Sedimentation Survey of

SHERIDAN COUNTY STATE LAKE

KANSAS

JANUARY 1950

UNITED STATES DEPARTMENT OF THE INTERIOR

BUREAU OF
RECLAMATION,
REGION 7

KANSAS RIVER
DISTRICT,
INDIANOLA, NEB.

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
Region 7 - Denver, Colorado

SEDIMENTATION SURVEY

OF

SHERIDAN COUNTY STATE LAKE

KANSAS

Kansas River District

Indianola, Nebraska

April 1950

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INTRODUCTION

Failure of the Quinter Dam on June 28, 1948, afforded an opportunity to make a sedimentation survey of the empty Sheridan County State Lake Reservoir, Kansas. Field investigations by District personnel, under the technical supervision of the Sedimentation Section, Hydrology Division, Bureau of Reclamation, were started July 21, 1948, and were completed August 11, 1948. This report presents the findings of the survey.

AUTHORITY FOR THE REPORT

This report is authorized to be made by virtue of the Federal Reclamation Laws (Act of June 17, 1902, 32 Stat. 388, and acts amendatory thereof or supplementary thereto).

ACKNOWLEDGMENTS

Excellent cooperation was furnished throughout the investigation by the Wilson Engineering Company, Salina, Kansas; by Mr. Dave Leahy, Director, Kansas State Forestry Fish and Game Commission; and by Mr. J. B. Spiegel, District Engineer, Surface Water Division, Geological Survey, Topeka, Kansas. Valuable information concerning the original construction of the dam was also furnished by Mr. George S. Knapp, Chief Engineer of the Division of Water Resources, Kansas State Board of Agriculture.

Mr. Louis M. Seavy, Hydrology Division, and Mr. V. A. Koelzer, Regional Office, Bureau of Reclamation, Denver, Colorado, assisted in the initiation of the field surveys. Mr. R. J. Walter, Jr., Construction Engineer, and Mr. Glenn E. Thomas, Office Engineer, Cedar Bluff Unit, Ellis, Kansas, provided personnel, valuable data, equipment, and services.

PURPOSE OF THE SURVEY

The survey was conducted to obtain data on the rate of sedimentation in the Sheridan County State Lake Reservoir for possible application in the design and operation of other reservoirs. The data should be valuable in estimating the useful life of water storage facilities and may provide support for the justification of upstream sediment control measures.

LOCATION

The channel reservoir is located on the Saline River, approximately three miles east and five miles north of Quinter, Kansas. The reservoir is in Sections 26 and 35, T. 10 S., R. 26 W., in Sheridan County, Kansas.

The Quinter Dam impounds water of the Saline River from a drainage area which includes parts of Sheridan, Gove, Thomas, Logan, and Sherman Counties, Kansas. (See Figure 6.)

OWNERSHIP

The dam was constructed by the Civilian Conservation Corps for the State Game and Fish Commission. It is still under the supervision of the Commission.

USE

The lake is used chiefly for recreation.

DESCRIPTION OF THE DAM

The original Amberson type dam was supported on piling. The dam utilized a Wakefield sheet piling as a cut-off wall at the upstream toe. The cut-off wall was supposed to extend a minimum of two feet into shale. The streambed consists of a coarse sand-gravel strata overlying soft shale, while the valley slopes are composed of a fine clay-loess soil overlying the shale.

Upon completion in September 1935, the gates were closed and the heavy run-off during the period of September 9-14, 1935, caused the reservoir to fill rapidly. Numerous leaks appeared which showed that water was passing through the cut-off wall under the dam. When the lake level had risen to about three feet below spillway crest elevation, the dam failed. In spite of the washing out of material under a section of the dam, there appeared to be little, if any, vertical or horizontal displacement in the main structure.

Investigations disclosed that the Wakefield piling had been poorly placed. Some of the piling had been driven at varying angles to the vertical, which caused the piling to split and leave wide openings.

The piling in one portion was driven only to elevation 103 feet although the coarse gravel strata extended down to elevation 85 feet. 1/

In repairing the dam, the existing structure was used as a toe for an impervious earthfill dam which was constructed by placing an earth blanket above the dam on a 15 to 1 slope. The earthfill was covered for a width of 20 feet by a solid concrete slab and for an additional width of 40 feet by old concrete slabs and ungrouted rock riprap. (See Figure 4.) The reduction in reservoir capacity below elevation 117 feet due to the additional blanket, etc., is estimated at 16.25 acre-feet.

The height of the dam is approximately 21 feet above the streambed. The crest is 430 feet in length and the maximum width at the base is 40 feet. The uncontrolled spillway has a crest elevation of 118 feet.

The eroded area under the dam and the interior of the dam were filled with hand-placed dry masonry fill. Only the silting of the reservoir made it possible to hold water in the lake by sealing off the pervious material underlying the dam. The gates were closed for a second time about August 1, 1937.

At some stage in the life of the dam, the 12-inch weep holes were plugged with concrete. The hydrostatic pressure that built up on the inside of the dam blew off a large section of the downstream face and on June 28, 1948, washed out the hand-placed dry masonry fill from the interior. (See Figure 1.)

Repair work on the dam was initiated in October 1948. Repairs included the placement of a cut-off to shale at the upstream toe of the original concrete dam, repair of flood damage to the concrete, and placing the gate in operative condition. The reservoir was filling by April 1949.

DESCRIPTION OF THE LAKE

Because of seepage the normal water surface level was below the spillway elevation 118 feet and no apparent deposition of sediment occurred above elevation 117. Computations disclose that the original reservoir at elevation 117 had a capacity of 793 acre-feet and a surface area of 116 acres.

1/ A topographic map of the reservoir area drawn from the original plane-table sheet is the basis of dam and reservoir elevations used in this report. All elevations are in feet.

The repair of the dam in 1936 reduced the capacity of the reservoir to 777 acre-feet with an area of 116 acres at elevation 117. In June 1948 the capacity at that same elevation was 436 acre-feet with an area of 116 acres.

The lake is approximately 2.3 miles in length, measured along the thalweg from the dam to the head of the backwater. The width of the lake ranges from 600 feet at the dam to 1,200 feet at a point approximately 0.7 of a mile upstream. Beyond that point the lake gradually narrows in the remaining 1.6 miles to the headwater. (See Figures 2 and 3.)

Both sides of the valley along the reservoir and the lake basin are gently rolling terrain. Some fairly steep slopes exist on the southwest side of the reservoir area.

DESCRIPTION OF THE DRAINAGE AREA

Area

The drainage area above Quinter Dam is approximately 493 square miles, of which about 30 square miles are noncontributing. (See Figure 6.) There are no major structures in the watershed above the dam which might reduce the sediment contribution to the reservoir. The drainage area lies in portions of five counties in Kansas as follows:

County	Gross D.A. (sq.mi.)	Noncontributing D.A. (sq.mi.)	Net D.A. (sq.mi.)
Gove	36.0	...	36.0
Sheridan	210.0	5.0	205.0
Thomas	224.0	24.0	200.0
Logan	5.0	...	5.0
Sherman	18.0	1.0	17.0
	493.0	30.0	463.0

Geology

The geology of the drainage area is shown on Figure 7. Over 95 percent of the area is of the Ogallala group, the remainder is Niobrara chalk in the vicinity of the reservoir.

Topography

The lower portion of the valley is irregular and varies from gentle to steep slopes with hilly to rough broken topography. The valley becomes more entrenched near the headwaters. Back from the steep banks along the stream the country is gently rolling in character and contains areas of nearly level ground.

Climate

This part of Kansas is noted for extreme and sudden changes in weather. Floods, tornados, hailstorms, and duststorms are not unknown. The stream flows depend largely on rainfall rather than snowmelt, and the fluctuations are wide and unpredictable. The winters are cold and the summers are hot. Based on 40 years record at Hoxie, Goodland, and Colby, Kansas, the mean annual temperature is 53° Fahrenheit and the mean annual precipitation is 18.5 inches. Although the range of temperature may vary between 113° F. and -23° F., the average maximum temperature is 107° F. and the average minimum is -12° F.

Rainfall

No weather record stations are located within the drainage area, therefore, three nearby stations were used.

Station	Mean annual rainfall (inches)	Years of record
Colby, Kansas	18.02	56
Goodland, Kansas	17.98	40
Hoxie, Kansas	19.35	48

Inflow

No records of inflow to the reservoir exist; the nearest gaging station on the Saline River is at Russell, Kansas, approximately 68 miles downstream.

Land Cover

The greater part of the area is naturally treeless. Small wooded areas, timbered mainly with cottonwood trees, are located in the alluvial valleys. The grass is of the short type, chiefly buffalo grass.

Cover	Percent of drainage area	Square miles
Short grass and sage	21.4	106
Cultivated	76.5	377
Barren	2.1	10
Total	100.0	493

Note: The noncontributing area is excluded.

Land Use

Little irrigation is done in the drainage area; the farming and grazing are in about the same ratios as the land cover types would indicate.

Soils

The parent soil material is loess for the entire drainage area. The soil, according to land use capability, is described in the following tabulation:

Land use capability	Percent	Sq. Miles
Suitable for cultivation with simple practices	37.7	186
Suitable for cultivation with intensive practices	35.6	175
Limited cultivation with intensive practices	2.0	10
Suitable for grazing or woodland	24.7	122
Total	100.0	493

Erosion

Erosion in the drainage area is tabulated on the following page. (Also see Figure 8.)

Erosion type	Percent	Sq. miles
None or slight	70.8	349
Heavy sheet, gully and scour	29.2	144
Total	100.0	493

HISTORY OF SURVEY

In July 1948, a representative of the Hydrology Section of Region 7 and a representative of the Sedimentation Section of the Hydrology Division, Branch of Project Planning, Bureau of Reclamation, Denver, Colorado, visited the Cedar Bluff Dam construction office at Ellis, Kansas for the purpose of inspecting and planning a sedimentation survey of the Sheridan County State Lake Reservoir.

The field work was performed by personnel from the Ellis office between July 21 and August 11, 1948. These personnel included the following: E. E. Wheatley, Engineer of Surveys; Jay R. Brown, Chief Inspector; Glen B. Wilder, Carrol Malinowsky, Russel Christensen, Jack V. Rhoades, Duane Kerth, Dean Schoenthaler, Louis Schuster, and Robert McAter.

In order to determine the amount of sediment that had accumulated in the reservoir since Quinter Dam was constructed, it was necessary to obtain the original reservoir topography. The Wilson Engineering Company, designers of the first dam, had made the initial survey of the reservoir area. The Company does not have the original planetable sheet, it had been forwarded to the Director of the Kansas State Forestry, Fish and Game Department. Efforts to locate the planetable sheet have proved fruitless. However, the Wilson Engineering Company did furnish a topographic map of the reservoir area showing five-foot contour intervals drawn from the original planetable sheet. This topographic map was the basis for the resurvey of the reservoir area.

Control for the original planetable survey of the area was accomplished by running a closed traverse around the area. Points of intersection on that traverse were marked with concrete monuments. Ranges were established for the 1948 survey and were tied into the original survey monuments. Vertical control was established from the original bench mark which was also checked against the elevation of the crest of the dam. Actual surface elevations of points where sediment samples were taken, were established by stadia shots. Location of sediment prior to flushing when the dam failed in 1948 was estimated in the resurvey.

The crest contour of the lake (elevation 118 feet) was mapped on a topography sheet at a scale of one inch to 300 feet. (See Figure 5.) The length of the shoreline is about 5.1 miles. Original and present capacities were determined by the contour method.

DISTRIBUTION OF SEDIMENT

In many instances the old floor of the reservoir was hard to identify from borings. Evidence of vegetation and surface debris were relied upon when found. Occasionally several strata of vegetative matter were encountered. Consequently, difficulty was encountered in checking the accuracy of the original map of the reservoir area.

It was believed that the contours shown on the map prepared by the Wilson Engineering Company were not sufficiently accurate to use in plotting the original profiles. However, close agreement was obtained between the interpolated value for the surface area at elevation 117 on the original survey and the value obtained from the 1948 field survey. Normal water level in the reservoir was seldom above this elevation and sediment would have been negligible except in the delta area. The delta deposition may have been largely eliminated by the flood which destroyed the dam.

In order to show the distribution of sediment in the Sheridan Reservoir from the head of the backwater to the dam, the lake area was divided into segments. This made it possible to apply the volume weight for the various segments. The segregation and the distribution obtained are shown in the following table:

From	To	Acre-feet a/	Lb/cu.ft.	Tons
Dam	1050' upstream (between R1 and R4)	58.62 b/	50.0	63,837
1050'	3330' upstream (between R4 and R7)	138.12	65.0	195,536
3330'	7240' upstream (between R7 and R10)	112.11	69.4	169,457
7240'	Headwater of res.	32.45	92.4	65,305
Total or average		341.30	66.5	494,135

a/ Crest elevation of 117 feet was used.

b/ The volume of earth-fill, 16.25 acre-feet, placed over the face of the original dam has been deducted.

Volume Weights and Mechanical Analyses

Eleven samples of the sediment that had been deposited in the reservoir were secured at various depths and locations for the purpose of obtaining the volume weight and the gradation of the sediment. The sediment sampler was a two-inch diameter tube and suction valve, to which lengths of two-inch pipe could be attached.

Data pertaining to the analyses of the sediment samples are presented on the next page. Figure 9 is a graph of the size analyses of these samples.

Analysis of Observed Densities

An analysis of the observed densities is illustrated on the graph, Figure 10. Sample data from four other reservoirs were also used. The sediment samples for this analysis were divided into sand, silt, and clay fractions. The curve obtained from the analysis of the samples shows a definite increase in weight with an increase in sand content.

TRAP EFFICIENCY

Due to the lack of nearby sediment sampling stations, the trap efficiency of the reservoir cannot be established mathematically. Qualified engineers familiar with the reservoir believe that the trap efficiency has been relatively high. This has been due principally to the large amount of seepage through the gravel underlying the dam, which kept the lake level low. Large spills were very infrequent. A trap efficiency of 80 percent was assumed.

METHOD OF COMPUTATION

The initial failure of the dam occurred less than a week after the first closure. Very little sediment could have been deposited in those few days. Therefore, the effective period of sedimentation was considered to be the 10.8 years occurring between the second closure August 1, 1937 and the final failure June 28, 1948.

The storage capacity and sediment accumulation for the reservoir were computed by the contour method. This method was used so that the distribution of the sediment by elevations could be more closely determined and for obtaining the data required for drawing a new capacity curve. (See Figure 11.) Because of the inability to establish the original floor of the reservoir along the profiles, computation of storage capacity and sediment accumulation by the range method was impractical. The table on page 11 presents a statistical summary of significant findings.

Sediment Sample Data of
Sheridan County State Lake Reservoir

Sample No.	Range	Station	Elevation	Volume weight (lb/cu.ft.)	Mechanical analysis: Percent of grade size smaller than													
					19.05 mm	9.52 mm	4.76 mm	2.38 mm	.119 mm	.590 mm	.297 mm	.149 mm	.074 mm	.050 mm	.037 mm	.019 mm	.009 mm	.005 mm
1	-			108.6*	100	99.1	96.9	88.9	67.6	35.7	5.9	1.5	1.3					
2	1	2/00	105.7	50.5			100	99.9	99.6	97.5	94.4	92.3	91.1	87.6	84.9	69.4	53.0	42.1
3	1	4/00	107.5	49.5									100	97.2	94.0	84.6	70.6	58.6
4	4	2/00	112.6	71.0			100	99.8	99.3	98.4	96.1	90.6	85.6	70.4	60.1	37.8	25.9	17.3
5	4	3/15	104.4	64.5				100	99.9	99.4	98.6	97.6	95.1	81.6	72.1	50.2	37.8	30.2
6	4	6/22	108.8	63.4					100	99.7	99.2	98.8	98.2	88.2	77.4	59.3	44.0	32.6
7	4	10/24	110.1	61.3					100	99.8	99.4	99.1	98.8	91.9	85.6	63.8	46.0	34.6
8	7	2/80	113.5	67.7				100	99.9	99.3	97.8	95.7	94.0	87.0	80.5	57.5	38.2	27.4
9	7	4/60	111.5	71.0				100	99.6	97.8	91.0	85.1	81.8	71.3	64.0	45.6	32.9	26.3
10	10	0/10	-	95.7		100	99.6	99.0	97.3	82.0	22.8	3.6	2.5					
11	10	0/85	114.1	89.2				100	99.8	98.7	96.5	93.4	90.0	79.9	65.5	41.2	28.6	25.4

* Sample 1 considered not representative and was not used.

STATISTICAL SUMMARY

Item	Quantity	Unit
Age	10.8	years
Watershed		
Contributing	463	sq. miles
Non-contributing	30	sq. miles
Reservoir a/		
Area at crest elevation:		
Original	116	acres
At date of survey	116	acres
Storage capacity at crest elevation:		
Original	777	ac.-ft.
At date of survey	436	ac.-ft.
Storage capacity per square mile of drainage area:		
Original	1.68	ac.-ft.
Present	0.94	ac.-ft.
Sedimentation		
Sediment deposited in reservoir	341	ac.-ft.
Total sediment yield to reservoir (Trap efficiency 80%)	426	ac.-ft.
Sediment yield per year	39.4	ac.-ft.
Sediment yield per year per 100 square miles of drainage area	8.52	ac.-ft.
Sediment yield per year per acre of drainage area:		
By volume	5.80	cu. ft.
By weight	0.19	tons
Depletion of storage		
Loss of original capacity per year	4.06	percent
Loss of original capacity to date of failure	43.89	percent

a/ Using crest elevation 117 feet and deducting the volume of earth fill placed over the face of the original dam.

SUMMARY

With the failure of Quinter Dam on June 28, 1948, the Sheridan County State Lake Reservoir was emptied, presenting an opportunity to make a sedimentation survey of the reservoir.

Based on the original reservoir area topographic map and on the resurvey of the reservoir area, it is concluded that in 10.8 years of operation, the reservoir storage capacity was reduced 341 acre-feet or 44 percent by sedimentation. The reservoir trap efficiency was estimated at 80 percent making the total 10.8-year sediment yield to the reservoir 426 acre-feet or 39.4 acre-feet per year, or 0.085 acre-feet per square mile of contributing drainage area per year.

The large annual rate of storage depletion in the reservoir was due largely to its small original storage capacity in relation to its large drainage area run-off.

These studies emphasize the necessity for providing sufficient additional storage space to provide adequately for the expected sediment production from drainage areas above proposed reservoirs and dams.

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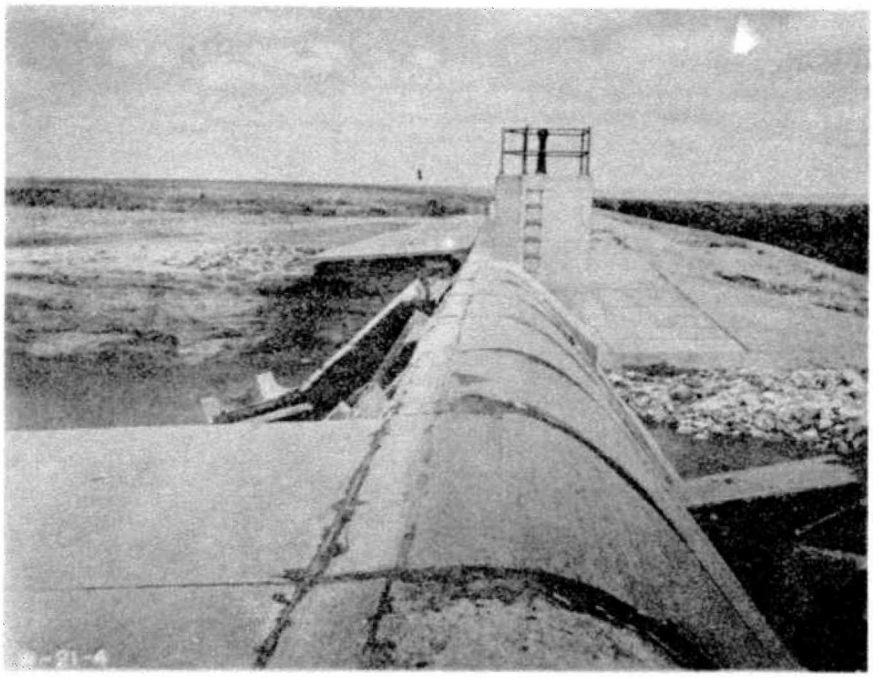
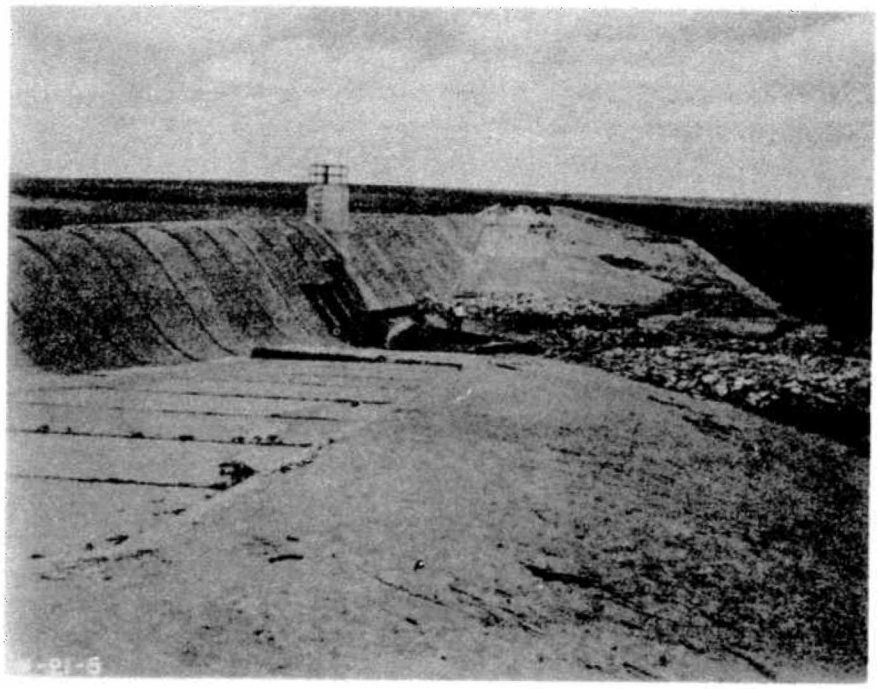
FIGURE 1

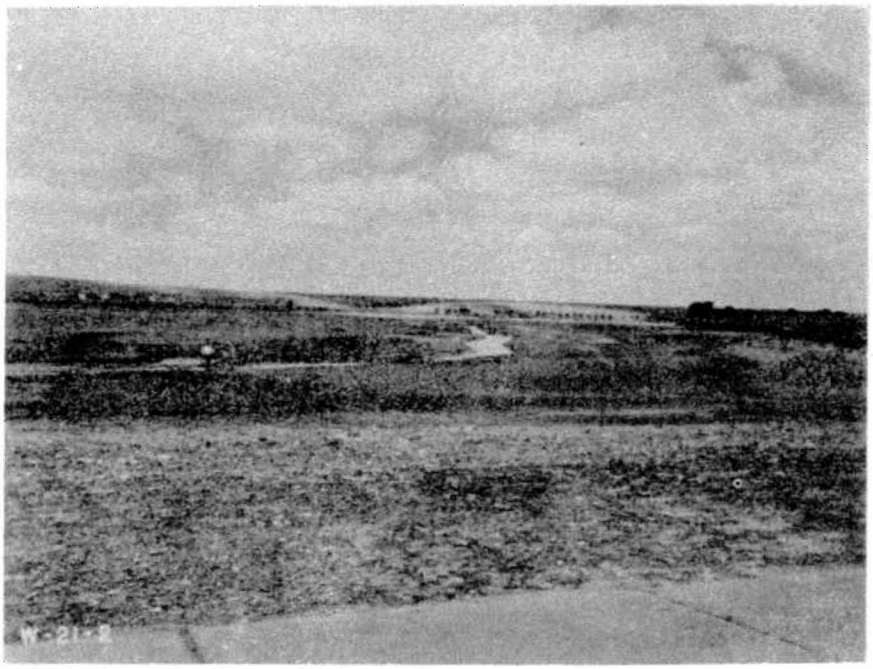


View showing break (1948) in Quinter Dam - upstream face of dam on left side.

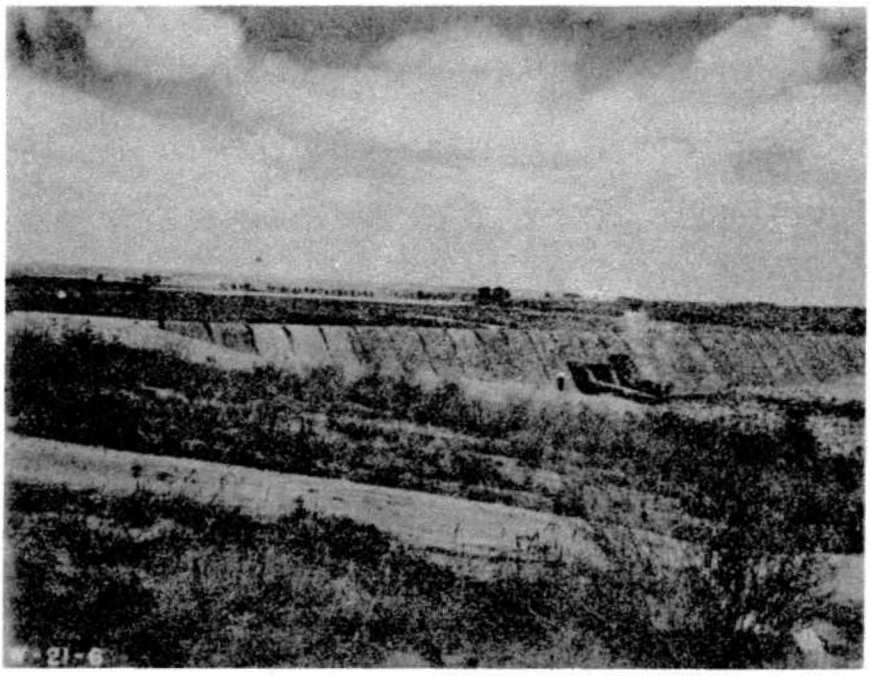


View of downstream face showing break of 1948 due to hydrostatic pressure.

FIGURE 2

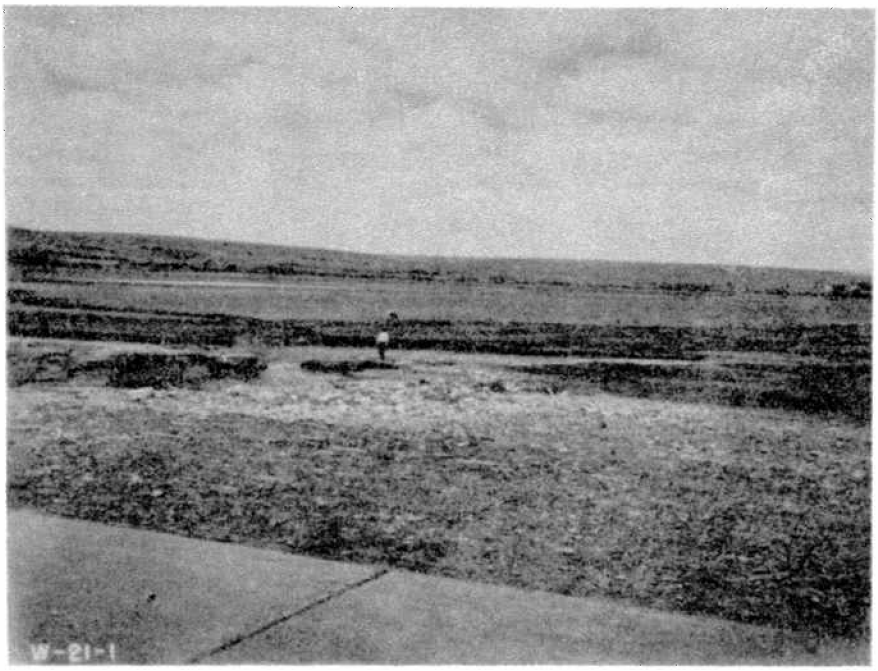


Looking upstream - showing sediment deposits in reservoir area above dam.



View showing break in Quinter Dam and sediment in reservoir area above dam.

FIGURE 3



View of sediment deposits in reservoir - looking upstream from dam towards right bank.

Looking upstream, note sediment deposits in reservoir.

Space intentionally left blank due to security concerns

FIGURE 5

Section 35, T10S, R.26 W

Match Line Sheet 2

N

115
110
105
100

R-4

R-1

105
110
115

115
110
105
100
105
110
120

℄ of Dam

WATER LINE EL. 118.0

SCALE 1" = 300'

R 26 W

KANSAS

SALINE R.

34 35 36

T 10 S

SHERIDAN CO.

GOVE CO.

LOCATION MAP

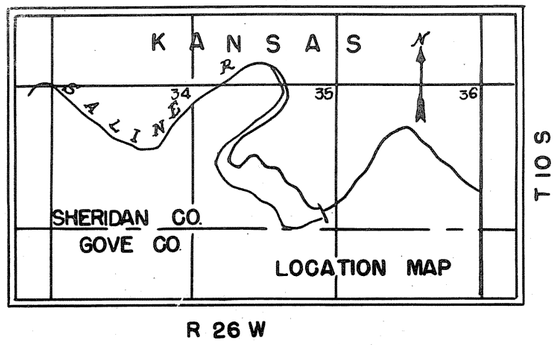
SHEET 1 OF 3 SHEETS

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION REGION 7
MISSOURI RIVER BASIN PROJECT
RESERVOIR TOPOGRAPHY
SHERIDAN CO STATE LAKE

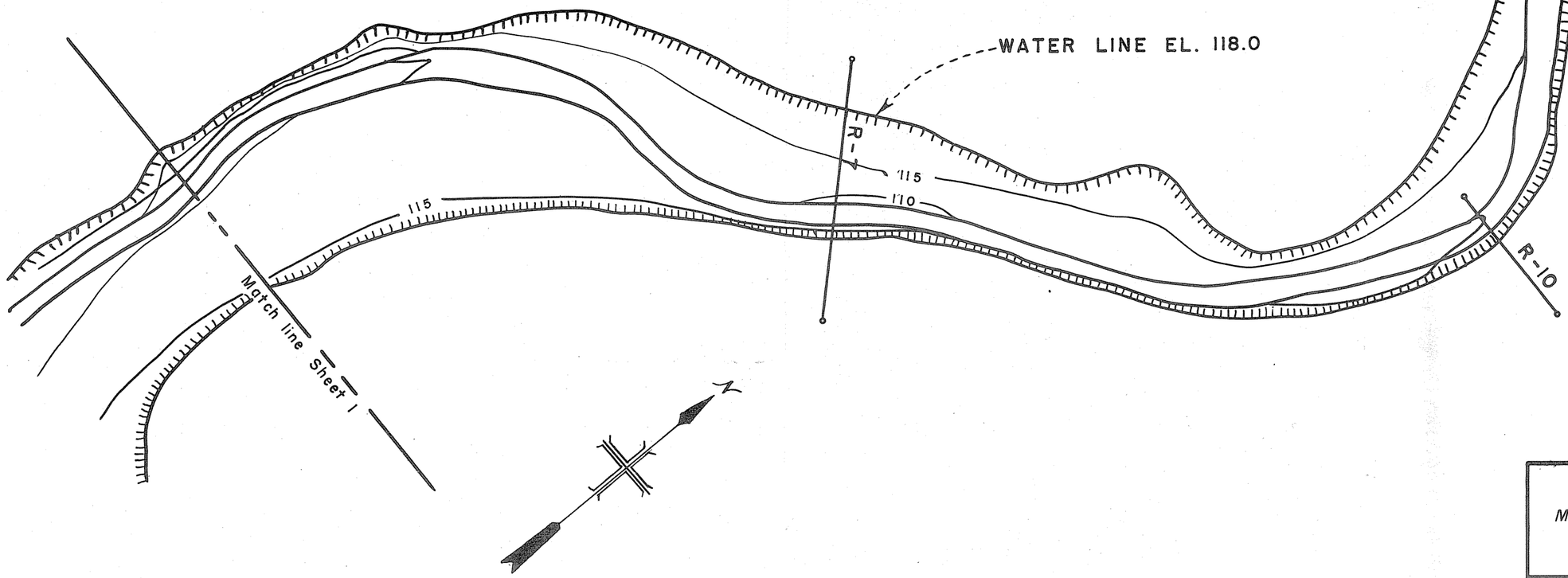
DRAWN C.T.J. SUBMITTED
TRACED RET RECOMMENDED
CHECKED HBS APPROVED

INDIANOLA, NEBR. MAR. 9, 1949

FIGURE 5



Section 35, T. 10 S., R. 26 W.



SCALE 1" = 300'

SHEET 2 OF 3 SHEETS

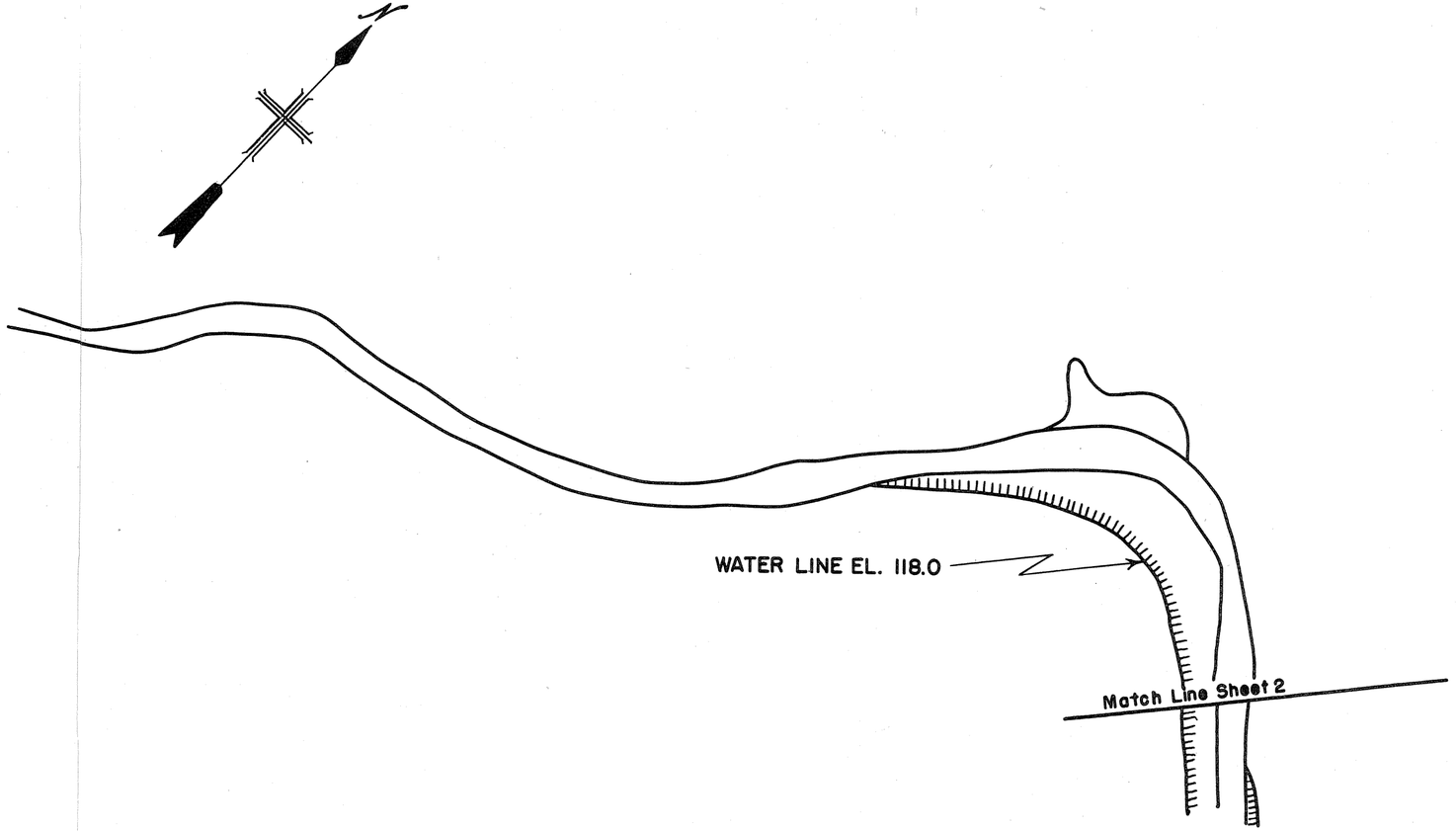
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - REGION 7
MISSOURI RIVER BASIN PROJECT
RESERVOIR TOPOGRAPHY
SHERIDAN CO. STATE LAKE

DRAWN CTJ. SUBMITTED J. A. Buchholz
TRACED RET RECOMMENDED J. W. Robinson
CHECKED HBS APPROVED H. P. Robinson

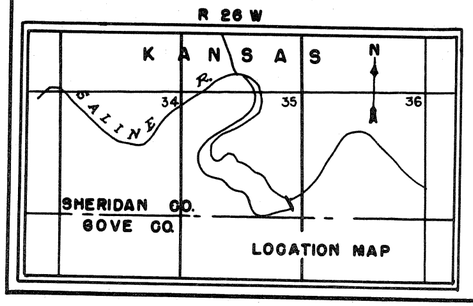
INDIANOLA, NEBR. MAR 9, 1949

FIGURE 5

Parts of Sections 26 & 35, T. 10 S., R. 26 W.



SCALE 1" = 300'



SHEET 3 OF 3 SHEETS

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION-REGION 7
MISSOURI RIVER BASIN PROJECT

RESERVOIR TOPOGRAPHY

SHERIDAN CO. STATE LAKE

DRAWN G.T.J. SUBMITTED J. A. Buckholz
TRACED R.E.T. RECOMMENDED [illegible]
CHECKED H.B.S. APPROVED H. C. Stevens

INDIANOLA, NEBR. MAR. 9, 1949

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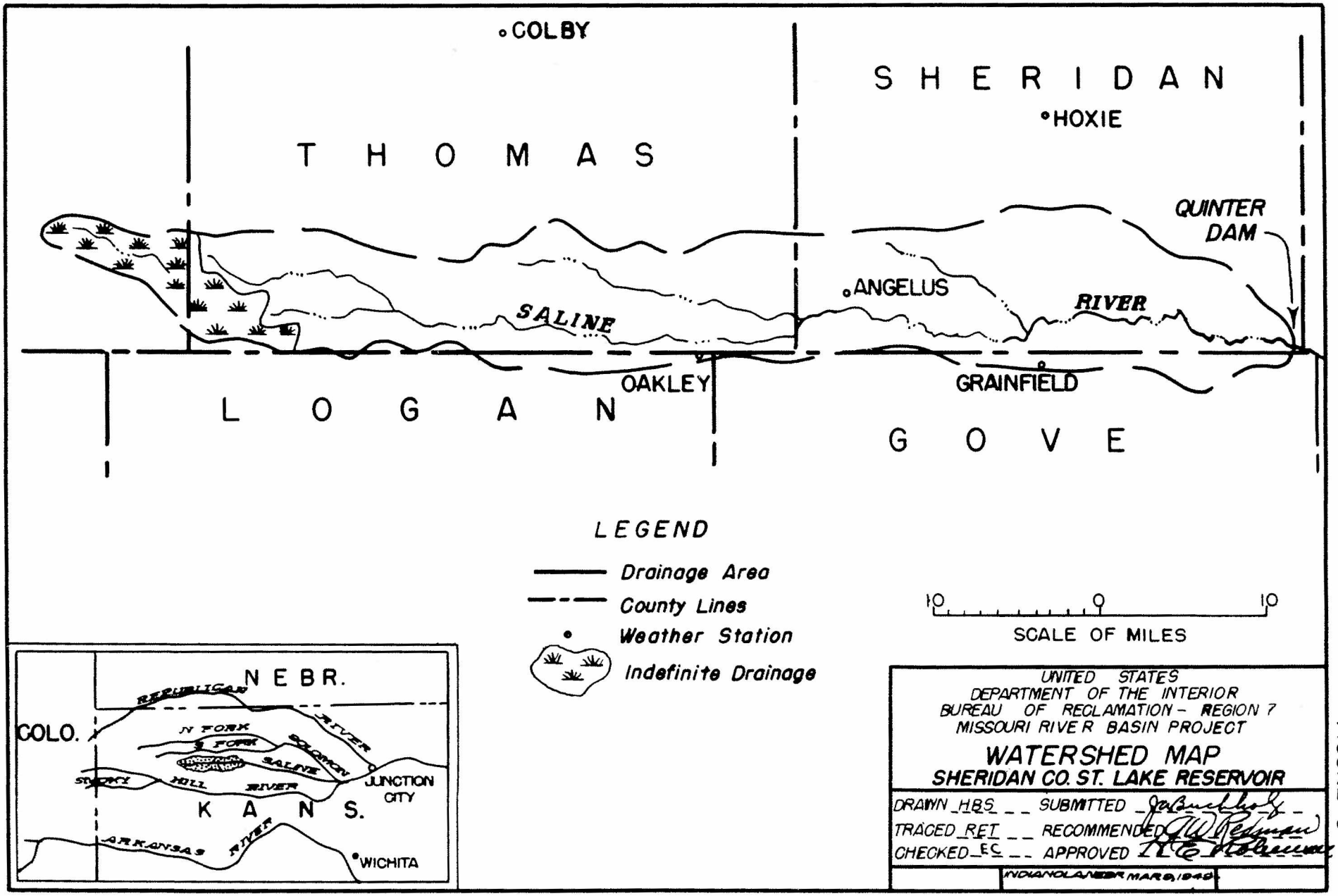
COLBY
SHERIDAN
HOXIE
THOMAS
QUINTER DAM
ANGELUS
SALINE
RIVER
OAKLEY
GRAINFIELD
LOGAN
GOVE
LEGEND
Drainage Area
County Lines
Weather Station
Indefinite Drainage
10 0 10
SCALE OF MILES
NEBR.
REPUBLICAN
RIVER
COLO.
N FORK
S FORK
SOLOMON
SALINE
SMOKY
HILL
RIVER
JUNCTION CITY
KANS.
ARKANSAS
RIVER
WICHITA
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - REGION 7
MISSOURI RIVER BASIN PROJECT
WATERSHED MAP
SHERIDAN CO. ST. LAKE RESERVOIR
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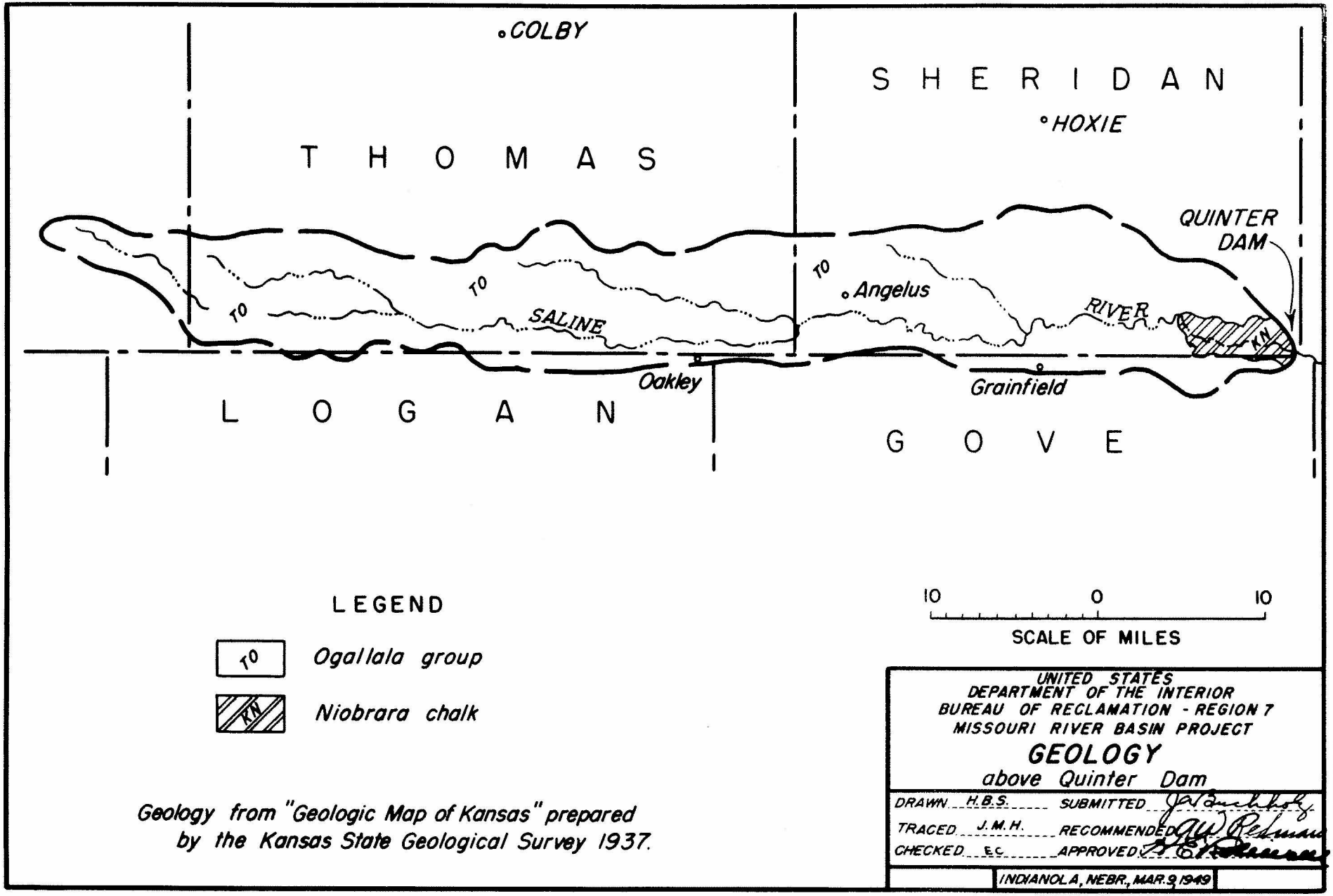
SUBMITTED
RECOMMENDED
APPROVED
INDIANOLA NEB. MAR 9 1948

FIGURE 6



Geology from "Geologic Map of Kansas" prepared by the Kansas State Geological Survey 1937.

FIGURE 7

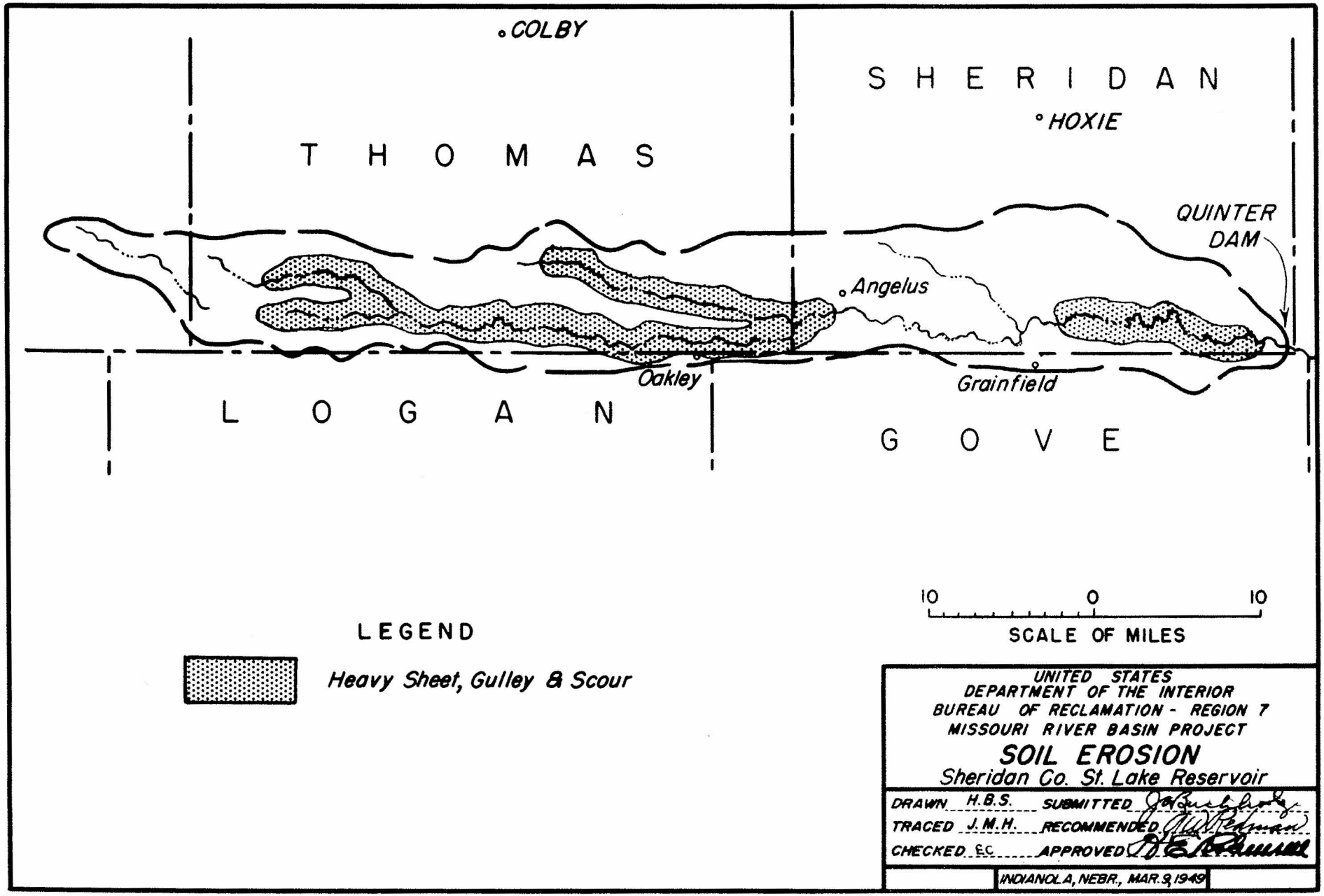
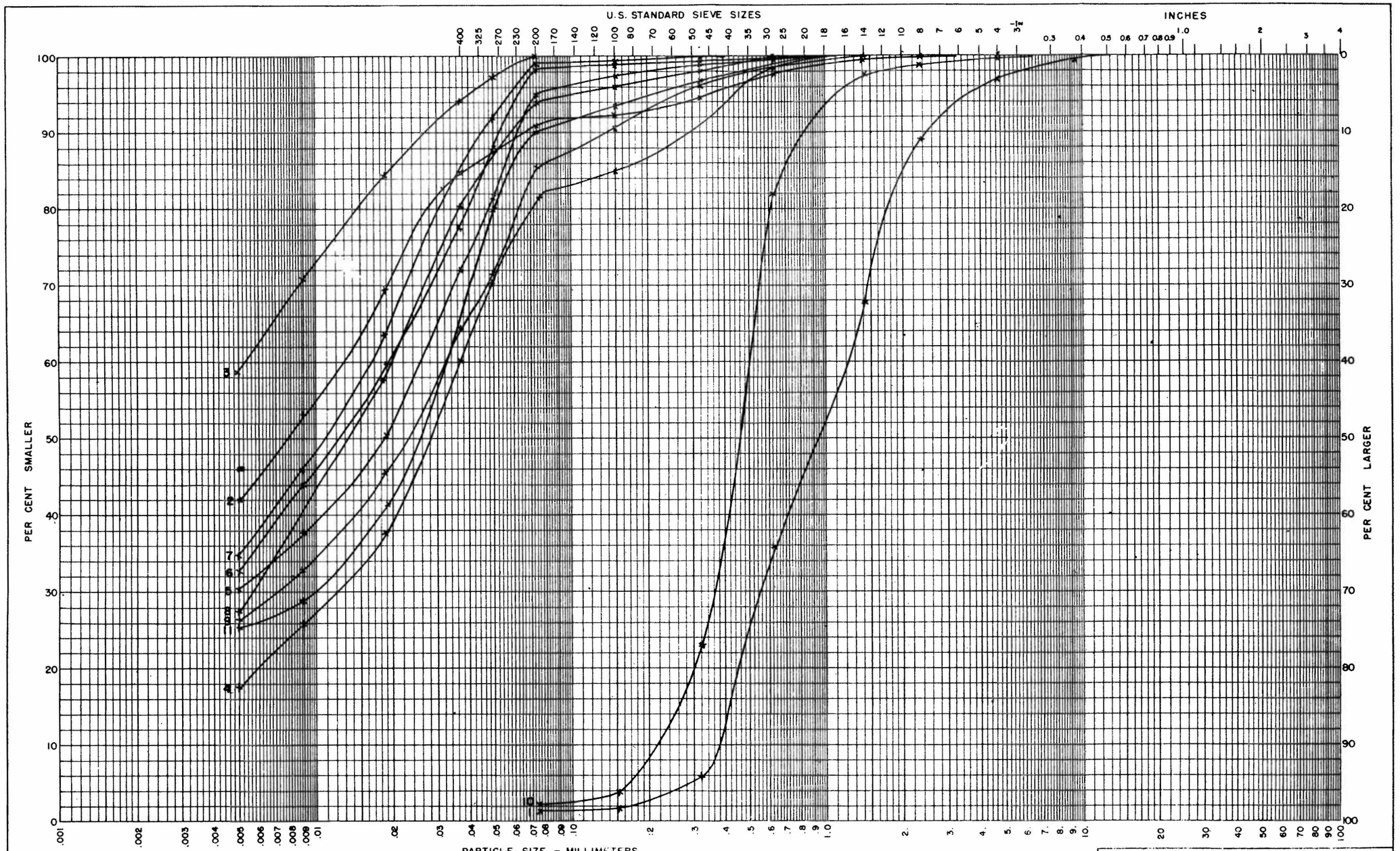

COLBY
SHERIDAN
HOXIE
THOMAS
QUINTER DAM
Angelus
Oakley
Grainfield
LOGAN
GOVE
10 0 10
SCALE OF MILES
LEGEND
Heavy Sheet, Gulley & Scour
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - REGION 7
MISSOURI RIVER BASIN PROJECT
SOIL EROSION
Sheridan Co. St. Lake Reservoir
DRAWN H.B.S.
TRACED J.M.H.
CHECKED E.C.
SUBMITTED
RECOMMENDED
APPROVED
INDIANOLA, NEBR., MAR. 9, 1949

FIGURE 8

FIGURE 9



CLAY			SILT				SAND					GRAVEL		
Fine	Medium	Coarse	Very Fine	Fine	Medium	Coarse	Very Fine	Fine	Medium	Coarse	Very Coarse	Very Fine	Fine	Med.

AMERICAN GEOPHYSICAL UNION (A.G.U.) CLASSIFICATION

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION

SEDIMENT SIZE ANALYSIS

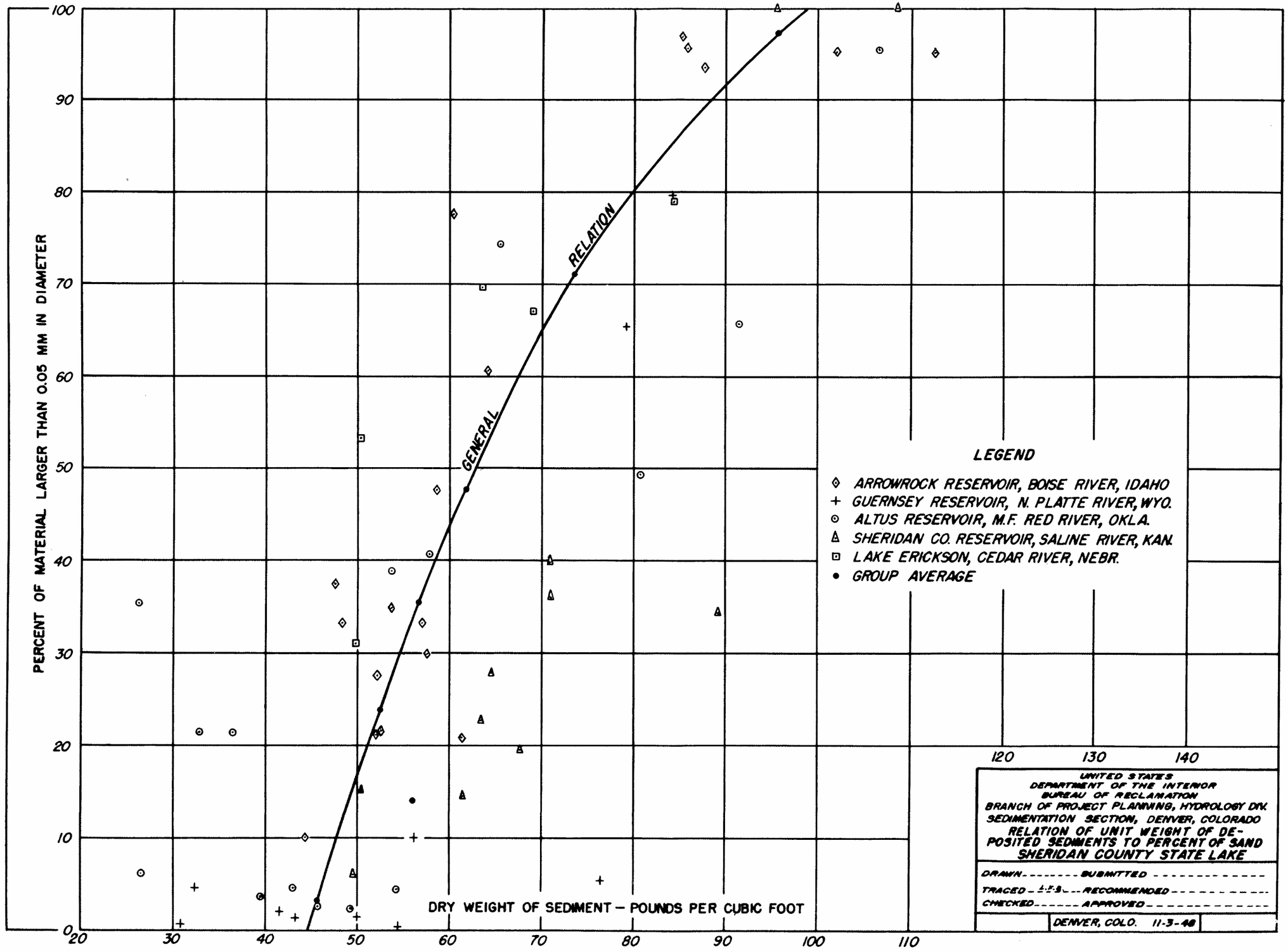
SHERIDAN CO. ST. LAKE RESERVOIR

DRAWN C.T.J.
TRACED J.M.H.
CHECKED H.B.S.

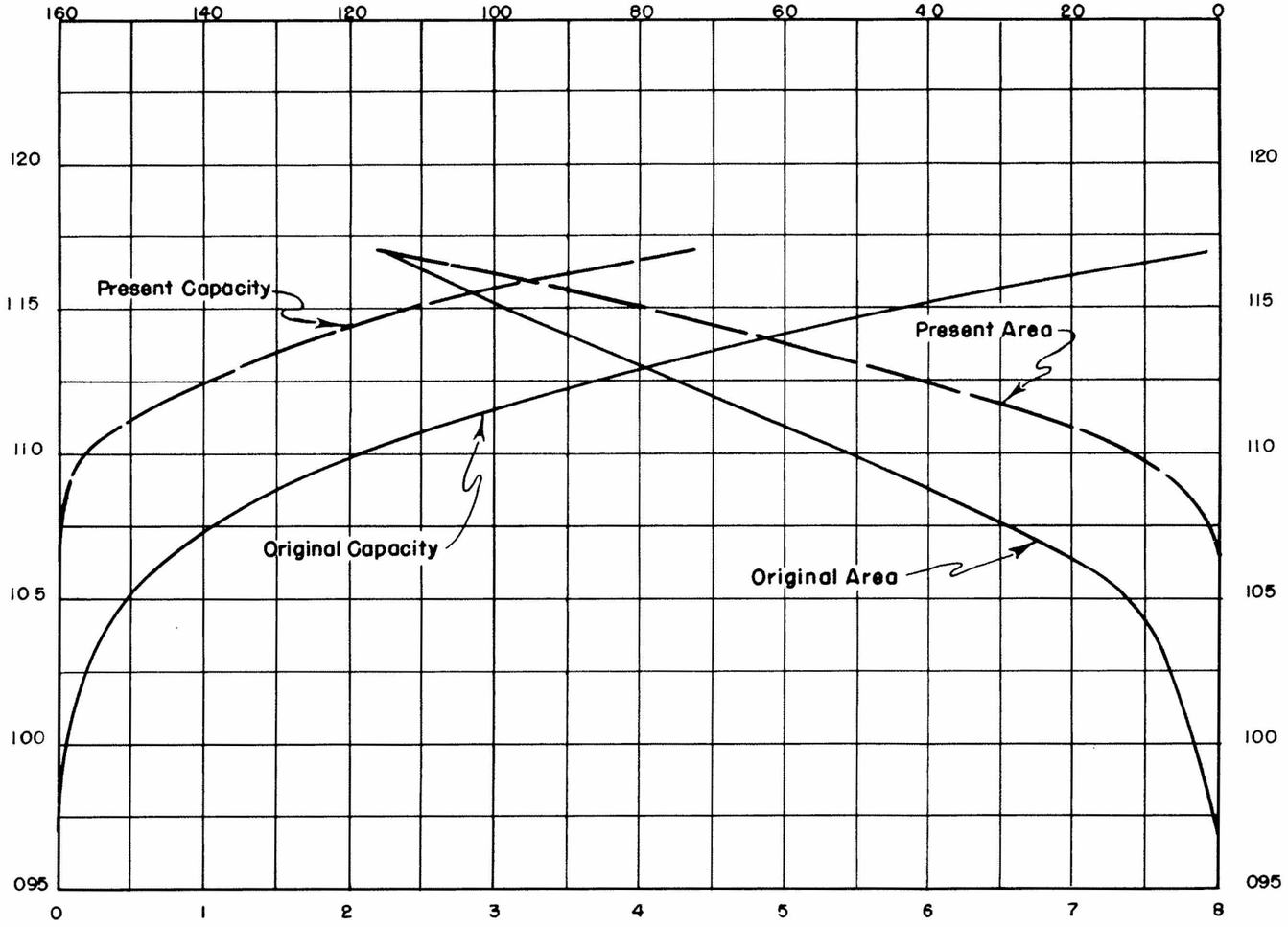
SUBMITTED
RECOMMENDED
APPROVED

DENVER, COLORADO MAR 2 1949

FIGURE 10


PERCENT OF MATERIAL LARGER THAN 0.05 MM IN DIAMETER
100
90
80
70
60
50
40
30
20
10
0
20
30
40
50
60
70
80
90
100
110
120
130
140
DRY WEIGHT OF SEDIMENT – POUNDS PER CUBIC FOOT
GENERAL RELATION
LEGEND
◊ ARROWROCK RESERVOIR, BOISE RIVER, IDAHO
+ GUERNSEY RESERVOIR, N. PLATTE RIVER, WYO.
⊙ ALTUS RESERVOIR, M.F. RED RIVER, OKLA.
△ SHERIDAN CO. RESERVOIR, SALINE RIVER, KAN.
⊡ LAKE ERICKSON, CEDAR RIVER, NEBR.
• GROUP AVERAGE
UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION
BRANCH OF PROJECT PLANNING, HYDROLOGY DIV.
SEDIMENTATION SECTION, DENVER, COLORADO
RELATION OF UNIT WEIGHT OF DEPOSITED SEDIMENTS TO PERCENT OF SAND
SHERIDAN COUNTY STATE LAKE
DRAWN – SUBMITTED –
TRACED – L.F.S. – RECOMMENDED –
CHECKED – APPROVED –
DENVER, COLO. 11-3-48

RESERVOIR AREA IN ACRES



RESERVOIR CAPACITY IN HUNDREDS OF ACRE-FEET

ELEV.	ORIGINAL SURVEY		JUNE 1948 SURVEY	
	AREA (ACRES)	CAPACITY A.F.	AREA (ACRES)	CAPACITY A.F.
097	0	0		
100	3.7	5.5		
105	13	46		
106.5			0	0
107			0.6	0.1
108			2.5	1.7
109			6	6.0
110	51	206	11	15
115	98	579	79	241
117	116	793	116	436
		777 a/		

a/ *Volume of earthfill, 16.25 acre-feet, placed over face of original Dam must be deducted from total capacity.*

NOTE

Data from a topographic map drawn from the original planetable sheet.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF RECLAMATION - REGION 7
MISSOURI RIVER BASIN PROJECT
AREA - CAPACITY CURVES
SHERIDAN CO. ST. LAKE RESERVOIR

DRAWN H.B.S. SUBMITTED J.A. Buchholz
TRACED R.E.T. RECOMMENDED G.W. Pedersen
CHECKED E.C. APPROVED A.B. Rebuffoni

INDIANOLA, NEBR. 11-23-49