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EXAMPLE

Computing Benfits and Costs
in Present Value Terms

Economics Division, NO
February, 1980

AVAILABLE DATA--MIDWEST AGRIC. W/S
(50 yr. evaluation period @ 7 1/8%)

~~Construction~~ INSTALLATION Period		Costs		Benefits
Yr.	Structure	(Installation)	(O&M) AVG ANN	(Avg. Ann.)
		FLOOD PREVENTION		
1	*3-A	225,000	(6,800)	24,800
2	4-B, 5-A	800,000	(24,000)	88,300
		800,000	(24,000)	88,300
3	5-A	825,000	(24,800)	91,000
4	1-B, 6-C	450,000	(13,500)	49,700
		450,000	(13,500)	49,700
5	4-C, 7-A	400,000	(12,000)	44,200
		360,000	(10,800)	39,700
		4,310,000	(129,400)	475,700
		RECREATION		
1	*3-A	225,000	(6,800)	---
2	---	---	---	---
3	---	---	---	---
4	*Facilities	300,000	(9,000)	57,900
5	---	---	---	---
		525,000	(15,800)	57,900

PRESENT VALUE COSTS
(beginning of evaluation period)

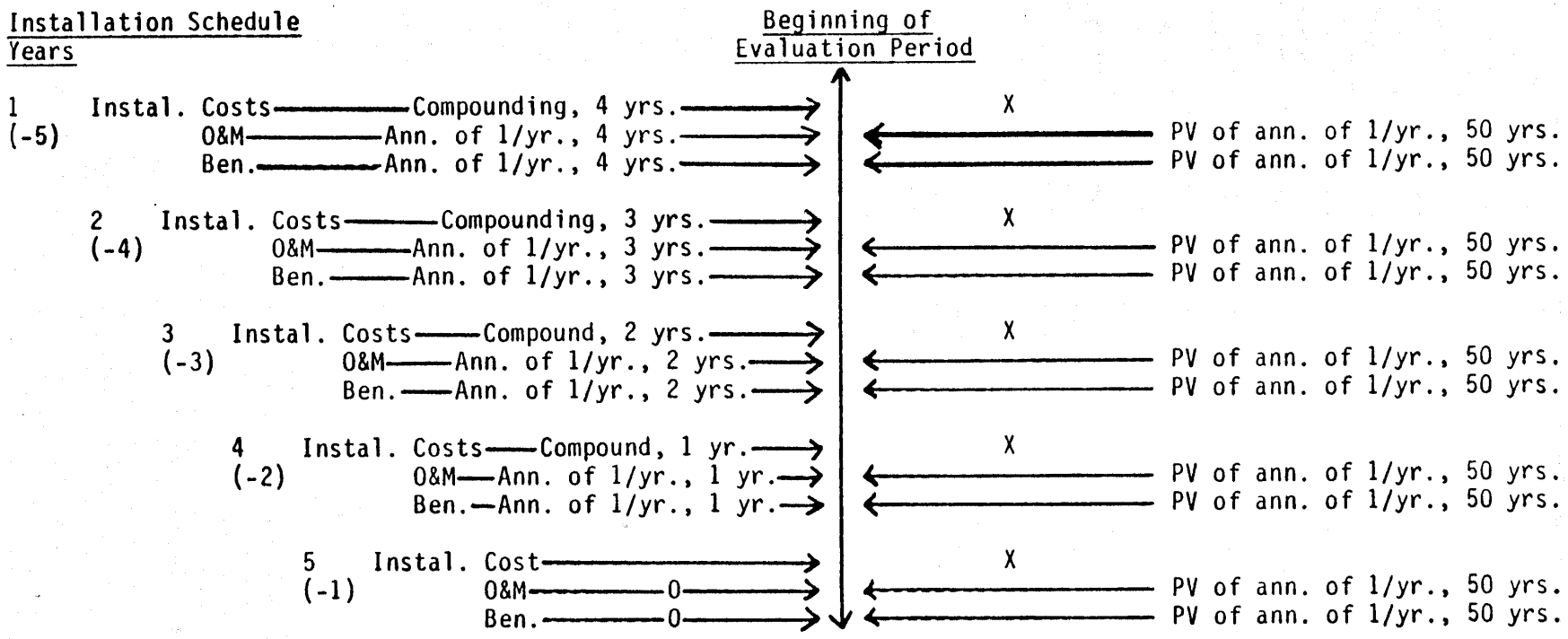
FLOOD PREVENTION

1	*3-A	225,000 X 1.31693 1/ =	296,300
		6,800 X 4.44816 2/ =	30,200
		6,800 X13.58564 3/ =	92,400
		Sub total	418,900

* Multi-purpose structure

1/ Compound interest, 4 yrs.
2/ Ann. of 1/yr., 4 yrs.
3/ PV, ann. of 1/yr., 50 yrs.
4/ Compound interest, 3 yrs.
5/ Ann. of 1/yr., 3 yrs.
6/ Compound interest, 2 yrs.
7/ Ann. of 1/yr., 2 yrs.
8/ Compound interest, 1 yr.

COMPUTING BENEFITS AND COSTS AT A COMMON POINT IN TIME



FLOOD PREVENTION CONT.

2	4-B	800,000 X 1.22935[4/] =	983,500
		24,000 X 3.21882[5/] =	77,300
		24,000 X 13.58564[3/] =	326,100
		Sub total	1,386,900
	5-A	800,000 X 1.22935[4/] =	983,500
3	5-A	825,000 X 1.14758[6/] =	946,800
		48,800 X 2.07124[7/] =	101,100
		48,800 X 13.58564[3/] =	663,000
		Sub total	2,694,400
4	1-B	450,000 X 1.07125[8/] =	482,100
		13,500 X 1.00[9/] =	13,500
		13,500 X 13.58564[3/] =	183,400
		Sub total	679,000
	6-C	450,000 X 1.07125[8/] =	482,100
		13,500 X 1.00[9/] =	13,500
		13,500 X 13.58564[3/] =	183,400
		Sub total	679,000
5	4-C	400,000 X 1.00[9/] =	400,000
		12,000 X 13.58564[3/] =	163,000
		Sub total	563,000
	7-A	360,000 X 1.00[9/] =	360,000
		10,800 X 13.58564[4/] =	146,700
		Sub total	506,700

RECREATION

1	*3-A	225,000 X 1.31693[1/] =	296,300
		6,800 X 4.44816[2/] =	30,200
		6,800 X 13.58564[3/] =	92,400
		Sub total	418,900
4	*Facilities	300,000 X 1.07125[8/] =	321,400
		9,000 X 1.00[9/] =	9,000
		9,000 X 13.58564[3/] =	122,300
		Sub total	452,700
		Grand total	7,799,500

Present Value Benefits (beginning of evaluation period)

		Flood Prevention		
1	*3-A	24,800 X 4.44816[2/]	=	110,300
		24,800 X 13.58564[3/]	=	336,900
		Sub total		447,200
2	4-B	88,300 X 3.21882[5/]	=	284,200
		88,300 X 13.58564[3/]	=	1,199,600
		Sub total		1,483,800
3	5-A	179,300 X 2.07124[7/]	=	371,400
		179,300 X 13.58564[3/]	=	2,435,900
		Sub total		2,807,300
4	1-B	49,700 X 1.00[9/]	=	49,700
		49,700 X 13.58564[3/]	=	675,200
		Sub total		724,900
	6-C	49,700 X 1.00[9/]	=	49,700
		49,700 X 13.58564[3/]	=	675,200
		Sub total		724,900
5	4-C	44,200 X 13.58564[3/]	=	600,500
		Sub total		600,500
	7-A	39,700 X 13.58564[3/]	=	539,300
		Sub total		539,300
		Recreation		
4	*Facilities	57,900 X 1.00[9/]	=	57,900
		57,900 X 13.58564[3/]	=	786,600
				844,500
		Grand Total		8,172,400

Present Value--Benefits = $8,172,400

Present Value--Costs = $7,799,500

TABLE 4

STRUCTURE	AMORTIZED COSTS 1/	OM&R	AVERAGE ANNUAL
7 structures and facilities	408,600 2/	165,400 3/	574,000
TOTAL	408,600	165,400	574,000

1/ Amortized at 7 1/8% for 50 years.
2/ Includes $52,700 for interest on costs incurred during installation period.
3/ Includes $20,200 for interest on costs incurred during installation period.

TABLE 6

AVERAGE ANNUAL BENEFITS

STRUCTURE	FLOOD PREVENTION	RECREATION	TOTAL
7 structures and facilities	539,300 1/	57,900 ~~62,200~~ 2/	601,500
TOTAL	539,300	62,200	597,200 601,500

1/ Includes $63,600 for interest on benefits accruing during installation period.
2/ Includes $4,300 ~~for interest on benefits accruing during installation period~~.

AVERAGE ANNUAL COSTS	BENEFIT COST RATIO	NET BENEFITS
574,000 3/	1.05:1	27,500
TOTAL 574,000	1.05:1	27,500

3/ From TABLE 4.