

## WESTERN AREA POWER ADMINISTRATION HYDRO CONDITIONS AND PURCHASE POWER REPORT

**March 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	1,822,862	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	1,370,760				
<b>Mar 21</b>								
<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>	7,149,318	7,320,657	9,288,088	7,344,471	1,978,257	\$48,474,554	\$40,142,848	\$51,663,947

Actual generation as a percentage of average:      79.1%      Cost per MWh:      \$26.12

Western Area Power Administration (WAPA) generated a total of 7,344 gigawatt-hours (GWh) during October through February of fiscal year 2021, or 79.1 percent of the average. Actual purchase power data is currently available from October through January for all of WAPA's regions, and during this period total purchase power was 1,978 GWh and total purchase power expenses were \$51,663,947, which equates to \$26.12 per MWh.

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	346,535	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	290,211	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	323,530	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	335,021	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	298,455	390,580	290,289	108,150	\$4,550,403	\$3,198,843	\$5,267,596
Mar 21														
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							1,383,349	1,593,752	2,056,521	1,657,640	638,506	\$26,784,745	\$19,326,486	\$22,309,424

Actual generation as a percentage of average: 80.6%

Cost per MWh: \$34.94

### Lake/Reservoir Levels

End of January storage volume for Lake Powell was 9.6 million acre-feet or 39 percent of capacity. Lake Powell reservoir inflow for the most recent historical month (February 2021) was 201,000 acre-feet or 51 percent of average. End of January Lake Powell elevation was about 3,571 feet, 129 feet from maximum reservoir level, and 81 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														
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							1,578,750	1,605,805	1,880,934	1,621,914	121,482	\$4,593,344	\$4,593,344	\$5,968,646

Actual generation as a percentage of average: 86.2%

Cost per MWh: \$49.13

### Lake/Reservoir Levels

Aggregate system storage for the Lower Colorado River Basin, or Lakes Mead, Mohave and Havasu, was 12.88 million acre-feet at the end of January, or 45.1 percent of the Lower Basin capacity. The lower basin tributary inflow into Lake Mead for January was 56,000 acre-feet and the total side inflow into Lake Mead projected for WY21 is 767,000 acre-feet, which is 59 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 77 percent of average and the snowpack is currently 87 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	3.85	4.14	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	3.70	4.02	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	3.79	4.11	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	3.79	4.08	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	3.77	4.06	101,654	111,654	100,751	95,375	37,972			\$3,394,430
Mar 21														
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							456,000	506,000	483,009	411,107	430,914	\$6,005,056	\$4,725,056	\$15,042,523

Actual generation as a percentage of average: 85.1% Cost per MWh: \$34.91

## Lake/Reservoir Content

At the end of January, reservoir inflows were 76 percent of average and reservoir storage was 108 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 Wyoming area, the snowpack is currently below average, March through May temperatures are projected to be above average, and precipitation is projected to be below average. Spring generation in the Colorado River Basin is forecasted to be average this spring due to decent storage and storage movement. Spring generation in the North Platte Basin and Big Horn Basin is also forecasted to be average.

*Note: actual generation for February 2021 was obtained from WAPA’s energy management system rather than the Bureau of Reclamation’s monthly report, which is the typical source of data for this report. The entry will be updated in the April report.*



## 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	\$ 979,064
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														
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							278,000	117,000	768,000	314,779	276,389	\$3,154,508	\$3,154,508	\$5,874,426

Actual generation as a percentage of average: 41.0%

Cost per MWh: \$21.25

### Lake/Reservoir Content

As of February 28, reservoir storage for the water year was 82 percent of the 15-year average for Trinity, 74 percent for Shasta, 73 percent for Folsom, and 104 percent for New Melones. Accumulated inflow was 30 percent of the 15-year average for Trinity, 54 percent for Shasta, 38 percent for Folsom, and 52 percent for New Melones.

### Weather and Other Conditions

October precipitation was zero percent of average (at 0.01 inches), November was 56 percent, December was 41 percent, January was 78 percent, and February was 49 percent of average (at 8.2 inches). Reclamation is working to conserve storage while still meeting all its instream flow requirements and Delta water quality requirements. Based upon March 1 conditions, the Sacramento River Index forecast for 50 percent exceedance at 7.8 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	*	\$5,815,691	\$5,834,334	*
Mar 21														
Apr 21														
May 21														
Jun 21														
Jul 21														
Aug 21														
Sep 21														
<b>Total</b>							3,453,219	3,498,100	4,099,624	3,339,031	725,373	\$19,629,151	\$18,702,788	\$13,002,416

Actual generation as a percentage of average: 81.4%

Cost per MWh: \$17.93

### Lake/Reservoir Content

The yearly runoff forecast for the Missouri River basin as of March 1 was 21.6 million acre-feet (MAF) or 84 percent of average and runoff above Sioux City for the month of January was 0.79 MAF (70 percent of average). System storage is at 56.3 MAF. On March 28 the mountain Snow Water Equivalent (SWE) in the “Total above Fort Peck” reach was 13.8 inches or 88 percent of average and the mountain SWE in the “Fort Peck to Garrison” reach was 13.0 inches or 95 percent of average. Mountain snowpack in both reaches is below 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.

*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.*

