

RECLAMATION

Managing Water in the West

February 8, 2016

Dear Customer:

Attached is the Monthly Water Supply Outlook and projected operations for Yellowtail Dam and Powerplant. Streamflows into Bighorn Lake during January were 115 percent of average. On February 1, the Natural Resource Conservation Services (NRCS) measured the snow water content of the mountain snowpack in the Bighorn Basin at 70 percent of average. Based on the February 1 water supply forecast and the planned releases out of Boysen and Buffalo Bill Reservoirs, the April through July runoff into Bighorn Lake is expected to equal 596,200 acre-feet (54 percent of average). If you have any questions or concerns, please feel free to contact Tim Felchle at 406-247-7318 or me at 406-247-7334.

Clayton R. Jordan
Reservoir and River Operations



U. S. Department of the Interior
Bureau of Reclamation
Montana Area Office
River and Reservoir Operations

YELLOWTAIL RESERVOIR OPERATIONS
 Water Supply Forecasts and Reservoir Operations
 February 1, 2016

Present Elevations & Storages:

	Elevation (feet)	Storage (acre-feet)	Percent of Average	Percent Full
Boysen	4716.28	585,743	105	79
Buffalo Bill	5364.04	426,588	100 *	66
Bighorn Lake	3625.28	870,379	110	85

Actual Inflows (1,000's of Acre-Feet):

Water Year 2016	Inflow	Percent of Average
October	133.5	84
November	121.1	102
December	116.1	114
January	118.0	115

Water Year 2015	Inflow	Percent of Average
January	133.6	129
February	166.4	159
March	161.2	110
April	130.5	87
May	311.8	116
June	876.9	214
July	223.6	88
August	150.1	102
September	134.2	83
April-July	1,542.8	142

Actual Gains between Boysen and Buffalo Bill to Yellowtail (1,000's of Acre-Feet):

Water Year 2016	Gains	Percent of Average
October	34.3	51
November	58.0	103
December	51.2	136
January	52.7	132

Water Year 2015	Gains	Percent of Average
January	54.9	138
February	94.9	199
March	75.9	104
April	24.3	73
May	96.4	192
June	178.1	207
July	-50.2 (avg. -62.9)	-
August	-31.7 (avg. -54.0)	-
September	-12.6 (avg. 10.5)	-
April-July	248.6	232

February 1 Runoff Forecast (April-July Inflows - 1,000's of Acre-Feet):

Agency	Inflows	Percent of Average
USBR	596.2	54

Average based on past 30 years

*This does not reflect the 30 year average because in 1992 the capacity of the reservoir was increased to approximately 646,565 acre-feet as a result of raising the dam. The average used here reflects data from 1993 through 2015.

SNOW and PRECIPITATION UPDATE
Based on Mountain Data from NRCS SNOTEL Sites
As of February 1, 2016

BASIN Data Site Name	Elev.	Snow Water Equivalent			Total Precipitation		
	feet	Current	Median	% Median	Current	Median	% Median
UPPER YELLOWSTONE RIVER BASIN							
Beartooth Lake	9360	10.9	13.9	78	11.5	12.9	89
Box Canyon	6670	4.9	5.8	84	7.9	8.2	96
Brackett Creek	7320	12.7	11.4	111	18.1	16.3	111
Burnt Mtn Canyon	5880 7870	2.4 7.7	2.4 8.2	100 94	6.9 9.7	7.8 10.8	88 90
Cole Creek	7850	4.4	8.4	52	5.8	7.6	76
East Boulder Mine	6335	2.4	-M	*	7.3	-M	*
Evening Star	9200	15.7	16.4	96	18.1	18.0	101
Fisher Creek	9100	18.2	20.6	88	17.1	20.9	82
Monument Peak	8850	10.8	12.0	90	13.2	14.1	94
Northeast Entrance	7350	5.4	6.4	84	8.3	8.3	100
Parker Peak	9400	12.4	13.0	95	13.6	11.4	119
Placer Basin	8830	7.8	10.5	74	9.5	12.0	79
Porcupine	6500	3.8	4.1	93	7.6	7.5	101
Sacajawea	6550	9.6	8.9	108	17.0	14.6	116
Shower Falls	8100	11.1	12.1	92	14.6	14.4	101
S Fork Shields	8100	7.7	9.2	84	13.6	12.6	108
Sylvan Lake	8420	11.0	13.0	85	15.2	15.0	101
Sylvan Road	7120	6.3	7.8	81	10.9	11.9	92
Thumb Divide	7980	8.6	9.6	90	10.4	12.2	85
Two Ocean Plateau	9240	16.3	17.6	93	16.2	17.4	93
White Mill	8700	14.5	14.6	99	14.3	15.5	92
Wolverine	7650	8.5	7.1	120	9.0	8.2	110
Younts Peak	8350	7.0	9.6	73	7.6	10.5	72
Basin Index (%)					90		96
WIND RIVER BASIN (WYOMING)							
Burroughs Creek	8750	7.2	-M	*	8.6	-M	*
Castle Creek	8400	3.0	-M	*	4.5	-M	*
Cold Springs	9630	3.8	4.5	84	4.6	6.2	74
Deer Park	9700	6.7	9.4	71	6.9	12.3	56
Hobbs Park	10100	5.7	8.0	71	5.8	7.8	74
Kirwin	9550	5.2	5.9	88	6.4	7.2	89
Little Warm	9370	5.1	6.4	80	6.8	8.2	83
Owl Creek	8975	2.0	3.1	65	2.6	3.6	72
South Pass	9040	5.5	8.9	62	4.7	11.0	43
St. Lawrence Alt	8620	2.0	4.2	48	3.3	5.3	62
Togwotee Pass	9580	13.3	15.0	89	15.7	15.9	99
Townsend Creek	8700	3.4	5.2	65	4.4	7.1	62
Younts Peak	8350	7.0	9.6	73	7.6	10.5	72
Basin Index (%)					74		72
SHOSHONE RIVER BASIN (WYOMING)							
Blackwater	9780	13.1	14.8	89	14.8	13.3	111
Evening Star	9200	15.7	16.4	96	18.1	18.0	101
Marquette	8760	2.5	-M	*	6.0	-M	*
Sylvan Lake	8420	11.0	13.0	85	15.2	15.0	101
Sylvan Road	7120	6.3	7.8	81	10.9	11.9	92
Younts Peak	8350	7.0	9.6	73	7.6	10.5	72
Basin Index (%)					86		97

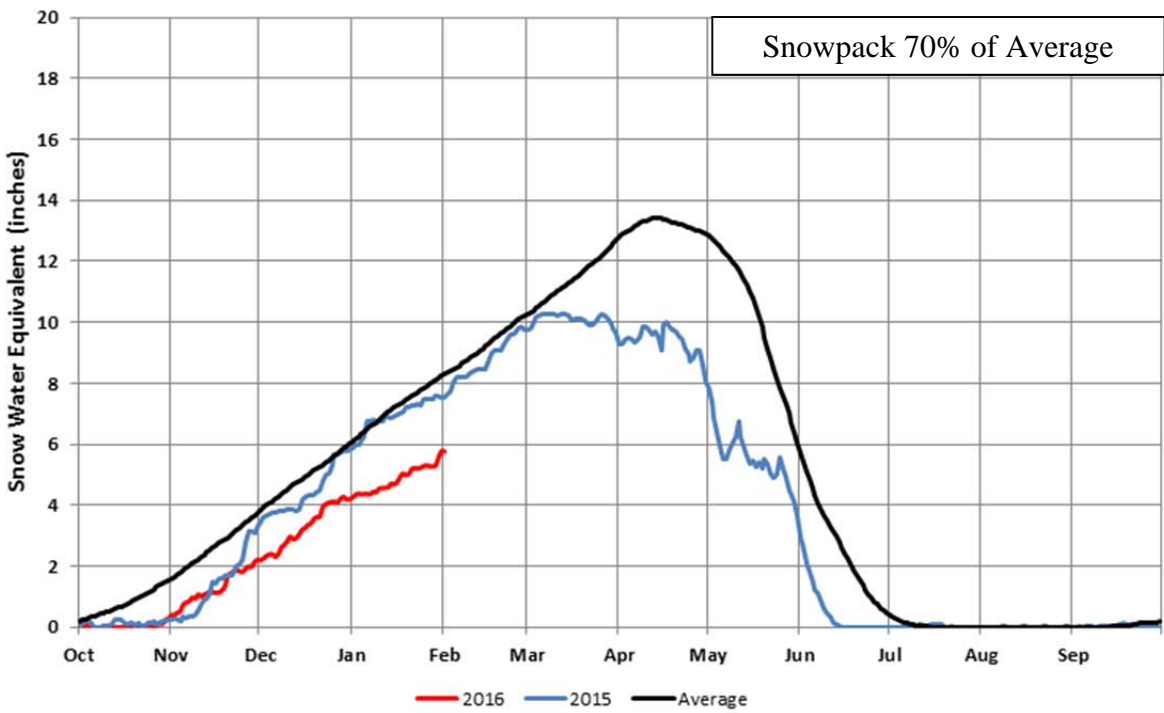
SNOW and PRECIPITATION UPDATE
Based on Mountain Data from NRCS SNOTEL Sites
As of February 1, 2016

BASIN Data Site Name	Elev.	Snow Water Equivalent			Total Precipitation		
		Current	Median	% Median	Current	Median	% Median
BIGHORN BASIN ABOVE YELLOWTAIL DAM							
Bald Mtn.	9380	7.0	10.8	65	6.4	10.7	60
Bear Trap Meadow	8200	3.2	3.4	94	3.4	5.2	65
Blackwater	9780	13.1	14.8	89	14.8	13.3	111
Bone Springs Div	9350	5.9	9.8	60	5.5	9.6	57
Burroughs Creek	8750	7.2	-M	*	8.6	-M	*
Castle Creek	8400	3.0	-M	*	4.5	-M	*
Cold Springs	9630	3.8	4.5	84	4.6	6.2	74
Deer Park	9700	6.7	9.4	71	6.9	12.3	56
Evening Star	9200	15.7	16.4	96	18.1	18.0	101
Grave Springs	8550	3.0	4.9	61	2.9	6.4	45
Kirwin	9550	5.2	5.9	88	6.4	7.2	89
Little Warm	9370	5.1	6.4	80	6.8	8.2	83
Marquette	8760	2.5	-M	*	6.0	-M	*
Middle Powder	7760	4.3	6.3	68	2.9	7.4	39
Owl Creek	8975	2.0	3.1	65	2.6	3.6	72
Powder River Pass	9480	3.7	6.5	57	3.6	7.9	46
Shell Creek	9580	5.2	9.1	57	4.9	9.0	54
South Pass	9040	5.5	8.9	62	4.7	11.0	43
St. Lawrence Alt	8620	2.0	4.2	48	3.3	5.3	62
Sylvan Lake	8420	11.0	13.0	85	15.2	15.0	101
Sylvan Road	7120	6.3	7.8	81	10.9	11.9	92
Timber Creek	7950	2.1	2.9	72	5.7	4.5	127
Togwotee Pass	9580	13.3	15.0	89	15.7	15.9	99
Townsend Creek	8700	3.4	5.2	65	4.4	7.1	62
Younts Peak	8350	7.0	9.6	73	7.6	10.5	72
Basin Index (%)							
				76			76

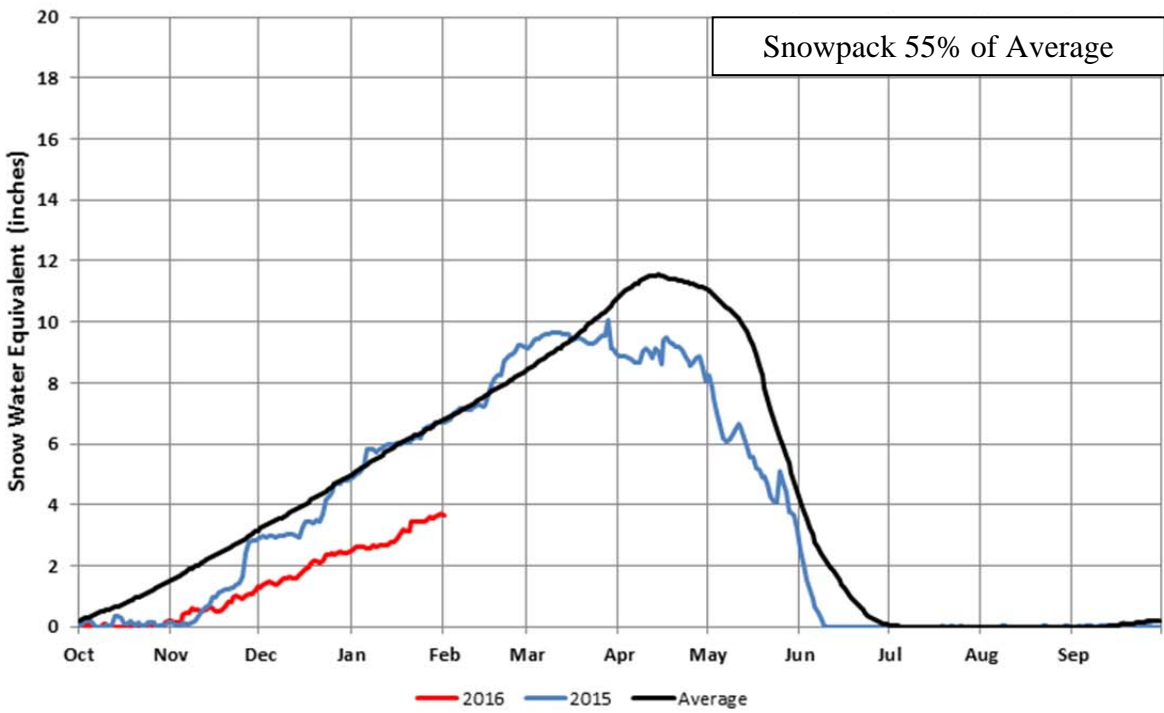
-M = Missing data

* = Data may not provide a valid measure of conditions.

Snowpack above Bighorn Lake



Snowpack in Bighorn Mountains



BHXAOP V1.16 Run: 01-Feb-2016 16:02
Based on Most Probable Inflow Forecast

BIGHORN LAKE MONTHLY OPERATIONS

Bighorn Reservoir	Initial Cont 870.4 kaf Elev 3625.28 ft					Maximum Cont 1278.9 kaf Elev 3657.00 ft				Minimum Cont 469.9 kaf Elev 3547.00 ft				Total
	2016	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	
Boysen Release	kaf	47.4	57.2	49.1	67.7	71.4	73.8	67.6	49.1	50.7	49.0	50.7	50.7	684.4
Boysen Release	cfs	824	930	825	1101	1200	1200	1099	825	825	823	825	825	
Buffalo Bill Release	kaf	11.8	12.6	39.6	103.4	107.9	119.7	116.1	105.6	44.8	23.6	21.8	21.8	728.7
Buffalo Bill Release	cfs	205	205	666	1682	1813	1947	1888	1775	729	397	355	355	
Station Gain	kaf	50.7	68.5	23.5	4.6	18.9	-83.4	-50.9	2.4	49.8	50.3	32.4	36.7	203.5
Monthly Inflow	kaf	109.9	138.3	112.2	175.7	198.2	110.1	132.8	157.1	145.3	122.9	104.9	109.2	1616.6
Monthly Inflow	cfs	1911	2249	1886	2857	3331	1791	2160	2640	2363	2065	1706	1776	
Turbine Release	kaf	139.8	134.0	110.2	124.4	131.7	140.6	145.7	132.3	137.0	142.1	146.9	146.9	1631.6
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	139.8	134.0	110.2	124.4	131.7	140.6	145.7	132.3	137.0	142.1	146.9	146.9	1631.6
Total Release	cfs	2430	2179	1852	2023	2213	2287	2370	2223	2228	2388	2389	2389	
Spring Flow	kaf	4.0	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	50.9
Irrigation Reqmnt	kaf	0.0	0.0	1.3	11.9	22.8	28.1	27.0	17.5	3.0	0.0	0.0	0.0	111.6
Afterbay Rels	kaf	143.8	138.3	114.4	128.7	135.9	144.9	150.0	136.5	141.3	146.3	151.2	151.2	1682.5
Afterbay Rels	cfs	2500	2249	1923	2093	2284	2357	2440	2294	2298	2459	2459	2459	
River Release	kaf	143.8	138.3	113.1	116.8	113.1	116.8	123.0	119.0	138.3	146.3	151.2	151.2	1570.9
River Release	cfs	2500	2249	1901	1900	1901	1900	2000	2000	2249	2459	2459	2459	
Min Release	kaf	143.8	138.3	113.1	116.8	113.1	116.8	123.0	119.0	138.3	89.3	92.2	92.2	1395.9
End-Month Content	kaf	840.5	844.8	846.8	898.1	964.6	934.1	921.2	946.0	954.3	935.1	893.1	855.4	
End-Month Elevation	ft	3621.50	3622.06	3622.32	3628.53	3635.27	3632.37	3631.06	3633.54	3634.32	3632.47	3627.96	3623.42	
Net Change Content	kaf	-29.9	4.3	2.0	51.3	66.5	-30.5	-12.9	24.8	8.3	-19.2	-42.0	-37.7	-15.0
Yellowtail Power	2016	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Total
Turbine Release	kaf	139.8	134.0	110.2	124.4	131.7	140.6	145.7	132.3	137.0	142.1	146.9	146.9	1631.6
Generation	gwh	51.153	48.696	38.520	45.204	49.132	52.776	54.895	49.211	51.394	53.458	55.047	54.486	603.972
End-Month Power Cap	mw	269.9	270.5	270.7	276.6	283.0	280.3	279.0	281.4	282.1	280.4	276.1	271.8	
% Max Gen		26	23	19	21	24	25	26	24	24	26	26	25	
Ave kwh/af		366	363	350	363	373	375	377	372	375	376	375	371	370
Upstream Generation	gwh	6.014	7.888	13.978	25.371	26.033	28.560	28.933	26.082	15.853	10.654	10.256	10.206	209.828
Total Generation	gwh	57.167	56.584	52.498	70.575	75.165	81.336	83.828	75.293	67.247	64.112	65.303	64.692	813.800

BHXAOP V1.16 Run: 01-Feb-2016 16:02
Based on Minimum Probable Inflow Forecast

BIGHORN LAKE MONTHLY OPERATIONS

Bighorn Reservoir	2016	Initial Cont Elev 3625.28 ft				Maximum Cont Elev 3657.00 ft				Minimum Cont Elev 3547.00 ft				Total
		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	
Boysen Release	kaf	47.4	57.2	49.1	67.7	71.4	73.8	67.7	44.6	36.9	29.8	30.7	30.7	607.0
Boysen Release	cfs	824	930	825	1101	1200	1200	1101	750	600	501	499	499	
Buffalo Bill Release	kaf	11.8	12.6	31.7	101.2	105.0	118.7	104.3	83.3	28.3	9.2	9.5	9.5	625.1
Buffalo Bill Release	cfs	205	205	533	1646	1765	1930	1696	1400	460	155	155	155	
Station Gain	kaf	41.4	59.9	6.2	-32.9	-30.2	-123.2	-52.3	-0.8	46.2	46.4	29.1	33.0	22.8
Monthly Inflow	kaf	100.6	129.7	87.0	136.0	146.2	69.3	119.7	127.1	111.4	85.4	69.3	73.2	1254.9
Monthly Inflow	cfs	1749	2109	1462	2212	2457	1127	1947	2136	1812	1435	1127	1190	
Turbine Release	kaf	134.0	118.7	95.3	109.1	116.8	125.3	124.2	111.5	100.2	91.3	94.3	94.3	1315.0
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	134.0	118.7	95.3	109.1	116.8	125.3	124.2	111.5	100.2	91.3	94.3	94.3	1315.0
Total Release	cfs	2330	1930	1602	1774	1963	2038	2020	1874	1630	1534	1534	1534	
Spring Flow	kaf	4.0	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	50.9
Irrigation Reqmnt	kaf	0.0	0.0	1.3	11.9	22.8	28.1	27.0	17.5	3.0	0.0	0.0	0.0	111.6
Afterbay Rels	kaf	138.0	123.0	99.5	113.4	121.0	129.6	128.5	115.7	104.5	95.5	98.6	98.6	1365.9
Afterbay Rels	cfs	2399	2000	1672	1844	2033	2108	2090	1944	1700	1605	1604	1604	
River Release	kaf	138.0	123.0	98.2	101.5	98.2	101.5	101.5	98.2	101.5	95.5	98.6	98.6	1254.3
River Release	cfs	2399	2000	1650	1651	1650	1651	1651	1650	1651	1605	1604	1604	
Min Release	kaf	138.0	123.0	98.2	101.5	98.2	101.5	101.5	98.2	101.5	89.3	92.2	92.2	1235.3
End-Month Content	kaf	837.0	848.0	839.7	866.6	896.0	840.0	835.5	851.1	862.3	856.4	831.4	810.3	
End-Month Elevation	ft	3621.04	3622.48	3621.40	3624.82	3628.29	3621.44	3620.84	3622.88	3624.28	3623.55	3620.29	3617.34	
Net Change Content	kaf	-33.4	11.0	-8.3	26.9	29.4	-56.0	-4.5	15.6	11.2	-5.9	-25.0	-21.1	-60.1
Yellowtail Power	2016	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Total
Turbine Release	kaf	134.0	118.7	95.3	109.1	116.8	125.3	124.2	111.5	100.2	91.3	94.3	94.3	1315.0
Generation	gwh	48.583	42.146	32.248	38.272	41.880	44.872	44.339	39.119	34.489	30.768	31.758	31.545	460.019
End-Month Power Cap	mw	269.5	270.9	269.9	273.1	276.4	269.9	269.3	271.3	272.6	271.9	268.8	266.0	
% Max Gen		24	20	16	18	20	21	21	19	16	15	15	15	
Ave kwh/af		363	355	338	351	359	358	357	351	344	337	337	335	350
Upstream Generation	gwh	6.003	7.849	11.775	25.024	24.995	26.824	24.042	18.524	8.729	4.313	4.491	4.505	167.074
Total Generation	gwh	54.586	49.995	44.023	63.296	66.875	71.696	68.381	57.643	43.218	35.081	36.249	36.050	627.093

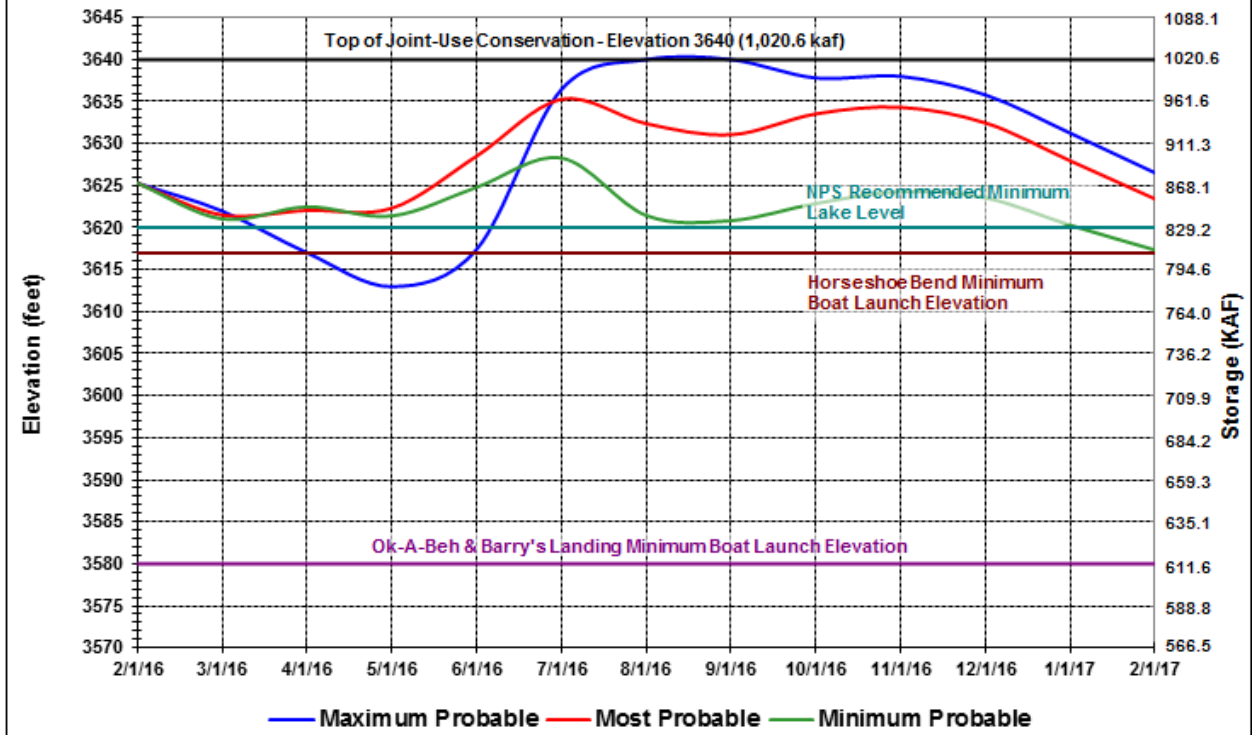
BHXAOP V1.16 Run: 01-Feb-2016 16:02
 Based on Maximum Probable Inflow Forecast

BIGHORN LAKE MONTHLY OPERATIONS

Bighorn Reservoir		Initial Cont Elev 3625.28 ft				Maximum Cont Elev 3657.00 ft				Minimum Cont Elev 3547.00 ft				Total
2016		Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Total
Boysen Release	kaf	47.4	57.2	69.9	104.5	130.8	146.0	141.8	81.8	61.5	59.5	61.5	61.5	1023.4
Boysen Release	cfs	824	930	1175	1700	2198	2374	2306	1375	1000	1000	1000	1000	
Buffalo Bill Release	kaf	11.8	12.6	49.3	146.3	187.3	201.2	155.6	106.5	54.1	21.1	21.8	21.8	989.4
Buffalo Bill Release	cfs	205	205	829	2379	3148	3272	2531	1790	880	355	355	355	
Station Gain	kaf	60.0	77.2	34.9	19.6	184.0	-9.5	-40.9	21.3	69.8	58.2	39.3	44.3	558.2
Monthly Inflow	kaf	119.2	147.0	154.1	270.4	502.1	337.7	256.5	209.6	185.4	138.8	122.6	127.6	2571.0
Monthly Inflow	cfs	2072	2391	2590	4398	8438	5492	4172	3522	3015	2333	1994	2075	
Turbine Release	kaf	145.6	183.1	180.1	241.3	335.1	295.1	256.5	236.4	183.2	164.4	169.9	169.9	2560.6
Bypass/Spill/Waste	kaf	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Release	kaf	145.6	183.1	180.1	241.3	335.1	295.1	256.5	236.4	183.2	164.4	169.9	169.9	2560.6
Total Release	cfs	2531	2978	3027	3924	5632	4799	4172	3973	2979	2763	2763	2763	
Spring Flow	kaf	4.0	4.3	4.2	4.3	4.2	4.3	4.3	4.2	4.3	4.2	4.3	4.3	50.9
Irrigation Reqmnt	kaf	0.0	0.0	1.3	11.9	22.8	28.1	27.0	17.5	3.0	0.0	0.0	0.0	111.6
Afterbay Rels	kaf	149.6	187.4	184.3	245.6	339.3	299.4	260.8	240.6	187.5	168.6	174.2	174.2	2611.5
Afterbay Rels	cfs	2601	3048	3097	3994	5702	4869	4242	4043	3049	2833	2833	2833	
River Release	kaf	149.6	187.4	183.0	233.7	316.5	271.3	233.8	223.1	184.5	168.6	174.2	174.2	2499.9
River Release	cfs	2601	3048	3075	3801	5319	4412	3802	3749	3001	2833	2833	2833	
Min Release	kaf	149.6	169.1	148.8	153.7	119.0	172.2	230.6	223.1	184.5	89.3	92.2	92.2	1824.3
End-Month Content	kaf	844.0	807.9	781.9	811.0	978.0	1020.6	1020.6	993.8	996.0	970.4	923.1	880.8	
End-Month Elevation	ft	3621.96	3617.00	3612.99	3617.44	3636.46	3640.00	3640.00	3637.81	3638.00	3635.79	3631.25	3626.53	
Net Change Content	kaf	-26.4	-36.1	-26.0	29.1	167.0	42.6	0.0	-26.8	2.2	-25.6	-47.3	-42.3	10.4
Yellowtail Power	2016	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Total
Turbine Release	kaf	145.6	183.1	180.1	241.3	335.1	295.1	256.5	236.4	183.2	164.4	169.9	169.9	2560.6
Generation	gwh	53.737	69.392	67.464	94.212	136.794	121.835	105.673	96.499	72.793	63.931	65.757	65.065	1013.152
End-Month Power Cap	mw	270.4	265.7	261.9	266.1	284.2	287.5	287.5	285.4	285.6	283.5	279.2	274.7	
% Max Gen		27	32	33	44	66	57	49	47	34	31	31	30	
Ave kwh/af		369	379	375	390	408	413	412	408	397	389	387	383	396
Upstream Generation	gwh	6.026	7.933	18.441	31.534	33.789	35.304	35.265	29.020	19.284	10.815	11.134	11.063	249.608
Total Generation	gwh	59.763	77.325	85.905	125.746	170.583	157.139	140.938	125.519	92.077	74.746	76.891	76.128	1262.760

BIGHORN LAKE

BIGHORN LAKE ELEVATION



BIGHORN RIVER FLOW BELOW AFTERBAY

