THE SILT LOAD OF TEXAS STREAMS--PART VII
(A progress report as of October 1, 1944, to September 30, 1945)

Prepared cooperatively by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

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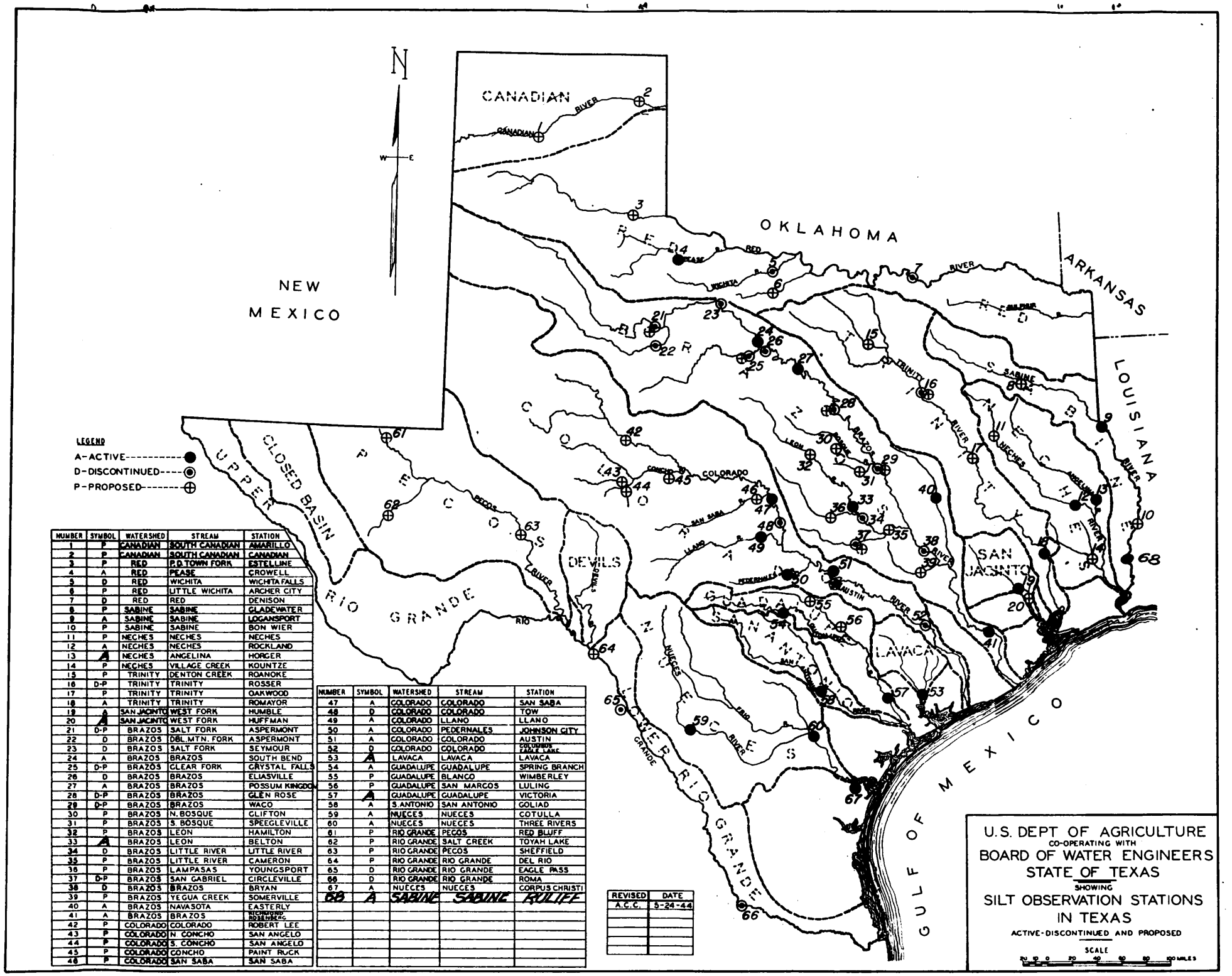
Austin, Texas September, 1946



LEGEND

A-ACTIVE----------●

D-DISCONTINUED----◉

P-PROPOSED-------⊕

NUMBER	SYMBOL	WATERSHED	STREAM	STATION
1	P	CANADIAN	SOUTH CANADIAN	AMARILLO
2	P	CANADIAN	SOUTH CANADIAN	CANADIAN
3	P	RED	P.D. TOWN FORK	ESTELLINE
4	A	RED	PEASE	CROWELL
5	D	RED	WICHITA	WICHITA FALLS
6	P	RED	LITTLE WICHITA	ARCHER CITY
7	D	RED	RED	DENISON
8	P	SABINE	SABINE	GLADEWATER
9	A	SABINE	SABINE	LOGANSPORT
10	P	SABINE	SABINE	BON WIER
11	P	NECHES	NECHES	NECHES
12	A	NECHES	NECHES	ROCKLAND
13	A	NECHES	ANGELINA	HORGER
14	P	NECHES	VILLAGE CREEK	KOUNTZE
15	P	TRINITY	DENTON CREEK	ROANOKE
16	D-P	TRINITY	TRINITY	ROSSER
17	P	TRINITY	TRINITY	OAKWOOD
18	A	TRINITY	TRINITY	ROMAYOR
19	A	SAN JACINTO	WEST FORK	HUMBLE
20	A	SAN JACINTO	WEST FORK	HUFFMAN
21	D-P	BRAZOS	SALT FORK	ASPERMONT
22	D	BRAZOS	DBL. MTN. FORK	ASPERMONT
23	D	BRAZOS	SALT FORK	SEYMOUR
24	A	BRAZOS	BRAZOS	SOUTH BEND
25	D-P	BRAZOS	CLEAR FORK	CRYSTAL FALLS
26	D	BRAZOS	BRAZOS	ELIASVILLE
27	A	BRAZOS	BRAZOS	POSSUM KINGDOM
28	D-P	BRAZOS	BRAZOS	GLEN ROSE
29	D-P	BRAZOS	BRAZOS	WACO
30	P	BRAZOS	N. BOSQUE	CLIFTON
31	P	BRAZOS	S. BOSQUE	SPEEGLEVILLE
32	P	BRAZOS	LEON	HAMILTON
33	A	BRAZOS	LEON	BELTON
34	D	BRAZOS	LITTLE RIVER	LITTLE RIVER
35	P	BRAZOS	LITTLE RIVER	CAMERON
36	P	BRAZOS	LAMPASAS	YOUNGSPORT
37	D-P	BRAZOS	SAN GABRIEL	CIRCLEVILLE
38	D	BRAZOS	BRAZOS	BRYAN
39	P	BRAZOS	YEGUA CREEK	SOMERVILLE
40	A	BRAZOS	NAVASOTA	EASTERLY
41	A	BRAZOS	BRAZOS	FREEPORT ROSENBERG
42	P	COLORADO	COLORADO	ROBERT LEE
43	P	COLORADO	N. CONCHO	SAN ANGELO
44	P	COLORADO	S. CONCHO	SAN ANGELO
45	P	COLORADO	CONCHO	PAINT ROCK
46	P	COLORADO	SAN SABA	SAN SABA

NUMBER	SYMBOL	WATERSHED	STREAM	STATION
47	A	COLORADO	COLORADO	SAN SABA
48	D	COLORADO	COLORADO	TOW
49	A	COLORADO	LLANO	LLANO
50	A	COLORADO	PEDERNALES	JOHNSON CITY
51	A	COLORADO	COLORADO	AUSTIN
52	D	COLORADO	COLORADO	COLUMBUS LAKE
53	A	LAVACA	LAVACA	LAVACA
54	A	GUADALUPE	GUADALUPE	SPRING BRANCH
55	P	GUADALUPE	BLANCO	WIMBERLEY
56	P	GUADALUPE	SAN MARCOS	LULING
57	A	GUADALUPE	GUADALUPE	VICTORIA
58	A	S. ANTONIO	SAN ANTONIO	GOLIAD
59	A	NUECES	NUECES	COTULLA
60	A	NUECES	NUECES	THREE RIVERS
61	P	RIO GRANDE	PECOS	RED BLUFF
62	P	RIO GRANDE	SALT CREEK	TOYAH LAKE
63	P	RIO GRANDE	PECOS	SHEFFIELD
64	P	RIO GRANDE	RIO GRANDE	DEL RIO
65	D	RIO GRANDE	RIO GRANDE	EAGLE PASS
66	D	RIO GRANDE	RIO GRANDE	ROMA
67	A	NUECES	NUECES	CORPUS CHRISTI
68	A	SABINE	SABINE	BULLIFE

REVISED	DATE
A.C.C.	5-24-44

U.S. DEPT OF AGRICULTURE
CO-OPERATING WITH
BOARD OF WATER ENGINEERS
STATE OF TEXAS

SHOWING

SILT OBSERVATION STATIONS IN TEXAS

ACTIVE-DISCONTINUED AND PROPOSED

SCALE

50 25 0 25 50 75 100 MILES

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(Continued next page)

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(continued)

THE SILT LOAD OF TEXAS STREAMS
(Progress report as of September 30, 1945)

By Dean W. Bloodgood, Associate Irrigation Engineer, Division of Irrigation, Soil Conservation Service, 1/ A. A. Meador, Testing Engineer, and A. C. Cook, Assistant Office Engineer, Board of Water Engineers.

INTRODUCTION

In the greater part of Texas the precipitation varies widely throughout the year and also from year to year. At times long droughts occur, especially in the western part of the state, and at other times the precipitation is excessive. As a result of this erratic precipitation, wide fluctuations occur in the natural flow of the streams, sometimes varying in the course of a few days from only a small flow or even none at all to heavy floods.

It is planned to established many reservoirs on the streams of Texas for the regulation and conservation of their waters so that these resources may be developed to their fullest usefulness. Many storages have already been built, such as the Buchanan, Marshall Ford, Possum Kingdom, Red Bluff and Denison reservoirs. Nevertheless, many additional larger reservoirs, as well as small storages on tributaries, must be created before the water resources of the state become completely available for domestic, livestock, municipal, irrigation, power and other uses, and before the prevention of floods in lower stream channels can be accomplished.

Many Texas streams carry large quantities of silt resulting from erosion on their watershed, especially at times of heavy precipitation. When a reservoir is established on such a silt-carrying stream, much of the transported material is deposited and the storage capacity of the reservoir is reduced accordingly. Hence, when each new reservoir is built, it is necessary to estimate the rate at which it will be filled with silt in order that its economic feasibility may be determined. To obtain accurate information both as to the amounts of silt carried in Texas streams and the manner and conditions of its deposition in reservoirs, a cooperative silt investigation was begun in June 1924. This investigation has been carried on continously to the present time.

The principal purpose of this cooperative investigation is to obtain the facts regarding the amount of silt carried by Texas streams from which the length of life of any proposed reservoir may be estimated. Accumulated results show definitely that, as affected by silt deposition, the life of any large reservoir built on major Texas streams will be far in excess of that necessary to satisfy the financial and economic consideration involved.

1/ Under the supervision of W. W. McLaughlin, Chief of Division of Irrigation, Soil Conservation Service, U. S. Department of Agriculture.

It is also a matter of great importance to Texas cities and towns that will have to, more and more, resort to the streams for increased water supplies, to know the amount of silt being carried by such streams throughout the year. Determing the desirability of the supply and the economic handling and treating such supply depends upon a knowledge of the silt load of the stream. This is also true of the various industries seeking location in Texas. For many large industries, the quality of the water supply is of major importance, and consideration cannot be given to the location of such an industry along a stream unless the quality of water has been determined.

Silt Investigations - Method and Procedure

Sampling equipment:-- An eight-ounce sample is accepted as being both convenient and sufficient in volume for all tests. Narrow mouthed bottles are found to be more convenient for use in the laboratory.

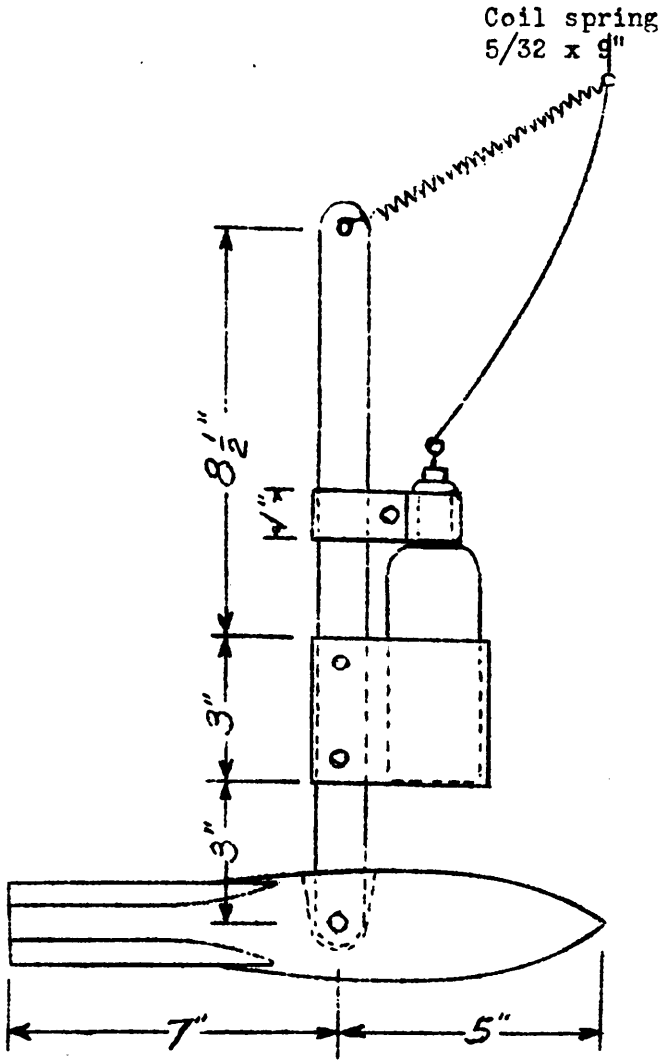

Fig. 1--Sampling apparatus used in Texas

The apparatus adopted for handling bottles in the process of taking samples, shown in Figure 1, consists of a one-eighth by three-quarter by fifteen inch hanger to which a sheet metal bottle container, 2⅜ inches in diameter, is fastened in such a way that the top of the neck of a round eight-ounce bottle is 0.8 foot above the lower extremity when attached to an old style 15-pound current meter weight. Above the container is a sliding clamp with a loop slightly larger in diameter than the lip on the neck of the bottle. In order to prevent the stopper from being removed prematurely by tension produced in the stopper line by the current, a 5/32 by 9 inch coil spring is attached to the top of the hanger and to the stopper wire in such a manner that the spring takes the tension. A No. 8 sash cord is used as a hand line for lowering and raising the apparatus, and a 3/32 inch cotton chalk line is used to remove the stopper. In order to hold the stopper line away from the apparatus and prevent entanglement with the hoisting line, a piece of stiff baling wire 17⅞ inches long is used as a connection between the rubber stopper and the line.

For sampling flood waters with high velocities, a special hanger made of steel, one-eighth inch thick, one-inch wide, and 16-1/4 inches long, with the vertical bottle container, using a 100 pound weight, was provided. The hoisting line used with this equipment was a 3/16 inch diameter airplane strand cable, and a hand winch with a 4-inch drum attached to an A-frame. 1/

Method of sampling -- A study of many samples taken at various depths throughout a cross-section and at different gage heights showed that a sample from six-tenths the depth gave the mean percentage of silt in the vertical within limits of permissible error. It was further disclosed that the mean percentage of silt by weight in verticals as abscissas and the distances from the edge of the water surface in a cross-section as ordinates showed that the weighted mean of the results obtained from the 6/10 depths at three points in the cross-section, viz., 1/6, 1/2, and 5/6 of the width, gave mean percentages for the cross-section.

Bed load -- That portion of the silt load which is rolled along the bed of the stream by the velocity of the water is not included in this report for the reason that no practicable means have yet been devised for securing reliable measurement.

Samples are taken daily at designated intervals in the cross-section and each sample is immediately labeled for indentification, as shown in Figure 2.

_____

Stream_____ At_____

Date_____ Sampler_____

Station_____ Depth_____

Gage Height_____ Color_____

Time_____

_____

Figure 2 - Bottle label.

Laboratory method -- (a) Fold Whatman No. 2 filter papers, 24 cm in diameter, three times; dry in oven at 110° C for 1½ hours, cool in a dessicator for one-half hour, and weigh on analytical balance to nearest .005 gram. (b) Weight eight ounce silt laden water samples on torsion balance to nearest one-tenth gram. (c) Place one of the above oven dried filter papers in a No. 16 ribbed glass funnel, and into this pour an eight-ounce sample whose weight has been recorded. (d) Air dry the filter paper containing the silt and then transfer to oven where procedure is same as outlined in (a).

Then from the above data - oven dry weight of silt divided by wet weight of 8-ounce sample and multiplied by one hundred, gives the percentage of dry silt by weight.

If the sample be taken at the surface of the stream (within the top 10 inches of flow) the per cent of silt by weight is multiplied by the factor 1.102 to secure the percentage that should be used for the six-tenths depth.

1/ The sampling of flood waters in regular field work has been confined to surface flow (top 8 inches) and as a result the 100 pound weight, etc. have not been required.

The daily average per cent of silt is accepted as - (1) that shown by a single sample when only one sample is received (2) that shown as an average when two samples are received (3) that shown as a weighted average when three samples are received; namely, add together the percentages for the one-sixth and five-sixth intervals, and to this sum add twice the percentage shown at midstream. Divide this total by four to secure weighted average.

Silt data subsequent to December 31, 1930, have been computed in accordance with the procedure used prior to that date and published by the United States Department of Agriculture, Bureau of Agricultural Engineering, as Technical Bulletin No. 382, "The Silt Load of Texas Streams" by the late C. A. Faris.

Since one cubic foot of run-off (water) is assumed to weigh 62.5 pounds, and one cubic foot of silt deposit in reservoirs is assumed to weigh 70 pounds, it follows that:

One ac. ft. of runoff = 1361.25 tons
One ac. ft. of silt = 1524.60 tons

$$\frac{\text{Tons of silt}}{1524.60} = \text{Tons of silt} \times .00065590975 = \text{ac. ft. of silt.}$$

$$\frac{\text{Tons of silt} \times 100}{\text{Ac. ft. of run-off} \times 1361.25} = \frac{\text{Tons of silt}}{\text{Ac. ft. of runoff}} \times .073462$$

= per cent of dry silt by weight.

The average weight of the dry material inssilt deposits which are continously submerged approaches 30 pounds per cubic foot. In those deposits which are occasionally exposed, the average dry weight approaches 70 pounds per cubic foot. In deposits where reservoirs are used exclusively for flood control, the average weight ultimately approaches 90 pounds per cubic foot. After a careful consideration of the volume-weight ratios of silt samples in different degrees of consolidation together with the fact that an indeterminable volume of vegetable matter in the form of logs and brush deposited in reservoirs become water-logged and lasts indefinitely, seventy (70) pounds was selected as the average ultimate weight of the dry material per cubic foot of deposit in reservoirs where the deposits are subjected to alternate wetting and drying.

In order to compute the silt load in acre-feet, the silt sampling station must be located where a stream flow measuring station is maintained.

The discharge records for Inks Dam were furnished by the Lower Colorado River Authority; and that at Possum Kingdom Dam, by the Brazos River Conservation and Reclamation District. The discharge records for all other stations set up in this report were supplied by the Water Resources Branch of the United States Geological Survey.

The following organizations have assisted in the collection of water samples and other associated work:

Water Resources Branch of the United States Geological Survey, Austin, Texas; the Brazos River Conservation and Reclamation District, Mineral Wells, Texas; Lower Colorado River Authority, Austin, Texas; City of Houston, Houston, Texas; and City of Corpus Christi, Corpus Christi, Texas.

The following new stations were established on September 1, 1945: Belton Station on Leon River, Harger Station on Angelina, Edna Station on Lavaca River, Victoria Station on Guadalupe River, Ruliff Station on Sabine River, and Huffman Station on the San Jacinto River. A total of 25 silt stations are in actual operation as of September 30, 1945.

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
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Soil Conservation Service
Division of Irrigation

Stream: LEON
Station: BELTON (Samples taken from inlet to pumping plant at Belton - located about $\frac{1}{4}$ mile upstream from bridge on U.S. Highway No. 81).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
Total to Sept. 30, 1945	10,380 1/	26,320 1/	17 1/	.186

For period of 0.083 years. (1 month)

Average discharge in acre-feet per year	10,380
Average acre-feet of silt per year	17
Average acre-feet of silt per year per square mile of contributing watershed	.005
Average tons of silt per year	26,320
Average per cent of silt by weight	.186
Drainage area in square miles (net)	3,547

1/ One month.

Note: Station was established September 1, 1945.

SILT RECORD

Belton on Leon River, 1944-45 [1]

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
(1945) September	10,380	26,320	17	.186
Totals	10,380	26,320	17	

U. S. G. S. yearly discharge in acre-feet	10,380 [1]
Total silt for year in acre-feet	17 [1]
Acre-feet of silt per year per sq. mile of contributing watershed	.005
Average percent of silt by weight for year	.186 [1]
Drainage area in square miles (net)	3,547

1/ Station established September 1, 1945.

SILT RECORD
(As of Sept. 30, 1945)

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Stream: NAVASOTA
Station: EASTERLY (Samples were taken from bridge on U. S. Highway No. 79).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	199,800	142,600	94	.052
1942-43	84,820	59,600	39	.052
1943-44	592,700	889,340	584	.110
1944-45	556,100	607,980	400	
TOTALS	1,433,420	1,699,520	1,117	

For period of 3.748 years.

Average discharge in acre-feet per year	382,449
Average acre-feet of silt per year	298
Average acre-feet of silt per year per square mile of contributing watershed	.314
Average tons of silt per year	453,447
Average percent of silt by weight	.087
Drainage area in square miles (net)	949

1/ Station was established January 1, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Easterly, Navasota River (Brazos River Watershed)
1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944) October	98	60	0	.045
November	19,220	26,990	18	.103
December	54,710	50,020	33	.067
(1945) January	80,080	72,770	48	.067
February	39,140	36,160	24	.068
March	116,500	147,190	97	.093
April	149,400	165,480	108	.081
May	12,280	18,400	12	.110
June	15,960	20,270	13	.093
July	11,600	17,560	12	.111
August	30,840	27,580	18	.066
September	26,290	25,500	17	.071
Totals	556,100	607,980	400	

U. S. G. S. yearly discharge in acre-feet	556,100
Total silt for year in acre-feet	400
Acre-feet of silt per year per sq. mile of contributing watershed	.421
Average percent of silt by weight for year	.080
Drainage area in square miles (net)	949

SILT RECORD
(As of Sept. 30, 1945)

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Stream: BRAZOS
Station: SOUTH BEND (Samples were taken from bridge on State Highway No. 67).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	672,200	4,581,930	3,005	.501
1942-43	491,100	3,846,100	2,523	.575
1943-44	171,400	1,071,620	703	.459
1944-45	394,500	2,258,250	1,482	.421
TOTALS	1,729,200	11,757,900	7,713	

For period of 3.710 years.

Average discharge in acre-feet per year----------	466,092
Average acre-feet of silt per year----------	2,079
Average acre-feet of silt per year per square mile of contributing watershed----------	.168
Average tons of silt per year----------	3,169,245
Average per cent of silt by weight----------	.500
Drainage area in square miles (net)----------	12,360

1/ Station was established January 15, 1942.

Note: A water year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Brazos River near South Bend, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	51,260	320,350	225	.460
November	4,860	3,990	3	.060
December	7,870	31,735	21	.296
(1945)				
January	4,560	4,400	3	.071
February	3,720	3,885	3	.077
March	66,650	322,850	212	.356
April	63,410	238,300	156	.276
May	13,150	15,200	10	.085
June	48,960	372,985	245	.560
July	118,700	855,155	561	.529
August	7,660	7,960	5	.076
September	3,660	48,955	32	.983
Totals	394,500	2,225,765	1,476	.414

U. S. G. S. yearly discharge in acre-feet --------	394,500
Total silt for year in acre-feet----------	1,476
Acre-feet of silt per year per sq. mile of contributing watershed----------	.119
Average percent of silt by weight for year--------	.414
Drainage area in square miles (net)----------	12,360

SILT RECORD
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Stream: BRAZOS
Station: POSSUM KINGDOM DAM (Samples were taken in tailrace and over spillway).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-foot	
1941-42 1/	588,000	55,070	36	.007
1942-43	851,300	625,770	410	.054
1943-44	92,040	15,590	10	.012
1944-45	307,410	51,350	32	.012
TOTALS	1,838,750	747,780	488	

For period of 3.710 years.

Average discharge in acre-feet per year	495,620
Average acre-foot of silt per year	132
Average acre-feet of silt per year per square mile of contributing watershed	.010
Average tons of silt per year	201,558
Average percent of silt by weight	.030
Drainage area in square miles (net)	13,310

1/ Station was established Jan. 15, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Possum Kingdom Dam, Brazos River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	19,040	6,640	4	.026
November	18,200	5,330	3	.022
December	21,870	2,780	2	.009
(1945)				
January	21,410	1,570	1	.005
February	21,400	1,680	1	.006
March	24,370	1,650	1	.005
April	19,740	1,630	1	.006
May	27,420	2,190	1	.006
June	38,130	3,400	2	.007
July	40,130	4,820	3	.009
August	38,930	14,200	9	.027
September	16,770	5,460	4	.024
Totals	307,410	51,350	32	

U. S. G. S. yearly discharge in acre-feet----------	307,410
Total silt for year in acre-feet----------	51,350
Acre-feet of silt per year per sq. mile of contributing watershed----------	.002
Average percent of silt by weight for year---------	.012
Drainage area in square miles (net)----------	13,310

SILT RECORD
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Stream: BRAZOS
Station: ROSENBERG-RICHMOND (Samples obtained from bridge on U. S. Highway No. 90).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1923-24 1/	494,900	714,220	468	.106
1924-25	1,237,300	12,676,710	8,314	.753
1925-26	8,762,800	44,939,350	29,476	.377
1926-27	5,562,600	34,377,320	21,739	.454
1927-28	3,318,400	28,163,890	18,472	.623
1928-29	6,000,000	32,284,200	21,174	.395
1929-30	5,218,900	38,686,330	25,373	.545
1930-31	5,640,000	27,766,660	18,212	.362
1931-32 2-3/	8,040,000	63,649,510	41,749	.582
1932-33	2,560,000	15,175,520	9,954	.435
1933-34	3,370,000	23,318,780	15,294	.508
1934-35	7,334,000	63,472,990	41,633	.636
1935-36	6,032,000	40,330,500	26,453	.491
1936-37	5,406,000	25,531,710	16,747	.347
1937-38	7,204,000	55,656,280	36,544	.568
1938-39	1,966,000	14,742,470	9,668	.551
1939-40	3,161,000	23,679,220	15,531	.550
1940-41	16,120,000	97,306,510	63,824	.443
1941-42	8,523,000	71,490,110	46,891	.616
1942-43	3,255,000	11,426,360	7,496	.258
1943-44	7,627,000	46,735,630	30,654	.450
1944-45	9,805,000	57,254,020	37,555	.429
TOTALS	126,637,900	829,378,290	543,221	

For period of 21.306 years.

Average discharge in acre-feet per year	5,943,767
Average acre-feet of silt per year	25,496
Average acre-feet of silt per year per square mile of contributing watershed	.732
Average tons of silt per year	38,926,982
Average percent of silt by weight	.481
Drainage area in square miles (not)	34,810

1/ Station was established at Rosenberg, June 11, 1924.
2/ Station was discontinued at Rosenberg, April 12, 1932.
3/ Station was established at Richmond, April 13, 1932.
Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Richmond Station on Brazos River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	83,530	45,110	30	.040
November	335,800	1,008,120	661	.221
December	791,400	3,960,280	2,598	.368
(1945)				
January	1,327,000	7,462,450	4,895	.413
February	927,500	5,864,920	3,847	.465
March	1,285,000	6,698,590	4,394	.383
April	2,493,000	23,036,040	15,110	.679
May	757,800	1,985,570	1,302	.192
June	561,600	2,709,310	1,777	.354
July	433,900	1,707,350	1,120	.289
August	445,600	2,085,000	1,368	.344
September	362,600	691,290	453	.140
Totals	9,805,000	57,254,020	37,555	

U. S. G. S. yearly discharge in acre-feet----------	9,805,000
Total silt for year in acre-feet----------	37,555
Acre-feet of silt per year per sq. mile of contributing watershed----------	1.079
Average percent of silt by weight for year----------	.429
Drainage area in square miles (net)----------	34,810

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: LLANO
Station: LLANO (Samples were taken at U. S. gaging station ½ mile downstream from bridge on State Highway No. 16).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	66,000	252,700	166	.281
1942-43	235,500	381,560	250	.119
1943-44	196,100	120,450	79	.045
1944-45	156,900	90,120	60	
TOTALS	654,500	844,830	555	

For period of 3.167 years.

Average discharge in acre-feet per year	206,662
Average acre-feet of silt per year	175
Average acre-feet of silt per year per square mile of contributing watershed	.044
Average tons of silt per year	266,760
Average percent of silt by weight	.095
Drainage area in square miles (net)	4,000

1/ Station was established August 1, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Llano Station, Llano River (Brazos River Watershed)
1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	9,120	5,370	4	.043
November	7,400	2,060	1	.020
December	11,710	3,180	2	.020
(1945)				
January	28,080	16,100	11	.042
February	28,110	17,660	12	.046
March	21,180	10,270	7	.036
April	29,520	22,230	15	.055
May	8,700	5,190	3	.044
June	5,140	3,130	2	.045
July	2,710	1,580	1	.043
August	2,670	1,700	1	.047
September	2,580	1,650	1	.047
Totals	156,900	90,120	60	

U. S. G. S. yearly discharge in acre-feet	156,900
Total silt for year in acre-feet	60
Acre-feet of silt per year per sq. mile of contributing watershed	.015
Average percent of silt by weight for year	.042
Drainage area in square miles (net)	4,000

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
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Soil Conservation Service
Division of Irrigation

Stream: PEDERNALES
Station: JOHNSON CITY (Samples were taken from highway bridge on U. S. Highway No. 281, about 1½ miles north of Johnson City).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	22,630	107,030	70	.347
1942-43	79,850	150,740	99	.139
1943-44	167,700	724,550	476	.317
1944-45	187,000	191,740	126	.075
TOTALS	457,180	1,174,060	771	

For period of 3.167 years.

Average discharge in acre-feet per year	144,357
Average acre-feet of silt per year	243
Average acre-feet of silt per year per square mile of contributing watershed	.257
Average tons of silt per year	370,717
Average percent of silt by weight	.189
Drainage area in square miles (net)	947

1/ Station was established August 1, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Johnson City, Pedernales River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	5,430	5,240	3	.071
November	4,360	1,110	1	.019
December	18,710	12,220	8	.048
(1945)				
January	20,780	13,440	9	.048
February	18,630	7,410	5	.029
March	40,160	24,350	16	.045
April	36,270	36,550	24	.074
May	11,670	5,760	4	.036
June	5,520	3,120	2	.042
July	3,120	1,860	1	.044
August	2,810	4,010	3	.105
September	19,540	76,670	50	.288
Totals	187,000	191,740	126	

U. S. G. S. yearly discharge in acre-feet----------	187,000
Total silt for year in acre-feet----------	126
Acre-feet of silt per year per sq. mile of contributing watershed----------	.133
Average percent of silt by weight for year----------	.075
Drainage area in square miles (net)----------	947

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: COLORADO
Station: NEAR SAN SABA (Samples were taken from Red Bluff bridge about midway between San Saba and Lometa).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1/				
1929-30	24,000	143,140	94	.439
1930-31	1,370,000	5,136,520	3,369	.275
1931-32	2,220,000	9,934,850	6,516	.328
1932-33	475,000	1,303,620	855	.201
1933-34	504,000	2,121,550	1,391	.309
1934-35	2,564,000	14,423,520	9,459	.413
1935-36	2,276,000	7,520,550	4,933	.243
1936-37	1,197,000	2,688,230	1,764	.165
1937-38	2,809,000	8,923,940	5,853	.233
1938-39	819,400	3,709,100	2,432	.333
1939-40	773,700	3,191,810	2,094	.303
1940-41	2,053,000	8,613,430	5,650	.308
1941-42	1,286,000	4,571,140	2,998	.261
1942-43	475,100	703,520	461	.109
1943-44	592,790	2,129,300	1,397	.264
1944-45	870,400	2,655,490	1,743	.224
TOTALS	20,309,390	77,769,710	51,009	

For period of 15.055 years.

Average discharge in acre-feet per year	1,349,013
Average acre-feet of silt per year	3,388
Average acre-feet of silt per year per square mile of contributing watershed	.180
Average tons of silt per year	5,165,706
Average percent of silt by weight	.281
Drainage area in square miles (net)	18,800

1/ Station was established September 11, 1930.

Note: A water-year extends from October 1 to the following September 30, inclusive.

Note: Water samples were discontinued at old Red Bluff bridge and started one half mile upstream at the new Red Bluff bridge on May 24, 1940.

SILT RECORD

San Saba, Colorado River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	73,160	277,710	182	.279
November	17,000	8,600	6	.037
December	25,480	16,840	11	.049
(1945)				
January	29,760	27,690	18	.068
February	42,260	66,330	44	.115
March	58,890	106,800	70	.133
April	114,800	198,030	130	.127
May	43,690	40,910	27	.069
June	49,450	117,330	77	.174
July	373,200	1,756,440	1,152	.346
August	32,530	31,640	21	.071
September	10,150	7,170	5	.052
Totals	870,400	2,655,490	1,743	

U. S. G. S. yearly discharge in acre-feet	870,400
Total silt for year in acre-feet	1,743
Acre-feet of silt per year per sq. mile of contributing watershed	.093
Average percent of silt by weight for year	.224
Drainage area in square miles (net)	18,800

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
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Soil Conservation Service
Division of Irrigation

Stream: COLORADO
Station: INKS DAM (Samples were taken from tailrace)

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	285,200	41,270	27	.011
1942-43	662,400	67,090	44	.007
1943-44	768,040	127,980	84	.012
1944-45	751,950	157,540	104	.015
TOTALS	2,467,590	393,880	259	

For period of 3.167 years.

Average discharge in acre-feet per year----------	779,157
Average acre-feet of silt per year----------	82
Average acre-feet of silt per year per square mile of contributing watershed----------	.004
Average tons of silt per year----------	124,370
Average percent of silt by weight----------	.012
Drainage area in square miles (net)----------	19,490

1/ Station was established August 1, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Inks Dam, Colorado River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre feet	Silt tons	Silt Acre-feet	
(1944) October	41,030	9,470	6	.017
November	54,020	10,460	7	.014
December	22,190	3,310	2	.011
(1945) January	33,760	4,630	3	.010
February	27,550	3,750	2	.010
March	39,860	5,880	4	.011
April	22,600	4,000	3	.013
May	32,570	6,080	4	.014
June	45,320	8,530	6	.014
July	329,030	66,370	44	.015
August	63,480	26,060	17	.030
September	40,540	9,000	6	.016
Totals	751,950	157,540	104	

U. S. G. S. yearly discharge in acre-feet----------	751,950
Total silt for year in acre-feet----------	157,540
Acre-feet of silt per year per sq. mile of contributing watershed----------	.005
Average percent of silt by weight for year---------	.015
Drainage area in square miles (net)----------	19,490

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
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Soil Conservation Service
Division of Irrigation

Stream: COLORADO
Station: AUSTIN (Samples were taken from Congress Avenue or Montopolis bridges).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1936-37 1/	48,040	1,830	1	.003
1937-38*	3,610,000	8,881,220	5,826	.181
1938-39	986,600	735,150	481	.055
1939-40*	1,334,000	906,750	596	.050
1940-41	3,869,000	979,240	642	.019
1941-42	986,400	121,570	80	.009
1942-43	1,788,000	328,050	215	.013
1943-44	1,392,380	186,590	122	.010
1944-45	1,751,000	444,540	292	.019
TOTALS	15,765,420	12,584,940	8,255	

For period of 8.164 years.

Average discharge in acre-feet per year	1,931,090
Average acre-feet of silt per year	1,011
Average acre-feet of silt per year per square mile of contributing watershed	.038
Average tons of silt per year	1,541,516
Average percent of silt by weight	.059
Drainage area in square miles (net)	26,360

1/ Station was established August 2, 1937.
Note: A water-year extends from October 1 to the following September 30, inclusive.

(*) Rehabilitation of the old Austin Dam (now termed Tom Miller Dam) was started August 1, 1938. This construction at times doubtless distorted the silt load of samples which were taken from 1½ to 4 miles downstream therefrom. Rehabilitation was completed and the impounding of water was begun on January 7, 1940.

SILT RECORD

Colorado River at Austin, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	138,800	19,490	13	.010
November	90,970	8,110	5	.007
December	130,700	27,670	18	.016
(1945)				
January	122,400	28,700	19	.017
February	113,900	21,300	14	.014
March	134,200	39,860	26	.022
April	155,000	41,380	27	.020
May	145,100	25,140	16	.013
June	137,000	53,160	35	.028
July	241,000	58,720	39	.018
August	203,500	80,990	53	.029
September	138,200	40,020	26	.021
Totals	1,751,000	444,540	291	

U. S. G. S. yearly discharge in acre-feet---------- 1,751,000

Total silt for year in acre-feet---------- 444,540

Acre-foot of silt per year per sq. mile of contributing watershed---------- .011

Average percent of silt by weight for year---------- .019

Drainage area in square miles (net)---------- 26,360

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
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Stream: GUADALUPE
Station: SPRING BRANCH (Samples were taken 4 miles southeast of Spring Branch from bridge on old Highway No. 46).

Water Year	Discharge		Silt	Average percent of silt by weight
	Water Acre-feet	Silt tons	Acre-feet	
1941-42 1/	167,150	164,150	108	.072
1942-43	145,600	79,630	52	.040
1943-44	272,800	401,650	262	.108
1944-45	304,900	190,830	126	.046
TOTALS	890,450	836,260	548	

For period of 3.748 years.

Average discharge in acre-feet per year	237,580
Average acre-feet of silt per year	146
Average acre-feet of silt per year per square mile of contributing watershed	.102
Average tons of silt per year	223,122
Average percent of silt by weight	.069
Drainage area in square miles (net)	1,432

1/ Station was established January 1, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Spring Branch, Guadalupe River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	15,730	11,590	8	.054
November	10,440	2,410	2	.017
December	29,660	13,660	9	.034
(1945)				
January	45,040	26,630	17	.043
February	42,270	12,010	8	.021
March	59,010	68,340	45	.085
April	43,180	14,880	10	.025
May	18,720	2,630	2	.010
June	11,150	3,570	2	.024
July	9,250	4,680	3	.037
August	5,820	7,780	5	.098
September	14,590	22,650	15	.114
Totals	304,900	190,830	126	

U. S. G. S. yearly discharge in acre-feet----------	304,900
Total silt for year in acre-feet----------	126
Acre-feet of silt per year per sq. mile of contributing watershed----------	.088
Average percent of silt by weight for year----------	.046
Drainage area in square miles (net)----------	1,432

SILT RECORD
(As of Sept. 30, 1945)

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Stream: GUADALUPE
Station: VICTORIA (Samples taken from bridge on U. S. Highway No. 59).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1944-45 1/	38,430	19,480	13	
TOTALS	38,430	19,480	13	

For period of .083 years. (1 month)

Average discharge in acre-feet per year	38,430
Average acre-feet of silt per year	13
Average acre-feet of silt per year per square mile of contributing watershed	.002
Average tons of silt per year	19,490
Average per cent of silt by weight	.037
Drainage area in square miles (net)	5,676

1/ Station was started on September 1, 1945.

SILT RECORD

Victoria on Guadalupe River, 1944-45 1/

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
(1945) September	38,430	19,490	13	.037
Totals	38,430	19,490	13	.037

U. S. G. S. yearly discharge in acre-feet	38,430 1/
Total silt for year in acre-feet	13 1/
Acre-feet of silt per year per sq. mile of contributing watershed	.002
Average percent of silt by weight for year	.037
Drainage area in square miles (net)	5,676

1/ Station established September 1, 1945 (one month).

SILT RECORD
(As of Sept. 30, 1945)

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Stream: LAVACA
Station: EDNA (Samples taken from bridge on U. S. Highway No. 59 between Victoria and Edna)

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1944-45	980	570	0	.043
TOTALS	980	570	0	.043

For period of .083 years.

Average discharge in acre-feet per year	980 1/
Average acre-feet of silt per year	0
Average acre-feet of silt per year per square mile of contributing watershed	0
Average tons of silt per year	570 1/
Average per cent of silt by weight	.043
Drainage area in square miles (not)	887

1/ Station established September 1, 1945 (one month).

SILT RECORD

Edna on Lavaca River, 1944-45 1/

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
(1945) September	980	570	0	.043
Totals	980	570	0	

U. S. G. S. yearly discharge in acre-feet----------	980
Total silt for year in acre-feet ----------	0
Acre-feet of silt per year per sq. mile of contributing watershed----------	0
Average percent of silt by weight for year----------	.043
Drainage area in square miles (net)----------	887

1/ Station established September 1, 1945.

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
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Stream: ANGELINA
Station: HORGER (Samples taken from bridge on State Highway No. 63 between Zavalla and Jasper).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1944-45 1/	19,470	11,020	7	.042
TOTALS	19,470	11,020	7	.042

For period of .083 years.

Average discharge in acre-feet per year	19,470 1/
Average acre-foot of silt per year	7 1/
Average acre-feet of silt per year per square mile of contributing watershed	.002
Average tons of silt per year	11,020 1/
Average per cent of silt by weight	.042
Drainage area in square miles (net)	3,435

1/ Station established September 1, 1945 (one month).

SILT RECORD

Horger on Angelina River 1944-45 [1]

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
(1945) September	19,470	11,020	7	.042
Totals	19,470	11,020	7	.042

U. S. G. S. yearly discharge in acre-feet----------	19,470 [1]
Total silt for year in acre-feet----------	7 [1]
Acre-feet of silt per year per sq. mile of contributing watershed----------	.002
Average percent of silt by weight for year----------	.042
Drainage area in square miles (net)----------	3,435

1/ Station established September 1, 1945.

SILT RECORD
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Stream: NECHES
Station: NEAR ROCKLAND (Samples were taken from bridge on Woodville-Lufkin highway--one daily in midstream).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1929-30 1/	10,620	290	0	.002
1930-31	1,490,000	229,220	151	.011
1931-32	2,560,000	193,940	128	.006
1932-33	1,400,000	144,700	95	.008
1933-34	1,550,000	174,070	112	.008
1934-35	2,602,000	297,100	194	.008
1935-36	1,041,000	140,280	91	.010
1936-37	928,400	110,180	71	.009
1937-38	1,400,000	225,940	147	.012
1938-39	854,400	140,590	91	.012
1939-40	1,098,000	227,590	149	.015
1940-41	3,578,000	586,140	384	.012
1941-42	2,522,000	550,920	361	.016
1942-43	748,500	316,090	207	.031
1943-44	3,230,410	1,865,580	1,223	.042
1944-45	3,396,000	1,967,220	1,290	.043
TOTALS	28,409,330	7,169,850	4,694	

For period of 15.148 years.

Average discharge in acre-feet per year----------	1,875,450
Average acre-feet of silt per year----------	310
Average acre-feet of silt per year per square mile of contributing watershed----------	.088
Average tons of silt per year----------	473,320
Average percent of silt by weight----------	.019
Drainage area in square miles (net)----------	3,539

1/ Station was established August 8, 1930.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Rockland, Neches River, 1944-45

Month	Discharge			Silt
	Water Acre-feet	Silt tons	Silt Acre-feet	percent by weight
(1944)				
October	8,570	3,990	3	.034
November	40,300	22,850	15	.042
December	273,700	155,440	102	.042
(1945)				
January	688,400	357,100	234	.038
February	392,100	214,480	141	.040
March	431,700	256,730	168	.044
April	1,088,000	655,900	430	.044
May	219,300	146,020	96	.049
June	62,200	42,700	28	.050
July	108,600	66,650	44	.045
August	66,420	35,510	23	.039
September	16,750	9,850	6	.043
Totals	3,396,000	1,967,220	1,290	

U. S. G. S. yearly discharge in acre-feet---------	3,396,000
Total silt for year in acre-feet----------	1,290
Acre-feet of silt per year por sq. mile of contributing watershed----------	.365
Average percent of silt by weight for year---------	.043
Drainage area in square miles (net)----------	3,539

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
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Soil Conservation Service
Division of Irrigation

Stream: NUECES
Station: COTULLA (Samples were taken from highway bridge in Cotulla).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	141,400	64,130	42	.033
1942-43	64,240	33,270	22	.038
1943-44	482,500	367,860	241	.056
1944-45	82,440	65,460	43	.058
TOTALS	770,580	530,720	348	

For period of 3.748 years.

Average discharge in acre-feet per year	205,598
Average acre-feet of silt per year	93
Average acre-feet of silt per year per square mile of contributing watershed	.018
Average tons of silt per year	141,601
Average per cent of silt by weight	.051
Drainage area in square miles (net)	5,260

1/ Station was established January 1, 1942.

Note: A water-year extends from Oct. 1 to the following September 30, inclusive.

SILT RECORD

Cotulla on Nueces River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	2,730	1,610	1	.043
November	24	0	0	0
December	529	90	0	.012
(1945)				
January	28	0	0	0
February	68	10	0	.011
March	4,610	2,910	2	.046
April	61,320	51,470	34	.062
May	13,120	9,370	6	.052
June	12	0	0	0
July	0	0	0	0
August	0	0	0	0
September	0	0	0	0
Totals	82,440	65,460	43	

U. S. G. S. yearly discharge in acre-feet--------	82,440
Total silt for year in acre-feet----------	43
Acre-feet of silt per year per sq. mile of contributing watershed----------	.008
Average percent of silt by weight for year-------	.058
Drainage area in square miles (net)----------	5,260

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: NUECES
Station: NEAR THREE RIVERS (Samples were taken 2 miles south of Three Rivers from railroad bridge, except at extreme low stage when samples were taken at low dam).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1927-28 1/	318,927	617,917	405	.142
1928-29	741,299	1,303,605	855	.129
1929-30	596,507	721,443	473	.089
1930-31	456,000	443,420	291	.071
1931-32	1,010,000	581,880	381	.042
1932-33	287,000	275,050	179	.070
1933-34	254,000	668,320	438	.193
1934-35	2,547,000	2,383,630	1,565	.069
1935-36	768,200	752,320	494	.072
1936-37	318,000	142,270	94	.033
1937-38	479,700	771,540	506	.118
1938-39	306,600	450,960	297	.108
1939-40	840,200	1,035,600	679	.091
1940-41	1,301,000	1,635,320	1,073	.092
1941-42	1,108,000	987,340	648	.065
1942-43	260,500	323,990	213	.091
1943-44	700,090	668,660	439	.070
1944-45	297,100	590,010	387	.146
TOTALS	12,590,123	14,353,275	9,417	

For period of 18.000 years.	
Average discharge in acre-feet per year	699,451
Average acre-feet of silt per year	523
Average acre-feet of silt per year per square mile of contributing watershed	.034
Average tons of silt per year	797,404
Average percent of silt by weight	.084
Drainage area in square miles (net)	15,600

1/ Station was established October 1, 1927.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Nueces River at Three Rivers, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	15,770	21,980	14	.102
November	3,320	2,680	2	.059
December	5,130	7,810	5	.112
(1945)				
January	7,820	10,810	7	.102
February	17,340	35,240	23	.149
March	22,350	50,370	33	.166
April	133,900	228,710	150	.125
May	40,740	36,730	24	.066
June	43,290	184,200	121	.313
July	5,620	5,540	4	.072
August	77	50	0	.048
September	1,710	5,890	4	.253
Totals	297,100	590,010	387	

U. S.G. S. yearly discharge in acre-feet----------	297,100
Total silt for year in acre-feet----------	387
Acre-feet of silt per year per sq. mile of contributing watershed----------	.025
Average percent of silt by weight for year---------	.146
Drainage area in square miles (not)----------	15,600

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: NUECES
Station: CORPUS CHRISTI DAM (Samples were taken below and adjacent to outlet gates).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	1,203,000	546,500	358	.033
1942-43	249,600	44,790	29	.013
1943-44	740,310	323,550	212	.032
1944-45	273,800	125,070	81	.034
TOTALS	2,466,710	1,039,910	680	

For period of 3.660 years.

Average discharge in acre-feet per year	673,964
Average acre-feet of silt per year	186
Average acre-feet of silt per year per square mile of contributing watershed	.011
Average tons of silt per year	284,128
Average percent of silt by weight	.031
Drainage area in square miles (net)	16,660

1/ Station was established February 2, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Corpus Christi Dam, Nueces River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	13,730	3,360	2	.018
November	5,090	1,270	1	.018
December	5,690	790	1	.010
(1945)				
January	3,290	700	0	.016
February	14,250	2,960	2	.015
March	18,640	6,340	4	.025
April	117,000	56,320	37	.035
May	44,330	24,870	16	.041
June	40,760	22,440	15	.040
July	4,430	2,260	1	.037
August	3,990	2,140	1	.039
September	2,620	1,620	1	.045
Totals	273,800	125,070	81	

U. S. G. S. yearly discharge in acre-feet----------	273,800
Total silt for year in acre-feet----------	81
Acre-feet of silt per year per sq. mile of contributing watershed----------	.005
Average percent of silt by weight for year----------	.034
Drainage area in square miles (net)----------	16,660

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
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Soil Conservation Service
Division of Irrigation

Stream: PEASE
Station: CROWELL (Samples were taken from highway bridge about 10 miles north of Crowell on U. S. Highway No. 283).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	36,630	485,320	318	.973
1942-43	80,680	601,090	394	.547
1943-44	54,190	908,130	596	1.231
1944-45	96,060	1,591,185	1,043	1.217
TOTALS	267,560	3,585,725	2,351	

For period of 3.252 years.

Average discharge in acre-feet per year	82,276
Average acre-feet of silt per year	723
Average acre-feet of silt per year per square mile of contributing watershed	.300
Average tons of silt per year	1,102,621
Average percent of silt by weight	.985
Drainage area in square miles (net)	2,410

1/ Station was established July 1, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Crowell, Pease River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	2,090	12,830	8	.451
November	603	630	0	.077
December	1,710	4,930	3	.212
(1945)				
January	1,190	750	1	.046
February	752	400	0	.039
March	1,010	1,050	1	.076
April	1,600	8,160	5	.375
May	222	155	0	.051
June	4,550	6,980	5	.113
July	63,320	1,362,700	894	1.581
August	15,860	180,290	118	.835
September	3,150	12,310	8	.287
Totals	96,060	1,591,185	1,043	

U. S. G. S. yearly discharge in acre-feet--------	96,060
Total silt for year in acre-feet----------	1,043
Acre-feet of silt per year per sq. mile of contributing watershed----------	.433
Average percent of silt by weight for year-------	1,217
Drainage area in square miles (not)----------	2,410

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
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Soil Conservation Service
Division of Irrigation

Stream: SABINE
Station: RULIFF (Samples taken from bridge on State Highway No. 87 between Deweyville, Texas and Starks, La.).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1944-45 1/	115,800	78,760	52	.050
TOTALS	115,800	78,760	52	.050

For period of .083 years.

Average discharge in acre-feet per year	115,800 1/
Average acre-feet of silt per year	52
Average acre-feet of silt per year per square mile of contributing watershed	.006
Average tons of silt per year	78,760 1/
Average per cent of silt by weight	.050
Drainage area in square miles (net)	9,440

1/ Station established September 1, 1945 (one month).

SILT RECORD

Ruliff on Sabine River, 1944-45 1/

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
(1945) September	115,800	78,760	52	.050
Totals	115,800	78,760	52	.050

U. S. G. S. yearly discharge in acre-feet	115,800 1/
Total silt for year in acre-feet	52 1/
Acre-feet of silt per year per sq. mile of contributing watershod	.006
Average percent of silt by weight for year	.050 1/
Drainage area in square miles (net)	9,440

1/ Station established September 1, 1945 (one month).

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
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Division of Irrigation

Stream: SABINE
Station: LOGANSPORT (Samples 1/6, 1/2, and 5/6, were taken from highway bridge in downtown Shreveport).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1932-33 1/	2,545,700	503,740	330	.015
1933-34 2/	69,200	5,780	4	.006
1934-35 3/	13,910	400	0	.002
1935-36	841,400	137,020	89	.012
1936-37	1,690,000	270,430	176	.012
1937-38	3,155,000	537,990	353	.013
1938-39	1,326,000	291,500	190	.016
1939-40	1,303,000	458,990	301	.026
1940-41	4,876,000	825,330	541	.012
1941-42	3,817,000	1,439,880	944	.028
1942-43	1,717,000	999,370	655	.043
1943-44	4,193,000	3,002,050	1,969	.053
1944-45	5,997,000	4,502,820	2,953	.055
TOTALS	31,544,210	12,975,300	8,505	

For period of 11.156 years.

Average discharge in acre-feet per year	2,827,556
Average acre-feet of silt per year	762
Average acre-feet of silt per year per square mile of contributing watershed	.157
Average tons of silt per year	1,163,078
Average per cent of silt by weight	.030
Drainage area in square miles (net)	4,858

1/ Station was established December 1, 1932
2/ Station was discontinued December 27, 1933
3/ Station was reestablished September 1, 1935
Note: A water-year extends from October 1 to the following Sept. 30, incl.

SILT RECORD

Logansport, Sabine River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	8,630	5,000	3	.043
November	33,920	23,970	16	.052
December	224,200	186,350	122	.061
(1945)				
January	899,100	555,690	364	.045
February	335,900	255,060	167	.056
March	1,316,000	1,002,320	657	.056
April	2,048,000	1,548,260	1,016	.056
May	174,000	158,220	104	.067
June	298,800	271,140	178	.067
July	582,300	443,560	291	.056
August	57,540	41,350	27	.053
September	18,340	11,900	8	.048
Totals	5,997,000	4,502,820	2,953	

U. S. G. S. yearly discharge in acre-feet----------	5,997,000
Total silt for year in acre-feet----------	2,953
Acre-feet of silt per year per sq. mile of contributing watershed----------	.061
Average percent of silt by weight for year----------	.055
Drainage area in square miles (net)----------	4,858

SILT RECORDS
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: SAN ANTONIO
Station: GOLIAD (Samples were taken in Goliad from bridge on State Highway No. 29).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1941-42 1/	699,600	848,340	556	.089
1942-43	453,200	581,740	382	.094
1943-44	365,100	725,630	475	.146
1944-45	352,500	567,440	371	.118
TOTALS	1,870,400	2,723,150	1,784	

For period of 3.748 years.

Average discharge in acre-feet per year	499,039
Average acre-feet of silt per year	476
Average acre-feet of silt per year per square mile of contributing watershed	.122
Average tons of silt per year	726,561
Average percent of silt by weight	.107
Drainage area in square miles (not)	3,914

1/ Station was established January 1, 1942.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Goliad Station on San Antonio River, 1944-45

Month	Discharge			Silt
	Water Acre-feet	Silt tons	Silt Acre-feet	percent by weight
(1944)				
October	16,470	11,190	7	.050
November	15,970	11,290 1/	7	.052
December	28,680	37,950 1/	25	.097
(1945)				
January	43,910	76,440 2/	50	.128
February	48,350	86,860 1/	57	.132
March	32,780	35,420 1/	23	.079
April	68,050	195,020 3/	128	.211
May	24,660	19,690	13	.059
June	30,060	58,160	38	.142
July	16,020	12,730	8	.058
August	14,760	10,730	7	.053
September	12,750	11,960	8	.069
Totals	352,500	567,440	371	

U. S. G. S. yearly discharge in acre-feet----------	352,500
Total silt for year in acre-feet----------	371
Acre-feet of silt per year per sq. mile of contributing watershed----------	.095
Average percent of silt by weight for year---------	.118
Drainage area in square miles (net)----------	3,914

1/ Calculated and estimated.
2/ Partially calculated and estimated.
3/ 33,322 acre-feet - silt estimated.

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: SAN JACINTO
Station: HUFFMAN (Samples at Sheldon pumping plant, City of Houston).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1944-45	221,940	163,730	107	.054
TOTALS	221,940	163,730	107	.054

For period of .083 years.

Average discharge in acre-feet per year	221,940 1/
Average acre-feet of silt per year	107
Average acre-feet of silt per year per square mile of contributing watershed	.038
Average tons of silt per year	163,730
Average per cent of silt by weight	.054
Drainage area in square miles (not)	2,791

1/ Station established September 1, 1945 (one month).

SILT RECORD

Huffman on San Jacinto River, 1944-45 [1]

Month	Discharge			Silt
	Water Acre-feet	Silt tons	Silt Acre-feet	percent by weight
October				
November				
December				
January				
February				
March				
April				
May				
June				
July				
August				
(1945) September	221,940	163,730	107	.054
Totals	221,940	163,730	107	.054

U. S. G. S. yearly discharge in acre-feet [1]	221,940
Total silt for year in acre-feet	107
Acre-feet of silt per year per sq. mile of contributing watershed	.038
Average percent of silt by weight for year	.054
Drainage area in square miles (not)	2,791

1/ Station established September 1, 1945.

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: WEST FORK OF SAN JACINTO
Station: NEAR HUMBLE (Samples were taken from highway bridge about 2 miles north of Humble).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1932-33 1/	253,210	144,800	93	.042
1933-34 2/	7,450	520	0	.005
1936-37 3/	12,540	1,370	1	.008
1937-38	491,900	150,650	97	.022
1938-39	319,500	120,660	77	.028
1939-40	282,700	162,070	105	.042
1940-41	2,566,000	896,050	588	.026
1941-42	909,200	373,670	245	.030
1942-43	545,800	290,820	191	.039
1943-44	881,200	660,570	434	.055
1944-45	1,577,400	1,241,490	815	.058
TOTALS	7,846,900	4,042,670	2,646	

For period of 9.337 years.

Average discharge in acre-feet per year	840,409
Average acre-feet of silt per year	283
Average acre-feet of silt per year per square mile of contributing watershed	.156
Average tons of silt per year	432,973
Average percent of silt by weight	.038
Drainage area in square miles (net)	1,811

1/ Station established December 1, 1932.
2/ Station discontinued December 31, 1933.
3/ Station reestablished July 1, 1937.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Humble Station, San Jacinto River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	5,350	3,270	2	.045
November	66,390	57,750	38	.064
December	196,600	155,560	102	.058
(1945)				
January	225,700	149,700	98	.049
February	154,400	109,980	72	.052
March	57,220	44,110	29	.057
April	418,300	284,510	187	.050
May	129,500	104,990	69	.060
June	34,100	24,240	16	.052
July	12,120	8,740	6	.053
August	141,100	140,580	92	.073
September	136,600	158,060	104	.085
Totals	1,577,380	1,241,490	815	

U. S. G. S. yearly discharge in acre-feet----------	1,577,380
Total silt for year in acre-feet----------	815
Acre-feet of silt per year per sq. mile of contributing watershed----------	.450
Average percent of silt by weight for year----------	.058
Drainage area in square miles (net)----------	1,811

SILT RECORD
(As of Sept. 30, 1945)

Prepared by
TEXAS BOARD OF WATER ENGINEERS
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Soil Conservation Service
Division of Irrigation

Stream: TRINITY
Station: ROMAYOR (Samples were taken from the railroad bridge).

Water Year	Discharge			Average percent of silt by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
1935-36 1/	42,130	5,220	4	.009
1936-37	3,901,000	3,481,600	2,285	.066
1937-38	6,753,000	6,741,220	4,423	.073
1938-39	2,165,000	3,199,280	2,099	.109
1939-40	3,218,000	4,999,040	3,280	.114
1940-41	12,260,000	9,657,990	6,335	.058
1941-42	9,901,000	9,447,990	6,197	.070
1942-43	4,298,000	4,914,950	3,224	.084
1943-44	7,588,000	11,433,850	7,501	.111
1944-45	12,200,000	13,559,310	8,893	.082
TOTALS	62,326,130	67,440,450	44,241	

For period of 9.142 years.

Average discharge in acre-feet per year	6,817,559
Average acre-feet of silt per year	4,839
Average acre-feet of silt per year per square mile of contributing watershed	.282
Average tons of silt per year	7,377,433
Average percent of silt by weight	.079
Drainage area in square miles (net)	17,190

1/ Station was established August 10, 1936.

Note: A water-year extends from October 1 to the following September 30, inclusive.

SILT RECORD

Romayor, Trinity River, 1944-45

Month	Discharge			Silt percent by weight
	Water Acre-feet	Silt tons	Silt Acre-feet	
(1944)				
October	44,640	26,370	17	.043
November	234,600	279,010	183	.087
December	685,900	732,120	480	.078
(1945)				
January	1,429,000	1,360,060	892	.070
February	707,200	799,360	524	.083
March	2,589,000	3,065,330	2,011	.087
April	3,910,000	4,178,670	2,741	.078
May	675,100	856,870	562	.093
June	655,200	708,120	464	.079
July	904,100	1,132,910	743	.092
August	162,600	179,580	118	.081
September	205,500	240,910	158	.086
Totals	12,200,000	13,559,310	8,893	

U. S. G.S. yearly discharge in acre-feet----------	12,200,000
Total silt for year in acre-feet----------	13,559,310
Acre-feet of silt per year per sq. mile of contributing watershed----------	.517
Average percent of silt by weight for year--------	.082
Drainage area in square miles (net)----------	17,190

SUMMARY OF SILT RECORDS COVERING MAJOR STREAMS OF TEXAS

Prepared by TEXAS BOARD OF WATER ENGINEERS and UNITED STATES DEPARTMENT OF AGRICULTURE

Austin, Texas — As of September 30, 1945

Watershed	Stream	Silt station	Years samples taken	Total length record	Average per Year: Run-off	Average per Year: Silt	Average per Year: Silt	Silt per aq-mi watershed	Silt by Weight	Net drainage area
				years	ac-ft	ac-ft	tons	ac-ft	percent	sq-mi
Brazos	Salt Fork	Aspermont 1/	1924-25	1.238	111,100	2,818	4,297,420	1.272	2.842	2,216
Brazos	Salt Fork	Seymour 1/	1924-30	6.107	337,790	5,450	8,309,370	1.038	1.807	5,250
Brazos	Dbl. Mt. Fk.	Aspermont 1/	1924-33	9.244	135,280	2,665	406,240	1.765	2,206	1,510
Brazos	Clear Fk.	Crystal Falls 1/	1925-29	3.307	214,440	568	866,020	.131	.297	4,320
Brazos	Clear Fk.	Eliasville 1/	1924-25	1.244	177,240	429	808,630	.092	.335	5,740
Brazos	Little Riv.	Little River 1/	1924-29	4.962	419,870	752	1,147,190	.143	.201	5,253
Brazos	San Gabriel	Circleville 1/	1924-29	5.403	110.744	222	339,590	.369	.225	602
Brazos	Leon	Belton	1945 2/	.083	10,380	17	26,320	.005	.186	3,547
Brazos	Navasota	Easterly	1942-45	3.748	382,449	298	453,447	.314	.087	949
Brazos	Brazos	South Bend	1942-45	3.710	466,092	2,079	3,169,245	.168	.500	12,360
Brazos	Brazos	Possum K. Dam	1942-45	3.710	495,620	132	201,558	.010	.030	13,310
Brazos	Brazos	Mineral Wells 1/	1924-34	10.332	953,550	6,506	9,920,060	.468	.764	13,910
Brazos	Brazos	Glen Rose 1/	1924-29	4.588	1,181,370	8,378	12,773,810	.537	.794	15,600
Brazos	Brazos	Waco 1/	1924-33	9.254	1,717,130	10,325	15,742,010	.536	.673	19,260
Brazos	Brazos	Bryan 1/	1899-02	3.419	4,156,740	39,117	------	1.340	.943*	29,190
Brazos	Brazos	Richmond-Rosenberg	1924-45	21.306	5,943,767	25,496	38,926,982	.732	.481	34,810
Colorado	Llano	Llano	1942-45	3.167	206,662	175	266,760	.044	.095	4,000
Colorado	Pedernales	Johnson City	1942-45	3.167	144,357	243	370,717	.257	.189	947
Colorado	Colorado	San Saba	1930-45	15.055	1,349,013	3,388	5,165,706	.180	.281	18,300
Colorado	Colorado	Tow 1/	1927-32	5.162	1,245,440	3,360	5,122,520	.174	.302	19,300
Colorado	Colorado	Inks Dam	1942-45	3.167	779,157	82	124,370	.004	.012	19,490
Colorado	Colorado	Austin	1937-45	8.164	1,931,090	1,011	1,541,516	.038	.059	26,360
Colorado	Colorado	Columbas-E.Lake 4/	30-33-37-41	6.997	3,167,710	5,898	8,991,960	.202	.209	29,140

*Percent of silt by volume

1/ 4/ Silt progress reports by numbers showing date by months when station was discontinued.

2/ Station was established September 1, 1945

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Watershed	Stream	Silt station	Years samples taken	Total length record	Average per Year			Silt per sq-mi net wathershed	Silt by weight	Net drainage area
					Run-off	Silt				
				Years	ac-ft	ac-ft	tons	ac-ft	percent	sq-mi
Guadalupe	Guadalupe	Spring Branch	1442-45	3.748	237,580	146	223,122	.102	.069	1,432
Guadalupe	Guadalupe	Victoria	1945 2/	.083	38,430	13	19,490	.002	.037	5,676
Lavaca	Lavaca	Edna	1945 2/	.083	980	0	570	0	.043	337
Nueces	Nueces	Cotulla	1942-45	3.748	205,598	93	141,601	.018	.051	5,260
Nueces	Nueces	Three Rivers	1927-45	18.000	699,451	523	797.404	.034	.084	15,600
Nueces	Nueces	Corpus Christi Dam	1942-45	3.660	673,964	186	284,128	.011	.031	16,660
Rio Grande	Rio Grande	Eagle Pass	1934-43 5/	9.068	3,180,057	9,776	14,904,545	.078	.344	125,260
Rio Grande	Rio Grande	Roma	1929-43 5/	14,184	4,166,619	12,588	19,192,311	.080	.338	157,204
Sabine	Sabine	Logansport, La.	32-33-35-45	11.156	2,827,556	762	1,168,078	.157	.030	4,358
Sabine	Sabine	Ruliff	1945 2/	.083	115,800	52	78,760	.006	.050	9,440
Neches	Angelena	Horger	1945 2/	.083	19,470	7	11,020	.002	.042	3,435
Neches	Neches	Rockland	1930-45	15.148	1,875,450	310	473,320	.088	.019	3,539
Red	Pease	Crowell	1942-45	3.252	82,276	723	1,102,621	.300	.985	2,410
Red	Wichita	Wichita Falls 1/	1900-02	2.014	566,420	5,516	------	1.776	.974*	3,105
Red	Red	Denison 1/	30-33-36-39	6.260	3,326,780	13,640	20,793,380	.415	.459	32,840
San Antonio	San Antonio	Falls City 1/	1927-33	5.967	127,120	142	216,730	.069	.125	2,070
San Antonio	San Antonio	Goliad	1942-45	3.748	499,039	476	726,561	.122	.107	3,914
San Jacinto	West Fork	Humble	32-33-37-45	9.337	840,409	283	432,973	.156	.083	1,811
San Jacinto	San Jacinto	Huffman	1945 2/	.083	221,940	107	163,730	.038	.054	2,791

2/ Station established September 1, 1945
1/ 4/ Silt progress reports by numbers showing date by months when station was discontinued
* Percent by volume

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Watershed	Stream	Silt station	Years samples taken	Total Length record	Average per Year			Silt per sq-mi net wathershed	Silt by weight	Net drainage area
					Run-off	Silt				
				years	ac-ft	ac-ft	tons	ac-ft	percent	sq-mi
Trinity	Trinity	Rosser 1/	1938-40	1.598	760,700	986	1,504,920	.122	.145	8,057
Trinity	Trinity	Romayor	1936-45	9.142	6,817,559	4,839	7,377,483	.282	.079	17,190

1/ Silt progress reports by numbers showing data by mohths when station was discontinued.
2/ Station established September 1, 1945
* Percent by volume.