WESTERN AREA POWER ADMINSTRATION
HYDRO CONDITIONS AND PURCHASE POWER REPORT
August 2021

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 20	1,637,082	1,708,515	1,967,791	1,707,748	330,036	$9,229,116	$5,508,878	$9,801,302
Nov 20	1,413,902	1,475,455	1,822,863	1,442,689	480,048	$10,118,812	$9,189,960	$12,556,811
Dec 20	1,276,475	1,375,669	1,800,527	1,367,249	639,892	$15,963,137	$14,405,573	$16,561,267
Jan 21	1,403,979	1,511,519	1,933,074	1,456,026	528,281	$13,163,488	$11,038,437	$12,744,567
Feb 21	1,417,880	1,388,085	1,763,834	1,396,003	457,148	$11,692,250	$10,359,333	$125,044,358
Mar 21	1,832,993	1,797,417	1,967,511	1,681,182	364,245	$6,603,587	$7,804,168	$7,898,312
Apr 21	2,101,732	2,108,894	2,313,461	2,011,044	189,417	$4,703,774	$4,505,043	$3,863,739
May 21	2,278,194	2,330,224	2,689,563	2,192,273	150,782	$2,528,661	$3,808,755	$3,674,161
Jun 21	2,308,513	2,344,781	2,863,634	2,252,205	193,587	$7,904,393	$8,050,265	$11,800,145
Jul 21	2,413,875	2,422,616	3,078,737	2,317,160				
Aug 21								
Sep 21								
Total	18,084,626	18,463,175	22,200,994	17,823,578	3,333,437	$81,907,219	$74,670,413	$203,944,662
	Actual generation as a percentage of average:			80.3%			Cost per MWh:	$61.18

Western Area Power Administration (WAPA) generated a total of 17,824 gigawatt-hours (GWh) during October through July of fiscal year 2021, or 80.3 percent of the average. Actual purchase power data is currently available from October through June for all WAPA's regions, and during this period total purchase power was 3,333 GWh and total purchase power expenses were $203,944,662, which equates to $61.18 per 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 is melted instantaneously.

The monthly purchase power numbers indicated herein are used by WAPA's Regions as a forecasting tool, and 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 20	1.30	0.80	514.42	78.00	15.01	10.98	247,024	376,668	382,430	352,623	96,196	$5,712,150	$2,383,148	$2,993,074
Nov 20	4.80	3.40	474.23	261.00	14.91	10.62	241,664	315,446	388,155	310,304	136,279	$5,110,150	$4,402,490	$4,502,668
Dec 20	8.10	6.30	362.96	169.00	14.86	10.13	279,537	351,663	437,962	345,778	156,942	$6,299,733	$5,277,929	$5,473,649
Jan 21	11.50	8.60	361.45	198.00	14.98	9.64	329,144	364,153	457,394	358,646	140,939	$5,112,308	$4,064,075	$4,072,438
Feb 21	15.10	12.60	392.01	201.00	15.99	9.23	285,980	324,408	390,580	315,532	133,406	$4,550,403	$3,198,843	$7,857,765
Mar 21	18.90	16.30	666.27	297.00	16.77	8.84	300,884	340,401	390,170	330,480	132,948	$3,588,199	$3,937,998	$3,770,513
Apr 21	19.40	13.90	1,057.14	289.00	16.74	8.50	299,431	331,588	397,861	340,907	67,641	$1,970,254	$1,901,016	$1,769,595
May 21	7.90	4.00	2,337.68	543.00	16.30	8.37	364,111	335,179	475,860	374,602	61,640	$1,374,340	$2,528,177	$1,769,724
Jun 21	0.00	0.30	2,668.50	810.00	16.00	8.33	350,695	402,219	534,248	377,717	81,446	$3,910,230	$3,769,301	$5,403,667
Jul 21	0.00	0.30	1,093.88	289.00	15.88	7.87	393,842	429,051	536,434	418,129	80,576	$6,386,456	$11,472,558	$7,018,209
Aug 21														
Sep 21														
Total							3,092,313	3,570,776	4,391,093	3,524,719	1,088,013	$44,014,225	$42,935,536	$44,631,300
							Actual generation as a percentage of average:			80.3%			Cost per MWh:	$41.02

Lake/Reservoir Levels

End of July storage volume for Lake Powell was 7.9 million acre-feet or about 32 percent of capacity. Lake Powell reservoir inflow for July was 209,000 acre-feet or 19 percent of average. End of July Lake Powell elevation was about 3,554 feet, 146 feet from maximum reservoir level, and 64 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 ft; 35 ft from minimum power pool of 3,490 ft) that triggers Drought Response Operations Agreement (DROA) releases from Upper Colorado River Basin reservoirs Blue Mesa, Flaming Gorge, and Navajo by March of 2022. The Bureau of Reclamation plans to release an additional 181,000 acre-feet total from these reservoirs by the end of December 2021 to try and maintain Lake Powell elevation above 3,525 ft.

Due to the dry hydrologic conditions, purchase power estimates for FY 2021 are expected to be very high.

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 20	1.30	0.80	59.65	35.00	19.82	12.25	407,200	384,190	377,268	391,920	27,216	$498,024	$498,024	$1,510,510
Nov 20	4.80	3.40	55.47	56.00	19.86	12.28	361,600	360,155	362,391	355,236	21,032	$800,684	$800,684	$1,098,412
Dec 20	8.10	6.30	73.06	60.00	20.00	12.46	217,750	256,520	365,340	266,410	24,797	$1,639,676	$1,639,676	$1,208,261
Jan 21	11.50	8.60	93.00	74.00	20.16	12.78	274,050	299,265	388,937	296,996	33,596	$907,204	$907,204	$1,391,031
Feb 21	15.10	12.60	107.50	56.00	20.20	12.88	318,150	305,675	386,998	311,351	14,841	$747,756	$747,756	$760,432
Mar 21	18.90	16.30	103.81	34.00	20.01	12.63	522,450	517,060	526,368	517,092	10,701	$1,092,436	$1,092,436	$475,939
Apr 21	19.40	13.90	83.65	37.00	19.84	12.22	553,400	567,845	569,446	570,700	9,356	$286,954	$286,954	$453,665
May 21	7.90	4.00	58.40	28.00	19.92	11.75	535,900	582,945	570,961	592,962	10,127	$383,310	$383,310	$516,477
Jun 21	0.00	0.30	26.28	-13.00	20.09	11.40	493,750	508,340	535,980	505,949	11,268	$3,097,474	$3,097,474	$3,295,728
Jul 21	0.00	0.30	66.28	93.00	20.00	11.31	455,000	454,435	545,092	452,862	9,229	$6,398,969	$6,398,969	$5,041,605
Aug 21														
Sep 21														
Total							4,139,250	4,236,430	4,628,781	4,261,481	172,163	$15,852,487	$15,852,487	$15,752,060
							Actual generation as a percentage of average:			92.1%			Cost per MWh:	$91.50

Lake/Reservoir Levels

Aggregate system storage for the Lower Colorado River Basin, or Lakes Mead, Mohave and Havasu, was 11.3 million acre-feet at the end of July, or 40 percent of the Lower Basin capacity. The lower basin tributary inflow into Lake Mead for July was 93 KAF. The total side inflow into Lake Mead for WY 2021 is projected at 606 KAF which represents a 30 percent decrease over last year's actual of 863 KAF and represents 47 percent of the normal annual side inflow of 1.3 MAF.

Weather and Other Conditions

The Desert Southwest Region's (DSWR) 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 82 percent of average.

Note: DSWR'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
Oct 20	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
Nov 20	3.70	4.00	125.30	111.10	3.702	4.020	49,932	59,932	71,586	48,589	124,138	$ 1,131,072	$ 811,072	$ 3,817,277
Dec 20	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
Jan 21	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
Feb 21	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
Mar 21	37.30	33.90	160.50	130.80	3.785	4.125	108,080	118,080	144,642	106,409	35,071	$ -	$ -	$ 894,723
Apr 21	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
May 21	43.30	36.70	759.80	536.80	4.143	4.341	197,390	207,390	234,507	181,846	10,531	$ -	$ -	$ 332,956
Jun 21	11.30	9.00	1,197.50	870.70	3.733	4.665	211,066	221,066	269,854	204,831	21,365	$ 89,312	$ 230,688	$ 1,310,337
Jul 21	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
Aug 21														
Sep 21														
Total							1,316,451	1,416,451	1,599,207	1,291,319	539,864	$9,500,768	$7,722,144	$20,003,000
							Actual generation as a percentage of average:			80.7%			Cost per MWh:	$37.05

Lake/Reservoir Content

At the end of July, reservoir inflows were 61 percent of average and reservoir storage was at 102 percent of average.

Weather and Other Conditions

LAP's hydrologic conditions can vary from one river basin and watershed to another. Runoff is complete. Temperatures through October are projected to be above average and precipitation is projected to be below average in Wyoming and Colorado. Summer generation in the Colorado River Basin, North Platte Basin and Big Horn Basin is forecasted to be average due to decent storage and water movement.

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 20	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
Nov 20	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
Dec 20	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
Jan 21	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
Feb 21	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
Mar 21	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
Apr 21	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
May 21	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
Jun 21	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
Jul 21	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
Aug 21														
Sep 21														
Total							1,575,000	1,424,000	2,669,000	1,343,075	512,922	$5,539,983	$5,539,983	$12,159,285
							Actual generation as a percentage of average:			50.3%			Cost per MWh:	$23.71

Lake/Reservoir Content

As of July 31, reservoir storage for the water year was 64 percent of the 15 year average for Trinity, 51 percent for Shasta, 43 percent for Folsom and 75 percent for New Melones. Accumulated inflow was 33 percent of the 15 year average for Trinity, 50 percent for Shasta, 33 percent for Folsom and 36 percent for New Melones.

Weather and Other Conditions

July precipitation was 0.08 inches for the month that averages 0.17 inches and the water year total is 46 percent of average. Based upon May 1 conditions, the Sacramento River Index forecast for 50 percent exceedance at 6.7 is "critical" and the 90 percent 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 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 20	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	$1,072,149
Nov 20	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
Dec 20	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
Jan 21	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
Feb 21	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
Mar 21	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
Apr 21	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
May 21	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
Jun 21	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
Jul 21	0.00	0.00	10,694.00	7,809.00	60.49	53.87	1,005,351	989,448	1,212,432	866,662	*	$110,000	$98,906	*
Aug 21														
Sep 21														
Total							7,961,612	7,815,518	8,912,912	7,402,985	1,171,324	$22,217,205	$22,592,720	$128,658,293
							Actual generation as a percentage of average:			83.1%			Cost per MWh:	$109.84

Lake/Reservoir Content

The yearly runoff forecast for the Missouri River basin as of August 17 was 14.6 million acre-feet (MAF) or 57 percent of average and projected runoff above Sioux City for the month of August is 1195 MAF or 55 percent of average. System storage as of August 2 is at 55.2 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 FY21 in just the month of February.

Note: The Upper Great Plains Region reports its 50 percent 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.