

**WESTERN AREA POWER ADMINISTRATION
HYDRO CONDITIONS AND PURCHASE POWER REPORT
May 2023**

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
	Oct 22	1,471,054	1,281,310	2,016,884	1,312,652	195,951	\$ 15,852,897	\$ 9,880,231
Nov 22	1,134,982	1,182,145	1,855,262	1,276,441	322,030	\$ 20,513,204	\$ 15,163,852	\$ 18,426,107
Dec 22	968,994	1,037,489	1,806,685	1,047,546	635,103	\$ 25,803,693	\$ 20,016,256	\$ 63,858,131
Jan 23	1,008,125	1,262,843	1,908,943	1,146,877	513,734	\$ 23,173,682	\$ 19,950,358	\$ 37,257,995
Feb 23	875,656	1,207,142	1,776,880	1,044,966	509,571	\$ 19,250,749	\$ 14,634,934	\$ 19,262,212
Mar 23	1,230,683	1,427,195	1,963,861	1,312,316	373,927	\$ 19,804,795	\$ 16,136,383	\$ 15,242,443
Apr 23	1,186,726	1,624,121	2,262,056	1,655,067				
May 23								
Jun 23								
Jul 23								
Aug 23								
Sep 23								
Total	7,876,221	9,022,244	13,590,570	8,795,865	2,550,316	\$ 124,399,018	\$ 95,782,013	\$ 167,950,338

Actual generation as a percentage of average: 64.7% Cost per MWh: \$65.85

Western Area Power Administration (WAPA) generated a total of 8,796 gigawatt-hours (GWh) from October through April of fiscal year 2023, or 64.7 percent of average. Actual purchase power data is currently available from October through March for all of WAPA’s Regions, and during this period total purchase power was 2,550 GWh and total purchase power expenses were \$167,950, which equates to \$65.85 per MWh overall.

The following pages indicate WAPA’s regional snowpack, lake/reservoir inflow and storage, generation, and purchase power expenses. Snowpack is reported as snow water equivalent, which is the depth of water that theoretically would result if the entire snowpack melted instantaneously.

Disclaimer: The monthly purchase power numbers in this report are used by WAPA’s regions as a forecasting tool; therefore, they do not reflect energy imbalance transactions and other such information that cannot be forecasted. Furthermore, the purchase power numbers have not been verified for financial auditing purposes. Consequently, these numbers will vary from those reported in WAPA’s year-end financial statements, and the latter should be considered the definitive source for WAPA’s purchase power data.



Colorado River Storage Project

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 22	1.00	1.20	514.42	437.00	15.01	5.83	218,843	271,947	392,070	250,183	16,261	\$ 0	\$ 0	\$ 886,454
Nov 22	4.30	3.80	474.23	349.00	14.91	5.72	115,541	232,979	379,493	225,788	12,799	\$ 0	\$ 0	\$ 854,554
Dec 22	7.80	8.80	362.96	281.00	14.86	5.53	143,368	265,055	449,721	253,334	24,410	\$ 0	\$ 0	\$ 5,147,050
Jan 23	11.20	15.10	361.45	361.00	14.98	5.45	46,967	306,090	457,656	237,467	17,955	\$ 0	\$ 0	\$ 2,199,458
Feb 23	14.80	18.50	392.01	270.00	15.99	5.32	42,649	269,775	389,089	201,464	13,140	\$ 0	\$ 0	\$ 697,832
Mar 23	18.30	25.10	666.27	573.00	16.77	5.38	44,385	225,422	412,640	210,998	20,366	\$ 0	\$ 0	\$ 1,019,519
Apr 23	18.70	24.70	1,057.14	1,399.00	16.74	5.54	67,300	396,922	413,625	336,409	640	\$ 0	\$ 0	\$ 21,162
May 23														
Jun 23														
Jul 23														
Aug 23														
Sep 23														
Total							679,053	1,968,189	2,894,294	1,715,643	105,571	\$ 0	\$ 0	\$ 10,826,029

Actual generation as a percentage of average: 59.3%

Cost per MWh: \$102.55

Lake/Reservoir Levels

End of April storage volume for Lake Powell was 5.54 million acre-feet (MAF) or about 23 percent of capacity. Lake Powell reservoir inflow for April was 1,400,000 acre-feet or 155 percent of average. Lake Powell elevation at the end of April was about 3,523 feet, or about 175 feet from maximum reservoir level and 35 feet from the minimum generation level.

Weather and Other Conditions

Inflow forecasts into Lake Powell continue to be much above average. Consequently, releases from Lake Powell are expected to be very high for the remainder of water year 2023. As a result of high releases from Lake Powell, CRSP is forecasting generation amounts that are well above average.

Firming purchase power costs through April of 2023 totaled \$10,826,029. Due to the increased generation forecasts, CRSP is projecting minimal purchases of energy at least through June. With the improved Lake Powell Reservoir elevation, Reclamation has delayed consideration of an experiment that would require significant volumes of water to be released via bypass and we anticipate no such experiment in water year 2023. However, Reclamation is still considering this experiment for future years. Purchase power in the region was generally available and prices over the last month have averaged in upper \$30s on peak and low \$30s off peak.



Desert Southwest Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 22	1.00	1.20	60.81	94.00	19.94	9.44	403,200	143,050	374,715	226,279	26,405	\$ 2,587,690	\$ 2,587,690	\$ 2,636,428
Nov 22	4.30	3.80	54.39	18.00	19.94	9.37	315,600	252,200	361,456	328,466	17,711	\$ 2,208,802	\$ 2,208,802	\$ 1,753,563
Dec 22	7.80	8.80	72.64	63.00	20.01	9.49	209,550	145,820	362,198	216,036	45,046	\$ 3,847,693	\$ 3,847,693	\$ 13,754,789
Jan 23	11.20	15.10	92.45	104.00	19.90	9.70	222,150	191,405	385,753	196,764	64,435	\$ 4,018,823	\$ 4,018,823	\$ 13,284,477
Feb 23	14.80	18.50	105.16	46.00	19.93	9.74	236,250	243,135	384,361	245,324	38,936	\$ 1,951,269	\$ 1,951,269	\$ 4,259,534
Mar 23	18.30	25.10	105.02	226.00	19.86	9.72	454,900	382,850	524,515	380,126	56,015	\$ 6,133,050	\$ 6,133,050	\$ 3,910,407
Apr 23	18.70	24.70	85.83	243.00	19.78	9.93	435,900	435,285	567,347	431,994	37,878	\$ 2,428,320	\$ 2,428,320	\$ 3,298,166
May 23														
Jun 23														
Jul 23														
Aug 23														
Sep 23														
Total							2,277,550	1,793,745	2,960,345	2,024,989	286,426	\$ 23,175,647	\$ 23,175,647	\$ 42,897,364

Actual generation as a percentage of average: 68.4%

Cost per MWh: \$149.77

Lake/Reservoir Levels

Aggregate system storage for the Lower Colorado River Basin, or Lakes Mead, Mohave, and Havasu, was 9.93 MAF at the end of April, or 35 percent of the Lower Basin capacity. The Lower Basin tributary inflow into Lake Mead for April was 243,000 acre-feet, or 405 percent of the five-year average for the month. The total side inflow into Lake Mead for WY 2023 is projected to be 1,277,000 acre-feet, which represents a 62 percent increase over last year and 98 percent of the normal annual side inflow. Lake Mead's elevation at the end of April was 1,049.69 feet, or 169.95 feet below full storage elevation and 99.69 feet above the minimum generation elevation for Hoover Dam. Lake Mead's current peak elevation for WY 2023 occurred in April at 1,049.69 feet (17.1 feet below the WY 2022 peak elevation). Lake Mead is projected to peak at 1,066.97 in September.

Weather and Other Conditions

The Desert Southwest Region's hydrology, or the Lower Colorado River Basin, is mostly dependent on the Colorado River Basin snowpack and precipitation above Lake Powell. The precipitation is currently 120 percent of average and the snowpack is 149 percent of median.



Rocky Mountain Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 22	0.00	0.20	142.20	127.20	3.90	3.71	46,425	61,900	97,400	50,264	105,370	\$ 10,707,550	\$ 4,716,720	\$ 7,487,439
Nov 22	3.70	3.10	123.80	105.80	3.89	3.71	44,513	59,350	110,000	47,809	117,764	\$ 10,119,341	\$ 4,486,824	\$ 8,815,650
Dec 22	11.80	11.00	101.70	95.40	3.90	3.64	67,688	90,250	123,500	54,084	120,394	\$ 9,118,069	\$ 3,379,154	\$ 18,057,020
Jan 23	20.30	24.10	100.50	102.70	3.88	3.65	100,538	134,050	122,100	101,230	62,053	\$ 5,914,777	\$ 2,063,458	\$ 7,586,960
Feb 23	29.00	36.70	98.30	87.40	3.88	3.62	88,275	117,700	111,600	103,126	32,334	\$ 5,345,785	\$ 1,135,538	\$ 1,942,405
Mar 23	38.10	37.90	160.30	115.60	3.91	3.74	98,625	131,500	128,900	137,928	25,862	\$ 4,324,615	\$ 594,118	\$ 1,242,921
Apr 23	46.80	58.80	251.70	322.60	3.94	3.64	99,863	133,150	144,600	186,653	47,766	\$ 10,192,971	\$ 1,708,072	\$ 968,674
May 23														
Jun 23														
Jul 23														
Aug 23														
Sep 23														
Total							545,925	727,900	838,100	681,094	511,543	\$ 55,723,106	\$ 18,083,883	\$ 46,101,069

Actual generation as a percentage of average: 81.3%

Cost per MWh: \$90.12

Lake/Reservoir Content

At the end of April, reservoir inflows were 128 percent of average and storage was 92 percent of average.

Weather and Other Conditions

LAP's hydrologic conditions can vary from one river basin and watershed to another. The snowpack is above average for both the Wyoming area and the Colorado East Slope area. The latest National Weather Service forecast indicates June through August temperatures will be slightly above average in northern Colorado, Wyoming and lower Montana. The same forecast indicates precipitation will have an equal chance to be above or below average for the Wyoming area, Colorado area and Montana area. Spring generation in the Colorado River Basin, the North Platte Basin and the Bighorn Basin is forecasted to be slightly above average.



Sierra Nevada Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 22	N/A	N/A	322.00	189.00	4.94	2.82	63,000	68,000	163,000	56,344	38,052	\$ 2,102,450	\$ 2,102,450	\$ 2,162,501
Nov 22	N/A	N/A	398.00	243.00	4.92	2.76	30,000	15,000	104,000	22,059	38,127	\$ 2,036,081	\$ 2,036,081	\$ 2,185,091
Dec 22	26.25	14.70	822.00	891.00	5.25	3.34	13,000	0	143,000	19,020	44,132	\$ 2,102,450	\$ 2,102,450	\$ 3,658,267
Jan 23	26.33	33.70	1,121.00	2,356.00	5.65	4.82	0	0	163,000	25,336	43,928	\$ 2,874,940	\$ 2,874,940	\$ 3,667,261
Feb 23	25.93	42.00	1,114.00	842.00	6.28	5.20	0	49,000	195,000	8,361	45,937	\$ 4,072,080	\$ 4,072,080	\$ 4,241,556
Mar 23	25.85	61.00	1,519.00	2,483.00	7.01	6.74	0	90,000	207,000	14,410	44,578	\$ 3,486,068	\$ 3,486,068	\$ 3,505,072
Apr 23	26.02	51.00	1,319.00	1,945.00	7.45	7.64	137,000	127,000	288,000	214,226	36,087	\$ 2,027,700	\$ 2,027,700	\$ 2,049,670
May 23														
Jun 23														
Jul 23														
Aug 23														
Sep 23														
Total							243,000	349,000	1,263,000	359,757	290,841	\$ 18,701,769	\$ 18,701,769	\$ 21,469,417

Actual generation as a percentage of average: 28.5%

Cost per MWh: \$73.82

Lake/Reservoir Content

As of April 30, reservoir storage was 54 percent of the 15-year average for Trinity, 123 percent for Shasta, 110 percent for Folsom, and 104 percent for New Melones. Accumulated inflow was 109 percent of the 15-year average for Trinity, 114 percent for Shasta, 168 percent for Folsom, and 194 percent for New Melones.

Weather and Other Conditions

February had 4.79 inches or 58 percent of average, March had 17.14 inches or 244 percent of average, and April had 1.64 inches which is 41 percent of average. The cumulative total for WY 2023 is at 61.03 inches or 121 percent of average. The statewide snowpack was assumed to reach its peak on April 1, and at the end of April the snowpack was at 196 percent of this average. Based on May 1 conditions, the Sacramento Valley 40-30-30 index at the 50 percent exceedence level is "wet" while the 90 percent exceedence level is "above normal."

Note: The Sierra Nevada Region's average generation is based upon long-term modeling done for its "Green Book." The region does not project purchase power expenses for dry conditions, and its most probable expenses are based upon term purchases of 35 to 65 percent of projected power needs, with the difference being left to day-ahead markets after project pumping and generation have been scheduled.



Upper Great Plains Region

	Snowpack (Inches in Snow Water Equivalent)		Lake/Reservoir Inflow (Thousand Acre-Feet)		Lake/Reservoir Content (Million Acre-Feet)		Generation (MWh)				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Median	Actual	Average	Actual	Average	Actual	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 22	1.20	0.00	7,972.00	6,662.59	56.14	48.67	739,586	736,413	989,699	729,582	9,863	\$ 455,207	\$ 473,370	\$ 730,628
Nov 22	3.80	4.10	7,334.00	5,908.08	55.06	47.47	629,328	622,616	900,312	652,319	135,629	\$ 6,148,980	\$ 6,432,145	\$ 4,817,249
Dec 22	7.10	7.90	6,422.00	4,608.00	54.46	47.01	535,389	536,364	728,266	505,072	401,121	\$ 10,735,481	\$ 10,686,959	\$ 23,241,005
Jan 23	10.30	10.50	6,664.00	5,662.09	54.34	47.16	638,471	631,298	780,434	586,079	325,363	\$ 10,365,142	\$ 10,993,137	\$ 10,519,839
Feb 23	13.10	12.90	6,297.00	4,791.31	54.63	47.38	508,482	527,532	696,830	486,691	379,224	\$ 7,881,615	\$ 7,476,047	\$ 8,120,885
Mar 23	15.80	17.90	8,247.00	6,106.99	56.39	47.90	632,773	597,423	690,806	568,854	227,106	\$ 5,861,062	\$ 5,923,147	\$ 5,564,524
Apr 23	14.90	16.90	8,205.00	7,629.62	57.24	50.93	446,664	531,764	848,484	485,785	*	\$ 4,814,835	\$ 4,010,173	*
May 23														
Jun 23														
Jul 23														
Aug 23														
Sep 23														
Total							4,130,693	4,183,410	5,634,831	4,014,382	1,478,306	\$ 46,262,322	\$ 45,994,978	\$ 52,994,130

Actual generation as a percentage of average: 71.2% Cost per MWh: \$35.85

Lake/Reservoir Content

The yearly runoff forecast for the Missouri River Basin, as of May 1, was 26.9 MAF or 105 percent of average. Runoff above Sioux City, as of March 1, was 4.7 MAF or 159 percent of average. As of May 23, System storage was 51.1 MAF.

Weather and Other Conditions

On May 22, the mountain snow water equivalent in the total above Fort Peck reach was 6.2 inches or 33 percent of average, and the mountain snow water equivalent in the Fort Peck to Garrison reach was 5.2 inches or 33 percent of average. The normal peak for both reaches occurs on or around April 17. The High Plains region has seen phenomenal rainfall totals in mid-May that led to significant reductions in drought coverage, especially from eastern Colorado and northwestern Kansas into western North Dakota. Goodland, Kansas. While rainfall has been good, the rampant storminess largely bypassed some of the extreme to exceptional drought areas in a strip extending from southwestern Kansas into eastern Nebraska.

Note: The Upper Great Plains Region reports 50 percent share of Yellowtail Dam generation while Rocky Mountain Region reports the snowpack, inflow, content, and remaining share of generation. Asterisks indicate that actual purchase power data is not available for the month.

