

Table 3. Water Quality Parameters, Laboratory Methods, and Detection Limits

Parameter	Laboratory	Methodology	Detection Limit (mg/l)	References
Total Ammonia (TNH ₃)	PADEP	Colorimetry	0.020	USEPA 350.1
	CAS*	Colorimetry	0.010	USEPA 350.1R
Dissolved Ammonia (DNH ₃)	PADEP	Block Digest, Colorimetry	0.020	USEPA 350.1
		Block Digest, Colorimetry	0.010	USEPA 350.1R
Total Nitrogen (TN)	PADEP	Persulfate Digestion for TN	0.040	Standard Methods #4500-N _{org} -D
Dissolved Nitrogen (DN)	PADEP	Persulfate Digestion	0.040	Standard Methods #4500-N _{org} -D
Total Organic Nitrogen (TON)	N/A	TN minus TNH ₃ and TNO ₂ 3	N/A	N/A
Dissolved Organic Nitrogen (DON)	N/A	DN minus DNH ₃ and DNO ₂ 3	N/A	N/A
Total Kjeldahl Nitrogen (TKN)	CAS*	Block Digest, Flow Injection	0.050	USEPA 351.2
Dissolved Kjeldahl Nitrogen (DKN)	CAS*	Block Digest, Flow Injection	0.050	USEPA 351.2
Total Nitrite plus Nitrate (TNO _x)	PADEP	Cd-reduction, Colorimetry	0.010	USEPA 353.2
	CAS*	Colorimetric by LACHAT	0.002	USEPA 353.2
Dissolved Nitrite plus Nitrate (DNO _x)	PADEP	Cd-reduction, Colorimetry	0.010	USEPA 353.2
	CAS*	Colorimetric by LACHAT	0.002	USEPA 353.2
Dissolved Orthophosphate (DOP)	PADEP	Colorimetry	0.010	USEPA 365.1
	CAS*	Colorimetric Determination	0.002	USEPA 365.1
Dissolved Phosphorus (DP)	PADEP	Block Digest, Colorimetry	0.010	USEPA 365.1
	CAS*	Colorimetric Determination	0.002	USEPA 365.1
Total Phosphorus (TP)	PADEP	Persulfate Digest, Colorimetry	0.010	USEPA 365.1
	CAS*	Colorimetric Determination	0.002	USEPA 365.1
Total Organic Carbon (TOC)	PADEP	Combustion/Oxidation	0.50	SM 5310D
	CAS*	Chemical Oxidation	0.05	GEN 415.1/9060
Suspended Sediment Fines & Sand	USGS	**		
Suspended Sediment (Total)	SRBC	**		
	USGS	**		

* Columbia Analytical Services, Rochester, NY (New York sites only)

** TWRI Book 3, Chapter C2 and Book 5, Chapter C1, Laboratory Theory and Methods for Sediment Analysis (Guy and others, 1969)

PRECIPITATION

Precipitation data were obtained from long-term monitoring stations operated by the U.S. Department of Commerce. The data are published as Climatological Data–Pennsylvania, and as Climatological Data–New York by the National Oceanic and Atmospheric Administration (NOAA) at the National Climatic Data Center in Asheville, North Carolina. Quarterly and annual data from these

sources were compiled across the subbasins of the Susquehanna River Basin and are reported in Table 4 for Group A sites.

Precipitation for 2008 was above average at all Group A sites. Highest departure from the LTM for precipitation was recorded at Danville, Pa., with 6.82 inches above the LTM. Highest precipitation months occurred during January through March at all sites, with an average of 3.5 inches above the LTM.

Table 4. Summary of Annual Precipitation for Selected Areas in the Susquehanna River Basin, Calendar Year 2008

River Location	Season	Calendar Year 2008 Precipitation inches	Average Long-term Precipitation inches	Departure From Long-term inches
Susquehanna River above Towanda, Pa.	January-March	11.42	7.56	3.86
	April-June	8.64	10.54	-1.90
	July-September	12.19	11.17	1.02
	<u>October-December</u>	<u>10.10</u>	<u>9.14</u>	<u>0.96</u>
	Yearly Total	42.35	38.41	3.94
Susquehanna River above Danville, Pa.	January-March	14.30	7.74	6.56
	April-June	10.22	10.69	-0.47
	July-September	11.90	11.38	0.52
	<u>October-December</u>	<u>9.47</u>	<u>9.26</u>	<u>0.21</u>
	Yearly Total	45.89	39.07	6.82
West Branch Susquehanna River above Lewisburg, Pa.	January-March	12.31	8.40	3.91
	April-June	10.96	11.03	-0.07
	July-September	10.82	12.43	-1.61
	<u>October-December</u>	<u>9.16</u>	<u>9.66</u>	<u>-0.50</u>
	Yearly Total	43.25	41.52	1.73
Juniata River above Newport, Pa.	January-March	9.92	7.74	2.18
	April-June	13.43	9.73	3.70
	July-September	9.10	10.05	-0.95
	<u>October-December</u>	<u>8.70</u>	<u>8.97</u>	<u>-0.27</u>
	Yearly Total	41.15	36.49	4.66
Susquehanna River above Marietta, Pa.	January-March	11.69	8.21	3.48
	April-June	10.38	10.73	-0.35
	July-September	11.23	11.52	-0.29
	<u>October-December</u>	<u>9.44</u>	<u>9.44</u>	<u>0.00</u>
	Yearly Total	42.74	39.90	2.84
Conestoga River above Conestoga, Pa.	January-March	9.89	8.91	0.98
	April-June	11.03	10.74	0.29
	July-September	13.28	12.59	0.69
	<u>October-December</u>	<u>10.50</u>	<u>10.58</u>	<u>-0.08</u>
	Yearly Total	44.70	42.82	1.88

WATER DISCHARGE

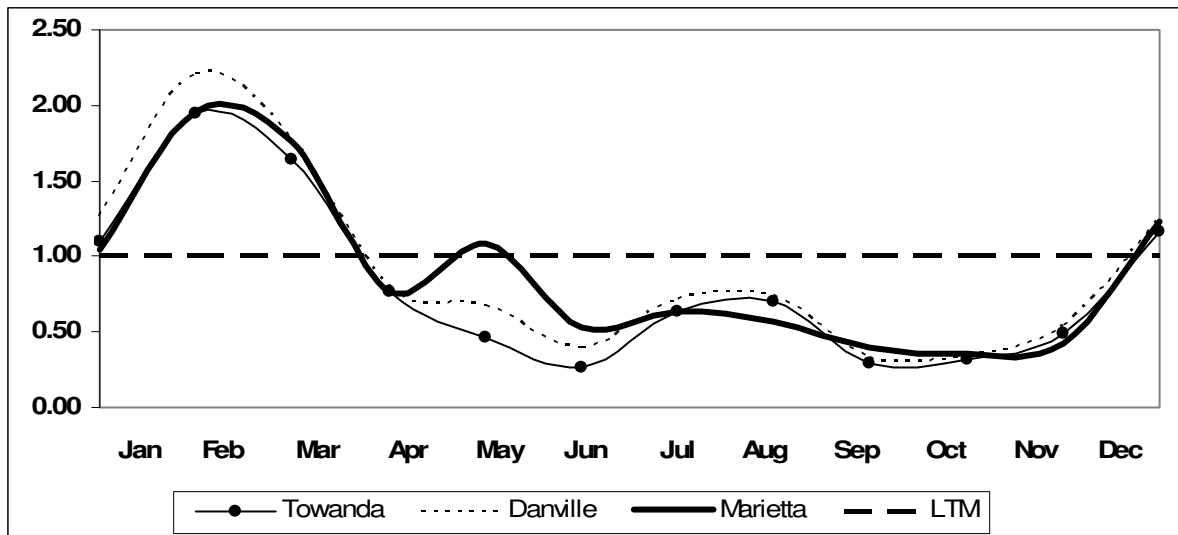
Water discharge data were obtained from the USGS and are listed in Table 5. Monthly water discharge ratios are plotted in Figure 3 for all sites. The water discharge ratio is the actual flow for the time period divided by the LTM for the same time period. Thus, a value of one equals the 2008 flow being the same as the LTM, while a value of three equals the 2008

flow being three times the volume of the LTM. Discharge values were below the LTM at Towanda, Lewisburg, and Conestoga and above the LTM at Danville, Newport, and Marietta. Highest departures from the LTM were at Newport with 110.3 percent of the LTM and at Lewisburg with 93.3 percent of the LTM. Flows levels were highest at all sites during February and March with additional high flow levels in May and December 2008.

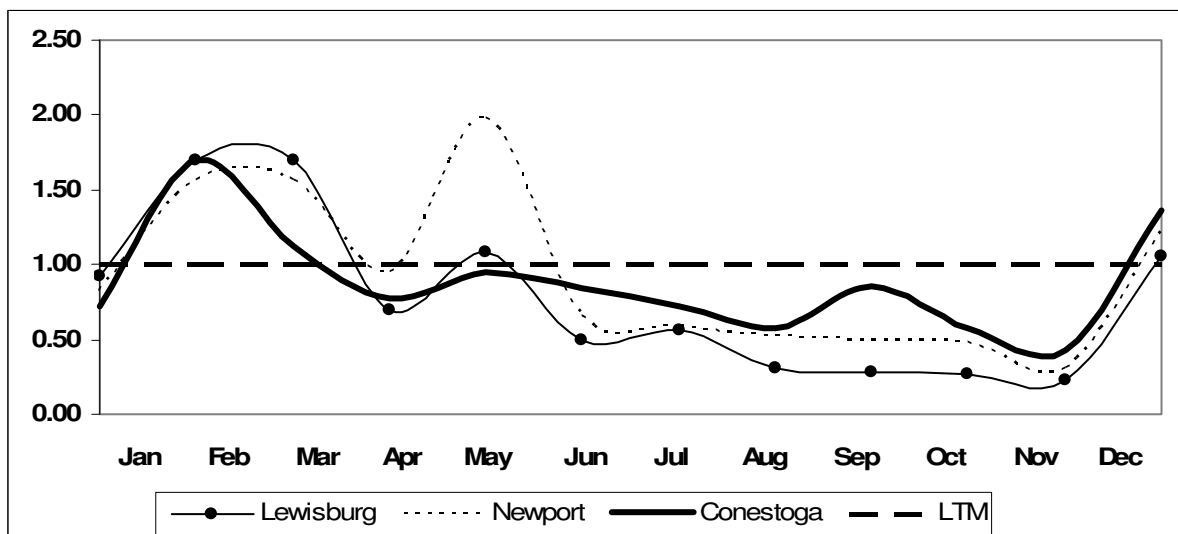
Table 5. Annual Water Discharge, Calendar Year 2008

Site	Years of Record	Long-term Annual Mean cfs ¹	2008	
			Mean cfs	Percent of LTM ²
Towanda	20	11,841	11,359	95.9
Danville	24	16,557	17,620	106.4
Lewisburg	24	10,848	10,108	93.2
Newport	24	4,399	4,851	110.3
Marietta	22	39,123	41,023	104.9
Conestoga	24	677	635	93.8

¹ Cubic feet per second ² Long-term mean



A



B

Figure 3. Discharge Ratios for Long-term Sites, Susquehanna Mainstem Sites (A) and Tributaries (B)