4-1. Summary

Although shoreline damage curves presented above appear to impose significant economic, environmental and social costs when they are reduced to an annual basis, their impact is small due to the infrequency of extreme lake level fluctuations.[3/]

This annual damage is further reduced in significance when it is weighted for seasonality as much of the impact of low water levels would occur in the winter and spring, while freshet levels occur in early summer. The socio-economic implications of a recurrence of a prolonged drought will be difficult to assess and should be discussed with the public through the public involvement programme.

4-2 OSOYOOS LAKE

The results for Osoyoos Lake only include damage that would result from high water levels, up to two feet above 912 feet. As mentioned in the Preface, as a result of this year's flooding, a more comprehensive analysis of actual and potential flood damage up to 918 feet will be undertaken this summer and presented in a later report.

4-2.1 Environmental Aspects

Only two boat ramps were encountered that would suffer any damage from high water levels and such damage would not occur until one foot above high water mark of 912'(Table 12 and Figures 21 and 22).

A. ENVIRONMENTAL

OSOYOOS LAKE

a) Public Boat Ramps Inconvenienced — Cumulative

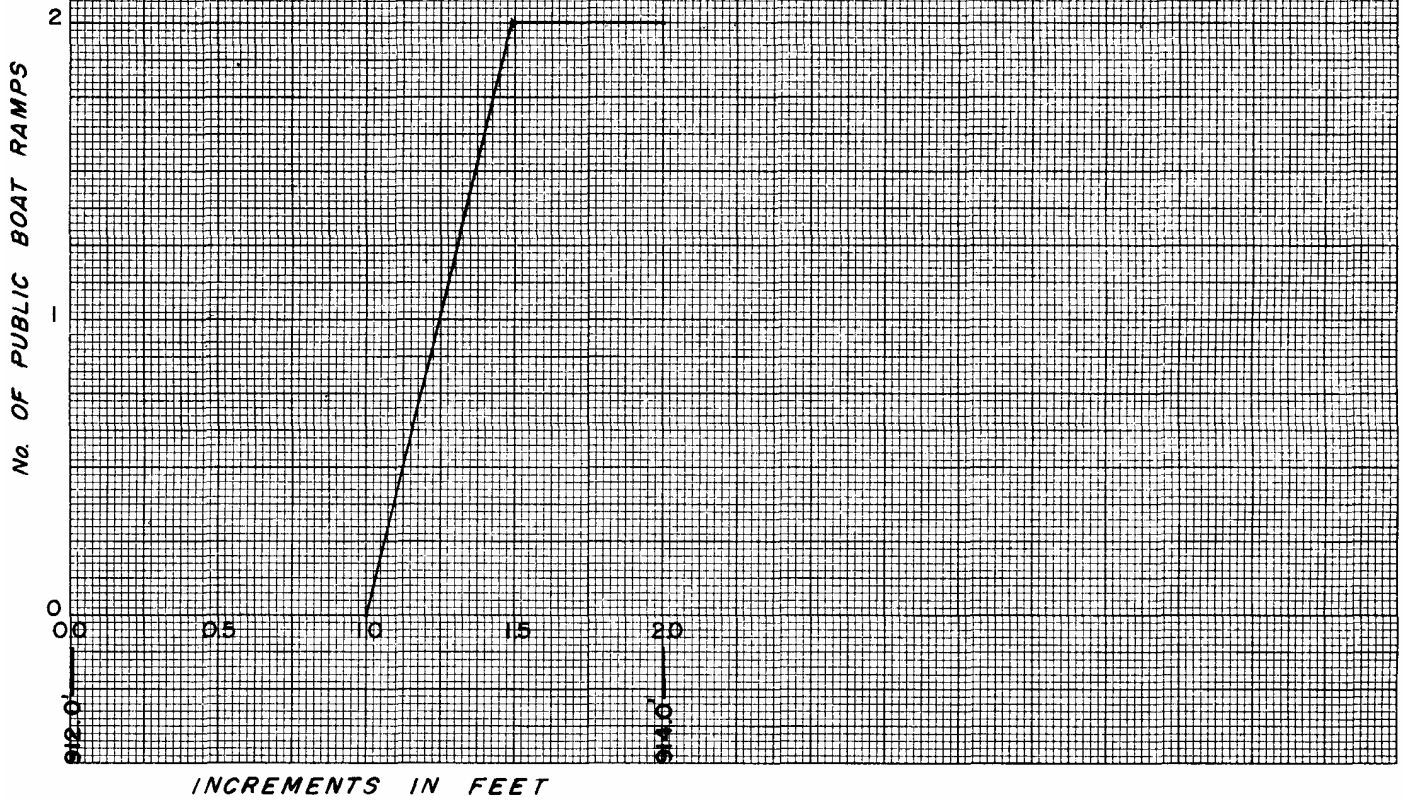

FIGURE 21

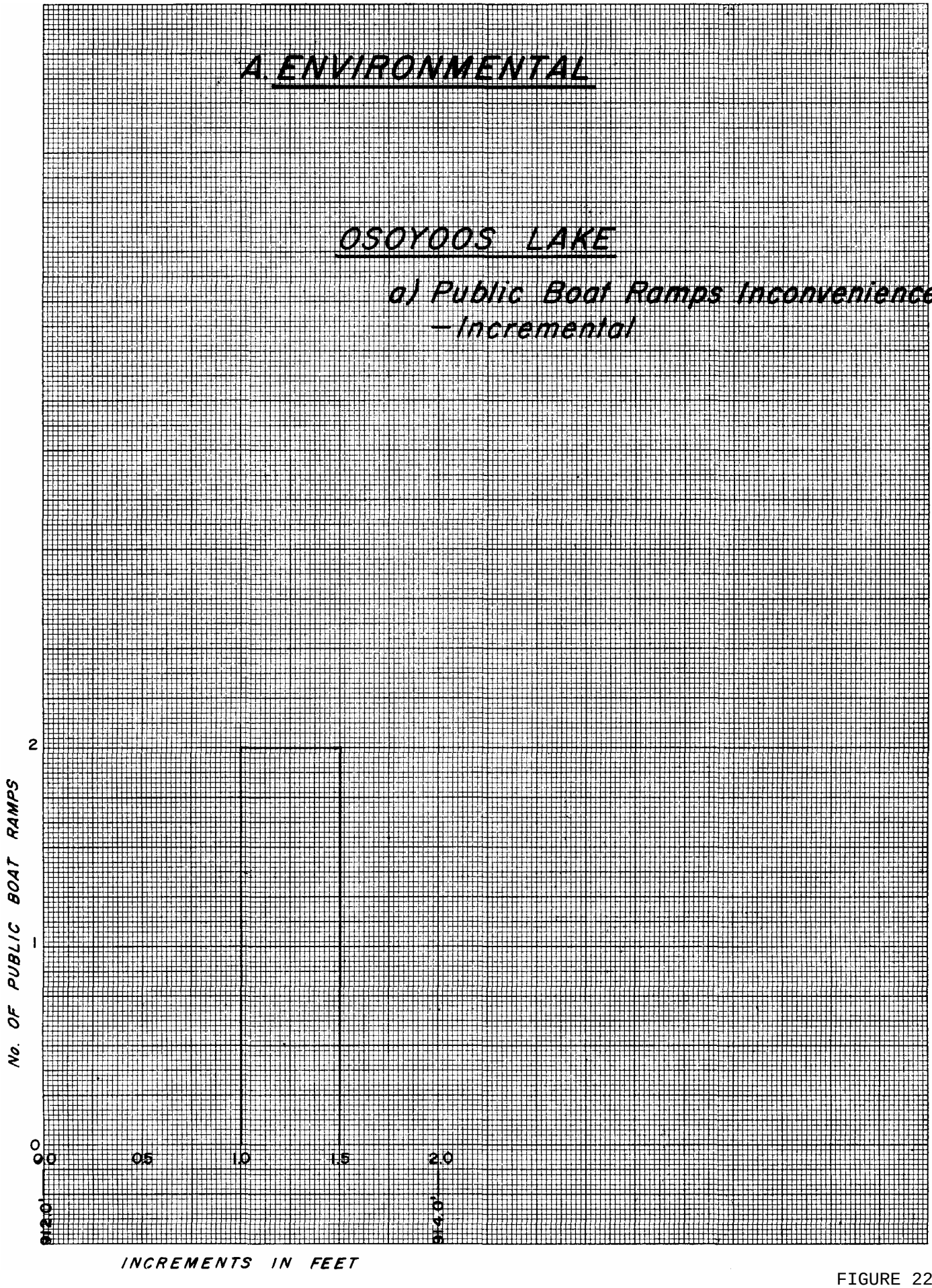
A. ENVIRONMENTAL
OSOYOOS LAKE
a) Public Boat Ramps Inconvenienced
—Incremental
No. OF PUBLIC BOAT RAMPS
2
1
0
0.0
0.5
1.0
1.5
2.0
912.0'
914.0'
INCREMENTS IN FEET

FIGURE 22

TABLE 12

PUBLIC BOAT RAMPS INCONVENIENCED (OSOYOOS LAKE)

(i) Cumulative		(ii) Incremental
Increment	No.	No.
1.5' - 2.0'	2	0
1.0' - 1.5'	2	2
0.5' - 1.0'	0	0
0.0' - 0.5'	0	0

TABLE 13

AREA OF PUBLIC RECREATION SITES FLOODED (OSOYOOS LAKE)

	(i) Cumulative		(ii) Incremental	
Increment	Sq. Ft.	Acres	Sq. Ft.	Acres
0.0'-0.5'	24,350	0.559	24,350	0.559
0.5'-1.0'	47,620	1.093	23,270	0.534
1.0'-1.5'	78,690	1.806	31,070	0.713
1.5'-2.0'	114,360	2.602	35,670	0.819

Recreation sites are quite sensitive to high lake levels, the area of inundation increasing when the lake levels rise over 913 feet (Table 13, Figures 23, 24). At a lake level of 914 feet, a total of 114,360 sq. ft. of recreation areas will be flooded which represents 73 per cent of all accessible developed recreation land around the lake (l53,200 sq. ft,). The provincial campground on the sand spit is especially sensitive to high lake levels.

A. ENVIRONMENTAL

OSOYOOS LAKE

b) Area of Public Recreation Sites Flooded

—Cumulative

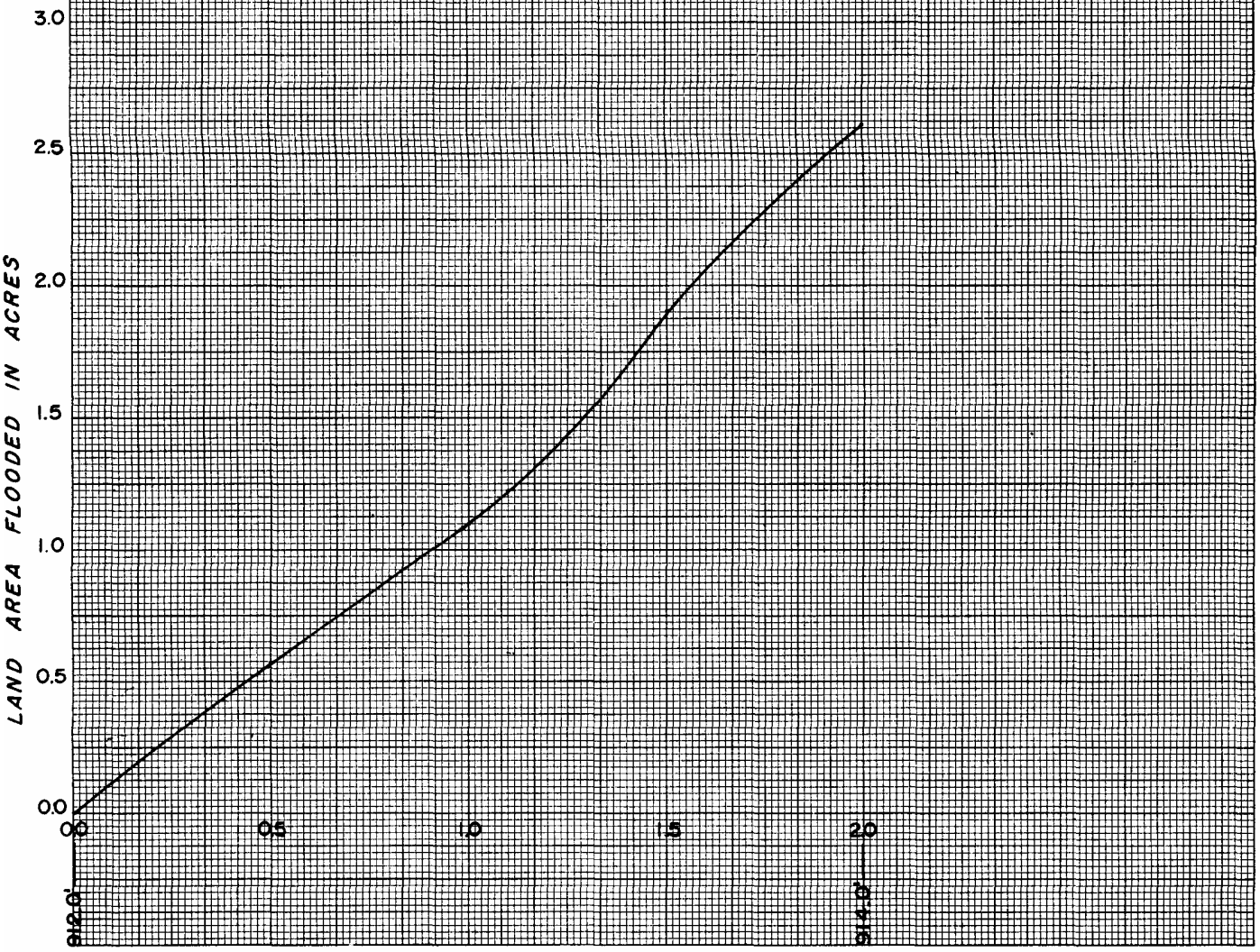

FIGURE 23

A. ENVIRONMENTAL

OSOYOOS LAKE

b) Area of Public Recreation Sites Flooded

—Incremental

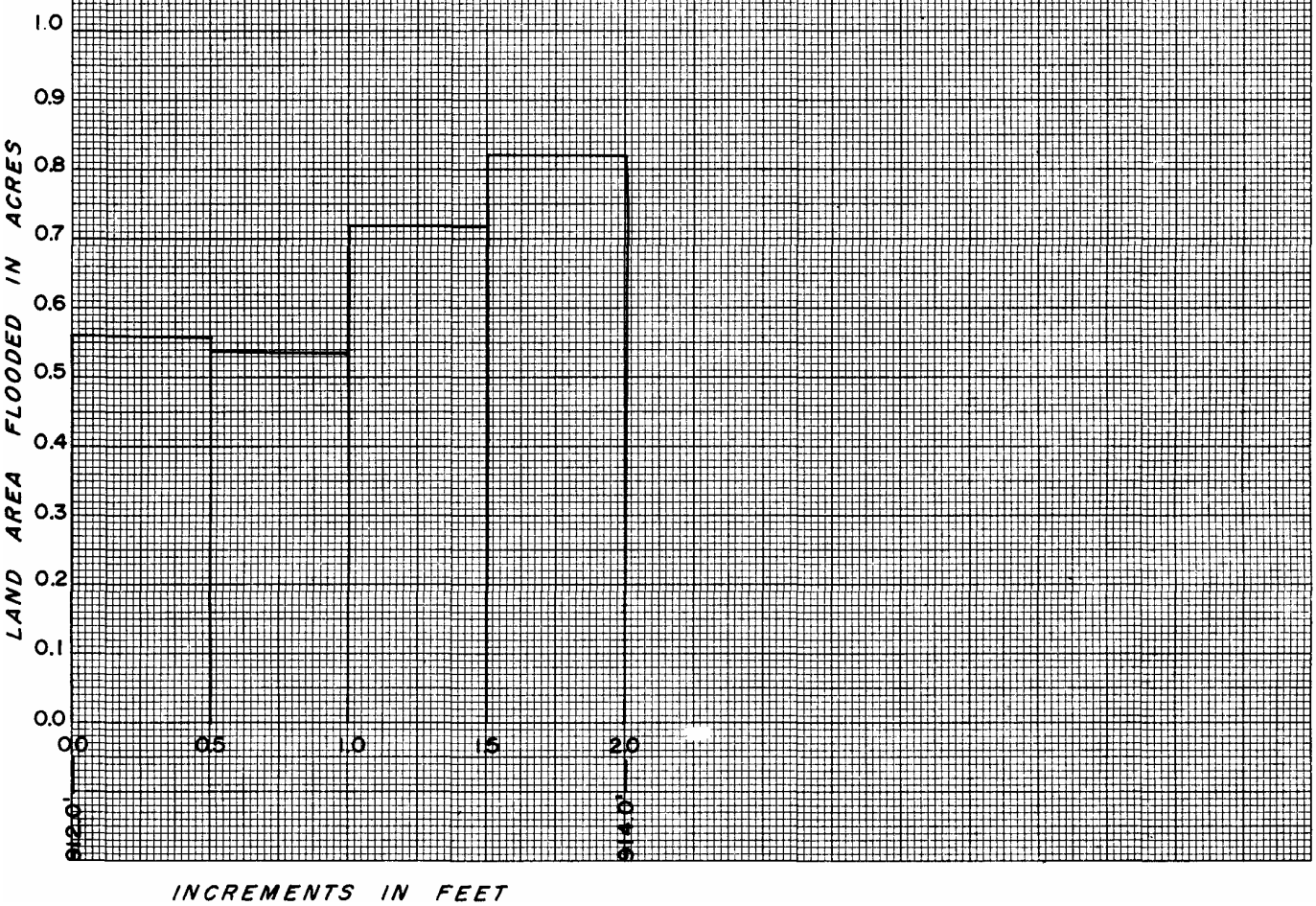

FIGURE 24

4-2.2 Social Aspects

All three categories of land use under the social objective show a marked increased sensitivity to damage when the lake levels exceed one foot above maximum (Tables 14, 15, 16 and Figures 25-30). The total damage to private land use developments however are small mainly because, at present only the western shoreline of Osoyoos lake has been developed, most of the north and east shores being Indian Reserves with little development. If the east shore was developed for summer cottages such as the north arm of Okanagan Lake, then these totals could rise sharply which suggests that land use controls close to the lake may be required if the flood damage in the future is to be minimized.

TABLE 14

AREA OF PRIVATE PROPERTY FLOODED (OSOYOOS LAKE)

	(i) Cumulative		(ii) Incremental	
Increment	Sq. Ft.	Acres	Sq. Ft.	Acres
0.0'-0.5'	132,995	3.053	132,995	3.053
0.5'-1.0'	236,770	5.435	103,775	2.382
1.0'-1.5'	411,410	9.445	174,640	4.009
1.5'-2.0'	512,740	11.771	101,330	2.326

TABLE 15

BOAT DOCKS INCONVENIENCED (OSOYOOS LAKE)

	(i) Cumulative	(ii) Incremental
Increment	No.	No.
0.0' - 0.5'	3	3
0.5' - 1.0'	5	2
1.0' - 1.5'	11	6
1.5' - 2.0'	15	4

B. SOCIAL

OSOYOOS LAKE

a) Private Property Flooded —Cumulative

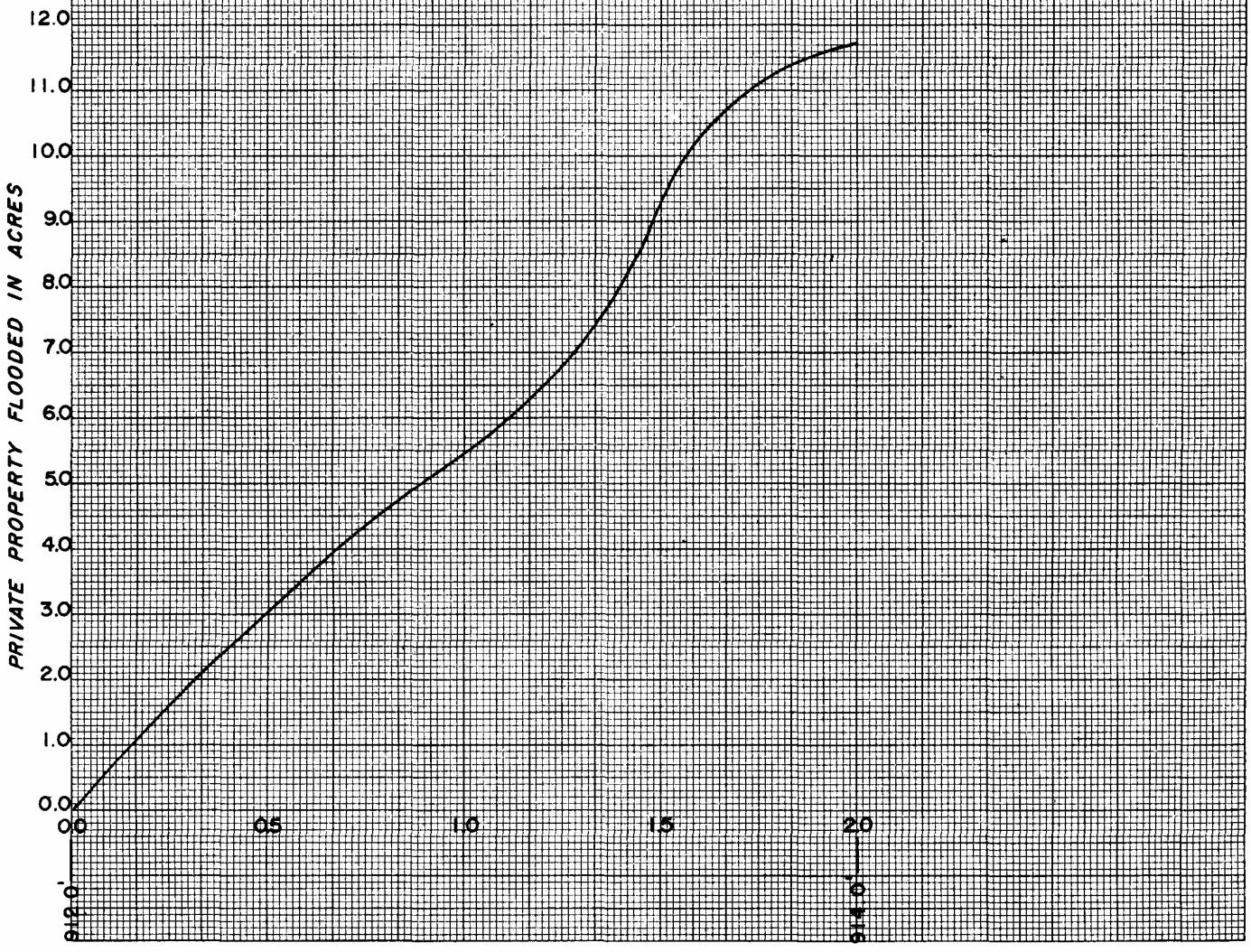

FIGURE 25

B. SOCIAL

OSOYOOS LAKE

a) Private Property Flooded – Incremental

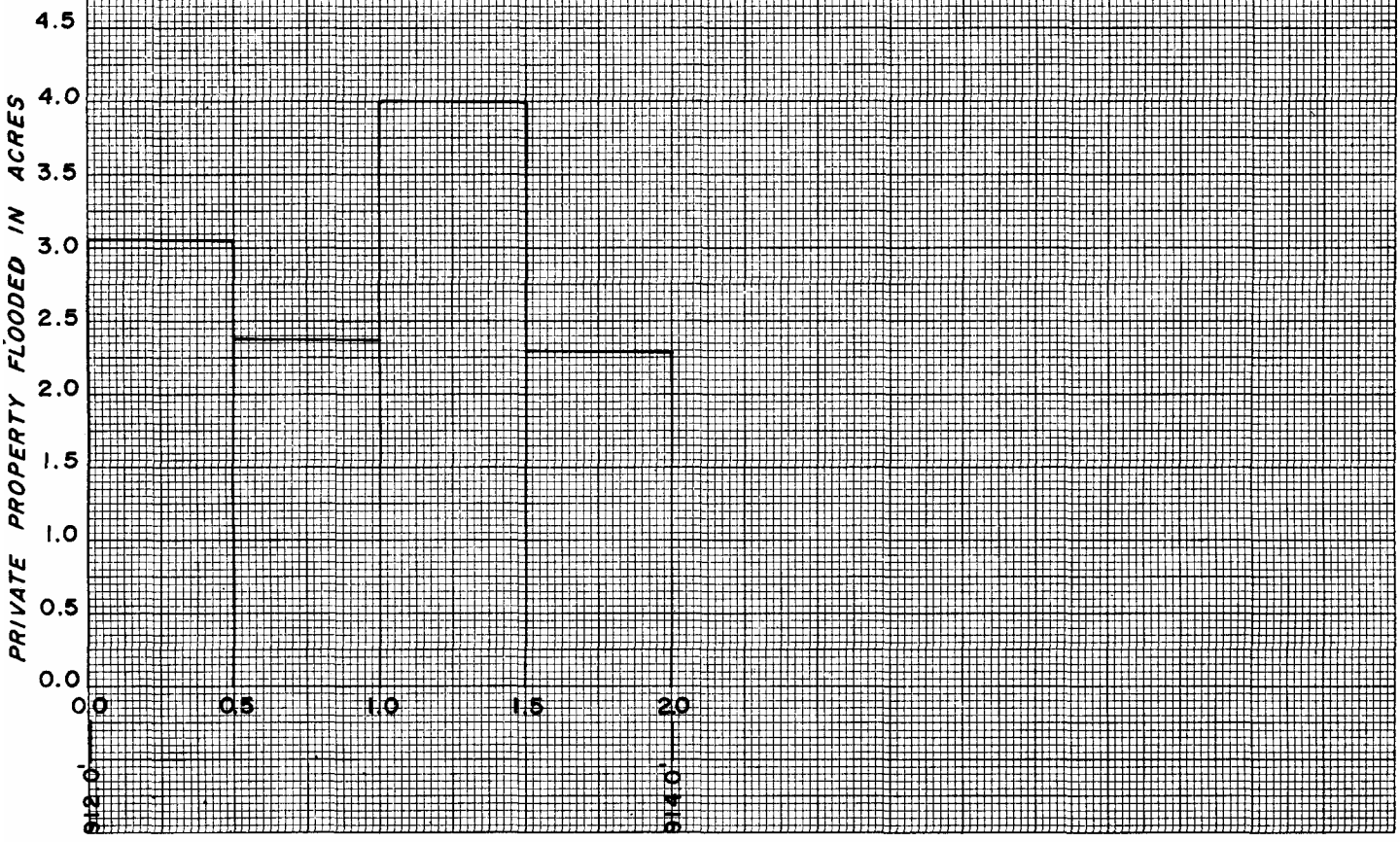

FIGURE 26

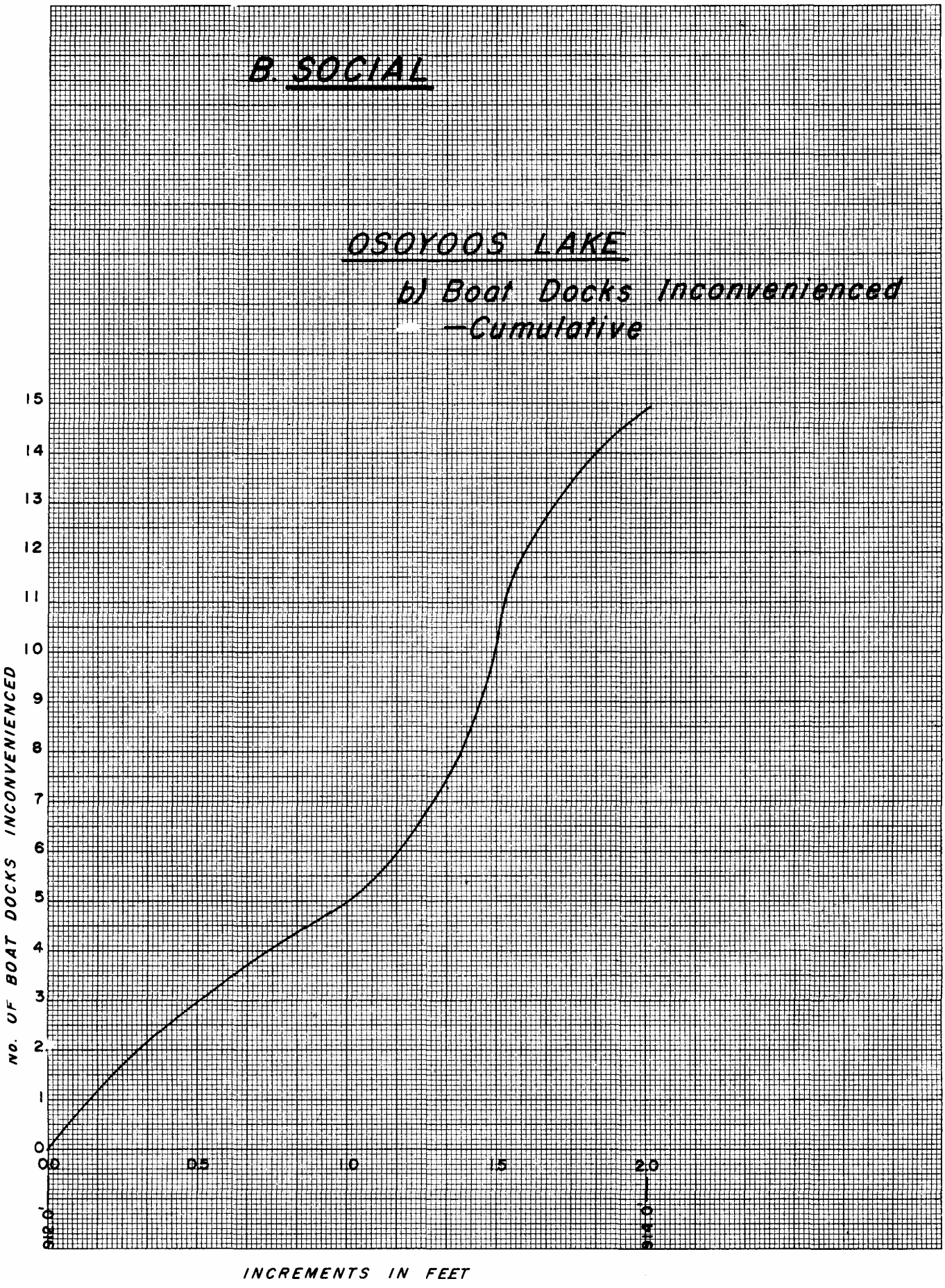
B. SOCIAL
OSOYOOS LAKE
b) Boat Docks Inconvenienced
—Cumulative
NO. OF BOAT DOCKS INCONVENIENCED
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
0.0
0.5
1.0
1.5
2.0
INCREMENTS IN FEET

FIGURE 27

B. SOCIAL

OSOYOOS LAKE

b) Boat Docks Inconvenienced —Incremental

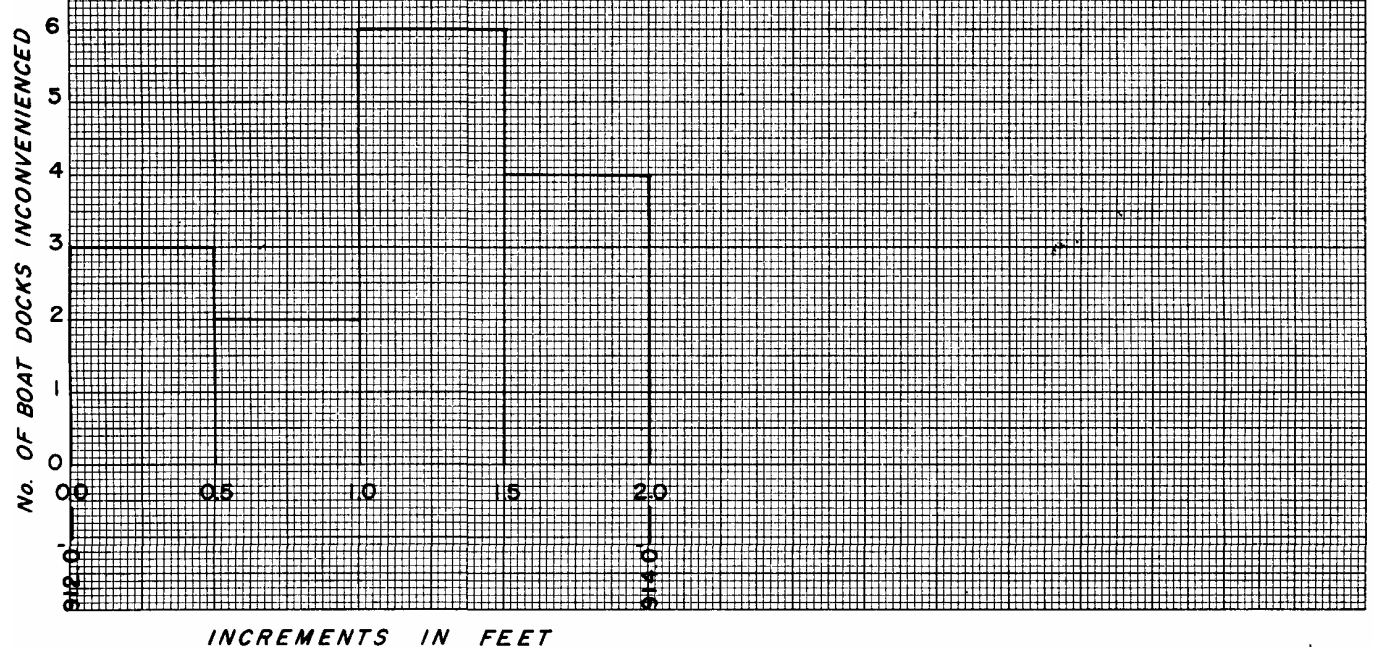

FIGURE 28

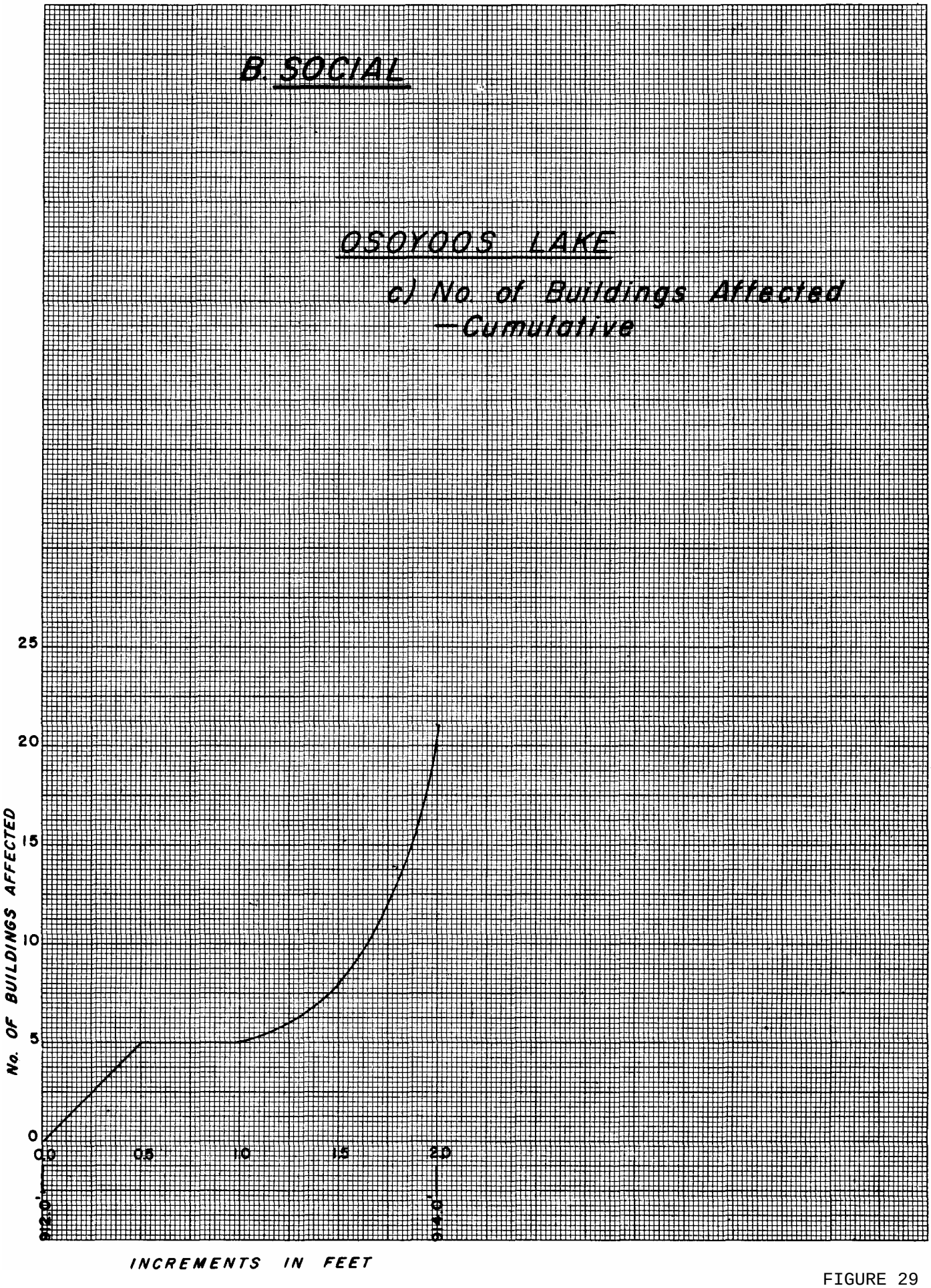
B. SOCIAL
OSOYOOS LAKE
c) No. of Buildings Affected
—Cumulative
No. OF BUILDINGS AFFECTED
25
20
15
10
5
0
0.0
0.5
1.0
1.5
2.0
912.0'
914.0'
INCREMENTS IN FEET

FIGURE 29

B. SOCIAL

OSOYOOS LAKE

c) No. of Buildings Affected — Incremental

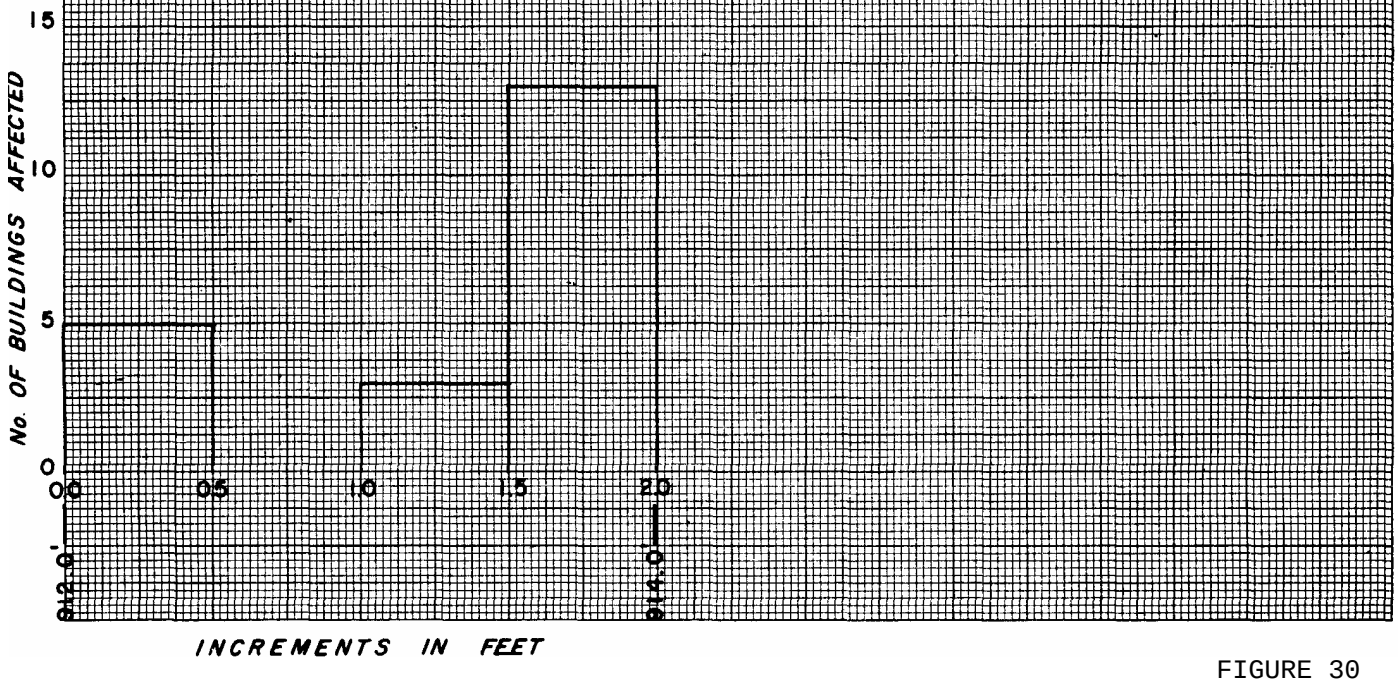

FIGURE 30

TABLE 16

NUMBER OF BUILDINGS AFFECTED (OSOYOOS LAKE)

(i) Cumulative		(ii) Incremental
Increment	No.	No.
0.0' - 0.5'	5	5
0.5' - 1.0'	5	0
1.0' - 1.5'	8	3
1.5' - 2.0'	21	13

TABLE 17

POTENTIAL DIRECT DAMAGE (OSOYOOS LAKE)

(i) Cumulative		(ii) Incremental
Increment	Damage	Damage
0.0' - 0.5'	$ 3,680	$ 3,680
0.5' - 1.0'	7,411	3,731
1.0' - 1.5'	16,965	9,554
1.5' - 2.0'	27,167	10,202

4-2.3 Economic Aspects

Direct economic damage to structures is relatively small, a total of $27,167 occurring should the lake level rise to 914 feet (Tables 17, 18 and Figures 31-36). As was the case with Okanagan lakeshore development, there is little economic damage incurred within the first foot (913 feet) but a fairly rapid increase in damage thereafter, which indicates that many property owners allow themselves a 1.0' margin above the high water mark before landscaping and developing their property.

Commercial operations such as marinas and campgrounds could suffer a substantial loss of revenue if water levels rose over the high water mark, especially campgrounds. For example, campgrounds could suffer a seasonal loss of $60,000 which would

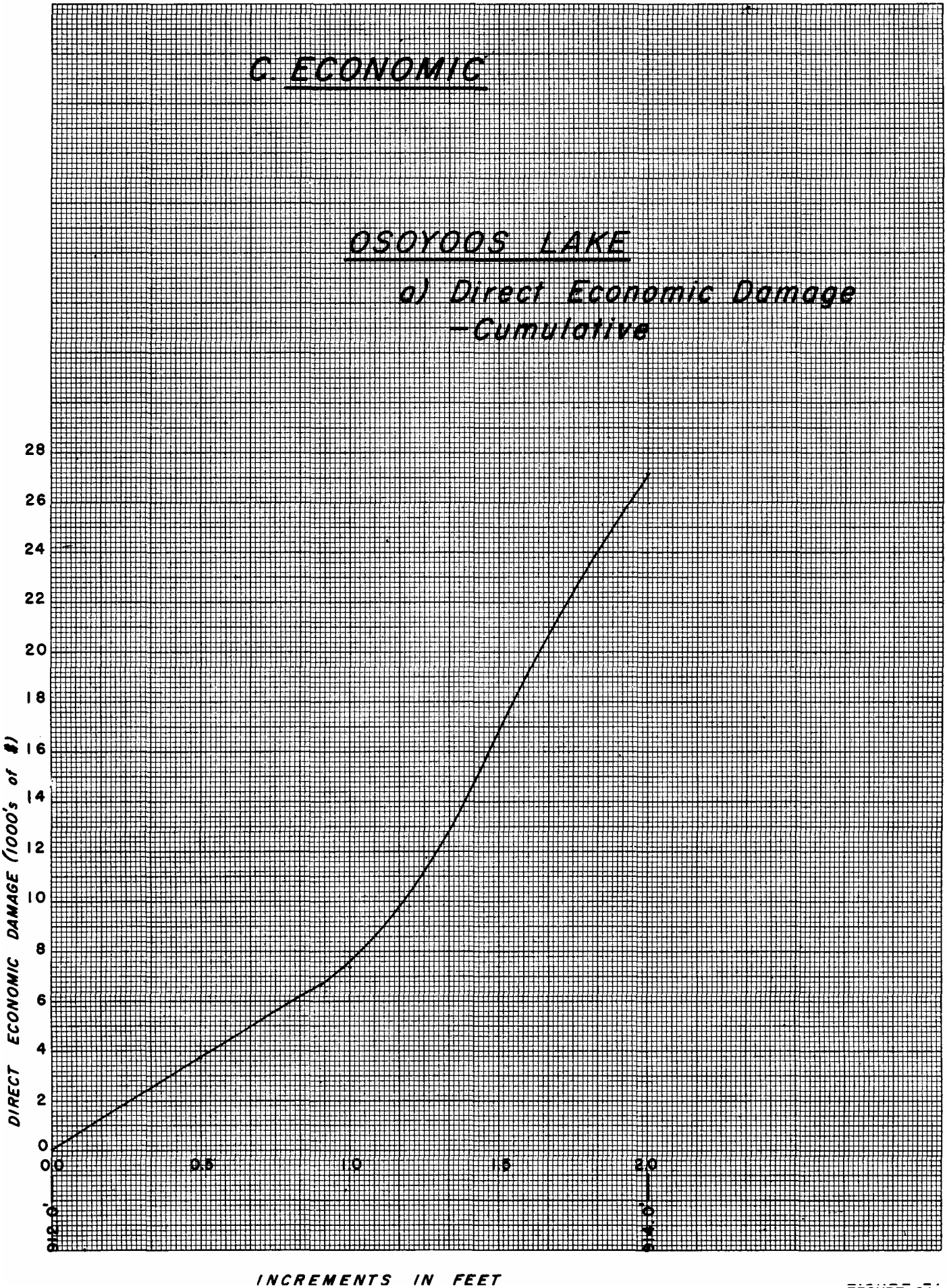
C. ECONOMIC
OSOYOOS LAKE
a) Direct Economic Damage
—Cumulative
DIRECT ECONOMIC DAMAGE (1000's of $)
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
0.0
0.5
1.0
1.5
2.0
INCREMENTS IN FEET

FIGURE 31

C. ECONOMIC

OSOYOOS LAKE

a) Direct Economic Damage -Incremental

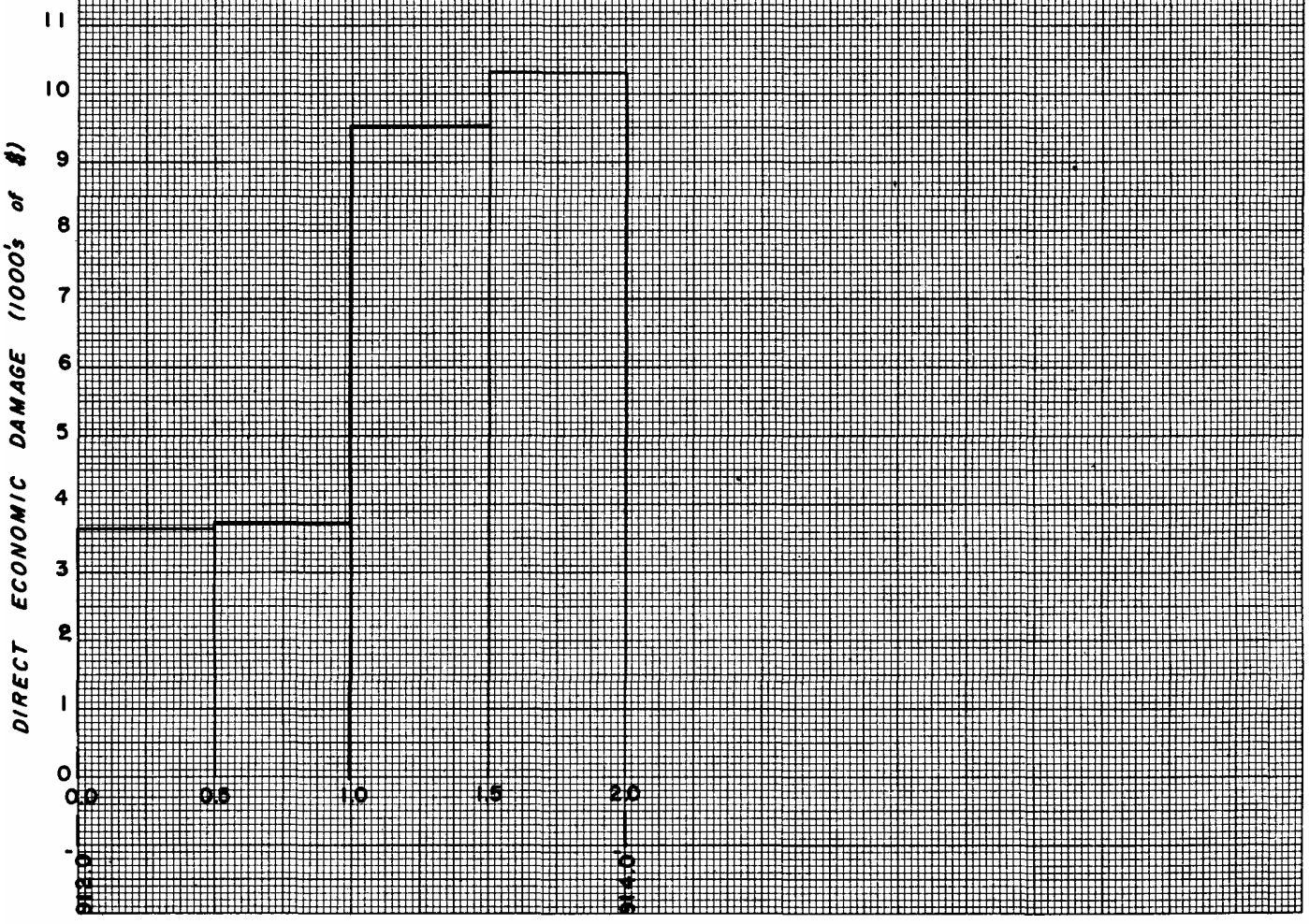

FIGURE 32

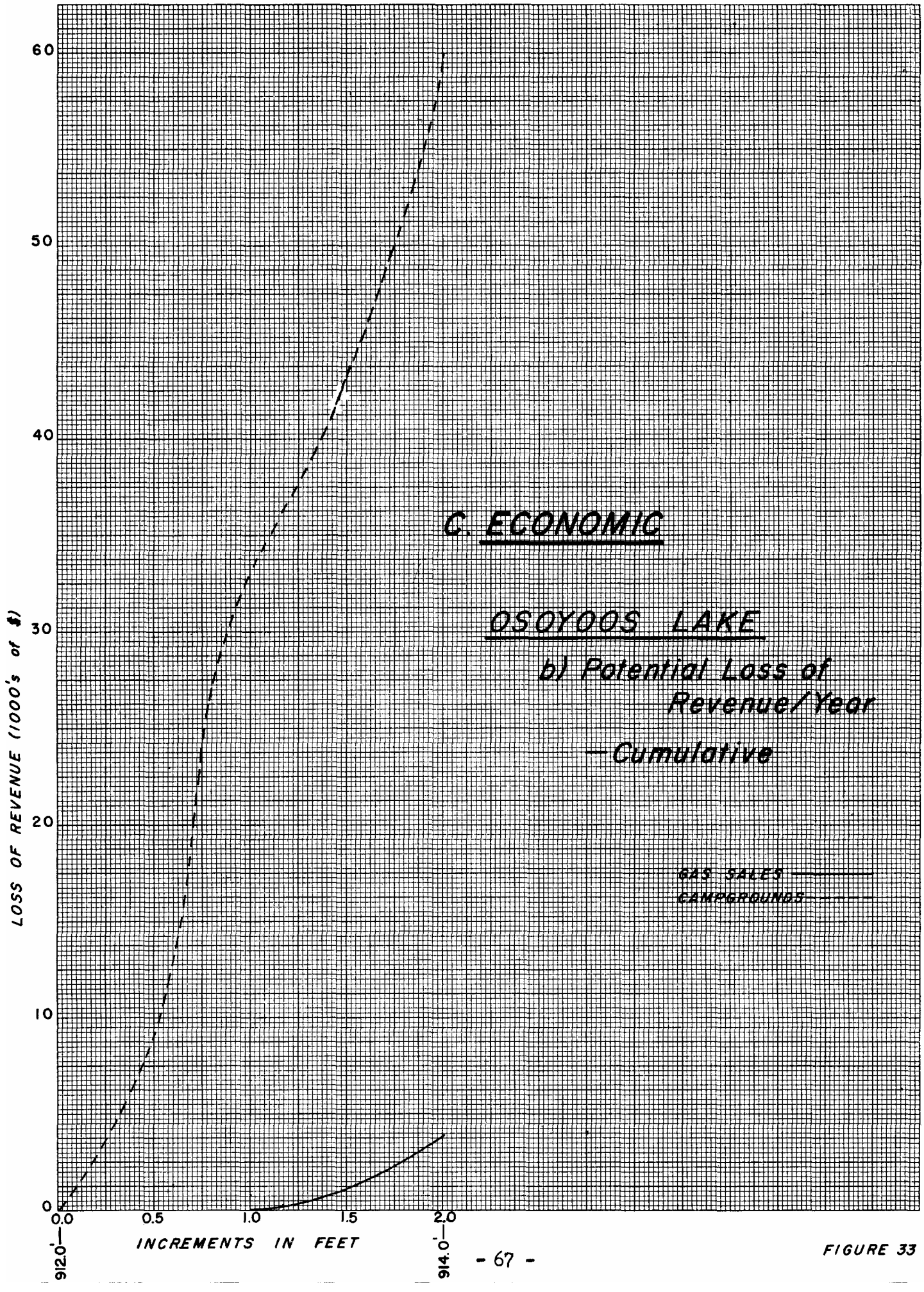
C. ECONOMIC
OSOYOOS LAKE
b) Potential Loss of Revenue/Year
—Cumulative
GAS SALES
CAMPGROUNDS
LOSS OF REVENUE (1000's of $)
60
50
40
30
20
10
0
0.0
0.5
1.0
1.5
2.0
INCREMENTS IN FEET
912.0
914.0

FIGURE 33

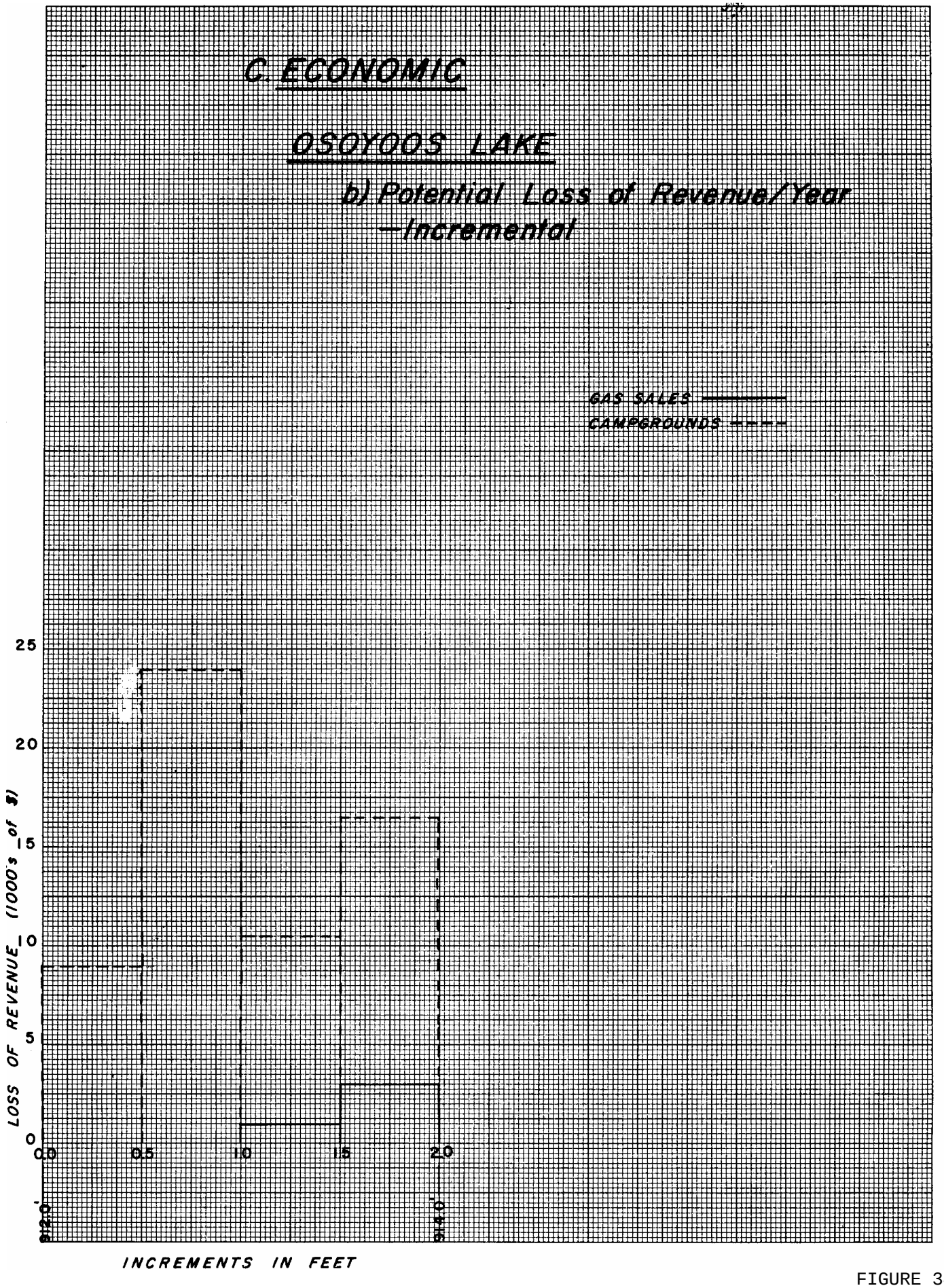
C. ECONOMIC
OSOYOOS LAKE
b) Potential Loss of Revenue/Year
—Incremental
GAS SALES
CAMPGROUNDS
LOSS OF REVENUE (1000's of $)
25
20
15
10
5
0
0.0
0.5
1.0
1.5
2.0
INCREMENTS IN FEET

FIGURE 34

C. ECONOMIC

OSOYOOS LAKE

b) Potential Loss of Revenue/Month
Dock Rental
—Cumulative

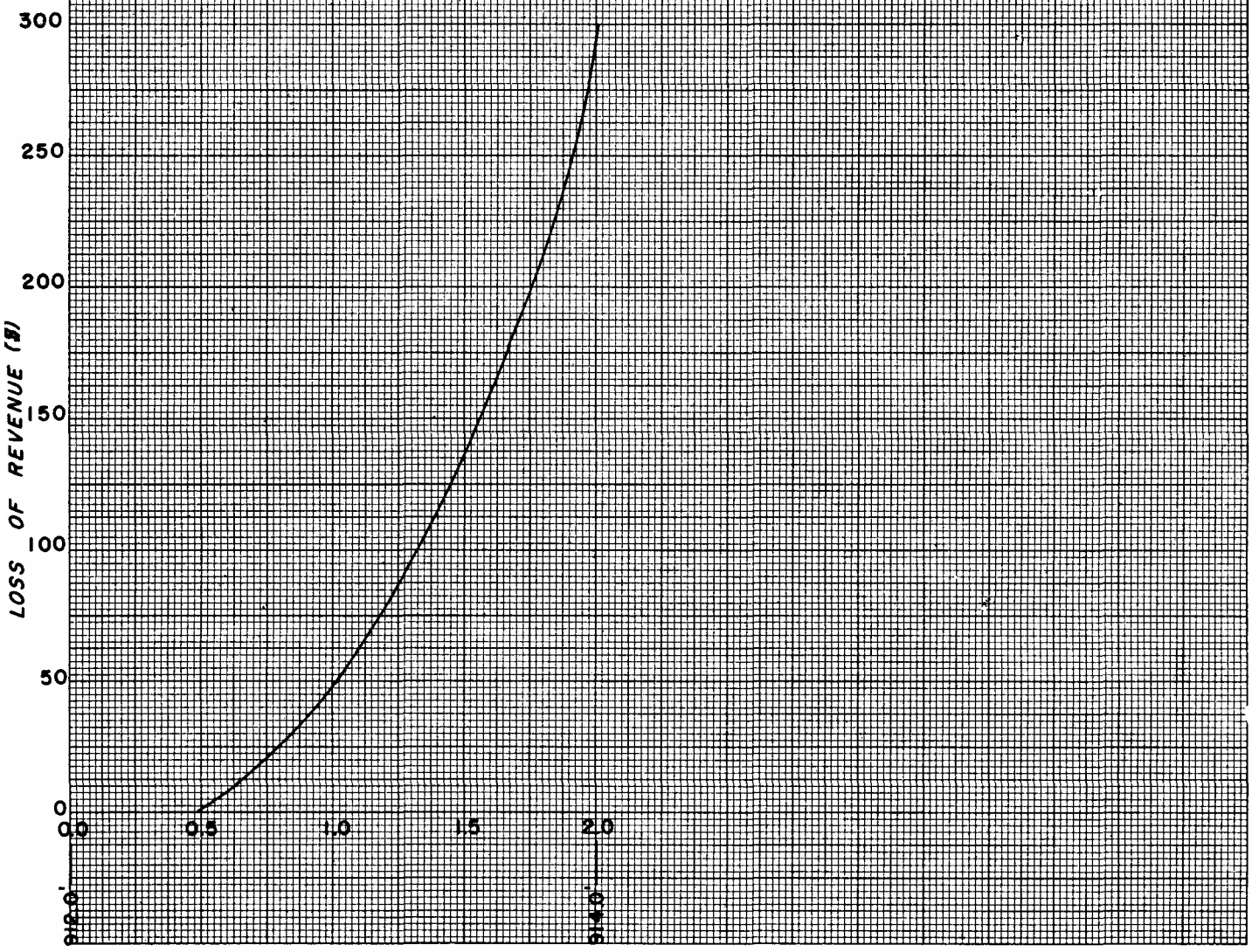

FIGURE 35

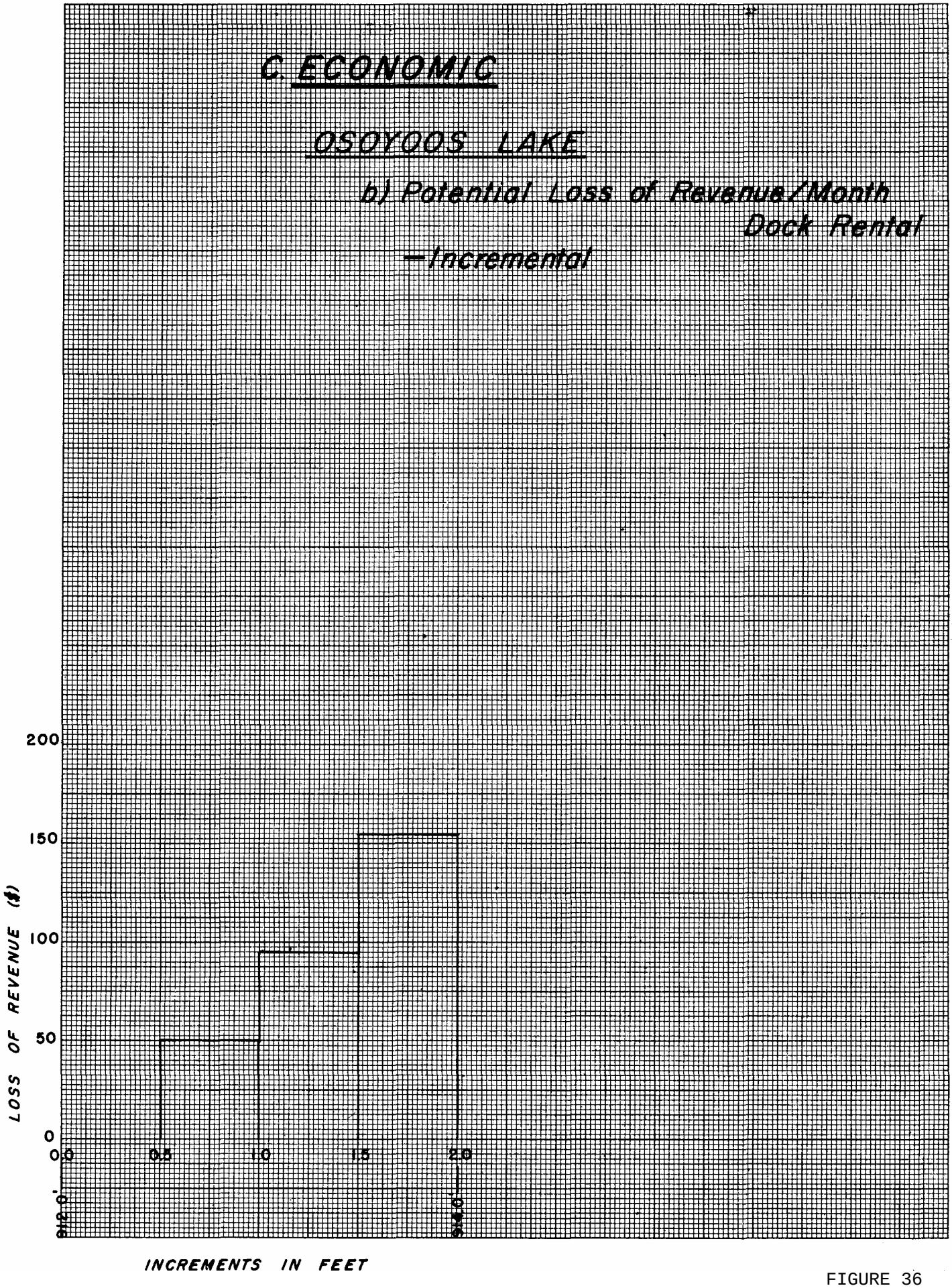
C. ECONOMIC
OSOYOOS LAKE
b) Potential Loss of Revenue/Month
Dock Rental
-Incremental
200
150
100
50
0
LOSS OF REVENUE ($)
0.0
0.5
1.0
1.5
2.0
INCREMENTS IN FEET

FIGURE 36

TABLE 18

POTENTIAL LOSS OF REVENUE (OSOYOOS LAKE

Increment	(i) Cumulative			(ii) Incremental		
	Gas Sales (Loss/Season)	Campgrounds (Loss/Season)	Boat Dock Rental (Per Month)	Gas Sales (Loss/Season)	Campgrounds (Loss/Season)	Boat Dock Rental (Per Month)
0.0' - 0.5'	$ 0	$ 9,000	$ 0	$ 0	$ 9,000	$ 0
0.5' - 1.0'	0	33,000	50	0	24,000	50
1.0' - 1.5'	1,000	43,500	140	1,000	10,500	90
1.5' - 2.0'	4,000	60,000	300	3,000	16,500	160

be a result of the campsites being flooded. Because extremely high lake levels would be expected in May-June, this economic damage should be pro-rated to these months which would reduce the economic damage to approximately $15,000.[8/] Similarly, boat rentals foregone would have to be adjusted and would perhaps total $400 for the two months when freshet occurs.

4-2.4 Summary

The impact of high lake levels on Osoyoos Lake would be relatively severe on recreation sites but appears to be small within the first foot increment for social and economic categories of land use. Because such flooding would occur in the early summer, the actual impact on recreation might be limited as beach counts indicated that there is little recreation activity until late June. There can be no doubt that many campsites are located within a flood hazard zone around the lake and operators should be informed of this fact and the probability of flooding at an early opportunity.

[8/] This assumption may be revised as a result of this summer's investigations.

CONCLUSIONS AND IMPLICATIONS

This report has discussed the methodology and results of field work associated with a shoreline survey around Okanagan and Osoyoos lakes. The purpose of the task was to inventory damage or disbenefits to shoreline land use that night occur as a result of extreme lake level fluctuations and to evaluate this damage in terms of the economic environmental and social values associated with the goals of the Okanagan Study. Results were presented in the form of stage-damage curves for each specified land use category, each curve indicating the potential damage that could occur for both high and low lake level fluctuations outside the present range.

The main findings were as follows;

1. Economic damage to shoreline property around Okanagan Lake resulting from flooding would be relatively small for the first foot above present maximum (less than $100,000) but would rise rapidly for the second foot to almost $600,000. Economic damage occurring to low lake levels would be small ($6,000) as the navigation wharves can adjust relatively cheaply. This figure does not include possible damage to the Kelowna bridge at lake levels below 1118.8 feet.

2. Social disbenefits due to loss of opportunities associated with private boat docks; private property and buildings, and environmental costs

due to loss of opportunity at public recreation sites, should be regarded as an inconvenience rather than a true cost as many short-term adjustments would be available.

3. Exposure of shoreline around Okanagan Lake at drawdowns of up to 3 feet would be greatest in the Kelowna and Okanagan Mission locales and in the Vernon Arm. Generally, exposure would be greater around developed sites than in undeveloped areas.

4. Similar conclusions apply to potential flood damage up to 2 feet above present maximum levels for Osoyoos Lake. Economic damage is small ($27,000) and social and environmental costs do not appear to be significant, with the exception of flooding of private and public campsites.

5. The results are presented in form designed to facilitate evaluation of shoreline damage around Okanagan Lake for 22 operational alternatives modelled by U.B.C. in connection with Task 23, O'Riordan, 1971 (b).

6. These damage data do not include seepage problems associated with high water levels. Such seepage gives rise to two problems. Firstly, reports indicated that septic tanks did not function properly with high water tables, and not only was this a personal inconvenience to the householder,

but in cases of high density development such as trailer courts, it apparently gave rise to water pollution and odour problems. Secondly, in some low-lying areas, houses with basements or crawl-spaces experience actual flooding when the lake level was above 1123.5 feet during the summer of 1971. Neither of these problems was analysed in this report due to logistical constraints, but may require further study.

7. Damage potential was relatively large on Indian Reserves, particularly those in the North Arm of Okanagan Lake. Sub-division of foreshore for summer cottages developments has occurred without any apparent controls and because lake levels have not risen above 1123.5 feet in recent years, encroachment below the maximum levels has taken place.

5-1 IMPLICATIONS

1. Although the general data indicates that little damage is incurred within the first 6-inch increment above maximum water levels on Okanagan Lake (1123.8 to 1124.3 feet), a number of recent sub-divisions have been developed close to this maximum level. The most likely reason for this trend is the fact that, since the Okanagan Flood Control Project was built in the mid-1950s, the maximum level of Okanagan Lake has been maintained below 1123.5 feet whereas,

before this date, levels of 1123.8 feet and above had occurred. Consequently, development has encroached onto the lakeshore as evidenced by septic tank problems and flooded basements when the lake rises to within a few inches of its maximum.

There is a real danger that potential storage on the lake will be foregone if this trend continues. At present, operators of the Penticton Dam are reluctant to allow the lake to rise above 1123.3 feet, partly due to the uncertainty of a heavy rainfall that could raise the lake over its agreed maximum and partly due to the inconvenience resulting from levels above 1123.5 feet. Consequently, one-half foot of potential storage or approximately 40,000 acre feet is foregone. Tight land use controls, particularly with regard to basement developments and septic tanks in all areas of the lakeshore including Indian lands, should be instituted so that such encroachment is prevented and the maximum storage potential can be realised.

2. A number of trailer courts have recently developed close to the Okanagan lakeshore, an example being the trailer court north of the Penticton Dam, and at high water their septic tanks do not work properly. It would appear that density standards should be set or developments restricted to areas served by adequate sewerage facilities.

3. The amount of public land adjacent to the lake shore for public recreational purposes appears very limited indeed in view of the economic forecasts for the Okanagan basin for resident population and tourist growth, (B.C. Dept. Industrial Development, Trade and Commerce, 1971). It is suggested that the Okanagan Study should include within the shoreline survey programme, a study of land use tenure patterns and land use capability so that water and related land use management alternatives can be evaluated for different growth patterns on the shoreline with regard to public recreation potential.

4. A recurrence of the prolonged drought of 1929-32 could under present operating conditions reduce Okanagan Lake levels below the minimum level for over 30 months. The implications of such a drawdown could have important impacts on tourism and some attempts to measure such impacts will be made this summer.

RECOMMENDATIONS

1. There appears to be a need for stricter control on shoreline development around both lakes as encroachment close to present maximum lake elevations has become evident in recent years through new residential sub-divisions, motels and trailer courts. A possible reason for such encroachment is that in the case of Okanagan lake, lake levels have not exceeded 1123.5 feet (0.3 feet below maximum elevation) since the Okanagan Flood Control Project was implemented 15 years ago. Continued encroachment, especially locating basements and septic tanks near or below high water levels could prevent maximum storage potential on Okanagan Lake from being realized without significant social costs.

2. In areas where septic tanks do not operate effectively at high water levels, such as recent trailer court developments, consideration should be given to relocation of these tanks or the construction of adequate sewage collection facilities.

3. The amount of public access to Okanagan Lake for public recreation appears very limited in view of forecasts of resident population and tourist growth presented in Task 201. It is recommended that the terms of reference associated with the shore-line survey programme should be expanded to include land tenure and landuse capability so that water and related landuse management alternatives can be evaluated with regard to public recreation potential.

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Robertson, A.R.D., 1963 "Eraser River Flood Control Benefit Study", British Columbia Water Resources Service, Department of Lands, Forests and Water Resources.

B.C. Department Industrial Development, Trade and Commerce "An Economic Study of the Okanagan-Shuswap Region, Queen's Printers, Victoria, B.C., April 1971.

APPENDICES

7-1. APPENDIX A

EXAMPLE OF INVENTORY FORM

LEGAL DESCRIPTION:

ASSESSMENT AREA:

ASSESSMENT ZONE:

CODE NO:

LAND USE:

AIR PHOTO NO:

ASSESSMENT:

DATE:

HOUSE EL._____

LAKE LEVELS		PROPERTY				STRUCTURES							COMMENTS
		WIDTH	LENGTH	AREA	DESCRIPTION	HOUSES FD.I.	HOUSES B'SMT	HOUSES MAIN	GARAGE	DOCKS	RET'N WALL	OTHER STRUCTURES	
HIGH	1125.8 2.0' 1125.3												
	1.5' 1124.8												
	1.0' 1124.3												
	0.5' 1123.8												
4' FLUCTUATION 1119.8													
LOW	0.5' 1119.3												
	1.0' 1118.8												
	1.5' 1118.3												
	2.0' 1117.8												
	2.5' 1117.3												
	3.0' 1116.8												

7-2. APPENDIX B

LAND USE TOTALS FOR OKANAGAN LAKE

OKANAGAN LAKE RESIDENTIAL LAND USE

NO. OF PROPERTIES 1303

PROPERTY DAMAGE: Cumulative Totals

Increments	Improved		Unimproved	Total
	Area	Cost	Area	Area
	Square Feet		Square Feet	Square Feet
0.5'	35,011	$ 8,752.75	753,843	788,854'
1.0'	133,785	33,451.25	1,523,801	1,657,583'
1.5'	369,152	92,288.00	2,229,961	2,599,113'
2.0'	718,960	181,740.00	2,855,385	3,574,345'

STRUCTURAL DAMAGE:

Houses - Cumulative Totals

Increments	Foundations		Basements		Main Floor	
	No.	$	No.	$	No.	$
0.5'	73	$0	0	$ 0	1	$ 560.00
1.0'	133	$0	2	$10,560.00	3	$ 5,799.00
1.5'	188	$0	9	$20,150.00	7	$ 37,935.00
2.0'	295	$0	23	$43,478.00	35	$143,225.00

Garages - Cumulative

	No.	$
0.5'	4	$1,400.00
1.0'	22	$7,700.00
1.5'	43	$15,050.00
2.0'	62	$21,700.00

Retaining Wall - Cumulative

	Length	$
0.5'	830	$ 5,810.00
1.0'	1,970	$ 13,790.00
1.5'	3,082	$ 21,574.00
2.0'	6,555	$ 45,885.00

STRUCTURAL DAMAGE:

Docks - Cumulative

High	No.
0.5'	191
1.0'	303
1.5'	417
2.0'	521
1123.8'-1119.8' Fluctuation	396

Low	No.
0.5'	455
1.0'	491
1.5'	529
2.0'	553
2.5'	567
3.0'	589

OKANAGAN LAKE

COMMERCIAL LAND USE

NO. OF PROPERTIES 45

PROPERTY DAMAGE: Cumulative Totals

Increments	Improved		Unimproved	Total
	Area	Cost - $	Area	Area
	Square Feet		Square Feet	Square Feet
0.5'	1,400	$ 350.00	250,640	252,040
1.0'	3,300	$ 825.00	389,090	392,390
1.5'	22,350	$5,587.50	559,850	582,200
2.0'	38,850	$9,712.50	765,080	803,930

STUCTURAL DAMAGE:

Buildings - Cumulative Totals

Increments	Foundations		Basements		Main Floor	
	No.	$ Cost	No.	$ Cost	No.	$ Cost
0.5'	2	$ 0	0	$ 0	2	$ 15,720.
1.0'	2	$ 0	1	$ 800	2	$ 20,200.
1.5'	5	$ 0	1	$ 800	3	$ 26,080.
2.0'	11	$ 0	1	$ 800	5	$118,406.

Garages - Cumulative

	No.	$
0.5'	0	$ 0
1.0'	0	$ 0
1.5'	1	$350
2.0'	1	$350

Retaining Wall - Cumulative

	Length	$
0.5'	0	0
1.0'	0	0
1.5'	0	0
2.0'	0	0

OKANAGAN LAKE COMMERCIAL LAND USE cont'd

STRUCTURAL DAMAGE:

Docks - Cumulative

High	No.
0.5'	24
1.0'	29
1.5'	35
2.0'	42
1123.8' - 1119.8' Fluctuation	9

Low	No.
0.5'	30
1.0'	31
1.5'	37
2.0'	64
2.5'	73
3.0'	78

OTHER DAMAGE: Potential Loss of Revenue

OKANAGAN LAKE

INDUSTRIAL LAND USE

NO. OF PROPERTIES 2

PROPERTY DAMAGE: - Cumulative Totals

Increments	Improved		Unimproved	Total
	Area	Cost	Area	Area
	Square Feet		Square Feet	Square Feet
0.5'	0'	$ 0	0	0
1.0'	0'	0	350	350
1.5'	0'	0	700	700
2.0'	0'	0	1,050	1,050

STRUCTURAL DAMAGE:

Buildings - Cumulative Totals

Increments	Foundations		Basements		Main Floor	
	No.	$ Cost	No.	$ Cost	No.	$ Cost
0.5'	0	$ 0	0	$ 0	0	$ 0
1.0'	0	0	0	0	0	0
1.5'	0	0	0	0	0	0
2.0'	0	0	0	0	0	0

EQUIPMENT DAMAGE: - Cumulative

	$ Cost
0.5'	$ 0
1.0'	0
1.5'	0
2.0'	0

Retaining Wall - Cumulative

	Length	$ Cost
0.5'	0	$ 0
1.0'	0	0
1.5'	0	0
2.0'	0	0

OKANAGAN LAKE

RECREATIONAL LAND USE

NO. OF PROPERTIES 34

AREAS COVERED - Cumulative Totals (Square Feet)

Increments	Sand	Grass	Rough Ground	Total
	Square Feet	Square Feet	Square Feet	Square Feet
0.5'	277,180	3,000	19,730	299,910
1.0'	538,765	35,600	43,790	623,555
1.5'	790,070	81,010	52,390	923,470
2.0'	1,030,410	178,200	62,580	1,271,990

Total Area of Recreation Sites (Square Feet)

Sand	-	1,709,885
Grass	-	858,300
Rough Ground	-	35,000
TOTAL		2,603,185

Retaining Wall - Damage Estimates

Increments	Length	Cost
0.5'	20'	$140
1.0'	20'	$140
1.5'	20'	$140
2.0'	20'	$140

Number of Docks Inconvenienced

High Water	No.
0.5'	13
1.0'	24
1.5'	43
2.0'	72
1123.8' - 1119.8' Fluctuation	68

Low Water	No.
0.5'	92
1.0'	105
1.5'	145
2.0'	187
2.5'	219
3.0'	224

OKANAGAN LAKE

AGRICULTURAL LAND USE

NO. OF PROPERTIES 1

PROPERTY DAMAGE - Cumulative

	Improved		Unimproved	Pasture	Orchard	Total
	Area	Cost	Area	Area	Area	Area
			Square Ft.			Square Ft.
0.5'	0	0	12,800	0	0	12,800
1.0'	0	0	25,600	0	0	25,600
1.5'	0	0	38,400	0	0	38,400
2.0'	0	0	51,200	0	0	51,200

STRUCTURAL DAMMAGE:

Buildings - Cumulative

	Foundation		Basement		Main Floor	
	No.	$ Costs	No.	$ Costs	No.	$ Cost
0.5'	0	$ 0	0	$ 0	0	$ 0
1.0'	0	0	0	0	0	0
1.5'	0	0	0	0	0	0
2.0'	1	0	0	0	0	0

OKANAGAN LAKE

TRANSPORTATIONAL LAND USE

NO. OF PROPERTIES 45

Roads Area Inundated (Square Feet)

Increments	Distance		Area	
	Gravel	Asphalt	Gravel	Asphalt
0.5'	340		19,443	
1.0'	691		47,269	
1.5'	1,131		78,250	
2.0'	1,503		103 ,357	

High Water	No.	Cost - $	Low water	No.	Cost - $
0.5'	0	0	0.5'	0	0
1.0'	0	0	1.0'	0	0
1.5'	0	0	1.5'	0	0
2.0'	0	0	2.0'	0	0
			2.5'	0	0
Fluctuation			3.0'	0	0

Property Area Inundated (Square Feet)

Increments	Improved	Unimproved	Total
		Square Feet	Square Feet
0.5'	-	1,600	1,600
1.0'	-	3,800	3,800
1.5'	-	6,000	6,000
2.0'	-	9,400	9,400

Retaining Wall Flood Damage

Increments	Length Feet	$ Cost
0.5'	0	$ 0
1.0'	0	0
1.5'	550	$3,850.00
2.0'	550	$3,850.00

7-3. APPENDIX C

LAND USE TOTALS FOR OSOYOOS LAKE

OSOYOOS LAKE

RESIDENTIAL LAND USE

NO. OF PROPERTIES: 141

PROPERTY DAMAGE: Cumulative Totals

Increments	Improved		Unimproved	Total
	Area	Cost	Area	Area
	Square Ft.		Square Ft.	Square Ft.
0.5'	13,320	$ 3,330.00	85,255	98,575
1.0'	28,245	7,061.00	146,365	174,610
1.5'	53,020	13,255.00	188,840	241,860
2.0'	81,510	20,377.50	236,630	318,140

STRUCTURAL DAMAGE:

Houses - Cumulative Totals

Increments	Foundations		Basements		Main Floor	
	No.	Cost	No.	Cost	No.	Cost
0.5'	4	0	0	0	0	0
1.0'	4	0	0	0	0	0
1.5'	6	0	0	0	0	0
2.0'	14	0	0	0	0	$14,513

Garages - Cumulative

	No.	Cost
0.5'	0	0
1.0'	0	0
1.5'	1	$ 350
2.0'	3	$1,050

Retaining Wall - Cumulative

	Length	Cost
0.5'	0	0
1.0'	0	0
1.5'	430'	$3,010
2.0'	770'	$5,390

STRUCTURAL DAMAGE:

Docks - Cumulative

High	No.
0.5'	3
1.0'	5
1.5'	11
2.0'	15

Fluctuation

OSOYOOS LAKE

COMMERCIAL LAND USE

NO. OF PROPERTIES 16

PROPERTY DAMAGE: Cumulative Totals

Increments	Improved		Unimproved	Total
	Area	Cost $	Area	Area
	Square Ft.		Square Ft.	Square Ft.
0.5'	0	0	34,420	34,420
1.0'	0	0	62,160	62,160
1.5'	0	0	169,550	169,550
2.0'	0	0	276,110	276,110

STRUCTURAL DAMAGE:

Buildings - Cumulative Totals

rements	Foundations		Basements		Main Floor	
	No.	$	No.	$	No.	$
0.5'	0	0	0	0	0	0
1.0'	0	0	0	0	0	0
1.5'	0	0	0	0	0	0
2.0'	0	0	0	0	0	0

Garages - Cumulative

	No.	Cost
0.5'	1	350
1.0'	1	350
1.5'	1	350
2.0'	1	350

Retaining Wall - Cumulative

	Length	Cost
0.5'	0	0
1.0'	0	0
1.5'	0	0
2.0'	0	0

OSOYOOS LAKE COMMERCIAL LAND USE cont'd.

STRUCTURAL DAMAGE:

Docks - Cumulative

High	No.
0.5'	0
1.0'	0
1.5'	0
2.0'	0
Fluctuation	

Low	No.
0.5'	0
1.0'	0
1.5'	0
2.0'	0
2.5'	0
3.0'	0

OTHER DAMAGE:

OSOYOOS LAKE

TRANSPORTATION LAND USE

NO. OF PROPERTIES 2

Roads Area Inundated (Square Feet)

	Distance		Area	
	Gravel	Asphalt	Gravel	Asphalt
0.5'	5	0	2,000	0
1.0'	10	0	4,000	0
1.5'	15	0	6,000	0
2.0'	15	1,600	6,000	60,000

Structures Number Affected

High	No.	Cost $
0.5'	0	0
1.0'	0	0
1.5'	0	0
2.0'	0	0

Fluctuation

OSOYOOS LAKE

INDUSTRIAL LAND USE

NO. OF PROPERTIES ____

PROPERTY DAMAGE: Comulative Totals

Increments	Improved		Unimproved	Total
	Area	Cost	Area	Area
0.5'	0	0	0	0
1.0'	0	0	0	0
1.5'	0	0	0	0
2.0'	0	0	0	0

STRUCTURAL DAMAGE:

Buildings - Cumulative Totals

Increments	Foundations		Basements		Main Floor	
	No.	$	No.	$	No.	$
0.5'	0	0	0	0	0	0
1.0'	0	0	0	0	0	0
1.5'	0	0	0	0	0	0
2.0'	0	0	0	0	0	0

Equipment Damage - Cumulative

	$
0.5'	0
1.0'	0
1.5'	0
2.0'	0

Retaining Wall - Cumulative

	Length	$
0.5'	0	0
1.0'	0	0
1.5'	0	0
2.0'	0	0

OSOYOOS LAKE

AGRICULTURAL LAND USE

NO.OF PROPERTIES ____

PROPERTY DAMAGE: - Cumulative

	Improved		Unimproved	Pasture	Orchard	Total
	Area	Cost	Area	Area	Area	Area
0.5'	0	0	0	0	0	0
1.0'	0	0	0	0	0	0
1.5'	0	0	0	0	0	0
2.0'	0	0	0	0	0	0

STRUCTURAL DAMAGE:

Buildings - Cumulative

	Foundations		Basements		Main Floor	
	No.	$ Cost	No.	$ Cost	No.	$ Cost
0.5'	0	0	0	0	0	0
1.0'	0	0	0	0	0	0
1.5'	0	0	0	0	0	0
2.0'	0	0	0	0	0	0

OSOYOOS LAKE

RECREATION LAND USE

NO. OF PROPERTIES 7

AREAS COVERED - Cumulative Totals (Square Feet)

Increments	Sand	Grass	Rough Ground	Total
	Square Ft.	Square Ft.	Square Ft.	Square Ft.
0.5'	16,950	0	7,400	24,350
1.0'	35,620	0	12,000	47,620
1.5'	62,090	0	16,600	78,690
2.0'	75,560	18,000	20,800	114,360

TOTAL AREA OF RECREATION SITES (Square Feet)

Sand	-	182,400
Grass	-	30,000
Rough Ground	-	20,800
TOTAL	-	153,300