

Prediction Interval Maximum Exceedance Calculations, Linear Regression Analysis
Maximum Exceedance Multiplier Calculations
Maximum Day-Average Day (MGD)

Kentucky-American Water Company
(Revised) 02/14/02

Linear Regression F

coeff. -2.138
coeff. 1.54187
alpha 1.6829
No. of pts. 41

$$b = \frac{\text{Sum}(X*Y) - n*Xbar*Ybar}{\text{Sum}(X^2) - n*Xbar^2} = 1.58442$$

$$a = Ybar - b*Xbar = -3.1104$$

$$Y_{\text{maxfit}}(Y^{\wedge}) = a + (b*X)$$

$$\text{Standard Error (SE)} = \text{SQRT}(\text{Sum}((Y-Y^{\wedge})^2)/(n-2)) = 3.63572$$

Year	"X" Average Day MGD	"Y" Maximum Day MGD	"Y/X" Ratio of Max to Av	Deviation of Ratio	X-Xbar	(X-Xbar)^2	"Y^"	"Y-Y^"	(Y-Y^)^2			"X*Y"	"X^2"						
1960	12.988	19.322	1.488	0.00028	-16.3972	268.8696	17.46734	1.85466	3.43976			250.945	168.676						
1961	13.551	19.619	1.448	0.00053	-15.8342	250.7231	18.35938	1.25962	1.58665			265.848	183.617						
1962	14.283	20.209	1.415	0.00313	-15.1021	228.0734	19.51940	0.68960	0.47555			288.639	203.995						
1963	15.275	20.282	1.328	0.02048	-14.1098	199.0877	21.09155	-0.80955	0.65537			309.806	233.324						
1964	16.863	25.500	1.512	0.00170	-12.5215	156.7884	23.60813	1.89187	3.57917			430.013	284.37						
1965	17.649	29.354	1.663	0.03697	-11.7355	137.7223	24.85349	4.50051	20.25456			518.076	311.496						
1966	18.839	30.726	1.631	0.02562	-10.5458	111.2134	26.73854	3.98746	15.89987			578.847	354.908						
1967	19.266	28.629	1.486	0.00023	-10.1190	102.3945	27.41471	1.21429	1.47451			551.559	371.169						
1968	20.106	28.767	1.431	0.00161	-9.2789	86.0973	28.74587	0.02113	0.00045			578.387	404.248						
1969	22.058	31.440	1.425	0.00208	-7.3271	53.6864	31.83828	-0.39828	0.15863			693.493	486.541						
1970	22.788	34.880	1.531	0.00356	-6.5964	43.5128	32.99599	1.88401	3.54949			794.858	519.309						
1971	22.697	30.500	1.344	0.01616	-6.6877	44.7254	32.85135	-2.35135	5.52886			692.261	515.157						
1972	24.170	31.760	1.314	0.02461	-5.2149	27.1950	35.18493	-3.42493	11.73013			767.636	584.184						
1973	26.546	35.410	1.334	0.01878	-2.8383	8.0558	38.95047	-3.54047	12.53494			940.011	704.716						
1974	26.485	34.620	1.307	0.02682	-2.8998	8.4088	38.85302	-4.23302	17.91845			916.91	701.454						
1975	26.956	37.360	1.386	0.00722	-2.4286	5.8983	39.59592	-2.23952	5.01545			1007.08	726.633						
1976	28.143	38.380	1.364	0.01148	-1.2421	1.5429	41.47946	-3.09946	9.60665			1080.11	792.009						
1977	30.323	41.160	1.357	0.01289	0.9381	0.8800	44.93386	-3.77386	14.24203			1248.09	919.477						
1978	30.847	44.130	1.431	0.00162	1.4620	2.1373	45.76388	-1.63388	2.66957			1361.27	951.521						
1979	30.654	39.220	1.279	0.03667	1.2696	1.6120	45.45915	-6.23915	38.92701			1202.27	939.693						
1980	32.024	48.010	1.499	0.00080	2.6396	6.9675	47.62975	0.38025	0.14459			1537.49	1025.56						
1981	32.006	44.780	1.399	0.00516	2.6213	6.8712	47.60077	-2.82077	7.95675			1433.23	1024.39						
1982	31.863	46.030	1.445	0.00069	2.4779	6.1398	47.37348	-1.34348	1.80494			1466.64	1015.23						
1983	32.383	51.090	1.578	0.01140	2.9977	8.9864	48.19718	2.89282	8.36839			1654.42	1048.63						
1984	32.954	49.070	1.489	0.00033	3.5695	12.7411	49.10305	-0.03305	0.00109			1617.06	1085.98						
1985	33.505	46.720	1.394	0.00585	4.1198	16.9727	49.97501	-3.25501	10.59506			1565.33	1122.56						
1986	35.721	57.470	1.609	0.01902	6.3366	40.1528	53.48741	3.98259	15.86101			2052.91	1276.02						
1987	38.245	54.890	1.435	0.00127	8.8599	78.4977	57.48533	-2.59533	6.73573			2099.25	1462.65						
1988	36.696	63.910	1.742	0.07327	7.3111	53.4521	55.03138	8.87862	78.82985			2345.23	1346.59						
1989	33.355	47.720	1.431	0.00162	3.9703	15.7636	49.73821	-2.01821	4.07317			1591.71	1112.56						
1990	34.402	58.520	1.701	0.05297	5.0172	25.1725	51.39692	7.12308	50.73829			2013.21	1183.5						
1991	36.849	56.420	1.531	0.00362	7.4642	55.7146	55.27400	1.14600	1.31331			2079.02	1357.85						
1992	36.347	47.220	1.299	0.02951	6.9622	48.4726	54.47862	-7.25862	52.68759			1716.31	1321.1						
1993	39.151	59.490	1.520	0.00236	9.7662	95.3791	58.92134	0.56866	0.32337	Std. Err of Ind. Y^	Maximum Day (95%)	2329.09	1532.8						
1994	39.647	58.360	1.472	0.00000	10.2622	105.3132	59.70722	-1.34722	1.81500			2313.8	1571.88						
1995	39.860	63.770	1.600	0.01662	10.4752	109.7303	60.04470	3.72530	13.87786			2541.87	1588.82						
1996	39.082	53.690	1.374	0.00944	9.6972	94.0362	58.81202	-5.12202	26.23508			2098.31	1527.4						
1997	39.532	60.7	1.535	0.00416	10.1476	102.9743	59.52564	1.17436	1.37911			2399.62	1562.81						
1998	40.166	64.67	1.610	0.01937	10.7809	116.2283	60.52906	4.14094	17.14739			2597.52	1613.28						
1999	40.934	61.18	1.495	0.00056	11.5488	133.3753	61.74574	-0.56574	0.32006			2504.32	1675.56						
2000	39.569	66.37	1.677	0.04261	10.1837	103.7082	59.58284	6.78716	46.06552			2626.16	1565.67						
2001	44.580				15.1952	230.8948	67.52318			6.43064	73.954	1.659	4.975	72.499	2.598	70.122	0.000	67.523	
2002	44.540				15.1552	229.6808	67.45980			6.42945	73.889	1.659	4.974	72.434	2.598	70.058	0.000	67.460	
2003	44.710				15.3252	234.8625	67.72915			6.43453	74.164	1.659	4.978	72.708	2.600	70.329	0.000	67.729	
2004	44.700				15.3152	234.5561	67.71331			6.43423	74.148	1.659	4.978	72.691	2.600	70.313	0.000	67.713	
2005	45.110				15.7252	247.2827	68.36292			6.44669	74.810	1.658	4.988	73.351	2.605	70.968	0.000	68.363	
2006	45.440				16.0552	257.7702	68.88578			6.45695	75.343	1.658	4.996	73.881	2.609	71.495	0.000	68.886	
2007	45.700				16.3152	266.1865	69.29773			6.46516	75.763	1.658	5.002	74.300	2.612	71.910	0.000	69.298	
2008	45.950				16.5652	274.4067	69.69384			6.47317	76.167	1.658	5.008	74.702	2.616	72.309	0.000	69.694	
2009	46.190				16.8052	282.4156	70.07410			6.48097	76.555	1.657	5.014	75.088	2.619	72.693	0.000	70.074	
2010	46.320				16.9352	286.8018	70.28007			6.48524	76.765	1.657	5.018	75.298	2.620	72.900	0.000	70.280	
2015	46.970				17.5852	309.2401	71.30995			6.50702	77.817	1.657	5.034	76.344	2.629	73.939	0.000	71.310	
2020	47.840				18.4552	340.5953	72.68840			6.53734	79.226	1.656	5.058	77.746	2.641	75.330	0.000	72.688	
Average	29.385	43.448	1.471	0.553	= sum =	2975.27398			515.52027			1.6579	38377.3						
				0.11759	Std. Dev.														

Degrees of freedom = 39

Exceedance	f(t)	Multiplier	
95 %	1.6849	6.1258	#REF!
90 %	1.3036	4.7395	#REF!
75 %	0.6808	2.4752	#REF!
50 %	0	0.0000	#REF!

Drought of 1988 f(t) = 0.4894 = 98.28% exceedance

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Maximum Exceedance Multiplier Calculations
Maximum Day-Average Day (MGD)

$$b = \frac{\text{Sum}(X*Y) - n*Xbar*Ybar}{\text{Sum}(X^2) - n*Xbar^2} = 1.84634$$

Kentucky-American Water Company
(Revised) 02/14/02

Linear Regression F

coeff. -2.138
coeff. 1.54187
alpha 1.6955
No. of pts. 31

$$a = Ybar - b*Xbar = -12.3042$$

$$Y_{\text{maxfit}}(Y^{\wedge}) = a + (b*X)$$

$$\text{Standard Error (SE)} = \text{SQRT}(\text{Sum}((Y-Y^{\wedge})^2)/(n-2)) = 3.71499$$

Year	"X" Average Day MGD	"Y" Maximum Day MGD	"Y/X" Ratio of Max to Av	Deviation of Ratio	X-Xbar	(X-Xbar)^2	"Y^A"	"Y-Y^A"	(Y-Y^A)^2			"X*Y"	"X^2"							
1970	22.788	34.880	1.531	0.00403	-10.5632	111.5819	29.77087	5.10913	26.10316			794.858	519.309							
1971	22.697	30.500	1.344	0.01521	-10.6545	113.5188	29.60233	0.89767	0.80582			692.261	515.157							
1972	24.170	31.760	1.314	0.02344	-9.1817	84.3036	32.32166	-0.56166	0.31546			767.636	584.184							
1973	26.546	35.410	1.334	0.01775	-6.8051	46.3093	36.70967	-1.29967	1.68915			940.011	704.716							
1974	26.485	34.620	1.307	0.02559	-6.8666	47.1502	36.59611	-1.97611	3.90501			916.91	701.454							
1975	26.956	37.360	1.386	0.00659	-6.3955	40.9018	37.46602	-0.10602	0.01124			1007.08	726.633							
1976	28.143	38.380	1.364	0.01068	-5.2089	27.1330	39.65672	-1.27672	1.63002			1080.11	792.009							
1977	30.323	41.160	1.357	0.01204	-3.0287	9.1731	43.68216	-2.52216	6.36130			1248.09	919.477							
1978	30.847	44.130	1.431	0.00133	-2.5048	6.2743	44.64939	-0.51939	0.26977			1361.27	951.521							
1979	30.654	39.220	1.279	0.03523	-2.6972	7.2748	44.29429	-5.07429	25.74838			1202.27	939.693							
1980	32.024	48.010	1.499	0.00103	-1.3272	1.7615	46.82370	1.18630	1.40731			1537.49	1025.56							
1981	32.006	44.780	1.399	0.00463	-1.3455	1.8104	46.78993	-2.00993	4.03982			1433.23	1024.39							
1982	31.863	46.030	1.445	0.00051	-1.4890	2.2170	46.52507	-0.49507	0.24509			1466.64	1015.23							
1983	32.383	51.090	1.578	0.01223	-0.9691	0.9391	47.48493	3.60507	12.99650			1654.42	1048.63							
1984	32.954	49.070	1.489	0.00048	-0.3974	0.1579	48.54055	0.52945	0.28032			1617.06	1085.98							
1985	33.505	46.720	1.394	0.00528	0.1530	0.0234	49.55664	-2.83664	8.04654			1565.33	1122.56							
1986	35.721	57.470	1.609	0.02008	2.3698	5.6160	53.64968	3.82032	14.59488			2052.91	1276.02							
1987	38.245	54.890	1.435	0.00102	4.8931	23.9422	58.30848	-3.41848	11.68598			2099.25	1462.65							
1988	36.696	63.910	1.742	0.07534	3.3443	11.1842	55.44888	8.46112	71.59062			2345.23	1346.59							
1989	33.355	47.720	1.431	0.00133	0.0035	0.0000	49.28070	-1.56070	2.43580			1591.71	1112.56							
1990	34.402	58.520	1.701	0.05473	1.0504	1.1034	51.21361	7.30639	53.38334			2013.21	1183.5							
1991	36.849	56.420	1.531	0.00409	3.4974	12.2319	55.73160	0.68840	0.47389			2079.02	1357.85							
1992	36.347	47.220	1.299	0.02822	2.9954	8.9725	54.80474	-7.58474	57.52829			1716.31	1321.1							
1993	39.151	59.490	1.520	0.00274	5.7994	33.6332	59.98188	-0.49188	0.24194	Std. Err of Ind. Y^A	Maximum Day (95%)	2329.09	1532.8							
1994	39.647	58.360	1.472	0.00002	6.2954	39.6322	60.89766	-2.53766	6.43973			2313.8	1571.88							
1995	39.860	63.770	1.600	0.01761	6.5084	42.3594	61.29093	2.47907	6.14577			2541.87	1588.82							
1996	39.082	53.690	1.374	0.00871	5.7304	32.8376	59.85448	-6.16448	38.00082			2098.31	1527.4							
1997	39.532	60.7	1.535	0.00467	6.1808	38.2024	60.68607	0.01393	0.00019			2399.62	1562.81							
1998	40.166	64.67	1.610	0.02044	6.8141	46.4321	61.85536	2.81464	7.92220			2597.52	1613.28							
1999	40.934	61.18	1.495	0.00076	7.5820	57.4869	63.27316	-2.09316	4.38133			2504.32	1675.56							
2000	39.569	66.37	1.677	0.04419	6.2169	38.6500	60.75272	5.61728	31.55378			2626.16	1565.67							
2001	44.580				11.2284	126.0772	70.00566					6.40177	76.407	1.7139	4.9410	74.9467	2.5734	72.579	0.000	70.006
2002	44.540				11.1884	125.1805	69.93180					6.40185	76.334	1.7138	4.9411	74.8729	2.5734	72.505	0.000	69.932
2003	44.710				11.3584	129.0135	70.24568			6.40151	76.647	1.7143	4.9408	75.1865	2.5733	72.819	0.000	70.246		
2004	44.700				11.3484	128.7864	70.22722			6.40153	76.629	1.7143	4.9408	75.1680	2.5733	72.800	0.000	70.227		
2005	45.110				11.7584	138.2602	70.98422			6.40067	77.385	1.7155	4.9402	75.9244	2.5729	73.557	0.000	70.984		
2006	45.440				12.0884	146.1297	71.59351			6.39996	77.993	1.7164	4.9396	76.5331	2.5726	74.166	0.000	71.594		
2007	45.700				12.3484	152.4833	72.07356			6.39939	78.473	1.7171	4.9392	77.0127	2.5724	74.646	0.000	72.074		
2008	45.950				12.5984	158.7200	72.53514			6.39883	78.934	1.7178	4.9387	77.4739	2.5722	75.107	0.000	72.535		
2009	46.190				12.8384	164.8248	72.97826			6.39828	79.377	1.7185	4.9383	77.9166	2.5720	75.550	0.000	72.978		
2010	46.320				12.9684	168.1797	73.21829			6.39797	79.616	1.7188	4.9381	78.1564	2.5718	75.790	0.000	73.218		
2015	46.970				13.6184	185.4611	74.41841			6.39641	80.815	1.7206	4.9369	79.3553	2.5712	76.990	0.000	74.418		
2020	47.840				14.4884	209.9141	76.02473			6.39420	82.419	1.7228	4.9352	80.9599	2.5703	78.595	0.000	76.025		
Average	33.352	49.274	1.467	0.460	= sum =	892.81412			400.23347			1.71699								
				0.12383																
					Std. Dev.															

degrees of freedom = 29

Exceedance	f(t)	Multiplier	
95 %	1.6991	6.3121	#REF!
90 %	1.3114	4.8718	#REF!
75 %	0.683	2.5373	#REF!
50 %	0	0.0000	#REF!

f(t) taken from Normal Distribution Table

Drought of 1988 f(t) = 0.5967 = 98.28% exceedance

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 Maximum Exceedance Multiplier Calculations
 Maximum Day-Average Day (MGD)

Kentucky-American Water Company
 (Revised) 02/14/02

Linear Regression F

coeff. -2.138
 coeff. 1.54187
 alpha 1.7207
 No. of pts. 21

b = $\frac{\text{Sum}(X*Y) - n*\bar{X}\bar{Y}}{\text{Sum}(X^2) - n*\bar{X}^2} = 1.76674$

a = $\bar{Y} - b*\bar{X} = -9.05807$

Ymaxfit (Y^) = a + (b*X)

Standard Error (SE) = $\text{SQRT}(\text{Sum}((Y-Y^)^2)/(n-2)) = 4.16463$

Year	"X" Average Day MGD	"Y" Maximum Day MGD	"Y/X" Ratio of Max to Av	Deviation of Ratio	X-Xbar	(X-Xbar)^2	"Y^"	"Y-Y^"	(Y-Y^)^2			"X*Y"	"X^2"
1980	32.024	48.010	1.499	0.00028	-4.3704	19.1002	47.52060	0.48940	0.23951			1537.49	1025.56
1981	32.006	44.780	1.399	0.01365	-4.3887	19.2604	47.48829	-2.70829	7.33482			1433.23	1024.39
1982	31.863	46.030	1.445	0.00508	-4.5321	20.5401	47.23485	-1.20485	1.45165			1466.64	1015.23
1983	32.383	51.090	1.578	0.00382	-4.0122	16.0981	48.15333	2.93667	8.62405			1654.42	1048.63
1984	32.954	49.070	1.489	0.00072	-3.4405	11.8371	49.16343	-0.09343	0.00873			1617.06	1085.98
1985	33.505	46.720	1.394	0.01476	-2.8902	8.3531	50.13572	-3.41572	11.66713			1565.33	1122.56
1986	35.721	57.470	1.609	0.00863	-0.6733	0.4534	54.05229	3.41771	11.68077			2052.91	1276.02
1987	38.245	54.890	1.435	0.00651	1.8499	3.4222	58.51023	-3.62023	13.10606			2099.25	1462.65
1988	36.696	63.910	1.742	0.05094	0.3011	0.0907	55.77392	8.13608	66.19586			2345.23	1346.59
1989	33.355	47.720	1.431	0.00727	-3.0396	9.2394	49.87168	-2.15168	4.62971			1591.71	1112.56
1990	34.402	58.520	1.701	0.03428	-1.9927	3.9710	51.72125	6.79875	46.22305			2013.21	1183.5
1991	36.849	56.420	1.531	0.00023	0.4543	0.2063	56.04445	0.37555	0.14103			2079.02	1357.85
1992	36.347	47.220	1.299	0.04699	-0.0477	0.0023	55.15755	-7.93755	63.00473			1716.31	1321.1
1993	39.151	59.490	1.520	0.00001	2.7563	7.5969	60.11148	-0.62148	0.38624	Std. Err of Ind. Y^	Maximum Day (95%)	2329.09	1532.8
1994	39.647	58.360	1.472	0.00193	3.2523	10.5772	60.98779	-2.62779	6.90526			2313.8	1571.88
1995	39.860	63.770	1.600	0.00704	3.4653	12.0080	61.36410	2.40590	5.78835			2541.87	1588.82
1996	39.082	53.690	1.374	0.02021	2.6873	7.2213	59.98958	-6.29958	39.68471			2098.31	1527.4
1997	39.532	60.7	1.535	0.00038	3.1377	9.8449	60.78532	-0.08532	0.00728			2399.62	1562.81
1998	40.166	64.67	1.610	0.00887	3.7710	14.2201	61.90419	2.76581	7.64968			2597.52	1613.28
1999	40.934	61.18	1.495	0.00045	4.5389	20.6012	63.26087	-2.08087	4.33003			2504.32	1675.56
2000	39.569	66.37	1.677	0.02606	3.1738	10.0727	60.84910	5.52090	30.48036			2626.16	1565.67
2001	44.580				8.1853	66.9984	69.70310			7.3620	77.065	1.729	5.653
2002	44.540				8.1453	66.3452	69.63244			7.3621	76.995	1.729	5.653
2003	44.710				8.3153	69.1435	69.93278			7.3618	77.295	1.729	5.653
2004	44.700				8.3053	68.9773	69.91511			7.3618	77.277	1.729	5.653
2005	45.110				8.7153	75.9557	70.63948			7.3609	78.000	1.729	5.652
2006	45.440				9.0453	81.8166	71.22250			7.3602	78.583	1.729	5.652
2007	45.700				9.3053	86.5878	71.68185			7.3596	79.041	1.730	5.651
2008	45.950				9.5553	91.3029	72.12354			7.3590	79.483	1.730	5.651
2009	46.190				9.7953	95.9470	72.54755			7.3584	79.906	1.730	5.650
2010	46.320				9.9253	98.5107	72.77723			7.3581	80.135	1.730	5.650
2015	46.970				10.5753	111.8360	73.92561			7.3564	81.282	1.731	5.649
2020	47.840				11.4453	130.9939	75.46267			7.35394	82.817	1.731	5.647
Average	36.395	55.242	1.516	0.258									
				0.11360	Std. Dev.	204.71651			329.53902			1.72953	

Degrees of freedom = 19

Exceedance f(t) Multiplier

95 % 1.7291 7.2011 #REF! 95.41 %

90 % 1.3277 5.5294 #REF!

75 % 0.6876 2.8636 #REF!

50 % 0 0.0000 #REF!

f(t) taken from Normal Distribution Table

Drought of 1988 f(t) = 0.8744 = 98.28% exceedance

95% Pred. Int. = Ymaxfit +/- t(alpha) * SEY

75.356	2.928	72.631	0.000	69.703
75.285	2.928	72.560	0.000	69.632
75.586	2.928	72.860	0.000	69.933
75.568	2.928	72.843	0.000	69.915
76.292	2.927	73.567	0.000	70.639
76.874	2.927	74.149	0.000	71.222
77.333	2.927	74.608	0.000	71.682
77.774	2.926	75.050	0.000	72.124
78.198	2.926	75.474	0.000	72.548
78.427	2.926	75.703	0.000	72.777
79.574	2.925	76.851	0.000	73.926
81.109	2.924	78.387	0.000	75.463

Prediction Interval Maximum Day Calculations, Linear Regression Analysis
Unaccounted-For Water Levels Disaggregated from Max Day Factor

$$b = \frac{\text{Sum}(X*Y) - n*Xbar*Ybar}{\text{Sum}(X^2) - n*Xbar^2} = 1.6566172 \quad t(\alpha) = 2.0452$$

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$$a = Ybar - b*Xbar = -2.9987117$$

$$Y_{\text{maxfit}}(Y^{\wedge}) = a + (b*X)$$

$$\text{Standard Error (SE)} = \text{SQRT}(\text{Sum}((Y-Y^{\wedge})^2)/(n-2)) = 3.37778741$$

Year	"X" Avrg Day Sys. Del. MGD	"Y" Max Day Sys. Del. MGD	Max Day Ratio	Unacct. For %	Unacct. For MGD	Avrg Day Water Sales MGD	Max Day Water Sales MGD	Max Day Adjusted Ratio	"X*Y"	"X^2"	X-Xbar	(X-Xbar)^2	"Y^A"	"Y-Y^A"	"(Y-Y^A)^2"	"SEY"	"95%" PI	
1960	12.988	19.322	1.488	0.096	1.246	11.742	18.076	1.539	212.241	137.864	-12.2032	148.9183	16.4526	1.6235	2.6356			
1961	13.551	19.619	1.448	0.130	1.757	11.794	17.862	1.515	210.666	139.095	-12.1509	147.6444	16.5392	1.3231	1.7506			
1962	14.283	20.209	1.415	0.113	1.614	12.668	18.595	1.468	235.566	160.489	-11.2764	127.1564	17.9880	0.6067	0.3681			
1963	15.275	20.282	1.328	0.100	1.528	13.747	18.754	1.364	257.814	188.981	-10.1977	103.9936	19.7749	-1.0208	1.0420			
1964	16.863	25.500	1.512	0.083	1.408	15.456	24.092	1.559	372.366	238.879	-8.4891	72.0643	22.6055	1.4870	2.2111			
1965	17.649	29.354	1.663	0.076	1.341	16.309	28.013	1.718	456.865	265.976	-7.6360	58.3088	24.0187	3.9948	15.9587			
1966	18.839	30.726	1.631	0.091	1.718	17.121	29.008	1.694	496.627	293.115	-6.8242	46.5695	25.3636	3.6440	13.2790			
1967	19.266	28.629	1.486	0.095	1.826	17.439	26.803	1.537	467.417	304.129	-6.5055	42.3212	25.8915	0.9110	0.8299			
1968	20.106	28.767	1.431	0.107	2.156	17.950	26.611	1.483	477.666	322.200	-5.9948	35.9380	26.7375	-0.1264	0.0160			
1969	22.058	31.440	1.425	0.123	2.706	19.351	28.734	1.485	556.041	374.479	-4.5933	21.0985	29.0593	-0.3255	0.1059			
1970	22.788	34.880	1.531	0.105	2.390	20.398	32.490	1.593	662.738	416.089	-3.5465	12.5777	30.7934	1.6965	2.8781			
1971	22.697	30.500	1.344	0.082	1.870	20.827	28.630	1.375	596.295	433.780	-3.1174	9.7181	31.5043	-2.8740	8.2598			
1972	24.170	31.760	1.314	0.115	2.786	21.384	28.974	1.355	619.565	457.261	-2.5611	6.5593	32.4258	-3.4521	11.9167			
1973	26.546	35.410	1.334	0.127	3.367	23.179	32.043	1.382	742.733	537.282	-0.7654	0.5859	35.4006	-3.3577	11.2744			
1974	26.485	34.620	1.307	0.140	3.698	22.787	30.922	1.357	704.634	519.259	-1.1575	1.3399	34.7510	-3.8288	14.6595			
1975	26.956	37.360	1.386	0.135	3.641	23.315	33.719	1.446	786.167	543.599	-0.6296	0.3963	35.6257	-1.9066	3.6351			
1976	28.143	38.380	1.364	0.148	4.158	23.985	34.222	1.427	820.801	575.262	0.0398	0.0016	36.7346	-2.5126	6.3134			
1977	30.323	41.160	1.357	0.161	4.868	25.455	36.292	1.426	923.833	647.971	1.5105	2.2816	39.1709	-2.8785	8.2860			
1978	30.847	44.130	1.431	0.162	4.989	25.858	39.141	1.514	1012.088	668.615	1.9128	3.6588	39.8374	-0.6966	0.4852			
1979	30.654	39.220	1.279	0.149	4.579	26.075	34.641	1.328	903.281	679.929	2.1307	4.5398	40.1983	-5.5573	30.8834			
1980	32.024	48.010	1.499	0.141	4.516	27.508	43.494	1.581	1196.414	756.683	3.5631	12.6957	42.5713	0.9222	0.8504			
1981	32.006	44.780	1.399	0.126	4.033	27.973	40.747	1.457	1139.801	782.478	4.0280	16.2251	43.3415	-2.5948	6.7330			
1982	31.863	46.030	1.445	0.129	4.120	27.743	41.910	1.511	1162.718	769.673	3.7982	14.4264	42.9608	-1.0504	1.1034			
1983	32.383	51.090	1.578	0.139	4.491	27.891	46.599	1.671	1299.683	777.911	3.9463	15.5731	43.2061	3.3925	11.5088			
1984	32.954	49.070	1.489	0.146	4.818	28.136	44.252	1.573	1245.079	791.643	4.1914	17.5677	43.6121	0.6398	0.4093			
1985	33.505	46.720	1.394	0.159	5.313	28.192	41.407	1.469	1167.334	794.769	4.2469	18.0359	43.7041	-2.2970	5.2761			
1986	35.721	57.470	1.609	0.154	5.513	30.209	51.957	1.720	1569.548	912.555	6.2637	39.2345	47.0452	4.9119	24.1265			
1987	38.245	54.890	1.435	0.158	6.053	32.191	48.837	1.517	1572.106	1036.273	8.2464	68.0033	50.3298	-1.4932	2.2298			
1988	36.696	63.910	1.742	0.130	4.775	31.921	59.135	1.853	1887.629	1018.934	7.9760	63.6161	49.8817	9.2531	85.6204			
1989	33.355	47.720	1.431	0.114	3.804	29.551	43.916	1.486	1297.766	873.268	5.6063	31.4310	45.9562	-2.0402	4.1623			
1990	34.402	58.520	1.701	0.107	3.698	30.704	54.822	1.786	1683.254	942.735	6.7592	45.6869	47.8660	6.9559	48.3852			
1991	36.849	56.420	1.531	0.146	5.374	31.475	51.046	1.622	1606.693	990.691	7.5305	56.7080	49.1437	1.9025	3.6196			
1992	36.347	47.220	1.299	0.148	5.376	30.971	41.844	1.351	1295.973	959.222	7.0265	49.3722	48.3089	-6.4646	41.7908			
1993	39.151	59.490	1.520	0.165	6.450	32.701	53.040	1.622	1734.462	1069.356	8.7562	76.6716	51.1743	1.8657	3.4807			
1994	39.647	58.360	1.472	0.141	5.586	34.061	52.774	1.549	1797.514	1160.135	10.1160	102.3332	53.4269	-0.6532	0.4266			
1995	39.860	63.770	1.600															
1996																		
						23.945	36.669	1.524										
1995	39.440			0.13	5.127	34.313					10.3680	107.4959	53.8445			3.5451	61.0950	66.2222
1996	39.600			0.13	5.148	34.452					10.5072	110.4018	54.0751			3.5483	61.3320	66.4800
1997	39.750			0.13	5.168	34.583					10.6377	113.1612	54.2913			3.5513	61.5544	66.7219
1998	39.890			0.13	5.186	34.704					10.7595	115.7674	54.4930			3.5541	61.7620	66.9477
1999	40.020			0.13	5.203	34.817					10.8726	118.2140	54.6804			3.5568	61.9548	67.1574
2000	40.150			0.13	5.220	34.931					10.9857	120.6861	54.8678			3.5595	62.1477	67.3672
2005	40.400			0.13	5.252	35.148					11.2032	125.5122	55.2281			3.5648	62.5187	67.7707
2010	40.650			0.13	5.285	35.366					11.4207	130.4329	55.5884			3.5701	62.8899	68.1744
2015	41.360			0.13	5.377	35.983					12.0384	144.9237	56.6117			3.5858	63.9453	69.3221
2020	41.510			0.13	5.396	36.114					12.1689	148.0827	56.8279			3.5892	64.1685	69.5648
Average	27.590	40.313																

$$\text{Standard Error of } = \text{SE*SQRT} \frac{1+1/N+}{\text{of Ind. Est. (SEY)} \quad \text{Sum}(X-Xbar)^2}$$

$$95\% \text{ Pred. Int. } = Y_{\text{maxfit}} \pm t(\alpha) * \text{SEY}$$

Maximum Exceedance Multiplier Calculations
Maximum Day-Average Day (MGD)

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Year	Average Day MGD	Maximum Day MGD	Ratio of Max to Avg					
1960	12.988	19.322	1.488	0.00093				
1961	13.551	19.619	1.448	0.00009				
1962	14.283	20.209	1.415	0.00179				
1963	15.275	20.282	1.328	0.01675				
1964	16.863	25.500	1.512	0.00302				
1965	17.649	29.354	1.663	0.04242				
1966	18.839	30.726	1.631	0.03019				
1967	19.266	28.629	1.486	0.00083				
1968	20.106	28.767	1.431	0.00070				
1969	22.058	31.440	1.425	0.00102				
1970	22.788	34.880	1.531	0.00538				
1971	22.697	30.500	1.344	0.01287				
1972	24.170	31.760	1.314	0.02051				
1973	26.546	35.410	1.334	0.01521				
1974	26.485	34.620	1.307	0.02252				
1975	26.956	37.360	1.386	0.00508				
1976	28.143	38.380	1.364	0.00874				
1977	30.323	41.160	1.357	0.00997				
1978	30.847	44.130	1.431	0.00071				
1979	30.654	39.220	1.279	0.03161	1.519			
1980	32.024	48.010	1.499	0.00176	0.00039	1.386075	1.5748	
1981	32.006	44.780	1.399	0.00338	0.01435	1.393143	1.5819	
1982	31.863	46.030	1.445	0.00016	0.00551	1.410593	1.5994	
1983	32.383	51.090	1.578	0.01451	0.00346	1.440009	1.6288	
1984	32.954	49.070	1.489	0.00101	0.00089	1.481931	1.6707	
1985	33.505	46.720	1.394	0.00394	0.01549	1.460985	1.6497	
1986	35.721	57.470	1.609	0.02299	0.00809	1.502931	1.6917	
1987	38.245	54.890	1.435	0.00048	0.00700	1.501049	1.6898	
1988	36.696	63.910	1.742	0.08087	0.04960	1.533831	1.7226	
1989	33.355	47.720	1.431	0.00071	0.00778	1.522157	1.7109	
1990	34.402	58.050	1.687	0.05298	0.02839	0.113 1.58075	1.7695	
1991	36.849	56.420	1.531	0.00546				
1992	36.347	47.220	1.299	0.02499				
1993	39.151	59.490	1.520	0.00388				
1994	39.647	58.360	1.472	0.00022				
Mean			1.457	0.115	Standard Dev.			

Exceedance	f(t)	Multiplier			
95 %	1.645	1.6460	1.7051	1.9674	95.41 %
90 %	1.2817	1.6043	1.6640		
75 %	0.6745	1.5346	1.5953		
50 %	0	1.4572	1.5189		

f(t) taken from Normal Distribution Table

Drought of 1988 f(t) = 2.4784 = 98.28% exceedance

KAW_R_AGKYDR1#1d_SCH4_021402 STDDEV

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