

## **CHAPTER 2**

### **HYDROLOGIC CHARACTERISTICS OF THE CHATHAM RUN WATERSHED**

#### **General Features**

The Chatham Run watershed is comprised of three principal subwatersheds, having a total combined area of approximately 24 square miles, as shown on Plate 1. These three principal subwatersheds include Chatham Run mainstem (approximately 14 square miles), Little Plum Run (approximately 4 square miles), and Big Plum Run (approximately 6 square miles). The Chatham Run watershed discharges to the West Branch of the Susquehanna River just below the Village of Chatham Run.

As shown on Plate 1, Big Plum and Little Plum Runs join together and discharge to Chatham Run in a low-lying marshy area just below Chatham Run Village, (located approximately 0.5 miles above the confluence with the West Branch Susquehanna River). This confluence point is located approximately 6 river miles downstream from the City of Lock Haven and approximately 9 miles upstream of Jersey Shore. Chatham Run mainstem and Big Plum and Little Plum Runs flow in a northwest to southeast direction.

#### **Topography**

Topography in the Chatham Run watershed ranges from gently sloping in the higher elevations to very steep in the middle reaches where Chatham Run cuts through heavily forested mountains. The average slope of Chatham Run mainstem is approximately 3% overall from the northern watershed divide to the outlet at the West Branch of the Susquehanna River. This channel slope does not vary significantly, as the channel traverses the open meadow areas in the upper reaches and the forest valley in the middle and lower reaches of the watershed. The very low area near the confluence with the West Branch of the Susquehanna River is extremely flat, and is characterized by swampy wetlands.

Land surface slopes range from approximately 1.5% in the upper-lying meadow areas to approximately 51% in the rugged valleys surrounding the middle reaches of Chatham Run mainstem. Steep slopes (greater than ten percent) appear on Plate 2.

## **Surface Geology**

Geologically, the Chatham Run watershed lies in the Allegheny high plateau, just north of the Allegheny Front. There are no known limestone or dolomite formations present in the Chatham Run watershed.

## **Soils and Hydrologic Soil Groups**

The soils within the Chatham Run watershed and their associated hydrologic soil group(s) (HSG) appear in Table 2-1 at the end of this chapter. Marginal soils ( HSG B/D) appear on Plate 2.

## **Existing Land Uses and Land Covers**

The predominant existing land use categories that comprise the Chatham Run watershed include undeveloped land, recreation areas, public and semi-public lands, residential areas, commercial areas, and industrial areas, as shown on Plate 1. Most of the developed area lies along Chatham Run mainstem, in the Villages of Chatham Run, Woolrich, and Crestmont. Most of the new residential development has occurred in Little Plum Run subwatershed as a part of the Turkey Trot and Saylor subdivisions. Some new residential development has also occurred in the Big Plum Run subwatershed and the Chatham Run mainstem subwatershed.

The Chatham Water Company owns approximately 5,000 acres of forest land located largely in the middle and upper regions of the Chatham Run mainstem subwatershed. Select cutting of trees for lumber is permitted by the Company on a managed basis, except for the mountain sides facing Chatham Run mainstem. There are approximately 550 acres of protected Tiadaghton State Forest in the eastern middle portion of the Chatham Run mainstem subwatershed.

Although several secondary roads traverse the study area, the only major highways are PA 150 (formerly US 220, which passes through the lower reach of the watershed just above the confluence with the West Branch of the Susquehanna River) and State Route 664. The limited development pattern consists of residential subdivisions and vacation homes in Big Plum and Little Plum Run subwatersheds. Commercial/industrial areas are found in the village of Woolrich (associated primarily with the woolen mill and outlet stores operated by the Woolrich Woolen Mills), along State Route 150 in Dunnstable Township, and along a portion of Little Plum Run Road in Gallagher Township.

Three small water supply reservoirs, (owned by the former Chatham Water Company) are located in the middle and upper reaches of Chatham Run mainstem (please refer to Plate 1). However, these impoundments do not have excess storage capacity for flood protection or stormwater management purposes.

### **Proposed Land Uses**

There are no new large-scale land developments known to be planned for the Chatham Run watershed. The Clinton County Comprehensive Plan of 2005 shows a “Central Core Growth Area” that spans the lower portions of Dunnstable, Pine Creek, and Woodward Townships. This County Comprehensive Plan is available for review at the Clinton County Planning office, and on the Clinton County website.

### **Precipitation**

There are no known raingages within the Chatham Run watershed. A recording raingage is located at the Lock Haven sewage treatment plant; however, the records are insufficient for developing long-term (over 25 years or more) annual average rainfall. The long-term mean annual rainfall at the Williamsport Airport, located approximately 24 miles east of Chatham Run, is 41.28 inches (based on the National Oceanic and Atmospheric Administration NOAA, National Climatic Data Center, Climatological Data Annual Summary for Pennsylvania, 1986).

### **Streamflow and Estimated Design Floods**

There are no known stream gages in the Chatham Run watershed. However, based on long-term stream flow records at the USGS Trout Run gage on Lycoming Creek (an adjacent 173.6 square mile watershed having similar hydrologic characteristics), the mean annual runoff on a calendar year basis is 19.93 inches, including base-flow. This would indicate that approximately half of the average annual rainfall is lost to evaporation and deep percolation, while the other half occurs as streamflow.

**Table 2-1****Soils and Hydrologic Groups**

<b>SYMBOL</b>	<b>NAME</b>	<b>Hydrologic Soils Group</b>
AgB	ALLENWOOD GRAVELLY SILT LOAM, 3 TO 8 PERCENT SLOPES	B
AgC	ALLENWOOD GRAVELLY SILT LOAM, 8 TO 15 PERCENT SLOPES	B
AgD	ALLENWOOD GRAVELLY SILT LOAM, 15 TO 25 PERCENT SLOPES	B
At	ATKINS SILT LOAM	D
Bb	BARBOUR-CRAIGSVILLE COMPLEX	B
Bc	BASHER SILT LOAM	B
BeB	BERKS CHANNERY SILT LOAM, 3 TO 8 PERCENT SLOPES	C
BeC	BERKS CHANNERY SILT LOAM, 8 TO 15 PERCENT SLOPES	C
BeD	BERKS-WEIKERT COMPLEX, 15 TO 25 PERCENT SLOPES	B/D
BeE	BERKS-WEIKERT COMPLEX, 25 TO 60 PERCENT SLOPES	B/D
BgA	BRINKERTON SILT LOAM, 0 TO 3 PERCENT SLOPES	D
BhB	BUCHANAN GRAVELLY LOAM, 3 TO 8 PERCENT SLOPES	C
BhD	BUCHANAN GRAVELLY LOAM, 8 TO 25 PERCENT SLOPES	C
BmB	BUCHANAN GRAVELLY LOAM, 0 TO 8 PERCENT SLOPES, EXTREMELY STONY	C
BmC	BUCHANAN GRAVELLY LOAM, 8 TO 25 PERCENT SLOPES, EXTREMELY STONY	C
BuB	BUCHANAN-ANDOVER GRAVELLY LOAMS, 3 TO 8 PERCENT SLOPES	D
BuC	BUCHANAN-ANDOVER GRAVELLY LOAMS, 8 TO 15 PERCENT SLOPES	D
CcB	CHENANGO GRAVELLY LOAM, 3 TO 8 PERCENT SLOPES	A
CdB	CLYMER LOAM, 3 TO 8 PERCENT SLOPES	B
CdD	CLYMER LOAM, 8 TO 25 PERCENT SLOPES	B
CfB	CLYMER CHANNERY LOAM, 0 TO 8 PERCENT SLOPES, EXTREMELY STONY	B
CgB	CLYMER-COOKPORT CHANNERY LOAMS, 0 TO 8 PERCENT SLOPES, EXTREMELY STONY	C
ChB	CLYMER-HAZLETON SANDY LOAMS, 0 TO 8 PERCENT SLOPES, EXTREMELY STONY	B
CmA	COMLY SILT LOAM, 0 TO 3 PERCENT SLOPES	C
CmB	COMLY SILT LOAM, 3 TO 8 PERCENT SLOPES	C
CmC	COMLY SILT LOAM, 8 TO 15 PERCENT SLOPES	C
CpB	COOKPORT CHANNERY LOAM, 0 TO 8 PERCENT SLOPES, EXTREMELY STONY	C
CpD	COOKPORT CHANNERY LOAM, 8 TO 25 PERCENT SLOPES, EXTREMELY STONY	C
Cr	CRAIGSVILLE GRAVELLY LOAM	B
HhB	HARTLETON CHANNERY SILT LOAM, 3 TO 8 PERCENT SLOPES	B
HhC	HARTLETON CHANNERY SILT LOAM, 8 TO 15 PERCENT SLOPES	B
HkE	HAZLETON CHANNERY SANDY LOAM, 25 TO 80 PERCENT SLOPES, RUBBLY	B
HIC	HAZLETON-CLYMER CHANNERY LOAMS, 8 TO 15 PERCENT SLOPES	B
HID	HAZLETON-CLYMER CHANNERY LOAMS, 15 TO 25 PERCENT SLOPES	B
HmD	HAZLETON-CLYMER CHANNERY LOAMS, 8 TO 25 PERCENT SLOPES, EXTREMELY STONY	B
HoF	HAZLETON-LAIDIG COMPLEX, 25 TO 50 PERCENT SLOPES, EXTREMELY STONY	C
HuC	HUSTONTOWN SILT LOAM, 8 TO 15 PERCENT SLOPES	C
KcD	KLINESVILLE CHANNERY SILT LOAM, 15 TO 25 PERCENT SLOPES	C
KcE	KLINESVILLE CHANNERY SILT LOAM, 25 TO 80 PERCENT SLOPES	C
LkB	LECK KILL CHANNERY SILT LOAM, 3 TO 8 PERCENT SLOPES	B
LkC	LECK KILL CHANNERY SILT LOAM, 8 TO 15 PERCENT SLOPES	B
LkD	LECK KILL CHANNERY SILT LOAM, 15 TO 25 PERCENT SLOPES	B
LkE	LECK KILL CHANNERY SILT LOAM, 25 TO 35 PERCENT SLOPES	B
Lo	LINDEN SILT LOAM, OCCASSIONALLY FLOODED	B
Lr	LINDEN SILT LOAM, RARELY FLOODED	B
MeB	MECKESVILLE SILT LOAM, 3 TO 8 PERCENT SLOPES	C
MeC	MECKESVILLE SILT LOAM, 8 TO 15 PERCENT SLOPES	C
Mn	MELVIN AND NEWARK SILT LOAMS	D
NoA	NOLO SILT LOAM, 0 TO 3 PERCENT SLOPES	D
Pb	PHILO SILT LOAM	B
UoC	UNGERS LOAM, 8 TO 25 PERCENT SLOPES, EXTREMELY STONY	B
UoE	UNGERS LOAM, 25 TO 50 PERCENT SLOPES, EXTREMELY STONY	B
W	WATER	
WaA	WATSON SILT LOAM, 0 TO 5 PERCENT SLOPES	C
WeB	WHARTON SILT LOAM, 0 TO 8 PERCENT SLOPES, VERY STONY	C