

**WESTERN AREA POWER ADMINISTRATION  
HYDRO CONDITIONS AND PURCHASE POWER REPORT  
April 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	1,678,382	1,967,791	1,707,748	330,036	\$9,229,116	\$5,508,878	\$9,801,302
<b>Nov 20</b>	1,413,902	1,450,220	1,822,863	1,442,689	480,048	\$10,118,812	\$9,189,960	\$12,556,811
<b>Dec 20</b>	1,276,475	1,347,536	1,800,527	1,367,249	639,892	\$15,963,137	\$14,405,573	\$16,561,267
<b>Jan 21</b>	1,403,979	1,482,387	1,933,074	1,456,026	528,281	\$13,163,488	\$11,038,437	\$12,744,567
<b>Feb 21</b>	1,417,880	1,362,132	1,763,834	1,396,003	456,183	\$11,692,250	\$10,359,333	\$122,693,782
<b>Mar 21</b>	1,832,993	1,770,184	1,441,669	1,681,182				
<b>Apr 21</b>								
<b>May 21</b>								
<b>Jun 21</b>								
<b>Jul 21</b>								
<b>Aug 21</b>								
<b>Sep 21</b>								
<b>Total</b>	8,982,312	9,090,841	10,729,758	9,050,896	2,434,441	\$60,166,803	\$50,502,181	\$174,357,729
Actual generation as a percentage of average:				84.4%	Cost per MWh: \$71.62			

Western Area Power Administration (WAPA) generated a total of 9,050 gigawatt-hours (GWh) during October through March of fiscal year 2021, or 84.4 percent of the average. Actual purchase power data is currently available from October through February for all of WAPA’s Regions, and during this period total purchase power was 2,434 GWh and total purchase power expenses were \$174,357,729, which equates to \$71.62 per MWh overall, across WAPA. By comparison, the most recent monthly report showed purchase power expenses equated to a calculated average of \$26.12 per MWh. This large increase reflects extreme power pricing during the February polar vortex.

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
<b>Oct 20</b>	1.30	0.80	514.42	78.00	15.01	10.98	247,024	346,535	382,430	352,623	96,196	\$5,712,150	\$2,383,148	\$2,993,074
<b>Nov 20</b>	4.80	3.40	474.23	261.00	14.91	10.62	241,664	290,211	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	169.00	14.86	10.13	279,537	323,530	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	198.00	14.98	9.64	329,144	335,021	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	201.00	15.99	9.23	285,980	298,455	390,580	315,532	108,150	\$4,550,403	\$3,198,843	\$5,267,596
<b>Mar 21</b>	18.90	16.30	666.27	297.00	16.77	8.84	300,884	313,168	390,170	330,480	118,883	\$3,588,199	\$3,937,998	\$3,687,171
<b>Apr 21</b>														
<b>May 21</b>														
<b>Jun 21</b>														
<b>Jul 21</b>														
<b>Aug 21</b>														
<b>Sep 21</b>														
<b>Total</b>							1,684,234	1,906,920	2,446,691	2,013,364	757,389	\$30,372,944	\$23,264,484	\$25,996,595

Actual generation as a percentage of average: 82.3%

Cost per MWh: \$34.32

### Lake/Reservoir Levels

End of March storage volume for Lake Powell was 8.8 million acre-feet or 36 percent of capacity. Lake Powell reservoir inflow for March was 297,000 acre-feet or 45 percent of average. End of March Lake Powell elevation was about 3,567 feet, 133 feet from maximum reservoir level, and 77 feet from the minimum generation level.

### Weather and Other Conditions

The Upper Colorado River Basin is currently experiencing a protracted drought that began in 2000 with hydrologic conditions in April through December being some of the driest on record. Dry conditions have resulted in low reservoir conditions that reduce power head greatly reducing power generation. 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	517,092	10,701	\$1,092,436	\$1,092,436	\$475,939
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							2,101,200	2,122,865	1,881,460	2,139,007	132,183	\$5,685,780	\$5,685,780	\$6,444,585

Actual generation as a percentage of average: 113.7%

Cost per MWh: \$48.76

### Lake/Reservoir Levels

Aggregate system storage for the Lower Colorado River Basin, or Lakes Mead, Mohave and Havasu, was 12.63 million acre-feet at the end of March, or 44.2 percent of the Lower Basin capacity. The lower basin tributary inflow into Lake Mead for March was 34,000 acre-feet and the total side inflow into Lake Mead projected for WY21 is 688,000 acre-feet, which is 53 percent of average.

### 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 74 percent of average and the snowpack is currently 72 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
<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	4.020	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	\$0	\$0	\$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	\$0	\$0	\$894,723
<b>Apr 21</b>														
<b>May 21</b>														
<b>Jun 21</b>														
<b>Jul 21</b>														
<b>Aug 21</b>														
<b>Sep 21</b>														
<b>Total</b>							564,080	624,080	627,652	517,516	465,985	\$6,005,056	\$4,725,056	\$15,937,246

Actual generation as a percentage of average: 82.5%

Cost per MWh: \$34.20

### Lake/Reservoir Content

At the end of March, reservoir inflows were 82 percent of average and reservoir storage was at 109 percent of average.

### Weather and Other Conditions

LAP's hydrologic conditions can vary from one river basin and watershed to another. In the Colorado and southwestern Wyoming area, the snowpack is currently below average. Northeastern Wyoming snowpack has reached average due to late season storms. April through June temperatures are projected to be above average, and precipitation is projected to be below average. Spring generation in the Colorado River Basin, North Platte Basin and Big Horn Basin is forecasted to be average this spring due to decent storage and storage 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	5.38	5.23	139,000	79,000	163,000	119,699	55,232	\$659,220	\$659,220
Nov 20	N/A	N/A	399.00	283.00	5.34	5.13	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	5.62	5.12	30,000	-	143,000	74,714	55,552	\$654,300	\$654,300	\$1,302,849
Jan 21	28.29	11.60	949.00	417.00	6.03	5.22	-	-	163,000	38,018	58,365	\$634,400	\$634,400	\$1,330,776
Feb 21	27.96	15.10	1,216.00	501.00	6.62	5.45	56,000	-	195,000	11,982	53,443	\$578,400	\$578,400	\$1,111,030
Mar 21	28.00	16.80	1,439.00	515.00	7.31	5.58	107,000	92,000	207,000	85,317	52,517	\$641,275	\$641,275	\$912,219
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							385,000	209,000	975,000	400,096	328,905	\$3,795,783	\$3,795,783	\$6,786,645

Actual generation as a percentage of average: 41.0%

Cost per MWh: \$20.63

### Lake/Reservoir Content

As March 31, reservoir storage for the water year was 76 percent of the 15-year average for Trinity, 69 percent for Shasta, 60 percent for Folsom, and 101 percent for New Melones. Accumulated inflow was 29 percent of the 15-year average for Trinity, 50 percent for Shasta, 36 percent for Folsom, and 48 percent for New Melones.

### Weather and Other Conditions

March precipitation was 61 percent of average (at 7.6 inches) and the water year total is 44 percent of average. Reclamation is working to conserve storage while still meeting all its instream flow requirements and Delta water quality requirements. Based upon April 1 conditions, the Sacramento River Index forecast for 50 percent exceedance at 8.8 is "critical" and the 90 percent exceedance at 6.7 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	241,777	\$5,815,691	\$5,834,334	\$112,160,294
Mar 21	15.80	14.00	8,151.00	6,911.39	56.20	57.66	794,579	729,876	699,331	641,883	*	\$1,281,677	\$2,132,459	*
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							4,247,798	4,227,976	4,798,955	3,980,914	967,150	\$20,910,827	\$20,835,246	\$125,162,710

Actual generation as a percentage of average: 83.0%

Cost per MWh: \$129.41

### Lake/Reservoir Content

The yearly runoff forecast for the Missouri River basin as of April 1 was 21.3 million acre-feet (MAF) or 83 percent of average and runoff above Sioux City for the month of February was 2.1 MAF or 70 percent of average. System storage is at 55.5 MAF. On April 21 the mountain Snow Water Equivalent (SWE) in the “Total above Fort Peck” reach was 13.5 inches or 86 percent of average and the mountain SWE in the “Fort Peck to Garrison” reach was 13.5 inches or 95 percent of average.

### Weather and Other Conditions

The U.S. Drought Monitor shows large areas of the upper Basin continue to be impacted by abnormally dry conditions and drought conditions. Extreme Drought conditions are occurring in western North Dakota. Severe and Moderate Drought conditions are occurring in eastern Montana and most of the Dakotas. UGP experienced extreme purchase power pricing along with orders to curtail loads during the polar vortex on February 15 and 16. For context, purchase power expenses for FY21 were projected at approximately \$46M (for the entirety of FY21), but UGP incurred purchase power purchase expenses for \$112M just for the month of February. The calculated average purchase power costs for the water year is skewed accordingly.



*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.*

