

# RECLAMATION

## *Managing Water in the West*

### **BUFFALO BILL RESERVOIR OPERATIONS**

Water Supply Forecasts and Reservoir Operations

Prepared February 2019

**End of December Elevation and Storage:** 5367.47 FT & 450,050 Acre-Feet

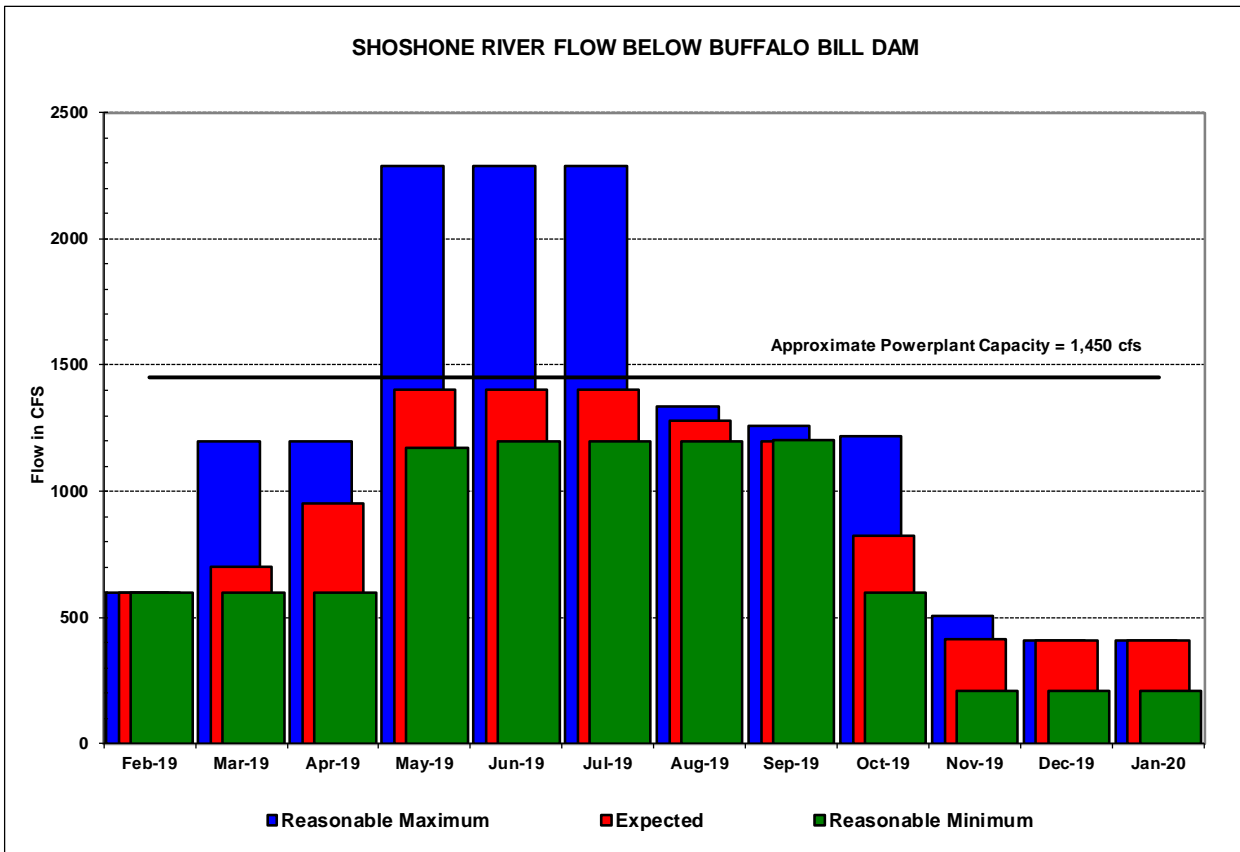
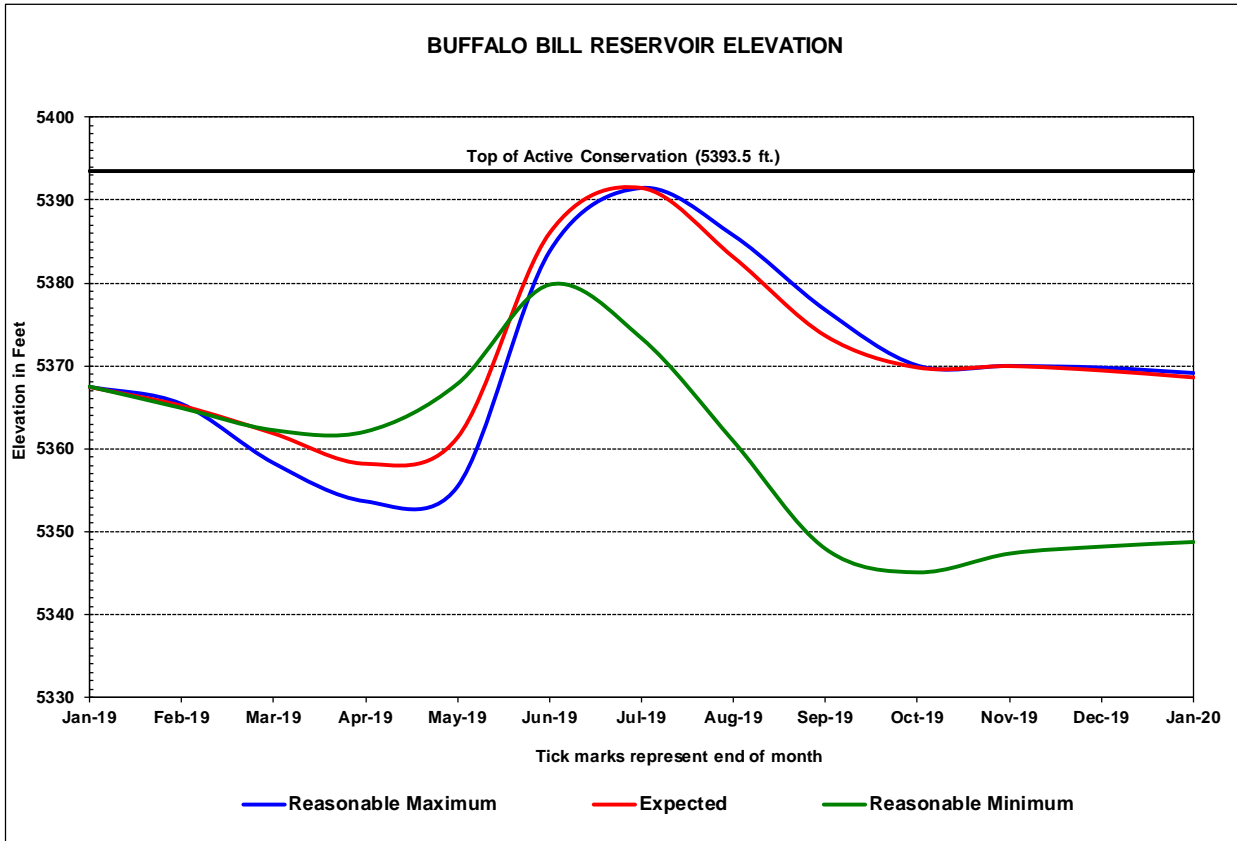
**Actual Inflows (1,000 Acre-Feet):**

<u>Month</u>	<u>Inflow</u>	<u>Percent of Normal</u>
February 18	17.9	137
March 18	23.8	112
April 18	76.5	167
May 18	451.3	258
June 18	554.1	175
July 18	217.8	130
August 18	54.4	127
September 18	21.7	87
October 18	30.8	114
November 18	27.2	118
December 18	19.1	116
January 19	18.1	110



U.S Department of the Interior  
Bureau of Reclamation  
Great Plains Region  
Wyoming Area Office  
Mills, Wyoming

# BUFFALO BILL RESERVOIR



BUFFALO BILL RESERVOIR MONTHLY OPERATIONS

Buffalo Bill Reservoir		Initial Cont Elev 446.7 kaf 5367.57 ft				Maximum Cont Elev 643.1 kaf 5393.59 ft				Minimum Cont Elev 41.8 kaf 5259.64 ft			
	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Monthly Inflow	kaf	13.9	17.4	36.5	139.3	300.6	173.7	50.9	30.0	27.8	22.5	18.0	15.9
Shoshone Release	kaf	5.6	6.1	6.0	7.2	9.3	11.3	6.2	6.0	6.1	6.0	6.1	6.1
Non-Power Release	kaf	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Flow Below Dam	kaf	5.6	6.1	6.0	7.2	9.3	12.1	6.2	6.0	6.1	6.0	6.1	6.1
Buffalo Bill Release	kaf	24.4	33.2	37.9	56.7	52.6	51.8	50.0	49.1	28.2	15.0	15.4	15.4
Municipal Delivery	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Heart Mtn Release	kaf	0.0	0.0	9.0	18.6	18.0	18.6	18.6	12.4	12.7	0.0	0.0	0.0
Heart Mtn Delivery	kaf	0.0	0.0	7.0	36.0	42.0	48.0	41.0	33.0	8.0	0.0	0.0	0.0
Total Outflow	kaf	30.3	39.6	60.2	118.8	122.2	130.8	116.1	100.8	55.3	21.3	21.8	21.8
Bypass/Spill	kaf	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0
End-Month Targets	kaf	430.3	411.4				626.2				463.9		
End-Month Content	kaf	430.3	408.1	384.4	404.9	583.3	626.2	561.0	490.2	462.7	463.9	460.1	454.2
Est Total Storage	kaf	433.7	411.5	387.8	408.3	586.7	629.6	564.4	493.6	466.1	467.3	463.5	457.6
End-Month Elevation	ft	5365.21	5361.87	5358.21	5361.38	5386.05	5391.50	5383.14	5373.65	5369.83	5370.00	5369.47	5368.63
Net Change Content	kaf	-16.4	-22.2	-23.7	20.5	178.4	42.9	-65.2	-70.8	-27.5	1.2	-3.8	-5.9
Flow Below BB Pwr	kaf	30.0	39.3	43.9	63.9	61.9	63.9	56.2	55.1	34.3	21.0	21.5	21.5
Flow Below BB Pwr	cfs	540	639	738	1039	1040	1039	914	926	558	353	350	350
Spring Inflow	kaf	3.3	3.7	3.6	3.7	3.6	3.7	3.7	3.6	3.7	3.6	3.7	3.7
Passing Cody Gage	kaf	33.3	43.0	56.5	86.2	83.5	86.2	78.5	71.1	50.7	24.6	25.2	25.2
Passing Cody Gage	cfs	600	699	950	1402	1403	1402	1277	1195	825	413	410	410
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Shoshone Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Shoshone Release	kaf	5.6	6.1	6.0	7.2	9.3	11.3	6.2	6.0	6.1	6.0	6.1	6.1
Generation	gwh	1.016	1.094	1.060	1.270	1.741	2.241	1.225	1.145	1.132	1.105	1.123	1.120
Max Generation	gwh	1.290	1.362	2.160	2.232	2.160	2.232	2.232	2.160	2.232	2.160	2.232	2.232
% Max Generation		79	80	49	57	81	100	55	53	51	51	50	50
Ave kwh/af		181	179	177	176	187	198	198	191	186	184	184	184
End-Month Power Cap	mw	2	2	3	3	3	3	3	3	3	3	3	3
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Buffalo Bill Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Buffalo Bill Release	kaf	24.4	33.2	37.9	56.7	52.6	51.8	50.0	49.1	28.2	15.0	15.4	15.4
Generation	gwh	6.569	8.814	9.765	13.388	12.966	13.393	13.090	12.724	7.623	4.112	4.219	4.210
Max Generation	gwh	12.096	13.392	12.960	13.392	12.960	13.392	13.392	12.960	13.392	10.368	9.374	13.392
% Max Generation		54	66	75	100	100	100	98	98	57	40	45	31
Ave kwh/af		269	265	258	236	247	259	262	259	270	274	274	273
End-Month Power Cap	mw	18	18	18	18	18	18	18	18	18	14	13	18
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Spirit Mtn Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Spirit Mtn Release	kaf	0.0	0.0	16.0	34.4	33.3	34.4	34.4	33.3	20.7	0.0	0.0	0.0
Generation	gwh	0.000	0.000	1.439	2.375	2.655	3.170	3.278	3.083	2.118	0.000	0.000	0.000
Max Generation	gwh	0.000	0.000	1.620	3.348	3.240	3.348	3.348	3.240	2.277	0.000	0.000	0.000
% Max Generation		0	0	89	71	82	95	98	95	93	0	0	0
Ave kwh/af				90	69	80	92	95	93	102			
End-Month Power Cap	mw	0	0	2	4	5	5	5	4	3	0	0	0
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Heart Mtn Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Heart Mtn Release	kaf	0.0	0.0	9.0	18.6	18.0	18.6	18.6	12.4	12.7	0.0	0.0	0.0
Generation	gwh	0.000	0.000	2.154	4.453	4.309	4.453	4.453	2.968	3.040	0.000	0.000	0.000
Max Generation	gwh	0.000	0.000	2.160	4.464	4.320	4.464	4.464	4.320	3.036	0.000	0.000	0.000
% Max Generation		0	0	100	100	100	100	100	69	100	0	0	0
Ave kwh/af				239	239	239	239	239	239	239			
End-Month Power Cap	mw	0	0	3	6	6	6	6	6	4	0	0	0
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Total Generation	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Total Generation	gwh	7.585	9.908	14.418	21.486	21.671	23.257	22.046	19.920	13.913	5.217	5.342	5.330
End-month Power Cap	mw	20	20	26	31	32	32	32	31	28	17	16	21

BBRAOP V1.04 Run: 05-Feb-2019 11:16  
 Based on reasonable minimum April-July inflow of 450 kaf

BUFFALO BILL RESERVOIR MONTHLY OPERATIONS

Buffalo Bill Reservoir		Initial Cont Elev 446.7 kaf 5367.57 ft				Maximum Cont Elev 643.1 kaf 5393.59 ft				Minimum Cont Elev 41.8 kaf 5259.64 ft			
	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Monthly Inflow	kaf	11.7	15.8	38.3	143.9	197.1	70.7	25.3	20.5	25.2	22.2	14.4	12.8
Shoshone Release	kaf	5.6	6.1	6.0	6.1	6.0	6.2	6.2	6.0	6.1	6.0	6.1	6.1
Non-Power Release	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
Total Flow Below Dam	kaf	5.6	6.1	6.0	6.1	6.0	6.2	6.2	6.0	6.1	6.0	6.1	6.1
Buffalo Bill Release	kaf	24.4	27.1	14.8	53.5	50.7	52.3	53.5	53.9	15.4	2.9	3.1	3.1
Municipal Delivery	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Heart Mtn Release	kaf	0.0	0.0	11.3	8.9	11.1	11.6	10.4	8.0	11.7	0.0	0.0	0.0
Heart Mtn Delivery	kaf	0.0	0.0	7.0	36.0	42.0	48.0	41.0	33.0	8.0	0.0	0.0	0.0
Total Outflow	kaf	30.3	33.5	39.4	104.8	110.1	118.4	111.4	101.2	41.5	9.2	9.5	9.5
Bypass/Spill	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
End-Month Targets	kaf			409.3					320.9				368.4
End-Month Content	kaf	428.1	410.4	409.3	448.4	535.4	487.7	401.6	320.9	304.6	317.6	322.5	325.8
Est Total Storage	kaf	431.5	413.8	412.7	451.8	538.8	491.1	405.0	324.3	308.0	321.0	325.9	329.2
End-Month Elevation	ft	5364.89	5362.22	5362.05	5367.81	5379.75	5373.30	5360.88	5347.92	5345.09	5347.35	5348.19	5348.75
Net Change Content	kaf	-18.6	-17.7	-1.1	39.1	87.0	-47.7	-86.1	-80.7	-16.3	13.0	4.9	3.3
Flow Below BB Pwr	kaf	30.0	33.2	20.8	59.6	56.7	58.5	59.7	59.9	21.5	8.9	9.2	9.2
Flow Below BB Pwr	cfs	540	540	350	969	953	951	971	1007	350	150	150	150
Spring Inflow	kaf	3.3	3.7	3.6	3.7	3.6	3.7	3.7	3.6	3.7	3.6	3.7	3.7
Passing Cody Gage	kaf	33.3	36.9	35.7	72.2	71.4	73.8	73.8	71.5	36.9	12.5	12.9	12.9
Passing Cody Gage	cfs	600	600	600	1174	1200	1200	1200	1202	600	210	210	210
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Shoshone Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Shoshone Release	kaf	5.6	6.1	6.0	6.1	6.0	6.2	6.2	6.0	6.1	6.0	6.1	6.1
Generation	gwh	1.016	1.094	1.069	1.101	1.123	1.174	1.129	1.034	1.014	0.996	1.020	1.023
Max Generation	gwh	1.290	1.362	2.160	2.232	2.160	2.232	2.232	2.160	2.232	2.160	2.232	2.232
% Max Generation		79	80	49	49	52	53	51	48	45	46	46	46
Ave kwh/af		181	179	178	180	187	189	182	172	166	166	167	168
End-Month Power Cap	mw	2	2	3	3	3	3	3	2	2	2	2	2
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Buffalo Bill Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Buffalo Bill Release	kaf	24.4	27.1	14.8	53.5	50.7	52.3	53.5	53.9	15.4	2.9	3.1	3.1
Generation	gwh	6.566	7.229	3.926	13.202	12.716	13.128	13.159	12.801	3.872	0.739	0.794	0.796
Max Generation	gwh	12.096	13.392	12.960	13.392	12.960	13.392	13.392	12.960	13.392	10.368	9.374	13.392
% Max Generation		54	54	30	99	98	98	98	99	29	7	8	6
Ave kwh/af		269	267	265	247	251	251	246	237	251	255	256	257
End-Month Power Cap	mw	18	18	18	18	18	18	18	17	18	14	13	18
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Spirit Mtn Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Spirit Mtn Release	kaf	0.0	0.0	18.3	34.4	33.3	34.4	34.4	33.3	19.7	0.0	0.0	0.0
Generation	gwh	0.000	0.000	1.760	2.747	2.796	2.896	2.718	2.343	1.608	0.000	0.000	0.000
Max Generation	gwh	3.024	3.248	3.013	3.348	3.240	3.348	3.348	3.240	2.277	2.365	3.348	3.348
% Max Generation		0	0	58	82	86	86	81	72	71	0	0	0
Ave kwh/af				96	80	84	84	79	70	82			
End-Month Power Cap	mw	0	0	3	4	4	4	4	3	2	0	0	0
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Heart Mtn Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Heart Mtn Release	kaf	0.0	0.0	11.3	8.9	11.1	11.6	10.4	8.0	11.7	0.0	0.0	0.0
Generation	gwh	0.000	0.000	2.705	2.131	2.657	2.777	2.490	1.915	2.801	0.000	0.000	0.000
Max Generation	gwh	0.000	0.000	4.320	4.464	4.320	4.464	4.464	4.320	3.036	0.000	0.000	0.000
% Max Generation		0	0	63	48	62	62	56	44	92	0	0	0
Ave kwh/af				239	239	239	239	239	239	239			
End-Month Power Cap	mw	0	0	6	6	6	6	6	6	4	0	0	0
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Total Generation	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Total Generation	gwh	7.582	8.323	9.460	19.181	19.292	19.975	19.496	18.093	9.295	1.735	1.814	1.819
End-month Power Cap	mw	20	20	30	31	31	31	31	28	26	16	15	20

BBRAOP V1.04 Run: 05-Feb-2019 11:16  
 Based on reasonable maximum April-July inflow of 850 kaf

BUFFALO BILL RESERVOIR MONTHLY OPERATIONS

Buffalo Bill Reservoir		Initial Cont Elev 446.7 kaf 5367.57 ft				Maximum Cont Elev 643.1 kaf 5393.59 ft				Minimum Cont Elev 41.8 kaf 5259.64 ft			
	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Monthly Inflow	kaf	15.2	23.5	45.8	184.5	374.5	245.3	74.7	36.3	30.8	26.4	20.3	17.2
Shoshone Release	kaf	5.6	7.7	6.7	13.1	11.8	11.4	8.9	6.0	9.4	6.0	6.2	6.1
Non-Power Release	kaf	0.0	10.7	0.0	48.1	49.2	54.8	0.0	0.0	0.0	0.0	0.0	0.0
Total Flow Below Dam	kaf	5.6	18.4	6.7	61.2	61.0	66.2	8.9	6.0	9.4	6.0	6.2	6.1
Buffalo Bill Release	kaf	24.4	51.7	52.1	57.2	53.6	52.2	51.0	48.6	50.6	20.4	15.3	15.4
Municipal Delivery	kaf	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Heart Mtn Release	kaf	0.0	0.0	9.0	18.6	18.0	18.6	18.6	16.6	11.2	0.0	0.0	0.0
Heart Mtn Delivery	kaf	0.0	0.0	7.0	36.0	42.0	48.0	41.0	33.0	8.0	0.0	0.0	0.0
Total Outflow	kaf	30.3	70.4	75.1	173.3	174.9	185.3	119.8	104.5	79.5	26.7	21.8	21.8
Bypass/Spill	kaf	0.0	10.7	0.0	48.1	49.2	54.8	0.0	0.0	0.0	0.0	0.0	0.0
End-Month Targets	kaf	431.6	384.7				626.2				463.9		
End-Month Content	kaf	431.6	384.7	355.4	366.6	566.2	626.2	581.1	512.9	464.2	463.9	462.4	457.8
Est Total Storage	kaf	435.0	388.1	358.8	370.0	569.6	629.6	584.5	516.3	467.6	467.3	465.8	461.2
End-Month Elevation	ft	5365.40	5358.26	5353.63	5355.42	5383.82	5391.50	5385.76	5376.74	5370.04	5370.00	5369.79	5369.14
Net Change Content	kaf	-15.1	-46.9	-29.3	11.2	199.6	60.0	-45.1	-68.2	-48.7	-0.3	-1.5	-4.6
Flow Below BB Pwr	kaf	30.0	70.1	58.8	118.4	114.6	118.4	59.9	54.6	60.0	26.4	21.5	21.5
Flow Below BB Pwr	cfs	540	1140	988	1926	1926	1926	974	918	976	444	350	350
Spring Inflow	kaf	3.3	3.7	3.6	3.7	3.6	3.7	3.7	3.6	3.7	3.6	3.7	3.7
Passing Cody Gage	kaf	33.3	73.8	71.4	140.7	136.2	140.7	82.2	74.8	74.9	30.0	25.2	25.2
Passing Cody Gage	cfs	600	1200	1200	2288	2289	2288	1337	1257	1218	504	410	410
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Shoshone Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Shoshone Release	kaf	5.6	7.7	6.7	13.1	11.8	11.4	8.9	6.0	9.4	6.0	6.2	6.1
Generation	gwh	1.017	1.365	1.162	2.235	2.157	2.235	1.766	1.158	1.755	1.106	1.142	1.122
Max Generation	gwh	1.290	1.362	2.160	2.232	2.160	2.232	2.232	2.160	2.232	2.160	2.232	2.397
% Max Generation		79	100	54	100	100	100	79	54	79	51	51	47
Ave kwh/af		182	177	173	171	183	196	198	193	187	184	184	184
End-Month Power Cap	mw	2	2	3	3	3	3	3	3	3	3	3	3
-----													
Buffalo Bill Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Buffalo Bill Release	kaf	24.4	51.7	52.1	57.2	53.6	52.2	51.0	48.6	50.6	20.4	15.3	15.4
Generation	gwh	6.572	13.384	12.963	13.180	12.959	13.394	13.380	12.640	13.389	5.578	4.194	4.216
Max Generation	gwh	12.096	13.392	12.960	13.392	12.960	13.392	13.392	12.960	13.392	10.368	9.374	13.392
% Max Generation		54	100	100	98	100	100	100	98	100	54	45	31
Ave kwh/af		269	259	249	230	242	257	262	260	265	273	274	274
End-Month Power Cap	mw	18	18	18	18	18	18	18	18	18	14	13	18
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Spirit Mtn Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Spirit Mtn Release	kaf	0.0	0.0	16.0	34.4	33.3	34.4	34.4	33.3	19.2	0.0	0.0	0.0
Generation	gwh	0.000	0.000	1.313	2.198	2.519	3.128	3.302	3.114	1.888	0.000	0.000	0.000
Max Generation	gwh	0.000	0.000	3.240	3.348	3.240	3.348	3.348	3.240	2.277	2.365	0.000	0.000
% Max Generation		0	0	41	66	78	93	99	96	83	0	0	0
Ave kwh/af				82	64	76	91	96	94	98			
End-Month Power Cap	mw	0	0	2	3	5	5	5	4	3	0	0	0
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Heart Mtn Power	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Heart Mtn Release	kaf	0.0	0.0	9.0	18.6	18.0	18.6	18.6	16.6	11.2	0.0	0.0	0.0
Generation	gwh	0.000	0.000	2.154	4.453	4.309	4.453	4.453	3.974	2.681	0.000	0.000	0.000
Max Generation	gwh	0.000	0.000	2.160	4.464	4.320	4.464	4.464	4.320	2.678	0.000	0.000	0.000
% Max Generation		0	0	100	100	100	100	100	92	100	0	0	0
Ave kwh/af				239	239	239	239	239	239	239			
End-Month Power Cap	mw	0	0	3	6	6	6	6	6	4	0	0	0
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Total Generation	2019	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Total Generation	gwh	7.589	14.749	17.592	22.066	21.944	23.210	22.901	20.886	19.713	6.684	5.336	5.338
End-month Power Cap	mw	20	20	26	30	32	32	32	31	28	17	16	21