Table 19.--Comparison of Pennsylvania, Maryland and West Virginia reservoirs receiving mine drainage and their effects on downstream water quality

[mi^2, square miles; acre-ft, acre-feet; ft, feet; mi, miles; mg/L, milligrams per liter; µg/L, micrograms per liter; µS/cm, microsiemens per centimeter at 25° Celsius; min., minimum; max., maximum; med., median]

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Location and lake characteristics								Resultant inflow chemistry for Swatara Creek at Inwood and outflowing chemistry for similiar reservoirs								Obaerved downstream water-quality characteristics
Reservoir location (years data collected)	Drainage area (mi^2)	Surface area normal pool (acres)	Volume of normal pool (acre-ft)	Mean depth (ft)	Maximum depth (ft)	Shore line (mi)	Surface elevation (ft)		pH	Total alkalinity (mg/L as $CaCO_3$)	Total acidity (mg/L as $CaCO_3$)	Specific conductance (µS/cm)	Hardness (mg/L $CaCO_3$)	Total iron (µg/L)	Total aluminum (µg/L)	Total manganese (µg/L)	
Swatara Creek at Inwood (1982-84)	167	775	10,500	13.5	40	20	473	min.	5.9	0.0	0.0	72	13	70	80	40	
								max.	7.5	11	14	268	86	30,000	15,000	1,400	
								med.	6.5	5.0	4.0	129	40	740	480	350	
Crooked Creek Lake Pennsylvania (May-October 1979)	277	430	5,830	13.6	40.5	15	843	min.	6.3	24	3	210	94	310	<500	20	Crooked Creek Lake -A delay of several days occurs in the spring warming and autumn cooling at the outflow, relative to the inflow. Outflow diurnal variations seldom were more than 1 °F and never exceeded 3 °F. -Although the lake is shallow and mixing of inflows was relatively good, overflowing, interflowing, and underflowing temperature density currents occurred allowing phosphorus laden run-off to overflow the lower lake sections. -Anoxia was limited to only a brief period late in July, and confined to the deepest lake stratum near the sediment water interface, outflows therefore were well aerated. These obaervations like those for water temperature probably were influenced largely by the 4.75 inches of runoff which flushed the impoundment 12 times during the 5-month study period. -Water quality data suggests that some improvement has been made due to the decline in acid mine drainege problems. -Settling of suspended solids and precipitation of calcium, magnesium, iron, manganese, and other salts have resulted in lower conductivity, sulfate, hardness, and heavy metals at the outflow. -Short term water-quality extremes have been moderated by mixing and dilution with in-pool storage. Acidities were lowered and alkalinities increased at the outflow again probably due to the above normal runoff. -The buffering effect of the lake continues to be a significant factor in protecting lake and outflow water quality from mine blowouts and treatment plant failures that have occurred. Buffering is enhanced by higher summer pool elevations, but hypolimetric anoxia is then increased with dissolved iron and manganese accumulating within the withdrawal zone of the outlet works.
								max.	7.9	51	9	700	392	1,510	1,400	555	
								med.	7.0	36	6	414	155	700	730	310	
Loyalhanna Lake Pennsylvania (1980)	290	350	3,500	10	49	16	918	min.	5.4	14	2	239	74	400	59	540	Loyalhanna Lake -Withdrawals from low elevations resulted in a moderate shift in the downstream water temperature regime. -Discharge from outflows need to be discharged carefully because density currents in the lake cause plunging of interflows and underflows about 2 miles upstream from the dam where the thalweg elevation drops sharply. -The absence of significant summer hypolimnetic anoxia in the lake has resulted in year round well aerated discharges. -Water quality improved at the outflow during the summer when minimum pool elevations were high. -Suspended sediment and associated chemical-constituent concentrations were reduced. -In pool storage caused moderation of short term inflow water-quality extremes by mixing and dilution thereby reducing outflow concentrations. -Iron degradation occurs at the outflow during the winter. -Manganese concentrations are regularly highest in the summer. Because of manganese's solubility there is little tendency for concentration reductions in the acidic lake. Outflow concentrations are therefore similar to inflow concentrations. -Beside instream aesthetic degration and toxicity to aquatic life, the iron and manganese discharges to domestic water supplies result in staining porcelain and clothes, drinking water taste problems and substantial costs for coagulation water treatment by downstream suppliers.
								max.	6.8	33	16	733	340	1,100	500	1,400	
								mean	6.3	23	8	514	203	706	212	1,056	