WESTERN AREA POWER ADMINSTRATION
HYDRO CONDITIONS AND PURCHASE POWER REPORT
October 2018 Final

	Generation (Megawatt-Hours [MWh])				Purchase Power (MWh)	Purchase Power Expenses (Dollars)		
	Projected Dry	Most Probable	Average	Actual	Actual	Projected Dry	Most Probable	Actual
Oct 17	1,730,649	1,783,328	1,806,598	1,829,010	224,962	$7,025,369	$4,525,684	$4,200,828
Nov 17	1,660,557	1,805,533	1,648,787	1,740,440	242,952	$6,772,182	$5,642,757	$5,480,909
Dec 17	1,491,799	1,801,088	1,650,745	1,765,969	282,069	$8,460,270	$6,286,591	$6,160,468
Jan 18	1,755,692	2,211,822	1,797,023	1,797,795	261,184	$6,957,236	$4,779,639	$7,143,828
Feb 18	1,607,945	1,848,508	1,648,760	1,712,414	271,155	$4,210,182	$4,675,873	$6,031,838
Mar 18	2,013,094	2,084,486	1,937,385	1,937,572	150,540	$3,080,470	$3,692,309	$2,777,444
Apr 18	2,529,978	2,570,864	2,203,210	2,372,438	51,501	$1,898,301	$857,095	$1,007,746
May 18	2,880,506	2,919,998	2,564,629	2,922,384	16,335	$2,100,915	$1,267,040	$886,087
Jun 18	2,920,923	3,195,287	2,655,774	2,941,781	51,892	$2,845,658	$1,578,921	$1,506,185
Jul 18	3,303,366	3,287,898	2,862,467	3,088,451	111,778	$5,091,356	$3,210,534	$7,055,051
Aug 18	2,956,421	3,060,225	2,614,772	2,889,557	140,702	$9,833,122	$7,164,116	$7,007,520
Sep 18	2,513,439	2,634,211	2,207,803	2,310,120	176,864	$6,085,541	$4,091,427	$4,576,960
Total	27,364,369	29,203,249	25,597,954	27,307,931	1,981,935	$64,360,603	$47,771,985	$53,834,864
Actual generation as a percentage of average:				106.7%			Cost per MWh:	$27.16

Western Area Power Administration (WAPA) generated a total of 27,308 gigawatt-hours (GWh) during October through September of fiscal year 2018, or 106.7 percent of the average. For the same period, total purchase power was 1,982 GWh and total purchase power expenses were $53,834,864, which equates to $27.16 per MWh.

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

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 17	1.30	0.70	514.42	449.00	15.01	14.53	248,012	389,938	382,430	430,186	28,274	$3,545,634	$1,146,330	$583,418
Nov 17	4.80	2.60	474.23	387.00	14.91	14.33	230,952	370,900	388,155	385,035	64,772	$3,484,280	$1,392,536	$1,497,035
Dec 17	8.10	4.60	362.96	299.00	14.86	14.07	270,310	499,967	437,962	492,421	19,156	$2,604,643	$472,737	$508,199
Jan 18	11.50	7.00	361.45	262.00	14.98	13.67	355,138	521,095	457,394	518,559	7,891	$1,995,079	$156,142	$213,132
Feb 18	15.10	11.00	392.01	269.00	15.99	13.35	265,647	428,060	390,580	423,720	38,938	$1,135,713	$1,388,952	$1,169,613
Mar 18	18.90	14.10	666.27	332.00	16.77	12.96	272,465	433,495	390,170	452,487	14,674	$1,523,814	$1,337,054	$343,030
Apr 18	19.40	11.30	1,057.14	382.00	16.74	12.67	399,512	420,896	397,861	436,264	2,238	$190,955	$190,955	$29,228
May 18	7.90	2.30	2,337.68	1,214.00	16.30	12.89	411,642	419,318	501,886	481,877	7,500	$496,103	$496,103	$111,935
Jun 18	0.00	0.20	2,668.50	883.00	16.00	12.73	441,250	460,245	585,467	507,864	10,887	$535,078	$535,078	$264,133
Jul 18	0.00	0.30	1,093.88	123.00	15.88	12.12	502,616	500,241	612,093	536,730	7,931	$777,877	$628,164	$492,811
Aug 18	0.00	0.00	496.08	11.00	15.68	11.48	488,604	514,953	554,076	534,657	9,361	$689,289	$634,308	$378,633
Sep 18	0.00	0.00	405.88	1.00	15.38	11.03	363,619	391,556	471,043	362,327	38,586	$1,512,198	$1,419,697	$881,068
Total							4,249,768	5,350,665	5,569,117	5,562,127	250,208	$18,490,664	$9,798,057	$6,472,235
							Actual generation as a percentage of average:			99.9%			Cost per MWh:	$25.87

Lake/Reservoir Levels

Lake Powell's elevation was 3,592 feet at the end of September, about 108 feet below the maximum reservoir level and about 96 feet above the minimum generation level. The storage volume for Lake Powell was 11.03 million acre-feet at the end of September, or about 45 percent of capacity.

Weather and Other Conditions

Hydrologic conditions in the Upper Colorado River Basin continue to be very dry. Consequently, releases from Lake Powell could be reduced from 9.0 million acre-feet to as low as 8.23 million acre-feet in water year 2019. If that were to occur, purchase power costs would increase about $10 million in water year 2019.

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 17	1.30	0.70	59.90	45.00	20.15	12.26	321,455	321,455	378,173	327,168	622	$0	$0	$15,967
Nov 17	4.80	2.60	53.75	40.00	20.20	12.29	373,825	373,825	363,506	373,021	6,160	$96,950	$96,950	$192,517
Dec 17	8.10	4.60	72.83	44.00	20.32	12.30	271,905	271,905	371,404	316,487	10,262	$246,131	$246,131	$399,541
Jan 18	11.50	7.00	93.50	76.00	20.48	12.82	239,355	239,355	394,030	242,881	33,068	$1,160,420	$1,160,420	$1,228,802
Feb 18	15.10	11.00	109.23	62.00	20.51	13.00	369,850	369,850	389,769	366,664	7,164	$0	$0	$242,860
Mar 18	18.90	14.10	102.00	71.00	20.31	12.95	567,350	456,815	530,595	461,758	15,615	$101,634	$538,050	$494,215
Apr 18	19.40	11.30	83.98	44.00	20.14	12.63	561,970	561,970	571,411	556,605	778	$25,798	$0	$25,798
May 18	7.90	2.30	58.55	23.00	20.24	12.30	556,390	556,390	571,099	562,522	0	$251,457	$251,457	$0
Jun 18	0.00	0.20	26.39	28.00	20.41	10.51	523,605	523,605	537,038	518,495	14,176	$524,363	$524,363	$534,323
Jul 18	0.00	0.30	67.46	105.00	20.34	12.08	472,700	438,755	547,487	441,551	45,716	$2,098,205	$2,082,870	$4,699,756
Aug 18	0.00	0.00	99.10	75.00	20.22	12.17	399,400	396,265	510,936	401,403	50,934	$5,990,348	$5,990,348	$4,473,763
Sep 18	0.00	0.00	87.80	86.00	20.11	12.03	391,500	401,525	431,732	397,886	37,219	$1,927,630	$1,927,630	$1,472,229
Total							5,049,305	4,911,715	5,597,179	4,966,440	221,715	$12,422,935	$12,818,219	$13,779,771
							Actual generation as a percentage of average:			88.7%			Cost per MWh:	$62.15

Lake/Reservoir Levels

Lake Mead's elevation was 1,078 feet at the end of September, about 141 feet below the full storage level and about 128 feet above the minimum generation level. Lake Mead reached an annual peak elevation of 1,088 feet in February and a minimum elevation of 1,077 feet in June.

Weather and Other Conditions

The Desert Southwest Region's (DSWR) hydrology is mostly dependent on the Colorado River Basin snowpack and precipitation above Lake Powell. The precipitation was 65 percent of average at the end of September.

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 17	0.00	1.00	135.50	239.20	3.92	4.72	94,856	104,129	92,921	102,835	108,038	$1,612,050	$1,456,780	$2,259,949
Nov 17	3.70	3.40	118.80	205.90	3.88	4.72	63,717	94,184	63,235	90,440	64,645	$980,138	$1,865,825	$1,559,905
Dec 17	12.00	12.40	98.00	106.40	3.83	4.68	96,244	104,950	97,078	93,454	68,072	$614,713	$1,458,113	$1,291,601
Jan 18	19.70	19.00	96.70	131.40	3.80	4.62	127,240	115,455	92,940	105,200	53,872	$1,013,650	$628,963	$1,165,509
Feb 18	28.40	27.80	95.30	112.90	3.70	4.53	115,792	110,586	85,852	136,005	2,474	$0	$101,250	-$61,466
Mar 18	35.80	35.80	158.80	165.20	3.82	4.47	140,516	156,327	121,269	183,257	-14,131	$0	$0	-$574,042
Apr 18	43.60	43.80	250.80	258.70	3.83	4.32	150,610	201,824	163,503	221,709	-10,572	$1,007,950	$0	-$399,082
May 18	42.90	43.10	719.80	1,229.40	4.48	5.16	223,870	300,241	236,764	277,919	-21,249	$833,875	$0	$8,899
Jun 18	12.60	7.00	1,149.50	1,251.70	4.48	5.49	240,830	303,199	250,194	254,744	-4,599	$1,266,738	$0	-$131,176
Jul 18	0.00	0.00	524.90	443.40	4.58	5.01	233,324	287,224	248,594	248,551	15,867	$1,715,775	$0	$681,528
Aug 18	0.00	0.00	185.20	134.00	4.05	4.44	193,503	201,329	204,564	206,045	26,047	$2,614,025	$0	$1,028,188
Sep 18	0.00	0.00	244.50	115.40	3.82	4.19	117,824	139,055	168,061	107,841	46,510	$2,146,213	$244,600	$1,245,689
Total							1,798,326	2,118,501	1,824,973	2,028,000	334,975	$13,805,126	$5,755,530	$8,075,503
							Actual generation as a percentage of average:			111.1%			Cost per MWh:	$24.11

Lake/Reservoir Content

Reservoir inflows were at or above average for the majority of this water year for all of the Loveland Area Projects (LAP). However, the July, August, and September the inflows dropped to below average and were only 47 percent of average at the end of September.

Weather and Other Conditions

Hydrologic conditions for the LAP area can vary from one river basin and watershed to another. LAP is currently drought free from a water perspective due to storage. The latest National Weather Service forecast indicates November through January temperatures are more likely to be at or above normal in the LAP area. For LAP as a whole, November generation is expected to be below the marketed amount due to maintenance on hydro units and the end of the irrigation season. November through January generation in the Bighorn, Colorado, and North Platte River Basins is forecasted to be average for this time of year as winter flow rates are set.

Note: The Rocky Mountain Region's (RMR) most recent reported actual generation and purchase power data are provisional values. RMR previously reported snowpack data as a total for all reservoirs throughout LAP, but is now reporting that data as an average value.

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 17	0.00	0.00	339.00	339.00	5.38	7.49	261,000	171,000	163,000	208,470	46,751	$1,179,286	$1,179,286	$1,005,159
Nov 17	0.00	0.00	416.00	636.00	5.36	7.60	154,000	149,000	104,000	118,897	49,097	$1,139,734	$1,139,734	$1,140,296
Dec 17	11.54	3.00	975.00	696.00	5.77	7.48	99,000	104,000	143,000	105,005	54,113	$1,179,286	$1,179,286	$1,171,386
Jan 18	16.67	5.00	1,097.00	478.00	6.15	7.88	118,000	423,000	163,000	65,639	57,687	$499,500	$499,500	$1,356,822
Feb 18	30.00	6.00	1,310.00	424.00	6.72	7.65	130,000	220,000	195,000	99,148	47,468	$479,520	$479,520	$924,010
Mar 18	27.27	15.00	1,570.00	1,417.00	7.49	8.56	105,000	180,000	207,000	68,648	55,294	$539,460	$539,460	$1,079,804
Apr 18	21.88	7.00	1,377.00	1,405.00	7.90	9.05	406,000	366,000	288,000	218,682	39,877	$499,500	$499,500	$803,475
May 18	0.00	0.00	1,230.00	745.00	7.88	8.76	446,000	396,000	442,000	393,020	29,155	$519,480	$519,480	$717,857
Jun 18	0.00	0.00	808.00	457.00	7.45	8.16	542,000	472,000	440,000	417,456	30,314	$519,480	$519,480	$815,818
Jul 18	0.00	0.00	405.00	362.00	6.67	7.29	495,000	445,000	524,000	435,515	40,861	$499,500	$499,500	$1,125,003
Aug 18	0.00	0.00	350.00	352.00	6.00	6.59	217,000	242,000	402,000	252,836	52,956	$539,460	$539,460	$1,086,443
Sep 18	0.00	0.00	312.00	308.00	5.57	6.16	212,000	217,000	269,000	152,721	53,772	$499,500	$499,500	$929,441
Total							3,185,000	3,385,000	3,340,000	2,536,035	557,346	$8,093,706	$8,093,706	$12,155,514
							Actual generation as a percentage of average:			75.9%			Cost per MWh:	$21.81

Lake/Reservoir Content

As of September 30, accumulated inflow for the water year was 45 percent of the 15-year average for Trinity, 69 percent for Shasta, 95 percent for Folsom, and 85 percent for New Melones. Reservoir storage as of the same date was 107 percent of the 15-year average for Trinity, 100 percent for Shasta, 103 percent for Folsom, and 136 percent for New Melones.

Weather and Other Conditions

As of September 30, cumulative precipitation of the Northern Sierra Eight Station Index was at 81 percent of average for the date. August had no measurable precipitation while September had 0.05 inches. The Sacramento River Index forecast for the 50 percent exceedence case is "below normal" and the 90 percent exceedence case is "dry."

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 17	1.20	1.20	8,050.00	6,477.30	56.01	59.78	805,326	796,806	790,075	760,352	41,277	$688,399	$743,287	$336,335
Nov 17	3.80	4.50	7,375.00	6,901.97	54.92	58.89	838,063	817,624	729,890	773,047	58,278	$1,071,080	$1,147,712	$1,091,157
Dec 17	7.10	8.50	6,442.00	6,415.93	54.32	58.03	754,340	820,267	601,300	758,602	130,466	$3,815,497	$2,930,323	$2,789,741
Jan 18	10.30	11.90	6,641.00	7,574.06	54.18	57.80	915,959	912,918	689,660	865,517	108,666	$2,288,588	$2,334,615	$3,179,563
Feb 18	13.10	16.80	6,281.00	5,985.82	54.50	57.68	726,656	720,012	587,560	686,877	175,111	$2,594,949	$2,706,151	$3,756,821
Mar 18	15.80	20.10	8,151.00	8,984.98	56.20	59.57	927,763	857,849	688,351	771,423	79,088	$915,562	$1,277,744	$1,434,437
Apr 18	14.90	20.20	8,041.00	12,116.97	57.06	61.91	1,011,886	1,020,174	782,435	939,178	19,180	$174,097	$166,640	$548,327
May 18	6.30	5.70	9,654.00	16,082.12	58.35	65.08	1,242,604	1,248,050	812,880	1,207,046	929	$0	$0	$47,396
Jun 18	0.50	0.03	11,746.00	17,990.67	60.54	69.76	1,173,238	1,436,238	843,075	1,243,222	1,114	$0	$0	$23,086
Jul 18	0.00	0.00	10,694.00	15,979.26	60.49	69.25	1,599,726	1,616,678	930,294	1,426,104	1,402	$0	$0	$55,953
Aug 18	0.00	0.00	9,716.00	14,916.04	58.91	66.40	1,657,914	1,705,679	943,197	1,494,616	1,404	$0	$0	$40,493
Sep 18	0.09	0.12	8,629.00	13,164.30	57.38	63.79	1,428,497	1,485,076	867,967	1,289,345	777	$0	$0	$48,533
Total							13,081,970	13,437,367	9,266,685	12,215,329	617,692	$11,548,172	$11,306,473	$13,351,842
							Actual generation as a percentage of average:			131.8%			Cost per MWh:	$21.62

Lake/Reservoir Content

As of October 10, the active conservation pools for the Canyon Ferry and Yellowtail Dams were 86.4 percent and 93.2 percent full, respectively.

Weather and Other Conditions

The September runoff was 151 percent of normal. Runoff was above average at Gavins Point and below average in the Fort Peck, Fort Randall, Garrison, and Oahe reaches. The U.S. Drought Monitor shows that portions of the upper Missouri River Basin continue to be impacted by drought. Abnormally dry (D0) and moderate (D1) drought conditions are present in much of North Dakota and north-central and central South Dakota, with some areas experiencing severe (D2) and extreme (D3) drought. In addition, abnormally dry and moderate drought conditions are present in northern and western Montana.

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 data is not available for the month.