

Table 1. D-1641 Flow Requirements at Vernalis

Compliance Location	Description Unit	Water Year Type	Time Period	Value
Vernalis	Minimum monthly average ⁽¹³⁾ flow rate (cfs) ⁽¹⁴⁾	W, AN	Feb - Apr 14 and May 16 - Jun	2,130 or 3,420
		BN, D		1,420 or 2,280
		C		710 or 1,140
Vernalis		W	Apr 15 - May 15 ⁽¹⁵⁾	7,330 or 8,620
		AN		5,730 or 7,020
		BN		4,620 or 5,480
		D		4,020 or 4,880
		C		3,110 or 3,540
Vernalis		All	Oct	1,000 ⁽¹⁶⁾

⁽¹³⁾ Partial months are averaged for that period. For example, the flow rate for April 1-14 would be averaged over 14 days. The 7-day running average shall not be less than 20% below the flow rate objective, with the exception of the April 15-May 15 pulse flow period when this restriction does not apply.

⁽¹⁴⁾ The water year classification will be established using the best available estimate of the 60-20-20 San Joaquin Valley Water Year Hydrologic Classification (see Figure 3) at the 75% exceedance level. The higher flow objective applies when the 2-ppt isohaline (measured as 2.64 mmhos/cm surface salinity) is required to be at or west of Chipps Island.

⁽¹⁵⁾ This time period may be varied based on real-time monitoring. One pulse, or two separate pulses of combined duration equal to the single pulse, should be scheduled to coincide with fish migration in San Joaquin River tributaries and the Delta. The USBR will schedule the time period of the pulse or pulses in consultation with the USFWS, the NOAA Fisheries, and the DFG. Consultation with the CALFED Operations Group established under the Framework Agreement will satisfy the consultation requirement. The schedule is subject to the approval of the Executive Director of the State Water Board.

⁽¹⁶⁾ Plus up to an additional 28 TAF pulse/attraction flow during all water year types. The amount of additional water will be limited to that amount necessary to provide a monthly average flow of 2,000 cfs. The additional 28 TAF is not required in a critical year following a critical year. The pulse flow will be scheduled by the DWR and the USBR in consultation with the USFWS, the NOAA Fisheries and the DFG. Consultation with the CALFED Operations Group established under the Framework Agreement will satisfy the consultation requirement.

Table 2 (excerpt) February - March, 1922 - 1966

WY	(2)		(4)		(7)		(9)		(11)		(14)		(16)	
	60-20-20 Classification		XZVERNMIN_REQDV - CFS		C639 - CFS		C10Mn - AF		XZVERNMIN_REQDV - CFS		C639 - CFS		C10Mn - AF	
	NAA	DCR15	Feb NAA	Feb DCR15	Feb NAA	Feb DCR15	Feb NAA	Feb DCR15	Mar NAA	Mar DCR15	Mar NAA	Mar DCR15	Mar NAA	Mar DCR15
1922	5	5	3,420	3,420	5,992	5,451	0	0	3,420	3,420	8,156	7,447	0	0
1923	4	4	3,420	3,420	4,469	5,266	0	0	3,254	3,254	5,374	5,265	0	0
1924	1	1	784	784	1,937	1,937	0	0	1,043	1,043	1,663	1,664	0	0
1925	3	3	2,034	2,034	2,704	2,704	0	0	2,280	2,280	2,361	2,361	0	0
1926	1	2	833	1,666	2,053	2,053	0	0	1,140	2,280	1,887	2,280	0	23,355
1927	4	4	3,420	3,420	3,798	3,894	0	0	3,420	3,420	3,420	3,420	22,987	23,001
1928	2	3	2,250	2,250	2,477	2,778	0	0	2,280	2,280	3,152	7,298	0	0
1929	1	1	802	802	1,983	1,983	0	0	1,001	1,001	1,656	1,818	0	0
1930	1	1	1,140	1,140	1,814	1,972	0	0	1,140	1,140	1,876	1,879	0	0
1931	1	1	848	848	1,879	1,880	0	0	738	738	1,499	1,502	0	0
1932	4	4	3,376	3,376	4,683	4,658	0	0	3,420	3,420	3,420	3,420	39,048	43,644
1933	1	2	818	1,635	2,141	1,953	0	0	724	1,448	1,913	1,919	0	0
1934	1	1	1,140	1,140	2,022	2,022	0	0	1,140	1,140	1,703	1,704	0	0
1935	4	4	3,420	3,420	2,577	2,847	16,023	30,999	3,420	3,420	3,420	3,420	32,798	32,798
1936	4	4	3,376	3,376	11,887	11,696	0	0	3,420	3,420	4,374	4,145	0	0
1937	4	5	2,360	2,360	16,291	14,901	0	0	3,420	3,420	11,068	10,299	0	0
1938	5	5	3,420	3,420	26,434	22,902	0	0	3,420	3,420	31,079	29,038	0	0
1939	2	2	1,696	1,696	2,596	2,520	0	0	1,503	1,503	2,620	3,148	0	0
1940	4	4	3,376	3,376	3,961	3,886	0	0	3,420	3,420	9,765	9,214	0	0
1941	5	5	3,420	3,420	17,774	14,796	0	0	3,420	3,420	13,145	12,461	0	0
1942	5	5	3,420	3,420	8,494	7,563	0	0	3,420	3,420	8,403	7,629	0	0
1943	4	5	3,420	3,420	9,338	9,219	0	0	3,420	3,420	20,824	20,089	0	0
1944	3	3	1,687	1,687	2,979	3,022	0	0	2,280	2,280	3,237	3,818	0	0
1945	4	4	3,420	3,420	11,403	11,192	0	0	3,420	3,420	7,333	7,314	0	0
1946	4	4	3,420	3,420	4,236	4,169	0	0	3,420	3,420	4,738	6,073	0	0
1947	1	2	802	1,604	2,640	2,783	0	0	1,140	2,280	1,866	2,280	0	24,545
1948	2	3	2,250	2,250	2,250	2,250	26,303	26,254	1,475	1,475	1,671	1,671	0	0
1949	2	3	1,574	1,574	2,015	2,015	0	0	1,642	1,642	2,457	2,457	0	0
1950	2	3	2,280	2,280	2,293	2,293	0	0	2,280	2,280	2,280	2,280	11,591	11,568
1951	3	4	2,280	3,420	6,679	6,901	0	0	2,280	3,420	5,888	5,864	0	0
1952	5	5	3,376	3,376	8,322	7,478	0	0	3,420	3,420	14,310	14,006	0	0
1953	3	3	2,280	2,280	4,141	4,014	0	0	2,280	2,280	4,902	4,902	0	0
1954	3	3	2,280	2,280	2,280	2,280	14,562	14,560	2,280	2,280	2,280	2,280	13,933	11,959
1955	1	2	1,140	2,280	1,951	2,280	0	18,276	849	1,697	1,823	1,827	0	0
1956	5	5	3,376	3,376	12,456	11,575	0	0	3,420	3,420	7,942	7,724	0	0
1957	3	3	1,696	1,696	2,094	2,094	0	0	2,280	2,280	2,904	3,337	0	0
1958	5	5	3,420	3,420	3,540	3,684	0	0	3,420	3,420	10,054	11,914	0	0
1959	2	2	2,280	2,280	2,836	3,105	0	0	2,280	2,280	2,653	2,851	0	0
1960	1	1	918	918	2,276	2,276	0	0	1,140	1,140	1,690	1,690	0	0
1961	1	1	864	864	1,830	1,830	0	0	1,140	1,140	1,560	1,560	0	0
1962	3	3	1,696	1,696	5,142	5,157	0	0	2,280	2,280	3,609	3,609	0	0
1963	4	4	3,420	3,420	3,460	3,420	0	17,066	3,420	3,420	3,420	3,420	62,312	62,305
1964	1	2	1,125	2,250	2,005	2,250	0	12,696	890	1,781	1,719	1,781	0	3,045
1965	4	5	3,420	3,420	7,831	6,906	0	0	3,420	3,420	4,703	4,670	0	0
1966	2	3	2,280	2,280	3,861	3,940	0	0	2,280	2,280	3,817	3,761	0	0

Table 2 (excerpt) February - March, 1967 - 2003

(1)	(2)	(3)	(4)	(5)	(7)	(8)	(9)	(10)	(11)	(12)	(14)	(15)	(16)	(17)
60-20-20 Classification			X2VERNMIN_REQDV - CFS		C639 - CFS		C10Mn - AF		X2VERNMIN_REQDV - CFS		C639 - CFS		C10Min - AF	
WY	NAA 602020	DCR15 602020	Feb NAA	Feb DCR15	Feb NAA	Feb DCR15	Feb NAA	Feb DCR15	Mar NAA	Mar DCR15	Mar NAA	Mar DCR15	Mar NAA	Mar DCR15
1967	5	5	3,420	3,420	3,420	3,420	45,281	45,620	3,420	3,420	8,379	9,595	0	0
1968	2	2	2,250	2,250	2,250	2,343	6,118	0	2,280	2,280	2,851	3,160	0	0
1969	5	5	3,420	3,420	29,832	26,948	0	0	3,420	3,420	22,386	21,204	0	0
1970	4	4	3,420	3,420	8,546	8,137	0	0	3,420	3,420	8,410	7,984	0	0
1971	3	3	2,280	2,280	2,541	2,682	0	0	2,280	2,280	2,372	5,104	0	0
1972	1	2	1,125	2,250	1,964	2,250	0	8,734	1,140	2,280	1,610	2,280	0	40,302
1973	4	4	3,420	3,420	4,693	4,844	0	0	3,420	3,420	5,828	7,744	0	0
1974	4	5	3,420	3,420	4,046	3,956	0	0	3,420	3,420	6,641	8,325	0	0
1975	4	5	3,420	3,420	5,913	5,700	0	0	3,420	3,420	7,725	8,791	0	0
1976	1	1	799	799	2,223	2,231	0	0	793	793	1,788	1,788	0	0
1977	1	1	771	771	1,606	1,606	0	0	724	724	1,172	1,174	0	0
1978	5	5	3,420	3,420	9,041	7,759	0	0	3,420	3,420	9,069	8,644	0	0
1979	4	4	3,420	3,420	5,862	6,740	0	0	3,420	3,420	9,259	9,019	0	0
1980	5	5	3,376	3,376	23,048	20,136	0	0	3,420	3,420	18,057	16,781	0	0
1981	2	2	2,280	2,280	2,280	2,280	513	491	2,280	2,280	3,108	3,516	0	0
1982	5	5	3,420	3,420	15,051	13,860	0	0	3,420	3,420	15,635	14,140	0	0
1983	5	5	3,420	3,420	38,202	34,941	0	0	3,420	3,420	50,754	48,254	0	0
1984	5	4	3,376	3,376	10,746	9,968	0	0	3,420	3,420	8,287	7,560	0	0
1985	2	2	1,727	1,727	2,845	2,841	0	0	2,197	2,197	3,029	3,523	0	0
1986	5	5	3,420	3,420	25,327	19,783	0	0	3,420	3,420	29,322	26,146	0	0
1987	1	1	848	848	2,022	2,022	0	0	1,140	1,140	2,470	2,470	0	0
1988	1	1	1,125	1,125	1,732	1,732	0	0	890	890	1,335	1,338	0	0
1989	1	1	864	864	1,801	1,802	0	0	863	863	1,636	1,636	0	0
1990	1	1	1,140	1,140	1,823	1,824	0	0	807	807	1,270	1,270	0	0
1991	1	1	741	741	1,621	1,621	0	0	724	724	2,362	2,362	0	0
1992	1	1	784	784	2,479	2,479	0	0	1,140	1,140	1,877	1,698	0	0
1993	4	5	3,420	3,420	3,913	3,625	0	0	3,420	3,420	3,548	3,420	0	19,190
1994	1	1	833	833	1,984	1,985	0	0	1,112	1,112	1,455	1,455	0	0
1995	5	5	3,420	3,420	4,332	4,287	0	0	3,420	3,420	19,510	17,381	0	0
1996	5	5	3,376	3,376	12,546	11,517	0	0	3,420	3,420	11,090	10,360	0	0
1997	5	5	3,420	3,420	26,499	22,206	0	0	3,420	3,420	14,510	10,304	0	0
1998	5	5	3,420	3,420	28,354	23,649	0	0	3,420	3,420	16,475	14,659	0	0
1999	4	4	3,420	3,420	11,765	11,191	0	0	3,420	3,420	7,000	6,825	0	0
2000	4	4	3,376	3,376	10,423	11,245	0	0	3,420	3,420	9,884	8,862	0	0
2001	1	2	910	1,819	2,253	2,253	0	0	1,140	2,280	2,833	3,109	0	0
2002	1	2	1,140	2,280	1,865	2,280	0	23,029	1,140	2,280	1,888	2,280	0	23,865
2003	3	3	2,280	2,280	2,280	2,280	26,314	26,322	2,280	2,280	2,280	2,280	31,580	31,578
	5	W	3,408	3,368	16,285	12,761	2,383	1,901	3,420	3,420	16,661	14,303	0	800
	4	AN	3,358	3,406	6,955	6,878	801	3,004	3,412	3,410	7,008	6,222	7,857	10,109
	3	BN	2,057	2,067	3,427	2,885	4,542	5,164	2,280	2,169	3,315	3,474	5,057	4,239
	2	D	2,087	2,001	2,570	2,399	3,293	4,864	2,050	2,067	2,764	2,612	1,159	8,855
	1	C	929	900	1,996	1,950	0	0	987	971	1,773	1,688	0	0
	Average		2,361	2,471	6,743	6,295	1,648	2,732	2,414	2,527	6,789	6,695	2,613	4,282

Each simulation rank averaged based on its own 602020 designation

Table 3. Modeled Vernalis Flows and D-1641 Pulse Flow Requirements

Table with columns for classification (1)-(3), simulation rank (19)-(24), computed requirement (25)-(29), deficit-af (30)-(31), computed requirement (32)-(33), deficit-af (34)-(35), and simulation rank (36)-(45). Rows include simulation numbers and flow values for various years and months.

Each simulation rank averaged based on its own 602020 designation.

Table 3 (excerpt). April, 1922 - 1966

(1)	(2)	(3)	(18)	(19)	(21)	(22)	(23)	(24)	(25)	(26)	(28)	(29)	(30)	(31)
60-20-20 Classification			X2VERNMIN_REQDV - CFS		C639_NP_DV - CFS		C10Min - AF		Computed Requirement		C639_P_DV - CFS		Deficit - AF	
WY	NAA	DCR15	Apr 1-14		Apr 1-14		Apr 1-14		Apr 15-30		Apr 15-30		Apr 15-30	
	602020	602020	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15
1922	5	5	3,334	3,334	8,029	7,922	0	0	8,513	8,513	7,627	7,520	28,118	31,532
1923	4	4	2,689	2,689	7,327	7,036	0	0	6,147	6,147	6,926	6,635	0	0
1924	1	1	710	710	1,423	1,425	0	0	3,110	3,110	2,103	2,105	31,949	31,897
1925	3	3	2,165	2,165	4,429	4,429	0	0	5,400	5,400	6,566	6,567	0	0
1926	1	2	997	1,993	2,802	2,881	0	0	3,540	4,433	4,013	4,091	0	10,852
1927	4	4	3,420	3,420	3,420	4,332	1,623	0	7,020	7,020	5,323	5,947	53,847	34,042
1928	2	3	2,280	2,280	3,782	4,719	0	0	4,880	5,480	4,282	5,219	18,963	8,271
1929	1	1	810	810	1,615	1,666	0	0	3,540	3,540	2,481	2,512	33,622	32,639
1930	1	1	1,126	1,126	1,450	1,505	0	0	3,540	3,540	2,297	2,325	39,458	38,565
1931	1	1	782	782	1,322	1,342	0	0	3,540	3,540	1,665	1,666	59,518	59,480
1932	4	4	3,377	3,377	3,377	3,377	36,959	38,764	6,969	6,969	3,931	3,902	96,403	97,310
1933	1	2	1,040	2,079	1,555	2,079	0	13,084	3,540	4,567	2,344	2,409	37,965	68,507
1934	1	1	1,040	1,040	1,212	1,047	0	0	3,540	3,540	1,649	1,652	60,009	59,928
1935	4	4	3,248	3,248	4,425	4,463	0	0	6,815	6,815	6,374	6,412	13,974	12,777
1936	4	4	3,377	3,377	5,164	5,462	0	0	6,969	6,969	7,126	6,324	0	20,456
1937	4	5	3,420	3,420	9,304	9,121	0	0	7,020	8,620	9,804	9,621	0	0
1938	5	5	3,420	3,420	20,797	18,734	0	0	8,620	8,620	19,279	18,332	0	0
1939	2	2	2,079	2,079	3,356	3,536	0	0	4,679	4,679	3,655	3,690	32,495	31,397
1940	4	4	3,420	3,420	8,925	8,607	0	0	7,020	7,020	9,079	8,205	0	0
1941	5	5	3,420	3,420	9,924	10,245	0	0	8,620	8,620	9,522	9,844	0	0
1942	5	5	3,291	3,291	9,705	8,783	0	0	8,460	8,460	8,187	8,381	8,655	2,505
1943	4	5	3,420	3,420	11,013	9,822	0	0	7,020	8,620	9,495	8,304	0	10,035
1944	3	3	2,108	2,108	4,428	4,363	0	0	5,360	5,360	4,645	4,647	22,704	22,613
1945	4	4	3,248	3,248	6,180	5,709	0	0	6,815	6,815	6,334	5,863	15,268	30,209
1946	4	4	3,291	3,291	5,249	5,042	0	0	6,866	6,866	5,402	4,641	46,448	70,624
1947	1	2	1,126	2,251	1,696	2,665	0	0	3,540	4,835	2,813	3,513	23,088	41,968
1948	2	3	1,850	1,850	2,194	2,196	0	0	4,450	4,750	3,615	3,618	26,490	35,929
1949	2	3	2,280	2,280	2,280	2,280	13,695	13,565	4,880	5,480	2,983	2,986	60,218	79,141
1950	2	3	2,251	2,251	2,251	2,251	2,054	2,005	4,851	5,431	4,297	4,299	17,595	35,945
1951	3	4	2,251	3,377	4,550	4,343	0	0	5,460	6,949	6,194	6,194	0	23,955
1952	5	5	3,420	3,420	15,750	13,174	0	0	8,620	8,620	14,232	11,656	0	0
1953	3	3	2,165	2,165	4,300	4,256	0	0	5,400	5,400	4,970	4,970	13,660	13,653
1954	3	3	2,280	2,280	3,281	5,153	0	0	5,480	5,480	4,375	5,307	35,081	5,494
1955	1	2	810	1,621	1,813	1,885	0	0	3,540	3,853	3,023	3,095	16,403	24,035
1956	5	5	3,420	3,420	6,315	5,634	0	0	8,620	8,620	5,913	5,232	85,910	107,519
1957	3	3	2,280	2,280	3,216	3,263	0	0	5,480	5,480	5,452	5,453	883	858
1958	5	5	3,420	3,420	20,284	19,144	0	0	8,620	8,620	19,882	18,742	0	0
1959	2	2	2,137	2,137	2,783	3,149	0	0	4,737	4,737	3,534	3,534	38,178	38,173
1960	1	1	1,140	1,140	1,617	1,621	0	0	3,540	3,540	2,604	2,608	29,706	29,583
1961	1	1	1,054	1,054	1,313	1,321	0	0	3,540	3,540	1,724	1,731	57,619	57,402
1962	3	3	2,223	2,223	2,223	2,223	9,939	9,930	5,440	5,440	5,027	5,028	13,100	13,089
1963	4	4	3,248	3,248	3,575	3,576	0	0	6,815	6,815	5,537	5,537	40,550	40,535
1964	1	2	767	1,535	1,585	1,710	0	0	3,540	3,719	2,524	2,909	32,242	25,705
1965	4	5	3,162	3,162	7,790	7,824	0	0	6,712	7,992	7,944	7,977	0	464
1966	2	3	2,251	2,251	2,715	2,892	0	0	4,851	5,431	3,215	3,392	51,925	64,717

Table 3 (excerpt). April, 1967 – 2003

(1)	(2)	(3)	(18)	(19)	(21)	(22)	(23)	(24)	(25)	(26)	(28)	(29)	(30)	(31)
60-20-20 Classification			X2VERNMIN_REQDV - CFS		C639_NP_DV - CFS		C10Min - AF		Computed Requirement		C639_P_DV - CFS		Deficit - AF	
WY	NAA 602020	DCR15 602020	Apr 1-14 NAA	Apr 1-14 DCR15	Apr 1-14 NAA	Apr 1-14 DCR15	Apr 1-14 NAA	Apr 1-14 DCR15	Apr 15-30 NAA	Apr 15-30 DCR15	Apr 15-30 NAA	Apr 16-30 DCR15	Apr 15-30 NAA	Apr 16-30 DCR15
1967	5	5	3,420	3,420	17,203	16,518	0	0	8,620	8,620	17,356	16,116	0	0
1968	2	2	2,251	2,251	3,162	3,411	0	0	4,851	4,851	3,773	3,773	34,219	34,221
1969	5	5	3,420	3,420	21,868	21,596	0	0	8,620	8,620	20,350	20,078	0	0
1970	4	4	3,420	3,420	4,515	4,544	0	0	7,020	7,020	4,532	4,534	78,975	78,894
1971	3	3	2,280	2,280	4,685	4,592	0	0	5,480	5,480	5,150	4,738	10,475	23,539
1972	1	2	1,140	2,280	2,661	2,736	0	0	3,540	4,880	3,488	3,563	1,644	41,803
1973	4	4	3,420	3,420	5,702	5,870	0	0	7,020	7,020	5,856	6,023	36,947	31,634
1974	4	5	3,420	3,420	7,432	7,348	0	0	7,020	8,620	7,586	6,947	0	53,107
1975	4	5	3,420	3,420	5,990	6,169	0	0	7,020	8,620	6,143	5,768	27,829	90,521
1976	1	1	839	839	1,697	1,698	0	0	3,540	3,540	2,551	2,552	31,380	31,361
1977	1	1	710	710	1,030	1,050	0	0	3,110	3,110	1,461	1,463	52,342	52,283
1978	5	5	3,420	3,420	12,536	11,689	0	0	8,620	8,620	14,498	13,650	0	0
1979	4	4	3,420	3,420	6,559	6,486	0	0	7,020	7,020	6,713	6,640	9,747	12,070
1980	5	5	3,420	3,420	7,969	7,670	0	0	8,620	8,620	7,567	7,268	33,417	42,905
1981	2	2	2,251	2,251	2,579	3,755	0	0	4,851	4,851	3,118	3,908	55,018	29,926
1982	5	5	3,420	3,420	28,813	26,982	0	0	8,620	8,620	28,813	26,080	0	0
1983	5	5	3,420	3,420	25,706	24,487	0	0	8,620	8,620	24,189	22,969	0	0
1984	5	4	3,420	3,420	5,830	5,405	0	0	8,620	7,020	5,717	5,715	92,132	41,416
1985	2	2	1,879	1,879	4,185	4,144	0	0	4,479	4,479	4,339	4,297	4,434	5,757
1986	5	5	3,420	3,420	14,167	12,608	0	0	8,620	8,620	12,649	11,090	0	0
1987	1	1	1,126	1,126	2,415	2,418	0	0	3,540	3,540	3,059	3,061	15,265	15,188
1988	1	1	796	796	1,395	1,497	0	0	3,540	3,540	1,861	2,177	53,273	43,246
1989	1	1	1,140	1,140	1,339	1,344	0	0	3,540	3,540	2,101	2,105	45,654	45,533
1990	1	1	1,025	1,025	1,025	1,025	2,844	2,780	3,540	3,540	1,515	1,517	64,256	64,210
1991	1	1	1,126	1,126	1,186	1,189	0	0	3,540	3,540	1,900	1,902	52,057	51,997
1992	1	1	1,068	1,068	1,068	1,068	983	2,183	3,540	3,540	1,597	1,569	61,665	62,543
1993	4	5	3,420	3,420	3,420	3,420	46,774	48,389	7,020	8,620	3,432	3,319	113,875	168,226
1994	1	1	896	896	1,025	1,026	0	0	3,540	3,540	1,854	1,855	53,511	53,484
1995	5	5	3,420	3,420	14,626	13,579	0	0	8,620	8,620	14,779	13,733	0	0
1996	5	5	3,420	3,420	7,126	7,038	0	0	8,620	8,620	6,724	6,637	60,170	62,946
1997	5	5	3,377	3,377	4,209	3,758	0	0	8,567	8,567	4,355	4,358	133,652	133,574
1998	5	5	3,420	3,420	15,423	16,197	0	0	8,620	8,620	13,905	14,679	0	0
1999	4	4	3,420	3,420	5,862	5,776	0	0	7,020	7,020	5,461	5,374	49,490	52,237
2000	4	4	3,420	3,420	5,538	5,711	0	0	7,020	7,020	5,136	5,309	59,787	54,306
2001	1	2	1,111	2,223	1,814	4,164	0	0	3,540	4,791	2,754	4,318	24,932	15,008
2002	1	2	1,097	2,194	1,105	2,194	0	28,496	3,540	4,746	2,355	2,418	37,607	73,886
2003	3	3	2,251	2,251	2,251	2,251	21,550	21,543	5,460	5,460	3,400	3,401	65,363	65,354
	5	W	3,406	3,399	14,015	12,061	0	2,016	8,603	8,581	13,450	11,596	23,266	29,306
	4	AN	3,334	3,326	6,038	5,359	4,268	2,423	6,917	6,906	6,407	5,828	32,157	37,529
	3	BN	2,223	2,205	3,707	3,452	3,499	3,619	5,440	5,390	5,087	4,587	17,918	28,354
	2	D	2,151	2,059	2,929	2,947	1,575	3,198	4,751	4,571	3,681	3,501	33,953	33,941
	1	C	978	962	1,549	1,390	159	310	3,504	3,486	2,322	2,050	38,132	45,584
		Average	2,395	2,507	5,937	5,861	1,664	2,204	5,883	6,118	6,366	6,213	30,502	34,670

Each simulation rank averaged based on its own 602020 designation

Table 3 (excerpt). May, 1922 – 1966

(1)	(2)	(3)	(32)		(33)		(35)		(36)		(37)		(38)		(39)		(40)		(42)		(43)		(44)		(45)	
60-20-20 Classification			Computed Requirement				C639_P_DV - CFS				Deficit - AF				X2VERNMIN_REQDV - CFS				C639_NP_DV - CFS				C10Min - AF			
WY	NAA	DCR15	May 1-15		May 1-15		May 1-15		May 1-15		May 1-15		May 1-15		May 16-31		May 16-31		May 16-31		May 16-31		May 16-31		May 16-31	
	602020	602020	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15
1922	5	5	8,620	8,620	9,215	8,772	0	0	3,420	3,420	7,069	6,577	0	0												
1923	4	4	6,970	6,970	6,386	6,391	17,384	17,224	3,378	3,378	4,191	4,196	0	0												
1924	1	1	3,110	3,110	2,055	2,057	31,386	31,315	710	710	1,317	1,320	0	0												
1925	3	3	5,480	5,480	6,839	6,835	0	0	2,280	2,280	4,420	4,416	0	0												
1926	1	2	3,540	4,880	3,383	3,474	4,663	41,834	1,140	2,280	1,957	2,280	0	7,371												
1927	4	4	7,020	7,020	5,048	5,513	58,671	44,833	3,420	3,420	3,420	3,616	17,432	0												
1928	2	3	4,880	5,480	3,744	3,746	33,805	51,600	2,280	2,280	2,280	2,280	2,778	2,718												
1929	1	1	3,540	3,110	2,288	2,340	37,261	22,906	710	710	1,419	1,507	0	0												
1930	1	1	3,540	3,540	2,351	2,389	35,366	34,260	932	932	1,494	1,559	0	0												
1931	1	1	3,540	3,110	1,717	1,724	54,240	41,235	710	710	1,307	1,334	0	0												
1932	4	4	6,424	6,424	4,714	4,665	50,864	52,320	2,921	2,921	2,921	2,921	5,865	7,417												
1933	1	2	3,540	4,048	2,494	2,570	31,114	43,954	724	1,448	1,699	1,750	0	0												
1934	1	1	3,540	3,110	1,695	1,699	54,879	41,974	710	710	998	1,002	0	0												
1935	4	4	7,020	7,020	5,288	5,292	51,517	51,421	3,420	3,420	3,420	3,420	3,490	3,387												
1936	4	4	7,020	7,020	6,481	6,412	16,041	18,093	3,420	3,420	4,304	4,235	0	0												
1937	4	5	7,020	8,620	12,023	10,681	0	0	3,420	3,420	9,846	8,504	0	0												
1938	5	5	8,620	8,620	27,032	23,913	0	0	3,420	3,420	26,550	23,180	0	0												
1939	2	2	4,020	3,110	3,366	3,415	19,452	0	1,420	1,420	2,320	2,369	0	0												
1940	4	4	7,020	7,020	6,876	7,170	4,284	0	3,420	3,420	4,979	4,975	0	0												
1941	5	5	8,620	8,620	13,742	11,040	0	0	3,420	3,420	13,009	10,148	0	0												
1942	5	5	8,620	8,620	10,117	8,667	0	0	3,420	3,420	9,636	7,933	0	0												
1943	4	5	7,020	8,620	7,581	7,550	0	31,845	3,420	3,420	5,637	5,795	0	0												
1944	3	3	4,899	4,899	4,150	4,154	22,304	22,180	1,448	1,448	2,532	2,536	0	0												
1945	4	4	6,573	6,573	6,686	6,197	0	11,190	3,045	3,045	4,789	4,300	0	0												
1946	4	4	6,970	6,970	6,032	6,684	27,907	8,505	3,378	3,378	4,135	4,489	0	0												
1947	1	2	3,540	4,103	2,751	3,294	23,489	24,082	752	1,503	1,622	2,164	0	0												
1948	2	3	4,880	5,480	3,609	3,609	37,808	55,660	2,280	2,280	2,280	2,280	9,779	9,779												
1949	2	3	4,825	5,441	3,199	3,204	48,363	66,562	2,225	2,225	2,225	2,225	10,470	10,258												
1950	2	3	4,880	5,480	4,014	4,017	25,756	43,530	2,280	2,280	2,280	2,280	19,068	18,986												
1951	3	4	5,306	6,573	5,873	5,873	0	20,833	2,030	3,045	2,447	3,045	0	18,991												
1952	5	5	8,620	8,620	17,549	16,059	0	0	3,420	3,420	17,067	15,577	0	0												
1953	3	3	5,441	5,441	6,277	6,277	0	0	2,225	2,225	3,101	3,101	0	0												
1954	3	3	5,480	5,480	4,369	4,369	33,053	33,051	2,280	2,280	2,957	2,957	0	0												
1955	1	2	3,540	4,048	3,035	3,107	15,027	27,996	724	1,448	1,810	1,843	0	0												
1956	5	5	8,568	8,568	7,998	7,746	16,974	24,466	3,378	3,378	6,093	5,551	0	0												
1957	3	3	5,015	5,015	5,498	5,499	0	0	1,614	1,614	2,703	2,704	0	0												
1958	5	5	8,620	8,620	13,203	12,644	0	0	3,420	3,420	12,470	11,910	0	0												
1959	2	2	4,131	4,131	3,396	3,397	21,853	21,845	1,531	1,531	2,340	2,340	0	0												
1960	1	1	3,540	3,540	2,629	2,635	27,113	26,936	863	863	1,535	1,542	0	0												
1961	1	1	3,540	3,540	1,775	1,782	52,509	52,295	724	724	1,367	1,375	0	0												
1962	3	3	5,480	5,480	5,034	5,034	13,269	13,259	2,280	2,280	2,280	2,280	13,889	13,879												
1963	4	4	7,020	7,020	4,712	4,713	68,670	68,650	3,420	3,420	3,420	3,420	28,099	28,077												
1964	1	2	3,540	4,048	2,486	2,897	31,356	34,252	724	1,448	1,547	1,585	0	0												
1965	4	5	7,020	8,620	5,079	5,082	57,742	105,259	3,420	3,420	3,420	3,420	7,550	7,456												
1966	2	3	4,825	5,441	3,001	3,001	54,245	72,619	2,225	2,225	2,225	2,225	18,827	18,860												

Table 3 (excerpt). May, 1967 – 2003

(1)		(2)	(3)	(32)		(33)		(35)		(36)		(37)		(38)		(39)		(40)		(42)		(43)		(44)		(45)		
60-20-20 Classification			Computed Requirement		C639_P_DV - CFS		Deficit - AF		X2VERNMIN_REQDV - CFS		C639_NP_DV - CFS		C10Min - AF															
WY	NAA	DCR15	May 1-15	May 1-15	May 1-15	May 1-15	May 1-15	May 1-15	May 1-15	May 1-15	May 1-15	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	May 16-31	
	602020	602020	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15
1967	5	5	8,620	8,620	16,870	12,888	0	0	3,420	3,420	16,435	11,935	0	0														
1968	2	2	4,075	4,075	3,489	3,489	17,453	17,453	1,475	1,475	2,427	2,427	0	0														
1969	5	5	8,620	8,620	26,674	23,209	0	0	3,420	3,420	26,192	22,727	0	0														
1970	4	4	5,480	4,620	4,851	4,855	18,706	0	2,130	2,130	2,656	2,660	0	0														
1971	3	3	5,461	5,461	4,971	5,439	14,571	652	2,252	2,252	2,762	2,932	0	0														
1972	1	2	3,540	4,325	3,342	3,422	5,883	26,865	863	1,725	2,234	2,314	0	0														
1973	4	4	6,871	6,871	7,228	6,550	0	9,538	3,295	3,295	5,331	4,653	0	0														
1974	4	5	7,020	8,620	5,993	6,434	30,565	65,050	3,420	3,420	4,096	4,239	0	0														
1975	4	5	6,672	8,259	4,833	4,981	54,716	97,506	3,129	3,129	3,129	3,129	6,114	10,862														
1976	1	1	3,540	3,110	2,488	2,489	31,294	18,473	710	710	1,556	1,557	0	0														
1977	1	1	3,110	3,110	1,770	1,773	39,875	39,792	710	710	1,364	1,384	0	0														
1978	5	5	8,620	8,620	16,616	12,256	0	0	3,420	3,420	14,438	10,079	0	0														
1979	4	4	6,325	6,325	7,911	8,161	0	0	2,837	2,837	7,476	7,726	0	0														
1980	5	5	8,465	8,465	8,255	6,947	6,254	45,161	3,295	3,295	7,151	5,286	0	0														
1981	2	2	4,159	4,159	3,217	3,684	28,014	14,120	1,559	1,559	1,915	2,662	0	0														
1982	5	5	8,620	8,620	19,858	18,210	0	0	3,420	3,420	19,376	17,729	0	0														
1983	5	5	8,620	8,620	25,933	23,575	0	0	3,420	3,420	25,451	23,093	0	0														
1984	5	4	7,588	6,026	5,767	5,764	54,178	7,821	2,588	2,588	3,572	3,569	0	0														
1985	2	2	4,603	4,603	3,886	3,886	21,335	21,313	2,003	2,003	2,639	2,640	0	0														
1986	5	5	8,517	8,517	11,009	11,225	0	0	3,337	3,337	10,528	10,743	0	0														
1987	1	1	3,540	3,110	2,914	2,917	18,637	5,737	710	710	1,988	1,992	0	0														
1988	1	1	3,540	3,110	1,775	2,114	52,510	29,646	710	710	1,368	1,390	0	0														
1989	1	1	3,540	3,540	1,888	1,894	49,141	48,984	1,126	1,126	1,166	1,175	0	0														
1990	1	1	3,540	3,110	1,991	1,993	46,096	33,238	710	710	1,407	1,409	0	0														
1991	1	1	3,540	3,110	1,958	1,963	47,055	34,112	710	710	1,160	1,256	0	0														
1992	1	1	3,540	3,540	1,573	1,526	58,517	59,932	738	738	708	660	0	0														
1993	4	5	7,020	8,620	5,002	3,351	60,037	156,764	3,420	3,420	3,420	3,420	12,578	50,673														
1994	1	1	3,540	3,110	2,352	2,353	35,338	22,514	710	710	1,513	1,514	0	0														
1995	5	5	8,620	8,620	24,369	21,317	0	0	3,420	3,420	23,933	20,881	0	0														
1996	5	5	8,620	8,620	7,748	8,548	25,934	2,154	3,420	3,420	6,507	7,814	0	0														
1997	5	5	7,949	7,949	6,198	6,177	52,086	52,708	2,879	2,879	4,003	3,982	0	0														
1998	5	5	8,620	8,620	17,731	16,967	0	0	3,420	3,420	17,249	16,485	0	0														
1999	4	4	6,921	6,921	5,587	5,588	39,666	39,654	3,337	3,337	3,392	3,393	0	0														
2000	4	4	6,970	6,970	6,045	6,365	27,532	18,016	3,378	3,378	3,850	4,170	0	0														
2001	1	2	3,540	3,110	2,884	3,429	19,511	0	710	1,420	1,646	2,383	0	0														
2002	1	2	3,540	4,630	2,853	2,926	20,429	50,698	1,015	2,030	1,611	2,030	0	12,233														
2003	3	3	5,441	5,441	3,803	3,803	48,741	48,729	2,225	2,225	2,225	2,225	16,174	16,158														
	5	W	8,514	8,564	15,047	12,010	8,180	24,205	3,335	3,375	14,038	10,839	0	2,875														
	4	AN	6,819	6,646	6,218	6,012	29,215	23,006	3,251	3,152	4,392	4,049	4,056	3,617														
	3	BN	5,334	5,386	5,201	4,538	14,660	31,373	2,070	2,146	2,825	2,649	3,340	6,972														
	2	D	4,528	4,098	3,492	3,307	30,808	24,955	1,928	1,638	2,293	2,214	6,092	1,508														
	1	C	3,504	3,244	2,352	2,103	34,279	33,959	785	762	1,491	1,373	0	0														
		Average	5,799	5,940	6,688	6,342	24,420	27,129	2,258	2,351	5,350	5,002	2,099	2,892														

Table 4 (excerpt). Wet, Above Normal and Below Normal Years

(acre-feet) WY	Feb	Feb	Mar	Mar	Apr 1-14	Apr 1-14	Apr 15-30	Apr 15-30	May 1-15	May 1-15	May 16-31	May 16-31	Jun	Jun
	C10Min NAA	C10Min DCR15	C10Min NAA	C10Min DCR15	C10Min NAA	C10Min DCR15	Deficit NAA	Deficit DCR15	Deficit NAA	Deficit DCR15	C10Min NAA	C10Min DCR15	C10Min NAA	C10Min DCR15
1983	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1969	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1995	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1938	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1998	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1982	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1967	45,281	45,620	0	0	0	0	0	0	0	0	0	0	0	0
1952	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1958	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1980	0	0	0	0	0	0	33,417	42,905	6,254	45,161	0	0	0	0
1978	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1922	0	0	0	0	0	0	28,118	31,532	0	0	0	0	0	0
1956	0	0	0	0	0	0	85,910	107,519	16,974	24,466	0	0	0	0
1942	0	0	0	0	0	0	8,655	2,505	0	0	0	0	0	0
1941	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1986	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1993	0	0	0	19,190	46,774	48,389	113,875	168,226	60,037	156,764	12,578	50,673	0	0
1997	0	0	0	0	0	0	133,652	133,574	52,086	52,708	0	0	0	0
1996	0	0	0	0	0	0	60,170	62,946	25,934	2,154	0	0	0	0
1943	0	0	0	0	0	0	0	10,035	0	31,845	0	0	0	0
1937	0	0	0	0	0	0	0	0	0	0	0	0	24,351	0
1974	0	0	0	0	0	0	0	53,107	30,565	65,050	0	0	5,160	0
1975	0	0	0	0	0	0	27,829	90,521	54,716	97,506	6,114	10,862	0	0
1965	0	0	0	0	0	0	0	464	57,742	105,259	7,550	7,456	55,701	33,756
1936	0	0	0	0	0	0	0	20,456	16,041	18,093	0	0	18,858	0
1984	0	0	0	0	0	0	92,132	41,416	54,178	7,821	0	0	0	0
1979	0	0	0	0	0	0	9,747	12,070	0	0	0	0	78,127	77,789
1945	0	0	0	0	0	0	15,268	30,209	0	11,190	0	0	38,889	7,137
1999	0	0	0	0	0	0	49,490	52,237	39,666	39,654	0	0	35,009	0
1963	0	17,066	62,312	62,305	0	0	40,550	40,535	68,670	68,650	28,099	28,077	49,947	49,897
1927	0	0	22,987	23,001	1,623	0	53,847	34,042	58,671	44,833	17,432	0	58,524	52,224
1935	16,023	30,999	32,798	32,798	0	0	13,974	12,777	51,517	51,421	3,490	3,387	53,122	52,885
1923	0	0	0	0	0	0	0	0	17,384	17,224	0	0	0	0
1973	0	0	0	0	0	0	36,947	31,634	0	9,538	0	0	72,196	41,182
1932	0	0	39,048	43,644	36,959	38,764	96,403	97,310	50,864	52,320	5,865	7,417	63,845	67,066
2000	0	0	0	0	0	0	59,787	54,306	27,532	18,016	0	0	5,281	5,164
1940	0	0	0	0	0	0	0	0	4,284	0	0	0	34,269	0
1946	0	0	0	0	0	0	46,448	70,624	27,907	8,505	0	0	21,123	0
1970	0	0	0	0	0	0	78,975	78,894	18,706	0	0	0	3,537	3,268
1951	0	0	0	0	0	0	0	23,955	0	20,833	0	18,991	0	30,036
1962	0	0	0	0	9,939	9,930	13,100	13,089	13,269	13,259	13,889	13,879	0	0
1953	0	0	0	0	0	0	13,660	13,653	0	0	0	0	0	0
1957	0	0	0	0	0	0	883	858	0	0	0	0	7,800	7,717
1925	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1971	0	0	0	0	0	0	10,475	23,539	14,571	652	0	0	23,159	0
1950	0	0	11,591	11,568	2,054	2,005	17,595	35,945	25,756	43,530	19,068	18,986	0	0
2003	26,314	26,322	31,580	31,578	21,550	21,543	65,363	65,354	48,741	48,729	16,174	16,158	60,039	60,004
1944	0	0	0	0	0	0	22,704	22,613	22,304	22,180	0	0	0	0
1954	14,562	14,560	13,933	11,959	0	0	35,081	5,494	33,053	33,051	0	0	0	0
1948	26,303	26,254	0	0	0	0	26,490	35,929	37,808	55,660	9,779	9,779	3,872	3,872
1928	0	0	0	0	0	0	18,963	8,271	33,805	51,600	2,778	2,718	0	0
1949	0	0	0	0	13,695	13,565	60,218	79,141	48,363	66,562	10,470	10,258	0	0
1966	0	0	0	0	0	0	51,925	64,717	54,245	72,619	18,827	18,860	6,467	6,526

Table 4 (excerpt). Dry and Critical Years

(acre-feet)	Feb		Mar		Apr 1-14		Apr 15-30		May 1-15		May 16-31		Jun	
	C10Min	C10Min	C10Min	C10Min	C10Min	C10Min	Deficit	Deficit	Deficit	Deficit	C10Min	C10Min	C10Min	C10Min
	WY	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA	DCR15	NAA
1933	0	0	0	0	0	13,084	37,965	68,507	31,114	43,954	0	0	0	5,262
1981	513	491	0	0	0	0	55,018	29,926	28,014	14,120	0	0	0	0
1985	0	0	0	0	0	0	4,434	5,757	21,335	21,313	0	0	0	0
2002	0	23,029	0	23,865	0	28,496	37,607	73,886	20,429	50,698	0	12,233	0	19,433
1926	0	0	0	23,355	0	0	0	10,852	4,663	41,834	0	7,371	0	2,633
1955	0	18,276	0	0	0	0	16,403	24,035	15,027	27,996	0	0	0	14,129
1959	0	0	0	0	0	0	38,178	38,173	21,853	21,845	0	0	0	0
1968	6,118	0	0	0	0	0	34,219	34,221	17,453	17,453	0	0	0	0
1939	0	0	0	0	0	0	32,495	31,397	19,452	0	0	0	1,056	0
2001	0	0	0	0	0	0	24,932	15,008	19,511	0	0	0	0	0
1964	0	12,696	0	3,045	0	0	32,242	25,705	31,356	34,252	0	0	0	8,145
1947	0	0	0	24,545	0	0	23,088	41,968	23,489	24,082	0	0	0	0
1972	0	8,734	0	40,302	0	0	1,644	41,803	5,883	26,865	0	0	0	2,046
1994	0	0	0	0	0	0	53,511	53,484	35,338	22,514	0	0	0	0
1930	0	0	0	0	0	0	39,458	38,565	35,366	34,260	0	0	0	0
1929	0	0	0	0	0	0	33,622	32,639	37,261	22,906	0	0	0	0
1989	0	0	0	0	0	0	45,654	45,533	49,141	48,984	0	0	0	0
1991	0	0	0	0	0	0	52,057	51,997	47,055	34,112	0	0	0	0
1987	0	0	0	0	0	0	15,265	15,188	18,637	5,737	0	0	0	0
1960	0	0	0	0	0	0	29,706	29,583	27,113	26,936	0	0	0	0
1976	0	0	0	0	0	0	31,380	31,361	31,294	18,473	0	0	0	0
1992	0	0	0	0	983	2,183	61,665	62,543	58,517	59,932	0	0	0	0
1990	0	0	0	0	2,844	2,780	64,256	64,210	46,096	33,238	0	0	0	0
1988	0	0	0	0	0	0	53,273	43,246	52,510	29,646	0	0	0	0
1934	0	0	0	0	0	0	60,009	59,928	54,879	41,974	0	0	0	0
1924	0	0	0	0	0	0	31,949	31,897	31,386	31,315	0	0	0	0
1961	0	0	0	0	0	0	57,619	57,402	52,509	52,295	0	0	0	0
1931	0	0	0	0	0	0	59,518	59,480	54,240	41,235	0	0	0	0
1977	0	0	0	0	0	0	52,342	52,283	39,875	39,792	0	0	1,018	667
W	1,887	1,901	0	800	1,949	2,016	20,484	29,306	12,680	24,205	1,093	2,875	3,551	1,407
AN	1,001	3,004	9,822	10,109	2,411	2,423	37,098	37,529	27,214	23,006	3,430	3,617	33,295	24,165
BN	5,168	5,164	4,393	4,239	3,634	3,619	25,881	28,354	25,532	31,373	6,999	6,972	7,795	6,009
D	510	4,864	0	8,855	0	3,198	26,017	33,941	19,968	24,955	0	1,508	81	3,973
C	0	0	0	0	239	310	46,330	45,584	41,951	33,959	0	0	64	42
Average	1,648	2,732	2,613	4,282	1,664	2,204	30,502	34,670	24,420	27,129	2,099	2,892	8,797	6,718

Note: Results rank ordered on DCR15 602020 year type. Year type averages for CWF NAA will not match separate analysis.