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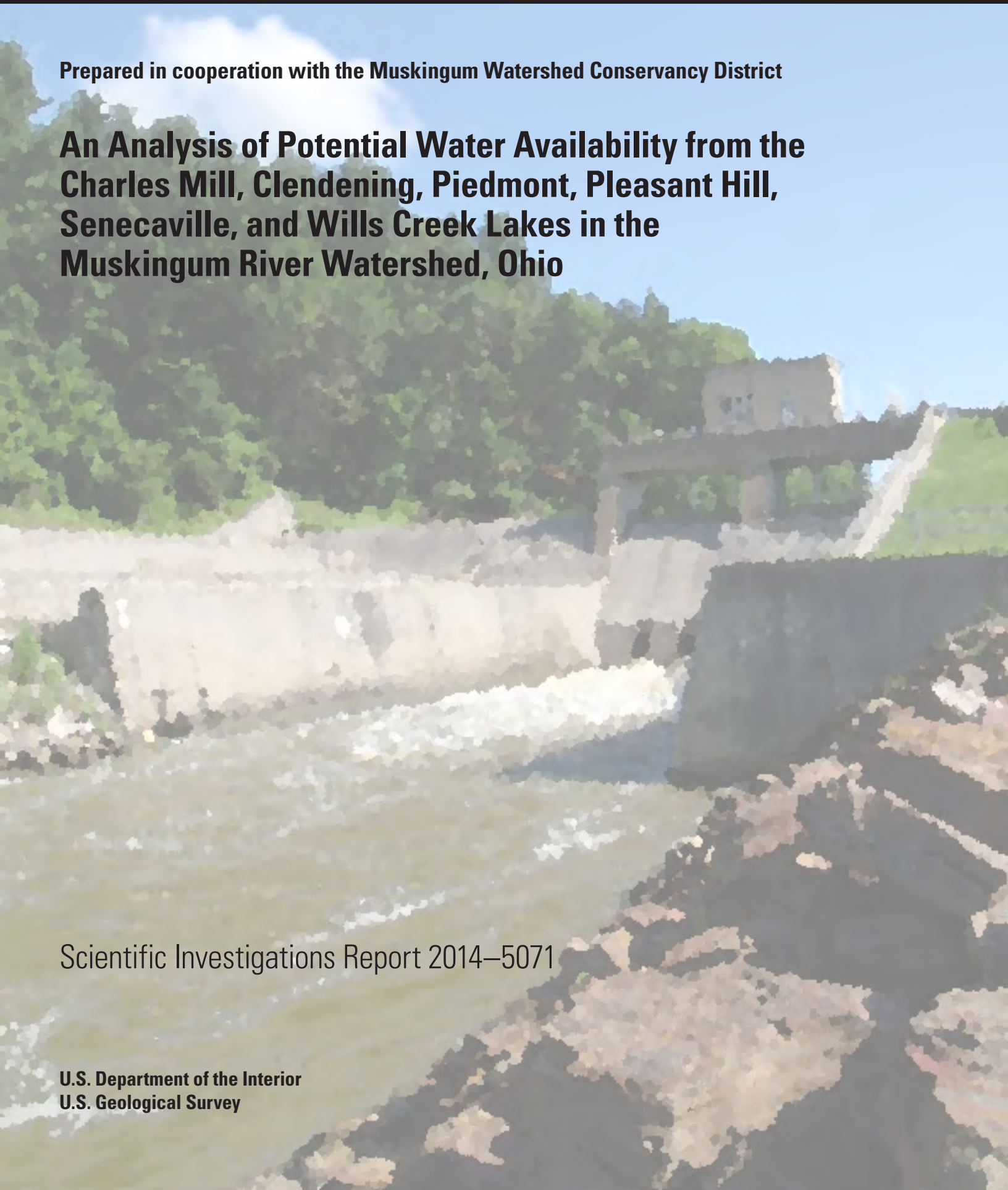
An Analysis of Potential Water Availability from the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio



Scientific Investigations Report 2014–5071

U.S. Department of the Interior
U.S. Geological Survey

Cover: View of Charles Mill Lake outlet works and outlet channel, Muskingum River Watershed, Ohio. Rendering based on original photograph provided by the Muskingum Watershed Conservancy District (used with permission).

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SALLY JEWELL, Secretary

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Conversion Factors and Abbreviations

Multiply	By	To obtain
	Length	
foot (ft)	0.3048	meter (m)
	Area	
square mile (mi^2)	259.0	hectare (ha)
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
million gallons (Mgal)	3,785	cubic meter (m^3)
	Flow rate	
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)

Abbreviations

MWCD	Muskingum Watershed Conservancy District
RMSD	Root-mean-square-deviation
SAS	Statistical Analysis System
USACE	U.S. Army Corps of Engineers
USGS	U.S. Geological Survey

An Analysis of Potential Water Availability from the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio

By G.F. Koltun

Abstract

This report presents the results of a study to assess potential water availability from the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes, located within the Muskingum River Watershed, Ohio. The assessment was based on the criterion that water withdrawals should not appreciably affect maintenance of recreation-season pool levels in current use. To facilitate and simplify the assessment, it was assumed that historical lake operations were successful in maintaining seasonal pool levels, and that any discharges from lakes constituted either water that was discharged to prevent exceeding seasonal pool levels or discharges intended to meet minimum in-stream flow targets downstream from the lakes. It further was assumed that the volume of water discharged in excess of the minimum in-stream flow target is available for use without negatively impacting seasonal pool levels or downstream water uses and that all or part of it is subject to withdrawal.

Historical daily outflow data for the lakes were used to determine the quantity of water that potentially could be withdrawn and the resulting quantity of water that would flow downstream (referred to as "flow-by") on a daily basis as a function of all combinations of three hypothetical target minimum flow-by amounts (1, 2, and 3 times current minimum in-stream flow targets) and three pumping capacities (1, 2, and 3 million gallons per day). Using both U.S. Geological Survey streamgage data (where available) and lake-outflow data provided by the U.S. Army Corps of Engineers resulted in analytical periods ranging from 51 calendar years for Charles Mill, Clendening, and Piedmont Lakes to 74 calendar years for Pleasant Hill, Senecaville, and Wills Creek Lakes.

The observed outflow time series and the computed time series of daily flow-by amounts and potential withdrawals were analyzed to compute and report order statistics (95th, 75th, 50th, 25th, 10th, and 5th percentiles) and means for the analytical period, in aggregate, and broken down by calendar month. In addition, surplus-water mass curve data were tabulated for each of the lakes.

Monthly order statistics of computed withdrawals indicated that, for the three pumping capacities considered, increasing the target minimum flow-by amount tended to reduce the amount of water that can be withdrawn. The reduction was greatest in the lower percentiles of withdrawal; however, increasing the flow-by amount had no impact on potential withdrawals during high flow. In addition, for a given target minimum flow-by amount, increasing the pumping rate typically increased the total amount of water that could be withdrawn; however, that increase was less than a direct multiple of the increase in pumping rate for most flow statistics. Potential monthly withdrawals were observed to be more variable and more limited in some calendar months than others.

Monthly order statistics and means of computed daily mean flow-by amounts indicated that flow-by amounts generally tended to be lowest during June–October. Increasing the target minimum flow-by amount for a given pumping rate resulted in some small increases in the magnitudes of the mean and 50th percentile and lower order statistics of computed mean flow-by, but had no effect on the magnitudes of the higher percentile statistics. Increasing the pumping rate for a given target minimum flow-by amount resulted in decreases in magnitudes of higher-percentile flow-by statistics by an amount equal to the flow equivalent of the increase in pumping rate; however, some lower percentile statistics remained unchanged.

Introduction

The Muskingum Watershed Conservancy District (MWCD)—a political subdivision of the State of Ohio—was created in 1933 under the Conservancy Act (Ohio Revised Code, Chapter 6101) (LAWriter Ohio Laws and Rules, 2000). In addition to flood reduction and protection, other approved purposes of the MWCD include conserving and developing water supplies for domestic, industrial, and public use; treating

wastewater; and providing recreational opportunities. In support of the MWCD's role in developing water supplies, a study was conducted by the U.S. Geological Survey (USGS), in cooperation with the MWCD, to assess potential water availability from the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes, located within the Muskingum River Watershed, Ohio (fig. 1). These lakes, which have been operational since between 1936 and 1938, are operated by the U.S. Army Corps of Engineers (USACE) in partnership with the MWCD. A previous study by Koltun (2013) employed identical analytical methods to assess potential water availability from three other lakes in the Muskingum River Watershed.

The MWCD stipulated that the water-availability assessment be based on the criterion that water withdrawals should not appreciably affect maintenance of recreation-season pool levels in current use. To facilitate and simplify the water-availability analyses, it was assumed that historical lake operations were successful in maintaining seasonal pool levels, and that any discharges from the lakes constituted either water that was discharged to prevent exceeding seasonal pool levels or discharges intended to meet minimum in-stream flow targets downstream from the lakes. It is assumed that volumes of water discharged in excess of minimum in-stream flow targets (hereafter referred to as "surplus water") are, by definition, available for use without negatively impacting seasonal pool levels or downstream water uses. The residual lake outflow (that is, the outflow minus withdrawals, if any) will be referred to as the "flow-by" because that water flows by (or through) the lake and is available for downstream uses.

Descriptions of the Lakes

The lakes addressed in this report include Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes. The dams that form these lakes were all completed between 1936 and 1938. While the primary purpose of the lakes and dams is flood control, they also were designed to provide storage for water conservation and recreation, and to promote fish and wildlife enhancement.

Information about the lakes and dams is provided in appendix 1, table 1–1. The areas draining to the dams range from about 69.3 square miles (mi^2) (for Clendening Lake) to 842 mi^2 (for Wills Creek Lake). All of the dams are constructed of rolled earth with an impervious core and have some form of uncontrolled spillway (U.S. Army Corps of Engineers, 2005). At each of the lakes, normal flow (that is, when inflows to the lake result in pool levels that are lower than the uncontrolled spillway) is controlled by gates.

The USACE has set minimum in-stream flow targets, immediately downstream from the lakes, of 1.5 cubic feet per second (ft^3/s) for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake. It is worth noting that during very dry periods, it is possible to release less than the minimum in-stream flow target. Also, because of gate leakage, it is possible that flows as low as the minimum in-stream flow targets do not occur (Timothy Curran, U.S. Army Corps of Engineers, Huntington District, written commun., 2012).

Purpose and Scope

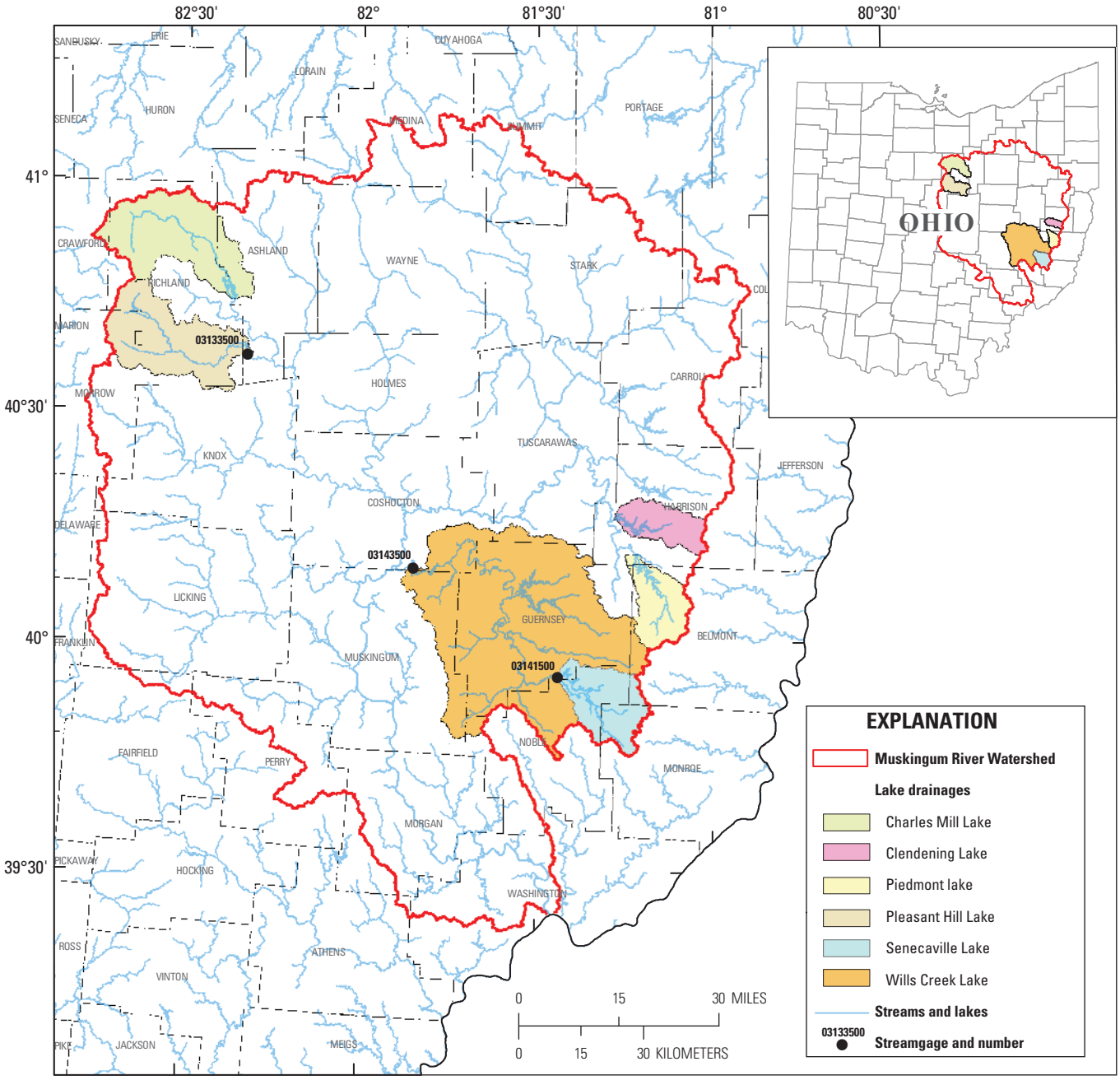
The purpose of this report is to describe analytical methods and present results of a study to assess potential water availability from the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio. The analysis involved determining the amounts of water that potentially could be withdrawn and the resulting amounts of water that would flow downstream on a daily basis as a function of all combinations of three hypothetical target minimum flow-by amounts (1, 2, and 3 times current minimum in-stream flow targets) and three pumping capacities (1, 2, and 3 million gallons per day (Mgal/d)). The analysis was based on an examination of the best available historical daily outflow data for the lakes.

Flow Data Used in the Analyses

Lake-outflow data used for this report came from either daily mean streamflow values published by the USGS for streamgages located short distances downstream from the outlet works of the lakes (table 1 and fig. 1) or from daily mean outflow data provided by the USACE. The streamflow data published by the USGS were determined based on relations developed between water-level data and physical measurements of streamflow. The USACE stated that they typically

Table 1. U.S. Geological Survey streamgages and periods of gage record used in the water-availability analyses for the Muskingum River Watershed, Ohio.

Station number	Station name	Period of streamgage record used
03133500	Clear Fork below Pleasant Hill Dam near Perrysville, Ohio	01/01/1939–09/30/1991
03141500	Seneca Fork below Senecaville Dam near Senecaville, Ohio	01/01/1939–09/30/1991
03143500	Wills Creek below Wills Creek Dam at Wills Creek, Ohio	01/01/1939–09/30/1991



Base from U.S. Geological Survey digitial data
Universal Transverse Mercator projection, Zone 17
North American Datum of 1983

Figure 1. Locations of lake drainages and streamgages in the Muskingum River Watershed, Ohio.

used gate and (or) siphon ratings to compute the outflows for the Charles Mill, Clendening, and Piedmont Lakes and used legacy stage-discharge ratings to compute outflows from Pleasant Hill, Senecaville, and Wills Creek Lakes (Matthew Gibson, U.S. Army Corps of Engineers, Huntington District, oral commun., 2013). Previous discussions with the USACE indicated that the accuracy of their reported flows for gate and siphon ratings may be poor during some low-flow periods (for example, due to unaccounted for gate leakages) (Timothy Curran, U.S. Army Corps of Engineers, Huntington District, written commun., 2012).

Pearson's correlation coefficient (r), which measures the strength of the linear relationship between two variables, was computed for each lake for the relation between same-day USGS-published daily mean streamflows and USACE-computed daily mean outflows. Pearson's r can range from −1 to 1 where an r of ±1 indicates a perfect linear relationship between variables and an r of 0 indicates no linear relationship between variables. The correlation coefficients for the relations between same-day USGS-published streamflows for stations immediately downstream from Pleasant Hill, Senecaville, and Wills Creek Lakes and the corresponding USACE-computed lake outflows were 0.89, 0.96, and 0.97, respectively. In spite of these relatively high correlation coefficients, there were some time periods when the USACE outflow estimates for Pleasant Hill and Wills Creek Lakes were systematically larger than the streamflows reported for the corresponding downstream Clear Fork and Wills Creek streamgages, respectively.

High biases in the USACE outflow estimates for Pleasant Hill Lake relative to same-day USGS-published streamflows for station 03133500 predominately occurred before 1987. In contrast, high biases in the USACE outflow estimates for Wills Creek Lake relative to same-day USGS-published streamflows for station 03143500 persisted to the end of the gage streamflow record. Unfortunately, the USACE was unable to provide specific information on the derivation of their historical flow estimates to help resolve the observed discrepancies (Matthew Gibson, U.S. Army Corps of Engineers, Huntington District, oral commun., 2013). Root-mean-square-deviations (RMSDs) were computed to help the reader assess correspondence between the concurrent USACE daily mean outflow estimates and the same-day USGS-published daily mean streamflows for the downstream gage. RMSDs computed from all concurrent USGS and USACE daily mean flows out of Pleasant Hill, Senecaville, and Wills Creek Lakes were 1.0, 0.4, and 2.1 ft^3/s, respectively.

Because of the stated uncertainty surrounding the low-flow data supplied by the USACE, USGS streamgage data were used whenever available and applicable; USACE data were used at other times. The resulting daily-mean-outflow time series will henceforth be referred to as the "observed" outflows.

The USACE provided lake-outflow data for the period 01/01/1962 to 12/31/2012, for all of the lakes. Using both USGS streamgage data (where applicable) and outflow data provided by the USACE resulted in analytical periods ranging from 51 calendar years (1962–2012) for Charles Mill, Clendening, and Piedmont Lakes to 74 calendar years (1939–2012) for Pleasant Hill, Senecaville, and Wills Creek Lakes.

Methods of Analysis

The analytical methods used for this study are identical to those used previously to assess potential water availability from Atwood, Leesville, and Tappan Lakes in the Muskingum River Watershed (Koltun, 2013). Following is a brief description of those methods.

To assess potential future water availability, observed outflow data from the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes were used to determine the amounts of water that potentially could be withdrawn and the resulting residual amounts of water that would flow downstream (referred to as "flow-by") on a daily basis as a function of all combinations of three hypothetical target minimum flow-by amounts and three pumping capacities. It is worth noting that the "target minimum flow-by amounts" represent targets (not regulatory mandates) for minimum daily mean flows immediately downstream from the lakes; however, there may be times when those targets cannot be met. The occasional inability to fulfill those targets in this analysis occurs because the flow-by comes from observed lake outflows, which at times was already less than the target. This might occur, for example, during extended dry periods when lake outflows are completely controlled by the siphons. Irrespective of the actual outflows from the lakes, in no case does the analytical method used for this report yield flow-by amounts less than the observed lake outflows.

The target minimum flow-by amounts used in this analysis were 1, 2, and 3 times the current minimum in-stream flow targets for the lakes (1.5 ft^3/s for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake) as specified by the USACE. The pumping rates used in this analysis were 1, 2, and 3 Mgal/d. Pumping rates and multipliers for target minimum flow-by amounts used in this analysis were specified by the MWCD.

As illustrated in figure 2, for each day in the lake-outflow time series, the outflow amount was compared to the target minimum flow-by amount. If the outflow amount did not exceed the target minimum flow-by amount, then there was no surplus water available for withdrawal and the total outflow was designated as flow-by. If instead the outflow amount exceeded the target minimum flow-by amount, then the amount of outflow in excess of that target minimum flow-by amount was said to be surplus water.

The amount of surplus water was compared to the amount of water that could be pumped (withdrawn) in 1 day at the specified pumping rate. If the amount of surplus water exceeds that which could be pumped, then the withdrawal was set equal to the product of time and the pumping rate. For

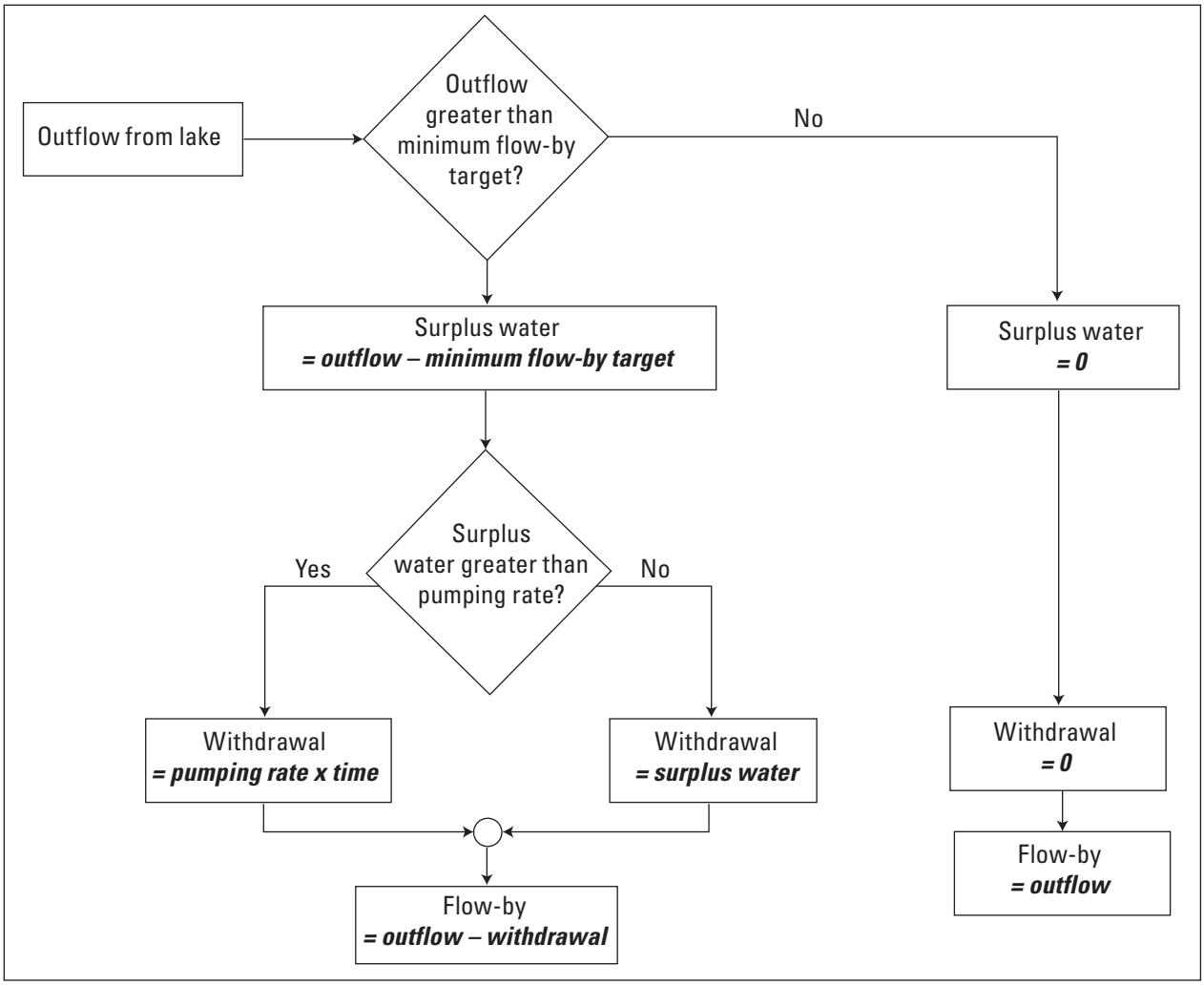


Figure 2. Flowchart outlining the logic by which withdrawal and flow-by amounts were determined.

example, if the pumping rate was 1 Mgal/d, then the amount of water that could be pumped over a 24-hour period equals 1 million gallons (Mgal). If instead the amount of surplus water did not exceed that which could be pumped in 1 day, then the withdrawal was set equal to the amount of surplus water (the assumption being that the pump would be operated only for the portion of the day required to pump the surplus amount). The resulting flow-by amount (that is the water that flows downstream) is equal to the outflow minus withdrawals (if any). This approach ensures that the resulting flow-by amount equals or exceeds the target minimum flow-by amount whenever the outflow exceeds the target minimum flow-by.

The observed outflow time series and the time series of daily flow-by amounts and potential withdrawals (computed as previously described) were analyzed to compute order statistics and means. The order statistics computed include the 95th, 75th, 50th, 25th, 10th, and 5th percentiles. In general, the Pth percentile refers to the value in the series that is greater than or equal to P percent of values in the series. Conversely, the Pth percentile value is less than or equal to 100-P percent of the values in the series. For example, the 5th percentile value is greater than or equal to 5 percent of the values in the series and less than or equal to 95 percent (100-5 percent) of the values.

Order statistics and means were computed for daily mean observed outflows and computed flow-by amounts, as well as for monthly and annual total withdrawals. The ultimate objective of computing order statistics is to provide information on the frequency with which outflows, flow-by amounts, and withdrawals with various magnitudes were exceeded (or not exceeded). Order statistics were computed with the Statistical Analysis System (SAS) (SAS Institute, Inc., 2011) using the SAS type 5 estimator (which calculates percentiles based on the empirical distribution function with averaging when the percentile boundary lies between two observations). For some tables presented in this report, statistics are reported for the aggregate analytical period; for other tables, order statistics were computed based on data further subdivided by calendar month. The aggregate analytical-period order statistics provide information on exceedance/nonexceedance without consideration for seasonality, whereas the monthly order statistics provide more information about seasonal variation in the flows and potential withdrawals.

Cumulative surplus-water volumes were tabulated as a function of time for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes based on target minimum outflows equal to 1, 2, and 3 times current target minimum outflows. When cumulative volumes are plotted as a function of time, they are called mass curves. Both tabular and graphical versions of surplus-water mass curves can be used to assess hypothetical water-demand rates to determine whether the demand could have been met at all times or, if not, to determine the maximum amount and duration of demand excess.

Results and Discussion

Order statistics and means of calendar-year and monthly total withdrawals are shown in tables 2–8 for the various combinations of pumping rates and target minimum flow-by amounts. The data presented in table 2 show some general trends in withdrawal statistics for Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes. Specifically, for any of the given pumping rates, increasing the target minimum flow-by amount tends to reduce the amount of water that can be withdrawn. The reduction is greatest in the lower percentiles of withdrawal because increasing the flow-by amount has a large impact on water available for withdrawal during low-flow periods; however, increasing the flow-by amount has no impact on potential withdrawals during high-flow periods because the amount of surplus water (from which withdrawals are made) already far exceeds pumping rate.

For a given target minimum flow-by amount, increasing the pumping rate typically increases the total amount of water that can be withdrawn; however, that increase is less than a direct multiple of the increase in pumping rate for most statistics. The increase in withdrawal can be less than a direct multiple of the increase in pumping rate because sufficient surplus water is available on some days to meet the demand associated with smaller pumping rates, but it may not be sufficient to meet the demand associated with larger pumping rates. When the amount of surplus water is not sufficient to meet the full demand associated with an increased pumping rate, the amount of additional withdrawal (beyond that which is associated with the lower pumping rate) will range from zero to some fraction of the difference in pump capacities.

Withdrawal data shown in tables 3–8 illustrate that, for most of the lakes, potential monthly withdrawals are more variable and more limited in some calendar months (the typically drier months) than others. Wills Creek Lake stands out as being different from the other lakes in that its drainage area is so large that the withdrawal amounts considered for this study could almost always be met for the flow-by amounts being considered.

Aggregate analytical-period order statistics and monthly order statistics of observed daily mean outflows are reported in tables 9 and 10, respectively. Data from these tables provide a base against which to compare flow-by statistics from the analyses employing the various combinations of pumping and target minimum flow-by amounts. Notable from table 9 is that the minimum in-stream flow targets for the lakes range from a low of 0.2 percent (for Wills Creek Lake) to a high of 12.9 percent (for Pleasant Hill Lake) of the respective mean daily outflows. An examination of the data presented in table 10 indicates that the daily mean observed outflows for the lakes tend to be lowest during June–October.

Table 2. Statistics of calendar-year potential withdrawals for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.

[Mgal/d, million gallons per day; minimum in-stream flow target equals 1.5 cubic feet per second (ft^3/s) for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake]

Statistic	Calendar-year potential withdrawals, in millions of gallons, for indicated lakes, pumping rates, and minimum in-stream flow-target multiples								
	Pumping rate, in Mgal/d								
	1			2			3		
	Minimum in-stream flow-target multiple								
	1	2	3	1	2	3	1	2	3
	Charles Mill Lake								
95th percentile	366	365	360	732	730	720	1098	1095	1080
75th percentile	365	353	315	730	700	628	1095	1045	939
mean	351	314	280	698	624	556	1040	930	829
50th percentile	361	322	286	721	640	566	1074	956	838
25th percentile	343	284	245	683	562	488	1013	831	726
10th percentile	320	250	214	630	494	425	928	733	634
5th percentile	299	210	180	591	412	357	879	611	532
	Clendening Lake								
95th percentile	366	366	366	732	732	732	1098	1098	1088
75th percentile	365	365	365	730	730	730	1095	1095	1059
mean	350	344	340	694	684	675	1034	1020	986
50th percentile	363	362	360	726	723	715	1086	1078	1034
25th percentile	350	335	319	684	651	632	990	956	918
10th percentile	308	291	283	608	574	556	898	847	811
5th percentile	283	267	266	549	532	531	801	798	793
	Piedmont Lake								
95th percentile	364	364	364	728	728	728	1092	1092	1090
75th percentile	349	342	342	688	684	684	1028	1026	1026
mean	327	313	308	640	621	611	948	924	910
50th percentile	332	324	316	652	642	626	972	950	934
25th percentile	307	297	288	610	583	565	901	870	834
10th percentile	282	244	227	530	468	449	766	683	664
5th percentile	274	231	223	508	455	438	731	675	648

Table 2. Statistics of calendar-year potential withdrawals for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.—Continued

[Mgal/d, million gallons per day; minimum in-stream flow target equals 1.5 cubic feet per second (ft^3/s) for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake]

Statistic	Calendar-year potential withdrawals, in millions of gallons, for indicated lakes, pumping rates, and minimum in-stream flow-target multiples								
	Pumping rate, in Mgal/d								
	1			2			3		
	Minimum in-stream flow-target multiple								
	1	2	3	1	2	3	1	2	3
	Pleasant Hill Lake								
95th percentile	366	358	314	732	716	626	1098	1068	936
75th percentile	365	308	248	730	609	495	1095	906	741
mean	352	264	214	700	526	426	1042	783	635
50th percentile	364	261	213	727	520	422	1083	771	630
25th percentile	354	226	175	702	449	346	1037	667	516
10th percentile	312	178	152	614	351	303	893	524	453
5th percentile	295	172	129	571	343	257	835	511	384
	Senecaville Lake								
95th percentile	365	356	342	722	704	677	1075	1042	1011
75th percentile	346	300	265	645	563	525	923	825	782
mean	309	241	220	568	467	434	802	685	644
50th percentile	319	246	213	577	481	421	808	696	609
25th percentile	276	189	163	497	368	319	694	520	473
10th percentile	242	153	137	421	297	271	581	438	405
5th percentile	228	142	130	408	275	260	555	405	388
	Wills Creek Lake								
95th percentile	366	366	366	732	732	732	1098	1098	1098
75th percentile	365	365	365	730	730	730	1095	1095	1095
mean	365	365	365	730	730	729	1094	1094	1094
50th percentile	365	365	365	730	730	730	1095	1095	1095
25th percentile	365	365	365	730	730	730	1095	1095	1095
10th percentile	364	364	364	728	728	728	1092	1092	1092
5th percentile	363	363	363	726	726	725	1089	1089	1086

Table 3. Statistics of Charles Mill Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	30.8	28.0	30.8	29.5	30.6	28.3	29.1	28.7	26.9	28.5	28.8	30.3
13.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	31.0	30.0	31.0	30.0	30.9	30.0	26.0	29.6	30.0	31.0
	10th percentile	31.0	28.0	31.0	29.3	31.0	26.3	23.6	24.3	15.6	23.2	28.5	31.0
	5th percentile	31.0	27.0	29.0	26.0	29.2	9.6	21.6	11.0	14.4	14.0	18.0	26.7
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	29.6	26.4	30.4	28.9	30.0	26.1	24.3	20.7	18.4	21.7	26.8	29.7
26.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	30.5	25.6	20.0	23.4	30.0	31.0
	25th percentile	31.0	28.0	31.0	30.0	31.0	25.0	17.9	11.6	6.4	15.0	28.0	31.0
	10th percentile	26.0	20.0	29.0	27.0	30.0	15.0	6.9	1.0	0.0	4.6	16.1	29.0
	5th percentile	22.0	14.0	28.0	22.0	23.0	8.0	3.0	0.0	0.0	0.0	11.0	19.5
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	26.7	24.0	30.0	30.0	31.0
	mean	28.4	25.3	30.0	28.4	28.7	22.4	19.8	14.3	12.9	16.5	23.9	28.8
39.0	50th percentile	31.0	28.0	31.0	30.0	31.0	27.6	25.0	10.1	11.0	16.0	29.0	31.0
	25th percentile	30.0	25.0	30.0	29.0	28.0	17.4	8.0	4.0	1.6	6.2	18.6	31.0
	10th percentile	20.0	16.0	28.0	25.0	26.0	8.6	0.0	0.0	0.0	0.0	9.8	21.0
	5th percentile	15.7	10.0	23.0	22.0	18.0	0.0	0.0	0.0	0.0	0.0	6.0	16.0
		Pumping rate = 2 Mgal/d											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	61.5	55.8	61.6	58.9	61.1	56.4	57.9	56.8	52.8	56.2	57.4	60.5
13.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	62.0	60.0	62.0	60.0	60.5	58.6	50.0	56.2	60.0	62.0
	10th percentile	62.0	55.9	62.0	58.0	62.0	51.6	45.1	45.3	29.9	41.1	55.7	62.0
	5th percentile	59.9	52.1	58.0	52.0	56.9	18.6	41.3	19.4	23.7	27.3	36.0	51.7
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	59.1	52.8	60.7	57.8	59.9	51.7	48.0	40.8	36.1	42.7	53.3	59.3
26.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	60.4	49.9	39.4	44.6	60.0	62.0
	25th percentile	62.0	55.4	62.0	60.0	61.9	50.0	33.0	22.6	12.0	30.0	54.2	62.0
	10th percentile	51.3	40.0	58.0	54.0	60.0	29.9	12.5	2.0	0.0	8.5	32.1	58.0
	5th percentile	44.0	28.0	55.9	44.0	46.0	14.3	6.0	0.0	0.0	0.0	22.0	37.2

Table 3. Statistics of Charles Mill Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	52.0	47.3	59.2	60.0	62.0
	mean	56.5	50.5	60.0	56.8	57.2	44.6	39.2	27.9	25.3	32.6	47.3	57.4
39.0	50th percentile	62.0	56.0	62.0	60.0	62.0	54.6	47.8	18.6	22.0	31.2	57.3	62.0
	25th percentile	60.0	49.3	60.0	58.0	55.9	34.1	15.9	7.8	2.6	12.2	35.2	61.9
	10th percentile	36.2	32.0	55.3	50.0	50.5	16.5	0.0	0.0	0.0	0.0	17.6	41.8
	5th percentile	28.3	19.9	46.0	42.5	35.2	0.0	0.0	0.0	0.0	0.0	12.0	32.0
		Pumping rate = 3 Mgal/d											
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	92.2	83.4	92.3	88.2	91.4	84.3	86.2	84.0	77.2	82.9	85.7	90.8
13.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	93.0	84.0	93.0	90.0	93.0	90.0	87.7	82.8	71.3	76.8	90.0	93.0
	10th percentile	93.0	82.2	92.6	87.0	93.0	76.2	64.3	63.0	37.4	55.0	80.8	93.0
	5th percentile	87.0	76.9	87.0	77.5	83.9	27.0	55.5	26.9	30.3	40.0	54.0	76.5
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	88.5	79.0	91.0	86.6	89.7	76.8	71.1	60.0	53.2	63.2	79.3	88.8
26.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	90.0	71.7	58.4	65.6	90.0	93.0
	25th percentile	93.0	81.4	93.0	90.0	91.6	75.0	47.4	32.2	17.7	45.0	80.6	93.0
	10th percentile	76.3	60.0	87.0	80.4	88.8	43.9	16.9	3.0	0.0	11.5	47.6	87.0
	5th percentile	66.0	41.6	82.9	66.0	69.0	20.3	9.0	0.0	0.0	0.0	33.0	54.2
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	92.2	78.0	70.3	88.1	90.0	93.0
	mean	84.5	75.5	90.0	85.1	85.5	66.4	58.0	41.1	37.0	48.1	70.4	86.0
39.0	50th percentile	93.0	84.0	93.0	90.0	93.0	81.6	68.4	27.0	32.9	45.0	84.7	93.0
	25th percentile	90.0	73.3	90.0	87.0	82.9	50.1	22.5	9.0	3.2	16.6	50.2	91.5
	10th percentile	53.2	48.0	82.3	75.0	73.1	22.5	0.0	0.0	0.0	0.0	25.1	58.8
	5th percentile	40.3	28.5	69.0	60.7	51.2	0.0	0.0	0.0	0.0	0.0	18.0	48.0

Table 4. Statistics of Clendening Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	31.0	28.1	30.5	29.9	31.0	29.0	29.4	28.3	26.1	27.4	29.0	30.7
1.5	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	30.0	30.0	31.0	30.0	31.0	30.6	29.1	31.0	30.0	31.0
	10th percentile	31.0	28.0	28.8	30.0	31.0	30.0	23.2	17.0	14.5	10.3	26.5	31.0
	5th percentile	31.0	26.3	28.3	30.0	31.0	17.9	21.0	11.2	0.0	2.0	21.5	30.9
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	31.0	28.0	30.0	29.9	31.0	28.8	29.0	27.2	24.6	26.4	28.2	30.6
3.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	29.3	30.0	31.0	30.0	31.0	26.2	24.0	31.0	30.0	31.0
	10th percentile	31.0	28.0	28.0	30.0	31.0	28.9	20.8	16.4	3.2	7.1	20.5	31.0
	5th percentile	31.0	26.0	25.3	29.7	31.0	15.8	18.3	8.3	0.0	0.0	16.4	30.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	31.0	28.0	29.5	29.8	31.0	28.6	28.4	26.1	23.5	26.0	27.8	30.6
4.5	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	28.5	30.0	31.0	30.0	31.0	24.7	19.8	29.6	29.6	31.0
	10th percentile	31.0	28.0	26.8	30.0	31.0	26.0	17.8	10.7	0.4	6.4	18.3	31.0
	5th percentile	31.0	26.0	24.0	28.0	31.0	14.1	12.8	5.1	0.0	0.0	15.0	30.0
		Pumping rate = 2 Mgal/d											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	62.0	56.1	60.4	59.8	62.0	57.8	58.4	55.5	50.7	53.8	57.1	61.3
1.5	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	59.9	60.0	62.0	60.0	62.0	55.6	51.1	62.0	60.0	62.0
	10th percentile	62.0	56.0	56.8	60.0	62.0	58.8	43.8	33.4	28.5	19.1	46.8	62.0
	5th percentile	62.0	52.3	55.5	59.6	62.0	33.6	39.5	19.2	0.0	2.1	37.7	60.5
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	61.9	56.0	59.5	59.7	62.0	57.4	57.3	53.3	48.0	52.4	56.0	61.3
3.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	57.9	60.0	62.0	60.0	62.0	50.8	43.7	60.5	59.6	62.0
	10th percentile	62.0	56.0	56.0	60.0	62.0	54.6	37.9	22.6	3.5	14.1	39.7	62.0
	5th percentile	62.0	51.9	49.3	57.4	62.0	29.7	31.0	16.3	0.0	0.0	31.9	60.0

Table 4. Statistics of Clendening Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	61.8	55.6	58.7	59.6	62.0	56.8	56.1	51.5	45.9	51.3	55.4	61.0
4.5	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	56.5	60.0	62.0	60.0	61.3	48.0	31.8	53.8	58.0	62.0
	10th percentile	61.6	54.0	52.8	60.0	62.0	51.4	34.1	17.0	0.4	8.8	35.9	61.2
	5th percentile	61.0	50.0	47.2	56.0	62.0	26.3	23.3	9.1	0.0	0.0	30.0	57.5
		Pumping rate = 3 Mgal/d											
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	92.9	84.1	89.9	89.6	93.0	86.4	86.7	81.5	74.1	79.7	84.9	92.0
1.5	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	93.0	84.0	87.6	90.0	93.0	90.0	93.0	79.3	70.4	91.4	89.5	93.0
	10th percentile	93.0	83.9	84.6	90.0	93.0	84.4	60.4	48.5	29.1	25.2	66.3	93.0
	5th percentile	93.0	78.2	77.5	87.3	93.0	47.2	52.8	26.6	0.0	2.1	54.0	90.5
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	92.8	83.6	88.7	89.5	93.0	85.6	85.1	78.6	70.5	77.7	83.5	91.7
3.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	93.0	84.0	85.9	90.0	93.0	90.0	92.2	73.1	55.6	84.4	87.9	93.0
	10th percentile	92.6	81.0	82.0	90.0	93.0	77.3	52.6	31.9	3.6	17.6	57.3	92.2
	5th percentile	92.0	75.0	72.5	84.4	93.0	41.8	41.3	18.5	0.0	0.0	46.9	87.0
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	91.5	90.0	93.0	90.0	93.0
	mean	92.5	82.8	87.5	89.3	92.5	82.5	79.4	71.4	63.6	72.8	81.6	91.2
4.5	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	87.7	83.4	72.6	90.4	90.0	93.0
	25th percentile	93.0	84.0	84.0	90.0	93.0	84.0	73.0	67.9	40.0	70.1	81.3	93.0
	10th percentile	91.3	80.4	78.8	89.3	91.4	67.9	48.0	22.5	0.4	10.4	52.9	90.2
	5th percentile	90.2	73.1	69.0	84.0	87.7	33.7	32.3	12.1	0.0	0.0	45.0	83.5

Table 5. Statistics of Piedmont Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	29.2	20.3	23.0	28.1	31.0	29.4	29.1	28.3	23.9	26.4	28.9	29.7
1.5	50th percentile	31.0	25.0	28.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	29.0	13.0	16.0	29.3	31.0	30.0	31.0	28.2	16.5	23.6	30.0	31.0
	10th percentile	25.0	5.0	7.0	22.0	31.0	26.5	24.2	20.1	9.7	10.0	25.4	26.8
	5th percentile	21.0	0.0	0.0	17.0	31.0	25.2	12.0	10.0	3.7	3.3	21.5	20.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	28.9	19.4	22.3	27.8	30.9	28.5	27.2	26.1	21.1	24.4	27.9	29.4
3.0	50th percentile	31.0	25.0	27.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	29.0	9.0	16.0	29.0	31.0	30.0	31.0	22.8	8.6	19.0	29.0	31.0
	10th percentile	24.8	1.0	0.0	21.6	31.0	22.6	12.3	11.9	0.0	1.1	20.5	26.0
	5th percentile	19.0	0.0	0.0	16.0	31.0	19.3	4.6	2.6	0.0	0.0	16.4	20.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	28.9	19.0	22.1	27.6	30.8	27.9	26.6	24.9	20.5	23.6	27.6	29.4
4.5	50th percentile	31.0	25.0	27.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	29.0	8.2	16.0	29.0	31.0	30.0	28.3	19.0	7.2	17.4	29.0	31.0
	10th percentile	24.0	1.0	0.0	21.0	31.0	18.4	10.3	7.9	0.0	0.0	19.5	26.0
	5th percentile	19.0	0.0	0.0	16.0	31.0	16.6	4.0	0.0	0.0	0.0	16.0	20.0
		Pumping rate = 2 Mgal/d											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	58.2	39.7	45.2	55.9	61.9	57.9	56.3	54.3	45.0	50.7	56.7	59.1
1.5	50th percentile	62.0	50.0	54.5	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	58.0	24.1	32.0	58.3	62.0	60.0	62.0	49.1	27.5	43.2	58.8	62.0
	10th percentile	49.8	9.0	10.0	44.0	62.0	48.1	39.5	32.5	9.7	10.0	46.9	52.8
	5th percentile	41.2	0.0	0.0	34.0	62.0	45.0	23.1	12.3	6.7	4.3	37.8	40.0
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	57.8	38.4	44.4	55.3	61.8	56.4	53.8	50.9	41.6	48.0	55.4	58.9
3.0	50th percentile	62.0	50.0	54.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	58.0	18.0	32.0	58.0	62.0	60.0	59.1	42.6	15.7	36.3	58.0	62.0
	10th percentile	48.8	2.0	0.0	42.6	62.0	40.7	22.1	19.6	0.0	1.1	40.0	52.0
	5th percentile	38.0	0.0	0.0	32.0	62.0	36.3	8.6	2.6	0.0	0.0	32.4	40.0

Table 5. Statistics of Piedmont Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	57.7	38.0	44.2	55.0	61.6	54.9	52.5	48.4	40.1	46.2	54.9	58.9
4.5	50th percentile	62.0	50.0	54.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	58.0	16.2	32.0	58.0	62.0	60.0	54.6	28.2	9.4	34.0	57.8	62.0
	10th percentile	48.0	2.0	0.0	42.0	62.0	33.9	18.9	14.3	0.0	0.0	37.9	52.0
	5th percentile	36.8	0.0	0.0	32.0	62.0	29.0	7.0	0.0	0.0	0.0	32.0	40.0
		Pumping rate = 3 Mgal/d											
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	87.0	58.7	67.4	83.4	92.8	85.8	82.8	79.1	65.4	74.3	84.3	88.5
1.5	50th percentile	93.0	75.0	81.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	87.0	33.1	48.0	87.3	93.0	90.0	90.0	68.8	34.3	56.6	87.8	93.0
	10th percentile	73.8	9.0	10.0	66.0	93.0	68.2	49.6	39.5	9.7	10.0	66.4	78.8
	5th percentile	60.2	0.0	0.0	49.8	93.0	61.6	30.3	12.3	9.7	4.6	53.8	60.0
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	86.6	57.3	66.5	82.8	92.5	83.3	79.8	74.4	61.1	70.5	82.8	88.3
3.0	50th percentile	93.0	75.0	81.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	87.0	25.8	48.0	87.0	93.0	90.0	85.1	54.8	17.9	52.2	87.0	93.0
	10th percentile	72.8	3.0	0.0	63.6	93.0	53.8	31.1	22.9	0.0	1.1	59.5	78.0
	5th percentile	55.8	0.0	0.0	48.0	93.0	49.1	11.6	2.6	0.0	0.0	48.4	60.0
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	86.5	56.9	66.2	82.4	92.2	81.3	78.3	71.1	59.0	68.0	82.1	88.3
4.5	50th percentile	93.0	75.0	81.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	86.4	24.2	48.0	86.5	93.0	90.0	80.3	40.2	12.0	47.4	83.8	93.0
	10th percentile	72.0	3.0	0.0	63.0	93.0	44.1	26.8	20.6	0.0	0.0	55.3	78.0
	5th percentile	52.8	0.0	0.0	48.0	92.1	39.8	9.9	0.0	0.0	0.0	48.0	60.0

Table 6. Statistics of Pleasant Hill Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	30.6	28.0	30.2	30.0	30.8	29.9	30.1	28.7	26.5	28.6	29.0	30.3
26.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	30.2	28.0	31.0	30.0	31.0
	10th percentile	31.0	28.0	30.6	30.0	31.0	30.0	29.0	25.0	20.0	27.0	28.6	31.0
	5th percentile	30.0	26.0	26.0	30.0	31.0	30.0	25.0	11.6	0.0	7.0	24.0	26.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	27.0	19.0	20.0	30.0	31.0
	mean	26.1	24.0	29.0	29.8	30.5	26.4	20.2	12.6	9.6	11.3	19.8	25.0
52.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	22.4	9.0	3.5	7.8	24.0	31.0
	25th percentile	25.0	21.5	30.0	30.0	31.0	26.6	12.7	0.0	0.0	0.0	10.0	25.0
	10th percentile	9.0	13.0	25.0	29.0	31.0	16.0	0.0	0.0	0.0	0.0	0.0	3.0
	5th percentile	4.0	8.0	17.0	28.0	29.0	12.3	0.0	0.0	0.0	0.0	0.0	0.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	30.0	22.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	22.6	10.6	6.0	12.0	25.0	31.0
	mean	21.1	22.0	27.8	29.1	27.9	19.9	12.8	6.6	4.8	6.2	14.5	21.7
78.0	50th percentile	28.5	26.0	31.0	30.0	31.0	23.0	11.0	1.0	0.1	1.5	11.0	28.5
	25th percentile	10.0	17.0	27.0	30.0	28.0	8.6	0.0	0.0	0.0	0.0	6.0	11.0
	10th percentile	4.0	8.0	19.0	28.0	18.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
	5th percentile	3.0	7.0	14.0	22.0	14.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0
		Pumping rate = 2 Mgal/d											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	60.9	55.8	60.2	59.9	61.7	59.7	59.7	56.5	51.8	56.3	57.6	60.2
26.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	59.3	52.1	58.9	60.0	62.0
	10th percentile	62.0	55.9	59.2	60.0	62.0	60.0	53.9	43.9	30.4	41.3	53.8	62.0
	5th percentile	53.3	48.0	50.0	60.0	62.0	60.0	47.0	22.6	0.0	9.8	40.5	40.1
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	52.7	38.0	37.8	60.0	62.0
	mean	52.0	47.9	58.0	59.5	61.1	52.6	40.0	24.7	18.8	22.1	39.2	49.9
52.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	43.6	16.2	7.0	15.3	47.7	62.0
	25th percentile	50.0	42.0	60.0	60.0	62.0	52.6	23.8	0.0	0.0	0.0	20.0	48.5
	10th percentile	17.9	26.0	50.0	58.0	62.0	32.0	0.0	0.0	0.0	0.0	0.0	6.0
	5th percentile	8.0	16.0	34.0	56.0	58.0	23.2	0.0	0.0	0.0	0.0	0.0	0.0

Table 6. Statistics of Pleasant Hill Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	60.0	42.7	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	44.6	20.6	12.0	23.3	50.0	62.0
	mean	42.0	43.8	55.5	58.2	55.6	39.5	25.3	13.0	9.4	12.2	28.9	43.3
78.0	50th percentile	57.0	51.0	62.0	60.0	62.0	45.5	22.0	2.0	0.1	3.0	22.0	56.0
	25th percentile	20.0	34.0	54.0	60.0	56.0	16.6	0.0	0.0	0.0	0.0	12.0	22.0
	10th percentile	7.9	16.0	38.0	56.0	34.6	8.0	0.0	0.0	0.0	0.0	0.0	0.0
	5th percentile	6.0	14.0	28.0	44.0	28.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0
		Pumping rate = 3 Mgal/d											
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	90.9	83.3	90.1	89.9	92.5	89.5	88.7	83.2	75.6	82.9	85.7	90.0
26.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	83.9	75.9	86.9	90.0	93.0
	10th percentile	90.7	81.6	86.2	90.0	93.0	90.0	76.3	62.2	37.2	61.3	77.8	92.6
	5th percentile	79.3	70.0	75.0	90.0	93.0	89.2	64.4	33.6	0.0	12.0	57.0	53.4
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	92.7	78.3	53.0	53.8	90.0	93.0
	mean	77.7	71.6	86.9	89.3	91.5	78.3	59.1	36.2	27.6	32.5	58.2	74.5
52.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	63.7	21.9	10.0	21.8	69.0	93.0
	25th percentile	70.9	63.0	90.0	90.0	93.0	74.4	33.9	0.0	0.0	0.0	30.0	69.9
	10th percentile	25.9	39.0	75.0	87.0	91.9	47.2	0.0	0.0	0.0	0.0	0.0	8.6
	5th percentile	12.0	24.0	51.0	84.0	86.3	32.8	0.0	0.0	0.0	0.0	0.0	0.0
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	92.1	88.5	90.7	90.0	93.0
	mean	78.9	57.6	68.1	78.2	87.0	79.5	67.9	48.7	39.9	52.6	70.9	75.7
78.0	50th percentile	91.8	72.6	84.0	90.0	93.0	90.0	85.7	48.0	24.1	58.6	87.5	93.0
	25th percentile	69.0	33.0	45.0	75.6	93.0	78.4	45.9	6.0	0.0	16.7	59.0	62.5
	10th percentile	50.6	3.0	15.4	50.5	86.1	46.8	12.3	0.0	0.0	0.0	33.2	39.2
	5th percentile	12.0	0.0	0.1	12.0	26.6	26.7	0.0	0.0	0.0	0.0	0.0	4.2

Table 7. Statistics of Senecaville Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.

[ft³/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft³/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	29.9	31.0	30.0	31.0
	mean	28.5	24.5	27.9	27.3	29.3	27.1	25.9	24.0	20.6	20.6	25.5	27.2
2.5	50th percentile	31.0	27.2	30.2	30.0	31.0	30.0	29.3	28.7	25.7	26.7	29.3	31.0
	25th percentile	29.4	21.6	27.0	28.9	29.5	26.9	22.9	17.6	9.0	8.2	24.3	28.1
	10th percentile	25.0	17.6	21.1	21.1	25.9	19.7	14.4	11.1	5.8	1.8	16.0	12.3
	5th percentile	10.6	13.2	19.5	8.6	22.6	10.7	6.0	3.7	1.4	0.3	0.1	4.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	29.0	21.2	23.1	30.0	31.0
	mean	26.3	19.7	22.8	24.0	25.0	20.8	18.6	14.1	10.0	11.5	22.5	24.8
5.0	50th percentile	30.0	23.0	26.0	28.0	28.6	25.0	20.6	12.8	4.6	6.5	25.0	30.0
	25th percentile	25.0	13.1	16.6	20.0	21.6	13.1	6.1	1.0	0.0	0.0	17.0	21.0
	10th percentile	18.1	4.0	7.8	9.0	12.3	1.3	0.2	0.0	0.0	0.0	12.0	4.0
	5th percentile	8.0	1.0	3.7	2.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	95th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	30.7	29.0	31.0	30.0	30.0	26.0	14.0	18.5	29.0	31.0
	mean	24.9	18.4	21.4	22.6	23.8	18.5	15.5	11.6	8.0	9.3	21.5	23.9
7.5	50th percentile	28.0	20.5	25.0	25.9	26.0	20.0	15.0	6.6	0.6	1.8	24.0	29.0
	25th percentile	21.0	10.7	13.2	17.0	20.0	7.5	3.0	0.0	0.0	0.0	16.0	21.0
	10th percentile	15.1	2.3	6.0	8.0	9.0	0.0	0.0	0.0	0.0	0.0	12.0	4.0
	5th percentile	2.0	1.0	0.0	1.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Pumping rate = 2 Mgal/d											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	61.2	51.9	58.0	60.0	62.0
	mean	55.4	45.1	52.1	52.3	55.7	49.7	46.5	40.6	33.2	34.0	48.5	52.6
2.5	50th percentile	62.0	51.6	57.6	58.7	60.1	57.0	52.0	39.3	33.8	37.8	55.4	61.6
	25th percentile	55.1	36.3	45.2	51.7	53.4	41.5	37.1	28.3	13.8	10.3	44.9	54.0
	10th percentile	45.5	23.1	34.4	37.3	43.2	28.6	23.2	12.0	5.8	1.8	24.2	22.7
	5th percentile	16.0	18.6	25.5	16.6	27.9	18.8	6.0	3.7	1.4	0.3	0.1	6.4
	95th percentile	62.0	57.3	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	60.5	56.3	31.0	42.0	58.4	62.0
	mean	51.6	38.4	44.7	46.9	49.1	39.9	34.9	26.3	18.4	21.4	44.2	49.0
5.0	50th percentile	58.4	45.2	51.0	55.3	55.8	46.8	38.4	20.5	7.0	10.6	48.8	59.7
	25th percentile	48.0	24.8	32.6	38.7	41.7	22.0	12.0	1.3	0.0	0.0	34.0	42.0
	10th percentile	31.7	7.0	13.8	18.0	24.1	2.1	0.2	0.0	0.0	0.0	24.0	8.0
	5th percentile	16.0	2.0	3.7	4.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 7. Statistics of Senecaville Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	55.2	60.1	58.0	62.0	58.3	59.2	48.0	26.0	34.0	57.2	62.0
	mean	49.3	36.4	42.3	44.6	47.1	36.2	30.4	22.6	15.5	17.5	42.7	47.4
7.5	50th percentile	54.6	41.0	50.0	50.0	52.0	40.0	28.2	12.2	0.6	3.0	46.3	56.9
	25th percentile	42.0	20.0	26.0	34.0	39.2	14.0	6.0	0.0	0.0	0.0	32.0	41.9
	10th percentile	30.1	4.3	12.0	16.0	18.0	0.0	0.0	0.0	0.0	0.0	20.9	8.0
	5th percentile	4.0	2.0	0.0	2.0	12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Pumping rate = 3 Mgal/d											
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	92.5	88.1	72.2	80.3	89.6	93.0
	mean	81.3	64.4	74.5	75.7	80.3	69.7	64.1	53.7	42.3	44.8	70.6	77.1
2.5	50th percentile	90.5	75.1	80.8	86.0	87.5	78.7	69.5	49.2	37.4	42.8	79.3	90.5
	25th percentile	79.8	48.5	60.2	67.8	74.4	56.8	42.5	30.4	13.8	10.3	63.4	75.0
	10th percentile	58.5	25.1	44.5	49.2	52.4	30.5	26.4	12.0	5.8	1.8	36.2	32.5
	5th percentile	24.0	19.6	25.7	24.6	31.8	18.8	6.0	3.7	1.4	0.3	0.1	6.4
	95th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	83.8	91.7	87.6	93.0	89.4	90.0	80.9	45.0	63.0	87.0	93.0
	mean	76.3	56.7	65.9	69.2	72.7	58.1	50.1	37.6	26.2	30.2	65.6	72.8
5.0	50th percentile	85.0	65.7	75.5	80.5	81.0	66.1	51.3	27.6	7.1	13.6	72.0	87.7
	25th percentile	69.4	36.0	48.1	54.9	61.7	33.0	18.0	1.3	0.0	0.0	48.5	63.0
	10th percentile	46.7	9.0	18.0	24.2	33.3	2.6	0.2	0.0	0.0	0.0	36.0	12.0
	5th percentile	23.5	3.0	3.7	6.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	95th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	81.0	90.0	87.0	93.0	87.0	87.0	72.0	37.7	51.0	84.0	93.0
	mean	73.6	54.0	62.9	66.3	70.3	53.6	45.0	33.4	22.5	25.1	63.3	70.7
7.5	50th percentile	81.0	60.8	73.2	75.0	78.0	60.0	40.0	17.1	0.6	4.5	69.0	84.0
	25th percentile	63.0	30.0	39.0	51.0	56.1	21.0	7.0	0.0	0.0	0.0	48.0	60.0
	10th percentile	45.1	6.3	18.0	24.0	27.0	0.0	0.0	0.0	0.0	0.0	25.4	12.0
	5th percentile	6.0	3.0	0.0	3.0	18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Table 8. Statistics of Wills Creek Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	31.0	28.2	30.9	30.0	31.0	30.0	30.9	31.0	30.0	30.9	29.9	31.0
2.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	10th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	5th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	31.0	28.2	30.9	29.9	31.0	30.0	30.9	31.0	30.0	30.9	29.9	31.0
4.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	10th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	5th percentile	31.0	28.0	31.0	29.6	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	95th percentile	31.0	29.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	75th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	mean	31.0	28.2	30.9	29.9	31.0	30.0	30.9	31.0	30.0	30.9	29.9	31.0
6.0	50th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	25th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	10th percentile	31.0	28.0	31.0	30.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
	5th percentile	31.0	28.0	31.0	29.0	31.0	30.0	31.0	31.0	30.0	31.0	30.0	31.0
		Pumping rate = 2 Mgal/d											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	62.0	56.5	61.9	60.0	62.0	60.0	61.9	62.0	60.0	61.8	59.8	62.0
2.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	10th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	5th percentile	62.0	56.0	62.0	59.9	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	62.0	56.4	61.8	59.9	62.0	60.0	61.9	62.0	60.0	61.8	59.8	62.0
4.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	10th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	5th percentile	62.0	56.0	62.0	58.6	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0

Table 8. Statistics of Wills Creek Lake, Ohio, total monthly potential withdrawals for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Total monthly potential withdrawals, in millions of gallons, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	62.0	58.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	75th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	mean	61.9	56.4	61.8	59.8	62.0	60.0	61.9	62.0	60.0	61.8	59.8	61.9
6.0	50th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	25th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	10th percentile	62.0	56.0	62.0	60.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
	5th percentile	62.0	56.0	62.0	58.0	62.0	60.0	62.0	62.0	60.0	62.0	60.0	62.0
		Pumping rate = 3 Mgal/d											
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	92.9	84.7	92.8	89.9	93.0	90.0	92.8	93.0	90.0	92.8	89.6	93.0
2.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	10th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	5th percentile	93.0	84.0	93.0	88.9	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	92.9	84.7	92.8	89.8	93.0	90.0	92.8	93.0	90.0	92.8	89.6	92.9
4.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	10th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	5th percentile	93.0	84.0	93.0	87.6	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	95th percentile	93.0	87.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	75th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	mean	92.9	84.6	92.8	89.7	93.0	90.0	92.8	92.9	89.9	92.8	89.6	92.9
6.0	50th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	25th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	10th percentile	93.0	84.0	93.0	90.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0
	5th percentile	93.0	84.0	93.0	87.0	93.0	90.0	93.0	93.0	90.0	93.0	90.0	93.0

Table 9. Analytical period statistics of observed daily mean outflows from the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.

[%, percent]

Statistic	Observed daily mean outflow amounts for indicated lakes (in cubic feet per second)					
	Charles Mill	Clendening	Piedmont	Pleasant Hill	Senecaville	Wills Creek
95th percentile	926.7	374.0	384.7	786.9	591.0	3710.0
75th percentile	285.0	109.3	140.1	228.0	186.0	1180.0
mean	233.2	88.2	103.3	201.9	131.4	938.6
50th percentile	111.0	36.1	54.9	103.0	27.0	457.0
25th percentile	42.0	14.4	14.9	49.0	4.2	132.6
10th percentile	21.3	8.0	2.0	34.0	2.7	49.0
5th percentile	15.0	3.3	1.0	28.1	2.2	32.0
Minimum in-stream flow target, in cubic feet per second	13.0	1.5	1.5	26.0	2.5	2.0
Minimum in-stream flow target, in percentage of mean flow	5.6%	1.7%	1.5%	12.9%	1.9%	0.2%

Table 10. Statistics of observed daily mean outflows by month for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.

Statistic	Observed daily mean reservoir outflows, in cubic feet per second, for indicated month and lake											
	Month											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Charles Mill Lake												
95th percentile	1122.0	1118.0	1362.0	1135.8	918.0	796.6	697.8	322.0	261.0	307.0	654.3	936.0
75th percentile	325.0	429.0	662.0	542.7	319.2	236.6	111.1	75.8	62.0	77.5	181.0	385.0
mean	298.4	343.8	479.2	387.6	252.0	195.0	144.0	84.8	65.7	83.2	169.9	301.4
50th percentile	175.0	213.4	334.0	274.9	141.0	85.0	52.2	37.0	34.0	43.0	99.0	181.5
25th percentile	95.0	118.0	182.0	129.0	75.0	39.6	29.8	22.0	19.0	23.9	45.6	112.6
10th percentile	43.0	38.0	84.0	70.2	46.0	23.0	18.0	15.8	13.9	15.0	26.0	58.0
5th percentile	29.6	23.0	58.0	38.0	34.1	12.0	12.5	11.8	12.0	12.0	15.8	36.0
Clendening Lake												
95th percentile	445.8	433.7	499.0	444.7	426.0	296.9	146.5	81.8	140.0	140.0	292.0	452.0
75th percentile	143.8	112.1	158.0	154.0	140.0	68.0	37.0	21.0	20.5	30.6	163.0	223.0
mean	118.0	95.8	126.5	131.6	113.1	65.2	42.0	28.7	36.6	35.0	108.6	158.0
50th percentile	67.8	31.0	60.0	78.2	64.0	33.0	17.0	12.0	10.7	14.3	94.0	131.0
25th percentile	30.8	18.6	20.0	48.3	32.0	13.6	8.0	8.0	6.8	8.0	18.0	44.5
10th percentile	18.0	14.0	12.8	21.0	17.0	8.0	6.6	3.0	1.0	1.0	7.8	18.1
5th percentile	14.3	12.0	5.6	18.0	13.0	5.7	2.0	1.0	1.0	1.0	3.0	14.0

Table 10. Statistics of observed daily mean outflows by month for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.—Continued

Statistic	Observed daily mean reservoir outflows, in cubic feet per second, for indicated month and lake											
	Month											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
						Piedmont Lake						
95th percentile	436.1	381.0	508.0	447.0	407.6	369.0	249.2	151.9	210.0	161.7	317.3	513.0
75th percentile	187.0	141.0	188.0	195.6	185.7	77.0	66.2	49.0	45.9	49.0	227.7	257.9
mean	129.2	93.8	130.7	148.6	132.1	86.7	63.7	41.2	47.9	44.7	138.0	183.5
50th percentile	68.3	31.0	65.0	92.0	70.4	55.9	42.7	23.0	19.0	20.0	139.0	164.0
25th percentile	34.0	2.0	2.0	60.0	53.2	26.7	15.0	7.0	2.0	6.0	35.8	57.0
10th percentile	11.0	1.0	1.0	13.0	29.0	7.0	3.0	2.0	2.0	2.0	10.0	19.6
5th percentile	2.0	1.0	1.0	1.7	21.0	4.0	2.0	2.0	1.0	1.0	2.5	11.0
						Pleasant Hill Lake						
95th percentile	950.0	925.0	1076.3	918.5	856.8	794.0	440.2	203.0	150.0	196.0	442.4	769.0
75th percentile	319.0	426.8	548.0	476.0	310.2	190.1	117.9	71.0	60.0	66.0	145.0	264.0
mean	265.1	290.0	380.1	354.7	270.0	193.6	125.8	74.2	62.2	65.0	126.7	220.5
50th percentile	132.0	163.0	255.0	250.3	177.9	106.0	67.0	46.0	40.0	42.0	75.0	136.0
25th percentile	63.1	85.0	137.0	164.0	110.0	67.4	45.0	35.0	32.0	34.0	43.3	66.5
10th percentile	43.0	40.0	77.8	117.0	78.4	49.0	34.0	28.0	26.0	28.0	32.0	37.1
5th percentile	36.0	34.0	41.0	93.7	65.2	40.0	28.6	26.0	21.0	24.0	28.0	32.0
						Senecaville Lake						
95th percentile	615.0	683.7	691.4	672.5	665.0	572.5	315.0	250.0	282.0	278.0	508.4	636.0
75th percentile	270.4	325.0	308.1	330.0	245.0	108.0	50.0	24.0	9.5	11.0	267.1	310.0
mean	179.8	188.2	193.8	200.3	164.7	109.8	60.1	41.8	39.2	42.8	162.9	197.6
50th percentile	88.4	81.7	110.0	113.0	78.0	30.0	8.2	5.2	4.3	4.3	102.2	125.0
25th percentile	14.1	4.3	5.4	8.4	10.7	4.8	4.0	3.4	2.9	2.8	5.7	11.0
10th percentile	3.8	2.9	3.4	3.6	4.0	3.3	2.7	2.6	2.2	2.0	2.1	2.8
5th percentile	2.6	2.6	2.6	2.4	3.4	2.8	2.2	2.2	1.9	1.7	1.6	2.0
						Wills Creek Lake						
95th percentile	5105.2	4410.0	5340.0	4797.1	3760.0	3540.0	1740.0	1050.0	1330.0	1080.0	1700.0	3170.0
75th percentile	1718.2	2340.0	2663.7	2328.1	1529.1	911.5	450.0	255.0	163.6	193.0	672.2	1312.5
mean	1297.7	1565.4	1912.4	1712.1	1205.5	810.1	452.7	292.2	287.9	245.3	522.8	998.4
50th percentile	753.1	1050.0	1310.0	1210.0	753.0	354.9	209.0	104.5	62.0	84.0	346.0	650.5
25th percentile	328.7	530.9	767.2	669.9	395.0	171.4	96.7	54.0	34.9	42.0	124.0	299.0
10th percentile	161.0	256.0	449.2	428.0	247.0	99.0	52.0	30.0	21.0	26.0	54.0	126.0
5th percentile	87.0	168.0	329.0	330.2	194.0	72.5	39.0	22.0	17.0	18.2	41.0	70.0

Aggregate analytical-period order statistics and means of computed daily mean flow-by amounts are shown in table 11 for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes for the various combinations of pumping rates and target minimum flow-by amounts. The data show that increases in the target minimum flow-by amounts for a given pumping rate typically resulted in some small increases in the magnitudes of the means and 25th percentile and smaller order statistics, but had no effect on the magnitudes of the higher percentile statistics. Also, increases in the pumping rate for a given target minimum flow-by amount resulted in decreases in magnitudes of higher-percentile flow statistics by an amount equal to the flow equivalent of the increase in pumping rate; however, some lower-percentile flow statistics remained unchanged because they represent days during which there was no surplus water (and so withdrawals could not be increased on those days in spite of increases in pumping rate).

Monthly order statistics and means of computed daily mean flow-by amounts are shown in tables 12–17 for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes, respectively, for the various combinations of pumping rates and target minimum flow-by amounts. Similar to the observed outflows, computed mean flow-by amounts generally tended to be lowest during June–October. The data in tables 12–17 show that increases in the target minimum flow-by amounts for a given pumping rate resulted in some small increases in the magnitudes of the mean and 50th percentile and lower order statistics, but had no effect on the magnitudes of the higher percentile statistics. As was observed with the aggregate analytical-period order statistics, increases in the pumping rate for a given target minimum flow-by amount resulted in decreases in magnitudes of higher-percentile flow statistics by an amount equal to the flow equivalent of the increase in pumping rate; however, some lower percentile statistics remained unchanged.

Table 18 shows the computed aggregate analytical-period flow-by statistics from table 9 reported as a percentage of the corresponding observed outflow statistics from table 11. The cells of table 18 have been color-coded according to a gradient, where the maximum value in the table (100 percent) is colored dark green and the minimum value (42.0 percent) is colored red. Values that lie between these two extremes are graded in color from light green to dark orange as a function of their magnitude. The objective of coloring the table cells is to make it easier to visualize the conditions and flow percentiles that deviate most from the corresponding observed outflow statistics. Clearly, with the exception of some of the lower percentiles (10 percent and smaller), the flow-by amounts for most of the lakes tend to represent an increasingly smaller proportion of the observed outflows as pumping rates are increased. Increasing the target minimum flow-by amount mitigates the effect of increased pumping for some order statistics. The reason that some low-percentile flow-by amounts were unchanged from observed outflows after increases in pump capacities and target minimum flow-by amounts is that the observed outflows were already less than or equal to the smallest flow-by amount considered, so no additional water was available for pumping and (or) to be reserved as flow-by. Once again, Wills Creek Lake stands out as being different from the other lakes in that respect because observed outflows were almost always larger than target minimum flow-by amounts.

Tables 19–24 show the computed monthly flow-by statistics from tables 12–17 reported as percentages of the corresponding observed outflow statistics from table 10. Similar to table 18, the cells in these tables have been colored-coded according to a gradient, where the maximum value in each table is colored dark green and the minimum value is colored red. As was observed with the aggregate analytical-period results (table 18), with the exception of some of the lower percentiles, the monthly flow-by amounts tend to represent an increasingly smaller proportion of the observed outflows as pumping rates are increased. Clearly, for some order statistics, flow-by amounts tend to represent proportionally smaller amounts of the observed outflows in certain months (for example, July–October) than in others. Increasing flow-by amounts mitigate some of these reductions in flow; however, that mitigation comes at the expense of smaller potential withdrawals.

Mass-curve data are reported for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in appendix 1 (table 1–2). Figure 3 shows an example plot of the surplus-water mass curves for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes based on current target minimum outflows. The mass curve for Charles Mill, Clendening, and Piedmont Lakes are based on 51 years of data whereas the mass curves for Pleasant Hill, Senecaville, and Wills Creek Lakes are each based on 74 years of data. The slope of a line that connects the first and last point on a mass curve for a given lake in figure 3 represents the average daily surplus-water volume for that lake. It is evident from figure 3 that the Wills Creek Lake has an average daily surplus-water volume that is considerably larger than that of the other lakes (in part because the drainage area of the Wills Creek Lake is approximately 4 to 12 times larger than that of the other lakes). Clendening Lake has the smallest average daily surplus-water volume, which is consistent with the fact that it also has the smallest contributing drainage area of the six lakes.

Table 11. Statistics of daily mean flow-by amounts for indicated pumping rates and target minimum flow-by multiples for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.

[Mgal/d, million gallons per day; minimum in-stream flow targets equal 1.5 cubic feet per second (ft^3/s) for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake]

Statistic	Daily mean flow-by amounts, in ft^3/s, for indicated lakes, pumping rates, and target minimum flow-by multiples								
	Pumping rate, in Mgal/d								
	1			2			3		
	Target minimum flow-by multiple								
	1	2	3	1	2	3	1	2	3
Charles Mill Lake									
95th percentile	925.2	925.2	925.2	923.6	923.6	923.6	922.1	922.1	922.1
75th percentile	283.5	283.5	283.5	281.9	281.9	281.9	280.4	280.4	280.4
mean	231.7	231.9	232.0	230.3	230.6	230.9	228.8	229.3	229.7
50th percentile	109.5	109.5	109.5	107.9	107.9	107.9	106.4	106.4	106.4
25th percentile	40.5	40.5	40.5	38.9	38.9	39.0	37.4	37.4	39.0
10th percentile	19.8	21.3	21.3	18.2	21.3	21.3	16.7	21.3	21.3
5th percentile	13.5	15.0	15.0	13.0	15.0	15.0	13.0	15.0	15.0
Clendening Lake									
95th percentile	372.5	372.5	372.5	370.9	370.9	370.9	369.4	369.4	369.4
75th percentile	107.8	107.8	107.8	106.2	106.2	106.2	104.7	104.7	104.7
mean	86.7	86.7	86.7	85.2	85.3	85.3	83.8	83.8	84.0
50th percentile	34.6	34.6	34.6	33.0	33.0	33.0	31.5	31.5	31.5
25th percentile	12.9	12.9	12.9	11.3	11.3	11.3	9.8	9.8	9.8
10th percentile	6.5	6.5	6.5	4.9	4.9	4.9	3.4	3.4	4.5
5th percentile	1.8	3.0	3.3	1.5	3.0	3.3	1.5	3.0	3.3
Piedmont Lake									
95th percentile	383.1	383.1	383.1	381.6	381.6	381.6	380.0	380.0	380.0
75th percentile	138.5	138.5	138.5	137.0	137.0	137.0	135.4	135.4	135.4
mean	101.9	102.0	102.0	100.6	100.7	100.7	99.3	99.4	99.5
50th percentile	53.4	53.4	53.4	51.8	51.8	51.8	50.3	50.3	50.3
25th percentile	13.3	13.3	13.3	11.8	11.8	11.8	10.2	10.2	10.2
10th percentile	1.5	2.0	2.0	1.5	2.0	2.0	1.5	2.0	2.0
5th percentile	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Table 11. Statistics of daily mean flow-by amounts for indicated pumping rates and target minimum flow-by multiples for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.—Continued

[Mgal/d, million gallons per day; minimum in-stream flow targets equal 1.5 cubic feet per second (ft^3/s) for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake]

Statistic	Daily mean flow-by amounts, in ft^3/s, for indicated lakes, pumping rates, and target minimum flow-by multiples								
	Pumping rate, in Mgal/d								
	1			2			3		
	Target minimum flow-by multiple								
	1	2	3	1	2	3	1	2	3
Pleasant Hill Lake									
95th percentile	785.4	785.4	785.4	783.8	783.8	783.8	782.3	782.3	782.3
75th percentile	226.5	226.5	226.5	224.9	224.9	224.9	223.4	223.4	223.4
mean	200.4	200.8	201.0	198.9	199.7	200.1	197.5	198.6	199.2
50th percentile	101.5	101.5	101.5	99.9	99.9	99.9	98.4	98.4	98.4
25th percentile	47.5	49.0	49.0	45.9	49.0	49.0	44.4	49.0	49.0
10th percentile	32.5	34.0	34.0	30.9	34.0	34.0	29.4	34.0	34.0
5th percentile	26.6	28.1	28.1	26.0	28.1	28.1	26.0	28.1	28.1
Senecaville Lake									
95th percentile	589.5	589.5	589.5	587.9	587.9	587.9	586.4	586.4	586.4
75th percentile	184.5	184.5	184.5	182.9	182.9	182.9	181.4	181.4	181.4
mean	130.1	130.3	130.4	129.0	129.4	129.5	128.0	128.5	128.6
50th percentile	25.5	25.5	25.5	23.9	23.9	23.9	22.4	22.4	22.4
25th percentile	2.7	4.2	4.2	2.5	4.2	4.2	2.5	4.2	4.2
10th percentile	2.5	2.7	2.7	2.5	2.7	2.7	2.5	2.7	2.7
5th percentile	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
Wills Creek Lake									
95th percentile	3708.5	3708.5	3708.5	3706.9	3706.9	3706.9	3705.4	3705.4	3705.4
75th percentile	1178.5	1178.5	1178.5	1176.9	1176.9	1176.9	1175.4	1175.4	1175.4
mean	937.0	937.0	937.0	935.5	935.5	935.5	933.9	933.9	933.9
50th percentile	455.5	455.5	455.5	453.9	453.9	453.9	452.4	452.4	452.4
25th percentile	131.1	131.1	131.1	129.5	129.5	129.5	128.0	128.0	128.0
10th percentile	47.5	47.5	47.5	45.9	45.9	45.9	44.4	44.4	44.4
5th percentile	30.5	30.5	30.5	28.9	28.9	28.9	27.4	27.4	27.4

Table 12. Statistics of Charles Mill Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.

[ft³/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by, in ft³/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	1120.5	1116.5	1360.5	1134.3	916.4	795.0	696.3	320.5	259.5	305.5	652.7	934.5
	75th percentile	323.5	427.5	660.5	541.2	317.7	235.0	109.6	74.3	60.5	76.0	179.5	383.5
	mean	296.8	342.3	477.7	386.1	250.5	193.6	142.5	83.4	64.3	81.8	168.4	299.9
13.0	50th percentile	173.5	211.9	332.4	273.3	139.5	83.5	50.7	35.5	32.5	41.5	97.5	179.9
	25th percentile	93.5	116.5	180.5	127.5	73.5	38.1	28.3	20.5	17.5	22.4	44.1	111.1
	10th percentile	41.5	36.5	82.5	68.6	44.5	21.5	16.5	14.2	13.0	13.5	24.5	56.5
	5th percentile	28.1	21.5	56.5	36.5	32.6	12.0	12.5	11.8	12.0	12.0	14.3	34.5
	95th percentile	1120.5	1116.5	1360.5	1134.3	916.4	795.0	696.3	320.5	259.5	305.5	652.7	934.5
	75th percentile	323.5	427.5	660.5	541.2	317.7	235.0	109.6	74.3	60.5	76.0	179.5	383.5
	mean	296.9	342.4	477.7	386.1	250.5	193.7	142.8	83.8	64.7	82.1	168.5	299.9
26.0	50th percentile	173.5	211.9	332.4	273.3	139.5	83.5	50.7	35.5	32.5	41.5	97.5	179.9
	25th percentile	93.5	116.5	180.5	127.5	73.5	38.1	28.3	22.0	19.0	23.9	44.1	111.1
	10th percentile	41.5	36.5	82.5	68.6	44.5	23.0	18.0	15.8	13.9	15.0	26.0	56.5
	5th percentile	28.1	23.0	56.5	36.5	32.6	12.0	12.5	11.8	12.0	12.0	15.8	34.5
	95th percentile	1120.5	1116.5	1360.5	1134.3	916.4	795.0	696.3	320.5	259.5	305.5	652.7	934.5
	75th percentile	323.5	427.5	660.5	541.2	317.7	235.0	109.6	74.3	60.5	76.0	179.5	383.5
	mean	297.0	342.4	477.7	386.2	250.6	193.9	143.0	84.1	65.0	82.4	168.7	299.9
39.0	50th percentile	173.5	211.9	332.4	273.3	139.5	83.5	50.7	37.0	34.0	41.5	97.5	179.9
	25th percentile	93.5	116.5	180.5	127.5	73.5	39.0	29.8	22.0	19.0	23.9	44.1	111.1
	10th percentile	41.5	38.0	82.5	68.6	44.5	23.0	18.0	15.8	13.9	15.0	26.0	56.5
	5th percentile	29.6	23.0	56.5	38.0	34.1	12.0	12.5	11.8	12.0	12.0	15.8	36.0
		Pumping rate = 2 Mgal/d											
	95th percentile	1118.9	1114.9	1358.9	1132.7	914.9	793.5	694.7	318.9	257.9	303.9	651.2	932.9
	75th percentile	321.9	425.9	658.9	539.6	316.1	233.5	108.0	72.7	58.9	74.4	177.9	381.9
	mean	295.3	340.7	476.2	384.6	249.0	192.1	141.1	82.0	62.9	80.4	166.9	298.3
13.0	50th percentile	171.9	210.3	330.9	271.8	137.9	81.9	49.1	33.9	30.9	39.9	95.9	178.4
	25th percentile	91.9	114.9	178.9	125.9	71.9	36.5	26.7	18.9	15.9	20.8	42.5	109.5
	10th percentile	39.9	34.9	80.9	67.1	42.9	19.9	14.9	13.0	13.0	13.0	22.9	54.9
	5th percentile	26.5	19.9	54.9	34.9	31.0	12.0	12.5	11.8	12.0	12.0	13.0	32.9
	95th percentile	1118.9	1114.9	1358.9	1132.7	914.9	793.5	694.7	318.9	257.9	303.9	651.2	932.9
	75th percentile	321.9	425.9	658.9	539.6	316.1	233.5	108.0	72.7	58.9	74.4	177.9	381.9
	mean	295.4	340.9	476.2	384.7	249.1	192.4	141.6	82.8	63.8	81.1	167.2	298.4
26.0	50th percentile	171.9	210.3	330.9	271.8	137.9	81.9	49.1	33.9	30.9	39.9	95.9	178.4
	25th percentile	91.9	114.9	178.9	125.9	71.9	36.5	26.7	22.0	19.0	23.9	42.5	109.5
	10th percentile	39.9	34.9	80.9	67.1	42.9	23.0	18.0	15.8	13.9	15.0	26.0	54.9
	5th percentile	26.5	23.0	54.9	34.9	31.0	12.0	12.5	11.8	12.0	12.0	15.8	32.9

Table 12. Statistics of Charles Mill Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft³/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by, in ft³/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Pumping rate = 2 Mgal/d–Continued													
	95th percentile	1118.9	1114.9	1358.9	1132.7	914.9	793.5	694.7	318.9	257.9	303.9	651.2	932.9
	75th percentile	321.9	425.9	658.9	539.6	316.1	233.5	108.0	72.7	58.9	74.4	177.9	381.9
	mean	295.6	341.0	476.2	384.7	249.2	192.7	142.0	83.4	64.4	81.6	167.5	298.5
39.0	50th percentile	171.9	210.3	330.9	271.8	137.9	81.9	49.1	37.0	34.0	39.9	95.9	178.4
	25th percentile	91.9	114.9	178.9	125.9	71.9	39.0	29.8	22.0	19.0	23.9	42.5	109.5
	10th percentile	39.9	38.0	80.9	67.1	42.9	23.0	18.0	15.8	13.9	15.0	26.0	54.9
	5th percentile	29.6	23.0	54.9	38.0	34.1	12.0	12.5	11.8	12.0	12.0	15.8	36.0
Pumping rate = 3 Mgal/d													
	95th percentile	1117.4	1113.4	1357.4	1131.2	913.4	791.9	693.2	317.4	256.4	302.4	649.7	931.4
	75th percentile	320.4	424.4	657.4	538.1	314.6	231.9	106.5	71.2	57.4	72.9	176.4	380.4
	mean	293.8	339.2	474.6	383.1	247.5	190.7	139.7	80.6	61.7	79.0	165.5	296.8
13.0	50th percentile	170.4	208.8	329.3	270.3	136.4	80.4	47.6	32.4	29.4	38.4	94.4	176.9
	25th percentile	90.4	113.4	177.4	124.4	70.4	35.0	25.2	17.4	14.4	19.3	41.0	108.0
	10th percentile	38.4	33.4	79.4	65.5	41.4	18.4	13.4	13.0	13.0	13.0	21.4	53.4
	5th percentile	25.0	18.4	53.4	33.4	29.5	12.0	12.5	11.8	12.0	12.0	13.0	31.4
	95th percentile	1117.4	1113.4	1357.4	1131.2	913.4	791.9	693.2	317.4	256.4	302.4	649.7	931.4
	75th percentile	320.4	424.4	657.4	538.1	314.6	231.9	106.5	71.2	57.4	72.9	176.4	380.4
	mean	294.0	339.5	474.7	383.2	247.6	191.1	140.4	81.8	62.9	80.0	165.8	296.9
26.0	50th percentile	170.4	208.8	329.3	270.3	136.4	80.4	47.6	32.4	29.4	38.4	94.4	176.9
	25th percentile	90.4	113.4	177.4	124.4	70.4	35.0	26.0	22.0	19.0	23.9	41.0	108.0
	10th percentile	38.4	33.4	79.4	65.5	41.4	23.0	18.0	15.8	13.9	15.0	26.0	53.4
	5th percentile	26.0	23.0	53.4	33.4	29.5	12.0	12.5	11.8	12.0	12.0	15.8	31.4
	95th percentile	1117.4	1113.4	1357.4	1131.2	913.4	791.9	693.2	317.4	256.4	302.4	649.7	931.4
	75th percentile	320.4	424.4	657.4	538.1	314.6	231.9	106.5	71.2	57.4	72.9	176.4	380.4
	mean	294.2	339.7	474.8	383.2	247.8	191.6	141.1	82.8	63.8	80.8	166.3	297.1
39.0	50th percentile	170.4	208.8	329.3	270.3	136.4	80.4	47.6	37.0	34.0	39.0	94.4	176.9
	25th percentile	90.4	113.4	177.4	124.4	70.4	39.0	29.8	22.0	19.0	23.9	41.0	108.0
	10th percentile	39.0	38.0	79.4	65.5	41.4	23.0	18.0	15.8	13.9	15.0	26.0	53.4
	5th percentile	29.6	23.0	53.4	38.0	34.1	12.0	12.5	11.8	12.0	12.0	15.8	36.0

Table 13. Statistics of Clendening Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by, in ft^3/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	444.3	432.2	497.5	443.2	424.5	295.4	145.0	80.3	138.5	138.5	290.5	450.5
	75th percentile	142.3	110.6	156.5	152.5	138.5	66.5	35.5	19.5	19.0	29.1	161.5	221.5
	mean	116.4	94.3	124.9	130.1	111.6	63.7	40.5	27.3	35.2	33.6	107.1	156.4
1.5	50th percentile	66.3	29.5	58.5	76.7	62.5	31.5	15.5	10.5	9.1	12.8	92.5	129.5
	25th percentile	29.3	17.1	18.5	46.8	30.5	12.0	6.5	6.5	5.3	6.5	16.5	42.9
	10th percentile	16.5	12.5	11.3	19.5	15.5	6.5	5.1	1.5	1.0	1.0	6.3	16.5
	5th percentile	12.8	10.5	4.1	16.5	11.5	4.2	1.5	1.0	1.0	1.0	1.5	12.5
	95th percentile	444.3	432.2	497.5	443.2	424.5	295.4	145.0	80.3	138.5	138.5	290.5	450.5
	75th percentile	142.3	110.6	156.5	152.5	138.5	66.5	35.5	19.5	19.0	29.1	161.5	221.5
	mean	116.4	94.3	125.0	130.1	111.6	63.7	40.6	27.4	35.3	33.7	107.2	156.4
3.0	50th percentile	66.3	29.5	58.5	76.7	62.5	31.5	15.5	10.5	9.1	12.8	92.5	129.5
	25th percentile	29.3	17.1	18.5	46.8	30.5	12.0	6.5	6.5	5.3	6.5	16.5	42.9
	10th percentile	16.5	12.5	11.3	19.5	15.5	6.5	5.1	3.0	1.0	1.0	6.3	16.5
	5th percentile	12.8	10.5	4.1	16.5	11.5	4.2	2.0	1.0	1.0	1.0	3.0	12.5
	95th percentile	444.3	432.2	497.5	443.2	424.5	295.4	145.0	80.3	138.5	138.5	290.5	450.5
	75th percentile	142.3	110.6	156.5	152.5	138.5	66.5	35.5	19.5	19.0	29.1	161.5	221.5
	mean	116.4	94.3	125.0	130.1	111.6	63.7	40.6	27.4	35.4	33.7	107.2	156.4
4.5	50th percentile	66.3	29.5	58.5	76.7	62.5	31.5	15.5	10.5	9.1	12.8	92.5	129.5
	25th percentile	29.3	17.1	18.5	46.8	30.5	12.0	6.5	6.5	5.3	6.5	16.5	42.9
	10th percentile	16.5	12.5	11.3	19.5	15.5	6.5	5.1	3.0	1.0	1.0	6.3	16.5
	5th percentile	12.8	10.5	4.5	16.5	11.5	4.5	2.0	1.0	1.0	1.0	3.0	12.5
		Pumping rate = 2 Mgal/d											
	95th percentile	442.7	430.6	495.9	441.6	422.9	293.8	143.4	78.7	136.9	136.9	288.9	448.9
	75th percentile	140.7	109.0	154.9	150.9	136.9	64.9	33.9	17.9	17.4	27.5	159.9	219.9
	mean	114.9	92.8	123.4	128.6	110.0	62.2	39.1	26.0	33.9	32.3	105.7	154.9
1.5	50th percentile	64.7	27.9	56.9	75.1	60.9	29.9	13.9	8.9	7.6	11.2	90.9	127.9
	25th percentile	27.7	15.5	16.9	45.2	28.9	10.5	4.9	4.9	3.7	4.9	14.9	41.4
	10th percentile	14.9	10.9	9.7	17.9	13.9	4.9	3.5	1.5	1.0	1.0	4.7	15.0
	5th percentile	11.2	8.9	2.5	14.9	9.9	2.6	1.5	1.0	1.0	1.0	1.5	10.9
	95th percentile	442.7	430.6	495.9	441.6	422.9	293.8	143.4	78.7	136.9	136.9	288.9	448.9
	75th percentile	140.7	109.0	154.9	150.9	136.9	64.9	33.9	17.9	17.4	27.5	159.9	219.9
	mean	114.9	92.8	123.5	128.6	110.0	62.2	39.2	26.1	34.1	32.4	105.7	154.9
3.0	50th percentile	64.7	27.9	56.9	75.1	60.9	29.9	13.9	8.9	7.6	11.2	90.9	127.9
	25th percentile	27.7	15.5	16.9	45.2	28.9	10.5	4.9	4.9	3.7	4.9	14.9	41.4
	10th percentile	14.9	10.9	9.7	17.9	13.9	4.9	3.5	3.0	1.0	1.0	4.7	15.0
	5th percentile	11.2	8.9	3.0	14.9	9.9	3.0	2.0	1.0	1.0	1.0	3.0	10.9

Table 13. Statistics of Clendening Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft³/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by, in ft³/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	442.7	430.6	495.9	441.6	422.9	293.8	143.4	78.7	136.9	136.9	288.9	448.9
	75th percentile	140.7	109.0	154.9	150.9	136.9	64.9	33.9	17.9	17.4	27.5	159.9	219.9
	mean	114.9	92.8	123.5	128.6	110.0	62.2	39.2	26.2	34.2	32.4	105.8	154.9
4.5	50th percentile	64.7	27.9	56.9	75.1	60.9	29.9	13.9	8.9	7.6	11.2	90.9	127.9
	25th percentile	27.7	15.5	16.9	45.2	28.9	10.5	4.9	4.9	4.5	4.9	14.9	41.4
	10th percentile	14.9	10.9	9.7	17.9	13.9	4.9	4.5	3.0	1.0	1.0	4.7	15.0
	5th percentile	11.2	8.9	4.5	14.9	9.9	4.5	2.0	1.0	1.0	1.0	3.0	10.9
		Pumping rate = 3 Mgal/d											
	95th percentile	441.2	429.1	494.4	440.1	421.4	292.3	141.9	77.2	135.4	135.4	287.4	447.4
	75th percentile	139.2	107.5	153.4	149.4	135.4	63.4	32.4	16.4	15.9	26.0	158.4	218.4
	mean	113.3	91.2	122.0	127.0	108.5	60.7	37.7	24.7	32.7	31.0	104.2	153.3
1.5	50th percentile	63.2	26.4	55.4	73.6	59.4	28.4	12.4	7.4	6.0	9.7	89.4	126.4
	25th percentile	26.2	14.0	15.4	43.7	27.4	9.0	3.4	3.4	2.2	3.4	13.4	39.8
	10th percentile	13.4	9.4	8.2	16.4	12.4	3.4	2.0	1.5	1.0	1.0	3.2	13.4
	5th percentile	9.7	7.4	1.5	13.4	8.4	1.5	1.5	1.0	1.0	1.0	1.5	9.4
	95th percentile	441.2	429.1	494.4	440.1	421.4	292.3	141.9	77.2	135.4	135.4	287.4	447.4
	75th percentile	139.2	107.5	153.4	149.4	135.4	63.4	32.4	16.4	15.9	26.0	158.4	218.4
	mean	113.3	91.3	122.0	127.0	108.5	60.8	37.8	24.8	32.9	31.1	104.3	153.3
3.0	50th percentile	63.2	26.4	55.4	73.6	59.4	28.4	12.4	7.4	6.0	9.7	89.4	126.4
	25th percentile	26.2	14.0	15.4	43.7	27.4	9.0	3.4	3.4	3.0	3.4	13.4	39.8
	10th percentile	13.4	9.4	8.2	16.4	12.4	3.4	3.0	3.0	1.0	1.0	3.2	13.4
	5th percentile	9.7	7.4	3.0	13.4	8.4	3.0	2.0	1.0	1.0	1.0	3.0	9.4
	95th percentile	441.2	429.1	494.4	440.1	421.4	292.3	141.9	77.2	135.4	135.4	287.4	447.4
	75th percentile	139.2	107.5	153.4	149.4	135.4	63.4	32.4	16.4	15.9	26.0	158.4	218.4
	mean	113.3	91.3	122.1	127.0	108.5	60.9	38.0	25.2	33.3	31.4	104.4	153.4
4.5	50th percentile	63.2	26.4	55.4	73.6	59.4	28.4	12.4	7.4	6.0	9.7	89.4	126.4
	25th percentile	26.2	14.0	15.4	43.7	27.4	9.0	4.5	4.5	4.5	4.5	13.4	39.8
	10th percentile	13.4	9.4	8.2	16.4	12.4	4.5	4.5	3.0	1.0	1.0	4.5	13.4
	5th percentile	9.7	7.4	4.5	13.4	8.4	4.5	2.0	1.0	1.0	1.0	3.0	9.4

Table 14. Statistics of Piedmont Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by, in ft^3/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	434.6	379.5	506.5	445.5	406.1	367.5	247.6	150.3	208.5	160.2	315.7	511.5
	75th percentile	185.5	139.5	186.5	194.0	184.1	75.5	64.7	47.4	44.3	47.5	226.2	256.3
	mean	127.7	92.7	129.5	147.1	130.6	85.2	62.3	39.8	46.7	43.4	136.5	182.0
1.5	50th percentile	66.8	29.5	63.5	90.5	68.9	54.3	41.1	21.5	17.5	18.5	137.5	162.5
	25th percentile	32.5	1.5	1.5	58.4	51.6	25.2	13.5	5.5	1.5	4.5	34.3	55.5
	10th percentile	9.5	1.0	1.0	11.5	27.5	5.5	1.5	1.5	1.5	1.5	8.5	18.1
	5th percentile	1.5	1.0	1.0	1.5	19.5	2.5	1.5	1.5	1.0	1.0	1.5	9.5
	95th percentile	434.6	379.5	506.5	445.5	406.1	367.5	247.6	150.3	208.5	160.2	315.7	511.5
	75th percentile	185.5	139.5	186.5	194.0	184.1	75.5	64.7	47.4	44.3	47.5	226.2	256.3
	mean	127.7	92.7	129.6	147.1	130.6	85.3	62.4	39.9	46.8	43.5	136.6	182.0
3.0	50th percentile	66.8	29.5	63.5	90.5	68.9	54.3	41.1	21.5	17.5	18.5	137.5	162.5
	25th percentile	32.5	2.0	2.0	58.4	51.6	25.2	13.5	5.5	2.0	4.5	34.3	55.5
	10th percentile	9.5	1.0	1.0	11.5	27.5	5.5	3.0	2.0	2.0	2.0	8.5	18.1
	5th percentile	2.0	1.0	1.0	1.7	19.5	3.0	2.0	2.0	1.0	1.0	2.5	9.5
	95th percentile	434.6	379.5	506.5	445.5	406.1	367.5	247.7	150.4	208.5	160.2	315.8	511.5
	75th percentile	185.5	139.5	186.5	194.0	184.2	75.5	64.7	47.4	44.4	47.5	226.2	256.3
	mean	127.7	92.7	129.6	147.1	130.6	85.3	62.4	39.9	46.9	43.5	136.6	182.0
4.5	50th percentile	66.8	29.5	63.5	90.5	68.9	54.3	41.1	21.5	17.5	18.5	137.5	162.5
	25th percentile	32.5	2.0	2.0	58.4	51.6	25.2	13.5	5.5	2.0	4.5	34.3	55.5
	10th percentile	9.5	1.0	1.0	11.5	27.5	5.5	3.0	2.0	2.0	2.0	8.5	18.1
	5th percentile	2.0	1.0	1.0	1.7	19.5	4.0	2.0	2.0	1.0	1.0	2.5	9.5
		Pumping rate = 2 Mgal/d											
	95th percentile	433.0	377.9	504.9	443.9	404.5	365.9	246.1	148.8	206.9	158.6	314.2	509.9
	75th percentile	183.9	137.9	184.9	192.5	182.6	73.9	63.1	45.9	42.8	45.9	224.6	254.8
	mean	126.3	91.6	128.4	145.7	129.0	83.7	60.9	38.5	45.6	42.1	135.1	180.5
1.5	50th percentile	65.2	27.9	61.9	88.9	67.3	52.8	39.6	19.9	15.9	16.9	135.9	160.9
	25th percentile	30.9	1.5	1.5	56.9	50.1	23.6	11.9	3.9	1.5	2.9	32.7	53.9
	10th percentile	7.9	1.0	1.0	9.9	25.9	3.9	1.5	1.5	1.5	1.5	6.9	16.5
	5th percentile	1.5	1.0	1.0	1.5	17.9	1.5	1.5	1.5	1.0	1.0	1.5	7.9
	95th percentile	433.0	377.9	504.9	443.9	404.5	365.9	246.1	148.8	206.9	158.6	314.2	509.9
	75th percentile	183.9	137.9	184.9	192.5	182.6	73.9	63.1	45.9	42.8	45.9	224.6	254.8
	mean	126.3	91.7	128.5	145.7	129.0	83.8	61.0	38.6	45.8	42.3	135.2	180.5
3.0	50th percentile	65.2	27.9	61.9	88.9	67.3	52.8	39.6	19.9	15.9	16.9	135.9	160.9
	25th percentile	30.9	2.0	2.0	56.9	50.1	23.6	11.9	3.9	2.0	3.0	32.7	53.9
	10th percentile	7.9	1.0	1.0	9.9	25.9	3.9	3.0	2.0	2.0	2.0	6.9	16.5
	5th percentile	2.0	1.0	1.0	1.7	17.9	3.0	2.0	2.0	1.0	1.0	2.5	7.9

Table 14. Statistics of Piedmont Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by, in ft^3/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	433.0	377.9	504.9	443.9	404.5	365.9	246.1	148.8	206.9	158.6	314.2	509.9
	75th percentile	183.9	137.9	184.9	192.5	182.6	73.9	63.1	45.9	42.8	45.9	224.6	254.8
	mean	126.3	91.7	128.5	145.7	129.0	83.9	61.1	38.8	45.8	42.4	135.2	180.5
4.5	50th percentile	65.2	27.9	61.9	88.9	67.3	52.8	39.6	19.9	15.9	16.9	135.9	160.9
	25th percentile	30.9	2.0	2.0	56.9	50.1	23.6	11.9	4.5	2.0	4.5	32.7	53.9
	10th percentile	7.9	1.0	1.0	9.9	25.9	4.5	3.0	2.0	2.0	2.0	6.9	16.5
	5th percentile	2.0	1.0	1.0	1.7	17.9	4.0	2.0	2.0	1.0	1.0	2.5	7.9
		Pumping rate = 3 Mgal/d											
	95th percentile	431.5	376.4	503.4	442.4	403.0	364.4	244.5	147.2	205.4	157.1	312.6	508.4
	75th percentile	182.4	136.4	183.4	190.9	181.0	72.4	61.6	44.3	41.3	44.4	223.1	253.2
	mean	124.8	90.6	127.3	144.3	127.5	82.3	59.6	37.2	44.5	41.0	133.7	179.1
1.5	50th percentile	63.7	26.4	60.4	87.4	65.8	51.2	38.0	18.4	14.4	15.4	134.4	159.4
	25th percentile	29.4	1.5	1.5	55.3	48.5	22.1	10.4	2.4	1.5	1.5	31.2	52.4
	10th percentile	6.4	1.0	1.0	8.4	24.4	2.4	1.5	1.5	1.5	1.5	5.4	15.0
	5th percentile	1.5	1.0	1.0	1.5	16.4	1.5	1.5	1.5	1.0	1.0	1.5	6.4
	95th percentile	431.5	376.4	503.4	442.4	403.0	364.4	244.5	147.2	205.4	157.1	312.6	508.4
	75th percentile	182.4	136.4	183.4	190.9	181.0	72.4	61.6	44.3	41.3	44.4	223.1	253.2
	mean	124.8	90.6	127.4	144.3	127.5	82.4	59.7	37.5	44.8	41.2	133.8	179.1
3.0	50th percentile	63.7	26.4	60.4	87.4	65.8	51.2	38.0	18.4	14.4	15.4	134.4	159.4
	25th percentile	29.4	2.0	2.0	55.3	48.5	22.1	10.4	3.0	2.0	3.0	31.2	52.4
	10th percentile	6.4	1.0	1.0	8.4	24.4	3.0	3.0	2.0	2.0	2.0	5.4	15.0
	5th percentile	2.0	1.0	1.0	1.7	16.4	3.0	2.0	2.0	1.0	1.0	2.5	6.4
	95th percentile	431.5	376.4	503.4	442.4	403.0	364.4	244.6	147.3	205.4	157.1	312.7	508.4
	75th percentile	182.4	136.4	183.4	190.9	181.1	72.4	61.6	44.3	41.3	44.4	223.1	253.2
	mean	124.8	90.7	127.4	144.3	127.5	82.5	59.8	37.6	44.9	41.3	133.8	179.1
4.5	50th percentile	63.7	26.4	60.4	87.4	65.8	51.2	38.0	18.4	14.4	15.4	134.4	159.4
	25th percentile	29.4	2.0	2.0	55.3	48.5	22.1	10.4	4.5	2.0	4.5	31.2	52.4
	10th percentile	6.4	1.0	1.0	8.4	24.4	4.5	3.0	2.0	2.0	2.0	5.4	15.0
	5th percentile	2.0	1.0	1.0	1.7	16.4	4.0	2.0	2.0	1.0	1.0	2.5	6.4

Table 15. Statistics of Pleasant Hill Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by, in ft^3/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	948.5	923.5	1074.8	917.0	855.3	792.5	438.7	201.5	148.5	194.5	440.9	767.5
	75th percentile	317.5	425.3	546.5	474.5	308.7	188.6	116.4	69.5	58.5	64.5	143.5	262.5
	mean	263.5	288.5	378.6	353.2	268.4	192.0	124.3	72.8	60.8	63.6	125.2	219.0
26.0	50th percentile	130.5	161.5	253.5	248.8	176.4	104.5	65.5	44.5	38.5	40.5	73.5	134.5
	25th percentile	61.6	83.5	135.5	162.4	108.5	65.9	43.5	33.5	30.5	32.5	41.7	65.0
	10th percentile	41.5	38.5	76.3	115.5	76.8	47.5	32.5	26.5	26.0	26.5	30.5	35.6
	5th percentile	34.5	32.5	39.5	92.2	63.7	38.5	27.1	26.0	21.0	24.0	26.5	30.5
	95th percentile	948.5	923.5	1074.8	917.0	855.3	792.5	438.7	201.5	148.5	194.5	440.9	767.5
	75th percentile	317.5	425.3	546.5	474.5	308.7	188.6	116.4	69.5	58.5	64.5	143.5	262.5
	mean	263.8	288.7	378.7	353.2	268.4	192.2	124.8	73.6	61.7	64.4	125.7	219.3
52.0	50th percentile	130.5	161.5	253.5	248.8	176.4	104.5	65.5	46.0	40.0	42.0	73.5	134.5
	25th percentile	61.6	83.5	135.5	162.4	108.5	65.9	45.0	35.0	32.0	34.0	43.3	65.0
	10th percentile	43.0	40.0	76.3	115.5	76.8	49.0	34.0	28.0	26.0	28.0	32.0	37.1
	5th percentile	36.0	34.0	41.0	92.2	63.7	40.0	28.6	26.0	21.0	24.0	28.0	32.0
	95th percentile	948.5	923.5	1074.8	917.0	855.3	792.5	438.7	201.5	148.5	194.5	440.9	767.5
	75th percentile	317.5	425.3	546.5	474.5	308.7	188.6	116.4	71.0	60.0	66.0	143.5	262.5
	mean	264.0	288.8	378.7	353.2	268.6	192.5	125.2	73.9	62.0	64.7	126.0	219.4
78.0	50th percentile	130.5	161.5	253.5	248.8	176.4	104.5	67.0	46.0	40.0	42.0	75.0	134.5
	25th percentile	63.1	83.5	135.5	162.4	108.5	67.4	45.0	35.0	32.0	34.0	43.3	66.5
	10th percentile	43.0	40.0	77.8	115.5	78.0	49.0	34.0	28.0	26.0	28.0	32.0	37.1
	5th percentile	36.0	34.0	41.0	92.2	65.2	40.0	28.6	26.0	21.0	24.0	28.0	32.0
		Pumping rate = 2 Mgal/d											
	95th percentile	946.9	921.9	1073.2	915.4	853.7	790.9	437.1	199.9	146.9	192.9	439.3	765.9
	75th percentile	315.9	423.8	544.9	472.9	307.1	187.0	114.8	67.9	56.9	62.9	141.9	260.9
	mean	262.0	287.0	377.1	351.6	266.9	190.5	122.8	71.4	59.5	62.2	123.7	217.5
26.0	50th percentile	128.9	159.9	251.9	247.2	174.9	102.9	63.9	42.9	36.9	38.9	71.9	132.9
	25th percentile	60.0	81.9	133.9	160.9	106.9	64.3	41.9	31.9	28.9	30.9	40.2	63.4
	10th percentile	39.9	36.9	74.7	113.9	75.3	45.9	30.9	26.0	26.0	26.0	28.9	34.0
	5th percentile	32.9	30.9	37.9	90.6	62.1	36.9	26.0	26.0	21.0	24.0	26.0	28.9
	95th percentile	946.9	921.9	1073.2	915.4	853.7	790.9	437.1	199.9	146.9	192.9	439.3	765.9
	75th percentile	315.9	423.8	544.9	472.9	307.1	187.0	114.8	67.9	56.9	62.9	141.9	260.9
	mean	262.5	287.4	377.2	351.7	266.9	190.9	123.8	73.0	61.2	63.9	124.7	218.0
52.0	50th percentile	128.9	159.9	251.9	247.2	174.9	102.9	63.9	46.0	40.0	42.0	71.9	132.9
	25th percentile	60.0	81.9	133.9	160.9	106.9	64.3	45.0	35.0	32.0	34.0	43.3	63.4
	10th percentile	43.0	40.0	74.7	113.9	75.3	49.0	34.0	28.0	26.0	28.0	32.0	37.1
	5th percentile	36.0	34.0	41.0	90.6	62.1	40.0	28.6	26.0	21.0	24.0	28.0	32.0

Table 15. Statistics of Pleasant Hill Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by, in ft^3/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	946.9	921.9	1073.2	915.4	853.7	790.9	437.1	199.9	146.9	192.9	439.3	765.9
	75th percentile	315.9	423.8	544.9	472.9	307.1	187.0	114.8	71.0	60.0	66.0	141.9	260.9
	mean	263.0	287.7	377.4	351.7	267.2	191.5	124.6	73.6	61.7	64.4	125.2	218.4
78.0	50th percentile	128.9	159.9	251.9	247.2	174.9	102.9	67.0	46.0	40.0	42.0	75.0	132.9
	25th percentile	63.1	81.9	133.9	160.9	106.9	67.4	45.0	35.0	32.0	34.0	43.3	66.5
	10th percentile	43.0	40.0	77.8	113.9	78.0	49.0	34.0	28.0	26.0	28.0	32.0	37.1
	5th percentile	36.0	34.0	41.0	90.6	65.2	40.0	28.6	26.0	21.0	24.0	28.0	32.0
		Pumping rate = 3 Mgal/d											
	95th percentile	945.4	920.4	1071.7	913.9	852.2	789.4	435.6	198.4	145.4	191.4	437.8	764.4
	75th percentile	314.4	422.2	543.4	471.4	305.6	185.5	113.3	66.4	55.4	61.4	140.4	259.4
	mean	260.5	285.5	375.6	350.1	265.3	189.0	121.4	70.1	58.3	60.9	122.3	216.0
26.0	50th percentile	127.4	158.4	250.4	245.7	173.3	101.4	62.4	41.4	35.4	37.4	70.4	131.4
	25th percentile	58.5	80.4	132.4	159.3	105.4	62.8	40.4	30.4	27.4	29.4	38.6	61.9
	10th percentile	38.4	35.4	73.2	112.4	73.7	44.4	29.4	26.0	26.0	26.0	27.4	32.5
	5th percentile	31.4	29.4	36.4	89.1	60.6	35.4	26.0	26.0	21.0	24.0	26.0	27.4
	95th percentile	945.4	920.4	1071.7	913.9	852.2	789.4	435.6	198.4	145.4	191.4	437.8	764.4
	75th percentile	314.4	422.2	543.4	471.4	305.6	185.5	113.3	66.4	55.4	61.4	140.4	259.4
	mean	261.2	286.1	375.8	350.1	265.4	189.5	122.9	72.4	60.8	63.4	123.7	216.8
52.0	50th percentile	127.4	158.4	250.4	245.7	173.3	101.4	62.4	46.0	40.0	42.0	70.4	131.4
	25th percentile	58.5	80.4	132.4	159.3	105.4	62.8	45.0	35.0	32.0	34.0	43.3	61.9
	10th percentile	43.0	40.0	73.2	112.4	73.7	49.0	34.0	28.0	26.0	28.0	32.0	37.1
	5th percentile	36.0	34.0	41.0	89.1	60.6	40.0	28.6	26.0	21.0	24.0	28.0	32.0
	95th percentile	945.4	920.4	1071.7	913.9	852.2	789.4	435.6	198.4	145.4	191.4	437.8	764.4
	75th percentile	314.4	422.2	543.4	471.4	305.6	185.5	113.3	71.0	60.0	66.0	140.4	259.4
	mean	261.9	286.5	376.0	350.2	265.8	190.5	123.9	73.2	61.5	64.1	124.5	217.3
78.0	50th percentile	127.4	158.4	250.4	245.7	173.3	101.4	67.0	46.0	40.0	42.0	75.0	131.4
	25th percentile	63.1	80.4	132.4	159.3	105.4	67.4	45.0	35.0	32.0	34.0	43.3	66.5
	10th percentile	43.0	40.0	77.8	112.4	78.0	49.0	34.0	28.0	26.0	28.0	32.0	37.1
	5th percentile	36.0	34.0	41.0	89.1	65.2	40.0	28.6	26.0	21.0	24.0	28.0	32.0

Table 16. Statistics of Senecaville Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.

[ft³/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by, in ft³/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	613.5	682.1	689.8	671.0	663.5	570.9	313.5	248.5	280.5	276.5	506.8	634.5
	75th percentile	268.8	323.5	306.6	328.5	243.5	106.5	48.5	22.5	8.0	9.5	265.6	308.5
	mean	178.4	186.9	192.4	198.9	163.2	108.4	58.8	40.6	38.2	41.7	161.6	196.2
2.5	50th percentile	86.9	80.2	108.5	111.5	76.5	28.5	6.7	3.6	2.7	2.7	100.7	123.5
	25th percentile	12.6	2.8	3.8	6.9	9.1	3.3	2.5	2.5	2.5	2.5	4.1	9.5
	10th percentile	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.2	2.0	2.1	2.5
	5th percentile	2.5	2.5	2.5	2.4	2.5	2.5	2.2	2.2	1.9	1.7	1.6	2.0
	95th percentile	613.5	682.1	689.8	671.0	663.5	570.9	313.5	248.5	280.5	276.5	506.8	634.5
	75th percentile	268.8	323.5	306.6	328.5	243.5	106.5	48.5	22.5	8.0	9.5	265.6	308.5
	mean	178.5	187.1	192.7	199.1	163.4	108.7	59.2	41.1	38.7	42.2	161.8	196.3
5.0	50th percentile	86.9	80.2	108.5	111.5	76.5	28.5	6.7	5.0	4.3	4.3	100.7	123.5
	25th percentile	12.6	4.3	5.0	6.9	9.1	4.8	4.0	3.4	2.9	2.8	5.0	9.5
	10th percentile	3.8	2.9	3.4	3.6	4.0	3.3	2.7	2.6	2.2	2.0	2.1	2.8
	5th percentile	2.6	2.6	2.6	2.4	3.4	2.8	2.2	2.2	1.9	1.7	1.6	2.0
	95th percentile	613.5	682.1	689.8	671.0	663.5	570.9	313.5	248.5	280.5	276.5	506.8	634.5
	75th percentile	268.8	323.5	306.6	328.5	243.5	106.5	48.5	22.5	8.0	9.5	265.6	308.5
	mean	178.6	187.2	192.7	199.2	163.5	108.9	59.3	41.2	38.8	42.3	161.8	196.4
7.5	50th percentile	86.9	80.2	108.5	111.5	76.5	28.5	7.5	5.2	4.3	4.3	100.7	123.5
	25th percentile	12.6	4.3	5.4	7.5	9.1	4.8	4.0	3.4	2.9	2.8	5.7	9.5
	10th percentile	3.8	2.9	3.4	3.6	4.0	3.3	2.7	2.6	2.2	2.0	2.1	2.8
	5th percentile	2.6	2.6	2.6	2.4	3.4	2.8	2.2	2.2	1.9	1.7	1.6	2.0
		Pumping rate = 2 Mgal/d											
	95th percentile	611.9	680.6	688.3	669.4	661.9	569.4	311.9	246.9	278.9	274.9	505.3	632.9
	75th percentile	267.3	321.9	305.0	326.9	241.9	104.9	46.9	20.9	6.4	7.9	264.0	306.9
	mean	177.0	185.8	191.2	197.7	161.9	107.2	57.8	39.8	37.5	41.1	160.4	194.9
2.5	50th percentile	85.3	78.6	106.9	109.9	74.9	26.9	5.1	2.5	2.5	2.5	99.1	121.9
	25th percentile	11.0	2.5	2.5	5.3	7.6	2.5	2.5	2.5	2.5	2.5	2.6	7.9
	10th percentile	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.2	2.0	2.1	2.5
	5th percentile	2.5	2.5	2.5	2.4	2.5	2.5	2.2	2.2	1.9	1.7	1.6	2.0
	95th percentile	611.9	680.6	688.3	669.4	661.9	569.4	311.9	246.9	278.9	274.9	505.3	632.9
	75th percentile	267.3	321.9	305.0	326.9	241.9	104.9	46.9	20.9	6.4	7.9	264.0	306.9
	mean	177.2	186.1	191.6	197.9	162.2	107.7	58.4	40.5	38.3	41.7	160.7	195.1
5.0	50th percentile	85.3	78.6	106.9	109.9	74.9	26.9	5.1	5.0	4.3	4.3	99.1	121.9
	25th percentile	11.0	4.3	5.0	5.3	7.6	4.8	4.0	3.4	2.9	2.8	5.0	7.9
	10th percentile	3.8	2.9	3.4	3.6	4.0	3.3	2.7	2.6	2.2	2.0	2.1	2.8
	5th percentile	2.6	2.6	2.6	2.4	3.4	2.8	2.2	2.2	1.9	1.7	1.6	2.0

Table 16. Statistics of Senecaville Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by, in ft^3/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	611.9	680.6	688.3	669.4	661.9	569.4	311.9	246.9	278.9	274.9	505.3	632.9
	75th percentile	267.3	321.9	305.0	326.9	241.9	104.9	46.9	20.9	7.5	7.9	264.0	306.9
	mean	177.3	186.2	191.7	198.0	162.3	107.9	58.6	40.7	38.4	41.9	160.7	195.2
7.5	50th percentile	85.3	78.6	106.9	109.9	74.9	26.9	7.5	5.2	4.3	4.3	99.1	121.9
	25th percentile	11.0	4.3	5.4	7.5	7.6	4.8	4.0	3.4	2.9	2.8	5.7	7.9
	10th percentile	3.8	2.9	3.4	3.6	4.0	3.3	2.7	2.6	2.2	2.0	2.1	2.8
	5th percentile	2.6	2.6	2.6	2.4	3.4	2.8	2.2	2.2	1.9	1.7	1.6	2.0
		Pumping rate = 3 Mgal/d											
	95th percentile	610.4	679.0	686.7	667.9	660.4	567.8	310.4	245.4	277.4	273.4	503.7	631.4
	75th percentile	265.7	320.4	303.5	325.4	240.4	103.4	45.4	19.4	4.9	6.4	262.5	305.4
	mean	175.7	184.7	190.1	196.4	160.7	106.2	56.9	39.1	37.0	40.5	159.3	193.7
2.5	50th percentile	83.8	77.1	105.4	108.4	73.4	25.4	3.6	2.5	2.5	2.5	97.6	120.4
	25th percentile	9.5	2.5	2.5	3.8	6.0	2.5	2.5	2.5	2.5	2.5	2.5	6.4
	10th percentile	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.2	2.0	2.1	2.5
	5th percentile	2.5	2.5	2.5	2.4	2.5	2.5	2.2	2.2	1.9	1.7	1.6	2.0
	95th percentile	610.4	679.0	686.7	667.9	660.4	567.8	310.4	245.4	277.4	273.4	503.7	631.4
	75th percentile	265.7	320.4	303.5	325.4	240.4	103.4	45.4	19.4	5.0	6.4	262.5	305.4
	mean	176.0	185.1	190.5	196.8	161.0	106.8	57.6	39.9	37.9	41.3	159.6	193.9
5.0	50th percentile	83.8	77.1	105.4	108.4	73.4	25.4	5.0	5.0	4.3	4.3	97.6	120.4
	25th percentile	9.5	4.3	5.0	5.0	6.0	4.8	4.0	3.4	2.9	2.8	5.0	6.4
	10th percentile	3.8	2.9	3.4	3.6	4.0	3.3	2.7	2.6	2.2	2.0	2.1	2.8
	5th percentile	2.6	2.6	2.6	2.4	3.4	2.8	2.2	2.2	1.9	1.7	1.6	2.0
	95th percentile	610.4	679.0	686.7	667.9	660.4	567.8	310.4	245.4	277.4	273.4	503.7	631.4
	75th percentile	265.7	320.4	303.5	325.4	240.4	103.4	45.4	19.4	7.5	7.5	262.5	305.4
	mean	176.1	185.3	190.7	196.9	161.2	107.0	57.8	40.1	38.1	41.5	159.7	194.0
7.5	50th percentile	83.8	77.1	105.4	108.4	73.4	25.4	7.5	5.2	4.3	4.3	97.6	120.4
	25th percentile	9.5	4.3	5.4	7.5	7.5	4.8	4.0	3.4	2.9	2.8	5.7	7.5
	10th percentile	3.8	2.9	3.4	3.6	4.0	3.3	2.7	2.6	2.2	2.0	2.1	2.8
	5th percentile	2.6	2.6	2.6	2.4	3.4	2.8	2.2	2.2	1.9	1.7	1.6	2.0

Table 17. Statistics of Wills Creek Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by, in ft^3/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	5103.6	4408.5	5338.5	4795.5	3758.5	3538.5	1738.5	1048.5	1328.5	1078.5	1698.5	3168.5
	75th percentile	1716.7	2338.5	2662.2	2326.5	1527.6	910.0	448.5	253.5	162.1	191.5	670.7	1310.9
	mean	1296.1	1563.9	1910.9	1710.6	1204.0	808.5	451.2	290.7	286.4	243.7	521.2	996.9
2.0	50th percentile	751.5	1048.5	1308.5	1208.5	751.5	353.4	207.4	102.9	60.5	82.5	344.5	649.0
	25th percentile	327.2	529.4	765.7	668.3	393.5	169.9	95.1	52.5	33.4	40.5	122.5	297.5
	10th percentile	159.5	254.5	447.7	426.5	245.5	97.5	50.5	28.5	19.5	24.5	52.5	124.5
	5th percentile	85.5	166.5	327.5	328.6	192.5	70.9	37.5	20.5	15.5	16.6	39.5	68.5
	95th percentile	5103.6	4408.5	5338.5	4795.5	3758.5	3538.5	1738.5	1048.5	1328.5	1078.5	1698.5	3168.5
	75th percentile	1716.7	2338.5	2662.2	2326.5	1527.6	910.0	448.5	253.5	162.1	191.5	670.7	1310.9
	mean	1296.1	1563.9	1910.9	1710.6	1204.0	808.5	451.2	290.7	286.4	243.7	521.2	996.9
4.0	50th percentile	751.5	1048.5	1308.5	1208.5	751.5	353.4	207.4	102.9	60.5	82.5	344.5	649.0
	25th percentile	327.2	529.4	765.7	668.3	393.5	169.9	95.1	52.5	33.4	40.5	122.5	297.5
	10th percentile	159.5	254.5	447.7	426.5	245.5	97.5	50.5	28.5	19.5	24.5	52.5	124.5
	5th percentile	85.5	166.5	327.5	328.6	192.5	70.9	37.5	20.5	15.5	16.6	39.5	68.5
	95th percentile	5103.6	4408.5	5338.5	4795.5	3758.5	3538.5	1738.5	1048.5	1328.5	1078.5	1698.5	3168.5
	75th percentile	1716.7	2338.5	2662.2	2326.5	1527.6	910.0	448.5	253.5	162.1	191.5	670.7	1310.9
	mean	1296.1	1563.9	1910.9	1710.6	1204.0	808.5	451.2	290.7	286.4	243.7	521.2	996.9
6.0	50th percentile	751.5	1048.5	1308.5	1208.5	751.5	353.4	207.4	102.9	60.5	82.5	344.5	649.0
	25th percentile	327.2	529.4	765.7	668.3	393.5	169.9	95.1	52.5	33.4	40.5	122.5	297.5
	10th percentile	159.5	254.5	447.7	426.5	245.5	97.5	50.5	28.5	19.5	24.5	52.5	124.5
	5th percentile	85.5	166.5	327.5	328.6	192.5	70.9	37.5	20.5	15.5	16.6	39.5	68.5
		Pumping rate = 2 Mgal/d											
	95th percentile	5102.1	4406.9	5336.9	4794.0	3756.9	3536.9	1736.9	1046.9	1326.9	1076.9	1696.9	3166.9
	75th percentile	1715.1	2336.9	2660.6	2325.0	1526.0	908.4	446.9	251.9	160.5	189.9	669.1	1309.4
	mean	1294.6	1562.4	1909.4	1709.0	1202.4	807.0	449.7	289.2	284.8	242.2	519.7	995.3
2.0	50th percentile	750.0	1046.9	1306.9	1206.9	749.9	351.8	205.9	101.4	58.9	80.9	342.9	647.4
	25th percentile	325.6	527.8	764.1	666.8	391.9	168.3	93.6	50.9	31.8	38.9	120.9	295.9
	10th percentile	157.9	252.9	446.1	424.9	243.9	95.9	48.9	26.9	17.9	22.9	50.9	122.9
	5th percentile	83.9	164.9	325.9	327.1	190.9	69.4	35.9	18.9	13.9	15.1	37.9	66.9
	95th percentile	5102.1	4406.9	5336.9	4794.0	3756.9	3536.9	1736.9	1046.9	1326.9	1076.9	1696.9	3166.9
	75th percentile	1715.1	2336.9	2660.6	2325.0	1526.0	908.4	446.9	251.9	160.5	189.9	669.1	1309.4
	mean	1294.6	1562.4	1909.4	1709.0	1202.4	807.0	449.7	289.2	284.8	242.2	519.7	995.3
4.0	50th percentile	750.0	1046.9	1306.9	1206.9	749.9	351.8	205.9	101.4	58.9	80.9	342.9	647.4
	25th percentile	325.6	527.8	764.1	666.8	391.9	168.3	93.6	50.9	31.8	38.9	120.9	295.9
	10th percentile	157.9	252.9	446.1	424.9	243.9	95.9	48.9	26.9	17.9	22.9	50.9	122.9
	5th percentile	83.9	164.9	325.9	327.1	190.9	69.4	35.9	18.9	13.9	15.1	37.9	66.9

Table 17. Statistics of Wills Creek Lake, Ohio, daily mean flow-by amounts, by month, for indicated pumping rates and target minimum flow-by amounts.—Continued

[ft³/s, cubic foot per second; Mgal/d, million gallons per day]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by, in ft³/s, for indicated months and pump rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d—Continued											
	95th percentile	5102.1	4406.9	5336.9	4794.0	3756.9	3536.9	1736.9	1046.9	1326.9	1076.9	1696.9	3166.9
	75th percentile	1715.1	2336.9	2660.6	2325.0	1526.0	908.4	446.9	251.9	160.5	189.9	669.1	1309.4
	mean	1294.6	1562.4	1909.4	1709.0	1202.4	807.0	449.7	289.2	284.8	242.2	519.7	995.3
6.0	50th percentile	750.0	1046.9	1306.9	1206.9	749.9	351.8	205.9	101.4	58.9	80.9	342.9	647.4
	25th percentile	325.6	527.8	764.1	666.8	391.9	168.3	93.6	50.9	31.8	38.9	120.9	295.9
	10th percentile	157.9	252.9	446.1	424.9	243.9	95.9	48.9	26.9	17.9	22.9	50.9	122.9
	5th percentile	83.9	164.9	325.9	327.1	190.9	69.4	35.9	18.9	13.9	15.1	37.9	66.9
		Pumping rate = 3 Mgal/d											
	95th percentile	5100.5	4405.4	5335.4	4792.4	3755.4	3535.4	1735.4	1045.4	1325.4	1075.4	1695.4	3165.4
	75th percentile	1713.6	2335.4	2659.1	2323.4	1524.5	906.9	445.4	250.4	159.0	188.4	667.6	1307.8
	mean	1293.0	1560.8	1907.8	1707.5	1200.9	805.4	448.1	287.6	283.3	240.7	518.1	993.8
2.0	50th percentile	748.4	1045.4	1305.4	1205.4	748.4	350.3	204.4	99.8	57.4	79.4	341.4	645.9
	25th percentile	324.1	526.3	762.6	665.2	390.4	166.8	92.0	49.4	30.3	37.4	119.4	294.4
	10th percentile	156.4	251.4	444.6	423.4	242.4	94.4	47.4	25.4	16.4	21.4	49.4	121.4
	5th percentile	82.4	163.4	324.4	325.5	189.4	67.8	34.4	17.4	12.4	13.5	36.4	65.4
	95th percentile	5100.5	4405.4	5335.4	4792.4	3755.4	3535.4	1735.4	1045.4	1325.4	1075.4	1695.4	3165.4
	75th percentile	1713.6	2335.4	2659.1	2323.4	1524.5	906.9	445.4	250.4	159.0	188.4	667.6	1307.8
	mean	1293.0	1560.8	1907.8	1707.5	1200.9	805.4	448.1	287.6	283.3	240.7	518.1	993.8
4.0	50th percentile	748.4	1045.4	1305.4	1205.4	748.4	350.3	204.4	99.8	57.4	79.4	341.4	645.9
	25th percentile	324.1	526.3	762.6	665.2	390.4	166.8	92.0	49.4	30.3	37.4	119.4	294.4
	10th percentile	156.4	251.4	444.6	423.4	242.4	94.4	47.4	25.4	16.4	21.4	49.4	121.4
	5th percentile	82.4	163.4	324.4	325.5	189.4	67.8	34.4	17.4	12.4	13.5	36.4	65.4
	95th percentile	5100.5	4405.4	5335.4	4792.4	3755.4	3535.4	1735.4	1045.4	1325.4	1075.4	1695.4	3165.4
	75th percentile	1713.6	2335.4	2659.1	2323.4	1524.5	906.9	445.4	250.4	159.0	188.4	667.6	1307.8
	mean	1293.0	1560.8	1907.8	1707.5	1200.9	805.4	448.1	287.6	283.3	240.7	518.1	993.8
6.0	50th percentile	748.4	1045.4	1305.4	1205.4	748.4	350.3	204.4	99.8	57.4	79.4	341.4	645.9
	25th percentile	324.1	526.3	762.6	665.2	390.4	166.8	92.0	49.4	30.3	37.4	119.4	294.4
	10th percentile	156.4	251.4	444.6	423.4	242.4	94.4	47.4	25.4	16.4	21.4	49.4	121.4
	5th percentile	82.4	163.4	324.4	325.5	189.4	67.8	34.4	17.4	12.4	13.5	36.4	65.4

Table 18. Daily mean flow-by statistics for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes, Muskingum River Watershed, Ohio, expressed as a percentage of observed outflow statistics.

[Mgal/d, million gallons per day; minimum in-stream flow targets equal 1.5 cubic feet per second (ft^3/s) for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake; color scale is gradient from maximum value, in green, to minimum value, in red]

Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated lakes, pumping rates, and minimum in-stream flow-target multiples								
	Pumping rate, in Mgal/d								
	1			2			3		
	Minimum in-stream flow-target multiple								
	1	2	3	1	2	3	1	2	3
Charles Mill Lake									
95th percentile	99.8%	99.8%	99.8%	99.7%	99.7%	99.7%	99.5%	99.5%	99.5%
75th percentile	99.5%	99.5%	99.5%	98.9%	98.9%	98.9%	98.4%	98.4%	98.4%
mean	99.4%	99.4%	99.5%	98.7%	98.9%	99.0%	98.1%	98.3%	98.5%
50th percentile	98.6%	98.6%	98.6%	97.2%	97.2%	97.2%	95.8%	95.8%	95.8%
25th percentile	96.3%	96.3%	96.3%	92.6%	92.6%	92.9%	88.9%	88.9%	92.9%
10th percentile	92.7%	100.0%	100.0%	85.5%	100.0%	100.0%	78.2%	100.0%	100.0%
5th percentile	89.7%	100.0%	100.0%	86.7%	100.0%	100.0%	86.7%	100.0%	100.0%
Clendening Lake									
95th percentile	99.6%	99.6%	99.6%	99.2%	99.2%	99.2%	98.8%	98.8%	98.8%
75th percentile	98.6%	98.6%	98.6%	97.2%	97.2%	97.2%	95.8%	95.8%	95.8%
mean	98.3%	98.3%	98.4%	96.7%	96.7%	96.8%	95.0%	95.1%	95.3%
50th percentile	95.7%	95.7%	95.7%	91.4%	91.4%	91.4%	87.1%	87.1%	87.1%
25th percentile	89.3%	89.3%	89.3%	78.5%	78.5%	78.5%	67.8%	67.8%	67.8%
10th percentile	80.7%	80.7%	80.7%	61.3%	61.3%	61.3%	42.0%	42.0%	56.3%
5th percentile	53.1%	90.9%	100.0%	45.5%	90.9%	100.0%	45.5%	90.9%	100.0%
Piedmont Lake									
95th percentile	99.6%	99.6%	99.6%	99.2%	99.2%	99.2%	98.8%	98.8%	98.8%
75th percentile	98.9%	98.9%	100.0%	97.8%	97.8%	100.0%	96.7%	96.7%	100.0%
mean	98.7%	98.7%	99.9%	97.4%	97.4%	99.8%	96.1%	96.2%	99.7%
50th percentile	97.2%	97.2%	100.0%	94.4%	94.4%	100.0%	91.5%	91.5%	100.0%
25th percentile	89.6%	89.6%	100.0%	79.2%	79.2%	100.0%	68.8%	68.8%	100.0%
10th percentile	75.0%	100.0%	100.0%	75.0%	100.0%	100.0%	75.0%	100.0%	100.0%
5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 18. Daily mean flow-by statistics for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes, Muskingum River Watershed, Ohio, expressed as a percentage of observed outflow statistics.—Continued

[Mgal/d, million gallons per day; minimum in-stream flow targets equal 1.5 cubic feet per second (ft^3/s) for Clendening and Piedmont Lakes, 2.0 ft^3/s for Wills Creek Lake, 2.5 ft^3/s for Senecaville Lake, 13.0 ft^3/s for Charles Mill Lake, and 26.0 ft^3/s for Pleasant Hill Lake; color scale is gradient from maximum value, in green, to minimum value, in red]

Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated lakes, pumping rates, and minimum in-stream flow-target multiples								
	Pumping rate, in Mgal/d								
	1			2			3		
	Minimum in-stream flow-target multiple								
	1	2	3	1	2	3	1	2	3
Pleasant Hill Lake									
95th percentile	99.8%	99.8%	99.8%	99.6%	99.6%	99.6%	99.4%	99.4%	99.4%
75th percentile	99.3%	99.3%	99.3%	98.6%	98.6%	98.6%	98.0%	98.0%	98.0%
mean	99.3%	99.4%	99.5%	98.5%	98.9%	99.1%	97.8%	98.4%	98.7%
50th percentile	98.5%	98.5%	98.5%	97.0%	97.0%	97.0%	95.5%	95.5%	95.5%
25th percentile	96.8%	100.0%	100.0%	93.7%	100.0%	100.0%	90.5%	100.0%	100.0%
10th percentile	95.4%	100.0%	100.0%	90.9%	100.0%	100.0%	86.3%	100.0%	100.0%
5th percentile	94.5%	100.0%	100.0%	92.5%	100.0%	100.0%	92.5%	100.0%	100.0%
Senecaville Lake									
95th percentile	99.7%	99.7%	99.7%	99.5%	99.5%	99.5%	99.2%	99.2%	99.2%
75th percentile	99.2%	99.2%	99.2%	98.3%	98.3%	98.3%	97.5%	97.5%	97.5%
mean	99.0%	99.2%	99.3%	98.2%	98.5%	98.6%	97.4%	97.8%	97.9%
50th percentile	94.3%	94.3%	94.3%	88.5%	88.5%	88.5%	82.8%	82.8%	82.8%
25th percentile	63.2%	100.0%	100.0%	59.5%	100.0%	100.0%	59.5%	100.0%	100.0%
10th percentile	92.6%	100.0%	100.0%	92.6%	100.0%	100.0%	92.6%	100.0%	100.0%
5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Wills Creek Lake									
95th percentile	100.0%	100.0%	100.0%	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%
75th percentile	99.9%	99.9%	99.9%	99.7%	99.7%	99.7%	99.6%	99.6%	99.6%
mean	99.8%	99.8%	99.8%	99.7%	99.7%	99.7%	99.5%	99.5%	99.5%
50th percentile	99.7%	99.7%	99.7%	99.3%	99.3%	99.3%	99.0%	99.0%	99.0%
25th percentile	98.8%	98.8%	98.8%	97.7%	97.7%	97.7%	96.5%	96.5%	96.5%
10th percentile	96.8%	96.8%	96.8%	93.7%	93.7%	93.7%	90.5%	90.5%	90.5%
5th percentile	95.2%	95.2%	95.2%	90.3%	90.3%	90.3%	85.5%	85.5%	85.5%

Table 19. Monthly statistics of Charles Mill Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.

[ft³/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
13.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.8%	99.8%	99.8%	99.5%	99.4%	99.5%	99.8%	99.8%
	75th percentile	99.5%	99.6%	99.8%	99.7%	99.5%	99.3%	98.6%	98.0%	97.5%	98.0%	99.1%	99.6%
	mean	99.5%	99.6%	99.7%	99.6%	99.4%	99.3%	99.0%	98.3%	97.9%	98.3%	99.1%	99.5%
	50th percentile	99.1%	99.3%	99.5%	99.4%	98.9%	98.2%	97.0%	95.8%	95.4%	96.4%	98.4%	99.1%
	25th percentile	98.4%	98.7%	99.1%	98.8%	97.9%	96.1%	94.8%	93.0%	91.9%	93.5%	96.6%	98.6%
	10th percentile	96.4%	95.9%	98.2%	97.8%	96.6%	93.3%	91.4%	90.2%	93.9%	89.7%	94.0%	97.3%
	5th percentile	94.8%	93.3%	97.3%	95.9%	95.5%	100.0%	100.0%	100.0%	100.0%	100.0%	90.2%	95.7%
26.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.8%	99.8%	99.8%	99.5%	99.4%	99.5%	99.8%	99.8%
	75th percentile	99.5%	99.6%	99.8%	99.7%	99.5%	99.3%	98.6%	98.0%	97.5%	98.0%	99.1%	99.6%
	mean	99.5%	99.6%	99.7%	99.6%	99.4%	99.3%	99.2%	98.8%	98.6%	98.7%	99.2%	99.5%
	50th percentile	99.1%	99.3%	99.5%	99.4%	98.9%	98.2%	97.0%	95.8%	95.4%	96.4%	98.4%	99.1%
	25th percentile	98.4%	98.7%	99.1%	98.8%	97.9%	96.1%	94.8%	100.0%	100.0%	100.0%	96.6%	98.6%
	10th percentile	96.4%	95.9%	98.2%	97.8%	96.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.3%
	5th percentile	94.8%	100.0%	97.3%	95.9%	95.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	95.7%
39.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.8%	99.8%	99.8%	99.5%	99.4%	99.5%	99.8%	99.8%
	75th percentile	99.5%	99.6%	99.8%	99.7%	99.5%	99.3%	98.6%	98.0%	97.5%	98.0%	99.1%	99.6%
	mean	99.5%	99.6%	99.7%	99.6%	99.4%	99.4%	99.3%	99.2%	99.0%	99.0%	99.3%	99.5%
	50th percentile	99.1%	99.3%	99.5%	99.4%	98.9%	98.2%	97.0%	100.0%	100.0%	96.4%	98.4%	99.1%
	25th percentile	98.4%	98.7%	99.1%	98.8%	97.9%	98.5%	100.0%	100.0%	100.0%	100.0%	96.6%	98.6%
	10th percentile	96.4%	100.0%	98.2%	97.8%	96.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	97.3%
	5th percentile	100.0%	100.0%	97.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 19. Monthly statistics of Charles Mill Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d											
	95th percentile	99.7%	99.7%	99.8%	99.7%	99.7%	99.6%	99.6%	99.0%	98.8%	99.0%	99.5%	99.7%
	75th percentile	99.0%	99.3%	99.5%	99.4%	99.0%	98.7%	97.2%	95.9%	95.0%	96.0%	98.3%	99.2%
	mean	99.0%	99.1%	99.4%	99.2%	98.8%	98.5%	98.0%	96.7%	95.9%	96.6%	98.3%	99.0%
13.0	50th percentile	98.2%	98.5%	99.1%	98.9%	97.8%	96.4%	94.1%	91.6%	90.9%	92.8%	96.9%	98.3%
	25th percentile	96.7%	97.4%	98.3%	97.6%	95.9%	92.2%	89.6%	85.9%	83.7%	87.1%	93.2%	97.3%
	10th percentile	92.8%	91.9%	96.3%	95.6%	93.3%	86.5%	82.8%	82.3%	93.9%	86.7%	88.1%	94.7%
	5th percentile	89.5%	86.5%	94.7%	91.9%	90.9%	100.0%	100.0%	100.0%	100.0%	100.0%	82.3%	91.4%
	95th percentile	99.7%	99.7%	99.8%	99.7%	99.7%	99.6%	99.6%	99.0%	98.8%	99.0%	99.5%	99.7%
	75th percentile	99.0%	99.3%	99.5%	99.4%	99.0%	98.7%	97.2%	95.9%	95.0%	96.0%	98.3%	99.2%
	mean	99.0%	99.2%	99.4%	99.2%	98.8%	98.6%	98.3%	97.6%	97.2%	97.4%	98.4%	99.0%
26.0	50th percentile	98.2%	98.5%	99.1%	98.9%	97.8%	96.4%	94.1%	91.6%	90.9%	92.8%	96.9%	98.3%
	25th percentile	96.7%	97.4%	98.3%	97.6%	95.9%	92.2%	89.6%	100.0%	100.0%	100.0%	93.2%	97.3%
	10th percentile	92.8%	91.9%	96.3%	95.6%	93.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.7%
	5th percentile	89.5%	100.0%	94.7%	91.9%	90.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	91.4%
	95th percentile	99.7%	99.7%	99.8%	99.7%	99.7%	99.6%	99.6%	99.0%	98.8%	99.0%	99.5%	99.7%
	75th percentile	99.0%	99.3%	99.5%	99.4%	99.0%	98.7%	97.2%	95.9%	95.0%	96.0%	98.3%	99.2%
	mean	99.1%	99.2%	99.4%	99.2%	98.9%	98.8%	98.6%	98.4%	98.0%	98.0%	98.6%	99.0%
39.0	50th percentile	98.2%	98.5%	99.1%	98.9%	97.8%	96.4%	94.1%	100.0%	100.0%	92.8%	96.9%	98.3%
	25th percentile	96.7%	97.4%	98.3%	97.6%	95.9%	98.5%	100.0%	100.0%	100.0%	100.0%	93.2%	97.3%
	10th percentile	92.8%	100.0%	96.3%	95.6%	93.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	94.7%
	5th percentile	100.0%	100.0%	94.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 19. Monthly statistics of Charles Mill Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft³/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 3 Mgal/d											
13.0	95th percentile	99.6%	99.6%	99.7%	99.6%	99.5%	99.4%	99.3%	98.6%	98.2%	98.5%	99.3%	99.5%
	75th percentile	98.6%	98.9%	99.3%	99.1%	98.5%	98.0%	95.8%	93.9%	92.5%	94.0%	97.4%	98.8%
	mean	98.5%	98.7%	99.0%	98.8%	98.2%	97.8%	97.0%	95.1%	93.9%	95.0%	97.4%	98.5%
	50th percentile	97.3%	97.8%	98.6%	98.3%	96.7%	94.5%	91.1%	87.5%	86.3%	89.2%	95.3%	97.4%
	25th percentile	95.1%	96.1%	97.4%	96.4%	93.8%	88.3%	84.4%	78.9%	75.6%	80.6%	89.8%	95.9%
	10th percentile	89.2%	87.8%	94.5%	93.4%	89.9%	79.8%	74.2%	82.3%	93.9%	86.7%	82.1%	92.0%
	5th percentile	84.3%	79.8%	92.0%	87.8%	86.4%	100.0%	100.0%	100.0%	100.0%	100.0%	82.3%	87.1%
26.0	95th percentile	99.6%	99.6%	99.7%	99.6%	99.5%	99.4%	99.3%	98.6%	98.2%	98.5%	99.3%	99.5%
	75th percentile	98.6%	98.9%	99.3%	99.1%	98.5%	98.0%	95.8%	93.9%	92.5%	94.0%	97.4%	98.8%
	mean	98.5%	98.7%	99.1%	98.8%	98.2%	98.0%	97.5%	96.5%	95.8%	96.2%	97.6%	98.5%
	50th percentile	97.3%	97.8%	98.6%	98.3%	96.7%	94.5%	91.1%	87.5%	86.3%	89.2%	95.3%	97.4%
	25th percentile	95.1%	96.1%	97.4%	96.4%	93.8%	88.3%	87.2%	100.0%	100.0%	100.0%	89.8%	95.9%
	10th percentile	89.2%	87.8%	94.5%	93.4%	89.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	92.0%
	5th percentile	87.8%	100.0%	92.0%	87.8%	86.4%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	87.1%
39.0	95th percentile	99.6%	99.6%	99.7%	99.6%	99.5%	99.4%	99.3%	98.6%	98.2%	98.5%	99.3%	99.5%
	75th percentile	98.6%	98.9%	99.3%	99.1%	98.5%	98.0%	95.8%	93.9%	92.5%	94.0%	97.4%	98.8%
	mean	98.6%	98.8%	99.1%	98.9%	98.3%	98.2%	98.0%	97.6%	97.1%	97.1%	97.9%	98.6%
	50th percentile	97.3%	97.8%	98.6%	98.3%	96.7%	94.5%	91.1%	100.0%	100.0%	90.7%	95.3%	97.4%
	25th percentile	95.1%	96.1%	97.4%	96.4%	93.8%	98.5%	100.0%	100.0%	100.0%	100.0%	89.8%	95.9%
	10th percentile	90.7%	100.0%	94.5%	93.4%	89.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	92.0%
	5th percentile	100.0%	100.0%	92.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 20. Monthly statistics of Clendening Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
1.5	95th percentile	99.7%	99.6%	99.7%	99.7%	99.6%	99.5%	98.9%	98.1%	98.9%	98.9%	99.5%	99.7%
	75th percentile	98.9%	98.6%	99.0%	99.0%	98.9%	97.7%	95.8%	92.6%	92.5%	94.9%	99.1%	99.3%
	mean	98.7%	98.4%	98.8%	98.8%	98.6%	97.7%	96.5%	95.1%	96.3%	96.1%	98.6%	99.0%
	50th percentile	97.7%	95.0%	97.4%	98.0%	97.6%	95.3%	90.9%	87.1%	85.5%	89.2%	98.4%	98.8%
	25th percentile	95.0%	91.7%	92.3%	96.8%	95.2%	88.6%	80.7%	80.7%	77.2%	80.7%	91.4%	96.5%
	10th percentile	91.4%	88.9%	87.9%	92.6%	90.9%	80.7%	76.6%	50.0%	100.0%	100.0%	80.2%	91.4%
	5th percentile	89.2%	87.1%	72.4%	91.4%	88.1%	72.9%	75.0%	100.0%	100.0%	100.0%	50.0%	88.9%
3.0	95th percentile	99.7%	99.6%	99.7%	99.7%	99.6%	99.5%	98.9%	98.1%	98.9%	98.9%	99.5%	99.7%
	75th percentile	98.9%	98.6%	99.0%	99.0%	98.9%	97.7%	95.8%	92.6%	92.5%	94.9%	99.1%	99.3%
	mean	98.7%	98.4%	98.8%	98.8%	98.6%	97.7%	96.6%	95.3%	96.5%	96.2%	98.7%	99.0%
	50th percentile	97.7%	95.0%	97.4%	98.0%	97.6%	95.3%	90.9%	87.1%	85.5%	89.2%	98.4%	98.8%
	25th percentile	95.0%	91.7%	92.3%	96.8%	95.2%	88.6%	80.7%	80.7%	77.2%	80.7%	91.4%	96.5%
	10th percentile	91.4%	88.9%	87.9%	92.6%	90.9%	80.7%	76.6%	100.0%	100.0%	100.0%	80.2%	91.4%
	5th percentile	89.2%	87.1%	72.4%	91.4%	88.1%	72.9%	100.0%	100.0%	100.0%	100.0%	100.0%	88.9%
4.5	95th percentile	99.7%	99.6%	99.7%	99.7%	99.6%	99.5%	98.9%	98.1%	98.9%	98.9%	99.5%	99.7%
	75th percentile	98.9%	98.6%	99.0%	99.0%	98.9%	97.7%	95.8%	92.6%	92.5%	94.9%	99.1%	99.3%
	mean	98.7%	98.4%	98.8%	98.8%	98.6%	97.7%	96.6%	95.5%	96.7%	96.3%	98.7%	99.0%
	50th percentile	97.7%	95.0%	97.4%	98.0%	97.6%	95.3%	90.9%	87.1%	85.5%	89.2%	98.4%	98.8%
	25th percentile	95.0%	91.7%	92.3%	96.8%	95.2%	88.6%	80.7%	80.7%	77.2%	80.7%	91.4%	96.5%
	10th percentile	91.4%	88.9%	87.9%	92.6%	90.9%	80.7%	76.6%	100.0%	100.0%	100.0%	80.2%	91.4%
	5th percentile	89.2%	87.1%	80.4%	91.4%	88.1%	78.9%	100.0%	100.0%	100.0%	100.0%	100.0%	88.9%

Table 20. Monthly statistics of Clendening Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft³/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d											
1.5	95th percentile	99.3%	99.3%	99.4%	99.3%	99.3%	99.0%	97.9%	96.2%	97.8%	97.8%	98.9%	99.3%
	75th percentile	97.8%	97.2%	98.0%	98.0%	97.8%	95.4%	91.6%	85.3%	84.9%	89.9%	98.1%	98.6%
	mean	97.4%	96.8%	97.6%	97.7%	97.3%	95.4%	93.1%	90.4%	92.9%	92.3%	97.3%	98.0%
	50th percentile	95.4%	90.0%	94.8%	96.0%	95.2%	90.6%	81.8%	74.2%	70.9%	78.4%	96.7%	97.6%
	25th percentile	90.0%	83.4%	84.5%	93.6%	90.3%	77.2%	61.3%	61.3%	54.5%	61.3%	82.8%	93.0%
	10th percentile	82.8%	77.9%	75.8%	85.3%	81.8%	61.3%	53.1%	50.0%	100.0%	100.0%	60.3%	82.9%
	5th percentile	78.4%	74.2%	44.7%	82.8%	76.2%	45.7%	75.0%	100.0%	100.0%	100.0%	50.0%	77.9%
3.0	95th percentile	99.3%	99.3%	99.4%	99.3%	99.3%	99.0%	97.9%	96.2%	97.8%	97.8%	98.9%	99.3%
	75th percentile	97.8%	97.2%	98.0%	98.0%	97.8%	95.4%	91.6%	85.3%	84.9%	89.9%	98.1%	98.6%
	mean	97.4%	96.8%	97.7%	97.7%	97.3%	95.5%	93.2%	90.7%	93.2%	92.5%	97.3%	98.0%
	50th percentile	95.4%	90.0%	94.8%	96.0%	95.2%	90.6%	81.8%	74.2%	70.9%	78.4%	96.7%	97.6%
	25th percentile	90.0%	83.4%	84.5%	93.6%	90.3%	77.2%	61.3%	61.3%	54.5%	61.3%	82.8%	93.0%
	10th percentile	82.8%	77.9%	75.8%	85.3%	81.8%	61.3%	53.1%	100.0%	100.0%	100.0%	60.3%	82.9%
	5th percentile	78.4%	74.2%	53.6%	82.8%	76.2%	52.6%	100.0%	100.0%	100.0%	100.0%	100.0%	77.9%
4.5	95th percentile	99.3%	99.3%	99.4%	99.3%	99.3%	99.0%	97.9%	96.2%	97.8%	97.8%	98.9%	99.3%
	75th percentile	97.8%	97.2%	98.0%	98.0%	97.8%	95.4%	91.6%	85.3%	84.9%	89.9%	98.1%	98.6%
	mean	97.4%	96.8%	97.7%	97.7%	97.3%	95.5%	93.3%	91.1%	93.5%	92.7%	97.4%	98.1%
	50th percentile	95.4%	90.0%	94.8%	96.0%	95.2%	90.6%	81.8%	74.2%	70.9%	78.4%	96.7%	97.6%
	25th percentile	90.0%	83.4%	84.5%	93.6%	90.3%	77.2%	61.3%	61.3%	66.2%	61.3%	82.8%	93.0%
	10th percentile	82.8%	77.9%	75.8%	85.3%	81.8%	61.3%	68.2%	100.0%	100.0%	100.0%	60.3%	82.9%
	5th percentile	78.4%	74.2%	80.4%	82.8%	76.2%	78.9%	100.0%	100.0%	100.0%	100.0%	100.0%	77.9%

Table 20. Monthly statistics of Clendening Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 3 Mgal/d											
1.5	95th percentile	99.0%	98.9%	99.1%	99.0%	98.9%	98.4%	96.8%	94.3%	96.7%	96.7%	98.4%	99.0%
	75th percentile	96.8%	95.9%	97.1%	97.0%	96.7%	93.2%	87.5%	77.9%	77.4%	84.8%	97.2%	97.9%
	mean	96.1%	95.2%	96.5%	96.5%	95.9%	93.2%	89.7%	85.8%	89.6%	88.6%	96.0%	97.1%
	50th percentile	93.2%	85.0%	92.3%	94.1%	92.7%	85.9%	72.7%	61.3%	56.4%	67.5%	95.1%	96.5%
	25th percentile	84.9%	75.0%	76.8%	90.4%	85.5%	65.9%	42.0%	42.0%	31.7%	42.0%	74.2%	89.6%
	10th percentile	74.2%	66.8%	63.7%	77.9%	72.7%	42.0%	29.7%	50.0%	100.0%	100.0%	40.5%	74.3%
	5th percentile	67.5%	61.3%	26.8%	74.2%	64.3%	26.3%	75.0%	100.0%	100.0%	100.0%	50.0%	66.8%
3.0	95th percentile	99.0%	98.9%	99.1%	99.0%	98.9%	98.4%	96.8%	94.3%	96.7%	96.7%	98.4%	99.0%
	75th percentile	96.8%	95.9%	97.1%	97.0%	96.7%	93.2%	87.5%	77.9%	77.4%	84.8%	97.2%	97.9%
	mean	96.1%	95.2%	96.5%	96.5%	95.9%	93.2%	89.9%	86.3%	90.1%	88.9%	96.0%	97.1%
	50th percentile	93.2%	85.0%	92.3%	94.1%	92.7%	85.9%	72.7%	61.3%	56.4%	67.5%	95.1%	96.5%
	25th percentile	84.9%	75.0%	76.8%	90.4%	85.5%	65.9%	42.0%	42.0%	44.1%	42.0%	74.2%	89.6%
	10th percentile	74.2%	66.8%	63.7%	77.9%	72.7%	42.0%	45.5%	100.0%	100.0%	100.0%	40.5%	74.3%
	5th percentile	67.5%	61.3%	53.6%	74.2%	64.3%	52.6%	100.0%	100.0%	100.0%	100.0%	100.0%	66.8%
4.5	95th percentile	99.0%	98.9%	99.1%	99.0%	98.9%	98.4%	96.8%	94.3%	96.7%	96.7%	98.4%	99.0%
	75th percentile	96.8%	95.9%	97.1%	97.0%	96.7%	93.2%	87.5%	77.9%	77.4%	84.8%	97.2%	97.9%
	mean	96.1%	95.3%	96.5%	96.5%	95.9%	93.5%	90.6%	87.6%	91.0%	89.6%	96.1%	97.1%
	50th percentile	93.2%	85.0%	92.3%	94.1%	92.7%	85.9%	72.7%	61.3%	56.4%	67.5%	95.1%	96.5%
	25th percentile	84.9%	75.0%	76.8%	90.4%	85.5%	65.9%	56.3%	56.3%	66.2%	56.3%	74.2%	89.6%
	10th percentile	74.2%	66.8%	63.7%	77.9%	72.7%	56.3%	68.2%	100.0%	100.0%	100.0%	57.7%	74.3%
	5th percentile	67.5%	61.3%	80.4%	74.2%	64.3%	78.9%	100.0%	100.0%	100.0%	100.0%	100.0%	66.8%

Table 21. Monthly statistics of Piedmont Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
1.5	95th percentile	99.6%	99.6%	99.7%	99.7%	99.6%	99.6%	99.4%	99.0%	99.3%	99.0%	99.5%	99.7%
	75th percentile	99.2%	98.9%	99.2%	99.2%	99.2%	98.0%	97.7%	96.8%	96.6%	96.8%	99.3%	99.4%
	mean	98.9%	98.8%	99.1%	99.0%	98.8%	98.3%	97.7%	96.6%	97.4%	97.1%	98.9%	99.2%
	50th percentile	97.7%	95.0%	97.6%	98.3%	97.8%	97.2%	96.4%	93.3%	91.9%	92.3%	98.9%	99.1%
	25th percentile	95.4%	75.0%	75.0%	97.4%	97.1%	94.2%	89.7%	77.9%	75.0%	74.2%	95.7%	97.3%
	10th percentile	85.9%	100.0%	100.0%	88.1%	94.7%	77.9%	50.0%	75.0%	75.0%	75.0%	84.5%	92.1%
	5th percentile	75.0%	100.0%	100.0%	89.7%	92.6%	61.3%	75.0%	75.0%	100.0%	100.0%	60.6%	85.9%
3.0	95th percentile	99.6%	99.6%	99.7%	99.7%	99.6%	99.6%	99.4%	99.0%	99.3%	99.0%	99.5%	99.7%
	75th percentile	99.2%	98.9%	99.2%	99.2%	99.2%	98.0%	97.7%	96.8%	96.6%	96.8%	99.3%	99.4%
	mean	98.9%	98.9%	99.1%	99.0%	98.8%	98.3%	97.9%	96.8%	97.7%	97.3%	99.0%	99.2%
	50th percentile	97.7%	95.0%	97.6%	98.3%	97.8%	97.2%	96.4%	93.3%	91.9%	92.3%	98.9%	99.1%
	25th percentile	95.4%	100.0%	100.0%	97.4%	97.1%	94.2%	89.7%	77.9%	100.0%	74.2%	95.7%	97.3%
	10th percentile	85.9%	100.0%	100.0%	88.1%	94.7%	77.9%	100.0%	100.0%	100.0%	100.0%	84.5%	92.1%
	5th percentile	100.0%	100.0%	100.0%	100.0%	92.6%	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	85.9%
4.5	95th percentile	99.6%	99.6%	99.7%	99.7%	99.6%	99.6%	99.4%	99.0%	99.3%	99.0%	99.5%	99.7%
	75th percentile	99.2%	98.9%	99.2%	99.2%	99.2%	98.0%	97.7%	96.8%	96.6%	96.8%	99.3%	99.4%
	mean	98.9%	98.9%	99.2%	99.0%	98.8%	98.3%	97.9%	97.0%	97.8%	97.4%	99.0%	99.2%
	50th percentile	97.7%	95.0%	97.6%	98.3%	97.8%	97.2%	96.4%	93.3%	91.9%	92.3%	98.9%	99.1%
	25th percentile	95.4%	100.0%	100.0%	97.4%	97.1%	94.2%	89.7%	77.9%	100.0%	75.0%	95.7%	97.3%
	10th percentile	85.9%	100.0%	100.0%	88.1%	94.7%	77.9%	100.0%	100.0%	100.0%	100.0%	84.5%	92.1%
	5th percentile	100.0%	100.0%	100.0%	100.0%	92.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	85.9%

Table 21. Monthly statistics of Piedmont Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d											
	95th percentile	99.3%	99.2%	99.4%	99.3%	99.2%	99.2%	98.8%	98.0%	98.5%	98.1%	99.0%	99.4%
	75th percentile	98.3%	97.8%	98.4%	98.4%	98.3%	96.0%	95.3%	93.7%	93.3%	93.7%	98.6%	98.8%
	mean	97.8%	97.7%	98.3%	98.1%	97.7%	96.6%	95.6%	93.4%	95.2%	94.3%	97.9%	98.4%
1.5	50th percentile	95.5%	90.0%	95.2%	96.6%	95.6%	94.5%	92.7%	86.5%	83.7%	84.6%	97.8%	98.1%
	25th percentile	90.9%	75.0%	75.0%	94.8%	94.2%	88.4%	79.4%	55.8%	75.0%	48.4%	91.4%	94.6%
	10th percentile	71.9%	100.0%	100.0%	76.2%	89.3%	55.8%	50.0%	75.0%	75.0%	75.0%	69.1%	84.2%
	5th percentile	75.0%	100.0%	100.0%	89.7%	85.3%	37.5%	75.0%	75.0%	100.0%	100.0%	60.6%	71.9%
	95th percentile	99.3%	99.2%	99.4%	99.3%	99.2%	99.2%	98.8%	98.0%	98.5%	98.1%	99.0%	99.4%
	75th percentile	98.3%	97.8%	98.4%	98.4%	98.3%	96.0%	95.3%	93.7%	93.3%	93.7%	98.6%	98.8%
	mean	97.8%	97.8%	98.3%	98.1%	97.7%	96.6%	95.8%	93.8%	95.5%	94.6%	97.9%	98.4%
3.0	50th percentile	95.5%	90.0%	95.2%	96.6%	95.6%	94.5%	92.7%	86.5%	83.7%	84.6%	97.8%	98.1%
	25th percentile	90.9%	100.0%	100.0%	94.8%	94.2%	88.4%	79.4%	55.8%	100.0%	50.0%	91.4%	94.6%
	10th percentile	71.9%	100.0%	100.0%	76.2%	89.3%	55.8%	100.0%	100.0%	100.0%	100.0%	69.1%	84.2%
	5th percentile	100.0%	100.0%	100.0%	100.0%	85.3%	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	71.9%
	95th percentile	99.3%	99.2%	99.4%	99.3%	99.2%	99.2%	98.8%	98.0%	98.5%	98.1%	99.0%	99.4%
	75th percentile	98.3%	97.8%	98.4%	98.4%	98.3%	96.0%	95.3%	93.7%	93.3%	93.7%	98.6%	98.8%
	mean	97.8%	97.8%	98.3%	98.1%	97.7%	96.7%	95.9%	94.1%	95.7%	94.8%	97.9%	98.4%
4.5	50th percentile	95.5%	90.0%	95.2%	96.6%	95.6%	94.5%	92.7%	86.5%	83.7%	84.6%	97.8%	98.1%
	25th percentile	90.9%	100.0%	100.0%	94.8%	94.2%	88.4%	79.4%	64.3%	100.0%	75.0%	91.4%	94.6%
	10th percentile	71.9%	100.0%	100.0%	76.2%	89.3%	64.3%	100.0%	100.0%	100.0%	100.0%	69.1%	84.2%
	5th percentile	100.0%	100.0%	100.0%	100.0%	85.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	71.9%

Table 21. Monthly statistics of Piedmont Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 3 Mgal/d											
1.5	95th percentile	98.9%	98.8%	99.1%	99.0%	98.9%	98.7%	98.1%	96.9%	97.8%	97.1%	98.5%	99.1%
	75th percentile	97.5%	96.7%	97.5%	97.6%	97.5%	94.0%	93.0%	90.5%	89.9%	90.5%	98.0%	98.2%
	mean	96.6%	96.6%	97.4%	97.1%	96.5%	94.9%	93.5%	90.4%	93.0%	91.7%	96.8%	97.6%
	50th percentile	93.2%	85.0%	92.9%	95.0%	93.4%	91.7%	89.1%	79.8%	75.6%	76.8%	96.7%	97.2%
	25th percentile	86.3%	75.0%	75.0%	92.3%	91.3%	82.6%	69.1%	33.7%	75.0%	25.0%	87.0%	91.9%
	10th percentile	57.8%	100.0%	100.0%	64.3%	84.0%	33.7%	50.0%	75.0%	75.0%	75.0%	53.6%	76.4%
	5th percentile	75.0%	100.0%	100.0%	89.7%	77.9%	37.5%	75.0%	75.0%	100.0%	100.0%	60.6%	57.8%
3.0	95th percentile	98.9%	98.8%	99.1%	99.0%	98.9%	98.7%	98.1%	96.9%	97.8%	97.1%	98.5%	99.1%
	75th percentile	97.5%	96.7%	97.5%	97.6%	97.5%	94.0%	93.0%	90.5%	89.9%	90.5%	98.0%	98.2%
	mean	96.7%	96.7%	97.5%	97.1%	96.5%	95.0%	93.8%	91.0%	93.4%	92.1%	96.9%	97.6%
	50th percentile	93.2%	85.0%	92.9%	95.0%	93.4%	91.7%	89.1%	79.8%	75.6%	76.8%	96.7%	97.2%
	25th percentile	86.3%	100.0%	100.0%	92.3%	91.3%	82.6%	69.1%	42.9%	100.0%	50.0%	87.0%	91.9%
	10th percentile	57.8%	100.0%	100.0%	64.3%	84.0%	42.9%	100.0%	100.0%	100.0%	100.0%	53.6%	76.4%
	5th percentile	100.0%	100.0%	100.0%	100.0%	77.9%	75.0%	100.0%	100.0%	100.0%	100.0%	100.0%	57.8%
4.5	95th percentile	98.9%	98.8%	99.1%	99.0%	98.9%	98.7%	98.1%	96.9%	97.8%	97.1%	98.5%	99.1%
	75th percentile	97.5%	96.7%	97.5%	97.6%	97.5%	94.0%	93.0%	90.5%	89.9%	90.5%	98.0%	98.2%
	mean	96.7%	96.7%	97.5%	97.1%	96.5%	95.2%	93.9%	91.4%	93.6%	92.4%	96.9%	97.6%
	50th percentile	93.2%	85.0%	92.9%	95.0%	93.4%	91.7%	89.1%	79.8%	75.6%	76.8%	96.7%	97.2%
	25th percentile	86.3%	100.0%	100.0%	92.3%	91.3%	82.6%	69.1%	64.3%	100.0%	75.0%	87.0%	91.9%
	10th percentile	57.8%	100.0%	100.0%	64.3%	84.0%	64.3%	100.0%	100.0%	100.0%	100.0%	53.6%	76.4%
	5th percentile	100.0%	100.0%	100.0%	100.0%	77.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	57.8%

Table 22. Monthly statistics of Pleasant Hill Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	99.8%	99.8%	99.9%	99.8%	99.8%	99.8%	99.6%	99.2%	99.0%	99.2%	99.7%	99.8%
	75th percentile	99.5%	99.6%	99.7%	99.7%	99.5%	99.2%	98.7%	97.8%	97.4%	97.7%	98.9%	99.4%
	mean	99.4%	99.5%	99.6%	99.6%	99.4%	99.2%	98.8%	98.1%	97.8%	97.8%	98.8%	99.3%
26.0	50th percentile	98.8%	99.1%	99.4%	99.4%	99.1%	98.5%	97.7%	96.6%	96.1%	96.3%	97.9%	98.9%
	25th percentile	97.5%	98.2%	98.9%	99.1%	98.6%	97.7%	96.6%	95.6%	95.2%	95.4%	96.4%	97.7%
	10th percentile	96.4%	96.1%	98.0%	98.7%	98.0%	96.8%	95.4%	94.5%	100.0%	94.5%	95.2%	95.8%
	5th percentile	95.7%	95.4%	96.2%	98.3%	97.6%	96.1%	94.6%	100.0%	100.0%	100.0%	94.5%	95.2%
	95th percentile	99.8%	99.8%	99.9%	99.8%	99.8%	99.8%	99.6%	99.2%	99.0%	99.2%	99.7%	99.8%
	75th percentile	99.5%	99.6%	99.7%	99.7%	99.5%	99.2%	98.7%	97.8%	97.4%	97.7%	98.9%	99.4%
	mean	99.5%	99.5%	99.6%	99.6%	99.4%	99.3%	99.2%	99.2%	99.2%	99.1%	99.2%	99.4%
52.0	50th percentile	98.8%	99.1%	99.4%	99.4%	99.1%	98.5%	97.7%	100.0%	100.0%	100.0%	97.9%	98.9%
	25th percentile	97.5%	98.2%	98.9%	99.1%	98.6%	97.7%	100.0%	100.0%	100.0%	100.0%	100.0%	97.7%
	10th percentile	100.0%	100.0%	98.0%	98.7%	98.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	98.3%	97.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	95th percentile	99.8%	99.8%	99.9%	99.8%	99.8%	99.8%	99.6%	99.2%	99.0%	99.2%	99.7%	99.8%
	75th percentile	99.5%	99.6%	99.7%	99.7%	99.5%	99.2%	98.7%	100.0%	100.0%	100.0%	98.9%	99.4%
	mean	99.6%	99.6%	99.6%	99.6%	99.5%	99.5%	99.5%	99.6%	99.6%	99.5%	99.4%	99.5%
78.0	50th percentile	98.8%	99.1%	99.4%	99.4%	99.1%	98.5%	100.0%	100.0%	100.0%	100.0%	100.0%	98.9%
	25th percentile	100.0%	98.2%	98.9%	99.1%	98.6%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	10th percentile	100.0%	100.0%	100.0%	98.7%	99.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	98.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 22. Monthly statistics of Pleasant Hill Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft³/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d											
	95th percentile	99.7%	99.7%	99.7%	99.7%	99.6%	99.6%	99.3%	98.5%	97.9%	98.4%	99.3%	99.6%
	75th percentile	99.0%	99.3%	99.4%	99.3%	99.0%	98.4%	97.4%	95.6%	94.8%	95.3%	97.9%	98.8%
	mean	98.9%	98.9%	99.2%	99.1%	98.9%	98.4%	97.6%	96.2%	95.7%	95.7%	97.7%	98.6%
26.0	50th percentile	97.7%	98.1%	98.8%	98.8%	98.3%	97.1%	95.4%	93.3%	92.3%	92.6%	95.9%	97.7%
	25th percentile	95.1%	96.4%	97.7%	98.1%	97.2%	95.4%	93.1%	91.2%	90.3%	90.9%	92.8%	95.3%
	10th percentile	92.8%	92.3%	96.0%	97.4%	96.1%	93.7%	90.9%	92.9%	100.0%	92.9%	90.3%	91.7%
	5th percentile	91.4%	90.9%	92.5%	96.7%	95.3%	92.3%	90.9%	100.0%	100.0%	100.0%	92.9%	90.3%
	95th percentile	99.7%	99.7%	99.7%	99.7%	99.6%	99.6%	99.3%	98.5%	97.9%	98.4%	99.3%	99.6%
	75th percentile	99.0%	99.3%	99.4%	99.3%	99.0%	98.4%	97.4%	95.6%	94.8%	95.3%	97.9%	98.8%
	mean	99.0%	99.1%	99.2%	99.1%	98.9%	98.6%	98.4%	98.3%	98.4%	98.3%	98.4%	98.9%
52.0	50th percentile	97.7%	98.1%	98.8%	98.8%	98.3%	97.1%	95.4%	100.0%	100.0%	100.0%	95.9%	97.7%
	25th percentile	95.1%	96.4%	97.7%	98.1%	97.2%	95.4%	100.0%	100.0%	100.0%	100.0%	100.0%	95.3%
	10th percentile	100.0%	100.0%	96.0%	97.4%	96.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	96.7%	95.3%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	95th percentile	99.7%	99.7%	99.7%	99.7%	99.6%	99.6%	99.3%	98.5%	97.9%	98.4%	99.3%	99.6%
	75th percentile	99.0%	99.3%	99.4%	99.3%	99.0%	98.4%	97.4%	100.0%	100.0%	100.0%	97.9%	98.8%
	mean	99.2%	99.2%	99.3%	99.2%	99.0%	98.9%	99.0%	99.1%	99.2%	99.1%	98.8%	99.0%
78.0	50th percentile	97.7%	98.1%	98.8%	98.8%	98.3%	97.1%	100.0%	100.0%	100.0%	100.0%	100.0%	97.7%
	25th percentile	100.0%	96.4%	97.7%	98.1%	97.2%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	10th percentile	100.0%	100.0%	100.0%	97.4%	99.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	96.7%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 22. Monthly statistics of Pleasant Hill Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 3 Mgal/d											
26.0	95th percentile	99.5%	99.5%	99.6%	99.5%	99.5%	99.4%	98.9%	97.7%	96.9%	97.6%	99.0%	99.4%
	75th percentile	98.5%	98.9%	99.2%	99.0%	98.5%	97.6%	96.1%	93.5%	92.3%	93.0%	96.8%	98.2%
	mean	98.3%	98.4%	98.8%	98.7%	98.3%	97.6%	96.5%	94.4%	93.7%	93.6%	96.5%	98.0%
	50th percentile	96.5%	97.2%	98.2%	98.1%	97.4%	95.6%	93.1%	89.9%	88.4%	88.9%	93.8%	96.6%
	25th percentile	92.6%	94.5%	96.6%	97.2%	95.8%	93.1%	89.7%	86.7%	85.5%	86.3%	89.3%	93.0%
	10th percentile	89.2%	88.4%	94.0%	96.0%	94.1%	90.5%	86.3%	92.9%	100.0%	92.9%	85.5%	87.5%
	5th percentile	87.1%	86.3%	88.7%	95.0%	92.9%	88.4%	90.9%	100.0%	100.0%	100.0%	92.9%	85.5%
52.0	95th percentile	99.5%	99.5%	99.6%	99.5%	99.5%	99.4%	98.9%	97.7%	96.9%	97.6%	99.0%	99.4%
	75th percentile	98.5%	98.9%	99.2%	99.0%	98.5%	97.6%	96.1%	93.5%	92.3%	93.0%	96.8%	98.2%
	mean	98.5%	98.6%	98.9%	98.7%	98.3%	97.9%	97.7%	97.6%	97.7%	97.5%	97.6%	98.3%
	50th percentile	96.5%	97.2%	98.2%	98.1%	97.4%	95.6%	93.1%	100.0%	100.0%	100.0%	93.8%	96.6%
	25th percentile	92.6%	94.5%	96.6%	97.2%	95.8%	93.1%	100.0%	100.0%	100.0%	100.0%	100.0%	93.0%
	10th percentile	100.0%	100.0%	94.0%	96.0%	94.1%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	95.0%	92.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
78.0	95th percentile	99.5%	99.5%	99.6%	99.5%	99.5%	99.4%	98.9%	97.7%	96.9%	97.6%	99.0%	99.4%
	75th percentile	98.5%	98.9%	99.2%	99.0%	98.5%	97.6%	96.1%	100.0%	100.0%	100.0%	96.8%	98.2%
	mean	98.8%	98.8%	98.9%	98.7%	98.5%	98.4%	98.5%	98.7%	98.9%	98.6%	98.2%	98.5%
	50th percentile	96.5%	97.2%	98.2%	98.1%	97.4%	95.6%	100.0%	100.0%	100.0%	100.0%	100.0%	96.6%
	25th percentile	100.0%	94.5%	96.6%	97.2%	95.8%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	10th percentile	100.0%	100.0%	100.0%	96.0%	99.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	95.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 23. Monthly statistics of Senecaville Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.

[ft³/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
	95th percentile	99.7%	99.8%	99.8%	99.8%	99.8%	99.7%	99.5%	99.4%	99.5%	99.4%	99.7%	99.8%
	75th percentile	99.4%	99.5%	99.5%	99.5%	99.4%	98.6%	96.9%	93.6%	83.7%	85.9%	99.4%	99.5%
	mean	99.2%	99.3%	99.3%	99.3%	99.1%	98.7%	97.9%	97.1%	97.3%	97.6%	99.2%	99.3%
2.5	50th percentile	98.3%	98.1%	98.6%	98.6%	98.0%	94.8%	81.1%	70.2%	63.8%	63.7%	98.5%	98.8%
	25th percentile	89.0%	64.0%	71.2%	81.6%	85.5%	67.8%	62.5%	73.5%	86.2%	89.3%	72.8%	85.9%
	10th percentile	65.1%	86.2%	74.2%	69.4%	62.5%	75.8%	92.6%	96.2%	100.0%	100.0%	100.0%	89.3%
	5th percentile	96.2%	96.2%	96.2%	100.0%	73.5%	89.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	95th percentile	99.7%	99.8%	99.8%	99.8%	99.8%	99.7%	99.5%	99.4%	99.5%	99.4%	99.7%	99.8%
	75th percentile	99.4%	99.5%	99.5%	99.5%	99.4%	98.6%	96.9%	93.6%	83.7%	85.9%	99.4%	99.5%
	mean	99.3%	99.4%	99.4%	99.4%	99.2%	99.0%	98.5%	98.3%	98.7%	98.7%	99.3%	99.4%
5.0	50th percentile	98.3%	98.1%	98.6%	98.6%	98.0%	94.8%	81.1%	96.4%	100.0%	100.0%	98.5%	98.8%
	25th percentile	89.0%	100.0%	92.9%	81.6%	85.5%	100.0%	100.0%	100.0%	100.0%	100.0%	88.0%	85.9%
	10th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	95th percentile	99.7%	99.8%	99.8%	99.8%	99.8%	99.7%	99.5%	99.4%	99.5%	99.4%	99.7%	99.8%
	75th percentile	99.4%	99.5%	99.5%	99.5%	99.4%	98.6%	96.9%	93.6%	83.7%	85.9%	99.4%	99.5%
	mean	99.3%	99.5%	99.4%	99.4%	99.3%	99.1%	98.7%	98.6%	98.9%	98.9%	99.3%	99.4%
7.5	50th percentile	98.3%	98.1%	98.6%	98.6%	98.0%	94.8%	91.5%	100.0%	100.0%	100.0%	98.5%	98.8%
	25th percentile	89.0%	100.0%	100.0%	89.0%	85.5%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	85.9%
	10th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 23. Monthly statistics of Senecaville Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d											
	95th percentile	99.5%	99.5%	99.6%	99.5%	99.5%	99.5%	99.0%	98.8%	98.9%	98.9%	99.4%	99.5%
	75th percentile	98.9%	99.0%	99.0%	99.1%	98.7%	97.1%	93.8%	87.1%	67.5%	71.9%	98.8%	99.0%
	mean	98.5%	98.7%	98.7%	98.7%	98.3%	97.7%	96.1%	95.2%	95.6%	96.0%	98.5%	98.7%
2.5	50th percentile	96.5%	96.2%	97.2%	97.3%	96.0%	89.7%	62.3%	48.2%	58.4%	58.6%	97.0%	97.5%
	25th percentile	78.1%	58.1%	46.5%	63.3%	71.0%	52.1%	62.5%	73.5%	86.2%	89.3%	45.5%	71.9%
	10th percentile	65.1%	86.2%	74.2%	69.4%	62.5%	75.8%	92.6%	96.2%	100.0%	100.0%	100.0%	89.3%
	5th percentile	96.2%	96.2%	96.2%	100.0%	73.5%	89.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	95th percentile	99.5%	99.5%	99.6%	99.5%	99.5%	99.5%	99.0%	98.8%	98.9%	98.9%	99.4%	99.5%
	75th percentile	98.9%	99.0%	99.0%	99.1%	98.7%	97.1%	93.8%	87.1%	67.5%	71.9%	98.8%	99.0%
	mean	98.6%	98.9%	98.8%	98.8%	98.5%	98.1%	97.1%	96.9%	97.6%	97.5%	98.6%	98.8%
5.0	50th percentile	96.5%	96.2%	97.2%	97.3%	96.0%	89.7%	62.3%	96.4%	100.0%	100.0%	97.0%	97.5%
	25th percentile	78.1%	100.0%	92.9%	63.3%	71.0%	100.0%	100.0%	100.0%	100.0%	100.0%	88.0%	71.9%
	10th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	95th percentile	99.5%	99.5%	99.6%	99.5%	99.5%	99.5%	99.0%	98.8%	98.9%	98.9%	99.4%	99.5%
	75th percentile	98.9%	99.0%	99.0%	99.1%	98.7%	97.1%	93.8%	87.1%	78.8%	71.9%	98.8%	99.0%
	mean	98.6%	98.9%	98.9%	98.9%	98.6%	98.3%	97.5%	97.3%	98.0%	98.0%	98.7%	98.8%
7.5	50th percentile	96.5%	96.2%	97.2%	97.3%	96.0%	89.7%	91.5%	100.0%	100.0%	100.0%	97.0%	97.5%
	25th percentile	78.1%	100.0%	100.0%	89.0%	71.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	71.9%
	10th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 23. Monthly statistics of Senecaville Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 3 Mgal/d											
2.5	95th percentile	99.2%	99.3%	99.3%	99.3%	99.3%	99.2%	98.5%	98.1%	98.4%	98.3%	99.1%	99.3%
	75th percentile	98.3%	98.6%	98.5%	98.6%	98.1%	95.7%	90.7%	80.7%	51.2%	57.8%	98.3%	98.5%
	mean	97.7%	98.1%	98.1%	98.1%	97.6%	96.7%	94.7%	93.6%	94.4%	94.8%	97.8%	98.1%
	50th percentile	94.8%	94.3%	95.8%	95.9%	94.0%	84.5%	43.4%	48.2%	58.4%	58.6%	95.5%	96.3%
	25th percentile	67.1%	58.1%	46.5%	44.9%	56.5%	52.1%	62.5%	73.5%	86.2%	89.3%	44.0%	57.8%
	10th percentile	65.1%	86.2%	74.2%	69.4%	62.5%	75.8%	92.6%	96.2%	100.0%	100.0%	100.0%	89.3%
	5th percentile	96.2%	96.2%	96.2%	100.0%	73.5%	89.9%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
5.0	95th percentile	99.2%	99.3%	99.3%	99.3%	99.3%	99.2%	98.5%	98.1%	98.4%	98.3%	99.1%	99.3%
	75th percentile	98.3%	98.6%	98.5%	98.6%	98.1%	95.7%	90.7%	80.7%	52.5%	57.8%	98.3%	98.5%
	mean	97.9%	98.4%	98.3%	98.2%	97.8%	97.3%	95.8%	95.5%	96.6%	96.5%	97.9%	98.2%
	50th percentile	94.8%	94.3%	95.8%	95.9%	94.0%	84.5%	61.0%	96.4%	100.0%	100.0%	95.5%	96.3%
	25th percentile	67.1%	100.0%	92.9%	59.3%	56.5%	100.0%	100.0%	100.0%	100.0%	100.0%	88.0%	57.8%
	10th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
7.5	95th percentile	99.2%	99.3%	99.3%	99.3%	99.3%	99.2%	98.5%	98.1%	98.4%	98.3%	99.1%	99.3%
	75th percentile	98.3%	98.6%	98.5%	98.6%	98.1%	95.7%	90.7%	80.7%	78.8%	68.2%	98.3%	98.5%
	mean	98.0%	98.4%	98.4%	98.3%	97.9%	97.5%	96.3%	96.0%	97.0%	97.1%	98.0%	98.2%
	50th percentile	94.8%	94.3%	95.8%	95.9%	94.0%	84.5%	91.5%	100.0%	100.0%	100.0%	95.5%	96.3%
	25th percentile	67.1%	100.0%	100.0%	89.0%	70.4%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	68.2%
	10th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	5th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 24. Monthly statistics of Wills Creek Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 1 Mgal/d											
2.0	95th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%	99.9%	99.9%	99.9%	99.9%	100.0%
	75th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.4%	99.1%	99.2%	99.8%	99.9%
	mean	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.5%	99.5%	99.4%	99.7%	99.8%
	50th percentile	99.8%	99.9%	99.9%	99.9%	99.8%	99.6%	99.3%	98.5%	97.5%	98.2%	99.6%	99.8%
	25th percentile	99.5%	99.7%	99.8%	99.8%	99.6%	99.1%	98.4%	97.1%	95.6%	96.3%	98.8%	99.5%
	10th percentile	99.0%	99.4%	99.7%	99.6%	99.4%	98.4%	97.0%	94.8%	92.6%	94.0%	97.1%	98.8%
	5th percentile	98.2%	99.1%	99.5%	99.5%	99.2%	97.9%	96.0%	93.0%	90.9%	91.5%	96.2%	97.8%
4.0	95th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%	99.9%	99.9%	99.9%	99.9%	100.0%
	75th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.4%	99.1%	99.2%	99.8%	99.9%
	mean	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.5%	99.5%	99.4%	99.7%	99.8%
	50th percentile	99.8%	99.9%	99.9%	99.9%	99.8%	99.6%	99.3%	98.5%	97.5%	98.2%	99.6%	99.8%
	25th percentile	99.5%	99.7%	99.8%	99.8%	99.6%	99.1%	98.4%	97.1%	95.6%	96.3%	98.8%	99.5%
	10th percentile	99.0%	99.4%	99.7%	99.6%	99.4%	98.4%	97.0%	94.8%	92.6%	94.0%	97.1%	98.8%
	5th percentile	98.2%	99.1%	99.5%	99.5%	99.2%	97.9%	96.0%	93.0%	90.9%	91.5%	96.2%	97.8%
6.0	95th percentile	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	99.9%	99.9%	99.9%	99.9%	99.9%	100.0%
	75th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.4%	99.1%	99.2%	99.8%	99.9%
	mean	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.5%	99.5%	99.4%	99.7%	99.8%
	50th percentile	99.8%	99.9%	99.9%	99.9%	99.8%	99.6%	99.3%	98.5%	97.5%	98.2%	99.6%	99.8%
	25th percentile	99.5%	99.7%	99.8%	99.8%	99.6%	99.1%	98.4%	97.1%	95.6%	96.3%	98.8%	99.5%
	10th percentile	99.0%	99.4%	99.7%	99.6%	99.4%	98.4%	97.0%	94.8%	92.6%	94.0%	97.1%	98.8%
	5th percentile	98.2%	99.1%	99.5%	99.5%	99.2%	97.9%	96.0%	93.0%	90.9%	91.5%	96.2%	97.8%

Table 24. Monthly statistics of Wills Creek Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft³/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft³/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 2 Mgal/d											
2.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.8%	99.7%	99.8%	99.9%
	75th percentile	99.8%	99.9%	99.9%	99.9%	99.8%	99.7%	99.3%	98.8%	98.1%	98.4%	99.5%	99.8%
	mean	99.8%	99.8%	99.8%	99.8%	99.7%	99.6%	99.3%	98.9%	98.9%	98.7%	99.4%	99.7%
	50th percentile	99.6%	99.7%	99.8%	99.7%	99.6%	99.1%	98.5%	97.0%	95.0%	96.3%	99.1%	99.5%
	25th percentile	99.1%	99.4%	99.6%	99.5%	99.2%	98.2%	96.8%	94.3%	91.1%	92.6%	97.5%	99.0%
	10th percentile	98.1%	98.8%	99.3%	99.3%	98.7%	96.9%	94.0%	89.7%	85.3%	88.1%	94.3%	97.5%
	5th percentile	96.4%	98.2%	99.1%	99.1%	98.4%	95.7%	92.1%	85.9%	81.8%	83.0%	92.5%	95.6%
4.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.8%	99.7%	99.8%	99.9%
	75th percentile	99.8%	99.9%	99.9%	99.9%	99.8%	99.7%	99.3%	98.8%	98.1%	98.4%	99.5%	99.8%
	mean	99.8%	99.8%	99.8%	99.8%	99.7%	99.6%	99.3%	98.9%	98.9%	98.7%	99.4%	99.7%
	50th percentile	99.6%	99.7%	99.8%	99.7%	99.6%	99.1%	98.5%	97.0%	95.0%	96.3%	99.1%	99.5%
	25th percentile	99.1%	99.4%	99.6%	99.5%	99.2%	98.2%	96.8%	94.3%	91.1%	92.6%	97.5%	99.0%
	10th percentile	98.1%	98.8%	99.3%	99.3%	98.7%	96.9%	94.0%	89.7%	85.3%	88.1%	94.3%	97.5%
	5th percentile	96.4%	98.2%	99.1%	99.1%	98.4%	95.7%	92.1%	85.9%	81.8%	83.0%	92.5%	95.6%
6.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.8%	99.7%	99.8%	99.7%	99.8%	99.9%
	75th percentile	99.8%	99.9%	99.9%	99.9%	99.8%	99.7%	99.3%	98.8%	98.1%	98.4%	99.5%	99.8%
	mean	99.8%	99.8%	99.8%	99.8%	99.7%	99.6%	99.3%	98.9%	98.9%	98.7%	99.4%	99.7%
	50th percentile	99.6%	99.7%	99.8%	99.7%	99.6%	99.1%	98.5%	97.0%	95.0%	96.3%	99.1%	99.5%
	25th percentile	99.1%	99.4%	99.6%	99.5%	99.2%	98.2%	96.8%	94.3%	91.1%	92.6%	97.5%	99.0%
	10th percentile	98.1%	98.8%	99.3%	99.3%	98.7%	96.9%	94.0%	89.7%	85.3%	88.1%	94.3%	97.5%
	5th percentile	96.4%	98.2%	99.1%	99.1%	98.4%	95.7%	92.1%	85.9%	81.8%	83.0%	92.5%	95.6%

Table 24. Monthly statistics of Wills Creek Lake, Ohio, daily mean flow-by amounts for indicated pumping rates and target minimum flow-by amounts, expressed as a percentage of corresponding statistic based on observed outflows.—Continued

[ft^3/s, cubic foot per second; Mgal/d, million gallons per day; color scale is gradient from maximum value, in green, to minimum value, in red]

Target minimum flow-by (ft^3/s)	Statistic	Daily mean flow-by amounts expressed as a percentage of observed outflow statistics, for indicated months and pumping rates											
		Month											
		Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
		Pumping rate = 3 Mgal/d											
2.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.7%	99.6%	99.7%	99.6%	99.7%	99.9%
	75th percentile	99.7%	99.8%	99.8%	99.8%	99.7%	99.5%	99.0%	98.2%	97.2%	97.6%	99.3%	99.6%
	mean	99.6%	99.7%	99.8%	99.7%	99.6%	99.4%	99.0%	98.4%	98.4%	98.1%	99.1%	99.5%
	50th percentile	99.4%	99.6%	99.6%	99.6%	99.4%	98.7%	97.8%	95.6%	92.5%	94.5%	98.7%	99.3%
	25th percentile	98.6%	99.1%	99.4%	99.3%	98.8%	97.3%	95.2%	91.4%	86.7%	88.9%	96.3%	98.4%
	10th percentile	97.1%	98.2%	99.0%	98.9%	98.1%	95.3%	91.1%	84.5%	77.9%	82.1%	91.4%	96.3%
	5th percentile	94.7%	97.2%	98.6%	98.6%	97.6%	93.6%	88.1%	78.9%	72.7%	74.5%	88.7%	93.4%
4.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.7%	99.6%	99.7%	99.6%	99.7%	99.9%
	75th percentile	99.7%	99.8%	99.8%	99.8%	99.7%	99.5%	99.0%	98.2%	97.2%	97.6%	99.3%	99.6%
	mean	99.6%	99.7%	99.8%	99.7%	99.6%	99.4%	99.0%	98.4%	98.4%	98.1%	99.1%	99.5%
	50th percentile	99.4%	99.6%	99.6%	99.6%	99.4%	98.7%	97.8%	95.6%	92.5%	94.5%	98.7%	99.3%
	25th percentile	98.6%	99.1%	99.4%	99.3%	98.8%	97.3%	95.2%	91.4%	86.7%	88.9%	96.3%	98.4%
	10th percentile	97.1%	98.2%	99.0%	98.9%	98.1%	95.3%	91.1%	84.5%	77.9%	82.1%	91.4%	96.3%
	5th percentile	94.7%	97.2%	98.6%	98.6%	97.6%	93.6%	88.1%	78.9%	72.7%	74.5%	88.7%	93.4%
6.0	95th percentile	99.9%	99.9%	99.9%	99.9%	99.9%	99.9%	99.7%	99.6%	99.7%	99.6%	99.7%	99.9%
	75th percentile	99.7%	99.8%	99.8%	99.8%	99.7%	99.5%	99.0%	98.2%	97.2%	97.6%	99.3%	99.6%
	mean	99.6%	99.7%	99.8%	99.7%	99.6%	99.4%	99.0%	98.4%	98.4%	98.1%	99.1%	99.5%
	50th percentile	99.4%	99.6%	99.6%	99.6%	99.4%	98.7%	97.8%	95.6%	92.5%	94.5%	98.7%	99.3%
	25th percentile	98.6%	99.1%	99.4%	99.3%	98.8%	97.3%	95.2%	91.4%	86.7%	88.9%	96.3%	98.4%
	10th percentile	97.1%	98.2%	99.0%	98.9%	98.1%	95.3%	91.1%	84.5%	77.9%	82.1%	91.4%	96.3%
	5th percentile	94.7%	97.2%	98.6%	98.6%	97.6%	93.6%	88.1%	78.9%	72.7%	74.5%	88.7%	93.4%

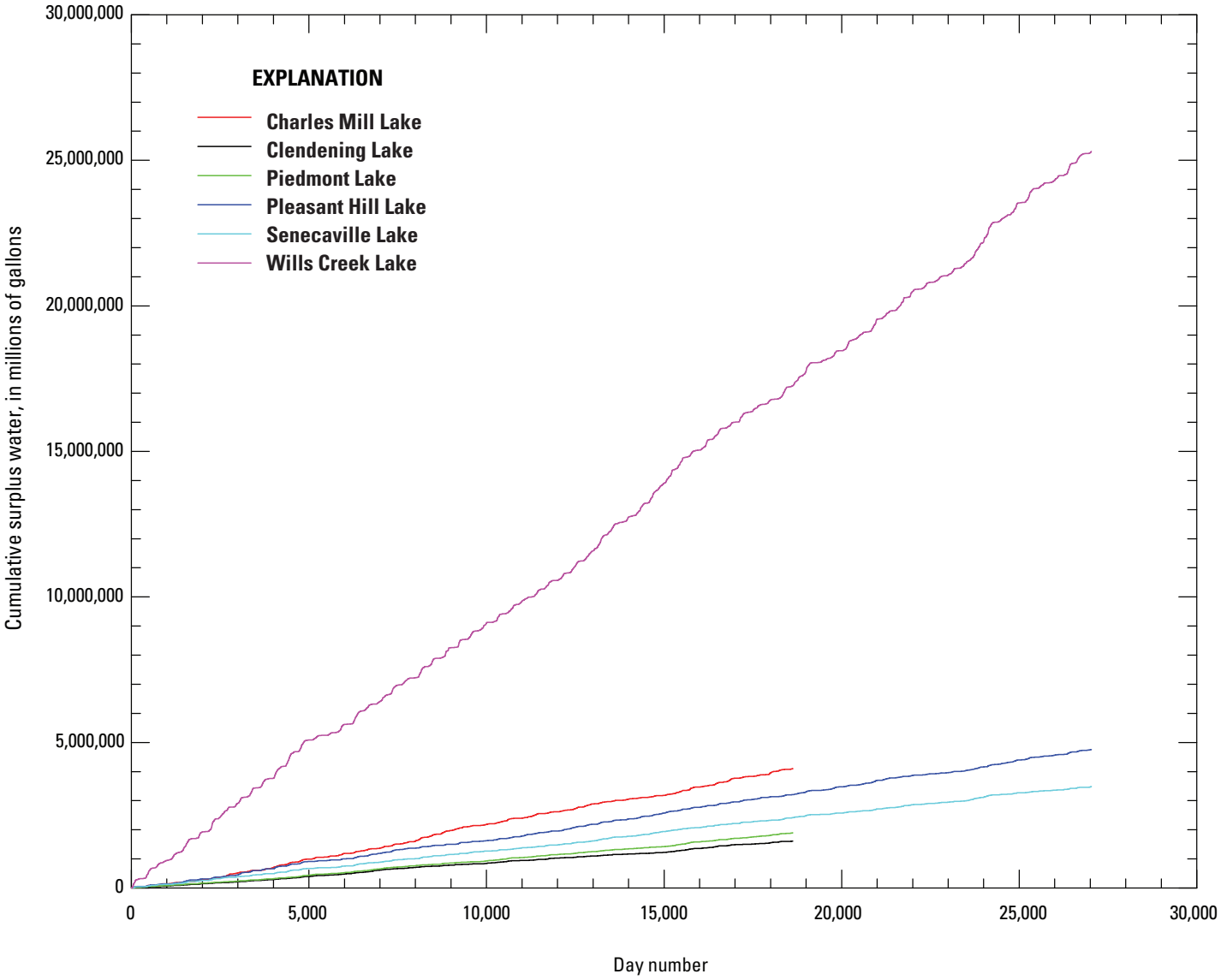


Figure 3. Surplus-water mass curves based on current target minimum outflows for the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes in the Muskingum River Watershed, Ohio.

Limitations

Direct use of the data presented in this report to make decisions about future water uses requires assumptions about the extent to which historical outflow characteristics will be representative of future outflow characteristics. Those assumptions could be in error depending on the degree to which there are changes in future climate or other factors that affect inflows to, or water losses from, the lakes.

Computed withdrawals represent maximum values given the combination of pumping rate and target minimum flow-by amounts, and assume that the observed outflow data are accurate. The ability to actually capture these maximum withdrawals will depend on how the pumps are operated, the maximum amount of storage for pumped water, and the rate and (or) timing of removal of water from storage.

The term "surplus water," as used in this report, is not meant to imply judgment about the value of the water for any particular use, but is used merely to signify the amount of water that potentially is available for withdrawal while still meeting the minimum flow-by target immediately downstream from the lake.

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Glossary

flow-by The computed net flow in the stream immediately downstream from a lake or reservoir, after accounting for withdrawals. The flow-by amount equals the outflow minus any withdrawals. Flow-by amounts are, by definition, available to support water uses downstream from the lake or reservoir.

minimum in-stream flow-target multiple A multiplier applied to established minimum in-stream flow targets to compute new hypothetical target minimum flow-by amounts.

outflow The total amount of water discharged from a lake or reservoir before withdrawals.

seasonal pool levels Target water levels for a lake or reservoir that vary as a function of season. In Ohio, winter pool levels typically are set lower than summer pool levels to facilitate greater flood control.

surplus water The lake or reservoir outflow minus the target minimum flow-by amount. Surplus water represents the amount of water that potentially is available for withdrawal while still meeting the minimum flow-by target immediately downstream from the lake or reservoir.

surplus water mass curve A curve produced by plotting the cumulative amount of surplus water as a function of time. Mass curves can be used to determine whether hypothetical water demands can be met at all times or, if not, to determine the maximum amount and duration of demand excess.

target minimum flow-by Minimum in-stream flow targets downstream from the lake or reservoir, after accounting for withdrawals. Target minimum flow-by amounts represent goals for minimum in-stream flows; however, they are not legal mandates and may not be achievable during extended low-flow periods.

withdrawals Water removed for some purpose from a lake, reservoir, or their outflows. Withdrawals are not part of the flow-by and as such are not available to support in-stream water uses downstream from the lake or reservoir.

Appendix 1.

Table 1–1. Selected characteristics of the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes and dams.

[ft, feet; mi^2, square miles]

Lake name	Charles Mill Lake	Clendening Lake	Piedmont Lake	Pleasant Hill Lake	Senecaville Lake	Wills Creek Lake
Completion year	1936	1936	1937	1938	1937	1937
Drainage area at dam (mi^2)	215	69.3	86.0	197	118	842
Discharges to:	Black Fork of the Mohican River	Brushy Fork of Stillwater Creek	Stillwater Creek	Clear Fork of the Mohican River	Seneca Fork of Wills Creek	Wills Creek
Location (counties in Ohio)	Richland and Ashland	Harrison	Harrison, Belmont, and Guernsey	Richland and Ashland	Guernsey and Noble	Muskingum and Coshocton
Dam construction	rolled earth with an impervious core	rolled earth with an impervious core	rolled earth with an impervious core	rolled earth with an impervious core	rolled earth with an impervious core	rolled earth with an impervious core
Maximum embankment height (ft)	48	64	56	113	45	87

Table 1–2. Cumulative surplus water at the Charles Mill, Clendening, Piedmont, Pleasant Hill, Senecaville, and Wills Creek Lakes as a function of target minimum flow-by amount, is a separate document available for downloading at *http://dx.doi.org/10.3133/sir20145071*.

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