

**WESTERN AREA POWER ADMINISTRATION**  
**HYDRO CONDITIONS AND PURCHASE POWER REPORT**  
**September 2021**

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected	Most	Average	Actual	Actual	Projected	Most	Actual
	Dry	Probable				Dry	Probable	
<b>Oct 20</b>	1,637,082	1,708,515	1,967,791	1,707,749	330,036	\$9,229,116	\$5,508,878	\$9,801,302
<b>Nov 20</b>	1,413,902	1,475,455	1,822,863	1,442,689	480,048	\$10,118,812	\$9,189,960	\$12,556,811
<b>Dec 20</b>	1,276,475	1,375,669	1,800,527	1,367,249	639,892	\$15,963,137	\$14,405,573	\$16,561,267
<b>Jan 21</b>	1,403,979	1,511,519	1,933,074	1,456,025	528,281	\$13,163,488	\$11,038,437	\$12,744,567
<b>Feb 21</b>	1,417,880	1,388,085	1,763,834	1,396,002	457,148	\$11,692,250	\$10,359,333	\$125,044,358
<b>Mar 21</b>	1,832,993	1,797,417	1,967,511	1,681,182	364,245	\$6,603,587	\$7,804,168	\$7,898,312
<b>Apr 21</b>	2,101,732	2,108,894	2,313,461	2,011,044	189,417	\$4,703,774	\$4,505,043	\$3,863,739
<b>May 21</b>	2,278,194	2,330,224	2,689,563	2,192,272	150,782	\$2,528,661	\$3,808,755	\$3,674,161
<b>Jun 21</b>	2,308,513	2,344,781	2,863,634	2,252,204	193,587	\$7,904,393	\$8,050,265	\$11,800,145
<b>Jul 21</b>	2,413,875	2,422,616	3,078,737	2,317,160	225,959	\$15,217,449	\$19,972,457	\$19,302,166
<b>Aug 21</b>	2,143,092	2,088,522	2,885,690	2,307,892				
<b>Sep 21</b>								
<b>Total</b>	20,227,718	20,551,698	25,086,683	20,131,468	3,559,395	\$97,124,668	\$94,642,870	\$223,246,828

Actual generation as a percentage of average: 80.2%

Cost per MWh: \$62.72

Western Area Power Administration (WAPA) generated a total of 20,131 gigawatt-hours (GWh) from October through August of fiscal year 2021, or 80.2% of average. Actual purchase power data is currently available from October through July for all WAPA's regions, and during this period, total purchase power was 3,559 GWh and total purchase power expenses were \$223,246,828, which equates to \$62.72 per megawatt-hour (MWh) overall, across WAPA. High purchase power prices during the February polar vortex contribute to the average.

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.

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
	<b>Oct 20</b>	1.30	0.80	514.42	78	15.01	10.98	247,024	376,668	382,430	352,623	96,196	\$5,712,150	\$2,383,148
<b>Nov 20</b>	4.80	3.40	474.23	261	14.91	10.62	241,664	315,446	388,155	310,304	136,279	\$5,110,150	\$4,402,490	\$4,502,668
<b>Dec 20</b>	8.10	6.30	362.96	169	14.86	10.13	279,537	351,663	437,962	345,778	156,942	\$6,299,733	\$5,277,929	\$5,473,649
<b>Jan 21</b>	11.50	8.60	361.45	198	14.98	9.64	329,144	364,153	457,394	358,646	140,939	\$5,112,308	\$4,064,075	\$4,072,438
<b>Feb 21</b>	15.10	12.60	392.01	201	15.99	9.23	285,980	324,408	390,580	315,532	133,406	\$4,550,403	\$3,198,843	\$7,857,765
<b>Mar 21</b>	18.90	16.30	666.27	297	16.77	8.84	300,884	340,401	390,170	330,480	132,948	\$3,588,199	\$3,937,998	\$3,770,513
<b>Apr 21</b>	19.40	13.90	1,057.14	289	16.74	8.5	299,431	331,588	397,861	340,907	67,641	\$1,970,254	\$1,901,016	\$1,769,595
<b>May 21</b>	7.90	4.00	2,337.68	543	16.3	8.37	364,111	335,179	475,860	374,602	61,640	\$1,374,340	\$2,528,177	\$1,769,724
<b>Jun 21</b>	0.00	0.30	2,668.50	810	16	8.33	350,695	402,219	534,248	377,717	81,446	\$3,910,230	\$3,769,301	\$5,403,667
<b>Jul 21</b>	0.00	0.30	1,093.88	209	15.88	7.87	393,842	429,051	536,434	418,129	80,576	\$6,386,456	\$11,472,558	\$7,018,209
<b>Aug 21</b>	0.00	0.00	496.08	294	15.68	7.51	407,318	445,460	558,659	431,182	66,171	\$5,796,958	\$7,771,409	\$2,711,975
<b>Sep 21</b>														
<b>Total</b>							3,499,631	4,016,237	4,949,752	3,955,901	1,154,184	\$49,811,183	\$50,706,945	\$47,343,275

Actual generation as a percentage of average: 79.9%

Cost per MWh: \$41.02

### Lake/Reservoir Levels

End of August storage volume for Lake Powell was 7.5 million acre-feet or about 31% of capacity. Lake Powell reservoir inflow for August was 294,000 acre-feet or 59% of average. End of August Lake Powell elevation was about 3,549 feet, 151 feet from maximum reservoir level and 59 feet from the minimum generation level.

### Weather and Other Conditions

Due to the extreme drought in the Colorado River Basin, Lake Powell elevation is forecasted to drop below the threshold elevation (3,525 feet; 35 feet from minimum power pool of 3,490 feet) that triggers Drought Response Operations Agreement releases from Upper Colorado River Basin reservoirs Blue Mesa, Flaming Gorge, and Navajo by March 2022. The U.S. Bureau of Reclamation plans to release an additional 181,000 acre-feet total from these reservoirs by the end of December 2021 to maintain Lake Powell elevation above 3,525 feet. These additional releases are expected to add about 3 feet of elevation at Lake Powell but will not prevent the reservoir from dropping below the 3,525 feet target elevation. Future additional releases from these reservoirs are currently being considered.



## 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
	<b>Oct 20</b>	1.3	0.8	59.65	35	19.82	12.25	407,200	384,190	377,268	391,920	27,216	\$498,024	\$498,024
<b>Nov 20</b>	4.8	3.4	55.47	56	19.86	12.28	361,600	360,155	362,391	355,236	21,032	\$800,684	\$800,684	\$1,098,412
<b>Dec 20</b>	8.1	6.3	73.06	60	20	12.46	217,750	256,520	365,340	266,410	24,797	\$1,639,676	\$1,639,676	\$1,208,261
<b>Jan 21</b>	11.5	8.6	93	74	20.16	12.78	274,050	299,265	388,937	296,996	33,596	\$907,204	\$907,204	\$1,391,031
<b>Feb 21</b>	15.1	12.6	107.5	56	20.2	12.88	318,150	305,675	386,998	311,351	14,841	\$747,756	\$747,756	\$760,432
<b>Mar 21</b>	18.9	16.3	103.81	34	20.01	12.63	522,450	517,060	526,368	517,092	10,701	\$1,092,436	\$1,092,436	\$475,939
<b>Apr 21</b>	19.4	13.9	83.65	37	19.84	12.22	553,400	567,845	569,446	570,700	9,356	\$286,954	\$286,954	\$453,665
<b>May 21</b>	7.9	4	58.4	28	19.92	11.75	535,900	582,945	570,961	592,962	10,127	\$383,310	\$383,310	\$516,477
<b>Jun 21</b>	0	0.3	26.28	-13	20.09	11.4	493,750	508,340	535,980	505,949	11,268	\$3,097,474	\$3,097,474	\$3,295,728
<b>Jul 21</b>	0	0.3	66.28	93	20	11.31	455,000	454,435	545,092	452,862	9,229	\$6,398,969	\$6,398,969	\$5,041,605
<b>Aug 21</b>	0	0	97.47	89	19.88	11.32	394,150	396,310	507,986	400,165	37,055	\$10,525,501	\$10,525,501	\$5,182,292
<b>Sep 21</b>														
<b>Total</b>							4,533,400	4,632,740	5,136,767	4,661,646	209,218	\$26,377,988	\$26,377,988	\$20,934,352

Actual generation as a percentage of average: 90.8%

Cost per MWh: \$100.06

### Lake/Reservoir Levels

Aggregate system storage for the Lower Colorado River Basin, or Lakes Mead, Mohave and Havasu, was 11.3 million acre-feet (MAF) at the end of August, or 40% of the Lower Basin capacity. The Lower Basin tributary inflow into Lake Mead for August 2021 was 89 thousand acre-feet (KAF). The total side inflow into Lake Mead for Water Year 2021 is projected at 612 KAF, which represents a 29% decrease over last year's actual of 863 KAF and 47% of the normal annual side inflow of 1.3 MAF.

### Weather and Other Conditions

The Desert Southwest Region's (DSW) 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 81% of average.

*Note: DSW's projected dry and most probable generation data are reported from studies conducted by the U.S. Bureau of Reclamation.*



## 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
<b>Oct 20</b>	0.00	0.00	142.50	95.30	3.854	4.138	97,268	107,268	104,469	73,515	103,847	\$ 1,853,600	\$ 1,533,600	\$ 3,246,505
<b>Nov 20</b>	3.70	4.00	125.30	111.10	3.702	4.02	49,932	59,932	71,586	48,589	124,138	\$ 1,131,072	\$ 811,072	\$ 3,817,277
<b>Dec 20</b>	11.80	8.90	126.10	111.20	3.794	4.105	92,471	102,471	105,136	81,323	99,875	\$ 1,319,040	\$ 999,040	\$ 3,007,865
<b>Jan 21</b>	18.60	20.40	100.40	84.30	3.788	4.075	114,675	124,675	101,067	112,305	65,082	\$ 1,701,344	\$ 1,381,344	\$ 1,576,446
<b>Feb 21</b>	25.80	27.90	99.30	78.60	3.771	4.064	101,654	111,654	100,751	95,375	37,972	\$ -	\$ -	\$ 3,394,430
<b>Mar 21</b>	37.30	33.90	160.50	130.80	3.785	4.125	108,080	118,080	144,642	106,409	35,071	\$ -	\$ -	\$ 894,723
<b>Apr 21</b>	45.70	43.50	252.20	191.20	3.819	4.129	123,233	133,233	206,415	151,191	21,931	\$ 1,322,176	\$ 1,002,176	\$ 593,809
<b>May 21</b>	43.30	36.70	759.80	536.80	4.143	4.341	197,390	207,390	234,507	181,846	10,531	\$ -	\$ -	\$ 332,956
<b>Jun 21</b>	11.30	9.00	1197.50	870.70	3.733	4.665	211,066	221,066	269,854	204,831	21,365	\$ 89,312	\$ 230,688	\$ 1,310,337
<b>Jul 21</b>	0.00	0.00	543.10	334.00	4.373	4.443	220,682	230,682	260,779	235,935	20,052	\$ 2,084,224	\$ 1,764,224	\$ 1,828,652
<b>Aug 21</b>	0.00	0.00	165.10	145.50	3.835	3.883	221,646	231,646	199,700	193,651	16,655	\$ 3,592,576	\$ 3,272,576	\$ 828,711
<b>Sep 21</b>														
<b>Total</b>							1,538,097	1,648,097	1,798,907	1,484,970	556,519	\$13,093,344	\$10,994,720	\$20,831,711

Actual generation as a percentage of average: 82.5%

Cost per MWh: \$37.43

### Lake/Reservoir Content

At the end of August, reservoir inflows were 88% of average and reservoir storage was at 100% of average.

### Weather and Other Conditions

LAP's hydrologic conditions can vary from one river basin and watershed to another. The runoff is complete; no snow accumulation yet. The latest National Weather Service forecast indicates October through December temperatures will most likely be above average in Wyoming and Colorado. The same forecast indicates precipitation will be below average for Wyoming and Colorado. Winter generation in the Colorado River Basin, the North Platte Basin and the Big Horn Basin is forecasted to be below average due to unit and transmission maintenance schedules.



## 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
<b>Oct 20</b>	N/A	N/A	328.00	256.00	5.383	5.233	139,000	79,000	163,000	119,699	55,232	\$ 659,220	\$ 659,220	\$ 979,064
<b>Nov 20</b>	N/A	N/A	399.00	283.00	5.338	5.133	53,000	38,000	104,000	70,365	53,796	\$ 628,188	\$ 628,188	\$ 1,150,708
<b>Dec 20</b>	27.37	5.20	791.00	303.00	5.617	5.117	30,000	0	143,000	74,714	55,552	\$ 654,300	\$ 654,300	\$ 1,302,849
<b>Jan 21</b>	28.29	11.60	949.00	417.00	6.032	5.223	0	0	163,000	38,018	58,365	\$ 634,400	\$ 634,400	\$ 1,330,776
<b>Feb 21</b>	27.96	15.10	1,216.00	501.00	6.620	5.451	56,000	0	195,000	11,982	53,443	\$ 578,400	\$ 578,400	\$ 1,111,030
<b>Mar 21</b>	28.00	16.80	1,439.00	515.00	7.309	5.584	107,000	92,000	207,000	85,317	52,517	\$ 641,275	\$ 641,275	\$ 912,219
<b>Apr 21</b>	27.37	5.20	1,241.00	486.00	7.667	5.414	234,000	219,000	288,000	143,983	47,646	\$ 496,000	\$ 496,000	\$ 520,900
<b>May 21</b>	0.00	0.00	1,017.00	364.00	7.587	5.058	264,000	319,000	442,000	172,564	49,957	\$ 514,400	\$ 514,400	\$ 673,243
<b>Jun 21</b>	0.00	0.00	694.00	224.00	7.122	4.399	353,000	358,000	440,000	282,859	45,421	\$ 496,000	\$ 496,000	\$ 807,686
<b>Jul 21</b>	0.00	0.00	412.00	216.00	6.367	3.744	339,000	319,000	524,000	343,572	40,993	\$ 237,800	\$ 237,800	\$ 3,370,811
<b>Aug 21</b>	0.00	0.00	331.00	220.00	5.72	3.22	84,000	49,000	402,000	291,047	38,879	\$ 237,800	\$ 237,800	\$ 3,390,629
<b>Sep 21</b>														
<b>Total</b>							1,659,000	1,473,000	3,071,000	1,634,122	551,801	\$5,777,783	\$5,777,783	\$15,549,914

Actual generation as a percentage of average: 53.2%

Cost per MWh: \$28.18

### Lake/Reservoir Content

As of August 31, reservoir storage was 60% of the 15-year average for Trinity, 49% for Shasta, 49% for Folsom, and 69% for New Melones. Accumulated inflow was 33% of the 15-year average for Trinity, 51% for Shasta, 35% for Folsom, and 36% for New Melones.

### Weather and Other Conditions

August's precipitation was 0.01 inch. Water year total remains at 46% of average. Based upon May 1 conditions, the Sacramento River Index forecast for 50% exceedance at 6.7 is "critical," and the 90% exceedance at 6.0 is also "critical."

*Note: The Sierra Nevada Region's (SNR) average generation is based upon long-term modeling done for its "Green Book." SNR does not project purchase power expenses for dry conditions, and its most probable expenses are based upon term purchases of 35 to 65% 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
	<b>Oct 20</b>	1.20	1.80	7,972.00	7,076.94	56.14	58.83	746,590	761,389	940,624	769,992	47,545	\$506,122	\$434,886
<b>Nov 20</b>	3.80	3.60	7,334.00	6,581.48	55.06	57.86	707,706	701,922	896,730	658,194	144,803	\$2,448,719	\$2,547,526	\$1,987,746
<b>Dec 20</b>	7.10	5.80	6,422.00	5,580.68	54.46	57.57	656,717	665,015	749,088	599,023	302,726	\$6,050,388	\$5,834,628	\$5,568,644
<b>Jan 21</b>	10.30	8.20	6,641.00	5,891.16	54.18	57.41	686,110	723,426	822,676	650,060	230,299	\$4,808,232	\$4,051,414	\$4,373,877
<b>Feb 21</b>	13.10	12.40	6,281.00	5,848.92	54.50	57.08	656,096	646,348	690,506	661,762	217,486	\$5,815,691	\$5,834,334	\$111,920,701
<b>Mar 21</b>	15.80	14.00	8,151.00	6,911.39	56.20	57.66	794,579	729,876	699,331	641,883	133,008	\$1,281,677	\$2,132,459	\$1,844,918
<b>Apr 21</b>	14.90	11.40	8,041.00	7,292.99	57.06	56.84	891,668	857,228	851,739	804,263	42,843	\$628,390	\$818,897	\$525,770
<b>May 21</b>	6.30	5.00	9,654.00	8,690.01	58.35	56.76	916,793	885,710	966,235	870,298	18,527	\$256,611	\$382,869	\$381,761
<b>Jun 21</b>	0.50	0.00	11,746.00	9,067.75	60.54	56.84	900,002	855,156	1,083,552	880,848	34,087	\$311,377	\$456,802	\$982,727
<b>Jul 21</b>	0.00	0.00	10,694.00	7,809.00	60.49	53.87	1,005,351	989,448	1,212,432	866,662	75,109	\$110,000	\$98,906	\$2,042,889
<b>Aug 21</b>	0.00	0.00	9,716.00	8,523.33	58.91	53.54	1,035,978	966,106	1,217,345	991,847	*	\$218,407	\$427,909	*
<b>Sep 21</b>														
<b>Total</b>							8,997,590	8,781,624	10,130,257	8,394,832	1,246,433	\$22,435,612	\$23,020,629	\$130,701,182

Actual generation as a percentage of average: 82.9%

Cost per MWh: \$104.86

### Lake/Reservoir Content

The yearly runoff forecast for the Missouri River basin as of September 1 was 14.7 million acre-feet (MAF) or 57% of average, and projected runoff above Sioux City for September was 798 MAF or 55% of average. System storage as of October 5 is at 50.6 MAF. The snowpack has melted.

### Weather and Other Conditions

The U.S. Drought Monitor shows large areas of the upper Basin continue to be impacted by drought. Extreme Drought conditions are occurring in most of North Dakota, northwest South Dakota, and northeastern Montana with some Exceptional Drought conditions in north central North Dakota. Severe, Moderate Drought, and Abnormally Dry conditions are occurring in much of the lower half of South Dakota.

Average purchase power amounts and prices for the year are skewed by the extreme pricing and increased purchasing during the polar vortex on February 15 and 16, with UGP significantly exceeding its purchase power estimates for fiscal year 2021 in just February.

*Note: The Upper Great Plains Region reports its 50% share of generation from Yellowtail Dam, and RMR reports the snowpack, inflow, content, and remaining share of generation. Asterisks indicate that actual purchase power data is not available for the month.*

