

**WESTERN AREA POWER ADMINISTRATION
HYDRO CONDITIONS AND PURCHASE POWER REPORT
May 2018**

| | Generation (Megawatt-Hours [MWh]) | | | | Purchase Power (MWh) | Purchase Power Expenses (Dollars) | | |
|---------------|-----------------------------------|-----------------|------------|------------|----------------------|-----------------------------------|-----------------|--------------|
| | Projected | Most | Average | Actual | Actual | Projected | Most | Actual |
| | <u>Dry</u> | <u>Probable</u> | | | | <u>Dry</u> | <u>Probable</u> | |
| Oct 17 | 1,730,649 | 1,783,328 | 1,806,598 | 1,829,010 | 186,432 | \$6,365,563 | \$3,865,878 | \$3,581,776 |
| Nov 17 | 1,660,557 | 1,805,533 | 1,648,787 | 1,740,440 | 247,472 | \$6,131,948 | \$5,002,523 | \$5,591,396 |
| Dec 17 | 1,491,799 | 1,801,088 | 1,650,745 | 1,765,969 | 293,104 | \$7,780,484 | \$5,606,805 | \$6,812,893 |
| Jan 18 | 1,755,692 | 2,211,822 | 1,797,023 | 1,797,795 | 267,782 | \$6,986,576 | \$4,808,979 | \$7,724,874 |
| Feb 18 | 1,607,945 | 1,848,508 | 1,648,760 | 1,712,414 | 278,318 | \$4,218,822 | \$4,684,513 | \$6,515,564 |
| Mar 18 | 2,013,094 | 2,084,486 | 1,937,385 | 1,937,572 | 162,857 | \$3,090,190 | \$3,702,029 | \$3,374,145 |
| Apr 18 | 2,529,978 | 2,570,864 | 2,203,210 | 2,372,438 | | | | |
| May 18 | | | | | | | | |
| Jun 18 | | | | | | | | |
| Jul 18 | | | | | | | | |
| Aug 18 | | | | | | | | |
| Sep 18 | | | | | | | | |
| Total | 12,789,714 | 14,105,629 | 12,692,509 | 13,155,639 | 1,435,965 | \$34,573,584 | \$27,670,726 | \$33,600,649 |

Actual generation as a percentage of average: 103.6% Cost per MWh: \$23.40

Western Area Power Administration (WAPA) generated a total of 13,156 gigawatt-hours (GWh) during October through April of fiscal year 2018, or 103.6 percent of the average. Actual purchase power data is currently available from October through March for all of WAPA's Regions, and during this period total purchase power was 1,436 GWh and total purchase power expenses were \$33,600,649, which equates to \$23.40 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 | | | | | | | | | | | | | | |
| Jun 18 | | | | | | | | | | | | | | |
| Jul 18 | | | | | | | | | | | | | | |
| Aug 18 | | | | | | | | | | | | | | |
| Sep 18 | | | | | | | | | | | | | | |
| Total | | | | | | | 2,042,037 | 3,064,352 | 2,844,551 | 3,138,672 | 175,943 | \$14,480,119 | \$6,084,707 | \$4,343,655 |

Actual generation as a percentage of average: 110.3%

Cost per MWh: \$24.69

Lake/Reservoir Levels

Lake Powell's elevation was 3,609 feet at the end of April, about 91 feet below the maximum reservoir level and about 119 feet above the minimum generation level. The storage volume for Lake Powell was 12.67 million acre-feet at the end of April, which is about 52 percent of capacity.

Weather and Other Conditions

Hydrologic conditions in the Upper Colorado River Basin continue to be very dry, and Lake Powell April – July inflows are currently forecasted to be 42 percent of average. Consequently, Lake Powell elevation is forecasted to be 30 feet lower at the end of water year 2018 than what was observed at the end of water year 2017.

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 | | | | | | | | | | | | | | |
| Jun 18 | | | | | | | | | | | | | | |
| Jul 18 | | | | | | | | | | | | | | |
| Aug 18 | | | | | | | | | | | | | | |
| Sep 18 | | | | | | | | | | | | | | |
| Total | | | | | | | 2,705,710 | 2,595,175 | 2,998,888 | 2,644,583 | 73,669 | \$1,630,932 | \$2,041,551 | \$2,599,700 |

Actual generation as a percentage of average: 88.2%

Cost per MWh: \$35.29

Lake/Reservoir Levels

Lake Mead's elevation was 1,084 feet at the end of April, about 135 feet below the full storage level and about 134 feet above the minimum generation level. Lake Mead reached an annual peak elevation of 1,088 feet in February and is projected to drop to a minimum elevation of 1,077 feet in July.

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 71 percent of average at the end of April. The total side inflow into Lake Mead for water year 2018 is projected to be 720 thousand acre-feet, or 55 percent of the normal annual amount.

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 | 69,508 | \$1,612,050 | \$1,456,780 | \$1,640,897 |
| Nov 17 | 3.70 | 3.40 | 118.80 | 205.90 | 3.88 | 4.72 | 63,717 | 94,184 | 63,235 | 90,440 | 69,165 | \$980,138 | \$1,865,825 | \$1,670,392 |
| Dec 17 | 12.00 | 12.40 | 98.00 | 106.40 | 3.83 | 4.68 | 96,244 | 104,950 | 97,078 | 93,454 | 79,107 | \$614,713 | \$1,458,113 | \$1,944,026 |
| Jan 18 | 19.70 | 19.00 | 96.70 | 131.40 | 3.80 | 4.62 | 127,240 | 115,455 | 92,940 | 105,200 | 60,470 | \$1,013,650 | \$628,963 | \$1,746,555 |
| Feb 18 | 28.40 | 27.80 | 95.30 | 112.90 | 3.70 | 4.53 | 115,792 | 110,586 | 85,852 | 136,005 | 9,637 | \$0 | \$101,250 | \$422,260 |
| Mar 18 | 35.80 | 35.80 | 158.80 | 165.20 | 3.82 | 4.47 | 140,516 | 156,327 | 121,269 | 183,257 | -1,814 | \$0 | \$0 | \$22,659 |
| Apr 18 | 43.60 | 43.80 | 250.80 | 258.70 | 3.83 | 4.32 | 150,610 | 201,824 | 163,503 | 221,709 | 2,803 | \$1,007,950 | \$0 | \$52,163 |
| May 18 | | | | | | | | | | | | | | |
| Jun 18 | | | | | | | | | | | | | | |
| Jul 18 | | | | | | | | | | | | | | |
| Aug 18 | | | | | | | | | | | | | | |
| Sep 18 | | | | | | | | | | | | | | |
| Total | | | | | | | 788,975 | 887,454 | 716,797 | 932,900 | 288,876 | \$5,228,501 | \$5,510,930 | \$7,498,952 |

Actual generation as a percentage of average: 130.1%

Cost per MWh: \$25.96

Lake/Reservoir Content

Reservoir inflows have been at or above average so far this water year for all of the Loveland Area Projects (LAP) area. At the end of April, inflows were 103 percent of average.

Weather and Other Conditions

Hydrologic conditions for the LAP area can vary from one river basin and watershed to another. Due to storage, LAP is currently free of drought from a water perspective. The snowpack ranged from below average in the Colorado River Basin to well above average in the Bighorn River Basin. The latest National Weather Service forecast indicates summer temperatures will most likely be at or above average in Colorado and the southern half of Wyoming, and at or near normal in the northern half of Wyoming. For LAP as a whole, June generation is expected to be above the marketed amount.

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 | | | 339.00 | 339.00 | 5.38 | 7.49 | 261,000 | 171,000 | 163,000 | 208,470 | 46,751 | \$519,480 | \$519,480 | \$1,005,159 |
| Nov 17 | | | 416.00 | 636.00 | 5.36 | 7.60 | 154,000 | 149,000 | 104,000 | 118,897 | 49,097 | \$499,500 | \$499,500 | \$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 | \$499,500 | \$499,500 | \$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 | \$528,840 | \$528,840 | \$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 | \$488,160 | \$488,160 | \$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 | \$549,180 | \$549,180 | \$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 | \$466,000 | \$466,000 | \$803,475 |
| May 18 | | | | | | | | | | | | | | |
| Jun 18 | | | | | | | | | | | | | | |
| Jul 18 | | | | | | | | | | | | | | |
| Aug 18 | | | | | | | | | | | | | | |
| Sep 18 | | | | | | | | | | | | | | |
| Total | | | | | | | 1,273,000 | 1,613,000 | 1,263,000 | 884,487 | 350,287 | \$3,550,660 | \$3,550,660 | \$7,480,952 |

Actual generation as a percentage of average: 70.0%

Cost per MWh: \$21.36

Lake/Reservoir Content

As of April 30, accumulated inflow for the water year was 53 percent of the 15-year average for Trinity, 67 percent for Shasta, 102 percent for Folsom, and 90 percent for New Melones. Reservoir storage as of the same date was 103 percent of the 15-year average for Trinity, 111 percent for Shasta, 118 percent for Folsom, and 136 percent for New Melones.

Weather and Other Conditions

As of April 30, cumulative precipitation of the Northern Sierra Eight Station Index was at 82 percent of average for the date. April had 4.75 inches of precipitation, or 122 percent of the average amount. 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 | * | \$174,097 | \$166,640 | * |
| May 18 | | | | | | | | | | | | | | |
| Jun 18 | | | | | | | | | | | | | | |
| Jul 18 | | | | | | | | | | | | | | |
| Aug 18 | | | | | | | | | | | | | | |
| Sep 18 | | | | | | | | | | | | | | |
| Total | | | | | | | 5,979,992 | 5,945,648 | 4,869,272 | 5,554,996 | 592,886 | \$11,548,172 | \$11,306,473 | \$12,588,054 |

Actual generation as a percentage of average: 114.1%

Cost per MWh: \$21.23

Lake/Reservoir Content

As of May 15, the active conservation pools for the Canyon Ferry and Yellowtail Dams were 78.7 percent and 74.9 percent full, respectively.

Weather and Other Conditions

The April runoff was 182 percent of normal. Runoff was above average in the Fort Peck, Garrison, Fort Randall, and Gavins Point reaches, and below average at Oahe. Snowpack reports indicate 123 percent of average above Fort Peck and 120 percent of average in the Fort Peck to Garrison reach. The U.S. Drought Monitor shows that some of the upper Missouri River Basin continues to be impacted by drought, with moderate (D1) drought conditions in northeastern Montana and western South Dakota and abnormally dry (D0) conditions in much of North Dakota.

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.