

FEDERAL INTERAGENCY SEDIMENTATION COMMITTEE

INSTRUCTIONS FOR COMPILING THE RESERVOIR  
SEDIMENT DATA SUMMARY FORM

DEPARTMENT OF AGRICULTURE

Forest Service  
Science and Education Administration  
Soil Conservation Service

DEPARTMENT OF THE INTERIOR

Bureau of Mines  
Bureau of Reclamation  
Geological Survey

DEPARTMENT OF ARMY

Corps of Engineers

DEPARTMENT OF TRANSPORTATION

Federal Highway  
Administration

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric  
Administration

ENVIRONMENTAL PROTECTION  
AGENCY

DEPARTMENT OF ENERGY

Federal Energy Regulatory  
Commission

TENNESSEE VALLEY AUTHORITY

Foreword

(REVISED \* 1978)

The following instructions were prepared by members of the Sedimentation Committee as a guide for use in the completion of Reservoir Sediment Data Summary forms. The purpose of the summary form is to provide for the uniform compilation and dissemination of pertinent basic data obtained from reservoir sedimentation surveys. A summary is desired for each reservoir on which one or more sedimentation surveys have been made. New summaries should be prepared when additional sedimentation surveys are made and should carry forward the results of previous surveys, as indicated in the instructions. A typed copy of each new summary in condition suitable for offset printing should be furnished for publication. After a summary is prepared it will be reproduced by the Committee in sufficient numbers to meet the needs of each agency represented on the Committee. This will permit each agency to maintain a file of basic data prepared in a uniform manner suitable for analysis and interpretation. The Committee recognizes that all items of data provided for on the summary will not be readily available for every reservoir. The early compilation and dissemination of available data is preferable to postponement until all items can be completed. However, it is important that every item be filled out for which data are obtainable. The following instructions are based on the instructions previously issued but are revised to apply to the new metric summary form.

### General Notes

- A. In all cases where data are estimated or assumed, insert an asterisk, and show an asterisk with the word "assumed" at the bottom of the front page of the form.
- B. Where other information is presented that needs clarification, footnotes should be used and shown by numbers, as 1/, 2/, etc. All footnotes are to be explained in the space provided under Item 47.
- C. All data should be shown to at least three significant figures, if available, and if accuracy of the survey warrants. However, it is common practice and permissible to show all items of data to the nearest whole number, even though the accuracy of the survey may not give significance to the last one or two whole numbers. For example: 167,624, 16,762, 1676, 168, 16.8, 1.68.
- D. Items 31, 32, 33, 37, 38, 40, 41.

Where the sedimentation survey of a multiple-purpose reservoir has covered only the pool level or levels used for storage most of the year (as irrigation, power, inactive) and has not covered the flood-control pool above such levels, the data should be shown for the pool levels surveyed. However, any data obtained concerning sedimentation in the controllable flood-control pool (not including surcharge storage) should be shown under the above items with a footnote reference of explanation under Item 47.

- E. Use continuation sheets when all data cannot be placed on one sheet.

### Specific Items

Name of Reservoir: Give the official or most commonly used name. If the dam has another name, give it in parentheses, i.e., Lake Mead (Hoover Dam).

Data Sheet No.: The Data Sheet Number is composed of two parts, the first being the river basin map number as shown in the hydrologic atlas compiled under the auspices of the Subcommittee on Hydrology, ICWR, and the second is the sheet reference number supplied by the Sedimentation Committee periodically when data are compiled for publication. If the map number for the river basin in which the reservoir is located is available, it should be shown here. The data sheet reference number will be supplied later by the Sedimentation Committee.

Item

1. The name of the person or the organization that owns or operates the structure. If a Federal or State government, give both the department and agency having supervision or control over the operation of the dam. (Abbreviate as necessary.)
2. If the reservoir is located on a small stream, the name of which is not known, list as a tributary of the next largest stream. For example, "Trib. of Rock R."
3. If the dam lies in two States, both States should be given, the first State being that in which the headquarters for operation of the dam are located.
4. Give the location of the dam by section, township and range.
5. Give the name of the nearest post office. If space permits, adding the distance in kilometers and direction of the dam from the nearest post office helps to pinpoint the location of the dam, as Tulsa 2 SE.
6. Give the county in which the dam is located. If the dam is in two counties, the first-named county should be the one in which headquarters for operation of the dam are located, followed by a hyphen and the name of the second county.
7. Give the latitude and longitude of the dam in degrees and minutes (seconds, if known.)

In Items 8, 9 and 21, if no actual sea level datum elevation is available, an assumed elevation or local datum plane should be given for these items wherever possible, so that the height of the dam and the spillway above streambed can be determined. (See A under General Notes, page 2.)

8. The elevation of the top of the dam.
9. This the elevation of the highest spillway. If the spillway is topped by movable gates, give the elevation of the top of the gates in closed position, with an explanatory footnote in Item 47, "REMARKS AND REFERENCES." (See B under General Notes, page 2.)
- 10-14. All data corresponding to storage allocation 10a-g refer to original storage in the reservoir, if these data are available, or otherwise, to the first accurate capacities determined after the beginning of storage. Show revisions of the initial storages if recent surveys yield more accurate data than the early surveys.

- 10a-b. These items designate the purpose of storage space allocation. Multiple use storage space (Item 10b) refers to that which is purposely varied, seasonally or alternately, as required to serve two or more purposes. Use a footnote to explain in Item 47 the specific uses.
- 10c. This item ordinarily refers to storage for hydroelectric or direct power development. However, storage developed or allocated specifically for cooling purposes in steam power plant operation should be listed under this item with a footnote explanation in Item 47.
- 10d. This item refers to water supply for municipal, industrial, domestic or livestock use, and fire protection.
- 10e. This item refers to storage space allocated specifically for water used to irrigate agricultural land.
- 10f. This item refers to storage allocated for regulation of low-water flow of streams, navigation pools, recharge of ground water, recreation, fish and wildlife, etc. Specify by footnote.
- 10g. This refers to storage below the lowest outlet in the dam which cannot be withdrawn for any consumptive or beneficial use and is not generally considered to be of significant value for any purposes listed under Item 10f, "Conservation." This pool elevation in small reservoirs generally is considered by the Department of Agriculture to be the sediment pool elevation. It is the level below which sediment is generally continually submerged and above which the sediment deposits tend to be more compacted due to periodic exposure to the air.
- 11a-g. These elevations should correspond to the top of pools listed under Item 10, in terms of mean sea level, if known. Otherwise, an assumed elevation or local datum should be given, as relative elevation to the streambed level, the top of the dam or the spillway crest. If regulation schedules provide for variation (seasonal or otherwise) in the top-of-pool levels, the maximum elevation should be shown with a reference to the footnote explanation of the other pertinent pool levels.
- 12a-g. Give the original surface area in square dekameters at the elevation at the top of each pool shown in Item 11.
- 13a-g. Give the original storage capacity in cubic dekameters in each allocation.
- 14a-g. Give the total original accumulated storage in cubic dekameters from the bottom of the reservoir to the top of each pool elevation indicated. Thus, the uppermost item recorded should be the original capacity of the reservoir below the spillway crest elevation shown in Item 9.

15. Give the date when water was first impounded (month, day, and year, if possible).
16. Give the date (month, day, and year, if possible) that the initial operation for any function started.
17. Give the length of the reservoir, from the dam to the head of the backwater of the contributing stream. If the reservoir is composed of two or more principal arms, give the sum of the lengths and specify the length of each main arm in a footnote in Item 47. Give the average width by dividing the largest figure under Item 12 by  $10^4$  times Item 17.
18. Give the entire flow-contributing drainage area above the dam.
19. Give the drainage area exclusive of the surface area of the reservoir at spillway crest elevation (Item 9) and exclusive of the upstream non-contributing basins or the watersheds above the larger reservoirs that are effective sediment traps.
20. Give the length of the total drainage area along the center-line of the main stream valley. The average width is the area in Item 18 divided by the length in Item 20.
21. The maximum elevation would be the highest point of the watershed boundary. The minimum elevation of the watershed should be the lowest original streambed elevation at the axis of the dam. This elevation is used to determine the height of the dam.
- 22-24. Give the longest available recorded mean value. If known, include in parentheses the number of years of record.
22. Give the average annual precipitation value for the total drainage area. If the mean annual precipitation varies widely for different parts of the watershed, record the range of values, for example, "450-880" mm.
23. Mean annual runoff in millimeters may be obtained from direct measurement; from published reports such as USGS Water Supply Papers; by transposing known data from similar adjacent watersheds; or from average annual runoff maps such as USGS Circular 52. The source of data may be shown by footnote with explanation under Item 47.
24. The mean annual runoff in cubic dekameters may be obtained by multiplying Item 23, mean annual runoff in millimeters, by Item 18, total drainage area in square kilometers.

25. The mean annual temperature and the average annual range in temperature should be given in degrees Celsius. For range of temperature use January mean and August mean.
26. Give the date of the beginning of storage, if used to compute sedimentation, or the average date (month, day, and year) of the first reservoir survey, and of all succeeding surveys used in computing sedimentation.
27. Give the elapsed period between the beginning of storage or the first survey used to compute sedimentation (whichever is the more recent date) and between the average dates of each succeeding sedimentation survey. Record to the nearest 0.1 year.
28. Give the accumulative period from the beginning of storage or the first survey used to compute the sedimentation (whichever is the more recent date) to each succeeding sedimentation survey. Record to the nearest 0.1 year.
29. Indicate "Range" or "Contour" and "Detailed" or "Reconnaissance" as applicable. Detailed may be shown by the symbol (D); reconnaissance by (R). A detailed range survey is defined as one in which instrumental control of all sounding and spudding positions in the lake was maintained. Where this was not done, the survey should be labeled as (R). A contour survey to be labeled (D) should conform with at least standards of third order accuracy for topographic mapping (1 in 5000). If the contouring was of a sketchy or very generalized nature, designation should be (R). All contouring done with Kelsh Plotters and similar equipment shall be considered (D), but sketching of contours with portable stereoscope shall be considered (R).
30. Give the number of ranges or the contour interval.
31. The surface area at the spillway crest elevation (use the elevation of Item 9 to obtain the first entry). If the areas of different allocated storages have been determined each should be referenced with a footnote to be shown in Item 47.
32. The first figure entered should be the original capacity (below the spillway crest elevation, Item 9). If the capacities for different allocated storages have been determined these should be shown and each referenced with a footnote in Item 47. If the original capacity was not determined, give the first accurate capacity determined after the beginning of storage and note the date.
33. Capacity-Inflow ratio.  $C/I = \text{Item 32} \div \text{Item 24}$ . Use the maximum capacity for the date (Item 32) for which the C/I

ratio is being calculated and divide by the mean annual runoff in cubic dekameters (Item 24). This ratio should be adjusted if there are one or more upstream reservoirs that have a significant trap efficiency and control a substantial part of the drainage area (usually more than 25 percent).

34. Give the mean annual precipitation over the drainage area for each period of years given in Item 27. If there is a substantial variation in precipitation for different parts of the drainage area, give the range as "250-580" mm.
35. In 35a give the average annual water inflow to the reservoir, in cubic dekameters, for each period of years given in Item 27. The highest annual for each period, in cubic dekameters, is to be given in Item 35b, and the total for each period is given in Item 35c.
36. Give the water inflow, in cubic dekameters, to the reservoir for the accumulated periods of years given in Item 28.
37. In Item 37a, give the volume of capacity loss below crest (Item 9) for the periods of years given in Item 27. Item 37b is obtained by dividing the volume given in Item 37a by the corresponding period of years shown in Item 27. Item 37c is obtained by dividing the value in 37b by the net sediment contributing area shown in Item 19.
38. In Item 38a give the accumulative total sediment deposits below crest for the period or periods of years given in Item 28. Item 38b is obtained by dividing the value of Item 38a by the correspond-accumulative years shown in Item 28. Item 38c is determined by dividing Item 38b by the net sediment contributing area shown in Item 19.
39. Weighted average dry weight in grams per cubic centimeter of sediment in place in the reservoir. Since the dry weight of deposits tends to increase with time due to compaction, an average dry weight for the total deposit should be measured or estimated at the time of each survey. The number of samples taken to determine dry weight is to be shown in parentheses beside the average dry weight value.
40. Compute the values as follows:  
Item 40a = for first survey, Item 38c x Item 39 x 1000  
Item 40a = for subsequent surveys:

$$\frac{\left[ \left( \begin{array}{cc} \text{Item 38a} & \text{Item 39} \\ \text{for latest} & \text{for latest} \\ \text{survey} & \text{survey} \end{array} \right) - \left( \begin{array}{cc} \text{Item 38a} & \text{Item 39} \\ \text{for preced-} & \text{for preced-} \\ \text{ing survey} & \text{ing survey} \end{array} \right) \right] \times 1000}{(\text{Item 27 for latest period}) \times (\text{Item 19})}$$

It is imperative that samples of the sediment representative of the entire period of sediment accumulation be obtained at the time of each survey.

$$\text{Item 40b} = \text{Item 38c} \times \text{Item 39} \times 1000$$

41. Compute the values as follows:

$$\text{Item 41a} = \frac{\text{Item 38b} \times 100}{\text{Item 14}} \text{ (Maximum value in item)}$$

$$\text{Item 41b} = \frac{\text{Item 38a} \times 100}{\text{Item 14}} \text{ (Maximum value in item)}$$

42. Compute as follows:

$$\text{Item 42a} = \frac{\text{Item 38b} \times \text{Item 39} \times 10^6}{\text{Item 35a}} = \text{Average PPM by weight}$$

$$\text{Item 42b} = \frac{\text{Item 38a} \times \text{Item 39} \times 10^6}{\text{Item 36b}} = \text{Average PPM by weight}$$

43. If elevation-capacity curves are developed, select the appropriate intervals in meters below and above the crest. Give the percentage of the total sediment deposits located within each depth designation (elevation zone). For example:

$$\frac{\text{(depth range)}}{\text{(\% of sed't)}} = \frac{21-18}{4} \quad \frac{18-16}{5} \quad \frac{16-14}{6} \quad \frac{14-12}{7} \quad \frac{12-10}{7} \quad \frac{10-8}{9}$$

$$\frac{8-6}{10} \quad \frac{6-4}{12} \quad \frac{4-2}{15} \quad \frac{2-\text{Crest}}{18} \quad \frac{\text{Crest}+2}{5} \quad \frac{+2-+4}{2}$$

44. The sediment distribution in percent according to distance from the dam. The reach designation is the percent of the distance from the dam to the maximum upstream extent of the spillway-crest contour at the elevation given in Item 9 at the date of the beginning of storage. Thus, 20 percent would be 1/5 of the distance from the dam to the head of backwater at the original crest stage.
45. List the maximum and minimum water elevations and the total inflow in cubic dekameters for each water year of record.
46. Give data from the elevation-capacity curve for the latest survey shown on Item 26. Be sure to label each survey date on the form. If space permits, give data from the elevation-capacity curve for the original survey.
47. List here all published and unpublished reports on sedimentation surveys of this reservoir. All footnote explanations are to be shown in this space. Also note any pertinent data, including dates of abnormal operational

occurrences, such as reservoir evacuation; sluicing out sediment; releasing density currents; extreme floods and droughts; changes in spillway-crest elevation; use of flash boards; and the installation of upstream control structures. Briefly describe the sediment and any available textural analyses. If needed, use continuation sheets.

48. Give the department, agency, and division, branch, or field office responsible for each survey.
49. Give the agency and department reporting the data.
50. Give the number of years that the reservoir was designed to function without adverse effect of sediment.
51. Give the date this form was prepared by the office listed in Item 49.

DAM	1. OWNER Elno Cons. District			2. STREAM Six Mile Creek			3. STATE Any State									
	4. SEC. 25 TWP. 2N RANGE 4W			5. NEAREST P.O. 3.2E of Nebo			6. COUNTY Carroll									
	7. LAT. 37° 17' 24" LONG. 87° 34' 15"			8. TOP OF DAM ELEVATION 39.9 m			9. SPILLWAY CREST ELEV. 37.5 m									
RESERVOIR	10. STORAGE ALLOCATION		11. ELEVATION TOP OF POOL, m		12. ORIGINAL SURFACE AREA, dam <sup>2</sup>		13. ORIGINAL CAPACITY, dam <sup>3</sup>		14. GROSS STORAGE, dam <sup>3</sup>		15. DATE STORAGE BEGAN					
	a. FLOOD CONTROL		37.5		8,000		1,330		3,054		April 18, 1948					
	b. MULTIPLE USE															
	c. POWER															
	d. WATER SUPPLY		34.0		5,200		672		1,724		16. DATE NORMAL OPER. BEGAN					
	e. IRRIGATION															
	f. CONSERVATION															
	g. INACTIVE		30.0		2,470		658		658		April 28, 1948					
WATERSHED	17. LENGTH OF RESERVOIR 2.16 km			AV. WIDTH OF RESERVOIR 0.37 km												
	18. TOTAL DRAINAGE AREA 26.3 km <sup>2</sup>			22. MEAN ANNUAL PRECIPITATION 638 (25 yr) mm												
	19. NET SEDIMENT CONTRIBUTING AREA 25.5 km <sup>2</sup>			23. MEAN ANNUAL RUNOFF 102 (16 yr) mm												
	20. LENGTH 8.32 km		AV. WIDTH 3.16 km		24. MEAN ANNUAL RUNOFF 2,683 dam <sup>3</sup>											
	21. MAX. ELEV. 121.3 m		MIN. ELEV. 23.2 m		25. ANNUAL TEMP: MEAN 14.4 RANGE 19.4 to 37.8											
	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, dam <sup>2</sup>		32. CAPACITY, dam <sup>3</sup>		33. C/I. RATIO, dam <sup>3</sup> /dam <sup>3</sup>
4-18-48										8,000		3,054		1.14		
6-23-64		16.18		16.18		Range - Contour (D)		21R 2CI		7,900		2,828		1.05		
26. DATE OF SURVEY		34. PERIOD ANNUAL PRECIPITATION		35. PERIOD WATER INFLOW, dam <sup>3</sup>				36. WATER INFL. TO DATE, dam <sup>3</sup>								
				a. MEAN ANNUAL		b. MAX. ANNUAL		c. PERIOD TOTAL		a. MEAN ANNUAL		b. TOTAL TO DATE				
6-23-64		630		2,286		3,295		36,979		2,286		36,979				
26. DATE OF SURVEY		37. PERIOD CAPACITY LOSS, dam <sup>3</sup>				38. TOTAL SED. DEPOSITS TO DATE, dam <sup>3</sup>										
		a. PERIOD TOTAL		b. AV. ANNUAL		c. PER km <sup>2</sup> / YEAR		a. TOTAL TO DATE		b. AV. ANNUAL		c. PER km <sup>2</sup> / YEAR				
6-23-64		226		13.97		0.55		226		13.97		0.55				
26. DATE OF SURVEY		39. AV. DRY WGT., g/cm <sup>3</sup>		40. SED. DEP., Mg/km <sup>2</sup> / YR.		41. STORAGE LOSS, PCT.		42. SED. INFLOW, PPM								
				a. PERIOD		b. TOTAL TO DATE		a. AV. ANN.		b. TOT. TO DATE		a. PERIOD		b. TOT. TO DATE		
6-23-64		1.197(8)		658		658		0.46		7.40		7,315		7,315		

26. DATE OF SURVEY	43. DEPTH DESIGNATION RANGE IN FEET BELOW, AND ABOVE, CREST ELEVATION												
	37.5-36	36-34	34-32	32-31	31-30	30-29	29-28	28-27	27-26	26-25	25-24	24-23	2
PERCENT OF TOTAL SEDIMENT LOCATED WITHIN DEPTH DESIGNATION													
6-23-64	4	8	11	11	12	11	11	9	8	7	7	1	

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	-105	-110	-115	-120
PERCENT OF TOTAL SEDIMENT LOCATED WITHIN REACH DESIGNATION														
6-23-64	2	15	19	14	17	10	9	7	10	2				

45. RANGE IN RESERVOIR OPERATION							
WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, dam <sup>3</sup>	WATER YEAR	MAX. ELEV.	MIN. ELEV.	INFLOW, dam <sup>3</sup>
1948	30.3	23.2	908	1957	35.0	29.0	1,713
1949	37.5	33.8	3,295	1958	35.7	29.3	2,251
1950	36.6	34.4	2,129	1959	36.3	29.3	2,001
1951	36.0	34.1	2,458	1960	37.5	34.1	2,549
1952	37.5	33.8	2,727	1961	37.5	33.2	2,327
1953	37.5	32.9	2,441	1962	36.3	33.2	2,127
1954	36.3	32.3	2,273	1963	37.5	33.2	2,058
1955	34.7	29.6	2,142	1964	36.7	33.8	2,042
1956	35.7	29.2	1,538				

46. ELEVATION-AREA-CAPACITY DATA								
ELEVATION, m	AREA, dam <sup>2</sup>	CAPACITY, dam <sup>3</sup>	ELEVATION	AREA	CAPACITY	ELEVATION	AREA	CAPACITY
Original Capacity	1942							
24	120	10	32	3,740	1,277	28	1,160	195
25	330	33	34	5,200	1,724	29	1,640	335
26	610	80	36	6,700	2,319	30	2,220	528
27	960	159	37.5	8,000	3,054	31	2,870	782
28	1,380	276	1964 Capacity			32	3,440	1,099
29	1,890	440	25	170	8	34	5,000	1,521
30	2,470	658	26	440	39	36	6,620	2,102
31	3,080	936	27	760	99	37.5	7,900	2,828

47. REMARKS AND REFERENCES

50. Design Life 50 years

Land Use in Watershed: 21 percent Woodland; 47 percent Pasture; 18 percent Cropland; 6 percent Idle; 8 percent Residential.

Geology: 25 percent Chaco shale; 18 percent Thomas ls.; 57 percent Orville ss.

48. AGENCY MAKING SURVEY New State Watershed Planning Party, Soil Conservation Service

49. AGENCY SUPPLYING DATA Soil Conservation Service

51. DATE Sept 3, 1968