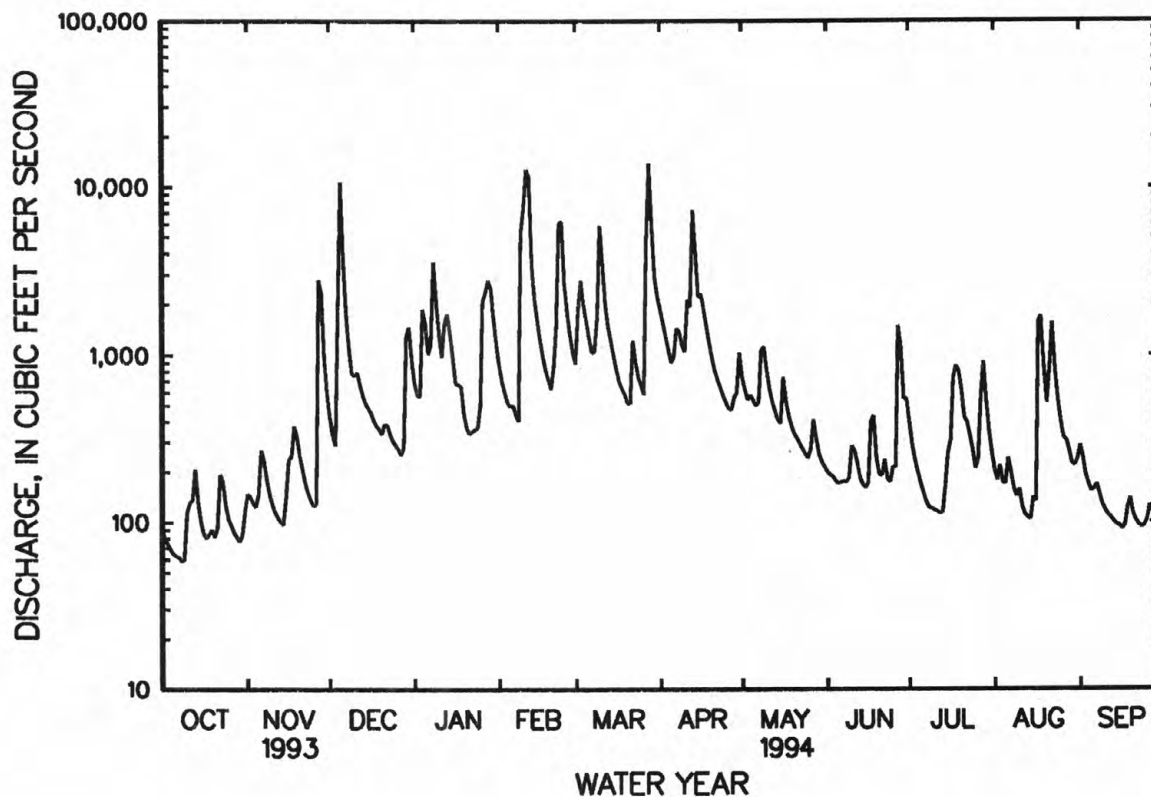
WATER YEARS 1932 - 1994

ANNUAL TOTAL	205715		323668			
ANNUAL MEAN	564		887			541
HIGHEST ANNUAL MEAN						943
LOWEST ANNUAL MEAN						218
HIGHEST DAILY MEAN	10700	Dec 5	13800	Mar 28	35000	Apr 5 1977
LOWEST DAILY MEAN	55	Sep 24	59	Oct 8	18	Oct 3 1933
ANNUAL SEVEN-DAY MINIMUM	59	Sep 9	65	Oct 3	18	Sep 11 1954
INSTANTANEOUS PEAK FLOW			19700	Feb 11	57000	Apr 5 1977
INSTANTANEOUS PEAK STAGE			26.59	Feb 11	a44.32	Apr 5 1977
INSTANTANEOUS LOW FLOW			56	bOct 8	17	cSep 19 1954
ANNUAL RUNOFF (CFSM)	1.77		2.78			1.70
ANNUAL RUNOFF (INCHES)	23.99		37.74			23.03
10 PERCENT EXCEEDS	1270		1900			1220
50 PERCENT EXCEEDS	288		383			254
90 PERCENT EXCEEDS	75		104			54

a From floodmark.

b Also Oct. 9, 1993.

c Also Sept. 20, 1954, and as a result of storage behind temporary dam Oct. 18, 1961.



As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to these events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at crest-stage partial-record stations are presented in the following table. Discharge measurements made at miscellaneous sites and for special studies are given in separate tables.

#### Crest-stage partial-record stations

The following table contains annual maximum discharges for crest-stage stations. A crest-stage gage is a device that will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Maximum discharge at crest-stage partial-record stations during water year 1994

Maximum discharge at crest stage partial record stations during water year 1994								
Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum		Period of record maximum			
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
POTOMAC RIVER BASIN								
Buffalo Branch tributary near Christian, Va. (01622400)	Lat 38°11'55", long 79°13'10", Augusta County, Hydrologic Unit 02070005, on left up- stream wingwall of culvert on State Highway 42, 0.8 mi upstream from mouth, and 1.3 mi north of Christian. Datum of gage is 1,622.53 ft above sea level. Drainage area is 0.49 mi <sup>2</sup> .	1967-94	8-17-94	3.27	38	11- 4-85	6.96	211
Chub Run near Stanley, Va. (01629945)	Lat 38°34'31", long 78°27'32", Page County, Hydrologic Unit 02070005, at culvert on State Highway 689, 2.2 mi east of Stanley, and 3.1 mi upstream from mouth. Datum of gage is 1,023.05 ft above sea level. Drainage area is 3.16 mi <sup>2</sup> .	1959-69 <sup>a</sup> , 1970-94	11-28-93	2.22	186	11- 4-85	9.66	(*)
Crooked Run near Mt. Jackson, Va. (01632970)	Lat 38°45'44", long 78°41'06", Shenandoah County, Hydrologic Unit 02070006, on right up- stream wingwall of culvert on State Highway 263, 0.4 mi up- stream from mouth, and 2.3 mi west of Mt. Jackson. Datum of gage is 962.84 ft above sea level. Drainage area is 6.49 mi <sup>2</sup> .	1972-94	8-17-94	6.68	1,390	8- 7-78	8.90	2,600
Pughs Run near Woodstock, Va. (01633650)	Lat 38°55'48", long 78°32'43", Shenandoah County, Hydrologic Unit 02070006, on left up- stream wingwall of culvert on State Highway 623, 4.0 mi northwest of Woodstock, and 5.4 mi upstream from mouth. Datum of gage is 1,027.27 ft above sea level. Drainage area is 3.66 mi <sup>2</sup> .	1971-94	3-29-94	5.25	145	6-22-72	9.30	543

\* Discharge not determined.

a Records provided by U.S. Department of Agriculture, Soil Conservation Service.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
POTOMAC RIVER BASIN--Continued								
Snakeden Branch at Reston, Va. (01645784)	Lat 38°55'48", long 77°20'43", Fairfax County, Hydrologic Unit 02070008, on right bank at upstream side of culvert on Soapstone Drive, 1.1 mi upstream from Lake Elsa Dam, and in Reston. Datum of gage is 320.15 ft above sea level. Drainage area is 0.79 mi <sup>2</sup> .	1972-78 <sup>#</sup> , 1985-94 <sup>c</sup>	7-27-94	5.16	561	6-21-72	<u>b</u> 6.4	760
Fourmile Run at Alexandria, Va. (01652500)	Lat 38°50'35", long 77°05'09", Arlington County, Hydrologic Unit 02070010, on left up- stream wingwall of bridge on Shirlington Road, at Arlington County-Alexandria City line, 0.1 mi upstream from Interstate Highway 395, and 2.5 mi upstream from mouth. Datum of gage is 28.57 ft above sea level. Drainage area is 13.8 mi <sup>2</sup> .	1947, 1952-69 <sup>#d</sup> , 1970-73 <sup>d</sup> , 1974-75 <sup>#</sup> , 1976-77, 1979-82 <sup>#</sup> , 1983-94	11-28-93	10.23	4,310	7-22-69	<u>d</u> 11.60	14,600
Cedar Run near Warrenton, Va. (01655500)	Lat 38°44'25", long 77°47'16", Fauquier County, Hydrologic Unit 02070010, on right bank at downstream side of bridge on State Highway 672, 1.9 mi north of Warrenton, and 14.5 mi upstream from Licking Run. Datum of gage is 419.40 ft above sea level. Drainage area is 12.3 mi <sup>2</sup> .	1951-86 <sup>#</sup> , 1987-94	8-17-94	8.77	2,170	6-21-72	12.87	7,840
Broad Run near Warrenton, Va. (01656200)	Lat 38°48'25", long 77°48'47", Fauquier County, Hydrologic Unit 02070010, on left down- stream wingwall of culvert on U.S. Highway 17, 7 mi north of Warrenton, and 8.6 mi upstream from Mill Run. Elevation of gage is 610 ft above sea level, from topo- graphic map. Drainage area is 2.94 mi <sup>2</sup> .	1950-78, 1983-94	8-17-94	<u>e</u> 4.33	(*)	6-21-72	7.86	276
Middle Fork Chopawamsic Creek near Garrisonville, Va. (01659500)	Lat 38°33'26", long 77°25'32", Stafford County, Hydrologic Unit 02070011, on left bank 300 ft upstream from bridge on Marine Road 1, 0.4 mi up- stream from confluence with North Branch Chopawamsic Creek, and 5.6 mi north of Garrisonville. Datum of gage is 192.48 ft above sea level. Drainage area is 4.51 mi <sup>2</sup> .	1951-57 <sup>#</sup> , 1990-94	11-27-93	<u>f</u> 8.61	(*)	8-13-55	5.80	340

\* Discharge not determined.

<sup>a</sup> Operated as a continuous-record gaging station.<sup>b</sup> From high-water marks.<sup>c</sup> Operated as a stage-only station.<sup>d</sup> At different site and datum 6.02 feet lower.<sup>e</sup> Affected by backwater from beaver dam.<sup>f</sup> Affected by debris jam at upstream end of culvert.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
GREAT WICOMICO RIVER BASIN								
Great Wicomico River near Horse Head, Va. (01661600)	Lat 37°53'15", long 76°27'00", Northumberland County, Hydrologic Unit 02080102, on right upstream wingwall of culvert on State Highway 604, 1.5 mi upstream from Bush Mill Stream, and 1.7 mi west of Horse Head. Drainage area is 6.98 mi <sup>2</sup> .	1969-94	3- 3-94	6.46	1,090	6 -3-79	8.88	1,950
Bush Mill Stream near Heathsville, Va. (01661800)	Lat 37°52'36", long 76°29'42", Northumberland County, Hydrologic Unit 02080102, on right bank 12 ft upstream from bridge on State High- way 601, 2.2 mi northwest of Howland, and 3.0 mi southwest of Heathsville. Datum of gage is 22.22 ft above sea level. Drainage area is 6.82 mi <sup>2</sup> .	1964-69 <sup>a</sup> , 1970-86 <sup>a</sup> , 1987-94	3- 3-94	8.10	625	7-30-79	8.52	714
RAPPAHANNOCK RIVER BASIN								
Carter Run near Marshall, Va. (01661900)	Lat 38°47'57", long 77°52'09", Fauquier County, Hydrologic Unit 02080103, on left bank 50 ft upstream from farm road, 1.2 mi downstream from Horner Run, 4.7 mi south of Marshall, 6.7 mi southwest of The Plains, and 9 mi up- stream from mouth. Datum of gage is 388.39 ft above sea level. Drainage area is 19.5 mi <sup>2</sup> .	1977-82 <sup>a</sup> , 1983-94	8-17-94	8.84	3,900	10- 9-76	10.40	7,100
Rappahannock River near Warrenton, Va. (01662000)	Lat 38°41'05", long 77°54'15", Fauquier County, Hydrologic Unit 02080103, on left bank 50 ft downstream from west- bound bridge on U.S. Highway 211, 0.9 mi downstream from Carter Run, 6.2 mi southwest of Warrenton, and 15 mi upstream from Hazel River. Datum of gage is 312.57 ft above sea level. Drainage area is 195 mi <sup>2</sup> .	1943-86 <sup>a</sup> , 1987-94	8-17-94	15.71	6,400	10-15-42	23.50	32,000
Pony Mountain Branch near Culpeper, Va. (01665050)	Lat 38°27'04", long 77°57'24", Culpeper County, Hydrologic Unit 02080103, at culvert on State Highway 3, 0.3 mi upstream from mouth, and 2.7 mi southeast of Culpeper. Elevation of gage is 335 ft above sea level, from topo- graphic map. Drainage area is 0.30 mi <sup>2</sup> .	1958-69 <sup>a</sup> , 1970-94	8-17-94	2.17	85	8-16-70	4.02	196

\* Operated as a continuous-record gaging station.

a Records provided by U.S. Department of Agriculture, Soil Conservation Service.



## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
RAPPAHANNOCK RIVER BASIN--Continued								
Mountain Run near Burr Hill, Va. (01667870)	Lat 38°21'13", long 77°53'38", Orange County, Hydrologic Unit 02080103, at center on downstream side of bridge on State Highway 611, 2.4 mi west of Burr Hill, and 4.4 mi upstream from mouth. Elevation of gage is 620 ft above sea level, from topo- graphic map. Drainage area is 28.8 mi <sup>2</sup> .	1990-91#, 1992-94	11-28-93	10.30	3,990	5- 5-89	12.1	(*)
Farmers Hall Creek near Champlain, Va. (01668300)	Lat 38°00'05", long 76°58'40", Essex County, Hydrologic Unit 02080104, on left up- stream wingwall of culvert on U.S. Highway 17, 1.0 mi upstream from Rouzie Swamp, and 1.2 mi southeast of Champlain. Datum of gage is 42.10 ft above sea level. Drainage area is 2.18 mi <sup>2</sup> .	1966-94	3- 3-94	6.89	160	8-20-69	19.2	510
Hoskins Creek near Tappa- hannock, Va. (01668800)	Lat 37°55'38", long 76°57'16", Essex County, Hydrologic Unit 02080104, at bridge on State Highway 717, 0.4 mi upstream from Criddlin Swamp, and 5.0 mi west of Tappahannock. Datum of gage is 36.28 ft above sea level. Drainage area is 15.5 mi <sup>2</sup> .	1965-69#, 1971-86#, 1987-94	3- 3-94	5.40	340	8-20-69	10.23	1,380
PIANKATANK RIVER BASIN								
My Ladys Swamp near Saluda, Va. (01669800)	Lat 37°34'34", long 76°31'30", Middlesex County, Hydrologic Unit 02080102, on left upstream wingwall of culvert on State Highway 629, 1.45 mi upstream from mouth, and 4.4 mi southeast of Saluda. Datum of gage is 4.16 ft above sea level. Drainage area is 4.81 mi <sup>2</sup> .	1970-94	3- 2-94	6.04	241	1- 2-85	8.38	592
YORK RIVER BASIN								
Pamunkey Creek at Lahore, Va. (01670180)	Lat 36°11'53", long 77°58'09", Orange County, Hydrologic Unit 02080106, on right bank on upstream side of bridge on State Highway 669, 0.45 mi south of Lahore, and 3.8 mi upstream from Lake Anna. Elevation of gage is 200 ft above sea level, from topographic map. Drainage area is 40.5 mi <sup>2</sup> .	1989-91#, 1992-94	11-28-93	11.81	4,710	11-28-93	11.81	4,710

\* Discharge not determined.

<sup>a</sup> Operated as a continuous-record gaging station.

b From high-water marks.

g From profile extended from high-water marks recovered prior to establishment of gage, flow over road, and  
and bridge.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis-charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis-charge (ft <sup>3</sup> /s)
YORK RIVER BASIN--Continued								
Contrary Creek near Mineral, Va. (01670300)	Lat 38°03'53", long 77°52'45", Louisa County, Hydrologic Unit 02080106, on left bank 200 ft downstream from bridge on U.S. Highway 522, 4.0 mi northeast of Mineral. Elevation of gage is 275 ft above sea level, from topographic map. Drainage area is 5.53 mi <sup>2</sup> .	1976-86 <sup>a</sup> , 1987-94	11-28-93	6.94	7,050	11-28-93	6.94	7,050
Fosters Creek near Ferncliff, Va. (01671615)	Lat 37°57'35", long 78°11'20", Louisa County, Hydrologic Unit 02080106, at culvert on U.S. Highway 250, 1.9 mi southeast of Zion Crossroads, 4.6 mi northwest of Ferncliff, and 5.0 mi upstream from mouth. Datum of gage is 424.22 ft above sea level. Drainage area is 0.61 mi <sup>2</sup> .	1960-69 <sup>a</sup> , 1970-94	11-28-93	9.53	(*)	8-20-69 7- 4-91	10.55 10.60	1,000 1,020
Waldrop Creek near Louisa, Va. (01671650)	Lat 38°00'08", long 78°04'22", Louisa County, Hydrologic Unit 02080106, on left upstream wingwall of culvert on State Highway 632, 2.3 mi upstream from mouth, and 4.2 mi southwest of Louisa. Datum of gage is 361.41 ft above sea level. Drainage area is 2.85 mi <sup>2</sup> .	1969-94	11-28-93	14.73	1,360	8-20-69	21.00	2,500
Harris Creek near Trevilians, Va. (01671750)	Lat 38°01'02", long 78°03'06", Louisa County, Hydrologic Unit 02080106, on right upstream wingwall of culvert on State Highway 632, 2.7 mi southeast of Trevilians, and 6 mi upstream from mouth. Drainage area is 3.31 mi <sup>2</sup> .	1969-94	11-28-93	12.42	1,850	8-20-69	16.70	3,300
Reedy Creek near Dawn, Va. (01674200)	Lat 37°52'55", long 77°21'35", Caroline County, Hydrologic Unit 02080105, at bridge on U.S. Highway 301, 3.3 mi north of Dawn, and 11 mi south of Bowling Green. Drainage area is 16.8 mi <sup>2</sup> .	1951-69, 1972-94	3-29-94	5.29	229	8-20-69	7.28	2,500
Aylett Creek at Aylett, Va. (01674700)	Lat 37°47'05", long 77°06'23", King William County, Hydrologic Unit 02080105, on right upstream wingwall of culvert on U.S. Highway 360 at Aylett, 2.8 mi upstream from mouth. Datum of gage is 26.72 ft above sea level. Drainage area is 6.17 mi <sup>2</sup> .	1969-94	3- 2-94	4.81	(*)	9-26-75	4.91	720

\* Discharge not determined.

<sup>a</sup> Operated as a continuous-record gaging station.<sup>a</sup> Records provided by U.S. Department of Agriculture, Soil Conservation Service.<sup>e</sup> Affected by backwater from beaver dam.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
JAMES RIVER BASIN								
Jackson River at Falling Spring, Va. (02012500)	Lat 37°52'36", long 79°58'39", Alleghany County, Hydrologic Unit 02080201, on right bank 20 ft upstream from Smith Bridge, 0.8 mi south of Falling Spring, and 5.5 mi north of Covington. Datum of gage is 1,333.49 ft above sea level. Drainage area is 411 mi <sup>2</sup> .	1925-84 <sup>#</sup> , 1987-94	3-30-94	9.56	6,270	3-17-36 h1913	14.74 20	24,700 j50,000
Sweet Springs Creek tributary at Sweet Chaly- beate, Va. (02012950)	Lat 37°39'25", long 80°14'10", Alleghany County, Hydrologic Unit 02080201, on left bank at culvert on State Highway 311, 0.1 mi upstream from mouth, and 0.9 mi north of Sweet Chalybeate. Datum of gage is 1,926.94 ft above sea level. Drainage area is 0.66 mi <sup>2</sup> .	1966-75, 1978-94	-	<4.14	<36	7- 5-74	10.5	375
Cowpasture River near Head Waters, Va. (02015600)	Lat 38°19'30", long 79°26'14", Highland County, Hydrologic Unit 02080201, on left down- stream wingwall of bridge on U.S. Highway 250, 1.2 mi west of Head Waters, and 3 mi upstream from Shaw Fork. Datum of gage is 1,985.65 ft above sea level. Drainage area is 11.3 mi <sup>2</sup> .	1949-94	5- 8-94	k3.83	k249	6-17-49	6.5	5,650
Craig Creek at New Castle, Va. (02017300)	Lat 37°30'06", long 80°06'18", Craig County, Hydrologic Unit 02080201, on left bank on upstream end of old bridge pier, about 20 ft downstream from new bridge on State Highway 616, 800 ft upstream from Johns Creek, and 0.3 mi southeast of New Castle. Datum of gage is 1,245.69 ft above sea level. Drainage area is 112 mi <sup>2</sup> .	1967-94	8-18-94	13.70	8,530	11- 4-85	19.55	24,400
Craig Creek tributary near New Castle, Va. (02017700)	Lat 37°33'21", long 79°59'52", Craig County, Hydrologic Unit 02080201, on right up- stream wingwall of culvert on State Highway 606, 0.4 mi upstream from mouth, and 7.1 mi northeast of New Castle. Drainage area is 2.05 mi <sup>2</sup> .	1968-94	8-18-94	6.54	263	11- 4-85	13.45	1,100

<sup>#</sup> Operated as a continuous-record gaging station.

< Less than.

h Maximum known historical peak outside period of record.

j Approximate.

k Partial year 10-1-93 to 7-18-94 but probably peak for year based on comparison with other nearby gages.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
JAMES RIVER BASIN--Continued								
North Fork near Fincastle, Va. (02018800)	Lat 37°32'07", long 79°56'03", Botetourt County, Hydrologic Unit 02080201, on left up- stream wingwall of culvert on State Highway 606, 3.5 mi upstream from mouth, and 3.9 mi northwest of Fincastle. Datum of gage is 1,248.65 ft above sea level. Drainage area is 4.17 mi <sup>2</sup> .	1968-94	8-17-94 1968 10-19-68 12-31-69 2-13-71 6-21-72 5-28-73 5-12-74 3-19-75 5-29-76 3-13-77 1-25-78 9-21-79 4-14-80 5-28-81 2- 3-82 3-18-83 5- 6-84	5.01 <3.25 5.15 4.45 5.15 7.00 8.10 4.85 5.57 4.35 6.10 6.25 9.88 9.25 6.44 4.20 7.17 5.55	342 m<56 m374 m214 m374 m990 m1,570 m301 m479 m196 m639 m691 m2,960 m2,400 m760 m171 m1,070 m474	4-16-87	10.76	3,870
Renick Run near Buchanan, Va. (02020100)	Lat 37°35'27", long 79°38'04", Botetourt County, Hydrologic Unit 02080201, on left up- stream wingwall of culvert on Frontage Road F054 of Interstate Highway 81 between Exits 48 and 49, 2.2 mi upstream from mouth, and 4.8 mi northeast of Buchanan. Datum of gage is 1,261.85 ft above sea level. Drainage area is 2.06 mi <sup>2</sup> .	1967-94	8-17-94	4.94	332	8-20-69	9.90	1,210
Cedar Grove Branch near Rockbridge Baths, Va. (02021700)	Lat 37°53'00", long 79°23'10", Rockbridge County, Hydrologic Unit 02080202, on right upstream wingwall of culvert on State Highway 39, 0.1 mi upstream from mouth, and 1.8 mi southeast of Rockbridge Baths. Datum of gage is 1,041.22 ft above sea level. Drainage area is 12.3 mi <sup>2</sup> .	1967-94	12- 5-93	5.29	191	8-20-69	31.2	7,300
South River near Steeles Tavern, Va. (02023300)	Lat 37°55'50", long 79°09'55", Augusta County, Hydrologic Unit 02080202, at bridge on State Highway 608, 2.5 mi northeast of Vesuvius, 3 mi east of Steeles Tavern, and 5 mi south of Greenville. Elevation of gage is 1,600 ft above sea level, from topo- graphic map. Drainage area is 15.7 mi <sup>2</sup> .	1951-94	-	<2.04	<135	8-20-69	8.70	4,700
James River at Bedford Dam, near Major, Va. (02024750)	Lat 37°34'40", long 79°22'36", Amherst County, Hydrologic Unit 02080203, on left bank 10 ft upstream from head- gates on headrace to city of Bedford hydroelectric plant, 1.2 mi north of Major, and 1.4 mi upstream from Blue Ridge Parkway. Drainage area is 3,070 mi <sup>2</sup> .	1988-94*	3-29-94	8.46	33,100	4-22-92	13.91	99,600

\* Operated as a continuous-record gaging station.

&lt; Less than.

m Revised.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
JAMES RIVER BASIN--Continued								
Buffalo River tributary near Amherst, Va. (02027700)	Lat 37°33'45", long 78°57'35", Amherst County, Hydrologic Unit 02080203, on left bank just upstream from culvert on U.S. Highway 60, 0.8 mi upstream from mouth, and 5.2 mi southeast of Amherst. Datum of gage is 583.66 ft above sea level. Drainage area is 0.46 mi <sup>2</sup> .	1966-94	3-28-94	4.18	55	6-21-72	7.18	187
Stockton Creek near Afton, Va. (02030800)	Lat 38°01'48", long 78°48'30", Albemarle County, Hydrologic Unit 02080204, on left up- stream wingwall of culvert on State Highway 6, 1.7 mi east of Afton, and 4.3 mi upstream from Stony Run. Datum of gage is 835.27 ft above sea level. Drainage area is 2.80 mi <sup>2</sup> .	1967-94	8-17-94	4.66	82	6-21-72 11-23-92	9.68 9.73	678 425
Doyles River near White Hall, Va. (02032200)	Lat 38°12'10", long 78°40'17", Albemarle County, Hydrologic Unit 02080204, on right down- stream abutment of bridge on State Highway 810, 5.5 mi upstream from mouth, and 5.9 mi north of White Hall. Datum of gage is 928.08 ft above sea level. Drainage area is 6.70 mi <sup>2</sup> .	1967-94	-	<10.10	<220	9-22-79	13.73	2,560
Muddy Run near Stanardsville, Va. (02032300)	Lat 38°14'05", long 78°37'02", Albemarle County, Hydrologic Unit 02080204, on right downstream abutment of bridge on State Highway 810, 0.7 mi upstream from mouth, and 11 mi southwest of Stanardsville. Datum of gage is 756.79 ft above sea level. Drainage area is 3.36 mi <sup>2</sup> .	1967-94	-	<6.06	(*)	5-13-73 8-28-79	8.33 8.33	(*) (*)
Haneytown Creek near Stanards- ville, Va. (02032540)	Lat 38°16'48", long 78°30'50", Greene County, Hydrologic Unit 02080204, on left down- stream wingwall of bridge on State Highway 810, 0.2 mi upstream from mouth, and 4.5 mi west of Stanardsville. Datum of gage is 616.34 ft above sea level. Drainage area is 4.45 mi <sup>2</sup> .	1967-94	-	<12.33	<389	3-19-75	13.85	1,220
Lynch River at Nortonville, Va. (02032550)	Lat 38°14'12", long 78°32'34", Albemarle County, Hydrologic Unit 02080204, on right down- stream abutment of bridge on State Highway 810, 4 mi up- stream from mouth, and 7 mi southwest of Stanardsville. Datum of gage is 591.70 ft above sea level. Drainage area is 13.6 mi <sup>2</sup> .	1967-94	11-28-93	12.48	(*)	6-21-72	16.50	(**)

\* Discharge not determined.

\*\* Discharge not determined. Discharge of 18,000 ft<sup>3</sup>/s published in the 1991 report was undefined.

&lt; Less than.

f Affected by debris jam at upstream end of culvert.



## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
JAMES RIVER BASIN--Continued								
North Fork Rivanna River near Proffit, Va. (02032680)	Lat 38°05'16", long 78°24'44", Albemarle County, Hydrologic Unit 02080204, on left bank 50 ft downstream from bridge on State Highway 649, 1.9 mi southeast of Proffit, and 2.2 mi upstream from con- fluence with South Fork Rivanna River. Datum of gage is 323.43 ft above sea level. Drainage area is 176 mi <sup>2</sup> .	1970-92#, 1993-94	11-28-93	13.87	5,120	6-21-72	b30.40	31,800
Schenks Branch at Charlottesville, Va. (02032700)	Lat 38°02'32", long 78°28'30", Charlottesville City, Hydro- logic Unit 02080204, on right downstream retaining wall of small road culvert, 25 ft upstream from U.S. Highway 250 bypass culvert, 200 ft southeast of inter- section of U.S. Highway 250 bypass and McIntire Road, and 1.2 mi upstream from mouth. Datum of gage is 371.63 ft above sea level. Drainage area is 1.34 mi <sup>2</sup> .	1950-94	7-26-94	f6.32	(*)	9-8-87	b12.54	1,670
Moore's Creek near Char- lottesville, Va. (02033300)	Lat 38°00'25", long 78°34'25", Albemarle County, Hydrologic Unit 02080204, on right down- stream wingwall of culvert on access road, 30 ft north of U.S. Highway 29, 2.8 mi upstream from Morey Creek, and 4 mi southwest of Char- lottesville. Datum of gage is 505.40 ft above sea level. Drainage area is 3.52 mi <sup>2</sup> .	1967-94	11-28-93	14.24	131	6- 2-79	18.74	(*)
Willis River at Lakeside Village, Va. (02034500)	Lat 37°40'00", long 78°10'00", Cumberland County, Hydrologic Unit 02080205, on left bank 15 ft upstream from bridge on State Highway 690, 0.4 mi east of Lakeside Village, 6.9 mi upstream from mouth, and 7.7 mi downstream from Reynolds Creek. Datum of gage is 178.98 ft above sea level. Drainage area is 262 mi <sup>2</sup> .	1927-86#, 1987-94	3-29-94	19.19	6,260	6-22-72	29.80	24,000
Holiday Creek near Toga, Va. (02038840)	Lat 37°25'58", long 78°41'12", Buckingham County, Hydro- logic Unit 02080207, on left bank 40 ft downstream from State Forest Road 2307 (old Richmond Road), 1.8 mi up- stream from confluence of North Holiday Creek, and 5.2 mi south-southwest of Toga. Datum of gage is 614.40 ft above sea level. Drainage area is 1.68 mi <sup>2</sup> .	1971-94	11-28-93	4.45	532	6-21-72	6.72	2,820

\* Discharge not determined.

\* Operated as a continuous-record gaging station.

b From high-water marks.

f Affected by debris jam at upstream end of culvert.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
JAMES RIVER BASIN--Continued								
North Holiday Creek near Toga, Va. (02038845)	Lat 37°26'09, long 78°40'04", Buckingham County, Hydro- logic Unit 02080207, on left bank 18 ft upstream from State Forest Road 2307 (old Richmond Road), 1.0 mi up- stream from confluence of Holiday Creek, and 4.5 mi south-southwest of Toga. Datum of gage is 588.84 ft above sea level. Drainage area is 1.31 mi <sup>2</sup> .	1971-94	11-28-93	5.44	272	6-21-72	6.79	1,570
Flat Creek near Amelia, Va. (02040500)	Lat 37°23'27", long 78°03'45", Amelia County, Hydrologic Unit 02080207, at bridge on State Highway 681, 0.5 mi downstream from Horsepen Creek, and 6.0 mi northwest of Amelia. Elevation of gage is 240 ft above sea level, from topographic map. Drainage area is 73.0 mi <sup>2</sup> .	1947, 1954-70, 1972-94	3-29-94	10.50	3,180	4-16-87	12.38	5,260
Bailey Branch tributary at Spring Grove, Va. (02042250)	Lat 37°10'29", long 76°59'13", Surry County, Hydrologic Unit 02080206, on right up- stream wingwall of culvert on State Highway 10, 1.0 mi northwest of Spring Grove. Datum of gage is 61.39 ft above sea level. Drainage area is 0.71 mi <sup>2</sup> .	1967-94	3-29-94	4.23	84	7-14-75	6.52	282
Horsepen Branch at Richmond, Va. (02042300)	Lat 37°35'45", long 77°30'40", Henrico County, Hydrologic Unit 02080206, on left down- stream retaining wall at culverts on U.S. Highway 250 (Broad Street), at Richmond, and 0.9 mi upstream from mouth. Drainage area is 1.27 mi <sup>2</sup> .	1965-94	11-28-93	4.98	1,250	8-18-85	7.50	2,730
Jordans Branch at Richmond, Va. (02042400)	Lat 37°35'10", long 77°29'55", Henrico County, Hydrologic Unit 02080206, on left down- stream wall of bridge on U.S. Highway 250 (Broad Street), at Richmond, and 2.0 mi up- stream from mouth. Drainage area is 2.53 mi <sup>2</sup> .	1965-94	11-28-93	10.47	1,340	9-30-79 6-22-91	12.60 13.10	2,460 2,760
West Branch Long Hill Swamp near Lightfoot, Va. (02042780)	Lat 37°18'50", long 77°46'01", James City County, Hydrologic Unit 02080206, on left up- stream wingwall of culvert on State Highway 612, 2.2 mi upstream from mouth, and 2.0 mi south of Lightfoot. Drainage area is 2.47 mi <sup>2</sup> .	1970-76, 1978-94	3- 2-94	3.63	90	9- 1-75	5.20	320

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
CHOWAN RIVER BASIN								
Nottoway River near Burkeville, Va. (02044000)	Lat 37°04'40", long 78°11'52", Lunenburg County, Hydrologic Unit 03010201, on right bank at downstream side of bridge on State Highway 723, 4.0 mi upstream from Modest Creek, 5.6 mi north of Victoria, and 7.5 mi south of Burkeville. Datum of gage is 354.58 ft above sea level. Drainage area is 38.7 mi <sup>2</sup> .	1947-86#, 1987-94	3- 2-94	15.01	2,180	10-23-71	22.33	13,400
Falls Creek tributary near Victoria, Va. (02044200)	Lat 37°02'04", long 78°10'26", Lunenburg County, Hydrologic Unit 03010201, at upstream end of culvert on State High- way 49, 3.6 mi northeast of Victoria. Datum of gage is 409.21 ft above sea level. Drainage area is 0.34 mi <sup>2</sup> .	1962-94	3- 2-94	3.62	41	6-21-72	9.15	343
Blackwater River tributary near Holland, Va. (02050050)	Lat 36°38'44", long 76°51'29", Suffolk City, Hydrologic Unit 03010202, on left up- stream wingwall of culvert on State Highway 272, 3.0 mi upstream from mouth, and 4.9 mi southwest of Holland. Datum of gage is 29.25 ft above sea level. Drainage area is 2.76 mi <sup>2</sup> .	1967-94	3- 2-94	7.24	354	8- 3-73	7.65	408
Great Creek near Cochran, Va. (02051600)	Lat 36°48'46", long 77°55'19", Brunswick County, Hydrologic Unit 03010204, on left up- stream side of bridge on State Highway 763, 1.4 mi southwest of Cochran, and 9.5 mi upstream from Roses Creek. Datum of gage is 215.72 ft above sea level. Drainage area is 30.7 mi <sup>2</sup> .	1958-86#, 1987-94	3- 2-94	9.59	1,050	10- 6-72	16.65	7,100
ROANOKE RIVER BASIN								
Powder Mill Creek at Rocky Mount, Va. (02057700)	Lat 37°00'26", long 79°52'25", Franklin County, Hydrologic Unit 03010101, on right upstream wingwall of western- most culvert in the interchange between U.S. Highway 220 bypass and State Highways 40 and 122 at Rocky Mount, 3.5 mi upstream from mouth. Elevation of gage is 1,075 ft above sea level, from topographic map. Drainage area is 0.64 mi <sup>2</sup> .	1967-94	3-28-94	15.49	189	5- 5-89	16.78	305

<sup>#</sup> Operated as a continuous-record gaging station.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
ROANOKE RIVER BASIN--Continued								
Snake Creek near Brookneal, Va. (02065100)	Lat 37°00'42", long 78°57'52", Halifax County, Hydrologic Unit 03010102, on left up- stream wingwall of culvert on U.S. Highway 501, 0.5 mi upstream from mouth, and 2.1 mi south of Brookneal. Elevation of gage is 418 ft above sea level, from topo- graphic map. Drainage area is 1.68 mi <sup>2</sup> .	1967-94	3-28-94	8.77	(*)	9- 8-87	15.9	1,500
Right Hand Fork near Appomattox, Va. (02065300)	Lat 37°16'12", long 78°49'14", Appomattox County, Hydro- logic Unit 03010102, on right upstream wingwall of culvert on State Highway 727, 0.5 mi upstream from Maple Spring Branch, and 5.2 mi south of Appomattox. Eleva- tion of gage is 580 ft above sea level, from topographic map. Drainage area is 2.08 mi <sup>2</sup> .	1967-94	11-28-93	>10.71	300	8- 8-87	16.8	962
Powells Creek near Turbeville, Va. (02075350)	Lat 36°34'50", long 79°11'20", Halifax County, Hydrologic Unit 03010104, at culvert on U.S. Highway 58, 0.8 mi up- stream from mouth, 1.1 mi east of Halifax-Pittsylvania County line, and 8.8 mi southwest of Turbeville. Datum of gage is 386.76 ft above sea level. Drainage area is 0.28 mi <sup>2</sup> .	1958-69a, 1970-94	7-29-94	3.23	129	7-11-65	7.86	384
Dan River at South Boston, Va. (02076000)	Lat 36°41'37", long 78°54'09", South Boston City, Hydro- logic Unit 03010104, on left bank 100 ft upstream from Norfolk and Western Railroad bridge at South Boston. Datum of gage is 299.23 ft above sea level. Drainage area is 2,730 mi <sup>2</sup> .	1900-07#, 1923-52#, 1953-62c, 1980-94c	3-30-94	28.26	(*)	8-16-40	31.8	81,000
Bearskin Creek near Chatham, Va. (02076200)	Lat 36°50'30", long 79°29'05", Pittsylvania County, Hydro- logic Unit 03010105, on left upstream wingwall of culvert on State Highway 57, 4.5 mi west of Chatham, and 6 mi upstream from mouth. Eleva- tion of gage is 630 ft above sea level, from topographic map. Drainage area is 4.06 mi <sup>2</sup> .	1967-94	3- 2-94	4.64	277	11- 4-85	16.00	2,300

\* Discharge not determined.

# Operated as a continuous-record gaging station.

&gt; Greater than.

a Records provided by U.S. Department of Agriculture, Soil Conservation Service.

c Operated as a stage-only station.

e Affected by backwater from beaver dam.

n Affected by backwater from ice, water overtopped upstream gage; discharge determined from rating for downstream gage.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
ROANOKE RIVER BASIN--Continued								
Blacks Creek near Mt. Airy, Va. (02076700)	Lat 36°56'40", long 79°09'56", Pittsylvania County, Hydro- logic Unit 03010105, on left upstream wingwall of culvert on State Highway 40, 1.5 mi east of Mt. Airy, and 3.5 mi upstream from mouth. Eleva- tion of gage is 420 ft above sea level, from topographic map. Drainage area is 3.44 mi <sup>2</sup> .	1966-94	3- 2-94	5.41	251	9- 8-87	<u>b</u> 19.5	2,200
Roanoke River at Buggs Island, Va. (02079500)	Lat 36°36'06", long 78°17'56", Mecklenburg County, Hydro- logic Unit 03010106, on left bank 1,200 ft downstream from John H. Kerr dam, 5.3 mi upstream from bridge on U.S. Highway 1, and 6.7 mi southeast of Boydton. Datum of gage is 196.72 ft above sea level. Drainage area is 7,780 mi <sup>2</sup> .	1947-62 <sup>#</sup> , 1963-94	11-10-93	<u>p</u> 10.57	(*)	12- 7-48	<u>q</u> 14.97	76,000
KANAWHA RIVER BASIN								
Cripple Creek at Cedar Springs, Va. (03165700)	Lat 36°49'31", long 81°16'45", Wythe County, Hydrologic Unit 05050001, on right down- stream wingwall of bridge on State Highway 749, 0.6 mi southeast of Cedar Springs, and 1.5 mi upstream from Gray Branch. Elevation of gage is 2,455 ft above sea level, from topographic map. Drainage area is 11.3 mi <sup>2</sup> .	1967-94	-	<13.90	<360	11- 6-77	20.37	1,860
Glade Creek at Grahams Forge, Va. (03166800)	Lat 36°55'51", long 80°54'02", Wythe County, Hydrologic Unit 05050001, on right down- stream wingwall of culvert on State Highway 629, 1.0 mi southwest of Grahams Forge, and at mile 0.4. Elevation of gage is 1,972 ft above sea level, from topographic map. Drainage area is 7.15 mi <sup>2</sup> .	1976-93 <sup>#</sup> , 1994	3-28-94	4.31	533	9-16-89	6.75	3,210
Mira Fork tributary near Dugspur, Va. (03167300)	Lat 36°50'16", long 80°35'47", Carroll County, Hydrologic Unit 05050001, on left up- stream wingwall of culvert on U.S. Highway 221, 1.3 mi upstream from mouth, and 2.2 mi northeast of Dugspur. Datum of gage is 2,602.96 ft above sea level. Drainage area is 0.62 mi <sup>2</sup> .	1967-94	3-28-94	3.18	52	4-21-92	7.20	257

\* Discharge not determined.

<sup>#</sup> Operated as a continuous-record gaging station.

&lt; Less than.

b From high-water marks.

p Could have been slightly higher (10.59 ft) during period of no gage-height record, 10-1-93 to 10-28-93.

q At different datum.



## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Maximum discharge at crest stage partial record stations during water year 1994--Continued								
Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
KANAWHA RIVER BASIN--Continued								
Beaverdam Creek at Hillsville, Va. (03167700)	Lat 36°46'05", long 80°43'33", Carroll County, Hydrologic Unit 05050001, at bridge on private road to Burlington Industries, 0.2 mi east of Hillsville corporate limits, and 3.0 mi upstream from mouth. Datum of gage is 2,373.04 ft above sea level. Drainage area is 4.75 mi <sup>2</sup> . Prior to 1971, peaks reported for site 0.4 mi upstream at datum 12.93 ft higher (drainage area, 4.13 mi <sup>2</sup> ).	1962-94	8-17-94	5.50	470	10-19-68 1- 1-90 4-21-92	<u>r</u> 8.69 <u>s</u> 8.50 7.63	(*) (*) 876
Thorne Springs Branch near Dublin, Va. (03168750)	Lat 37°05'30", long 80°44'34", Pulaski County, Hydrologic Unit 05050001, at pond dam just upstream from U.S. Highway 11, 3.3 mi southwest of Dublin, and 4.3 mi up- stream from mouth. Elevation of gage is 1,975 ft above sea level, from topographic map. Drainage area is 4.77 mi <sup>2</sup> .	1957-69a, 1970-94	4-30-94	2.09	99	5-28-73	8.01	2,200
BIG SANDY RIVER BASIN								
Levisa Fork near Grundy, Va. (03207500)	Lat 37°17'52", long 82°07'34", Buchanan County, Hydrologic Unit 05070202, on right bank 200 ft upstream from Six and Twentymile Creek, 2.4 mi northwest of Grundy. Datum of gage is 984.47 ft above sea level. Drainage area is 235 mi <sup>2</sup> , includes that of Six and Twentymile Creek. Prior to Oct. 1, 1971, at various locations and datums.	1942-74#, 1986-87#, 1988-94	2-11-94	15.46	12,700	4- 4-77	<u>t</u> 28.87	52,000
Russell Fork at Council, Va. (03208040)	Lat 37°04'41", long 82°03'56", Buchanan County, Hydrologic Unit 05070202, on left bank 50 ft upstream from bridge on State Highway 80, 750 ft downstream from Ball Creek, 0.6 mi southeast of Council, and 4.7 mi upstream from Hurricane Creek. Elevation of gage is 1,680 ft above sea level, from topographic map. Drainage area is 10.2 mi <sup>2</sup> .	1981-83#, 1984-94	3-28-94 9-14-82 12-16-82 5- 7-84 2-18-86 4-18-87 4- 8-88 5- 5-89 5- 5-90 3-23-91 12- 2-91 3- 4-93	4.64 2.60 1.99 5.98 3.18 3.87 2.93 4.37 4.36 3.54 3.34 3.41	697 <u>m</u> 234 <u>m</u> 135 <u>m</u> 1,090 <u>m</u> 346 <u>m</u> 500 <u>m</u> 296 <u>m</u> 625 <u>m</u> 622 <u>m</u> 424 <u>m</u> 380 <u>m</u> 395	5- 7-84	5.98	<u>m</u> 1,090

\* Discharge not determined.

≠ Operated as a continuous-record gaging station.

a Records provided by U.S. Department of Agriculture, Soil Conservation Service.

m Revised.

r At site upstream.

s Affected by backwater from ice.

t At present site and datum.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
BIG SANDY RIVER BASIN--Continued								
Russell Fork near Birchleaf, Va. (03208100)	Lat 37°09'50", long 82°15'20", Dickenson County, Hydrologic Unit 05070202, on right bank 125 ft upstream from bridge on State Highway 80, 150 ft upstream from Fryingpan Creek, 1.3 mi southeast of Birchleaf, and 3.5 mi southeast of Haysi. Elevation of gage is 1,280 ft above sea level, from topo- graphic map. Drainage area is 87.4 mi <sup>2</sup> .	1981-83#, 1984-94	3-28-94	15.15	11,100	5- 7-84	21.30	22,600
North Fork Pound River at Pound, Va. (03208700)	Lat 37°07'32", long 82°37'36", Wise County, Hydrologic Unit 05070202, on right bank at Pound, 700 ft downstream from Stacy Branch, and 1,600 ft downstream from North Fork Pound River dam. Datum of gage is 1,500.00 ft above sea level. Drainage area is 18.5 mi <sup>2</sup> . Prior to Oct. 1, 1965, at datum 44.88 ft higher.	1963-87#, 1988-94	2-11-94	51.71	376	3-12-63	61.58	4,480
Pound River above Indian Creek, at Pound, Va. (03208800)	Lat 37°07'26", long 82°36'29", Wise County, Hydrologic Unit 05070202, on left bank at Pound, 1,600 ft down- stream from confluence of North and South Forks, 0.5 mi upstream from bridge on U.S. Highway 23, and 0.7 mi upstream from Indian Creek. Datum of gage is 1,535.64 ft above sea level. Drainage area is 36.7 mi <sup>2</sup> .	1966-78#, 1979-94	2-11-94	13.67	2,020	5-18-75	19.44	3,460
Pound River below Bold Camp Creek at Pound, Va. (03208850)	Lat 37°07'19", long 82°35'55", Wise County, Hydrologic Unit 05070202, at Pound, on left bank 1,000 ft upstream from bridge on State Highway 83, 0.3 mi downstream from Bold Camp Creek, and 0.5 mi downstream from Indian Creek. Datum of gage is 1,527.36 ft above sea level. Drainage area is 61.2 mi <sup>2</sup> .	1966-78#, 1979-94	2-11-94	17.59	3,090	5-18-75	25.64	6,290
Pound River near Georges Fork, Va. (03208900)	Lat 37°09'51", long 82°31'30", Dickenson County, Hydro- logic Unit 05070202, on right bank 50 ft upstream from bridge on State High- way 624, 150 ft upstream from Camp Creek, and 2.6 mi northwest of Georges Fork. Datum of gage is 1,470.39 ft above sea level. Drainage area is 82.5 mi <sup>2</sup> .	1964-82#, 1983-94	2-11-94	9.68	3,670	5-18-75	14.91	10,900

\* Operated as a continuous-record gaging station.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Maximum discharge at crest stage partial record stations during water year 1994--Continued								
Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
BIG SANDY RIVER BASIN--Continued								
Russell Fork at Bartlick, Va. (03209200)	Lat 37°14'45", long 82°19'25", Dickenson County, Hydrologic Unit 05070202, on left bank at Bartlick just upstream from bridge on State High- way 611, 0.2 mi downstream from Pound River, and 1.1 mi upstream from Fall Branch. Datum of gage is 1,165.00 ft above sea level. Drainage area is 526 mi <sup>2</sup> .	1963-82#, 1983-94	3-28-94	18.05	15,800	4- 4-77	27.55	50,000
Knox Creek at Kelsa, Va. (03213590)	Lat 37°27'02", long 82°03'34", Buchanan County, Hydrologic Unit 05070201, on downstream end of right bridge pier on State Highway 697, 0.3 mi downstream from Pawpaw Creek, 0.8 mi northeast of Kelsa, and 10.0 mi upstream from mouth. Elevation of gage is 945 ft above sea level, from topographic map. Drainage area is 84.3 mi <sup>2</sup> .	1980-81#, 1982-94	4-13-94	13.80	7,090	5- 7-84	20.2	13,000
TENNESSEE RIVER BASIN								
South Fork Holston River at Teas, Va. (03471200)	Lat 36°46'22", long 81°27'08", Smyth County, Hydrologic Unit 06010102, at Teas, on right downstream pier of bridge on State Highway 601, and 0.1 mi downstream from Mullins Branch. Datum of gage is 2,496.98 ft above sea level. Drainage area is 31.1 mi <sup>2</sup> .	1967-94	2-11-94	17.61	7,660	2-11-94	17.61	7,660
Beaverdam Creek at Damascus, Va. (03472500)	Lat 36°37'40", long 81°47'28", Washington County, Hydrologic Unit 06010102, at Damascus, on right bank 350 ft west of State Highway 716, in old plant area of Mobay Chemical Corporation, and 0.6 mi up- stream from mouth. Datum of gage is 1,946.66 ft above sea level. Drainage area is 56.0 mi <sup>2</sup> .	1948-59#, 1960-94	3-28-94	6.24	3,740	10- 2-77	8.45	6,000
Middle Fork Holston River at Groseclose, Va. (03473500)	Lat 36°53'19", long 81°20'51", Smyth County, Hydrologic Unit 06010102, on left bank 10 ft downstream from cul- verts on State Highway 679 at Groseclose, 0.2 mi up- stream from Rocky Spring Branch, 10 mi northeast of Marion, and at mile 54.7. Datum of gage is 2,442.86 ft above sea level. Drainage area is 7.39 mi <sup>2</sup> .	1948-57#, 1958-87, 1988-89#, 1990-94	2-11-94	3.91	167	7- 6-53	7.42	813

<sup>#</sup> Operated as a continuous-record gaging station.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN--Continued								
Middle Fork Holston River at Seven Mile Ford, Va. (03474000)	Lat 36°48'26", long 81°37'20", Smyth County, Hydrologic Unit 06010102, on right bank at downstream side of bridge on U.S. Highway 11 at Seven Mile Ford, 0.3 mi upstream from Meade Creek, 3.3 mi downstream from Walker Creek, and at mile 32.1. Datum of gage is 1,960.00 ft above sea level. Drainage area is 132 mi <sup>2</sup> .	1942-81 <sup>#</sup> , 1982-87 <sup>#v</sup> , 1988-89 <sup>#</sup> , 1990-94 <sup>#v</sup> ,	3-28-94	5.80	5,880	1-29-57 11- 6-77	10.75 10.33	u7,680 14,500
Hutton Creek near Chilhowie, Va. (03474700)	Lat 36°47'00", long 81°44'05", Washington County, Hydro- logic Unit 06010102, on left downstream wingwall of bridge on U.S. Highway 11, 3.3 mi southwest of Chil- howie, and 1.4 mi upstream from mouth. Drainage area is 8.32 mi <sup>2</sup> .	1967-94	2-11-94	11.64	480	6-23-79	13.92	1,740
Hall Creek near Glade Spring, Va. (03474800)	Lat 36°45'47", long 81°48'15", Washington County, Hydro- logic Unit 06010102, on right downstream wingwall, of bridge on U.S. Highway 11, 2.0 mi upstream from Tattle Branch, and 2.5 mi southwest of Glade Spring. Drainage area is 7.90 mi <sup>2</sup> .	1967-94	2-11-94	10.59	614	9-22-89	11.51	1,310
Cedar Creek near Meadowview, Va. (03475600)	Lat 36°44'50", long 81°51'20", Washington County, Hydro- logic Unit 06010102, on left downstream wingwall of cul- vert on U.S. Highway 11, 1.2 mi south of Meadowview, and 2.5 mi upstream from mouth. Datum of gage is 2,034.66 ft above sea level. Drainage area is 3.38 mi <sup>2</sup> .	1967-94	2-11-94	6.69	57	7-10-71	7.54	92
Spring Creek near Abingdon, Va. (03475700)	Lat 36°40'43", long 82°02'29", Washington County, Hydrologic Unit 06010102, on right up- stream and left downstream wingwall of culvert on U.S. Highway 11, 1.5 mi upstream from Sinking Creek, and 3.8 mi southwest of Abingdon. Datum of gage is 1,977.54 ft above sea level. Drainage area is 2.99 mi <sup>2</sup> .	1967-94	2-11-94 6- 4-83 5- 7-84 7-28-85 11-30-85 4-23-87 4-24-88 9-22-89 1- 1-90 5-28-91 9- 4-92 3-23-93	5.09 4.15 4.27 3.07 3.68 4.15 4.41 4.65 3.84 4.78 4.75 4.35	224 m76 m91 m10 m34 m76 m111 m148 m46 m169 m164 m102	9-30-72	6.05	402
Lick Creek near Chatham Hill, Va. (03487800)	Lat 36°57'44", long 81°28'21", Smyth County, Hydrologic Unit 06010101, on left bank 270 ft upstream from bridge on State Highway 42, 2.9 mi northeast of Chatham Hill, and 1.6 mi upstream from mouth. Datum of gage is 2,076.97 ft above sea level. Drainage area is 25.5 mi <sup>2</sup> .	1966-68 <sup>#</sup> , 1969-94	3-28-94	6.04	1,420	11- 7-77	8.09	2,660

<sup>#</sup> Operated as a continuous-record gaging station.

m Revised.

u Prior to channelization work associated with construction of Interstate Highway 81.

v Records provided by Tennessee Valley Authority.

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Maximum discharge at crest stage partial record stations during water year 1994 Continued								
Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN--Continued								
Brumley Creek at Brumley Gap, Va. (03488450)	Lat 36°47'30", long 82°01'10", Washington County, Hydro- logic Unit 06010101, on left downstream wingwall of bridge on State Highway 611, 0.2 mi upstream from mouth, 0.8 mi southeast of Brumley Gap, and 2.7 mi downstream from Lee Creek. Datum of gage is 1,489.16 ft above sea level. Drainage area is 21.1 mi <sup>2</sup> .	1979-81 <sup>#</sup> , 1982-94	3-28-94	5.38	875	5- 7-84	6.60	1,500
Cove Creek near Shelleys, Va. (03489800)	Lat 36°39'13", long 82°21'16", Scott County, Hydrologic Unit 06010101, on right down- stream wingwall of bridge on U.S. Highways 58 and 421, 1.5 mi northwest of Shelleys, and at mile 3.3. Datum of gage is 1,381.53 ft above sea level. Drainage area is 17.3 mi <sup>2</sup> .	1951-94	2-11-94	6.18	996	3-12-63	8.40	2,500
Big Moccasin Creek at Collinwood, near Hanson- ville, Va. (03489870)	Lat 36°44'16", long 82°19'25", Russell County, Hydrologic Unit 06010101, at Collinwood, on left downstream wingwall of bridge on State Highway 612, 50 ft downstream from Meade Branch, and at mile 36.5. Datum of gage is 1,796.34 ft above sea level. Drainage area is 41.9 mi <sup>2</sup> .	1967-68 <sup>#</sup> , 1969-94	2-11-94 7-30-66 3- 7-67 12-22-67 2- 2-69 4-28-70 5- 7-71 6-21-72 12-10-72 12-26-73	b5.91 4.57 4.59 4.24 3.47 5.95 5.77 4.47 5.84 5.35	2,830 m1,760 m1,770 m1,520 m982 m2,860 m2,720 m1,680 m2,770 m2,380	3-30-75	6.85	3,660
North Fork Holston River near Gate City, Va. (03490000)	Lat 36°36'31", long 82°34'05", Scott County, Hydrologic Unit 06010101, on left bank 75 ft upstream from bridge on U.S. Highway 23, 1.6 mi downstream from Big Moccasin Creek, 2.1 mi southeast of Gate City, and at mile 8.8. Datum of gage is 1,197.56 ft above sea level. Drainage area is 672 mi <sup>2</sup> .	1932-81 <sup>#</sup> , 1982-94 <sup>v</sup>	2-11-94	15.00	25,300	4- 5-77 h1862	19.79 v22.5	41,000 v54,000
Clinch River at Richlands, Va. (03521500)	Lat 37°05'10", long 81°46'52", Tazewell County, Hydrologic Unit 06010205, on right bank 1.0 mi southeast of Richlands, 1.6 mi downstream from Middle Creek, 2.2 mi upstream from Big Creek, and at mile 321.0. Datum of gage is 1,924.08 ft above sea level. Drainage area is 137 mi <sup>2</sup> .	1946-89 <sup>#</sup> , 1990-94	2-11-94	12.48	5,060	6-22-01	v21.3	v11,500

<sup>#</sup> Operated as a continuous-record gaging station.

<sup>b</sup> From high-water marks.

<sup>h</sup> Maximum known historical peak outside period of record.

<sup>m</sup> Revised.

<sup>v</sup> Records provided by Tennessee Valley Authority.



## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN--Continued								
Big Cedar Creek near Lebanon, Va. (03523000)	Lat 36°02'20", long 82°02'20", (formerly published as Cedar Creek near Lebanon) Russell County, Hydrologic Unit 06010205, on right bank 200 ft upstream from bridge on U.S. Highway 19 (business), 0.2 mi upstream from Roaring Spring Creek, 1.3 mi down- stream from Burgess Creek, 1.9 mi upstream from Little Cedar Creek, and 2.3 mi east of Lebanon. Datum of gage is 1,895.76 ft above sea level. Drainage area is 51.5 mi <sup>2</sup> .	1953-59 <sup>‡</sup> , 1960-77, 1991-94	2-11-94 3-30-91 12- 2-91 3-24-93	4.50 3.05 3.57 4.07	2,500 m903 m1,370 m1,940	4- 5-77	5.83	14,000
Guest River at Coeburn, Va. (03524500)	Lat 36°55'45", long 82°27'23", Wise County, Hydrologic Unit 06010205, on right bank 30 ft downstream from bridge on State Highway 72, 1.0 mi southeast of Coeburn, 1.4 mi upstream from Jaybird Branch, 1.8 mi downstream from Pine Camp Creek, and at mile 6.3. Datum of gage is 1,935.80 ft above sea level. Drainage area is 87.3 mi <sup>2</sup> .	1950-59 <sup>‡</sup> , 1960-78, 1979-81 <sup>‡</sup> , 1982-94	3-28-94 2- 1-85 2-18-86 1-19-87 2- 4-88 5- 6-89 2-10-90 3-30-91 12- 2-91 3-23-93	12.88 6.65 7.61 7.16 6.70 9.71 8.93 8.46 9.55 8.42	5,400 m1,370 m1,780 m1,570 m1,390 m2,960 m2,460 m2,210 m2,850 m2,190	4- 5-77	20.95	18,000
Stony Creek at Ka, Va. (03524900)	Lat 36°48'57", long 82°37'02", Scott County, Hydrologic Unit 06010205, at Ka, on left bank 300 ft upstream from bridge on State High- way 619, 600 ft downstream from Straight Fork, and 4.2 mi upstream from mouth. Elevation of gage is 1,510 ft above sea level, from topo- graphic map. Drainage area is 30.9 mi <sup>2</sup> .	1981 <sup>‡</sup> , 1982-94	3-28-94	7.81	10,800	5- 7-84	7.31	8,010
Copper Creek near Gate City, Va. (03526000)	Lat 36°40'26", long 82°33'57", Scott County, Hydrologic Unit 06010205, on right bank on upstream end of old bridge pier, 50 ft upstream from bridge on State Highway 619, 0.2 mi upstream from Plank Camp Creek, 1.1 mi down- stream from Obeyes Creek, and 2.6 mi northeast of Gate City. Datum of gage is 1,301.95 ft above sea level. Drainage area is 106 mi <sup>2</sup> .	1948-72 <sup>‡</sup> , 1973-94	2-11-94	11.02	4,140	4- 5-77	13.57	7,660

<sup>‡</sup> Operated as a continuous-record gaging station.  
<sup>j</sup> Approximate.  
<sup>m</sup> Revised.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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## Maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location and drainage area	Period of record (water years)	Water year 1994 maximum			Period of record maximum		
			Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis- charge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN--Continued								
Clinch River at Speers Ferry, Va. (03527000)	Lat 36°38'55", long 82°45'02", Scott County, Hydrologic Unit 06010205, on right bank 200 ft downstream from bridge on U.S. Highway 58, 0.5 mi downstream from Copper Creek, 0.8 mi north- west of Speers Ferry, 1.8 mi south of Clinchport, and at mile 211.0. Datum of gage is 1,196.52 ft above sea level. Drainage area is 1,126 mi <sup>2</sup> .	1931-76 <sup>#</sup> , 1977-78, 1979-81 <sup>#</sup> , 1982-94	2-11-94	27.00	39,100	4- 5-77	36.69	89,000
Powell River at Big Stone Gap, Va. (03529500)	Lat 36°52'08", long 82°46'32", Wise County, Hydrologic Unit 06010206, on right bank 10 ft upstream from bridge on U.S. Highway 23, at Big Stone Gap, 1.0 mi upstream from South Fork Powell River, 2.5 mi downstream from Pigeon Creek, and at mile 179.2. Datum of gage is 1,459.07 ft above sea level. Drainage area is 112 mi <sup>2</sup> .	1945-59 <sup>#</sup> , 1960-77, 1979-81 <sup>#</sup> , 1982-94	2-11-94	10.32	10,200	4- 5-77	16.50	24,000

## FOOTNOTES FOR CREST-STAGE PARTIAL-RECORD STATIONS: 1994 water year

- \* Discharge not determined.
- \*\* Discharge not determined. Discharge of 18,000 ft<sup>3</sup>/s published in the 1991 report was undefined.
- <sup>a</sup> Operated as a continuous-record gaging station.
- < Less than.
- > Greater than.
- a Records provided by U.S. Department of Agriculture, Soil Conservation Service.
- b From high-water marks.
- c Operated as a stage-only station.
- d At different site and datum 6.02 feet lower.
- e Affected by backwater from beaver dam.
- f Affected by debris jam at upstream end of culvert.
- g From profile extended from high-water marks recovered prior to establishment of gage, flow over road, and bridge.
- h Maximum known historical peak outside period of record.
- j Approximate.
- k Partial year 10-1-93 to 7-18-94 but probably peak for year based on comparison with other nearby gages.
- m Revised.
- n Affected by backwater from ice; water overtopped upstream gage; discharge determined from rating for downstream gage.
- p May have been slightly higher (10.59 ft ) during period of no gage-height record, 10-1-93 to 10-28-93.
- q At different datum.
- r At site upstream.
- s Affected by backwater from ice.
- t At present site and datum.
- u Prior to channelization work associated with construction of Interstate Highway 81.
- v Records provided by Tennessee Valley Authority.

## Special study and miscellaneous sites

Discharge measurements in the following table were made at special study and miscellaneous sites throughout the State. Data for miscellaneous sites provided by the Virginia Department of Environmental Quality - Water Division are noted by an "[a]".

Discharge measurements made at special study and miscellaneous sites during water year 1994						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
MOSQUITO CREEK BASIN						
01484740	Little Mosquito Creek	Lat 37°56'42", long 75°28'42", Accomack County, at Wallops Flight Facility sewage treatment plant, 0.2 mi upstream from mouth, and 1.4 mi north-east of Wattsville.	0.11	-	3- 1-94 6-29-94	0 0
Unnamed tributary [a]						
NASSAWADOX CREEK BASIN						
01484790	Chesapeake Bay	Lat 37°31'31", long 75°52'37", Northampton County, at culvert on State Highway 606, 2.7 mi upstream from Kelly Cove, and 3.5 mi north of Nassawadox.	4.2	1968-93	1-10-94 4-25-94 9- 7-94	3.07 .328 .520
Nassawadox Creek [a]						
POTOMAC RIVER BASIN						
01616150	Opequon Creek	Lat 39°12'57", long 78°04'56", Frederick County, at Jordan Springs, 700 ft downstream from bridge on State Highway 664, and 2.1 mi southeast of Stephenson.	-	1993	6- 7-94	.121
Lick Run [a]						
01616200	Hot Run	Lat 39°15'06", long 78°05'31", Frederick County, upstream from W. S. Frey Company discharge, 0.04 mi downstream from U.S. Highway 11, and 0.4 mi southeast of Clear Brook.	.034	-	6- 7-94	3.60
Clearbrook Run [a]						
01621100	Dry River	Lat 38°27'58", long 78°58'33", Rockingham County, 60 ft upstream from Wampler and Longacre discharge, 350 ft downstream from bridge on U.S. Highway 33, and 0.2 mi southwest of Hinton.	-	1963, 1976, 1979, 1981, 1991-93	5-17-94	15.7
Muddy Creek [a]						
01621210	Muddy Creek	Lat 38°27'58", long 78°58'38", Rockingham County, 500 ft upstream from mouth, 0.3 mi west of Hinton.	12.5	1979, 1981, 1991-93	5-17-94	7.75
War Branch [a]						
01621280	Dry River	Lat 38°25'55", long 78°58'50", Rockingham County, at bridge on State Highway 737, 0.4 mi upstream from mouth, and 2.4 mi south of Hinton.	32.72	1979, 1981, 1993	10-20-93 11-22-93 12-15-93 1-26-94 2-15-94 3-16-94 4-12-94 5-17-94 6-16-94 6-30-94 7-27-94 8-17-94 9-19-94	7.26 4.91 25.0 96.1 48.6 75.2 50.2 34.0 14.3 12.7 21.2 43.3 12.5
Muddy Creek [a]						

a Provided by the Virginia Department of Environmental Quality - Water Division.

b Approximately.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
POTOMAC RIVER BASIN--Continued						
01621305 Dry River [a]	North River	Lat 38°23'33", long 78°58'51", Rockingham County, at bridge on State Highway 1306 (North River Road), at Bridgewater, and 100 ft upstream from mouth.	121.17	1993	10-20-93	9.65
					11-22-93	8.06
					12-15-93	72.4
					1-26-94	228
					2-15-94	229
					3-16-94	323
					4-12-94	167
					5-17-94	113
					6-16-94	21.2
					6-30-94	16.0
					7-27-94	77.1
					8-17-94	114
					9-19-94	18.0
01621390 Cooks Creek [a]	North River	Lat 38°22'23", long 78°56'06", Rockingham County, at down- stream bridge on U.S. High- way 11, 400 ft upstream from Blacks Run, and 1.2 mi north of Mount Crawford.	42.74	1993	10-20-93	9.60
					11-22-93	6.82
					12-15-93	18.1
					1-26-94	41.0
					2-15-94	26.1
					3-16-94	44.7
					4-12-94	28.1
					5-17-94	19.2
					6-16-94	8.66
					6-30-94	9.26
					7-27-94	9.19
					8-17-94	14.1
					9-19-94	7.94
01621600 Pleasant Run [a]	North River	Lat 38°20'48", long 78°55'32", Rockingham County, at bridge on State Highway 867, 0.2 mi upstream from mouth, and 1.1 mi southeast of Mount Crawford.	8.39	1981, 1993	10-20-93	2.26
					11-22-93	1.69
					12-15-93	3.58
					1-26-94	9.39
					2-15-94	7.38
					3-16-94	16.2
					4-12-94	10.8
					5-17-94	5.28
					6-16-94	3.35
					6-30-94	3.39
					7-27-94	2.90
					8-17-94	2.51
					9-19-94	2.21
01622220 Unnamed tribu- tary [a]	Middle River	Lat 38°04'23", long 79°14'57", Augusta County, at Castaline Trout Farms-Middlebrook, 0.6 mi upstream from bridge on State Highway 602, 0.7 mi upstream from mouth, and 2.4 mi north- west of Middlebrook.	-	-	4-21-94	3.79
01625200 Mill Creek [a]	North River	Lat 38°18'59", long 78°49'07", Rockingham County, at bridge on State Highway 671, 0.9 mi upstream from mouth, and 1.5 mi north of Port Republic.	13.53	1993	10-20-93	2.96
					11-22-93	2.62
					12-15-93	6.90
					1-26-94	27.5
					2-15-94	15.3
					3-16-94	27.2
					4-12-94	15.9
					5-17-94	7.34
					6-16-94	4.18
					6-30-94	4.12
					7-27-94	4.25
					8-17-94	4.09
					9-19-94	2.84
01625700 Poor Creek [a]	South River	Lat 37°59'22", long 79°09'03", Augusta County, upstream from State Prison Camp No. 10 sewage treatment plant dis- charge, 0.6 mi upstream from bridge on State Highway 662, and 1.2 mi south of Greenville.	3.45	1993	4-20-94	3.97
					9-12-94	.816

a Provided by the Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
POTOMAC RIVER BASIN--Continued						
01628590 Unnamed tribu- tary [a]	Cub Run	Lat 38°22'43", long 78°48'21", Rockingham County, at Lawyer Road sewage treatment plant, 0.4 mi upstream from mouth, and 0.5 mi south of Penn Laird.	0.687	-	7- 7-94	0.121
Cub Run [a]	South Fork Shenandoah River	Lat 38°22'38", long 78°47'56", Rockingham County, at bridge on State Highway 655, 0.7 mi south of Penn Laird.	14.9	-	7- 7-94	3.42
01629945 Chub Run	Hawksbill Creek	Lat 38°34'31", long 78°27'32", Page County, at culvert on State Highway 689, 2.2 mi east of Stanley, and 3.1 mi upstream from mouth.	3.16	-	2-25-94	14.8
01632700 Holmans Creek [a]	North Fork Shenandoah River	Lat 38°42'57", long 78°45'37", Shenandoah County, 100 ft downstream from Lake Wunder, 0.2 mi upstream from State Highway 728, and 1.4 mi west of Forestville.	4.96	-	5-18-94 8-26-94	5.85 3.87
01632970 Crooked Run	Mill Creek	Lat 38°45'44", long 78°41'06", Shenandoah County, at culvert on State Highway 263, 0.4 mi upstream from mouth, and 2.3 mi west of Mt. Jackson.	6.49	-	3-15-94	16.8
01633100 Unnamed tribu- tary [a]	Stony Creek	Lat 38°47'47", long 78°48'43", Shenandoah County, at Orkney Springs, 60 ft downstream from bridge on State Highway 263, and 0.95 mi upstream from mouth.	1.19	1991-93	5-18-94	.304
01633570 North Fork Shenandoah River [a]	Shenandoah River	Lat 38°49'34", long 78°32'03", Shenandoah County, upstream from Aileen, Inc. water intake, 1.5 mi downstream from Stony Creek, and 1.7 mi east of Edinburg.	644	1993	5-18-94	547
01633730 Toms Brook [a]	North Fork Shenandoah River	Lat 38°56'42", long 78°26'32", Shenandoah County, at bridge on U.S. Highway 11, at Toms Brook.	9.35	1952-54, 1969-70	5-18-94	8.52
01636210 Happy Creek [a]	Shenandoah River	Lat 38°54'20", long 78°11'10", Warren County, at bridge on Criser Road (Kerfoot Avenue), at Front Royal, 2.3 mi up- stream from Leach Run, and 2.9 mi upstream from mouth.	14.0	1948-77#, 1981-83, 1991-93	6- 8-94	4.26
01636225 Unnamed tribu- tary [a]	Crooked Run	Lat 39°02'56", long 78°10'29", Frederick County, at culvert on State Highway 636, 1.5 mi upstream from mouth, and 2.4 mi north of Nineveh.	.60	1993	6- 8-94	.105

\* Operated as a continuous-record gaging station.

a Provided by the Virginia Department of Environmental Quality - Water Division.



## Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
POTOMAC RIVER BASIN--Continued						
01636240 Crooked Run [a]	Shenandoah River	Lat 38°57'22", long 78°11'53", Warren County, 100 ft down- stream from bridge on U.S. Highways 340 and 522, 0.6 mi north of Riverton, and 0.9 mi upstream from mouth.	-	1991-93	6- 8-94	8.12
01636266 Manassas Run [a]	Shenandoah River	Lat 38°54'49", long 78°05'58", Warren County, 100 ft upstream from bridge on State Highway 79, 1.3 mi west of Linden.	5.25	1991-93	6- 8-94	2.41
01644110 Sycolin Creek [a]	Goose Creek	Lat 39°04'20", long 77°31'09", Loudoun County, upstream from Goose Creek Industrial Park wastewater treatment plant discharge, 0.2 mi upstream from mouth, and 3.8 mi south- east of Leesburg.	-	1993	6- 7-94	4.65
01644133 Goose Creek [a]	Potomac River	Lat 39°05'08", long 77°30'42", Loudoun County, at bridge on State Highway 7, 2.3 mi upstream from mouth, and 3.2 mi northwest of Ashburn.	-	1993	6- 7-94	104
01656200 Broad Run	Occoquan River	Lat 38°48'25", long 77°48'47", Fauquier County, at culvert on U.S. Highway 17, 7 mi north of Warrenton, and 8.6 mi upstream from Mill Run.	2.94	1953-56, 1959-61, 1976, 1991-93	11-28-93 5-14-94	14.5 1.98
01659500 Middle Fork Chopawamsic Creek	North Branch Chopawamsic Creek	Lat 38°33'26", long 77°25'32", Stafford County, on left bank 300 ft upstream from State Highway 618, on Quantico Marine Corps Base, 0.4 mi upstream from mouth, and 5.6 mi north of Garrisonville.	4.51	1951-57 <sup>#</sup> , 1989-93	10-19-93 1-26-94 3-16-94 6-16-94	.63 6.73 5.54 .89
RAPPAHANNOCK RIVER BASIN						
01661835 Unnamed tribu- tary [a]	Hickman Run	Lat 38°45'14", long 78°06'24", Rappahannock County, 50 ft upstream from culvert on State Highway 641, 0.8 mi southwest of Flint Hill.	.125	-	8-30-94	.121
01662050 Unnamed tribu- tary [a]	Great Run	Lat 38°43'00", long 77°48'57", Fauquier County, upstream from Warrenton sewage treat- ment plant discharge, at Warrenton, and 300 ft up- stream from bridge on U.S. Highway 211.	-	1993	6- 7-94	.292
01665050 Pony Mountain Branch	Mountain Run	Lat 38°27'04", long 77°57'24", Culpeper County, at culvert on State Highway 3, 0.3 mi upstream from mouth, and 2.7 mi southeast of Culpeper.	.30	1983	11-28-93	1.25

<sup>#</sup> Operated as a continuous-record gaging station.

a Provided by the Virginia Department of Environmental Quality - Water Division.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
RAPPAHANNOCK RIVER BASIN--Continued						
01667870 Mountain Run	Rapidan River	Lat 38°21'13", long 77°53'38", Orange County, at bridge on State Highway 611, 2.4 mi west of Burr Hill, and 4.4 mi upstream from mouth.	28.8	1990-91	3-29-94	822
YORK RIVER BASIN						
01670145 Unnamed tributu- ary [a]	Unnamed tributary	Lat 38°02'00", long 78°00'09", Louisa County, 25 ft upstream from Louisa County sewage treatment plant, 0.5 mi north of Louisa.	-	1991-93	4- 5-94 6-14-94	.490 .129
01670180 Pamunkey Creek	Lake Anna	Lat 36°11'53", long 77°58'09", Orange County, at bridge on State Highway 669, 0.45 mi south of Lahore, and 3.8 mi upstream from Lake Anna.	40.5	1989-91	3-29-94	1,360
01670300 Contrary Creek [c]	North Anna River	Lat 38°03'53", long 77°52'45", Louisa County, at bridge on U.S. Highway 522, 1.2 mi up- stream from Lake Anna, 4.0 mi northeast of Mineral, and 5.1 mi upstream from former mouth.	5.53	1976-87 <sup>‡</sup> , 1989-93	3-29-94 4- 5-94 6-14-94 9- 7-94	167 7.65 1.56 1.67
01670320 Freshwater Creek [a]	Contrary Creek	Lat 38°00'33", long 77°53'56", Louisa County, 20 ft upstream from Mineral sewage treatment plant, 600 ft upstream from culvert on State Highway 618, and 0.5 mi east of Mineral.	-	1991-93	4- 5-94 6-14-94	.555 .083
01671200 South Anna River [a]	Pamunkey River	Lat 38°07'25", long 78°12'20", Louisa County, at bridge 0.2 mi west of Gordonsville sewage treatment plant, 1.5 mi southwest of Gordonsville.	5.00	1981, 1991-93	4- 5-94 6-14-94	9.08 .572
01671230 Bowler Creek [a]	Dove Fork	Lat 38°05'22", long 78°13'23", Louisa County, at bridge on State Highway 660, 0.5 mi upstream from Lake Gordons- ville, and 1.3 mi east of Lindsay.	-	1992-93	4- 5-94	2.65
01671615 Fosters Creek	South Anna River	Lat 37°57'35", long 78°11'20", Louisa County, at culvert on U.S. Highway 250, 1.9 mi southeast of Zion Crossroads, 4.6 mi northwest of Ferncliff, and 5.0 mi upstream from mouth.	.61	1983	11-28-93	5.10
01671650 Waldrop Creek	South Anna River	Lat 38°00'08", long 78°04'22", Louisa County, at culvert on State Highway 632, 2.3 mi up- stream from mouth, and 4.2 mi southwest of Louisa.	2.85	1969-71	11-28-93	64.2

<sup>‡</sup> Operated as a continuous-record gaging station.

a Provided by the Virginia Department of Environmental Quality - Water Division.

c Provided by both the U.S. Geological Survey and Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
YORK RIVER BASIN--Continued						
01671750 Harris Creek	South Anna River	Lat 38°01'02", long 78°03'06", Louisa County, at culvert on State Highway 632, 2.7 mi southeast of Trevilians, and 6.0 mi upstream from mouth.	3.31	1969-70	11-28-93	36.7
01671925 Northeast Creek [a]	South Anna River	Lat 37°58'39", long 77°56'22", Louisa County, at Louisa WTP discharge, 300 ft downstream from culvert on U.S. Highway 33, and 2.5 mi south of Mineral.	10.07	-	9- 7-94	1.05
01674200 Reedy Creek	Mattaponi River	Lat 37°52'55", long 77°21'35", Caroline County, at bridge on U.S. Highway 301, 3.3 mi north of Dawn, and 11 mi south of Bowling Green.	16.8	1964, 1969, 1973-75, 1990-93	2-24-94	149
01674700 Aylett Creek	Mattaponi River	Lat 37°47'05", long 77°06'23", King William County, at culvert on U.S. Highway 360, at Aylett, and 2.8 mi upstream from mouth.	6.17	-	2-24-94	28.4
JAMES RIVER BASIN						
02011010 Warm Springs Run [a]	Jackson River	Lat 38°02'57", long 79°47'43", Bath County, 100 ft upstream from Warm Springs sewage treatment plant, 0.2 mi downstream from unnamed tributary, and 0.3 mi northwest of Warm Springs.	-	1991-93	4-21-94 9-30-94	6.84 3.26
02011830 Hot Springs Run [a]	Cedar Creek	Lat 38°00'33", long 79°51'47", Bath County, 50 ft upstream from Hot Springs Regional sewage treatment plant, 0.5 mi east of Bacova Junction, and 0.7 mi downstream from bridge on State Highway 615.	4.32	1993	4-21-94 9-30-94	5.15 2.56
02012500 Jackson River	James River	Lat 37°52'36", long 79°58'39", Alleghany County, at Smith Bridge, 0.8 mi south of Falling Spring, and 1.6 mi downstream from Falling Spring Creek.	411	1925-93	10- 6-93 11- 3-93 8- 1-94	201 172 300
02012800 Jackson River [a]	James River	Lat 37°48'40", long 79°59'20", Covington City, at Covington filtration plant, at Covington.	-	1990	10- 5-93	218
02012950 Sweet Springs Creek tributary	Sweet Springs Creek	Lat 37°39'25", long 80°14'10", Alleghany County, at culvert on State Highway 311, 0.1 mi upstream from mouth, and 0.9 mi north of Sweet Chalybeate.	.66	1968-71	2-24-94	3.12
Dunlap Creek [a]	Jackson River	Lat 37°47'44", long 79°59'51", Alleghany County, on U.S. Highway 60, 900 ft upstream from mouth, and at Covington.	-	1990	10- 5-93	17.7

a Provided by the Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
JAMES RIVER BASIN--Continued						
Jackson River [a]	James River	Lat 37°45'55", long 79°59'35", Covington City, 100 ft down- stream from Harmon Run, at Covington.	-	-	10- 5-93	242
Potts Creek [a]	Jackson River	Lat 37°45'06", long 79°59'50", Covington City, 75 ft down- stream from bridge on State Highway 18, 700 ft upstream from mouth, and at Covington.	-	1990	10- 5-93	22.9
Jackson River [a]	James River	Lat 37°45'24", long 79°59'14", Covington City, at bridge on State Highway 18, at Idlewilde.	-	-	10- 5-93	266
02017300 Craig Creek	James River	Lat 37°30'06", long 80°06'18", Craig County, at State High- way 616, 800 ft upstream from Johns Creek, and 0.3 mi south- east of New Castle.	112	-	2-24-94	1,110
02017700 Craig Creek tributary	Craig Creek	Lat 37°33'21", long 79°59'52", Craig County, at culvert on State Highway 606, 0.4 mi upstream from mouth, and 7.1 mi northeast of New Castle.	2.05	1968-71, 1992	2-24-94	15.9
02018800 North Fork	Catawba Creek	Lat 37°32'07", long 79°56'03", Botetourt County, at culvert on State Highway 606, 3.5 mi upstream from mouth, and 3.9 mi northwest of Fincastle.	4.17	1968-71	2-24-94	53.0
02021080 Alum Creek [a]	Brattons Run	Lat 37°54'36", long 79°36'27", Rockbridge County, 300 ft south of State Highway 633, 1.2 mi upstream from mouth, and 4.6 mi south of Millboro.	3.21	1992-93	9-30-94	.146
02021110 Brattons Run [a]	Calfpasture River	Lat 37°58'07", long 79°30'17", Rockbridge County, 200 ft upstream from bridge on State Highway 39, 0.7 mi southwest of Goshen, and 1.0 mi down- stream from bridge on State Highway 780.	28.86	1991-93	4-21-94 9-30-94	45.4 1.29
02021400 Unnamed tribu- tary [a]	Byrd Spring Creek tributary	Lat 38°02'26", long 79°23'12", Augusta County, at Castaline Trout Farm - Craigsville, 0.3 mi upstream from State Highway 683, and 2.7 mi south of Craigsville.	.38	-	4-21-94	1.96
James River	Chesapeake Bay	Lat 37°33'10", long 79°22'03", Amherst-Bedford County line, at bridge on Blue Ridge Parkway, 1.5 mi north of Big Island.	-	1990-93	4- 8-94 9-14-94	8,440 932
02023390 Moore's Creek [a]	South River	Lat 37°55'57", long 79°13'52", Rockbridge County, at Wilco Travel Plaza, 200 ft upstream from State Highway 917, and 0.3 mi south of Raphine.	.70	-	4-20-94 9-12-94	.976 .293

a Provided by the Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
JAMES RIVER BASIN--Continued						
02023395 Moores Creek [a]	South River	Lat 37°54'57", long 79°14'10", Rockbridge County, at Raphine Motel sewage treatment plant, 0.6 mi upstream from bridge on U.S. Highway 11, and 1.5 mi south of Raphine.	2.46	-	4-20-94 9-12-94	2.93 .941
02025680 Unnamed tributary [a]	Harris Creek	Lat 37°28'43", long 79°08'11", Amherst County, at bridge on private road, 100 ft upstream from Ivanhoe Forest Subdivision sewage treatment plant, and 1.4 mi south of Monroe.	0.50	1993	6-13-94	.220
02025850 Ivy Creek [a]	Blackwater Creek	Lat 37°23'36", long 79°18'35", Bedford County, 100 ft downstream from Ivy Hill Lake, 2.1 mi upstream from State Highway 662, and 2.7 mi northeast of Norwood.	9.68	-	6-13-94 9- 9-94	6.81 3.64
02025970 Wreck Island Creek [a]	James River	Lat 37°28'52", long 78°53'43", Appomattox County, 50 ft upstream from Appomattox Lime Company discharge, 2.0 mi downstream from bridge on State Highway 683, and 3.0 mi south of Riverville.	56.11	1993	9- 8-94	22.6
02028480 Unnamed tributary [a]	South Fork Rockfish River	Lat 37°54'16", long 78°57'51", Nelson County, 200 ft above Wintergreen Mountain sewage treatment plant, 2.8 mi northeast of Love.	.34	1993	4-20-94 9-12-94	.514 .179
02030400 Turpin Creek [a]	Slate River	Lat 37°14'19", long 78°28'50", Buckingham County, at Buckingham Medium Security Institute #3 discharge, 1.5 mi upstream from Peyton Creek, and 2.0 mi northwest of Dillwyn.	1.32	-	4-19-94 6-20-94	1.48 .574
02030755 Unnamed tributary [a]	North Creek	Lat 37°45'28", long 78°15'38", Fluvanna County, at Village Nursing Center discharge, 0.2 mi south of Fork Union, and 0.5 mi upstream from mouth.	.08	-	4-19-94 6-20-94 9- 7-94	.004 .001 0
02030760 North Creek [a]	South Creek	Lat 37°45'27", long 78°15'02", Fluvanna County, 100 ft upstream from Fork Union Military Academy sewage treatment plant, at bridge on State Highway 652, and 0.8 mi southeast of Fork Union.	1.77	1990-93	4-19-94 6-20-94 9- 7-94	1.16 .272 .180
02032700 Schenks Branch	Meadow Creek	Lat 38°02'32", long 78°28'30", Charlottesville City, at access road culvert, 25 ft upstream from U.S. Highway 250 bypass culvert, and 0.7 mi upstream from mouth.	1.34	1950, 1952, 1954, 1959-60, 1969	3- 4-94	8.03
02033390 Biscuit Run [a]	Moores Creek	Lat 37°59'57", long 78°31'09", Albemarle County, at Southwood Mobile Home Park discharge, 1.1 mi upstream from Interstate Highway 64, 0.8 mi south of Charlottesville City limits, and 1.3 mi upstream from mouth.	12.56	-	4-20-94 6-20-94	14.2 5.04

a Provided by the Virginia Department of Environmental Quality - Water Division.



Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
JAMES RIVER BASIN--Continued						
Mechunk Creek [a]	Rivanna River	Lat 38°59'03", long 78°18'44", Fluvanna County, at bridge on U.S. Highway 250, 5.0 mi west of Zion Crossroads.	-	1941, 1951, 1953-54, 1964	9-15-94	7.55
02038810 South Fork Appomattox River [a]	Appomattox River	Lat 37°21'13", long 78°48'50", Appomattox County, at Appomattox Lagoon discharge, 200 ft downstream from culvert on U.S. Highway 460 bypass, and 0.8 mi southeast of Appomattox.	0.46	-	6-13-94	.147
02038840 Holiday Creek	Appomattox River	Lat 37°25'58", long 78°41'12", Buckingham County, at State Forest Road 2307 (old Richmond Road), 1.8 mi upstream from confluence with North Holiday Creek, and 5.2 mi south-southwest of Toga.	1.68	1972, 1989-90	2-24-94 3-28-94	14.7 56.8
02038845 North Holiday Creek	Holiday Creek	Lat 37°26'09", long 78°40'04", Buckingham County, at State Forest Road 2307 (old Richmond Road), 1.0 mi upstream from mouth, and 4.5 mi south-southwest of Toga.	1.31	1972-73, 1989-90	2-24-94 3-28-94	14.8 63.0
02041700 Cattail Run [a]	Appomattox River	Lat 37°12'58", long 77°26'39", Dinwiddie County, at Petersburg, 500 ft upstream from U.S. Highways 1 and 460, and 0.7 mi upstream from mouth.	8.61	1993	3-17-94 6- 9-94 7-11-94 9-21-94	8.63 .910 .262 .815
02042080 Bailey Creek [a]	James River	Lat 37°16'26", long 77°17'24", Hopewell City and Prince George County line, at bridge on State Highway 156, at Hopewell, and 0.4 mi downstream from Manchester Run.	-	1992-93	3-17-94 7- 8-94 9-21-94	11.3 3.24 3.08
02042140 Powell Creek [a]	James River	Lat 37°14'54", long 77°09'09", Prince George County, at bridge on State Highway 10, at Garysville, and 4.7 mi upstream from mouth.	14.6	1980-83, 1991-93	3-17-94 7- 8-94 9-21-94	12.8 2.08 2.15
02042155 East Run [a]	West Run	Lat 37°22'12", long 77°09'29", Charles City County, at bridge on State Highway 609, at Barnetts, 50 ft upstream from Sign Post Estates sewage treatment plant, and 0.5 mi upstream from mouth.	9.67	1980, 1993	10-21-93	0
02042190 Courthouse Creek [a]	Queens Creek	Lat 37°20'36", long 77°04'36", Charles City County, at Charles City, 50 ft upstream from Charles City Middle School sewage treatment plant, 0.3 mi upstream from bridge on State Highway 155, and 1.2 mi upstream from mouth.	5.07	1993	3-17-94 7- 7-94	1.95 .869

a Provided by the Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
CHOWAN RIVER BASIN						
02044900 Great Creek [a]	Nottoway River	Lat 36°58'51", long 77°44'28", Dinwiddie County, at town of McKenney sewage treatment plant, 1.1 mi west of McKenney, and 1.8 mi upstream from mouth.	3.84	-	5-31-94 7-12-94 9-19-94	0.184 0 0
02046250 Stony Creek [a]	Nottoway River	Lat 36°56'53", long 77°23'24", Sussex County, at Stony Creek sewage treatment plant, 0.2 mi downstream from bridge on Interstate Highway 95, 0.6 mi east of Stony Creek, and 0.9 mi upstream from mouth.	236	-	6- 9-94 7-11-94 9-19-94	20.5 11.1 .976
02046750 Three Creek [a]	Nottoway River	Lat 36°43'25", long 77°31'13", Greensville County, at bridge on State Highway 616, 1.5 mi downstream from Macclins Creek, and 1.6 mi northeast of Emporia.	67.2	1981-84, 1993	5- 3-94 6- 9-94 7-11-94 9-20-94	21.7 3.32 .178 .392
ROANOKE RIVER BASIN						
02055515 Lick Run [a]	Tinker Creek	Lat 37°16'20", long 79°56'08", Roanoke City, at Roanoke, along Norfolk Avenue, 300 ft downstream from U.S. Highway 220, and 1.0 mi upstream from mouth.	5.0	-	6-22-94	8.80
02057620 Story Creek [a]	Pigg River	Lat 36°55'35", long 80°00'36", Franklin County, at Ferrum sewage treatment plant, 600 ft downstream from bridge on State Highway 864, and 0.7 mi north of Ferrum.	2.4	-	6-22-94	1.28
02057650 Pigg River [a]	Roanoke River	Lat 36°59'01", long 79°52'53", Franklin County, 500 ft upstream from Ronile Incorporated discharge, 0.4 mi downstream from bridge on Business Route 220, and 0.9 mi south of Rocky Mount.	68.8	1993	6-22-94	47.2
02060900 Roaring Run [a]	Big Otter River	Lat 37°24'28", long 79°24'11", Bedford County, at Gunnoe Sausage discharge, 500 ft upstream from bridge on State Highway 643, and 0.3 mi south of Cifax.	.70	-	9- 9-94	.240
02061460 Buffalo Creek [a]	Big Otter River	Lat 37°18'18", long 79°17'24", Campbell County, 300 ft upstream from bridge on U.S. Highway 460, and 0.5 mi northwest of New London.	5.86	1993	6-13-94 9- 9-94	14.0 16.5
02065300 Right Hand Fork	Big Cub Creek	Lat 37°16'12", long 78°49'14", Appomattox County, at culvert on State Highway 727, 0.5 mi upstream from Maple Spring Branch, and 5.2 mi south of Appomattox.	2.08	1968-71, 1987, 1993	2-23-94	40.5

a Provided by the Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
ROANOKE RIVER BASIN--Continued						
02071510 Smith River	Dan River	Lat 36°45'48", long 80°16'22", Patrick County, at State Highway 615, 0.9 mi upstream from Jacks Creek, and 1.7 mi south of Woolwine.	-	-	9- 6-94	17.7
					9-20-94	14.8
02071520 Smith River	Dan River	Lat 36°46'05", long 80°16'13", Patrick County, at State Highway 8, 0.5 mi upstream from Jacks Creek, and 1.5 mi south of Woolwine.	-	-	8-17-94	356
02071530 Smith River	Dan River	Lat 36°46'42", long 80°14'58", Patrick County, at bridge on State Highway 708 at Smith River Church, 0.9 mi downstream from Jacks Creek, and 1.6 mi southeast of Woolwine.	-	-	8-17-94	417
					8-17-94	321
					8-18-94	139
					8-19-94	91.9
					9- 6-94	26.4
9-20-94	22.3					
02072950 Grassy Creek [a]	Smith River	Lat 36°40'07", long 79°55'48", Henry County, 0.3 mi upstream from bridge on U.S. Highway 220, 1.8 mi upstream from mouth, and 2.3 mi south of Fieldale.	4.10	1993	5- 2-94	4.36
					6-22-94	3.13
02073200 Unnamed tributary [a]	Marrowbone Creek	Lat 36°34'29", long 79°52'04", Henry County, 100 ft upstream from culvert on U.S. Highway 220, 0.5 mi west of Ridgeway, and 2.0 mi upstream from mouth.	.05	1993	5- 2-94	.004
					6-21-94	.001
02073600 Smith River	Dan River	Lat 36°36'07", long 79°46'38", Henry County, at bridge on State Highway 636, 1.6 mi downstream from Leatherwood Creek, and 1.7 mi southwest of Irisburg.	-	-	8-18-94	794
					9- 7-94	132
					9-21-94	131
Unnamed tributary [a]	Hogans Creek	Lat 36°32'30", long 79°22'22", Pittsylvania County, at Good-year Tire and Rubber plant discharge, 0.4 mi upstream from bridge on State Highway 736, 1.1 mi southeast of Danville city limits, and 1.5 mi upstream from mouth.	.89	-	6-23-94	.205
02075045 Dan River	Roanoke River	Lat 36°33'45", long 79°22'12", Pittsylvania County, at foot-bridge at Danville sewage treatment plant, 0.1 mi downstream from Pumpkin Creek, and 0.6 mi southeast of Danville.	-	-	10-28-93	951
					11-30-93	2,010
					3-24-94	2,240
					3-29-94	34,700
					4-20-94	2,660
					6-21-94	863
					7- 6-94	712
					7-20-94	1,480
					8-16-94	11,610
9-21-94	990					
02076100 Wet Sleeve Creek [a]	Banister River	Lat 36°46'18", long 79°32'52", Pittsylvania County, 0.4 mi downstream from bridge on State Highway 815, 1.3 mi upstream from mouth, and 2.8 mi northeast of Swansonville.	3.75	1993	5- 2-94	2.91
					6-23-94	1.41

a Provided by the Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
ROANOKE RIVER BASIN--Continued						
02076280 Dry Fork [a]	White Oak Creek	Lat 36°44'40", long 79°23'48", Pittsylvania County, at Vulcan Materials Company discharge, 0.6 mi south of Dry Fork, and 0.7 mi upstream from bridge on State Highway 718.	2.42	-	6-23-94	0.030
02076340 Cherrystone Creek [a]	Banister River	Lat 36°48'21", long 79°22'44", Pittsylvania County, 50 ft upstream from Tanyard Branch, 0.8 mi downstream from bridge on U.S. Highway 29, and 1.7 mi southeast of Chatham.	36.18	1993	5- 2-94 6-21-94	26.4 14.4
02076350 Tanyard Branch [a]	Cherrystone Creek	Lat 36°48'23", long 79°22'44", Pittsylvania County, at mouth, 0.8 mi downstream from culvert on U.S. Highway 29, and 1.7 mi southeast of Chatham.	2.11	1993	5- 2-94 6-21-94	1.71 .880
KANAWHA RIVER BASIN						
03162750 Fox Creek [a]	New River	Lat 36°41'22", long 81°25'52", Grayson County, at Rives Casuals sewage treatment plant, 400 ft upstream from bridge on State Highway 16, and 1.1 mi southeast of Trout Dale.	13.82	-	5-24-94 9-22-94	14.2 7.74
03165700 Cripple Creek	New River	Lat 36°49'31", long 81°16'45", Wythe County, at bridge on State Highway 749, 0.6 mi southeast of Cedar Springs.	11.3	1969, 1972, 1978, 1992-93	3- 4-94 4-26-94	32.1 17.0
03166800 Glade Creek	Reed Creek	Lat 36°55'31", long 80°54'02", Wythe County, at bridge on State Highway 629, 0.4 mi upstream from mouth, and 1.0 mi southwest of Grahams Forge.	7.15	1976-93 <sup>a</sup>	10- 7-93	.153
03162852 Peach Bottom Creek [c]	New River	Lat 36°36'01" long 81°06'41", Grayson County, at Indepen- dence sewage treatment plant, 200 ft upstream from State Highway 697, and 2.7 mi southeast of Independence.	-	1993	10-29-93 5-17-94 9-16-94	5.25 26.1 12.9
03163480 Stone Creek [a]	Elk Creek	Lat 36°43'27", long 81°10'45", Grayson County, at Perry Manufacturing sewage treat- ment plant, 0.2 mi north of Elk Creek, and 0.3 mi upstream from bridge on State Highway 659.	2.31	-	5-24-94 9-22-94	2.58 1.83
03165360 Pine Branch [a]	Glade Creek	Lat 36°44'33", long 80°48'15", Carroll County, at Southwest Training Center sewage treat- ment plant, 100 ft downstream from bridge on State Highway 707, 1.5 mi upstream from mouth, and 1.8 mi southeast of Woodlawn.	.63	-	5-24-94 9-22-94	.302 .371

a Provided by the Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
KANAWHA RIVER BASIN--Continued						
03166100 Buddle Branch [a]	New River	Lat 36°50'17", long 80°55'00", Wythe County, 100 ft east of State Highway 636, 0.6 mi upstream from culvert on State Highway 69, and 0.9 mi south of Austinville.	-	1993	5-24-94 9-22-94	0.002 0
03166120 Buddle Branch [a]	New River	Lat 36°51'07", long 80°54'29", Wythe County, 20 ft upstream from Austinville sewage treat- ment plant discharge, 0.3 mi east of Austinville, and 0.5 mi downstream from culvert on State Highway 69.	-	1993	5-24-94 9-22-94	.002 .004
03166550 Unnamed tribu- tary [a]	South Fork Reed Creek	Lat 36°53'30", long 81°15'15", Wythe County, at culvert on road to Rural Retreat sewage treatment plant, 1.2 mi east of Rural Retreat.	1.58	1977, 1993	5-24-94 9-23-94	2.54 .882
03166765 Unnamed tribu- tary [a]	Reed Creek	Lat 36°56'27", long 80°58'22", Wythe County, at Flying J Travel Plaza sewage treatment plant discharge, at inter- section of State Highway 634 and frontage road, 0.1 mi up- stream from mouth, and 2.3 mi southwest of Max Meadows.	1.33	-	5-24-94 9-21-94	.290 .361
03166770 Unnamed tribu- tary [a]	Reed Creek	Lat 36°56'20", long 80°57'03", Wythe County, 0.3 mi down- stream from culvert on State Highway 632, 1.9 mi upstream from mouth, and 2.2 mi south of Max Meadows.	.77	1993	5-24-94 9-21-94	1.27 .983
03166775 Unnamed tribu- tary [a]	Reed Creek	Lat 36°56'47", long 80°55'55", Wythe County, at Merchants Mall sewage treatment plant discharge, 50 ft upstream from bridge on frontage road, 0.5 mi upstream from mouth, and 1.9 mi southeast of Max Meadows.	2.64	1993	5-24-94 9-21-94	3.37 3.05
03167150 Big Reed Island Creek [a]	New River	Lat 36°41'20", long 80°31'42", Carroll County, at Olde Mill Golf Resort, 0.2 mi down- stream from bridge on State Highway 618, and 2.1 mi south of Laurel Fork.	20.2	-	5-27-94 9-22-94	37.5 24.8
03168480 Tract Fork [a]	Peak Creek	Lat 37°02'50", long 80°47'14", Pulaski County, at Pulaski, 100 ft upstream from mouth, and 1.9 mi downstream from Harbison Branch.	25.55	-	5-23-94 6-22-94 9-23-94	8.19 12.8 3.06
03170100 Mill Creek [a]	Meadow Creek	Lat 37°03'23", long 80°26'39", Montgomery County, 0.2 mi downstream from bridge on State Highway 616, 0.7 mi south of Riner, and 1.1 mi upstream from Poplar Branch.	2.12	1993	5-23-94 9-23-94	.941 .633

a Provided by the Virginia Department of Environmental Quality - Water Division.



## Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued

Discharge measurements made at special study and miscellaneous sites during water year 1994 - Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
KANAWHA RIVER BASIN--Continued						
03171690 Unnamed tribu- tary [a]	Crab Orchard Creek	Lat 37°06'08", long 81°06'45", Bland County, at Bland Com- bined School sewage treatment plant, 0.3 mi upstream from bridge on State Highway 605, and 0.3 mi east of Bland.	1.56	-	5-23-94 9-21-94	0.591 .105
03171700 Crab Orchard Creek [a]	Walker Creek	Lat 37°05'36", long 81°06'37", Bland County, 0.4 mi down- stream from bridge on State Highway 605, 0.7 mi southeast of Bland.	15.91	1993	5-23-94 9-21-94	7.51 2.92
03171900 Kimberling Creek [a]	Walker Creek	Lat 37°10'38", long 80°58'54", Bland County, at bridge on State Highway 612, 0.5 mi upstream from East Wilderness Creek, and 1.8 mi southwest of Holly Brook.	27.3	1983-85, 1993	5-23-94 9-21-94	5.40 .121
03171950 Kimberling Creek [a]	Walker Creek	Lat 37°09'55", long 80°54'00", Bland County, at bridge on State Highway 42, 0.8 mi downstream from Dismal Creek, and 2.4 mi northeast of Mechanicsburg.	57.54	1941-42, 1951-55, 1993	5-23-94 9-21-94	32.5 9.56
03173800 Stony Creek [a]	New River	Lat 37°22'03", long 80°40'33", Giles County, 50 ft upstream from bridge on State Highway 720, 0.1 mi northeast of Kimballton, and 1.9 mi upstream from mouth.	45.19	1993	5-23-94 9-21-94	29.1 7.82
03174600 Wolf Creek [a]	New River	Lat 37°10'38", long 81°09'10", Bland County, at Kegley Manor sewage treatment plant dis- charge, 0.4 mi upstream from U.S. Highways 21 and 52, 0.8 mi upstream from Hunting Camp Creek, and 1.7 mi north of Bastian.	99.0	-	9-21-94	10.4
03177750 Laurel Fork [c]	Bluestone River	Lat 37°18'27", long 81°20'03", Tazewell County, at Pocahontas sewage treatment plant, 0.4 mi northeast of Pocahontas, and 1.5 mi upstream from mouth.	14.6	1993	10-28-93 5-16-94 8-11-94	.119 8.81 .818
BIG SANDY RIVER BASIN						
03207350 Levisa Fork [c]	Big Sandy River	Lat 37°14'21", long 82°04'02", Buchanan County, at Oakwood sewage treatment plant, 0.1 mi downstream from Laurel Branch, and 1.8 mi east of Vansant.	-	1993	10-28-93 5-16-94 9-15-94	26.9 252 33.0
03207438 Slate Creek [a]	Levisa Fork	Lat 37°18'45", long 81°58'36", Buchanan County, at J. M. Bevins Elementary School sewage treatment plant, 50 ft south of State Highway 83, 600 ft upstream from Twin Branch, and 0.9 mi southeast of Stacy.	16.12	-	5-24-94	3.75

a Provided by the Virginia Department of Environmental Quality - Water Division.

c Provided by both the U.S. Geological Survey and Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
BIG SANDY RIVER BASIN--Continued						
03208040 Russell Fork	Levisa Fork	Lat 37°04'41", long 82°03'56", Buchanan County, at bridge on State Highway 80, 750 ft downstream from Ball Creek, 0.6 mi southeast of Council, and 4.7 mi upstream from Hurricane Creek.	10.2	1981-83, 1992	4-28-94 4-28-94 5-31-94	341 377 2.43
03208340 McClure Creek [a]	McClure River	Lat 37°01'03", long 82°17'46", Dickenson County, 100 ft west of State Highway 63, 0.2 mi downstream from Trammel Branch, and 0.3 mi northwest of Trammel.	4.02	-	5-26-94	2.07
03208364 McClure Creek [a]	McClure River	Lat 37°04'04", long 82°20'40", Dickenson County, at Ervinton Elementary School sewage treatment plant, 0.2 mi upstream from bridge on State Highway 652, 0.2 mi upstream from Open Fork, and 0.3 mi southeast of Nora.	22.0	-	5-26-94	2.07
03208700 North Fork Pound River	Pound River	Lat 37°07'32", long 82°37'36", Wise County, 700 ft downstream from Stacy Branch, 1,600 ft downstream from North Fork Pound River dam, and at Pound.	18.5	1963-93	1-11-94 5-17-94	30.0 15.9
03208800 Pound River	Russell Fork	Lat 37°07'26", long 82°36'29", Wise County, 1,600 ft downstream from confluence of North and South Forks, 0.5 mi upstream from U.S. Highway 23, 0.7 mi upstream from Indian Creek, and at Pound.	36.7	1966-81, 1984-93	10- 5-93 4- 5-94	8.52 162
03208900 Pound River	Russell Fork	Lat 37°09'51", long 82°31'30", Dickenson County, 50 ft upstream from State Highway 624, 150 ft upstream from Camp Creek, and 2.6 mi northwest of Georges Fork.	82.5	1964-93	12- 7-93 4- 5-94	521 186
0320890485 Georges Fork [a]	Pound River	Lat 37°09'01", long 82°29'25", Dickenson County, 50 ft downstream from Laurel Creek, 300 ft downstream from bridge on State Highway 83, and 0.2 mi northwest of Georges Fork.	5.57	-	5-26-94	6.11
Russell Fork	Levisa Fork	Lat 37°14'45", long 82°19'25", Dickenson County, at bridge on State Highway 611, 0.2 mi downstream from Pound River, and at Bartlick.	526	1963-93	10- 5-93 2-23-94 7-12-94	74.5 3,360 85.3
03213570 Right Fork [a]	Knox Creek	Lat 37°22'53", long 82°00'01", Buchanan County, at Hurley Middle School sewage treatment plant, 200 ft downstream from Straight Fork, 0.1 mi upstream from mouth, and at Blackey.	8.53	-	5-25-94	1.92
03213590 Knox Creek	Tug Fork	Lat 37°27'02", long 82°03'34", Buchanan County, on State Highway 697, 0.3 mi downstream from Pawpaw Creek, and 0.8 mi northwest of Kelsa.	84.3	1980-81, 1989, 1992-93	2-22-94 3-28-94 3-28-94 7-11-94	334 2,250 1,810 4.42

a Provided by the Virginia Department of Environmental Quality - Water Division.

## Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued

Discharge measurements made at special study and miscellaneous sites during water year 1994 - Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN						
03472200 Big Laurel Creek [a]	Whitetop Laurel Creek	Lat 36°41'15", long 81°32'54", Smyth County, at Grindstone Recreation Area sewage treat- ment plant, 0.1 mi upstream from bridge on State Highway 603, and 1.9 mi north of Mt. Rogers.	0.53	-	5-24-94 9-22-94	0.693 .308
03473500 Middle Fork Holston River [c]	South Fork Holston River	Lat 36°53'19", long 81°20'51", Smyth County, at culvert on State Highway 679 at Grose- close, 0.2 mi upstream from Rocky Springs Branch, and 10 mi northeast of Marion.	7.39	1948-57, 1969, 1972, 1988-89, 1992-93	3- 4-94 5-24-94 9-23-94	20.1 7.09 4.80
03473830 Hungry Mother Creek [a]	Middle Fork Holston River	Lat 36°53'27", long 81°31'07", Smyth County, at Hungry Mother State Park Campground A sewage treatment plant, 0.1 mi down- stream from bridge on State Highway 703, and 3.9 mi north of Marion.	6.96	1993	5-24-94 9-23-94	2.11 .090
03473840 Unnamed tribu- tary [a]	Hungry Mother Creek	Lat 36°52'20", long 81°30'42", Smyth County, at Hungry Mother State Park Campground D sewage treatment plant, 400 ft down- stream from bridge on park road, and 2.7 mi north of Marion.	2.17	1993	5-24-94 9-23-94	.971 .190
03473850 Hungry Mother Creek [a]	Middle Fork Holston River	Lat 36°52'07", long 81°31'30", Smyth County, at Hungry Mother Campground sewage treatment plant, 0.2 mi upstream from bridge on State Highway 16, and 2.5 mi north of Marion.	12.74	1993	5-24-94 9-23-94	3.98 .140
03474740 Hall Creek [a]	Byers Creek	Lat 36°46'27", long 81°48'54", Washington County, at Patrick Henry High School sewage treat- ment plant, 0.5 mi upstream from Richardson Branch, 1.2 mi downstream from bridge on State Highway 609, and 1.2 mi east of Emory.	3.19	-	5-25-94	2.16
03475600 Cedar Creek	Middle Fork Holston River	Lat 36°44'50", long 81°51'20", Washington County, at culvert on U.S. Highway 11, 1.2 mi south of Meadowview, and 2.5 mi upstream from mouth.	3.38	1969, 1990, 1992-93	3- 4-94	13.0
03475605 Greenway Creek [a]	Middle Fork Holston River	Lat 36°44'51", long 81°53'13", Washington County, at Washington County Industrial Park sewage treatment plant, 400 ft down- stream from bridge on State Highway 694, and 5.9 mi north- east of Abingdon.	2.00	1993	5-25-94	1.86
03475630 Wolf Creek [a]	South Fork Holston River	Lat 36°41'11", long 81°58'56", Washington County, at town of Abingdon sewage treatment plant, 100 ft downstream from bridge on State Highway 670, and 1.6 mi south of Abingdon.	15.95	1948, 1988, 1993	5-24-94	21.7

a Provided by the Virginia Department of Environmental Quality - Water Division.

c Provided by both the U.S. Geological Survey and Virginia Department of Environmental Quality - Water Division.

## Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						Measurements
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Date	Discharge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN--Continued						
03475700 Spring Creek [c]	South Fork Holston River	Lat 36°40'43", long 82°02'29", Washington County, at culvert on U.S. Highway 11, 3.8 mi southwest of Abingdon.	2.99	1969, 1982-85, 1990, 1992-93	3- 4-94 5-24-94	11.5 3.71
034765085 Sinking Creek [a]	Paperville Creek	Lat 36°39'44", long 82°03'56", Washington County, on State Highway 808, 0.2 mi downstream from bridge on U.S. Highway 11, and 5.6 mi southwest of Abingdon.	.59	1993	5-24-94	1.60
03487800 Lick Creek	North Fork Holston River	Lat 36°57'44", long 81°28'21", Smyth County, 270 ft upstream from bridge on State Highway 42, 1.6 mi upstream from mouth, and 2.9 mi northeast of Chatham Hill.	25.5	1966-68, 1990, 1992	3- 4-94 7- 6-94	81.3 1.30
03488450 Brumley Creek	North Fork Holston River	Lat 36°47'30", long 82°01'10", Washington County, at bridge on State Highway 611, 0.2 mi upstream from mouth, 0.8 mi southeast of Brumley Gap, and 2.7 mi downstream from Lee Creek.	21.1	1979-81, 1982-85, 1992	6-15-94	4.35
03489860 Hilton Creek [a]	North Fork Holston River	Lat 36°39'12", long 82°27'50", Scott County, at Hilton Elementary School sewage treatment plant, 0.2 mi south- east of Hilton, and 0.4 mi upstream from mouth.	-	1993	5-25-94	.321
03489865 Unnamed tribu- tary [a]	Unnamed tributary	Lat 36°38'47", long 82°29'06", Scott County, at Pine Ridge Trailer Park sewage treatment plant, 0.3 mi downstream from bridge on U.S. Highway 421, and 1.2 mi southwest of Hilton.	-	1993	5-25-94	.559
03489870 Big Moccasin Creek	North Fork Holston River	Lat 36°44'16", long 82°19'25", Russell County, at Collinwood, at bridge on State Highway 612, 50 ft downstream from Meade Branch, 7 mi southwest of Hansonville, and 36.5 mi upstream from mouth.	41.9	1944, 1954, 1966-68, 1973, 1992	5-10-94	55.1
03490020 Cate Branch [a]	Possum Creek	Lat 36°36'58", long 82°37'47", Scott County, at Yuma Elementary School sewage treatment plant, 300 ft upstream from culvert on State Highway 713, and 0.9 mi west of Yuma.	-	1993	5-25-94	.051
03521500 Clinch River	Tennessee River	Lat 37°05'10", long 81°46'52", Tazewell County, 1.0 mi south- east of Richlands, 1.7 mi downstream from Indian Creek.	137	1945-93	2-10-94 5-16-94 6-28-94	1,720 160 74.5
03521980 Little River [c]	Clinch River	Lat 37°01'48", long 81°47'28", Tazewell County, at Claypool Hill sewage treatment plant, 0.2 mi upstream from bridge on State Highway 609, 0.2 mi upstream from Laurel Creek, and 0.2 mi southeast of Wardell.	-	1993	10-28-93 5-16-94 9-15-94	12.7 119 26.3

a Provided by the Virginia Department of Environmental Quality - Water Division.

c Provided by both the U.S. Geological Survey and Virginia Department of Environmental Quality - Water Division.

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN--Continued						
03522595 Lewis Creek	Clinch River	Lat 37°00'28", long 81°58'13", Russell County, at Honaker sewage treatment plant, 0.2 mi upstream from bridge on State Highway 653, and 0.7 mi south of Honaker.	20.8	-	10-27-93	1.64
					5-16-94	21.4
					9-15-94	2.14
03523000 Big Cedar Creek	Clinch River	Lat 36°02'20", long 82°02'20", Russell County, 200 ft upstream from bridge on U.S. Highway 19 (Business), 1.3 mi downstream from Burgess Creek, 1.9 mi upstream from Little Cedar Creek, and 2.3 mi east of Lebanon.	51.5	1953-59, 1970-80, 1991-92	3-28-94	1,690
					6-16-94	14.4
03523050 Big Cedar Creek [c]	Clinch River	Lat 36°55'19", long 82°03'10", Russell County, at Lebanon sewage treatment plant, 200 ft downstream from Little Cedar Creek, and 2.1 mi north-east of Lebanon.	-	1993	10-28-93	8.65
					5-16-94	84.4
					9-15-94	17.4
03524048 Lick Creek [a]	Clinch River	Lat 36°55'33", long 82°17'08", Russell County, at Hanging Rock Community Clinic sewage treatment plant, 0.4 mi west of Hamlin, and 2.3 mi upstream from mouth.	20.12	1993	5-27-94	14.4
03524500 Guest River	Clinch River	Lat 36°55'45", long 82°27'23", Wise County, at bridge on State Highway 72, 1.0 mi southeast of Coeburn, and 6.3 mi upstream from mouth.	87.3	1949-50, 1979-81, 1991-92	3-29-94	1,450
					6-16-94	50.0
03524900 Stony Creek	Clinch River	Lat 36°48'57", long 82°37'02", Scott County, at Ka, 300 ft upstream from bridge on State Highway 619, 600 ft downstream from Straight Fork, and 4.2 mi upstream from mouth.	30.9	1979-85	3-29-94	531
					6-15-94	6.27
03526000 Copper Creek	Clinch River	Lat 36°40'26", long 82°33'57", Scott County, at old bridge abutment 50 ft upstream from bridge on State Highway 619, 0.2 mi upstream from Plank Camp Creek, 1.1 mi downstream from Obeys Creek, and 2.6 mi northeast of Gate City.	106	1948-72, 1983-84	3-29-94	2,150
					9-14-94	36.2
03527000 Clinch River	Tennessee River	Lat 36°38'55", long 82°45'02", Scott County, at bridge on U.S. Highway 58, 0.5 mi downstream from Copper Creek, 0.8 mi northwest of Speers Ferry, and 211 mi upstream from mouth.	1,126	1931-76, 1979-81	2-14-94	7,270
03527510 North Fork Clinch River [a]	Clinch River	Lat 36°41'15", long 82°50'36", Scott County, at Beeline Trailer Park sewage treatment plant, 0.6 mi downstream from bridge on State Highway 638, and 0.9 mi south of Pattons-ville.	-	1993	5-25-94	17.2

a Provided by the Virginia Department of Environmental Quality - Water Division.

c Provided by both the U.S. Geological Survey and Virginia Department of Environmental Quality - Water Division.



## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at special study and miscellaneous sites during water year 1994--Continued						
Stream	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
TENNESSEE RIVER BASIN--Continued						
03529290 Black Creek [a]	Powell River	Lat 36°56'07", long 82°41'17", Wise County, at Betty B Coal sewage treatment plant, 0.5 mi upstream from U.S. Highways 23 and alternate 58, and 3.4 mi west of Norton.	3.32	1993	5-26-94	3.19
03530465 Straight Creek [a]	North Fork Powell River	Lat 36°47'54", long 83°03'28", Lee County, at bridge on State Highway 795, 0.2 mi below Big Branch, and 0.3 mi south of Saint Charles.	12.2	1993	5-26-94	9.28
03530467 Straight Creek [a]	North Fork Powell River	Lat 36°47'38", long 83°03'44", Lee County, at Saint Charles sewage treatment plant, 0.5 mi upstream from Meadow Branch, and 0.7 mi southwest of Saint Charles.	12.29	-	5-26-94	9.85
03530550 North Fork Powell River [a]	Powell River	Lat 36°45'27", long 83°00'38", Lee County, at Pennington Gap sewage treatment plant discharge, 0.1 mi upstream from Dry Branch, 0.3 mi down- stream from U.S. Highway alternate 58, and 0.8 mi east of Pennington Gap.	84.5	-	5-26-94	68.1
03531190 Station Creek [a]	Powell River	Lat 36°42'34", long 82°57'33", Lee County, at Dot Mobile Home Park sewage treatment plant, 500 ft upstream from bridge on U.S. Highway 58, and at Dot.	3.29	-	5-25-94	.015
03531200 Station Creek [a]	Powell River	Lat 36°41'58", long 83°00'02", Lee County, at Lee County Industrial Park discharge, 1.3 mi upstream from mouth, and 2.4 mi west of Dot.	7.55	-	5-25-94	2.88
03531620 Martin Creek [c]	Powell River	Lat 36°40'03", long 83°21'16", Lee County, 500 ft down- stream from bridge on State Highway 672, 0.7 mi downstream from Poor Valley Branch, and 0.8 mi southeast of Rose Hill.	7.35	1993	10-27-93 5-18-94 9-14-94	1.62 15.7 2.98

a Provided by the Virginia Department of Environmental Quality - Water Division.

c Provided by both the U.S. Geological Survey and Virginia Department of Environmental Quality - Water Division.

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

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Samples are collected at partial-record, special study, and miscellaneous sites to give better areal coverage. The results of these samples are given herein.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
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## POTOMAC RIVER BASIN

## 01660380 CANNON CREEK NEAR GARRISONVILLE, VA (LAT 38 29 23N LONG 077 29 12W)

SEP 1994	1030	5.9	47	6.9	20.5	19.5	757	7.8	85	--	--	--
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## 01660385 AQUIA CR AT RT 643 NR GARRISONVILLE ESTATES,VA (LAT 38 28 56N LONG 077 28 45W)

SEP 1994	1130	--	100	6.7	21.0	19.0	757	7.3	79	--	--	--
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## 01660809 MACHODOC CREEK AB WOOD ISLAND NEAR DAHLGREN, VA (LAT 38 18 28N LONG 077 04 03W)

JUL 1994	0845	--	7440	6.0	29.0	29.0	762	5.4	72	780	66	150
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## 01660811 MACHODAC CREEK ABOVE BABER POINT AT DAHLGREN, VA (LAT 38 18 38N LONG 077 01 59W)

JUL 1994	0930	--	9200	7.0	31.0	30.0	762	6.5	88	980	79	190
20...	0940	--	9200	7.0	31.0	30.0	762	6.5	88	970	77	190

## 01660812 BLACK MARSH NEAR MOUTH NEAR DAHLGREN, VA (LAT 38 18 00N LONG 077 01 19W)

JUL 1994	0915	--	9520	6.4	30.5	27.5	762	3.6	47	1000	84	200
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## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)
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## POTOMAC RIVER BASIN--Continued

01660380 CANNON CREEK NEAR GARRISONVILLE, VA (LAT 38 29 23N LONG 077 29 12W)

SEP 1994 27...	--	--	--	--	--	--	--	--	--	<0.010	0.059	0.059
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01660385 AQUIA CR AT RT 643 NR GARRISONVILLE ESTATES, VA (LAT 38 28 56N LONG 077 28 45W)

SEP 1994 27...	--	--	--	--	--	--	--	--	--	<0.010	0.086	0.086
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01660809 MACHODOC CREEK AB WOOD ISLAND NEAR DAHLGREN, VA (LAT 38 18 28N LONG 077 04 03W)

JUL 1994 20...	1300	49	2	320	2200	0.20	8.7	4430	4140	--	--	--
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01660811 MACHODAC CREEK ABOVE BABER POINT AT DAHLGREN, VA (LAT 38 18 38N LONG 077 01 59W)

JUL 1994 20...	1500	63	3	400	2800	0.30	6.1	5410	5090	--	--	--
20...	1500	64	5	400	2800	0.30	6.0	5420	5090	--	--	--

01660812 BLACK MARSH NEAR MOUTH NEAR DAHLGREN, VA (LAT 38 18 00N LONG 077 01 19W)

JUL 1994 20...	1600	61	2	410	2900	0.30	2.3	5530	5310	--	--	--
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&lt; Actual value is known to be less than the value shown.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)
POTOMAC RIVER BASIN--Continued											
01660380 CANNON CREEK NEAR GARRISONVILLE, VA (LAT 38 29 23N LONG 077 29 12W)											
SEP 1994 27...	<0.010	0.30	0.20	0.020	0.020	<0.010	--	--	--	--	--
01660385 AQUIA CR AT RT 643 NR GARRISONVILLE ESTATES,VA (LAT 38 28 56N LONG 077 28 45W)											
SEP 1994 27...	<0.010	0.50	0.30	0.040	0.020	<0.010	--	--	--	--	--
01660809 MACHODOC CREEK AB WOOD ISLAND NEAR DAHLGREN, VA (LAT 38 18 28N LONG 077 04 03W)											
JUL 1994 20...	--	--	--	--	--	--	<10	20	50	4.2	>3.3
01660811 MACHODAC CREEK ABOVE BABER POINT AT DAHLGREN, VA (LAT 38 18 38N LONG 077 01 59W)											
JUL 1994 20...	--	--	--	--	--	--	10	30	20	3.9	0.8
20...	--	--	--	--	--	--	<10	20	10	2.9	0.7
01660812 BLACK MARSH NEAR MOUTH NEAR DAHLGREN, VA (LAT 38 18 00N LONG 077 01 19W)											
JUL 1994 20...	--	--	--	--	--	--	<10	40	90	6.0	1.4

&gt; Actual value is known to be greater than the value shown.

&lt; Actual value is known to be less than the value shown.

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, diverse, and geographically distributed part of the Nation's ground- and surface-water resources, and to identify, describe, and explain the major natural and human factors that affect these observed conditions and trends.

Assessment activities have begun in more than one-third of the study units and ultimately will be conducted in 60 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide a basis for decision making on the use of water resources within the study units and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (MG/L) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
POTOMAC RIVER BASIN												
01638450 RICHARD CREEK NEAR WATERFORD, VA (LAT 39 13 03N LONG 077 37 50W)												
AUG 1994 24...	1620	2.2	142	7.0	21.5	28.0	760	8.7	99	52	13	4.7
01643705 CROMWELLS RUN NEAR RECTORTOWN, VA (LAT 38 55 51N LONG 077 48 36W)												
AUG 1994 24...	0800	2.6	116	6.7	17.0	16.0	759	8.6	89	38	10	3.2
01643800 N F GOOSE CREEK AT RT 722 NEAR LINCOLN, VA (LAT 39 04 38N LONG 077 41 52W)												
AUG 1994 24...	1245	5.3	197	7.4	20.0	26.0	762	9.2	101	66	17	5.7
01643820 BEAVERDAM CREEK NEAR UNISON, VA (LAT 39 02 35N LONG 077 46 01W)												
AUG 1994 24...	1000	3.4	171	7.0	17.5	21.0	761	8.7	91	63	16	5.7
01645725 DIFFICULT RUN NEAR VIENNA, VA (LAT 38 54 11N LONG 077 19 08W)												
AUG 1994 24...	1315	10	131	7.2	19.5	27.0	763	8.7	95	39	9.1	3.9
01652370 FOURMILE RUN AT ARLINGTON, VA (LAT 38 52 04N LONG 077 07 40W)												
AUG 1994 23...	1100	1.6	359	7.3	20.0	23.0	762	9.1	100	88	24	6.8
01656102 GOSLIN RUN NEAR ADEN, VA (LAT 38 36 40N LONG 077 33 04W)												
AUG 1994 23...	1115	3.0	50	6.7	19.5	24.0	763	8.5	92	15	3.9	1.3
01656655 KETTLE RUN NEAR NOKESVILLE, VA (LAT 38 43 28N LONG 077 36 32W)												
AUG 1994 23...	1300	21	103	6.9	21.5	23.0	762	8.4	95	35	8.6	3.4
01656725 BULL RUN NEAR CATHARPIN, VA (LAT 38 53 21N LONG 077 34 14W)												
AUG 1994 24...	0730	7.5	138	7.1	17.0	--	763	8.6	89	51	13	4.6



## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WAT DIS TOT IT FIELD (MG/L AS CACO3) (39086)	BICAR- BONATE WATER DIS IT FIELD (MG/L AS HCO3) (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)
POTOMAC RIVER BASIN--Continued											
	01638450	RICHARD CREEK NEAR WATERFORD, VA (LAT 39 13 03N LONG 077 37 50W)									
AUG 1994 24...	4.9	1.8	40	49	10	8.4	0.20	17	103	--	<0.010
	01643705	CROMWELLS RUN NEAR RECTORTOWN, VA (LAT 38 55 51N LONG 077 48 36W)									
AUG 1994 24...	4.7	3.3	31	38	7.9	7.1	0.20	15	81	4.3	0.020
	01643800	N F GOOSE CREEK AT RT 722 NEAR LINCOLN, VA (LAT 39 04 38N LONG 077 41 52W)									
AUG 1994 24...	9.5	2.2	50	61	17	13	0.20	13	120	5.6	0.030
	01643820	BEAVERDAM CREEK NEAR UNISON, VA (LAT 39 02 35N LONG 077 46 01W)									
AUG 1994 24...	5.9	2.8	48	59	13	12	0.20	14	109	--	<0.010
	01645725	DIFFICULT RUN NEAR VIENNA, VA (LAT 38 54 11N LONG 077 19 08W)									
AUG 1994 24...	7.4	1.9	28	34	6.5	12	0.20	12	84	--	<0.010
	01652370	FOURMILE RUN AT ARLINGTON, VA (LAT 38 52 04N LONG 077 07 40W)									
AUG 1994 23...	29	3.4	46	56	14	62	0.10	13	207	--	<0.010
	01656102	GOSLIN RUN NEAR ADEN, VA (LAT 38 36 40N LONG 077 33 04W)									
AUG 1994 23...	2.9	1.1	15	18	4.8	1.8	0.20	13	53	--	<0.010
	01656655	KETTLE RUN NEAR NOKESVILLE, VA (LAT 38 43 28N LONG 077 36 32W)									
AUG 1994 23...	3.8	2.0	26	32	8.7	5.3	0.20	12	85	--	<0.010
	01656725	BULL RUN NEAR CATHARPIN, VA (LAT 38 53 21N LONG 077 34 14W)									
AUG 1994 24...	5.3	2.2	40	49	12	6.5	0.20	14	85	--	<0.010

&lt; Actual value is known to be less than the value shown.

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)
POTOMAC RIVER BASIN--Continued											
	01638450	RICHARD CREEK NEAR WATERFORD, VA (LAT 39 13 03N LONG 077 37 50W)									
AUG 1994 24...	0.920	0.920	0.020	0.30	0.010	<0.010	420	100	<0.02	<0.01	<0.01
	01643705	CROMWELLS RUN NEAR RECTORTOWN, VA (LAT 38 55 51N LONG 077 48 36W)									
AUG 1994 24...	0.990	0.990	0.030	0.40	0.020	0.020	380	63	<0.02	<0.01	<0.01
	01643800	N F GOOSE CREEK AT RT 722 NEAR LINCOLN, VA (LAT 39 04 38N LONG 077 41 52W)									
AUG 1994 24...	1.30	1.30	0.020	0.30	0.160	0.140	200	52	<0.02	<0.01	<0.01
	01643820	BEAVERDAM CREEK NEAR UNISON, VA (LAT 39 02 35N LONG 077 46 01W)									
AUG 1994 24...	0.550	0.550	0.020	0.30	0.010	0.020	290	57	<0.02	<0.01	<0.01
	01645725	DIFFICULT RUN NEAR VIENNA, VA (LAT 38 54 11N LONG 077 19 08W)									
AUG 1994 24...	1.10	1.10	0.040	<0.20	<0.010	<0.010	350	89	<0.02	<0.01	<0.01
	01652370	FOURMILE RUN AT ARLINGTON, VA (LAT 38 52 04N LONG 077 07 40W)									
AUG 1994 23...	1.80	1.80	0.030	<0.20	0.020	0.020	86	16	<0.02	<0.01	<0.01
	01656102	GOSLIN RUN NEAR ADEN, VA (LAT 38 36 40N LONG 077 33 04W)									
AUG 1994 23...	--	<0.050	0.030	<0.20	<0.010	0.010	770	110	<0.02	<0.01	<0.01
	01656655	KETTLE RUN NEAR NOKESVILLE, VA (LAT 38 43 28N LONG 077 36 32W)									
AUG 1994 23...	0.250	0.250	0.030	0.40	0.030	0.040	490	26	<0.02	<0.01	<0.01
	01656725	BULL RUN NEAR CATHARPIN, VA (LAT 38 53 21N LONG 077 34 14W)									
AUG 1994 24...	0.280	0.280	0.010	0.20	<0.010	0.010	260	18	<0.02	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)
POTOMAC RIVER BASIN--Continued											
	01638450	RICHARD CREEK NEAR WATERFORD, VA (LAT 39 13 03N LONG 077 37 50W)									
AUG 1994 24...	<0.03	<0.01	<0.01	<0.01	<0.01	0.05	<0.01	<0.01	<0.05	<0.01	<0.01
	01643705	CROMWELLS RUN NEAR RECTORTOWN, VA (LAT 38 55 51N LONG 077 48 36W)									
AUG 1994 24...	<0.03	<0.01	<0.01	<0.01	<0.01	E0.02	<0.01	<0.01	<0.05	<0.01	<0.00
	01643800	N F GOOSE CREEK AT RT 722 NEAR LINCOLN, VA (LAT 39 04 38N LONG 077 41 52W)									
AUG 1994 24...	<0.03	<0.01	<0.01	<0.01	<0.01	E0.05	<0.01	<0.01	<0.05	<0.01	<0.00
	01643820	BEAVERDAM CREEK NEAR UNISON, VA (LAT 39 02 35N LONG 077 46 01W)									
AUG 1994 24...	<0.03	<0.01	<0.01	<0.01	<0.01	E0.02	<0.01	<0.01	<0.05	<0.01	<0.00
	01645725	DIFFICULT RUN NEAR VIENNA, VA (LAT 38 54 11N LONG 077 19 08W)									
AUG 1994 24...	<0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.04	<0.01	<0.00
	01652370	FOURMILE RUN AT ARLINGTON, VA (LAT 38 52 04N LONG 077 07 40W)									
AUG 1994 23...	<0.03	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.01	0.26	<0.01	0.01
	01656102	GOSLIN RUN NEAR ADEN, VA (LAT 38 36 40N LONG 077 33 04W)									
AUG 1994 23...	<0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.05	<0.01	<0.01
	01656655	KETTLE RUN NEAR NOKESVILLE, VA (LAT 38 43 28N LONG 077 36 32W)									
AUG 1994 23...	<0.03	<0.01	<0.01	<0.01	<0.01	0.04	<0.01	<0.01	<0.05	<0.01	<0.01
	01656725	BULL RUN NEAR CATHARPIN, VA (LAT 38 53 21N LONG 077 34 14W)									
AUG 1994 24...	<0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.05	<0.01	0.02

&lt; Actual value is known to be less than the value shown.

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
POTOMAC RIVER BASIN--Continued											
	01638450	RICHARD CREEK NEAR WATERFORD, VA (LAT 39 13 03N LONG 077 37 50W)									
AUG 1994 24...	<0.01	<0.00	<0.01	E0.05	<0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01
	01643705	CROMWELLS RUN NEAR RECTORTOWN, VA (LAT 38 55 51N LONG 077 48 36W)									
AUG 1994 24...	<0.01	<0.00	<0.01	E0.01	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
	01643800	N F GOOSE CREEK AT RT 722 NEAR LINCOLN, VA (LAT 39 04 38N LONG 077 41 52W)									
AUG 1994 24...	<0.01	<0.00	<0.01	E0.04	E0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
	01643820	BEAVERDAM CREEK NEAR UNISON, VA (LAT 39 02 35N LONG 077 46 01W)									
AUG 1994 24...	<0.01	<0.00	<0.01	E0.02	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
	01645725	DIFFICULT RUN NEAR VIENNA, VA (LAT 38 54 11N LONG 077 19 08W)									
AUG 1994 24...	<0.01	<0.00	<0.01	<0.01	0.04	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
	01652370	FOURMILE RUN AT ARLINGTON, VA (LAT 38 52 04N LONG 077 07 40W)									
AUG 1994 23...	<0.01	<0.00	<0.01	<0.00	0.04	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01
	01656102	GOSLIN RUN NEAR ADEN, VA (LAT 38 36 40N LONG 077 33 04W)									
AUG 1994 23...	<0.01	<0.00	<0.01	<0.00	<0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01
	01656655	KETTLE RUN NEAR NOKESVILLE, VA (LAT 38 43 28N LONG 077 36 32W)									
AUG 1994 23...	<0.01	<0.00	<0.01	0.02	<0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01
	01656725	BULL RUN NEAR CATHARPIN, VA (LAT 38 53 21N LONG 077 34 14W)									
AUG 1994 24...	<0.01	<0.00	<0.01	0.01	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PFB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
POTOMAC RIVER BASIN--Continued											
01638450 RICHARD CREEK NEAR WATERFORD, VA (LAT 39 13 03N LONG 077 37 50W)											
AUG 1994 24...	<0.04	E0.01	<0.05	<0.03	0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01643705 CROMWELLS RUN NEAR RECTORTOWN, VA (LAT 38 55 51N LONG 077 48 36W)											
AUG 1994 24...	<0.04	<0.01	<0.04	<0.03	E0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01643800 N F GOOSE CREEK AT RT 722 NEAR LINCOLN, VA (LAT 39 04 38N LONG 077 41 52W)											
AUG 1994 24...	<0.04	<0.01	<0.04	<0.03	E0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01643820 BEAVERDAM CREEK NEAR UNISON, VA (LAT 39 02 35N LONG 077 46 01W)											
AUG 1994 24...	<0.04	<0.01	<0.04	<0.03	E0.04	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01645725 DIFFICULT RUN NEAR VIENNA, VA (LAT 38 54 11N LONG 077 19 08W)											
AUG 1994 24...	<0.04	<0.01	<0.04	<0.03	0.00	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01652370 FOURMILE RUN AT ARLINGTON, VA (LAT 38 52 04N LONG 077 07 40W)											
AUG 1994 23...	<0.04	<0.01	<0.05	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01656102 GOSLIN RUN NEAR ADEN, VA (LAT 38 36 40N LONG 077 33 04W)											
AUG 1994 23...	<0.04	<0.01	<0.05	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01656655 KETTLE RUN NEAR NOKESVILLE, VA (LAT 38 43 28N LONG 077 36 32W)											
AUG 1994 23...	<0.04	<0.01	<0.05	<0.03	0.04	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01656725 BULL RUN NEAR CATHARPIN, VA (LAT 38 53 21N LONG 077 34 14W)											
AUG 1994 24...	<0.04	<0.01	<0.04	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02

&lt; Actual value is known to be less than the value shown.



## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
POTOMAC RIVER BASIN--Continued											
	01638450	RICHARD CREEK NEAR WATERFORD, VA (LAT 39 13 03N LONG 077 37 50W)									
AUG 1994 24...	<0.02	<0.01	<0.01	<0.02	<0.01	<0.02	E0.10	<0.02	<0.01	<0.01	<0.01
	01643705	CROMWELLS RUN NEAR RECTORTOWN, VA (LAT 38 55 51N LONG 077 48 36W)									
AUG 1994 24...	<0.02	<0.01	<0.01	<0.02	<0.01	<0.02	E0.01	<0.02	<0.01	<0.01	<0.01
	01643800	N F GOOSE CREEK AT RT 722 NEAR LINCOLN, VA (LAT 39 04 38N LONG 077 41 52W)									
AUG 1994 24...	<0.02	E0.02	<0.01	<0.02	<0.01	<0.02	E0.02	<0.02	<0.01	<0.01	<0.01
	01643820	BEAVERDAM CREEK NEAR UNISON, VA (LAT 39 02 35N LONG 077 46 01W)									
AUG 1994 24...	<0.02	E0.05	<0.01	<0.02	<0.01	<0.02	<0.01	E0.01	<0.01	<0.01	<0.01
	01645725	DIFFICULT RUN NEAR VIENNA, VA (LAT 38 54 11N LONG 077 19 08W)									
AUG 1994 24...	<0.02	0.03	<0.01	<0.02	<0.01	<0.02	0.25	<0.02	<0.01	<0.01	<0.01
	01652370	FOURMILE RUN AT ARLINGTON, VA (LAT 38 52 04N LONG 077 07 40W)									
AUG 1994 23...	<0.02	0.19	<0.01	<0.02	<0.01	<0.02	0.02	<0.02	<0.01	<0.01	<0.01
	01656102	GOSLIN RUN NEAR ADEN, VA (LAT 38 36 40N LONG 077 33 04W)									
AUG 1994 23...	<0.02	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
	01656655	KETTLE RUN NEAR NOKESVILLE, VA (LAT 38 43 28N LONG 077 36 32W)									
AUG 1994 23...	<0.02	0.02	<0.01	<0.02	<0.01	<0.02	0.02	<0.02	<0.01	<0.01	<0.01
	01656725	BULL RUN NEAR CATHARPIN, VA (LAT 38 53 21N LONG 077 34 14W)									
AUG 1994 24...	<0.02	0.01	<0.01	<0.02	<0.01	<0.02	0.01	<0.02	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	TEMPER- ATURE AIR (DEG C) (00020)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)
POTOMAC RIVER BASIN--Continued												
01656772 FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)												
AUG 1994 23...	1615	3.4	384	7.6	23.5	25.0	764	7.5	88	150	46	7.6
01656870 CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)												
AUG 1994 24...	1100	7.5	261	7.0	20.0	24.5	765	7.8	86	96	28	6.4
01656920 FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)												
AUG 1994 24...	0845	11	264	7.3	18.5	18.5	763	8.1	86	99	29	6.5
01657435 WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)												
AUG 1994 23...	1714	--	--	--	--	--	--	--	--	--	0.00	<0.00
AUG 1994 23...	1715	2.5	111	7.0	20.0	22.0	763	8.6	95	34	9.1	2.7
01659000 N BRANCH CHOPAWAMSIK CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)												
AUG 1994 23...	1120	3.6	39	6.4	19.0	27.0	761	9.1	98	12	2.3	1.4
01660350 AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)												
AUG 1994 23...	1335	6.1	86	7.1	21.0	27.5	761	9.2	103	29	6.8	2.9

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	ALKA- LINITY WAT DIS TOT IT MG/L AS CACO3 (39086)	BICAR- BONATE WATER DIS IT MG/L AS HCO3 (00453)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SIO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS NO3) (71851)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N) (00630)
POTOMAC RIVER BASIN--Continued												
01656772      FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)												
AUG 1994 23...	16	2.5	132	161	21	13	0.20	12	220	6.6	0.010	1.50
01656870      CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)												
AUG 1994 24...	11	2.8	81	99	22	10	0.20	11	166	--	<0.010	0.480
01656920      FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)												
AUG 1994 24...	11	2.7	79	96	19	13	0.20	12	160	--	<0.010	1.40
01657435      WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)												
AUG 1994 23...	<0.02	--	--	--	--	--	--	0.04	--	--	<0.001	--
23...	6.5	1.9	30	37	5.6	7.7	0.10	19	60	--	<0.010	0.320
01659000      N BRANCH CHOPAWAMSIC CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)												
AUG 1994 23...	2.7	0.80	20	24	2.5	2.1	0.10	14	36	--	<0.010	--
01660350      AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)												
AUG 1994 23...	3.8	1.5	32	39	3.6	4.3	0.20	12	58	--	<0.010	0.160

&lt; Actual value is known to be less than the value shown.

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

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## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BORON, DIS- SOLVED (UG/L AS B) (01020)	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)
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## POTOMAC RIVER BASIN--Continued

01656772      FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)												
AUG 1994 23...	1.50	0.030	0.20	0.070	0.080	--	--	--	--	--	--	--
01656870      CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)												
AUG 1994 24...	0.480	0.030	0.40	0.040	0.050	--	--	--	--	--	--	--
01656920      FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)												
AUG 1994 24...	1.40	0.030	0.20	0.020	0.030	--	--	--	--	--	--	--
01657435      WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)												
AUG 1994 23...	<0.005	<0.002	--	--	<0.001	3	<0	<0	<0.2	<20	<0.3	<0
23...	0.320	0.020	<0.20	0.020	0.010	--	--	--	--	--	--	--
01659000      N BRANCH CHOPAWAMSIK CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)												
AUG 1994 23...	<0.050	0.020	<0.20	<0.010	0.010	--	--	--	--	--	--	--
01660350      AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)												
AUG 1994 23...	0.160	0.030	0.30	0.030	<0.010	--	--	--	--	--	--	--

&lt; Actual value is known to be less than the value shown.

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	THAL- LIUM, DIS- SOLVED (UG/L AS TL) (01057)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	DIMETH- OATE WATER FLTRD 0.7 U GG, REC (UG/L) (82662)
POTOMAC RIVER BASIN--Continued												
01656772      FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)												
AUG 1994 23...	--	--	45	--	75	--	--	--	--	--	--	<0.02
01656870      CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)												
AUG 1994 24...	--	--	250	--	36	--	--	--	--	--	--	<0.02
01656920      FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)												
AUG 1994 24...	--	--	160	--	60	--	--	--	--	--	--	<0.02
01657435      WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)												
AUG 1994 23...	<0	<0	<3	<0	<0	<0	<1	<0.2	<0	<0	<1	<0.02
23...	--	--	300	--	37	--	--	--	--	--	--	<0.02
01659000      N BRANCH CHOPAWAMSIK CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)												
AUG 1994 23...	--	--	790	--	100	--	--	--	--	--	--	<0.02
01660350      AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)												
AUG 1994 23...	--	--	950	--	83	--	--	--	--	--	--	<0.02

&lt; Actual value is known to be less than the value shown.



## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

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## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	CHLOR- PYRIFOS DIS- SOLVED (UG/L) (38933)	CYANA- ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	P,P' DDE DISSOLV (UG/L) (34653)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L) (04040)	DI- AZINON, DIS- SOLVED (UG/L) (39572)	DI- ELDRIN DIS- SOLVED (UG/L) (39381)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS- SOLVED (UG/L) (39341)
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## POTOMAC RIVER BASIN--Continued

01656772      FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)												
AUG 1994 23...	<0.01	<0.01	<0.00	<0.01	<0.00	0.05	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01
01656870      CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)												
AUG 1994 24...	<0.00	<0.01	<0.00	<0.01	<0.01	0.08	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
01656920      FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)												
AUG 1994 24...	0.04	<0.01	<0.00	<0.01	0.00	0.11	<0.01	<0.01	<0.00	<0.01	0.01	<0.01
01657435      WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)												
AUG 1994 23...	<0.01	<0.01	<0.00	<0.01	<0.00	<0.01	<0.01	<0.06	<0.00	<0.01	<0.01	<0.01
01659000      N BRANCH CHOPAWAMSIK CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)												
AUG 1994 23...	<0.00	<0.01	<0.00	<0.01	<0.01	<0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01
01660350      AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)												
AUG 1994 23...	<0.00	<0.01	<0.00	<0.01	<0.01	0.01	<0.01	<0.01	<0.00	<0.01	<0.01	<0.01

&lt; Actual value is known to be less than the value shown.

## ANALYSES OF SAMPLES COLLECTED AT PARTIAL-RECORD, SPECIAL STUDY, AND MISCELLANEOUS SITES

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA- THION, DIS- SOLVED (UG/L) (39532)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO- LACHLOR WATER DISSOLV (UG/L) (39415)	METRI- BUZIN WATER DISSOLV (UG/L) (82630)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PEB- ULATE WATER FILTDR 0.7 U GF, REC (UG/L) (82669)	PARA- THION, DIS- SOLVED (UG/L) (39542)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)
POTOMAC RIVER BASIN--Continued											
01656772      FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)											
AUG 1994 23...	<0.04	<0.01	<0.05	<0.03	0.00	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01656870      CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)											
AUG 1994 24...	<0.04	<0.01	<0.04	<0.03	0.01	<0.01	<0.01	0.02	<0.01	<0.02	<0.02
01656920      FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)											
AUG 1994 24...	<0.04	<0.01	<0.04	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01657435      WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)											
AUG 1994 23...	<0.04	<0.01	<0.05	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01659000      N BRANCH CHOPAWAMSIK CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)											
AUG 1994 23...	<0.04	<0.01	<0.04	<0.03	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02
01660350      AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)											
AUG 1994 23...	<0.04	<0.01	<0.04	<0.03	0.01	<0.01	<0.01	<0.01	<0.01	<0.02	<0.02

&lt; Actual value is known to be less than the value shown.

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ALA- CHLOR, WATER, DISS, REC (UG/L) (46342)	ALPHA BHC DIS- SOLVED (UG/L) (34253)	ATRA- ZINE, WATER, DISS, REC (UG/L) (39632)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL- ATE, WATER, DISS, REC (UG/L) (04028)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)
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## POTOMAC RIVER BASIN--Continued

	01656772	FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)										
AUG 1994 23...	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	0.00	<0.01	<0.01	<0.05	<0.01
	01656870	CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)										
AUG 1994 24...	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.02	<0.01
	01656920	FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)										
AUG 1994 24...	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	0.15	<0.01
	01657435	WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)										
AUG 1994 23...	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.05	<0.01
	01659000	N BRANCH CHOPAWAMSIK CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)										
AUG 1994 23...	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	<0.02	<0.01	<0.01	<0.05	<0.01
	01660350	AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)										
AUG 1994 23...	<0.01	<0.01	<0.03	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.05	<0.01

&lt; Actual value is known to be less than the value shown.

## WATER QUALITY DATA (NATIONAL WATER-QUALITY ASSESSMENT PROGRAM), AUGUST 1994

DATE	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PRO- METON, WATER, DISS, REC (UG/L) (04037)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROP- CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	SI- MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)
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## POTOMAC RIVER BASIN--Continued

01656772      FLAT BRANCH AT MANASSAS PARK, VA (LAT 38 46 54N LONG 077 29 13W)											
AUG 1994 23...	<0.02	0.11	<0.01	<0.02	<0.01	<0.02	0.03	<0.02	<0.01	<0.01	<0.01
01656870      CUB RUN AT OLD LEE ROAD NEAR CHANTILLY, VA (LAT 38 52 56N LONG 077 28 13W)											
AUG 1994 24...	<0.02	0.04	<0.01	<0.02	<0.01	<0.02	0.01	<0.02	<0.01	<0.01	<0.01
01656920      FLATLICK BRANCH NEAR CHANTILLY, VA (LAT 38 52 03N LONG 077 27 51W)											
AUG 1994 24...	<0.02	0.02	<0.01	<0.02	<0.01	<0.02	0.02	<0.02	<0.01	<0.01	<0.01
01657435      WOLF RUN NEAR CLIFTON, VA (LAT 38 44 09N LONG 077 21 51W)											
AUG 1994 23...	<0.02	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
01659000      N BRANCH CHOPAWAMSIK CR NR INDEPENDENT HILL, VA (LAT 38 33 58N LONG 077 25 48W)											
AUG 1994 23...	<0.02	<0.01	<0.01	<0.02	<0.01	<0.02	<0.01	<0.02	<0.01	<0.01	<0.01
01660350      AQUIA CREEK AT ROUTE 610 NEAR GARRISONVILLE, VA (LAT 38 29 06N LONG 077 29 20W)											
AUG 1994 23...	<0.02	0.02	<0.01	<0.02	<0.01	<0.02	0.01	<0.02	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

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## CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
<i>Length</i>		
inch (in.)	$2.54 \times 10^1$	millimeter
	$2.54 \times 10^{-2}$	meter
foot (ft)	$3.048 \times 10^{-1}$	meter
mile (mi)	$1.609 \times 10^0$	kilometer
<i>Area</i>		
acre	$4.047 \times 10^3$	square meter
	$4.047 \times 10^{-1}$	square hectometer
	$4.047 \times 10^{-3}$	square kilometer
square mile (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometer
<i>Volume</i>		
gallon (gal)	$3.785 \times 10^0$	liter
	$3.785 \times 10^0$	cubic decimeter
	$3.785 \times 10^{-3}$	cubic meter
million gallons (Mgal)	$3.785 \times 10^3$	cubic meter
	$3.785 \times 10^{-3}$	cubic hectometer
cubic foot (ft <sup>3</sup> )	$2.832 \times 10^1$	cubic decimeter
	$2.832 \times 10^{-2}$	cubic meter
cubic-foot-per-second day [(ft <sup>3</sup> /s) d]	$2.447 \times 10^3$	cubic meter
	$2.447 \times 10^{-3}$	cubic hectometer
acre-foot (acre-ft)	$1.233 \times 10^3$	cubic meter
	$1.233 \times 10^{-3}$	cubic hectometer
	$1.233 \times 10^{-6}$	cubic kilometer
<i>Flow</i>		
cubic foot per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liter per second
	$2.832 \times 10^1$	cubic decimeter per second
	$2.832 \times 10^{-2}$	cubic meter per second
gallon per minute (gal/min)	$6.309 \times 10^{-2}$	liter per second
	$6.309 \times 10^{-2}$	cubic decimeter per second
	$6.309 \times 10^{-5}$	cubic meter per second
million gallons per day (Mgal/d)	$4.381 \times 10^1$	cubic decimeter per second
	$4.381 \times 10^{-2}$	cubic meter per second
<i>Mass</i>		
ton (short)	$9.072 \times 10^{-1}$	megagram or metric ton

*Sea level:* In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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