

**WESTERN AREA POWER ADMINISTRATION
HYDRO CONDITIONS AND PURCHASE POWER REPORT
May 2017**

Agency-wide

| | Generation (Megawatt-Hours [MWh]) | | | | Purchase Power (MWh) | Purchase Power Expenses (Dollars) | | |
|---------------|---|---------------|------------|------------|----------------------|-----------------------------------|---------------|--------------|
| | Projected Dry | Most Probable | Average | Actual | Actual | Projected Dry | Most Probable | Actual |
| Oct 16 | 1,315,017 | 1,426,426 | 1,875,969 | 1,427,953 | 327,454 | \$14,667,625 | \$9,521,646 | \$8,170,374 |
| Nov 16 | 1,383,358 | 1,355,599 | 1,760,444 | 1,389,326 | 435,683 | \$16,259,488 | \$12,897,315 | \$10,321,160 |
| Dec 16 | 1,328,808 | 1,461,830 | 1,702,290 | 1,591,771 | 418,448 | \$18,684,123 | \$12,067,535 | \$10,681,879 |
| Jan 17 | 1,491,887 | 1,745,023 | 1,873,622 | 1,855,506 | 418,457 | \$12,363,090 | \$9,284,807 | \$10,229,253 |
| Feb 17 | 1,398,791 | 1,649,920 | 1,721,646 | 1,734,010 | 447,044 | \$11,517,410 | \$7,943,048 | \$8,360,658 |
| Mar 17 | 1,925,710 | 2,008,918 | 1,965,516 | 2,193,546 | 265,434 | \$9,056,101 | \$5,158,661 | \$5,118,041 |
| Apr 17 | 2,364,984 | 2,543,514 | 2,174,480 | 2,532,826 | | | | |
| May 17 | | | | | | | | |
| Jun 17 | | | | | | | | |
| Jul 17 | | | | | | | | |
| Aug 17 | | | | | | | | |
| Sep 17 | | | | | | | | |
| Total | 11,208,556 | 12,191,230 | 13,073,966 | 12,724,939 | 2,312,521 | \$82,547,838 | \$56,873,011 | \$52,881,365 |
| | Actual generation as a percentage of average: 97.3% | | | | | Cost per MWh: \$22.87 | | |

Western Area Power Administration (WAPA) generated a total of 12,725 gigawatt-hours (GWh) during October through April of fiscal year 2017, or 97.3 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 2,313 GWh and total purchase power expenses were \$52,881,365, which equates to \$22.87 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 16 | 1.30 | 0.20 | 514.42 | 381.00 | 15.01 | 12.68 | 248,012 | 340,536 | 382,430 | 384,045 | 64,165 | \$6,704,081 | \$1,491,591 | \$1,683,280 |
| Nov 16 | 4.80 | 2.60 | 474.23 | 383.00 | 14.91 | 12.31 | 230,952 | 315,541 | 388,155 | 334,811 | 127,238 | \$7,549,826 | \$2,850,078 | \$3,213,841 |
| Dec 16 | 8.10 | 8.50 | 362.96 | 300.00 | 14.86 | 11.80 | 270,310 | 445,186 | 437,962 | 460,333 | 48,822 | \$7,692,571 | \$1,292,373 | \$1,282,528 |
| Jan 17 | 11.50 | 16.00 | 361.45 | 359.00 | 14.98 | 11.36 | 355,138 | 431,244 | 457,394 | 455,508 | 57,227 | \$4,412,679 | \$1,231,482 | \$1,678,096 |
| Feb 17 | 15.10 | 21.00 | 392.01 | 555.00 | 15.99 | 11.22 | 265,647 | 387,432 | 390,580 | 393,646 | 61,657 | \$5,024,221 | \$1,531,108 | \$1,555,701 |
| Mar 17 | 18.90 | 22.00 | 666.27 | 1,110.00 | 16.77 | 11.36 | 272,465 | 405,609 | 390,170 | 458,176 | 29,840 | \$5,517,603 | \$1,111,921 | \$644,587 |
| Apr 17 | 19.40 | 21.00 | 1,057.14 | 1,607.00 | 16.74 | 12.15 | 250,695 | 404,074 | 397,861 | 427,891 | 10,935 | \$3,468,325 | \$93,697 | \$210,181 |
| May 17 | | | | | | | | | | | | | | |
| Jun 17 | | | | | | | | | | | | | | |
| Jul 17 | | | | | | | | | | | | | | |
| Aug 17 | | | | | | | | | | | | | | |
| Sep 17 | | | | | | | | | | | | | | |
| Total | | | | | | | 1,893,220 | 2,729,621 | 2,844,551 | 2,914,410 | 399,884 | \$40,369,305 | \$9,602,250 | \$10,268,214 |

Actual generation as a percentage of average: 102.5%

Cost per MWh: \$25.68

Lake/Reservoir Levels

Lake Powell's elevation was 3,604 feet at the end of April, about 96 feet below the maximum reservoir level and about 114 feet above the minimum generation level. The storage volume for Lake Powell was 12.15 million acre-feet at the end of April, which is about 50 percent of capacity.

Weather and Other Conditions

The April-July inflow forecasts continue to run slightly above average with a mid-May inflow forecast of 116% of average. Current forecasts estimate Lake Powell will increase about 37 feet in elevation by the end of August.



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 16 | 1.30 | 0.20 | 60.29 | 79.00 | 20.40 | 11.75 | 282,630 | 282,630 | 378,811 | 290,888 | 5,020 | \$165,459 | \$165,459 | \$165,459 |
| Nov 16 | 4.80 | 2.60 | 54.10 | 78.00 | 20.31 | 11.90 | 345,830 | 373,020 | 363,391 | 374,705 | 1,919 | \$90,031 | \$64,805 | \$65,277 |
| Dec 16 | 8.10 | 8.50 | 73.53 | 63.00 | 20.44 | 12.31 | 254,600 | 268,015 | 372,094 | 277,597 | 13,258 | \$388,103 | \$289,603 | \$510,168 |
| Jan 17 | 11.50 | 16.00 | 93.88 | 126.00 | 20.59 | 12.80 | 284,450 | 253,225 | 395,966 | 255,068 | 21,520 | \$535,169 | \$535,169 | \$800,974 |
| Feb 17 | 15.10 | 21.00 | 110.31 | 148.00 | 20.62 | 13.11 | 328,350 | 292,965 | 390,077 | 268,179 | 2,595 | \$0 | \$0 | \$83,974 |
| Mar 17 | 18.90 | 22.00 | 102.80 | 99.00 | 20.40 | 13.00 | 558,800 | 504,200 | 531,483 | 496,001 | 12,330 | \$72,840 | \$391,582 | \$330,814 |
| Apr 17 | 19.40 | 21.00 | 84.98 | 94.00 | 20.25 | 12.70 | 524,735 | 524,735 | 571,605 | 537,707 | 4,094 | \$93,243 | \$93,243 | \$112,012 |
| May 17 | | | | | | | | | | | | | | |
| Jun 17 | | | | | | | | | | | | | | |
| Jul 17 | | | | | | | | | | | | | | |
| Aug 17 | | | | | | | | | | | | | | |
| Sep 17 | | | | | | | | | | | | | | |
| Total | | | | | | | 2,579,395 | 2,498,790 | 3,003,427 | 2,500,145 | 60,736 | \$1,344,845 | \$1,539,861 | \$2,068,678 |

Actual generation as a percentage of average: 83.2%

Cost per MWh: \$34.06

Lake/Reservoir Levels

Lake Mead's elevation was 1,085 feet at the end of April, about 135 feet below full storage level and about 135 feet above the new minimum generation level of 950 feet. Lake Mead started the water year with a minimum elevation of 1,076 feet in October and reached a peak elevation of 1,090 feet in February.

Weather and Other Conditions

The Desert Southwest Region's hydrology is mostly dependent on the Colorado River Basin snowpack and precipitation above Lake Powell. The water year 2017 precipitation is currently 115 percent of average.

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 16 | | | 138.60 | 177.30 | 3.85 | 4.66 | 93,769 | 98,500 | 82,866 | 90,186 | 56,146 | \$1,918,912 | \$1,768,512 |
| Nov 16 | | | 120.30 | 145.10 | 3.85 | 4.72 | 57,639 | 59,762 | 78,718 | 56,073 | 88,908 | \$3,104,240 | \$3,033,840 | \$2,226,606 |
| Dec 16 | 268.10 | 160.50 | 98.80 | 106.40 | 3.82 | 4.69 | 91,252 | 93,448 | 101,061 | 102,574 | 73,018 | \$2,601,536 | \$2,534,336 | \$2,020,033 |
| Jan 17 | 417.90 | 452.40 | 96.60 | 114.70 | 3.79 | 4.67 | 108,118 | 110,236 | 111,274 | 127,252 | 33,352 | \$2,062,592 | \$1,995,392 | \$1,205,222 |
| Feb 17 | 849.60 | 1,170.80 | 96.30 | 173.50 | 3.79 | 4.79 | 97,795 | 99,700 | 99,585 | 129,713 | 4,671 | \$1,254,624 | \$1,193,824 | \$143,568 |
| Mar 17 | 1,105.20 | 1,524.90 | 159.00 | 293.50 | 4.13 | 4.70 | 124,712 | 136,697 | 118,178 | 191,665 | 0 | \$785,728 | \$401,728 | \$0 |
| Apr 17 | 1,342.80 | 1,552.90 | 250.20 | 462.40 | 3.85 | 4.50 | 135,854 | 164,886 | 138,114 | 246,662 | 4,244 | \$1,295,328 | \$367,328 | \$55,309 |
| May 17 | | | | | | | | | | | | | | |
| Jun 17 | | | | | | | | | | | | | | |
| Jul 17 | | | | | | | | | | | | | | |
| Aug 17 | | | | | | | | | | | | | | |
| Sep 17 | | | | | | | | | | | | | | |
| Total | | | | | | | 709,138 | 763,228 | 729,797 | 944,125 | 260,339 | \$13,022,960 | \$11,294,960 | \$7,022,195 |

Actual generation as a percentage of average: 129.4%

Cost per MWh: \$26.97

Lake/Reservoir Content

The overall reservoir content at the end of April was 117 percent of average.

Weather and Other Conditions

The entire Loveland Area Projects (LAP) area is now considered to be drought free due to recent spring storms. The snowpack is now above average in the Upper North Platte River Basin, well above average in the Upper Colorado River headwaters, and far above average in the Bighorn River Basin. The May forecasts of most probable reservoir inflows from spring runoff is above average for the Colorado-Big Thompson Project (CBT) and the North Platte River Basin, and well above average for the Bighorn River Basin. The latest National Weather Service forecast indicates June through August temperatures are just as likely to be above as below normal, and the precipitation is more likely to be above normal in the LAP area.

Note: The Rocky Mountain Region's (RMR) most recent reported purchase power data are provisional values and may change.

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 16 | | | 336.00 | 561.00 | 5.26 | 4.66 | 121,000 | 146,000 | 163,000 | 100,955 | 56,052 | \$1,179,286 | \$1,179,286 | \$1,536,064 |
| Nov 16 | 4.76 | 3.00 | 399.00 | 706.00 | 5.21 | 4.99 | 104,000 | 34,000 | 104,000 | 42,525 | 57,080 | \$1,139,734 | \$1,139,734 | \$1,582,259 |
| Dec 16 | 9.09 | 6.00 | 1,046.00 | 1,621.00 | 5.72 | 5.63 | 79,000 | 19,000 | 143,000 | 115,177 | 54,748 | \$1,179,286 | \$1,179,286 | \$1,280,611 |
| Jan 17 | 27.78 | 30.00 | 1,167.00 | 3,436.00 | 6.13 | 6.43 | 78,000 | 293,000 | 163,000 | 385,479 | 32,534 | \$499,500 | \$499,500 | \$643,343 |
| Feb 17 | 27.78 | 45.00 | 1,339.00 | 5,725.00 | 6.71 | 7.68 | 139,000 | 300,000 | 195,000 | 439,436 | 19,673 | \$479,520 | \$479,520 | \$579,856 |
| Mar 17 | 28.22 | 46.00 | 1,553.00 | 2,574.00 | 7.46 | 8.61 | 290,000 | 330,000 | 207,000 | 399,223 | 26,567 | \$539,460 | \$539,460 | \$642,682 |
| Apr 17 | 25.77 | 42.00 | 1,380.00 | 2,758.00 | 7.88 | 9.29 | 431,000 | 426,000 | 288,000 | 426,215 | 20,095 | \$499,500 | \$499,500 | \$555,974 |
| May 17 | | | | | | | | | | | | | | |
| Jun 17 | | | | | | | | | | | | | | |
| Jul 17 | | | | | | | | | | | | | | |
| Aug 17 | | | | | | | | | | | | | | |
| Sep 17 | | | | | | | | | | | | | | |
| Total | | | | | | | 1,242,000 | 1,548,000 | 1,263,000 | 1,909,011 | 266,749 | \$5,516,286 | \$5,516,286 | \$6,820,789 |

Actual generation as a percentage of average: 151.1%

Cost per MWh: \$25.57

Lake/Reservoir Content

As of April 30, accumulated inflow for the water year was 215 percent of the 15-year average for Trinity, 207 percent for Shasta, 351 percent for Folsom, and 311 percent for New Melones. Reservoir storage as of the same date was 123 percent of the 15-year average for Trinity, 112 percent for Shasta, 95 percent for Folsom, and 123 percent for New Melones.

Weather and Other Conditions

As of April 30, cumulative precipitation of the Northern Sierra Eight Station Index was at 197 percent of average for the date. This water year will be officially designated as "wet."

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 16 | 1.20 | 0.40 | 8,092.00 | 5,601.83 | 55.94 | 58.67 | 569,606 | 558,761 | 868,863 | 561,879 | 146,071 | \$4,699,887 | \$4,916,797 | \$3,414,114 |
| Nov 16 | 3.80 | 1.40 | 7,411.00 | 5,690.87 | 54.83 | 58.32 | 644,937 | 573,277 | 826,179 | 581,212 | 160,538 | \$4,375,658 | \$5,808,858 | \$3,233,177 |
| Dec 16 | 7.10 | 5.60 | 6,468.00 | 5,454.05 | 54.23 | 57.60 | 633,647 | 636,181 | 648,173 | 636,090 | 228,602 | \$6,822,627 | \$6,771,937 | \$5,588,539 |
| Jan 17 | 10.30 | 7.80 | 6,659.00 | 5,727.89 | 54.03 | 57.50 | 666,182 | 657,318 | 745,987 | 632,199 | 273,824 | \$4,853,151 | \$5,023,264 | \$5,901,618 |
| Feb 17 | 12.90 | 12.70 | 6,300.00 | 5,706.99 | 54.34 | 58.54 | 568,000 | 569,823 | 646,404 | 503,036 | 358,448 | \$4,759,045 | \$4,738,596 | \$5,997,559 |
| Mar 17 | 15.80 | 14.80 | 8,219.00 | 7,544.34 | 56.08 | 59.94 | 679,733 | 632,412 | 718,685 | 648,481 | 196,697 | \$2,140,470 | \$2,713,970 | \$3,499,958 |
| Apr 17 | 15.10 | 16.00 | 8,052.00 | 9,087.27 | 56.95 | 60.50 | 1,022,700 | 1,023,820 | 778,900 | 894,351 | * | \$1,032,790 | \$1,044,144 | * |
| May 17 | | | | | | | | | | | | | | |
| Jun 17 | | | | | | | | | | | | | | |
| Jul 17 | | | | | | | | | | | | | | |
| Aug 17 | | | | | | | | | | | | | | |
| Sep 17 | | | | | | | | | | | | | | |
| Total | | | | | | | 4,784,804 | 4,651,591 | 5,233,191 | 4,457,248 | 1,364,180 | \$28,683,628 | \$31,017,566 | \$27,634,965 |

Actual generation as a percentage of average: 85.2%

Cost per MWh: \$20.26

Lake/Reservoir Content

As of May 22, the active conservation pools for the Canyon Ferry and Yellowtail Dams were 87.3 percent and 72.7 percent full, respectively.

Weather and Other Conditions

Most of the plains snowpack melted in March, which produced a below-average runoff for April of 93 percent. However, snowpack accumulations have since increased significantly to 107 percent of average above Fort Peck and 155 percent of average on the Garrison to Fort Peck reach, and late spring storms continue to add to the snowpack totals.

Note: The Upper Great Plains Region reports its 50 percent share of generation from Yellowtail Dam, while RMR reports the snowpack, inflow, content, and remaining share of generation. Asterisks indicate that actual data is not available for the month.