RESERVOIR SEDIMENTATION

Emma La Frontz

_	DATA SUMM	MARY	1 4				NAME (F RESE		DATA SHEET NO.						
Г	1 OWNER Emma		tz]2. p	RIVE	R Trib	of	Boyer R.							
Σ	4. SEC. 1.6 TV			E 38W			EST TOW				3. STATE IOWA 6. COUNTY Crawford					
۵	7. STREAM BED EL						OF DAM EL		110011		9. SPILLWAY CREST ELEV.					
	10.	Н.			12			13.		14.		AT CREST	II5	٧.		
	STORAGE ALLOCATION	ION POOL	1	SURFACE AREA ACRES			STORAGE CRE - FEET	14.	ACCUMULATED ACRE-FEET			TE STORAGE BEGAN				
œ	d. FLOOD CONTRO		2	0.5	7		2.59		15.28							
RVOIR	b. POWER													May 1942		
ER	C. WATER SUPPLY	_]]	L.7	1	1	2.69	\top	12.	.69	16. n	ATE NORMAL		
ESI	d. IRRIGATION		•							T			0	PER. BEGAN		
œ	e. CONSERVATION									†						
	f. INACTIVE	"							***	╅			_ J	lay 1942		
	17. LENGTH OF RE	SERVOIR			'		MILES	AV. WII	OTH OF RESE	RVO	1R		1	MILES		
25	18. TOTAL DRAINA	GE AREA	0.1	.55					AN ANNUAL F			v 28 ((40)			
ERSHED	19. NET SEDIMENT	CONTRIBUTI			0.152				AN ANNUAL I		(+*/					
ER	^{20.} LENGTH			AV. WIDT					AN ANNUAL F			<u> </u>		AG,-FT.		
WAT	21. MAX. ELEV.		+	MIN. ELE	 E V.	25. CLIMATIC CLASSIFIC										
	26. DATE OF	27. PERIOD	- 1		29. TYPE (0E 3	O. NO. OF RA		*1							
	SURVEY			ACCE.			NO. OF RA] SUKFACE		32. CAPACITY ACRE-FEET		33. CW RATIO			
						\dashv										
	May 1942	.942 -		-		- -			1.71		12.69		81.9			
	April 1949	6.9	6	.9 Range		nge 3 tailed			1.60		7	.86		50.7		
ĺ											1 '	•00		JU • 7		
	DATE OF	34. PERIOD ANNUAL 35. P			PERIOD WATER IN			LOW				36. WATER INFL.		DATE AGENT		
	SURVEY	PRECIPITAT	C. MEA	AUNUA N	L b	MAX. ANI	NUAL	C.PERIOD TOTAL		L G. MEAN ANNUAL						
				(ir	ches)							ches)				
				`	, ,						(Thomas)					
i	April 1949			7	, 9¥						7•9*					
DATA																
ă	26. DATE 05	TOCOC	CIT.	2 4005		38		DEBOSITE TO DA								
μ	DATE OF SURVEY	37. PERIOD SEDIMENT DE				۱۱:چ انچ	OFR CO	TEE!	O TOTAL TO S	L U. [
SURVE		FERIOD	AV. /	ANNUAL	JAL PERS		TEAR	TOTAL TO DATE		D. AV. AN	NNUAL	PE	R SQ.MI-YEAR			
S	April 1949	4.83	0.7	00		4.61	;	4.83		0.70	ര		4.61			
		(4.94) <u>1</u> / (0.716)					(4.71	(4.94)			(0.7		4.61 (4.71)			
ĺ					•		• - • -	•	(4474)		,	~,				
ļ																
1																
-	DATE OF						S PER SQ.MIYR.			LO	OSS PCT. 42 SED.		NFL	OW PPM		
	SURVEY	LBS. PER CU.FT.		a. PERIOD		b.	TOTAL TO	DATE	a.AV. ANNUAL b. TO		OT. TO DATE a. PERIO		D	b. TOT. TO DATE		
	April 1949 56.7 (3)		3)	5,690			5,690	4.64		32	2.1	9,74	//30	9,7403/		
				(5,820)		(5,820		,	(5.52)2/(38				ا2ده	/ _(9,960)		
			i	,,,,	,		(),,020	'	(38		8.17~ (9,960		7	(7)700/		
													ļ			

^{*} Estimated

^{1/} Above-crest deposits within original flow line at emergency spillway elevation; includes 0.04 acre-feet of sediment above emergency spillway crest elevation.
2/ Based on water supply pool.

26.	43.	DE	PTH DE	SIGN	OTTAL	N RANG	E IN FI	EETAL	BOVE	,AND BE	LOW, CF	REST ELI	VAT	ION	
DATE OF		T		T											- 1
SURVEY			PERGEN	IT OF	TOT	AL SE	IMEN	T LOC	ATED	WITHIN	DEPTH	DESIGN	ATIC	N	
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26,	44.	DE A	רש הבפו	GNA	TION	PERCEI	NT OF	TOTAL	OR	IGINAI	LENGH	OF RES	FRV	OLR	
DATE OF	1									00-100			-115	-120	-125
SURVEY	0-10													I	
		Р	ERCENT	OF	TOTA	L SEDI	MENT	LOCA	TED	WITHIN	REACH	DESIGN	AIIC	- N	
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45.				RA		N RES				ON					
WATER YEA	R MAX.	ELÉV.	MIN. E	LEV.	INFLO	W ACF	T. WAT	ER YE	AR	MAX. EL1	EV. I	MIN. ELEV.	INF	LOW A	C FT.
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46.				EL	E VATI	ON-AR	EA-C	APACIT	Y DA	ATA					
FI EVATION T	AREA	CAS	PAGITY		VATION		REA		ACITY		VATION	AREA		CAPA	CITY
ELEVATION	AREA	- GAF	AUTT	CCL	TATION	 		+		- 					
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 $\frac{3}{42} = \frac{376 \times 39 \times 1,000,000}{35a \times 18 \times \frac{640 \times 62.4}{35a \times 18}}$

48. AGENCY SUPPLYING DATA 12 Region 3. Soil Conservation Service 49. DATE January 9, 1950

^{47.} REMARKS AND REFERENCES

^{1.} Gottschalk, L.C., and Brune, G.M. Sediment design criteria for the Missouri Basin Loess Hills. Soil Conserv. Serv. SCS-TP-97, 21 pp., illus., processed. Milwaukee, Wisconsin, 1950.

^{2.} U.S.D.A. Yearbook of Agriculture, Washington, D.C., 1941.

For 270 feet downstream from dam, gradient was found to have decreased from 2.82 to 2.37%. From 270 to 970 feet downstream, gradient decreased from 1.45 to 1.29%.

RESERVOIR SEDIMENTATION DATA SUMMARY

Emma La Frontz NAME OF RESERVOIR

35-12a DATA SHEET NO.

_	DATA SUMM	IART				F RESE				SHEET NO.			
≥	OWNER Emma	La Front		2. RIVI			Boyer Riv		Iowa				
DAM	4 SEC. 16 TW	<u> </u>	ANGE 38V		REST TOW			6. COUNTY Crawford					
	"STREAM BED ELE				OF DAM E				Y CREST ELE	v.			
	10. STORAGE ALLOCATION	T T	VATION OF POOL		RFACE ACRES		STORAGE CRE – FEET	ACCUMUI ACRE-		ATE STORAGE BEGAN			
JIR SIR	d. FLOOD CONTRO		2,0	7	- Z	2.59	15.28		May 1942				
ERVOIR	C. WATER SUPPLY					12	2.69	12.69	16.	DATE NORMAL			
S	d IRRIGATION	1.7						PER. BEGAN					
RE	e. CONSERVATION									ay 1942			
	f. INACTIVE								, i	Japan			
	17. LENGTH OF RES	SERVOIR			MILES	AV. WIE	TH OF RESE	RVOIR		MILES			
ED	18. TOTAL DRAINAG		0.155				AN ANNUAL PI) INCHES			
SH	19. NET SEDIMENT	CONTRIBUTING	AREA ().152	SQ. MI.	23. ME	AN ANNUAL R	UNOFF 3.	2 est.	INCHES			
WATERSHED	^{20.} LENGTH	MIL	ES AV. WID	ТН	MILES	24. ME	AN ANNUAL R	UNOFF 171	OFF 171 A.F./sq.mi.AG-FT.				
WA			MIN. EL				MATIC CLASS	IFICATION	Sub-humi	d			
	26. DATE OF SURVEY	PERIOD YEARS	28. ACCL. YEARS	^{29.} TYPE OF SURVEY	OR CONTO		31. SURFACE AREA ACRE	1/32. CAPA	GITY 33. -FEET AC	C/W RATIO 2/			
	5/42		-	-			2.07	15.2	8	98.6			
,	4/18/49	7/13/53 4.23 11.1		etailed Range	3 Ran	ges	1.96	10.3	8	67.0			
	7/13/53				н		1.91	9.4		61.1			
	26. DATE OF	PERIOD ANN	976			LOW ACRE-FEET				DATE AC-FT.			
	SURVEY	PRECIPITATI	ON " ME	N ANNUAL	b. MAX, ANNUA		C.PERIOD TOT	TAL . MEAN	ANNUAL b. T	OTAL TO DATE.			
DATA													
ΥD	DATE OF	37. PERIOD	SEDIME	NT DEPOSI	TS ACRE-	FEET	39. TOTAL SED. DEPOSITS TO DATE ACRE-FE						
		O. PERIOD TO	TAL b. AV.	ANNUAL	C. PER SQ.M	I,-YEAR	G. TOTAL TO DA	ATE D. AV. AN	INUAL G.PI	ER SQ.MIYEAR			
SURVE	4/18/49	4.90 (4.94)	0.	710 716)	4.67 (4.71			0.71 (0.71	0	4.67 (4.71)			
	7/13/53	0.91 (0.93)		21 5 220)	1.41 (1.45		5.81 (5.87)		3 9)	3.44 (3.48)			
	26. DATE OF	39. AV. DRY W	GT. 40.SE	D, DEP. TON				LOSS PCT.					
	SURVEY	LBS, PER CL	J.FT. ^{G.} 1	PERIOD	b. TOTAL TO	DATE	^{O,} AV. ANNUAL	D. TOT, TO DATE	a. PERIOD	b. TOT. TO DATE			
	4/18/49	56.7 (3		,767 ,817)	5,767 (5,817		4.64	32.1	-	-			
	7/13/53	62.0 (3		,904 ,958)	4,645		3.42	38.0	:	• .			

^{1/} At crest elevation. 2/ C/I ratio 0.59 in 1942, 0.40 in 1949, and 0.36 in 1953. Trap efficiency estimated at 96 percent in 1942 and 1949, and 95 percent in 1953.

:6.	43.	DEF	TH DE	SIGN	NOITA	RANG	EINF	EETA	BOVE	, AND BI	ELOW, C	REST EL	_EVATIO	NCNC	
DATE OF Survey															
3011721		P	ERCEN	TOF	TOTA	L SE	DIMEN.	r Loc	ATED	WITHU	DEPT	1 DESIG	NATION	i ,	
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6. DATE OF	44.										LENGH				
SURVEY	0-10 10	20 20										-110	-115	-120 -	-125
	1	PEI	RCENT	OF T	OTAL	SEDI	MENT	LOCA	TED	WITHIN	REACH	DESIG	NATION		
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5,					05 10	DEC.	1	005	D A T I						
WATER YEAR	MAX. E	LEV	MIN. EL			ACF	T WAT	ER YEA		MAX. EL	FV I	AIN, ELEV	V INFI	OW AC:	-FT
WATER TEAR	INFA, E					, ,			+	MAN, EE			- 1111 2		
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6.	1			ELE'	VATIO	N-AR	EA⊸CA	PACIT	Y DA	TA					
ELEVATION	AREA	GAPAG	YTIC			AREA		CAPACITY		ELE	VATION	AREA		CAPACITY	
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7. REMARKS	AND REF	ERENCI	ES ((1)	Gott	scha	lk, L	.C	and	G.M.	Brune,	Sedin	ent D	esign	1
Criteria f	or the	Missou	uri Ba	sin	Loes	s Hi	lls,	SCS-7	rp-9	7. So:	Ll Con	segvat	ion S	ervi	œ.
Milwaukee,	Wis.,	1950.	(2)	U.S	D.A	. Ye	arboo.	k of	Agr	icult	ure, W	ashing	gton,	D. C.	. , 🕯
For 270	feet d	ownstr	eam f	rom	dam,	grad	dient	Was	fou	nd to	have	decrea	sed f	rom	
2.82 to 2.	<i>37 %</i> .	From 2	270 to	970) fee	t do	wnstr	eam,	gra	dient	decre	ased f	rom 1	.45 1	to

Total rate of sediment production, adjusted for trap efficiency, 4,820 tons/sq.mi.

1.29% (1942-1949).