UNITED STATES
DEPARTMENT OF THE INTERIOR

BUREAU OF RECLAMATION

# RESERVOIR SEDIMENTATION DATA SUMMARY

Buffalo Bill
NAME OF RESERVOIR

43-1b
DATA SHEET NO.

## DAM

| | | |
|---|---|---|
| 1. OWNER Bureau of Reclamation | 2. RIVER Shoshone | 3. STATE Wyoming |
| 4. SEC. 7 TWP. 52N RANGE 102W | 5. NEAREST TOWN Cody | 6. COUNTY Park |
| 7. STREAM BED ELEV. 5133 | 8. TOP OF DAM ELEV. 5370 | 9. SPILLWAY CREST ELEV. 5360 |

## RESERVOIR

| 10. STORAGE ALLOCATION | 11. ELEVATION TOP OF POOL | 12. SURFACE AREA ACRES | 13. STORAGE ACRE-FEET | 14. ACCUMULATED ACRE-FEET | 15. DATE STORAGE BEGAN |
|---|---|---|---|---|---|
| a. FLOOD CONTROL | | | | | May 18,1910 |
| b. POWER | | | | | |
| c. WATER SUPPLY | | | | | 16. DATE NORMAL OPER. BEGAN |
| d. IRRIGATION 1/ | 5360 | 6682 | 455,838 | 455,838 | |
| e. CONSERVATION | | | | | June 1913 |
| f. INACTIVE | 5259.6 | 1772 | 61,900 | 61,900 | |

17. LENGTH OF RESERVOIR 7.9 MILES — AV. WIDTH OF RESERVOIR 1.32 MILES

## WATERSHED

| | | | |
|---|---|---|---|
| 18. TOTAL DRAINAGE AREA | 1470 SQ. MI. | 22. MEAN ANNUAL PRECIPITATION | 4/11.44 43.90 INCHES |
| 19. NET SEDIMENT CONTRIBUTING AREA | 1470 SQ. MI. | 23. MEAN ANNUAL RUNOFF | 11.82 INCHES |
| 20. LENGTH 2/ 57 MILES | AV. WIDTH 34 MILES | 24. MEAN ANNUAL RUNOFF 3/ | 927,000 AC.-FT. |
| 21. MAX. ELEV. 12,000 + | MIN. ELEV. 5360 | 25. CLIMATIC CLASSIFICATION | Semi Arid-Humid |

## SURVEY DATA

| 26. DATE OF SURVEY | 27. PERIOD YEARS | 28. ACCL. YEARS | 29. TYPE OF SURVEY | 30. NO. OF RANGES OR CONTOUR INT. | 31. SURFACE AREA ACRES | 32. CAPACITY ACRE-FEET | 33. C/W RATIO AC-FT. PER SQ. MI. |
|---|---|---|---|---|---|---|---|
| May 1910 | | 0 | R | 10 Ft. | 6682 | 455,838 | 310.1 |
| 1941 | 31.7 | 31.7 | R | 10 Ft. | 6711 | 439,851 | 299.2 |
| 1958 | 17.0 | 48.7 | R | 10 Ft. | 6691 | 421,333 | 286.6 |

| 26. DATE OF SURVEY | 34. PERIOD ANNUAL PRECIPITATION | 35. PERIOD WATER INFLOW ACRE-FEET a. MEAN ANNUAL | b. MAX. ANNUAL | c. PERIOD TOTAL | 36. WATER INFL. TO DATE AC-FT. a. MEAN ANNUAL | b. TOTAL TO DATE |
|---|---|---|---|---|---|---|
| 1941 | Not Avail. | 5/ 929,200 | 1,336,600 | 5/ 24,158,000 | 929,200 | 5/ 24,158,600 |
| 1958 | Not Avail. | 923,800 | 1,359,700 | 15,704,300 | 927,000 | 39,862,900 |

| 26. DATE OF SURVEY | 37. PERIOD SEDIMENT DEPOSITS ACRE-FEET a. PERIOD TOTAL | b. AV. ANNUAL | c. PER SQ. MI.-YEAR | 38. TOTAL SED. DEPOSITS TO DATE ACRE-FEET. a. TOTAL TO DATE | b. AV. ANNUAL | c. PER SQ. MI.-YEAR |
|---|---|---|---|---|---|---|
| 1941 | 15,987 | 504 | .34 | 15,987 | 504 | .34 |
| 1958 | 18,518 | 1089 | .62 | 34,505 | 708 | .48 |

| 26. DATE OF SURVEY | 39. AV. DRY WGT. LBS. PER CU. FT. | 40. SED. DEP. TONS PER SQ. MI.-YR. a. PERIOD | b. TOTAL TO DATE | 41. STORAGE LOSS PCT. a. AV. ANNUAL | b. TOT. TO DATE | 42. SED. INFLOW PPM a. PERIOD | b. TOT. TO DATE |
|---|---|---|---|---|---|---|---|
| 1941 | Unknown | Unknown | Unknown | .11 | 3.51 | Unknown | Unknown |
| 1958 | Unknown | Unknown | Unknown | .16 | 7.57 | Unknown | Unknown |

26. DATE OF SURVEY

43. DEPTH DESIGNATION RANGE IN FEET ABOVE, AND BELOW, CREST ELEVATION

| 227-210 | 210-190 | 190-170 | 170-150 | 150-130 | 130-110 | 110-90 | 90-70 | 70-50 | 50-30 | 30-20 | 20-0 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION | | | | | | | | | | | |
| 1941 | .2 | 1.0 | 3.8 | 5.9 | 9.0 | 13.4 | 26.6 | 39.1 | 56.1 | 85.3 | 98.3 | 100.0 |
| 1958 | .2 | 1.9 | 7.6 | 15.6 | 23.5 | 33.9 | 46.1 | 61.7 | 85.1 | 100.8 | 102.8 | 100.0 |

26. DATE OF SURVEY

44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGH OF RESERVOIR

| 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | -105 | -110 | -115 | -120 | -125 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION | | | | | | | | | | | | | | |
| 1941 | 2.5 | 4.8 | 9.0 | 10.6 | 26.6 | 39.1 | 56.1 | 67.8 | 98.3 | 100.0 | | | | |
| 1958 | 4.4 | 11.6 | 23.5 | 28.4 | 46.1 | 61.7 | 85.1 | 94.3 | 102.5 | 100.0 | | | | |

45. RANGE IN RESERVOIR OPERATION

| WATER YEAR | MAX. ELEV. | MIN. ELEV. | INFLOW AC.-FT. | WATER YEAR | MAX. ELEV. | MIN. ELEV. | INFLOW AC.-FT. |
|---|---|---|---|---|---|---|---|
| | | | SEE ATTACHED SHEETS | | | | |

46. ELEVATION-AREA-CAPACITY DATA

| ELEVATION | AREA | CAPACITY | ELEVATION | AREA | CAPACITY | ELEVATION | AREA | CAPACITY |
|---|---|---|---|---|---|---|---|---|
| 5140 | 0 | 0 | 5220 | 523 | 8,490 | 5300 | 2902 | 136,970 |
| 50 | .23 | 1 | 30 | 739 | 14,800 | 10 | 3456 | 168,770 |
| 60 | .47 | 5 | 40 | 984 | 23,420 | 20 | 4036 | 206,220 |
| 70 | .70 | 11 | 50 | 1263 | 34,650 | 30 | 4662 | 249,710 |
| 80 | 22. | 125 | 60 | 1573 | 48,830 | 40 | 5406 | 300,060 |
| 90 | 63. | 550 | 70 | 1868 | 66,030 | 50 | 6078 | 357,470 |
| 5200 | 166. | 1700 | 80 | 2193 | 86,340 | 60 | 6691 | 421,320 |
| 10 | 335. | 4200 | 90 | 2516 | 109,880 | 70 | 7316 | 491,350 |

47. REMARKS AND REFERENCES

1/ Originally for irrigation only, Power Plant began operation - April 1922.
2/ Dam below Junction of North and South Forks Shoshone River, length for longest fork
3/ Average 1916 - 1958 incl.
4/ Average 11.44 at dam to 42.90 at storage gage elevation 9000 feet.
5/ 1916 - 1941 only

48. AGENCY SUPPLYING DATA Department of Interior, Bureau of Reclamation, Billings, Montana

49. DATE October 4, 1961

56621

Item #45. Range in Reservoir Operation

| Water Year | Max. Elev. | Min. Elev. | Inflow Ac.-Ft. |
|---|---|---|---|
| 1910 | 5290 | 5140 | - |
| 1911 | 5307 | 5140 | - |
| 1912 | 5356 | 5140 | - |
| 1913 | 5360 | 5140 | - |
| 1914 | 5360 | 5359 | - |
| 1915 | 5360 | 5351 | - |
| 1916 | 5360 | 5354 | 1,120,100 |
| 1917 | 5360 | 5341 | 1,042,900 |
| 1918 | 5360 | 5336 | 1,334,500 |
| 1919 | 5360 | 5335 | 525,300 |
| 1920 | 5360 | 5322 | 1,050,600 |
| 1921 | 5360 | 5310 | 964,200 |
| 1922 | 5360 | 5351 | 851,300 |
| 1923 | 5360 | 5338 | 906,800 |
| 1924 | 5360 | 5351 | 901,200 |
| 1925 | 5360 | 5350 | 1,296,500 |
| 1926 | 5360 | 5349 | 782,900 |
| 1927 | 5360 | 5342 | 1,179,200 |
| 1928 | 5360 | 5349 | 1,336,600 |
| 1929 | 5360 | 5349 | 795,800 |
| 1930 | 5360 | 5349 | 865,900 |
| 1931 | 5360 | 5341 | 618,400 |
| 1932 | 5360 | 5331 | 957,700 |
| 1933 | 5360 | 5330 | 855,500 |
| 1934 | 5360 | 5331 | 590,600 |
| 1935 | 5360 | 5343 | 958,600 |
| 1936 | 5360 | 5341 | 978,000 |
| 1937 | 5360 | 5340 | 770,400 |
| 1938 | 5360 | 5335 | 1,043,100 |
| 1939 | 5360 | 5327 | 831,200 |
| 1940 | 5343 | 5268 | 694,300 |
| 1941 | 5355 | 5230 | 906,600 |
| 1942 | 5360 | 5346 | 905,700 |
| 1943 | 5360 | 5335 | 1,359,700 |
| 1944 | 5360 | 5337 | 767,800 |
| 1945 | 5360 | 5322 | 868,000 |
| 1946 | 5360 | 5345 | 819,100 |
| 1947 | 5360 | 5333 | 1,004,500 |
| 1948 | 5360 | 5338 | 911,700 |
| 1949 | 5360 | 5306 | 797,700 |
| 1950 | 5360 | 5303 | 979,500 |
| 1951 | 5360 | 5322 | 1,276,400 |
| 1952 | 5358 | 5312 | 931,300 |
| 1953 | 5359 | 5299 | 778,200 |
| 1954 | 5360 | 5313 | 856,600 |
| 1955 | 5343 | 5303 | 612,000 |
| 1956 | 5360 | 5306 | 1,137,000 |
| 1957 | 5360 | 5299 | 978,400 |
| 1958 | 5360 | 5278 | 720,700 |
| 1959 | 5360 | 5240 | 737,300 |

RESERVOIR SEDIMENT
DATA SUMMARY

Buffalo Bill
NAME OF RESERVOIR

43-1c
DATA SHEET NO.

| | | | | | | |
|---|---|---|---|---|---|---|
| DAM | 1. OWNER Bureau of Reclamation | | 2. STREAM Shoshone | | | 3. STATE Wyoming |
| | 4. SEC 7 T 52N R102W | | 5. NEAREST PO Cody | | | 6. COUNTY Park |
| | 7. LAT 44°30'05" LONG 109°11'00" | | 8. TOP OF DAM 5370 | | | 9. SPILLWAY CREST 5360 |
| RESERVOIR | 10. STORAGE ALLOCATION | 11. ELEVATION TOP OF POOL | 12. ORIGINAL SURFACE AREA, Ac | 13. ORIGINAL CAPACITY, AF | 14. GROSS STORAGE ACRE FEET | 15. DATE STORAGE BEGAN |
| | a. FLOOD CONTROL | | | | | May, 1910[1] |
| | b. MULTIPLE USE | | | | | |
| | c. POWER | | | | | |
| | d. WATER SUPPLY | | | | | 16. DATE NORMAL OPERATION BEGAN 6/13 |
| | e. IRRIGATION | 5360 | 6682 | 455,838 | 455,838 | |
| | f. CONSERVATION | | | | | |
| | g. INACTIVE | 5259.6 | 1772 | 61,900 | 61,900 | |
| | 17. LENGTH OF RESERVOIR 7.9 MILES | | | AVG. WIDTH OF RESERVOIR 1.32 MILES | | |
| BASIN | 18. TOTAL DRAINAGE AREA 1470 SQ. MI. | | | 22. MEAN ANNUAL PRECIPITATION 11.48-43.90 IN. | | |
| | 19. NET SEDIMENT CONTRIBUTING AREA 1470 | | | 23. MEAN ANNUAL RUNOFF 11.02[3] IN. | | |
| | 20. LENGTH 57[2] MI | AV. WIDTH 34 MI | | 24. MEAN ANNUAL RUNOFF 863,900[3] AC.-FT. | | |
| | 21. MAX. ELEV. 12,000+/- | MIN. ELEV. 5360 ELEV. | | 25. ANNUAL TEMP. MEAN RANGE | | |

SURVEY DATA

| 26. DATE OF SURVEY | 27. PER. | 28. ACCL. | 29. TYPE OF SURVEY | 30. NO. OF RANGES OR | 31. SURFACE AREA, AC. | 32. CAPACITY ACRE-FEET | 33. C/I RATIO AF/AF |
|---|---|---|---|---|---|---|---|
| 1910 | | 0 | R | 10 ft | 6682 | 456,840[4] | |
| 1941 | 31.7 | 31.7 | R | 10 ft | 6711 | 439,851 | |
| 1958 | 17.0 | 48.7 | R | 10 ft | 6691 | 421,333 | |
| 1986 | 27.4 | 76.1 | D | 5 ft | 6746 | 398,687 | |

| 26. DATE OF SURVEY | 34. PERIOD ANNUAL PRECIP. | 35. PERIOD WATER INFLOW, ACRE FEET | | | 36. WATER INFLOW TO DATE, AF | |
|---|---|---|---|---|---|---|
| | | a. MEAN ANN. | b. MAX. ANN. | c. TOTAL | a. MEAN ANN. | b. TOTAL |
| 1941 | N/A | 929,200 | 1,336,600 | 24,158,000 | 929,200 | 24,158,600 |
| 1958 | N/A | 923,800 | 1,359,700 | 15,704,300 | 927,000 | 39,862,900 |
| 1986 | N/A | | | | | |

| 26. DATE OF SURVEY | 37. PERIOD CAPACITY LOSS, ACRE-FEET | | | 38. TOTAL SEDIMENT DEPOSITS TO DATE, AF | | |
|---|---|---|---|---|---|---|
| | a. TOTAL | b. AV. ANN. | c. /MI.$^2$-YR. | a. TOTAL | b. AV. ANNUAL | c. /MI.$^2$-YR. |
| 1941 | 15,987 | 504 | 0.34 | 15,987 | 504 | 0.34 |
| 1958 | 18,518 | 1089 | 0.74 | 34,505 | 708 | 0.48 |
| 1986 | 23,648 | 863 | 0.59 | 58,153 | 764 | 0.52 |

| 26. DATE OF SURVEY | 39. AV. DRY WT. (#/FT$^3$) | 40. SED. DEP. TONS/MI.$^2$-YR. | | 41. STORAGE LOSS, PCT. | | 42. SED. INFLOW, PPM | |
|---|---|---|---|---|---|---|---|
| | | a. PERIOD | b. TOTAL TO DATE | a. AV. ANNUAL | b. TOTAL TO DATE | a. PER. | b. TOT. |
| 1941 | Unknown | Unknown | Unknown | 0.11 | 3.51 | Unk | Unk |
| 1958 | Unknown | Unknown | Unknown | 0.16 | 7.57 | Unk | Unk |
| 1986 | Unknown | Unknown | Unknown | 0.17[4] | 12.72[4] | Unk | Unk |

| 26. DATE OF SURVEY | 43. DEPTH DESIGNATION RANGE IN FEET BELOW AND ABOVE CREST ELEVATION | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 220- | 200- | 180- | 160- | 140- | 120- | 100-80 | 80-60 | 60-40 | 40-30 | 30-0 | |
| | PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION | | | | | | | | | | | |
| 1986 | 0.5 | 2.4 | 6.2 | 7.2 | 8.5 | 10.6 | 14.2 | 20.0 | 21.8 | 7.6 | 1.0 | |

| 26. DATE OF SURVEY | 44. REACH DESIGNATION PERCENT OF TOTAL ORIGINAL LENGTH OF RESERVOIR | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | 100-105 | 105-110 | 110-115 | 115-120 | 120-125 |
| | PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION | | | | | | | | | | | | | | |
| 1986 | N/A | | | | | | | | | | | | | | |

45. RANGE IN RESERVOIR OPERATION

| WATER YEAR | MAX. ELEV. | MIN. ELEV. | INFLOW, AF | WATER YEAR | MAX. ELEV. | MIN. ELEV. | INFLOW, AF |
|---|---|---|---|---|---|---|---|
| 1910 | 5290 | 5140 | | 1949 | 5360 | 5306 | 797,700 |
| 1911 | 5307 | 5140 | | 1950 | 5360 | 5303 | 979,500 |
| 1912 | 5356 | 5140 | | 1951 | 5360 | 5322 | 1,276,400 |
| 1913 | 5360 | 5140 | | 1952 | 5358 | 5312 | 931,300 |
| 1914 | 5360 | 5359 | | 1953 | 5359 | 5299 | 778,200 |
| 1915 | 5360 | 5351 | | 1954 | 5360 | 5313 | 856,600 |
| 1916 | 5360 | 5354 | 1,120,100 | 1955 | 5343 | 5303 | 612,000 |
| 1917 | 5360 | 5341 | 1,042,900 | 1956 | 5360 | 5306 | 1,137,000 |
| 1918 | 5360 | 5336 | 1,334,500 | 1957 | 5360 | 5299 | 978,400 |
| 1919 | 5360 | 5335 | 525,300 | 1958 | 5360 | 5278 | 720,700 |
| 1920 | 5360 | 5322 | 1,050,600 | 1959 | 5360 | 5240 | 844,500[5] |
| 1921 | 5360 | 5310 | 964,200 | 1960 | 5347 | 5310 | 621,000 |
| 1922 | 5360 | 5351 | 851,300 | 1961 | 5361 | 5301 | 672,100 |
| 1923 | 5360 | 5338 | 906,800 | 1962 | 5364 | 5310 | 1,044,100 |
| 1924 | 5360 | 5351 | 901,200 | 1963 | 5364 | 5313 | 971,000 |
| 1925 | 5360 | 5350 | 1,296,500 | 1964 | 5364 | 5302 | 927,700 |
| 1926 | 5360 | 5349 | 782,900 | 1965 | 5364 | 5305 | 1,258,800 |
| 1927 | 5360 | 5342 | 1,179,200 | 1966 | 5361 | 5336 | 713,400 |
| 1928 | 5360 | 5349 | 1,336,600 | 1967 | 5365 | 5293 | 1,115,900 |
| 1929 | 5360 | 5349 | 795,800 | 1968 | 5359 | 5278 | 861,800 |
| 1930 | 5360 | 5349 | 865,900 | 1969 | 5362 | 5320 | 807,000 |
| 1931 | 5360 | 5341 | 618,400 | 1970 | 5365 | 5302 | 993,100 |
| 1932 | 5360 | 5331 | 957,700 | 1971 | 5363 | 5305 | 1,240,600 |
| 1933 | 5360 | 5330 | 855,500 | 1972 | 5362 | 5299 | 1,052,700 |
| 1934 | 5360 | 5331 | 590,600 | 1973 | 5353 | 5313 | 743,000 |
| 1935 | 5360 | 5343 | 958,600 | 1974 | 5365 | 5310 | 1,216,200 |
| 1936 | 5360 | 5341 | 978,000 | 1975 | 5363 | 5319 | 992,400 |
| 1937 | 5360 | 5340 | 770,400 | 1976 | 5363 | 5308 | 1,171,100 |
| 1938 | 5360 | 5335 | 1,043,100 | 1977 | 5343 | 5315 | 441,200 |
| 1939 | 5360 | 5327 | 831,200 | 1978 | 5363 | 5313 | 1,093,400 |
| 1940 | 5343 | 5268 | 694,300 | 1979 | 5355 | 5313 | 724,100 |
| 1941 | 5355 | 5230 | 906,600 | 1980 | 5363 | 5321 | 828,900 |
| 1942 | 5360 | 5346 | 905,700 | 1981 | 5367 | 5330 | 843,400 |
| 1943 | 5360 | 5335 | 1,359,700 | 1982 | 5364 | 5312 | 1,160,200 |
| 1944 | 5360 | 5337 | 767,800 | 1983 | 5363 | 5331 | 916,300 |
| 1945 | 5360 | 5322 | 868,000 | 1984 | 5364 | 5335 | 931,900 |
| 1946 | 5360 | 5345 | 819,100 | 1985 | 5354 | 5328 | 597,800 |
| 1947 | 5360 | 5333 | 1,004,500 | 1986 | 5365 | 5327 | 1,097,000 |
| 1948 | 5360 | 5338 | 911,700 | | | | |

46. ELEVATION - AREA - CAPACITY DATA FOR 1986

| ELEV. | AREA | CAP. | ELEV. | AREA | CAP. | ELEV. | AREA | CAP. |
|---|---|---|---|---|---|---|---|---|
| 5180 | 0 | 0 | 5250 | 1159 | 29,409 | 5320 | 3802 | 186,292 |
| 5190 | 13 | 39 | 5260 | 1428 | 42,317 | 5330 | 4492 | 227,682 |
| 5200 | 105 | 539 | 5270 | 1697 | 57,964 | 5340 | 5358 | 276,997 |
| 5210 | 263 | 2464 | 5280 | 1972 | 76,262 | 5350 | 6096 | 334,182 |
| 5220 | 427 | 5894 | 5290 | 2306 | 97,587 | 5360 | 6746 | 398,687 |
| 5230 | 651 | 11,209 | 5300 | 2655 | 122,374 | 5370 | 7409 | 469,289 |
| 5240 | 913 | 19,079 | 5310 | 3164 | 151,487 | | | |

47. REMARKS AND REFERENCES

[1] Originally for irrigation only - powerplant began operation in April, 1922 and ceased operation in 1980.

[2] Dam below junction of North and South Fork Shoshone River, length for longest fork.

[3] Average for 1916 - 1986 inclusive.

[4] 1910 area and capacity values recomputed by current methods for comparison with 1986 area and capacity values to compute sediment deposition.

[5] Inflow from 1959 computed by formula: Inflow = Outflow - ΔStorage.

48. AGENCY MAKING SURVEY Bureau of Reclamation

49. AGENCY SUPPLYING DATA Bureau of Reclamation | DATE December 1990