

From USGS NWIS USGS 06853500 REPUBLICAN R NR HARDY, NE AF

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Percent Rank	Percentile
1980	8,102	10,146	19,151	31,779	11,171	10,811	5,248	8,532	3,635	5,690	5,833	7,059	127,156	0.29	596,592
1981	7,059	5,932	7,059	2,928	22,772	7,781	23,263	18,107	9,563	7,427	8,732	12,706	133,329	0.33	394,043
1982	6,199	23,617	16,020	10,157	89,477	31,423	42,168	18,107	12,236	13,013	9,563	9,023	275,004	0.81	392,680
1983	11,417	19,238	39,345	37,422	41,309	70,686	19,519	13,135	43,956	66,332	15,800	13,811	391,989	0.90	386,449
1984	30,690	24,338	24,920	64,924	92,070	45,203	11,294	8,777	5,423	3,357	7,247	18,353	336,597	0.86	327,358
1985	9,330	14,193	12,583	10,870	43,212	11,524	15,591	42,168	14,672	15,284	11,939	11,417	212,781	0.57	
1986	14,731	11,642	11,969	17,701	14,117	13,187	11,908	16,204	23,285	23,018	10,454	12,030	180,247	0.48	
1987	10,987	8,870	48,920	59,281	37,626	13,662	20,931	20,624	7,960	7,979	9,801	11,908	258,548	0.76	
1988	11,601	14,304	11,846	9,088	6,752	3,309	31,856	14,424	4,158	3,333	6,237	7,059	123,966	0.24	
1989	7,366	8,039	8,532	5,411	2,093	4,402	29,708	10,680	3,659	5,383	6,296	5,230	96,798	0.10	
1990	7,794	5,333	5,365	8,019	8,839	17,642	11,417	29,831	4,271	2,142	2,138	2,148	104,878	0.14	
1991	3,922	8,316	4,082	2,323	6,384	13,068	3,333	3,603	909	1,056	1,325	1,608	49,927	0.00	
1992	2,069	1,497	4,782	3,374	1,817	2,762	57,083	14,915	8,316	7,488	7,544	7,427	119,074	0.19	
1993	7,059	28,607	97,226	32,254	28,419	19,424	197,030	52,050	69,676	76,786	77,695	56,961	743,187	1.00	
1994	29,094	29,328	69,544	23,819	21,913	8,019	16,757	8,716	8,316	6,813	8,197	9,391	239,907	0.71	
1995	7,059	7,263	9,944	10,039	70,648	68,726	18,966	14,363	6,356	6,506	9,682	9,268	238,820	0.67	
1996	8,593	7,152	9,637	8,613	24,552	20,255	36,276	59,416	76,210	69,789	53,341	20,317	394,151	0.95	
1997	19,396	16,521	13,995	49,658	28,971	17,582	12,092	11,048	6,356	4,935	14,612	18,230	213,397	0.62	
1998	15,959	14,747	17,923	46,213	29,647	7,247	16,020	12,583	4,574	8,961	11,702	12,276	197,852	0.52	
1999	15,591	11,033	10,987	15,206	44,009	19,305	9,698	10,435	3,416	5,745	7,247	8,655	161,326	0.43	
2000	9,084	7,928	4,646	14,315	5,708	7,781	31,058	5,702	2,293	1,755	2,519	1,492	94,283	0.05	
2001	2,498	2,844	33,207	12,949	48,183	23,404	17,984	9,023	6,415	0	0	0	156,507	0.38	
Mean 62-															
2001	11,161	16,448	25,009	22,207	25,552	24,379	30,955	18,858	18,914	17,431	13,880	11,975	237,071		
Max	30,690	53,666	97,226	64,924	92,070	117,553	197,030	110,484	86,427	120,919	77,695	56,961	743,187		
Min	2,069	1,497	4,082	2,323	1,817	2,762	3,333	3,603	909	0	0	0	49,927		
SD	7436.908	11452.03	21562.58	16388.3	21603	26962.08	43259.36	18826.4	22039.04	26479.66	17088.52	10311.99	148120.3		

5 MO - 375

3 MOS

First 200,000 -
over max in ground
counts rest logged

USGS 06853500 REPUBLICAN R NR HARDY, NE AF

From USGS NWIS

YEAR	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Total May-Aug
1962	13,381	16,133	17,923	34,808	22,588	96,109	171,557	110,483	58,034	27,007	12,533	11,662	592,220	400,738
1963	9,637	29,605	66,229	40,392	13,074	6,831	5,383	20,869	43,481	24,552	17,939	13,872	291,863	46,157
1964	13,442	18,073	10,557	7,900	4,775	10,157	5,696	14,670	27,740	6,445	6,653	6,506	132,616	35,299
1965	8,839	13,084	17,002	12,533	39,160	66,231	96,674	11,969	36,590	120,919	77,398	41,002	541,401	214,034
1966	39,038	53,666	59,354	40,036	16,695	12,949	34,557	11,908	15,147	10,005	8,554	13,442	315,351	76,109
1967	12,706	29,605	31,918	21,206	12,399	117,553	129,328	22,649	16,038	6,997	8,672	7,795	416,865	281,928
1968	6,199	18,628	21,115	38,135	17,616	10,930	8,164	14,854	11,048	8,409	7,366	5,659	168,122	51,563
1969	6,261	37,200	44,439	23,285	56,777	47,104	37,074	22,649	26,730	12,092	22,156	27,498	363,265	163,603
1970	18,107	29,938	38,792	44,550	17,371	8,791	4,358	5,904	4,918	8,716	10,217	8,225	201,168	36,719
1971	6,322	11,587	16,143	10,454	10,619	21,681	8,286	5,954	4,918	2,652	8,672	9,084	116,373	46,540
1972	7,243	7,484	7,979	7,603	9,698	6,712	12,030	13,381	8,554	6,875	10,811	9,882	108,253	41,822
1973	14,117	10,977	19,151	23,582	37,687	22,513	14,547	10,987	8,554	86,427	25,720	19,028	362,811	85,734
1974	23,202	43,243	44,378	37,244	32,593	11,345	4,395	12,215	5,328	7,427	9,148	9,330	239,015	60,548
1975	9,944	10,977	15,222	10,157	8,348	66,112	25,595	10,435	3,873	3,186	2,726	4,769	100,123	35,556
1976	9,514	9,425	9,453	21,622	10,373	9,801	9,330	6,052	47,579	10,373	9,207	7,795	150,360	47,362
1977	4,493	9,647	7,488	6,415	7,734	9,920	9,023	20,685	23,582	6,629	7,781	6,752	143,560	39,299
1978	5,960	5,483	33,759	14,315	9,637	4,312	8,102	17,248	5,423	7,488	13,246	9,575	201,836	63,722
1979	4,634	22,287	57,759	17,701	21,237	8,910	14,915	18,660	5,423	5,690	5,833	7,059	127,156	35,762
1980	8,102	10,146	19,151	31,779	11,171	10,811	5,248	8,532	18,107	7,427	8,732	12,706	133,329	71,324
1981	7,059	5,932	7,059	2,928	22,772	7,781	23,263	18,107	9,563	7,427	9,563	10,223	275,004	175,175
1982	6,199	23,617	16,020	10,157	83,477	31,423	42,168	18,107	12,236	13,013	9,563	9,811	391,989	144,349
1983	11,417	19,238	39,345	37,422	41,309	70,686	19,519	13,135	43,956	66,352	15,800	13,811	336,597	157,345
1984	30,690	24,338	24,920	64,920	92,070	45,203	11,294	8,777	5,423	3,357	7,247	18,353	336,597	157,345
1985	9,330	14,193	12,583	10,870	43,212	11,524	15,991	42,168	23,285	15,284	11,939	11,417	212,781	112,194
1986	14,731	11,642	11,969	17,701	14,117	13,187	11,908	16,204	7,960	23,018	10,454	12,030	180,247	55,116
1987	10,987	8,870	48,920	59,281	37,626	13,662	20,931	20,624	4,158	3,333	6,237	7,059	258,548	92,342
1988	11,601	14,304	11,846	9,088	6,752	3,309	31,856	14,424	3,659	5,383	6,237	5,230	123,966	56,341
1989	7,366	8,039	8,532	5,411	2,093	4,402	29,708	10,680	3,659	2,142	2,138	2,148	96,798	46,883
1990	7,734	5,333	5,365	8,019	8,839	17,642	11,417	29,831	4,271	1,056	1,325	1,608	104,878	67,728
1991	3,922	8,316	4,062	2,323	6,384	13,068	3,333	3,603	909	1,056	1,325	1,608	49,927	26,387
1992	2,069	1,497	4,782	3,374	1,817	2,762	57,083	14,915	8,316	7,488	7,544	7,427	119,074	76,578
1993	7,059	28,607	97,226	32,254	28,419	19,424	197,030	52,050	69,676	76,486	77,695	56,961	743,182	296,923
1994	29,094	29,328	69,544	23,819	21,913	8,019	16,757	8,716	8,316	6,813	8,197	9,391	239,907	55,404
1995	7,059	7,263	9,944	10,039	70,648	68,726	18,966	14,363	6,356	6,506	9,682	9,268	238,820	172,704
1996	8,593	7,152	9,637	8,613	24,552	20,255	36,276	59,416	76,210	69,789	53,341	20,317	394,151	140,499
1997	19,396	16,521	13,995	49,658	28,971	17,582	12,092	11,048	6,356	4,935	14,612	18,230	213,397	69,384
1998	15,959	14,747	17,923	46,213	29,647	7,247	16,020	12,583	4,574	8,961	11,702	12,276	197,852	65,196
1999	15,591	11,033	10,987	15,206	44,009	19,305	9,698	10,435	3,416	5,745	7,247	8,655	161,326	83,147
2000	9,084	7,928	4,646	14,315	5,708	7,781	31,058	5,702	2,293	1,755	2,519	1,492	94,283	50,250
2001	2,498	2,844	33,207	12,949	48,183	23,404	17,984	9,023	6,415	0	0	0	156,507	98,594
Mean 62-	11,464	16,448	25,009	22,207	25,552	24,379	30,955	18,858	18,914	17,431	13,880	11,975	237,071	99,744
2001	39,038	53,666	97,226	64,924	92,070	117,553	197,030	110,484	86,427	120,919	77,695	56,961	743,187	400,738
Max	2,069	1,497	4,082	2,323	1,817	2,762	3,333	3,603	909	0	0	0	49,927	26,387
Min	7783.596	11452.03	21562.58	16388.3	21603	26962.08	43259.36	18826.4	22039.04	26479.66	17088.52	10311.99	148120.3	81171.64
SD														

M-O = 485 - 285

342 - 443

was a flood year.

Took last 20 years - 18 as compared to mean of record.

330

2 hills 2 hills Madison main for USA release

aim 75,000 at Harder.

top 200

Confidential RRCL Settlement Document

Months in which flows for two consecutive months were greater than

Year	Month	Flow	Monthly AF	2-monthrur average	Average > 200 kaf
1935	5	1,807	111,138	141,969	
1935	6	10,390	618,413	729,551	729,551
1935	7	1,028	63,226	681,639	681,639
1935	8	1,213	74,604	137,830	
1935	9	1,750	104,160	178,764	
1935	10	383	23,556	127,716	
1935	11	454	27,022	50,578	
1935	12	513	31,552	58,574	
1936	1	307	18,882		
1936	2	261	14,499	33,381	
1936	3	733	45,082	59,582	
1936	4	561	33,391	78,473	
1936	5	2,020	124,238	157,629	
1941	5	1,055	64,887	113,038	
1941	6	5,709	339,800	404,686	404,686
1941	7	1,936	119,072	458,871	458,871
1941	8	1,041	64,026	183,097	
1941	9	1,577	93,863	157,889	
1941	10	757	46,559	140,422	
1941	11	573	34,105	80,663	
1941	12	495	30,444	64,549	
1942	1	449	27,615		
1942	2	790	43,886	71,501	
1942	3	1,184	72,821	116,707	
1942	4	1,885	112,195	185,016	
1942	5	1,290	79,340	191,535	
1942	6	3,590	213,677	293,017	293,017
1942	7	869	53,447	267,124	267,124
1942	8	1,179	72,513	125,960	
1942	9	1,963	116,838	189,351	
1942	10	504	30,998	147,836	
1942	11	563	33,510	64,508	
1942	12	493	30,321	63,831	
1943	1	467	28,722	59,044	
1943	2	926	51,441	80,164	
1943	3	637	39,178	90,619	
1943	4	1,437	85,530	124,708	
1943	5	464	28,538	114,068	
1943	6	1,784	106,184	134,722	
1943	7	386	23,741	129,924	
1944	3	781	62	48,035	
1944	4	1,748	60	104,041	
1944	5	1,933	62	118,887	222,928
1944	6	2,270	60	135,110	253,998
1944	7	3,136	62	192,877	327,987

35 flood
 SF v arikanee
 500 KAF total

Confidential RRCL Settlement Document

1944	8	1,588	62	97,668	290,545
1944	9	398	60	23,689	
1944	10	259	62	15,930	
1944	11	372	60	22,141	
1944	12	361	62	22,203	
1945	4	863	60	51,366	
1945	5	1,302	62	80,078	
1945	6	2,450	60	145,824	225,902
1945	7	1,472	62	90,534	236,358
1945	8	390	62	23,987	
1946	10	4,194	257,948	345,502	345,502
1946	11	1,375	81,840	339,788	339,788
1946	12	864	53,139	134,979	
1947	1	553	34,012	87,151	
1947	2	578	32,109	66,121	
1947	3	960	59,044	91,153	
1947	4	953	56,723	115,766	
1947	5	876	53,878	110,600	
1947	6	5,927	352,775	406,653	406,653
1947	7	1,468	90,288	443,063	443,063
1947	8	372	22,879	113,167	
1947	9	150	8,928	31,807	
1947	10	106	6,519	15,447	
1947	11	273	16,249	22,768	
1947	12	352	21,649	37,898	
1948	1	496	30,506		
1948	2	868	48,219	78,725	
1948	3	1,494	91,887	140,106	
1948	4	590	35,117	127,004	
1948	5	400	24,602	59,718	
1948	6	2,682	159,633	184,234	
1948	7	1,224	75,281	234,914	234,914
1948	8	545	33,520	108,801	
1948	9	196	11,666	45,186	
1948	10	106	6,519	18,185	
1948	11	314	18,689	25,209	
1948	12	358	22,018	40,708	
1949	1	224	13,777	35,795	
1949	2	1,128	62,663	76,440	
1949	3	1,697	104,372	167,035	
1949	4	1,242	73,924	178,296	
1949	5	3,161	194,414	268,338	268,338
1949	6	4,171	248,258	442,672	442,672
1949	7	822	50,556	298,814	298,814
1949	8	615	37,825	88,381	
1949	9	582	34,641	72,466	
1949	10	516	31,736	66,377	
1949	11	447	26,605	58,342	
1949	12	346	21,280	47,886	
1950	1	273	16,791	38,071	

Confidential RRCL Settlement Document

1950	2	641	35,609	52,399	
1950	3	781	48,035	83,643	
1950	4	541	32,200	80,235	
1950	5	1,014	62,365	94,565	
1950	6	532	31,665	94,030	
1950	7	2,362	145,272	176,937	
1950	8	2,270	139,614	284,887	284,887
1950	9	1,193	71,007	210,621	210,621
1950	10	572	35,180	106,188	
1950	11	337	20,058	55,239	
1950	12	334	20,542	40,601	
1951	1	358	22,018		
1951	2	529	29,387	51,405	
1951	3	642	39,486	68,873	
1951	4	650	38,688	78,174	
1951	5	2,024	124,484	163,172	
1951	6	4,548	270,697	395,181	395,181
1951	7	4,884	300,386	571,082	571,082
1951	8	1,630	100,252	400,637	400,637
1951	9	3,805	226,474	326,725	326,725
1951	10	797	49,019	275,492	275,492
1951	11	667	39,700	88,719	
1951	12	558	34,319	74,019	
1952	1	628	38,625	72,944	
1952	2	998	55,441	94,065	
1952	3	1,148	70,607	126,047	
1952	4	1,366	81,304	151,911	
1952	5	1,580	97,176	178,481	
1952	6	539	32,081	129,258	
1952	7	1,159	71,283	103,364	
1952	8	191	11,747	83,030	
1952	9	80	4,768	16,515	
1957	5	370	22,756	30,137	
1957	6	2,522	150,109	172,866	
1957	7	2,474	152,161	302,270	302,270
1957	8	437	26,877	179,038	
1957	9	245	14,582	41,460	
1957	10	81	4,951	19,533	
1960	4	2,415	143,741	184,579	
1960	5	2,523	155,175	298,915	298,915
1960	6	2,031	120,885	276,060	276,060
1960	7	1,005	61,812	182,697	
1960	8	180	11,071	72,882	
1962	5	368	22,633	57,512	
1962	6	1,618	96,303	118,937	
1962	7	2,795	171,904	268,207	268,207